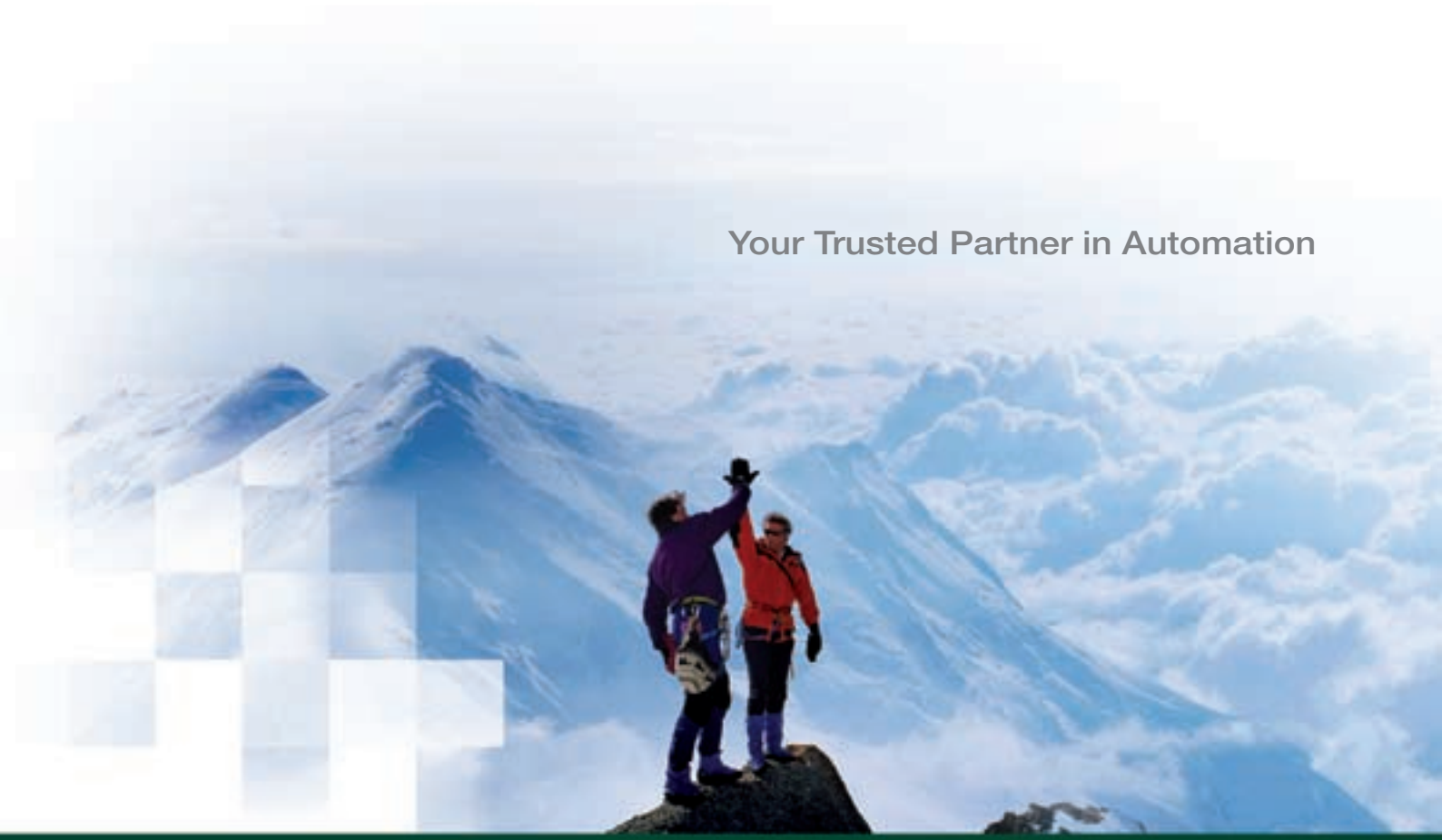
Master Catalog

Your Trusted Partner in Automation



Industrial Networking, Computing, and Automation Solutions

- Industrial Ethernet
- Industrial Wireless
- Device Connectivity
- Remote Automation
- IP Surveillance
- Industrial Computing

www.moxa.com

MOXA®

A Leader and Partner in Automation Solutions

Moxa's commitment to execution, innovation, and collaboration with our partners has fueled our transformative journey to leadership as a solution provider and partner in automation.



Moxa: Your Trusted Partner in Automation

Founded in 1987, Moxa is now one of the leading manufacturers of industrial networking, computing, and automation solutions. Moxa provides thousands of hardware and software products and draws upon 24 years of accumulated expertise. Moxa's products reflect our constant zeal for improvement, keen eye for innovation, and respect for proven solutions and expertise. We harness these qualities to create solutions that deliver a competitive edge for our customers and partners in adapting to fast-changing network and market environments.

Moxa delivers network-centric automation solutions that integrate automation and IT systems into a single network platform that simplifies management, reduces costs, and achieves greater reliability and efficiency.

Mission and Vision

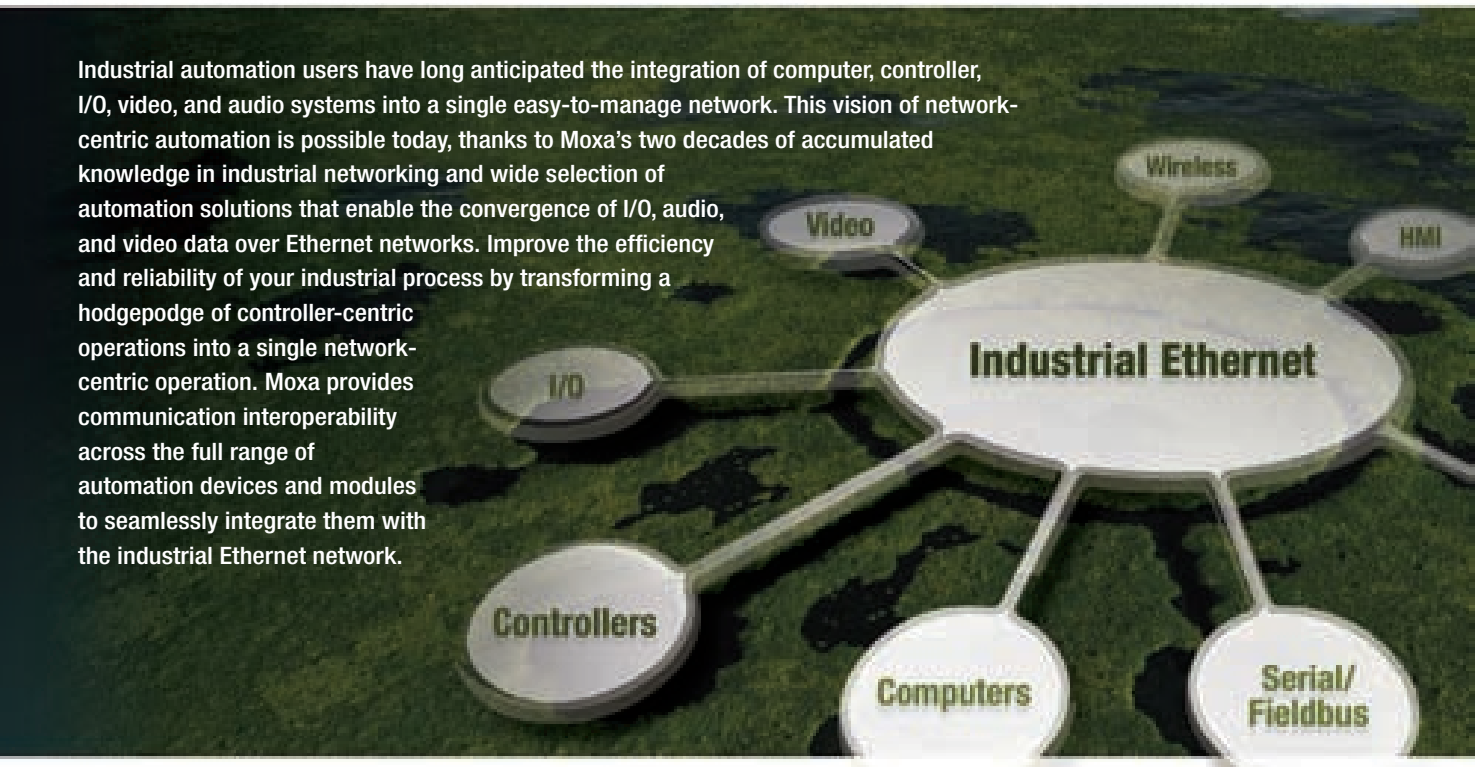
As a world-class leader and a trusted partner in industrial-grade device networking solutions for automation, Moxa proudly provides quality products and value-added service to establish win-win business relationships based on mutual trust and integrity. Moxa works closely as a team with our customers, channel-partners, and solution-partners to achieve and share success.

Delivering on Commitments

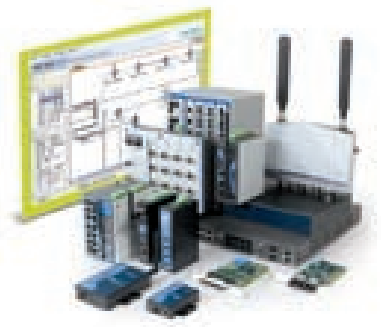
Moxa offers quick, flexible, and comprehensive R&D service to meet our customers' specific expectations and exact requirements with a talented design team experienced in networking technology and solution development. Moxa has close collaborations with our customers to drive advancements and faster time-to-market product delivery. These partnerships keep Moxa in touch with emerging technologies and ensure that new developments and successes are shared with all of Moxa's partners.

Integrating Automation by Enabling Convergence

Industrial automation users have long anticipated the integration of computer, controller, I/O, video, and audio systems into a single easy-to-manage network. This vision of network-centric automation is possible today, thanks to Moxa's two decades of accumulated knowledge in industrial networking and wide selection of automation solutions that enable the convergence of I/O, audio, and video data over Ethernet networks. Improve the efficiency and reliability of your industrial process by transforming a hodgepodge of controller-centric operations into a single network-centric operation. Moxa provides communication interoperability across the full range of automation devices and modules to seamlessly integrate them with the industrial Ethernet network.



Industrial Networking Solutions



Moxa offers a wide array of device networking products that feature open Ethernet infrastructure, industry-proven standards, extended temperature tolerance, environmental protection, and network redundancy to ensure network availability and reliability. Product lines range from industrial Ethernet switches, industrial wireless devices, serial cards, serial device servers, and embedded device servers, to USB and fieldbus components. All of our products are designed to stand up to harsh environments and are ideal for deploying mission critical applications in fields such as maritime, oil and gas, power and utilities, rail, and factory automation.

Industrial Computing Solutions



Moxa's industrial embedded solutions are used to construct powerful front-end controllers that can execute onsite data collection and control at widely distributed remote sites through industrial Ethernet or wireless backbones. All of the computers feature rugged reliability and fanless operations with a wide operating temperature range of -40 to 85°C. Our products feature a user-friendly environment that makes application development easy. Moxa provides prompt and extensive customization services in addition to a wide selection of ready-to-run products such as industrial computers, wireless computers, and wide temperature computers.

Remote Automation Solutions



Active Ethernet I/O solutions featuring intelligent I/O data transmission are the cutting edge of IP-based data acquisition and control technology. Moxa's Active Ethernet I/O and Cellular I/O solutions maximize the real-time accessibility of remote site measurement and control applications. Moxa also offers SCADA-compatible IP surveillance solutions that integrate network video monitoring to implement real-time visual management for SCADA/RTU applications. Our vast selection of automation products includes programmable automation controllers, cellular wireless I/Os, Active Ethernet I/Os, remote Ethernet I/Os, and IP-based video servers and cameras.

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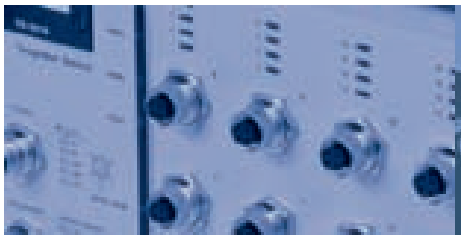
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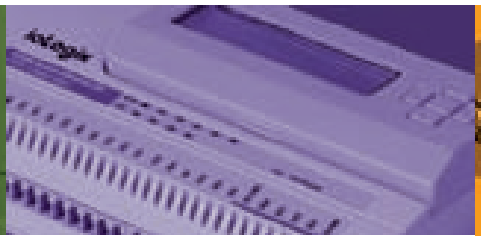
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Industrial Computing



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Complete Automation Solutions

Moxa empowers integrated network-centric operations that are more efficient, reliable, and manageable than systems that use a patchwork collection of industrial devices and modules.

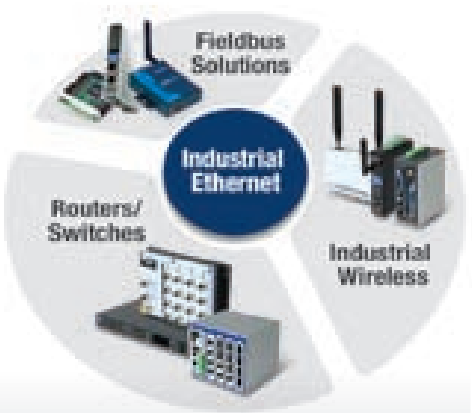
Vertical Solutions for Mission Critical Applications

Moxa provides solutions for vertical industrial markets tailored to meet industry-specific requirements and certifications, such as IEC 61850 certification for substation automation, NEMA TS2 for traffic control systems, EN50155/EN50121 for railway applications, DNV/GL for marine and offshore applications, Class I, Div 2/Zone 2 for hazardous locations, and more. We have led the way in overcoming the major challenges of developing vertical industrial solutions: interoperability, reliability, and environmental suitability. Moxa builds specific solutions consistent with industry-proven standards to operate reliably and consistently in the harshest of environments. With 24 years of combined expertise, Moxa is experienced in the integration of diverse automation infrastructures, protocols, and interfaces into one interoperable system.



Diverse Products for Complete Solutions

Moxa's diverse product line includes industrial Ethernet, serial connectivity/networking, industrial computing, and remote automation solutions. Moxa provides over a thousand different products in these four product groups to help you overcome any automation challenges. Select from Moxa's comprehensive portfolio of hardware and software solutions to find the product tailored to meet your needs. The breadth of this product line is bolstered by the depth of Moxa's technical expertise and accumulated technologies. Moxa combines these extensive products and services to provide a one-stop-shop for industrial automation solutions.



The Convergence of IT and Automation Technology

Moxa focuses on diversified information and communication technologies (ICT) that help customers build automation systems around a universal communication platform of off-the-shelf IT technology and open network communications. For ultimate efficiency, reliability and interoperability, Moxa stresses seamlessly integrated network-centric solutions. Possible solution architectures can consist of any combination of advanced Ethernet switches, industrial embedded computers, gateways, IP surveillance products, and secure terminal servers. This versatile suite of devices enables us to bring the power and flexibility of information technology to the industrial automation world and transform the way you do business.

Industrial Ethernet

- Router, Switch, Firewall, VPN, NMS
- Wireless Ethernet, GPRS, Edge, HSPDA
- IP67, M12, PoE
- Turbo Ring Redundancy, Turbo Wireless Roaming
- OPC, Industrial Ethernet Protocol Support

Turbo Ring | Turbo Chain | Turbo Roaming

Solutions



Products



Technology

Device Connectivity

- RS-232/422/485, USB, Fiber
- Serial to Ethernet
- Serial to USB
- Serial to Wifi
- Serial Boards
- USB-IF and WHQL Certifications
- ProCOM and NetEZ Technology

Industrial Computing

- RISC/x86-based Platforms
- DIN-Rail/Rackmount/Wallmount Form Factors
- Wireless LAN and Cellular Computers
- Windows and Linux Embedded Software Platforms
- Marine Computers

Remote Automation

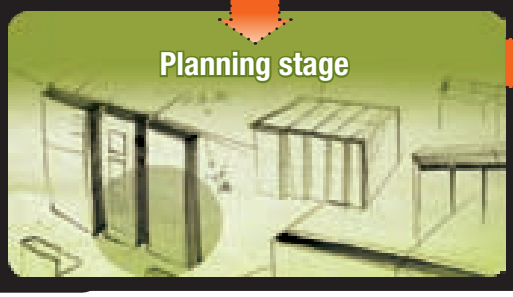
- Industrial Ethernet, Cellular I/O
- Push-based Active I/O Technology
- IEC-61131 Automation Controllers
- IP Cameras, Industrial Video/Audio Servers
- Click&Go, Active OPC Server, and Video Gadget for SCADA/RTU

New Product Development Process

How innovation and quality are integrated into our development process.

1 Use customer feedback and input to inspire new product ideas.





At Moxa, we approach every new product as an opportunity to further refine our development process and ultimately deliver a better solution to you. ISO 9001:2008 and 14001:2004 certifications confirm our commitment to quality and the environment.

2 Harness the creativity of the entire team to find innovative solutions.

The Moxa Process

Enhancing Customer Value with Every Step

Guiding Moxa's new product development process is an underlying commitment to deliver the best products possible to our customers. We consider excellence a moving target and are always adjusting our sights higher. To continually improve we constantly refine and evolve all of our processes to enhance value, verify reliability, and foster innovation.

Innovating to Maximize Customer Value

At Moxa, we foster constant innovation and creativity to fulfill our mission of finding new ways to simplify management, reduce costs, and increase operations reliability and efficiency for our customers. To achieve this we devote nearly half of our manpower to R&D. Our in-house engineering team is dedicated to developing creative solutions that improve the capabilities of our products. Recent successes include power modules that can run on extremely low power for resource-scarce environments and elegant thermal solutions for fanless wide temperature operations.

Moxa continually fine-tunes and optimizes our designs to achieve the perfect combination of cost-effectiveness and performance. We've long made it part of our culture to nurture the creativity and ambition that makes it possible to reduce costs without compromising on performance. In 1996, Moxa internally developed an ASIC chip for serial boards to eliminate the costs of outsourcing this key component. For our EDS-600 series of compact modular Ethernet switches, we improved on the efficiency of conventional case design by creating a heat-dissipating vented aluminum case. This allows us to deliver devices capable of operating in extreme temperatures at competitive prices.

Global Recognition



Engineer's Choice Award, Control Engineering Magazine

- EDR-G903 Industrial Gigabit secure router (2011)
- ToughNet TN-5518 EN50155 Ethernet switch (2010)
- W345 RISC-based wireless computer (2007)
- ioLogik E2210 Active Ethernet I/O (2006)

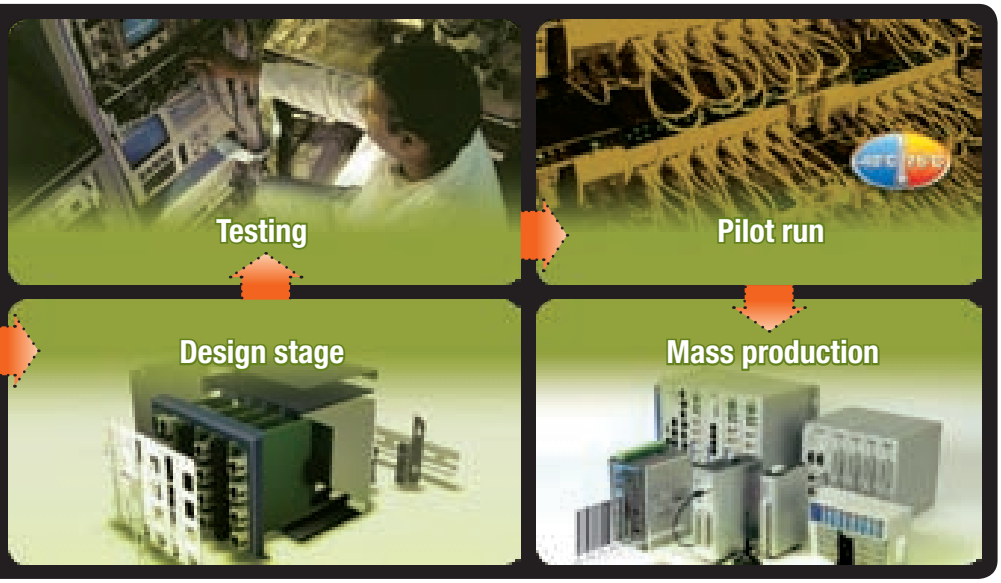


Embedded Award 2007, Embedded World Exhibition and Conference

- W315/325/345 wireless embedded computers

4 Test all functions in a simulated industrial networking environment.

5 Plan production and rigorously test product samples.

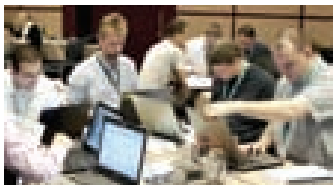


3 Explore all opportunities to improve existing solutions for greater efficiency and performance.

6 Every product is tracked, verified, and traced throughout production with a unique bar code identifier.

Service





Annual MTSC Training includes hands-on exercises.

Engineers receive MTSCs for specific product lines.

A Meticulous Commitment to Product Quality

Moxa's commitment to quality products begins from the moment they are conceived. Our quality assurance teams contribute to the very earliest planning stages of our new product development process by setting the engineering, hardware, and software testing plan of all proposed functions. These solid, tangible benchmarks are verified during the development process with a rigorous testing regimen. For example, before the pilot run, all products must pass an integrated test stage that simulates a network environment and confirms the product can succeed in real world applications. All pilot run samples of wide-temperature models run for 48 hours with eight -40 to 75°C cycles.

A consistent manufacturing process ensures that the products that go out the door conform to the specified design. Even a product designed for perfect reliability can be crippled by shoddy manufacturing. Moxa uses a barcode system to increase production efficiency, reduce errors, and deliver products on time. Each individual product serial number can be traced from initial work order to shipping, and every step in between. This production system allows us to scan and confirm the product's conformity with specifications at any stage of production.

Moxa continues to elevate and refine quality and efficiency. In 2009, we implemented "Total Quality Management" (TQM) to further channel our drive to deliver high quality, cost efficient products to users in a timely way. As a result, the production lead time of incomplete products has been reduced from 7.3 days to 6 days, and product failure rate and cost were reduced by 24%. Ultimately, Moxa realizes that excellence in industrial technology is a moving target that constantly demands higher standards to achieve. We evolve and improve our processes to persist in reaching and surpassing that goal.

Prompt and Professional Technical Service

Moxa products are a complete package that encompasses more than just the solution itself. Moxa confidently offers an exceptional 5-year warranty that includes real-time service. With offices in Taiwan, the US, Germany, India, and China, the sun never sets on Moxa's technical support network. Deployed all over the world, our technical support engineers form a global relay of on-call expertise so that your service needs can be fulfilled promptly and professionally.

Above this global service backbone, Moxa has nurtured a capable local repair network by partnering with distributors and certifying their engineers with the Moxa Technical Support Certification (MTSC) program. MTSC gives engineers the opportunity to gain hands-on experience servicing Moxa's products at three-day training programs, and then verifies their expertise with annual exams.



Trend 100 Products, SPS Magazine

- PT-7828 IEC 61850-3 rackmount Ethernet switch (2008/2009)



Product of the Year Finalist, Plant Engineering Magazine

- EDS-P308 industrial PoE switch



Good Design Award

- EDS-728 industrial Gigabit modular Ethernet switch (2008)



Red Dot Award

- EDS-619 compact modular Ethernet switch (2009)
- EDS-728 industrial Gigabit modular Ethernet switch (2008)



iF design

- ToughNet TN-5518 EN50155 Ethernet switch (2010)
- EDS-726 industrial Gigabit modular Ethernet switch (2006)
- VPort-16-M12 EN50155 IP Camera

Connect to Moxa Anytime, Anywhere

Take advantage of Moxa's professionalism and 24 years of experience in industrial automation to empower your applications and business. Our global distribution network includes branch offices in China, the United States, Europe, and the Asia Pacific region. The Moxa.com site is an additional knowledge resource that can be accessed globally at any time.



Global Sales and Service Network

Moxa has built a global network of professional sales staff to discover and fulfill customer needs. Our distributor network extends throughout the Americas, Europe, Asia Pacific, and China. For your convenience, Moxa's worldwide distribution and marketing network reaches more than 60 countries.

You can receive the highest level of support from our teams of specially trained and certified staff wherever you are in the world. Moxa's experienced and professional engineering team is ready to analyze your specific requirements and offer product and solution recommendations. Clients can also dictate detailed project specifications, testing requirements, and network architecture. In addition, all Moxa distributors are required to meet rigorous standards for quality, and technical proficiency.

www.moxa.com

A Rich Knowledge Resource



Global Online Service

You can easily find the latest product information and news about Moxa at www.moxa.com. In addition to real-time information about Moxa's products, the site is a rich resource for acquiring knowledge, technical know-how, and new solution ideas. With decades of experience in networking and industrial automation, Moxa can assist you in selecting the perfect solution for your application. Register as a site member to gain access to our library of white papers and guidebooks.

In addition to information and resources, the www.moxa.com website is a quick and convenient way to reach our technical support engineers, who stand ready to respond to your inquiries within 24 hours. You may also find answers to your questions in our FAQ section or track product RMA status online. Information is also available in German, Chinese, French, and Japanese on the respective regional websites.





Moxa Online—A Convenient Ordering Service for Sample Products

In 2009, Moxa launched Moxa Online for USA customers at store.moxa.com. Moxa Online makes it possible to conveniently order evaluation units directly from Moxa and receive them within 48 hours. This service allows you to dramatically reduce transaction costs during the testing phase of your project. Instead of being required to request a quote, wait for a response, and then put everything on hold until delivery, you can just use Moxa Online and focus on developing your project. Moxa Online customers have the added confidence of a 30-day warranty and a standard lifetime warranty in the USA, or a 5-year warranty for customized products.



Moxa Partner Zone—Exclusive News, Marketing Resources, and Sales Tools

Moxa's authorized distributors can access Partner Zone to get the latest marketing material, sales tools, and technical documents. Registered partners receive a monthly newsletter to stay current with product news. Moxa also provides integrated marketing programs and promotions to assist partners in promoting Moxa products and services.



Moxa Newsletters—Keep Your Industrial Automation Knowledge Base Up-to-date

Every month, Moxa Connection explores a new hot topic in industrial automation and networking. With Moxa Connection, you have access to insider industry know-how and can explore the optimal solutions for your specific problems. Moxa Spotlight showcases the latest Moxa products and their potential applications, so you never miss any of the exciting emerging technologies that are transforming industry. Join the over 70,000 industrial engineers who have already tapped this rich knowledge source and subscribe at www.moxa.com.

Substation Automation

IEC 61850-3
IEEE 1613

IEC61850-certified Communication Networks for Substation Automation

A reliable and intelligent network is a key success factor for modern substations that transmit and distribute electric power over large areas. Since substations are often located in areas subjected to high electromagnetic interference and extreme temperature conditions, the substation infrastructure must be capable of providing EMC protection, network redundancy, high reliability, and flexible deployment options for future upgrades.

In addition to reliability, coordination between the many standards and proprietary protocols used in substations is also a major requirement in developing power automation systems. Since Ethernet technology is used to provide better extensibility and interoperability, adherence to IEC 61850 communication standards is required to achieve compatibility between different intelligent electronic devices (IEDs).

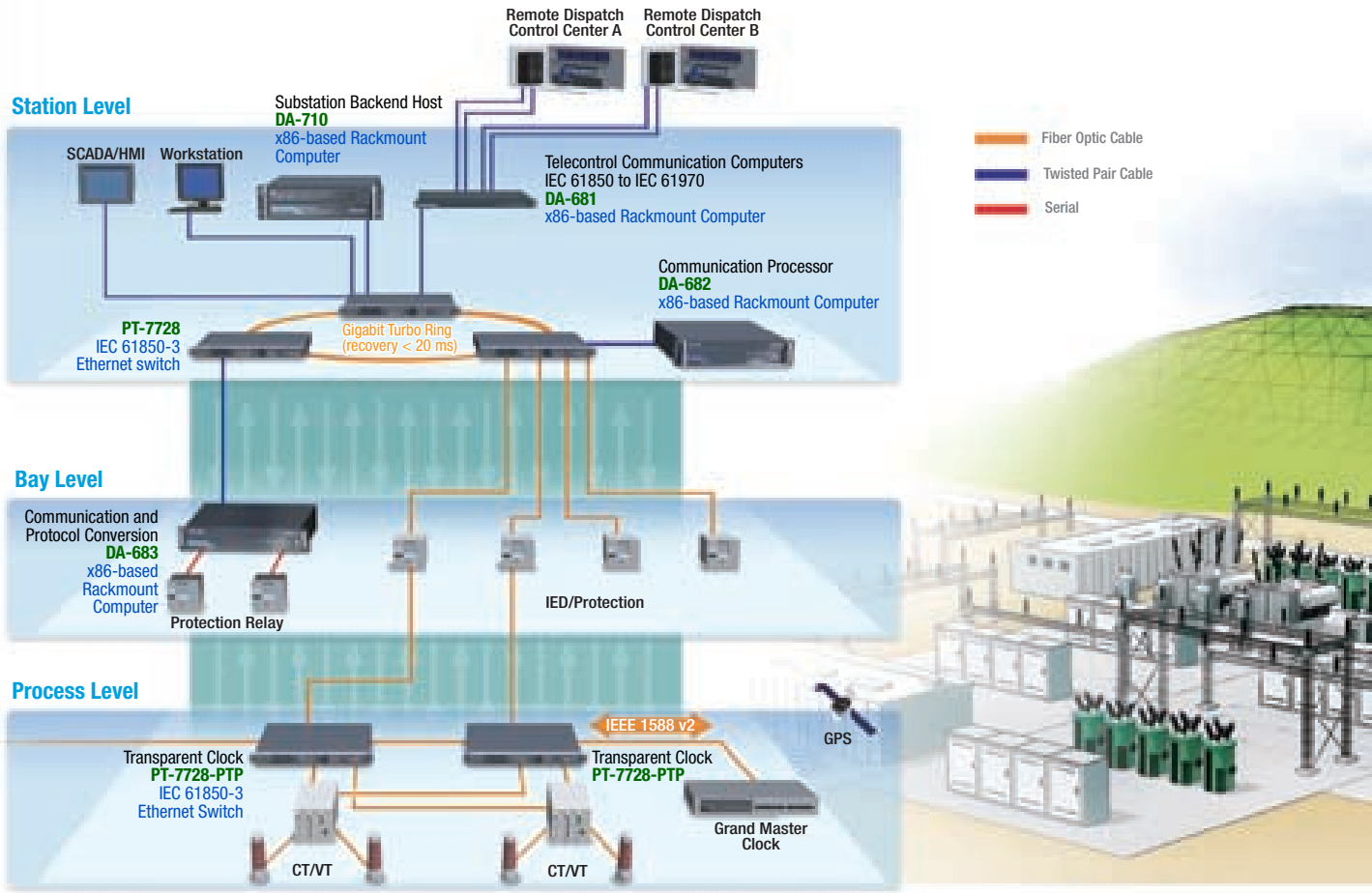
Strengths of Moxa's Industrial Networking and Computing Solutions

Facilitate Data Communication Between Legacy Devices Using Different Protocols

In front-end communication applications for power substations, the front-end processor requires many communication interfaces in order to act as a protocol gateway. Moxa's x86-based embedded computers feature multiple connection options for greater networking versatility.

Tailor-made Ethernet Switches for Substation Automation

Moxa's PowerTrans Ethernet switches are designed to withstand all of the EMI types covered by IEC 61850-3 without experiencing any communications loss. The product line has passed IEC 61850-3 and IEEE1613 certification testing conducted by KEMA. The series also supports the latest version of IEEE 1588 v2 technology to fulfill precise time synchronization requirements for protection and control applications.

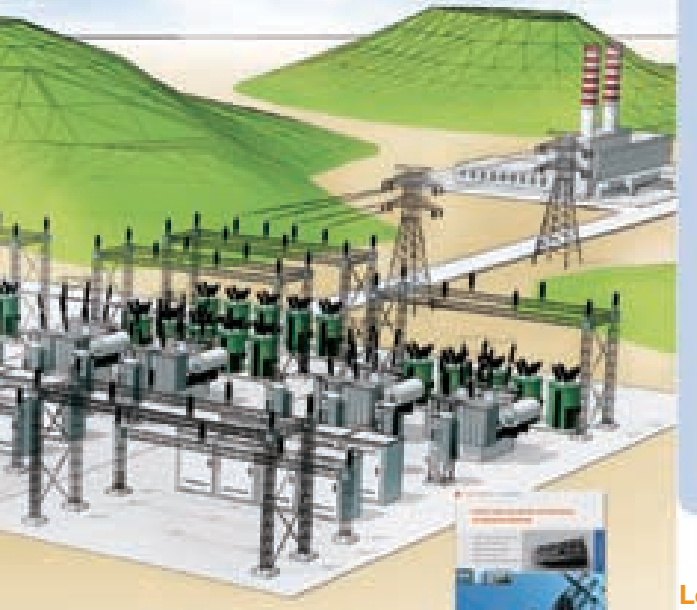


Confirmed Expertise and Trusted Partnership

- Over 300 successful substation deployments of IEC 61850 Ethernet switches and industrial embedded computers
- Satisfied customers: China State Grid, China Southern Power, Korea Southern Power, Efacec, Elkomtech

Utility-grade Design for Substation Environment

- IEC 61850/IEEE 1613 certified (KEMA tested)
- Zero-packet-loss Ethernet switches
- -40 to 85°C operating temp. (no fans)
- 20 ms network redundancy
- Cyber security





Key Products



DA-683 Series
x86-based rackmount embedded computers

- 2 PCI expansion slots for inserting expansion modules
- Intel Dual Core Atom D510 1.66GHz processor with 1 MB L2 cache
- IEC 61850-3/IEEE 1613 certified and IEEE 1588 supported

Page 17-20



PT-7728-PTP Series
IEC 61850-3 24+4G-port IEEE 1588 v2 managed Ethernet switches

- Zero packet loss under harsh EMI stress
- Hardware based IEEE 1588v2 PTP supported
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC inputs

Page 2-30



PTC-101 Series
IEC 61850-3 Ethernet-to-fiber media converters

- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- Link Fault Pass-Through (LFP)
- Power failure, port break alarm by relay output

Page 4-9



CN2600 Series
8/16-port RS-232/422/485 terminal servers with LAN redundancy

- Redundant COM function available when both LANs are active
- Dual-LAN cards with two independent MAC addresses and IP addresses
- Dual AC power inputs

Page 7-24



MGate™ MB3170/MB3270
1 and 2-port advanced serial-to-Ethernet Modbus gateways

- Configuration is exceptionally easy
- Slave mode supports 16 TCP masters and up to 62 serial slaves at the same time
- Master mode supports 32 TCP slaves at the same time
- Emergency request tunnels ensure QoS control

Page 3-11

Learn more about substation automation solutions on Moxa's website:

Visit: www.moxa.com/SubstationAutomation

Renewable Energy

A Complete Renewable Energy Solution

The move from traditional coal-fired and other fossil fuel plants to renewable energy sources is well underway and is expected to accelerate in the future. In particular, wind and solar power have been recognized as viable energy alternatives. Moxa's products have been used in a number of renewable energy applications around the world. Some typical renewable energy applications, such as wind farms, solar transportation grids, and solar tracking systems, are illustrated below.

Strengths of Moxa's Industrial Networking Solutions

Wind Power

Communication between wind turbine towers is a major issue since wind farms typically cover a vast area. Wind turbines are also prone to electrical interference, so highly reliable anti-interference protection is also required to prevent unstable transmissions and data loss. Given these circumstances, it is essential for wind farms to employ rugged networking devices with long distance transmission capability for remote monitoring in harsh environments.

Industrial-grade Reliability for Harsh Environments

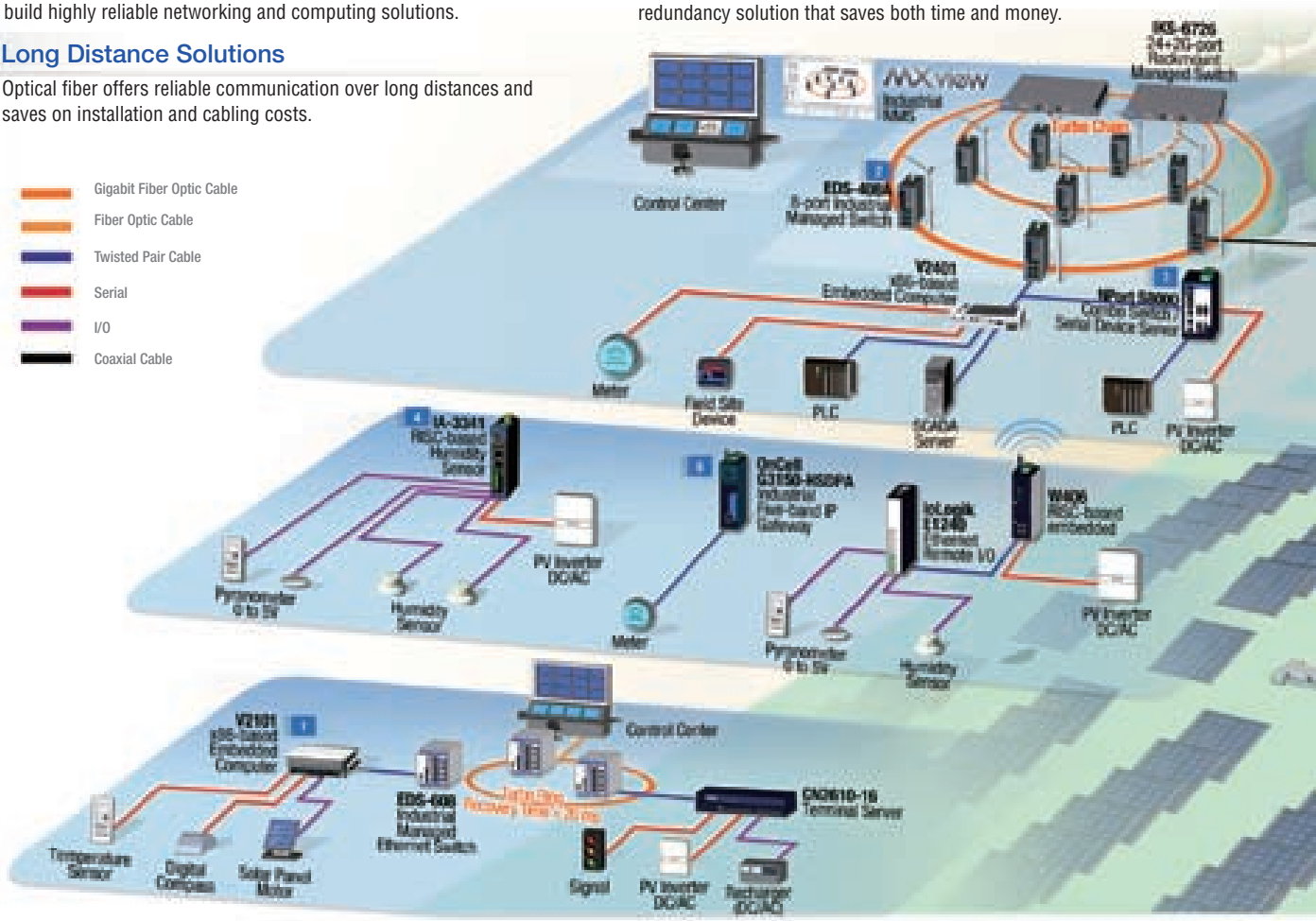
Wind power generation systems are installed in harsh environments subjected to extreme temperatures, dust, and wind. Under these conditions, using network devices (e.g., industrial Ethernet switches, embedded computers, and device servers from Moxa) with fanless design, high MTBF, wide operating temperature range, redundant power, and rugged housing protection, allows system integrators to build highly reliable networking and computing solutions.

Long Distance Solutions

Optical fiber offers reliable communication over long distances and saves on installation and cabling costs.

Uninterrupted Redundant Networking

Network uptime is extremely critical to a wind farm. To ensure high network availability, Moxa's managed Ethernet switches support proprietary Turbo Ring™ and Turbo Chain™ redundant mechanisms featuring a fast recovery time of under 20 ms to ensure that your network runs non-stop. In particular, Turbo Chain™ is an ideal wind power solution for creating multiple redundant connections: it is both highly flexible and endlessly expandable, which creates a cost-effective redundancy solution that saves both time and money.



Solar Power

Many communities are turning to solar energy as a greener power alternative. In order to succeed, these solar-powered communities will need stable and reliable remote monitoring systems. Solar tracking systems, transportation systems, solar power plants, and other sophisticated solar power solutions use solar tracking systems to maximize the amount of solar energy that can be absorbed from the Sun's rays. The plants need embedded computers to act as central controllers that map and track the Sun. In addition, solar power can also be used to operate traffic signals, roadside displays, and various peripheral transportation devices.

Low Power Consumption and Compact Form Factor for Easy Installation

Solar applications require low power solutions, and Moxa's RISC-based embedded computers, with their energy efficient design and compact form factor, are a cost-effective and easy-to-install to install option.

Stable and Reliable Hardware and Software Computing Platform

Moxa's x86-based embedded computers are extremely stable and reliable and can be used as high performance solar tracking systems for mapping and tracking the Sun. Use Moxa's embedded computers for data acquisition and front-end computing, and Moxa's Rcore embedded platform for faster and easier programming.



Key Products



1 V2101 Series
x86-based communication embedded computers

- 2 software-selectable RS-232/422/485 serial ports
- Dual independent displays (VGA + LVDS) for field site monitoring
- 10/100/1000 Mbps LANs for network redundancy

Page 17-17



2 EDS-408A Series
8-port industrial managed Ethernet switches with 3 fiber ports

- 3 fiber optic ports (single/multi-mode, SC/ST connectors)
- Turbo Ring™ and Turbo Chain™ (recovery time < 20 ms), and RSTP/STP for Ethernet redundancy
- -40 to 75°C operating temperature

Page 1-35



3 NPort® S8000 Series
Combo Switch / Serial Device Server

- 4-port RS-232/422/485 serial device server with 2 KV (DC) isolation protection
- 5-port managed Ethernet switch with Turbo Ring® (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D) supported
- Surge protection for serial, power, and Ethernet line

Page 8-12



4 IA3341 Series
RISC-based embedded computers

- 4 DIs, 4 DOs, 2 AIs, 2 thermocouple inputs for field site device connections
- Supports Modbus TCP library to retrieve AI and thermocouple
- Dual 10/100 Mbps Ethernet ports for network redundancy

Page 17-25



5 OnCell G3150-HSDPA
Industrial five-band IP gateway

- UMTS/HSDPA and GSM/GPRS/EDGE compliant
- Connect both Ethernet and serial devices to cellular networks
- Centralize private IP management software with OnCell Central Manager

Page 6-11



Learn more about
renewable energy solutions on Moxa's website:

Visit: www.moxa.com/RenewableEnergy

Railway Automation

EN50155 EN50121

Migrating to the Next Generation of Railway Networks

Modern railway data networks need high reliability, availability, and cost-effectiveness, but today's conventional train communication networks (TCN) are held back by a mix of different proprietary legacy technologies. This hodgepodge creates unnecessary costs, has limited bandwidth, and is difficult to upgrade for improved passenger comfort and security.

Moxa's railway solutions upgrade railway infrastructure operation and maintenance in order to deliver improved passenger security, enhanced traffic safety, and higher operational efficiency for next generation railway networks. Moxa's products are designed with efficient operation and high reliability in mind. All of these solutions comply with EN 50155 and EN 50121 standards and incorporate extensive future-proof features specifically for railway applications. An investment in a modern communications backbone with Moxa's railway solutions will reap dividends for years to come.

Moxa's Complete and Industry-proven Network Solutions Excel in Railway Applications

Onboard Train and Train-to-Ground Communications

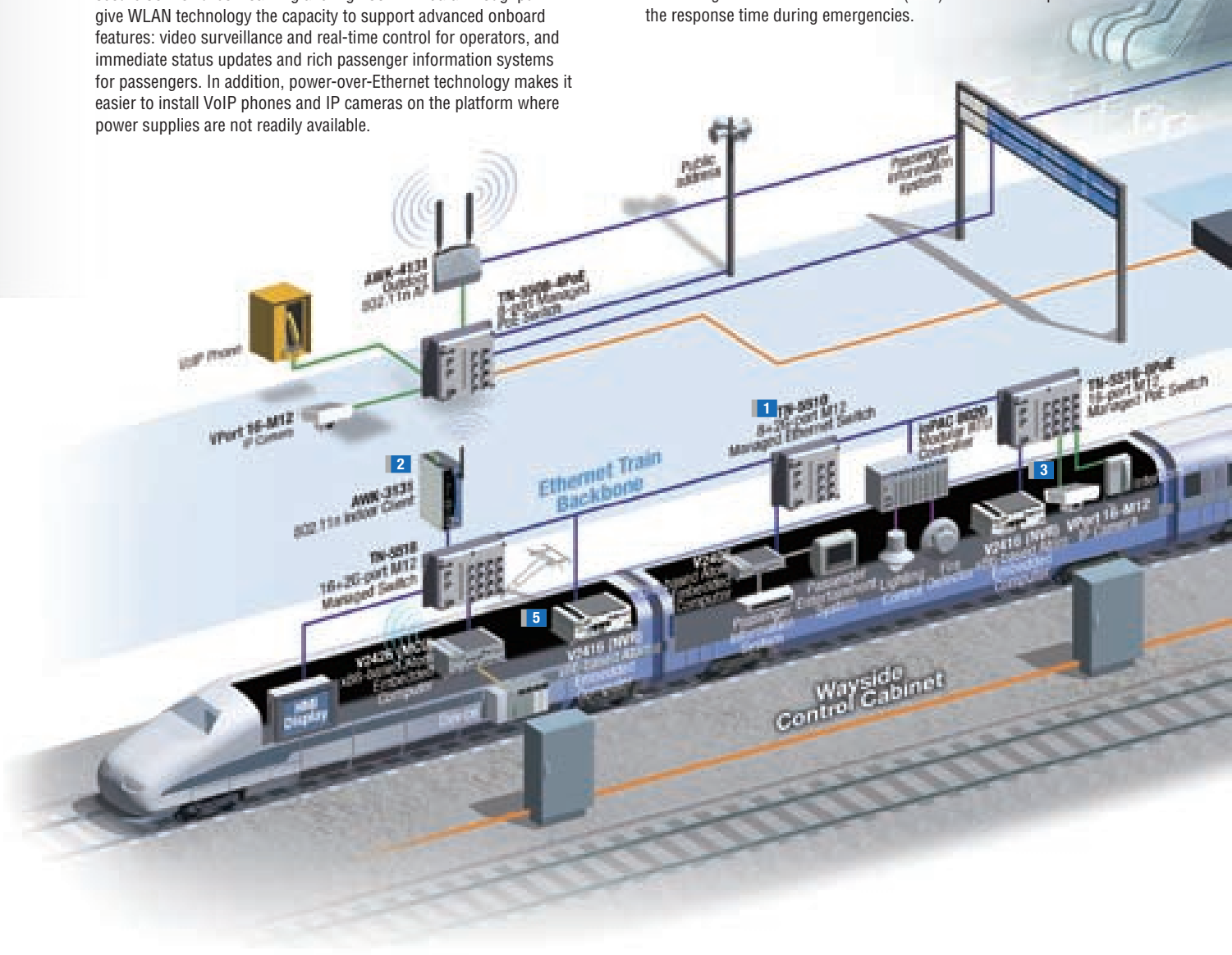
Onboard Video Surveillance and Seamless Train-to-Ground Wireless Connectivity

Passenger safety and highly available connectivity are top priorities for onboard train networks. These networks allow rail operators to share real-time information between trains, OCC, and stations to provide immediate status updates and emergency controls. Fast and secure 50 ms Turbo Roaming and high 802.11n data throughput give WLAN technology the capacity to support advanced onboard features: video surveillance and real-time control for operators, and immediate status updates and rich passenger information systems for passengers. In addition, power-over-Ethernet technology makes it easier to install VoIP phones and IP cameras on the platform where power supplies are not readily available.

Station and Rolling Stock Solutions

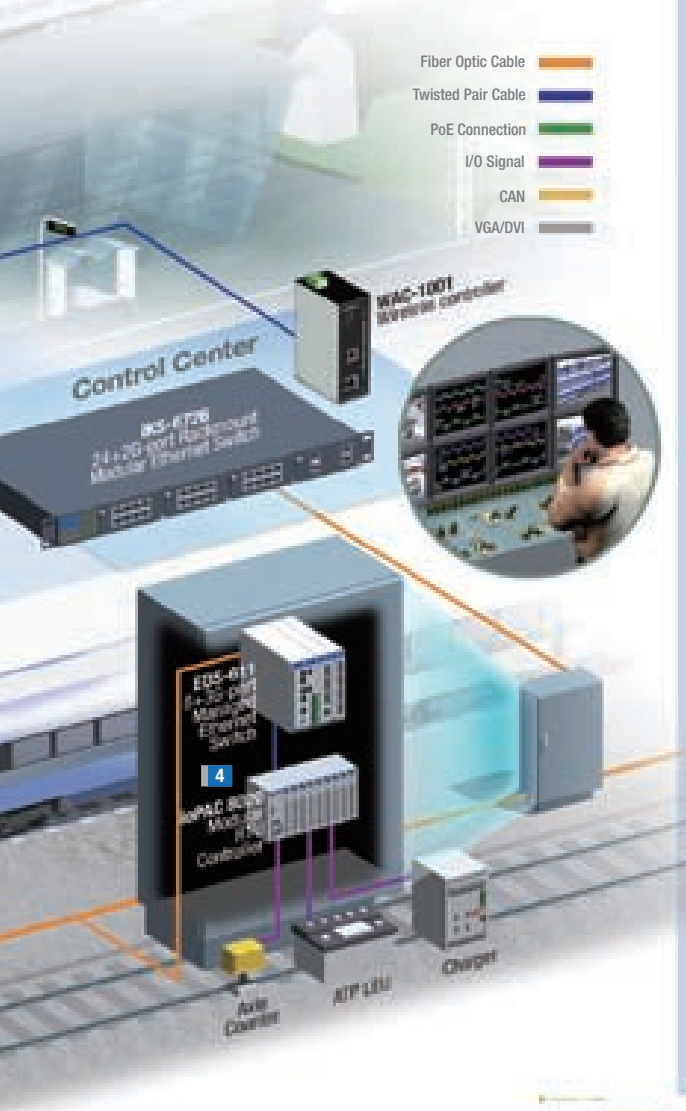
High-bandwidth Ethernet Train Backbone Maximizes Passenger Comfort and Security

Industrial Ethernet enables a high bandwidth backbone to transmit the video, voice, and data needed for passenger entertainment, emergency intercoms, and video surveillance systems. A high-speed network can transmit live video surveillance images in real-time to an existing human machine interface (HMI) in the cab to optimize the response time during emergencies.



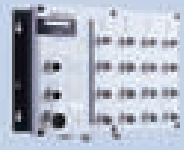
Wayside Networks and Monitoring
Real Time Monitor and Reliable Connections of Wayside Networks

Signals, track circuits and switches are deployed near the tracks to control the train traffic. A reliable link is essential to railway signalling systems; any service interruptions can become serious maintenance and even safety issues. In addition, costly and complex multi-vendor deployment is another issue that confrots railway companies today. Moxa's wayside network solutions put you back in charge of your track control and signalling system. Use compact Turbo Chain switches and modular RTU controllers to efficiently control and monitor the condition of your track integrity and railway signalling system.



Key Products

TN-5508/5510/5516/5518 Series
8, 2G+8, 16, 2G+16-port M12 managed Ethernet switches



- Gigabit flexibility to future-proof your network
- PoE models available
- Wide power input range for universal applications
- High availability: ring and power redundancy, and bypass relay
- Easy IP configuration for hassle-free maintenance

EN 50155 EN 50121-4

Page 2-7

AWK-3131 Series
Industrial IEEE 802.11a/b/g/n single-RF wireless AP/bridge/client



- Up to 300 Mbps data rate
- Under 100 ms Turbo Roaming for seamless wireless connections
- MIMO technology increases data throughput and range
- QoS (WMM) to prioritize time-sensitive data and VLAN support

EN 50155

Page 5-15

VPort 16-M12 Series
EN 50155 compliant, high CCD image quality, compact IP cameras



- 1/3" CCD camera with maximum resolution of 800 x 600
- Up to 3 H.264 and MJPEG video streams
- Supports DHCP Opt 66/67 for auto-configuration
- DynaStream™ support for auto frame rate adjustments

EN 50155

Page 16-27

ioPAC 8020 Series
Modular RTU controllers



- IF-THEN-ELSE Click&Go™ logic for intelligent I/O control
- Anti-vibration rugged designs and EN50155/50121 certified
- Hot swappable I/O module design
- Report-by-exception active alarm
- -40~75°C operating temperature range

EN 50155 EN 50121-3 EN 50121-4

Page 13-13

V2416 Series
x86-based Atom 1.6 GHz embedded computers



- 2 removable and hot swappable trays supporting storage expansion
- 2 SATA-150 connectors for HDD/SSD expansion
- Dual independent displays (VGA, DVI-I selectable)
- 2 10/100/1000 Mbps Ethernet ports with M12 connectors

EN 50155

Page 17-18



Learn more about
railway automation solutions on Moxa's website:

Visit: www.moxa.com/Rail

Intelligent Transportation System

NEMA TS2

Reliable Ethernet-centric Automation Solutions for Demanding ITS Systems

Intelligent Transportation Systems (ITS) combine intelligent computers, efficient network infrastructure, sensors, video detection, and advanced information and automation technologies to constantly monitor and analyze real-time data on traffic flow and weather conditions. By centralizing traffic information collection and analysis, an ITS reduces traffic congestion, increases the efficiency of public transportation, and enhances overall road safety. However, an ITS is a large and highly complex system with many interconnected subsystems. Integrating the entire ITS on an open-architecture IP-based communications network can dramatically simplify and improve the interoperation of many existing subsystems and applications, while also remaining flexible and scalable enough to accommodate any future expansions and upgrades.

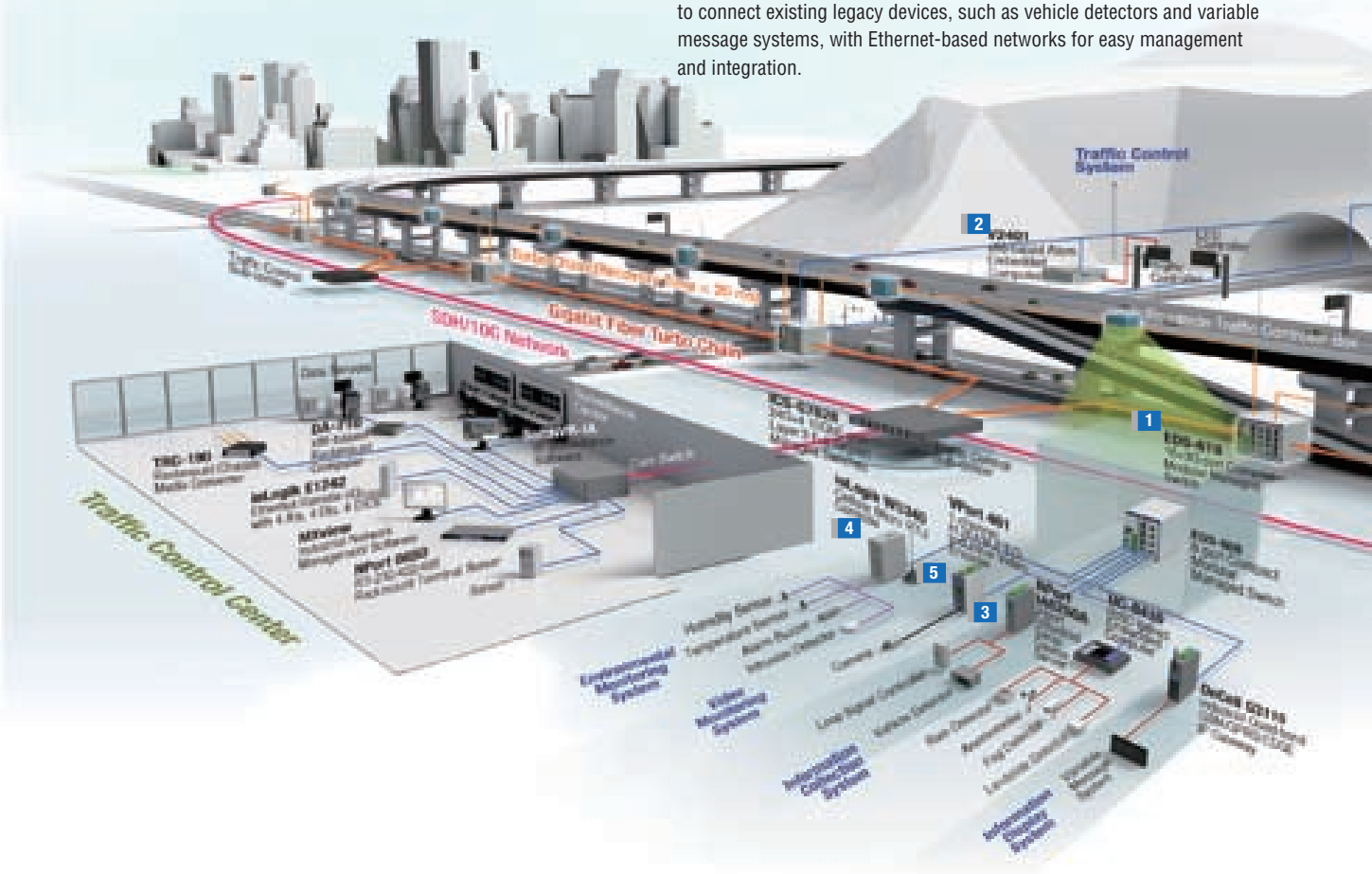
Strengths of Moxa's Industrial Networking Solutions

Comprehensive Portfolio for Reliable Ethernet Infrastructure

Moxa offers a complete set of industrial Ethernet switch solutions to complete your inter-city and street-side Ethernet-based traffic management system. With high performance full Gigabit core switches, high-port-density compact modular Ethernet switches with multiple fiber connections, PoE+ switches for high installation flexibility and efficiency, M12 anti-vibration switches for eBus systems, and 1000-node industrial network management software for easy network troubleshooting, Moxa has everything you need to deploy an effective ITS network infrastructure. All of Moxa's managed switches support the highly resilient Turbo Ring and Turbo Chain redundancy technologies (recovery time < 20 ms) to ensure high network availability.

Accurate Data Acquisition, Computing, and Communications

- Moxa's ready-to-run, fanless embedded computers are smart front-end control platforms with powerful programming capability dedicated to dynamic real-time computations and control. The computers are able to process large amounts of data to provide greater responsiveness and precise traffic information.
- Moxa's Ethernet Remote I/O have two Ethernet ports that can be daisy-chained together to provide a cost-effective remote I/O solution for monitoring the tunnel environments. For hard-to-wire locations, the cellular micro RTU controller is the best choice. Its 3-in-1 compact design that combines the functions of a cellular modem, I/O controller, and data logger in one box to reduce the total cost of system deployment and the amount of time wasted on debugging system problems.
- The NPort series serial-to-Ethernet device servers provide an efficient way to connect existing legacy devices, such as vehicle detectors and variable message systems, with Ethernet-based networks for easy management and integration.

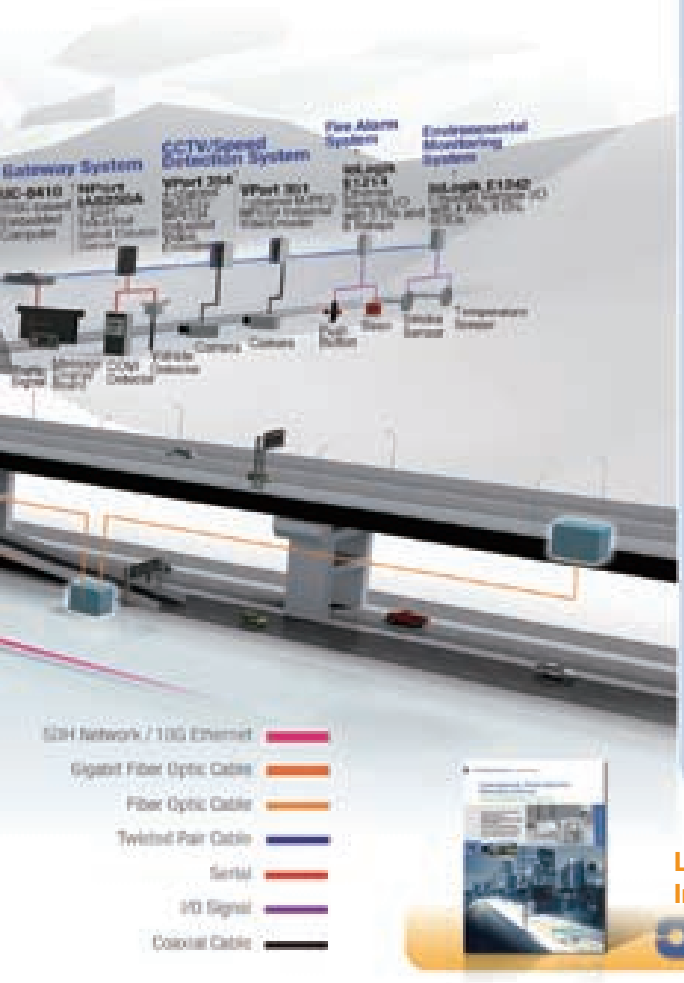


Compact Rugged IP Video Surveillance

Moxa's industrial IP video surveillance solutions, including H.264/MJPEG/MPEG4 video encoders and decoders, outdoor IP cameras, and IP surveillance software, monitor traffic online and capture images in real time over the network. Moxa's video servers come with a number of industrial features, including NEMA TS2 compliancy, a wide operating temperature range, redundant power inputs, and fiber-optic connections. In addition, a compact, high quality IP camera with PoE interface saves space and cost for both city and mobile surveillance.

Industrial-grade, Fanless Design

Reliability is built into all of Moxa's industrial-grade networking and computing solutions, which feature a fanless design, extended temperature options, better EMI/EMC resistance, high MTBF, and solid 3 or 5-year warranty. In addition, by meeting strict transportation standards, the products are rugged enough to withstand harsh outdoor traffic environments.



Key Products



EDS-608/611/616/619 Series
8/8+3G/16/16+3G-port compact modular managed switches

- Up to 3 Gigabit ports for Gigabit redundancy (EDS-611/619)
- Modular form factor supports multiple fiber connections
- Complete management and security features
- Works with Moxa MXview industrial network management software

Page 1-22



V2401 Series
x86-based Atom 1.6 GHz embedded computers

- Dual independent displays (VGA, DVI-I, or LVDS selectable)
- Various connection options: 4 RS-232/422/485 and 8 RS-232 serial ports, 2 Gigabit LAN ports, 6 USB ports, and 4 DI/Os
- Flexible storage expansion

Page 17-18



NPort IA5000A Series
1/2/4-port serial device servers for industrial automation

- Enhanced surge protection for the serial, Ethernet, and power lines
- 2 KV isolation for serial signals
- Rugged screw-type terminal blocks for power and serial connectors

Page 8-45



ioLogik W5300 Series
cellular micro RTU controllers

- GPRS/HSDPA mobile communications
- -30 to 70°C wide temperature model available
- 3-in-one compact design (Cellular Modem + I/O Controller + Data Logger)

Page 13-20



VPort 461 Series
1-channel H.264/MJPEG industrial video encoders

- Three simultaneous streams, latency under 200
- Video stream up to 30/25 FPS at full D1 (720 x 480 / 720 x 576) resolution
- Modbus/TCP support and free VPort SDK PLUS

Page 16-9

Learn more about
Intelligent Transportation System on Moxa's website:

Visit: www.moxa.com/IntelligentTransportationSystem

Oil and Gas

Maximize Synergy between Industrial Automation and Ethernet Networks for the Oil and Gas Industry

Oil and gas remains an indispensible fuel of the global economy, and natural resource exploration and production remains a lucrative and attractive endeavor. New oil platforms, rigs, and pipelines are constantly being constructed to meet the demand for oil, with a corresponding growth in the number of factories and control centers to process and manage oil extraction.Unfortunately, the traditional SCADA systems used by the oil and gas industry are inflexible and difficult to integrate because they are highly independent and have limited connectivity to other systems. This limitation will need to be overcome as oil facilities grow more complex and safety and reliability grow ever more important. Moxa provides a complete range of Ethernet products that create oil and gas facilities that are easy, safe, and cost-effective to maintain and operate.

Achieve Operational Excellence Through

Improved Flexibility

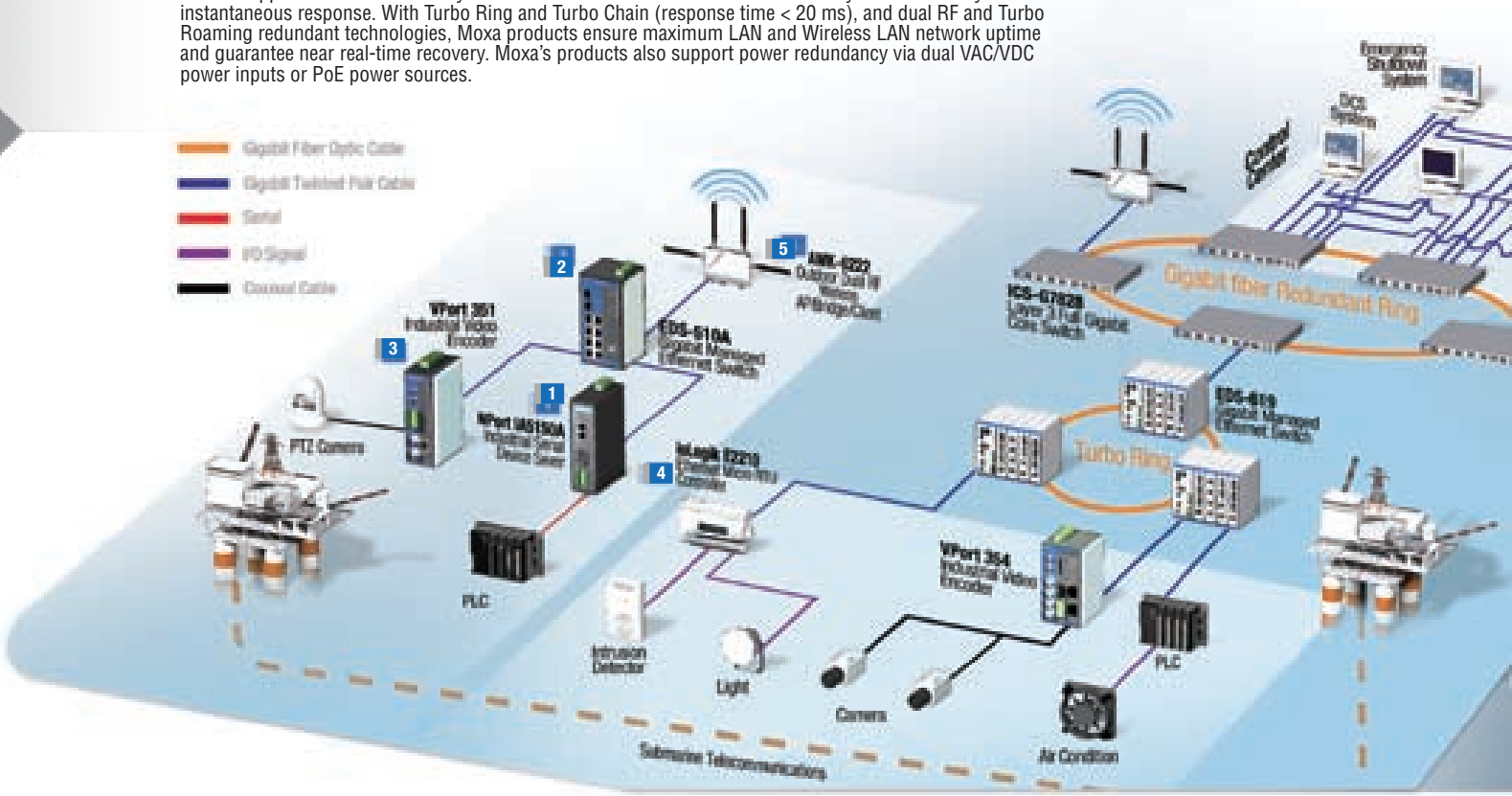
Ethernet significantly enhances the flexibility and availability of data for SCADA systems as well as their integration capability with other networking devices, which is why it is a highly cost-effective and efficient technology. Moxa provides a wide array of Ethernet products, including industrial Ethernet switches, industrial wireless Ethernet devices, secure routers, IP cameras, Ethernet micro RTU controllers, serial-to-Ethernet device servers, and embedded PCs, helping customers make the most of Ethernet technologies. Highly integrated with serial, LAN, and WLAN, Moxa's Ethernet products are available in a variety of port configurations such as fiber, copper, SFP, and PoE and bandwidth options from 10/100 Mb to 10 Gb.

Added Safety

Safety is a top priority of the oil and gas industry, so on-site and off-site equipment must all be held to the highest standards. Devices must meet many different safety standards to ensure that they are able to resist damage from corrosion and vibration, and to ensure constant and reliable operation in hazardous environments. Moxa's Ethernet products have passed a variety of certifications specially developed for oil and gas facilities, such as DNV/ABS/LR/NK/GL, Class I, Div. 2, and ATEX Zone 2. Apart from environmental approvals, Moxa's security router products help enhance network and device security with comprehensive firewall, VPN, and advanced routing functions. In addition, Moxa's Ethernet products support a number of security standards such as 802.1X, HTTPS, and SSL.

Increased Redundancy and Availability

Unexpected system downtime and failure to respond in real time can cause significant damage to oil and gas facilities, threatening assets and even lives. For this reason, it is highly important to keep the system functional at all times, even during an unforeseen event. Moxa's Ethernet switches and wireless AP/Bridge/Clients support various redundancy features to ensure maximum communication system availability and instantaneous response. With Turbo Ring and Turbo Chain (response time < 20 ms), and dual RF and Turbo Roaming redundant technologies, Moxa products ensure maximum LAN and Wireless LAN network uptime and guarantee near real-time recovery. Moxa's products also support power redundancy via dual VAC/VDC power inputs or PoE power sources.

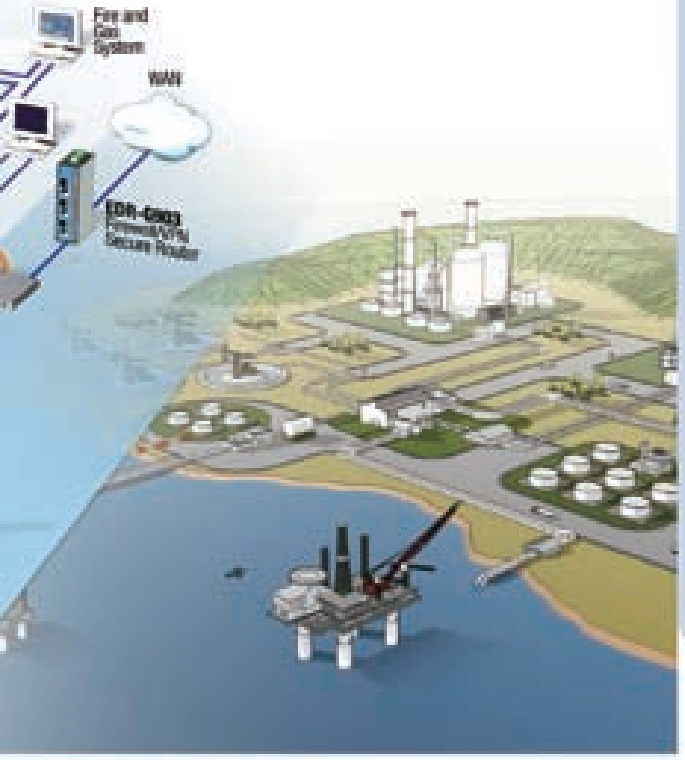


Enhanced Reliability

Off-shore oil drilling platforms, on-shore oil wells, and refineries must cope with moisture, salt, and airborne chemicals that can react with and damage the electronics on printed circuit boards. Conformal coating is a thin and even layer of non-conductive material applied over electronics. This protective coat protects against moisture contaminants, and corrosion, and resists extreme temperatures, vibration, salt spray, and chemical vapors, ensuring a longer lifecycle.Moxa's Ethernet switches have an IP30 housing, robust metal casing, wide temperature tolerance, vibration proofing, and conformal coating for erosion resistance, making them suitable for use in tough industrial environments. They also have other heavy-duty networking features, including high MTBF and EMI noise immunity.

Easier Management

Modern industrial automation networks unify many different applications over an open industrial Ethernet network by using the TCP/IP protocol to simplify development and maintenance efforts and easily integrate with the office network. The move to Ethernet has delivered tremendous benefits in efficiency and interoperability, but has also opened up industrial networks to communications from the outside world. Industrial network security requirements have evolved significantly in recent years and there is a growing recognition that industrial devices can be targets of sabotage. Any intrusion in the industrial control system can lower production quality and even cause significant damage and safety risks. A network system with effective Layer 2 security features, such as IEEE 802.1X, SSH, HTTPS, and port security, and security routers can greatly enhance the security and availability of the process control network infrastructure to achieve safe and efficient production while protecting critical SCADA and DCS systems from unexpected external and internal cyber attacks and vulnerabilities.



Key Products



NPort IA5150A, IA5250A, IA5450A 1/2/4-port industrial serial device servers

- Enhanced surge protection for the serial, Ethernet, and power lines
- 2 KV isolation for serial signals
- Low power consumption with built-in MiiNe CPU
- C1D2 and ATEX certified for harsh industrial environments

Page 8-49



EDS-510A Series
7+3G-port Gigabit managed Ethernet switches

- 2 GE ports for a redundant ring and 1 GE port for uplink or ring coupling
- Gigabit fiber Turbo Ring and Turbo Chain (recovery time < 20 ms), and RSTP/STP
- Long-distance fiber transmission up to 100 km
- Class I Div. 2/ATEX Zone 2 and -40 to 75°C operating temp. range

Page 1-30



VPort 351 Series
Full motion, 1-channel MJPEG/MPEG4 industrial video encoders

- Industrial design with -40 to 75°C operating temperature and fiber optic Ethernet port
- Video stream up to 30 frames/sec at full D1 (720 x 480) resolution
- Pre/post-alarm video recording function for advanced surveillance

Page 16-13



ioLogik E2210 Series
Ethernet micro RTU controllers

- Front-end intelligence that supports IF-THEN-ELSE Click&Go™ control logic
- SNMPv1/v2/v3 protocol supported
- Active Messaging with real-time stamp, including SNMP Trap with I/O status, TCP and email

Page 13-23



AWK-6222 Series
Industrial dual-RF wireless AP/bridge/client

- Higher security with WEP/WPA/WPA2/802.11X and powerful filter
- Redundant dual-RF design for rapid fail-over
- Wide operating temperature range and IP68-rated metal housing

Page 5-7

Water Distribution

Optimize Water Distribution Networks

A water distribution system is the essential link between the water supply source and residential or industrial users. It is an elaborate conveyance system that pumps treated water through miles of water pipeline to the tap. Modern water distribution network face substantial maintenance and replacement costs. Today, there are significant challenges affecting water distribution network efficiency, such as security problems at pump and lift stations, and pipe damage. Moxa offers real-time and historical analysis solutions to monitor and manage water infrastructure. These invaluable systems help utility engineers ensure that water flows continuously and efficiently to residential and industrial users.

Advantages of Moxa's Remote Automation Solutions for Water Distribution Networks

Historical Data Analysis to Improve Efficiency

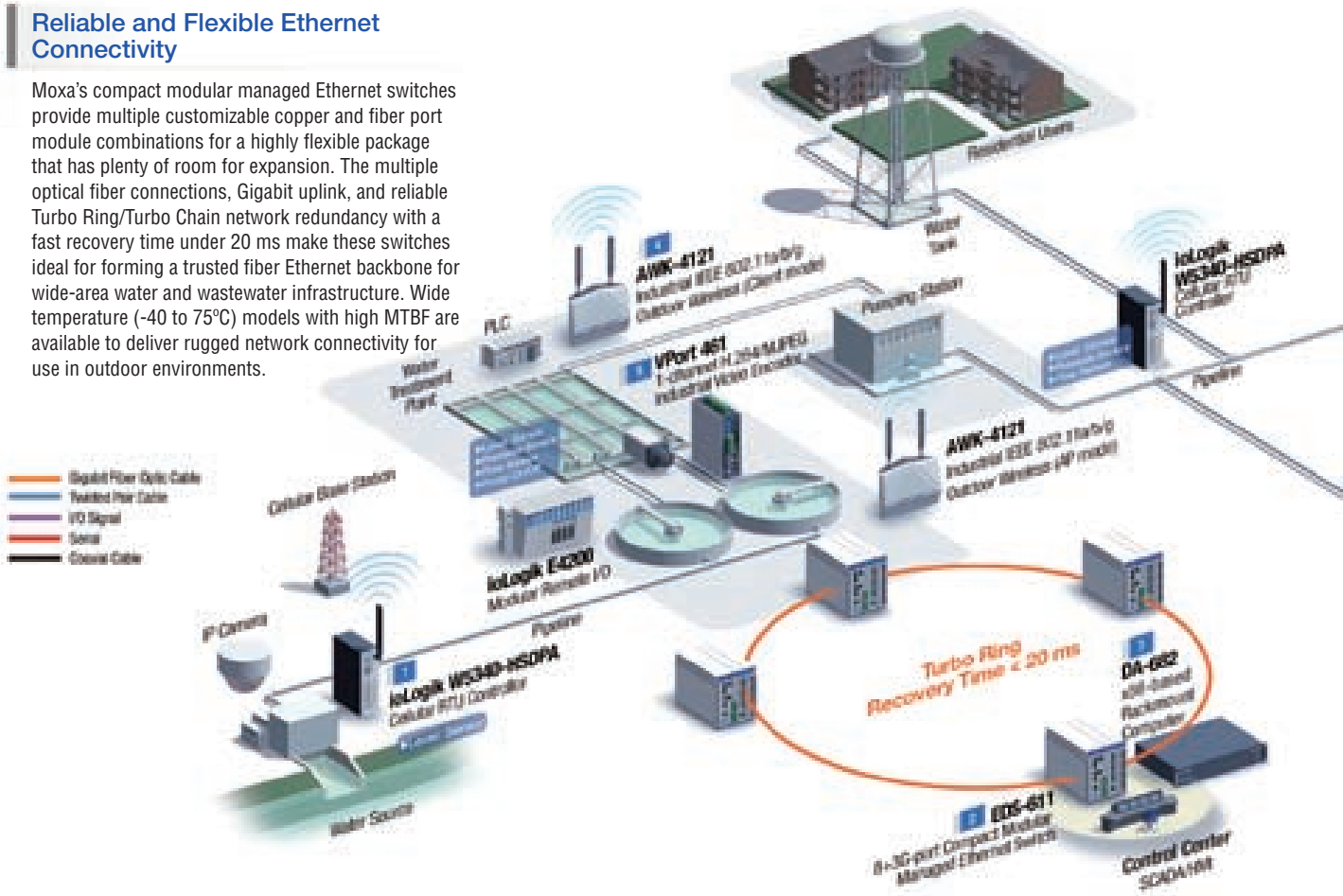
Data logging capability is a key requirement for water pipeline monitoring utility operation staff can use Moxa's Click&Go™ control logic to control when to start and stop logging, and choose either FTP or e-mail attachments to upload log files. The historical logs can be viewed and transmitted in trend graph format through DA-center. DA-center is a historical analysis tool that seamlessly interacts with Active OPC server using the standard and open OPC protocol and works with any DBC-compliant IT database. Users can now log data from Active OPC to their database without any additional time wasted in developing a socket program. The historical information can be used by utility operation staff to optimize the current water distribution infrastructure in order to increase the efficiency and service life of the water pipeline.

Video on SCADA System for Enhanced Safety and Security

Moxa is a one-stop-shop for SCADA surveillance solutions, with a product portfolio that includes industrial IP video surveillance products, cellular RTU controllers, and industrial Gigabit/PoE Ethernet switches which make it easy to build a complete remote monitoring system that seamlessly integrates video, I/O events, and network information on the existing SCADA platform. With industrial standard protocol Modbus/TCP support and OPC communications, SCADA/HMI systems can add event-triggered IP video display and recording to monitor the status of the entire network. System operators can now substantially improve their remote on-site security and response time thanks to the addition of video data to the SCADA system.

Reliable and Flexible Ethernet Connectivity

Moxa's compact modular managed Ethernet switches provide multiple customizable copper and fiber port module combinations for a highly flexible package that has plenty of room for expansion. The multiple optical fiber connections, Gigabit uplink, and reliable Turbo Ring/Turbo Chain network redundancy with a fast recovery time under 20 ms make these switches ideal for forming a trusted fiber Ethernet backbone for wide-area water and wastewater infrastructure. Wide temperature (-40 to 75°C) models with high MTBF are available to deliver rugged network connectivity for use in outdoor environments.

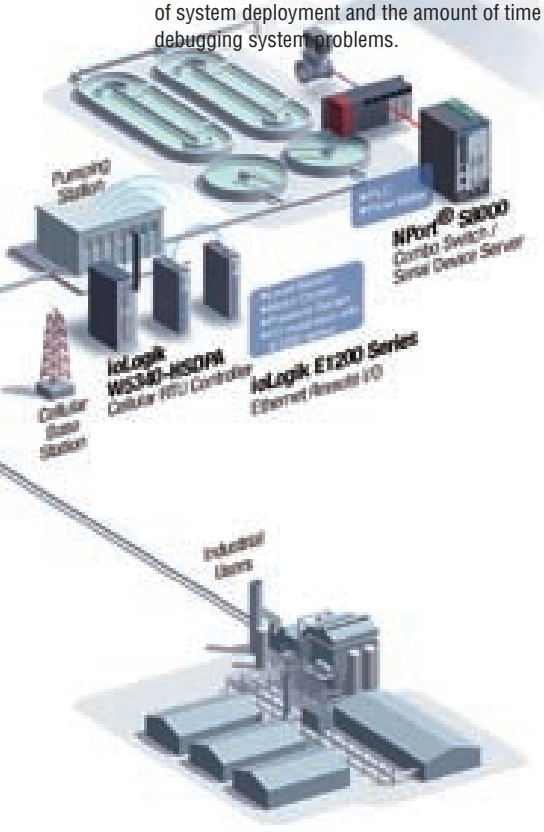


Waterproof Wireless for Wastewater Plant Remote Monitoring and Control

Water and wastewater treatment plants are now improving their network infrastructure with state-of-the-art wireless technology that is readily available and cost-effective to integrate in order to collect data from many locations throughout the plant. The AWK-4121 is housed in a tough IP68-rated metal casing and can be powered by PoE. No extra power cable or waterproof cabinet is needed, so deployment is simple and installation costs are kept low. A reliable wireless network can monitor storage tanks, well level and flow rate, and quickly open or close valves to meet sudden changes in demand. The system also makes it easier to store the results of sampling, schedules, and maintenance activities, and provides data for diagnostic reports that are essential to any water or wastewater treatment facility.

Timely Notifications to Reduce Downtime

Water distribution networks need timely notifications of any damage or problems at pump and lift stations. SCADA systems typically use polling systems, but Moxa's cellular RTU controllers support Active OPC server, which uses push technology to communicate when necessary. This event-driven push technology minimizes unnecessary data transmissions and provides instant I/O status reports. Moxa's cellular RTU controllers combine the functions of a cellular modem, I/O controller, and data logger in one compact package to reduce the total cost of system deployment and the amount of time wasted on debugging system problems.



Key Products

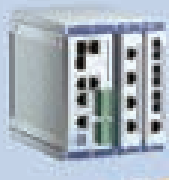
ioLogik W5340-HSDPA Series
cellular micro RTU controllers



- Universal tri-band UMTS/HSDPA 850/1900/2100 MHz with IPSec
- Flexible, unicode alarm system supporting SMS, email, SNMP Trap, TCP, UDP
- Definable cellular connection strategy to optimize data transmission
- -20 to 70°C operating temperature range (T model)

Page 13-20

EDS-611 Series
8+3G-port compact modular managed Ethernet switches



- Modular form factor with rich selection of copper and fiber options for flexible cabling options
- Support Turbo Ring and Turbo Chain network redundancy (recovery time < 20 ms) and power redundancy
- Intelligent network management and security supports Modbus/TCP, QoS, IGMP Snooping, VLAN, and IEEE 802.1X

Page 1-22

DA-682 Series
x86-based rackmount embedded computers



- Modular design for system integration and flexibility
- High performance with low power consumption
- A powerful controller with multiple serial and LAN ports for legacy devices and network redundancy
- Carry out front-end tasks and remote monitoring and management

Page 17-20

AWK-4121 Series
Industrial IEEE 802.11a/b/g outdoor wireless AP/bridge/client



- IP68 rating to protect against water and dust in hazardous environments
- PoE-enabled powering to reduce cabling efforts
- High-level security with WPA/WPA2/802.11X
- User-friendly web-based management utility for easier configuration

Page 5-13

VPort 461 Series
1-channel H.264/MJPEG industrial video encoders



- Video stream up to 30 FPS at full D1 (720 x 480) resolution
- Three simultaneous streams
- Video latency under 200 ms
- SD slot for local storage

Page 16-9

Marine

Proven Marine-grade Computers, Switches, and IP Surveillance Products for Maritime Applications

Moxa's marine products give our maritime business partners the competitive edge to succeed in challenging conditions. Moxa's portfolio includes the latest and most up-to-date solutions tailored to the needs of our valued customers and partners. For example, our marine panel computers include features specifically for the latest marine applications. In addition, many of Moxa's industrial networking solutions, such as industrial Ethernet switches and industrial video encoders, are accredited by major maritime classification societies. Moxa's products are rugged and excel under extreme conditions such as the constant vibration, shock, and humidity found in harsh marine environments. Moxa's marine products: making your marine visions a reality.

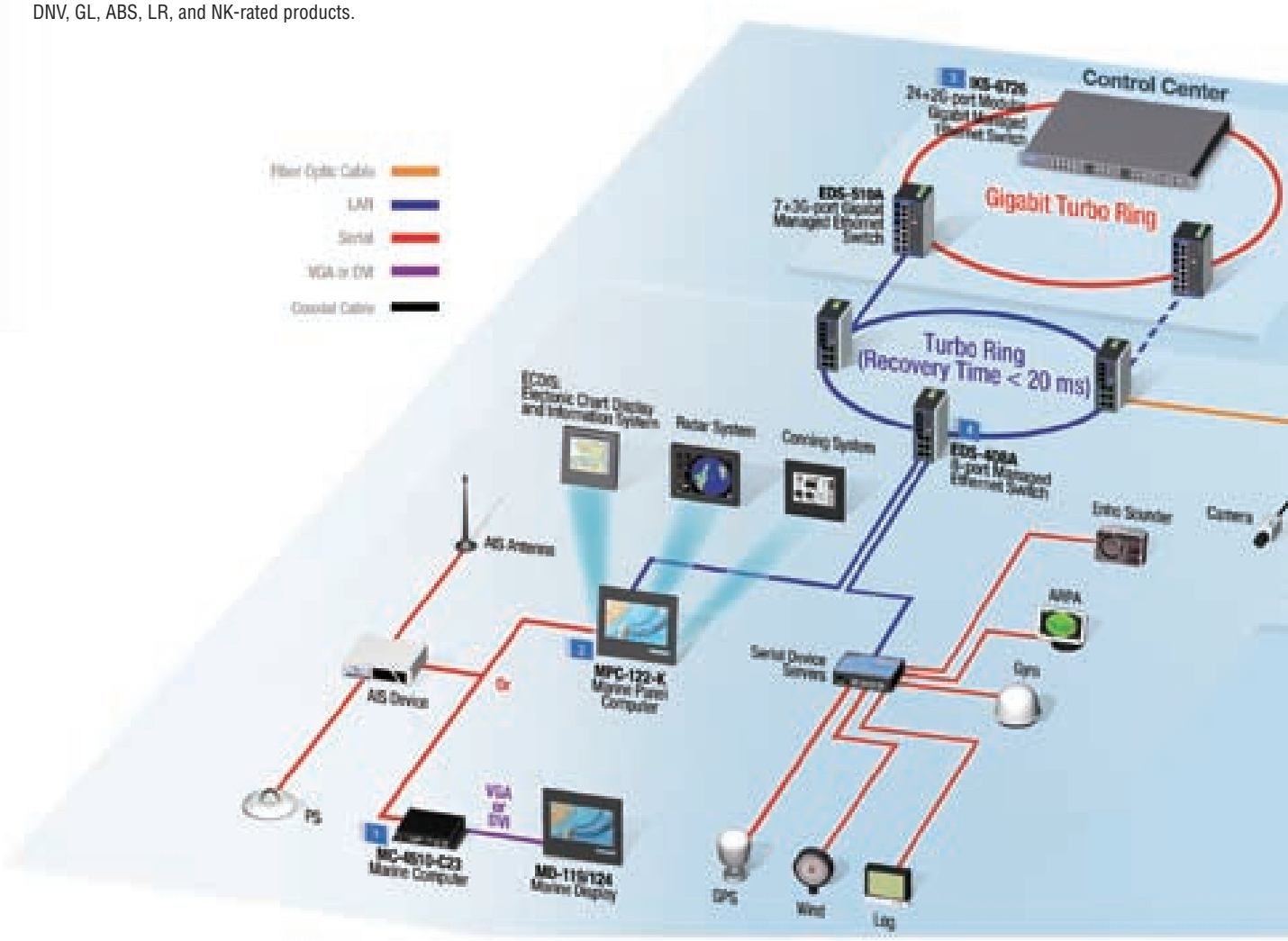
Advantages of Moxa's Marine Solutions

Marine-grade Reliability for Harsh Environments

Marine applications usually require rugged and compact products that offer reliability under harsh environments. Moxa's marine computers, panel computers and industrial networking products are all designed with industrial-grade requirements, such as fanless design, longer MTBF, wide temperature range, redundant power and rugged housing protection, allowing users to build the reliable marine computing and networking solutions. In addition, many of Moxa's rugged solutions are DNV, GL, ABS, LR, and NK-rated products.

Innovative Redundant Technology Ensures High Network Availability

Moxa's managed Ethernet switches ensure uninterrupted system operations using reliable network redundancy technology: Turbo Ring and Turbo Chain (recovery time < 20 ms). Turbo Ring supports many ring architectures, such as ring coupling, dual homing, and dual ring, and Turbo Chain simplifies the creation of multiple complex redundant networks.

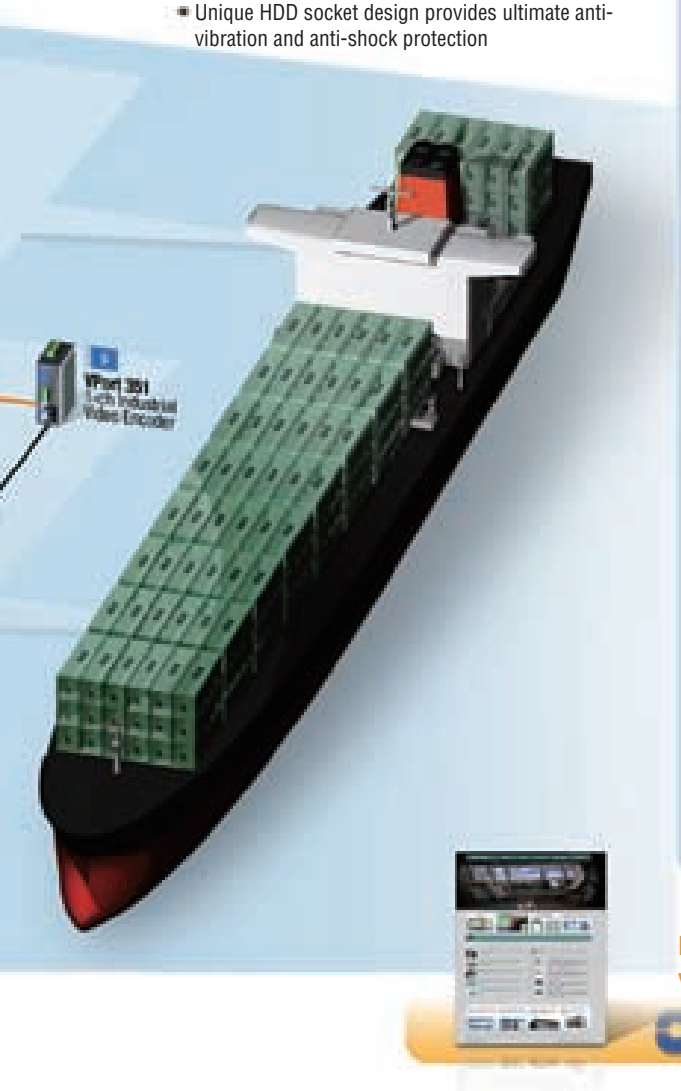


System Flexibility that Fulfills Your Needs

- Both DVI-D and VGA signal outputs available for dual independent displays
- Onboard mini-PCIe slot available for future expansions and upgrades
- Multiple USB 2.0 ports for connecting high-speed peripherals
- Modular design for easy integration with display panels; PC case is replaceable

Extreme Performance that Surpasses Existing Marine Requirements

- Extreme performance thanks to Intel Core 2 Duo 2.26 GHz processor, and 2 GB DDR3 memory, expandable to 4 GB for multi-tasking requirements.
- Features multiple Gigabit LANs for fast and powerful network redundancy
- Optically-isolated RS-232/422/485 serial ports for safe and stable system operations
- Unique HDD socket design provides ultimate anti-vibration and anti-shock protection



Key Products

MC-4510-C23 Series
Marine computers



- High performance with Intel Core 2 Duo 2.26 GHz processor
- Dual independent displays (VGA + DVI-D)
- Low power consumption

Page 17-21

MPC-122-K
Marine panel computers



- 22” panel with 16:10 aspect ratio
- High performance with Intel Core 2 Duo 2.26 GHz processor
- Full-range dimming, optical bonding, and wide view angle

Page 17-21

IKS-6726 Series
24+2G-port Gigabit modular managed Ethernet switches



- High port density for central networks
- Turbo Ring and Turbo Chain (recovery time < 20 ms), and RSTP/STP for Ethernet redundancy
- Isolated redundant power inputs with 24/48 VDC or 110/220 VDC/VAC power supply

Page 1-58

EDS-408A Series
8-port industrial managed Ethernet switches



- Turbo Ring and Turbo Chain (recovery time < 20 ms), and RSTP/STP for Ethernet redundancy
- Network management with IGMP snooping, QoS, VLAN, Modbus/TCP, and more
- -40 to 75˚C operating temperature range

Page 1-35

VPort 351 Series
1-channel MJPEG/MPEG4 Industrial Video Encoders



- Video stream up to 30 FPS at full D1 (720 x 480) resolution
- Industrial design with -40 to 75˚C operating temperature and fiber optic Ethernet port
- High MTBF and fanless design

Page 16-13

Learn more about marine solutions on Moxa’s website:

Visit: www.moxa.com/Marine

Factory Automation

Overview

Build highly reliable, precise, and safe factory automation applications with Moxa's device connectivity, I/O, surveillance, embedded computing, and wired/wireless communication infrastructure solutions.

Today, hundreds of factories all over the world are using Moxa's comprehensive solutions to improve their productivity, efficiency, and cost-effectiveness, in applications such as building automation, process automation, logistics systems, communications infrastructure, and control centers.

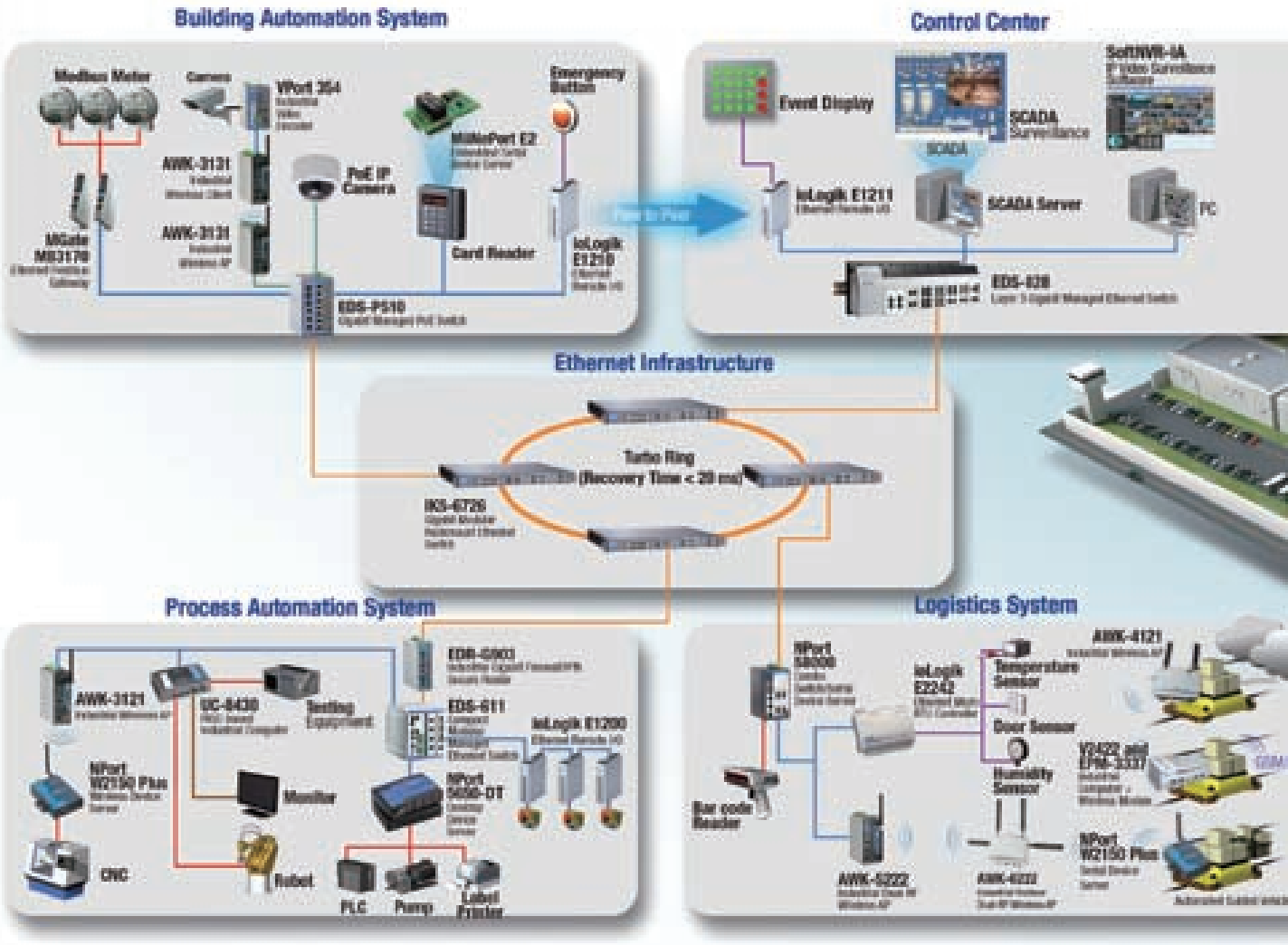
Advantages of Moxa's Factory Automation Solutions

Building Automation System

Designed to safely and securely monitor and control the network of electronic devices in a building, Moxa's building automation system (BAS) solutions deliver secure system performance and reduce maintenance requirements. Build a comprehensive building automation system system that encompasses IP surveillance video, SCADA/HMI systems, building access control, emergency alarms, meters, and mechanical systems.

Process Automation System

Manufacturers can achieve significant productivity gains by incorporating machinery and facility monitoring device into a centralized control network. Moxa offers products that directly or wirelessly connect CNCs, robots, monitors, testing equipment, PLCs, pumps, sensors, and other devices to the management network.

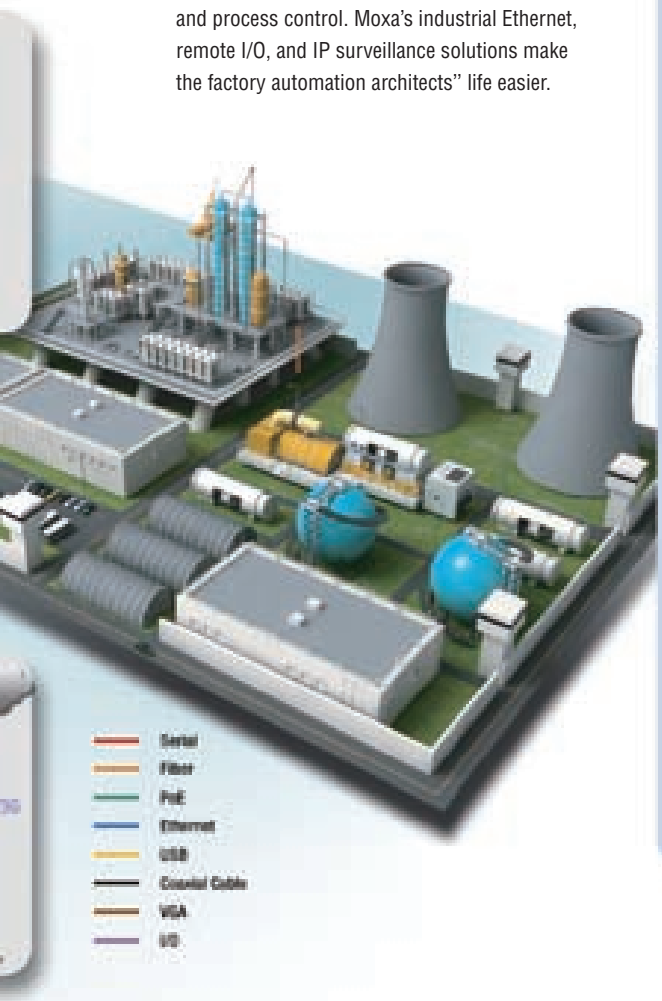


Logistics System

Logistics involves the complicated integration of information, transportation, inventory, warehousing, materials handling, packaging, and security operations. The ultimate goal of any logistics system is to maximize time and place utility for processed goods. Make your logistics operation simpler, faster, and more reliable with Moxa's Gigabit Ethernet switches, RTU controllers, device servers, and wireless AP/bridge/clients that can be quickly deployed anywhere your system needs to go.

Control Center and Infrastructure

Industrial Ethernet solution is massively adopted in building today's factory communication infrastructures due to it makes redundancy, scalability and easy maintenance possible. With the Ethernet infrastructure the factory administrators in the control center are empowered in remote missions like people and equipment safety monitoring, data acquisition, and process control. Moxa's industrial Ethernet, remote I/O, and IP surveillance solutions make the factory automation architects" life easier.



Key Products



MGate MB3170 Series
1-port advanced serial-to-Ethernet Modbus gateways

- Integrate TCP Masters without Altering the Modbus RTU/ASCII Network or Software
- Cascade Ethernet Ports for Easy Wiring
- Redundant dual DC power inputs
- Emergency request tunnels ensure QoS control

Page 3-11



NPort W2150 Plus Series
1-port RS-232/422/485 IEEE 802.11a/b/g wireless device servers

- 921.6 Kbps baudrate for RS-232/422/485 transmissions
- Secure remote management and configuration with SSH/SSL
- Built-in WLAN site survey tool
- Video recording with manual control, event-trigger, and schedule setting

Page 8-53



SoftNVR-IA
32-channel IP video surveillance software

- Built-in OPC server for easy communication with automation systems
- Live view with H.264, MPEG4, and MJPEG, from VPort products
- i-frame (key frame) decode only to save system resources for higher priority tasks

Page 16-35



V2422 Series
x86 Intel Atom N270 1.6 GHz ready-to-run embedded computers

- DDR2 SODIMM socket, supporting DDR2 533 up to 2 GB (max.)
- 2 10/100/1000 Mbps Ethernet ports and 4 RS-232/422/485 serial ports, supporting non-standard baudrates
- 1 SATA-II connector for storage expansion
- Ready-to-run Embedded Linux, or Windows Embedded Standard 2009 platform

Page 17-18



IKS-6726 Series
24+2G-port Gigabit modular rackmount managed Ethernet switches

- Turbo Ring and Turbo Chain (recovery time < 20 ms at full load), and RSTP/STP (IEEE 802.1w/D)
- IEEE 1588 PTP V2 (Precision Time Protocol) for precise time synchronization of networks
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply
- Modular design lets you choose from a variety of media combinations

Page 1-59

PAGE 1-46

Next-generation, High Capacity 10GbE Core Switches

- High performance modular platform
- Industrial-grade fanless design
- Flexible multiple fiber connections
- Intelligent Layer 3 switching



ICS-G7848/G7850/G7852 Series

48G/48G+2 10GbE/48G+4 10GbE-port L3 Full Gigabit Modular Managed Ethernet Switches

- Up to forty-eight Gigabit Ethernet ports plus four 10GbE ports
- Up to fifty-two optical fiber connections (SFP slots)
- Layer 3 routing interconnects multiple LAN segments
- Turbo Ring, Turbo Chain, and RSTP/STP for Ethernet redundancy
- Fanless, 0 to 60°C operating temperature range
- Isolated redundant power inputs with universal 110/220 VAC power supply range
- Modular design for maximum flexibility and hassle-free future expansion
- Hot swap interface and power modules for continuous operation

10GbE Turbo Ring Turbo Chain

Product Family



ICS-G7748/G7750 /G7752
48G/48G+2 10GbE/48G+ 4 10GbE-port full Gigabit modular managed Ethernet switches

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ICS-G7826/G7828
24G+2 10GbE/24G+ 4 10GbE-port L3 full Gigabit managed Ethernet switches

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ICS-G7526/G7528
24G+2 10GbE/24G+ 4 10GbE-port full Gigabit managed Ethernet switches

PAGE 1-52

PAGE 1-68

Power Up Network Devices with High Power PoE

- Up to 30 watts per PoE port
- 24/48 VDC flexible redundant power inputs
- Intelligent PoE power management
- -40 to 75°C wide operating temperature range



EDS-P506A-4PoE

6-port IEEE 802.3af/at PoE+ Managed Ethernet Switches

- Supports 4 IEEE 802.3af/802.3at Ethernet ports
- Provide high power up to 30 watts per PoE port
- Flexible and redundant 24 VDC or 48 VDC power inputs
- Advanced web management of PoE functions including PD failure check and PoE scheduling
- Turbo Ring and Turbo Chain (recovery time < 20 ms), and RSTP/STP for network redundancy
- -40 to 75°C wide-range operating temperature (T models)

Turbo Ring Turbo Chain -40°C 75°C PoE

Product Family



EDS-P206A-4PoE Series
6-port IEEE 802.3af/at PoE+ unmanaged Ethernet switches

PAGE 1-72



INJ-24 Series
IEEE 802.3af/at Gigabit PoE+ injectors

PAGE 1-77

PAGE 1-81

Build Reliable Industrial Networks with Firewall/VPN

- All-in-one VPN routing/firewall/NAT capability
- Reliable dual WAN redundancy
- Gigabit Ethernet RJ45/SFP connectivity
- Proven robust design



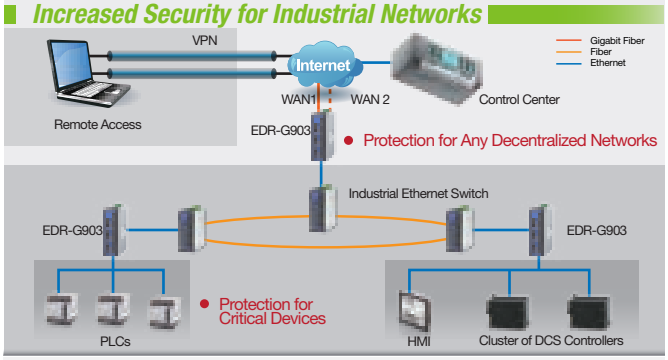
EDR-G903 Series

Industrial Gigabit Firewall/VPN Secure Routers

- High speed Gigabit Ethernet connectivity—RJ45/SFP combo
- Dual WAN ports for connection redundancy
- IPSec and L2TP VPN for secure connections over Internet
- Selectable router mode or bridge mode firewall
- Firewall with Quick Automation Profile for common Fieldbus protocols (over 25 protocols)
- Network Address Translation (1-to-1, N-to-1, and port forwarding)
- Static routing and RIP v1/v2 for connecting different network segments
- Easy-to-use PolicyCheck and SettingCheck functionality
- -40 to 75°C operating temperature (T model)

-40°C 75°C

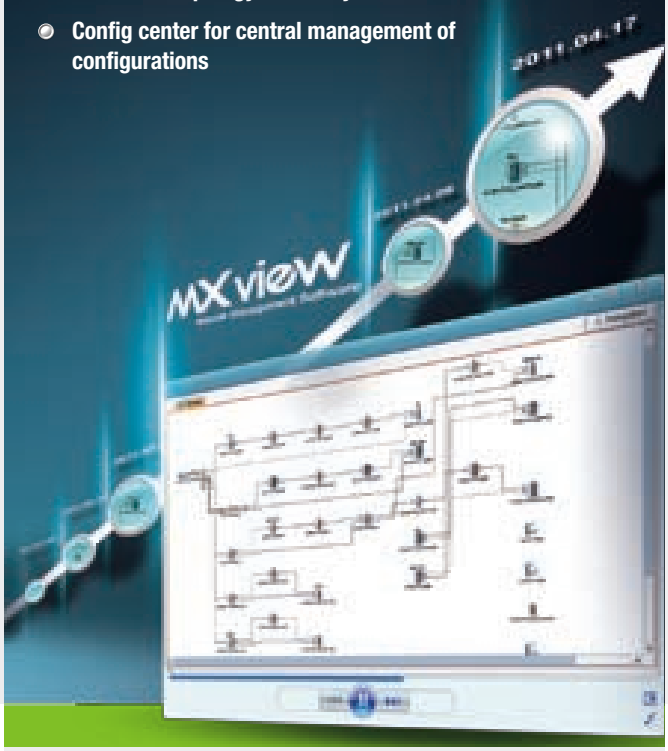
Increased Security for Industrial Networks



PAGE 1-83

Easy Troubleshooting with Event Playback

- Review historical network status with playback
- Supports up to 1000 nodes
- Automatic topology discovery and visualization
- Config center for central management of configurations

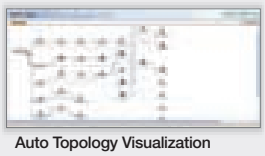


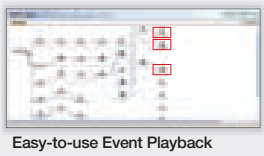
MXview

Industrial Network Management Software

- Monitors up to 1000 network devices
- Store historical events for playback
- Discovers and visualizes network devices automatically
- Notifies users in real time when events occur
- Provides central management of configurations and firmware for Moxa devices
- Presents historical traffic trend and comprehensive event logs for troubleshooting

Supervise Networks At A Glance


Auto Topology Visualization


Easy-to-use Event Playback


Remote Config Center


Comprehensive Performance Report

PAGE 2-30

Ensure Ultimate Precision in Substation Timing with IEEE 1588

- IEEE 1588 version 2 compliant
- Key reference site: 500 kV substation in Suzhou, Jiangsu, China
- Nanosecond accuracy
- Zero packet loss
- IEC 61850-3 and IEEE 1613 certified

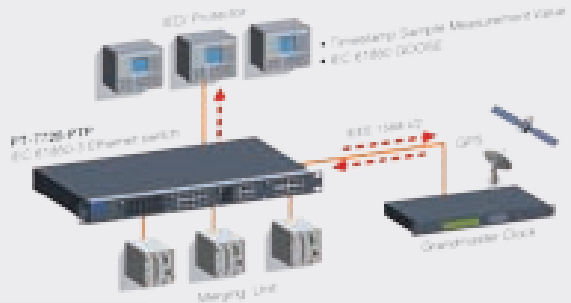


PT-7728-PTP Series

IEC 61850-3 modular IEEE 1588 v2 rackmount Ethernet switches

- Hardware-based IEEE 1588 v2 PTP
- IEC 61850-3 and IEEE 1613 (power substations) compliant
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

Networking Diagram



PAGE 2-30

PAGE 4-12

Rugged UL 508 Certified Industrial PoE Media Converters

- Rugged and UL 508-certified
- Support wide temperature from -40 to 75°C
- Reduce cabling costs and setup times



IMC-P101 Series

IEEE 802.3af PoE Ethernet-to-fiber media converters

- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- IEEE 802.3af compliant PoE
- Power failure alarm by relay output
- Store-and-Forward mode and Cut Through mode
- -40 to 75°C operating temperature range (T models)
- Redundant dual DC power inputs

Ethernet-to-Fiber Media Converters



IMC-101G Series

Industrial Gigabit Ethernet-to-fiber media converter

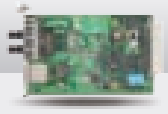
PAGE 4-14



PTC-101 Series

IEC 61850 and EN50155 Certified

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CSM-200 Series

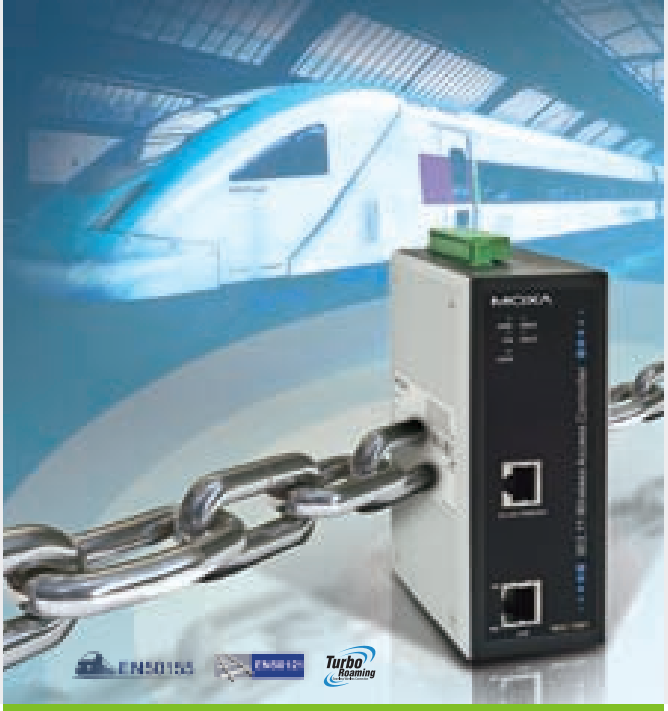
Slide-in Ethernet-to-fiber media converters for the NRack System

PAGE 4-7

PAGE 5-19

50 ms Turbo Roaming Enables Seamless Mobile Communications

- Enable faster secure roaming
- Achieve secure pre-authentication
- Prioritize real-time traffic with QoS



Moxa's 50 ms Roaming Solutions



WAC-1001
Wireless Controller

- Advanced security with WPA/WPA2 support
- Automatic configuration back-up
- -40 to 75°C wide operating temperature (T model)



AWK-3121
Indoor AP/Bridge/Client



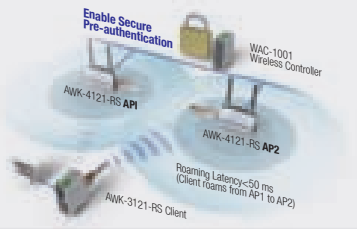
AWK-4121
Outdoor AP/Bridge/Client

- Single RF mode, 802.11a/b/g standards
- QoS (WMM) to prioritize time-sensitive data
- VLAN for network segment
- Dual power inputs and PoE for redundancy
- IP68-rated protection and -40 to 75°C operating temp. (AWK-4121)

Application

50 ms Turbo Roaming for mobility connectivity

Moxa's Turbo Roaming solution combines WAC-1001 wireless controllers with AWK-RS series APs to shrink handover time below 50 ms by reducing the time spent on re-association and re-authentication.



PAGE 5-19

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Higher Throughput WLAN Networks with 802.11n

- Up to 300 Mbps wireless data rate
- Reduced interference and enhanced connectivity
- Backward Compatible with IEEE 802.11a/b/g



AWK-3131
IEEE 802.11n Indoor Wireless AP/Bridge/Client



AWK-4131
IEEE 802.11n Outdoor Wireless AP/Bridge/Client



- MIMO increases data throughput and range
- Transmit more data with 40 MHz channel bonding
- One RJ45/SFP Gigabit combo port (AWK-3131 series only)
- One M12/SFP Gigabit combo port (AWK-4131 series only)
- IP68-rated for outdoor use (AWK-4131 series only)
- Temperature range: -40 to 75°C (T models)

Key Techniques Used by 802.11n



MIMO Technology

Multiple Input Multiple Output (MIMO) technology overcomes multipath signal reflection and interference and improves wireless range and reliability.



Channel Bonding

802.11n uses channel bonding to combine two adjacent 20 MHz channels into a single 40 MHz channel, so that more bandwidth is available for data transfer.



Frame Aggregation

802.11n introduces frame aggregation, which greatly reduces the average delay and increases the throughput performance of the 802.11 WLAN.

PAGE 5-15

PAGE 8-18

Advancing Device Server Ideas



NPort® 5000A/IA5000A Series

1/2/4-port serial device servers

- Uses 50% less power
- 3-step web-based configuration
- Surge-protected serial/Ethernet/power lines


Green


Easy


Surge-Protected

Product Family



NPort® 5000A Series

1 and 2-port serial device servers

- The world's lowest power consumption- just 1 W
- Quick and easy 3-step web-based configuration
- Surge protection for serial, Ethernet, and power lines
- COM port grouping and UDP multicast applications

PAGE 8-18



NPort® IA5000A Series

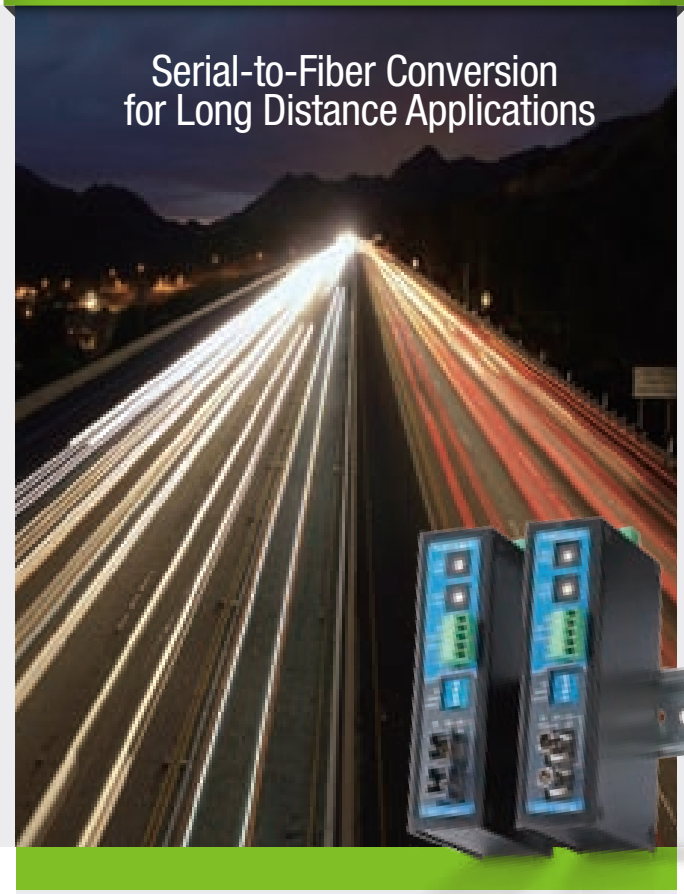
1/2/4-port serial device servers for industrial automation

- Enhanced surge protection for serial, Ethernet, and power lines
- 2 KV isolation for serial signals
- Rugged screw-type terminal blocks for power and serial connectors

PAGE 8-45

PAGE 12-6

Rugged Serial-to-Fiber Conversion



Serial-to-Fiber Media Converters for All Levels

Chassis Solutions | Entry-level Solutions | Advanced Solutions | Board Solutions

- Immunity to electromagnetic interference and electrical resistance
- No sparks
- Wider bandwidth and faster speed
- Longer transmission distance

Product Family



NRack System

Rackmount chassis converter



ICF-1150I

Industrial serial-to-fiber converters



TCF-142

RS-232/422/485 to fiber Converter



CP-102UF

Universal PCI serial over fiber boards

PAGE 12-6 , 12-13

PAGE 12-10 , 10-58

PAGE 9-6

Embedded Serial-to-Ethernet MiiNePort Makes It Simple!



MiiNePort E2 Series

10/100 Mbps embedded serial device servers

- No RJ45 connector
- The world's smallest—only 29 x 17 x 9 mm
- 3.3 VDC to 5 VDC power input range
- Transformer included

Product Family

EZPage



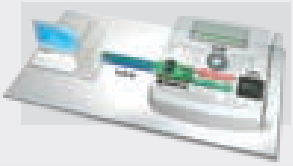
EZPower



MSCS



SCM



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PAGE 10-17

High Performance One-chip PCI Express Serial Solutions



One-chip Serial PCIe Solution

Fits any PCIe Slot

- One-chip solution optimizes CPU performance
- Software adjustable serial interface and terminator
- Windows 7 driver now available


One-chip design



No DIP Switches or Jumpers


Windows 7 Compatible

Product Family



CP-102E
2-port RS-232 PCI Express serial board

PAGE 10-25

CP-132EL-I
2-port RS-422/485 PCI Express serial board with 2 KV isolation protection

PAGE 10-27

CP-114EL-I
4-port RS-232/422/485 PCI Express serial board with 2 KV isolation protection

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PAGE 13-20

3G Cellular RTU Controller for Remote Monitoring

- 3-in-one compact design (cellular modem + I/O controller + data logger)
- -20 to 70°C operating temperature
- Push-based Active OPC to SCADA connection



ioLogik W5340-HSDPA Series

Cellular Micro RTU Controller

- Universal tri-band UMTS/HSDPA 850/1900/2100 MHz with IPSec/VPN support
- Flexible, unicode alarm system supporting SMS, email, SNMP Trap, TCP, UDP
- One RS-232/422/485 serial port built in to connect with field serial devices
- Backup with sustainable data logging function
- Seamless SCADA connectivity using Active OPC technology

Video Monitoring over 3G



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PAGE 13-13

Rugged Modular RTU Controller

- Anti-vibration and tough design
- EN 50155/50121 compliant
- -40 to 75°C operating temperature range



ioPAC-8020 Series

Modular RTU Controller

- Robust and compact design for harsh environments
- -40 to 75°C operating temperature range
- Anti-vibration spring lock terminal block
- Two Ethernet ports with M12 or RJ45 connectors for daisy chain connections

Anti-Vibration Design



M12 Ethernet Connector



Spring Type Terminal Block



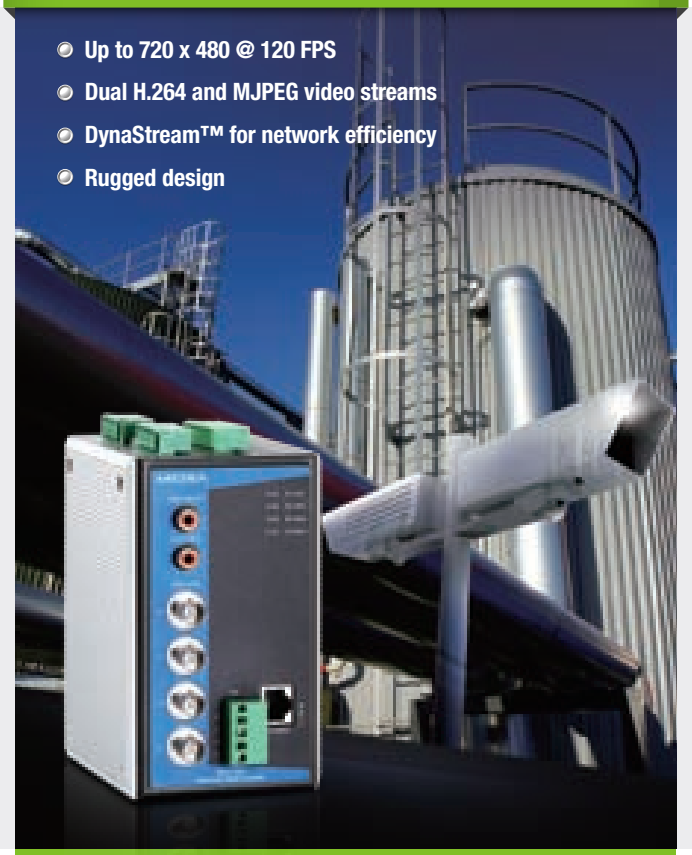
Serial Interface

PAGE 13-13

PAGE 16-17

High Performance 4-channel H.264 Industrial Video Encoders

- Up to 720 x 480 @ 120 FPS
- Dual H.264 and MJPEG video streams
- DynaStream™ for network efficiency
- Rugged design



VPort 364 Series

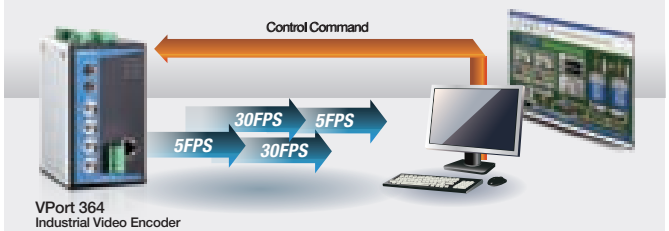
Excellent Video Quality, 4-channel H.264/MJPEG Industrial Video Encoders

- Dual simultaneous video streams for H.264 and MJPEG
- Video stream up to 30/25 frames/sec at full D1 (NTSC: 720 x 480; PAL: 720 x 576) resolution
- Video latency under 200 ms
- Exclusive Moxa DynaStream technology to optimize network bandwidth usage
- Industrial design with -40 to 75°C operating temperature
- VPort SDK PLUS provided free

-40°C 75°C

DynaStream

Dynamic Frame Rate Control for Maximum Flexibility



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PAGE 16-33

Distributed Recording Designed for Harsh Environments

- Front-end recording
- Robust industrial design
- Lower backbone bandwidth load



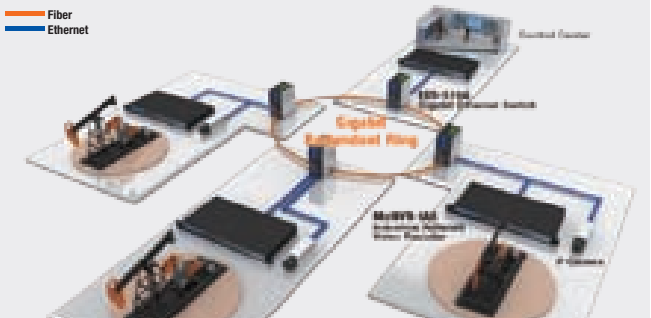
MxNVR-IA8 Series

Industrial Network Video Recorder

- Supports H.264, MPEG4, and MJPEG video recording
- Record up to 8-ch VPort video streams
- Scheduled and event-triggered recording
- Built-in 2x2.5" SATA slot for storage hard disks
- -40 to 75°C operating temperature (with solid state disks)
- Modbus/TCP supported for triggering video record in SCADA system
- Support IEEE802.1X for high network security
- Robust, fanless, 19" rackmount design

-40°C 75°C

Distributed IP Recording Solution



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PAGE 17-21

Marine Panel Computers

- Fanless design with low power consumption
- Marine-grade design for reliable operation
- Multiple display outputs

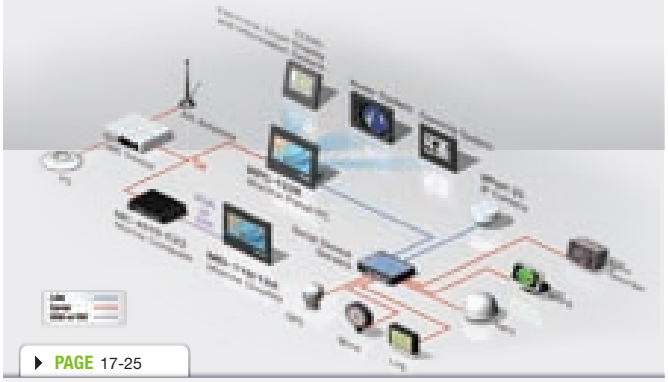


MPC-122-K / MC-4510-C23

Marine Panel Computer and Marine Computers

- 22" wide viewable image size with 16:10 aspect ratio and 1680x1050 resolution pixels
- Full range dimming, optical bonding (optional), and wide view angle (178/178)
- Color calibration
- IP66 rated for waterproof and dust enclosure
- High performance with Intel Core 2 Duo 2.26 GHz processor

Application



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PAGE 17-17

EN 50155-certified Computers for Reliable Railway Applications

- Non-symmetric leveraged storage socket design for reducing vibration and shock
- Multiple interface communications for versatile device connectivity
- Multiple display outputs



V2406/2416/2422/2426 Series

x86-based Railway Computers

- EN 50155 certified for railway applications
- Intel Atom N270 CPU for high performance
- Tightened M12 power connector for reliable operation
- Modular design with additional expansion for flexibility

Product Family





V2416

x86-based Railway Computer

- 2 Removable and hot swappable trays supporting storage expansion
- Anti-vibration/shock design for stable and reliable operation
- Multiple interface connections

PAGE 17-17

EPM-3032/3112/3337/3438/3552/DK01

V Series Expansion Modules

- PCI slots for interface expansion
- 2 isolated RS-232/422/485 ports with DB9 connectors
- 2 isolated CAN ports with DB9 connectors
- HSDPA, GPS, WLAN (11a/b/g/n)
- 8+8 DI/DO with 3 KV digital isolation protection, 2 KHz counter
- VGA or DVI-D display connector
- Mini PCI and Mini PCIe expansion modules

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Industrial Ethernet Switches

Product Selection Guide

DIN-Rail Ethernet Switches 1-2
Rackmount Ethernet Switches 1-5
PoE Switches 1-7

Introduction

Introduction to Industrial Ethernet Switches 1-8
Solutions Tailored for Industrial Infrastructures 1-9

DIN-Rail Ethernet Switches

EDS-828: 24+4G-port Layer 3 Gigabit modular managed Ethernet switch 1-16
EDS-728: 24+4G-port Gigabit modular managed Ethernet switch 1-18
IM Series: 2-port Gigabit Ethernet and 4-port fast Ethernet interface modules for EDS-728/828 series Ethernet switches . . . 1-20
EDS-608/611/616/619 Series: 8, 8+3G, 16, 16+3G-port compact modular managed Ethernet switches 1-22
CM-600 Series: 4-port fast Ethernet interface modules for EDS-600 series Ethernet switches 1-25
EDS-G509 Series: 9G-port full Gigabit managed Ethernet switches 1-26
EDS-518A Series: 16+2G-port Gigabit managed Ethernet switches 1-28
EDS-510A Series: 7+3G-port Gigabit managed Ethernet switches 1-30
EDS-505A/508A/516A Series: 5, 8, and 16-port managed Ethernet switches 1-32
EDS-405A/408A Series: 5 and 8-port entry-level managed Ethernet switches 1-35
EDS-G205/G308 Series: 5G and 8G-port full Gigabit unmanaged Ethernet switches 1-37
EDS-305/308/309/316 Series: 5, 8, 9, and 16-port unmanaged Ethernet switches 1-39
EDS-205A/208A Series: 5 and 8-port unmanaged Ethernet switches 1-42
EDS-205/208 Series: 5 and 8-port entry-level unmanaged Ethernet switches 1-44

Rackmount Ethernet Switches

ICS-G7848/G7850/G7852 Series: 48G/48G+2 10GbE/48G+4 10GbE-port Layer 3 full Gigabit modular managed Ethernet switches 1-46
ICS-G7748/G7750/G7752 Series: 48G/48G+2 10GbE/48G+4 10GbE-port full Gigabit modular managed Ethernet switches 1-48
ICS-G7826/G7828 Series: 24G+2 10GbE/24G+4 10GbE-port Layer 3 full Gigabit managed Ethernet switches 1-50
ICS-G7526/G7528 Series: 24G+2 10GbE/24G+4 10GbE-port full Gigabit managed Ethernet switches 1-52
IM-G7000 Series: 4G-port Gigabit Ethernet interface modules for ICS-G7700/G7800 series modular managed switches . . . 1-54
IKS-G6824 Series: 24G-port Layer 3 full Gigabit managed Ethernet switches 1-55
IKS-G6524 Series: 24G-port full Gigabit managed Ethernet switches 1-57
IKS-6726 Series: 24+2G-port Gigabit modular managed Ethernet switches 1-59
IKS-6524/6526 Series: 24 and 24+2G-port managed Ethernet switches 1-62
IKS-6324 Series: 22+2G-port Gigabit unmanaged Ethernet switches 1-64

PoE Switches

EDS-P510 Series: 7+3G-port Gigabit PoE managed Ethernet switches 1-66
EDS-P506A-4PoE Series: 6-port IEEE 802.3af/at PoE+ managed Ethernet switches 1-68
EDS-P308 Series: 8-port PoE unmanaged Ethernet switches 1-70
EDS-P206A-4PoE Series: 6-port IEEE 802.3af/at PoE+ unmanaged Ethernet switches 1-72
IKS-6726-8PoE Series: 24+2G-port Gigabit modular rackmount PoE managed Ethernet switches 1-74
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Firewall/VPN Secure Routers

EDR-G903 Series: Industrial Gigabit Firewall/VPN secure routers 1-81

Network Management Software

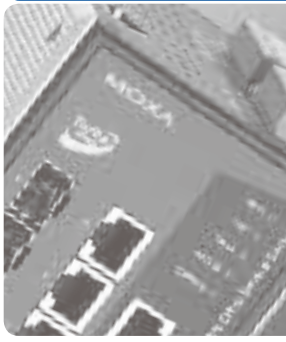
MXview: Industrial network management software designed for Moxa's networking solutions 1-83
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Industrial Ethernet Switches



DIN-Rail Ethernet Switches

	Managed DIN-Rail Switches						
							
	EDS-828	EDS-728	EDS-619	EDS-616	EDS-611	EDS-608	EDS-G509
Supported Modules							
Gigabit Ethernet Modules	✓	✓	–	–	–	–	–
Fast Ethernet Modules	✓	✓	✓	✓	✓	✓	–
SFP Gigabit Ethernet Modules	✓	✓	✓	–	✓	–	✓
SFP Fast Ethernet Modules	–	–	✓	–	✓	–	✓
Number of Ports							
Max. Number of Ports	28	28	19	16	11	8	9
Gigabit Ethernet, 10/100/1000 Mbps	up to 4	up to 4	3	–	3	–	9
Fast Ethernet, 10/100 Mbps	up to 24	up to 24	up to 16	up to 16	up to 8	up to 8	–
Available Power Supplies							
3.3 VDC	–	–	–	–	–	–	–
24 VDC	✓	✓	–	–	–	–	–
12/24/48 VDC	–	–	✓	✓	✓	✓	✓
Installation Options							
DIN-Rail Mounting	✓	✓	✓	✓	✓	✓	✓
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures							
0 to 60°C	✓	✓	✓	✓	✓	✓	✓
-40 to 75°C	–	–	✓	✓	✓	✓	✓
Redundancy and Backup Options							
Turbo Ring (recovery time < 20 ms)	✓	✓	✓	✓	✓	✓	✓
Turbo Chain (recovery time < 20 ms)	✓	✓	✓	✓	✓	✓	✓
STP/RSTP	✓	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-01)	✓	✓	✓	✓	✓	✓	✓
Network Management and Control							
Layer 3 Switching	✓	–	–	–	–	–	–
Port Trunking	✓	✓	✓	✓	✓	✓	✓
Modbus/TCP	✓	✓	✓	✓	✓	✓	✓
IEEE 1588 PTP	✓	✓	✓	✓	✓	✓	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓
IGMP Snooping/GMRP	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓
IEEE 802.1Q VLAN	✓	✓	✓	✓	✓	✓	✓
Port-based VLAN	–	–	✓	✓	✓	✓	✓
IEEE 802.1X	✓	✓	✓	✓	✓	✓	✓
Port Lock	✓	✓	✓	✓	✓	✓	✓
IPv6	–	✓	✓	✓	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications							
CE/FCC	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	✓	–	–	–	–	–
UL 508	✓	✓	✓	✓	✓	✓	✓
UL/cUL Class I Div. 2	–	–	✓	✓	✓	✓	–
ATEX Zone 2	–	–	✓	✓	✓	✓	–
DNV, GL	✓	✓	✓	✓	✓	✓	✓
ABS, LR, NK	✓	✓	✓	✓	✓	✓	✓
EN 50121-4	–	–	✓	✓	✓	✓	✓

DIN-Rail Ethernet Switches

	Managed DIN-Rail Switches						
							
	EDS-518A	EDS-510A	EDS-516A	EDS-508A	EDS-505A	EDS-408A	EDS-405A
Supported Modules							
Gigabit Ethernet Modules	–	–	–	–	–	–	–
Fast Ethernet Modules	–	–	–	–	–	–	–
SFP Gigabit Ethernet Modules	✓	✓	–	–	–	–	–
SFP Fast Ethernet Modules	–	–	–	–	–	–	–
Number of Ports							
Max. Number of Ports	18	10	16	8	5	8	5
Gigabit Ethernet, 10/100/1000 Mbps	2	3	–	–	–	–	–
Fast Ethernet, 10/100 Mbps	16	7	16	8	5	8	5
Available Power Supplies							
3.3 VDC	–	–	–	–	–	–	–
24 VDC	✓	✓	✓	✓	✓	✓	✓
12/24/48 VDC	–	–	–	–	–	–	–
Installation Options							
DIN-Rail Mounting	✓	✓	✓	✓	✓	✓	✓
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures							
0 to 60°C	✓	✓	✓	✓	✓	✓	✓
-40 to 75°C	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options							
Turbo Ring (Recovery Time < 20 ms)	✓	✓	✓	✓	✓	✓	✓
Turbo Chain (Recovery Time < 20 ms)	✓	✓	✓	✓	✓	✓	✓
STP/RSTP	✓	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-01)	✓	✓	✓	✓	✓	✓	✓
Network Management and Control							
Layer 3 Switching	–	–	–	–	–	–	–
Port Trunking	✓	✓	✓	✓	✓	–	–
Modbus/TCP	✓	✓	✓	✓	✓	✓	✓
IEEE 1588 PTP	✓	✓	✓	✓	✓	–	–
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓
IGMP Snooping/GMRP	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓
IEEE 802.1Q VLAN	✓	✓	✓	✓	✓	✓	✓
Port-based VLAN	✓	✓	✓	✓	✓	✓	✓
IEEE 802.1X	✓	✓	✓	✓	✓	–	–
Port Lock	✓	✓	✓	✓	✓	–	–
IPv6	✓	✓	✓	✓	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications							
CE/FCC	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	✓	✓	✓	✓	✓	✓
UL508	✓	✓	✓	✓	✓	✓	✓
UL/cUL Class I, Div. 2	✓	✓	✓	✓	✓	✓	✓
ATEX Zone 2	✓	✓	✓	✓	✓	✓	✓
DNV, GL	✓	✓	✓	✓	✓	✓	✓
ABS, LR, NK	–	–	–	–	–	EDS-408A 3 Fiber series only	–
EN50121-4	–	–	–	–	–	✓	–

DIN-Rail Ethernet Switches

	Unmanaged DIN-Rail Switches									
										
	EDS-G308	EDS-G205	EDS-316	EDS-309	EDS-308	EDS-305	EDS-208A	EDS-205A	EDS-208	EDS-205
Supported Modules										
SFP Gigabit Ethernet Modules	✓	–	–	–	–	–	–	–	–	–
SFP Fast Ethernet Modules	✓	–	–	–	–	–	–	–	–	–
Number of Ports										
Max. Number of Ports	8	5	16	9	8	5	8	5	8	5
Gigabit Ethernet, 10/100/1000 Mbps	8	5	–	–	–	–	–	–	–	–
Fast Ethernet, 10/100 Mbps	–	–	16	9	8	5	8	5	8	5
Available Power Supplies										
24 VDC	–	–	✓	✓	✓	✓	–	–	✓	✓
24 VAC	–	–	–	–	–	–	✓	✓	✓	✓
12/24/48 VDC	✓	✓	–	–	–	–	✓	✓	–	–
Installation Options										
DIN-Rail Mounting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	–	–
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures										
0 to 60°C	✓	✓	✓	✓	✓	✓	–	–	–	–
-10 to 60°C	–	–	–	–	–	–	✓	✓	✓	✓
-40 to 75°C	✓	✓	✓	✓	✓	✓	✓	✓	–	–
Standards and Certifications										
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	–	–	✓	✓	✓	✓	–	–	✓	–
UL508	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL/cUL Class I, Div. 2	✓	✓	✓	✓	✓	✓	✓	✓	–	–
ATEX Zone 2	✓	✓	✓	✓	✓	✓	✓	✓	–	–
DNV/GL	✓	✓	✓	✓	✓	✓	✓	✓	–	–
ABS/LR/NK	✓	✓	–	–	–	–	✓	✓	–	–
EN50121-4	–	–	–	–	–	–	✓	✓	–	–

Rackmount Ethernet Switches

	Managed Rackmount Switches							
								
	ICS-G7852	ICS-G7850	ICS-G7848	ICS-G7752	ICS-G7750	ICS-G7748	ICS-G7828	ICS-G7826
Supported Modules								
Gigabit Ethernet Modules	✓	✓	✓	✓	✓	✓	–	–
Fast Ethernet Modules	–	–	–	–	–	–	–	–
SFP+ 10 Gigabit Ethernet Modules	✓	✓	–	✓	✓	–	✓	✓
SFP Gigabit Ethernet Modules	✓	✓	✓	✓	✓	✓	✓	✓
SFP Fast Ethernet Modules	✓	✓	✓	✓	✓	✓	✓	✓
Number of Ports								
Max. Number of Ports	52	50	48	52	50	48	28	26
10 Gigabit Ethernet	4	2	–	4	2	–	4	2
Gigabit Ethernet, 10/100/1000 Mbps	up to 48	up to 48	up to 48	up to 48	up to 48	up to 48	24	24
Fast Ethernet, 10/100 Mbps	–	–	–	–	–	–	–	–
Available Power Supplies								
24 VDC	–	–	–	–	–	–	–	–
24 VAC	–	–	–	–	–	–	–	–
48 VDC	–	–	–	–	–	–	–	–
12/24/48 VDC	–	–	–	–	–	–	–	–
85-264 VAC	✓	✓	✓	✓	✓	✓	✓	✓
88-300 VDC or 85-264 VAC, isolated	–	–	–	–	–	–	–	–
Installation Options								
DIN-Rail Mounting	–	–	–	–	–	–	–	–
Panel Mounting	–	–	–	–	–	–	–	–
Rack Mounting	✓	✓	✓	✓	✓	✓	✓	✓
Supported Operating Temperatures								
0 to 60°C	✓	✓	✓	✓	✓	✓	✓	✓
-40 to 75°C	–	–	–	–	–	–	–	–
Redundancy and Backup Options								
Turbo Ring (Recovery Time < 20 ms)	–	–	–	–	–	–	–	–
Turbo Chain (Recovery Time < 20 ms)	–	–	–	–	–	–	–	–
Turbo Ring (Recovery Time < 50 ms)	✓	✓	✓	✓	✓	✓	✓	✓
Turbo Chain (Recovery Time < 50 ms)	✓	✓	✓	✓	✓	✓	✓	✓
STP/RSTP	✓	✓	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-01)	✓	✓	✓	✓	✓	✓	✓	✓
Network Management and Control								
Layer 3 Switching	✓	✓	✓	–	–	–	✓	✓
Port Trunking	✓	✓	✓	✓	✓	✓	✓	✓
Modbus/TCP	✓	✓	✓	✓	✓	✓	✓	✓
IEEE 1588 PTP	✓	✓	✓	✓	✓	✓	✓	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓	✓
IGMP/GMRP	✓	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓	✓
VLAN	✓	✓	✓	✓	✓	✓	✓	✓
IEEE 802.1X	✓	✓	✓	✓	✓	✓	✓	✓
Port Lock	✓	✓	✓	✓	✓	✓	✓	✓
IPv6	Pending	Pending	Pending	✓	✓	✓	Pending	Pending
Relay Warning	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications								
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
UL508	–	–	–	–	–	–	–	–
DNV/GL	–	–	–	–	–	–	–	–
ABS, LR, NK	–	–	–	–	–	–	–	–
NEMA TS2	–	–	–	–	–	–	–	–
EN50121-4	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending

Rackmount Ethernet Switches

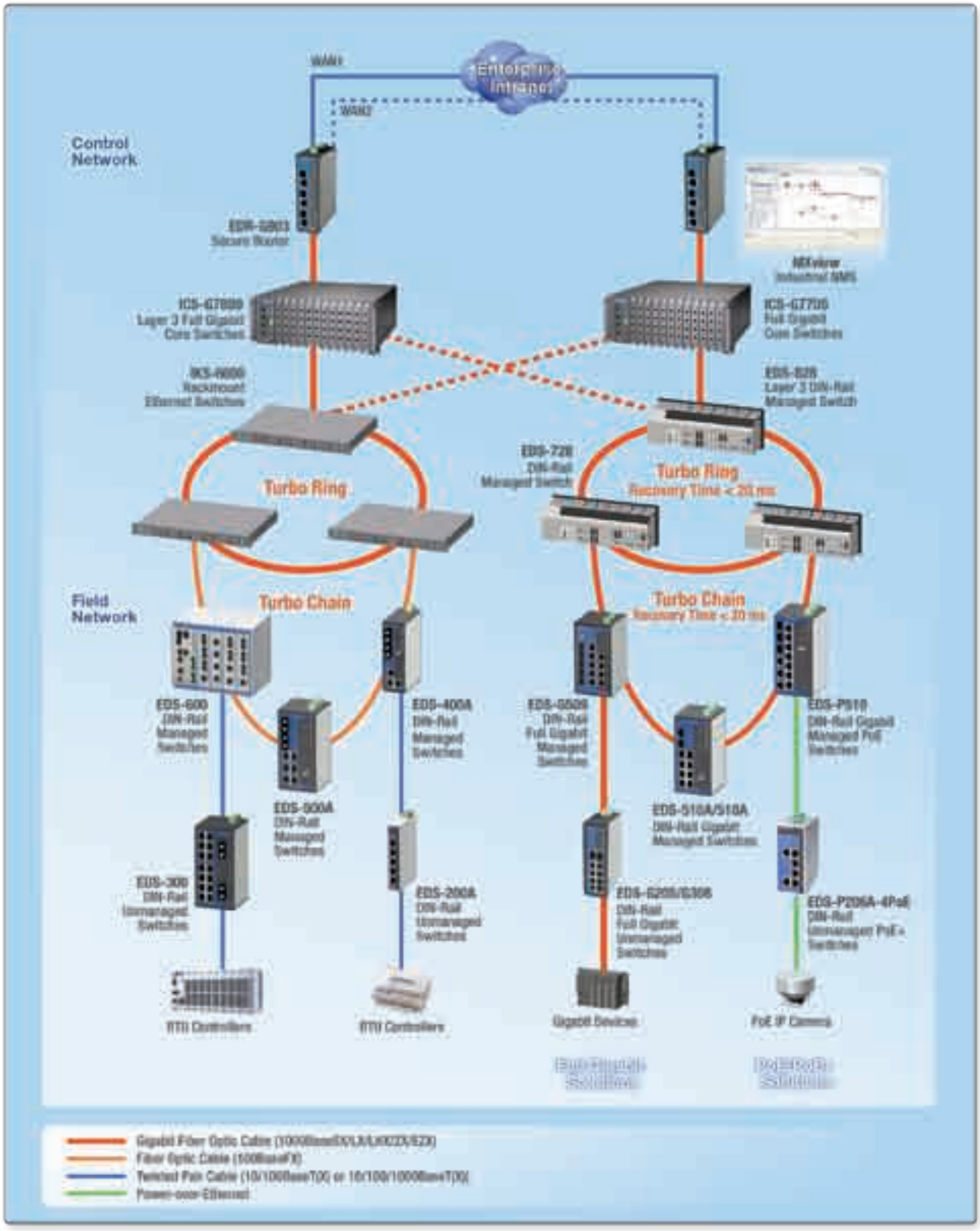
	Managed Rackmount Switches							Unmanaged Rackmount Switches
								
	ICS-G7528	ICS-G7526	IKS-G6824	IKS-G6524	IKS-6726	IKS-6526	IKS-6524	IKS-6324
Supported Modules								
Gigabit Ethernet Modules	–	–	–	–	✓	–	–	✓
Fast Ethernet Modules	–	–	–	–	✓	–	–	✓
SFP+ 10 Gigabit Ethernet Modules	✓	✓	–	–	–	–	–	–
SFP Gigabit Ethernet Modules	✓	✓	✓	✓	✓	✓	–	✓
SFP Fast Ethernet Modules	✓	✓	✓	✓	✓	–	IKS-6524-8SFP series only	–
Number of Ports								
Max. Number of Ports	28	26	24	24	26	26	24	24
10 Gigabit Ethernet	4	2	–	–	–	–	–	–
Gigabit Ethernet, 10/100/1000 Mbps	24	24	24	24	up to 2	2	–	up to 2
Fast Ethernet, 10/100 Mbps	–	–	–	–	up to 24	24	24	–
Available Power Supplies								
24 VDC	–	–	–	–	✓	–	–	–
24 VAC	–	–	–	–	–	–	–	–
48 VDC	–	–	–	–	✓	–	–	–
12/24/48 VDC	–	–	–	–	–	–	–	✓
85-264 VAC	✓	✓	✓	✓	–	✓	✓	–
88-300 VDC or 85-264 VAC, isolated	–	–	–	–	✓	–	–	✓
Installation Options								
DIN-Rail Mounting	–	–	–	–	–	–	–	–
Panel Mounting	–	–	–	–	–	–	–	–
Rack Mounting	✓	✓	✓	✓	✓	✓	✓	✓
Supported Operating Temperatures								
0 to 60°C	✓	✓	✓	✓	–	–	–	–
-40 to 75°C	–	–	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options								
Turbo Ring (Recovery Time < 20 ms)	–	–	–	–	✓	✓	✓	–
Turbo Chain (Recovery Time < 20 ms)	–	–	–	–	✓	✓	✓	–
Turbo Ring (Recovery Time < 50 ms)	✓	✓	✓	✓	–	–	–	–
Turbo Chain (Recovery Time < 50 ms)	✓	✓	✓	✓	–	–	–	–
STP/RSTP	✓	✓	✓	✓	✓	✓	✓	–
Automatic Backup Configurator (ABC-01)	✓	✓	✓	✓	✓	✓	✓	–
Network Management and Control								
Layer 3 Switching	–	–	✓	–	–	–	–	–
Port Trunking	✓	✓	✓	✓	✓	✓	✓	–
Modbus/TCP	✓	✓	✓	✓	✓	✓	✓	–
IEEE 1588 PTP	✓	✓	✓	✓	✓	✓	✓	–
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓	–
LLDP	✓	✓	✓	✓	✓	✓	✓	–
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓	–
IGMP/GMRP	✓	✓	✓	✓	✓	✓	✓	–
QoS	✓	✓	✓	✓	✓	✓	✓	–
VLAN	✓	✓	✓	✓	✓	✓	✓	–
IEEE 802.1X	✓	✓	✓	✓	✓	✓	✓	–
Port Lock	✓	✓	✓	✓	✓	✓	✓	–
IPv6	✓	✓	Pending	✓	✓	✓	✓	–
Relay Warning	✓	✓	✓	✓	✓	✓	✓	–
Standards and Certifications								
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	Pending	Pending	Pending	Pending	✓	✓	✓	–
UL508	–	–	–	–	–	–	–	–
DNV/GL	–	–	–	–	✓	✓	✓	✓
ABS, LR, NK	–	–	–	–	✓	✓	✓	✓
NEMA TS2	–	–	–	–	✓	✓	✓	✓
EN50121-4	Pending	Pending	Pending	Pending	✓	✓	✓	✓

PoE Switches

	Managed DIN-Rail PoE Switches		Unmanaged DIN-Rail PoE Switches		Managed Rackmount PoE Switches
					
	EDS-P510	EDS-P506A-4PoE	EDS-P308	EDS-P206A-4PoE	IKS-6726-8PoE
Supported Modules					
Gigabit Ethernet Modules	–	–	–	–	✓
Fast Ethernet Modules	–	–	–	–	✓
SFP Gigabit Ethernet Modules	✓	–	–	–	✓
SFP Fast Ethernet Modules	✓	–	–	–	✓
Number of Ports					
Max. Number of Ports	10	6	8	6	26
Gigabit Ethernet, 10/100/1000 Mbps	3	–	–	–	up to 2
Fast Ethernet, 10/100 Mbps	3	2	4	2	up to 16
PoE, Fast Ethernet, 10/100 Mbps	4	4	4	4	up to 16
Available Power Supplies					
24 VDC	–	✓	–	✓	–
48 VDC	✓	✓	✓	✓	✓
12/24/48 VDC	–	–	–	–	–
88-300 VDC or 85-264 VAC, isolated	–	–	–	–	✓
Installation Options					
DIN-Rail Mounting	✓	✓	✓	✓	–
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	–
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	✓
Supported Operating Temperatures					
0 to 60°C	✓	✓	✓	✓	–
-40 to 75°C	✓	✓	✓	✓	✓
Redundancy and Backup Options					
Turbo Ring (Recovery Time < 20 ms)	✓	✓	–	–	✓
Turbo Chain (Recovery Time < 20 ms)	✓	✓	–	–	✓
STP/RSTP	✓	✓	–	–	✓
Automatic Backup Configurator (ABC-01)	✓	✓	–	–	✓
Network Management and Control					
Port Trunking	✓	✓	–	–	✓
Modbus/TCP	✓	✓	–	–	✓
IEEE 1588 PTP	✓	✓	–	–	✓
SNMP/RMON	✓	✓	–	–	✓
LLDP	✓	✓	–	–	✓
DHCP Option 66/67/82	✓	✓	–	–	✓
IGMP Snooping/GMRP	✓	✓	–	–	✓
QoS	✓	✓	–	–	✓
VLAN	✓	✓	–	–	✓
IEEE 802.1X	✓	✓	–	–	✓
Port Lock	✓	✓	–	–	✓
IPv6	✓	✓	–	–	✓
Relay Warning	✓	✓	–	–	✓
Standards and Certifications					
CE/FCC	✓	✓	✓	✓	✓
UL 60950-1	–	–	–	–	Pending
UL508	✓	Pending	✓	Pending	–
UL/cUL Class I, Div. 2	–	–	–	–	–
ATEX Zone 2	–	–	–	–	–
DNV/GL	✓	–	✓	–	–
ABS/LR/NK	✓	–	✓	–	–
NEMA TS2	–	–	–	–	–
EN50121-4	–	Pending	–	Pending	✓

Introduction to Industrial Ethernet Switches

The Broadest Portfolio of Industrial Ethernet Switch Solutions



Solutions Tailored for Industrial Infrastructures

Industrial automation applications require industrial-grade solutions that ensure availability, real-time operation, security, and reliability. Building a fully rugged infrastructure that is stable enough to ensure smooth system operations is even more challenging. In this case, solutions that support resilient and flexible network redundancy, real-time monitoring and control, seamless integrated security, and rugged parameters are needed. Moxa offers a full spectrum of industrial Ethernet switches that fit all industrial requirements.

Network Requirements for Industrial Applications	Moxa's Solutions
Absolute Network Availability and Resilience • Rapid recovery capability eliminating single points of failure to ensure continuous operations • Easy and flexible redundant network planning	• Moxa Turbo Ring™ self-healing technology for network redundancy (recovery time < 20 ms) • Line-swap fast recovery for quick response when devices change ports • Innovative Turbo Chain™ technology for flexible redundant network planning (recovery time < 20 ms)
Real-time Network Monitoring and Control • Powerful network management platform to supervise networks, ensuring optimal operations and minimal system downtime • Dynamic device status reports by email warning or signal outputs (e.g., digital output, relay contact) prevent system damage and losses	• MXview industrial network management software for visualizing and troubleshooting your networks • Automatic email warnings and relay output alarms for port breaks and power failures
Advanced Network Management and Security • Seamlessly integrate with industrial automation networks • Intelligent implementations to optimize network performance • Easily migrate to next generation networking standards • Secure data transmission across networks	• EtherNet/IP, Modbus/TCP, IEEE 1588 PTP, LLDP, DHCP Option 82, SNMP Inform, QoS, IGMP snooping, and VLAN supported • IPv6 compliant for next generation Internet technologies • Integrated security features: TACACS+, IEEE 802.1X, HTTPS, SSH, SNMPv3, and port security supported
Rugged Design with Reliability and Durability • Redundant power inputs to reduce vulnerability to power failures • Ring topology to provide a backup path • Fanless and high MTBF • Withstands extreme temperature, shock, drops, and vibrations • A rugged high strength housing to keep out harmful substances • Strict industrial regulatory approval to ensure safe operation	Strict industry standards (Class I Div. 2, ATEX Zone 2, DNV/GL/ABS/LR/NK, NEMA TS2, EN 50121-4, etc.) and rigorous EMI/EMS tests confirm that Moxa's switches are ideal for harsh environments. Other industrial-grade features include dual power inputs, completely fanless designs, -40 to 75°C operating temperature range, hardened housings, and a 5-year warranty.

Product Portfolio

Moxa is your one-stop shop for industrial DIN-Rail mounted and rack mounted Ethernet switches, allowing you to choose the right products for your applications. All of Moxa's network switches have an optimal price-to-performance ratio for building robust Ethernet platforms in industrial environments.



DIN-Rail managed and unmanaged Ethernet switches

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Rackmount managed and unmanaged Ethernet switches

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PoE/PoE+ managed and unmanaged Ethernet switches

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Embedded Ethernet switches

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Firewall/VPN secure router

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Network management software

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Multiple Industrial Network Management Solutions

The SCADA/HMI system is the supervisory core of industrial control systems. It connects to RTUs, PLCs, and the network infrastructure for complicated data acquisition, monitoring, and control to ensure efficient and safe operations. Moxa provides several network management solutions, including SNMP OPC server and EtherNet/IP and Modbus/TCP-enabled network devices, to easily and directly integrate network status into SCADA/HMI systems. In addition, users now have a new option for network supervision with Moxa's industrial network management software, which supports SNMP devices and Moxa's Ethernet switches installed on industrial networks.



MXview Live Network Topology Visualization for Easy Troubleshooting

Moxa's MXview industrial network management software is designed to analyze, monitor, configure, and troubleshoot the remote network connections formed by Moxa's managed Ethernet switches, wireless AP/bridge/client solutions, and other SNMP networked devices for industrial automation. It visualizes the physical wiring map of your network via a simple, user-friendly Web Browser UI for remote management. You can easily track real-time network status, identify failure points quickly, and reduce the troubleshooting response time of complex and critical network operations with MXview.

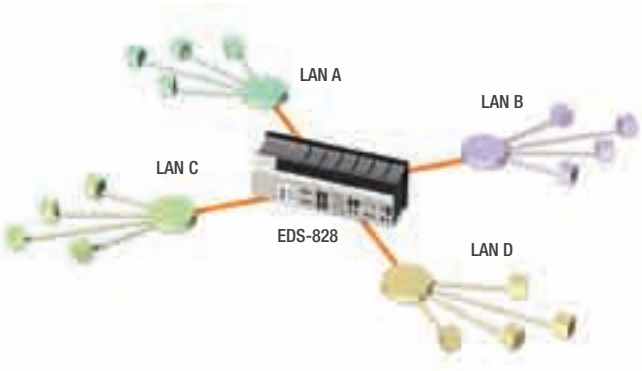


MXview
Industrial Network Management Software

High-performance Layer 3 Switching Capability

Optimum Network Efficiency through LAN Segmentation

Layer 3 switches use the IP address to make switching decisions, as routers do, but are hardware optimized to transmit data just as fast as Layer 2 switches. The 802.1Q VLAN of a Layer 2 switch allows network operators to configure and maintain their network more effectively, but cross VLAN communication still relies on traditional Layer 3 routers. Both routers and Layer 3 switches use a routing protocol and routing table to determine the best path. However, compared to routers, which are usually software-based, Layer 3 switches are faster and less expensive. This is due to their built-in switching hardware with optimized chips and full-wire speed IP frame forwarding performance suitable for interconnecting VLANs. Moxa now offers high-performance Layer 3 switches that use state-of-the-art routing technology to partition a large-scale LAN into multiple subnets for improved network performance.



Layer 3 Switching Supported by Moxa

- Static Routing
- RIP v1/v2 (Routing Information Protocol)
- OSPF (Open Shortest Path First)
- DVMRP (Distance Vector Multicast Routing Protocol)
- PIM-DM (Protocol Independent Multicast-Dense Mode)

Versatile Layer 2 Industrial Network Management

• Reliable Network Redundancy • Efficient Network Performance • Easy Network Management • Advanced Network Security

Reliable Network Redundancy

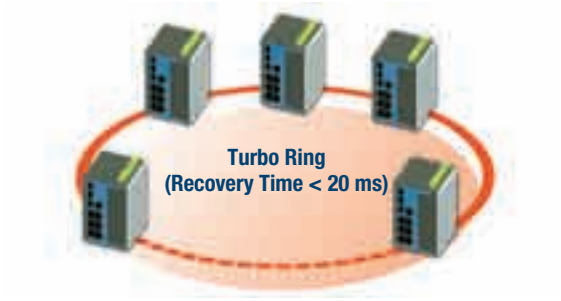
Ethernet network redundancy is essential to today's industrial Ethernet infrastructures. When a highly integrated system experiences a connection failure, the consequences are costly or even disastrous. In order to maximize system reliability and uptime during network failures so that your networks run non-stop, Moxa industrial managed Ethernet switches support enhanced Turbo Ring™ and Turbo Chain™ redundant technology in addition to standard RSTP/STP and port trunking.

Turbo Ring™ for Ring and Media Redundancy

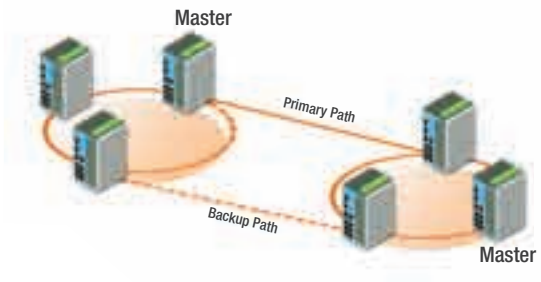
Moxa Turbo Ring™ is a proprietary self-healing technology that enables fast fault recovery of under 20 ms (at a full load of 250 switches). Turbo Ring™ supports three topology options—ring coupling, dual-ring, and dual homing—to reduce redundant network cabling and network planning costs and to ensure the high reliability of your industrial network applications.

Ring Coupling—helps you separate distributed devices into different smaller redundant rings, without a control line, but in such a way that the smaller rings at different remote sites will still be able to communicate with each other.

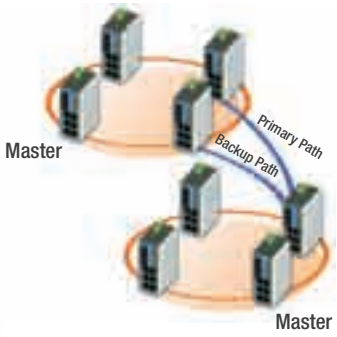
Dual-Homing—involves coupling two separate rings with a single EDS switch connecting to two independent connection points. The back-up path will be activated if the operating connection (or main path) fails.



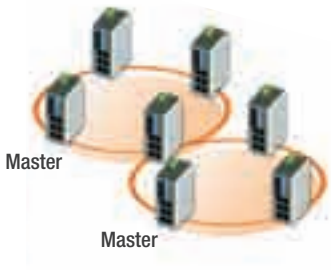
Dual-Ring—adds reliability by using a single EDS switch to connect two separate rings for applications that present cabling difficulties.



Ring Coupling



Dual-Homing



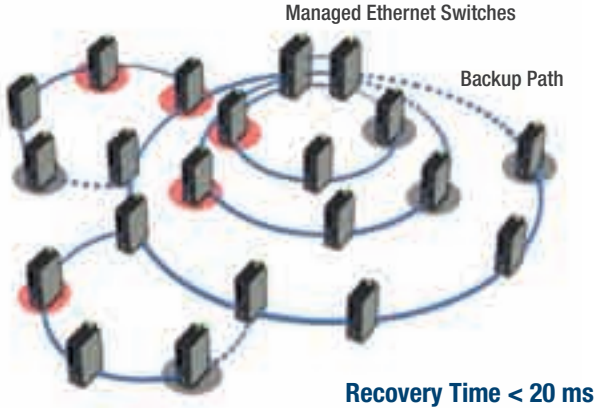
Dual-Ring

Use Turbo Chain™ to Create Redundant Connections for Large-scale Networks

Moxa's Turbo Chain™ is an innovative breakthrough that unlocks the ability to create multiple redundant networks beyond the current limitations of redundant ring technology. Turbo Chain™ is easily configured by linking two user-configured end ports with the same segment. Turbo Chain™ easily connects and extends existing redundant networks by enabling high network availability with its self-healing capability (recovery time < 20 ms). In addition, Turbo Chain™ supports standard IEEE 802.1w/802.1D-2004 RSTP and STP protocols. Compared with ring coupling solutions or a network re-design, Moxa Turbo Chain™ is more flexible and cost-efficient and has the potential to save a significant amount on development costs, time, effort, cabling, and Ethernet ports.

Turbo Chain™: Beyond Redundant Ring

- Flexible network topology
- Unlimited and easy network expansions
- Fast fault recovery (recovery time < 20 ms)
- Cost-effective configurations
- Moxa's industrial managed Ethernet switches supported

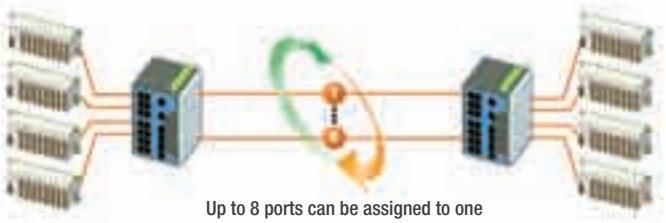


Recovery Time < 20 ms

● Head switch: Edge switch is assigned the forwarding state
● Tail switch: Edge switch is assigned the blocked state

Port Trunking for Flexible Network Connections

IEEE 802.3ad (LACP, Link Aggregation Control Protocol) provides flexible network connections and a redundant path for critical devices. For example, the EDS-518A allows users to set up a wider communication path by aggregating a trunk group. A maximum of eight ports can be assigned to one trunk group to optimize your network connection and redundant paths. When selected ports are grouped for trunking, LACP will exchange information to determine whether or not the ports selected in a group can be trunked together.



Up to 8 ports can be assigned to one trunk group

Efficient Network Performance

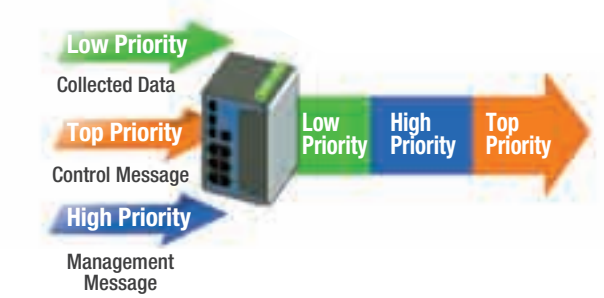
Transition to Next Generation IPv6 Networks

IPv6 was introduced to increase the number of available IP addresses. Available IPv4 addresses will soon be completely exhausted, so support for IPv6 (128-bit IP addresses) is important to secure the future of your network. Moxa's managed Ethernet switches have been certified as IPv6 ready by the global IPv6 Forum. They can support IPv6 and IPv4 dual stack service to offer better addressing and security for large networks to protect your future investments.



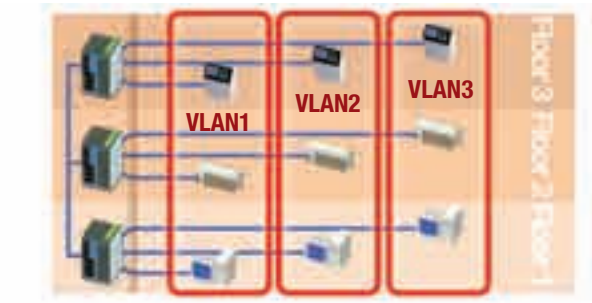
QoS Increases Data Determinism

Quality of Service (QoS) provides a traffic prioritization capability to ensure that important data is delivered consistently and predictably. Moxa's managed Ethernet switches can inspect IEEE 802.1p/1Q layer 2 CoS tags, and even layer 3 TOS information, to provide a consistent classification of the entire network. The QoS capability of the managed Ethernet switches improve your industrial network's performance and determinism for mission-critical applications.



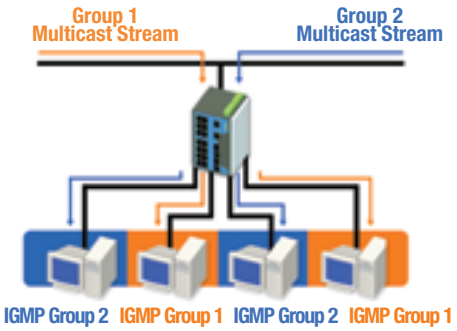
VLAN Eases Network Planning

A VLAN is a group of devices that can be located anywhere on a network, but which communicate as if they are on the same physical segment. VLANs can be used to segment your network without being restricted by physical connections—a limitation imposed by traditional network design. Since all automation systems incorporate sensitive devices that must be protected from unauthorized access, it is essential to have an authentication system set up that only allows authorized users to access the system. If devices belong to different VLANs, they cannot communicate with each other, providing extra security and protection from unwanted invasion or traffic. The IEEE 802.1Q standard and GVRP protocol can exchange the same interoperable parameters to keep consistent VLAN settings over the entire network.



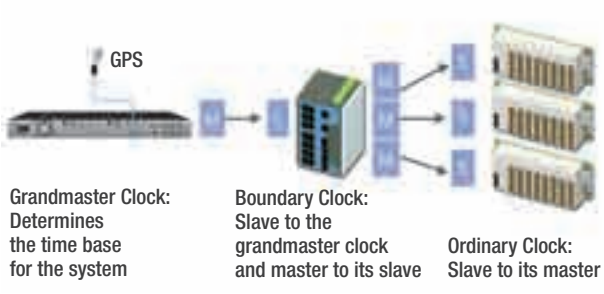
IGMP Snooping and GMRP for Filtering Multicast Traffic

Moxa's managed Ethernet switches support IEEE 802.1D-1998 GMRP (GARP Multicast Registration Protocol) and IGMP snooping, which provide the ability to prune multicast traffic so that it travels only to those end destinations that require it. The overall effect is to reduce the amount of traffic on the Ethernet LAN.



IEEE 1588 PTP Enhances Clock Synchronization of Automation Devices

IEEE 1588 PTP, also known as Precision Time Protocol (PTP), is designed to synchronize the real-time clocks located at the nodes of a distributed system that communicates over a network. Moxa's managed Ethernet switches with IEEE 1588 PTP are well suited for applications such as motion control that require distributed clocks to be synchronized with great accuracy.



Easy Network Management

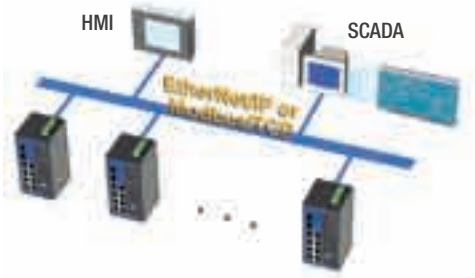
SNMP Inform Enables Reliable Event Management

SNMP Inform is used to acknowledge receipt of event notifications. If you use SNMP to monitor your network systems, you can use this event action to send an SNMP Inform notification in response to the specified critical event. Moxa's managed Ethernet switches can ask an SNMP manager to send an SNMP response to confirm that notification has been received. This means that the SNMP Inform message can be resent several times if a response is not initially received.



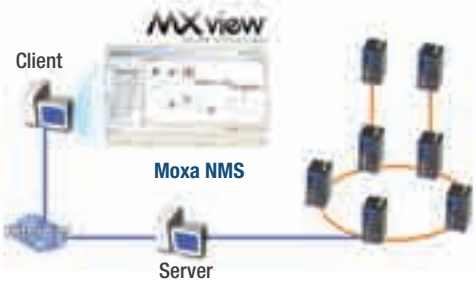
EtherNet/IP and Modbus/TCP Easily Integrate with SCADA/HMI Systems

EtherNet/IP and Modbus/TCP are international industrial communication protocols that provide a direct connection to automation and control systems. Moxa's managed Ethernet switches support communication with SCADA/HMI systems using the EtherNet/IP or Modbus/TCP protocol. SCADA/HMI systems can monitor the status of managed Ethernet switches to provide industrial applications with a seamless process and real-time data acquisition.



Automated Topology Discovery with LLDP

The Link Layer Discovery Protocol or LLDP (IEEE 802.1AB) is a data-link layer protocol that advertises device information, such as IP address, description, and system capabilities, to neighboring devices over the network. Moxa's managed Ethernet switches fully implement LLDP. Network management software, such as Moxa's MXview, can easily discover and manage LLDP-enabled devices to create accurate network topologies and maintain the information used by access devices.



Intelligent DHCP Option 82 IP Address Allocation

DHCP Option 82 refers to the "DHCP Relay Agent Information Option," which allows a DHCP Relay Agent to insert detailed information, such as port information and MAC addresses of relay agents, to a request being transmitted to a DHCP server. DHCP servers can use this information to allocate IP addresses and other assignment settings that are mapped to its MAC address table. Moxa's managed Ethernet switches support DHCP Option 82, and play the role of DHCP relay agent to communicate a DHCP request. When a new device replaces a device connected to a Moxa switch, the DHCP server can offer the same assigned IP address to reduce system downtime and maintenance requirements.



Efficient Network Monitoring and Proactive Management with RMON

RMON (Remote Network Monitoring) is an Internet Engineering Task Force (IETF) standard monitoring specification that allows various network agents and console systems to exchange network monitoring data. RMON provides you with comprehensive network fault diagnosis, planning, and performance-tuning information, and helps you manage your network in a more proactive manner. If configured correctly, RMON probes deliver information before problems occur. This means that you can take action before the problems affect users.

Immediate Event Notifications with Real-time Alarms

Warning by E-mail

Moxa's managed Ethernet switches send out a warning e-mail when an exception is triggered, providing system managers with real-time alarm messages.

Switch Events		Port Events
Cold Start	Warm Start	Link On
Power On/Off	Authentication Failure	Link Off
Topology Change	Configuration Change	Traffic Overload

Warning by Relay Output

The managed Ethernet switches provide relay outputs that can be configured to indicate the importance of events when notifying or warning engineers in the field. In response, engineers can respond to higher priority messages quickly and with the appropriate emergency maintenance procedures.

DI for Integrating Other Important Sensors

Moxa's managed Ethernet switches (not including the EDS-400A or IKS series switches) have two digital inputs for integrating sensors into the Ethernet switches' automatic alarm mechanism. This is done by redirecting warning messages to an IP network by e-mail notification.

Advanced Network Security

Seamlessly Integrated Network Security

Security is one of the most important requirements for protecting the infrastructure of mission-critical networks. Moxa's managed Ethernet switches support IEEE 802.1X (port-based network access control) to restrict port access to authorized users only. Authentication is done using the local user database or an external RADIUS server. To further protect data interception, HTTPS and SSH protocols are supported for transferring encrypted data over the Internet. With Radius, TACACS+, IEEE 802.1X, HTTPS, SSH, SNMPv3, and port lock limited access by MAC address, Moxa's managed switches offer a seamless integrated network security solution to secure your industrial network data.



Rugged Industrial Design for Outstanding Reliability

Industrial environments have many hazards, and have exacting requirements for ruggedized equipment:

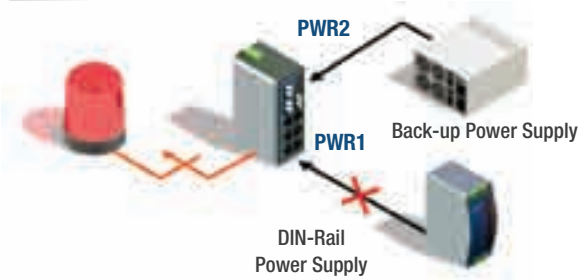
- Reliable power inputs for maximum network uptime
- Ability to withstand exposure to extreme temperatures
- Immunity from electromagnetic interference
- Ability to withstand vibration, impacts, dust, humidity, and corrosive environments
- Compliant with certification standards
- Long-term durability

Moxa's solutions satisfy all of these industrial requirements. Moxa's rugged industrial-grade Ethernet switches can be used to build automation infrastructures for applications—such as traffic control, marine and offshore operations, and oil and gas process control—that operate in harsh industrial environments.

Stable and Versatile Power Inputs for Industrial Applications

The redundant power inputs on Moxa's industrial Ethernet switches can be a life saver; if one power source fails, the redundant power input will kick in and keep the entire system operating safely. Some models feature a wide range of 12/24/48 VDC power inputs, and can handle large power fluctuations (e.g., 48 VDC can handle voltage increases of up to +20%, and 12 VDC can handle voltage decreases down to -20%). If your application is restricted to VAC input power, choose a Moxa Ethernet switch (such as the EDS-200A/200 series) that is specially designed to handle AC power. With these switches you can use either a 24 VDC or 24 VAC power input.

- DC input: wide power range from 9.6 to 60 VDC
- AC input: 18 to 30 VAC



Designed to Withstand Extreme Temperatures

Industrial environments can be extremely hot or unbearably cold, and require network devices that operate reliably when subjected to wide temperature fluctuations. Moxa's Ethernet switches are rigorously tested beyond industry standards to ensure they will operate in a -40 to 75ºC operating temperature range. For example, whereas regulatory standards require only a temperature change of 1ºC/minute throughout the cycling examination, Moxa conducts stricter testing with 3ºC/minute.

Moxa's Ethernet switches are all held to strict minimal packet loss requirements, and use passive cooling to ensure reliability even in extreme temperatures.

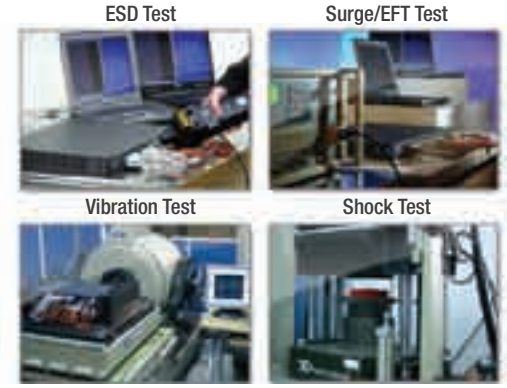


Outstanding Electromagnetic Immunity

The rugged design of Moxa's industrial Ethernet switches includes excellent electromagnetic immunity that often surpass the requirements stipulated by EN 50121-4, DNV, and IEC 61000. For example, to provide immunity against magnetic fields induced by power frequencies, Moxa designs for 300 A/m applied continuously and 1000 A/m applied for 1 to 3 second intervals, which is three times stricter than EN 50121-4.

Network Connections Well-protected against Harsh Environmental Conditions

Moxa's Ethernet switches are built to endure harsh environmental conditions. For example, vibration is a significant challenge for maritime and transportation applications. Moxa's switches conform to the IEC60068-2-6 standard and are tested at over 1 g of acceleration for an extended time period. When it comes to shock impacts, some of Moxa's Ethernet switches are designed to exceed other standards, such as NEMA TS2, by an additional 5 g's of acceleration. Moreover, all Moxa products feature a rugged and high strength housing to protect against the dust and spills that are commonplace at manufacturing locations.



Networking Solutions Certified to Meet Industrial Standards

Several certifications confirm the reliability of Moxa's industrial Ethernet switches:

- UL 508 and UL 60950-1 certifications for safe use in hazardous locations
- Class I Division 2, ATEX Zone 2 for use in mining and oil and gas industries
- DNV/GL/ABS/LR/NK for marine environments
- NEMA TS2 for traffic control applications
- EN 50121-4 for railway wayside applications

Relay Output Alarm, Broadcast Storm Protection, 5-year Warranty

- Many of Moxa's Ethernet switches feature relay output alarms, which provide relay contact outputs to warn engineers on the shop floor when the power fails or a port link breaks, so that they can respond quickly with appropriate emergency procedures.
- Moxa's unmanaged Ethernet switches are protected from receiving too many broadcast packets. These Ethernet switches have an option to discard broadcast or multicast packets if the number of those packets exceeds a threshold in a preset period of time. When the preset time period expires, the switch will resume receiving broadcast or multicast packets until the threshold is reached again.
- All of Moxa's Ethernet switches are fanless and feature high MTBF (Mean time Between Failures) ratings for long-term operation. In addition, Moxa's switches carry a solid 5-year warranty.

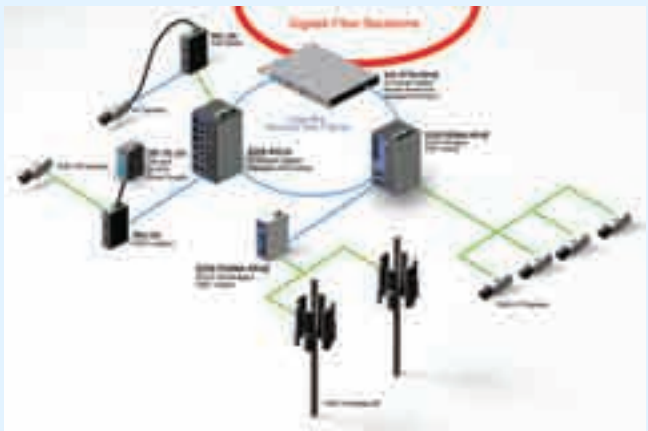
Power-over-Ethernet Solution for Simple and Flexible Connections

Moxa provides a complete range of solutions for any IEEE 802.3af/at PoE/PoE+ compliant units that are ideal for hard-to-reach outdoor or harsh environments where a power installation is not readily available or is cost-prohibitive. These PoE products provide PoE powered devices (PDs) with a stable and cost-effective electric power source over an Ethernet cable.

PoE Portfolio

- **Managed and unmanaged PoE and PoE+ switches** support a highly resilient technology, redundant VDC power inputs, smart PoE functionality, and industrial-grade design.
- Easy-to-scale **rackmount PoE switches** support up to 16 PoE ports
- **PoE+ injectors** inject the needed power, and the data to PoE devices
- **PoE splitters** separate the power and data from a PoE input, and distribute the power to non-PoE devices

See Page 1-66



Gigabit Fiber
Power-over-Ethernet
Ethernet
Power

Power over Ethernet

EDS-828

Award-winning Product

24+4G-port Layer 3 Gigabit modular managed Ethernet switch



- Layer 3 routing interconnects multiple LAN segments
- 4 Gigabit plus 24 fast Ethernet ports for copper and fiber
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01

*Available in Q3, 2011

Introduction

The EDS-828 is a high-performance Layer 3 Ethernet switch designed for network routing. The improved hardware technology built into the EDS-828 replaces the software logic used by traditional routers, offering better performance, and making the switch ideal for large-scale local area networks (LANs). In addition to Layer 3 features, the EDS-828 also supports advanced management and security features. In order to meet the demands of any industrial application, the EDS-828 uses a modular design that allows users to install up to 4 Gigabit Ethernet ports and 24 fast Ethernet ports, providing a high degree of flexibility for network expansion.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks
- Command line interface (CLI) for quickly configuring major managed functions*
- Supports advanced VLAN capability with Q-in-Q tagging*
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Redundant Gigabit Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs for integrating sensors and alarms with IP networks
- Redundant, dual DC power inputs
- Configurable by Web browser, Telnet/Serial console, CLI*, Windows utility, and ABC-01 automatic backup configurator

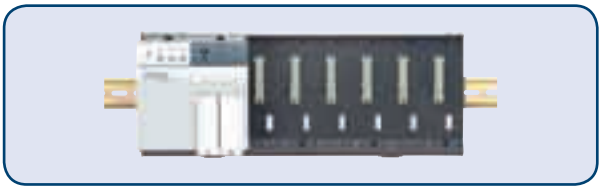
*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Layer 3 Modular Managed Ethernet Switch System, EDS-82810G



Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, LLDP, IEEE 1588 PTP V2*, EtherNet/IP*, Modbus/TCP, SNMP Inform, NTP Server/Client*

Layer 3 Switching: Static routing, RIP V1/V2, OSPF, VRRP for router redundancy, DVMRP*, PIM-DM*
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 16 K
Packet Buffer Size: 32 MB

Interface

Fast Ethernet: 6 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX
Gigabit Ethernet: 2 slots for any combination of 2-port interface modules, 10/100/1000BaseT(X) or 1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, T.RING
Mode LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs
Input Current: 0.96 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 362.4 x 142.5 x 128 mm (14.27 x 5.61 x 5.04 in)
Weight: 1950 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 4,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-12
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

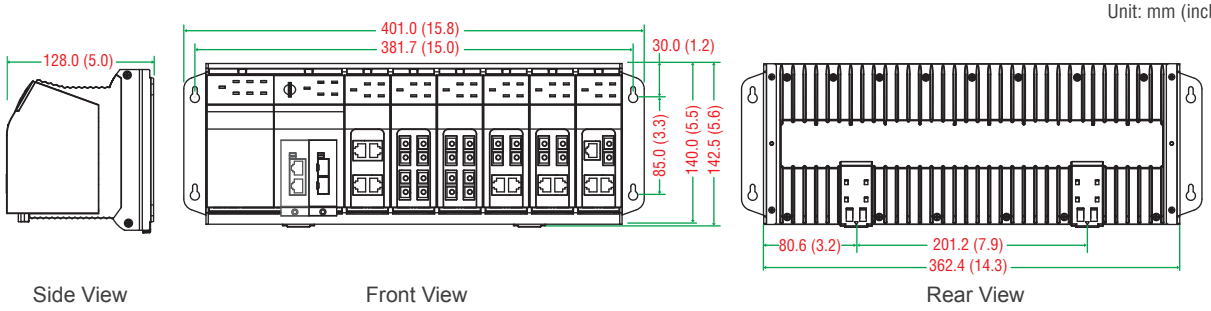
Time: 160,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View Front View Rear View

Ordering Information

Step 1: Select Ethernet switch system

EDS-82810G

Step 2: Select interface modules

IM series (Gigabit or fast Ethernet)

Note: The EDS-82810G switch system is delivered without interface modules. Please see page 1-20 for product information related to the IM series Gigabit and fast Ethernet interface modules.

Available Models

EDS-82810G: Layer 3 modular managed Ethernet switch system with 6 slots for 4-port fast Ethernet interface modules and 2 slots for 2-port Gigabit interface modules, for up to 24+4G ports

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-32: Wall mounting kit for the EDS-728/828 series
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-828 switch
- RJ45 to DB9 console port cable
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-728

Award-winning Product

24+4G-port Gigabit modular managed Ethernet switch



- 4 Gigabit plus 24 fast Ethernet ports for copper and fiber
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01

*Available in Q3, 2011

Introduction

The EDS-728 modular Gigabit Ethernet switch features a versatile modular design that allows different combinations of fiber and copper modules, creating a wide array of connection options ideal for any automation network. The modular design lets you install up to 4 Gigabit ports and 24 fast Ethernet ports. The EDS-728 is specially designed for redundant Gigabit network backbones and uses a modular configuration to provide a high degree of flexibility for network expansion. Top network performance, security, and reliability is assured through the EDS-728's advanced management and security features. The EDS-728 also features industrial-grade construction, a console port for automatic configuration backup, and an angled LED troubleshooting panel that can be conveniently viewed from both horizontal and vertical orientations.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- Supports advanced VLAN capability with Q-in-Q tagging*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Redundant Gigabit Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port for only authorized MAC address access
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs to integrate sensors and alarms with IP networks
- Redundant, dual DC power inputs
- Configurable by Web browser, Telnet/Serial console, CLI*, Windows utility, and ABC-01 automatic backup configurator

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Modular Managed Ethernet Switch System, EDS-72810G



Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, SNMP Inform, EtherNet/IP*, Modbus/TCP, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 16 K
Packet Buffer Size: 32 MB

Interface

Fast Ethernet: 6 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX
Gigabit Ethernet: 2 slots for any combination of 2-port interface modules, 10/100/1000BaseT(X) or 1000BaseSFP slot
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, T.RING
Mode LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs
Input Current: 0.96 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 362.4 x 142.5 x 128 mm (14.27 x 5.61 x 5.04 in)
Weight: 1950 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 4,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-12
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

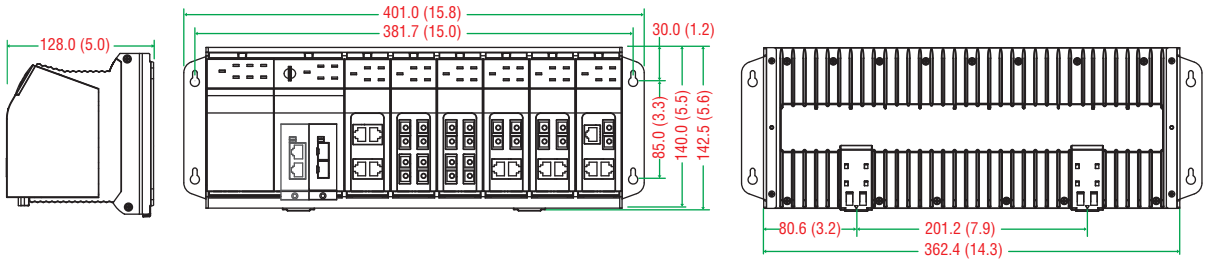
Time: 160,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View Front View Rear View

Ordering Information

Step 1: Select Ethernet switch system

EDS-72810G

Step 2: Select interface modules

IM series (Gigabit or fast Ethernet)

Note: The EDS-72810G switch system is delivered without interface modules. Please see page 1-20 for product information related to the IM series Gigabit and fast Ethernet interface modules.

Available Models

EDS-72810G: Modular managed Ethernet switch system with 6 slots for 4-port fast Ethernet interface modules and 2 slots for 2-port Gigabit interface modules, for up to 24+4G ports

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-32: Wall mounting kit for the EDS-728/828 series
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-728 switch
- RJ45 to DB9 console port cable
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IM Series

2-port Gigabit Ethernet and 4-port fast Ethernet interface modules for EDS-728/828 series Ethernet switches

Specifications

Gigabit Ethernet Interface Modules, IM-2G Series


IM-2GTX


IM-2GSFP

Interface

Fiber Ports: 1000BaseSFP slot
RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed and auto MDI/MDI-X connection
LED Indicators: Port status

Note: Please see page 1-87 for product information related to the SFP-1G series of Gigabit Ethernet SFP modules.

Power Requirements

Power Consumption (@ 24 V):
IM-2GTX: 2.96 W
IM-2GSFP: 3.04 W

Physical Characteristics

Dimensions: 24 x 65.9 x 101.1 mm (0.94 x 2.59 x 3.98 in)
Weight:
IM-2GTX: 150 g
IM-2GSFP: 148 g
Time:
IM-2GTX: 417,521 hrs
IM-2GSFP: 424,955 hrs
Database: MIL-HDBK-217F, GB 25°C

Fast Ethernet Interface Modules, IM Series


IM-4TX


IM-2MSC/2TX
IM-2SSC/2TX


IM-2MST/2TX


IM-1LSC/3TX


IM-4MSC
IM-4SSC


IM-4MST

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
LED Indicators: PWR, P1, P2, P3, P4 port status

Optical Fiber

	100BaseFX		
	Multi Mode	Single Mode	Single Mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Power Consumption (@ 24 V):
IM-4TX: 1.52 W
IM-2MSC/2TX: 2.43 W
IM-2MST/2TX: 2.43 W
IM-2SSC/2TX: 2.43 W
IM-1LSC/3TX: 2.5 W
IM-4MSC: 6.6 W
IM-4MST: 6.6 W
IM-4SSC: 6.6 W

Physical Characteristics

Housing: IP30 protection
Dimensions: 40 x 127.8 x 100 mm (1.57 x 5.03 x 3.94 in)
Weight:
IM-4TX: 215 g
IM-2MSC/2TX: 245 g
IM-2MST/2TX: 250 g
IM-2SSC/2TX: 245 g
IM-1LSC/3TX: 235 g
IM-4MSC: 250 g
IM-4MST: 270 g
IM-4SSC: 270 g

MTBF (mean time between failures)

Time: 620,000 hrs
Database: MIL-HDBK-217F, GB 25°C

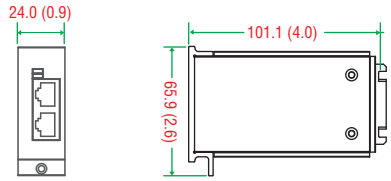
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

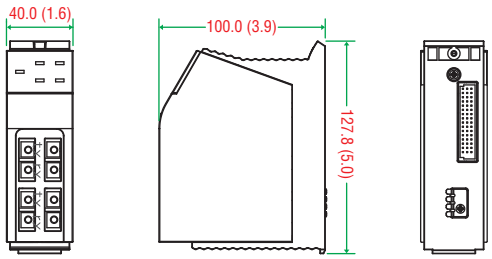
Unit: mm (inch)

Gigabit Ethernet Interface Modules



Front View Side View

Fast Ethernet Interface Modules



Front View Side View Rear View

Ordering Information

Available Models (0 to 60°C)	Port Interface						
	Gigabit Ethernet		Fast Ethernet				
				100BaseFX			
	10/100/1000BaseT(X)	1000BaseSFP*	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
IM-2G Series							
IM-2GTX	2	–	–	–	–	–	–
IM-2GSFP	–	2	–	–	–	–	–
IM Series							
IM-4TX	–	–	4	–	–	–	–
IM-4MSC	–	–	–	4	–	–	–
IM-4MST	–	–	–	–	4	–	–
IM-2MSC/2TX	–	–	2	2	–	–	–
IM-2MST/2TX	–	–	2	–	2	–	–
IM-4SSC	–	–	–	–	–	4	–
IM-2SSC/2TX	–	–	2	–	–	2	–
IM-1LSC/3TX	–	–	3	–	–	–	1

* Please see page 1-87 for product information related to the SFP-1G series Gigabit Ethernet SFP modules.

Package Checklist

- IM series interface modules
- Warranty card

EDS-608/611/616/619 Series

Award-winning Product
reddot design award winner 2009

8, 8+3G, 16, 16+3G-port compact modular managed Ethernet switches



- Up to 19 optical fiber connections in a compact switch (EDS-619)
- Modular design with 4-port copper/fiber combinations
- Hot swap media modules for continuous operation
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01
- -40 to 75°C operating temperature range (T models)

*Available in Q3, 2011

Introduction

The versatile modular design of the compact EDS-600 series Ethernet switch allows users to combine fiber and copper modules to create switch solutions suitable for any automation network. The EDS-600's modular design lets you install up to 3 Gigabit Ethernet ports and 16 Fast Ethernet ports, and the advanced Turbo Ring and Turbo Chain (recovery time < 20 ms) technology, RSTP/STP, and MSTP* helps increase the reliability and availability of your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The EDS-600 series supports several reliable and intelligent functions, including IEEE 1588 PTP V2, EtherNet/IP*, Modbus/TCP, LLDP, DHCP Option 82, SNMP Inform, QoS, IGMP snooping, VLAN, TACACS+*, IEEE 802.1X, HTTPS, SSH, SNMPv3, and more, making the Ethernet switches suitable for any harsh industrial environment.

*Available in Q3, 2011

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- Hot swap media modules for continuous operation
- Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* for network redundancy
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- SNMP Inform for ensuring reliable event management
- LLDP for automated topology discovery
- DHCP Option 82 for IP address assignment with different policies
- IEEE 1588 PTP V2 (Precision Time Protocol) for precise time synchronization of networks
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs to integrate sensors and alarms with IP networks

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, LLDP, EtherNet/IP*, Modbus/TCP, IEEE 1588 PTP V2, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

Fast Ethernet: 2 or 4 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX
Gigabit Ethernet: 3 10/100/1000BaseT(X) with 100/1000BaseSFP combo slots (EDS-611 and EDS-619 only)
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
System LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, G1/G2/G3 (EDS-611 and EDS-619 only)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Input Current:
EDS-608: 0.16A @ 24 V
EDS-611: 0.31A @ 24 V
EDS-616: 0.25A @ 24 V
EDS-619: 0.31A @ 24 V
Overload Current Protection: Present
Connection: 1 removable 5-contact and 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions:
EDS-608/611 Series: 124.9 x 151 x 157.2 mm (4.92 x 5.95 x 6.19 in)
EDS-616/619 Series: 185 x 151 x 157.2 mm (7.28 x 5.95 x 6.19 in)
Weight:
EDS-608: 2080 g
EDS-611: 2260 g
EDS-616: 2780 g
EDS-619: 2950 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nCnAnL IIC T4
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A, EN 61000-6-4
EMS: EN 61000-6-2
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-29
Marine: DNV, GL, LR, ABS, NK
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
EDS-608: 596,000 hrs
EDS-611: 483,000 hrs
EDS-616: 546,000 hrs
EDS-619: 475,000 hrs
Database: Telcordia (Bellcore), GB

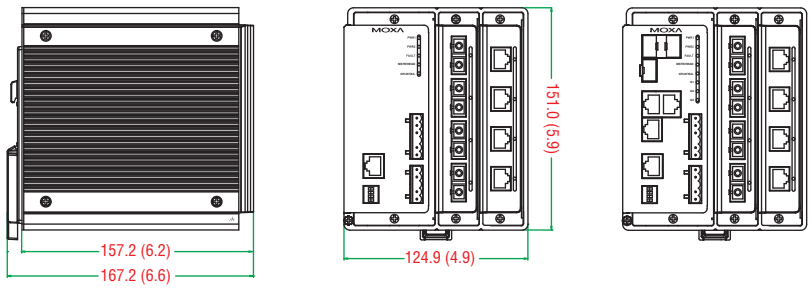
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

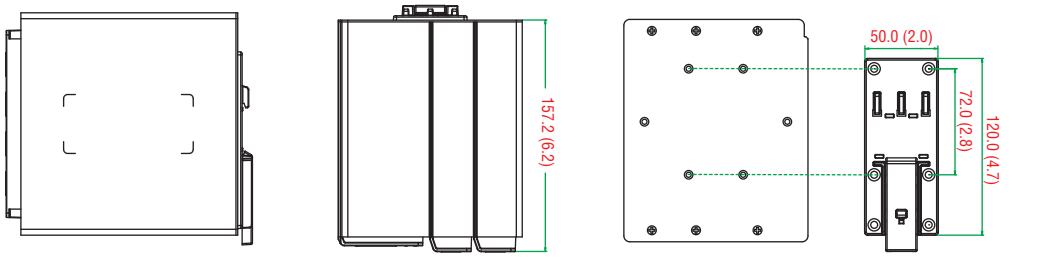
Dimensions

Unit: mm (inch)

EDS-608/611 Series



Side View | Front Views

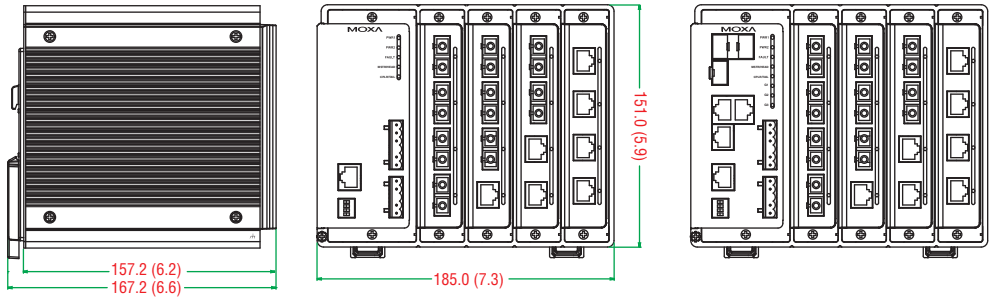


Side View | Top View | Rear View | DIN-Rail Mounting Kit

Dimensions

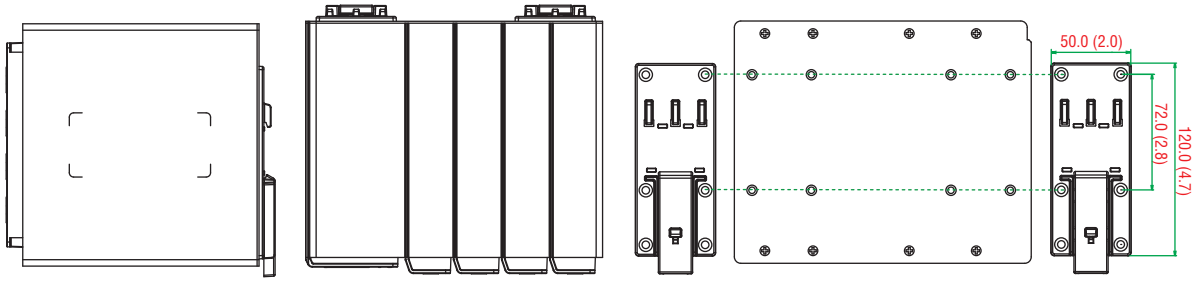
Unit: mm (inch)

EDS-616/619 Series



Side View

Front Views



Side View

Top View

Rear View

DIN-Rail Mounting Kit

Ordering Information

Step 1: Select Ethernet switch system

EDS-608/611/616/619

Step 2: Select interface modules

CM Series

Note: The EDS-600 switch system is delivered without interface modules. Please see page 1-25 for product information related to the CM series fast Ethernet interface modules.

Available Models		Total No. of Ports	Port Interface		
			Gigabit Ethernet	Fast Ethernet	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)		10/100/1000BaseT(X) or 100/1000BaseSFP*	Slots	10/100BaseT(X) and/or 100BaseFX
EDS-608	EDS-608-T	8	–	2	up to 8
EDS-611	EDS-611-T	11	3	2	up to 8
EDS-616	EDS-616-T	16	–	4	up to 16
EDS-619	EDS-619-T	19	3	4	up to 16

*The EDS-611/619 series supports 3 100/1000BaseSFP slots. See pages 1-87 and 1-89 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-75: Wall mounting kit
AVK-17: Anti-vibration wiring Kit

Package Checklist

- EDS-608 or EDS-611 or EDS-616 or EDS-619 switch
- RJ45 to DB9 console port cable
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

CM-600 Series

4-port fast Ethernet interface modules for EDS-600 series Ethernet switches

Specifications

Fast Ethernet Interface Modules, CM-600 Series


CM-600-4TX
CM-600-4TX-BP
CM-600-4TX-PTP


CM-600-4MSC
CM-600-4SSC


CM-600-4MST


CM-600-3MSC/1TX
CM-600-3SSC/1TX


CM-600-3MST/1TX


CM-600-2MSC/2TX
CM-600-2SSC/2TX


CM-600-2MST/2TX

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
LED Indicators: 10/100 for TP port, 100M for fiber port

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Power Consumption:
CM-600-4TX: 0.72 W
CM-600-4TX-BP: 2.81 W
CM-600-4TX-PTP: 4.08 W
CM-600-4MSC, -4MST, -4SSC: 2.64 W
CM-600-3MSC/1TX, -3MST/1TX, -3SSC/1TX: 2.16 W
CM-600-2MSC/2TX, -2MST/2TX, -2SSC/2TX: 1.68 W

Physical Characteristics

Housing: IP30 protection
Dimensions: 29.7 x 144.4 x 144.8 mm (1.17 x 5.69 x 5.7 in)

Weight:
CM-600-4TX: 190 g
CM-600-4TX-BP: 240 g
CM-600-4TX-PTP: 185 g
CM-600-4MSC, -4MST, -4SSC: 240 g
CM-600-3MSC/1TX, -3MST/1TX, -3SSC/1TX: 230 g
CM-600-2MSC/2TX, -2MST/2TX, -2SSC/2TX: 230 g

MTBF (mean time between failures)

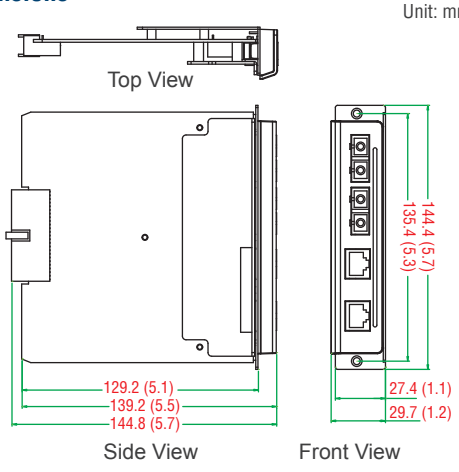
Time: 740,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models (-40 to 75°C)	Port Interface			
	10/100BaseT(X)	100BaseFX		
		Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector
CM-600-4TX	4	–	–	–
CM-600-4TX-BP*	4	–	–	–
CM-600-4TX-PTP*	4	–	–	–
CM-600-4MSC	–	4	–	–
CM-600-4MST	–	–	4	–
CM-600-4SSC	–	–	–	4
CM-600-3MSC/1TX	1	3	–	–
CM-600-3MST/1TX	1	–	3	–
CM-600-3SSC/1TX	1	–	–	3
CM-600-2MSC/2TX	2	2	–	–
CM-600-2MST/2TX	2	–	2	–
CM-600-2SSC/2TX	2	–	–	2

*The CM-600-4TX-BP supports the bypass relay function on each port; the CM-600-4TX-PTP supports the IEEE 1588 PTP V2 protocol on each port.

Package Checklist

- CM-600 interface module
- Warranty card

EDS-G509 Series

9G-port full Gigabit managed Ethernet switches



- 4 10/100/1000BaseT(X) ports plus 5 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports
- Fiber optic options for extending distance and improving electrical noise immunity
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01

*Available in Q3, 2011

Introduction

The EDS-G509 is equipped with 9 Gigabit Ethernet ports and up to 5 fiber optic ports, making it ideal for upgrading an existing network to Gigabit speed or building a new full Gigabit backbone. Gigabit transmission increases bandwidth for higher performance and transfers large amounts of video, voice, and data across a network quickly. Redundant Ethernet Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* increase system reliability and the availability of your network backbone. The EDS-G509 series is designed especially for communication demanding applications, such as video and process monitoring, shipbuilding, ITS, and DCS systems, all of which can benefit from a scalable backbone construction.

*Available in Q3, 2011

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring, Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- ABC-01 (Automatic Backup Configurator) for system configuration backup

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, EtherNet/IP*, Modbus/TCP, SNMP Inform, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

Fiber Ports: 100/1000BaseSFP slot
RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
LED Indicators: PWR1, PWR2, FAULT, 10/100/1000M, MSTR/HEAD, CPLR/TAIL
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Input Current: 0.81 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 87.1 × 135 × 107 mm (3.43 × 5.31 × 4.21 in)
Weight: 1510 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN61000-4-8
Marine: DNV, GL, LR, ABS, NK
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

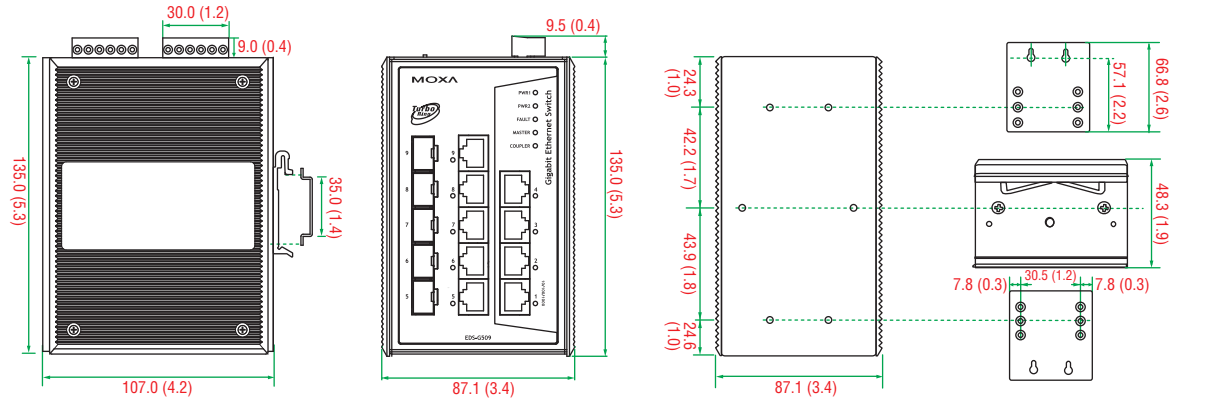
Time: 330,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models

EDS-G509: Industrial full Gigabit managed Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 10/100/1000BaseT(X) or 100/1000BaseSFP slot combo ports, 0 to 60°C operating temperature
EDS-G509-T: Industrial full Gigabit managed Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 10/100/1000BaseT(X) or 100/1000BaseSFP slot combo ports, -40 to 75°C operating temperature
Note: The EDS-G509 series switches support 5 100/1000BaseSFP slots. See pages 1-87 to 1-89 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-G509 switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-518A Series

16+2G-port Gigabit managed Ethernet switches



- 2 Gigabit plus 16 fast Ethernet ports for copper and fiber
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01

*Available in Q3, 2011

Introduction

The EDS-518A is a standalone 18-port managed Ethernet switch that provides 2 combo Gigabit ports with built-in RJ45 or SFP slots for Gigabit fiber optic communication. The Ethernet redundant Turbo Ring and Turbo Chain (recovery time < 20 ms) increases the reliability and speed of your network backbone. The EDS-518A also supports advanced management and security features.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- ABC-01 (Automatic Backup Configurator) for system configuration backup
- Automatic warning by exception through e-mail, relay output

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, SNMP Inform, EtherNet/IP*, Modbus/TCP, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 2 Mbit

Interface

Fiber Ports: 100BaseFX (SC/ST connector) and 1000BaseSFP slot
RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Console Port: RS-232 (RJ45 connector)
LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 100M (fiber port), MSTR/HEAD, CPLR/TAIL
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs
Input Current:
EDS-518A: 0.51 A @ 24 V
EDS-518A-MM/SS: 0.61 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 94 x 135 x 142.7 mm (3.7 x 5.31 x 5.62 in)
Weight: 1630 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC IIC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 2, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 2, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-12
Marine: DNV, GL
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

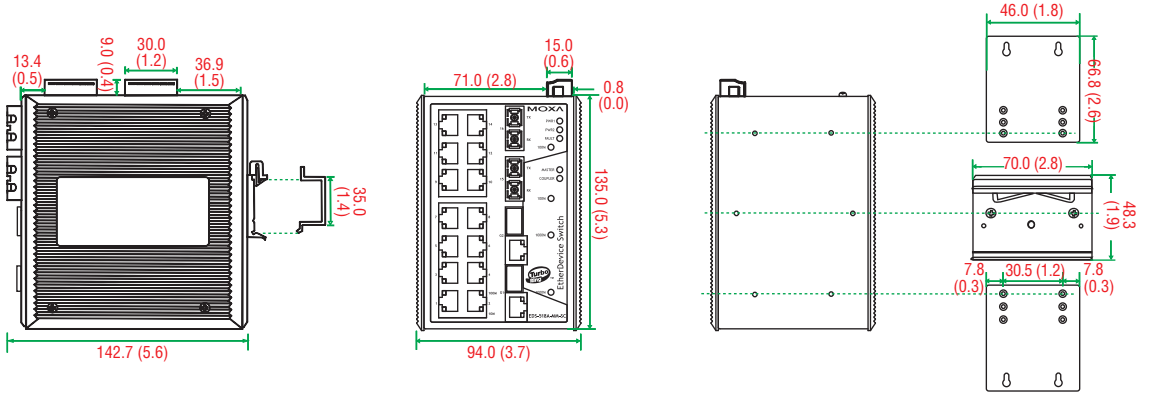
Time: 240,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface					
		Gigabit Ethernet	Fast Ethernet				
				100BaseFX			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
EDS-518A	EDS-518A-T	2	16	–	–	–	–
EDS-518A-MM-SC	EDS-518A-MM-SC-T	2	14	2	–	–	–
EDS-518A-MM-ST	EDS-518A-MM-ST-T	2	14	–	2	–	–
EDS-518A-SS-SC	EDS-518A-SS-SC-T	2	14	–	–	2	–
EDS-518A-SS-SC-80	-	2	14	–	–	–	2

*The EDS-518A series supports 2 1000BaseSFP slots. See page 1-87 for SFP-1G series Gigabit Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-518A switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-510A Series

7+3G-port Gigabit managed Ethernet switches



- 2 Gigabit Ethernet ports for redundant ring and 1 Gigabit Ethernet port for uplink solution
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01

*Available in Q3, 2011

Introduction

The EDS-510A Gigabit managed redundant Ethernet switch is equipped with up to 3 Gigabit Ethernet ports, making it ideal for building a Gigabit Turbo Ring, but leaving a spare Gigabit port for uplink use. The Ethernet redundant Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* can increase system reliability and the availability of your network backbone. The EDS-510A series is designed especially for communication demanding applications such as process control, shipbuilding, ITS, and DCS systems, which can benefit from a scalable backbone construction.

*Available in Q3, 2011

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Automatic warning by exception through e-mail, relay output

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, SNMP Inform, EtherNet/IP*, Modbus/TCP, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

Fiber Ports: 1000BaseSFP slot
RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (Gigabit port), MSTR/HEAD, CPLR/TAIL
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs
Input Current:
EDS-510A-3GT: 0.65 A @ 24 V
EDS-510A-1GT2SFP: 0.44 A @ 24 V
EDS-510A-3SFP: 0.46 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
Weight: 1170 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC IIC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8
Marine: DNV, GL
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

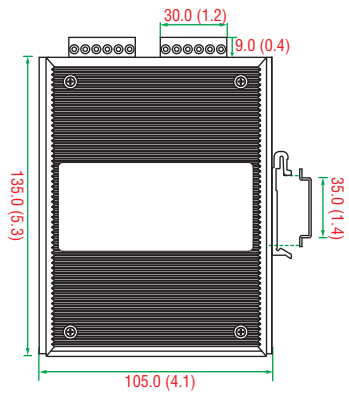
Time: 204,000 hrs
Database: MIL-HDBK-217J, GB 25°C

Warranty

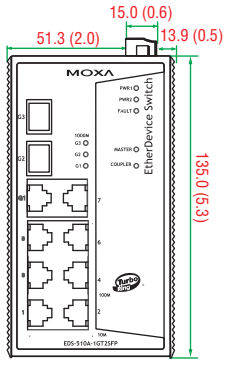
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

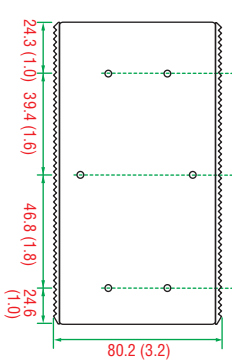
Unit: mm (inch)



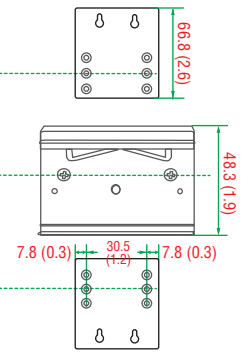
Side View



Front View



Rear View



DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface		
		Gigabit Ethernet		Fast Ethernet
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	1000BaseSFP*	10/100BaseT(X)
EDS-510A-3GT	EDS-510A-3GT-T	3	–	7
EDS-510A-1GT2SFP	EDS-510A-1GT2SFP-T	1	2	7
EDS-510A-3SFP	EDS-510A-3SFP-T	–	3	7

*The EDS-510A series supports up to 3 1000BaseSFP slots. See page 1-87 for SFP-1G series Gigabit Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-510A switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-505A/508A/516A Series

5, 8, and 16-port managed Ethernet switches



- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01

*Available in Q3, 2011

Introduction

The EDS-505A/508A/516A are standalone 5, 8, and 16-port managed Ethernet switches. With their advanced Turbo Ring and Turbo Chain technology (recovery time < 20 ms), RSTP/STP, and MSTP* support the EDS-505A/508A/516A switches increase the reliability and availability of your industrial Ethernet network. Models with an wide operating temperature range of -40 to 75°C are also available, and the switches support advanced management and security features, making the EDS-505A/508A/516A switches suitable for any harsh industrial environment.

*Available in Q3, 2011

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- RMON for efficient network monitoring and proactive capability
- SNMPv1/v2c/v3 for different levels of network management
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Bandwidth management to prevent unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Automatic warning by exception through e-mail, relay output

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, SNMP Inform, EtherNet/IP*, Modbus/TCP, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit (EDS-505A/508A), 2 Mbit (EDS-516A)

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve (EDS-505A/508A series only)

LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, 10/100M
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs
Input Current:
EDS-505A: 0.24 A @ 24 V
EDS-505A-MM/SS: 0.35 A @ 24 V
EDS-508A: 0.26A @ 24 V
EDS-508A-MM/SS: 0.36 A @ 24 V
EDS-516A: 0.41 A @ 24 V
EDS-516A-MM: 0.51 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions:
EDS-505A/508A Series: 80.2 x 135 x 105 mm
(3.16 x 5.31 x 4.13 in)
EDS-516A Series: 94 x 135 x 142.7 mm (3.7 x 5.31 x 5.62 in)
Weight:
EDS-505A/508A Series: 1040 g
EDS-516A Series: 1586 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC IIC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) (EDS-505A/508A: Level 3; EDS-516A: Level 2),
EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 3,
EN 61000-4-8
Marine: DNV, GL
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
EDS-505A Series: 352,000 hrs
EDS-508A Series: 339,000 hrs
EDS-516A Series: 247,000 hrs
Database: Telcordia (Bellcore), GB

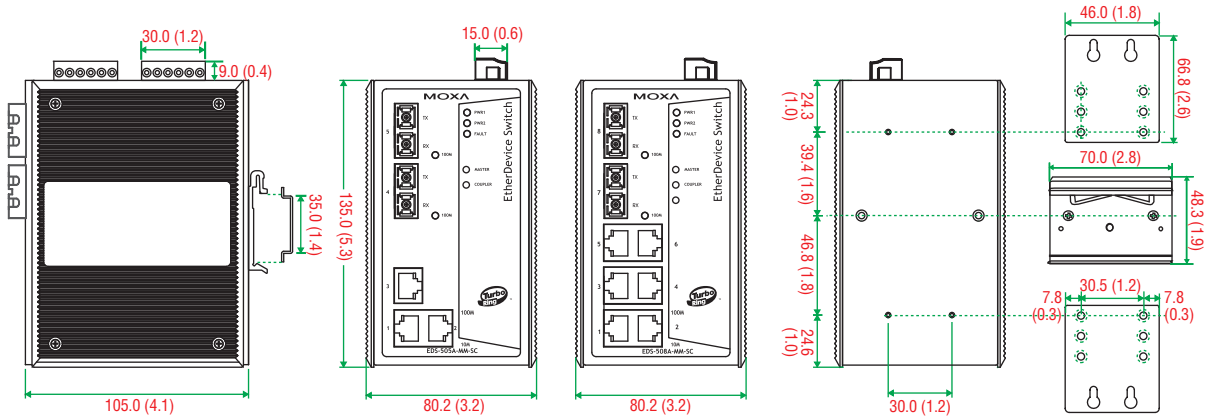
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

EDS-505A/508A Series

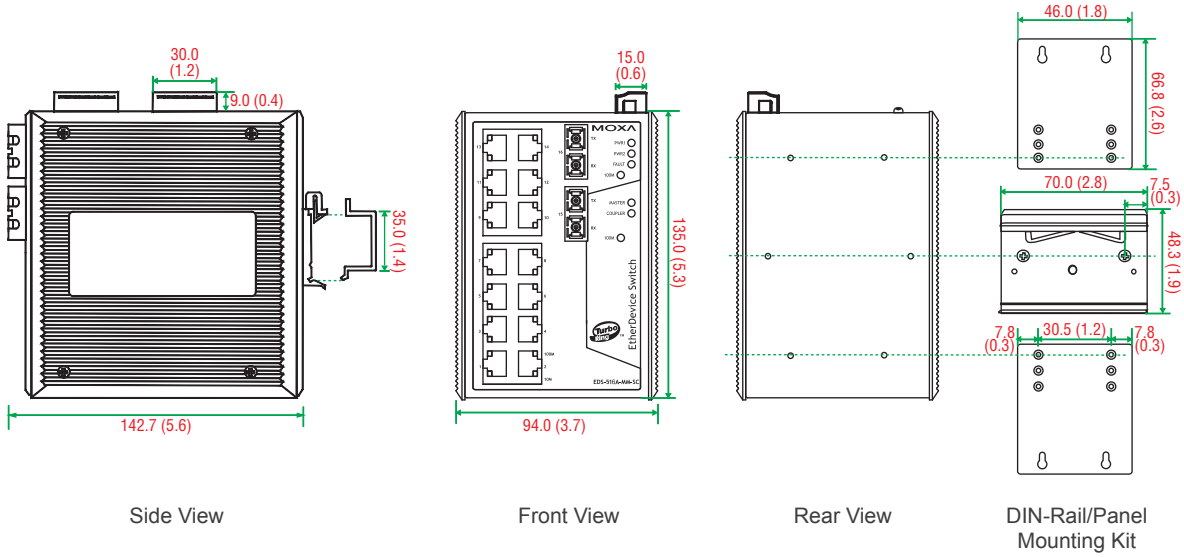


Side View | Front Views | Rear View | DIN-Rail/Panel Mounting Kit

Dimensions

Unit: mm (inch)

EDS-516A Series



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface				
Standard Temperature (0 to 60˚C)	Wide Temperature (-40 to 75˚C)	10/100BaseT(X)	100BaseFX			
			Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
EDS-505A/508A Series						
EDS-505A/508A	EDS-505A/508A-T	5/8	–	–	–	–
EDS-505A/508A-MM-SC	EDS-505A/508A-MM-SC-T	3/6	2	–	–	–
EDS-505A/508A-MM-ST	EDS-505A/508A-MM-ST-T	3/6	–	2	–	–
EDS-505A/508A-SS-SC	EDS-505A/508A-SS-SC-T	3/6	–	–	2	–
EDS-505A/508A-SS-SC-80	–	3/6	–	–	–	2
EDS-516A Series						
EDS-516A	EDS-516A	16	–	–	–	–
EDS-516A-MM-SC	EDS-516A-MM-SC-T	14	2	–	–	–
EDS-516A-MM-ST	EDS-516A-MM-ST-T	14	–	2	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-505A or EDS-508A or EDS-516A switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-405A/408A Series

5 and 8-port entry-level managed Ethernet switches



- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- IGMP Snooping, QoS, IEEE 802.1Q VLAN, and port-based VLAN supported
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01

*Available in Q3, 2011

Introduction

The EDS-405A/408A are entry-level 5 and 8-port managed Ethernet switches designed especially for industrial applications. The switches support a variety of useful management functions, such as Turbo Ring, Turbo Chain, ring coupling, IGMP snooping, IEEE 802.1Q VLAN, port-based VLAN, QoS, RMON, bandwidth management, port mirroring, and warning by email or relay. The ready-to-use Turbo Ring can be set up easily using the web-based management interface, or with the DIP switches located on the top panel of the EDS-405A/408A switches.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms), and RSTP/STP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p and TOS/DiffServ) to increase determinism
- RMON for efficient network monitoring and proactive capability
- SNMPv1/v2c/v3 for different levels of network management security
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1p for Class of Service
IEEE 802.1Q for VLAN Tagging
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, TFTP, SNTP, SMTP, RARP, RMON, HTTP, Telnet, Syslog, DHCP Option 66/67/82, BootP, LLDP, EtherNet/IP*, Modbus/TCP, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

MAC Table Size: 2 K (EDS-405A), 8 K (EDS-408A)
Packet Buffer Size: 1 Mbit

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, 10/100M
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs
Input Current:
EDS-405A: 0.24 A @ 24 V
EDS-405A-MM/SS: 0.32 A @ 24 V
EDS-408A: 0.26 A @ 24 V
EDS-408A-MM/SS: 0.35 A @ 24 V
EDS-408A-3M/3S/2M1S/1M2S: 0.32 A @ 24 V
Overload Current Protection: Present

Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight:
EDS-405A, EDS-405A-MM, EDS-405A-SS: 650 g
EDS-408A, EDS-408A-MM, EDS-408A-SS: 650 g
EDS-408A-3M/3S/2M1S/1M2S: 890 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508, UL 60950-1*, CSA C22.2 No. 60950-1, EN 60950-1**
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D*, ATEX Zone 2 Ex nC IIC*
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3; EN 61000-4-8
Marine:
EDS-405A, EDS-405A-MM, EDS-405A-SS: DNV, GL
EDS-408A, EDS-408A-MM, EDS-408A-SS: DNV, GL
EDS-408A-3M/3S/2M1S/1M2S: DNV, GL, LR, ABS, NK
Rail Traffic: EN 50121-4**
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

* EDS-405A, EDS-405A-MM/SS, EDS-408A, EDS-408A-MM/SS only
** EDS-408A series only
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

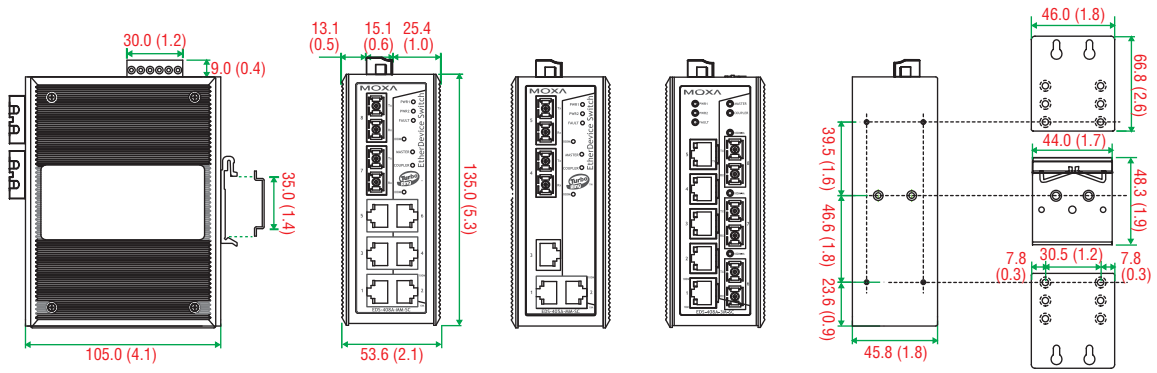
Time:
EDS-405A Series: 392,000 hrs
EDS-408A Series: 363,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front Views | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX		
			Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector
EDS-405A/408A	EDS-405A/408A-T	5/8	–	–	–
EDS-405A/408A-MM-SC	EDS-405A/408A-MM-SC-T	3/6	2	–	–
EDS-405A/408A-MM-ST	EDS-405A/408A-MM-ST-T	3/6	–	2	–
EDS-405A/408A-SS-SC	EDS-405A/408A-SS-SC-T	3/6	–	–	2
EDS-408A-3M-SC	EDS-408A-3M-SC-T	5	3	–	–
EDS-408A-3M-ST	EDS-408A-3M-ST-T	5	–	3	–
EDS-408A-3S-SC	EDS-408A-3S-SC-T	5	–	–	3
EDS-408A-2M1S-SC	EDS-408A-2M1S-SC-T	5	2	–	1
EDS-408A-1M2S-SC	EDS-408A-1M2S-SC-T	5	1	–	2

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-405A or EDS-408A switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-G205/G308 Series

5G and 8G-port full Gigabit unmanaged Ethernet switches



- Fiber optic options for extending distance and electrical noise immunity (EDS-G308 series)
- Redundant dual 12/24/48 VDC power inputs
- Supports jumbo frame transmission up to 9.6 KB
- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-G205 and EDS-G308 switches are equipped with 5 and 8 Gigabit Ethernet ports, respectively, and up to 2 fiber optic ports (EDS-G308-2SFP series only), making them ideal for applications that demand high bandwidth. The EDS-G205/G308 switches provide an economical solution for your industrial Gigabit Ethernet connections, and the built-in relay warning function alerts network managers when power failures or port breaks occur. Two models are available in this series. One model has an operating temperature range of 0 to 60°C, and the other model has an extended operating temperature range of -40 to 75°C. Both models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. The EDS-G205/G308 switches can be installed easily on a DIN-Rail or in distribution boxes.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
Processing Type: Store and Forward
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

MAC Table Size: 8 K
Packet Buffer Size: 1088 Kbit (EDS-G205), 1408 Kbit (EDS-G308)
Jumbo Frame Size: 9.6 KB

Interface

Fiber Ports: 100/1000BaseSFP slot (EDS-G308-2SFP series only)
RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
DIP Switches: One for port break alarm, one for Enable/Disable broadcast storm protection and jumbo frame
LED Indicators: PWR1, PWR2, FAULT, 10/100/1000M
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Power Requirements

Input Voltage: 12/24/48 VDC (9.6 to 60 VDC), redundant dual inputs
Input Current:
EDS-G205: 0.20 A @ 24 V
EDS-G308: 0.32 A @ 24 V
EDS-G308-2SFP: 0.34 A @ 24 V
Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions:
EDS-G205: 35 x 130 x 105 mm (1.37 x 5.12 x 4.13 in)
EDS-G308: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight:
EDS-G205: 290 g
EDS-G308: 630 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC IIC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
EDS-G308 Series: 325,000 hrs
EDS-G205 Series: 478,000 hrs
Database: Telcordia (Bellcore), GB (EDS-G308 series)

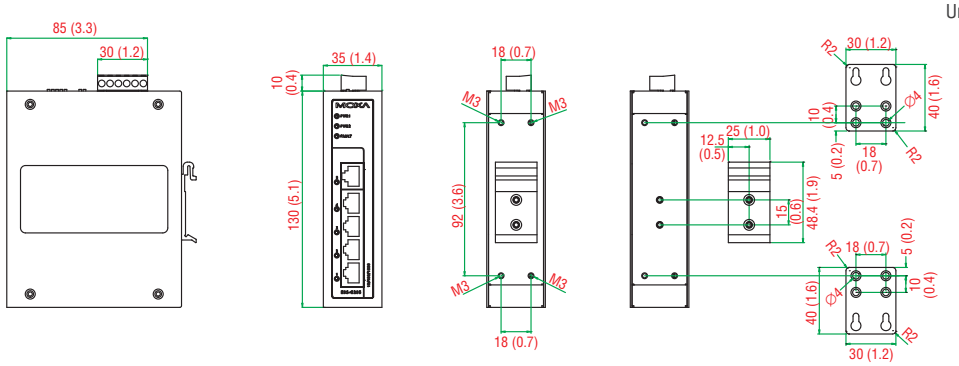
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

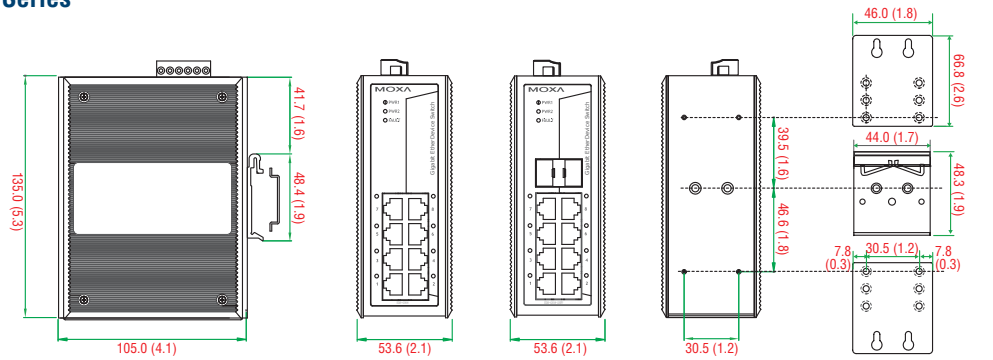
Unit: mm (inch)

EDS-G205



Side View | Front View | Rear Views | DIN-Rail/ Panel Mounting Kit

EDS-G308 Series



Side View | Front Views | Rear View | DIN-Rail/ Panel Mounting Kit

Ordering Information

Product Model		Port Interface	
		Gigabit Ethernet	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*
EDS-G205	EDS-G205-T	5	–
EDS-G308	EDS-G308-T	8	–
EDS-G308-2SFP	EDS-G308-2SFP-T	6	2

*The EDS-G308-2SFP and EDS-G308-2SFP-T support 2 100/1000BaseSFP slots. See pages 1-87 and 1-89 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-30: Wall mounting kit (EDS-G205 series only)
WK-46: Wall mounting kit (EDS-G308 series only)
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-G205 or EDS-G308 switch
- Protective caps for unused ports (EDS-G308 only)
- Hardware installation guide (printed)
- Warranty card

EDS-305/308/309/316 Series

5, 8, 9, and 16-port unmanaged Ethernet switches



- Redundant dual 24 VDC power inputs
- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- Transparent transmission of VLAN tagged packets
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-305/308/309/316 are 5, 8, 9, and 16-port Ethernet switches that provide an economical solution for your industrial Ethernet connections. The built-in relay warning function alerts network engineers when power failures or port breaks occur, and the switches are designed for harsh industrial environments, such as in hazardous locations (Class I, Div. 2 / ATEX Zone 2). The switches comply with FCC, UL, and CE standards, and come in two model types: standard operating temperature range models (0 to 60°C) and wide operating temperature range models (-40 to 75°C). Both models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. The EDS-305/308/309/316 switches can be installed easily on a DIN-Rail or in a distribution box.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
Processing Type: Store and Forward
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

MAC Table Size: 1 K (EDS-305/308/309), 4 K (EDS-316)
Packet Buffer Size: n/a (EDS-305), 512 Kbit (EDS-308/309), 1.25 Mbit (EDS-316)

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
DIP Switches: Port break alarm mask
LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 100M (fiber port)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Input Voltage:
EDS-305/308: 24 VDC (12 to 48 VDC), redundant dual inputs
EDS-309: 24 VDC (12 to 45 VDC), redundant dual inputs
EDS-316: 24 VDC (12 to 45 VDC), redundant dual inputs
Input Current:
EDS-305: 0.13 A @ 24 V
EDS-305-M/S: 0.17 A @ 24 V
EDS-308: 0.13 A @ 24 V
EDS-308-M/S: 0.21 A @ 24 V

EDS-308-MM/SS: 0.26 A @ 24 V
EDS-309-3M: 0.31 A @ 24 V
EDS-316: 0.27 A @ 24 V
EDS-316-M/S/MM/SS/MS: 0.44 A @ 24 V
Overload Current Protection:
EDS-305, EDS-305-M, EDS-305-S, EDS-308: 1.1 A
EDS-308-M/S/MM/SS, EDS-309 series, EDS-316 series: 1.6 A
Connection: 1 removable 6-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions:
EDS-305/308/309 Series:
53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
EDS-316 Series:
80.1 x 135 x 105 mm (3.15 x 5.31 x 4.13 in)
Weight:
EDS-305/308/309 Series: 630 g
EDS-316 Series: 1140 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety:
EDS-305 Series: UL 508, UL 60950-1, CSA C22.2 No. 60950-1
EDS-308/309/316 Series: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC IIC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) (EDS-305/308: Level 2; EDS-309/316: Level 3)
Marine: DNV, GL
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
EDS-305 series: 422,000 hrs
EDS-308 series: 255,000 hrs
EDS-309 series: 396,000 hrs
EDS-316 series: 257,000 hrs
Database: MIL-HDBK-217F, GB 25°C

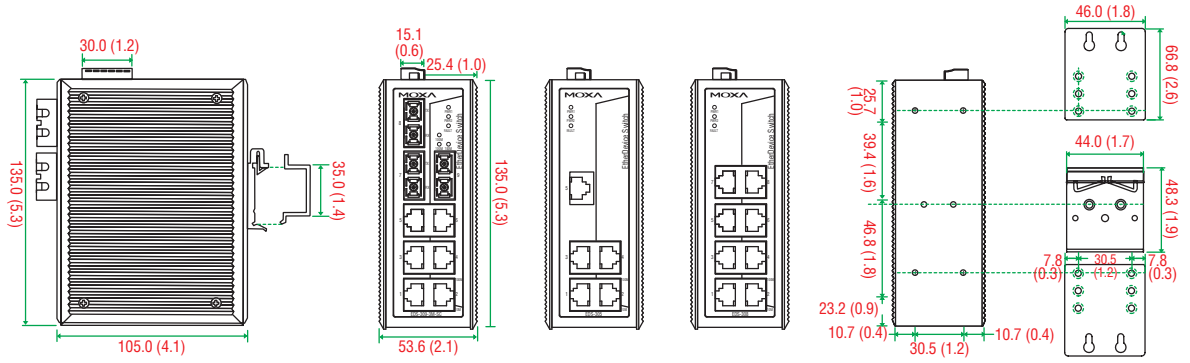
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

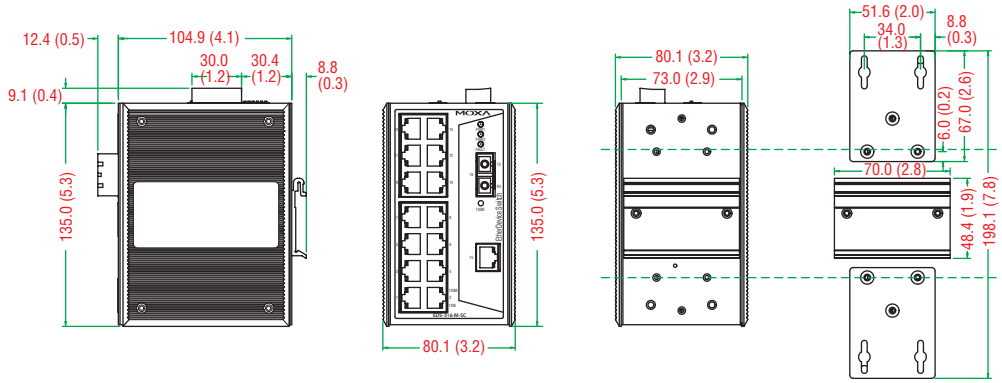
Unit: mm (inch)

EDS-305/308/309 Series



Side View | Front Views | Rear View | DIN-Rail/Panel Mounting Kit

EDS-316 Series



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface				
			100BaseFX			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
EDS-305 Series						
EDS-305	EDS-305-T	5	–	–	–	–
EDS-305-M-SC	EDS-305-M-SC-T	4	1	–	–	–
EDS-305-M-ST	EDS-305-M-ST-T	4	–	1	–	–
EDS-305-S-SC	EDS-305-S-SC-T	4	–	–	1	–
EDS-305-S-SC-80	–	4	–	–	–	1
EDS-308 Series						
EDS-308	EDS-308-T	8	–	–	–	–
EDS-308-M-SC	EDS-308-M-SC-T	7	1	–	–	–
EDS-308-MM-SC	EDS-308-MM-SC-T	6	2	–	–	–
EDS-308-MM-ST	EDS-308-MM-ST-T	6	–	2	–	–
EDS-308-S-SC	EDS-308-S-SC-T	7	–	–	1	–
EDS-308-SS-SC	EDS-308-SS-SC-T	6	–	–	2	–
EDS-308-S-SC-80	–	7	–	–	–	1
EDS-308-SS-SC-80	–	6	–	–	–	2
EDS-309 Series						
EDS-309-3M-SC	EDS-309-3M-SC-T	6	3	–	–	–
EDS-309-3M-ST	EDS-309-3M-ST-T	6	–	3	–	–
EDS-316 Series						
EDS-316	EDS-316-T	16	–	–	–	–
EDS-316-M-SC	EDS-316-M-SC-T	15	1			–
EDS-316-M-ST	EDS-316-M-ST-T	15	–	1	–	–
EDS-316-MM-SC	EDS-316-MM-SC-T	14	2	–	–	–
EDS-316-MM-ST	EDS-316-MM-ST-T	14	–	2	–	–
EDS-316-MS-SC	EDS-316-MS-SC-T	14	1	–	1	–
EDS-316-S-SC	EDS-316-S-SC-T	15	–	–	1	–
EDS-316-SS-SC	EDS-316-SS-SC-T	14	–	–	2	–
EDS-316-MS-SC-80	–	14	1	–	–	1
EDS-316-S-SC-80	–	15	–	–	–	1
EDS-316-SS-SC-80	–	14	–	–	–	2
EDS-316-SS-SC-40/80	–	14	–	–	1	1

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-305 or EDS-308 or EDS-309 or EDS-316 switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

EDS-205A/208A Series

5 and 8-port unmanaged Ethernet switches



- 10/100BaseT(X) (RJ45 connector), 100BaseFX (multi/single-mode, SC or ST connector)
- Redundant dual 12/24/48 VDC, 18 to 30 VAC power inputs
- IP30 aluminum housing
- Rugged hardware design well suited for hazardous locations (Class I Div. 2 / ATEX Zone 2) and maritime environments (DNV/GL/LR/ABS/NK)
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-205A/208A series are 5 and 8-port industrial Ethernet switches that support IEEE 802.3 and IEEE 802.3u/x with 10/100M full/half-duplex, MDI/MDI-X auto-sensing. The EDS-205A/208A switches provide 12/24/48 VDC (9.6 to 60 VDC), 18 to 30 VAC redundant power inputs that can be connected simultaneously to live AC/DC power sources. These switches have been designed for harsh industrial environments, such as in maritime (DNV/GL/LR/ABS/NK) or hazardous locations (Class I Div. 2, ATEX Zone 2) that comply with FCC, UL, and CE standards.

The EDS-205A/208A switches are available with a standard operating temperature range from -10 to 60°C, or with a wide operating temperature range from -40 to 75°C. All models are subjected to a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. In addition, the EDS-205A/208A switches have DIP switches for enabling or disabling broadcast storm protection, providing another level of flexibility for industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
Processing Type: Store and Forward
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 Kbit

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector, multi-mode, single-mode)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
DIP Switches: Enable/Disable broadcast storm protection
LED Indicators: Power, 10/100M (TP port), 100M (fiber port)

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Input Voltage: 12/24/48 VDC (9.6 to 60 VDC), 18 to 30 VAC (47 to 63 Hz), redundant dual inputs
Input Current:
EDS-205A: 0.1 A @ 24 V
EDS-205A-M/S: 0.11 A @ 24 V
EDS-208A: 0.13 A @ 24 V
EDS-208A-M: 0.17 A @ 24 V
EDS-208A-MM/SS: 0.22 A @ 24 V
Overload Current Protection: 1.1 A
Connection: 1 removable 4-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum, IP30 protection
Dimensions:
EDS-205A: 30 x 115 x 70 mm (1.18 x 4.52 x 2.76 in)
EDS-208A: 50 x 115 x 70 mm (1.96 x 4.52 x 2.76 in)
Weight:
EDS-205A: 175 g
EDS-208A: 275 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC IIC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-11
Marine: DNV, GL, LR, ABS, NK
Wheeled Vehicles: e-Mark (E1) (EDS-208A only)
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

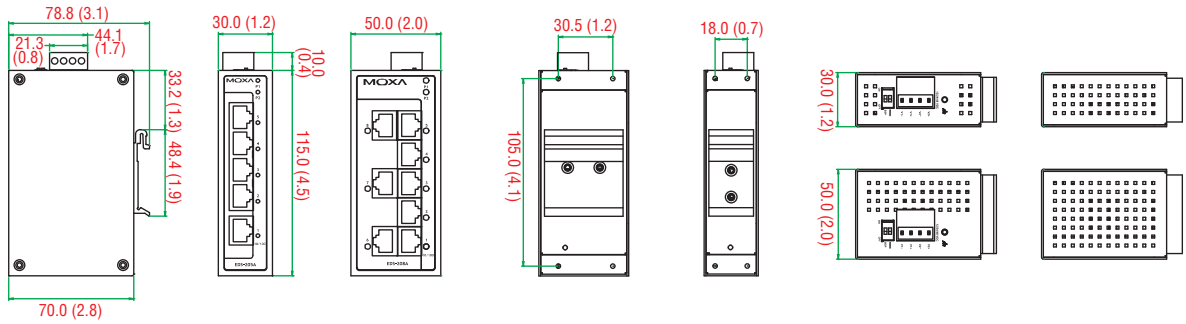
Time: 425,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front Views | Rear Views | Top & Bottom Views

Ordering Information

Available Models		Port Interface			
			100BaseFX		
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector
EDS-205A	EDS-205A-T	5	–	–	–
EDS-205A-M-SC	EDS-205A-M-SC-T	4	1	–	–
EDS-205A-M-ST	EDS-205A-M-ST-T	4	–	1	–
EDS-205A-S-SC	EDS-205A-S-SC-T	4	–	–	1
EDS-208A	EDS-208A-T	8	–	–	–
EDS-208A-M-SC	EDS-208A-M-SC-T	7	1	–	–
EDS-208A-M-ST	EDS-208A-M-ST-T	7	–	1	–
EDS-208A-MM-SC	EDS-208A-MM-SC-T	6	2	–	–
EDS-208A-MM-ST	EDS-208A-MM-ST-T	6	–	2	–
EDS-208A-S-SC	EDS-208A-S-SC-T	7	–	–	1
EDS-208A-SS-SC	EDS-208A-SS-SC-T	6	–	–	2

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-30: Wall mounting kit (EDS-205A series only)
WK-46: Wall mounting kit (EDS-208A series only)
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-205A or EDS-208A switch
- Hardware installation guide (printed)
- Warranty card

EDS-205/208 Series

5 and 8-port entry-level unmanaged Ethernet switches



- 10/100BaseT(X) (RJ45 connector), 100BaseFX (multi-mode, SC/ST connectors)
- IEEE802.3/802.3u/802.3x support
- Broadcast storm protection
- DIN-Rail mounting ability
- -10 to 60°C operating temperature range

Introduction

The EDS-205/208 series of industrial Ethernet switches are entry-level industrial 5 and 8-port Ethernet switches that support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, MDI/MDIX auto-sensing RJ45 ports. The EDS-205/208 switches are rated to operate at temperatures ranging from -10 to 60°C, and are rugged enough for any harsh industrial environment. The switches can be easily installed on a DIN-Rail as well as in distribution boxes. The DIN-Rail mounting capability, wide operating temperature, and the the IP30 housing with LED indicators make the plug-and-play EDS-205/208 switches easy to use and reliable.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
Processing Type: Store and Forward
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 Kbit

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector, multi-mode)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
LED Indicators: Power, 10/100M (TP port), 100M (fiber port)

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Input Voltage:
EDS-205: 12 to 48 VDC, 18 to 30 VAC (47 to 63 Hz)
EDS-208 series: 12 to 45 VDC, 18 to 30 VAC (47 to 63 Hz)
Input Current:
EDS-205: 0.12 A @ 24 V
EDS-208: 0.14 A @ 24 V
EDS-208-M: 0.23 A @ 24 V
Overload Current Protection: 1.1 A
Connection: 1 removable 3-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic, IP30 protection
Dimensions:
EDS-205: 24.9 x 100 x 86.5 mm (0.98 x 3.94 x 3.41 in)
EDS-208: 40 x 100 x 86.5 mm (1.57 x 3.94 x 3.41 in)
Weight:
EDS-205: 135 g
EDS-208: 170 g
Installation: DIN-Rail mounting

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety:
EDS-205: UL 508, EN 60950-1
EDS-208: UL 508, UL 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 2, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) (EDS-205: Level 3; EDS-208: Level 2),
EN 61000-4-8, EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

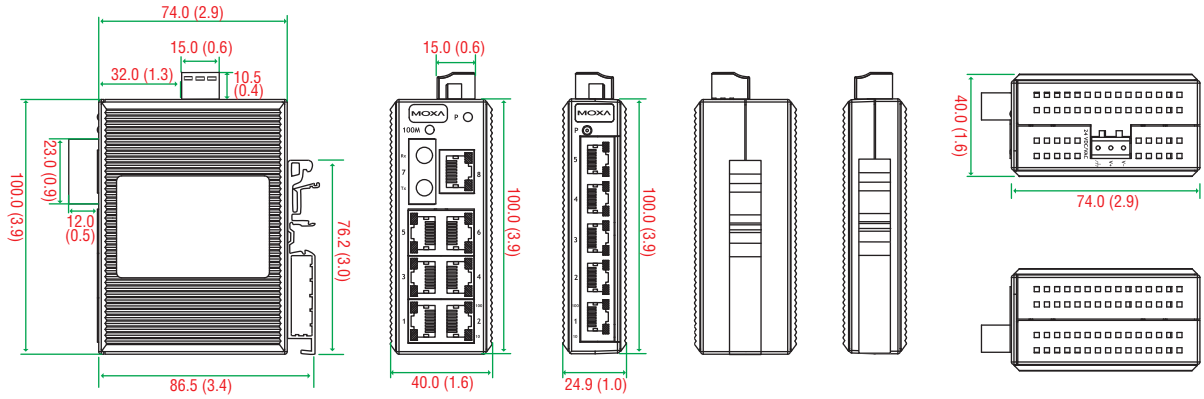
Time:
EDS-205: 323,000 hrs
EDS-208: 368,000 hrs
Database:
EDS-205: Telcordia (Bellcore), GB
EDS-208: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front Views | Rear Views | Top & Bottom Views

Ordering Information

Available Models	Port Interface			Housing Material	Power Range
Standard Temperature (-10 to 60°C)	10/100BaseT(X)	100BaseFX			
		Multi-mode, SC Connector	Multi-mode, ST Connector		
EDS-205	5	–	–	Plastic	12 to 48 VDC
EDS-208	8	–	–	Plastic	12 to 45 VDC
EDS-208-M-SC	7	1	–	Plastic	12 to 45 VDC
EDS-208-M-ST	7	–	1	Plastic	12 to 45 VDC

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-205 or EDS-208 switch
- Hardware installation guide (printed)
- Warranty card

ICS-G7848/G7850/G7852 Series

Preliminary

48G/48G+2 10GbE/48G+4 10GbE-port Layer 3 full Gigabit modular managed Ethernet switches



- Layer 3 routing interconnects multiple LAN segments
- Up to 48 Gigabit Ethernet ports plus 4 10G Ethernet ports
- Up to 52 optical fiber connections (SFP slots)
- Fanless, 0 to 60°C operating temperature range
- Modular design for maximum flexibility and hassle-free future expansion
- Hot swap interface and power modules for continuous operation
- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7848/G7850/G7852 series full Gigabit backbone switches' modular design makes network planning easy, and allows greater flexibility by letting you install up to 48 Gigabit Ethernet ports plus 4 10 Gigabit Ethernet ports. The ICS-G7848/G7850/G7852 series also supports Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large scale industrial networks. The ICS-G7848/G7850/G7852's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Layer 3 switching to divide large networks into different subnets and allow data and information to communicate across networks
- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- IGMP Snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- 802.3ad and LACP for optimum bandwidth utilization
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management ensures stable network performance
- Lock port to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email and relay output
- Automatic recovery of connected devices' IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, and Windows utility

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3ae for 10 Gigabit Ethernet
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog
Layer 3 Switching: Static routing, RIP V1/V2, OSPF, VRRP for router redundancy
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 8
Max. Number of Available VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 1000
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit

Interface

Gigabit Ethernet: 12 slots for 4-port interface modules, 10/100/1000BaseT(X) or 100/1000BaseSFP slots
Note: See page 1-54 for IM-G7000 Gigabit Ethernet module product information.

10 Gigabit Ethernet: 2 or 4 10GbE SFP+ slots (ICS-G7850 and ICS-G7852 only)
Console Port: RS-232 (RJ45 connector)
LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, 1/2/3/4 for 10GbE port (ICS-G7850 and ICS-G7852 only)
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110/220 VAC (85 to 264 VAC)
Input Current:
ICS-G7848: Max. 1.02/0.6 A @ 110/220 VAC
ICS-G7850: Max. 1.1/0.64 A @ 110/220 VAC
ICS-G7852: Max. 1.19/0.68 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 176 x 482.8 mm (17.32 x 6.93 x 19.01 in)
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

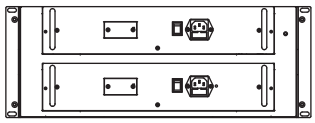
Safety: UL 60950-1 (Pending), EN 60950-1 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Rail Traffic: EN 50121-4 (Pending)
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

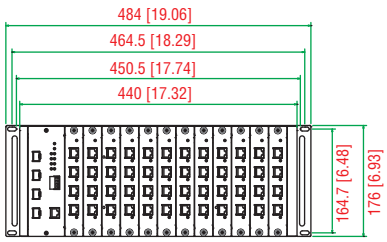
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

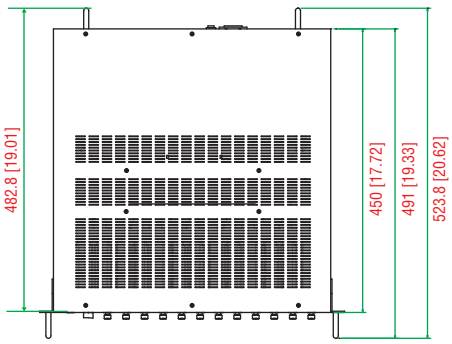
Unit: mm (inch)



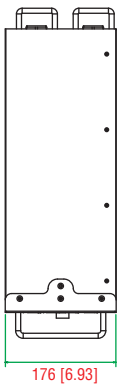
Rear View



Front View



Top View



Side View

Ordering Information

Step 1: Select Ethernet switch system

ICS-G7848/G7850/G7852 with power supply

Step 2: Select interface modules

IM-G7000 (Gigabit Ethernet)

Note: The ICS-G7848/G7850/G7852 Ethernet switch system is delivered without interface modules. Please see pages 1-54 to determine which IM-G7000 interface modules are suitable for your application.

Available Models

ICS-G7848-HV-HV: Layer 3 full Gigabit modular managed Ethernet switch system with 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G ports, 0 to 60°C operating temperature
ICS-G7850-2XG-HV-HV: Layer 3 full Gigabit modular managed Ethernet switch system with 2 10GbE SFP+ slots, 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G + 2 10GbE ports, 0 to 60°C operating temperature
ICS-G7852-4XG-HV-HV: Layer 3 full Gigabit modular managed Ethernet switch system with 4 10GbE SFP+ slots, 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G + 4 10GbE ports, 0 to 60°C operating temperature

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- ICS-G7848 or ICS-G7850 or ICS-G7852 switch
- RJ45 to DB9 console port cable
- 2 power cords
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

ICS-G7748/G7750/G7752 Series

Preliminary

48G/48G+2 10GbE/48G+4 10GbE-port full Gigabit modular managed Ethernet switches



- Up to 48 Gigabit Ethernet ports plus 4 10G Ethernet ports
- Up to 52 optical fiber connections (SFP slots)
- Fanless, 0 to 60°C operating temperature range
- Modular design for maximum flexibility and hassle-free future expansion
- Hot swap interface and power modules for continuous operation
- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7748/G7750/G7752 series full Gigabit backbone switches' modular design makes network planning easy, and allows greater flexibility by letting you install up to 48 Gigabit Ethernet ports plus 4 10 Gigabit Ethernet ports, making them ideal for large-scale industrial networks. The ICS-G7748/G7750/G7752's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- IGMP Snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- 802.3ad and LACP for optimum bandwidth utilization
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management ensures stable network performance
- Lock port to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email and relay output
- Automatic recovery of connected devices' IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, and Windows utility

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3ae for 10 Gigabit Ethernet
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 8
Max. Number of Available VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 1000
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit

Interface

Gigabit Ethernet: 12 slots for 4-port interface modules, 10/100/1000BaseT(X) or 100/1000BaseSFP slots
Note: See page 1-54 for IM-G7000 Gigabit Ethernet module product information.
10 Gigabit Ethernet: 2 or 4 10GbE SFP+ slots (ICS-G7750 and ICS-G7752 only)
Console Port: RS-232 (RJ45 connector)
LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, 1/2/3/4 for 10GbE port (ICS-G7750 and ICS-G7752 only)
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC

Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 110/220 VAC (85 to 264 VAC)
Input Current:
ICS-G7748: Max. 1.02/0.6 A @ 110/220 VAC
ICS-G7750: Max. 1.1/0.64 A @ 110/220 VAC
ICS-G7752: Max. 1.19/0.68 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 176 x 482.2 mm (17.32 x 6.93 x 19.01 in)
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

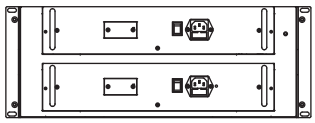
Safety: UL 60950-1 (Pending), EN 60950-1 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Rail Traffic: EN 50121-4 (Pending)
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

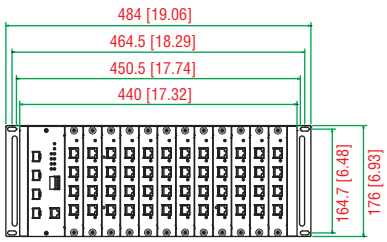
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

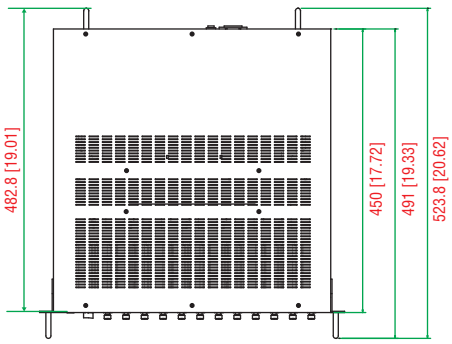
Unit: mm (inch)



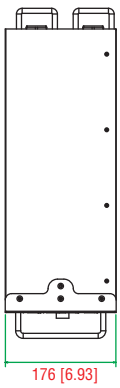
Rear View



Front View



Top View



Side View

Ordering Information

Step 1: Select Ethernet switch system

ICS-G7748/G7750/G7752 with power supply

Step 2: Select interface modules

IM-G7000 (Gigabit Ethernet)

Note: The ICS-G7748/G7750/G7752 Ethernet switch system is delivered without interface modules. Please see pages 1-54 to determine which IM-G7000 interface modules are suitable for your application.

Available Models

ICS-G7748-HV-HV: Full Gigabit modular managed Ethernet switch system with 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G ports, 0 to 60°C operating temperature
ICS-G7750-2XG-HV-HV: Full Gigabit modular managed Ethernet switch system with 2 10GbE SFP+ slots, 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G + 2 10GbE ports, 0 to 60°C operating temperature
ICS-G7752-4XG-HV-HV: Full Gigabit modular managed Ethernet switch system with 4 10GbE SFP+ slots, 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G + 4 10GbE ports, 0 to 60°C operating temperature

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- ICS-G7748 or ICS-G7750 or ICS-G7752 switch
- RJ45 to DB9 console port cable
- 2 power cords
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

ICS-G7826/G7828 Series

Preliminary

24G+2 10GbE/24G+4 10GbE-port Layer 3 full Gigabit managed Ethernet switches



- Layer 3 routing interconnects multiple LAN segments
- Up to 24 Gigabit Ethernet ports plus 4 10G Ethernet ports
- Up to 28 optical fiber connections (SFP slots)
- Fanless, 0 to 60°C operating temperature range
- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7826/G7828 series full Gigabit backbone switches are equipped with up to 24 Gigabit Ethernet ports plus 4 10 Gigabit Ethernet ports, and support Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large scale industrial networks.

The ICS-G7826/G7828's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Layer 3 switching to divide large networks into different subnets and allow data and information to communicate across networks
- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- IGMP Snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE802.1p/1Q) and TOS/DiffServ to increase determinism
- 802.3ad and LACP for optimum bandwidth utilization
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
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- Configurable by web browser, Telnet/serial console, and Windows utility

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3ae for 10 Gigabit Ethernet
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog

Layer 3 Switching: Static routing, RIP V1/V2, OSPF, VRRP for router redundancy
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 8
Max. Number of Available VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 1000
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit

Interface

Gigabit Ethernet: 10/100/1000BaseT(X) or 100/1000BaseSFP slot
10 Gigabit Ethernet: 10GbE SFP+ slot
Console Port: RS-232 (RJ45 connector)
LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL

Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 110/220 VAC (85 to 264 VAC)
Input Current:
ICS-G7826: Max. 0.98/0.55 A @ 110/220 VAC
ICS-G7828: Max. 1.16/0.65 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 386.9 mm (17.32 x 1.73 x 15.23 in)
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1 (Pending), EN 60950-1 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Rail Traffic: EN 50121-4 (Pending)
Note: Please check Moxa's website for the most up-to-date certification status.

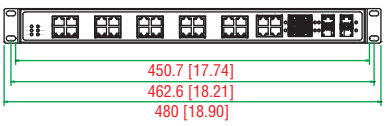
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

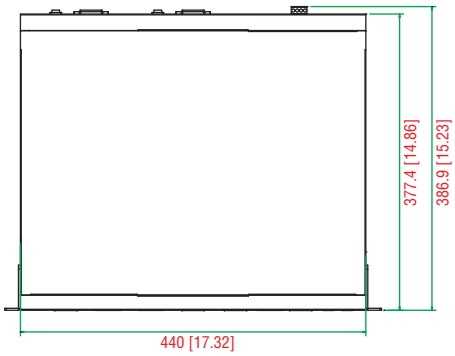
Dimensions

Unit: mm (inch)

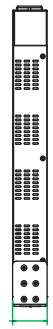

Rear View



Front View



Top View



Side View

Ordering Information

Available Models	Port Interface				Power Supply	
Standard Temperature (0 to 60°C)	Gigabit Ethernet			10 Gigabit Ethernet	Isolated Power Supply 1	Isolated Power Supply 2
	10/100/1000BaseT(X)	100/1000BaseSFP*	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*	10GbE SFP+*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
ICS-G7826-4GTXSFP-2XG-HV-HV	20	–	4	2	1	1
ICS-G7826-8GSFP-4GTXSFP-2XG-HV-HV	12	8	4	2	1	1
ICS-G7826-20GSFP-4GTXSFP-2XG-HV-HV	–	20	4	2	1	1
ICS-G7828-4GTXSFP-4XG-HV-HV	20	–	4	4	1	1
ICS-G7828-8GSFP-4GTXSFP-4XG-HV-HV	12	8	4	4	1	1
ICS-G7828-20GSFP-4GTXSFP-4XG-HV-HV	–	20	4	4	1	1

Note: The ICS-G7826/G7828 series supports 10GbE SFP+ and 100/1000BaseSFP slots. See pages 1-86 to 1-89 for product information about SFP-10G/1G/1FE series SFP modules.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- ICS-G7826 or ICS-G7828 switch
- RJ45 to DB9 console port cable
- 2 power cords
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

ICS-G7526/G7528 Series

Preliminary

24G+2 10GbE/24G+4 10GbE-port full Gigabit managed Ethernet switches



- Up to 24 Gigabit Ethernet ports plus 4 10G Ethernet ports
- Up to 28 optical fiber connections (SFP slots)
- Fanless, 0 to 60°C operating temperature range
- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7526/G7528 series full Gigabit backbone switches are equipped with up to 24 Gigabit Ethernet ports plus 4 10 Gigabit Ethernet ports, making them ideal for large-scale industrial networks. The ICS-G7526/G7528's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- IGMP Snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- 802.3ad and LACP for optimum bandwidth utilization
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management ensures stable network performance
- "Lock port" to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email and relay output
- Automatic recovery of connected devices' IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, and Windows utility

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3ae for 10 Gigabit Ethernet
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 8
Max. Number of Available VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 1000
MAC Table Size: 16 K
Packet Buffer Size: 8 Mbit

Interface

Gigabit Ethernet: 10/100/1000BaseT(X) or 100/1000BaseSFP slot
10 Gigabit Ethernet: 10GbE SFP+ slot
Console Port: RS-232 (RJ45 connector)
LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"

• -30 to +3V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110/220 VAC (85 to 264 VAC)
Input Current:
ICS-G7526: Max. 0.98/0.55 A @ 110/220 VAC
ICS-G7528: Max. 1.16/0.65 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 386.9 mm (17.32 x 1.73 x 15.23 in)
Installation: 19” rack mounting

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

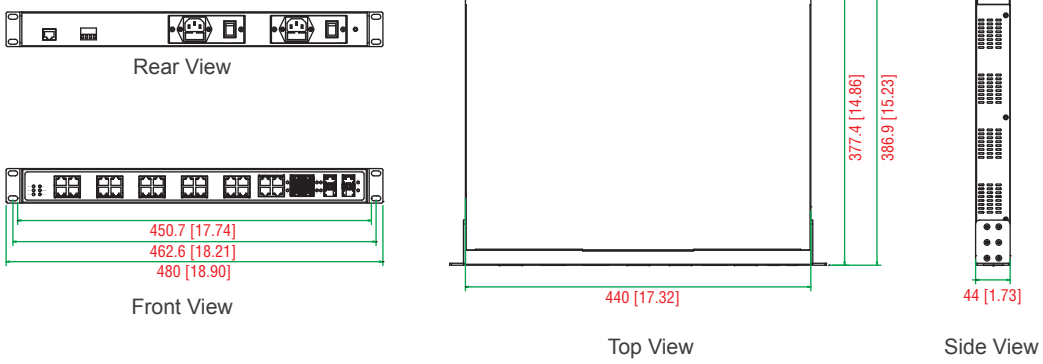
Safety: UL 60950-1 (Pending), EN 60950-1 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Rail Traffic: EN 50121-4 (Pending)
Note: Please check Moxa’s website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Port Interface				Power Supply	
	Gigabit Ethernet			10 Gigabit Ethernet	Isolated Power Supply 1	Isolated Power Supply 2
Standard Temperature (0 to 60°C)	10/100/1000BaseT(X)	100/1000BaseSFP*	Combo Port, 10/100/1000BaseT(X) or 100/1000 BaseSFP*	10GbE SFP+*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
ICS-G7526-4GTXSFP-2XG-HV-HV	20	–	4	2	1	1
ICS-G7526-8GSFP-4GTXSFP-2XG-HV-HV	12	8	4	2	1	1
ICS-G7526-20GSFP-4GTXSFP-2XG-HV-HV	–	20	4	2	1	1
ICS-G7528-4GTXSFP-4XG-HV-HV	20	–	4	4	1	1
ICS-G7528-8GSFP-4GTXSFP-4XG-HV-HV	12	8	4	4	1	1
ICS-G7528-20GSFP-4GTXSFP-4XG-HV-HV	–	20	4	4	1	1

Note: The ICS-G7526/G7528 series supports 10GbE SFP+ and 100/1000BaseSFP slots. See pages 1-86 to 1-89 for SFP-10G/1G/1FE series SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- ICS-G7526 or ICS-G7528 switch
- RJ45 to DB9 console port cable
- 2 power cords
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IM-G7000 Series

Preliminary

4G-port Gigabit Ethernet interface modules for ICS-G7700/G7800 series modular managed Ethernet switches

Specifications

Gigabit Ethernet Interface Modules, IM-G7000 Series



IM-G7000-4GTX



IM-G7000-4GSFP

Interface

Fiber Ports: 100/1000BaseSFP slot
RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
LED Indicators: STAT, 10/100/1000 for TP port, 100/1000 for fiber port
Hot Swap Button: Push this button prior to swapping IM-G7000 modules

Power Requirements

Power Consumption:
IM-G7000-4GTX: 4.1 W
IM-G7000-4GSFP: 3.3 W

Physical Characteristics

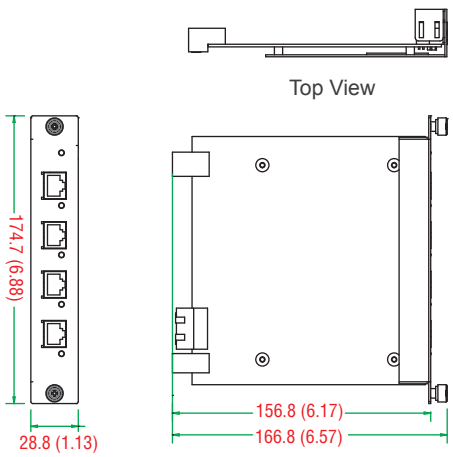
Housing: IP30 protection
Dimensions: 28.8 x 174.7 x 166.8 mm (1.13 x 6.88 x 6.57 in)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

IM-G7000-4GTX: Gigabit Ethernet interface module with 4 10/100/1000BaseT(X) ports, 0 to 60°C operating temperature
IM-G7000-4GSFP: Gigabit Ethernet interface module with 4 100/1000BaseSFP slots*, 0 to 60°C operating temperature
*See page 1-87 and 1-89 for product information related to the SFP-1G/1FE series SFP modules.

Package Checklist

- IM-G7000 interface module
- Warranty card

IKS-G6824 Series

Preliminary

24G-port Layer 3 full Gigabit managed Ethernet switches



- Layer 3 routing interconnects multiple LAN segments
- Up to 24 Gigabit Ethernet ports
- Up to 24 optical fiber connections (SFP slots)
- Fanless, -40 to 75°C operating temperature range (T models)
- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The IKS-G6824 series full Gigabit backbone switches are equipped with up to 24 Gigabit Ethernet ports, and support Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large scale industrial networks. The IKS-G6824's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Layer 3 switching to divide large networks into different subnets and allow data and information to communicate across networks
- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- IGMP Snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE802.1p/1Q) and TOS/DiffServ to increase determinism
- 802.3ad and LACP for optimum bandwidth utilization
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management ensures stable network performance
- Lock port to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email and relay output
- Automatic recovery of connected devices' IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, and Windows utility

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog
Layer 3 Switching: Static routing, RIP V1/V2, OSPF, VRRP for router redundancy
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 8
Max. Number of Available VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 1000
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit

Interface

Gigabit Ethernet: 10/100/1000BaseT(X) or 100/1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.

• +13 to +30V for state “1”
• -30 to +3V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110/220 VAC (85 to 264 VAC)
Input Current: Max. 0.79/0.44 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 386.9 mm (17.32 x 1.73 x 15.23 in)
Installation: 19” rack mounting

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

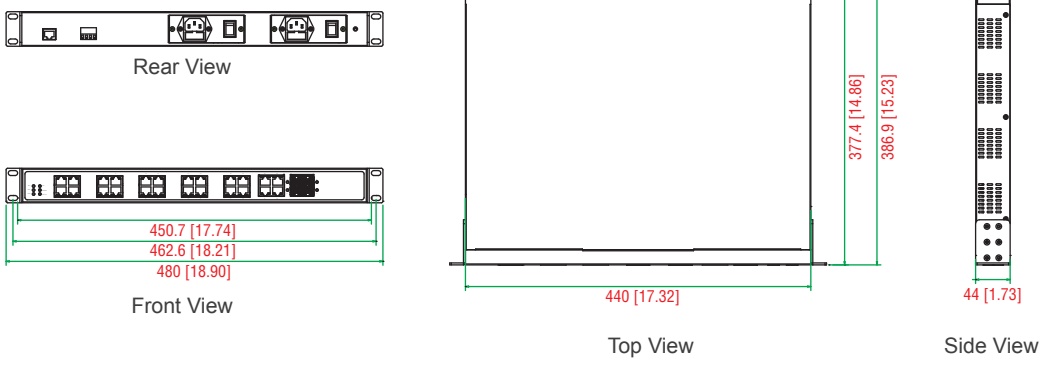
Safety: UL 60950-1 (Pending), EN 60950-1 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Rail Traffic: EN 50121-4 (Pending)
Note: Please check Moxa’s website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models		Port Interface			Power Supply	
		Gigabit Ethernet			Isolated Power Supply 1	Isolated Power Supply 2
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000 BaseT(X)	100/1000 BaseSFP*	Combo Port, 10/100/1000 BaseT(X) or 100/1000 BaseSFP*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
IKS-G6824-4GTXSFP-HV-HV	IKS-G6824-4GTXSFP-HV-HV-T	20	–	4	1	1
IKS-G6824-8GSFP-4GTXSFP-HV-HV	IKS-G6824-8GSFP-4GTXSFP-HV-HV-T	12	8	4	1	1
IKS-G6824-20GSFP-4GTXSFP-HV-HV	IKS-G6824-20GSFP-4GTXSFP-HV-HV-T	–	20	4	1	1

Note: The IKS-G6824 series supports 100/1000BaseSFP slots. See pages 1-87 and 1-89 for SFP-1G/1FE series SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- IKS-G6824 switch
- RJ45 to DB9 console port cable
- 2 power cords
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IKS-G6524 Series

Preliminary

24G-port full Gigabit managed Ethernet switches



- Up to 24 Gigabit Ethernet ports
- Up to 24 optical fiber connections (SFP slots)
- Fanless, -40 to 75°C operating temperature range (T models)
- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The IKS-G6524 series full Gigabit backbone switches are equipped with up to 24 Gigabit Ethernet ports, making them ideal for large-scale industrial networks. The IKS-G6524's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Turbo Ring, Turbo Chain, and RSTP/STP for network redundancy
- IGMP Snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- 802.3ad and LACP for optimum bandwidth utilization
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management ensures stable network performance
- "Lock port" to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email and relay output
- Automatic recovery of connected devices' IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, and Windows utility

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 8
Max. Number of Available VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 1000
MAC Table Size: 16 K
Packet Buffer Size: 8 Mbit

Interface

Gigabit Ethernet: 10/100/1000BaseT(X) or 100/1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110/220 VAC (85 to 264 VAC)
Input Current: Max. 0.79/0.44 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 386.9 mm (17.32 x 1.73 x 15.23 in)
Installation: 19" rack mounting

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

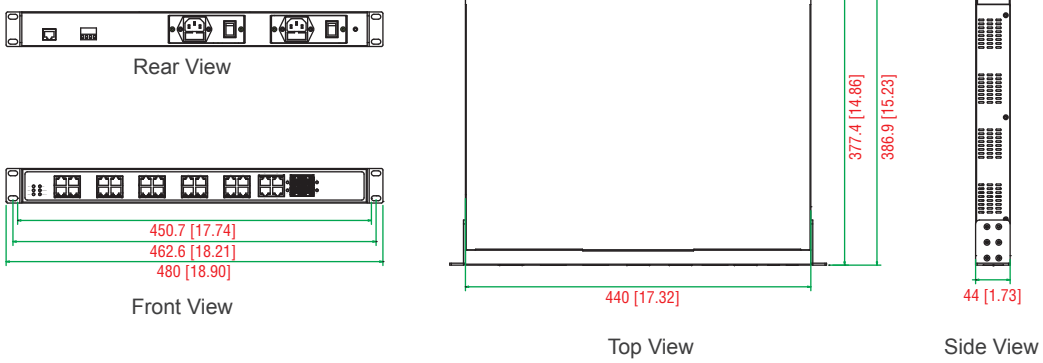
Safety: UL 60950-1 (Pending), EN 60950-1 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Rail Traffic: EN 50121-4 (Pending)
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models		Port Interface			Power Supply	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	Gigabit Ethernet			Isolated Power Supply 1	Isolated Power Supply 2
		10/100/1000 BaseT(X)	100/1000 BaseSFP*	Combo Port, 10/100/1000 BaseT(X) or 100/1000 BaseSFP*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
IKS-G6524-4GTXSFP-HV-HV	IKS-G6524-4GTXSFP-HV-HV-T	20	-	4	1	1
IKS-G6524-8GSFP-4GTXSFP-HV-HV	IKS-G6524-8GSFP-4GTXSFP-HV-HV-T	12	8	4	1	1
IKS-G6524-20GSFP-4GTXSFP-HV-HV	IKS-G6524-20GSFP-4GTXSFP-HV-HV-T	-	20	4	1	1

Note: The IKS-G6524 series supports 100/1000BaseSFP slots. See pages 1-87 and 1-89 for SFP-1G/1FE series SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- IKS-G6524 switch
- RJ45 to DB9 console port cable
- 2 power cords
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IKS-6726 Series

24+2G-port Gigabit modular managed Ethernet switches



- Meets UL 60950-1, NEMA TS2, EN 50121-4, and maritime certifications
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply
- Modular design lets you choose from a variety of media combinations
- -40 to 75°C operating temperature range

*Available in Q3, 2011

Introduction

The IKS-6726 series of industrial rackmount Ethernet switches are designed to meet the rigorous demands of mission critical applications for industry and business, such as traffic control systems (NEMA TS2) and maritime applications. The IKS-6726's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling and wiring costs. The modular design of the IKS-6726 also makes network planning easy, and allows greater flexibility by letting you install up to 2 Gigabit ports and 24 fast Ethernet ports.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- TACACS+*, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status with "Lock port" to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, CLI*, Windows utility, and ABC-01 automatic backup configurator

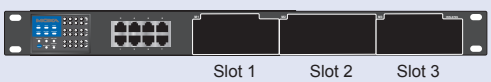
*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging

Modular Rackmount Ethernet Switch System, IKS-6726



IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMP v1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, EtherNet/IP*, Modbus/TCP, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 2 Mbit

Interface

Fast Ethernet: Slots 1 and 2 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP
Gigabit Ethernet: Slot 3 for 2-port PM-7200 Gigabit Ethernet combo module with 10/100/1000BaseT(X) or 1000BaseSFP slots
Note: See page 2-42 for PM-7200 Gigabit and fast Ethernet module product information.
Console Port: RS-232 (RJ45 connector)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Mode LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage: 24 VDC (18 to 36 V), or 48 VDC (36 to 72 V), or 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)
Input Current: (with max. number of fiber ports installed)
• Max. 1.11 A @ 24 VDC
• Max. 0.56 A @ 48 VDC
• Max. 0.56/0.28 A @ 110/220 VDC
• Max. 0.56/0.28 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 349.3 mm (17.32 x 1.73 x 13.75 in)
Weight: 4200 g
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-11
Marine: DNV, GL, LR, ABS, NK
Traffic Control: NEMA TS2
Rail Traffic: EN 50155, EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

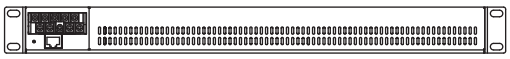
Time: 259,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

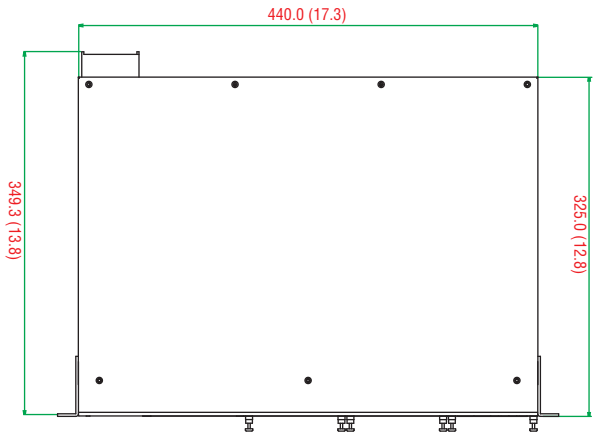
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

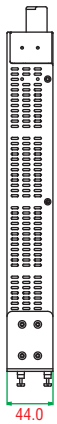
Unit: mm (inch)



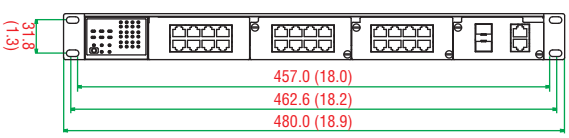
Rear View



Top View



Side View



Front View

Ordering Information

Step 1: Select Ethernet switch system **Step 2: Select interface modules**

IKS-6726 with power supply → PM-7200 modules (Gigabit or fast Ethernet)

Note: The IKS-6726 Ethernet switch system is delivered without interface modules. Please see pages 2-42 to determine which PM-7200 interface modules are suitable for your application.

IKS-6726 Modular Rackmount Ethernet Switch System

Modular managed rackmount Ethernet switch systems with 8 fixed 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. Supports up to 24+2G ports, -40 to 75°C operating temperature.

Available Models	Power Supply					
Front Cabling, Front Display	Isolated Power Supply 1			Isolated Power Supply 2		
	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
IKS-6726-F-24-T	1	–	–	–	–	–
IKS-6726-F-24-24-T	1	–	–	1	–	–
IKS-6726-F-24-48-T	1	–	–	–	1	–
IKS-6726-F-24-HV-T	1	–	–	–	–	1
IKS-6726-F-48-T	–	1	–	–	–	–
IKS-6726-F-48-48-T	–	1	–	–	1	–
IKS-6726-F-48-HV-T	–	1	–	–	–	1
IKS-6726-F-HV-T	–	–	1	–	–	–
IKS-6726-F-HV-HV-T	–	–	1	–	–	1

Gigabit/Fast Ethernet Module Compatibility Chart for the IKS-6726

	Interface Module																
	PM-7200-2GTXSFP	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8SFP	PM-7200-4M12
Slot 1	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 2	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 3	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- IKS-6726 switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IKS-6524/6526 Series

24 and 24+2G-port managed Ethernet switches



- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01
- Isolated redundant power inputs with 110/220 VAC power supply and standardized power inlets
- Meets industrially recognized standards for transportation, process automation, and maritime applications
- -40 to 75°C operating temperature range

*Available in Q3, 2011

Introduction

The IKS-6500 series fixed-type industrial managed rackmount switches are designed to seamlessly integrate your control networks and field networks. The switches can operate in extreme operating temperatures ranging from -40 to 75°C, and are equipped with up to two AC power inputs for conventional usage as well as advanced Ethernet switching functionality to ensure the reliability of your communication network. The IKS-6500 switches are designed to meet the rigorous demands of mission critical applications, including traffic control systems (NEMA TS2), networks along railway tracks (EN 50121-4), and maritime applications (DNV/GL and other maritime certifications).

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- TACACS+*, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status with “Lock port” to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email
- Automatic recovery of connected device’s IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, CLI*, Windows utility, and ABC-01 automatic backup configurator

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMP v1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, EtherNet/IP*, Modbus/TCP, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 2 Mbit

Interface

Fiber Ports: 100BaseSFP slot (IKS-6524-8SFP series) or 1000BaseSFP slot (IKS-6526-2GTXSFP series)
RJ45 Ports: 10/100BaseT(X) and/or 10/100/1000BaseT(X) auto negotiation speed
Console Port: RS-232 (RJ45 connector)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Mode LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Power Requirements

Input Voltage: 110/220 VAC (85 to 264 VAC)
Input Current:
- IKS-6524-F-HV-T: Max. 333/222 mA @ 110/230 VAC
- IKS-6524-F-HV-HV-T: Max. 402/324 mA @ 110/230 VAC
- IKS-6524-8SFP-F-HV-T: Max. 501/295 mA @ 110/230 VAC
- IKS-6524-8SFP-F-HV-HV-T: Max. 555/390 mA @ 110/230 VAC
- IKS-6526-2GTXSFP-F-HV-T: Max. 398/254 mA @ 110/230 VAC
- IKS-6526-2GTXSFP-F-HV-HV-T: Max. 465/350 mA @ 110/230 VAC

Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 342.5 mm (17.32 x 1.73 x 13.48 in)
Weight:
IKS-6524 series: 4780 g
IKS-6524-8SFP series: 4850 g
IKS-6526-2GTXSFP series: 4820 g
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-11
Marine: DNV, GL, LR, ABS, NK
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

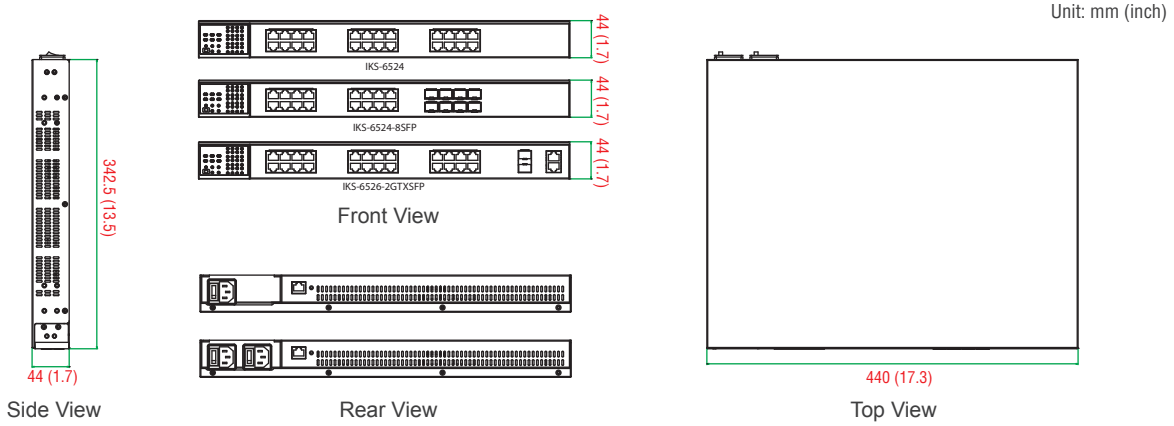
Time: 237,700 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models (-40 to 75°C)	Port Interface			Power Supply	
	Gigabit Ethernet	Fast Ethernet		Isolated Power Supply 1	Isolated Power Supply 2
	Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*	10/100BaseT(X)	100BaseSFP*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
IKS-6524-F-HV-T	–	24	–	1	–
IKS-6524-F-HV-HV-T	–	24	–	1	1
IKS-6524-8SFP-F-HV-T	–	16	8	1	–
IKS-6524-8SFP-F-HV-HV-T	–	16	8	1	1
IKS-6526-2GTXSFP-F-HV-T	2	24	–	1	–
IKS-6526-2GTXSFP-F-HV-HV-T	2	24	–	1	1

*The IKS-6500 series switches support 2 1000BaseSFP slots or 8 100BaseSFP slots. See pages 1-87 and 1-89 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

Power Cords and Adaptors: See Appendix A for details
MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- IKS-6524 or IKS-6526 switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IKS-6324 Series

22+2G-port Gigabit unmanaged Ethernet switches



- Meets NEMA TS2, EN 50121-4, and DNV/GL/ABS/LR/NK certifications
- Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- Redundant dual 12/24/48 VDC power inputs
- -40 to 75°C operating temperature range

Introduction

The IKS-6324 industrial rackmount Ethernet switches are designed to meet the demands of industrial application networks such as traffic control systems (NEMA TS2), and maritime applications (DNV/GL/LR/ABS/NK). The IKS-6324 is a 24-port industrial 19" rackmount Ethernet switch series that provides a rugged and economical solution for your industrial Ethernet connections. Up to two fast Ethernet fiber optic ports and combo Gigabit Ethernet TP or fiber optic ports can be chosen to make the construction of a reliable Ethernet network easy. A universal power supply range of 12/24/48 VDC or 110/220 VDC/VAC give users greater flexibility in choosing power inputs. The Ethernet switches comply with UL standards and support a wide operating temperature range of -40 to 75°C. All models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

MAC Table Size: 8 K
Packet Buffer Size: 2.5 Mbit

Interface

Fiber Ports: 100BaseFX (SC/ST connector) or 1000BaseSFP slots
RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode and auto MDI/MDI-X connection
LED Indicators: STAT, PWR1, PWR2, FAULT, LNK/ACT, FDX/HDX, SPEED
Note: Slot 1 is for a 2-port PM-7200 Gigabit Ethernet combo module, or 1 or 2-port PM-7200 fast Ethernet module. See page 2-42 for details.

Power Requirements

Input Voltage: 12/24/48 VDC (9 to 60 V), or 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)
Input Current: (with max. number of fiber ports installed)
• Max. 0.68 A @ 24 VDC
• Max. 0.35 A @ 48 VDC
• Max. 0.17/0.11 A @ 110/220 VDC
• Max. 0.33/0.23 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-contact terminal block
Reverse Polarity Protection: Present

Unmanaged Rackmount Ethernet Switch System, IKS-6324



Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 278.3 mm (17.32 x 1.73 x 10.96 in)
Weight: 4300 g
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Marine: DNV, GL, LR, ABS, NK
Traffic Control: NEMA TS2
Rail Traffic: EN 50155, EN 50121-4
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

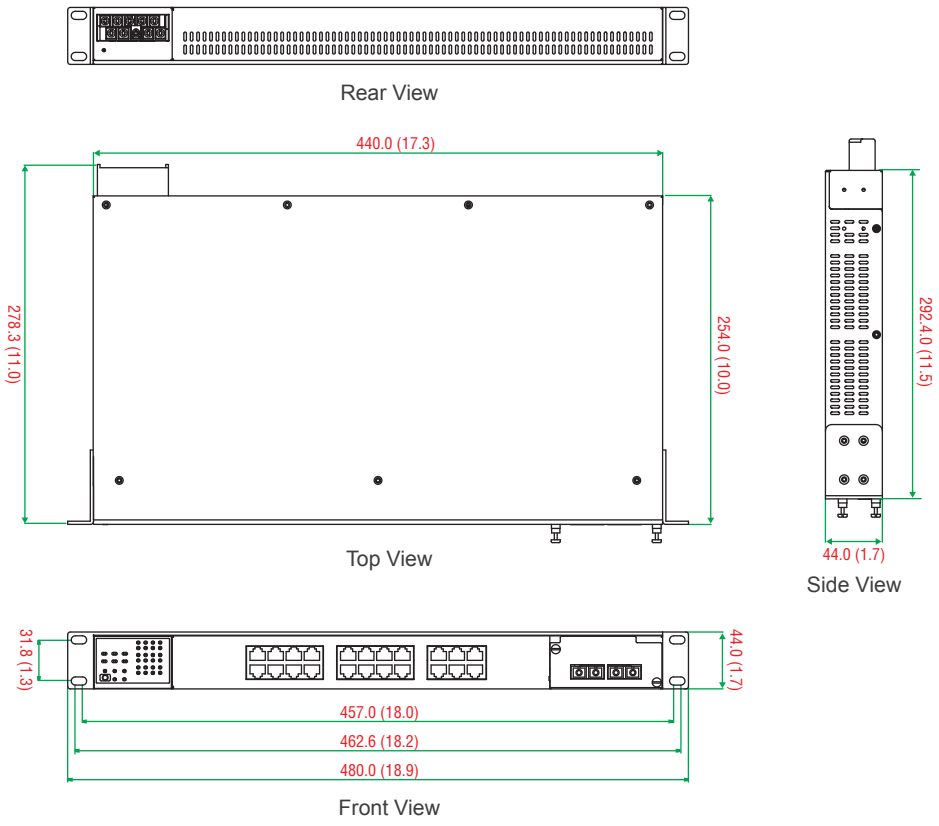
Time: 197,700 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Step 1: Select Ethernet switch system **Step 2: Select interface modules**

IKS-6324 with power supply → PM-7200 modules (Gigabit or fast Ethernet)

Note: The IKS-6324 Ethernet switch system is delivered without interface modules. Please see page 2-42 to determine which PM-7200 interface modules are suitable for your application.

IKS-6324 Unmanaged Rackmount Ethernet Switch System

The IKS-6324 switch system consists of 2 unmanaged rackmount Ethernet switch systems with 22 10/100BaseT(X) ports, and 1 slot for fast Ethernet or Gigabit Ethernet modules. A total of up to 24 or 22+2G ports can be installed, and the switch can be used in a temperature range from -40 to 75°C.

Product Model	Power Supply	
Front Cabling, Front Display	LV: 12/24/48 VDC (9 to 60 V)	HV: 88 to 300 VDC and 85 to 264 VAC,isolated
IKS-6324-F-LV-T	1	–
IKS-6324-F-HV-T	–	1

Gigabit/Fast Ethernet Module Compatibility Chart for the IKS-6324

	Interface Module						
	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-1SSC	PM-7200-2MSC	PM-7200-2MST	PM-7200-2SSC
Slot 1	✓	✓	✓	✓	✓	✓	✓

Package Checklist

- IKS-6324 switch
- Protective caps for unused ports
- 2 rackmount ears
- Hardware installation guide (printed)
- Warranty card

EDS-P510 Series

7+3G-port Gigabit PoE managed Ethernet switches



- 4 IEEE 802.3af-compliant PoE and Ethernet combo ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- Intelligent power consumption detection, PD failure check, and PoE scheduling function
- 3 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports; 2 ports for redundant ring and 1 port for uplink
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, windows utility, and ABC-01

*Available in Q3, 2011

Introduction

The EDS-P510 series Gigabit managed redundant Ethernet switches come standard with 4 10/100BaseT(X) 802.3af (PoE) compliant Ethernet ports and 3 combo Gigabit Ethernet ports. The EDS-P510 switches provide up to 15.4 watts of power per PoE port, and allow power to be supplied to connected devices (such as surveillance cameras, wireless access points, and IP phones) when AC power is not readily available or is cost-prohibitive to provide locally. The EDS-P510 switches are highly versatile, and their SFP fiber port can transmit data up to 80 km from the device to the control center with high EMI immunity. The Ethernet switches support advanced management and security features. The EDS-P510 series is designed especially for security automation applications such as IP surveillance, and gate of entry systems, which can benefit from a scalable backbone construction and Power-over-Ethernet support.

Features and Benefits

- Advanced PoE management function (PoE port setting, PD failure check, and PoE scheduling)
- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+*, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- Lock port function for blocking unauthorized access based on MAC address
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, EtherNet/IP*, Modbus/TCP, SNMP Inform, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

Fiber Ports: 100/1000BaseSFP slot
RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
LED Indicators: PWR1, PWR2, FAULT, 10/100/1000, 10/100, MSTR/HEAD, CPLR/TAIL, PoE
Alarm Contact: 2 relay outputs with current carrying capacity of 0.5 A @ 48 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.

- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 48 (46 to 50V) VDC, redundant dual inputs
Input Current: Max. 1.62 A @ 48 VDC (supports up to 4 ports at 15.4 W per PoE port)
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
Weight: 1170 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Operating Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

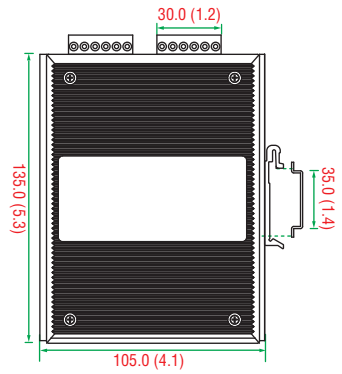
Time: 200,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

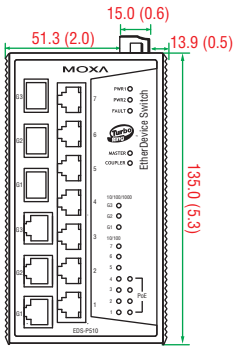
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

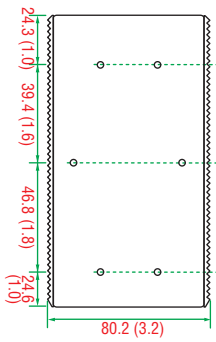
Unit: mm (inch)



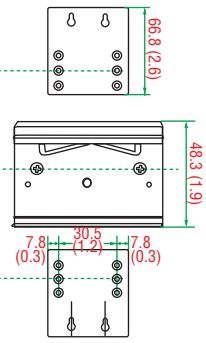
Side View



Front View



Rear View



DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface		
		Gigabit Ethernet	Fast Ethernet	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*	PoE, 10/100BaseT(X)	10/100BaseT(X)
EDS-P510	EDS-P510-T	3	4	3

*The EDS-P510 series supports 3 100/1000BaseSFP slots. See page pages 1-87 and 1-89 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

DR-75-48/120-48: 75/120 W DIN-Rail 48 VDC power supplies
MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-P510 switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-P506A-4PoE Series

Award-winning Product
TAIWAN EXCELLENCE 2010

6-port IEEE 802.3af/at PoE+ managed Ethernet switches



- 4 IEEE 802.3af/at compliant PoE and Ethernet combo ports
- Up to 30 watts per PoE port
- 24/48 VDC wide range redundant power inputs
- Advanced PoE management functions, including PD failure check and PoE scheduling
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- -40 to 75°C operating temperature range (T models)

*Available in Q3, 2011

Introduction

The EDS-P506A-4PoE series managed redundant Ethernet switches come standard with 4 10/100BaseT(X) 802.3at (PoE+) and 802.3af (PoE) compliant Ethernet ports and 2 10/100BaseT(X) or 2 10/100BaseFX Ethernet ports. The EDS-P506A-4PoE switches provide up to 30 watts of power per PoE port, and allow power to be supplied to connected high-power devices when AC power is not readily available or is cost-prohibitive to provide locally. The EDS-P506A-4PoE series series is designed especially for security automation applications such as IP surveillance, and gate of entry systems, which can benefit from a scalable backbone construction and Power-over-Ethernet support.

Features and Benefits

- Advanced PoE management function (PoE port setting, PD failure check, and PoE scheduling)
- 24/48 VDC wide range redundant power inputs
- Command Line Interface (CLI) for quickly configuring major managed functions*
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, EtherNet/IP*, Modbus/TCP, SNMP Inform, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
LED Indicators: PWR1, PWR2, FAULT, 10/100M, MSTR/HEAD, CPLR/TAIL, PoE
Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Input Voltage: 24/48 (20 to 60 V) VDC, redundant dual inputs
Input Current: Max. 7.8 A @ 24 VDC (supports up to 4 ports at 30 watts per PoE port)
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 80 x 135 x 131.5 mm (3.15 x 5.31 x 5.18 in)
Weight: 1270 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Operating Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8
Rail Traffic: EN 50121-4 (Pending)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

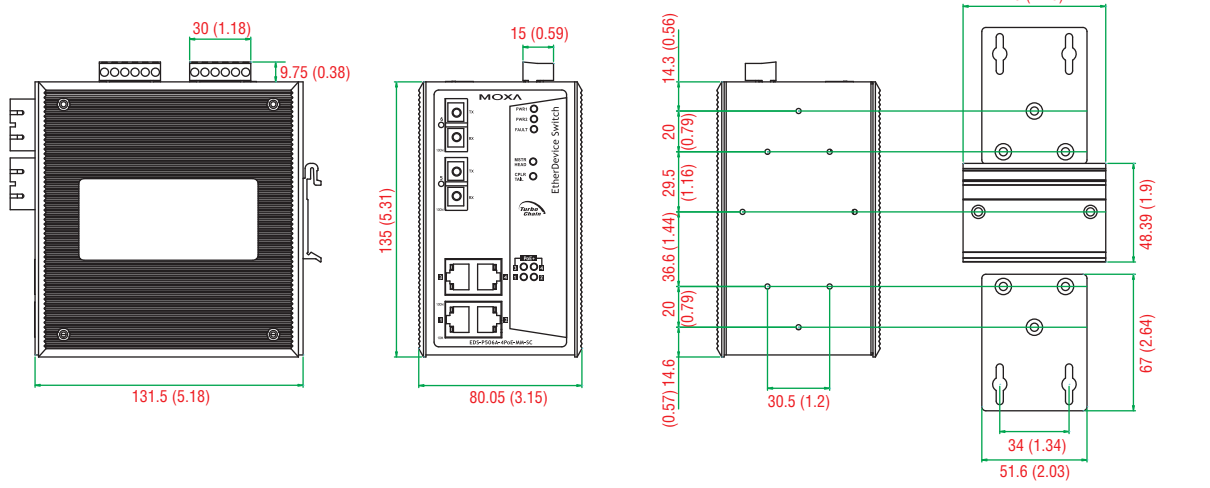
Time: 433,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface				
		PoE+, 10/100BaseT(X)	10/100BaseT(X)	100BaseFX		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)			Multi-mode SC Connector	Multi-mode ST Connector	Single-mode SC Connector
EDS-P506A-4PoE	EDS-P506A-4PoE-T	4	2	–	–	–
EDS-P506A-4PoE-MM-SC	EDS-P506A-4PoE-MM-SC-T	4	–	2	–	–
EDS-P506A-4PoE-MM-ST	EDS-P506A-4PoE-MM-ST-T	4	–	–	2	–
EDS-P506A-4PoE-SS-SC	EDS-P506A-4PoE-SS-SC-T	4	–	–	–	2

Optional Accessories (can be purchased separately)

DR-75-24/120-24: 75/120 W DIN-Rail 24 VDC power supplies
DR-75-48/120-48: 75/120 W DIN-Rail 48 VDC power supplies
MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
WK-51-01: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-P506A-4PoE switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- Document and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-P308 Series

8-port PoE unmanaged Ethernet switches



- 4 IEEE 802.3af compliant PoE and Ethernet combo ports
- Up to 15.4 watts at 48 VDC per PoE port
- Intelligent power consumption detection and classification
- Redundant dual VDC power inputs
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-P308 switches are smart, 8-port, unmanaged Ethernet switches supporting PoE (Power-over-Ethernet) on ports 1 to 4. The switches are classified as power source equipment (PSE), and when used in this way, the EDS-P308 switches enable centralization of the power supply and provide up to 15.4 watts of power per port. The switches can be used to power IEEE 802.3af compliant powered devices (PD), eliminating the need for additional wiring, and support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing to provide an economical solution for your industrial Ethernet network. In addition, the built-in relay warning function alerts network engineers when power failures or port breaks occur.

Specifications

Technology

Standards:
IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 Kbit

Interface

Fiber Ports: 100BaseFX ports (SC connector)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
DIP Switches: Port break alarm mask
LED Indicators: PWR1, PWR2, FAULT, 10/100M, PoE
Alarm Contact: 1 relay output with current carrying capacity of 0.5 A @ 48 VDC

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Input Voltage: 48 (46 to 50 V) VDC, redundant inputs
Input Current: Max. 1.6 A @ 48 V (supports up to 4 ports at 15.4 W per PoE port)
Overload Current Protection: 2.5 A @ 48 VDC
Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 53.6 × 135 × 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 840 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 4,
EN 61000-4-6 (CS) Level 3, EN61000-4-8

Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

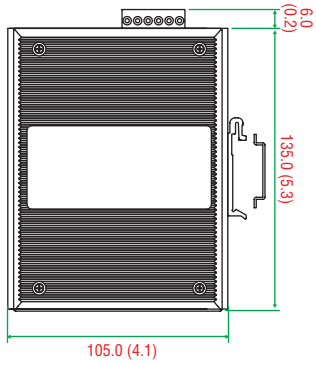
Time: 360,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

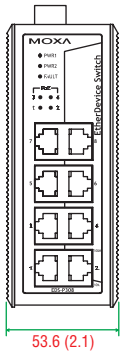
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

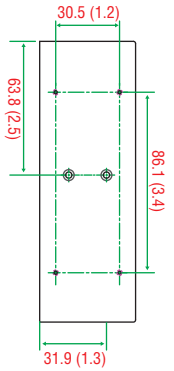
Unit: mm (inch)



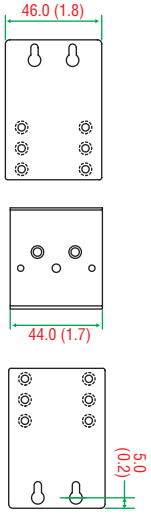
Side View



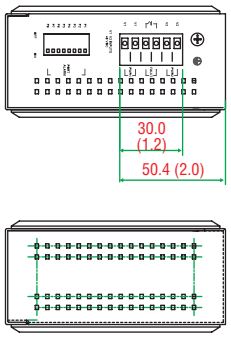
Front View



Rear View



DIN-Rail/Panel Mounting Kit



Top and Bottom Views

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	PoE, 10/100BaseT(X)	100BaseFX	
				Mulit-mode, SC Connector	Single-mode, SC Connector
EDS-P308	EDS-P308-T	4	4	–	–
EDS-P308-M-SC	EDS-P308-M-SC-T	3	4	1	–
EDS-P308-S-SC	EDS-P308-S-SC-T	3	4	–	1
EDS-P308-MM-SC	EDS-P308-MM-SC-T	2	4	2	–
EDS-P308-SS-SC	EDS-P308-SS-SC-T	2	4	–	2

Optional Accessories (can be purchased separately)

DR-75-48/120-48: 75/120 W DIN-Rail 48 VDC power supplies
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-P308 switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

EDS-P206A-4PoE Series

6-port IEEE 802.3af/at PoE+ unmanaged Ethernet switches



- IEEE 802.3af/at compliant PoE and Ethernet combo ports
- Up to 30 watts per PoE port
- 24/48 VDC wide range redundant power inputs
- Intelligent power consumption detection and classification
- Redundant dual VDC power inputs
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-P206A-4PoE switches are smart, 6-port, unmanaged Ethernet switches supporting PoE (Power-over-Ethernet) on ports 1 to 4. The switches are classified as power source equipment (PSE), and when used in this way, the EDS-P206A-4PoE switches enable centralization of the power supply and provide up to 30 watts of power per port. The switches can be used to power IEEE 802.3af/at compliant powered devices (PD), eliminating the need for additional wiring, and support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing to provide an economical solution for your industrial Ethernet network.

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 KB

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector)
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
LED Indicators: PWR1, PWR2, 10/100M, PoE

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Power Requirements

Input Voltage: 24/48 (20 to 60 V) VDC, redundant inputs
Input Current: Max 7.5 A @ 24 VDC (supports up to 4 ports at 30 watts per PoE port)
Overload Current Protection: Present
Connection: 1 removable 4-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 50.3 × 115 × 70 mm (1.98 x 4.53 x 2.76 in)
Weight: 375 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 4,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8
Rail Traffic: EN 50121-4 (Pending)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

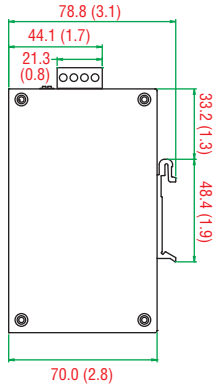
Time: 645,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

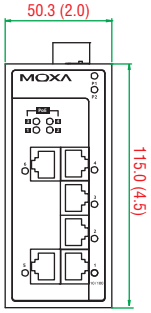
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

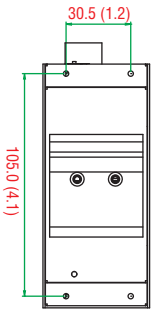
Unit: mm (inch)



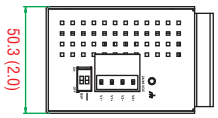
Side View



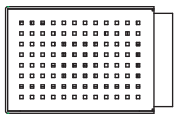
Front View



Rear View



DIN-Rail/Panel Mounting Kit



Top and Bottom Views

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX		
			Mulit-mode, SC Connector	Mulit-mode, ST Connector	Single-mode, SC Connector
EDS-P206A-4PoE	EDS-P206A-4PoE-T	6	–	–	–
EDS-P206A-4PoE-M-SC	EDS-P206A-4PoE-M-SC-T	5	1	–	–
EDS-P206A-4PoE-M-ST	EDS-P206A-4PoE-M-ST-T	5	–	1	–
EDS-P206A-4PoE-MM-SC	EDS-P206A-4PoE-MM-SC-T	4	2	–	–
EDS-P206A-4PoE-MM-ST	EDS-P206A-4PoE-MM-ST-T	4	–	2	–
EDS-P206A-4PoE-S-SC	EDS-P206A-4PoE-S-SC-T	5	–	–	1
EDS-P206A-4PoE-SS-SC	EDS-P206A-4PoE-SS-SC-T	4	–	–	2

Optional Accessories (can be purchased separately)

DR-75-24/120-24: 75/120 W DIN-Rail 24 VDC power supplies
DR-75-48/120-48: 75/120 W DIN-Rail 48 VDC power supplies
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDS-P206A-4PoE switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

IKS-6726-8PoE Series

24+2G-port Gigabit modular PoE managed Ethernet switches



- Supports a total of 120 W by smart PoE power management
- Meets UL 60950-1 and EN 50121-4 certifications
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI*, Telnet/serial console, Windows utility, and ABC-01
- Modular design lets you choose from a variety of media combinations
- -40 to 75°C operating temperature range

*Available in Q3, 2011

Introduction

The IKS-6726-8PoE series of industrial rackmount Ethernet switches are designed to meet the demands of mission critical applications for business and industry, such as power automation and critical facility surveillance. The IKS-6726-8PoE comes standard with 8 10/100BaseT(X) ports and 8 10/100BaseT(X) 802.3af (PoE) compliant Ethernet ports. The IKS-6726-8PoE Ethernet switches provide two kinds of power input source: 48 VDC and 110/220 VDC/VAC*. The IKS-6726-8PoE supports a total of 120 W PoE power supply. With a limit of 120 W, the IKS-6726-8PoE models can supply power to up to 16 PoE ports. The switches support advanced management and security features, and are designed especially for security automation applications such as IP surveillance and gate of entry systems, which can benefit from a scalable backbone construction and Power-over-Ethernet support. In addition, the modular design of the IKS-6726-8PoE makes network planning easy, and allows greater flexibility by letting you install up to 16 PoE ports, 2 Gigabit ports, and 24 fast Ethernet ports.

*HV models will be available in Q2, 2011.

Features and Benefits

- Advanced PoE management function
- IEEE 802.3af-compliant PoE and Ethernet combo ports
- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP* and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- TACACS+*, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status with “Lock port” to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device’s IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/serial console, CLI*, Windows utility, and ABC-01 automatic backup configurator

*Available in Q3, 2011

Specifications

Technology

Standards:

IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol*

IKS-6726-8PoE Modular Rackmount Ethernet Switch System



IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol*
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, EtherNet/IP*, Modbus/TCP, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 2 Mbit

Interface

Fast Ethernet: Slot 1 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/PoE/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP
Gigabit Ethernet: Slot 2 for 2-port PM-7200 Gigabit Ethernet combo module with 10/100/1000BaseT(X) or 1000BaseSFP ports
Note: See page 2-42 for PM-7200 Gigabit and fast Ethernet module product information.
Console Port: RS-232 (RJ45 connector)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Mode LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED, PoE on module
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage: 48 VDC (44 to 57 V) or 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)*
*HV models will be available in Q2, 2011.
Input Current: Max. 3.3 A @ 48 VDC (15.4 watts per PoE port, 120 watts total for PoE output)
Overload Current Protection: Present
Connection: 10-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight:
IKS-6726-8PoE-F-48-T: 4260 g
IKS-6726-8PoE-F-48-48-T: 4460 g
IKS-6726-8PoE-F-HV-T: 6000 g
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 3, EN 61000-4-8
Rail Traffic: EN 50121-4
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

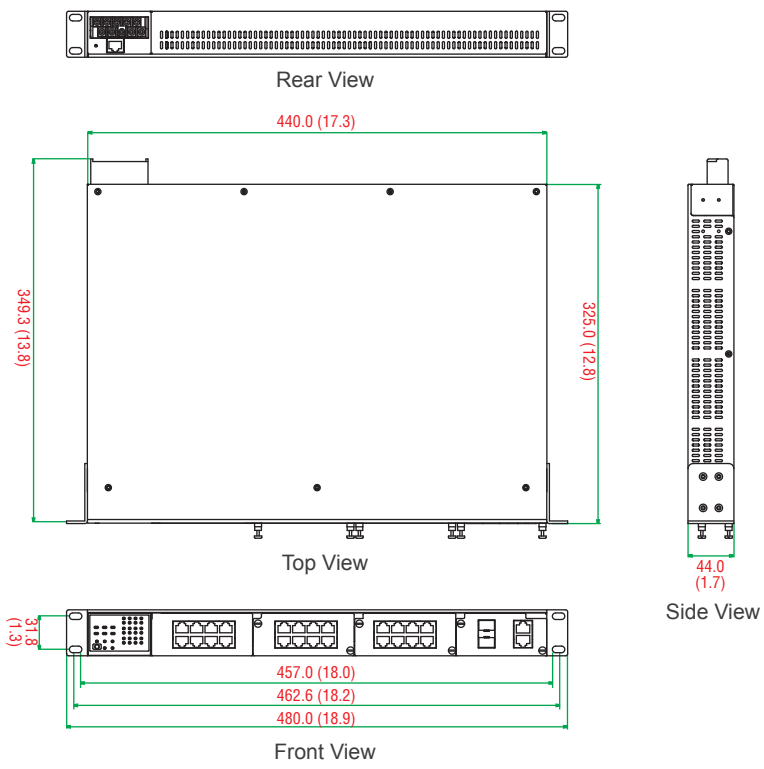
Time: 210,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Step 1: Select Ethernet switch system

IKS-6726-8PoE with power supply

Step 2: Select interface modules

PM-7200 series (Gigabit or fast Ethernet)

Note: The IKS-6726-8PoE Ethernet switch system is delivered without interface modules. Please see pages 2-42 to determine which PM-7200 interface modules are suitable for your application.

IKS-6726-8PoE Modular Rackmount Ethernet Switch System

Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports and 8 10/100BaseT(X) PoE ports, 1 slot for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules. Supports up to 24+2G ports and up to 16 PoE ports, -40 to 75°C operating temperature

Available Models	Power Supply			
Front Cabling, Front Display	Isolated Power Supply 1		Isolated Power Supply 2	
	48 VDC (44 to 57 V)	HV: 88 to 300 VDC and 85 to 264 VAC	48 VDC (44 to 57 V)	HV: 88 to 300 VDC and 85 to 264 VAC
IKS-6726-8PoE-F-48-T	1	–	–	–
IKS-6726-8PoE-F-48-48-T	1	–	1	–
IKS-6726-8PoE-F-HV-T	–	1	–	–
IKS-6726-8PoE-F-HV-HV-T	–	1	–	1

Note: HV models will be available in Q2, 2011.
Note: The IKS-6726-8PoE supports a total PoE power supply of 120 watts.

Gigabit/Fast Ethernet Module Compatibility Chart for the IKS-6726-8PoE

	Interface Module																	
	PM-7200-2GTXSFP	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 2	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

DR-75-48/120-48: 75/120 W DIN-Rail 48 VDC power supplies
MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- IKS-6726-8PoE switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

INJ-24 Series

IEEE 802.3af/at Gigabit PoE+ Injectors



- PoE injector for 10/100/1000M networks; inject power and data to PD (Power Device) equipment
- IEEE 802.3af/at compliant; supports a full 30 watt output
- 24/48 VDC wide range power input
- -40 to 75°C operating temperature range (T model)

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)

Interface

RJ45 Ports: 10/100/1000BaseT(X) for PoE OUT and DATA IN
LED Indicators: Power, PoE

Power Requirements

Input Voltage: 24/48 (20 to 60 V) VDC, redundant inputs
Input Current: Max. 1.3 A @ 24 VDC (supports up to 4 ports at 30 watts per PoE port)
Overload Current Protection: Present
Connection: 1 removable 3-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic, IP30 protection
Dimensions: 24.9 × 100 × 86.2 mm (0.98 x 3.93 x 3.39 in)
Weight: 115 g
Installation: DIN-Rail mounting

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8
Rail Traffic: EN 50121-4 (Pending)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

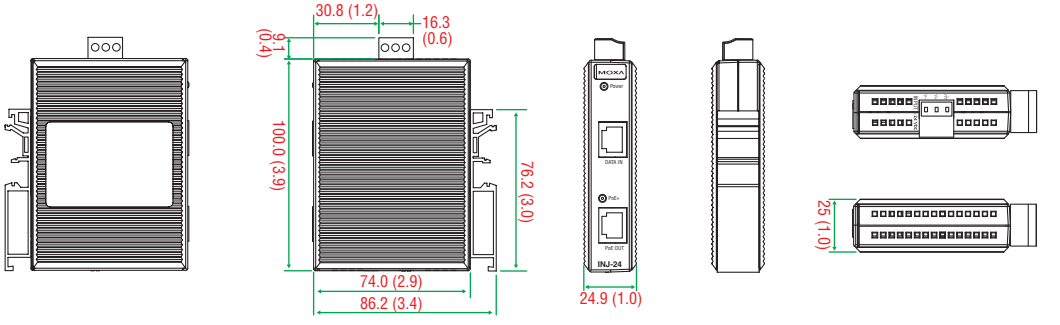
Time: 2,500,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Side View | Front View | Rear View | Top and Bottom Views

Ordering Information

Available Models

INJ-24: PoE+ Injector, maximum output of 30 W at 24/48 VDC, 0 to 60°C operating temperature
INJ-24-T: PoE+ Injector, maximum output of 30 W at 24/48 VDC, -40 to 75°C operating temperature

Package Checklist

- INJ-24 PoE+ injector
- Hardware installation guide (printed)
- Warranty card

SPL-24 Series

PoE splitters



- IEEE 802.3af compliant; splits power and data from PoE equipment
- Supports output power up to 12.95 W at 24 VDC
- Short circuit protection for power output
- -40 to 75°C operating temperature range (T model)
- DIN-Rail mounting ability

Specifications

Technology

Standards:
IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)

Interface

RJ45 Ports: 10/100BaseT(X) for PoE IN and DATA OUT
LED Indicators: Power

Power Requirements

Input Voltage: 44 to 75 VDC (PoE)
Output Voltage: 24 VDC
Overload Current Protection: 400 mA @ 48 VDC input
Connection: 1 removable 3-contact terminal block for output
Output Power: Max. 12.95 watts (0.54 A @ 24 VDC)

Physical Characteristics

Housing: Plastic, IP30 protection
Dimensions: 24.9 × 100 × 86.2 mm (0.98 x 3.93 x 3.39 in)
Weight: 95 g
Installation: DIN-Rail mounting

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class B, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

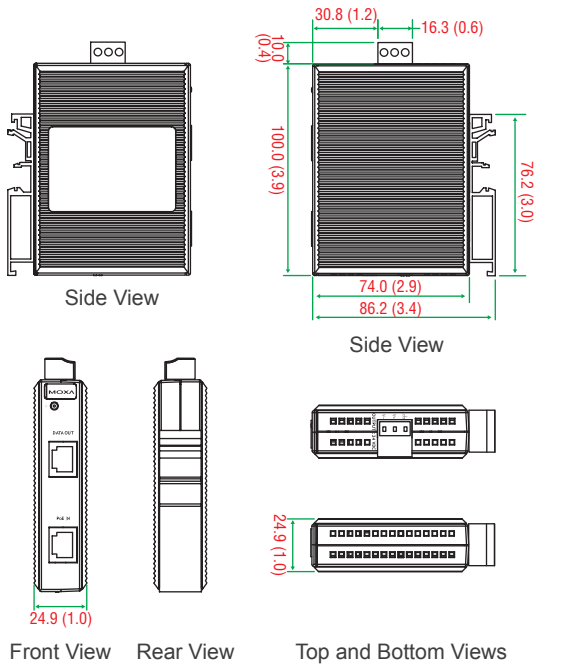
Time: 5,100,000 hrs
Database: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

SPL-24: PoE splitter, maximum output of 12.95 W at 24 VDC, 0 to 60°C operating temperature
SPL-24-T: PoE splitter, maximum output of 12.95 W at 24 VDC, -40 to 75°C operating temperature

Package Checklist

- SPL-24 PoE splitter
- Hardware installation guide (printed)
- Warranty card

EOM-104 Series

4-port embedded managed Ethernet switch modules



- 10/100BaseT(X) and 100BaseFX Ethernet interfaces
- Turbo Ring and RSTP/STP for Ethernet redundancy
- SNMP and e-mail alerts for event trapping and notification
- Two-thirds the size of a business card
- Low power consumption
- -40 to 75°C operating temperature range

Introduction

The EOM-104 series Ethernet switch modules are designed for device manufacturers who would like to embed Ethernet modules in their products to enhance performance and reliability.

The EOM-104 series modules provide an easy and cost-effective integrated solution for adding an Ethernet switch module to an existing product. The modules support 10/100M Ethernet transmission and come with Turbo Ring's fast recovery time of under 20 ms. The EOM-104 series also provide a rich set of peripherals, such as Turbo Ring Enable and GPIO programming pins, and is an ideal solution for embedded Ethernet applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for flow control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1p for Class of service
Protocols: SNMPv1/v2c/v3, DHCP Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, Telnet, Syslog
MIB: MIB-II, Ethernet-Like MIB, P-Bridge MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 Kbit

Interface

Ethernet Ports:
EOM-104: 4 10/100BaseT(X) ports
EOM-104-FO: 2 10/100BaseT(X) and 2 100BaseFX ports
Connectors: 1 connector with 2 x 20 pins, 2 connectors with 1 x 9 pins, and 1 connector with 2 x 2 pins
Console Port: RS-232 (TxD, RxD, DTR, DSR)
GPIO: 4 programmable I/O pins

Power Requirements

Input Voltage: 3.3 V
Input Current:
EOM-104: 0.59 A @ 3.3 V
EOM-104-FO: 1.22 A @ 3.3 V

Physical Characteristics

Dimensions: 54 x 60 x 8.25 mm (2.13 x 2.36 x 0.32 in)
Weight: 21 g

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

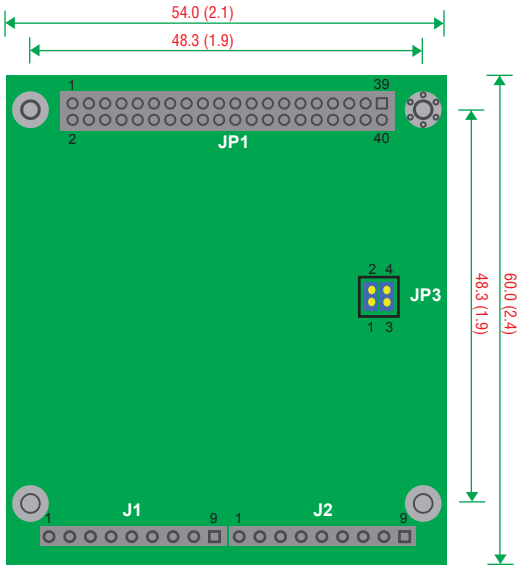
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A, CE Class A
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Pin Assignment

JP1 (2 x 20 connector pin assignment)

PIN	1	3	5	7	9	11	13	15	17	19
SIGNAL	TX2 -	RX2 -	NC	RX1 +	TX1 +	NC	GND	3.3V	GND	DTR

PIN	2	4	6	8	10	12	14	15	18	20
SIGNAL	TX2 +	RX2 +	NC	RX1 -	TX1 -	NC	GND	3.3V	GND	DSR

PIN	21	23	25	27	29	31	33	35	37	39
SIGNAL	TXD	GPIO 4	GPIO 2	MASTER ENABLE	MASTER LED	PORT 1 LED	PORT 3 LED	MANUAL RESET	3.3V	GND

PIN	22	24	26	28	30	32	34	36	38	40
SIGNAL	RXD	GPIO 3	GPIO 1	TURBO RING ENABLE	TURBO RING LED	RESET DEFAULT	PORT 4 LED	PORT 2 LED	3.3V	GND

J1 (1 x 9 connector pin assignment)

PIN	1	2	3	4	5	6	7	8	9
SIGNAL	GND	TX4 +	TX4 -	3.3 V	3.3 V	FXSD	RX4 -	RX4 +	GND

J2 (1 x 9 connector pin assignment)

PIN	1	2	3	4	5	6	7	8	9
SIGNAL	GND	TX3 +	TX3 -	3.3 V	3.3 V	FXSD	RX3 -	RX3 +	GND

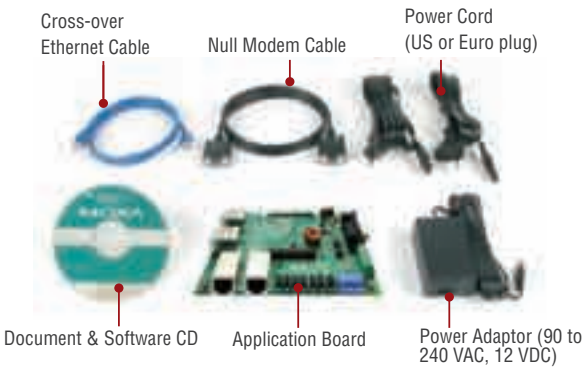
JP3 (2 x 2 connector pin assignment)



Jumpers 1 and 2 are used to enable the Ring Master
Jumpers 3 and 4 are used to enable Turbo Ring

Evaluation Kits

The EOM Evaluation Kit includes an evaluation board, power adaptor, software CD, and serial and Ethernet cables to allow quick and easy evaluation of all embedded Ethernet switch functions. The evaluation board is equipped with Ethernet ports, console port, and Turbo Ring DIP switch to help you test your modules and applications.



Ordering Information

Available Models

EOM-104: Embedded managed Ethernet switch module with 4 10/100BaseT(X) ports, -40 to 75°C operating temperature
EOM-104-FO: Embedded managed Ethernet switch module with 2 10/100BaseT(X) and 2 100BaseFX ports, -40 to 75°C operating temperature
EOM-104 20PCS: Embedded managed Ethernet switch module with 4 10/100BaseT(X) ports, -40 to 75°C operating temperature, 20 pcs per package
EOM-104-FO 20PCS: Embedded managed Ethernet switch module with 2 10/100BaseT(X) and 2 100BaseFX ports, -40 to 75°C operating temperature, 20 pcs per package

Evaluation Kits (must be purchased separately)

EOM-104 Evaluation Kit: Includes an EOM-104 switch module and evaluation board with 4 10/100BaseT(X) ports for testing and application development
EOM-104-FO Evaluation Kit: Includes an EOM-104-FO switch module and evaluation board with 2 10/100BaseT(X) ports and 2 100BaseFX multi-mode ports (SC connectors) for testing and application development

Package Checklist

- EOM-104 module
- EOM-104 evaluation board
- Universal power adaptor
- 2 power cords
- Null modem serial cable
- Cross-over Ethernet cable
- Accessories pack
- Quick installation guide (printed)
- Warranty card

EDR-G903 Series

▶ *Award-winning Product*

Industrial Gigabit Firewall/VPN secure routers



- Firewall/NAT/VPN/Router all-in-one
- High performance Gigabit copper/fiber combo port
- WAN redundancy function with 2 WAN interfaces and 1 LAN interface
- Firewall with Quick Automation Profile for Fieldbus protocols
- Network address translation (N-to-1, 1-to-1, and port forwarding)
- VPN security with IPSec, L2TP, and PPTP functions
- Intelligent PolicyCheck and SettingCheck tools
- -40 to 75°C operating temperature range (T model)
- NERC CIP compliance

Introduction

The EDR-G903 series is a Gigabit performance, all-in-one Firewall/VPN/Router. It is designed for Ethernet security applications in sensitive remote control or monitoring networks, and provides an Electronic Security Perimeter for the protection of critical cyber assets. The EDS-G903 series Cyber Security features include:

- Firewall: Controls network traffic between different trust zones. Network Address Translation (NAT), which shields the internal LAN from unauthorized activity from outside hosts, is included.
- Virtual Private Networking (VPN): VPNs are designed to provide users with secure communication links when accessing a private network from the public Internet. Uses IPSec (IP Security) for encryption and authentication of all IP packets at the network layer to ensure confidentiality and sender authentication.

The EDR-G903 supports one WAN, one LAN, and a user-configurable WAN/DMZ interface that provides high flexibility in different applications such as WAN redundancy or Data/FTP server security protection. The EDR-G903's Quick Automation Profile function supports most common Fieldbus protocols, including EtherCAT, EtherNet/IP, FOUNDATION Fieldbus, Modbus/TCP, and PROFINET. Users can easily create a secure Ethernet Fieldbus network from a user-friendly web UI with a single click operation. In addition, wide temperature models are available that operate reliably in hazardous, -40 to 75°C environments.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
Protocols: SNMPv1/v2c/v3, DHCP Server/Client, TFTP, NTP, HTTP, HTTPS, Telnet, SSH, Syslog, SMTP, LLDP, PPPoE, PPTP, Dynamic DNS, QoS (Quality of Service)
Routing: Static routing, RIP V1/V2
Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

WAN 1: 1 RJ45/fiber combo port
WAN 2 / DMZ: 1 RJ45/fiber combo port
LAN: 1 RJ45/fiber combo port
RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
LED Indicators: PWR1, PWR2, FAULT, 10/100/1000M, DMZ/WAN
DIP Switches: N/A
Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input
• +13 to +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA

Security Function

Firewall:
• Stateful inspection
• Filter: IP and MAC address, ports, protocol
• Bridge mode firewall
Quick Automation Profile: EtherCAT, EtherNet/IP, FOUNDATION Fieldbus, LonWorks, Modbus/TCP, PROFINET, IEC 60870-104, DNP, FTP, SSH, Telnet, HTTP, IPSec, L2TP, PPTP, RADIUS
NAT: N-to-1, 1-to-1, and port forwarding
VPN: IPsec, L2TP, PPTP
Encryption: DES, 3DES, AES
Authentication: Pre-shared key (PSK), X.509v3 certificates, MD5, SHA

Power Requirements

Input Voltage: 12/24/48 VDC (9.6 to 60 VDC), redundant dual inputs
Input Current: 0.53 A @ 24 V
Overload Current Protection: Present
Connection: Removable terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
Dimensions: 51 x 152 x 131.1 mm (2.01 x 5.98 x 5.16 in)
Weight: 1250 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95 % (non-condensing)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

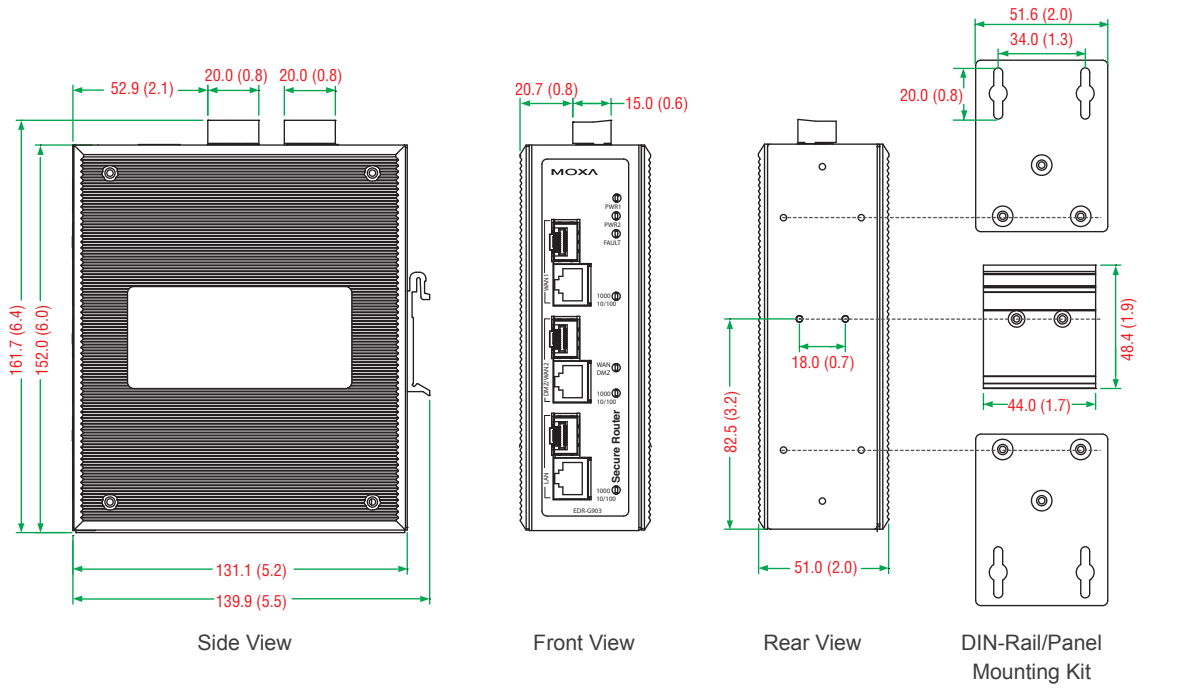
Time: 530,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models

EDR-G903: Industrial Gigabit firewall/VPN secure router with 3 combo 10/100/1000BaseT(X) ports or 100/1000BaseSFP slots, 0 to 60°C operating temperature
EDR-G903-T: Industrial Gigabit firewall/VPN secure router with 3 combo 10/100/1000BaseT(X) ports or 100/1000BaseSFP slots, -40 to 75°C operating temperature
Note: The EDR-G903 series secure routers support 3 100/1000BaseSFP slots. See pages 1-87 and 1-89 for information about SFP-1G/1FE series Gigabit/fast Ethernet SFP modules.

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
WK-51-01: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- EDR-G903 secure router
- RJ45 to DB9 console port cable
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

MXview

▶ *Award-winning Product*

TAIWAN EXCELLENCE 2010

Industrial network management software designed for Moxa's networking solutions



- Discovers and visualizes network devices automatically*
- Tracks past network status by playback*
- Monitors up to 1000 network devices and notifies users in real time when events occur
- Provides central management of configurations and firmware for Moxa devices
- Generates OPC 2.0 compliant tags automatically to integrate with SCADA/HMI applications

*Available in Q2, 2011

Introduction

Moxa's MXview network management software is designed for configuring, monitoring, and troubleshooting Moxa networking devices in industrial networks. MXview provides an integrated management platform that can discover Moxa networking devices and SNMP/IP devices installed in subnets. All selected network components can be managed graphically via web browser from both local and remote sites—anytime and anywhere.

Automatic Topology Discovery and Visualization

- Discovers Moxa devices and SNMP/ICMP devices within scan ranges
- Maps physical wiring automatically for LLDP devices
- Tabbed windows for multi-layer grouping
- Provides a tool to draw topologies manually
- Visualizes trunking link and wireless link
- A background image can be embedded into the map for reference
- Topology map can be migrated from site to site
- Supports Unicode for internationalization
- Changeable device icons

Real-time Event Notification

- Detects problems by SNMP Inform or Trap in real time
- Periodical polling for comprehensive problems
- Abnormal devices and links are highlighted in maps with specified colors
- Notifies users based on events, including link down, power down, SNMP failure, bandwidth utilization, and packet error rate
- Event notification can be sent remotely via SMS and email
- Event can be alarmed locally by beep and program

Centralized Configuration and Firmware Management

- Bulk deployment of device configurations and firmware*
- Backup of configurations to local computers or remote server
- Scheduling for periodic configuration backup
- Save history of configuration change

Traffic Reports and Event Logs

- Playback interface tracks network status and events any time in the past month*
- Collects bandwidth utilization and error packet rate statistics
- Provides comprehensive event history for troubleshooting
- Traffic report and event log can be stored

Integration with Other Systems

- Generate OPC 2.0 compliant tags for SCADA/HMI integration

*Available in Q2, 2011

System Requirements

Server Requirements	
CPU	Intel Core 2 Duo 2.4 Ghz or higher
RAM	1 G or higher
Hard Disk Space	10 G or higher
Operating System	Windows XP Professional, Windows 7 (32/64-bit), Windows Server 2008 (32/64-bit)
Client Requirements	
Browser	IE 6/7/8 and Firefox 3

Ordering Information

Commercial Versions

MXview-1000: Industrial network management software with a license for 1000 nodes (by IP address)
MXview-500: Industrial network management software with a license for 500 nodes (by IP address)
MXview-250: Industrial network management software with a license for 250 nodes (by IP address)
MXview-100: Industrial network management software with a license for 100 nodes (by IP address)
MXview-50: Industrial network management software with a license for 50 nodes (by IP address)

License Upgrade

MXview Upgrade-50: License expansion of MXview industrial network management software by 50 nodes (by IP address)

Trial Version

MXview Trial Version: A free trial version of MXview is available for download from Moxa's website

Supported Devices

Model Name	Required Firmware Version
EDS-405A/408A	2.6 or higher
EDS-505A/508A/516A	2.6 or higher
EDS-510A	2.6 or higher
EDS-518A	2.6 or higher
EDS-608/611/616/619	1.1 or higher
EDS-728	2.6 or higher
EDS-828	2.6 or higher
EDS-G509	2.6 or higher
EDS-P510	2.6 or higher
EDS-P506A-4PoE	2.6 or higher
IKS-6726-8PoE	2.6 or higher
IKS-6726	2.6 or higher
IKS-6524/6526	2.6 or higher

Model Name	Required Firmware Version
PT-7710	1.2 or higher
PT-7728	2.6 or higher
PT-7828	2.6 or higher
PT-G7509	1.1 or higher
TN-5508/5510	1.1 or higher
TN-5516/5518	1.2 or higher
TN-5508-4PoE	2.6 or higher
TN-5510-4PoE	2.6 or higher
TN-5516-8PoE	2.6 or higher
TN-5518-8PoE	2.6 or higher
AWK-3121	1.6 or higher
AWK-4121	1.6 or higher

Package Checklist

- MXview CD (includes the MXview software and related documents)
- Quick installation guide (printed)

Note: Additional model names will be added in the near future. Please check Moxa's website for the most up-to-date information.

EDS-SNMP OPC Server Pro

OPC server for integrating SNMP devices into HMI/SCADA systems



> **Seamlessly integrate EDS-SNMP OPC Server Pro with the leading HMI/SCADA software to create a comprehensive Ethernet network management solution for SNMP devices.**

Introduction

Moxa's EDS-SNMP OPC Server Pro provides a user-editable Tag file for any SNMP device. Use the default MIB file, or create and edit a standard or private MIB to generate a dedicated Tag file. This powerful function lets operators use an existing HMI software environment to create a customized and real time view of the integrity of all Ethernet network devices, the overall Ethernet network traffic volume, and overall Ethernet network status. Moxa's managed Ethernet switches are ideally suited for connecting Ethernet-enabled industrial devices in your mission critical applications. Combined with EDS-SNMP OPC Server Pro software, your HMI (Human Machine Interface) packages and SCADA (Supervisory Control And Data Acquisition) software will be turned into a complete remote network traffic and status monitoring tool. This solution gives control engineers the power to monitor the network from a central location with existing and familiar visualization and control applications.

Features and Benefits

- "Broadcast Search" the network for Moxa's managed Ethernet switches and any SNMP device



- Easy to create and edit the configuration of connected devices in advance



- Easy to create and edit the MIB Template for dedicated tag file of any SNMP device



- User-definable tag file meets the requirements of many different applications



System Requirements

Windows NT/2000/XP, Administrator Privileges, Ethernet Card

Ordering Information

Available Models

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

Package Checklist

- EDS-SNMP OPC Server Pro CD (includes the EDS-SNMP OPC Server Pro software and related documents)
- Quick installation guide (printed)

SFP-10G Series

Preliminary

1-port 10 Gigabit Ethernet SFP+ modules



- Compliant with IEEE 802.3ae
- SFF-8432 SFP+ MSA compliant
- Hot pluggable LC duplex connector
- Class 1 Laser International Safety Standard IEC 825 compliant
- RoHS compliant

EN : 60825

Specifications

Interface

10G Ethernet Port: 1
Connectors: Duplex LC Connector

Optical Fiber

	10 Gigabit Ethernet	
	SFP-SR	SFP-LR
Wavelength	850 nm	1310 nm
Max. TX	-1 dBm	0.5 dBm
Min. TX	-5 dBm	-8.2 dBm
RX Sensitivity	-7.5 dBm	-10.3 dBm
Link Budget	2.5 dB	2.1 dB
Typical Distance	33 m [a] 300 m [b]	10 km [c]
Saturation	0.5 dBm	0.5 dBm

a. 62.5/125 µm, 200 MHz*km (OM1) multi-mode fiber optic cable
b. 50/125 µm, 2000 MHz*km (OM3) multi-mode fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

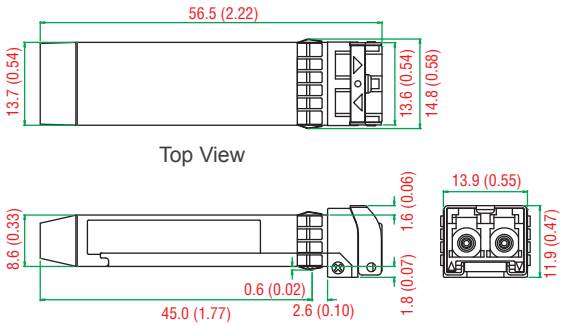
Safety: UL 60950-1, TÜV

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

SFP-10GSRLC: SFP+ module with 1 10GBase-SR port for 33 m transmission, LC connector, 0 to 60°C operating temperature
SFP-10GLRLC: SFP+ module with 1 10GBase-LR port for 10 km transmission, LC connector, 0 to 60°C operating temperature

The SFP-10G series modules can be used with the following products:
ICS-G7526/G7528, ICS-G7750/G7752, ICS-G7826/G7828, ICS-G7850/G7852

Package Checklist

- SFP-10G module
- Warranty card

SFP-1G Series

1-port Gigabit Ethernet SFP modules



- IEEE 802.3z compliant
- Differential LVPECL inputs and outputs
- TTL signal detect indicator
- Hot pluggable LC duplex connector
- Class 1 laser product, complies with EN 60825-1

EN : 60825

Specifications

Interface

Ethernet Ports: 1
Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)
Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1GXXALC and SFP-1GXXBLC)

Optical Fiber

	Gigabit Ethernet													
	SFP-SX	SFP-LSX	SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120	SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Wavelength	850 nm	1310 nm	1310 nm	1310 nm	1310 nm	1550 nm	1550 nm	1550 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
Max. TX	-4 dBm	-1 dBm	-3 dBm	-2 dBm	1 dBm	5 dBm	5 dBm	3 dBm	-3 dBm		-2 dBm		2 dBm	
Min. TX	-9.5 dBm	-9 dBm	-9.5 dBm	-8 dBm	-4 dBm	0 dBm	0 dBm	-2 dBm	-9 dBm		-8 dBm		-3 dBm	
RX Sensitivity	-18 dBm	-19 dBm	-20 dBm	-23 dBm	-24 dBm	-24 dBm	-30 dBm	-33 dBm	-21 dBm		-23 dBm		-23 dBm	
Link Budget	8.5 dB	10 dB	10.5 dB	15 dB	20 dB	24 dB	30 dB	31 dB	12 dB		15 dB		20 dB	
Typical Distance	550 m[a]	2 km[b]	10 km[c]	30 km[c]	40 km[c]	80 km[c]	110 km[c]	120 km[c]	10 km[c]		20 km[c]		40 km[c]	
Saturation	0 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-8 dBm	-1 dBm		-1 dBm		-1 dBm	

a. 50/125 µm, 400 MHz * km or 62.5/125 µm, 500 MHz * km @ 850 nm multi-mode fiber optic cable
b. 62.5/125 µm, 750 MHz * km @ 1310 nm multi-mode fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Note: The actual communication distance depends on many factors, including connector loss, cable deployment, and the age of the cabling system. We recommend doing a link budget analysis and reserving a 3 dB margin for such factors.

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Operating Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, TÜV

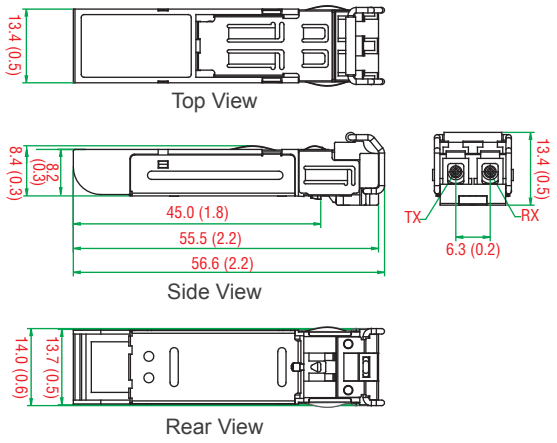
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

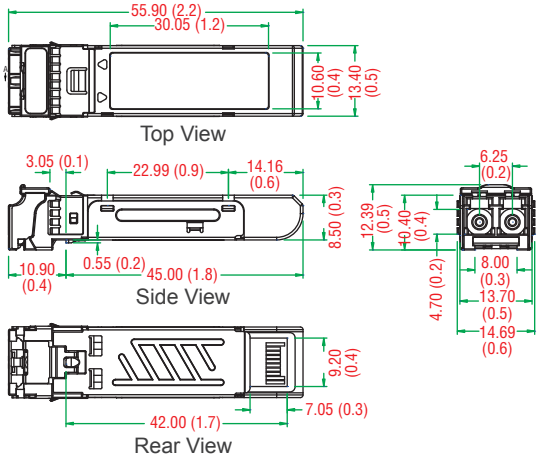
Dimensions

Unit: mm (inch)

SFP-1G Series



SFP-1GEZXLC-120



Ordering Information

SFP Modules

Available Models		Port Interface							
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	1000BaseSX, LC Connector, 0.5 km	1000BaseLSX, LC Connector, 2 km	1000BaseLX, LC Connector, 10 km	1000BaseLH, LC Connector, 30 km	1000BaseLHX, LC Connector, 40 km	1000BaseZX, LC Connector, 80 km	1000BaseEZX, LC Connector, 110 km	1000BaseEZX, LC Connector, 120 km
SFP-1GSXLC	SFP-1GSXLC-T*	1	–	–	–	–	–	–	–
SFP-1GLSXLC	SFP-1GLSXLC-T	–	1	–	–	–	–	–	–
SFP-1GLXLC	SFP-1GLXLC-T	–	–	1	–	–	–	–	–
SFP-1GLHLC	SFP-1GLHLC-T	–	–	–	1	–	–	–	–
SFP-1GLHXLC	SFP-1GLHXLC-T	–	–	–	–	1	–	–	–
SFP-1GZXLC	SFP-1GZXLC-T	–	–	–	–	–	1	–	–
SFP-1GEZXLC	–	–	–	–	–	–	–	1	–
SFP-1GEZXLC-120	–	–	–	–	–	–	–	–	1

* SFP-1GSXLC-T: -20 to 75°C operating temperature

WDM-type (BiDi) SFP Modules

Availabe Models		Port Interface					
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	1000BaseSFP, LC Connector, 10 km		1000BaseSFP, LC Connector, 20 km		1000BaseSFP, LC Connector, 40 km	
		TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
SFP-1G10ALC	SFP-1G10ALC-T	1	–	–	–	–	–
SFP-1G10BLC	SFP-1G10BLC-T	–	1	–	–	–	–
SFP-1G20ALC	SFP-1G20ALC-T	–	–	1	–	–	–
SFP-1G20BLC	SFP-1G20BLC-T	–	–	–	1	–	–
SFP-1G40ALC	SFP-1G40ALC-T	–	–	–	–	1	–
SFP-1G40BLC	SFP-1G40BLC-T	–	–	–	–	–	1

The SFP-1G series modules can be used with the following products:
IM-2GSFP, EDS-611/619 series, EDS-G509 series, EDS-518A series, EDS-510A series, EDS-P510 series, ICS-G7826/G7828 series, ICS-G7526/G7528 series, IM-G7000-4GSFP, IKS-G6824 series, IKS-G6524 series, IKS-6526-2GTXSFP series, PM-7200-2G/4G series, EDS-G308 series, EDR-G903 series, IMC-101G series, PT-G7509

Package Checklist

- SFP-1G module
- Warranty card

SFP-1FE Series

1-port fast Ethernet SFP modules



- IEEE 802.3u compliant
- Differential PECL inputs and outputs
- TTL signal detect indicator
- Hot pluggable LC duplex connector
- Class 1 laser product; complies with EN 60825-1

EN : 60825

Specifications

Interface

Ethernet Ports: 1
Connectors: Duplex LC Connector

Optical Fiber

	Fast Ethernet		
	SFP-M	SFP-S	SFP-L
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-18 dBm	0 dBm	0 dBm
Min. TX	-8 dBm	-5 dBm	-5 dBm
RX Sensitivity	-34 dBm	-34 dBm	-34 dBm
Link Budget	26 dB	29 dB	29 dB
Typical Distance	4 km [a]	40 km [b]	80 km [b]
Saturation	0 dBm	-3 dBm	-3 dBm

a. 50/125 µm or 62.5/125 µm, 800 MHz * km @ 1300 nm multi-mode fiber optic cable
b. 9/125 µm single-mode fiber optic cable

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

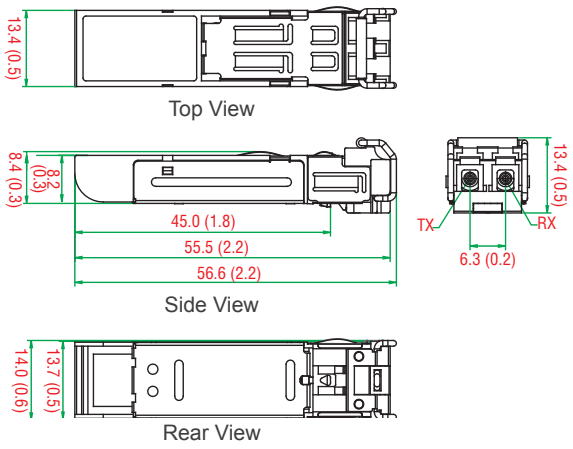
Safety: UL 60950-1, TÜV

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Port Interface		
Wide Temperature (-40 to 85°C)	100BaseFX, Multi-mode, LC Connector, 4 km	100BaseFX, Single-mode, LC Connector, 40 km	100BaseFX, Single-mode, LC Connector, 80 km
SFP-1FEMLC-T	1	–	–
SFP-1FESLC-T	–	1	–
SFP-1FELLC-T	–	–	1

The SFP-1FE series modules can be used with the following products:
EDS-611/619 series, EDS-G509 series, EDS-G308-2SFP, EDS-P510 series, ICS-G7826/G7828 series, ICS-G7526/G7528 series, IM-G7000-4GSFP, IKS-G6824 series, IKS-G6524 series, IKS-6524-8SFP series, PM-7200-8SFP, EDR-G903 series

Package Checklist

- SFP-1FE module
- Warranty card

ABC-01 Series

Configuration backup and restoration tool for managed switches and wireless APs/Bridges/Clients



- **Reduce system downtime, without an additional power input**
- **Plug-n-Play system backup and restoration**
- **Front label for writing identification information**
- **Compact, rugged, reliable design**
- **Supports Moxa's managed Ethernet switches and wireless APs/Bridges/Clients**

Features

- RS-232 RJ45/M12 console port connection
- Store the complete configuration of one switch
- Load the system configuration automatically after system reboot
- Manually load and save the system configuration through the web console
- Portable low-power design requires no power supply
- CE and FCC approval

Introduction

The ABC-01 configuration backup and restoration tool can be used to save and load the configuration of Moxa's managed Ethernet switches and AWK series wireless APs/Bridges/Clients through the RS-232 console port. This simple yet powerful tool makes it much easier to back up a device's system parameters, or even replace an existing device with a new one. With the ABC-01, you can quickly re-install a substitute device (of the same model) or recover the entire system configuration, including IP address, if the device fails.

Specifications

Basic Operation

Connector: RS-232 RJ45/M12 port
Configuration: Use the web console of Moxa's managed switches and wireless APs/Bridges/Clients

Power Requirements

Input Voltage: 3 to 5 VDC (through the RS-232 port's RTS signal)

Physical Characteristics

Housing: PVC molding, IP40 protection
Dimensions: 32.5 x 97 x 12 mm (1.28 x 3.82 x 0.47 in)
Weight:
ABC-01: 50 g
ABC-01-M12: 60 g
Mounting Method: M4 screws (< 4 mm)
Cable Length: 35 cm (including connector)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95 % (non-condensing)

Standards and Certifications

EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 2, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

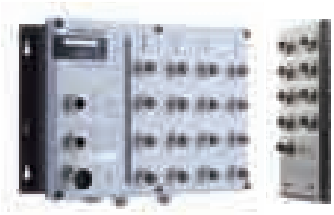
Ordering Information

Available Models

ABC-01: Configuration backup and restoration tool for managed Ethernet switches and AWK series wireless APs/Bridges/Clients, 0 to 60°C operating temperature
ABC-01-M12: Configuration backup and restoration tool with M12 connector for ToughNet series EN 50155 managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- ABC-01 configuration backup tool
- Hardware installation guide (printed)
- Warranty card



Industry-specific Ethernet Switches

Product Selection Guide

EN 50155 Ethernet Switches 2-2
IEC 61850-3 Ethernet Switches 2-3

EN 50155 Ethernet Switches

Introduction to EN 50155 Ethernet Switches 2-4
TN-5510/5518 Series: EN 50155 8+2G/16+2G-port Gigabit managed Ethernet switches 2-7
TN-5508/5516 Series: EN 50155 8/16-port managed Ethernet switches 2-10
TN-5508-4PoE/5516-8PoE Series: EN 50155 8/16-port PoE managed Ethernet switches 2-13
TN-5308 Series: EN 50155 8-port unmanaged Ethernet switches 2-16
TN-5308-4PoE Series: EN 50155 8-port PoE unmanaged Ethernet switches 2-18
TN-5305 Series: EN 50155 5-port IP67 unmanaged Ethernet switches 2-20
Accessories 2-22

IEC 61850-3 Ethernet Switches

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PT-7828 Series: IEC 61850-3 24+4G-port Layer 3 managed rackmount Ethernet switches 2-27
PT-7728-PTP Series: IEC 61850-3 24+4G-port IEEE 1588 v2 rackmount Ethernet switches 2-30
PT-7728 Series: IEC 61850-3 24+4G-port managed rackmount Ethernet switches 2-33
PT-G7509 Series: IEC 61850-3 9G-port full Gigabit managed rackmount Ethernet switches 2-36
PT-7710 Series: IEC 61850-3 8+2G-port managed rackmount Ethernet switches 2-39
PM-7200 Series: Gigabit and fast Ethernet modules for PT and IKS series switches 2-42
PT-508 Series: IEC 61850-3 8-port managed DIN-Rail Ethernet switches 2-45

2

Industry-specific Ethernet Switches



EN 50155 Ethernet Switches

	Managed Ethernet Switches Series			Unmanaged Ethernet Switches Series		
	Gigabit Ethernet Series	Fast Ethernet Series	Power-over-Ethernet Series	Fast Ethernet Series		Power-over-Ethernet Series
						
	TN-5510/5518 Series	TN-5508/5516 Series	TN-5508-4PoE/5516-8PoE Series	TN-5308 Series	TN-5305 Series	TN-5308-4PoE Series
Number of Ports						
Max. Number of Ports	10/18	8/16	8/16	8	5	8
Gigabit Ethernet, 10/100/1000 Mbps	2	–	–	–	–	–
Fast Ethernet, 10/100 Mbps	8/16	8/16	8 (4 PoE)/16 (8 PoE)	8	5	8 (4 PoE)
Power Supply						
12/24/36/48 VDC	✓	✓	–	✓	–	–
72/96/110 VDC	✓	✓	–	✓	–	–
80-300 VDC, 85-264 VAC	✓	✓	✓	–	–	–
24 VDC	–	–	✓	–	✓	–
48 VDC	–	–	✓	–	–	✓
24 VAC	–	–	–	–	✓	–
Installation Options						
DIN-Rail Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Panel Mounting	✓	✓	✓	✓	✓	✓
Operating Temperature						
0 to 60°C	✓	✓	✓	✓	✓	✓
-40 to 75°C	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options						
Turbo Ring (Recovery Time < 20 ms)	✓	✓	✓	–	–	–
Turbo Chain (Recovery Time < 20 ms)	✓	✓	✓	–	–	–
STP/RSTP	✓	✓	✓	–	–	–
Bypass Relay	✓	–	–	–	–	–
Network Management and Control						
IPv6	✓	✓	✓	–	–	–
DHCP Option 66/67/82	✓	✓	✓	–	–	–
LLDP	✓	✓	✓	–	–	–
Modbus/TCP	✓	✓	✓	–	–	–
IGMP/GMRP	✓	✓	✓	–	–	–
Port Trunking	✓	✓	✓	–	–	–
IEEE 802.1X	✓	✓	✓	–	–	–
Port Lock	✓	✓	✓	–	–	–
SNMP/RMON	✓	✓	✓	–	–	–
VLAN	✓	✓	✓	–	–	–
QoS	✓	✓	✓	–	–	–
Relay Warning	✓	✓	✓	–	–	–
Standards and Certifications						
CE/FCC	✓	✓	✓	✓	✓	✓
UL 508	Pending	Pending	Pending	Pending	✓	Pending
Railway Applications: EN 50155 EN 50121-4	 ✓ ✓	 ✓ ✓	 ✓ ✓	 ✓ ✓	 ✓ Pending	 ✓ ✓

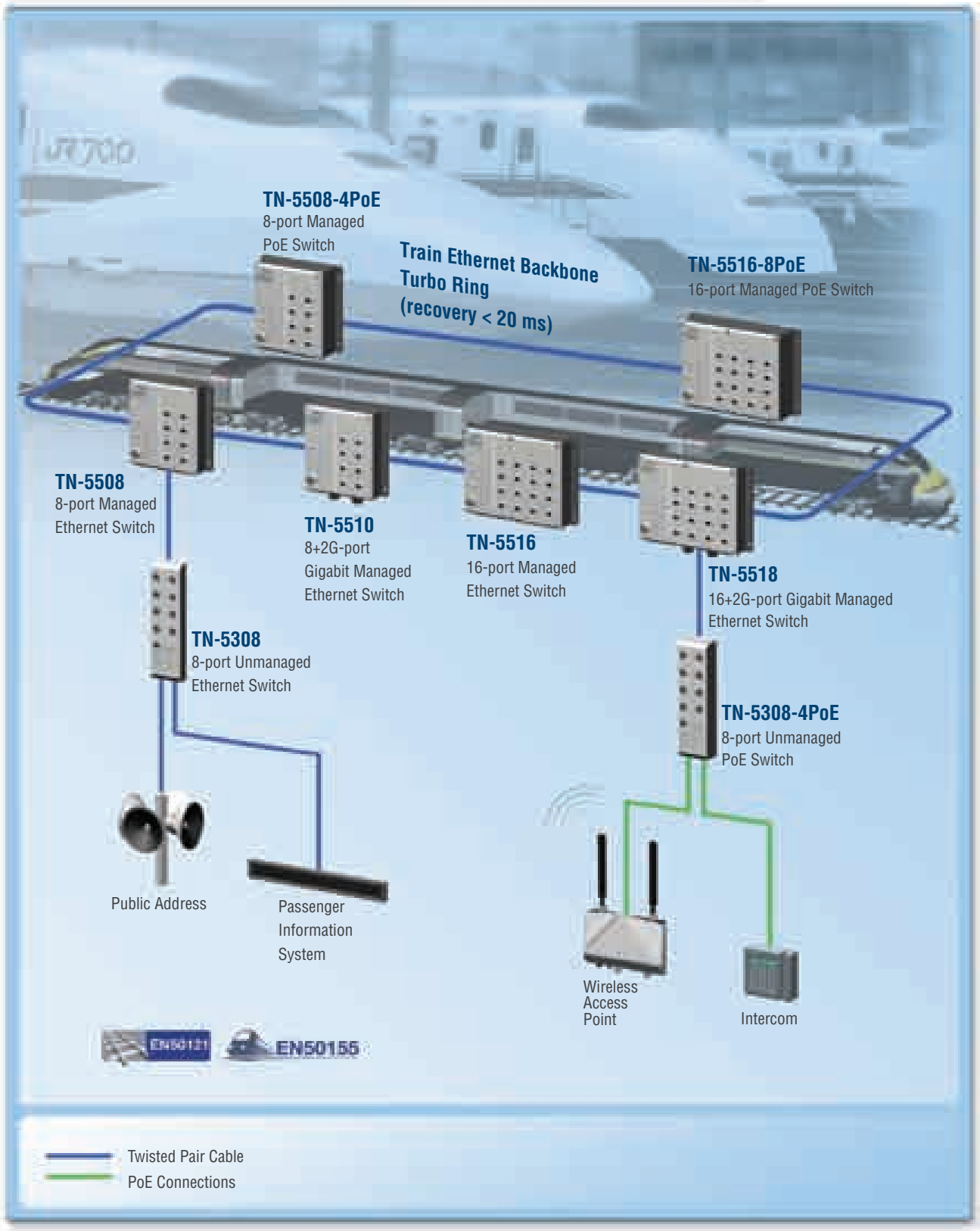
IEC 61850-3 Ethernet Switches



	PT-7828	PT-7728-PTP	PT-7728	PT-G7509	PT-7710	PT-508
Supported Modules						
Gigabit Ethernet Modules	✓	✓	✓	–	✓	–
Fast Ethernet Modules	✓	✓	✓	–	✓	–
SFP Gigabit Ethernet Modules	✓	✓	✓	✓	✓	–
SFP Fast Ethernet Modules	✓	✓	✓	✓	✓	–
Number of Ports						
Max. Number of Ports	28	28	28	9	10	8
Gigabit Ethernet, 10/100/1000 Mbps	Up to 4	Up to 4	Up to 4	9	Up to 2	–
Fast Ethernet, 10/100 Mbps	Up to 28	Up to 28	Up to 28	9	Up to 10	8
Power Supply						
24 VDC, isolated	✓	✓	✓	✓	–	✓
48 VDC, isolated	✓	✓	✓	✓	–	✓
12/24/48 VDC	–	–	–	–	✓	–
88-300 VDC or 85-264 VAC, isolated	✓	✓	✓	✓	✓	✓
Installation Options						
Rack Mounting	✓	✓	✓	✓	✓	–
Panel Mounting	–	–	–	–	✓	w/ optional kit
DIN-Rail Mounting	–	–	–	–	–	✓
Operating Temperature						
-40 to 85°C	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options						
Turbo Ring (Recovery Time < 20 ms)	✓	✓	✓	✓	✓	✓
Turbo Chain (Recovery Time < 20 ms)	✓	✓	✓	✓	✓	✓
STP/RSTP	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-01)	✓	✓	✓	✓	✓	✓
Network Management and Control						
Layer 3 Switching	✓	–	–	–	–	–
IPv6	–	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓
Hardware-based IEEE 1588 PTP V2	–	✓	–	–	–	–
LLDP	✓	✓	✓	✓	✓	✓
Modbus/TCP	✓	✓	✓	✓	✓	✓
IGMP/GMRP	✓	✓	✓	✓	✓	✓
Port Trunking	✓	✓	✓	✓	✓	✓
IEEE 802.1X	✓	✓	✓	✓	✓	✓
Port Lock	✓	✓	✓	✓	✓	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓
VLAN	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓
Standards and Certifications						
CE/FCC	✓	✓	✓	✓	✓	✓
UL/cUL 60950-1	✓	✓	✓	✓	✓	✓
IEC 61850-3 (Power Substation)	✓	✓	✓	✓	✓	✓
IEEE 1613 (Power Substation)	✓	✓	✓	✓	✓	✓
EN 50155/50121-4 (Railway Applications)	✓	–	✓	–	✓	–
NEMA TS2 (Traffic Control System)	✓	–	✓	–	✓	–

Introduction to EN 50155 Ethernet Switches

Designed for Rolling Stock and Rail Networks



Extensive Selection of EN 50155 Switches for Onboard Train Communications

Moxa's ToughNet series of Ethernet switches is specially designed to meet EN50155, the onboard standard for electronic equipment, which encompasses not just EMC requirements but also shock, vibration, extended temperature range, humidity, and power supply variations. To let users choose a precise solution to fit their railway networks, over 100 models are offered. The product line supports the comprehensive features for next-generation train networks, including 10/100/1000 Mbps transmission rate, Power-over-Ethernet, Turbo Ring, bypass relay, and various mounting options.

Rotary Switch for IP Address Configuration

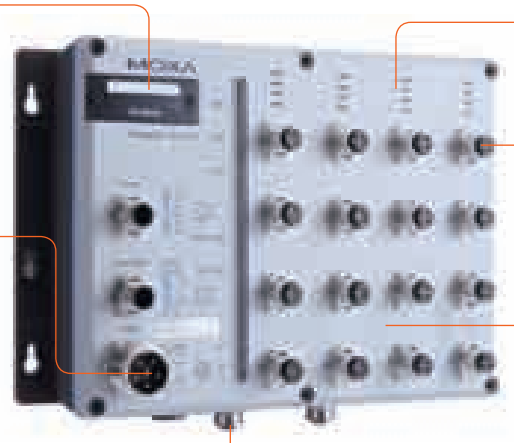
Easier maintenance

- Configure IP address without a PC

Wide Power Input Range

For universal applications

- Supports 12/24/36/48 VDC, 72/96/110 VDC, 110/220 VDC/VAC
- Redundant power inputs



Gigabit Bandwidth

For a higher level of passenger comfort and security

- Gigabit TP ports with or without bypass relay function
- Gigabit ports with M12 connectors

Certified Industry Standards

- EN50155
- EN50121-4

M12 Connectors

Robust vibration-proof connections

- M12 connectors
- M23 connector

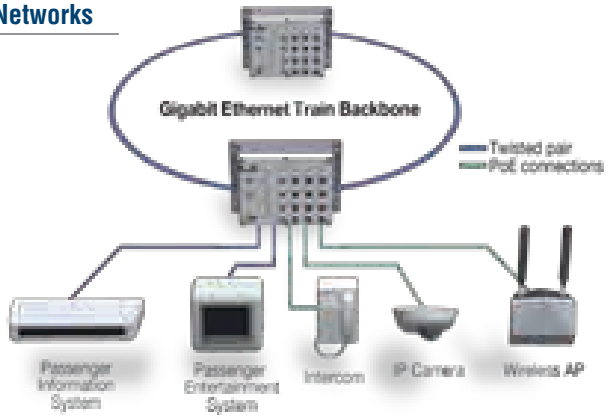
Tough Design

Withstands harsh environments

- -40 to 75°C operating temp.
- Die-cast metal housing
- IP54/67 protection
- Panel or DIN-Rail mounting
- Fan-less design

Future-proof Gigabit Solution Enables Next-generation Train Networks

Many new applications in the railway industry, such as video surveillance, emergency intercom, and web-like entertainment require large amounts of bandwidth. The Moxa TN-5518/5510 provides 2 Gigabit ports to allow video, audio, and data transmission over a single network.



Power-over-Ethernet Simplifies Network Connections

All applications can benefit from the ToughNet series' PoE function. Network designers can take advantage of the Power-over-Ethernet technology to power networked devices in difficult to reach locations and to simplify field wiring to reduce installation costs.

Enable High Network Availability with Excellent Redundancy

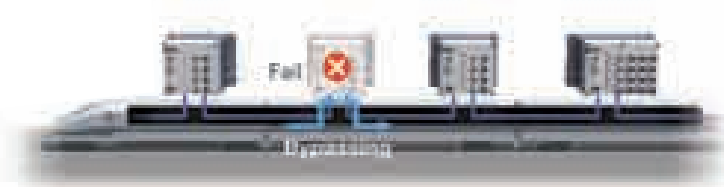
Turbo Ring™ for Ring Redundancy

All of Moxa's managed Ethernet switches support Turbo Ring™, which has a super fast fault recovery of under 20 ms at a full load of 250 Ethernet switches to minimize downtime caused by network failure. If a path in the network fails, the system will return to normal communication in under 20 ms.



Bypass Relay Function for Linear Topologies

In a linear topology, a failure in any of the upstream links will result in the failure of the downstream links as well. For railway communication systems with interconnected networks, such a failure will cause chaos. To prevent such a failure, Moxa's TN-5510/5518 series provides 2 optional Gigabit Ethernet ports with bypass relay function. If one of the Ethernet switches fails due to power loss, its ports are bypassed with the relay circuit, and the transmission lines will interconnect automatically to assure continuous system operation.



Moxa's Products are Certified to Meet Industrial Standards

Railway Application Standards

EN 50155

EN 50155 addresses the conditions of operation, design, construction, and testing of electronic equipment used on rail vehicles (rolling stock) in railway applications. The ToughNet series of M12 Ethernet switches are compliant with both the performance tests and environmental tests dictated by EN 50155. Reliable performance can be assured under different power supply conditions, such as voltage variations, power interruption, supply change over, and other conditions. The switches can also withstand environmental disturbances such as vibration, shock, and temperature variations.

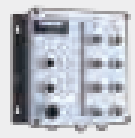
EN 50121-3-2

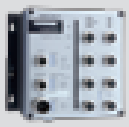
EN 50121-3-2 defines the electromagnetic compatibility (EMC) of an apparatus installed on rolling stock in railway applications. The TN series switches are compliant with this standard.

EN 50121-4

EN 50121-4 defines the emission and immunity standards for a signaling and telecommunications apparatus. The TN series switches are EN 50121-4 compliant.

EN 50155 Compliant Ethernet Switches

	Gigabit Ethernet				
	Managed				
					
	TN-5510	TN-5518	IKS-6726	PT-7828/PT-7728	PT-7710
No. of Ports	8 FE + 2 GE	16 FE + 2 GE	up to 2 GE + 24 FE	up to 4 GE + 24 FE	up to 2 GE + 8 FE
Power Input Range	12 to 110 VDC or 110 to 220 VDC/VAC		24 VDC or 48 VDC or 110 to 220 VDC/VAC		
IP Rating	IP54		IP30		
Installation	Panel or DIN-Rail Mounting		Rack Mounting		Rack or Panel Mounting
Temp. Range	0 to 60°C or -40 to 75°C		-40 to 75°C	-40 to 85°C	

	Fast Ethernet				Power-over-Ethernet		
	Managed		Unmanaged		Managed		Unmanaged
							
	TN-5508	TN-5516	TN-5308	TN-5305	TN-5508-4PoE	TN-5516-8PoE	TN-5308-4PoE
No. of Ports	8 FE	16 FE	8 FE	5 FE	4 FE + 4 PoE	8 FE + 8 PoE	4 FE + 4 PoE
Power Input Range	12 to 110 VDC or 110 to 220 VDC/VAC		12 to 48 VDC or 72 to 110 VDC	12 to 45 VDC 18 to 30 VDC	24 to 48 VDC or 110 to 220 VDC/VAC		48 VDC
IP Rating	IP54		IP40	IP67	IP54		IP40
Installation	Panel or DIN-Rail Mounting				Panel or DIN-Rail Mounting		
Temp. Range	0 to 60°C or -40 to 75°C				0 to 60°C or -40 to 75°C		

TN-5510/5518 Series

EN 50155 8+2G/16+2G-port Gigabit managed Ethernet switches



- 2 Gigabit ports with optional bypass relay function
- Wide power input range from 12 to 110 VDC (LV-MV model)
- Isolated redundant power inputs with universal 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC power supply range
- EN 50155 and EN 50121-4 compliant
- -40 to 75°C operating temperature range (T models)
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy

*Available in Q3, 2011

Introduction

The ToughNet TN-5510/5518 series M12 managed Ethernet switches are designed for industrial applications, such as rolling stock, vehicle, and railway applications. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5500-LV-MV switches provide the wide power input range of 12/24/36/48/72/96/110 VDC that allows you to use the same type of power source at different sites around the globe. In addition, the 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC dual, isolated redundant power supply increases the reliability of your communications system and saves on cabling/wiring costs. The TN-5510/5518 switches provide up to 8 or 16 fast Ethernet M12 ports, and 2 ports on the down side to provide the Gigabit Ethernet interface with an optional bypass relay function. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5500 series Ethernet switches are compliant with EN50155/50121-4 requirements, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Three rotary switches for setting the last 3 digits of the IP address makes maintenance even easier
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN50155-compliant Gigabit Ethernet switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP* and Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- Automatic recovery of connected device's IP addresses
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, and CLI* Windows utility
- Panel mounting or DIN-Rail mounting installation capability

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004* for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s* for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2C/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telent, SSH, Syslog, LLDP, IEEE 1588 PTP V2*, Modbus/TCP, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Gigabit Ethernet: Down cabling, M12 connector, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, auto MDI/MDI-X connection, with or without bypass relay function
Console Port: M12 A-coding 5-pin male connector
System LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Port LED Indicators: 10/100M (fast Ethernet port), 10/100/1000M (Gigabit Ethernet port)
Alarm Contact: 2 relay outputs in one M12 A-coding 5-pin male connector with current carrying capacity of 3 A @ 30 VDC
Rotary Switches: For setting the last 3 digits of the IP address

Power Requirements

Input Voltage:
- LV: 12/24/36/48 VDC (8.4 to 60 VDC)
- MV: 72/96/110 VDC (50.4 to 154 VDC)
- HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current:
- TN-5510-2GTX Series
  0.416 A @ 24 VDC, 0.187 A @ 72 VDC, 0.129 A @ 110 VDC, 0.316 A @ 110 VAC, 0.208 A @ 220 VAC
- TN-5510-2GTXBP Series
  0.52 A @ 24 VDC, 0.218 A @ 72 VDC, 0.150 A @ 11 VDC, 0.369 A @ 110 VAC, 0.243 A @ 220 VAC
- TN-5518-2GTX Series
  0.635 A @ 24 VDC, 0.28 A @ 72 VDC, 0.19 A @ 110 VDC, 0.37 A @ 110 VAC, 0.238 A @ 220 VAC
- TN-5518-2GTXBP Series
  0.667 A @ 24 VDC, 0.296 A @ 72 VDC, 0.202 A @ 11 VDC, 0.387 A @ 110 VAC, 0.244 A @ 220 VAC

Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP54 protection (optional protective caps available for unused ports)
Dimensions:
TN-5510 Series: 185 x 180.9 x 76.0 mm (7.28 x 7.12 x 2.99 in)
TN-5518 Series: 250 x 181.4 x 76.0 mm (9.84 x 7.14 x 2.99 in)
Weight:
TN-5510 Series: 1700 g
TN-5518 Series: 2550 g
Installation: Panel mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) exceeds Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11,
EN 61000-4-12
Rail Traffic: (for panel mounting installations)
EN 50155, EN 50121-4
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

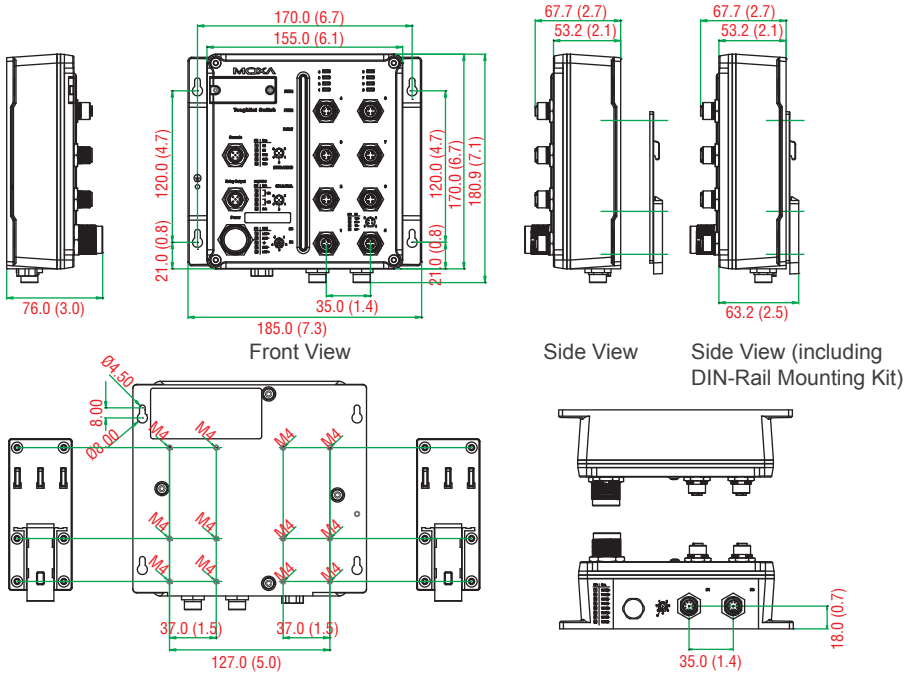
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

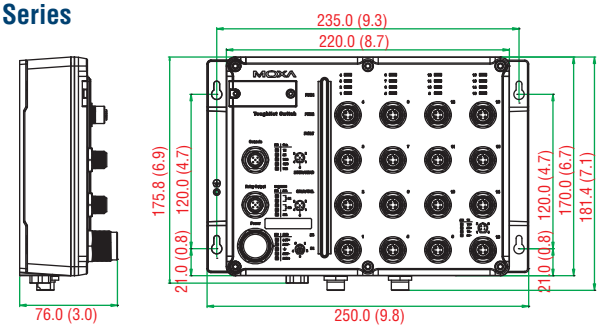
TN-5510 Series



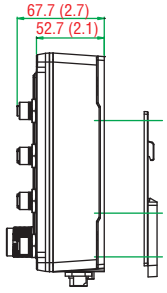
Dimensions

TN-5518 Series

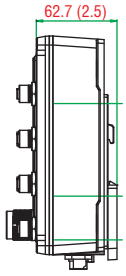
Unit: mm (inch)



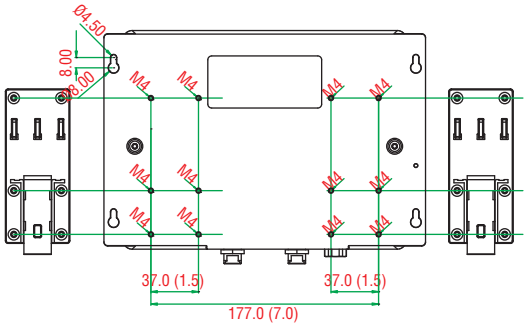
Front View



Side View

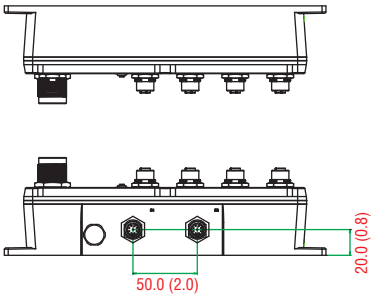


Side View (including DIN-Rail Mounting Kit)



DIN-Rail Mounting Kit

Rear View



Top & Bottom Views

Ordering Information

Available Models		Port Interface			Power Supply					
		Front Cabling	Down Cabling		Power Supply 1			Power Supply 2		
					LV	MV	HV	LV	MV	HV
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100 BaseT(X) M12 connector	10/100/1000 BaseT(X) M12 connector	10/100/1000 BaseT(X) M12 connector, bypass relay function	12/24/36/48 VDC (8.4 to 60 V), non-isolated	72/96/110 VDC (50.4 to 154 V), isolated	88 to 300 VDC and 85 to 264 VAC, isolated	12/24/36/48 VDC (8.4 to 60 V), non-isolated	72/96/110 VDC (50.4 to 154 V), isolated	88 to 300 VDC and 85 to 264 VAC, isolated
TN-5510 Series										
TN-5510-2GTX-LV-LV	TN-5510-2GTX-LV-LV-T	8	2	–	1	–	–	1	–	–
TN-5510-2GTX-LV-MV	TN-5510-2GTX-LV-MV-T	8	2	–	1	–	–	–	1	–
TN-5510-2GTX-LV-HV	TN-5510-2GTX-LV-HV-T	8	2	–	1	–	–	–	–	1
TN-5510-2GTXBP-LV-LV	TN-5510-2GTXBP-LV-LV-T	8	–	2	1	–	–	1	–	–
TN-5510-2GTXBP-LV-MV	TN-5510-2GTXBP-LV-MV-T	8	–	2	1	–	–	–	1	
TN-5510-2GTXBP-LV-HV	TN-5510-2GTXBP-LV-HV-T	8	–	2	1	–	–	–	–	1
TN-5518 Series										
TN-5518-2GTX-LV-LV	TN-5518-2GTX-LV-LV-T	16	2	–	1	–	–	1	–	–
TN-5518-2GTX-LV-MV	TN-5518-2GTX-LV-MV-T	16	2	–	1	–	–	–	1	–
TN-5518-2GTX-LV-HV	TN-5518-2GTX-LV-HV-T	16	2	–	1	–	–	–		1
TN-5518-2GTX-MV-MV	TN-5518-2GTX-MV-MV-T	16	2	–	–	1	–	–	1	–
TN-5518-2GTX-MV-HV	TN-5518-2GTX-MV-HV-T	16	2	–	–	1	–	–	–	1
TN-5518-2GTX-HV-HV	TN-5518-2GTX-HV-HV-T	16	2	–	–	–	1	–	–	1
TN-5518-2GTXBP-LV-LV	TN-5518-2GTXBP-LV-LV-T	16	–	2	1	–	–	1	–	–
TN-5518-2GTXBP-LV-MV	TN-5518-2GTXBP-LV-MV-T	16	–	2	1	–	–	–	1	–
TN-5518-2GTXBP-LV-HV	TN-5518-2GTXBP-LV-HV-T	16	–	2	1	–	–	–	–	1
TN-5518-2GTXBP-MV-MV	TN-5518-2GTXBP-MV-MV-T	16	–	2	–	1	–	–	1	–
TN-5518-2GTXBP-MV-HV	TN-5518-2GTXBP-MV-HV-T	16	–	2	–	1	–	–	–	1
TN-5518-2GTXBP-HV-HV	TN-5518-2GTXBP-HV-HV-T	16	–	2	–	–	1	–	–	1

*GTX: Giga Ethernet Copper port
*GTXBP: Giga Ethernet Copper port with bypass relay

Optional Accessories (must be purchased separately)

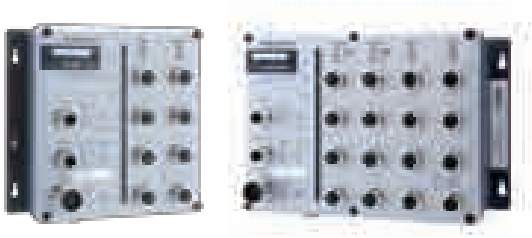
Power Cords, M12 Connectors, Protective Caps: See page 2-22
MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5510 or TN-5518 series switch
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5508/5516 Series

EN 50155 8/16-port managed Ethernet switches



- Wide power input range from 12 to 110 VDC (LV-MV model)
- Isolated redundant power inputs with universal 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC power supply range
- EN 50155 and EN 50121-4 compliant
- -40 to 75°C operating temperature range (T models)
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy

*Available in Q3, 2011

Introduction

The ToughNet TN-5508/5516 series M12 managed Ethernet switches are designed for industrial applications in harsh environments. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5500-LV-MV switches provide the wide power input range of 12/24/36/48/72/96/110 VDC that allows you to the same type of power source at different sites around the globe. In addition, the 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC dual, isolated redundant power supply increases the reliability of your communications and saves on cabling/wiring costs. The TN-5508/5516 switches provide up to 8 or 16 fast Ethernet M12 ports. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5500 series Ethernet switches are compliant with EN50155/50121-4 requirements, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Three rotary switches for setting the last 3 digits of the IP address makes maintenance even easier
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN50155-compliant industrial Ethernet switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP* and Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- Automatic recovery of connected device's IP addresses
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, and CLI*, Windows utility
- Panel mounting or DIN-Rail mounting installation capability

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004* for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s* for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2C/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telent, SSH, Syslog, LLDP, IEEE 1588 PTP V2*, Modbus/TCP, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: M12 A-coding 5-pin male connector
System LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Port LED Indicators: 10/100M
Alarm Contact: 2 relay outputs in one M12 A-coding 5-pin male connector with current carrying capacity of 3 A @ 30 VDC
Rotary Switches: For setting the last 3 digits of the IP address

Power Requirements

Input Voltage:
- LV: 12/24/36/48 VDC (8.4 to 60 VDC)
- MV: 72/96/110 VDC (50.4 to 154 VDC)
- HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current:
- TN-5508 Series:
  0.234 A @ 24 VDC, 0.104 A @ 72 VDC,
  0.072 A @ 110 VDC, 0.18 A @ 110 VAC, 0.12 A @ 220 VAC
- TN-5516 Series:
  0.338 A @ 24 VDC, 0.133 A @ 72 VDC,
  0.089 A @ 110 VDC, 0.270 A @ 110 VAC, 0.170 A @ 220 VAC

Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP54 protection (optional protective caps available for unused ports)

Dimensions:
TN-5508 Series: 185 x 170 x 69.8 mm (7.28 x 6.69 x 2.75 in)
TN-5516 Series: 250 x 170 x 69.8 mm (9.84 x 6.69 x 2.75 in)
Weight:
TN-5508 Series: 1650 g
TN-5516 Series: 2500 g
Installation: Panel mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) exceeds Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11,
EN 61000-4-12
Rail Traffic: (for panel mounting installations)
EN 50155, EN 50121-4
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

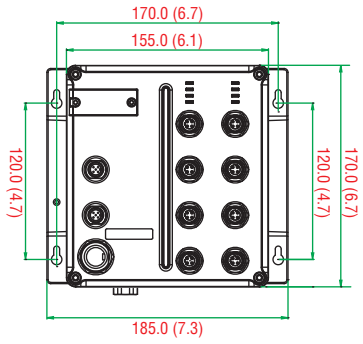
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

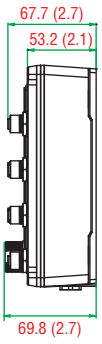
Dimensions

Unit: mm (inch)

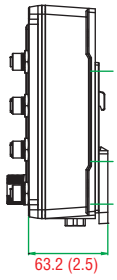
TN-5508 Series



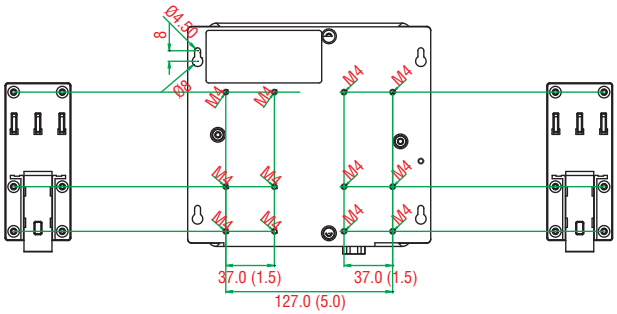
Front View



Side View

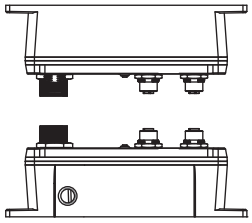


Side View (including DIN-Rail Mounting Kit)



DIN-Rail Mounting Kit

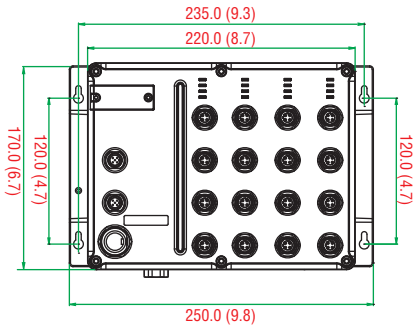
Rear View


Top & Bottom Views

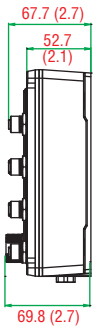
Dimensions

TN-5516 Series

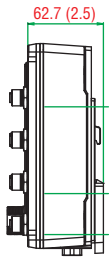
Unit: mm (inch)



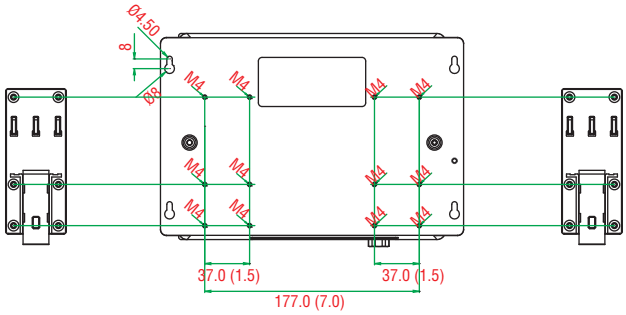
Front View



Side View

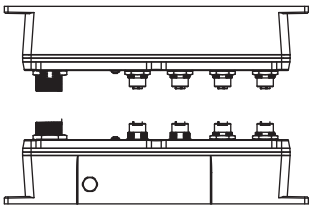


Side View (including DIN-Rail Mounting Kit)



DIN-Rail Mounting Kit

Rear View



Top & Bottom Views

Ordering Information

Available Models		Port Interface	Power Supply					
			Power Supply 1			Power Supply 2		
			LV	MV	HV	LV	MV	HV
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100 BaseT(X) M12 connector	12/24/36/48 VDC (8.4 to 60 V), non-isolated	72/96/110 VDC (50.4 to 154 V), isolated	88 to 300 VDC and 85 to 264 VAC, isolated	12/24/36/48 VDC (8.4 to 60 V), non-isolated	72/96/110 VDC (50.4 to 154 V), isolated	88 to 300 VDC and 85 to 264 VAC, isolated
TN-5508 Series								
TN-5508-LV-LV	TN-5508-LV-LV-T	8	1	–	–	1	–	–
TN-5508-LV-MV	TN-5508-LV-MV-T	8	1	–	–	–	1	–
TN-5508-LV-HV	TN-5508-LV-HV-T	8	1	–	–	–	–	1
TN-5516 Series								
TN-5516-LV-LV	TN-5516-LV-LV-T	16	1	–	–	1	–	–
TN-5516-LV-MV	TN-5516-LV-MV-T	16	1	–	–	–	1	–
TN-5516-LV-HV	TN-5516-LV-HV-T	16	1	–	–	–	–	1
TN-5516-MV-MV	TN-5516-MV-MV-T	16	–	1	–	–	1	–
TN-5516-MV-HV	TN-5516-MV-HV-T	16	–	1	–	–	–	1
TN-5516-HV-HV	TN–5516–HV–HV–T	16	–	–	1	–	–	1

Optional Accessories (must be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See page 2-22

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

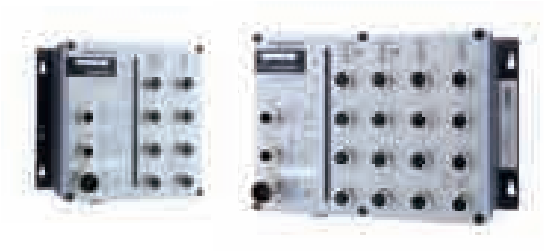
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5508 or TN-5516 series switch
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5508-4PoE/5516-8PoE Series

EN 50155 8/16-port IEEE 802.3af PoE managed Ethernet switches



- 4 or 8 IEEE 802.3af compliant PoE and Ethernet combo ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- Isolated redundant power inputs with universal 24/48 VDC, or 110/220 VDC/VAC power supply range
- EN 50155 and EN 50121-4 compliant
- -40 to 75°C operating temperature range (T models)
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy

*Available in Q3, 2011

Introduction

The ToughNet TN-5500 series M12 PoE managed Ethernet switches are designed for industrial applications, such as rolling stock, vehicle, and railway. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5500-PoE series Ethernet switches provide 8 or 16 fast Ethernet M12 ports with 4 or 8 IEEE 802.3af compliant PoE (Power-over-Ethernet) ports. The switches are classified as power source equipment (PSE) and provide up to 15.4 watts of power per port, and can be used to power IEEE 802.3af compliant powered devices (PDs) (such as surveillance cameras, wireless access points, and IP phones) when AC power is not readily available or is cost-prohibitive to provide locally for rolling stock. In addition, the 24/48 VDC, or 110/220 VDC/VAC dual, redundant power supply increases the reliability of your communications and saves on cabling/wiring costs. Wide temperature models with an extended operating temperature range of -40 to 75°C are also available. The TN-5500-PoE series Ethernet switches are compliant with EN50155//50121-4 requirements, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Advanced PoE management function
- Three rotary switches for setting the last 3 digits of the IP address makes maintenance even easier
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN50155-compliant PoE switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP* and Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- Automatic recovery of connected device's IP addresses
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, and CLI*,
- Windows utility
- Panel mounting or DIN-Rail mounting installation capability

*Available in Q3, 2011

Specifications

Technology

Standards:
IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004* for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s* for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2C/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telent, SSH, Syslog, LLDP, IEEE 1588 PTP V2*, Modbus/TCP, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: M12 A-coding 5-pin male connector
System LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Port LED Indicators: 10/100M (fast Ethernet port), PoE
Alarm Contact: 2 relay outputs in one M12 A-coding 5-pin male connector with current carrying capacity of 3 A @ 30 VDC
Rotary Switches: For setting the last 3 digits of the IP address

Power Requirements

Input Voltage:
• 24 VDC (16.8 to 36 V)
• 48 VDC (46 to 50 V)
• 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)
Input Current:
• TN-5508-4PoE Series
Max. 3.5 A @ 24 VDC
Max. 1.8 A @ 48 VDC
Max. 0.92/0.47 A @ 110/220 VDC
Max. 0.77/0.39 A @ 110/220 VAC
• TN-5516-8PoE Series
Max. 7.5 A @ 24 VDC
Max. 3 A @ 48 VDC
Max. 1.95/0.975 A @ 110/220 VDC
Max. 1.83/0.91 A @ 110/220 VAC
Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP54 protection (optional protective caps available for unused ports)
Dimensions:
TN-5508-4PoE series: 185 x 170 x 110 mm (7.28 x 6.69 x 4.33 in)
TN-5516-8PoE series: 250 x 170 x 110 mm (9.84 x 6.69 x 4.33 in)
Weight:
TN-5508-4PoE Series: 2140 g
TN-5516-8Poe Series: 4000 g
Installation: Panel mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) exceeds Level 3,
EN 61000-4-3 (RS) Level 4,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11,
EN 61000-4-12
Rail Traffic: (for panel mounting installations)
EN 50155, EN 50121-4
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

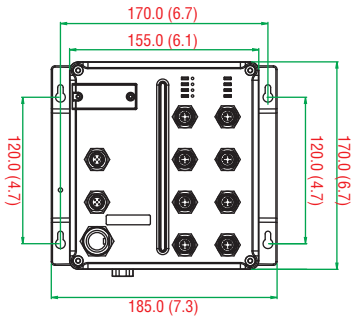
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

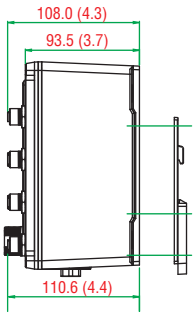
Dimensions

Unit: mm (inch)

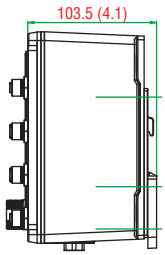
TN-5508-4PoE Series



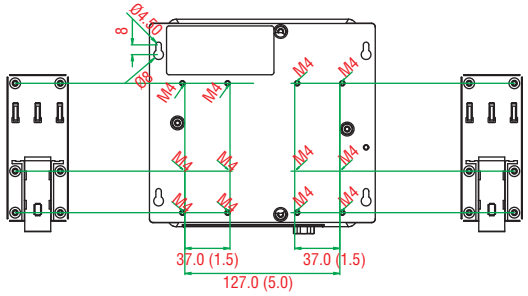
Front View



Side View

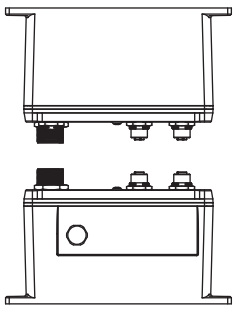


Side View
(including DIN-Rail)



DIN-Rail
Mounting Kit

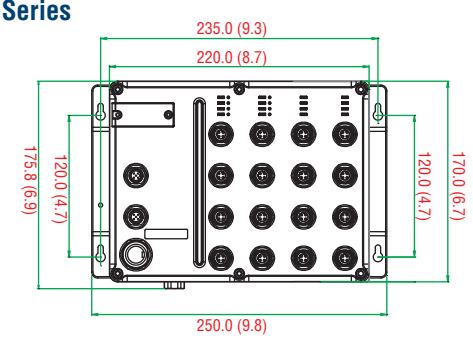
Rear View


Top & Bottom Views

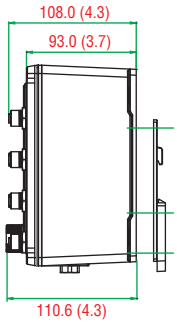
Dimensions

TN-5516-8PoE Series

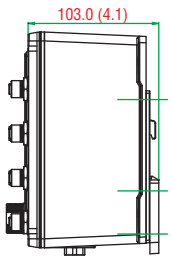
Unit: mm (inch)



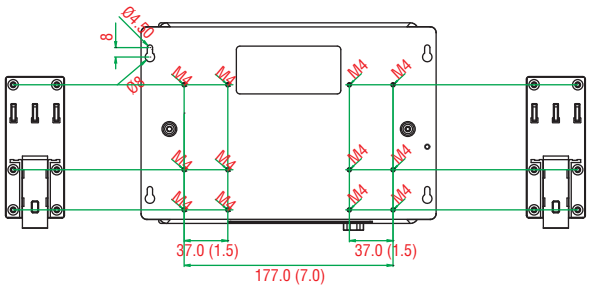
Front View



Side View

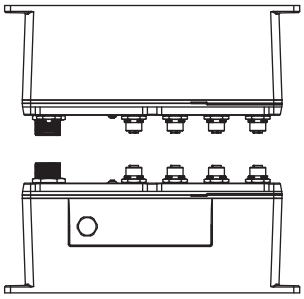


Side View
(including DIN-Rail)



DIN-Rail
Mounting Kit

Rear View



Top & Bottom Views

Ordering Information

Available Models		Port Interface		Power Supply					
				Power Supply 1			Power Supply 2		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	PoE, 10/100BaseT(X) M12 Connector	10/100BaseT(X) M12 Connector	24 VDC (16.8 to 36 V)	48 VDC (46 to 50 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (16.8 to 36 V)	48 VDC (46 to 50 V)	HV: 88 to 300 VDC and 85 to 264 VAC
TN-5508-4PoE Series									
TN-5508-4PoE-24	TN-5508-4PoE-24-T	4	4	1	–	–	–	–	–
TN-5508-4PoE-48	TN-5508-4PoE-48-T	4	4	–	1	–	–	–	–
TN-5508-4PoE-HV	TN-5508-4PoE-HV-T	4	4	–	–	1	–	–	–
TN-5516-8PoE Series									
TN-5516-8PoE-24	TN-5516-8PoE-24-T	8	8	1	–	–	–	–	–
TN-5516-8PoE-24-24	TN-5516-8PoE-24-24-T	8	8	1	–	–	1	–	–
TN-5516-8PoE-24-48	TN-5516-8PoE-24-48-T	8	8	1	–	–	–	1	–
TN-5516-8PoE-24-HV	TN-5516-8PoE-24-HV-T	8	8	1	–	–	–	–	1
TN-5516-8PoE-48	TN-5516-8PoE-48-T	8	8	–	1	–	–	–	–
TN-5516-8PoE-48-48	TN-5516-8PoE-48-48-T	8	8	–	1	–	–	1	–
TN-5516-8PoE-48-HV	TN-5516-8PoE-48-HV-T	8	8	–	1	–	–	–	1
TN-5516-8PoE-HV	TN-5516-8PoE-HV-T	8	8	–	–	1	–	–	–
TN-5516-8PoE-HV-HV	TN-5516-8PoE-HV-HV-T	8	8	–	–	1	–	–	1

Optional Accessories (must be purchased separately)

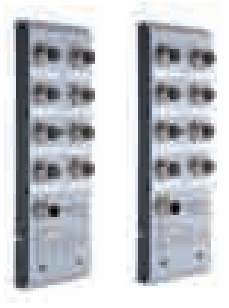
Power Cords, M12 Connectors, Protective Caps: See page 2-22
MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5508-4PoE or TN-5516-8PoE series switch
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5308 Series

EN 50155 8-port unmanaged Ethernet switches



- M12 connectors and IP40 metal housing
- Supports IEEE 802.3/802.3u/802.3x
- EN 50155 and EN 50121-4 compliant
- -40 to 75°C operating temperature range (T models)

Introduction

The ToughNet TN-5308 series M12 unmanaged Ethernet switches are designed for industrial applications in harsh environments. The TN series switches use M12 connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5308 series Ethernet switches provide 8 fast Ethernet M12 ports, support IEEE 802.3/802.3u/802/3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing, and provide an economical solution for your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5308 series Ethernet switches are compliant with EN50155/50121-4 requirements, making the switches suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward
Flow Control: IEEE802.3x flow control, back pressure flow control

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection
LED Indicators: PWR, 10/100M

Power Requirements

Input Voltage:
• TN-5308-LV: 12/24/36/48 VDC (7 to 60 VDC)
• TN-5308-MV: 72/96/110 VDC (50.4 to 154 VDC)
Input Current:
• TN-5308-LV: 0.19A @ 12 VDC,
0.10A @ 24 VDC, 0.054A @ 48 VDC
• TN-5308-MV: 0.033A @ 72 VDC,
0.024A @ 96 VDC, 0.021A @ 110 VDC
Overload Current Protection: Present
Connection:
• TN-5308-LV: M12 connector
• TN-5308-MV: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP40 protection
Dimensions:
TN-5308-LV: 60 x 216.6 x 36.1 mm (2.36 x 8.53 x 1.42 in)
TN-5308-MV: 60 x 216.6 x 53.8 mm (2.36 x 8.53 x 2.12 in)
Weight:
TN-5308-LV: 485 g
TN-5308-MV: 685 g
Installation: Panel mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) exceeds Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11,
EN 61000-4-12
Rail Traffic: (for panel mounting installations)
EN 50155, EN 50121-4
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

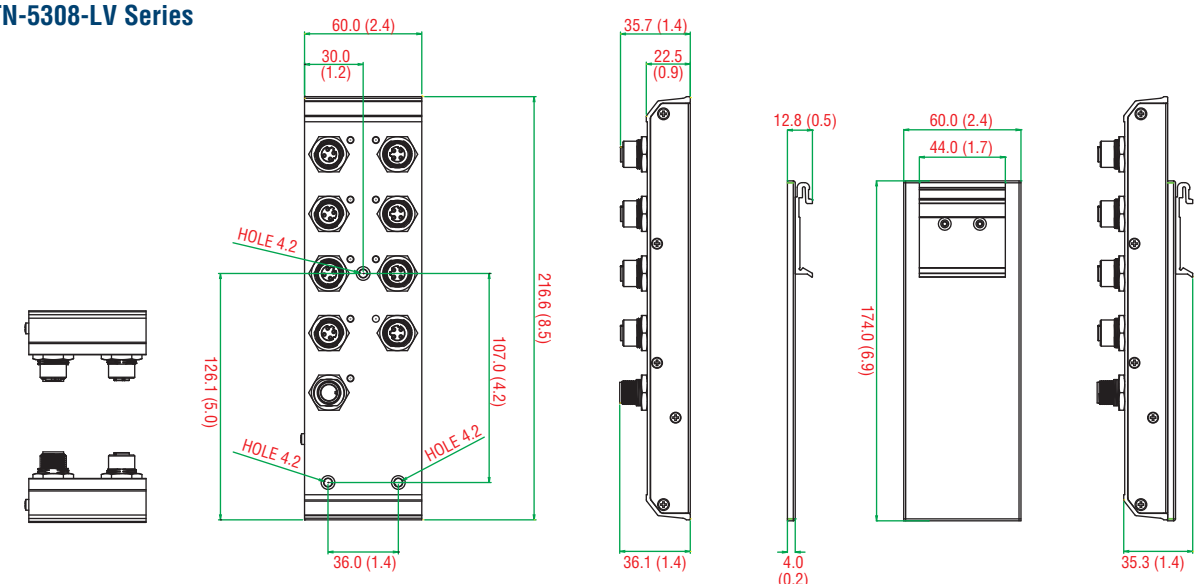
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

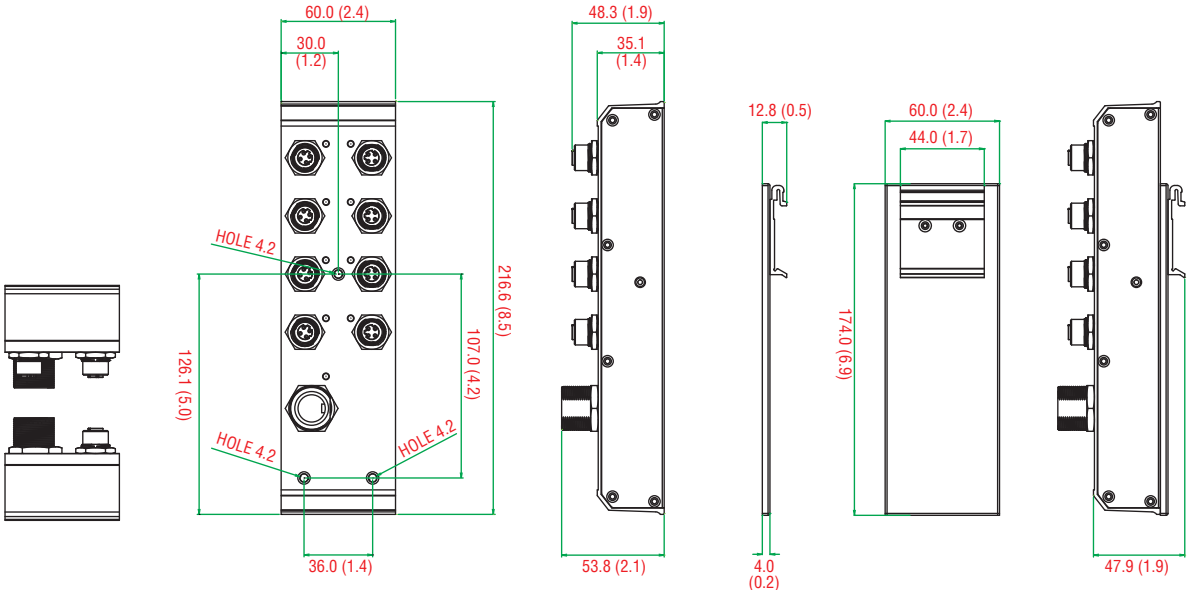
Unit: mm (inch)

TN-5308-LV Series



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit | Side View (including DIN-Rail)

TN-5308-MV Series



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit | Side View (including DIN-Rail)

Ordering Information

Available Models		Power Interface	Power Supply	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X) M12 connector	LV	MV
			12/24/36/48 VDC (7 to 60 V)	72/96/110 VDC (50.4 to 154V)
TN-5308-LV	TN-5308-LV-T	8	1	–
TN-5308-MV	TN-5308-MV-T	8	–	1

Package Checklist

- TN-5308 series switch
- Panel mounting kit
- Hardware installation guide
- Warranty card

Optional Accessories (must be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See page 2-22

TN-5308-4PoE Series

EN 50155 8-port IEEE 802.3af PoE unmanaged Ethernet switches



- 4 IEEE 802.3af compliant PoE and Ethernet combo ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- EN 50155 and EN 50121-4 compliant
- -40 to 75°C operating temperature range (T models)

PoE Power over Ethernet

EN50155 CE FC

Introduction

The ToughNet TN-5308-4PoE series M12 unmanaged Ethernet switches are designed for industrial applications in harsh environments. The M12 connectors ensure tight, robust connections, and guarantee reliable operation, even for applications that are subject to high vibration and shock. The TN-5308-4PoE series Ethernet switches provide 8 fast Ethernet M12 ports with 4 IEEE 802.3af compliant PoE (Power-over-Ethernet) ports. The switches are classified as power source equipment (PSE) and provide up to 15.4 watts of power per port.

The TN-5308-4PoE switches can be used to power IEEE 802.3af compliant powered devices (PDs), eliminating the need for additional wiring. The switches support IEEE 802.3/802.3u/802/3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing, and provide an economical solution for your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The TN- 5308-4PoE switches are compliant with EN50155/50121-4 making them suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.3af for Power-over-Ethernet
Processing Type: Store and Forward
Flow Control: IEEE802.3x flow control, back pressure flow control

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection
LED Indicators: PWR, LNK/ACT, PoE

Power Requirements

Input Voltage: 48 VDC (46 to 50 V)
Input Current: 1.6 A @ 48 VDC
Overload Current Protection: 3 A @ 48 VDC
Connection: M12 connector
Reverse Polarity Protection: Present

PoE (per port)

Max. Output Power: 15.4 W
Output Voltage: 44 to 48.5 VDC
Max. Output Current: 350 mA
Max. Overload Protection: 400 mA

Physical Characteristics

Housing: Metal, IP40 protection
Dimensions: 60 x 216.6 x 48.7 mm (2.36 x 8.53 x 1.91 in)
Weight: 675 g
Installation: Panel mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

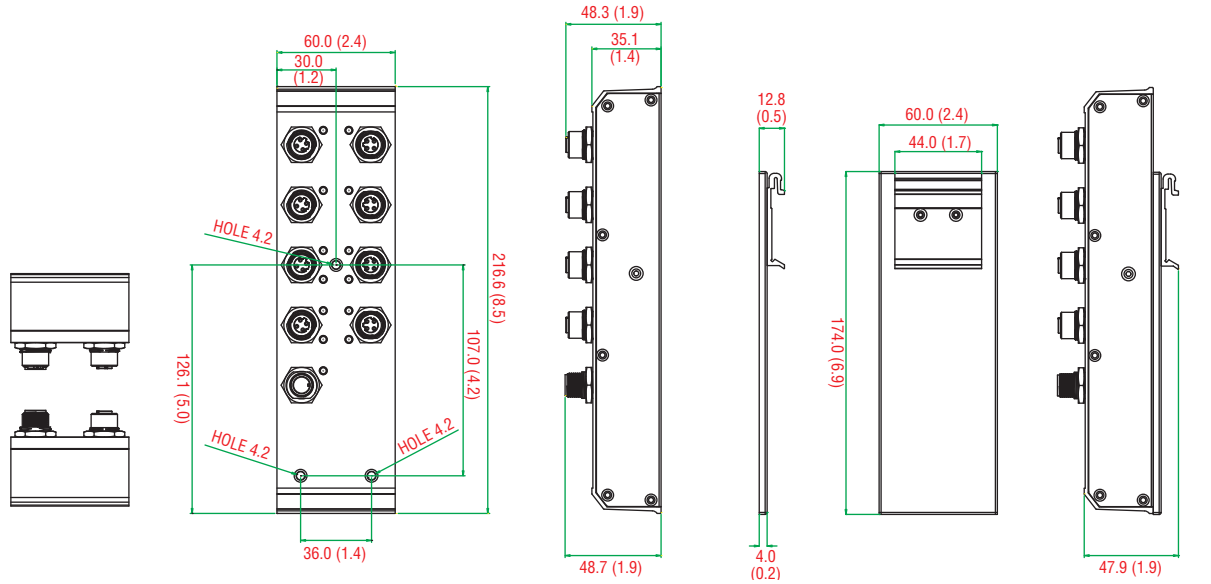
Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) exceeds Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11,
EN 61000-4-12
Rail Traffic: (for panel mounting installations)
EN 50155, EN 50121-4
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit | Side View (including DIN-Rail)

Ordering Information

Available Models		Port Interface	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	PoE, 10/100BaseT(X) M12 connector	10/100BaseT(X) M12 connector
TN-5308-4PoE-48	TN-5308-4PoE-48-T	4	4

Package Checklist

- TN-5308-4PoE series switch
- Hardware installation guide
- Warranty card

Optional Accessories (must be purchased separately)

DR-75-48/DR-120-48: 75/120 W DIN-Rail 48 VDC power supplies

Power Cords, M12 Connectors, Protective Caps: See page 2-22

TN-5305 Series

EN 50155 5-port IP67 unmanaged Ethernet switches



- 10/100BaseT(X), 4-pin M12 (D-coding), F/H duplex mode, and auto MDI/MDI-X connection
- IP-67 rated housing protection
- Power input: 12 to 45 VDC, 18 to 30 VAC
- EN 50155 and EN 50121-4 compliant
- -40 to 75°C operating temperature range (T models)

Introduction

The TN-5305 series Ethernet switches are IP67 rated for the toughest industrial applications, which means that the rugged housing and connectors guard against dust, water, and oil. By using M12 connectors, you can rest assured that Ethernet cables will connect tightly to the switch, and will be robust enough to protect your applications from external disturbances, such as the vibration and shock encountered in the transportation industry. The space-saving TN-5305 switches can be mounted virtually anywhere, and wide operating temperature (-40 to 75°C) models are also available for use in the extremest of conditions.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward
Flow Control: IEEE 802.3x full duplex, back pressure flow control

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
LED Indicators: Power, LNK/ACT

Power Requirements

Input Voltage:
• 12 to 45 VDC
• 18 to 30 VAC (47 to 63 Hz)
Input Current:
• 0.12A @ 24 VDC
• 0.28A @ 24 VAC
Overload Current Protection: 1.1 A (Limited Current)
Connection: 1 M12 socket (A-coding), single power input
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic, IP67 protection
Dimensions: 60 x 125 x 27.6 mm (2.36 x 4.92 x 1.09 in)
Weight: 250 g
Installation: Field-style mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

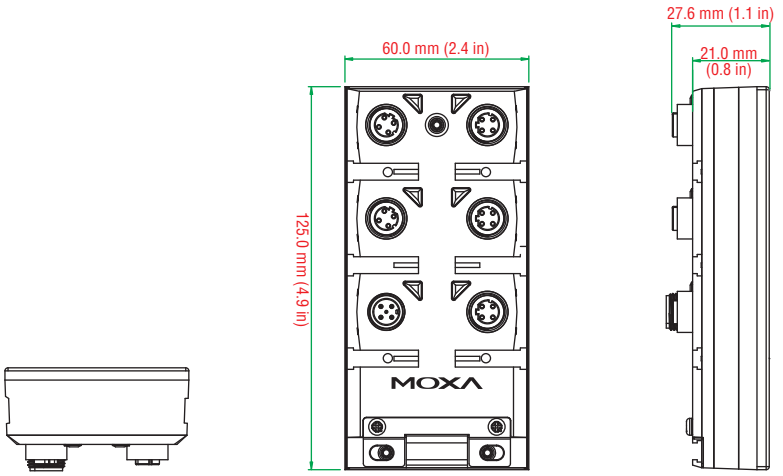
Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) exceeds Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8,
EN 61000-4-11
Maritime: DNV, GL (Pending), ABS, LR, NK
Rail Traffic: (for panel mounting installations)
EN 50155, EN 50121-4 (Pending)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Top View Front View Side View

Ordering Information

Available Models

TN-5305: EN50155 IP67 unmanaged Ethernet switch with 5 10/100BaseT(X) ports, 0 to 60°C operating temperature

TN-5305-T: EN50155 IP67 unmanaged Ethernet switch with 5 10/100BaseT(X) ports, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

Power Cords, M12 Connectors, Protective Caps: See page 2-22

Package Checklist

- TN-5305 series switch
- 3 protective caps for unused ports and 8 port labels
- Panel mounting kit
- Hardware installation guide
- Warranty card

Accessories

M12/M23 Power Cords

CBL-M12D(MM4P)/RJ45-100 IP67
1-meter M12-to-RJ45 Cat-5C UTP Ethernet cable with IP67-rated 4-pin male D-coded M12 connector



CBL-M12(FF5P)/OPEN-100 IP67
1-meter M12-to-5-pin power cable with IP67-rated 5-pin female A-coded M12 connector



CBL-M23(FF6P)/Open-BK-100 IP67
1-meter M23-to-6-pin power cable with IP67-rated female 6-pin M23 connector



M12 Connectors

M12D-4P-IP68
Field-installable M-12 D-coded screw-in sensor connector, 4-pin male, IP68-rated



M12A-5P-IP68
Field-installable M-12 A-coded screw-in sensor connector, 5-pin female, IP68-rated



M12 IP67 Protective Caps

A-CAP-M12F-M
Metal cap for M12 female connector

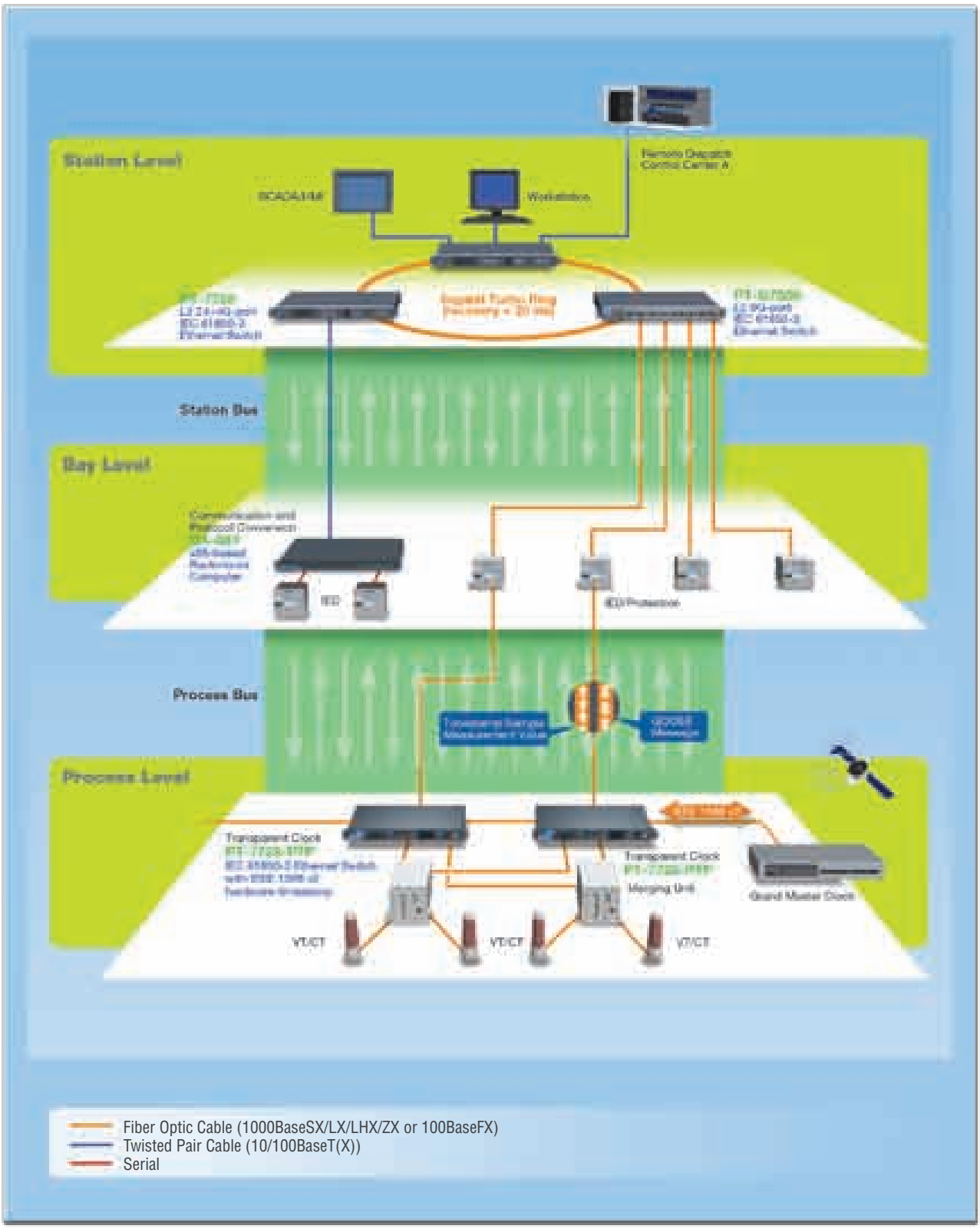


A-CAP-M12M-M
Metal cap for M12 male connector



Introduction to IEC 61850-3 Ethernet Switches

Suitable for All Demanding Power Utility Applications



IEC 61850-3 Ethernet Switches for Substation Automation

Industrial Ethernet is not only being used in a wide range of vertical markets, but is also finding uses in different facets of each market. For example, IEC 61850-3 industrial Ethernet networks are applied as the physical medium for power substation automation, which means that a host of legacy field buses must be connected to the Ethernet network. When used as a unified communication protocol in power automation, the IEC 61850 standard provides benefits that help power automation designers construct a complete, Ethernet-based communication system. These benefits include:

Integrated Protocol: The costs associated with setting up a monitoring system in a substation that uses different communication protocols (e.g., DNP3.0, UCA, and IEC 870-5) can be prohibitive. The IEC 61850 protocol is preferred since programmers only need to use one protocol to develop the required monitoring applications.

Maintenance and Implementation: System designers find it easier to select components and controllers that have been designed specifically to meet the standard requirements of the IEC 61850 protocol, saving on both implementation and system maintenance.

Time-to-Market: The fact that leading manufacturers such as ABB, Siemens, and Schneider Electric are producing integrated IEC 61850-based products saves time, since system integrators can design systems with products right off the shelf.

Enabling High Availability, Reliability, and Scalability of Power Transmission and Distribution Networks

Rugged Design Suitable for Harsh Environments

Verified Overall Reliability and Zero Packet Loss under Harsh EMI Interference

The EMI stress in high-voltage substations may cause errors or equipment damage in electronic communications. Moxa's PowerTrans Ethernet switches are designed to withstand all of the EMI type tests required by IEC 61850-3 without experiencing any loss in communications. The full product line has passed IEC 61850-3 and IEEE1613 certification testing conducted by KEMA, a well respected testing laboratory in the energy and utility markets. Further tests, including GOOSE messaging, EMC tests, extreme temperature tests, and mechanical tests for vibration and shock resistance, were conducted to verify the overall durability of the PowerTrans series.

Unaffected by extreme temperatures

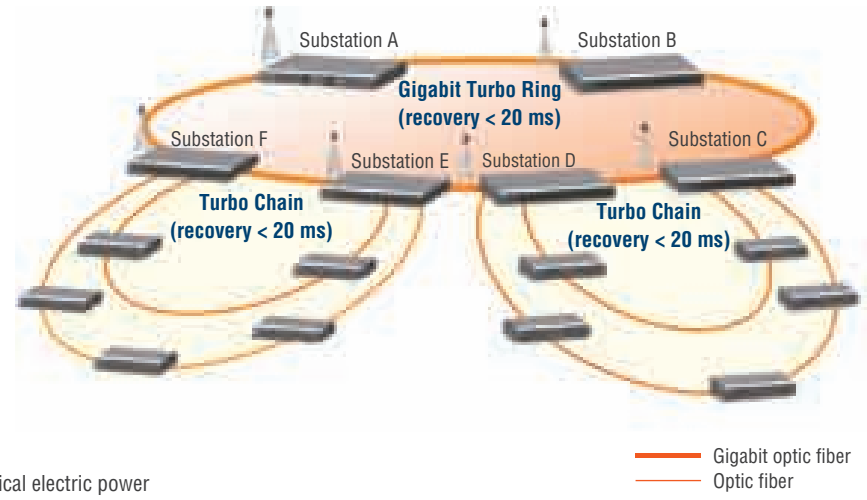
To perform flawlessly in the exposed climate of utility substations and industrial environments, Moxa's IEC 61850-3 substation Ethernet switches are designed for completely fanless operations in a wide temperature range of -40 to 85°C.

Redundancy for Higher Network Availability

Media Redundancy

- **Turbo Ring™ for Ring Redundancy**

Managed Ethernet switches come with the world's fastest Turbo Ring redundancy (20 ms @ 250 switches), and the standard STP/RSTP redundancy protocol. To reduce redundant network cabling and network planning costs, and to ensure high network reliability, three topology options are supported: ring coupling, dual-ring, and dual homing.



- **Turbo Chain™ Builds Complex Redundant Networks for Power Electricity Distribution**

Electric power distribution is the final stage in the delivery of electricity to end users. The distribution system carries electric power from the transmission system and delivers it to large numbers of consumers. Consequently, a typical electric power distribution system consists of a complex network that allows various connections by the power utilities.

Moxa's Turbo Chain™ is an innovative breakthrough that allows the creation of multiple redundant networks beyond the current limitations of redundant ring technology. Turbo Chain™ is easy to configure by linking two user-configured end ports within the same segment. Turbo Chain™ easily connects and extends existing redundant networks by enabling high network availability with its self-healing capability (recovery time < 20 ms). Moreover, compared with Turbo Ring in power distribution systems, Turbo Chain is more flexible and cost-efficient and has the potential to save a significant amount on development costs, time, effort, cabling, and Ethernet ports.

Isolated Power Input Redundancy

Non-stop operation is the key criterion for mission-critical applications. The PT-7828 , PT-G7509, and PT-7728 support dual, isolated, redundant power supplies with different power sources (24/48 VDC or 110/220 VAC/VDC input voltage). For example, you can choose 110/200 VAC/VDC as your main power source, and 48 VDC from a battery as your back up power source.



Redundant power supplies (88-300-VDC/85-264-VAC, and 24/48 VDC)

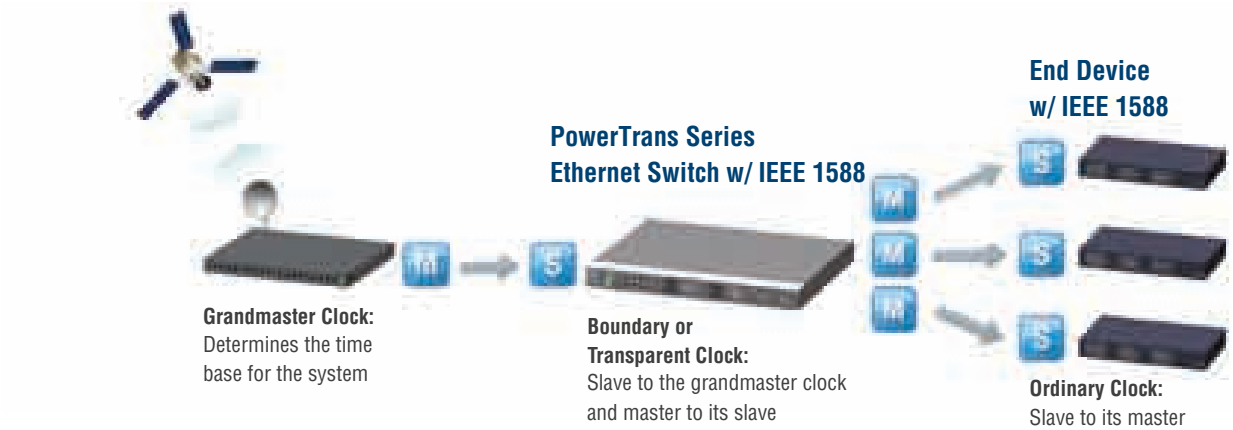
Configuration Redundancy

The ABC-01 backup configuration tool can both save and load configurations automatically when connected to a Moxa managed Ethernet switch. This novel management tool helps reduce downtime, and can be used for fast configuration duplication of large-scale networks.



IEEE 1588 Precision Time Protocol for the PowerTrans Series

Time synchronization can be accomplished using the IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems (IEEE 1588-2008) to synchronize real-time clocks incorporated within each component of the electrical power system in power automation applications. Moxa's PowerTrans products are designed to operate in tough power substation environments and provide highly accurate time synchronization for each process utility. To ensure the best time synchronization network design for power automation, substation designers must consider the convenience of IEEE 1588 deployment for Ethernet switches.



Grandmaster Clock: Determines the time base for the system

Boundary or Transparent Clock: Slave to the grandmaster clock and master to its slave

Ordinary Clock: Slave to its master

Scalable Network Infrastructure Capability

Substation and transportation automation networks can be extremely large and cover expansive territories. Moxa's PowerTrans Ethernet switches satisfy the scalable network requirements with long-haul fiber solutions from Layer 3 to Layer 2 Ethernet switches.

- The PT-7828 Layer 3 Ethernet switch can divide a large network into hierarchical subnets. Controlling network traffic on separate subnets can improve the performance of the entire network.
- The PT-7728 and PT-7710 are Layer 2 modular managed Ethernet switches that support advanced network management and control functions, including VLAN, QoS, IGMP snooping, LACP, and GMRP to optimize and prioritize network communications.
- The PT-G7509 is equipped with 9 combo Gigabit Ethernet ports, making it ideal for upgrading an existing network to Gigabit speeds and building a new full Gigabit backbone.

Note: Please check PowerTrans Ethernet Switch selection guide on page 2-3 for detailed features supported by each product model.

Future-proof Flexibility

Up to 9 Gigabit Ports for Backbone and Uplink

Demand is growing for applications in industrial networks that consist of multiple, interconnected Gigabit backbones among different network centers. Moxa offers a range of Gigabit managed Ethernet solutions that can be used to form a Gigabit backbone that connects to control centers, video-over-IP servers, Ethernet-enabled devices, or other Ethernet switches. These Gigabit Ethernet switches support fault-tolerant rings with fiber-optic ports, allowing operation in the toughest industrial environments.

Moxa's IEC 61850-3 Ethernet switches come with up to 9 Gigabit combo ports for the PT-G7509 series. Other modular Ethernet switches include the managed PT-7728/7828 Ethernet switches and the PT-7710 Ethernet switch, all of which support 2 or 4 Gigabit combo ports. Any combination of twisted pair and fiber optic ports can be chosen to form a redundant Gigabit Turbo Ring or for connecting to a Gigabit HMI/SCADA system in the control room.

Media Configuration Flexibility

The PT series of modular Ethernet switches supports different numbers of Gigabit and fast Ethernet interface modules, which allow users to choose from a variety of copper/fiber media combinations. The modular design benefits users in three ways:

- Higher flexibility for system design and fast network changes
- Easy maintenance and lower cost of spare parts
- Reduced cost of future upgrades

Cabling Flexibility

Moxa's rackmount Ethernet switches support two cabling options. Front cabling is ideal for maintenance, whereas rear cabling is neater and results in an arrangement that is safer in the event that a cable gets disconnected.

Certifications to Ensure Reliable Operation

Power Substation Certifications

IEC 61850-3

IEC 61850-3 specifically addresses immunity from certain environmental conditions and electromagnetic interference (EMI) for communication networks and systems in substations. The EMI immunity requirements are based on IEC 61000-6-5, which establishes performance criteria for key functions within the substation. To be compliant with the standard, critical functions, such as protection relay and control functions, on-line processing and regulation, as well as metering and network communication, must experience no delays or data loss when exposed to various EMI phenomena.

IEEE 1613

IEEE 1613 is another industry standard that establishes EMI immunity requirements for networking devices in electric power substations. Included in this standard are ratings, environmental performance requirements, and testing requirements for compliant communication devices.

According to the IEEE 1613 standard, compliant devices may not experience permanent damage under EMI stress. Two different classes of devices are defined in the standard according to how EMI stress affects performance.

Class 1

Compliant devices in this class may experience some data errors, losses, or delays under EMI stress conditions.

Class 2

Compliant devices in this class must not experience any data errors, delays, or losses under EMI stress conditions.

The PowerTrans PT series is compliant with IEC 61850-3 and IEEE 1613 certifications specifying a high level of EMC, shock, and vibration in power substations.

Railway Industry Standards

EN 50155

All PowerTrans series switches are certified according to the EN 50155 standard, ensuring safe deployment for railway applications.

EN 50121-4

EN 50121-4 defines emission and immunity standards for signaling and telecommunication devices.

PT-7828 Series

IEC 61850-3 / EN51055 24+4G-port Layer 3 Gigabit modular managed rackmount Ethernet switches



- IEC 61850-3, IEEE 1613 (power substations), and EN 50155, EN 50121-4 (railway applications) compliant
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Up to 12 ports with M12 connectors
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- Supports multicast routing protocols PIM-DM/DVMRP*
- NERC CIP compliance
- -40 to 85°C operating temperature range

*Available in Q3, 2011

Introduction

The PowerTrans PT-7828 switches are high performance Layer 3 Ethernet switches that support Layer 3 routing functionality to facilitate the deployment of applications across networks. The PT-7828 switches are also designed to meet the strict demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN50155/EN50121-4).

The PT-7828's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling and wiring costs. The modular design of the PT-7828 makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 fast Ethernet ports. Optional front or rear wiring makes the PT-7828 switches suitable for a variety of applications.

General Features and Benefits

- Layer 3 switching functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP* and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring, Turbo Chain, and RSTP/STP, and MSTP for network redundancy
- Supports multicast routing protocols PIM-DM/DVMRP*
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Supports advanced VLAN capability with Q-in-Q tagging*
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI* Windows utility, and ABC-01 automatic backup configurator

*Available in Q3, 2011

Cyber-security Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1x port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- Radius/TACACS+ allows you to manage passwords from a central location (available in Q1 Y2011)
- SNMPv3 provides encrypted authentication and access security

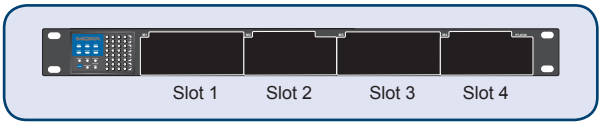
Specifications

Technology

Standards:

IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004* for Spanning Tree Protocol

Layer 3 Modular Rackmount Ethernet Switch System, PT-7828



IEEE 802.1s* for Multiple Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, RIP V1/V2, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP V2*, SNMP Inform, NTP Server/Client*
Layer 3 Switching: Static routing, RIP V1/V2, OSPF, VRRP for router redundancy
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slots 1, 2, and 3 for combinations of 2, 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP.
Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP
Console Port: RS-232 (RJ45)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Mode LED Indicators: LNK/ACT, FDX/HDX, RING/CHAIN PORT, COUPLER PORT, SPEED
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• 24 VDC (18 to 36 V)
• 48 VDC (36 to 72 V)
• 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)
Input Current: (all ports are equipped with fiber)
• Max. 2.58 A @ 24 VDC
• Max. 1.21 A @ 48 VDC
• Max. 0.64/0.33 A @ 110/220 VDC
• Max. 0.53/0.28 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80)
Weight: 5900 g
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

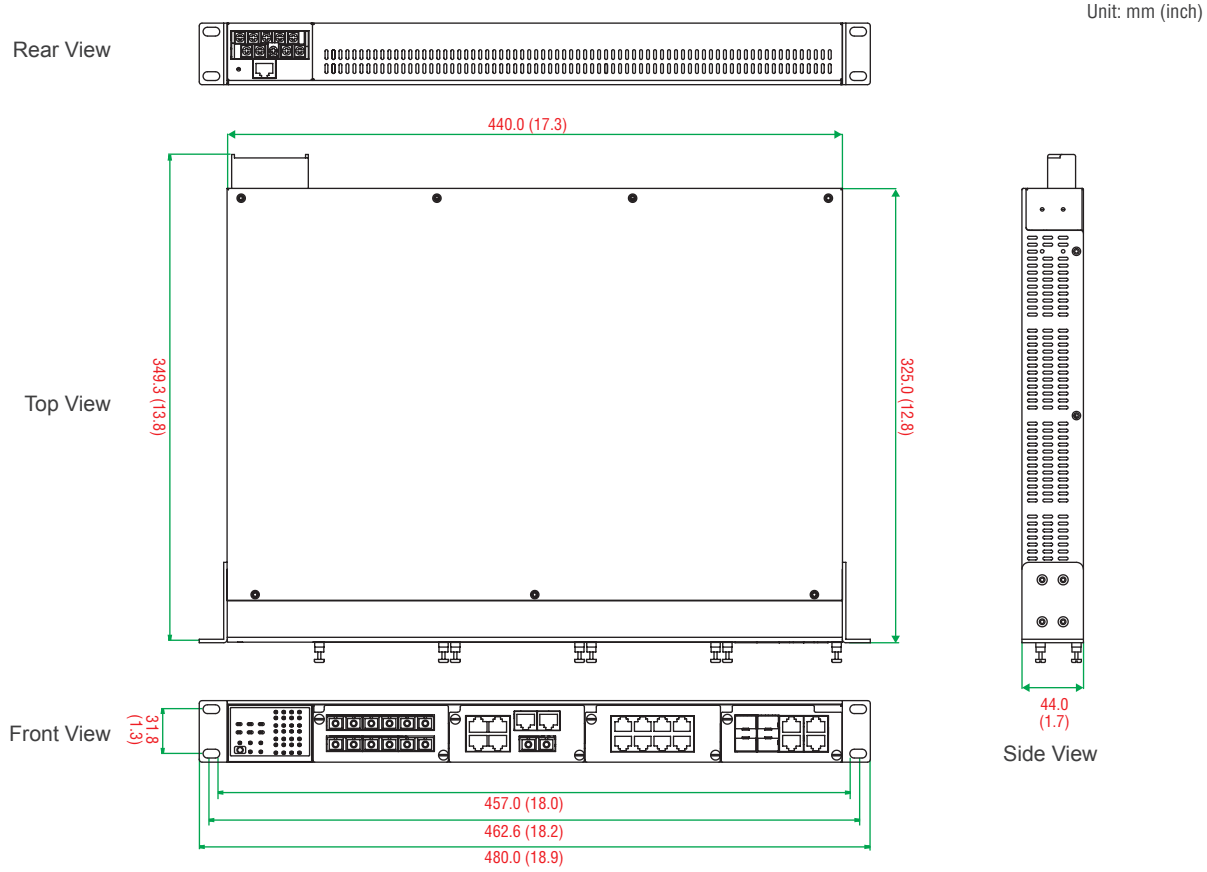
Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Power Automation: IEC 61850-3, IEEE 1613
Rail Traffic: EN 50155, EN 50121-4
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Step 1: Select Ethernet switch system

PT-7828 with power supply

Step 2: Select interface modules

PM-7200 module (Gigabit or fast Ethernet)

Note: The PT-7828 Ethernet switch system is delivered without interface modules. See page 2-42 to choose PM-7200 interface modules.

PT-7828 Layer 3 Modular Rackmount Ethernet Switch System

The PT-7828 switch system consists of 18 Layer 3 modular managed rackmount Ethernet switch systems, each with 3 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. A total of 28 or 24+4G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
PT-7828-F-24	PT-7828-R-24	1	–	–	–	–	–
PT-7828-F-24-24	PT-7828-R-24-24	1	–	–	1	–	–
PT-7828-F-24-48	PT-7828-R-24-48	1	–	–	–	1	–
PT-7828-F-24-HV	PT-7828-R-24-HV	1	–	–	–	–	1
PT-7828-F-48	PT-7828-R-48	–	1	–	–	–	–
PT-7828-F-48-48	PT-7828-R-48-48	–	1	–	–	1	–
PT-7828-F-48-HV	PT-7828-R-48-HV	–	1	–	–	–	1
PT-7828-F-HV	PT-7828-R-HV	–	–	1	–	–	–
PT-7828-F-HV-HV	PT-7828-R-HV-HV	–	–	1	–	–	1

Note: The PT-7828 Layer 3 Ethernet switch systems provide combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for fast Ethernet interface modules. See page 2-42 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules for your own application.

PT-7828-F series
(Front Cabling, Front Display)



PT-7828-R series
(Rear Cabling, Front Display)



Gigabit/Fast Ethernet Modules for the PT-7828

	Interface Modules																													
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12	PM-7200-2MTRJ	PM-7200-8MTRJ	PM-7200-4MST-FL	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP
Slot 1	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–	–	–
Slot 2	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–	–	–
Slot 3	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–	–	–
Slot 4	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

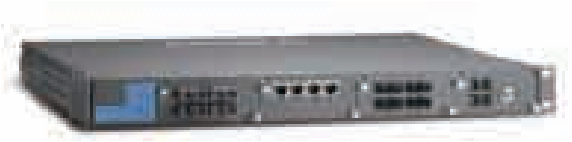
MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7828 series switch
- RJ45-to-DB9 console port cable
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7728-PTP Series

IEC 61850-3 24+4G-port IEEE 1588 v2 rackmount Ethernet switches



- IEEE 1588v2 PTP with hardware time stamping for precise time synchronization of networks
- IEC 61850-3 and IEEE 1613 (power substations) compliant
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

*Available in Q3, 2011

Introduction

PowerTrans PT-7728-PTP switches are designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613). The PT-7728-PTP's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling/wiring costs.

Moxa's PT-7728-PTP IEC 61850-3 fast Ethernet switches support the latest version of IEEE 1588 v2 technology to fulfill precision time synchronization requirements for protection and control applications.

These Ethernet switches guarantee time-stamping accuracy within 1 µs for the IEC 61850 process layer. They can be configured for 1588 v2 Master, Boundary Clock, and Transparent Clock functionality.

The modular design of the PT-7728-PTP also makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports, 24 fast Ethernet ports, and up to 14 IEEE 1588 fast Ethernet ports. Along with a choice of either front or rear wiring, these features together make the PT-7728-PTP suitable for a variety of industrial applications.

IEEE 1588 PTP Features

- IEEE 1588 PTP V2 (Precision Time Protocol) with hardware time stamping for precise time synchronization of networks
- Support for both IEEE 1588 Boundary Clock and Transparent Clock
- Support for both End to End (1-step & 2-step) and Peer to Peer (2-step) modes in Transparent Clock
- High precision time accuracy (under 1 µs)

General Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP* and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- Supports advanced VLAN capability with Q-in-Q tagging*
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI*, Windows utility, and ABC-01 automatic backup configurator

*Available in Q3, 2011

Cyber-security Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1x port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- Radius/TACACS+ allows you to manage passwords from a central location (available in Q1 Y2011)
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP, IPv6, SNMP Inform
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet:
• Slots 1, 2, and 3 for combinations of 2, 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP
• Slot 4 for BNC port.
Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP
Console Port: RS-232 (RJ45)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Mode LED Indicators: LNK/ACT, FDX/HDX, RING/CHAIN PORT, COUPLER PORT, SPEED
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC
IEEE 1588 PTP: Up to 12 10/100BaseT(X) or 14 100BaseFX (Multi-mode ST or SC connector) IEEE 1588 ports with hardware time stamping

Modular Rackmount Ethernet Switch System, PT-7728-PTP



Power Requirements

Input Voltage:
• 24 VDC (18 to 36 V)
• 48 VDC (36 to 72 V)
• 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)
Input Current: (all ports are equipped with fiber)
• Max. 2.58 A @ 24 VDC
• Max. 1.21 A @ 48 VDC
• Max. 0.64/0.33 A @ 110/220 VDC
• Max. 0.53/0.28 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80)
Weight: 5900 g
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

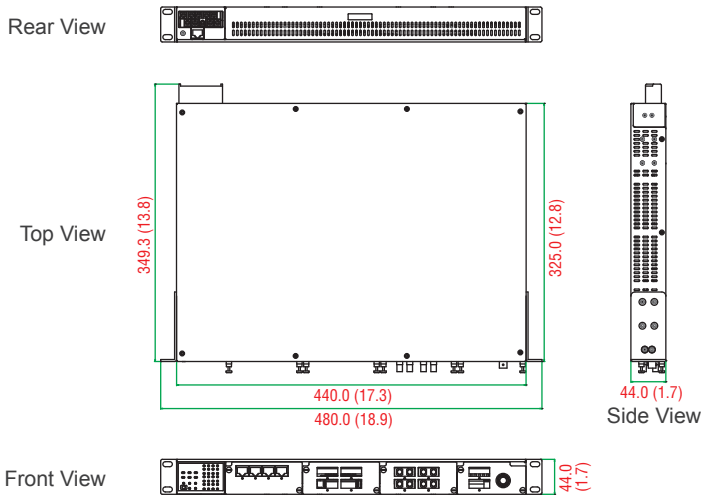
Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Power Automation: IEC 61850-3, IEEE 1613
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Step 1: Select Ethernet switch system → **Step 2: Select interface modules**

PT-7728 with power supply → PM-7200 modules (Gigabit or fast Ethernet)

Note: The PT-7728-PTP Ethernet switch system is delivered without interface module. See page 2-42 to choose PM-7200 interface modules.

PT-7728-PTP Modular Rackmount Ethernet Switch System

The PT-7728-PTP switch system consists of 18 modular managed rackmount Ethernet switch systems with 3 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. A total of 28 or 24+4G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
PT-7728-PTP-F-24	PT-7728-PTP-R-24	1	–	–	–	–	–
PT-7728-PTP-F-24-24	PT-7728-PTP-R-24-24	1	–	–	1	–	–
PT-7728-PTP-F-24-48	PT-7728-PTP-R-24-48	1	–	–	–	1	–
PT-7728-PTP-F-24-HV	PT-7728-PTP-R-24-HV	1	–	–	–	–	1
PT-7728-PTP-F-48	PT-7728-PTP-R-48	–	1	–	–	–	–
PT-7728-PTP-F-48-48	PT-7728-PTP-R-48-48	–	1	–	–	1	–
PT-7728-PTP-F-48-HV	PT-7728-PTP-R-48-HV	–	1	–	–	–	1
PT-7728-PTP-F-HV	PT-7728-PTP-R-HV	–	–	1	–	–	–
PT-7728-PTP-F-HV-HV	PT-7728-PTP-R-HV-HV	–	–	1	–	–	1

Note: The PT-7728-PTP Ethernet switch systems provide combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for fast Ethernet interface modules. See page 2-42 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7728-PTP-F series
(Front Cabling, Front Display)



PT-7728-PTP-R series
(Rear Cabling, Front Display)



Gigabit/Fast Ethernet Modules for the PT-7728-PTP

	Interface Modules																													
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12	PM-7200-2MTRJ	PM-7200-8MTRJ	PM-7200-4MST-FL	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP
Slot 1	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	–
Slot 2	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	–
Slot 3	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	–
Slot 4	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓

Optional Accessories (can be purchased separately)

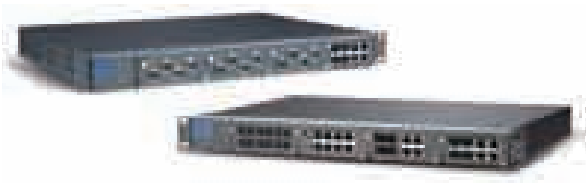
MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7728-PTP series switch
- RJ45-to-DB9 console port cable
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7728 Series

IEC 61850-3 / EN50155 24+4G-port Gigabit modular managed rackmount Ethernet switches



- IEC 61850-3, IEEE 1613 (power substations), and EN50155/EN50121-4 (railway applications) compliant
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Up to 12 ports with M12 connectors
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- NERC CIP compliance
- -40 to 85°C operating temperature range

*Available in Q3, 2011

Introduction

The PowerTrans PT-7728 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN50155/EN50121-4). The PT-7728's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling/wiring costs. The modular design of the PT-7728 also makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 fast Ethernet ports. Along with the optional front or rear wiring, these features together make the PT-7728 suitable for a variety of industrial applications.

General Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP* and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- Supports advanced VLAN capability with Q-in-Q tagging*
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI*, Windows utility, and ABC-01 automatic backup configurator

*Available in Q3, 2011

Cyber-security Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1x port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- Radius/TACACS+ allows you to manage passwords from a central location (available in Q1 Y2011)
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:

IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol

Modular Rackmount Ethernet Switch System, PT-7728



IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP, IPv6, SNMP Inform
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slots 1, 2, and 3 for combinations of 2, 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP.
Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP
Console Port: RS-232 (RJ45)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Mode LED Indicators: LNK/ACT, FDX/HDX, RING/CHAIN PORT, COUPLER PORT, SPEED
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• 24 VDC (18 to 36 V)
• 48 VDC (36 to 72 V)
• 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)
Input Current: (all ports are equipped with fiber)
• Max. 2.58 A @ 24 VDC
• Max. 1.21 A @ 48 VDC
• Max. 0.64/0.33 A @ 110/220 VDC
• Max. 0.53/0.28 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80)
Weight: 5900 g
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

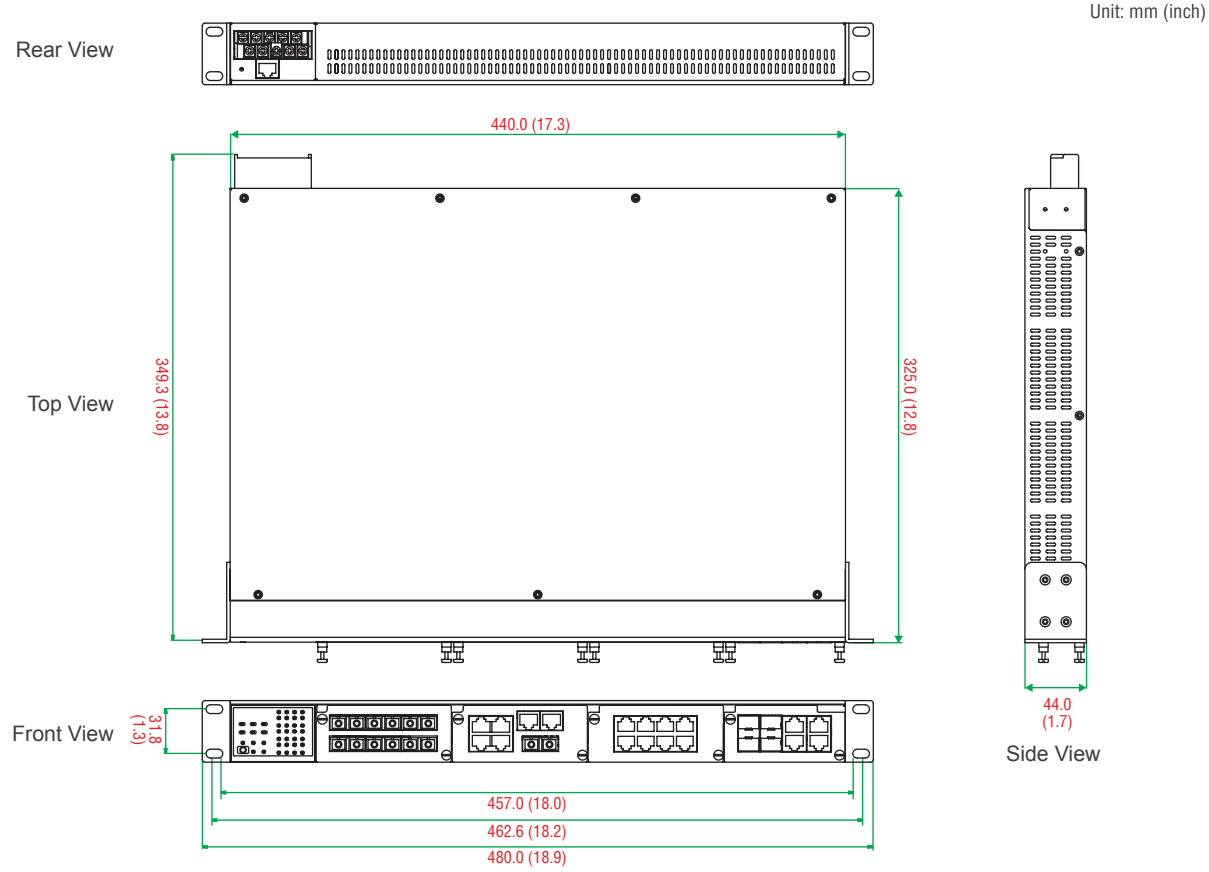
Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Power Automation: IEC 61850-3, IEEE 1613
Rail Traffic: EN 50155, EN 50121-4
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Step 1: Select Ethernet switch system

PT-7728 with power supply

Step 2: Select interface modules

PM-7200 modules (Gigabit or fast Ethernet)

Note: The PT-7728 Ethernet switch system is delivered without interface module. See page 2-42 to choose PM-7200 interface modules.

PT-7728 Modular Rackmount Ethernet Switch System

The PT-7728 switch system consists of 18 modular managed rackmount Ethernet switch systems with 3 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. A total of 28 or 24+4G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
PT-7728-F-24	PT-7728-R-24	1	–	–	–	–	–
PT-7728-F-24-24	PT-7728-R-24-24	1	–	–	1	–	–
PT-7728-F-24-48	PT-7728-R-24-48	1	–	–	–	1	–
PT-7728-F-24-HV	PT-7728-R-24-HV	1	–	–	–	–	1
PT-7728-F-48	PT-7728-R-48	–	1	–	–	–	–
PT-7728-F-48-48	PT-7728-R-48-48	–	1	–	–	1	–
PT-7728-F-48-HV	PT-7728-R-48-HV	–	1	–	–	–	1
PT-7728-F-HV	PT-7728-R-HV	–	–	1	–	–	–
PT-7728-F-HV-HV	PT-7728-R-HV-HV	–	–	1	–	–	1

Note: The PT-7728 Ethernet switch systems provide combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for fast Ethernet interface modules. See page 2-42 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7728-F series
(Front Cabling, Front Display)



PT-7728-R series
(Rear Cabling, Front Display)



Gigabit/Fast Ethernet Modules for the PT-7728

	Interface Modules																													
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8P0E	PM-7200-8SFP	PM-7200-4M12	PM-7200-2MTRJ	PM-7200-8MTRJ	PM-7200-4MST-FL	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP
Slot 1	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–	–	–
Slot 2	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–	–	–
Slot 3	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–	–	–
Slot 4	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7728 series switch
- RJ45-to-DB9 console port cable
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-G7509 Series

IEC 61850-3 / EN50155 9G-port full Gigabit managed rackmount Ethernet switches



- IEC 61850-3, IEEE 1613 (power substations), and EN50155/ EN50121-4 (railway applications) compliant
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- NERC CIP compliance
- -40 to 85°C operating temperature range

*Available in Q3, 2011

Introduction

The PowerTrans PT-G7509 is equipped with 9 combo Gigabit Ethernet ports, making it ideal for upgrading an existing network to Gigabit speeds and building a new full Gigabit backbone. The PT-G7509 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN50155/EN50121-4). Gigabit transmission increases bandwidth to provide higher performance and transfer large amounts of video, voice, and data across a network quickly. The redundant Ethernet Turbo Ring, Turbo Chain, and RSTP/STP (IEEE 802.1w/D) functions increase system reliability and the availability of your network backbone. The choice of either front or rear wiring makes the PT-G7509 suitable for different types of application.

General Features and Benefits

- Command line interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific devices
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP* and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI*, Windows utility, and ABC-01 automatic backup configurator

*Available in Q3, 2011

Cyber-security Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1x port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- Radius/TACACS+ allows you to manage passwords from a central location (available in Q1 Y2011)
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:

IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004* for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s* for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP V2*, IPv6, SNMP Inform, NTP Server/Client*
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: RS-232 (RJ45)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Mode LED Indicators: LNK/ACT, FDX/HDX, RING/CHAIN PORT, COUPLER PORT, SPEED
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• 24 VDC (18 to 36 V)
• 48 VDC (36 to 72 V)
• 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
• Max. 1.17 A @ 24 VDC
• Max. 0.59 A @ 48 VDC
• Max. 0.27/0.16 A @ 110/220 VDC
• Max. 0.61/0.35 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 44 x 254 mm (17.32 x 1.73 x 10.00 in)
Weight: 3300 g
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

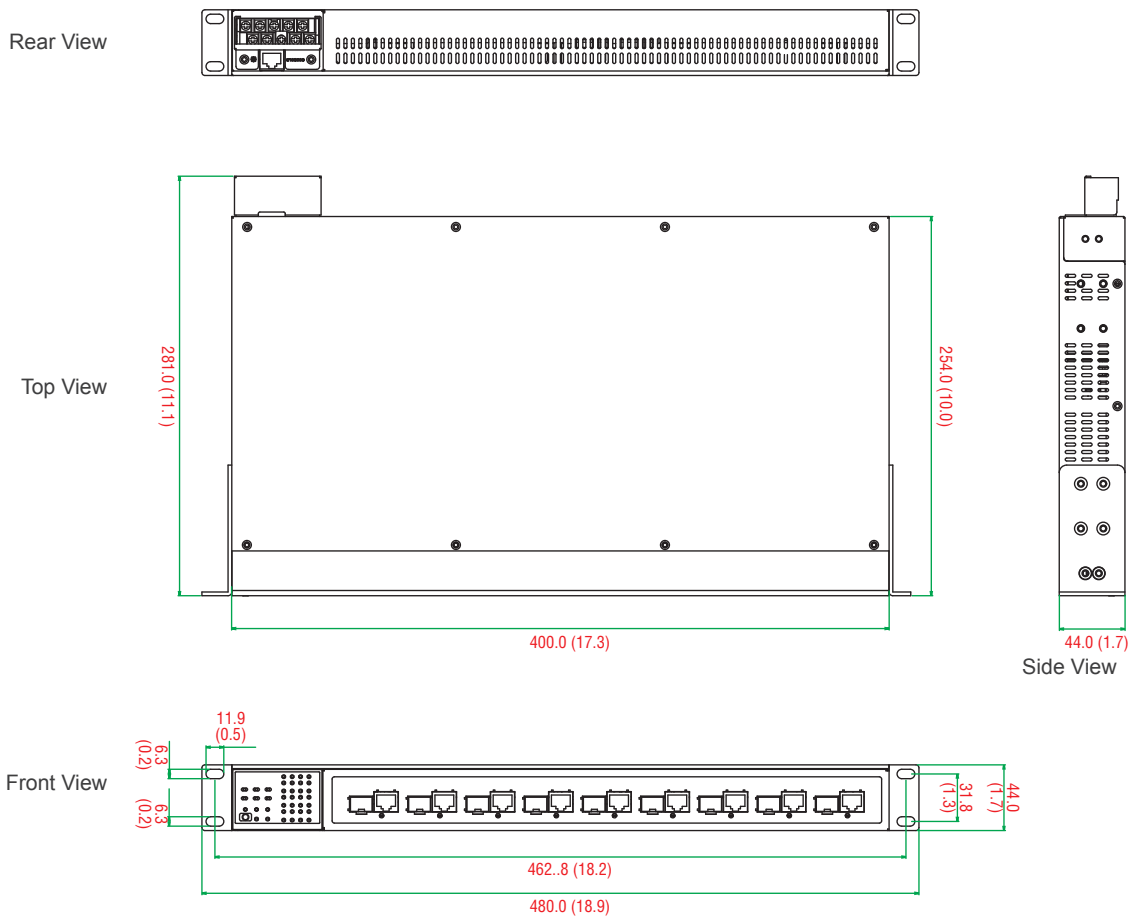
Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Power Automation: IEC 61850-3, IEEE 1613
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

PT-G7509 Full Gigabit Managed Rackmount Ethernet Switch System

The PT-G7509 switch system consists of 9 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slot Gigabit ports and the switch can be used in a temperature range from -40 to 85°C.

Note: See page 1-87 and 1-89 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
PT-G7509-F-24	PT-G7509-R-24	1	–	–	–	–	–
PT-G7509-F-24-24	PT-G7509-R-24-24	1	–	–	1	–	–
PT-G7509-F-24-48	PT-G7509-R-24-48	1	–	–	–	1	–
PT-G7509-F-24-HV	PT-G7509-R-24-HV	1	–	–	–	–	1
PT-G7509-F-48	PT-G7509-R-48	–	1	–	–	–	–
PT-G7509-F-48-48	PT-G7509-R-48-48	–	1	–	–	1	–
PT-G7509-F-48-HV	PT-G7509-R-48-HV	–	1	–	–	–	1
PT-G7509-F-HV	PT-G7509-R-HV	–	–	1	–	–	–
PT-G7509-F-HV-HV	PT-G7509-R-HV-HV	–	–	1	–	–	1

PT-G7509-F series
(Front Cabling, Front Display)



PT-G7509-R series
(Rear Cabling, Front Display)



Optional Accessories (can be purchased separately)

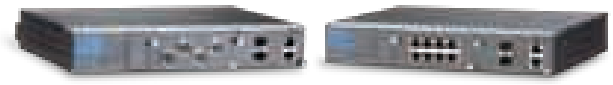
MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-G7509 series switch
- RJ45-to-DB9 console port cable
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7710 Series

IEC 61850-3 / EN 50155 8+2G-port Gigabit modular managed rackmount Ethernet switches



- IEC 61850-3, IEEE 1613 (power substations), and EN50155/ EN50121-4 (railway applications) compliant
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Up to 4 ports with M12 connectors
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- NERC CIP compliance
- -40 to 85°C operating temperature range

*Available in Q3, 2011

Introduction

The PowerTrans PT-7710 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN50155/EN50121-4). The PT-7710's Gigabit and fast Ethernet backbone, redundant ring, and 12/24/48 VDC dual redundant power supplies or 110/220 VDC/VAC power supplies increase the reliability of the communications and reduce cabling and wiring costs. The modular design of the PT-7710 makes network planning easy, and allows greater flexibility by letting you install up to 2 Gigabit ports and 8 fast Ethernet ports, or 10 fast Ethernet ports.

General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP* and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI*, Windows utility, and ABC-01 automatic backup configurator

*Available in Q3, 2011

Cyber-security Features

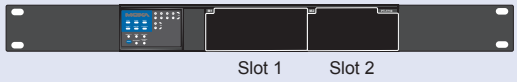
- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1x port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- Radius/TACACS+ allows you to manage passwords from a central location (available in Q1 Y2011)
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control

Modular Rackmount Ethernet Switch System, PT-7710



IEEE 802.1D-2004* for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s* for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP V2*, SNMP Inform, NTP Server/Client*
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control
*Available in Q3, 2011

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slot 1 for any combination of 2, 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP; Slot 2 for 1 or 2-port interface modules with 100BaseFX (SC/ST connector)
Gigabit Ethernet: Slot 2 for 2-port PM-7200 Gigabit Ethernet combo module, 100/1000BaseT(X) or 1000BaseSFP
Console Port: RS-232 (RJ45)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Mode LED Indicators: LNK/ACT, FDX/HDX, RING/CHAIN PORT, COUPLER PORT, SPEED
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• 12/24/48 VDC (9 to 60 V)
• 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)
Input Current: (all ports are equipped with fiber)
• Max. 0.81 A @ 24 VDC
• Max. 0.42 A @ 48 VDC
• Max. 0.17/0.10 A @ 110/220 VDC
• Max. 0.20/0.12 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 266.5 x 44 x 195 mm (10.5 x 1.7 x 7.7 in)
Weight: 2200 g
Installation: 19" rack mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F); cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Power Automation: IEC 61850-3, IEEE 1613
Rail Traffic: EN 50155, EN 50121-4
Note: Please check Moxa's website for the most up-to-date certification status.

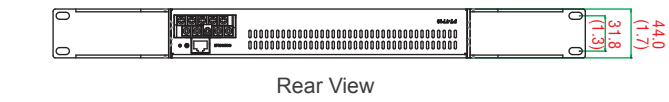
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

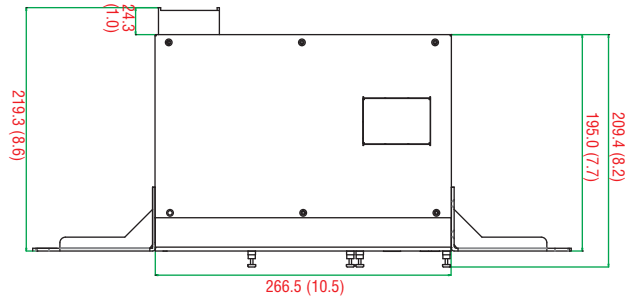
Dimensions

Unit: mm (inch)

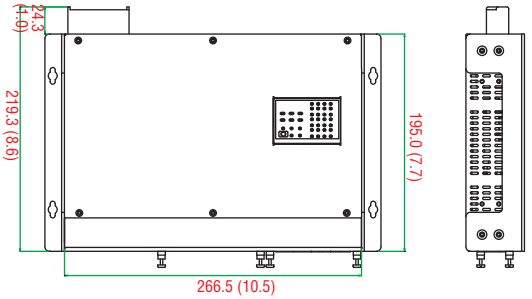
Rack Mounting



Rear View

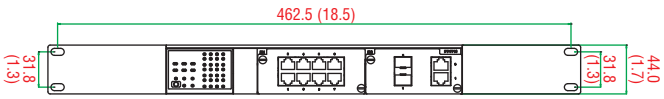


Top View

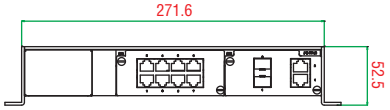


Top View

Side View



Front View



Front View

Ordering Information

Step 1: Select Ethernet switch system → **Step 2: Select interface modules**

PT-7710 with power supply → PM-7200 modules (Gigabit or fast Ethernet)

Note: The PT-7710 Ethernet switch system is delivered without interface module. See page 2-42 to choose PM-7200 interface modules.

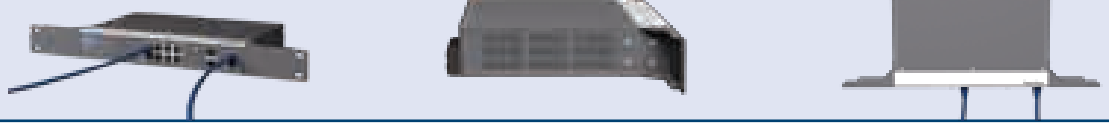
PT-7710 Modular Rackmount Ethernet Switch System

The PT-7710 switch system consists of 4 modular managed rackmount Ethernet switch systems with 1 slot for a fast Ethernet module, and 1 slot for a fast Ethernet or Gigabit Ethernet module. A total of 10 or 8+2G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

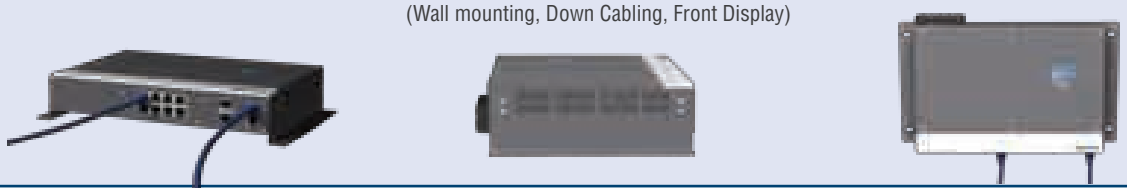
Available Models		Power Supply	
Rackmounting, Front Cabling, Front Display	Wall mounting, Down Cabling, Front Display	LV: 12/24/48 VDC (9 to 60 V) (Dual power inputs)	HV: 88 to 300 VDC and 85 to 264 VAC, isolated
PT-7710-F-LV	PT-7710-D-LV	1	–
PT-7710-F-HV	PT-7710-D-HV	–	1

Note: The PT-7710 Ethernet switch systems provide 1 slot for a Gigabit Ethernet interface module and 1 slot for a fast Ethernet interface module. See page 2-42 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7710-F series
(Rackmounting, Front Cabling, Front Display)



PT-7710-D series
(Wall mounting, Down Cabling, Front Display)



Gigabit/Fast Ethernet Modules for the PT-7710

	Interface Modules																													
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12	PM-7200-2MTRJ	PM-7200-8MTRJ	PM-7200-4MST-FL	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP
Slot 1	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–	–	–
Slot 2	–	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7710 series switch
- RJ45-to-DB9 console port cable
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PM-7200 Series

Gigabit and fast Ethernet modules for PT and IKS series switches

Specifications

Gigabit Ethernet Interface Modules, PM-7200-2G/4G series


PM-7200-4GTXSFP


PM-7200-2GTXSFP

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection

Fiber Ports: 1000BaseSFP slots

Note: The PM-7200-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots. See page 1-87 to select the SFP-1G series Gigabit Ethernet modules for your application.

Fast Ethernet Interface Modules, PM-7200 series


PM-7200-8TX


PM-7200-6MSC
PM-7200-6SSC


PM-7200-6MST


PM-7200-4MSC2TX
PM-7200-4SSC2TX


PM-7200-4MST2TX


PM-7200-2MSC4TX
PM-7200-2SSC4TX


PM-7200-2MST4TX


PM-7200-1LSC6TX


PM-7200-2MSC
PM-7200-2SSC


PM-7200-2MST


PM-7200-1MSC
PM-7200-1SSC


PM-7200-1MST


PM-7200-1MST6TX


PM-7200-1MSC6TX
PM-7200-1SSC6TX


PM-7200-8PoE


PM-7200-8SFP*


PM-7200-4M12


PM-7200-2MTRJ


PM-7200-8MTRJ


PM-7200-4MST-FL


PM-7200-4TX-PTP


PM-7200-4MST-PTP


PM-7200-4MSC-PTP


PM-7200-1BNC2MST-PTP

* See page 1-87 and 1-89 to select SFP-1G/1FE series Gigabit Ethernet and fast Ethernet modules.

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST/MTRJ or SFP LC connector)
PoE Ports: IEEE 802.3af Power-over-Ethernet Technology, provide up to 15.4 watts per port
M12 Ports: 10/100BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection
BNC Ports: Time clock signal PPS (pulses per second) output for IEEE 1588 time synchronization

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Ordering Information

Rackmount Ethernet Switch System and Interface Module Compatibility Chart

Modular Rackmount Ethernet Switch System:

PT-7828/PT-7728-PTP/ PT-7728



PT-7710



IKS-6726



IKS-6726-8PoE



IKS-6324



		Interface Modules																													
		PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1MSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1LSC6TX	PM-7200-8PoE	PM-7200-8SFP*	PM-7200-4M12	PM-7200-2MTRJ	PM-7200-8MTRJ	PM-7200-4MST-FL	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP
PT-7828 PT-7728	Slots 1-3	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–	–
	Slot 4	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PT-7728-PTP	Slots 1-3	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–
	Slot 4	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓
PT-7710	Slot 1	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–	–
	Slot 2	–	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IKS-6726	Slots 1-2	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	–	–	–	–	–	–
	Slot 3	–	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IKS-6726-8PoE	Slot 1	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–
	Slot 2	–	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IKS-6324	Slot 1	–	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

* If you are using an SFP-1FELLC module, the operating temperature is limited to -40 to 75°C (-40 to 167°F).

Gigabit Ethernet Modules for PT and IKS Series Rackmount Ethernet Switches, PM-7200-2G/4G Series

Available Models	Port Interface
	Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*
PM-7200-2GTXSFP	2
PM-7200-4GTXSFP	4

*The PM-7200-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots.

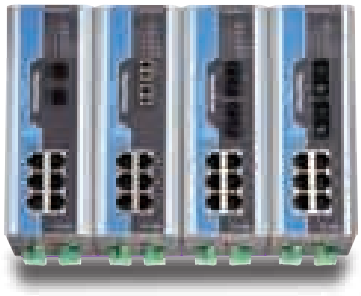
Fast Ethernet Modules for PT and IKS Series Rackmount Ethernet Switches, PM-7200 Series

Available Models	Port Interface									
	10/100BaseT(X)			100BaseFX					100BaseSFP	PPS output, BNC connector
	TP	PoE	M12	Multi-mode, SC Connector	Multi-mode, ST Connector	Multi-mode, MTRJ Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km		
PM-7200-8TX	8	–	–	–	–	–	–	–	–	–
PM-7200-6MSC	–	–	–	6	–	–	–	–	–	–
PM-7200-6MST	–	–	–	–	6	–	–	–	–	–
PM-7200-6SSC	–	–	–	–	–	–	6	–	–	–
PM-7200-4MSC2TX	2	–	–	4	–	–	–	–	–	–
PM-7200-4MST2TX	2	–	–	–	4	–	–	–	–	–
PM-7200-4SSC2TX	2	–	–	–	–	–	4	–	–	–
PM-7200-2MSC4TX	4	–	–	2	–	–	–	–	–	–
PM-7200-2MST4TX	4	–	–	–	2	–	–	–	–	–
PM-7200-2SSC4TX	4	–	–	–	–	–	2	–	–	–
PM-7200-1LSC6TX	6	–	–	–	–	–	–	1	–	–
PM-7200-2MSC	–	–	–	2	–	–	–	–	–	–
PM-7200-2MST	–	–	–	–	2	–	–	–	–	–
PM-7200-2SSC	–	–	–	–	–	–	2	–	–	–
PM-7200-1MSC	–	–	–	1	–	–	–	–	–	–
PM-7200-1MST	–	–	–	–	1	–	–	–	–	–
PM-7200-1SSC	–	–	–	–	–	–	1	–	–	–
PM-7200-1MSC6TX	6	–	–	1	–	–	–	–	–	–
PM-7200-1MST6TX	6	–	–	–	1	–	–	–	–	–
PM-7200-1SSC6TX	6	–	–	–	–	–	1	–	–	–
PM-7200-8SFP	–	–	–	–	–	–	–	–	8	–
PM-7200-4M12	–	–	4	–	–	–	–	–	–	–
PM-7200-2MTRJ	–	–	–	–	–	2	–	–	–	–
PM-7200-8MTRJ	–	–	–	–	–	8	–	–	–	–
PM-7200-4MST-FL	–	–	–	–	4	–	–	–	–	–
PM-7200-4TX-PTP	4	–	–	–	–	–	–	–	–	–
PM-7200-4MST-PTP	–	–	–	–	4	–	–	–	–	–
PM-7200-4MSC-PTP	–	–	–	4	–	–	–	–	–	–
PM-7200-1BNC2MST-PTP	–	–	–	–	2	–	–	–	–	1
PM-7200-8PoE	–	8	–	–	–	–	–	–	–	–

PT-508 Series

Preliminary

IEC 61850-3 8-port managed DIN-Rail Ethernet switches



- IEC 61850-3 and IEEE 1613 (power substations) compliant
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP* for network redundancy
- Easy network management by web browser, CLI*, Telnet/serial console, windows utility, and ABC-01
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- Modbus/TCP, LLDP, SNMP Inform, QoS, IGMP snooping, VLAN, IEEE 802.1X, HTTPS, SNMPv3, and SSH supported
- -40 to 85°C operating temperature range

*Available in Q3, 2011

Introduction

The PowerTrans PT-508 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613). The PT-508's optical fiber fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling/wiring costs. In addition, the DIN-Rail and wallmount design of the PT-508 makes network planning easy, and allows greater flexibility by letting you install up to 8 fast Ethernet ports for power distribution applications.

General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions*
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTP V2* (Precision Time Protocol) for precise time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP* and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI*, Windows utility, and ABC-01 automatic backup configurator

*Available in Q3, 2011

Cyber-security Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1x port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- Radius/TACACS+ allows you to manage passwords from a central location (available in Q1 Y2011)
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
IEEE 802.1s* for Multiple Spanning Tree Protocol
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP V2*,IPv6, SNMP Inform

MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST/LC/MTRJ connector)
Console Port: RS-232 (RJ45)
LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Power Requirements

Input Voltage:
• 24 VDC (18 to 36 V)
• 48 VDC (36 to 72 V)
• 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)
Input Current: (all ports are equipped with fiber)
• Max. 2.86 A @ 24 VDC
• Max. 1.3 A @ 48 VDC
• Max. 0.75/0.38 A @ 110/220 VDC
• Max. 0.6/0.31 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 5-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP40 protection
Dimensions: 60 x 160 x 110 mm (2.36 x 6.30 x 4.33 in)
Weight: 995 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

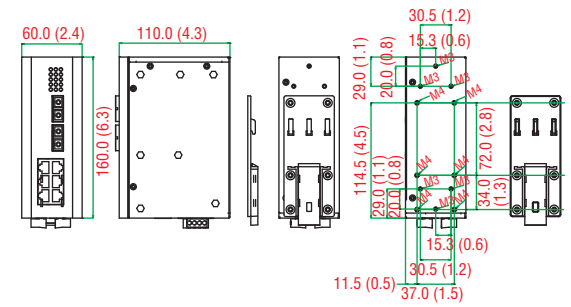
Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Power Automation: IEC 61850-3, IEEE 1613
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Front View Side View DIN-Rail Mounting Kit

Ordering Information

Available Models				Port Interface						
DIN-Rail, Front Cabling, Front Display	Power Supply			10/100BaseT(X)	100BaseFX					
	24 VDC (18 to 36 V)	48 VDC (36 to 60 V)	HV: 88 to 300 VDC and 85 to 264 VAC		Multi-mode, SC Connector	Multi-mode, ST Connector	Multi-mode, LC Connector	Multi-mode, MTRJ Connector	Single-mode, SC Connector	Single-mode, LC Connector
PT-508-SS-SC-24	1	–	–	6	–	–	–	–	2	–
PT-508-SS-SC-48	–	1	–	6	–	–	–	–	2	–
PT-508-SS-SC-HV	–	–	1	6	–	–	–	–	2	–
PT-508-MM-SC-24	1	–	–	6	2	–	–	–	–	–
PT-508-MM-SC-48	–	1	–	6	2	–	–	–	–	–
PT-508-MM-SC-HV	–	–	1	6	2	–	–	–	–	–
PT-508-MM-ST-24	1	–	–	6	–	2	–	–	–	–
PT-508-MM-ST-48	–	1	–	6	–	2	–	–	–	–
PT-508-MM-ST-HV	–	–	1	6	–	2	–	–	–	–
PT-508-MM-LC-24	1	–	–	6	–	–	2	–	–	–
PT-508-MM-LC-48	–	1	–	6	–	–	2	–	–	–
PT-508-MM-LC-HV	–	–	1	6	–	–	2	–	–	–
PT-508-SS-LC-24	1	–	–	6	–	–	–	–	–	2
PT-508-SS-LC-48	–	1	–	6	–	–	–	–	–	2
PT-508-SS-LC-HV	–	–	1	6	–	–	–	–	–	2
PT-508-2MTRJ-24	1	–	–	6	–	–	–	2	–	–
PT-508-2MTRJ-48	–	1	–	6	–	–	–	2	–	–
PT-508-2MTRJ-HV	–	–	1	6	–	–	–	2	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-508 PowerTrans switch
- RJ45-to-DB9 console port cable
- DIN-Rail kit or wall mount ears(optional)
- 1 grounding cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide
- Warranty card



Industrial Ethernet Gateways

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Ethernet Fieldbus Gateways

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Ethernet Fieldbus Gateways



	MGate MB3180	MGate MB3280	MGate MB3480	MGate MB3170 MGate MB3170-T	MGate MB3170I MGate MB3170I-T	MGate MB3270 MGate MB3270-T	MGate MB3270I MGate MB3270I-T
Ethernet Interface							
Number of Ports	1	1	1	2 (1 IP)	2 (1 IP)	2 (1 IP)	2 (1 IP)
Speed	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface							
Number of Ports	1	2	4	1	1	2	2
Serial Standards	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232/422/485
Connectors	DB9-M	DB9-M	DB9-M	RS-232: DB9-M; RS-422/485: Terminal Block		DB9-M	DB9-M
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
Serial Communication Parameters	Data Bits: 7, 8; Stop Bits: 1, 2						
Parity	None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, DTR/DSR (RS-232 only)						
Baudrate	50 bps to 921.6 Kbps						
Isolation	–	–	–	–	✓	–	✓
Software							
Operation Modes	RTU Slave, RTU Master, ASCII Slave, ASCII Master						
Utilities	MGate Manager Suite for Windows 98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64						
Smart Routing	✓	✓	✓	✓	✓	✓	✓
Serial Redirection	–	–	–	–	–	✓	✓
ProCOM	–	–	–	✓	✓	✓	✓
Priority Control	–	–	–	✓	✓	✓	✓
Ethernet Protocol				Modbus TCP			
Serial Protocol				Modbus RTU/ASCII			
Physical Characteristics							
Housing	Metal	Metal	Metal	Plastic	Plastic	Plastic	Plastic
Dimensions	22 x 52 x 80 mm	22 x 77 x 111 mm	35.5 x 103 x 158 mm	29 x 89.2 x 118.5 mm			
Environmental Limits							
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C or -40 to 75°C			
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 70°C	-20 to 70°C	-20 to 70°C	-40 to 85°C	-40 to 85°C	-40 to 85°C	-40 to 85°C
Power Requirements							
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Connector	Power jack	Power jack and terminal block		Terminal block	Terminal block	Terminal block	Terminal block
Standards and Certifications							
Safety	UL 60950-1, EN 60950-1						
Hazardous Location	–	–	–	UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2			
EMC	CE, FCC						
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A						
EMS	EN61000-4-2 (ESD): Level 2, EN61000-4-3 (RS): Level 2, EN61000-4-4 (EFT): Level 2, EN61000-4-5 (Surge): Level 2, EN61000-4-6 (CS): Level 2, EN61000-4-8, EN61000-4-11, EN61000-4-12			EN 55024, EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-11, EN 61000-4-12		
Marine	–	–	–	DNV			
Shock	–	–	–	IEC 60068-2-27			
Freefall	–	–	–	IEC 60068-2-23			
Vibration	–	–	–	IEC 60068-2-6			
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						

Ethernet Fieldbus Gateways






	MGate EIP3170 MGate EIP3170-T	MGate EIP3170I MGate EIP3170I-T	MGate EIP3270 MGate EIP3270-T	MGate EIP3270I MGate EIP3270I-T
Ethernet Interface				
Number of Ports	2 (2 IPs)	2 (2 IPs)	2 (2 IPs)	2 (2 IPs)
Speed	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps
Connector	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface				
Number of Ports	1	1	2	2
Serial Standards	RS-232/422	RS-232/422	RS-232/422	RS-232/422
Connectors	RS-232: DB9-M, RS-422: TB	RS-232: DB9-M, RS-422: TB	DB9-M	DB9-M
ESD Protection	15 KV	15 KV	15 KV	15 KV
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®
Serial Communication Parameters	Data Bits: 7, 8; Stop Bits: 1, 2			
Parity	None, Even, Odd, Space, Mark			
Flow Control	RTS/CTS, DTR/DSR			
Baudrate	1200 bps to 921.6 Kbps			
Isolation	–	✓	–	✓
Software				
Utilities	MGate Manager Suite for Windows 98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64			
Smart Routing	✓	✓	✓	✓
Serial Redirection	–	–	✓	✓
ProCOM	✓	✓	✓	✓
Priority Control	–	–	–	–
Ethernet Protocol	CIP (PCCC) on Ethernet/IP	CIP (PCCC) on Ethernet/IP	CIP (PCCC) on Ethernet/IP	CIP (PCCC) on Ethernet/IP
Serial Protocol	DF1 Full-duplex	DF1 Full-duplex	DF1 Full-duplex	DF1 Full-duplex
Physical Characteristics				
Housing	Plastic	Plastic	Plastic	Plastic
Dimensions	29 x 89.2 x 118.5 mm	29 x 89.2 x 118.5 mm	29 x 89.2 x 118.5 mm	29 x 89.2 x 118.5 mm
Environmental Limits				
Operating Temperature	0 to 55°C or -40 to 75°C	0 to 55°C or -40 to 75°C	0 to 55°C or -40 to 75°C	0 to 55°C or -40 to 75°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-40 to 85°C	-40 to 85°C	-40 to 85°C	-40 to 85°C
Power Requirements				
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Connector	Terminal block	Terminal block	Terminal block	Terminal block
Standards and Certifications				
Safety	UL 60950-1, EN 60950-1			
Hazardous Location	UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2			
EMC	CE, FCC			
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A			
EMS	EN 55024, EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-11, EN 61000-4-12			
Shock	IEC 60068-2-27			
Freefall	IEC 60068-2-23			
Vibration	IEC 60068-2-6			
Marine	–	–	–	–
Reliability				
Warranty	5 years (see www.moxa.com/warranty)			

Smart M2M Gateways





	SMG-1100	SMG-6100
Computer		
CPU Speed	200 MHz	1 GHz
DRAM	32 MB	–
Flash	16 MB	–
LAN Interface		
10/100 Mbps Ethernet Ports	1	4
Magnetic Isolation Protection	1.5 KV	1.5 KV
100BaseFX Fiber Ports (multi-mode)	–	–
Cellular Interface		
Cellular Modes	GPRS/EDGE	–
Radio Frequency Bands	850/900/1800/1900 MHz	–
GPRS Class	12	–
EDGE Class	12	–
Coding Schemes	CS1 to CS4	–
Serial Interface		
RS-232/422/485 Ports	2 (DB9-M)	(Reserved)
ESD Protection	15 KV	–
Serial Communication Parameters	Data Bits: 7, 8; Stop Bits: 1, 2; Parity: None, Even, Odd, Space, Mark	–
Flow Control	RTS/CTS	–
Baudrate	300 bps to 921.6 Kbps (non-standard baudrates supported)	–
LEDs		
System	Ready	Power, Storage
LAN	10M, 100M	10M, 100M
Cellular	Cellular Enabled, Signal Strength	–
Serial	TxD, RxD	TxD, RxD
Physical Characteristics		
Housing	Aluminum (1 mm)	SECC sheet metal (1 mm)
Weight	1 kg	4.5 kg
Dimensions	44 x 119 x 40 mm	440 x 315 x 450 mm
Mounting	DIN-Rail, wall	Rack
Antenna Length	85 mm	–
Environmental Limits		
Operating Temperature	-10 to 60°C	-10 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C
Anti Vibration/Shock	2 g's / 6 g's with DIN-Rail, 20 g's with wall mount	2 g's / 20 g's
Standards and Certifications		
Safety	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC GB4943
EMC	CE, FCC	
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A	
EMS	EN 55024	
Radio	EN 301 489-1, EN 301 489-7, EN 301 511	–
Green Product	RoHS, CRoHS, WEEE	
Reliability		
Buzzer, RTC, WDT	✓	✓
Warranty	5 years (see www.moxa.com/warranty)	

Introduction to Fieldbus Gateways

Seamless communication between Ethernet and Fieldbus devices

Fieldbus is an industrial network system used for real-time distributed control, and provides a way to connect devices in a manufacturing plant. Fieldbus works on a network structure that typically allows daisy-chain, star, ring, branch, and tree network topologies. In the past, computers were connected using RS-232 (serial connections), which only allows two devices to communicate with each other. This is equivalent to the currently used 4-20 mA communication scheme, which requires that each device has its own communication point at the controller level. Fieldbus, on the other hand, is equivalent to LAN-type connections, which require only one communication point at the controller level and allow multiple analog and digital points to be connected at the same time. The fact that Fieldbus works over a network is the main reason it is now widely used in industrial applications.



Moxa's own line of Fieldbus gateways is the MGate series:

- MGate MB3000 Series: Modbus TCP to Modbus serial gateways
- MGate EIP3000 Series: EtherNet/IP to DF1 gateways

The MGate family uses several innovative design concepts and powerful options to make the gateways easy to use. In particular, ProCOM is a user-friendly tool that simplifies implementation.

MGate™ MB3000 Series: Modbus TCP to Modbus Serial Gateways

Modbus is the standard protocol for communicating between a wide range of industrial devices, including PLCs, DCSs, HMIs, instruments, meters, motors, and drives. Moxa's MGate™ MB3000 is specially designed to integrate Modbus TCP and Modbus RTU/ASCII networks. MGate™ MB3000 products support one or two Ethernet connections, and up to four serial ports.

The MGate™ MB3000 series of Modbus gateway products support some or all of these advanced features:

- Multiple masters
- Priority control
- Smart routing
- Serial redirector
- Powerful Windows Utility with multi-language support
- Built-in protocol analyzer
- ProCOM
- Built-in optical isolation for industrial device protection (isolation models only)

MGate™ EIP3000 Series: EtherNet/IP to DF1 Gateways

The EtherNet/IP and DF1 protocols are used by Rockwell and AB PLC, respectively, as their main communications protocols. A problem faced by many engineers is figuring out how to connect devices that use these two different protocols. One option is to buy an expensive, budget-busting PLC communications interface module. However, a much more cost-effective option is to use Moxa's MGate™ line of products, which are specially designed to integrate EtherNet/IP and DF1 networks.

The MGate™ EIP3000 series of Modbus gateway products support some or all of these advanced features:

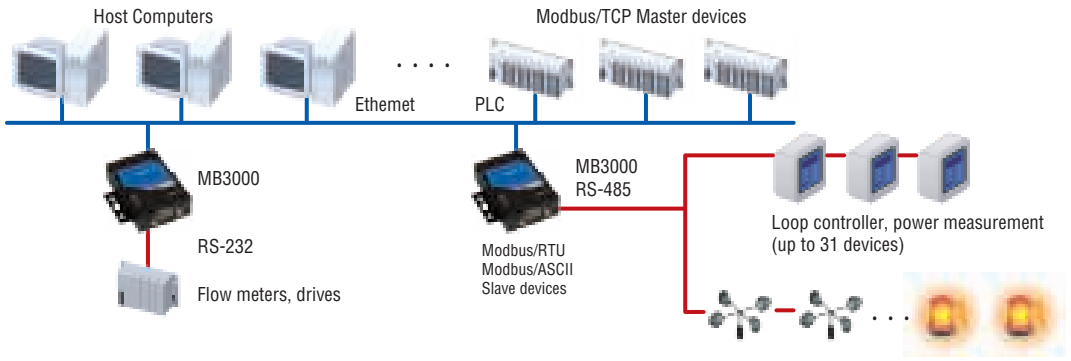
- Multiple EtherNet/IP connections
- Smart routing
- Serial redirector
- Powerful Windows utility with multi-language support
- Built-in protocol analyzer
- ProCOM
- Built-in optical isolation for industrial device protection (Isolation models only)

Features of the MGate™ MB3000 Series

Multiple Masters across Different Modbus Networks for Fully Compliant Operation

The MGate™ MB3000 supports 16 simultaneous TCP masters with up to 32 simultaneous requests per master. Serial masters are able to access up to 32 different IP addresses as TCP slaves. MGate™ MB3000 gateways have been designed so that even with multiple masters across different Modbus networks, communication remains compliant with each Modbus protocol.

Supports 16 TCP masters with up to 32 requests per master

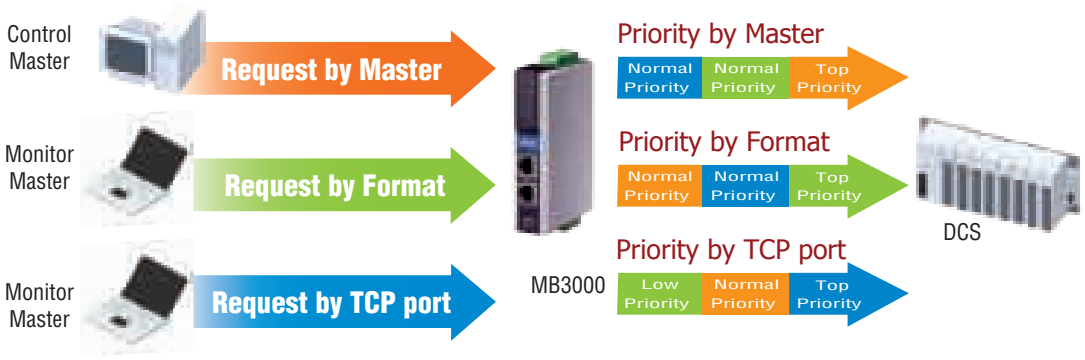


Built-in Optical Isolation for Industrial Device Protection

The MGate™ MB3000 series includes two advanced models—the MB3170I and MB3270I—that offer built-in optical isolation for the serial signals as an option. Optical isolation helps prevent dangerous ground loops, spikes, and surges.

Priority Control for Critical Commands (Patented)

Flag urgent commands for immediate response



Other Modbus gateways simply transfer all requests between Modbus networks on a FIFO (first in first out) basis, with no accommodation for urgent commands that require immediate attention. The advanced models of the MGate™ MB3000 (the MB3170 and MB3270) include a patent-pending priority control feature that allows urgent commands to be flagged for immediate response based on IP address, command type, or TCP port. The priority control feature allows the advanced models of the MB3000 series to get around the latency experienced by other Modbus gateways. With the priority control feature, the advanced MB3000 models are an ideal component of real-time control systems.

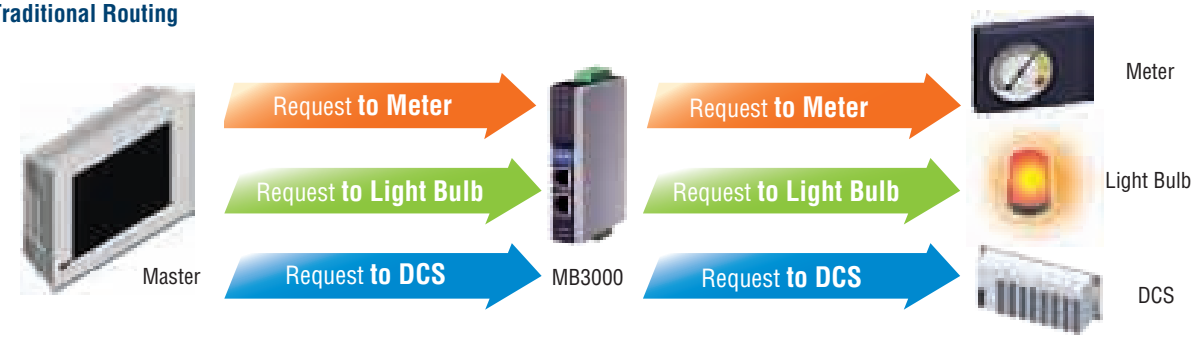
Patent Numbers: (US/TW)

US7,743,192 B2 / I332618
US7,725,635 B2 / I321007

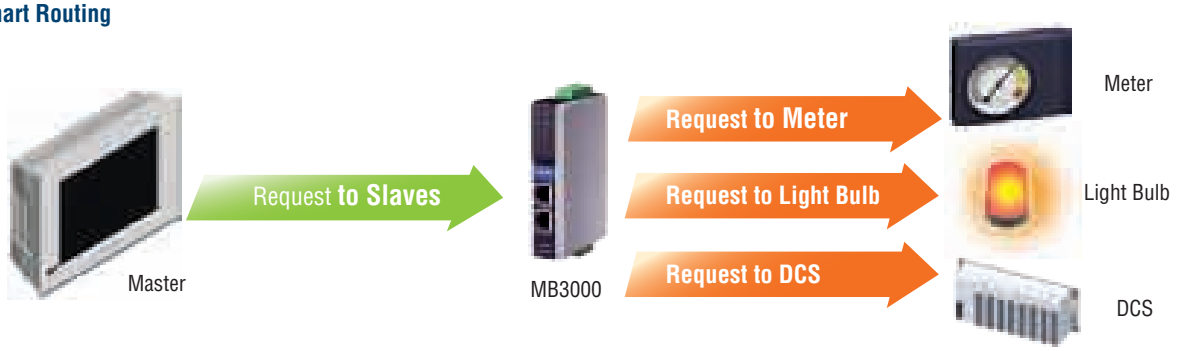
No Change to Existing Architecture with Smart Routing and Serial Redirector

Automatic Routing

Traditional Routing



Smart Routing



The MGate™ MB3270, MB3280, and MB3480 include smart routing for enhanced compatibility with existing Modbus networks. Other Modbus gateways require a separate socket connection for each serial port, making them useless for TCP masters that can only open one connection. With smart routing on the MB3000 Modbus gateway, a TCP master can use just one socket connection to command serial slaves on every serial port.

The MGate™ MB3270 has a serial redirector function that allows additional options for Modbus network integration. The serial redirector function allows the commands of a serial master to be redirected to serial slaves on another port. In addition, a serial master can operate simultaneously with TCP masters or other serial masters, without altering the Modbus architecture or software. Using the serial redirector function, advanced MB3000 gateways can establish redundant backup control or Ethernet monitoring of Modbus networks that were originally designed for a single serial master.

Create a backup system



Features of the MGate™ EIP3000 Series

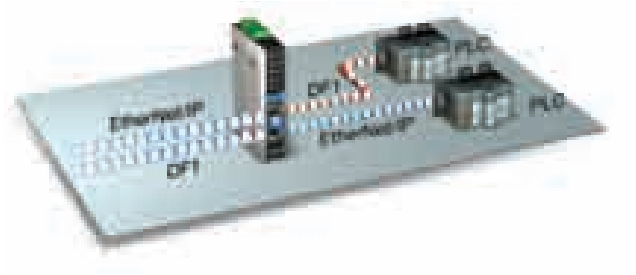
Support for Multiple EtherNet/IP Connections

The MGate™ EIP3000 series products support up to 8 EtherNet/IP servers (incoming connections) and 8 EtherNet/IP clients (outgoing connections) simultaneously. Each connection can be set up for connected messaging (CM) or unconnected messaging (UCMM), and can send up to 16 requests at one time.



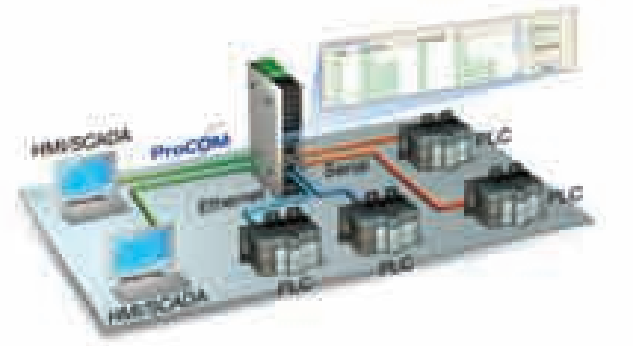
Easy-to-Use Routing Table

When using different serial port gateways, it is important to set up the "slave ID to serial port" mapping. Even when using a 1-port gateway, some legacy devices are only manufactured with one unique ID for all units. In this case, the ID must be translated before a message is sent to the same control network, and it helps the host computer to recognize all devices as individual units. The MGate™ EIP3000 is designed to meet all slave ID routing requirements. With MGate™ Manager, setting up a complete routing table is quick and easy with the graphical user interface that helps users design their "slave ID to serial port" mapping.



Use ProCOM to Implement Control via COM Port Mapping to Generate Four Additional Virtual Serial Channels

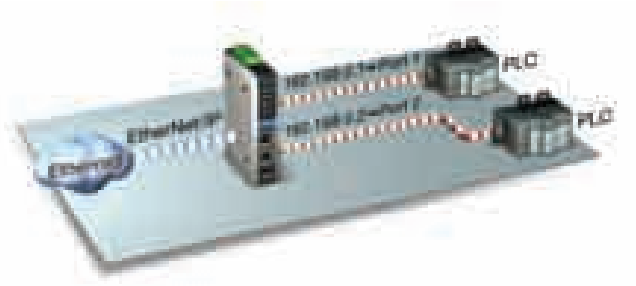
Most host software uses COM ports as a control interface. The MGate™ EIP3000 however, which is much more than just a device server, provides a COM mapping function and also retains DF1 connection capability. The MGate™ EIP3000 supports Windows 2000/XP/2003/Vista, and provides COM port mapping control of device servers and DF1 behavior compatibility of gateways. Each MGate™ EIP3000 gateway supports four virtual serial ports for remote control over an Ethernet connection.



Individual IP for Each Serial Port

For some SCADA software, such as RSLinx, the slave ID for an Ethernet connection is designed as a fixed number for every IP, which poses a problem when using multiple serial port gateways. If a gateway provides only one IP on the Ethernet network, devices connected to other serial ports will never receive requests or commands from the SCADA software.

With the IP alias function, the MGate™ EIP3000 supports an individual IP for each serial port, allowing SCADA software to communicate through the gateway with DF1 devices on different serial ports at the same time.



MGate™ MB3180/3280/3480

1, 2, and 4-port standard Modbus gateways



- Convert between Modbus TCP and Modbus RTU/ASCII
- 1 Ethernet port and 1, 2, or 4 RS-232/422/485 ports
- 16 simultaneous TCP masters with up to 32 simultaneous requests per master
- Easy hardware setup and configuration

Overview

The MB3180, MB3280, and MB3480 are standard Modbus gateways that convert between Modbus TCP and Modbus RTU/ASCII protocols. Up to 16 simultaneous Modbus TCP masters are supported, with up to 31 RTU/ASCII slaves per serial port. For RTU/ASCII masters, up to 32 TCP slaves are supported.

Standard Modbus Network Integration

The three standard MGate™ models (MB3180, MB3280, and MB3480) are designed for easy integration of Modbus TCP and RTU/ASCII networks. With these models, Modbus serial slave devices can be seamlessly incorporated into an existing Modbus TCP network, and Modbus TCP slaves can be made accessible to serial masters. The MB3180, MB3280, and MB3480 offer features that make network integration easy, customizable, and compatible with almost any Modbus network.

High Density, Cost-effective Gateways

The MGate™ MB3000 gateways can effectively connect a high density of Modbus nodes to the same network. The MB3280 can manage up to 62 serial slave nodes, and the MB3480 can manage up to 124 serial slave nodes. Each RS-232/422/485 serial port can be configured individually for Modbus RTU or Modbus ASCII operation and for different baudrates, allowing both types of networks to be integrated with Modbus TCP through one Modbus gateway.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports:
MB3180: 1
MB3280: 2
MB3480: 4
Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
ESD Protection: 15 KV for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR (RS-232 only)
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Operation Modes: RTU Slave, RTU Master, ASCII Slave, ASCII Master
Utilities: MGate Manager for Windows 98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64
Multi-master and Multi-drop:
Master mode: 32 TCP slaves
Slave mode: 16 TCP masters (request queue 32-deep for each master)
Bonus Feature: Smart Routing

Physical Characteristics

Housing: Metal, IP30 protection
Weight:
MGate MB3180: 340 g
MGate MB3280: 360 g
MGate MB3480: 740 g

Dimensions:
Without ears:
MB3180: 22 x 52 x 80 mm (0.87 x 2.05 x 3.15 in)
MB3280: 22 x 77 x 111 mm (0.87 x 3.03 x 4.37 in)
MB3480: 35.5 x 103 x 158 mm (1.40 x 4.06 x 6.22 in)
With ears:
MB3180: 22 x 75.2 x 80 mm (0.87 x 2.96 x 3.15 in)
MB3280: 22 x 100 x 111 mm (0.87 x 3.94 x 4.37 in)
MB3480: 35.5 x 103 x 181 mm (1.40 x 4.06 x 7.14 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Connector:
MGate MB3180: Power jack
MGate MB3280/3480: Power jack and terminal block
Power Consumption:
MGate M3180: 200 mA (max.)
MGate M3280: 250 mA (max.)
MGate M3480: 385 mA (max.)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 2,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8,
EN 61000-4-11,
EN 61000-4-12

Reliability

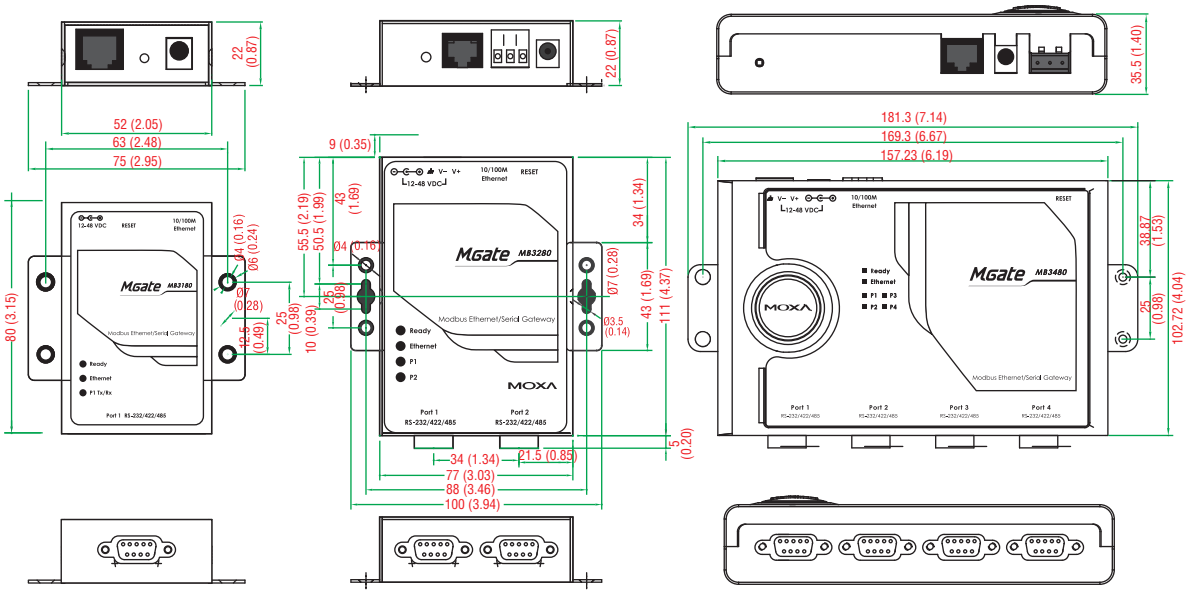
MTBF (mean time between failures):
MGate M3180: 628,376 hrs
MGate M3280: 503,029 hrs
MGate M3480: 295,812 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate MB3180: 1-port standard Modbus gateway
MGate MB3280: 2-port standard Modbus gateway
MGate MB3480: 4-port standard Modbus gateway

Optional Accessories (can be purchased separately)

DK-35A: Mounting kit for 35-mm DIN-rail

DK-35A



Package Checklist

- 1 MGate MB3180 or MB3280 or MB3480 modbus gateway
- Power Adaptor
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MGate™ MB3170/3270

1 and 2-port advanced serial-to-Ethernet Modbus gateways



- Configuration is exceptionally easy
- Slave mode supports 16 TCP masters and up to 31 or 62 serial slaves at the same time
- Master mode supports 32 TCP slaves at the same time
- Emergency request tunnels ensure QoS control
- Serial redirector function provided
- Embedded Modbus protocol analyzer
- Redundant dual DC power inputs
- Built-in Ethernet cascading for easy wiring

Overview

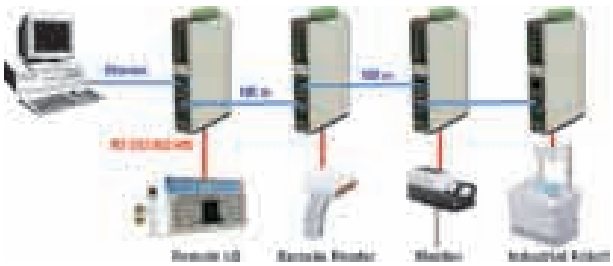
The MB3170 and MB3270 are advanced Modbus gateways that provide maximum flexibility for integrating industrial Modbus networks of all types and sizes. They are designed to integrate Modbus TCP, ASCII, and RTU devices in almost any master and slave combination, including serial master to serial slave, or simultaneous serial and Ethernet masters. A special priority control feature allows urgent commands to obtain an immediate response. All models are ruggedly constructed, are DIN-rail mountable, and offer built-in optical isolation for serial signals as an option.

Integrate TCP Masters without Altering the Modbus RTU/ASCII Network or Software

The MB3270 can integrate Modbus TCP with Modbus RTU/ASCII, without modifying the existing Modbus RTU/ASCII architecture or software. With the serial redirector function, a serial master can maintain direct access to serial slave devices through a specially mapped serial port. This allows the serial and TCP masters to access serial slaves simultaneously.

Cascade Ethernet Ports for Easy Wiring

Advanced models of the MGate™ MB3000 series have two Ethernet ports to make network wiring easier. Dual Ethernet ports allow users to string multiple Modbus gateways together using standard RJ45 Ethernet cables, eliminating the need for a separate Ethernet switch.



Redundant Power Inputs

Advanced models of the MB3000 series have dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources, so that continuous operation is provided even if one power source fails. The higher level of reliability makes these advanced Modbus gateways ideal for demanding industrial applications.

Warning by Relay Output

A relay output is provided for the Ethernet link and power input status. The relay output gives maintenance engineers an additional tool for troubleshooting and maintenance.

Priority Control for Urgent Commands (Patented)

As Modbus networks increase in size and complexity, the lag time between commands and responses becomes a major concern. Advanced models of the MB3000 series provide a priority control function for urgent commands, allowing users to force certain commands to get an immediate response. Depending on your system's requirements, different methods are available to define which commands receive priority.

Patent Numbers: (US/TW)
US7,743,192 B2 / I332618
US7,725,635 B2 / I321007

Specifications

Ethernet Interface
Number of Ports: 2 (1 IP)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface
Number of Ports:
MB3170/3170I: 1
MB3270/3270I: 2
Serial Standards: RS-232/422/485, software selectable
Connectors:
MB3170/3170I: DB9 male for RS-232, Terminal block for RS-422/485
MB3270/3270I: DB9 male x 2
ESD Protection: 15 KV for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ
Terminator for RS-485: 120 Ω

Serial Communication Parameters
Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR (RS-232 only)
Baudrate: 50 bps to 921.6 Kbps

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software
Operation Modes: RTU Slave, RTU Master, ASCII Slave, ASCII Master
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Utilities: MGate Manager for Windows 98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64
Multi-master and Multi-drop:
Master mode: 32 TCP slaves
Slave mode: 16 TCP masters (request queue 32-deep for each master)
Bonus Features: Smart Routing, Serial Redirection, Priority Control

Physical Characteristics
Housing: Plastic
Weight:
MGate MB3170: 360 g
MGate MB3270: 380 g
Dimensions:
Without ears: 29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)
With ears extended: 29 x 89.2 x 124.5 mm (1.14 x 3.51 x 4.90 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: 12 to 48 VDC
Power Connector: Terminal block
Power Consumption:
MGate M3170: 435 mA (max.)
MGate M3170I: 555 mA (max.)
MGate M3270: 435 mA (max.)
MGate M3270I: 510 mA (max.)

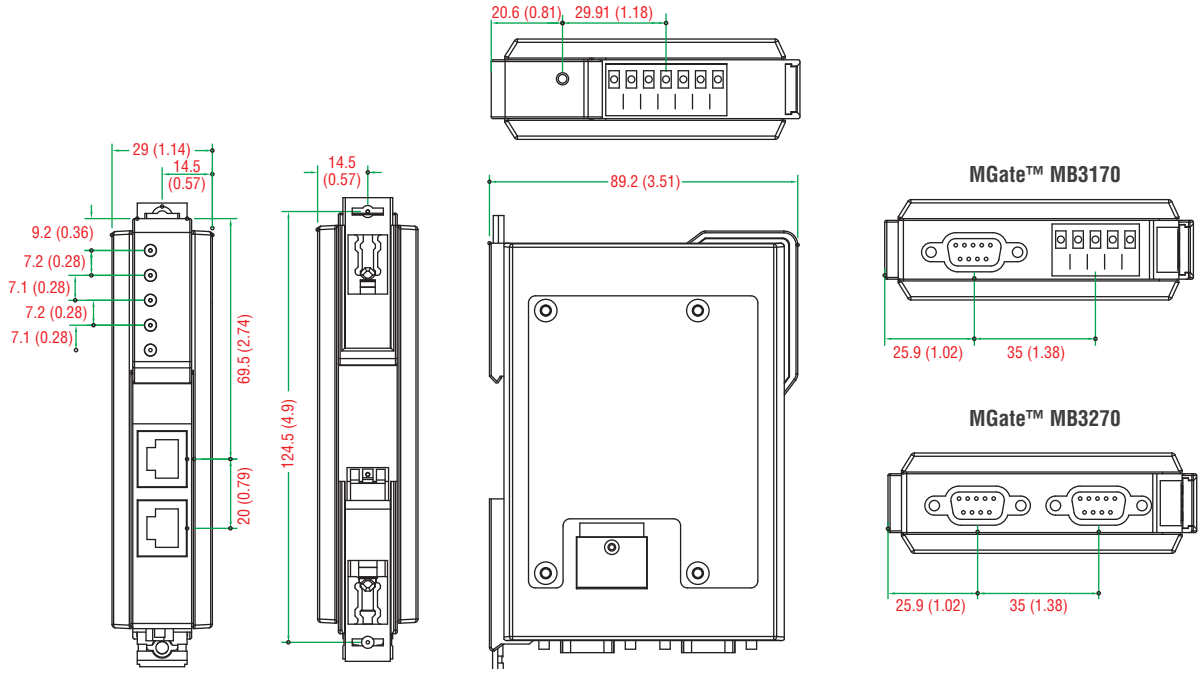
Standards and Certifications
Safety: UL 60950-1, EN 60950-1
Hazardous Location:
UL/cUL Class I Division 2 Groups A/B/C/D,
ATEX Zone 2
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 4,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11,
EN 61000-4-12
Marine: DNV
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-23
Vibration: IEC 60068-2-6

Reliability
MTBF (mean time between failures):
MGate M3170: 210,794 hrs
MGate M3270: 125,234 hrs

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate MB3170: 1-port advanced Modbus gateway, 0 to 55°C operating temperature
MGate MB3170I: 1-port advanced Modbus gateway with 2 KV isolation, 0 to 55°C operating temperature
MGate MB3270: 2-port advanced Modbus gateway, 0 to 55°C operating temperature
MGate MB3270I: 2-port advanced Modbus gateway with 2 KV isolation, 0 to 55°C operating temperature
MGate MB3170-T: 1-port advanced Modbus gateway, -40 to 75°C operating temperature
MGate MB3170I-T: 1-port advanced Modbus gateway with 2 KV isolation, -40 to 75°C operating temperature
MGate MB3270-T: 2-port advanced Modbus gateway, -40 to 75°C operating temperature
MGate MB3270I-T: 2-port advanced Modbus gateway with 2 KV isolation, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-45-24: 24 VDC DIN-rail power supply (2 A @ 45 W) with universal 85 to 264 VAC input
DR-75-24: 24 VDC DIN-rail power supply (3.2 A @ 75 W) with universal 85 to 264 VAC input
DR-120-24: 24 VDC DIN-rail power supply (5 A @ 120 W) with switch for choosing 88 to 132 VAC, or 176 to 264 VAC input

Package Checklist

- 1 MGate MB3170 or MB3170I or MB3270 or MB3270I modbus gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MGate™ EIP3000 Series

1 and 2-port EtherNet/IP to DF1 gateways



- PCCC objects for Rockwell Automation networks supported
- Use ProCOM to implement control via COM port mapping
- 16 simultaneous EtherNet/IP client/server pairs with up to 16 queued requests
- Serial redirector keeps the original serial master and slave connection while connecting devices to the Ethernet
- EtherNet/IP and DF1 protocol analyzer for easy troubleshooting
- Redundant dual DC power inputs
- Built-in Ethernet cascading for easy wiring
- -40 to 75°C wide operating temperature models available

Overview

MGate™ EIP3000 gateways provide EtherNet/IP to DF1 protocol conversion for users who need to connect Allen Bradley PLCs to an EtherNet/IP network. With a number of innovative functions, the MGate™ series overcomes the difficulties of connecting between legacy serial devices and SCADA software. Both 1 and 2-port gateways are available for use with different sized control networks.

Protocol Conversion between DF1 and EtherNet/IP

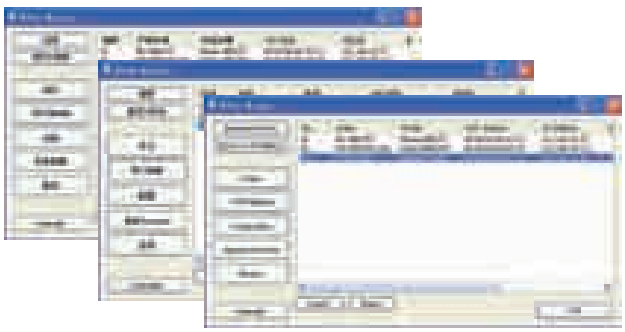
By supporting PCCC objects on CIP, the MGate™ EIP3000 can communicate seamlessly with SCADA software such as RSLinx. For users who develop control software based on EtherNet/IP, MGate EIP3000 offers the standard interface for connection.

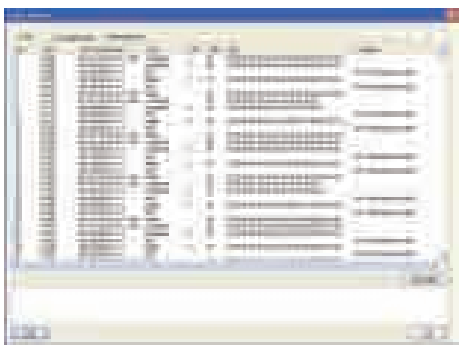
Support for Multiple EtherNet/IP Connections

MGate™ EIP3000 gateways support up to 16 EtherNet/IP clients and servers simultaneously. Each client can send up to 16 requests at a time, and the multiple connection capability can help establish redundancy for more complex control systems.

Windows Utility for Easy Setup and Traffic Monitoring

Moxa provides a user-friendly Windows utility with multi-language support. The utility supports a traffic monitoring function for EtherNet/IP and DF1 protocols, and not only logs events initiated by the gateway, but also records all commands and responses that pass through the gateway. The utility helps users determine the root cause of failures and performance bottlenecks.





Serial Redirector Function Maintains Original Master/Slave Connections

The serial redirector function allows the commands of a serial master (command initiator) to be redirected to the serial slave (command executor) on another port. In addition, a serial master can operate simultaneously with EtherNet/IP masters without changing the DF1 architecture or software. With the serial redirector function, MGate™ EIP3000 gateways can establish redundant control of legacy slave devices that were originally designed to be controlled by a single serial master.

ProCOM Implements Control via COM Port Mapping

Each MGate™ EIP3000 gateway supports virtual serial ports for the remote PC. You can connect to the MGate™ EIP3000 through the COM port by using Moxa's Real COM driver, with the actual physical connection over the Ethernet. The gateway supports up to 4 virtual COM port connections and offers greater flexibility when designing redundant control systems.

Pull high/low Resistors and Terminator Selection

When using termination resistors to prevent serial signal reflection, it is important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible with all environments, the EIP3000 has DIP switches on the bottom panel for setting the termination and pull high/low resistor values.

Built-in Isolation

Complex device networks that incorporate high amperage devices could be subject to electrical signal distortion from electrical discharges, magnetic noise, or common mode transients. MGate™ series products solve this problem by using built-in optical isolation.

Specifications

Ethernet Interface

Number of Ports: 2 (2 IPs)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports:
EIP3170/3170I: 1
EIP3270/3270I: 2
Serial Standards: RS-232/422, software selectable
Connectors:
EIP3170/3170I: DB9 male for RS-232, terminal block for RS-422
EIP3270/3270I: DB9 male x 2
ESD Protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 8
Stop Bits: 1, 2
Parity: None, Even, Odd
Flow Control: RTS/CTS, DTR/DSR (RS-232 only)
Baudrate: 1200 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
Ethernet Protocol: CIP (PCCC) on EtherNet/IP
Serial Protocol: DF1 Full-duplex

Software

Driver Support: Windows Real COM Drivers: Windows 2000, Windows XP/2003/Vista/200/8/7 x86/x64

Physical Characteristics

Housing: Plastic
Weight:
MGate EIP3170: 360 g
MGate EIP3270: 380 g
Dimensions:
Without ears: 29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)
With ears extended: 29 x 89.2 x 124.5 mm (1.14 x 3.51 x 4.90 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Connector: Terminal block
Power Consumption:
MGate M3170: 435 mA (max.)
MGate M3170I: 555 mA (max.)
MGate M3270: 435 mA (max.)
MGate M3270I: 510 mA (max.)

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location:
UL/cUL Class I Division 2 Groups A/B/C/D,
ATEX Zone 2
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 4,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11,
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-23
Vibration: IEC 60068-2-6

Reliability

MTBF (mean time between failures):
MGate EIP3170: 210,794 hrs
MGate EIP3270: 125,234 hrs

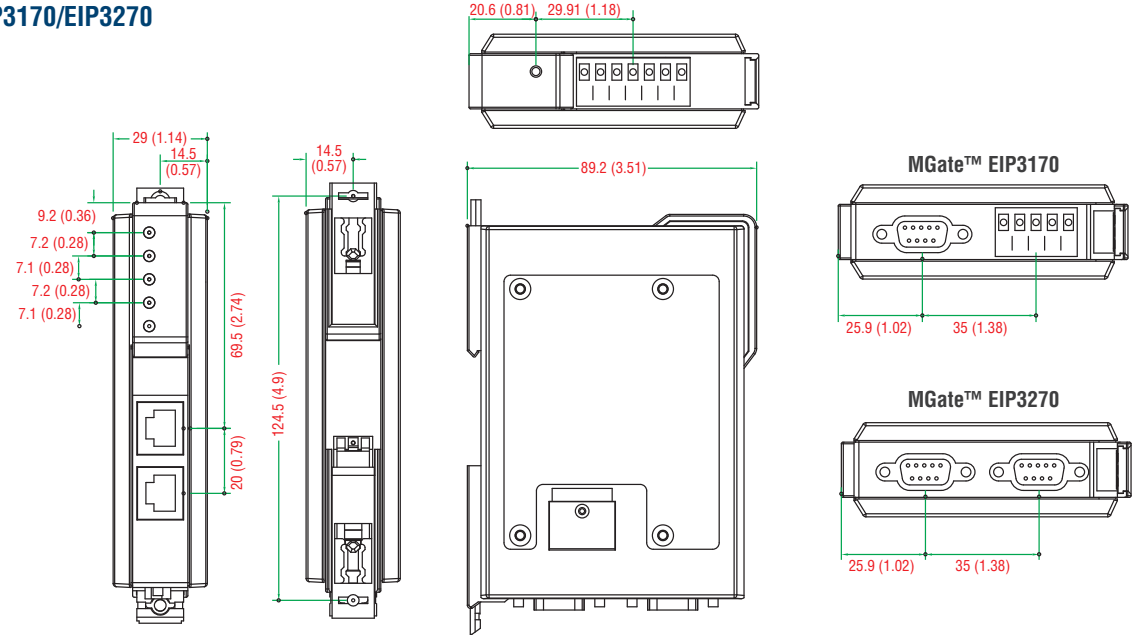
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

EIP3170/EIP3270



Ordering Information

Available Models

MGate EIP3170: 1-port EtherNet/IP to DF1 gateway, 0 to 55°C operating temperature
MGate EIP3170I: 1-port EtherNet/IP to DF1 gateway with 2 KV isolation, 0 to 55°C operating temperature
MGate EIP3270: 2-port EtherNet/IP to DF1 gateway, 0 to 55°C operating temperature
MGate EIP3270I: 2-port EtherNet/IP to DF1 gateway with 2 KV isolation, 0 to 55°C operating temperature
MGate EIP3170-T: 1-port EtherNet/IP to DF1 gateway, -40 to 75°C operating temperature
MGate EIP3170I-T: 1-port EtherNet/IP to DF1 gateway with 2 KV isolation, -40 to 75°C operating temperature
MGate EIP3270-T: 2-port EtherNet/IP to DF1 gateway, -40 to 75°C operating temperature
MGate EIP3270I-T: 2-port EtherNet/IP to DF1 gateway with 2 KV isolation, -40 to 75°C operating temperature

Package Checklist

- 1 MGate EIP3170 or EIP3170I or EIP3270 or EIP3270I EtherNet/IP gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

DR-45-24: 24 VDC DIN-rail power supply (2 A @ 45 W) with universal 85 to 264 VAC input
DR-75-24: 24 VDC DIN-rail power supply (3.2 A @ 75 W) with universal 85 to 264 VAC input
DR-120-24: 24 VDC DIN-rail power supply (5 A @ 120 W) with switch for choosing 88 to 132 VAC, or 176 to 264 VAC input

SMG-1100 Series

Smart machine-to-machine Modbus gateway with 2 serial ports, GPRS/EDGE, Ethernet, IPsec



- Built-in GPRS/EDGE cellular communication
- Frequency bands: 850/900/1800/1900 MHz supported
- 2 software selectable RS-232/422/485 serial ports
- 300 bps to 921.6 Kbps, non-standard baudrates supported
- 10/100 Mbps Ethernet for network redundancy
- Supports Modbus RTU and Modbus ASCII serial protocols
- Supports Modbus TCP
- Generate and filter out gateway exceptions
- Use Modbus addressing to route network traffic
- Automatic connection management
- Supports IPsec
- User interface for Modbus & IPsec configuration

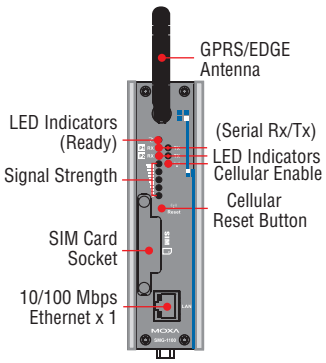
Overview

The SMG-1100 series features two software selectable RS-232/422/485 ports, one Ethernet port, and quad-band GPRS/EDGE 900/1800/850/1900 MHz for cellular communication.

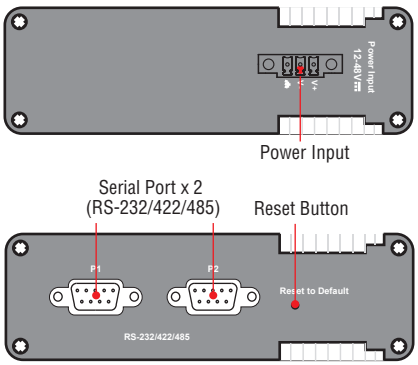
The SMG-1100 series provides a sophisticated wireless M2M solution for distributed Modbus devices. The SMG-1100 networks Modbus devices with Modbus RTU/ ASCII protocols can work well via GPRS/EDGE or Ethernet to Modbus TCP, and each serial port can support up to 31 serial slaves to IP network. Implemented with the protocol conversion functionality, the SMG-1100 can serve both serial master and slave and the built-in IPsec function guarantees that data transmission is encrypted even in a wireless environment.

Appearance

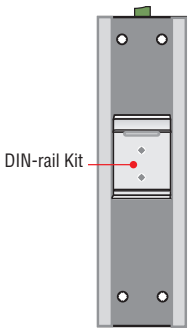
Front View



Top/Bottom View

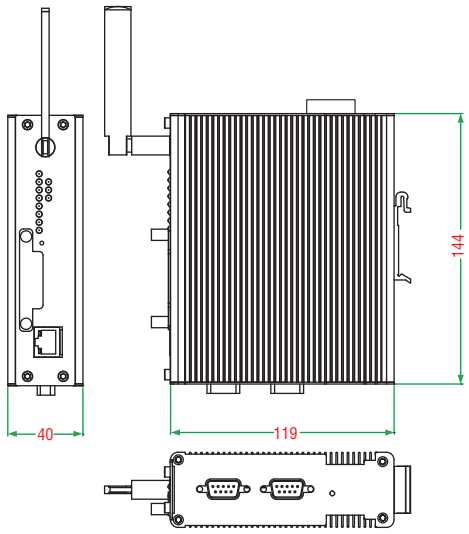


Rear View



Dimensions

Unit: mm (inch)



Specifications

Ethernet Interface
LAN: 1 auto-sensing 10/100 Mbps port (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Cellular Interface
Cellular Modes: GPRS, EDGE
Radio Frequency Bands: 850/900/1800/1900 MHz
GPRS Class: 12
EDGE Class: 12
Coding Schemes: CS1 to CS4

Serial Interface
Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)
ESD Protection: 15 KV ESD protection for all signals

Serial Communication Parameters
Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, None
Baudrate: 300 bps to 921.6 Kbps

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs
System: Ready
LAN: 10M/Link, 100M/Link (on connector)
Cellular: Cellular Enable, Signal Strength (5 LEDs)
Serial: TxD, RxD

Switches and Buttons
Reset Button: Supports "Reset to Factory Default"
Cellular Reset Button: Supports cellular reset function

Physical Characteristics
Housing: Aluminum (1 mm)
Weight: 1 kg
Dimensions: (without ears or antenna)
144 x 119 x 40 mm (5.7 x 4.7 x 1.6 in)
Mounting: DIN-Rail, wall (requires optional wall mount kit)
Antenna Length: 85 mm

Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -20 to 80°C (-4 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 2 g's @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis
Anti-shock:
• With DIN-Rail kit: 6 g's @ IEC-68-2-27, half sine wave, 11 ms
• With optional wall mount kit: 20 g's @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements
Input Voltage: 12 to 48 VDC
Power Consumption:
• 300 mA @ 24 VDC
• 600 mA @ 12 VDC

Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024
Radio: EN 301 489-1, EN 301 489-7, EN 301 511
Green Product: RoHS, CRoHS, WEEE

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock) with battery backup
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
SMG-1100: Smart machine-to-machine Modbus gateway with 2 serial ports, GPRS/EDGE, Ethernet, IPSec

Package Checklist
- 1 SMG-1100 Modbus gateway
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- GPRS/EDGE antenna
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

SMG-6100 Series

Smart machine-to-machine gateway with 4 Ethernet ports, VGA, USB, IPsec



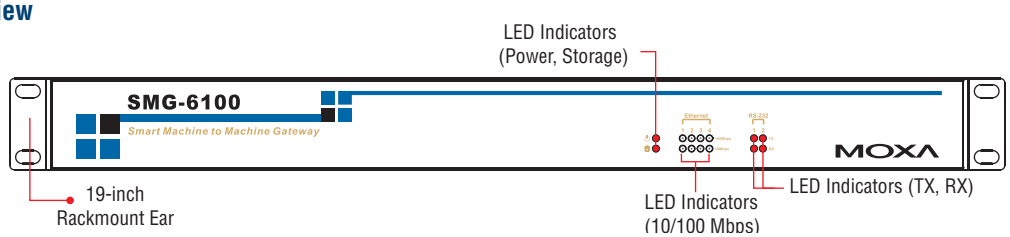
- Secure communication platform with tunnel server (IPSec) for 2-way IP communication to distributed Modbus Gateway (SMG-1100)
- Networking host to back-end host and Modbus TCP Master/Slave devices
- Supports unlimited Masters on serial or network side
- Modbus and IPsec configuration with SMG Manager 1.0

Overview

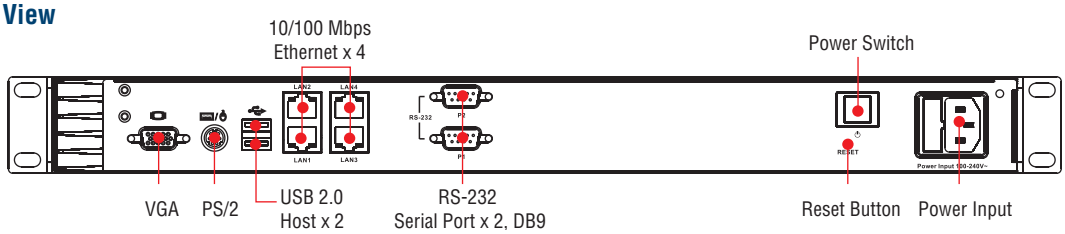
The SMG-6100 smart gateway can be used with sophisticated M2M solutions for constructing a tunnel server (IPsec) and bi-directional IP communications. When used with Moxa's SMG-1100 Series, the SMG-6100 can serve as a secure networking host over IPsec to back-end host computers and Modbus TCP Master/Slave devices. One of the key benefits of this architecture is that it can work with an unlimited number SMG-1100 units to facilitate and accelerate the remote monitoring and management of Modbus devices.

Appearance

Front View

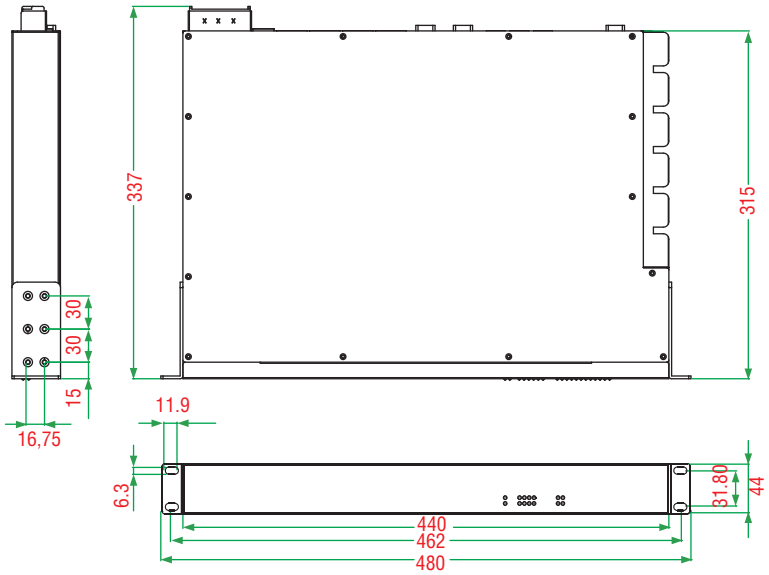


Rear View



Dimensions

Unit: mm (inch)



Specifications

Ethernet Interface

LAN: 4 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: Reserved

LEDs

System: Power x 1, Storage x 1
LAN: 10M x 4, 100M x 4
Serial: RS-232: 2 x Tx, 2 x Rx

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 4.5 kg
Dimensions: 440 x 315 x 45 mm (19-inch 1U height)
Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -20 to 80°C (-4 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: Single Input, 100 to 240 VAC auto ranging, 47 to 63 Hz for AC input
Power Consumption: 26 W

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC GB4943
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024
Radio: EN 301 489-1, EN 301 489-7, EN 301 511
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with battery lithium backup
Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

SMG-6100: Smart machine-to-machine gateway with 2 serial ports, 4 Ethernet ports, VGA, USB, IPsec

Package Checklist

- 1 SMG-6100 gateway
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Power cord
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card



Ethernet Media Converters

Product Selection Guide

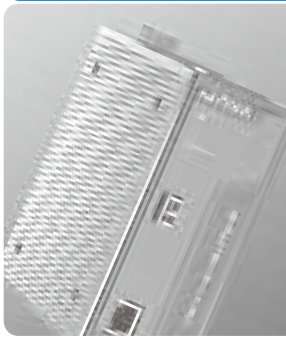
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NRack Systems

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Ethernet-to-Fiber Media Converters

PTC-101 Series: IEC 61850-3 and EN50155 Ethernet-to-fiber media converters 4-9
IMC-P101 Series: IEEE 802.3af PoE Ethernet-to-fiber media converters 4-12
IMC-101G: Industrial Gigabit Ethernet-to-fiber media converter 4-14
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IMC-21 Series: Entry-level industrial 10/100BaseT(X) to 100BaseFX media converters 4-18



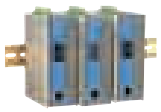
Chassis Media Converters





	TRC-190-AC TRC-190-DC	CSM-200-1213 CSM-200-1214	CSM-200-1218
Optical Fiber Interface			
Fiber Connector	–	SC or ST	SC
Cable Requirements	–	Multi-mode: 50/125, 62.5/125, or 100/140 µm	Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Transmission Distance	–	5 km	40 km
Wavelength	–	1300 nm	1310 nm
Tx Output	–	-10 to -20 dBm	0 to -5 dBm
Rx Sensitivity	–	-32 dBm	-34 dBm
Point-to-Point Transmission	–	Point-to-Point Transmission: Half-duplex or full-duplex	Point-to-Point Transmission: Half-duplex or full-duplex
Fast Ethernet Interface			
Connector	–	RJ45	
Speed	–	10/100BaseT(X)	
Physical Characteristics			
Housing	SECC (1.2 mm)	–	–
Dimensions (mm)	440 x 260 x 77 mm	86.8 x 136.5 x 21 mm	86.8 x 136.5 x 21 mm
Weight	5.2 kg (11.4 lbs), with one power module installed	CSM-200-1213: 115 g (0.25 lb) CSM-200-1214: 125 g (0.28 lb)	125 g (0.28 lb)
Number of Slots	19 slots in the front for slide-in modules, 2 slots in the back for power supply modules	–	–
Environmental Limits			
Operating Temperature	0 to 60°C	0 to 60°C	0 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C
Power Requirements			
Input Voltage	AC model: Universal 100 to 240 VAC (47 to 63 Hz) DC model: 36 to 72 VDC	12 VDC	12 VDC
Power Consumption	5.4 A @ 12 V (max. output)	180 mA @ 12 VDC	180 mA @ 12 VDC
Standards and Certifications			
Safety	UL 60950-1, EN 60950-1		
EMC	CE, FCC		
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A		
EMS	EN61000-4-2 (ESD) Level 4, EN61000-4-3 (RS) Level 2, EN61000-4-4 (EFT) Level 3, EN61000-4-5 (Surge) Level 3, EN61000-4-6 (CS) Level 2, EN61000-4-8 (PFMF) Level 3, EN61000-4-11 (DIPS)	EN61000-4-2 (ESD) Level 4, EN61000-4-3 (RS) Level 3, EN61000-4-4 (EFT) Level 3, EN61000-4-5 (Surge) Level 3, EN61000-4-6 (CS) Level 2, EN61000-4-8 (PFMF) Level 3	
Freefall	–	IEC 60068-2-32	
Reliability			
Warranty	5 years (see www.moxa.com/warranty)		

Ethernet-to-Fiber Media Converters





	IMC-101G Series	IMC-101 Series	IMC-P101 Series	PTC-101 Series (LV models)	PTC-101 Series (HV models)	IMC-21 Series
IEEE Standards						
IEEE 802.3	✓	✓	✓	✓	✓	✓
IEEE 802.3u	✓	✓	✓	✓	✓	✓
IEEE 802.3ab	✓	–	–	–	–	–
IEEE 802.3z	✓	–	–	–	–	–
IEEE 802.3x	–	–	✓	✓	✓	✓
IEEE 802.3af	–	–	✓	–	–	–
Interface						
RJ45 Ports	10/100/1000BaseT(X)	10/100BaseT(X)				
Fiber Modes	Multi-mode Fiber / Single-mode Fiber					
Fiber Ports	Optional 1000BaseSX/LX/LHX/ZX (LC connector)	100BaseFX (SC or ST connectors)		100BaseFX (SC, ST, or LC connectors)		100BaseFX (SC or ST)
LED Indicators	PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (TP and Fiber port)	PWR1, PWR2, FAULT, 10/100M (TP port), 100M (Fiber port), FDX/COL (Fiber port)	PWR1, PWR2, Fiber Link/Act, PSE Indicator, 10/100M (TP port)	PWR1, PWR2, Fiber Link/Act, 10/100M (TP port)	PWR, Fiber Link/Act, 10/100M (TP port)	Power, 10/100M (TP port), 100M (fiber port), FDX/COL (fiber port)
DIP Switches	Port break alarm, Fault Pass-Through, Fiber AN/Force	100BaseFX Full/Half duplex selection, Port break alarm	Auto Negotiation, Force TP Speed, Force TP Duplex, Link Fault Pass Through, Operating Mode, PSE, P.R.R. (PD Remote Reset)	Auto Negotiation, Force TP Speed, Force TP Duplex, Link Fault Pass Through, Operating Mode		TP port's 10/100M, Half/Full modes, and Force/Auto modes, fiber connection's Full/Half mode, Link Fault Pass-Through (LFP)
Alarm Contact	Relay output: 1 A @ 24 VDC					–
Multi-mode Transmission Distance						
1000BaseSX	See SFP-1G series datasheet	–	–	–	–	–
1000BaseLX	See SFP-1G series datasheet	–	–	–	–	–
Single-mode Transmission Distance						
1000BaseLX	See SFP-1G series datasheet	–	–	–	–	–
1000BaseLHX	See SFP-1G series datasheet	–	–	–	–	–
1000BaseZX	See SFP-1G series datasheet	–	–	–	–	–
Physical Characteristics						
Housing	Metal (IP30)					Plastic (IP30)
Dimensions (mm)	53.6 x 135 x 105	53.6 x 135 x 105	51.65 x 144.45 x 110.2	66.65 x 135.1 x 101.4	66.65 x 135.1 x 101.4	25 x 109 x 97
Weight	630 g	630 g	525 g	690 g	690 g	125 g
Installation	DIN-Rail mounting, wall mounting (with optional kit)					DIN-Rail mounting
Environmental Limits						
Operating Temperature	0 to 60°C for standard models, -40 to 75°C for wide-temperature models			-40 to 85°C		-10 to 60°C
Operating Humidity	5 to 95% RH					
Storage Temperature	-40 to 85°C					-40 to 70°C
Power Requirements						
Input Voltage	24 VDC (12 to 45 VDC), redundant inputs	24 VDC (12 to 45 VDC), redundant inputs	48 VDC (46 to 57 VDC), redundant inputs	20 VDC to 72 VDC	85 VAC to 264 VAC 88 VDC to 300 VDC	12 to 48 VDC
Input Current	110 mA @ 24 VDC	160 mA @ 24 VDC	430 mA @ 48 VDC	170 mA @ 20 VDC	73 mA @ 85 VAC 47 mA @ 88 VDC	150 mA @ 24 VDC
Connection	Removable terminal block					
Overload Current Protection	2.5 A	1.1 A	1.6 A	1.6 A	1.6 A	1.1 A
Reverse Polarity Protection	✓	✓	✓	✓	✓	✓
PoE	–	–	PSE, provides up to 15.4 W for PD	–	–	–
Standards and Certifications						
Safety	UL 508	UL 508, UL 60950-1, EN 60950-1	UL 508	UL 60950-1	UL 60950-1	UL 508, EN 60950-1
EMI	FCC Part 15, CISPR (EN55022) class A					
EMS	EN61000-4-2 (ESD) Level 3, EN61000-4-3 (RS) Level 3, EN61000-4-4 (EFT) Level 3 EN61000-4-5 (Surge) Level 2, EN61000-4-6 (CS) Level 3, EN61000-4-8, EN61000-4-11		IEC 61000-4-2 (ESD) Level 4, IEC 61000-4-3 (RS) Level 3, IEC 61000-4-4 (EFT) Level 4, IEC 61000-4-5 (Surge) Level 3, IEC 61000-4-6 (CS) Level 3, IEC 61000-4-8 (PFMF) Level 1, IEC 61000-4-11	EN 61000-4-2 (ESD) Level 4, EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 4, EN 61000-4-6 (CS) Level 3, EN 61000-4-8 (PFMF) Level 5, EN 61000-4-11		EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 2, EN 61000-4-4 (EFT) Level 2, EN 61000-4-5 (Surge) Level 2, EN 61000-4-6 (CS) Level 2, EN 61000-4-8 (PFMF) Level 1
Hazardous Location	UL/cUL Class1, Division 2, Groups A, B, C, and D, ATEX Class1, Zone 2, Ex nC IIC		–	–	–	–
Power	–	–	–	IEC 61850-3, IEEE 1613	IEC 61850-3, IEEE 1613	–
Rail Traffc	–	–	–	EN50155/EN50121-4	EN50155/EN50121-4	–
Freefall	IEC60068-2-32					
Shock	IEC60068-2-27					
Vibration	IEC60068-2-6					
Maritime	–	DNV, GL	–	–	–	–
MTBF	500,540 hrs	401,000 hrs	435,210 hrs	1,211,613 hrs	1,211,613 hrs	353,000 hrs
Reliability						
Warranty	5 years (see http://www.moxa.com/warranty)					

Introduction to the NRack System™

Introduction

Fiber converters have been widely used for FTTH and FTTP in transportation automation, power system automation, and many other automation systems. The primary advantages of fiber optic communications compared to wired cabling are ESD immunity, wide bandwidth, zero data loss, and long distance data transmission capability.

Media converters are generally used in connected pairs. That is, two media converters are used in tandem, with one converter located at the control center, and the other converter located at a remote site. This is the ideal setup from a central management point of view, in which all data is transmitted back to the control center for processing in a central computing system. For systems that require many media converters at the central site, system integrators must determine how and where to mount the converters and how to arrange power supplies.

Chassis-type media converters are a perfect choice for systems that require installing several converters in a confined space. Moxa's NRack System™ is designed to help customers who are faced with the challenge of installing a high density media converter system. The NRack System™ saves time since less mounting is required, and the power input wiring problem is much easier to handle.

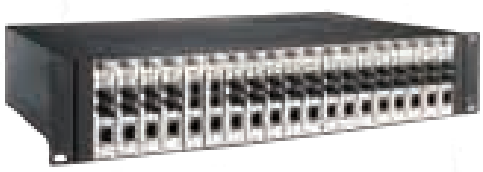
An NRack System™ consists of 3 major components: Rackmount Chassis, Slide-in Modules, and Power Supply Modules. Installing the power supply module in the chassis can save quite a bit of space since you do not need to deal with numerous power adaptors connecting to the various converters installed in your control center. Two main types of slide-in modules are available. One type handles data transmission only, whereas the other type is used to manage the entire chassis system.



Moxa's Ethernet media converters provide a wide range of solutions for applications that require industrial media converters. Moxa's media converters include entry-level, industrial-grade, and power source equipment (PSE) stand-alone converters and modular chassis-based slide in series converters designed for harsh industrial environments. The Ethernet media converters feature 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X, Link Fault Pass-Through (LFP), and wide temperature support for hazardous locations.

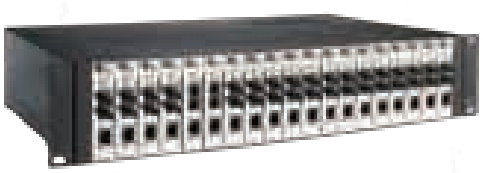
New Ethernet-to-Fiber Slide-in Converters with Rackmount Chassis

Moxa's NRack System™ allows you to centralize the management of your Ethernet media converters. The NRack System™ is designed for use in harsh industrial environments that are subject to extremely low or extremely high temperatures, and can be powered by either an AC or a DC power input. Users can install as many as 19 CSM-200 Ethernet-to-fiber converter modules in one NRack System™ chassis.



TRC-190 Series

Rackmount chassis for the NRack System™



- 19-inch chassis for rackmount use
- 19 slots for high density applications
- Supports hot-swap and dual power input with redundancy
- Fan-less chassis design reduces repair time

Introduction

The TRC-190 series provides 19 slots for media converter modules from the CSM-200 series of Ethernet-to-fiber modules and the TCF-142-RM series of serial-to-fiber modules. A TRC-190 chassis comes with one AC or DC power input, with an optional redundant power expansion module available for greater reliability. The TRC-190 series' power input module supports the hot-swap feature.

Specifications

Physical Characteristics

Housing: SECC (1.2 mm)
Dimensions: 440 x 260 x 77 mm (18.6 x 11 x 3.3 in)
Weight: 5.2 kg (11.4 lbs), with one power module installed
Number of Slots: 19 slots in the front for slide-in modules, 2 slots in the back for power supply modules

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: Universal 100 to 240 VAC (47 to 63 Hz) or 36 to 72 VDC
Power Consumption:
Max. Output: 5.4 A @ 12 V

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class B, FCC Part 15 Subpart B Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (PFMF) Level 3,
EN 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

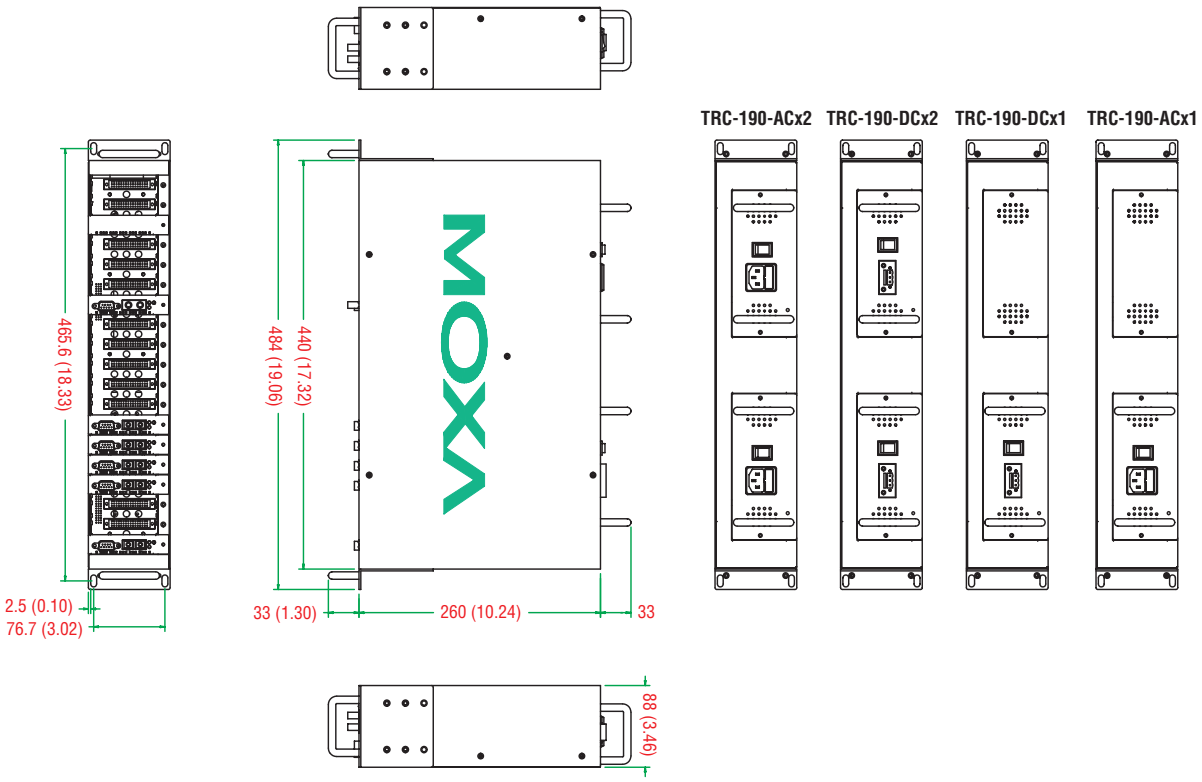
Time: 1,055,112 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TRC-190-AC: Rack chassis, 2U, single 110 to 240 VAC input, with 19 slots on front panel
TRC-190-DC-48: Rack chassis, 2U, single 36 to 72 VDC input, with 19 slots on front panel

Available Slide-in Modules

CSM-200-1213: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector
CSM-200-1214: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector
CSM-200-1218: 10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector
TCF-142-M-SC-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM: RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM: RS-232/422/485 to single-mode fiber slide-in module converter, ST connector

Optional Accessories (can be purchased separately)

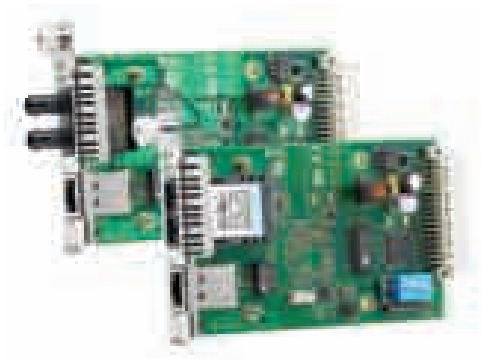
PWR-190-AC: Redundant power supply, 110 to 240 VAC
PWR-190-DC-48: Redundant power supply, 36 to 72 VDC
Plate-1: Face plate to cover unused front panel slots (required for all unused slots)

Package Checklist

- 1 TRC-190 with single power input
- Power cord (for TRC-190-AC only)
- 18 face plates
- User's Manual (printed)
- Warranty card

CSM-200 Series

10/100BaseT(X) to 100BaseFX slide-in modules for the NRack System™



- LFP (Link Fault Pass-through) and FEF (Far End Fault)
- Two different operation modes
  - Store-and-Forward
  - Pass Through
- Auto Negotiation
- Supports TS-1000 Version 2 protocol
- Supports Turbo Ring V2
- Plug and Play
- Hot-swap

Introduction

The CSM-200 modules are slide-in Ethernet-to-fiber media converters for the NRack System™. The modules provide media conversion from 10/100BaseT(X) to 100BaseFX (SC/ST connectors), and can be installed in any NRack System™ chassis.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT,
IEEE 802.3u for 100BaseT(X), 100BaseFX

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: PWR, Fiber Link, 10/100M (TP port)
DIP Switches:

Dip	Function	ON	OFF
1	Auto Negotiation	Enable	Disable
2	Force TP Speed	100 Mbps	10 Mbps
3	Force TP Duplex	Full Duplex	Half Duplex
4	Link Fault Pass Through	Enable	Disable
5	Operating Mode	Store-and-Forward	Pass Through

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm, 3.5 PS/(nm*km) fiber optic cable

Physical Characteristics

Housing: SPCC
Dimensions: 86.8 x 124.3 x 21 mm (3.42 x 4.89 x 0.83 in)
Weight:
Product only:
CSM-200-1213: 115 g (0.25 lb)
CSM-200-1214/1218: 125 g (0.28 lb)
Packaged:
CSM-200-1213: 170 g (0.37 lb)
CSM-200-1214/1218: 180 g (0.40 lb)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 VDC
Power Consumption: 180 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (PFMF) Level 3
Freefall: IEC 60068-2-32

MTBF (mean time between failures)

Time: 1,454,560 hrs
Database: Telcordia (Bellcore), GB

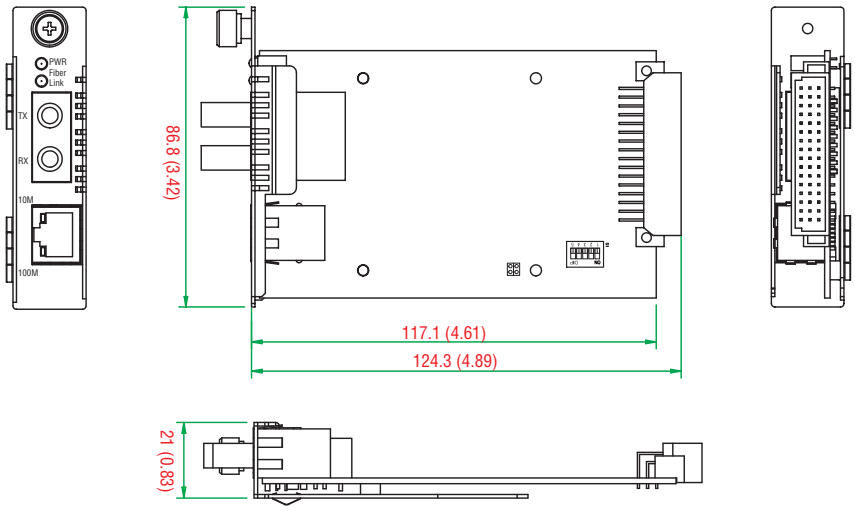
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

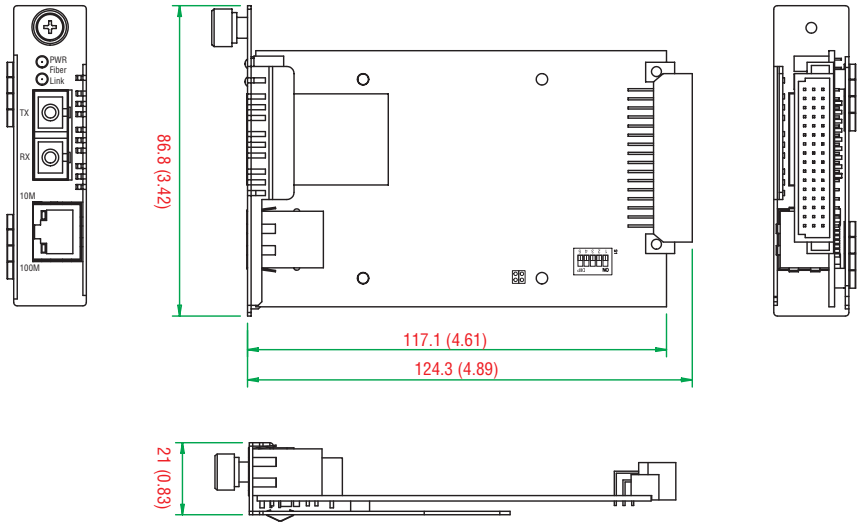
Dimensions

Unit: mm (inch)

CSM-200-1213



CSM-200-1214/CSM-200-1218



Ordering Information

Available Models

CSM-200-1213: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector
CSM-200-1214: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector
CSM-200-1218: 10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector

Package Checklist

- 1 CSM-200 media converter
- Quick installation guide (printed)
- Warranty card

PTC-101 Series

IEC 61850-3 and EN50155 Ethernet-to-fiber media converters



- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- Link Fault Pass-Through (LFP)
- Power failure alarm by relay output (LV model only)
- -40 to 85°C operating temperature range
- Redundant dual DC power inputs
- Integrated high-reliability power supply eliminates the need for external power transformer

Introduction

The PTC-101 Ethernet-to-fiber media converters convert from 10/100BaseT(X) to 100BaseFX. Models are available with either SC, ST, or LC connectors. The PTC-101 converters eliminate the need for additional wiring, and support IEEE 802.3 and IEEE 802.3u/x protocols with 10/100M, full/half-duplex, and MDI/MDI-X auto-sensing to provide a total solution for your industrial Ethernet networks.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X), 100BaseFX

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST/LC connectors)
LED Indicators: PWR1, PWR2, Fiber Link, 10/100M (TP port)
DIP Switches:

DIP No.	Function	ON	OFF
1	Auto Negotiation	Enable	Disable
2	Force TP Speed	100 Mbps	10 Mbps
3	Force TP Duplex	Full Duplex	Half Duplex
4	Link Fault Pass Throuth	Enable	Disable
5	Operating Mode	Store-and-Forward	Pass Through

The default setting for all DIP switches is ON.

Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm, 3.5 PS/(nm*km) fiber optic cable

Physical Characteristics

Housing: Aluminum, IP30 protection
Dimensions: 122.5 x 90 x 20 mm (4.82 x 3.54 x 0.79 in)
Weight:
Product only: 690 g
Packaged: 875 g

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage:

Power Supply Type		Power Consumption	Fuse Rating
LV - DC	20 to 72 VDC	170 mA @ 20 VDC	3.15A(T) 2
HV - AC	85 to 264 VAC	73 mA @ 85 VAC	3.15A(T) 2
HV - DC	88 to 300 VDC	47 mA @ 88 VDC	3.15A(T) 2

Connection: Removable terminal block
Overload Current Protection: 1.6 A (protects against two signals shorted together)
Reverse Polarity Protection: Protects against V+/V- reversal

Standards and Certifications

Safety: UL 60950-1
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 4,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 4,
EN 61000-4-5 (Surge) Level 4,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8 (PFMF) Level 5,
EN 61000-4-11
Power Automation: IEC 61850-3, IEEE 1613
Rail Traffic: EN 50155, EN 50121-4
Freefall: IEC 60068-2-32

Vibration: IEC-61850-3, IEC-60870-2-2
Green Product: RoHS, CRoHS, WEEE
Note: Refer to the "Environmental Type Tests" table below for more detailed information.

MTBF (mean time between failures)

Time: 1,211,613 hrs
Database: Telcordia (Bellcore), GB

Warranty

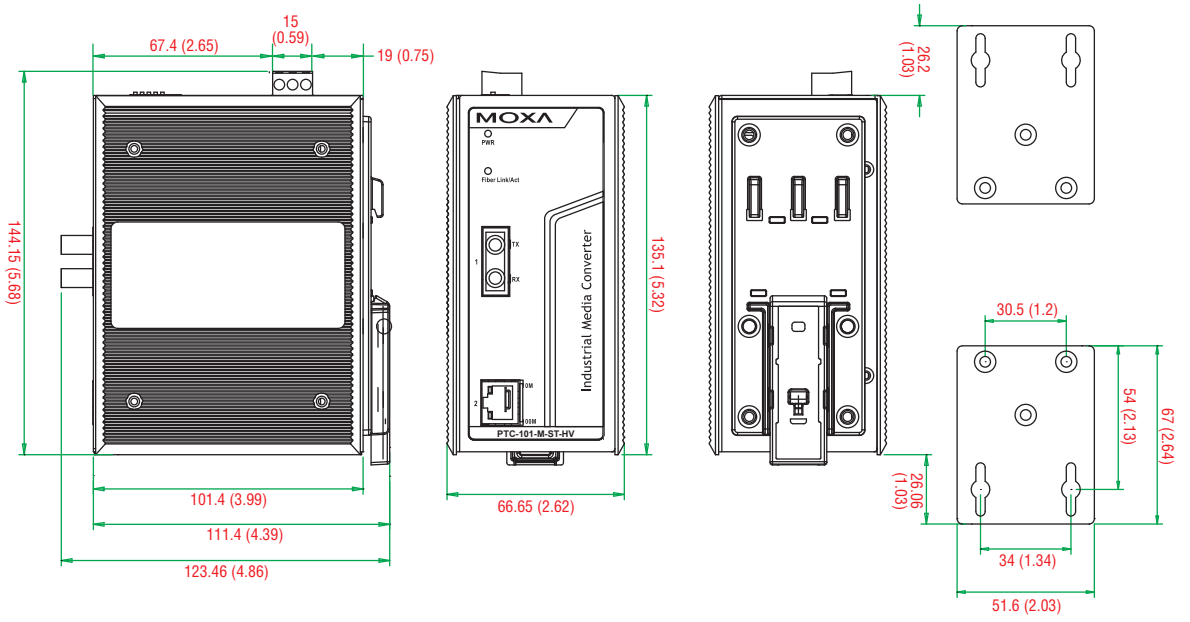
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Environmental Type Tests			
Test	**Description**		**Test Levels**
IEC 60068-2-1	Cold, operating (power ON/OFF)	Test Ad	-40°C, 48 hours
IEC 60068-2-3	Damp heat, steady state, operating	Test Ca	85°C, 95% R.H., 24 hours
IEC 60068-2-14	Changing temperature, operating	Test Nb	-40 to 85°C, Ramp rate: 3°C/min, 8 cycles
IEC 60068-2-48 IEC 60068-2-1	Cold, storage	Test Ad	-40°C, 12 hours
IEC 60068-2-48 IEC 60068-2-3	Damp heat, steady state, storage	Test Ca	90°C, 95% R.H., 24 hours
IEC 60068-2-32 ISTA-2A	Freefall, package	Test Ed	90 cm
IEC 60068-2-34	Random vibration, package	Test Fd	3 grms (5 to 500 Hz)
IEC 61850-3 IEC 60870-2-2 IEC 60068-2-6 IEC 60721-3-3	Vibration, operating	Class Cm (3M6, 4M6)	20 m/s² (9 to 200 Hz) 15 m/s² (200 to 500 Hz)
IEC 61850-3 IEC 60870-2-2 IEC 60068-2-27 IEC 60721-3-3	Shock, operating	Class Cm (3M6, 4M6)	300 m/s², 11 ms

Dimensions

Unit: mm (inch)

PTC-101-M-ST-HV (other models available by request)



Side View | Front View | Rear View | Panel Mounting Kit (Optional)

Ordering Information

Available Models

PTC-101-M-SC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with SC connector, dual redundant power inputs (20-70 VDC), -40 to 85°C operating temperature
PTC-101-M-ST-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with ST connector, dual redundant power inputs (20-70 VDC), -40 to 85°C operating temperature
PTC-101-M-LC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with LC connector, dual redundant power inputs (20-70 VDC), -40 to 85°C operating temperature
PTC-101-S-SC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with SC connector, dual redundant power inputs (20-70 VDC), -40 to 85°C operating temperature
PTC-101-S-LC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with LC connector, dual redundant power inputs (20-70 VDC), -40 to 85°C operating temperature
PTC-101-S-ST-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with ST connector, dual redundant power inputs (20-70 VDC), -40 to 85°C operating temperature
PTC-101-M-SC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with SC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-M-ST-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with ST connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-M-LC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with LC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-S-SC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with SC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-S-ST-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with ST connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-S-LC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with LC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature

Package Checklist

- 1 PTC-101 media converter
- Hardware installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

WK-51: Wall mounting kit

IMC-P101 Series

IEEE 802.3af PoE Ethernet-to-fiber media converters



- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- IEEE 802.3af compliant PoE
- Power failure alarm by relay output
- Store-and-Forward mode and Cut Through mode
- -40 to 75°C operating temperature range (T models)
- Redundant dual DC power inputs

PoE Power over Ethernet

RoHS c UL us LISTED CE FC

Introduction

IMC-P101 series Ethernet-to-fiber media converters provide Ethernet media conversion from 10/100BaseT(X) to 100BaseFX (with SC or ST connectors). These converters are classified as power source equipment (PSE), and when used in this way provide up to 15.4 watts to IEEE 802.3af compliant powered devices (PDs), eliminating the need for additional wiring. The IMC-P101 converters support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, and MDI/MDI-X auto-sensing, providing a complete solution for your industrial Ethernet network.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X), 100BaseFX
IEEE 802.3af for Power-over-Ethernet

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: PWR1, PWR2, Fiber Link, 10/100M (TP port), PSE Indicator
DIP Switches:

DIP No.	Function	ON	OFF
1	Auto Negotiation	Enable*	Disable
2	Force TP Speed	100 Mbps*	10 Mbps
3	Force TP Duplex	Full Duplex*	Half Duplex
4	Link Fault Pass Through	Enable*	Disable
5	Operating Mode	Store-and-Forward*	Pass Through
6	PSE	Disable	Enable*
7	P.R.R. (PD Remote Reset)	Enable	Disable*

* Default DIP switch setting.

Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]
Saturation	-6 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm, 3.5 PS/(nm*km) fiber optic cable

Physical Characteristics

Housing: Metal
Dimensions: 144.45 x 110.2 x 51.65 mm (5.69 x 4.34 x 2.03 in)
Weight:
Product only: 525 g
Packaged: 710 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 48 VDC (46 to 57 VDC), redundant inputs
Power Consumption: 430 mA @ 48 VDC (max.)
Connection: Removable terminal block
Overload Current Protection: 1.6 A (protects against two signals shorted together)
Reverse Polarity Protection: Protects against V+/V- reversal

Standards and Certifications

Safety: UL 508
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A

EMS:
IEC 61000-4-2 (ESD) Level 4,
IEC 61000-4-3 (RS) Level 3,
IEC 61000-4-4 (EFT) Level 4,
IEC 61000-4-5 (Surge) Level 3,
IEC 61000-4-6 (CS) Level 3,
IEC 61000-4-8 (PFMF) Level 1,
IEC 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

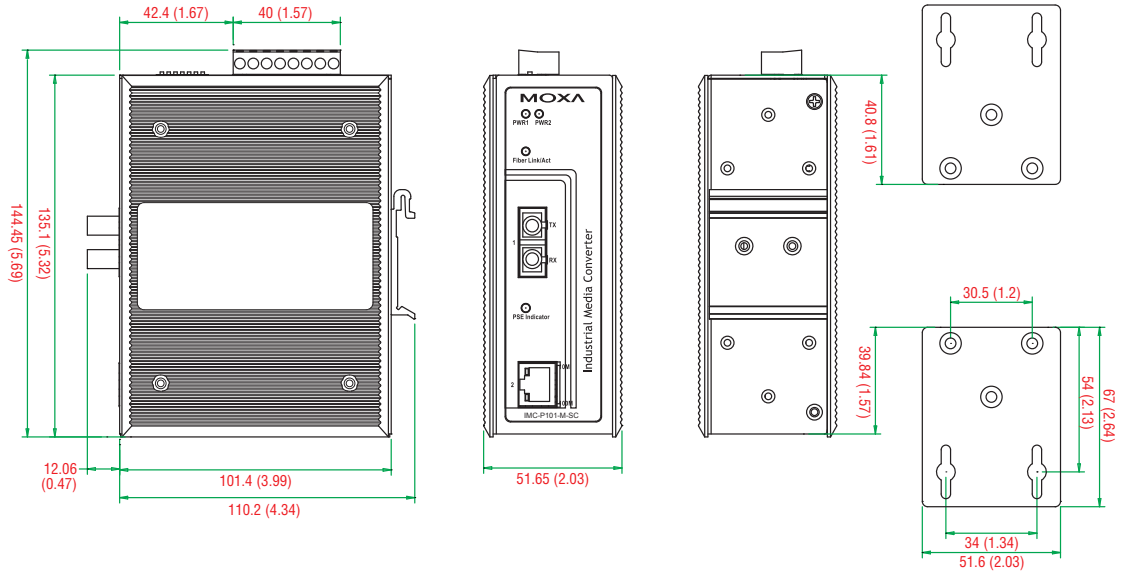
Time: 435,210 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Panel Mounting Kit (Optional)

Ordering Information

Available Models

IMC-P101-M-SC: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with SC connector, 0 to 60°C operating temperature
IMC-P101-M-ST: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with ST connector, 0 to 60°C operating temperature
IMC-P101-S-SC: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with SC connector, 0 to 60°C operating temperature
IMC-P101-S-ST: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with ST connector, 0 to 60°C operating temperature
IMC-P101-M-SC-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with SC connector, -40 to 75°C operating temperature
IMC-P101-M-ST-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with ST connector, -40 to 75°C operating temperature
IMC-P101-S-SC-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with SC connector, -40 to 75°C operating temperature
IMC-P101-S-ST-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with ST connector, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

WK-51: Wall mounting kit

Package Checklist

- 1 IMC-P101 media converter
- Hardware installation guide (printed)
- Warranty card

IMC-101G

Industrial Gigabit Ethernet-to-fiber media converter



- 10/100/1000BaseT(X) and 1000BaseSX/LX/LHX/ZX supported
- Link Fault Pass-Through (LFP)
- Power failure, port break alarm by relay output
- Redundant power input
- -40 to 75°C operating temperature range (T models)
- Designed for hazardous locations

Introduction

The IMC-101G industrial Gigabit media converters are designed to provide reliable and stable 10/100/1000BaseT(X) to 1000BaseSX/LX/LHX/ZX media conversion in harsh industrial environments. The IMC-101G's industrial design is excellent for keeping your industrial automation applications running continuously, and each IMC-101G converter comes with a relay output warning alarm to help prevent damage and loss. All IMC-101G models are subjected to a 100% burn-in test, and are available in models that support a standard operating temperature range of 0 to 60°C, and an extended operating temperature range of -40 to 75°C.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX

Interface

RJ45 Ports: 10/100/1000BaseT(X)
Fiber Ports: 1000BaseFX (SC/ST connectors)
LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (TP and Fiber port)
DIP Switches: Port break alarm mask, Fault Pass-Through, Fiber AN/Force
Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

Multi-mode Transmission Distance:
1000BaseSX:
• 0 to 500 m, 850 nm (50/125 µm, 400 MHz*km)
• 0 to 275 m, 850 nm (62.5/125 µm, 200 MHz*km)
1000BaseLX:
• 0 to 1100 m, 1310 nm (50/125 µm, 800 MHz*km)
• 0 to 550 m, 1310 nm (62.5/125 µm, 500 MHz*km)
Single-mode Transmission Distance:
1000BaseLX: 0 to 10 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))
1000BaseLHX: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))
1000BaseZX: 0 to 80 km, 1550 nm (9/125 µm, 19 PS/(nm*km))

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 630 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant inputs
Input Current: 110 mA @ 24 VDC
Connection: Removable terminal block
Overload Current Protection: 2.5 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC IIC
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

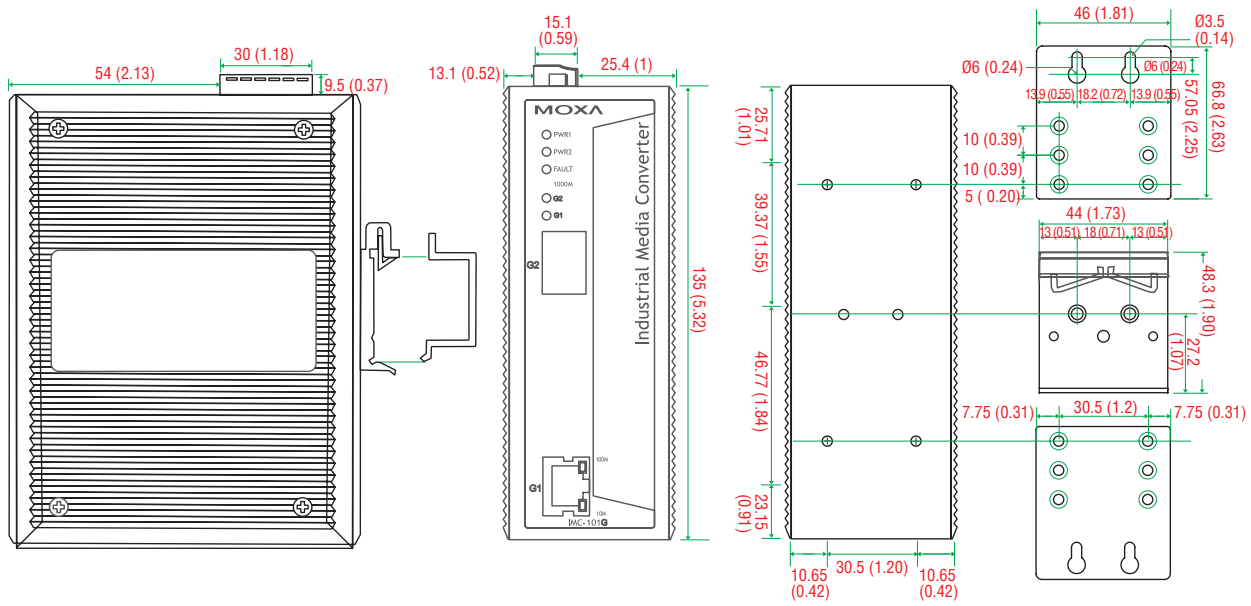
Time: 500,540 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Panel Mounting Kit

Ordering Information

Available Models

IMC-101G: Industrial 10/100/1000BaseT(X) to 1000BaseSX/LX/LHX/ZX media converter, 0 to 60°C operating temperature
IMC-101G-T: Industrial 10/100/1000BaseT(X) to 1000BaseSX/LX/LHX/ZX media converter, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

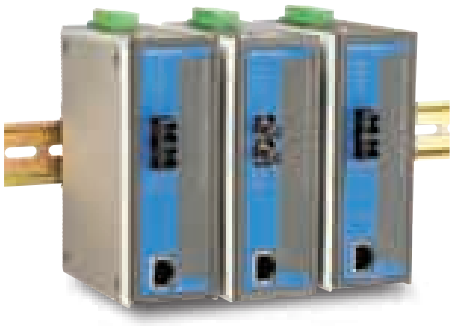
DR-4524: 45W/2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
DR-75-24: 75W/3.2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
DR-120-24: 120W/5A DIN-Rail 24 VDC power supply, 88 to 132 VAC or 176 to 264 VAC input by switch
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- 1 IMC-101G media converter
- Quick installation guide (printed)
- Warranty card

IMC-101 Series

Industrial 10/100BaseT(X) to 100BaseFX media converters



- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- Link Fault Pass-Through (LFP)
- Power failure, port break alarm by relay output
- Redundant power inputs
- -40 to 75°C operating temperature range (T models)
- Designed for hazardous locations (Class 1 Div. 2/Zone 2)

Introduction

The IMC-101 industrial media converters provide industrial-grade media conversion between 10/100BaseT(X) and 100BaseFX (SC/ST connectors). The IMC-101 converters' reliable industrial design is excellent for keeping your industrial automation applications running continuously, and each IMC-101 converter comes with a relay output warning alarm to help prevent damage and loss. The IMC-101 media converters are designed for harsh industrial environments, such as in hazardous locations (Class 1, Division 2/Zone 2, DNV, and GL Certification), and comply with FCC, TV, UL, and CE standards. The IMC-101 series is available in models that support an operating temperature from 0 to 60°C, and an extended operating temperature from -40 to 75°C. All IMC-101 series converters are subjected to a 100% burn-in test.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX

Interface

RJ45 Ports: 10/100/1000BaseT(X)
Fiber Ports: 1000BaseFX (SC/ST connectors)
LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 100M (Fiber port), FDX/COL (Fiber port)
DIP Switches: 100BaseFX Full/Half duplex selection, port break alarm mask
Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1310 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km [a] 4 km [b]	40 km [c]	80 km [d]
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm, 3.5 PS/(nm*km) fiber optic cable
d. 9/125 µm, 19 PS/(nm*km) fiber optic cable

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 630 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant inputs
Input Current: 160 mA @ 24 VDC
Connection: Removable terminal block
Overload Current Protection: 1.1 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 508, UL 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC IIC
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A

EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Marine: DNV, GL
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

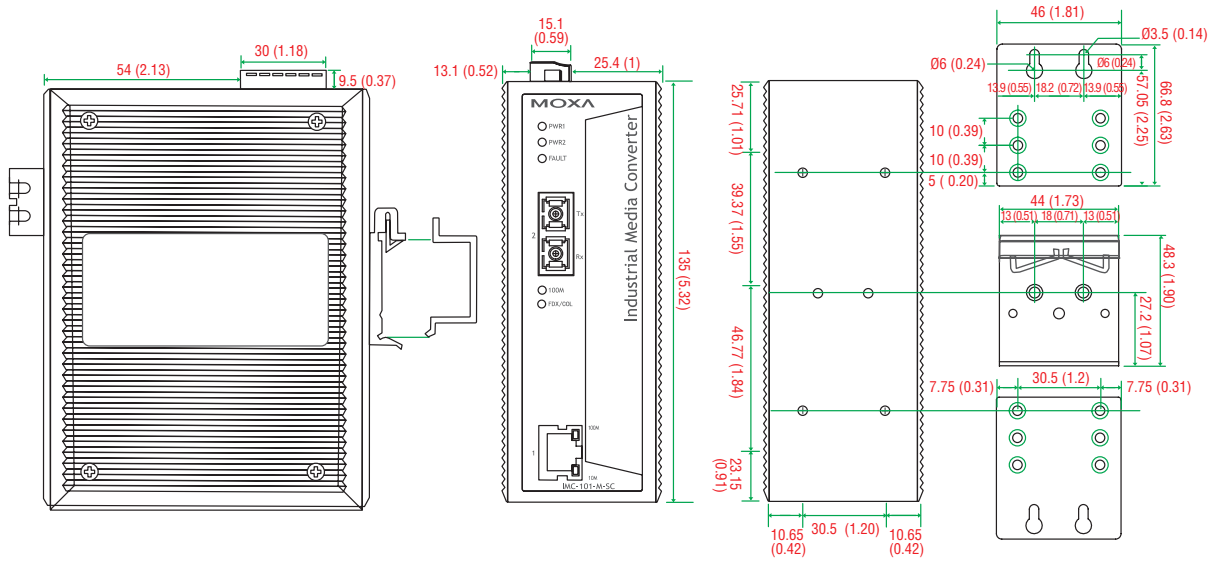
Time: 401,000 hrs
Database: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Panel Mounting Kit

Ordering Information

Available Models

IMC-101-M-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, SC connector, 0 to 60°C operating temperature
IMC-101-M-ST: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, ST connector, 0 to 60°C operating temperature
IMC-101-S-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 40 km, 0 to 60°C operating temperature
IMC-101-S-SC-80: Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 80 km, 0 to 60°C operating temperature
IMC-101-M-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, SC connector, -40 to 75°C operating temperature
IMC-101-M-ST-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, ST connector, -40 to 75°C operating temperature
IMC-101-S-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 40 km, -40 to 75°C operating temperature
IMC-101-S-SC-80-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector, 80 km, -40 to 75°C operating temperature

Package Checklist

- 1 IMC-101 media converter
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

DR-4524: 45W/2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
DR-75-24: 75W/3.2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
DR-120-24: 120W/5A DIN-Rail 24 VDC power supply, 88 to 132 VAC/176 to 264 VAC input by switch
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit
SC to ST, SC to SC, ST to ST Connectors: See Appendix A

IMC-21 Series

Entry-level industrial 10/100BaseT(X) to 100BaseFX media converters



- Multi-mode or single-mode, with SC or ST fiber connector
- Link Fault Pass-Through (LFP)
- -10 to 60°C operating temperature range
- DIP switches to select FDX/HDX/10/100/Auto/Force

Introduction

The IMC-21 industrial media converters are entry-level 10/100BaseT(X) to 100BaseFX media converters designed to provide reliable and stable operation in harsh industrial environments. The converters are a cost-effective solution that run on either a 12 to 45 VDC power input or 18 to 30 VAC power input, and can operate reliably in temperatures ranging from -10 to 60°C. The rugged hardware design ensures that your Ethernet equipment can withstand demanding industrial conditions. The IMC-21 converters are easy to mount on a DIN-Rail or in distribution boxes.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: Power, 10/100M (TP port), 100M (fiber port), FDX/COL (fiber port)
DIP Switches: TP port's 10/100M, Half/Full modes, and Force/Auto modes, fiber connection's Full/Half mode, Link Fault Pass-Through (LFP)

Optical Fiber

	100BaseFX	
	Multi-mode	Single-mode
Distance	5 km, 1300 nm	40 km, 1310 nm
Max. TX Output	-14 dBm	0 dBm
Min. TX Output	-20 dBm	-5 dBm
RX Sensitivity	-34 to -30 dBm	-36 to -32 dBm

Physical Characteristics

Housing: Plastic, IP30 protection
Dimensions: 25 x 109 x 97 mm (0.98 x 4.29 x 3.82 in)
Weight: 125 g
Installation: DIN-Rail mounting

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 70°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 150 mA @ 24 VDC
Connection: Removable 3-contact terminal block
Overload Current Protection: 1.1 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 508
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (PFMF) Level 1
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

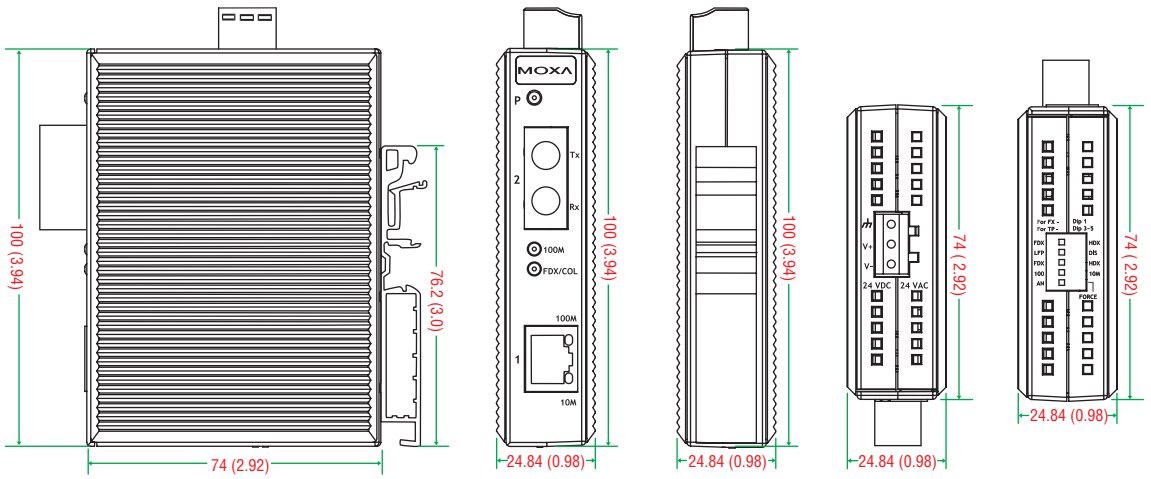
Time: 353,000 hrs
Database: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top View | Bottom View

Ordering Information

Available Models

IMC-21-M-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, SC connector
IMC-21-M-ST: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi mode, ST connector
IMC-21-S-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, single mode, SC connector

Optional Accessories (can be purchased separately)

RK-4U: 4U-high 19" rack mounting kit
SC to ST, SC to SC, ST to ST Connectors: See Appendix A

Package Checklist

- 1 IMC-21 media converter
- Quick installation guide (printed)
- Warranty card

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Industrial Wireless IEEE 802.11 Solutions

Product Selection Guide

Industrial Wireless AP/Bridge/Client Solutions 5-2

Introduction

Introduction to Industrial IEEE 802.11 Wireless 5-3

Dual-RF Wireless AP/Bridge/Client

AWK-6222 Series: Industrial IEEE 802.11a/b/g IP68 dual-RF wireless AP/bridge/client 5-7

AWK-5222 Series: Industrial IEEE 802.11a/b/g dual-RF wireless AP/bridge/client 5-9

Single-RF Wireless AP/Bridge/Client

AWK-4131 Series: Industrial IEEE 802.11a/b/g/n IP68 single-RF wireless AP/bridge/client 5-11

AWK-4121 Series: Industrial IEEE 802.11a/b/g IP68 single-RF wireless AP/bridge/client. 5-13

AWK-3131 Series: Industrial IEEE 802.11a/b/g/n single-RF wireless AP/bridge/client 5-15

AWK-3121 Series: Industrial IEEE 802.11a/b/g single-RF wireless AP/bridge/client 5-17

Wireless Access Controller

WAC-1001: Industrial wireless access controller 5-19

Wireless Antennas and Accessories

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Industrial Wireless IEEE 802.11 Solutions



Industrial Wireless AP/Bridge/Client Solutions








	AWK-6222	AWK-4121	AWK-5222	AWK-3121	AWK-3131	AWK-4131
WLAN						
IEEE Standards	IEEE 802.11a/b/g, IEEE 802.11i for wireless security, IEEE 802.3u, IEEE 802.3af, IEEE 802.1Q				IEEE 802.11a/b/g/n, IEEE 802.11i for wireless security, IEEE 802.3u for 100BaseT(X), IEEE 802.3u, IEEE 802.3ab for 1000BaseT, IEEE 802.1ab	
Spread Spectrum and Modulation (typical)	• DSSS with DBPSK, DQPSK, CCK • OFDM with BPSK, QPSK, 16QAM, 64QAM • 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps • 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps				• DSSS with DBPSK, DQPSK, CCK • OFDM with BPSK, QPSK, 16QAM, 64QAM • 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps • 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps • 802.11n: 64QAM @ 300 to BPSK @ 6.5 Mbps	
Operating Channels (central frequency)	US: 2.412 to 2.462 GHz (11 channels); 5.18 to 5.24 GHz (4 channels) EU: 2.412 to 2.472 GHz (13 channels); 5.18 to 5.24 GHz (4 channels) JP*: 2.412 to 2.472 GHz (13 channels, OFDM); 2.412 to 2.484 GHz (14 channels, DSSS); 5.18 to 5.24 GHz (4 channels for W52) *The AWK-5222 does not support JP bands.				US: 2.412 to 2.462 GHz (11 channels); 5.18 to 5.24 GHz (4 channels) EU: 2.412 to 2.472 GHz (13 channels); 5.18 to 5.24 GHz (4 channels) JP: 2.412 to 2.472 GHz (13 channels, OFDM); 2.412 to 2.484 GHz (14 channels, DSSS); 5.18 to 5.24 GHz (4 channels for W52)	
Number of RF modules	2	1	2	1	1	1
Interfaces						
Number of Antenna Connectors	4	2	4	2	2	2
Antenna Connector Type	N-type (female)	N-type (female)	RP-SMA (female)	RP-SMA (female)	RP-SMA (female)	N-type (female)
10/100BaseT(X) LAN Ports	2, waterproof RJ45	1, waterproof RJ45	2	1	–	–
10/100/1000BaseT(X) LAN Ports	–	–	–	–	1	1, M12
1000BaseT(X) Fiber Ports	–	–	–	–	1, SFP	1, SFP
RS-232 Console Ports	1, waterproof RJ45	1, waterproof RJ45	1, RJ45	1, RJ45	1, RJ45	1, waterproof RJ45
LED Indicators	PWR, FAULT, STATE, WLAN1, WLAN2, LAN1, LAN2	PWR, FAULT, STATE, WLAN, LAN	PWR1, PWR2, PoE, FAULT, STATE, WLAN1, WLAN2, 10M, 100M	PWR1, PWR2, PoE, FAULT, STATE, signal strength, CLIENT MODE, BRIDGE MODE, WLAN, 10M, 100M	PWR1, PWR2, PoE, FAULT, STATE, signal strength, WLAN, LAN	PWR, FAULT, STATE, WLAN, LAN
Alarm Contact (Digital Output)	1	1	1	1	1	1
Digital Inputs	2	2	2	2	2	2
DI/DO Connector Type	8-pin M12 (A-coding)		10-pin terminal block		10-pin terminal block	8-pin M12 (A-coding)
Physical Characteristics						
Housing	Metal (IP68)	Metal (IP68)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP68)
Weight	1.8 kg	1.5 kg	1.1 kg	850 g	1.3 kg	1.8 kg
Dimensions	224 x 147.7 x 66.5 mm		62.05 x 135 x 105 mm	53.6 x 135 x 105 mm	86.58 x 135 x 105 mm	224 x 147.7 x 66.5 mm
Installation	Wall mounting (standard), DIN-Rail mounting (optional), pole mounting (optional)		DIN-Rail mounting (standard), wall mounting (optional)			Wall mounting (standard), DIN-Rail mounting (optional), pole mounting (optional)
Environmental Limits						
Operating Temperature	-40 to 75°C	-40 to 75°C	0 to 60°C or -40 to 75°C	0 to 60°C or -40 to 75°C	0 to 60°C or -40 to 75°C	-40 to 75°C
Storage Temperature	-40 to 85°C	-40 to 85°C	-40 to 85°C	-40 to 85°C	-40 to 85°C	-40 to 85°C
Ambient Rlative Humidity	5 to 100% (non-condensing)	5 to 100% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 100% (non-condensing)
Power Requirements						
Input Voltage	Redundant dual power inputs (12 to 48 VDC)					
Connector	5-pin M12 (A-coding)		10-pin terminal block	10-pin terminal block	10-pin terminal block	5-pin M12 (A-coding)
IEEE 802.3af 48 VDC PoE	✓	✓	✓	✓	✓	✓
Reverse Polarity Protection	✓	✓	✓	✓	✓	✓
Standards and Certifications						
Safety	UL 60950-1, EN 60950-1					
Hazardous Location	UL/cUL Class I Division 2, ATEX Zone 2 (Pending)		–	UL/cUL Class I Division 2, ATEX Zone 2	–	–
EMC	EN 301 489-1/17, FCC Part 15 Subpart B Class B, EN 55022/55024		EN 301 489-1/17, FCC Part 15 Subpart B Class B, EN 55022/55024, IEC 61000-6-2/4	EN 301 489-1/17, FCC Part 15 Subpart B Class B, EN 55022/55024		
Radio	EN 300 328, EN 301 893, DSPR (Japan)		EN 300 328, EN 301 893	EN 300 328, EN 301 893, DSPR (Japan)		
Rail Traffic	EN 50155 (Environmental), EN 50121-1/4 (Environmental)					
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

Introduction to Industrial IEEE 802.11 Wireless

Industry has already accepted wireless networking as an excellent solution for many different applications. The main advantages are the convenience of connecting devices without relying on wired networks, and avoiding the cost of installing wire conduits at sites where doing so would be prohibitive.

IEEE 802.11 is not a wholesale replacement of broadband, but it is a fast and efficient way to distribute broadband transmissions. Wireless communication provides an easier way to connect devices, particularly those in remote locations or critical environments.

802.11 Specifications

The IEEE 802.11 standard specifies a way to use radio frequency (RF) technology to send Ethernet packets over the air. Today's WLANs are based on the IEEE 802.11 standard and referred to as Wi-Fi networks. By common agreement between regulatory agencies around the world (FCC, ETSI, etc.), a WLAN transmits over unlicensed spectrums, with only minor variations from country to country. The 802.11b standard, which operates in the 2.4 GHz frequency band at 11 Mbps, was the first commercially successful WLAN technology.

As wireless technology matured, a higher transmission rate of 54 Mbps was achieved with 802.11g, which operates in the 2.4 GHz band, and 802.11a, which operates in the 5 GHz frequency band. It is common for dual-band Wi-Fi access points and client network adapters to support various combinations of 802.11a, 802.11b, and 802.11g. Choosing the right WLAN technology is an important factor in determining the performance of your wireless network and overall return on investment.

Standard	IEEE 802.11b	IEEE 802.11a	IEEE 802.11g	IEEE 802.11n
Year Approved	1999	1999	2003	2009
Compatibility	IEEE 802.11b compliant	IEEE 802.11a compliant	IEEE 802.11b/g compliant	IEEE 802.11a/b/g/n compliant
Frequency Band	2.4 GHz	5 GHz	2.4 GHz	2.4/5 GHz
Channel Bandwidth	20 MHz	20 MHz	20 MHz	20 or 40 MHz
Number of Spatial Streams	1	1	1	1 to 4
Max. Data Rates	11 Mbps	54 Mbps	54 Mbps	600 Mbps[c]
Data Rate Configurations	4	8	12[a]	576
Spread Spectrum	DSSS	OFDM	OFDM, DSSS	OFDM
Typical Indoor Range[b]	100 to 150 feet	30 to 50 feet	100 to 150 feet	150 to 200 feet
Typical Indoor Range[b]	200 to 300 feet	50 to 100 feet	200 to 300 feet	450 to 600 feet

a. IEEE 802.11b includes backwards compatibility.
b. This is a general rule of thumb that can be applied when planning a wireless network.
c. Theoretical data rate with 4-stream MIMO

Next Generation High Bandwidth 802.11n Solutions

The next generation IEEE 802.11n standard allows wireless communication speeds to theoretically reach 300 Mbps. In order to achieve 300 Mbps, the physical layer needs to support a higher transmission speed that is at least 50 times faster than IEEE 802.11b and 10 times faster than IEEE 802.11g. To extend the wireless communication distance, IEEE 802.11n has added more specifications to the MIMO standard, which uses multiple antennas to increase transmission speed. MIMO (Multiple Input Multiple Output) is a key technology in the 802.11n standard, and offers greater transmit power and signal strength on the transmitter side and receiver side, respectively. By simultaneously transmitting several signals on the same transmission frequency but over two special streams, MIMO delivers greater range and data throughput. With improved OFDM (Orthogonal Frequency Division Multiplexing) modulation, MIMO can use multiple carriers to transmit multiple signals that are then combined into a single signal. This overcomes multipath fading effects that would otherwise severely degrade received signal quality. As an enhancement to existing 802.11 technologies, 802.11n offers a suite of advanced new features that increase effective data throughput, extend wireless coverage, and create more reliable networks.

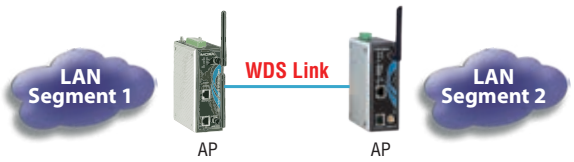
Wireless Architectures At-a-Glance

WDS

A Wireless Distribution System (WDS) provides an easy way for APs to communicate wirelessly with each other. As shown in the the figure to the right, one AP acts as a wireless access point and forwards packets to the other AP through the WDS before the packets are sent to the Ethernet LAN.



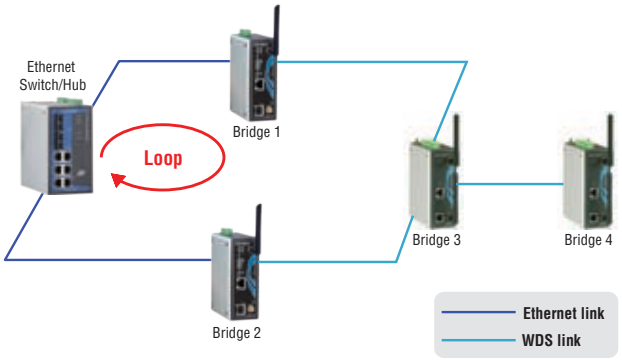
In addition, two or more LAN segments can be connected wirelessly. As illustrated in the figure to the right, a pair of wireless LAN-to-LAN bridges is used to connect two LAN segments. Since the AP is WDS-enabled, it can operate in bridge mode.



STP/RSTP

Spanning Tree Protocol (STP) was designed to help reduce link failures in a network and provide protection from loops. STP can effectively increase system reliability to allow your network to run non-stop. Networks that have a complicated architecture are prone to broadcast storms caused by unintended loops in the network. STP is part of the IEEE 802.1D standard (1998 Edition) bridge specification.

Rapid Spanning Tree Protocol (RSTP) implements the Spanning Tree algorithm and protocol defined by the IEEE 802.1w-2001 standard. RSTP is not only backwards compatible with STP, but is able to determine the topology of a bridged network much more quickly than STP.



Wireless Security

Wireless networks use radio waves, which mean that your data can be intercepted by other parties. A proper protection mechanism for radio transmissions on any network is always a concern for protocol designers. The right balance between security, transparency, and cost effectiveness is important when determining the type of security to use for your WLAN. You should take into account your target environment, the security levels that your WLAN can support, and the effect that stronger security methods could have on performance. The following table summarizes implementation considerations and client requirements when using different WLAN security strategies.

Method	Client Support	Considerations
WEP	Built-in support on all 802.11a, basic 802.11b, and 802.11g devices	-Provides basic security -Requires manual key management
WPA	Requires WPA-enabled system and network card driver	-Provides dynamically generated keys that are periodically refreshed -Provides similar shared key user authentication -Provides robust security for small networks
WPA2	Requires WPA-enabled system and network card driver	-Provides robust security for small networks -Wireless stations may require hardware to upgrade to support WPA2
802.11X	Requires WPA-enabled system and network card driver	-Provides dynamically generated keys that are backwards compatible with the original WPA technology

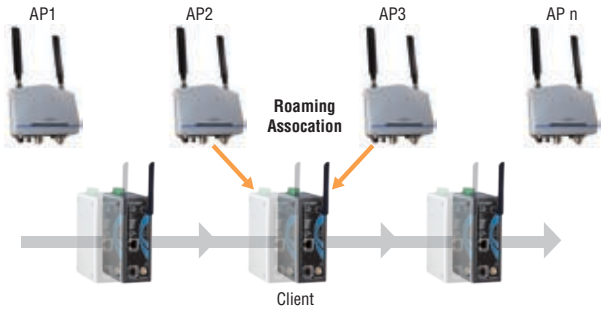
Industrial-grade Wireless LANs

Industrial environments are filled with hazards such as dust, EMI/noise, and temperature extremes. To overcome these challenges, Moxa's industrial-grade wireless solutions are ruggedized with IP68-rated housing that resists water, oil, and even corrosion damage. In addition, Moxa's AWK series meets or exceeds a number of industry standards, such as EN50155 certification for rolling stock and ULC1D2/ATEC or Class 1 Zone II for oil and gas.

AWK devices have redundant power and an extended temperature range of -40 to 75°C. With this suite of industrially-hardened features and certifications, Moxa's industrial-grade wireless products offer the most benefits available, and are tough enough to provide continuous, reliable, long-term operation in even the harshest industrial environments.

100 ms Turbo Roaming for Seamless Connections

IEEE 802.11 technology gives networks an effective range of only a few hundred meters. When wireless clients are on moving objects they need to "roam" between many wireless access points. However, in many applications users need an uninterrupted network data connection when the client moves from one access point to another. Without fast roaming time, constant roaming could create frequent handoffs and poor performance. Moxa's proprietary Turbo Roaming has a fast handover time of less than 100 ms. Turbo Roaming increases the roaming speed by unifying AP channels and avoiding wasted channel-hopping time while roaming. Moxa's APs support Turbo Roaming technology to provide fast seamless roaming on wireless networks.



Long-distance Communication

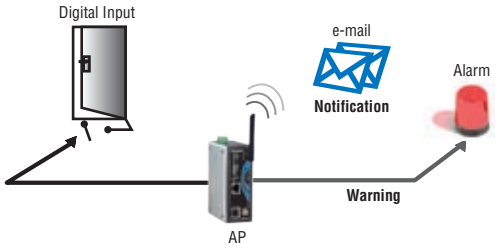
IEEE 802.11 standards are not designed for outdoor use, and generally speaking, the range of a standard 802.11 wireless network is only 100 to 300 meters. When the distance between two wireless devices is increased, packets sent over such a long distance can become unstable and create a drop in network performance. The AWK's support for long distance communication makes it easier to configure a long-distance solution .A proprietary algorithm developed by Moxa can be used to determine which parameters should be used to optimize performance. Practical uses of the algorithm include the deployment of long-range point-to-point and point-to-multipoint wireless networks at a reduced cost, and address issues related to security, reliability, and speed.



DI/DO

Moxa's AWK devices provide a more modern wawy for system operators to monitor remote APs with real-time alarm messages that trigger almost instantaneously when exceptions occur. In other words, warning messages are actively triggered in response to events such as network and power interruptions. When integrated with other important sensors via digital inputs (DI), the AWK can also provide an automatic alarm mechanism. This is done by redirecting warning messages to an IP network by email or log record.

AWK series products are also equipped with relay outputs (digital output, DO) that can be configured to indicate the importance of events when notifying or warning engineers in the field. Armed with this timely information, engineers can respond to higher priority messages quickly and with the appropriate emergency maintenance procedures.

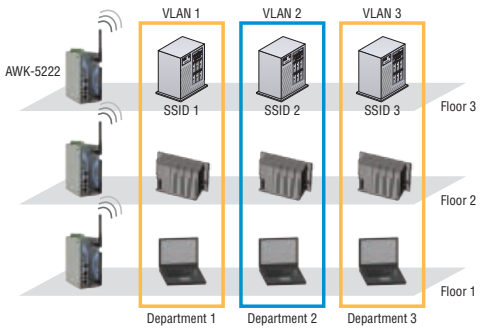


Certified to Meet Industrial Reliability Standards

Industrial environments often involve unknown, hazardous conditions that can influence the operation of Ethernet devices. Failure in an industrial system can cause serious disasters and even the loss of life and property. Moxa's industrial products have received UL/cUL Class 1 Division 2 and ATEX C1Z2 certifications, which were developed to indicate which industrial control and information technology devices are suitable for hazardous locations such as maritime environments, mines, oil refineries, and other industrial settings. In addition, environmental compliance with the EN50155 and EN50121-3-2 standards is essential for determining which devices can be used safely and reliably in railway-related and on-train applications.

Wireless VLAN (Multi-SSID)

A Virtual LAN (VLAN) is a collection of clients or hosts grouped together as if they were attached to the broadcast domains in a Layer 2 network. Based on the SSID, two or more clients can be added to a VLAN and grouped into the same LAN segment regardless of geographical location. Without additional routers, you can easily use Layer 2 switches with AWK APs and set the broadcast domain boundaries. VLANs provide network administrators with leeway in addressing network security, management, and scalability issues.



WMM for Communication Prioritization

Quality of Service (QoS) is a network term for controlling and measuring data transmission rates, throughput, and error rates, and is becoming an essential part of wireless communications when transmitting multimedia data, such as audio and video. Some important data requires a high quality of flow and throughput control and low error rates. WMM (Wi-Fi Multimedia) is based on a subset of the IEEE 802.11e protocol, which was designed to provide QoS on a WLAN. WMM allows the prioritization of data transmissions to help control the quality of communications.



Advanced Industrial Wireless Solutions

Moxa Makes Wireless Robust, Secure, and Reliable

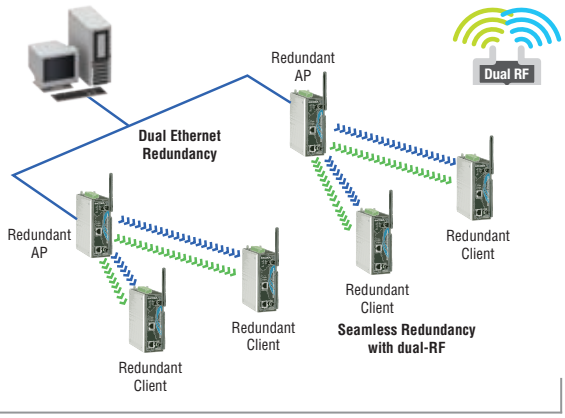
Today's wireless applications demand data integrity, secure transmissions, and high overall network reliability. As a leader in industrial device networking, Moxa provides you with more comprehensive industrial wireless solutions and is ready to help you ugrade to industry-leading WLAN solutions.

Moxa's support of standards-based wireless products allows an winning combination of reliability, redundancy and throughput in secure wireless LANs. Moxa's AWK series supports a high level of security, RF redundancy, and faster 50 ms Turbo Roaming for both indoor and outdoor environments. Successful proven deployments in highly demanding environments, such as mining, oil and gas, heavy industry and railway systems, demonstrate the AWK's unparalleled reliability under extreme conditions.

Redundant Wireless

In most cases, radio interference occurs on a dedicated frequency or a narrow frequency band. Utilizing two or more frequencies to communicate at the same time can help maintain constant data transmission, even if there is interference at one of the frequencies. This strategy greatly increases the availability of wireless links and makes the entire wireless network more reliable.

Dual-RF solutions such as the AWK-5222 and AWK-6222 feature two independent wireless communication modules as well as multiple Ethernet ports. In addition to being ideal for wireless infrastructures, these products can also provide a more reliable connection and greater versatility for use on a variety of industrial networks.



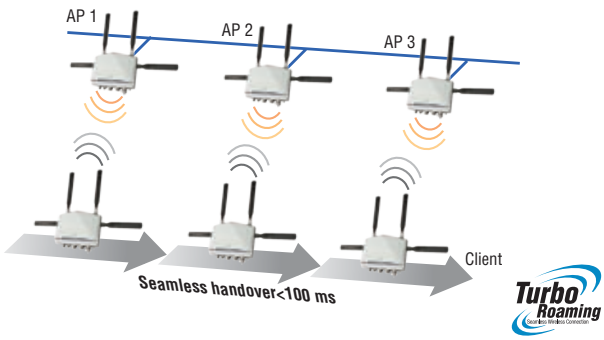
Wireless Bridging

In addition to wireless redundancy mode, "Wireless Bridge" mode is also available with Moxa's dual-RF solution, which can form a master-slave bridge mode to link other SSID and extend wireless coverage. This mode is designed to provide a more optimized WDS mode that overcomes WDS mode's throughput problems, in which more nodes can cause a serious drop in throughput. With Wireless Bridge mode, the bandwidth of the wireless link will not be reduced (from using Dual RF and isolation of the overlap frequency channel), but instead will easily extend your wireless range.



Redundant Roaming

By combining the advantages of two key techniques, Moxa's Turbo Roaming and dual RF redundancy, Moxa's advanced redundant roaming enhances secure mobility for mission-critical or latency-sensitive applications, and can benefit from more rapid roaming with a reliable wireless connection. The AWK-5222 and AWK-6222's redundant mode allows for super fast roaming ensuring quick handoff for roaming clients during the transition between access points. The two RFs of wireless client will transmit data simultaneously, and when they detect a weak or weakening AP signal, the dual RF client will instantaneously start roaming for the next AP.



Faster Secure 50 ms Turbo Roaming with the WAC-1001 Wireless Controller (Centralized)

Moxa's cutting-edge Turbo Roaming technology together with the WAC-1001 wireless controller dramatically shrinks roaming time down to 50 ms, even when wireless security is active. It is perfect for highly mobile wireless communications scenarios such as rolling stock applications. The WAC-1001 is designed for the AWK-3121-RS and AWK-4121-RS series which supports a high level of proactive authentication and encryption to ensure your network stays securely connected. To realize smooth handoffs, the wireless client can be pre-authenticated by the wireless controller to allow seamless roaming without re-authentication. This mechanism significantly reduces authentication latency during re-association and thus greatly enhances the speed and reliability of roaming connectivity for delay-sensitive real-time applications. Exclusive Moxa's 50 ms Turbo Roaming technology includes a higher data transmission rate, dependable remote equipment monitoring and alerts, and resilience in extreme mobile environments.

AWK-6222 Series

Industrial IEEE 802.11a/b/g IP68 dual-RF wireless AP/bridge/client



- IEEE 802.11a/b/g compliant
- Dual-RF design for redundant wireless communication and high-performance wireless bridging
- RSTP for dual Ethernet redundancy
- Supports 100 ms redundant roaming
- Industrial grade QoS (WMM) and VLAN supported
- EN 50155 and EN 50121-1/4 compliant
- Rugged IP68-rated housing and -40 to 75°C operating temperature

Introduction

Moxa's AWK-6222 outdoor wireless AP/bridge/client avoids interruptions in WLAN transmissions with its dual 2.4/5 GHz RF modules, which allow two independent wireless connections over different frequencies. To maximize wireless and wired network availability, the AWK-6222 can incorporate Ethernet redundancy using RSTP, and power redundancy using dual DC power inputs and PoE. In addition, the AWK-6222 is housed in an IP68 metal casing with M12 connectors for total protection against dust, water, vibration, and other environmental effects. This rugged unit supports seamless roaming to achieve ultra-reliable and redundant wireless networks under challenging outdoor, mobile conditions. These industrially hardened features let you set up a rock-solid WLAN to ensure that your entire network will always be in service.

Redundancy to Increase System Reliability

- PoE and dual DC power inputs
- Dual RF design with 2.4 or 5 GHz dual-band operation for redundant WLAN connections
- Redundant roaming for fast and stable handoff
- Ethernet redundancy via RSTP

Industrial and Outdoor Rated Features for Critical Environments

- IP68-rated metal housing and -40 to 75°C wide operating temperature
- Long-distance wireless transmission over 10 km
- Anti-vibration M12 design and waterproof/dust-tight RJ45 connectors
- Wall, DIN-Rail, and pole mounting options for versatile outdoor installation

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q VLAN
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)
Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2 Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
TX Transmit Power:
802.11b:
Typ. 23±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 20±1.5 dBm @ 6 to 24 Mbps, Typ. 19±1.5 dBm @ 36 Mbps, Typ. 18±1.5 dBm @ 48 Mbps, Typ. 17±1.5 dBm @ 54 Mbps
802.11a:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
RX Sensitivity:
802.11b:
-97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps

802.11g:
-93 dBm @ 6 Mbps, -91 dBm @ 9 Mbps, -90 dBm @ 12 Mbps, -88 dBm @ 18 Mbps, -84 dBm @ 24 Mbps, -80 dBm @ 36 Mbps, -76 dBm @ 48 Mbps, -74 dBm @ 54 Mbps
802.11a:
-90 dBm @ 6 Mbps, -89 dBm @ 9 Mbps, -89 dBm @ 12 Mbps, -85 dBm @ 18 Mbps, -83 dBm @ 24 Mbps, -79 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -74 dBm @ 54 Mbps

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP
AP-only Protocols: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)

Interface

Default Antennas: 2 dual-band omni-directional antennas, 5 dBi at 2.4 GHz, 2 dBi at 5 GHz, N-type (male)
Connector for External Antennas: N-type (female)
LAN Ports: 2, 10/100BaseT(X), auto negotiation speed (waterproof RJ45-type)
Console Port: RS-232 (waterproof RJ45-type)
LED Indicators: PWR, FAULT, STATE, WLAN1, WLAN2, LAN1, LAN2
Alarm Contact (digital output, M12 female connector): 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs (M12 female connector): 2 electrically isolated inputs
- +13 to +30 V for state "1"
- +3 to -30 V for state "0"
- Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP68 protection
Weight: 1.8 kg
Dimensions: 224 x 147.7 x 64.5 mm (8.82 x 5.82 x 2.54 in)
Installation: Wall mounting (standard), DIN-Rail mounting (optional), pole mounting (optional)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 100% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Connector: M12 male connector with A-coding
Power Consumption:
- 12 to 48 VDC, 800 mA (max.)
- 12 to 48 VDC, 1.066 to 0.312 A

Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2, ATEX Zone 2 (Pending)
EMC: EN 301 489-1/17, FCC Part 15 Subpart B Class B, EN 55022/55024
Radio: EN 300 328, EN 301 893, DSPR (Japan)
Rail Traffic: EN 50155, EN 50121-1/4
Note: Please check Moxa's website for the most up-to-date certification status.

Reliability

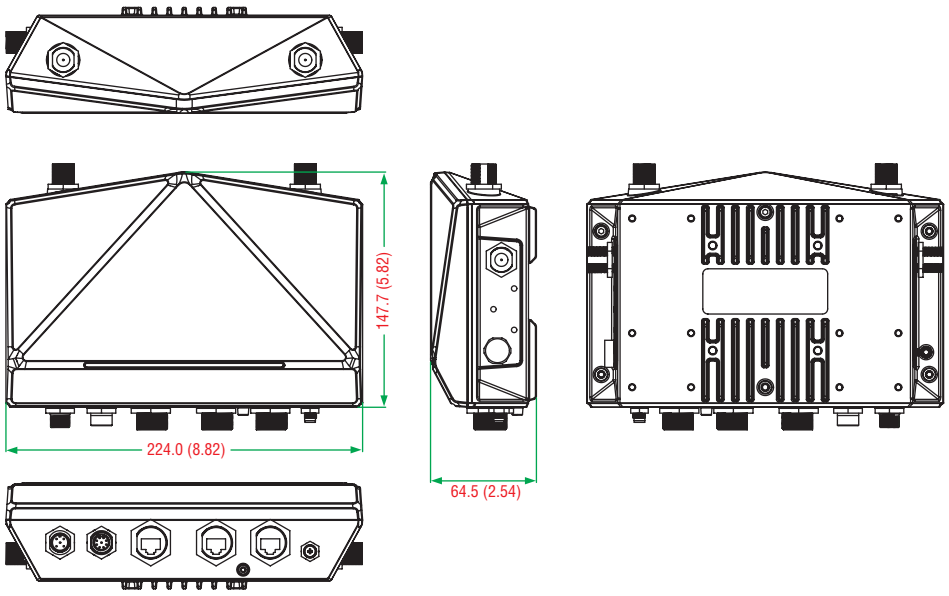
MTBF (mean time between failures): 284,072 hours

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

AWK-6222-US-T: IEEE 802.11a/b/g IP68 dual-RF wireless AP/bridge/client, US band, -40 to 75°C operating temperature
AWK-6222-EU-T: IEEE 802.11a/b/g IP68 dual-RF wireless AP/bridge/client, EU band, -40 to 75°C operating temperature
AWK-6222-JP-T: IEEE 802.11a/b/g IP68 dual-RF wireless AP/bridge/client, JP band, -40 to 75°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-6222 wireless AP/bridge/client
- 2 dual-band omni-directional antennas (5/2 dBi, N-type male, 2.4/5 GHz)
- Wall mounting kit (includes 2 supports)
- Field-installable power plug
- Field-installable RJ45 plug
- Metal cap to cover M12-female DI/O connector
- 2 metal caps to cover RJ45 connectors
- 2 metal caps to cover N-type connectors
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

AWK-5222 Series

Industrial IEEE 802.11a/b/g dual-RF wireless AP/bridge/client



- IEEE 802.11a/b/g compliant
- Dual-RF design for redundant wireless communication and high-performance wireless bridging
- RSTP for dual Ethernet redundancy
- Supports 100 ms redundant roaming
- Industrial grade QoS (WMM) and VLAN supported
- EN 50155 and EN 50121-1/4 compliant
- -40 to 75°C operating temperature range (T models)

Turbo Roaming | Dual RF | EN50155 | EN50121 | cULus LISTED | RoHS | CE | FC

Introduction

Moxa's new generation wireless redundancy technology allows you to set up independent wireless connections to avoid interruptions in transmission, even if interference occurs on one of the supported frequencies. The AWK-5222 is equipped with the newest proprietary wireless redundancy technology, which has two independent RF modules, and supports a greater variety of wireless configurations and applications. The redundant wireless connections increase the reliability of the entire wireless network. For reliability beyond wireless redundancy, Moxa's AWK-5222 has two Ethernet ports, and supports RSTP (Rapid Spanning Tree Protocol) and Turbo Ring for the Ethernet side of the connection. The AWK-5222 is rugged enough to help you establish the most robust wireless connection for critical industrial wireless applications.

Redundancy to Increase System Reliability

- Dual DC power inputs and PoE
- Dual RF design with 2.4 or 5 GHz dual-band operation for redundant WLAN connections
- Redundant roaming for fast and stable handoff
- Ethernet redundancy via RSTP

Specifications for Industrial-grade Applications

- Industrial-grade QoS and VLAN for efficient data traffic management
- Long-distance wireless transmission over 10 km
- Integrated DI/DO for on-site monitoring and warnings
- Signal strength LEDs for easy deployment and antenna alignment

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q VLAN
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
64QAM @ 54 Mbps, 16QAM @ 24/36 Mbps, QPSK @ 12/18 Mbps, CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBSK@ 1 Mbps
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA /WPA2 Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
TX Transmit Power:
802.11b:
Typ. 23±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 20±1.5 dBm @ 6 to 24 Mbps, Typ. 19±1.5 dBm @ 36 Mbps, Typ. 18±1.5 dBm @ 48 Mbps, Typ. 17±1.5 dBm @ 54 Mbps
802.11a:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
RX Sensitivity:
802.11b:
-97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps
802.11g:
-93 dBm @ 6 Mbps, -91 dBm @ 9 Mbps, -90 dBm @ 12 Mbps, -88 dBm @ 18 Mbps, -84 dBm @ 24 Mbps, -80 dBm @ 36 Mbps, -76 dBm @ 48 Mbps, -74 dBm @ 54 Mbps
802.11a:
-90 dBm @ 6 Mbps, -89 dBm @ 9 Mbps, -89 dBm @ 12 Mbps, -85 dBm @ 18 Mbps, -83 dBm @ 24 Mbps, -79 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -74 dBm @ 54 Mbps

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP
AP-only Protocols: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)

Interface

Default Antennas: 2 dual-band omni-directional antennas, 2 dBi, RP-SMA (male)
Connector for External Antennas: RP-SMA (female)
LAN Ports: 2, 10/100BaseT(X), auto negotiation speed (RJ45-type)
Console Port: RS-232 (RJ45-type)
LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, WLAN1, WLAN2, 10M, 100M
Alarm Contact (digital output): 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1"
• +3 to -30 V for state "0"
• Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 1.1 kg
Dimensions: 62.05 x 135 x 105 mm (2.44 x 5.31 x 4.13 in)
Installation: DIN-Rail mounting (standard), Wall mounting (optional)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Connector: 10-pin removable terminal block
Power Consumption: 12 to 48 VDC, 800 mA (max.)
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 301 489-1/17, FCC Part 15 Subpart B Class B, EN 55022/55024, IEC 61000-6-2/4
Radio: EN 300 328, EN 301 893
Rail Traffic: EN 50155, EN 50121-1/4
Note: Please check Moxa's website for the most up-to-date certification status.

Reliability

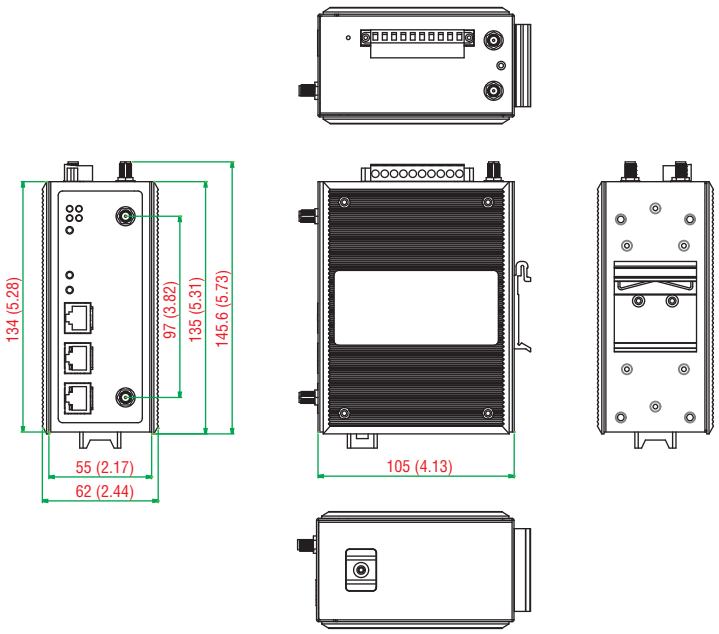
MTBF (mean time between failures): 291,367 hours

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

AWK-5222-US: IEEE 802.11a/b/g dual-RF wireless AP/bridge/client, US band, 0 to 60°C operating temperature
AWK-5222-EU: IEEE 802.11a/b/g dual-RF wireless AP/bridge/client, EU band, 0 to 60°C operating temperature
AWK-5222-US-T: IEEE 802.11a/b/g dual-RF wireless AP/bridge/client, US band, -40 to 75°C operating temperature
AWK-5222-EU-T: IEEE 802.11a/b/g dual-RF wireless AP/bridge/client, EU band, -40 to 75°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-5222 wireless AP/bridge/client
- 2 dual-band omni-directional antennas (2 dBi, RP-SMA, 2.4/5 GHz)
- Cable holder with one screw
- 2 protective caps
- DIN-Rail kit
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

AWK-4131 Series

Preliminary

Industrial IEEE 802.11a/b/g/n IP68 wireless AP/bridge/client



- IEEE 802.11a/b/g/n compliant
- One M12/SFP Gigabit combo port
- Up to 300 Mbps data rate
- Supports 100 ms Turbo Roaming
- MIMO technology increases data throughput and range
- Rugged IP68-rated housing and -40 to 75°C operating temperature

Turbo Roaming 802.11 EN50155 EN50121 cULus LISTED RoHS CE FC

Introduction

Moxa's new AWK-4131 3-in-1 industrial wireless AP/bridge/client meets the growing need for faster data transmission speeds and wider coverage by supporting IEEE 802.11n technology with a net data rate of up to 300 Mbps. The AWK-4131 combines two adjacent 20 MHz channels into a single 40 MHz channel to deliver a potent combination of greater reliability and more bandwidth. With a wide -40 to 75°C operating temperature and dust-tight/weatherproof IP68-rated design, the AWK-4131 allows you to extend existing wired networks to outdoor locations. The AWK-4131 can operate on either the 2.4 or 5 GHz bands and is backwards-compatible with existing 802.11a/b/g deployments to future-proof your wireless investments.

Higher Data Rate and Greater Bandwidth

- High-speed wireless connectivity with up to 150 Mbps data throughput
- MIMO technology to improve the capacity of multiple data stream transmits and receives
- Increased channel width with channel bonding technology

Industrial and Outdoor Features for Critical Environments

- Industrial-grade QoS and VLAN for efficient data traffic management
- IP68-rated metal housing and -40 to 75°C wide operating temperature
- PoE and dual DC power inputs
- Advanced security with WEP/WPA/WPA2/802.11X

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g/n for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE802.3u 100BaseTX
IEEE 802.3ab for 1000BaseT
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q VLAN
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
• 802.11n: 64QAM @ 300 bps to BPSK @ 6.5 Mbps (multiple rates supported)
Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)
Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: 6 to 300 Mbps (multiple rates supported)
TX Transmit Power:
802.11b:
1 to 11 Mbps: Typ. 18 dBm (± 1.5 dBm)
802.11g:
6 to 24 Mbps: Typ. 18 dBm (± 1.5 dBm)
36 to 48 Mbps: Typ. 17 dBm (± 1.5 dBm)
54 Mbps: Typ. 15 dBm (± 1.5 dBm)
802.11a:
6 to 24 Mbps: Typ. 17 dBm (± 1.5 dBm)
36 to 48 Mbps: Typ. 16 dBm (± 1.5 dBm)
54 Mbps: Typ. 14 dBm (± 1.5 dBm)
TX Transmit Power MIMO:
802.11a/n (20/40 MHz):
MCS15 20 MHz: Typ. 13 dBm (± 1.5 dBm)
MCS15 40 MHz: Typ. 12 dBm (± 1.5 dBm)

802.11g/n (20/40 MHz):
MCS15 20 MHz: Typ. 14 dBm (± 1.5 dBm)
MCS15 40 MHz: Typ. 13 dBm (± -1.5 dBm)
RX Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps,
-80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
RX Sensitivity MIMO:
802.11a/n:
-68 dBm @ MCS15 40 MHz, -70 dBm @ MCS7 40 MHz, -69 dBm @ MCS15 20 MHz, -71 dBm @ MCS7 20 MHz
802.11g/n:
-68 dBm @ MCS15 40 MHz, -70 dBm @ MCS7 40 MHz, -69 dBm @ MCS15 20 MHz,
-71 dBm @ MCS7 20 MHz

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP
AP-only Protocols: ARP, BOOTP, DHCP, dynamic VLAN-Tags for 802.1X-Clients, STP/RSTP (IEEE 802.1D/w)

Interface

Default Antennas: 2 dual-band omni-directional antennas, 5 dBi at 2.4 GHz, 2 dBi at 5 GHz, N-type (male)
Connector for External Antennas: N-type (female)
LAN Ports: 1, 10/100/1000BaseT(X), auto negotiation speed (M12 female type)
Fiber Ports: 1, 1000BaseSFP slot
Console Port: RS-232 (waterproof RJ45-type)
LED Indicators: PWR, FAULT, STATE, WLAN, LAN
Alarm Contact (digital output, M12 male connector): 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs (M12 connector): 2 electrically isolated inputs
- +13 to +30 V for state "1"
- +3 to -30 V for state "0"
- Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP68 protection
Weight: 1.8 kg
Dimensions: 224 x 147.7 x 64.5 mm (8.82 x 5.82 x 2.54 in)
Installation: Wall mounting (standard), DIN-Rail mounting (optional), pole mounting (optional)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 100% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Connector: M12 connector with A-coding
Reverse Polarity Protection: Present

Standards and Certifications

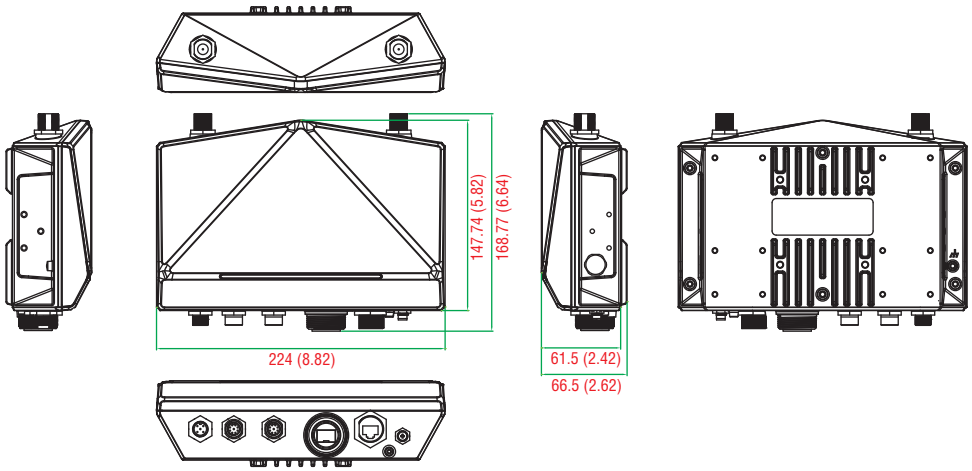
Safety: UL 60950-1, EN 60950-1
EMC: EN 301 489-1/17, FCC Part 15 Subpart B Class B, EN 55022/55024
Radio: EN 300 328, EN 301 893, DSPR (Japan)
Rail Traffic: EN 50155, EN 50121-1/4
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

AWK-4131-US-T: IEEE 802.11a/b/g/n IP68 wireless AP/bridge/client, US band, -40 to 75°C operating temperature
AWK-4131-EU-T: IEEE 802.11a/b/g/n IP68 wireless AP/bridge/client, EU band, -40 to 75°C operating temperature
AWK-4131-JP-T: IEEE 802.11a/b/g/n IP68 wireless AP/bridge/client, JP band, -40 to 75°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-4131 wireless AP/bridge/client
- 2 dual-band omni-directional antennas (2/5 dBi, N-type male, 2.4/5 GHz)
- Wall mounting kit (includes 2 supports)
- Field-installable power plug
- Field-installable Ethernet plug
- Metal cap to cover M12 male DI/O connector
- Metal caps to cover RJ45 connectors
- Metal cap to cover SFP connector
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

AWK-4121 Series

Industrial IEEE 802.11a/b/g IP68 wireless AP/bridge/client



- IEEE 802.11a/b/g compliant
- Redundant 24 VDC power inputs or PoE
- QoS (WMM) and VLAN for efficient network traffic
- Supports long-distance data transfer and 100 ms Turbo Roaming
- Maximum security with WEP/WPA/WPA2/802.11X and powerful filters
- EN 50155 and EN 50121-1/4 compliant
- Rugged IP68-rated housing and -40 to 75°C operating temperature

Turbo Roaming

EN50155 EN50121 c UL us LISTED RoHS CE FC

Introduction

The AWK-4121 outdoor wireless AP/bridge/client is the ideal outdoor wireless solution for industrial applications that are hard to wire, too expensive to wire, or use mobile equipment that connect to a TCP/IP network. The AWK-4121's dust-tight/weatherproof design is IP68-rated, allowing you to extend existing wired networks to outdoor locations and critical environments. The two redundant DC power inputs increase the reliability of the power supply and can be powered via PoE for easier deployment. With both DIN-Rail and wall mounting support, the AWK-4121 is easy to install in virtually any location, and with so many hardened industrial-grade features, you can rest assured that the AWK-4121 will provide stable and reliable wireless connectivity, even in the harshest locations.

Industrial and Outdoor Rated Features for Critical Environments

- IP68-rated metal housing and -40 to 75°C wide operating temperature
- Anti-vibration M12 design and waterproof/dust-tight RJ45 connectors
- PoE and dual DC power inputs

Specifications for Industrial-grade Applications

- Long-distance wireless transmission over 10 km
- Integrated DI/DO for on-site monitoring and warnings
- Status LED indicators for on-site monitoring and diagnosis

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q VLAN
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)

Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA /WPA2 Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
TX Transmit Power (for hardware revision 1.1):
802.11b:
Typ. 23±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 20±1.5 dBm @ 6 to 24 Mbps, Typ. 19±1.5 dBm @ 36 Mbps, Typ. 18±1.5 dBm @ 48 Mbps, Typ. 17±1.5 dBm @ 54 Mbps
802.11a:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
RX Sensitivity (for hardware revision 1.1):
802.11b:
-97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps
802.11g:
-93 dBm @ 6 Mbps, -91 dBm @ 9 Mbps, -90 dBm @ 12 Mbps, -88 dBm @ 18 Mbps, -84 dBm @ 24 Mbps, -80 dBm @ 36 Mbps, -76 dBm @ 48 Mbps, -74 dBm @ 54 Mbps
802.11a:
-90 dBm @ 6 Mbps, -89 dBm @ 9 Mbps, -89 dBm @ 12 Mbps, -85 dBm @ 18 Mbps, -83 dBm @ 24 Mbps, -79 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -74 dBm @ 54 Mbps

TX Transmit Power (for hardware revision 1.0):
802.11b:
Typ. 18±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
802.11a:
Typ. 16±1.5 dBm @ 6 to 24 Mbps, Typ. 14±1.5 dBm @ 36 to 48 Mbps, Typ. 13±1.5 dBm @ 54 Mbps
RX Sensitivity (for hardware revision 1.0):
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP
AP-only Protocols: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)

Interface

Default Antennas: 2 dual-band omni-directional antennas, 5 dBi at 2.4 GHz, 2 dBi at 5 GHz, N-type (male)
Connector for External Antennas: N-type (female)
LAN Ports: 1, 10/100BaseT(X), auto negotiation speed (waterproof RJ45-type)
Console Port: RS-232 (waterproof RJ45-type)
LED Indicators: PWR, FAULT, STATE, WLAN, LAN
Alarm Contact (digital output, M12 female connector): 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs (M12 female connector): 2 electrically isolated inputs
- +13 to +30 V for state "1"
- +3 to -30 V for state "0"
- Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP68 protection
Weight: 1.5 kg
Dimensions: 224 x 147.7 x 64.5 mm (8.82 x 5.82 x 2.54 in)
Installation: Wall mounting (standard), DIN-Rail mounting (optional), pole mounting (optional)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 100% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Connector: M12 male connector with A-coding
Power Consumption:
- 12 to 48 VDC, 0.121 to 0.494 A
- 24 VDC, 0.3 A

Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2, ATEX Zone 2 (Pending)
EMC: EN 301 489-1/17, FCC Part 15 Subpart B Class B, EN 55022/55024
Radio: EN 300 328, EN 301 893, DSPR (Japan)
Rail Traffic: EN 50155, EN 50121-1/4
Note: Please check Moxa's website for the most up-to-date certification status.

Reliability

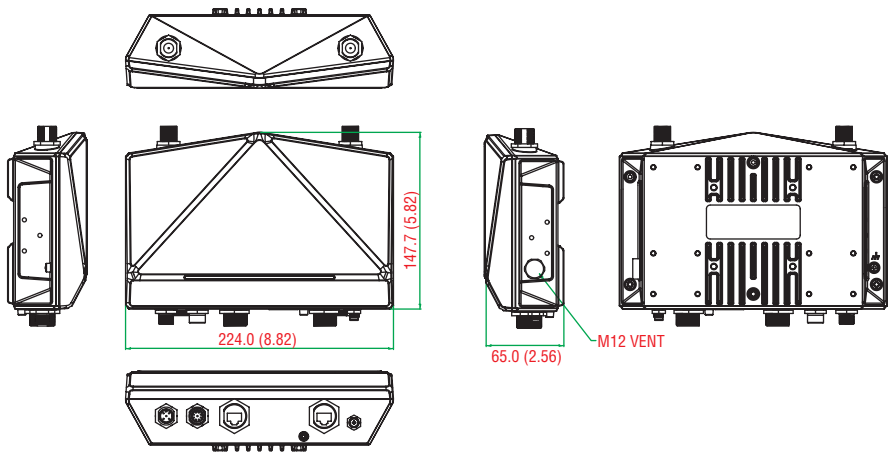
MTBF (mean time between failures): 364,564 hours

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

AWK-4121-US-T: IEEE 802.11a/b/g IP68 wireless AP/bridge/client, US band, -40 to 75°C operating temperature
AWK-4121-EU-T: IEEE 802.11a/b/g IP68 wireless AP/bridge/client, EU band, -40 to 75°C operating temperature
AWK-4121-JP-T: IEEE 802.11a/b/g IP68 wireless AP/bridge/client, JP band, -40 to 75°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-4121 wireless AP/bridge/client
- 2 dual-band omni-directional antennas (2/5 dBi, N-type male, 2.4/5 GHz)
- Wall mounting kit (includes 2 supports)
- Field-installable power plug
- Field-installable RJ45 plug
- Metal cap to cover M12-female DI/O connector
- Metal cap to cover RJ45 connector
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

AWK-3131 Series

Preliminary

Industrial IEEE 802.11a/b/g/n wireless AP/bridge/client



- IEEE 802.11a/b/g/n compliant
- One RJ45/SFP Gigabit combo port
- Up to 300 Mbps data rate
- Supports 100 ms Turbo Roaming
- MIMO technology increases data throughput and range
- -40 to 75°C operating temperature range (T models)

Introduction

Moxa's new AWK-3131 3-in-1 industrial wireless AP/bridge/client meets the growing need for faster data transmission speeds and wider coverage by supporting IEEE 802.11n technology with a net data rate of up to 300 Mbps. The AWK-3131 combines two adjacent 20 MHz channels into a single 40 MHz channel to deliver a potent combination of greater reliability and more bandwidth. The two redundant DC power inputs increase the reliability of the power supply, and the AWK-3131 can be powered via PoE to make deployment easier. The AWK-3131 can operate on either the 2.4 or 5 GHz bands and is backwards-compatible with existing 802.11a/b/g deployments to future-proof your wireless investments.

Improved Higher Data Rate and Bandwidth

- High-speed wireless connectivity with up to 150 Mbps data throughput
- MIMO technology to improve the capacity of multiple data stream transmits and receives
- Increased channel width with channel bonding technology

Specifications for Industrial-grade Applications

- Industrial-grade QoS and VLAN for efficient data traffic management
- Long-distance wireless transmission over 10 km
- Integrated DI/DO for on-site monitoring and warnings
- Signal strength LEDs for easy deployment and antenna alignment

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g/n for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3 for 10BaseT
IEEE802.3u 100BaseTX
IEEE 802.3ab for 1000BaseT
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q VLAN
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
• 802.11n: 64QAM @ 300 to BPSK @ 6.5 Mbps (multiple rates supported)
Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)
Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA /WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)
Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: 6 to 300 Mbps (multiple rates supported)
TX Transmit Power:
802.11b:
1 to 11 Mbps: Typ. 18 dBm (± 1.5 dBm)
802.11g:
6 to 24 Mbps: Typ. 18 dBm (± 1.5 dBm)
36 to 48 Mbps: Typ. 17 dBm (± 1.5 dBm)
54 Mbps: Typ. 15 dBm (± 1.5 dBm)
802.11a:
6 to 24 Mbps: Typ. 17 dBm (± 1.5 dBm)
36 to 48 Mbps: Typ. 16 dBm (± 1.5 dBm)
54 Mbps: Typ. 14 dBm (± 1.5 dBm)
TX Transmit Power MIMO:
802.11a/n (20/40 MHz):
MCS15 20 MHz: Typ. 13 dBm (± 1.5 dBm)
MCS15 40 MHz: Typ. 12 dBm (± 1.5 dBm)
802.11g/n (20/40 MHz):
MCS15 20 MHz: Typ. 14 dBm (± 1.5 dBm)
MCS15 40 MHz: Typ. 13 dBm (± -1.5 dBm)

RX Sensitivity:
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps,
-80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
RX Sensitivity MIMO:
802.11a/n:
-68 dBm @ MCS15 40 MHz, -70 dBm @ MCS7 40 MHz, -69 dBm @ MCS15 20 MHz, -71 dBm @ MCS7 20 MHz
802.11g/n:
-68 dBm @ MCS15 40 MHz, -70 dBm @ MCS7 40 MHz, -69 dBm @ MCS15 20 MHz,
-71 dBm @ MCS7 20 MHz

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP
AP-only Protocols: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)

Interface

Default Antennas: 2 dual-band omni-directional antennas, 2 dBi, RP-SMA (male)
Connector for External Antennas: RP-SMA (female)
LAN Ports: 1, 10/100/1000BaseT(X), auto negotiation speed (RJ45-type)
Fiber Ports: 1, 1000BaseSFP slot
Console for External Antenna: RS-232 (RJ45-type)

LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, signal strength, WLAN, LAN
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
- +13 to +30 V for state "1"
- +3 to -30 V for state "0"
- Max. input current: 8 mA

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 970 g
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Installation: DIN-Rail mounting (standard), wall mounting (optional)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Connector: 10-pin removable terminal block
Reverse Polarity Protection: Present

Standards and Certifications

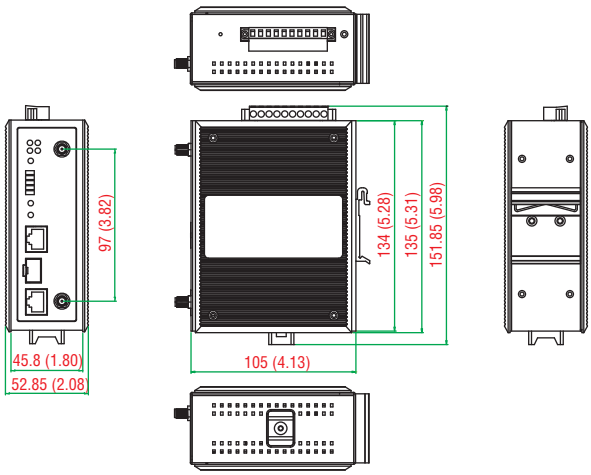
Safety: UL 60950-1, EN 60950-1
EMC: EN 301 489-1/17, FCC Part 15 Subpart B Class B, EN 55022/55024
Radio: EN 300 328, EN 301 893, DSPR (Japan)
Rail Traffic: EN 50155, EN 50121-1/4
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

AWK-3131-US: IEEE 802.11a/b/g/n wireless AP/bridge/client, US band, 0 to 60°C operating temperature
AWK-3131-EU: IEEE 802.11a/b/g/n wireless AP/bridge/client, EU band, 0 to 60°C operating temperature
AWK-3131-JP: IEEE 802.11a/b/g/n wireless AP/bridge/client, JP band, 0 to 60°C operating temperature
AWK-3131-US-T: IEEE 802.11a/b/g/n wireless AP/bridge/client, US band, -40 to 75°C operating temperature
AWK-3131-EU-T: IEEE 802.11a/b/g/n wireless AP/bridge/client, EU band, -40 to 75°C operating temperature
AWK-3131-JP-T: IEEE 802.11a/b/g/n wireless AP/bridge/client, JP band, -40 to 75°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-3131 wireless AP/bridge/client
- 2 dual-band omni-directional antennas (2 dBi, RP-SMA, 2.4/5 GHz)
- Cable holder with one screw
- 3 protective caps
- DIN-Rail kit
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

AWK-3121 Series

Industrial IEEE 802.11a/b/g wireless AP/bridge/client



- IEEE 802.11a/b/g compliant
- Redundant 24 VDC power inputs or PoE
- QoS (WMM) and VLAN for efficient network traffic
- Supports long-distance data transfer and 100 ms Turbo Roaming
- Maximum security with WEP/WPA/WPA2/802.11X and powerful filters
- UL C1D2/ATEX Zone 2, EN 50155, and EN 50121-1/-4 compliant
- -40 to 75°C operating temperature range (T models)

Turbo Roaming

EN50155 EN50121

Introduction

Are your industrial applications hard to wire or are your wiring costs out of control? Are you already using mobile equipment that connects over an IP network? If so, then what you need is the AWK-3121 AP/bridge/client. The AWK-3121 is rated to operate at temperatures ranging from 0 to 60°C for standard models and -40 to 75°C for wide temperature models, and is rugged enough for any harsh industrial environment. Installation is easy, with either DIN-Rail mounting or distribution boxes, and the DIN-Rail mounting capability, wide operating temperature range, and IP30 housing with LED indicators make the AWK-3121 a convenient yet reliable solution for any industrial wireless application.

Advanced Security

- 64-bit and 128-bit WEP (Wired Equivalent Privacy)
- Enable/disable SSID broadcasts
- WPA/WPA2 (Wi-Fi Protected Access) and 802.11i support
- IEEE802.1X/RADIUS support
- Powerful filters for access control

Specifications for Industrial-grade Applications

- PoE and dual DC power inputs
- Long-distance data transmission over 10 km
- Integrated DI/DO for on-site monitoring and warnings
- Signal strength LEDs for easy deployment and antenna alignment

Specifications

WLAN Interface

Standards:
IEEE 802.11a/b/g for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q VLAN
Spread Spectrum and Modulation (typical):
• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
Operating Channels (central frequency):
US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)
Security:
• SSID broadcast enable/disable
• Firewall for MAC/IP/Protocol/Port-based filtering
• 64-bit and 128-bit WEP encryption, WPA /WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)

Transmission Rates:
802.11b: 1, 2, 5.5, 11 Mbps
802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
TX Transmit Power (for hardware revision 1.2):
802.11b:
Typ. 23±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 20±1.5 dBm @ 6 to 24 Mbps, Typ. 19±1.5 dBm @ 36 Mbps, Typ. 18±1.5 dBm @ 48 Mbps, Typ. 17±1.5 dBm @ 54 Mbps
802.11a:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
RX Sensitivity (for hardware revision 1.2):
802.11b:
-97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps
802.11g:
-93 dBm @ 6 Mbps, -91 dBm @ 9 Mbps, -90 dBm @ 12 Mbps, -88 dBm @ 18 Mbps, -84 dBm @ 24 Mbps, -80 dBm @ 36 Mbps, -76 dBm @ 48 Mbps, -74 dBm @ 54 Mbps
802.11a:
-90 dBm @ 6 Mbps, -89 dBm @ 9 Mbps, -89 dBm @ 12 Mbps, -85 dBm @ 18 Mbps, -83 dBm @ 24 Mbps, -79 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -74 dBm @ 54 Mbps
TX Transmit Power (for hardware revisions 1.0 and 1.1):
802.11b:
Typ. 18±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
802.11a:
Typ. 16±1.5 dBm @ 6 to 24 Mbps, Typ. 14±1.5 dBm @ 36 to 48 Mbps, Typ. 13±1.5 dBm @ 54 Mbps

RX Sensitivity (for hardware revisions 1.0 and 1.1):
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP
AP-only Protocols: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)

Interface

Default Antennas: 2 dual-band omni-directional antenna, 2 dBi, RP-SMA (male)
Connector for External Antennas: RP-SMA (female)
LAN Ports: 1, 10/100BaseT(X), auto negotiation speed (RJ45-type)
Console for External Antenna: RS-232 (RJ45-type)
LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, signal strength, CLIENT MODE, BRIDGE MODE, WLAN, 10M, 100M
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
- +13 to +30 V for state "1"
- +3 to -30 V for state "0"
- Max. input current: 8 mA

Physical Characteristics

Housing: Metal, providing IP30 protection
Weight: 850 g
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Connector: 10-pin removable terminal block
Power Consumption: 12 to 48 VDC, 0.121 to 0.494 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2, ATEX Zone 2
EMC: EN 301 489-1/17, FCC Part 15 Subpart B Class B, EN 55022/55024
Radio: EN 300 328, EN 301 893, DSPR (Japan)
Rail Traffic: EN 50155, EN 50121-1/4
Note: Please check Moxa's website for the most up-to-date certification status.

Reliability

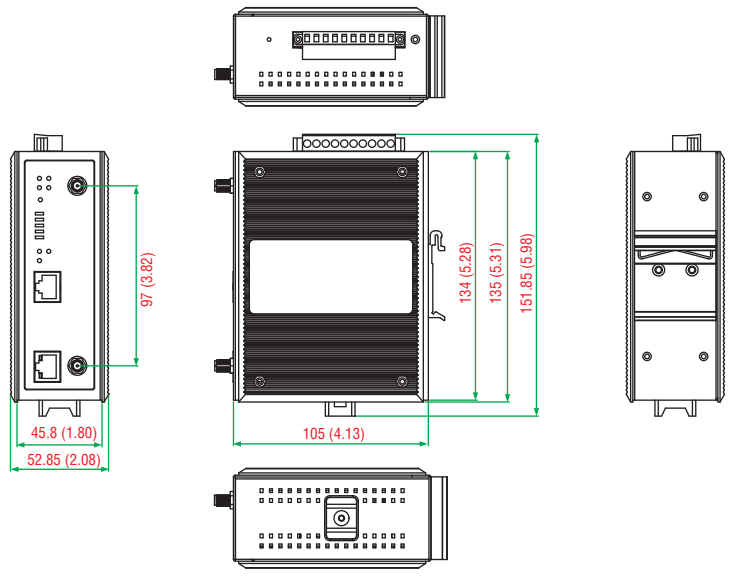
MTBF (mean time between failures): 392,209 hours

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

AWK-3121-US: IEEE802.11a/b/g wireless AP/bridge/client, US band, 0 to 60°C operating temperature
AWK-3121-EU: IEEE802.11a/b/g wireless AP/bridge/client, EU band, 0 to 60°C operating temperature
AWK-3121-JP: IEEE802.11a/b/g wireless AP/bridge/client, JP band, 0 to 60°C operating temperature
AWK-3121-US-T: IEEE802.11a/b/g wireless AP/bridge/client, US band, -40 to 75°C operating temperature
AWK-3121-EU-T: IEEE802.11a/b/g wireless AP/bridge/client, EU band, -40 to 75°C operating temperature
AWK-3121-JP-T: IEEE802.11a/b/g wireless AP/bridge/client, JP band, -40 to 75°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- AWK-3121 wireless AP/bridge/client
- 2 dual-band omni-directional antennas (2 dBi, RP-SMA, 2.4/5 GHz)
- Cable holder with one screw
- 2 protective caps
- DIN-Rail kit
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

WAC-1001

Industrial Wireless Access Controller



- Power input by redundant 24 VDC power inputs
- Less-than-50ms Turbo Roaming for seamless wireless connection
- IEEE802.11i-compliant Wireless security
- DIN-Rail or wall mounting ability for onsite installation
- IP30 protected high-strength metal housing
- -40 to 75°C operating temperature range (-T model)

EN50155 EN50121 cULus LISTED RoHS CE FC

Introduction

The goal of zero-latency-roaming is to create clients that can maintain communications seamlessly as they move from one access point to another. Moxa has introduced next generation Turbo Roaming technology with the WAC-1001 for the 50ms-roaming-enabled AWK series. This advanced roaming capability delivers high-speed secure handoffs. Wireless clients can roam between APs in under 50 milliseconds while preserving robust security in extremely demanding environments.

Maximum Availability

- Less-than-50ms Turbo Roaming
- Configuration back-up
- Dual redundant DC power inputs

Advanced Security

- IEEE802.1X/RADIUS supported
- WPA/WPA2/802.11i supported
- Integrated DI/DO for on-site monitoring and warnings

Specifications

WLAN Interface

Standards:
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet
Supported Models:
• AWK-3121-RS series
• AWK-4121-RS series
• AWK-5222-RS series
• AWK-6222-RS series
Security: WPA /WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)

Interface

LAN Port: 10/100BaseT(X), auto negotiation speed (RJ45-type)
Console: RS-232 (RJ45-type)
LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, 10M, 100M
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1"
• +3 to -30 V for state "0"
• Max. input current: 8 mA

Physical Characteristics

Housing: Metal, providing IP30 protection
Weight: 700 g
Dimensions: 52.85 x 135 x 105 mm (2.08 x 5.31 x 4.13 in)
Installation: DIN-Rail mounting, wall mounting

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)
Connector: 10-pin removable terminal block
Power Consumption:
• 12 to 48 VDC, 0.121 to 0.494 A
• 24 VDC, 0.3 A
Reverse Polarity Protection: Present

Standards and Certifications

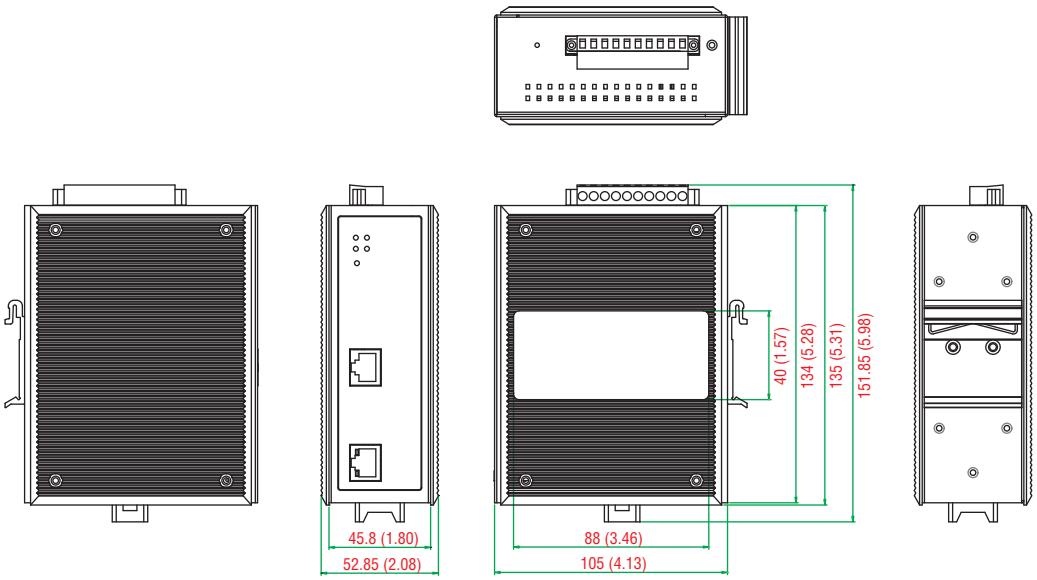
Safety: UL 60950-1, EN 60950-1
EMC: FCC Part 15 Subpart B Class A, EN 55022/55024
Rail Traffic: EN 50155, EN 50121-1/4
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

WAC-1001: Industrial wireless access controller, 0 to 60°C operating temperature
WAC-1001-T: Industrial wireless access controller, -40 to 75°C operating temperature

Package Checklist

- WAC-1001 wireless controller
- Wall mounting kit
- Cable holder with one screw
- 2 protective caps
- DIN-Rail kit
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Wireless Antennas and Accessories

Overview

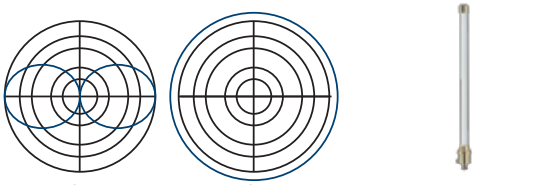
Moxa's antennas are specifically designed for long range applications. Additional aftermarket antennas are used to extend the wireless range. Selecting the right antenna system can greatly enhance transmission coverage and power.

This page briefly explains the differences between the two basic types of antennas: omni-directional and directional. The two types are categorized by the direction in which they beam radio signals.

Omni-directional

Omni-directional antennas are designed to radiate signals equally in all directions. They have very limited vertical spread, which determines the antenna gain. Antennas of this type are typically located in the center of open spaces or larger offices to provide even coverage to all clients. Omni-directional antennas are the right choice for applications that require constant location changes.

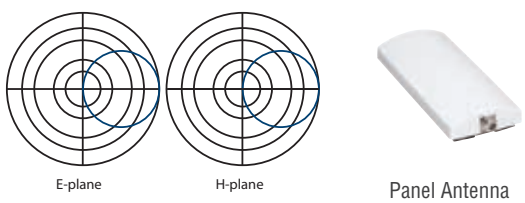
Types of Omni-directional Antennas



Directional

Directional antennas provide a more focused signal than omni-directional antennas. Signals are typically transmitted in an oval-shaped pattern with a beam width of only a few degrees. With higher gain, directional antennas can also be used outdoors to extend point-to-point links over a longer transmission distance, or to form a point-to-multipoint network.

Types of Directional Antennas



Antenna Connectors

Before you purchase an antenna for your wireless device, you should check the type of antenna connector that your device uses. You will need to buy an antenna with a matching connector. There are several types of antenna connectors, including MCX, TNC, N-type, SMA, and RP-SMA (RP stands for "reverse polarity" or "reverse ping"). On WLAN devices, the most commonly used antenna connectors for IEEE 802.11 applications are RP-SMA and N-type. Make sure to check the connector type of before you buy an antenna



N-type (male) | N-type (female) | RP-SMA (female) | RP-SMA (male) | SMA (female) | SMA (male)

Choosing the Right Antenna for Your Project

If you are planning to extend the range or widen the coverage of your wireless connection, then you may need to use external high-gain antennas for your access points. In addition to the antenna type and gain, there are a few other specifications that you should consider.

Frequency Range

The most important parameter of an antenna is its working frequency. If you use a 2.4G antenna for IEEE 802.11a applications, you will find that the signal is too weak and the data rate drops down to a very low level. Be sure to use the right antenna for your planned working frequency.

Half-power Beam Width (HPBW)

This parameter is measured from the antenna's radiation pattern, and refers to the beam width at which the antenna's radiation drops to half of its peak value. It also refers to the antenna's effective coverage area. Once you get outside the half-power beam width, the signal typically drops off very quickly. A very high-gain antenna has a very narrow-angled half-power beam width, which makes the directionality high as well.

Antenna Polarity

Polarization refers to the direction in which the electromagnetic field lines point as energy radiates away from the antenna. The simplest and most common type is linear polarization. When power is sent from transmitter to receiver, only that portion of the beam with the same polarization can be received. An improper antenna installation may decrease performance.

Equivalent Isotropically Radiated Power (EIRP)

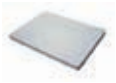
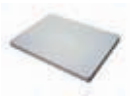
The EIRP value is defined as the power transmitted by a theoretical isotropic antenna that distributes power evenly in all directions and emits and produces the peak power density observed in the direction of maximum antenna gain. Local governments control the EIRP of radio devices under radiation/telecommunication regulations. You must ensure that your wireless system does not exceed legal EIRP values. The EIRP value is also used to estimate the service area of the transmitter and to coordinate transmitters on the same frequency so that their coverage areas do not overlap. EIRP is calculated by measuring the power of the transmitter, losses in transmission lines and connectors, and the gain of the antenna. The unit used for EIRP and transmitter power is dBm, cable loss is measured in dB, and antenna gain is expressed in dBi, relative to a (theoretical) isotropic reference antenna.

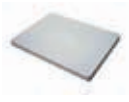
Online WLAN Distance Calculator

Moxa's wireless antennas improve effective wireless reach and overall performance. Use Moxa's Online WLAN distance calculator to choose the perfect antenna for the specific requirements of your project. The user-friendly Moxa WLAN distance calculator can be found at http://www.moxa.com/Event/IW/2010/Moxa_WLAN_Calculator_V12



Wireless Antenna Selection Guide

	IEEE 802.11b/g 2.4 GHz Wireless Antennas				IEEE 802.11a 5 GHz Wireless Antennas	
						
	ANT-WSB-AHRM-05-1.5m	ANT-WSB-ANF-09	ANT-WSB-PNF-12	ANT-WSB-PNF-18	ANT-WSB5-ANF-12	ANT-WSB5-PNF-18
Frequency Range	2.4 to 2.5 GHz				5.1 to 5.9 GHz	
Antenna Type	λ/4 Dipole	Omni-directional	Directional, Panel	Directional, Panel	Omni-directional	Directional, Panel
Typical Antenna Gain	5 dBi	9 dBi	12 dBi	18 dBi	12 dBi	18 dBi
Description	2.4 GHz, omni-directional/dipole antenna, 5 dBi	2.4GHz, Omni-directional antenna, 9 dBi, N-type (female)	2.4 GHz, panel antenna, 12 dBi, N-type (female)	2.4 GHz, panel antenna, 18 dBi, N-type (female)	5 GHz, omni-directional antenna, 12 dBi, N-type (female)	5 GHz, panel antenna, 18 dBi, N-type (female)
Impedance	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms
Polarization	Vertical	Linear	Linear	Linear	Linear	Linear
HPBW/Horizontal	360°	360°	50°	30°	360°	10°
HPBW/Vertical	–	10°	30°	20°	6°	10°
V.S.W.R.	2.0	1 : 1.3 Max.	1 : 1.5 Max.	1 : 1.5 Max.	1 : 1.3 Max.	1 : 1.5 Max.
Power Handling	–	15 W Max.	10 W Max.	15 W Max.	10 W Max.	10 W Max.
Connector(s)	RP-SMA (male)	N-type (female)	N-type (female)	N-type (female)	N-type (female)	N-type (female)
Operating Temperature	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C
IP rating	–	IP65	IP65	IP65	IP65	IP65
Antenna Profile	–	420 mm length	215 x 90 x 30 mm	270 x 205 x 15 mm	420 mm length	270 x 205 x 15 mm
Weight	300 g	430 g	560 g	310 g	430 g	990 g
Related Products	AWK-3121, AWK-3131, AWK-5222, NPort W2150/2250 Plus, NPort W2004	AWK-3121, AWK-3131, AWK-4121, AWK-4131, AWK-5222, AWK-6222, NPort W2150/2250 Plus, NPort W2004				

	IEEE 802.11a/b/g 2.4/5 GHz Dual-band Antennas					
						
	ANT-WDB-ANM-0502	ANT-WDB-ANM-0407	ANT-WDB-ANF-0407	ANT-WDB-ANM-0609	ANT-WDB-ANF-0609	ANT-WDB-PNF-1518
Frequency Range	2.4 to 2.5 / 5.1 to 5.9 GHz					
Antenna Type	Omni-directional	Omni-directional	Omni-directional	Omni-directional	Omni-directional	Directional, Panel
Typical Antenna Gain	2/5 dBi	4/7 dBi	4/7 dBi	6/9 dBi	6/9 dBi	15/18 dBi
Description	2.4/5 GHz, dual-band omni-directional antenna, 5/2 dBi, N-type (male)	2.4/5 GHz, dual-band omni-directional antenna, 4/7 dBi, N-type (male)	2.4/5 GHz, dual-band omni-directional antenna, 5/2 dBi, N-type (female)	2.4/5 GHz, dual-band omni-directional antenna, 6/9 dBi, N-type (male)	2.4/5 GHz, dual-band omni-directional antenna, 6/9 dBi, N-type (female)	2.4/5 GHz, dual-band panel antenna, 15/18 dBi, N-type (female)
Impedance	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms	50 ± 5 ohms
Polarization	Linear	Linear	Linear	Linear	Linear	Linear
HPBW/Horizontal	360°	360°	360°	360°	360°	50/10°
HPBW/Vertical	65°	10/8°	10/8°	10/8°	10/8°	30/10°
V.S.W.R.	1 : 2.0 Max.	1 : 1.5 Max.	1 : 1.5 Max.	1 : 1.5 Max.	1 : 1.5 Max.	1 : 1.5 Max.
Power Handling	2 W Max.	10 W Max.	10 W Max.	10 W Max.	10 W Max.	20 W Max.
Connector(s)	N-type (male)	N-type (male)	N-type (female)	N-type (male)	N-type (female)	N-type (female)
Operating Temperature	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C	-40 to 80°C
IP rating	IP67	IP65	IP65	IP65	IP65	IP65
Antenna Profile	220 mm length	220 mm length	260 mm length	632 mm length	660 mm length	270 x 205 x 15 mm
Weight	72 g	115g	155 g	238 g	286 g	1020±10 g
Related Products	AWK-4121, AWK-4131, AWK-6222		AWK-3121, AWK-3131, AWK-4121, AWK-4131, AWK-5222, AWK-6222, NPort W2150/2250 Plus, NPort W2004	AWK-4121, AWK-4131, AWK-6222	AWK-3121, AWK-3131, AWK-4121, AWK-4131, AWK-5222, AWK-6222, NPort W2150/2250 Plus, NPort W2004	

Wireless Accessories Selection Guide

Cables



	CRF-N0117SA-3M	CRF-N0429N-3M	A-CRF-NMNM-LL4-300	A-CRF-NMNM-LL4-600	A-CRF-NMNM-LL4-900	A-CRF-RMNM-L1-300	A-CRF-RMNM-L1-600	A-CRF-RMNM-L1-900	A-CRF-RFRM-S1-060
Description	CFD200 cable, N-type (male) to RP SMA (male), 3 m	CFD400 cable, N-type (male) to N-type (male), 3 m	LMR-400 Lite cable, N-type (male) to N-type (male), 3 m	LMR-400 LITE cable, N-type (male) to N-type (male), 6 m	LMR-400 LITE cable, N-type (male) to N-type (male), 9 m	LMR-195 Lite cable, N-type (male) to RP SMA (male), 3 m	LMR-195 Lite cable, N-type (male) to RP SMA (male), 6 m	LMR-195 Lite cable, N-type (male) to RP SMA (male), 9 m	S141 cable, RP-SMA (male) to RP-SMA (female), 0.6 m
Cable Type	CFD200	CFD400	LMR-400Lite	LMR-400 Lite	LMR-400 Lite	LMR-195 Lite	LMR-195 Lite	LMR-195 Lite	S141
Connector Type	N-type male to RP SMA male	N-type male to N-type male	N-type male to N-type male	N-type male to N-type male	N-type male to N-type male	N-type Male To RP SMA Male	N-type male To RP SMA male	N-type male To RP SMA male	RP-SMA male to RP-SMA female
Cable Length	3 m	3 m	3 m	6 m	9 m	3 m	6 m	9 m	0.6 m
Outer Dimension	5 mm	10.3 mm	10.29 mm	10.29 mm	10.29 mm	4.95 mm	4.95 mm	4.95 mm	5 mm
Min. Bend Radius	12.7 mm	24.5 mm	25.4 mm	25.4 mm	25.4 mm	12.7 mm	12.7 mm	12.7 mm	12.7 mm
Attenuation	55.4@2500 MHz 86.5@5800 MHz	22.2@2500 MHz 35.5@5800 MHz	22.2@2500 MHz 35.5@5800 MHz	22.2@2500 MHz 35.5@5800 MHz	22.2@2500 MHz 35.5@5800 MHz	62.4@2500 MHz 98.1@5800 MHz	62.4@2500 MHz 98.1@5800 MHz	62.4@2500 MHz 98.1@5800 MHz	75.4@3000 MHz 98.4@5000 MHz
Related Accessories	• IEEE 802.11 N-type antenna • Power amplifier	IEEE 802.11 N-type antenna	IEEE 802.11 N-type antenna	IEEE 802.11 N-type antenna	IEEE 802.11 N-type antenna	IEEE 802.11 N-type antenna	IEEE 802.11 N-type antenna	IEEE 802.11 N-type antenna	Power amplifier
Related Products	AWK-3121, AWK-3131, AWK-5222	AWK-4121, AWK-4131, AWK-6222				AWK-3121, AWK-3131, AWK-5222			

Caps



	A-CAP-M12M-M	A-CAP-M12F-M	A-CAP-N-M	A-CAP-M30M-MIP67	A-CAP-WPRJ45-MC
Description	Metal cap to cover M12-male connector	Metal cap to cover M12-female connector	Metal cap to cover N-type connector	Metal cap to cover M30 connector	Metal cap with chain for RJ45 connector
Related Products	Power cap for the AWK-4121, AWK-4131, AWK-6222	DI/O cap for the AWK-4121, AWK-6222; LAN cap for the AWK-4131	Antenna cap for the AWK-4121, AWK-4131, AWK-6222	SFP cap for the AWK-4131	Console & LAN caps for the AWK-4121, AWK-6222; Console cap for the AWK-4131

Connectors



Model Name	CBL-M12(FF5P)/Open-100 IP67	M12A-5P-IP68	M12A-8PMM-IP68	CBL-M12DFF4PRJ45-BK-10-IP67	CBL-M12MM8PRJ45-BK-100-IP67	M12A-8PFF-IP67	A-PLG-WPM30IP67-01	A-PLG-WPRJ
Description	M12 to 5-pin power cable with 5-pin A-coded M12 connector	Field-installation A-coded M12 screw-in 5-pin connector, female connector female pins	Field-installation A-coded M12 screw-in 8-pin connector, male connector male PIN	M12-to-RJ45 Cat-5E UTP Ethernet cable with IP67-rated female 4-pin D-coded M12 connector	M12-to-RJ45 Cat-5E UTP Ethernet cable with IP67-rated male 8-pin A-coded M12 connector	Field-installation A-coded M12 screw-in 8-pin connector, female connector female PIN	Field-Installation for M30 plug	Field-installation RJ-type plug
Cable Length	1 m	–	–	10 cm	1 m	–		–
Related Products	AWK-4121, AWK-4131, AWK-6222	Power connector for the AWK-4121, AWK-4131, AWK-6222	DI/O connector for the AWK-4121, AWK-6222; LAN connector for the AWK-4131	AWK-4121, AWK-4131, AWK-6222	AWK-4131 series	DI/DO connector for the AWK-4131	SFP LAN connector for the AWK-4131	LAN connector for the AWK-4121, AWK-6222

Mounting Kits







	DK-DC50131	WK-HA1002SU	WK-55	PK-DC2DOF	WK-51-01
Description	Din-Rail mounting kit, 50 x 131 mm	Swivel mounting kit with 90° horizontal range and 40° vertical range	Wall mounting kit, 55 mm high	Pole mounting kit	Wall mounting kit, 51 mm wide
Related Products	AWK-4121, AWK-4131, AWK-6222 (Note: Each of these products requires 2 pcs)	ANT-WSB-PNF-12	AWK-4121, AWK-4131, AWK-6222	AWK-4121, AWK-4131, AWK-6222	AWK-3121, AWK-3131, AWK-5222

Termination Resistors




	A-TRM-50-NM	A-TRM-50-RM
Description	Termination resistor, 50 ohms, N-type male	Termination resistor, 50 ohms, RP-SMA male
Related Products	AWK-4121, AWK-4131, AWK-6222	AWK-3121, AWK-3131, AWK-5222

Power Amplifiers




	A-WPA-2410gM-IDU	A-WPA-5410aM-IDU
Description	Wireless power amplifier	Wireless power amplifier
Signal Type	2.4 GHz band antenna (included)	5 GHz band antenna (included)
Connector Type	RP-SMA connector	RP-SMA connector
Power Output	1 W	1 W
Power Consumption	12 VDC	12 VDC
Power Cable	Power plug to power jack cable (included)	Power plug to power jack cable (included)
Dimensions	92 x 60 x 31 mm	92 x 60 x 31 mm
Related Accessories	• N-type male to RP-SMA male cable • RP-SMA male to RP-SMA female cable	• N-type male to RP-SMA male cable • RP-SMA male to RP-SMA female cable
Related Products	AWK-3121, AWK-3131, AWK-5222	AWK-3121, AWK-3131, AWK-5222

Splitters



	A-SP-0825-2
Frequency	800-2500 MHz
Split	2-way
Input Port	N-type (female)
Output Port	N-type (female)
Return Loss	Min 20 db
Insertion Loss	Typ 0.5 db
Power Capacity	50 W
Related Products	AWK-3121, AWK-3131, AWK-4121, AWK-4131, AWK-5222, AWK-6222

Arrestors



	A-SA-NMNF-01
Frequency	0-6 GHz
Connector Type	N-type female to N-type male
Related Products	AWK-3121, AWK-3131, AWK-4121, AWK-4131, AWK-5222, AWK-6222

Adaptors



	A-ADP-RJ458P-DB9F-ABC01
Description	RJ45-to-DB9 adaptor for the ABC-01
Related Products	All AWK series



Industrial Cellular Solutions

Product Selection Guide

Cellular Routers and Cellular IP Gateways 6-2
Cellular IP Gateways and Cellular Modems 6-3

Introduction

Introduction to Industrial Cellular 6-4

Cellular Routers

OnCell 5004/5104-HSDPA Series: Industrial five-band GSM/GPRS/EDGE/UMTS/HSDPA high speed cellular routers 6-7
OnCell 5004/5104: Industrial quad-band GSM/GPRS cellular routers 6-9

Cellular IP Gateways

OnCell G3110/G3150-HSDPA Series: Industrial five-band GSM/GPRS/EDGE/UMTS/HSDPA high speed IP gateways with VPN 6-11
OnCell G3110/G3150: Industrial quad-band GSM/GPRS/EDGE IP gateways with VPN 6-13
OnCell G3111/G3151/G3211/G3251: 1 and 2-port RS-232 or RS-232/422/485 GSM/GPRS IP gateways 6-15

Cellular Modems

OnCell G2110/G2150I: Industrial quad-band GSM/GPRS modems 6-17

Cellular Antennas and Accessories

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Industrial Cellular Solutions



Cellular Routers and Cellular IP Gateways



	OnCell 5004-HSDPA 5004-HSDPA-JPS	OnCell 5104-HSDPA 5104-HSDPA-JPS	OnCell 5004	OnCell 5104	OnCell G3110-HSDPA G3110-HSDPA-JPS	OnCell G3150-HSDPA G3150-HSDPA-JPS	OnCell G3110	OnCell G3150
Cellular Interface								
Standards	GSM/GPRS/EDGE/UMTS/HSDPA		GSM/GPRS		GSM/GPRS/EDGE/UMTS/HSDPA		GSM/GPRS/EDGE	
Tri-band Options	850/1900/2100 MHz		–	–	850/1900/2100 MHz		–	–
Quad-band Options	850/900/1800/1900 MHz							
EDGE Multi-slot	Class 10	Class 10	–	–	Class 10	Class 10	Class 12	Class 12
EDGE Terminal Device	Class B	Class B	–	–	Class B	Class B	Class B	Class B
GPRS Multi-slot	Class 10	Class 10	Class 10	Class 10	Class 10	Class 10	Class 12	Class 12
GPRS Terminal Device	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B
GPRS Coding Schemes	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4
Operator Network	OnCell 5004/5104-HSDPA: Most countries OnCell 5004/5104-HSDPA-JPS: Japan Softbank		–	–	OnCell G3110/G3150-HSDPA: Most countries OnCell G3110/G3150-HSDPA-JPS: Japan Softbank		–	–
WAN Interface								
Number of Ports	1	1	1	1	–	–	–	–
Ethernet	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	–	–	–	–
LAN Interface								
Number of Ports	4	4	4	4	1	1	1	1
Ethernet	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)	10/100M (RJ45)
SIM Interface								
Number of SIMs	2	2	2	2	1	1	1	1
SIM Control	3 V	3 V	3 V	3 V	3 V	3 V	3 V	3 V
Serial Interface								
Number of Ports	–	–	–	–	1	1	1	1
Serial Standards	–	–	–	–	RS-232	RS-232/422/485	RS-232	RS-232/422/485
Connector	–	–	–	–	DB9-M	DB9-M and TB	DB9-M	DB9-M and TB
Serial Parameters	–	–	–	–	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			
Flow Control	–	–	–	–	RTS/CTS, XON/XOFF			
Baudrate	–	–	–	–	50 bps to 921.6 Kbps			
I/O Interface								
Alarm Contacts	–	1	–	1	1	1	1	1
Digital Inputs	–	2	–	2	2	2	2	2
Software								
Network Protocols	UDP/TCP, SNTP, ICMP, DDNS, DHCP/BOOTP, PPPoE, PPP, DNS Relay, HTTPS, Telnet, IPSec				ICMP, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, SMTP, HTTPS, SNTP, ARP, SSL, IPSec			
Router/Firewall	NAT, port forwarding, routing				NAT, port forwarding			
Authentication	Local user-name and password				Local user-name and password			
Security	IP filtering				Accessible IP list			
Operation Modes	–	–	–	–	Real COM, Secure Real COM, TCP Server, Secure TCP Server, TCP Client, Secure TCP Client, UDP, RFC2217, Ethernet Modem, SMS Tunnel			
Utilities	–	–	–	–	Provided for Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/ Server-2008, Windows XP/2003/Vista/Server-2008 x64 Edition			
Windows Real COM Drivers	–	–	–	–	Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server 2008, Windows XP/2003/Vista/Server 2008 x64 Edition			
Management Software								
OnCell Central	Centralized management solution for accessing private IPs from the Internet							
Physical Characteristics								
Housing	Aluminum (IP30)	Aluminum (IP30)	Aluminum (IP30)	Aluminum (IP30)	Aluminum (IP30)			
Weight	505±5 g	645±5 g	505±5 g	645±5 g	440±5 g			
Dimensions (mm)	158 x 103 x 34	160 x 103 x 50	158 x 103 x 34	160 x 103 x 50	28 x 126 x 93			
Environmental Limits								
Operating Temperature	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C
Operating Humidity	5 to 95%	5 to 95%	5 to 95%	5 to 95%	5 to 95%	5 to 95%	5 to 95%	5 to 95%
Storage Temperature	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C
Power Requirements								
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Connector	1 TB, 1 power jack	2 TBs	1 TB, 1 power jack	2 TBs	2 TBs	2 TBs	2 TBs	2 TBs
Standards and Certifications								
Safety	UL60950-1							
EMC	EN 55022 Class A, EN 55024, FCC Part 15 Subpart B Class A							
Radio Frequency	FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511, EN 301 489-24	FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511, EN 301 489-24	FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511	FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511	FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 489-24, EN 301 511	FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 489-24, EN 301 511, PTCRB	FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511	FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511, PTCRB
Reliability								
Warranty	5 years (see www.moxa.com/warranty)							

Cellular IP Gateways and Cellular Modems



	OnCell G3111	OnCell G3151	OnCell G3211	OnCell G3251	OnCell G2100 OnCell G2100-T	OnCell G2150I
Cellular Interface						
Standards	GSM/GPRS	GSM/GPRS	GSM/GPRS	GSM/GPRS	GSM/GPRS	GSM/GPRS
Quad-band Options	850/900/1800/1900 MHz					
GPRS Multi-slot Class	Class 10	Class 10	Class 10	Class 10	Class 10	Class 10
GPRS Terminal Device Class	Class B	Class B	Class B	Class B	Class B	Class B
GPRS Coding Schemes	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4
LAN Interface						
Number of Ports	1	1	1	1	–	–
Ethernet	10/100 Mbps (RJ45)	10/100 Mbps (RJ45)	10/100 Mbps (RJ45)	10/100 Mbps (RJ45)	–	–
SIM Interface						
Number of SIMs	1	1	1	1	1	1
SIM Control	3 V	3 V	3 V	3 V	3 V	3 V
Serial Interface						
Number of Ports	1	1	2	2	1	1
Serial Standards	RS-232	RS-232/422/485	RS-232	RS-232/422/485	RS-232	RS-232/422/485
Connector	DB9-M	DB9-M	DB9-M	DB9-M	DB9-F	DB9-F and 5-pin TB
2.5 KV Optical Isolation	–	–	–	–	–	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark				Data Bits: 7, 8; Stop Bits: 1, 2; Parity: None, Even, Odd, Space, Mark	
Flow Control	RTS/CTS, XON/XOFF				RTS/CTS	
Baudrate	50 bps to 921.6 Kbps				300 bps to 115.2 Kbps	
Software						
Network Protocols	ICMP, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, HTTPS, SMTP, SNTP, ARP				–	–
Router/Firewall	NAT, port forwarding					
Authentication	Local user-name and password				–	–
Security	Accessible IP list				–	–
Operation Modes	Real COM, TCP Server, TCP Client, UDP, SMS Tunnel, Reverse Real COM				–	–
Configuration and Management Options	SNMP MIB-II, v3, DDNS, IP Report, Web/Telnet/Serial Console, Serial Logging				–	–
Utilities	Provided for Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64				–	–
Windows Real COM Drivers	Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64				–	–
Management Software						
OnCell Central	Centralized management solution for accessing private IPs from the Internet				–	–
Physical Characteristics						
Housing	Aluminum (IP30)				ABS + PC (IP30)	
Weight	165±5 g		185±5 g		150 ± 5 g	
Dimensions	111 x 77 x 26 mm				27 x 123 x 79 mm	
Environmental Limits						
Operating Temperature	-30 to 55°C	-30 to 55°C	-30 to 55°C	-30 to 55°C	0 to 55°C or -30 to 75°C	0 to 55°C
Operating Humidity	5 to 95%	5 to 95%	5 to 95%	5 to 95%	5 to 95%	5 to 95%
Storage Temperature	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C
Power Requirements						
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Connector	1 power jack	1 power jack	1 power jack	1 power jack	1 power jack	1 power jack
Standards and Certifications						
Safety	UL 60950-1					
EMC	EN 55022 Class A, EN 55024, FCC Part 15 Subpart B Class A					
Radio	EN 301 489-1, EN 301 489-7, EN 301 511				FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511	
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

Introduction to Industrial Cellular

The latest development in industrial device networking is the adoption of wireless technology for industrial applications. This is a very exciting development with potentially enormous benefits for system integrators and end users. However, many users may have questions about the different technologies that are available and how best to adapt them to specific applications. Moxa provides a complete line of cellular solutions, including cellular modems, IP gateways, IP gateways with VPN, and even cellular routers.

The following table gives a good overview of the different types of cellular products:

	Cellular Modem	Cellular IP Gateway with VPN	Cellular Router
How to Connect	AT command	TCP/IP	TCP/IP
Serial Device Connection	Requires dial-up capability	Does not require dial-up capability	Not supported
Ethernet Device Connection	Not supported	Supported	Supported
Expertise Level	Good knowledge of AT command protocols	Easy to use	Easy to use
Ethernet Protocols	Not supported	NAT, Port-forwarding	NAT, Port-forwarding, Routing
Modem on both Ends	Required (except GPRS)	Not required	Not required
Local Memory	–	✓	✓
VPN*	–	✓	✓

*OnCell G3111/G3151/G3211/G3251 IP gateways do not support VPN.

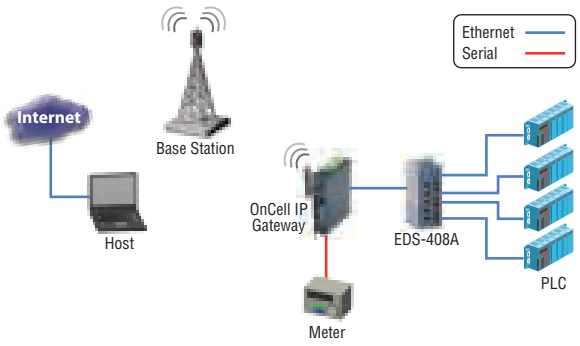
Overview of IP-based Cellular

The IP-based cellular device allows you to communicate with serial and Ethernet devices over a TCP/IP cellular network. As long as your host computer supports the TCP/IP protocol (Internet), your SCADA and data collection system will be able to access all instruments connected to a standard TCP/IP network, regardless of whether the devices are used locally or at a remote site. Cellular IP gateways are IP-based design solutions; they are equipped with dial-up capability, which means you no longer need to worry about installing an IPC or limit yourself to serial or Ethernet devices that have dial-up capability.

This not only eliminates the additional cost associated with deploying an IPC, but also saves room if your application is bound by tight space constrains. In addition, a cellular IP gateway is an "intelligent" device with a built-in memory and a ready-to-use TCP/IP operation mode, allowing it to connect over the Internet. The gateway can also be accessed with a simple web browser, which makes cellular IP gateways easier to use than cellular modems since no knowledge of the AT command protocol is required.

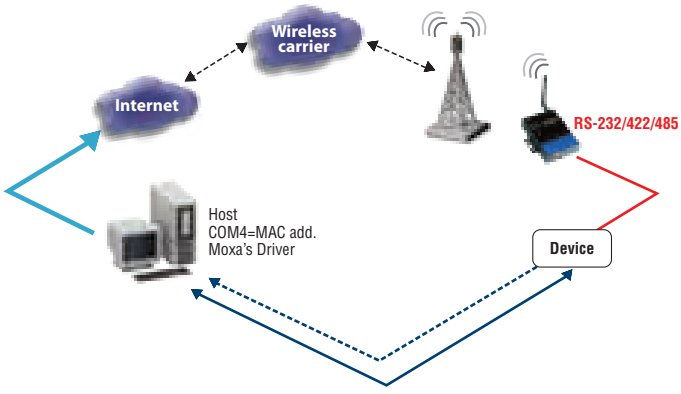
Ethernet-based Device-to-Cellular Products

The OnCell is assigned an IP address by your service provider (your "cellular ISP"), and outgoing TCP/IP connections are handled with Network Address Translation (NAT), allowing any number of local Ethernet devices to act as outgoing TCP/IP clients to access remote servers. However, the OnCell appears as a single IP address to the "public" Internet. This means that incoming connections must be forwarded manually, based on TCP port number, to the local Ethernet devices.



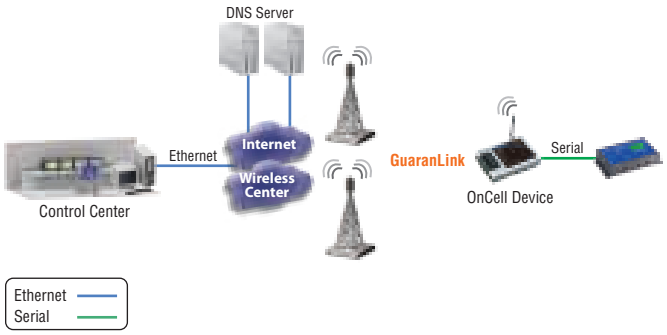
Serial-to-Cellular

The OnCell enables traditional serial (RS-232/422/485) devices to transmit data over the cellular network. The OnCell is a tiny computer equipped with a CPU and TCP/IP protocols that can bi-directionally translate data between the serial and IP formats. With this solution, your computer will be able to access, manage, and configure remote facilities and equipment over the cellular network from anywhere in the world.



GuaranLink

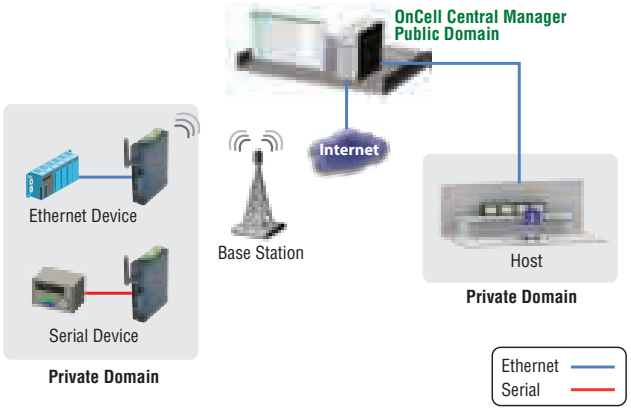
OnCell products come with GuaranLink, which enables reliable, consistent connectivity; GuaranLink ensures that your wireless connection will be there whenever you need it. What you get in return is zero-data-loss and on-demand cellular communications. GuaranLink achieves this in a number of ways: (1) the ISP Initial Connection Check function ensures that the OnCell can establish a connection with an ISP after rebooting, (2) the Cellular Connection Alive Check function ensures that the cellular connection will be kept alive—even if no data is transmitted for a period of time—by performing a DNS/Ping remote host check, and (3) the Packet-level Connection Check function will check to see if the cellular network can be accessed by performing a DNS/Ping remote host check



OnCell Central Manager

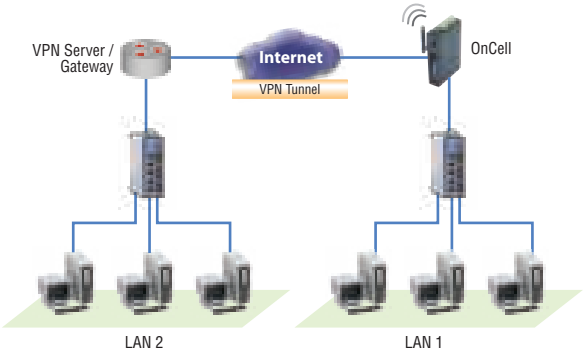
In the cellular world, most service providers only offer private IP addresses to mobile devices due to the limited availability of public addresses. Mobile devices configured with a private IP address can access resources on the Internet, but the mobile devices cannot be managed or accessed directly from the Internet since the private IP address is hidden.

The mechanism we developed uses a server configured with a public IP address to solve this private IP problem. The OnCell Central software installed in the server accepts connections from both Ethernet and serial mobile devices and remote hosts. Once a connection is established, the mobile device and the remote host can communicate with each other over the pre-established connection.



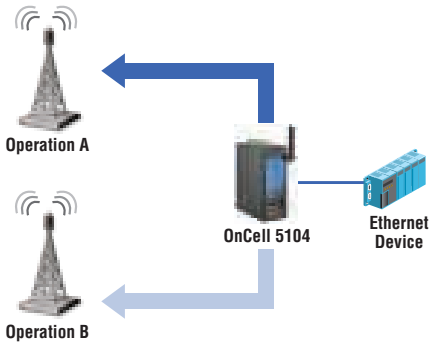
VPN

Computers that belong to a VPN use a second, "virtual" IP address to connect to the Internet. Instead of running across a single private network, some of the links between nodes that are part of a VPN use open network connections or virtual circuits on a larger network, such as the Internet. With the help of VPNs, cellular devices acting as a VPN client can initiate a connection with a VPN server. Once the connection is established, cellular devices can communicate with other network devices on the same private network.



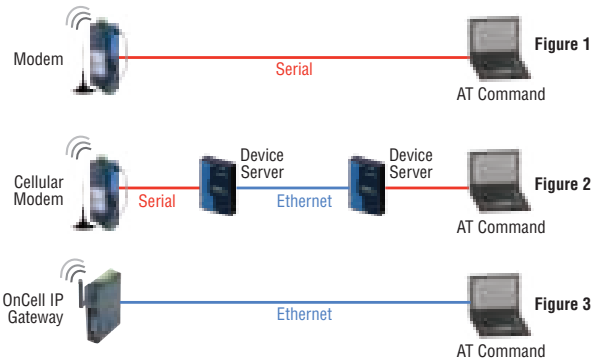
Dual SIM

Two SIM cards can be used with OnCell products, which have the ability to switch from one SIM card to the other as needed. Dual SIM devices can use SIM cards from the same or different service providers, which eliminates the need to install two cellular devices at the same place. Dual SIM operation ensures that the cellular connection is always available. It will automatically disconnect the 1st SIM card's low/weak cellular connection and will reconnect to establish a stronger connection using the 2nd SIM card. For some special mobile applications, dual SIM card devices have been used for "dual-country roaming" purposes as well.



Virtual Modem Mode

Virtual Modem mode is designed to extend the distance between devices and modems that communicate via RS-232 (Fig. 1) by allowing them to work with operating systems that support AT commands. In Fig. 2 we show a setup that uses two device servers to extend the transmission distance. If this type of solution is not feasible, or is deemed inefficient, then greater efficiency can be achieved using Moxa's OnCell IP gateway (Fig. 3). By connecting a properly configured OnCell IP gateway's Ethernet port to the computer's Ethernet port, and installing the Moxa driver in the computer, it is possible to transmit data over the cellular network even if the software running on the computer was originally designed to transmit data through a modem.

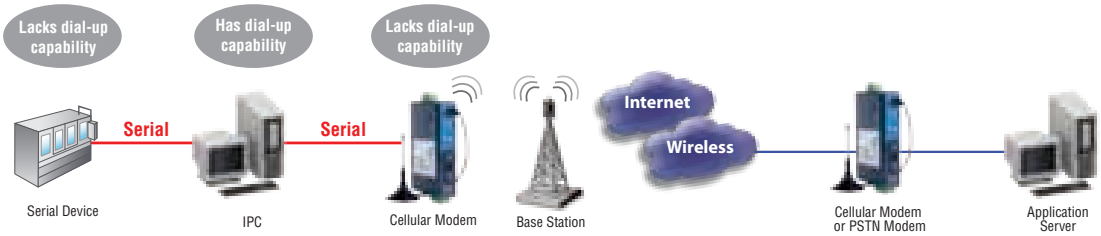


Overview of OnCell Cellular Products

OnCell Product Family	Ethernet over Cellular	Serial over Cellular	VPN	Dual SIM	Virtual Modem Mode	GuaranLink	OnCell Central Manager
OnCell G3111/G3151/G3211/G3251	✓	✓	–	–	–	✓	✓
OnCell G3110/G3150	✓	✓	✓	–	✓	✓	✓
OnCell G3110/G3150-HSDPA	✓	✓	✓	–	–	✓	✓
OnCell 5004/5104	✓	✓	✓	✓	–	✓	✓
OnCell 5004/5104-HSDPA	✓	✓	✓	✓	–	✓	✓

Traditional Modems

In industrial networking applications, cellular modems are used to enable communication with serial devices over a cellular network. Cellular modems only run AT commands and lack dial-up capability. Since most serial devices used in industrial applications today also lack dial-up capability, cellular modems must use an intermediary device with dial-up capability, such as an IPC or embedded computer, to connect serial devices to a cellular network. If you are using a serial device that has dial-up capability, then you do not need an intermediary device and can connect it to the cellular modem directly. In addition, you must also know how to use AT commands to program a cellular modem and construct the network architecture. This requirement contributes to the higher integration costs associated with using cellular modems, compared to IP gateways.

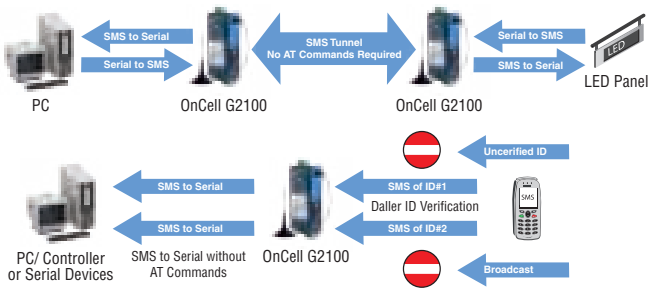


AT Commands

The OnCell G2100 supports both standard and extended Hayes* AT commands (AT stands for "attention code"). These commands form an industry standard language used to communicate with modems, which can switch between one of two modes. When in "data mode," the modem treats everything it receives from the intelligent device as data, and then sends it across the cellular network. When in "command mode," data is interpreted as commands by the local modem.

SMS Tunnel Mode

A major benefit of GSM technology is its support of short messages (SMS) for easy communication over the mobile network. With Moxa's SMS Tunnel Mode, the OnCell G2100 modems allow users to expand applications at little or no extra cost. For example, SMS Tunnel Mode can be used to update the message on a highway display panel, place refill orders for vending machines, handle maintenance for remote rental equipment, or even help create an SMS alarm by directly transforming the text, binary, or unicode data from a legacy device to short message format, without using AT Commands. SMS Tunnel Mode is particularly suitable for devices that communicate infrequently or do not have access to the local network. Although SMS Tunnel Mode converts both ASCII and binary data to short messages transparently, a caller ID (phone number identification) design has been implemented to block messages sent from uncertified users, system broadcasts, and commercial SMS advertisements.



OnCell 5004/5104-HSDPA Series

Industrial five-band GSM/GPRS/EDGE/UMTS/HSDPA high speed routers



OnCell 5004-HSDPA Series



OnCell 5104-HSDPA Series

- Universal tri-band UMTS/HSDPA 850/1900/2100 MHz
- Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
- GuaranLink and dual SIM redundancy for continuous cellular connections
- Connect to 4 10/100BaseT(X) devices over an integrated VPN
- Centralize private IP management with OnCell Central Manager
- DIN-Rail and wall mountable housing
- 2 digital inputs and 1 relay output (OnCell 5104-HSDPA only)

Overview

The OnCell 5004/5104-HSDPA are high-performance industrial grade cellular routers that allow up to 4 Ethernet-based devices to simultaneously use a single cellular data account for primary or backup network connectivity to remote sites and devices. Both products provide the functionality of a cellular router, firewall, and switch in one device, and to ensure zero data loss and on-demand cellular communication, the OnCell 5004/5104-HSDPA are integrated with the GuaranLink function. The difference between the OnCell 5004-HSDPA and OnCell 5104-HSDPA is that the OnCell 5104-HSDPA comes with a built-in relay output that can be configured to indicate the priority of events when notifying or warning engineers in the field, and the two digital inputs allow you to connect basic I/O devices, such as sensors, to the cellular network. The OnCell 5004-HSDPA can be placed on a desktop or wall-mounted, whereas the OnCell 5104-HSDPA has an IA design and can be attached to a DIN-rail. Both products use 12 to 48 VDC power inputs with a screw-on design for greater reliability, and the Ethernet ports come with 1.5 KV magnetic isolation protection to keep your system safe from unexpected electrical discharges.

Specifications

Cellular Interface (OnCell 5004/5104-HSDPA)

Standards: GSM/GPRS/EDGE/UMTS/HSDPA
Band Options:
Tri-band UMTS/HSDPA 850/1900/2100 MHz
Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
EDGE Multi-slot Class: Class 10
EDGE Terminal Device Class: Class B
GPRS Multi-slot Class: Class 10
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power:
GSM900: 2 W
UMTS/HSDPA: 0.25 W
EDGE900: 0.5 W
EDGE1800: 0.4 W
GSM1800: 1 W

Cellular Interface (OnCell 5004/5104-HSDPA-JPS)

Standards: UMTS/HSDPA
Band Options: 2100 MHz
Tx Power: UMTS/HSDPA: 0.25 W

WAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX
Magnetic Isolation Protection: 1.5 KV built-in

LAN Interface

Number of Ports: 4
Ethernet: 10/100 Mbps, RJ45 connector, auto MDI/MDIX
Magnetic Isolation Protection: 1.5 KV built-in

SIM Interface

Number of SIMs: 2
SIM Control: 3 V

I/O Interface (OnCell 5104-HSDPA)

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state “1” (On)
• +3 to -30 V for state “0” (Off)

Software

Network Protocols: UDP/TCP, SNTP, ICMP, DDNS, DHCP/BOOTP, PPPoE, PPP, DNS Relay, HTTPS, Telnet, IPSec
Router/Firewall: NAT, port forwarding, static routing
Authentication: Local user-name and password
Security: IP filtering

Management Software

OnCell Central Manager: Centralized management solution for accessing private IPs from the Internet

Physical Characteristics

Housing: Aluminum, providing IP30 protection
Weight:
OnCell 5004-HSDPA, OnCell 5004-HSDPA-JPS: 505±5 g
OnCell 5104-HSDPA, OnCell 5104-HSDPA-JPS: 645±5 g
Dimensions:
OnCell 5004-HSDPA, OnCell 5004-HSDPA-JPS: 158 x 103 x 34 mm (6.22 x 4.06 x 1.34 in)
OnCell 5104-HSDPA, OnCell 5104-HSDPA-JPS: 135 x 103 x 50.8 mm (5.32 x 4.06 x 2.00 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (30°C, non-condensing)

Power Requirements

Number of Power Inputs: 1 terminal block, 1 power jack
Input Voltage: 12 to 48 VDC
Power Consumption:
OnCell 5004-HSDPA, OnCell 5004-HSDPA-JPS: 12 to 48 VDC, 900 mA (max.)
OnCell 5104-HSDPA, OnCell 5104-HSDPA-JPS: 12 to 48 VDC, 950 mA (max.)

Standards and Certifications (OnCell 5004/5104-HSDPA)

Safety: UL 60950-1
EMC: EN 55022 Class A, EN 55024, FCC Part 15 Subpart B Class A
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 489-24, EN 301 511

Standards and Certifications (OnCell 5004/5104-HSDPA-JPS)

EMC: VCCI

Reliability

MTBF (mean time between failures):
OnCell 5004-HSDPA/5004-HSDPA-JPS: 441,000 hrs
OnCell 5104-HSDPA/5104-HSDPA-JPS: 411,000 hrs

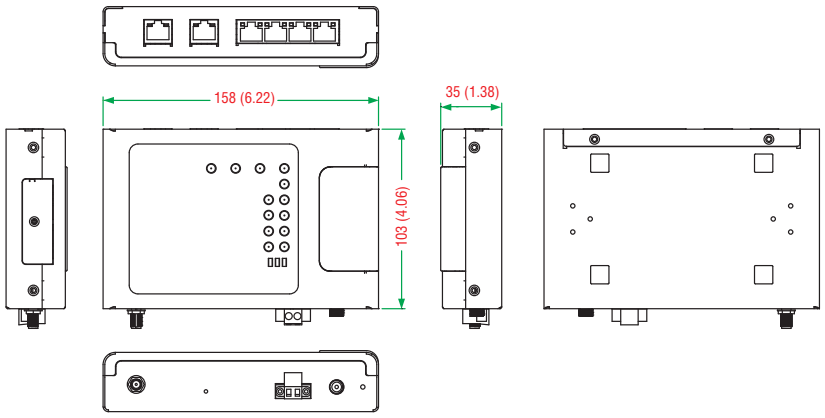
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

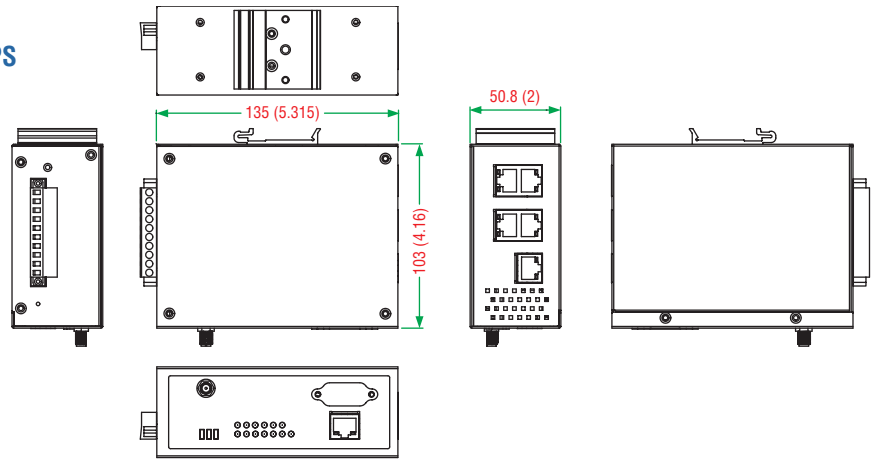
Dimensions

Unit: mm (inch)

OnCell 5004-HSDPA
OnCell 5004-HSDPA-JPS



OnCell 5104-HSDPA
OnCell 5104-HSDPA-JPS



Ordering Information

Available Models

OnCell 5004-HSDPA: 4-port 10/100M Ethernet to GSM/GPRS/EDGE/UMTS/HSDPA cellular router
OnCell 5004-HSDPA-JPS: 4-port 10/100M Ethernet to UMTS/HSDPA cellular router, Japan Softbank
OnCell 5104-HSDPA: 4-port 10/100M Ethernet to GSM/GPRS/EDGE/UMTS/HSDPA cellular router, IA design
OnCell 5104-HSDPA-JPS: 4-port 10/100M Ethernet to UMTS/HSDPA cellular router, IA design, Japan Softbank
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell cellular router
- Rubber SMA antenna
- Rubber stand (OnCell 5004-HSDPA only)
- Wallmount kit (OnCell 5004-HSDPA only)
- DIN-Rail kit (OnCell 5104-HSDPA only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

OnCell 5004/5104

Industrial quad-band GSM/GPRS routers



OnCell 5004



OnCell 5104

- Universal quad-band GSM/GPRS 850/900/1800/1900 MHz
- GuaranLink and dual SIM redundancy for continuous cellular connections
- Connect to 4 10/100BaseT(X) devices over an integrated VPN
- Centralize private IP management with OnCell Central Manager
- DIN-Rail and wall mountable housing
- 2 digital inputs and 1 relay output (OnCell 5104 only)

Overview

The OnCell 5004/5104 are high-performance industrial grade cellular routers that allow up to 4 Ethernet-based devices to simultaneously use a single cellular data account for primary or backup network connectivity to remote sites and devices. Both products provide the functionality of a cellular router, firewall, and switch in one device. To ensure zero data lose and on-demand cellular communication, OnCell 5004/5104 are integrated with GuaranLink function. The difference between the OnCell 5004 and OnCell 5104 is that the OnCell 5104 comes with a built-in relay output that can be configured to indicate the priority of events when notifying or warning engineers in the field, and the two digital inputs allow you to connect basic I/O devices, such as sensors, to the cellular network. The OnCell 5004 can be placed on a desktop or wall-mounted, whereas the OnCell 5104 has an IA design and can be attached to a DIN-rail. Both products use 12 to 48 VDC power inputs with a screw-on design for greater reliability, and the Ethernet ports come with 1.5 KV magnetic isolation protection to keep your system safe from unexpected electrical discharges.

Specifications

Cellular Interface

Standards: GSM/GPRS
Band Options: Quad-band 850/900 and 1800/1900 MHz
GPRS Multi-slot Class: Class 10
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power: 1 watt GSM 1800/1900, 2 watts EGSM 850/900

WAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX
Magnetic Isolation Protection: 1.5 KV built-in

LAN Interface

Number of Ports: 4
Ethernet: 10/100 Mbps, RJ45 connector, auto MDI/MDIX
Magnetic Isolation Protection: 1.5 KV built-in

SIM Interface

Number of SIMs: 2
SIM Control: 3 V

I/O Interface (OnCell 5104 only)

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state “1” (On)
• +3 to -30 V for state “0” (Off)

Software

Network Protocols: UDP/TCP, SNTP, ICMP, DDNS, DHCP/BOOTP, PPPoE, PPP, DNS Relay, HTTPS, Telnet, IPSec
Router/Firewall: NAT, port forwarding, routing
Authentication: Local user-name and password
Security: IP filtering

Management Software

OnCell Central Manager: Centralized management solution for accessing private IPs from the Internet

Physical Characteristics

Housing: Aluminum, providing IP30 protection
Weight:
OnCell 5004: 505±5 g
OnCell 5104: 645±5 g
Dimensions:
OnCell 5004: 158 x 103 x 35 mm (6.22 x 4.06 x 1.38 in)
OnCell 5104: 135 x 103 x 50.8 mm (5.315 x 4.06 x 2.000 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (30°C, non-condensing)

Power Requirements

Number of Power Inputs: 1 terminal block, 1 power jack
Input Voltage: 12 to 48 VDC
Power Consumption:
OnCell 5004: 12 to 48 VDC, 900 mA (max.)
OnCell 5104: 12 to 48 VDC, 950 mA (max.)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022 Class A, EN 55024, FCC Part 15 Subpart B Class A
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511

Reliability

MTBF (mean time between failures):
OnCell 5004: 352,000 hrs
OnCell 5104: 480,000 hrs

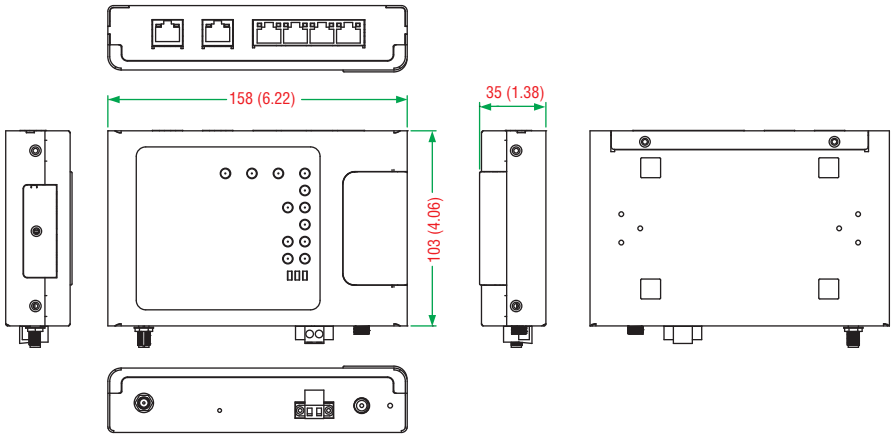
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

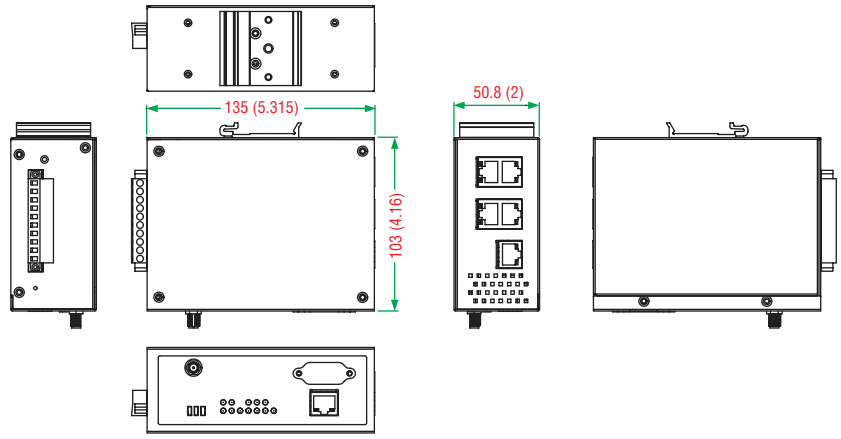
Dimensions

Unit: mm (inch)

OnCell 5004



OnCell 5104



Ordering Information

Available Models

OnCell 5004: 4-port 10/100M Ethernet to GSM/GPRS cellular router
OnCell 5104: 4-port 10/100M Ethernet to GSM/GPRS cellular router, IA design
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell cellular router
- Rubber SMA antenna
- Rubber stand (OnCell 5004 only)
- Wallmount kit (OnCell 5004 only)
- DIN-Rail kit (OnCell 5104 only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

OnCell G3110/G3150-HSDPA Series

Industrial five-band GSM/GPRS/EDGE/UMTS/HSDPA high performance IP gateways with VPN



- Tri-band UMTS/HSDPA 850/1900/2100 MHz
- Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
- Connect to Ethernet and serial devices over an integrated VPN
- Centralize private IP management software with OnCell Central Manager
- Redundant DC power inputs
- 2 digital inputs and 1 relay output

Overview

The OnCell G3110/G3150-HSDPA series of high-speed industrial-grade IP gateways are intelligent and fully-featured wireless communication platforms that connect your Ethernet and serial devices over a cellular TCP/IP network. The OnCell G3110/G3150-HSDPA series offers connectivity to all tri HSDPA/UMTS frequency bands and quad GSM/GPRS/EDGE frequency bands used in Europe, the United States, and Japan, allowing seamless global roaming on the best available network. The OnCell G3110/G3150-HSDPA come with private IP management software and support VPN for handling the IP address issue in cellular network structures. The OnCell G3110/G3150-HSDPA also have a built-in relay output that can be configured to indicate the priority of events when notifying or warning engineers in the field. Two digital inputs also allow you to connect basic I/O devices, and the OnCell G3110/G3150-HSDPA comes with redundant power inputs to assure non-stop operation.

Specifications

Cellular Interface (OnCell G3100-HSDPA series)

Standards: GSM/GPRS/EDGE/UMTS/HSDPA
Band Options:
• Tri-band UMTS/HSDPA 850/1900/2100 MHz
• Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
EDGE Multi-slot Class: Class 10
EDGE Terminal Device Class: Class B
GPRS Multi-slot Class: Class 10
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power:
GSM900: 2 W
UMTS/HSDPA: 0.25 W
EDGE900: 0.5 W
EDGE1800: 0.4 W
GSM1800: 1 W

Cellular Interface (OnCell G3100-HSDPA-JPS series)

Standards: UMTS/HSDPA
Band Options: 2100 MHz
Tx Power: UMTS/HSDPA: 0.25 W

LAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX
Magnetic Isolation Protection: 1.5 KV built-in

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1
Serial Standards:
G3110: RS-232 (DB9 male connector)
G3150: RS-232 (DB9 male connector), RS-422/485 (5-pin terminal block connector)
ESD Protection: 15 KV
Power EFT/Surge Protection: 2 KV

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2 (when parity = None)
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

I/O Interface

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state “1” (On)
• +3 to -30 V for state “0” (Off)

Software

Network Protocols: ICMP, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, SMTP, HTTPS, SNTP, ARP, SSL, IPSec
Router/Firewall: NAT, port forwarding
Authentication: Local user-name and password
Security: Accessible IP list

Operation Modes: Real COM, Secure Real COM, Reverse Real COM, Secure Reverse Real COM, TCP Server, Secure TCP Server, TCP Client, Secure TCP Client, UDP, RFC2217, Ethernet Modem, SMS Tunnel
Configuration and Management Options: SNMP MIB-II, SNMP Private MIB, SNMPv1/v2c/v3, DDNS, IP Report, Web/Telnet/Serial-Console/SSH
Utilities: Provided for Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64 Edition
Windows Real COM Drivers: Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server 2008, Windows XP/2003/Vista/Server 2008 x64 Edition
Fixed TTY Drivers: SCO Unix, SCO OpenServer 5, SCO OpenServer 6, UnixWare 7, SVR4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD 5, FreeBSD 6
Linux Real TTY Drivers: Linux kernels 2.2.x, 2.4.x, 2.6.x

Management Software

OnCell Central Manager: Centralized management solution for accessing private IPs from the Internet

Physical Characteristics

Housing: Aluminum, providing IP30 protection
Weight: 440±5 g
Dimensions: 28 x 126 x 93 mm (1.10 x 4.96 x 3.66 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (30°C, non-condensing)

Power Requirements

Number of Power Inputs: 2 (terminal block)
Input Voltage: 12 to 48 VDC
Power Consumption: 12 to 48 VDC, 900 mA (max.)

Standards and Certifications (OnCell G3100-HSDPA series)

Safety: UL 60950-1
EMC: EN 55022 Class A, EN 55024, FCC Part 15 Subpart B Class A
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 489-24, EN 301 511, PTCRB (OnCell G3150-HSDPA only)

Regulatory Approvals (OnCell G3100-HSDPA-JPS series)

EMC: VCCI (Japan)

Reliability

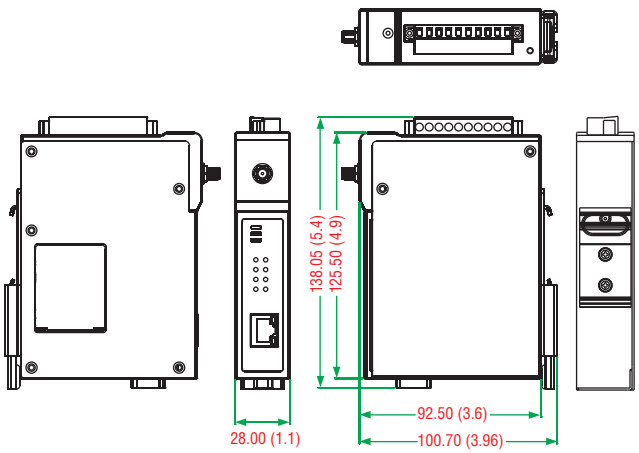
MTBF (mean time between failures): 380,000 hrs

Warranty

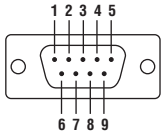
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions & Pin Assignment

Unit: mm (inch)



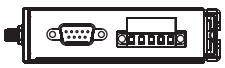
DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–



OnCell G3110-HSDPA Series



OnCell G3150-HSDPA Series

Ordering Information

Available Models

OnCell G3110-HSDPA: 1-port RS-232 to GSM/GPRS/EDGE/UMTS/HSDPA IP gateway with VPN
OnCell G3110-HSDPA-JPS: 1-port RS-232 to UMTS/HSDPA IP gateway with VPN, Japan Softbank
OnCell G3150-HSDPA: 1-port RS-232/422/485 to GSM/GPRS/EDGE/UMTS/HSDPA IP gateway with VPN
OnCell G3150-HSDPA-JPS: 1-port RS-232/422/485 to UMTS/HSDPA IP gateway with VPN, Japan Softbank
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell IP gateway
- Rubber SMA antenna
- DIN-Rail kit
- Documentation and software CD
- Quick installation guide
- Warranty card

OnCell G3110/G3150

Industrial quad-band GSM/GPRS/EDGE IP gateways with VPN



- Universal quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
- Connect to Ethernet and serial devices over an integrated VPN
- Redundant DC power input
- 2 digital inputs and 1 relay output
- Centralize private IP management software with OnCell Central Manager
- DIN-Rail mounting

Overview

The OnCell G3110 and G3150 industrial RS-232 and RS-232/422/485 GSM/GPRS/EDGE IP gateways are designed to transmit data transparently over GSM/GPRS/EDGE cellular networks. The OnCell G3110 and G3150 can transmit data from both serial devices and Ethernet devices to a WAN interface, and come with private IP management software and VPN support for handling the IP address issue in cellular network structures. The products also come with a built-in relay output that can be configured to indicate the priority of events when notifying or warning engineers in the field. Two digital inputs also allow you to connect basic I/O devices, and the OnCell's redundant power inputs assure non-stop operation.

Specifications

Cellular Interface

Standards: GSM/GPRS/EDGE
Band Options: Quad-band 850/900 and 1800/1900 MHz
EDGE Multi-slot Class: Class 12
GPRS Multi-slot Class: Class 12
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power: 1 watt GSM 1800/1900, 2 watts EGSM 850/900

LAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX
Magnetic Isolation Protection: 1.5 KV built-in

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1
Serial Standards:
G3110: RS-232 (DB9 male connector)
G3150: RS-232 (DB9 male connector), RS-422/485 (5-pin terminal block connector)
ESD Protection: 15 KV
Power EFT/Surge Protection: 2 KV

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2 (when parity = None)
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

I/O Interface

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 2 electrically isolated inputs
• +13 to +30 V for state "1" (On)
• +3 to -30 V for state "0" (Off)

Software

Network Protocols: ICMP, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, SMTP, HTTPS, SNTP, ARP, SSL, IPSec
Router/Firewall: NAT, port forwarding
Authentication: Local user-name and password
Security: Accessible IP list
Operation Modes: Real COM, Secure Real COM, Reverse Real COM, Secure Reverse Real COM, TCP Server, Secure TCP Server, TCP Client, Secure TCP Client, UDP, RFC2217, Ethernet Modem, Virtual Modem, SMS Tunnel
Configuration and Management Options: SNMP MIB-II, SNMP Private MIB, SNMPv1/v2c/v3, DDNS, IP Report, Web/Telnet/Serial-Console/SSH
Utilities: Provided for Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64 Edition
Windows Real COM Drivers: Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server 2008, Windows XP/2003/Vista/Server 2008 x64 Edition

Fixed TTY Drivers: SCO Unix, SCO OpenServer 5, SCO OpenServer 6, UnixWare 7, SVR4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD 5, FreeBSD 6
Linux Real TTY Drivers: Linux kernels 2.2.x, 2.4.x, 2.6.x

Management Software

OnCell Central Manager: Centralized management solution for accessing private IPs from the Internet

Physical Characteristics

Housing: Aluminum, providing IP30 protection
Weight: 440±5 g
Dimensions: 28 x 126 x 93 mm (1.10 x 4.96 x 3.66 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (30°C, non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption: 12 to 48 VDC, 900 mA (max.)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022 Class A, EN 55024, FCC Part 15 Subpart B Class A
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511, PTCRB (OnCell G3150 only)

Reliability

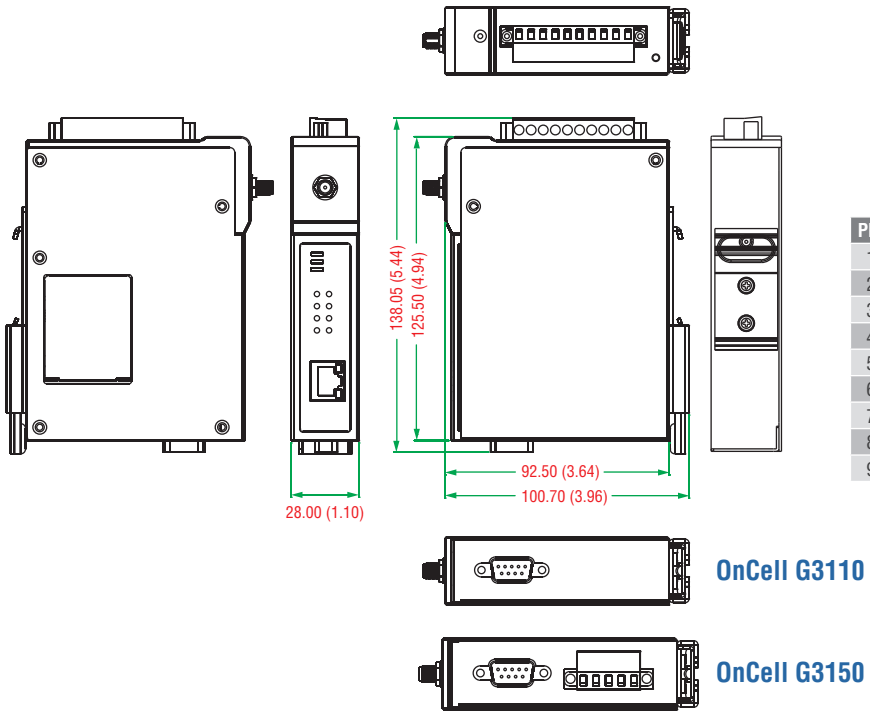
MTBF (mean time between failures): 339,000 hrs

Warranty

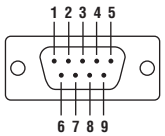
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions & Pin Assignment

Unit: mm (inch)



DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–

Ordering Information

Available Models

OnCell G3110: 1-port RS-232 to GSM/GPRS/EDGE IP gateway with VPN
OnCell G3150: 1-port RS-232/422/485 to GSM/GPRS/EDGE IP gateway with VPN
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell IP gateway
- Rubber SMA antenna
- DIN-Rail kit
- Documentation and software CD
- Quick installation guide
- Warranty card

OnCell G3111/G3151/G3211/G3251

1 and 2-port RS-232 or RS-232/422/485 GSM/GPRS IP gateways



- Universal quad-band GSM/GPRS 850/900/1800/1900 MHz
- Connect Ethernet and serial devices
- Centralize private IP management software with OnCell Central Manager
- Choice of configuration methods, including web console, serial console, and Telnet
- Desktop or DIN-Rail installation

Overview

The OnCell G3111/G3151/G3211/G3251 are cellular IP gateways that can conveniently and transparently connect up to two devices to a cellular network, allowing you to connect to your existing Ethernet and serial devices with only basic configuration. To ensure zero data loss and on-demand cellular communication, OnCell devices are integrated with the GuaranLink function. The G3111/G3151/G3211/G3251 cellular IP gateways are compact, and can be used on a desktop or mounted on a DIN-Rail. The products come with a 12 to 48 VDC power input and have 2 KV EFT/Surge protection to allow the use of different types of field power sources. The serial ports are also protected by 15 KV ESD line protection to keep your system safe from unexpected electrical discharges.

Specifications

Cellular Interface

Standards: GSM/GPRS
Band Options: Quad-band 850/900 and 1800/1900 MHz
GPRS Multi-slot Class: Class 10
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
Tx Power: 1 watt GSM 1800/1900, 2 watts EGSM 850/900
SIM Control: 3 V

LAN Interface

Number of Ports: 1
Ethernet: 10/100 Mbps, RJ45 connector, Auto MDI/MDIX
Magnetic Isolation Protection: 1.5 KV built-in

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1 or 2
Serial Standards:
G3111: 1 RS-232 port
G3151: 1 RS-232/422/485 port
G3211: 2 RS-232 ports
G3251: 2 RS-232/422/485 ports
ESD Protection: 15 KV
Power EFT/Surge Protection: 2 KV

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2 (when parity = None)
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, HTTPS, SMTP, SNTP, ARP
Router/Firewall: NAT, port forwarding
Authentication: Local user-name and password
Security: Accessible IP list
Operation Modes: Real COM, TCP Server, TCP Client, UDP, RFC2217, Ethernet Modem, SMS Tunnel, Reverse Real COM
Configuration and Management Options: SNMP MIB-II, v3, DDNS, IP Report, Web/Telnet/Serial Console, Serial Logging
Utilities: Provided for Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64
Windows Real COM Drivers: Windows 95/98/ME, Windows NT, Windows 2000/XP/2003/Vista/Server-2008, Windows XP/2003/Vista/Server-2008 x64

Management Software

OnCell Central Manager: Centralized management solution for accessing private IPs from the Internet

Physical Characteristics

Housing: Aluminum, providing IP30 protection
Weight:
OnCell G3111/G3151: 165±5 g
OnCell G3211/G3251: 185±5 g
Dimensions: 111 x 77 x 26 mm (4.37 x 3.03 x 1.02 in)

Environmental Limits

Operating Temperature: -30 to 55°C (-22 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (30°C, non-condensing)

Power Requirements

Number of Power Inputs: 1 power jack
Input Voltage: 12 to 48 VDC
Power Consumption: 12 to 48 VDC, 900 mA (max.)

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022 Class A, EN 55024, FCC Part 15 Subpart B Class A
Radio: EN 301 489-1, EN 301 489-7, EN 301 511

Reliability

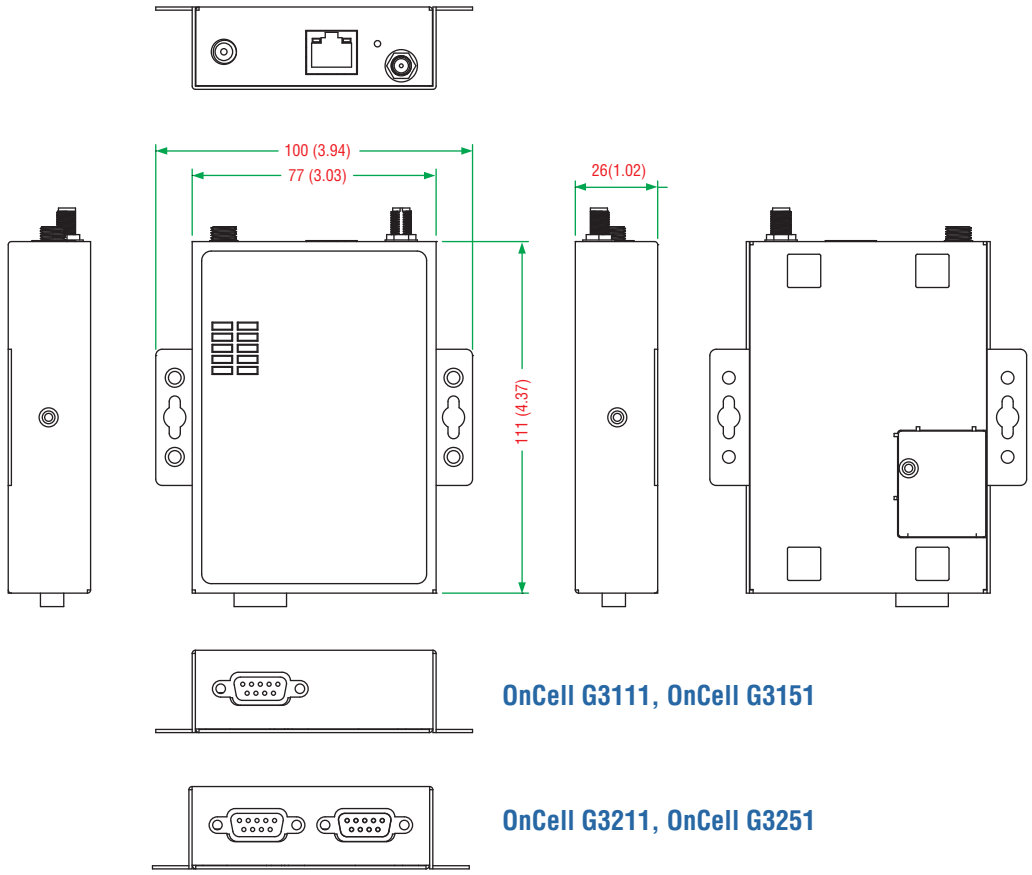
MTBF (mean time between failures):
OnCell G3111: 664,000 hrs
OnCell G3151: 661,000 hrs
OnCell G3211: 647,000 hrs
OnCell G3251: 642,000 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



OnCell G3111, OnCell G3151

OnCell G3211, OnCell G3251

Ordering Information

Available Models

OnCell G3111: 1-port RS-232 to GSM/GPRS IP gateway
OnCell G3151: 1-port RS-232/422/485 to GSM/GPRS IP gateway
OnCell G3211: 2-port RS-232 to GSM/GPRS IP gateway
OnCell G3251: 2-port RS-232/422/485 to GSM/GPRS IP gateway
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell IP gateway
- Rubber SMA antenna
- DC power supply (screw-on type)
- Din-Rail kit
- Document and software CD
- Quick installation guide
- Warranty card

OnCell G2110/G2150I

1-port RS-232 or RS-232/422/485 GSM/GPRS modems



- Quad-band GSM/GPRS 850/900/1800/1900 MHz
- Separate RS-232 and RS-422/485 serial interfaces (G2150I only)
- 2.5 KV RMS isolation for 1 min. for all serial signals (G2150I only)
- Extended operating temperature from -30 to 75°C (G2110-T only)
- LED indicators for GSM/GPRS, data transmission, and signal level
- SMS Tunnel Mode provided
- DIN-Rail and wall mounting

Overview

The OnCell G2100 series of industrial quad-band GSM/GPRS modems are designed to transmit data and short messages (SMS) over GSM/GPRS mobile networks. The modems can be used to increase the efficiency of maintenance and communication, but do not require extensive training. In addition, the modems can be mounted on a DIN-Rail or wall. The OnCell G2100 series modems accept a 12 to 48 VDC power input, making them suitable for use with a variety of field power sources. The serial ports feature 15 KV ESD line protection to protect the products from harmful electrical discharge, and separate RS-232 and RS-422/485 interfaces are built into the OnCell G2150I, each with 2.5 KV RMS isolation protection for one minute. The two serial interfaces on the OnCell G2150I make it ideal for attaching all kinds of devices, such as stand-alone controllers, PC COM ports, and multi-dropped electric meters. In addition, the OnCell G2110-T has an extended operating temperature (-30 to 75°C) design that makes it suitable for heavy industrial use.

Specifications

Cellular Interface

Standards: GSM/GPRS
Band Options: Quad-band 850/900/1800/1900 MHz
GPRS Multi-slot Class: Class 10
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
CSD Data Transmission Rate: Up to 14,400 bps
Tx Power: 1 watt GSM1800/1900, 2 watts EGSM 900/GSM 850

SIM Interface

Number of SIMs: 1
SIM Control: 3 V

Serial Interface

Number of Ports: 1
Serial Standards:
G2110: RS-232 (DB9 female connector)
G2150I: RS-232 (DB9 female connector), RS-422/485 (5-pin terminal block connector)
ESD Protection: 15 KV (G2110 only)
Optical Isolation: 2.5 KV (G2150I only)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS
Baudrate: 300 bps to 115.2 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics

Housing: ABS + PC, IP30 protected
Weight: 150 ± 5 g
Dimensions: 27 x 123 x 79 mm (1.06 x 4.84 x 3.11 in)

Environmental Limits

Operating Temperature:
OnCell G2110/G2150I: -20 to 55°C (-4 to 131°F)
OnCell G2110-T: -30 to 75°C (-22 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (30°C, non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption: 12 to 48 VDC, 900 mA (max.)

Standards and Certifications

EMC: EN 55022 Class A, EN 55024, FCC Part 15 Subpart B Class A
Radio: FCC Part 22H, FCC Part 24E, EN 301 489-1, EN 301 489-7, EN 301 511

Reliability

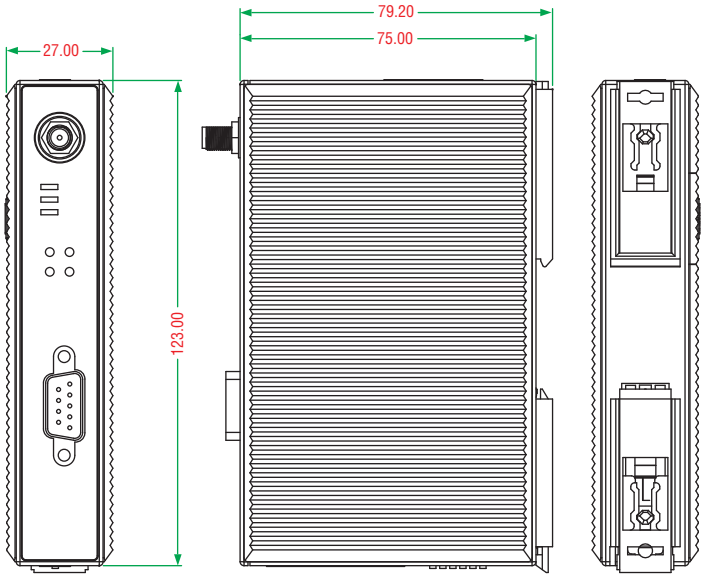
MTBF (mean time between failures):
OnCell G2110/G2110-T: 925,000 hrs
OnCell G2150I: 864,000 hrs

Warranty

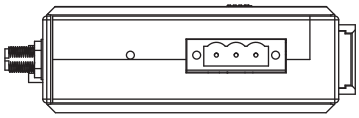
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

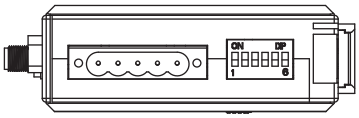
Unit: mm (inch)



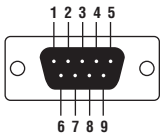
OnCell G2110



OnCell G2150I



DB9 female RS-232 port



PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

Ordering Information

Available Models

OnCell G2110: 1-port RS-232 to GSM/GPRS modem, -20 to 55°C operating temperature
OnCell G2150I: 1-port RS-232/422/485 to GSM/GPRS modem, with 2.5 KV optical isolation, -20 to 55°C operating temperature
OnCell G2110-T: 1-port RS-232 to GSM/GPRS modem, -30 to 75°C operating temperature
Note: Please visit Moxa's website for a complete list of optional wireless accessories and antennas available for Moxa's wireless products.

Package Checklist

- OnCell cellular modem
- 0 dBi magnetic mount SMA antenna
- Terminal block adaptor for power jack connector
- Document and software CD
- Quick installation guide
- Warranty card

Cellular Antennas

GSM/GPRS Cellular Antennas






	ANT-CQB-ASM-01	ANT-CQB-AHSM-00-3m	ANT-CQB-AHSM-03-3m	ANT-CQB-AHSM-05-3m
Frequency Range	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz
Description	Quad-band GSM/GPRS, omni-directional, 1 dBi, rubber SMA	Quad-band GSM/GPRS, omni-directional, 0 dBi, 10 cm high, magnetic SMA, 3 m	Quad-band GSM/GPRS, omni-directional, 3 dBi, 25 cm high, magnetic SMA, 3 m	Quad-band GSM/GPRS, omni-directional, 5 dBi, 37 cm high, magnetic SMA, 3 m
Antenna Type	Omni-directional	Omni-directional	Omni-directional	Omni-directional
Cable Type	–	RG174/U	RG174/U	RG174/U
Typical Antenna Gain	1 dBi (Max.)	0 dBi	3 dBi	5 dBi
Impedance	50 ohms	50 ohms	50 ohms	50 ohms
Polarization Type	Linear	Linear	Linear	Linear
HPBW/horizontal	360°	360°	360°	360°
V.S.W.R.	–	< 2	< 2	< 2
Connector(s)	SMA (male)	SMA (male)	SMA (male)	SMA (male)
Antenna Length	83 mm	100 mm	250 mm	370 mm
Weight	10 g	58 g	60 g	62 g
Cable Length	–	3 m	3 m	3 m
Related Products	OnCell G2100 series, OnCell G3111/G3151, OnCell G3211/G3251, OnCell G3100 series, OnCell 5000 series	OnCell G2100 series, OnCell G3111/G3151, OnCell G3211/G3251, OnCell G3100 series, OnCell 5000 series, ioLogik W5340/5312	OnCell G2100 series, OnCell G3111/G3151, OnCell G3211/G3251, OnCell G3100 series, OnCell 5000 series	OnCell G2100 series, OnCell G3111/G3151, OnCell G3211/G3251, OnCell G3100 series, OnCell 5000 series

UMTS/HSDPA Cellular Antennas





	ANT-WCDMA-ASM-1.5	ANT-WCDMA-AHSM-04-2.5m	ANT-WCDMA-ANF-00
Frequency Range	850/900/1800/1900/2100 MHz	850/900/1800/1900/2100 MHz	850/900/1800/1900/2100 MHz
Description	Five-band GSM/GPRS/UMTS/HSDPA, omni-directional, 1.5 dBi, rubber SMA	Five-band GSM/GPRS/UMTS/HSDPA, omni-directional, 4 dBi, 11 cm high, magnetic SMA, 2.5 m	Five-band GSM/GPRS/UMTS/HSDPA, omni-directional, 0 dBi, glass fiber, N-type (female)
Antenna Type	Omni-directional	Omni-directional	Omni-directional
Cable Type	–	RG174/U	–
Typical Antenna Gain	1.5 dBi	4 dBi	0 dBi
Impedance	50 ohms	50 ohms	50±5 ohms
Polarization Type	Vertical	Vertical	Vertical
HPBW/horizontal	360°	360°	360°
HPBW/vertical	–	–	40°
V.S.W.R.	< 2	< 2	1 : 1.5 Max.
Connector(s)	SMA (male)	SMA (male)	N-type Female
Antenna Length	104 mm	110 mm	420 mm
Weight	10 g	60 g	430 g
Cable Length	–	2.5 m	–
Related Products	OnCell G2100 series, OnCell G3111/G3151, OnCell G3211/G3251, OnCell G3100 series, OnCell G3100-HSDPA series, OnCell 5000 series	OnCell G2100 series, OnCell G3111/G3151, OnCell G3211/G3251, OnCell G3100 series, OnCell G3100-HSDPA series, OnCell 5000 series, ioLogik W5340-HSDPA	OnCell G2100 series, OnCell G3111/G3151, OnCell G3211/G3251, OnCell G3100 series, OnCell G3100-HSDPA series, OnCell 5000 series

Cellular Accessories

CRF-SMA(M)/N(M)-300



Description: CFD200 cable, SMA male to N-type (male), 3 m
Cable Type: CFD200
Connector Type: SMA male to N-type male
Length: 3 m
Outer Dimension: 4.14 mm
Min. Bend Radius: 20.32 mm
Attenuation: 55.4 @ 2500 MHz, 86.5 @ 5800 MHz
Related Accessory: Cellular 5-band N-type antenna
Related Products: OnCell G3111/G3151, OnCell G3211/G3251, OnCell G3100 series, OnCell G3100-HSDPA series, OnCell 5000 series



Terminal Servers

Product Selection Guide

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Secure Terminal Servers

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NPort® 6000 Terminal Servers



	NPort 6150	NPort 6250	NPort 6250-M-SC	NPort 6250-S-SC	NPort 6450	NPort 6610-8	NPort 6610-8-48V	NPort 6610-16	NPort 6610-16-48V
LAN Interface									
10/100BaseT(X) Ports	1 port (8-pin RJ45 connector)								
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
100BaseFX Ports	–	–	1 (multi-mode)	1 (single-mode)	–	–	–	–	–
Expansion Modules									
10/100BaseT(X) (RJ45)	–	–	–	–	✓	✓	✓	✓	✓
Multi-mode Fiber (SC)	–	–	–	–	✓	✓	✓	✓	✓
Single-mode Fiber (SC)	–	–	–	–	✓	✓	✓	✓	✓
GSM/GPRS	–	–	–	–	✓	✓	✓	✓	✓
Modem	–	–	–	–	✓	✓	✓	✓	✓
Serial Interface									
RS-232 Ports	–	–	–	–	–	8	8	16	16
RS-232/422/485 Ports	1	2	2	2	4	–	–	–	–
Connectors	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF								
Baudrate	50 bps to 921.6 Kbps (supports non-standard baudrates)								
15 KV ESD Protection	✓	✓	✓	✓	✓	✓	✓	✓	✓
2 KV isolation protection	–	–	–	–	–	–	–	–	–
RS-485 Data Direction Control	ADDC	ADDC	ADDC	ADDC	ADDC	ADDC	ADDC	ADDC	ADDC
RS-232 Console Port	✓	✓	✓	✓	✓	✓	✓	✓	✓
Advanced Features									
LCD Panel with 4 push buttons	–	–	–	–	✓	✓	✓	✓	✓
Serial Data Log	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
Offline Port Buffering	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
SD Slot	–	✓	✓	✓	✓	✓	✓	✓	✓
Software									
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, DDNS, HTTP, SMTP, HTTPS, SSL, SSH, PPPoE, RFC2217, IPv6, IPv4, Turbo Ring, Turbo Ring 2								
Security Protocols	DES, 3DES, AES, SSH, SSL								
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility								
Driver Support	Windows Real COM Drivers (for Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded), Linux Real TTY driver (for 2.4.x, 2.6.x), Fixed TTY driver (for SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x)								
Management	SNMP MIB-II								
IP Routing	Static, RIP-I, RIP-II								
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled								
Secure Operation Modes	Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH								
Terminal Sessions	8 sessions per port								
Physical Characteristics									
Housing	Metal	Metal	Metal	Metal	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	700 g	730 g	730 g	730 g	1020 g	3460 g	3460 g	3580 g	3580 g
Dimensions (mm)	67 x 100.4 x 28	77 x 111 x 28	77 x 111 x 28	77 x 111 x 28	158 x 103 x 35	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44
Environmental Limits									
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Storage Temperature	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements									
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	100 to 240 VAC	±48 VDC	100 to 240 VAC	±48 VDC
Power Consumption	285 mA @ 12 V 150 mA @ 24 V	333 mA @ 12 V 173 mA @ 24 V	428 mA @ 12 V 219 mA @ 24 V	376 mA @ 12 V 193 mA @ 24 V	730 mA @ 12 V 330 mA @ 24 V	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V
Standards and Certifications									
Safety	UL 60950-1, EN 60950-1								
EMC	CE (EN 55022 Class A, EN 55024), FCC Part 15 Subpart B Class A								
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
MTBF	231,709 hrs	226,128 hrs	225,762 hrs	225,762 hrs	120,354 hrs	135,891 hrs	135,891 hrs	102,373 hrs	102,373 hrs
Warranty	5 years (see www.moxa.com/warranty)								

NPort® 6000 Terminal Servers



	NPort 6610-32	NPort 6610-32-48V	NPort 6650-8 NPort 6650-8-T	NPort 6650-8-48V	NPort 6650-16 NPort 6650-16-T	NPort 6650-16-48V	NPort 6650-32	NPort 6650-32-48V
LAN Interface								
10/100BaseT(X) Ports	1 port (8-pin RJ45 connector)							
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
100BaseFX Ports	–	–	–	–	–	–	–	–
Expansion Modules								
10/100BaseT(X) (RJ45)	✓	✓	✓	✓	✓	✓	✓	✓
Multi-mode Fiber (SC)	✓	✓	✓	✓	✓	✓	✓	✓
Single-mode Fiber (SC)	✓	✓	✓	✓	✓	✓	✓	✓
GSM/GPRS	✓	✓	✓	✓	✓	✓	✓	✓
Modem	✓	✓	✓	✓	✓	✓	✓	✓
Serial Interface								
RS-232 Ports	32	32	–	–	–	–	–	–
RS-232/422/485 Ports	–	–	8	8	16	16	32	32
Connectors	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF							
Baudrate	50 bps to 921.6 Kbps (supports non-standard baudrates)							
15 KV ESD Protection	✓	✓	✓	✓	✓	✓	✓	✓
2 KV isolation protection	–	–	–	–	–	–	–	–
RS-485 Data Direction Control	ADDC	ADDC	ADDC	ADDC	ADDC	ADDC	ADDC	ADDC
RS-232 Console Port	✓	✓	✓	✓	✓	✓	✓	✓
Advanced Features								
LCD Panel with 4 push buttons	✓	✓	✓	✓	✓	✓	✓	✓
Serial Data Log	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
Offline Port Buffering	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB
SD Slot	✓	✓	✓	✓	✓	✓	✓	✓
Software								
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, DDNS, HTTP, SMTP, HTTPS, SSL, SSH, PPPoE, RFC2217, IPv6, IPv4, Turbo Ring, Turbo Ring 2							
Security Protocols	DES, 3DES, AES, SSH, SSL							
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility							
Driver Support	Windows Real COM Drivers (for Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded), Linux Real TTY driver (for 2.4.x, 2.6.x), Fixed TTY driver (for SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, \AIX 5.x)							
Management	SNMP MIB-II							
IP Routing	Static, RIP-I, RIP-II							
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled							
Secure Operation Modes	Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH							
Terminal Sessions	8 sessions per port							
Physical Characteristics								
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3600 g	3600 g	3460 g	3460 g	3580 g	3580 g	3600 g	3600 g
Dimensions (mm)	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44	440 x 195 x 44
Environmental Limits								
Operating Temperature (Standard Temperature)	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Temperature (Wide Temperature)	–	–	-40 to 75°C	–	-40 to 75°C	–	–	–
Storage Temperature	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements								
Input Voltage	100 to 240 VAC	±48 VDC	100 to 240 VAC	±48 VDC	100 to 240 VAC	±48 VDC	100 to 240 VAC	±48 VDC
Power Consumption	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V	285 mA @ 100 V 190 mA @ 240 V	293 mA @ 48 V
Standards and Certifications								
Safety	UL 60950-1, EN 60950-1							
EMC	CE (EN 55022 Class A, EN 55024), FCC Part 15 Subpart B Class A							
Reliability								
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓
MTBF	68,707 hrs	68,707 hrs	135,370 hrs	135,370 hrs	101,783 hrs	101,783 hrs	68,177 hrs	68,177 hrs
Warranty	5 years (see www.moxa.com/warranty)							

CN2600 Terminal Servers



	CN2610-8	CN2610-16	CN2610-8-2AC	CN2610-16-2AC	CN2650-8	CN2650-16
LAN Interface						
10/100BaseT(X) Ports	2 ports (2 IPs, 8-pin RJ45 connectors)					
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface						
RS-232 Ports	8	16	8	16	–	–
RS-232/422/485 Ports	–	–	–	–	8	16
Connectors	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45	8-pin RJ45
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF					
Baudrate	50 bps to 921.6 Kbps					
15 KV ESD Protection	✓	✓	✓	✓	✓	✓
2 KV isolation protection	–	–	–	–	–	–
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
RS-232 Console Port	✓	✓	✓	✓	✓	✓
Advanced Features						
LCD Panel with 4 push buttons	✓	✓	✓	✓	✓	✓
Serial Data Log	128 KB	128 KB	128 KB	128 KB	128 KB	128 KB
Offline Port Buffering	128 KB	128 KB	128 KB	128 KB	128 KB	128 KB
Software						
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS					
Security Protocols	RADIUS, HTTPS, SSH, PAP, CHAP					
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility					
Driver Support	Windows Real COM Drivers (for Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded), Linux Real TTY driver (for 2.4.x, 2.6.x), Fixed TTY driver (for SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x)					
Management	SNMP MIB-II					
IP Routing	Static, RIP-I, RIP-II					
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, RFC2217, Terminal, Reverse Telnet, PPP, DRDAS, Redundant COM, Disabled					
Terminal Sessions	8 sessions per port					
Physical Characteristics						
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3525 g	3560 g	3760 g	3980 g	3740 g	3790 g
Dimensions (mm)	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45
Environmental Limits						
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Storage Temperature	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements						
Dual Power Inputs for Redundancy	–	–	✓	✓	–	–
Input Voltage	100 to 240 VAC, 47 to 63 Hz					
Power Consumption	235 mA @ 100 VAC, 145 mA @ 240 V					
Standards and Certifications						
Safety	UL 60950-1, EN 60950-1					
EMC	CE (EN 55022 Class A, EN 55024), FCC Part 15 Subpart B Class A					
Reliability						
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓
MTBF	99,302 hrs					
Warranty	5 years (see www.moxa.com/warranty)					

CN2600 Terminal Servers



	CN2650-8-2AC CN2650-8-2AC-T	CN2650-16-2AC CN2650-16-2AC-T	CN2650I-8	CN2650I-16	CN2650I-8-2AC	CN2650I-16-2AC
LAN Interface						
10/100BaseT(X) Ports	2 ports (2 IPs, 8-pin RJ45 connectors)					
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface						
RS-232 Ports	–	–	–	–	–	–
RS-232/422/485 Ports	8	16	8	16	8	16
Connectors	8-pin RJ45	8-pin RJ45	DB9 male	DB9 male	DB9 male	DB9 male
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, DTR/DSR, XON/XOFF					
Baudrate	50 bps to 921.6 Kbps					
15 KV ESD Protection	✓	✓	✓	✓	✓	✓
2 KV isolation protection	–	–	✓	✓	✓	✓
RS-485 Data Direction Control	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®	ADDC®
RS-232 Console Port	✓	✓	✓	✓	✓	✓
Advanced Features						
LCD Panel with 4 push buttons	✓	✓	✓	✓	✓	✓
Serial Data Log	128 KB	128 KB	128 KB	128 KB	128 KB	128 KB
Offline Port Buffering	128 KB	128 KB	128 KB	128 KB	128 KB	128 KB
Software						
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS					
Security Protocols	RADIUS, HTTPS, SSH, PAP, CHAP					
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility					
Driver Support	Windows Real COM Drivers (for Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded), Linux Real TTY driver (for 2.4.x, 2.6.x), Fixed TTY driver (for SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x)					
Management	SNMP MIB-II					
IP Routing	Static, RIP-I, RIP-II					
Standard Operation Modes	Real COM, TCP Server, TCP Client, UDP, RFC2217, Terminal, Reverse Telnet, PPP, DRDAS, Redundant COM, Disabled					
Terminal Sessions	8 sessions per port					
Physical Characteristics						
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3900 g	3980 g	3666 g	3776 g	3932 g	4022 g
Dimensions (mm)	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45	440 x 198 x 45
Environmental Limits						
Operating Temperature (Standard Temperature)	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Temperature (Wide Temperature)	-40 to 75°C	-40 to 75°C	–	–	–	–
Storage Temperature	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C	-40 to 75°C
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements						
Dual Power Inputs for Redundancy	✓	✓	–	–	✓	✓
Input Voltage	100 to 240 VAC, 47 to 63 Hz					
Power Consumption	235 mA @ 100 VAC, 145 mA @ 240 VAC					
Standards and Certifications						
Safety	UL 60950-1, EN 60950-1					
EMC	CE (EN 55022 Class A, EN 55024), FCC Part 15 Subpart B Class A					
Reliability						
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓
MTBF	99,302 hrs					
Warranty	5 years (see www.moxa.com/warranty)					

Secure Terminal Servers

NPort® 6000 secure terminal servers provide serial-to-Ethernet connectivity that is both reliable and secure. They can be used to connect any serial device to an Ethernet network using a variety of operation modes—Real COM, TCP Server, TCP Client, UDP, RFC2217, Pair Connection, Ethernet Modem, Terminal, Reverse Terminal, Printer, and Dial in/out. For applications that require data security, such as banking, telecom, access control, and remote site management, secure modes are also available—Secure TCP Server, Secure TCP Client, Secure Pair-Connection, Secure Real COM, and Secure Terminal modes.



Safe Data Communication

Secure Data Communication with SSL

Network security is a critical issue for certain applications, and is especially important when data is transmitted over the Internet where it is vulnerable to interception by third parties. The NPort® 6000 secure terminal servers use SSL to implement secure data transmission for Secure TCP Server, Secure TCP Client, Secure Pair Connection, and Secure Real COM modes. The NPort®'s drivers follow the SSL standard and automatically negotiate the encryption key. To prevent hacker attacks, the NPort® will automatically switch from DES/3DES to AES encryption.



Secure Remote Management and Configuration with SSH and SSL

Unauthorized access is a major concern for system managers, and the NPort® 6000 secure terminal servers help control access by supporting IP filtering and password protection. Extra protection from hackers is also provided by SSH and SSL. Secure configuration of the NPort® 6000 is provided by opening the web console with a web browser that supports https (e.g., Internet Explorer), or by opening the Telnet console using a terminal emulator that supports SSH (e.g., PuTTY).

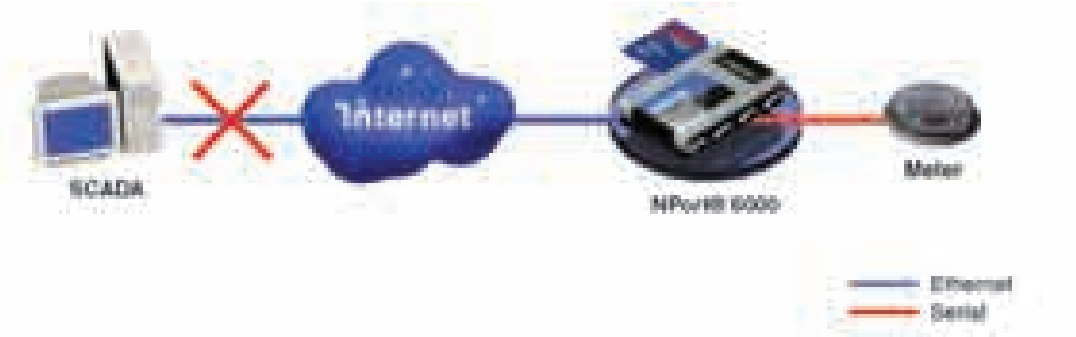
Powerful Hardware Encryption Engine

A powerful hardware encryption engine that supports the complete DES/3DES/AES encryption algorithms is built into the NPort® 6000. For DES and 3DES encryption, the NPort® 6000 supports ECB, CBC, CFB, and OFB modes. For AES encryption, the NPort® 6000 supports ECB, CBC, CFB, OFB, and CTR modes with a 128-bit, 192-bit, or 256-bit key.

Reliable Data Communication

Port Buffering that Preserves Data if the Ethernet Connection Fails

For mission-critical applications, data collected from a serial Connection device must be safeguarded in case the Ethernet network gets disconnected. The NPort® 6000 provides exceptionally reliable data transmission by saving serial data to an internal 64 KB port buffer if the Ethernet connection fails. When the Ethernet network is reconnected, data in the buffer is automatically released and sent to the appropriate destination. For the NPort® 6250, 6450, and 6650, this buffer can be expanded by installing an SD card.



Ethernet Port Expansion (NPort® 6450/6600 only)

Although more and more devices are now Ethernet-ready, many legacy devices only provide a serial interface. The main purpose of a device server is to connect serial devices to an Ethernet network, allowing engineers to integrate all of their devices into an Ethernet environment. A problem can arise if both Ethernet-ready and legacy serial devices need to be connected at the same location. The NPort® 6000 can use the Ethernet expansion module to add additional Ethernet ports, effectively allowing operation as a combination Ethernet switch and device server. By using the NPort® 6000's Ethernet expansion modules, users no longer need to invest in a more expensive switch or hub to connect every device. Modules are available for different Ethernet media, including copper Ethernet, multimode fiber, and single-mode fiber. Ethernet expansion modules can also be used to create a cascading topology in which device servers are connected to each other in a daisy chain arrangement.

The NM-GPRS/GSM and NM-Modem network modules can be used to provide NPort® 6000 secure terminal servers with an automatic backup capability. The NPort® 6000 backup function makes data transmission safer and more reliable.

Interchangeable modules for Ethernet expansion

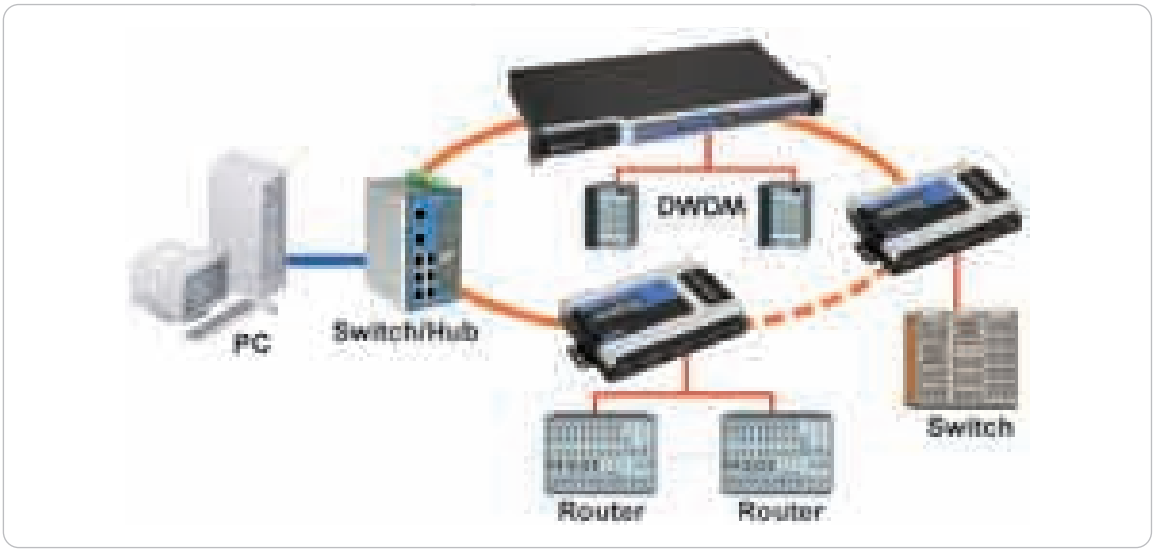




1 RJ45 Ethernet Port | 1 fiber Ethernet port (single or multi mode) | 2 fiber Ethernet ports (single or multi mode) | 2 RJ45 Ethernet Ports | NM-GPRS/GSM | NM-Modem

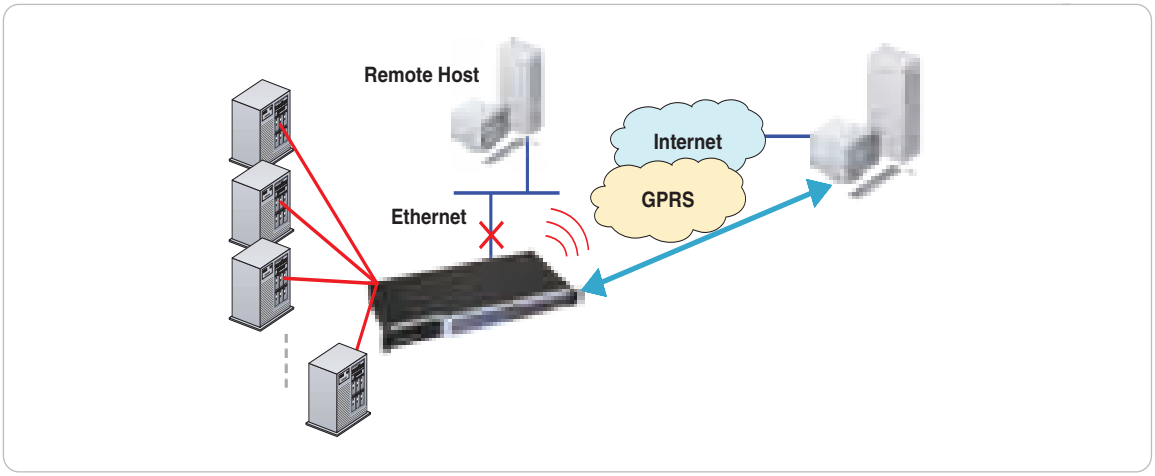
Ethernet Ring Topology with Fast Recovery (NPort® 6450/6600 only)

NPort® 6000 secure terminal servers support the Turbo Ring protocol for cascade topologies. With Turbo Ring™, if any segment of the daisy-chain ring is disconnected, the network will recover in less than 300 ms.



Redundant Ethernet (NPort® 6450/6600 only)

The NM-GPRS/GSM and NM-Modem network modules can be used to provide NPort® 6000 secure terminal servers with an automatic backup capability. When the backup function is enabled, the NPort® 6000 will check the remote host connection on the Ethernet side after powering on. Once a connection failure has occurred, data from the serial device will be sent out through the GSM/GPRS and PSTN network. When the remote host on the Ethernet side returns to normal status, data will again be sent through the Ethernet connection. The NPort® 6000 backup function makes data transmission safer and more reliable.



Flexible and Easy to Use Design

Supports ADSL Dial-up and DDNS

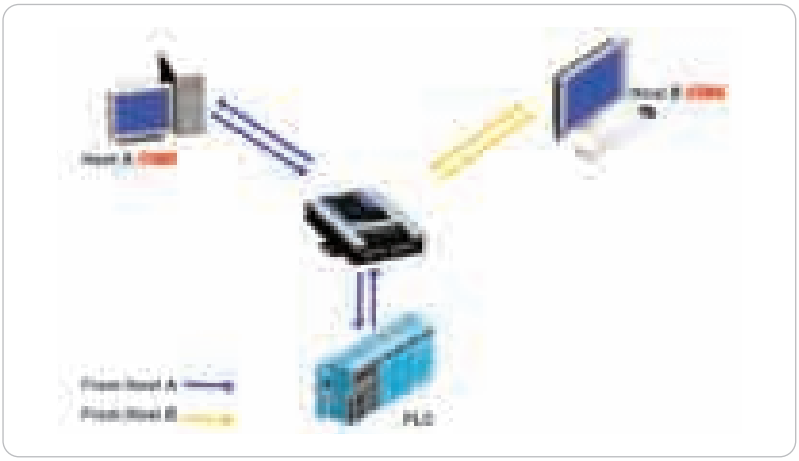
When serial devices are connected to an NPort® 6000 secure terminal server, any networked computer can be used to control the devices over an Ethernet network, intranet, or the Internet. Connections can be established using different operation modes, such as Real COM/TTY, TCP Server, and TCP Client. The NPort® 6000 also supports PPPoE for ADSL connections, and DDNS can be used to help locate NPort® 6000 secure terminal servers on the network. In addition, fiber optic models are available to extend the Ethernet connection distance.

Select Non-standard Baudrates between 50 bps and 921.6 Kbps

Engineers who use serial devices know that most device servers only support “standard” baudrates. However, some applications require special baudrates, such as 250 Kbps or 500 Kbps. One of the advantages of the NPort® 6000 device servers is that you can select any baudrate between 50 bps and 921.6 Kbps, allowing the NPort® 6000 to be used with serial devices that require special baudrates (the actual baudrate will be within 3% of the selected value; see the user’s manual for details).

"Command by Command" Mode

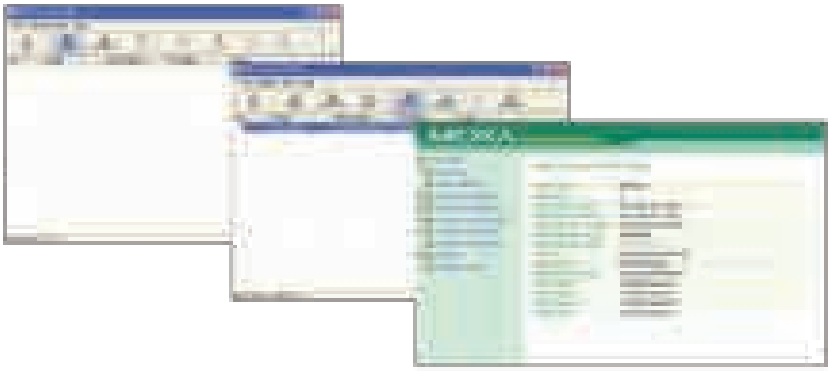
For applications that require multiple hosts to communicate with one serial device, it is often necessary to require the NPort® to issue one command at a time. What this means is that after the NPort® issues a command, it waits for the next request before issuing another command. In other words, the NPort® issues a command, waits for a request, issues a command, waits for a request, and so on. The "command by command" mode is designed specifically for this kind of multi-host application. With command by command mode, after issuing each command, the NPort® 6000 waits for a response before sending out the next command.



Two Powerful Utilities

The NPort® Search Utility and NPort® Windows Driver Manager make it easy for users to build a new system. After connecting the NPort® 6000 to your computer, or to a local network, use the NPort® Search Utility to search and load web console settings. After that, the NPort® Windows Driver Manager can be used to map NPort® 6000 serial ports to Windows COM ports.

NPort® Search Utility



NPort® Windows Driver Manager



NPort® 6150

1-port RS-232/422/485 secure terminal server



- Simple solution for connecting serial devices to a network
- Secure operation modes for Real COM, TCP Server, TCP Client, Pair Connection, Terminal, and Reverse Terminal
- Non-standard baudrates supported with high precision
- Automatic RS-485 data direction control with Moxa's patented ADDC®
- Enhanced remote configuration with HTTPS and SSH
- Port buffers for storing serial data when the Ethernet is off-line
- Supports IPv6

Overview

The NPort® 6150 is a 1-port device server that uses the SSL and SSH protocols to transmit encrypted serial data over Ethernet. The NPort® 6150's 3-in-1 serial port supports RS-232, RS-422, and RS-485, with the interface selected from an easy-to-access configuration menu.

Secure Data Transmission

For many applications, guaranteeing secure data transmission is an important concern when connecting serial devices to a network. To answer this concern, the NPort® 6150 supports the SSL and SSH protocols, which work by encrypting data before sending it over the network. With the NPort® 6150, users can rest assured that serial data is transmitted securely over both private and public networks.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 KV built-in

Serial Interface

Number of Ports: 1
Serial Standards: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Serial Line Protection: 15 KV ESD protection for all signals
Console Port: Serial port doubles as RS-232 console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE
Security Protocols: DES, 3DES, AES, SSH, SSL
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Search Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled
Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Applications

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal
Weight: 700 g
Dimensions:
Without ears: 67 x 100.4 x 28 mm (2.64 x 3.95 x 1.1 in)
With ears: 90 x 100.4 x 28 mm (3.54 x 3.95 x 1.1 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption: 285 mA @ 12 V, 150 mA @ 24 V
Alarm Contact: Relay output with current carrying capacity of 1 A @ 24 VDC
Power Line Protection: 1 KV burst (EN61000-4-4: EFT/B), 0.5 KV surge (EN61000-4-5)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 2/3,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 Level 1,
EN 61000-4-11
Freefall: IEC-68-2-6, IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6, IEC-68-2-34
Green Product: RoHS, CRoHS, WEEE

Reliability

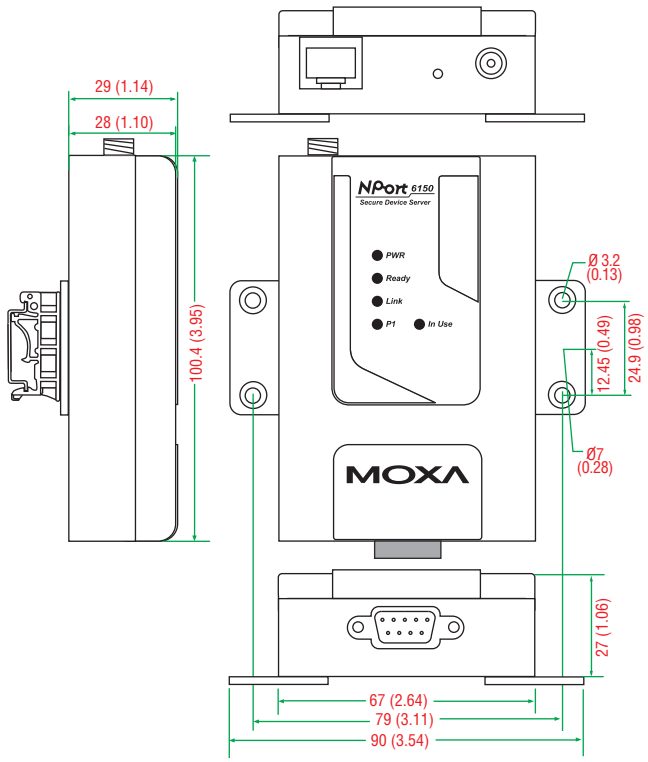
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures): 231,709 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

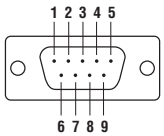


DK-35A DIN-Rail Kit



Available Accessory

DB9 male connector



Pin Assignment

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort 6150: 1-port RS-232/422/485 secure device server

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail
NP21101: DB25 male to DB9 female RS-232 cable, 30 cm

Package Checklist

- 1 NPort 6150 device server
- Power Adaptor
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® 6250 Series

2-port RS-232/422/485 secure terminal servers



- Simple solution for connecting serial devices to a network
- Secure operation modes for Real COM, TCP Server, TCP Client, Pair Connection, Terminal, and Reverse Terminal
- Non-standard baudrates supported with high precision
- Choice of network medium: 10/100BaseTX or 100BaseFX
- Enhanced remote configuration with HTTPS and SSH
- Port buffers for storing serial data when the Ethernet is off-line
- Supports IPv6

Overview

The 2-port NPort® 6250 device servers use the SSL and SSH protocols to transmit encrypted serial data over Ethernet. Models are available for connecting to a 10/100BaseTX copper Ethernet or 100BaseTX fiber network. Both single-mode and multi-mode fiber are supported.

Zero Data Loss if Ethernet Connection Fails

The NPort® 6250 device servers help guarantee reliability by providing users with secure serial-to-Ethernet data transmission and a customer-oriented hardware design. If the Ethernet connection fails, the NPort® 6250 will queue all serial data in its internal 64 KB port buffer. When the Ethernet connection is re-established, the NPort® 6250 will immediately release all of the data in the buffer in the order that it was received. Users can increase the port buffer size by installing an SD card.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 KV built-in

Optical Fiber Interface (NPort 6250-S-SC/6250-M-SC)

Fiber Port: 100BaseFX, SC connector
Distance:
Multi-mode: 0 to 4 km, 1310 nm (62.5/125 μm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 μm, 3.5 PS/(nm*km))
Min. TX Output:
Multi-mode: -20 dBm
Single-mode: -5 dBm
Max. TX Output:
Multi-mode: -10 dBm
Single-mode: 0 dBm
Sensitivity:
Multi-mode: -34 to -30 dBm
Single-mode: -36 to -32 dBm

Serial Interface

Number of Ports: 2
Serial Standards: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Serial Line Protection: 15 KV ESD protection for all signals
Console Port: Serial port 1 doubles as RS-232 console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Memory Expansion Slot

Slot Type: SD socket (supports up to 2 GB)

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE
Security Protocols: DES, 3DES, AES, SSH, SSL
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Search Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled
Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Applications

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal
Weight: 730 g
Dimensions:
Without ears: 77 x 111 x 28 mm (3.30 x 4.37 x 1.1 in)
With ears: 89 x 111 x 28 mm (3.50 x 4.37 x 1.1 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
NPort 6250: 333 mA @ 12 V, 173 mA @ 24 V
NPort 6250-M-SC: 428 mA @ 12 V, 219 mA @ 24 V
NPort 6250-S-SC: 376 mA @ 12 V, 193 mA @ 24 V
Alarm Contact: Relay output with current carrying capacity of 1 A @ 24 VDC

Power Line Protection: 1 KV burst (EN61000-4-4: EFT/B), 0.5 KV surge (EN61000-4-5)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 2/3,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 Level 1,
EN 61000-4-11
Freefall: IEC-68-2-6, IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6, IEC-68-2-34
Green Product: RoHS, CRoHS, WEEE

Reliability

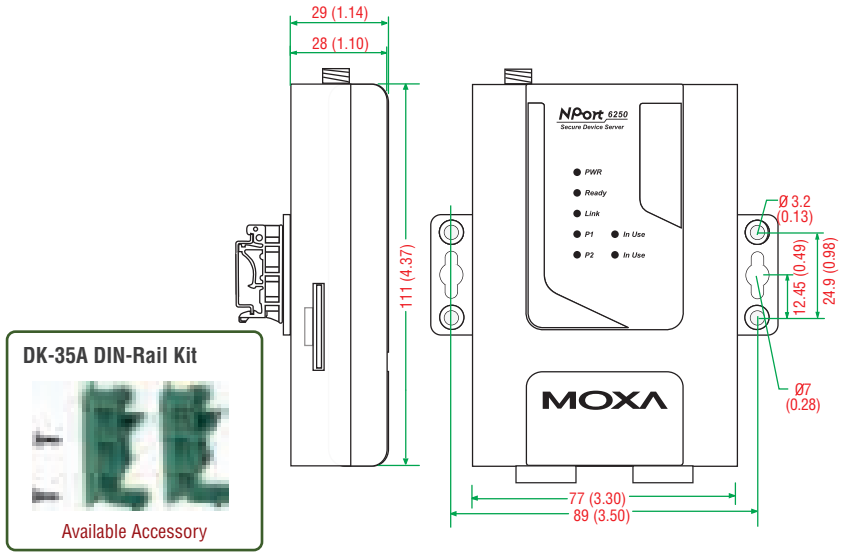
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
NPort 6250: 226,128 hrs
NPort 6250-M-SC: 225,762 hrs
NPort 6250-S-SC: 225,762 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

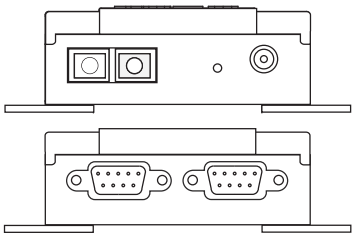
Unit: mm (inch)



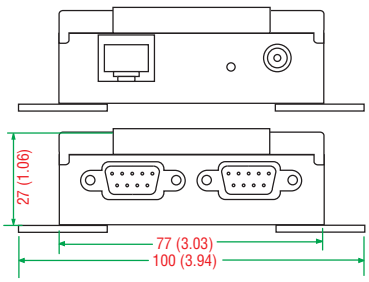
DK-35A DIN-Rail Kit

Available Accessory

NPort® 6250-M-SC/6250-S-SC



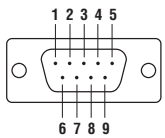
NPort® 6250



Pin Assignment

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

DB9 male connector



Ordering Information

Available Models

NPort 6250: 2-port secure device server, RS-232/422/485 to Ethernet
NPort 6250-M-SC: 2-port secure device server, RS-232/422/485 to multi-mode fiber (SC connector)
NPort 6250-S-SC: 2-port secure device server, RS-232/422/485 to single-mode fiber (SC connector)

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail
NP21101: DB25 male to DB9 female RS-232 cable, 30 cm

Package Checklist

- 1 NPort 6250 device server
- Power Adaptor
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® 6450

4-port RS-232/422/485 secure terminal server



- LCD panel for easy IP address configuration
- Secure operation modes for Real COM, TCP Server, TCP Client, Pair Connection, Terminal, and Reverse Terminal
- Non-standard baudrates supported with high precision
- Port buffers for storing serial data when the Ethernet is off-line
- Supports IPv6
- Ethernet redundancy (STP/RSTP/Turbo Ring) with network module

Overview

The NPort® 6450 is a 4-port device server that uses the SSL and SSH protocols to transmit encrypted serial data over Ethernet. Up to 4 serial devices of any type can be connected to the NPort® 6450, with all four devices using the same IP address. The Ethernet port can be configured for a normal or secure TCP/IP connection.

No Data Loss if Ethernet Connection Fails

The NPort® 6450 is a reliable device server that provides users with secure serial-to-Ethernet data transmission and a customer-oriented hardware design. If the Ethernet connection fails, the NPort® 6450 will queue all serial data in its internal 64 KB port buffer. When the Ethernet connection is re-established, the NPort® 6450 will immediately release all data in the buffer in the order that it was received. Users can increase the port buffer size by installing an SD card.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 KV built-in

Optical Fiber Interface (with network module)

Fiber Port: 100BaseFX, SC connector
Distance:
Multi-mode: 0 to 4 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))
Min. TX Output:
Multi-mode: -20 dBm
Single-mode: -5 dBm
Max. TX Output:
Multi-mode: -10 dBm
Single-mode: 0 dBm
Sensitivity:
Multi-mode: -34 to -30 dBm
Single-mode: -36 to -32 dBm

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Connector: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Serial Line Protection: 15 KV ESD protection for all signals
Console Port: Serial port 1 doubles as RS-232 console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Memory Expansion Slot

Slot Type: SD socket (supports up to 2 GB)

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE
Security Protocols: DES, 3DES, AES, SSH, SSL
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Search Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled
Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Applications

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 1020 g
Dimensions:
Without ears: 158 x 103 x 35 mm (6.22 x 4.06 x 1.38 in)
With ears: 181 x 103 x 35 mm (7.13 x 4.06 x 1.38 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption: 730 mA @ 12 V, 330 mA @ 24 V
Alarm Contact: Relay output with current carrying capacity of 1 A @ 24 VDC
Power Line Protection: 1 KV burst (EN61000-4-4: EFT/B), 0.5 KV surge (EN61000-4-5)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 2/3,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 Level 1,
EN 61000-4-11
Freefall: IEC-68-2-6, IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6, IEC-68-2-34
Green Product: RoHS, CRoHS, WEEE

Reliability

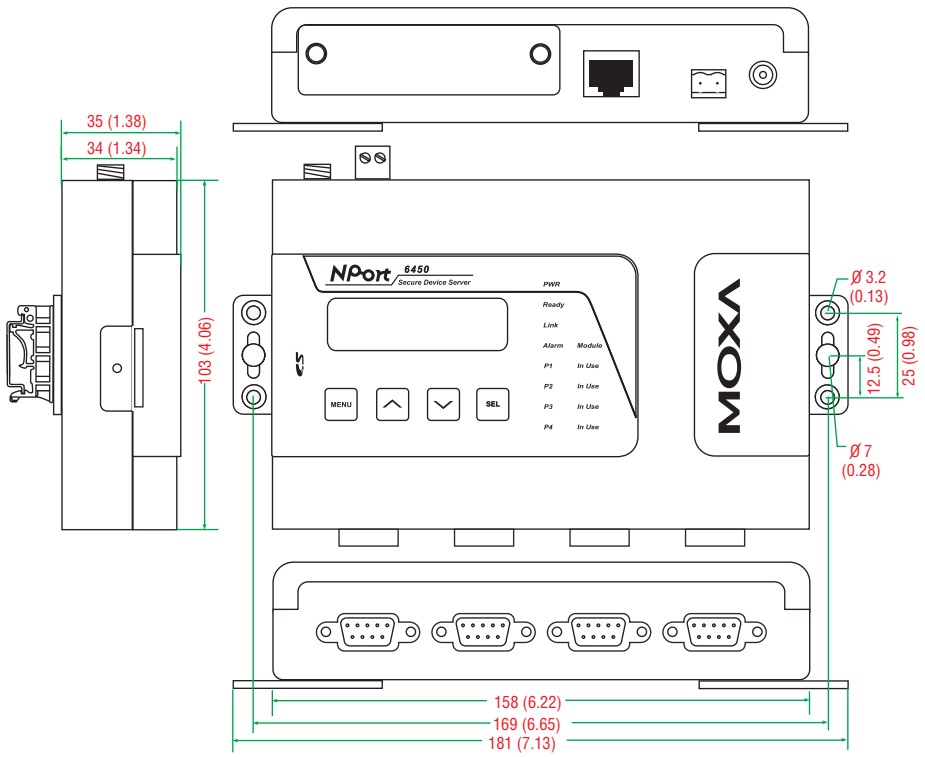
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures): 120,354 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

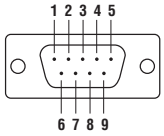
Unit: mm (inch)



Pin Assignment

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

DB9 male connector



Ordering Information

Available Models

NPort 6450: 4-port secure device server, RS-232/422/485 to Ethernet

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- 1 NPort 6450 secure device server
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Expansion Modules			Use with the following NPort models					
			6150	6250	6450	6610-8 6650-8	6610-16 6650-16	6610-32 6650-32
NM-TX01 NM-TX01-T		1 10/100BaseTX port	–	–	✓	✓	✓	✓
NM-TX02 NM-TX02-T		2 10/100BaseTX port	–	–	✓	✓	✓	✓
NM-FX01-S-SC NM-FX01-S-SC-T		1 100BaseFX port, single mode, SC connector	–	–	✓	✓	✓	✓
NM-FX01-M-SC NM-FX01-M-SC-T		1 100BaseFX port, multi mode, SC connector	–	–	✓	✓	✓	✓
NM-FX02-S-SC NM-FX02-S-SC-T		2 100BaseFX ports, single mode, SC connector	–	–	✓	✓	✓	✓
NM-FX02-M-SC NM-FX02-M-SC-T		2 100BaseFX ports, multi mode, SC connector	–	–	✓	✓	✓	✓
NM-GPRS/GSM		1 GPRS/GSM modem module	–	–	✓	✓	✓	✓
NM-Modem NM-Modem-T		1 PSTN modem port with RJ11 connector	–	–	✓	✓	✓	✓

Note: Expansion modules can be purchased separately.

NPort® 6600 Series

8/16/32-port RS-232/422/485 rackmount terminal servers



- Up to 32 ports for high density environments
- Non-standard baudrates supported with high precision
- Port buffers for storing serial data when the Ethernet is off-line
- Supports IPv6
- Ethernet redundancy (STP/RSTP/Turbo Ring) with network module
- Modular design for network expansion
- Secure data transmission

Overview

The NPort® 6600 series of secure device servers is the right choice for applications that use large numbers of serial devices packed into a small space. If you're worried about security, you can rest assured with the NPort® 6600, since it supports DES, 3DES, and AES, the three most common standards for data encryption. Serial devices of any type can be connected to the NPort® 6600, and each serial port on the NPort® can be configured independently for RS-232, RS-422, or RS-485 transmission.

LCD Panel Makes Configuration Easy*

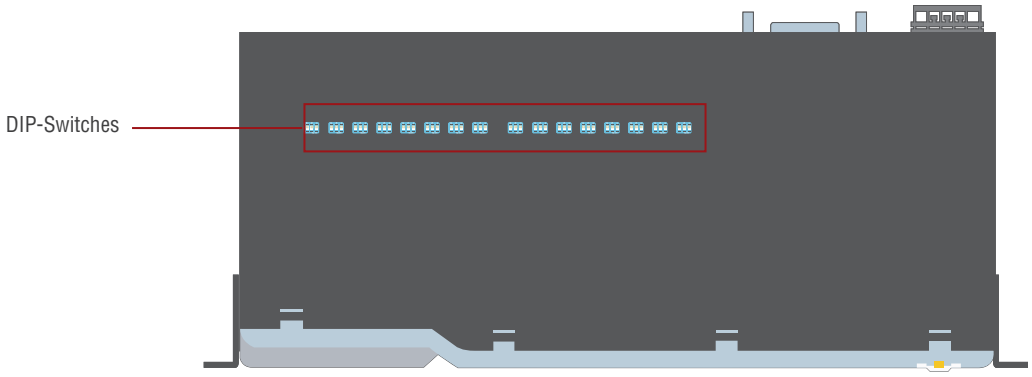
The NPort® 6600 has a built-in LCD panel for configuration. The panel displays the server name, serial number, and IP address, and any of the device server's configuration parameters, such as IP address, netmask, and gateway address, can be updated easily and quickly.



Note: The LCD panel is only available with standard temperature models.

Adjustable Resistor Values for RS-485 Communication

The NPort® 6600 provides adjustable termination, pull high, and pull low resistors for RS-485 communication. In some critical environments, termination resistors may be needed to prevent the reflection of serial signals, and the pull high and pull low resistors may need adjusting to maintain the integrity of the electrical signal. Since no set of resistor values works for every environment, the NPort® 6600 allows manual adjustment of the resistor values for each serial port using built-in DIP switches.



Specifications

Ethernet Interface
Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 KV built-in

Optical Fiber Interface (with network module)
Fiber Port: 100BaseFX, SC connector
Distance:
Multi-mode: 0 to 4 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))
Min. TX Output:
Multi-mode: -20 dBm
Single-mode: -5 dBm
Max. TX Output:
Multi-mode: -10 dBm
Single-mode: 0 dBm
Sensitivity:
Multi-mode: -34 to -30 dBm
Single-mode: -36 to -32 dBm

Serial Interface
Number of Ports: 8, 16, or 32
Serial Standards:
NPort 6610: RS-232
NPort 6650: RS-232/422/485
Connector: 8-pin RJ45
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Serial Line Protection: 15 KV ESD protection for all signals
Console Port: Dedicated RS-232 console port on rear panel (8-pin RJ45)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ
Terminator for RS-485: 120 Ω

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Memory Expansion Slot
Slot Type: SD socket (supports up to 2 GB)

Software
Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE
Security Protocols: DES, 3DES, AES, SSH, SSL
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Search Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes
Standard: Real COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, Ethernet Modem, Printer, PPP, Disabled
Secure: Secure Real COM, Secure TCP Server, Secure TCP Client, Secure Pair Connection, SSH, Reverse SSH

Applications
Terminal Sessions: 8 sessions per port

Physical Characteristics
Housing: Metal, IP30 protection
Weight:
NPort 6600-8: 3460 g
NPort 6600-16: 3580 g
NPort 6600-32: 3600g
Dimensions:
Without ears: 440 x 195 x 44 mm (17.32 x 7.68 x 1.73 in)
With ears: 480 x 195 x 44 mm (18.9 x 7.68 x 1.73 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage:
AC Models: 100 to 240 VAC
DC Models: ±48 VDC (20 to 72 VDC, -20 to -72 VDC)
Power Consumption:
AC Models: 285 mA @ 100 VAC, 190 mA @ 240 VAC
DC Models: 293 mA @ 48 VDC
Alarm Contact: Relay output with current carrying capacity of 1 A @ 24 VDC
Power Line Protection: 1 KV burst (EN61000-4-4: EFT/B), 0.5 KV surge (EN61000-4-5)

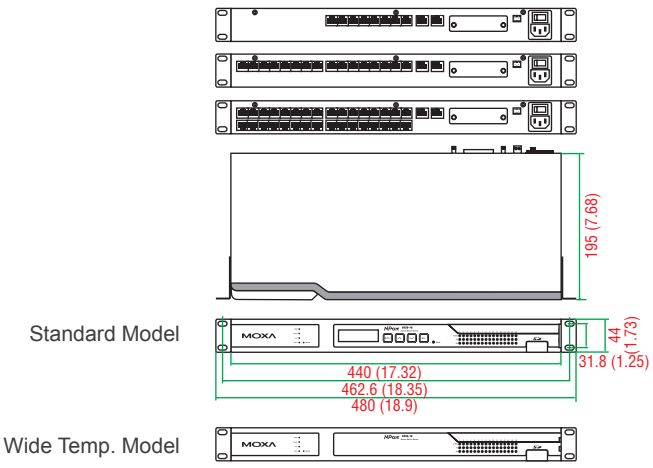
Standards and Certifications
Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 2/3,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 Level 1,
EN 61000-4-11
Freefall: IEC-68-2-6, IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6, IEC-68-2-34
Green Product: RoHS, CRoHS, WEEE

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
NPort 6610-8: 135,891 hrs
NPort 6610-16: 102,373 hrs
NPort 6610-32: 68,707 hrs
NPort 6650-8: 135,370 hrs
NPort 6650-16: 101,783 hrs
NPort 6650-32: 68,177 hrs

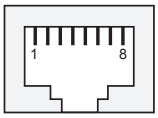
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions and Pin Assignment

Unit: mm (inch)



8-pin RJ45 connector



PIN	RS-232	RS-422/ 485-4W	RS-485-2w
1	DSR (in)	–	–
2	RTS (out)	TxD+	–
3	GND	GND	GND
4	TxD (out)	TxD-	–
5	RxD (in)	RxD+	Data+
6	DcD (in)	RxD-	Data-
7	CTS (in)	–	–
8	DTR (out)	–	–

Ordering Information

Available Models

NPort 6610-8: 8-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6610-8-48V: 8-port RS-232 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature
NPort 6610-16: 16-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6610-16-48V: 16-port RS-232 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature
NPort 6610-32: 32-port RS-232 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6610-32-48V: 32-port RS-232 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature
NPort 6650-8: 8-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6650-8-T: 8-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input, -40 to 75°C operating temperature
NPort 6650-8-48V: 8-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature
NPort 6650-16: 16-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6650-16-T: 16-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input, -40 to 75°C operating temperature
NPort 6650-16-48V: 16-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature
NPort 6650-32: 32-port RS-232/422/485 to Ethernet secure terminal server, 100 to 240 VAC power input, 0 to 55°C operating temperature
NPort 6650-32-48V: 32-port RS-232/422/485 to Ethernet secure terminal server, ±48 VDC power input, 0 to 55°C operating temperature

Package Checklist

- 1 NPort 6600 device server
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male connection cable, 150 cm
- Power Cord (AC models only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Serial Cables and Adaptors: See Appendix A for details

Expansion Modules			Use with the following NPort models					
			6150	6250	6450	6610-8 6650-8	6610-16 6650-16	6610-32 6650-32
NM-TX01 NM-TX01-T		1 10/100BaseTX port	–	–	✓	✓	✓	✓
NM-TX02 NM-TX02-T		2 10/100BaseTX port	–	–	✓	✓	✓	✓
NM-FX01-S-SC NM-FX01-S-SC-T		1 100BaseFX port, single mode, SC connector	–	–	✓	✓	✓	✓
NM-FX01-M-SC NM-FX01-M-SC-T		1 100BaseFX port, multi mode, SC connector	–	–	✓	✓	✓	✓
NM-FX02-S-SC NM-FX02-S-SC-T		2 100BaseFX ports, single mode, SC connector	–	–	✓	✓	✓	✓
NM-FX02-M-SC NM-FX02-M-SC-T		2 100BaseFX ports, multi mode, SC connector	–	–	✓	✓	✓	✓
NM-GPRS/GSM		1 GPRS/GSM modem module	–	–	✓	✓	✓	✓
NM-Modem NM-Modem-T		1 PSTN modem port with RJ11 connector	–	–	✓	✓	✓	✓

Note: Expansion modules can be purchased separately.

NM-GPRS/GSM Module

4-port cellular NM-GPRS/GSM module (for the NPort® 6400/6600 series)



- Quad-band 900/1800, 850/1900 MHz GSM/GPRS
- Cellular Status/Signal LED indicator
- GPRS Class 10
- CSD data connection
- Up to 14,400 bps in Circuit Switched Data mode
- Short message alerts
- Real COM mode supported

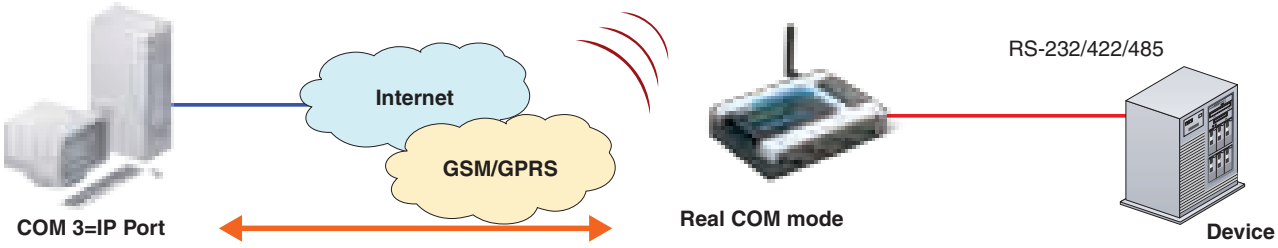
Quad-band GSM/GPRS Communication

Most countries in the world use the GSM-900 and GSM-1800 cellular frequencies. However, in the United States, Canada, and other parts of the Americas, GSM-850 and GSM-1900 are used. With the NM-GPRS/GSM quad-band cellular module, you don't need to worry about selecting different products for different parts of the world. The NM-GPRS/GSM module's GSM/GPRS band is configured at 900/1800 MHz by default, but can be easily reconfigured to 850/1900 MHz.



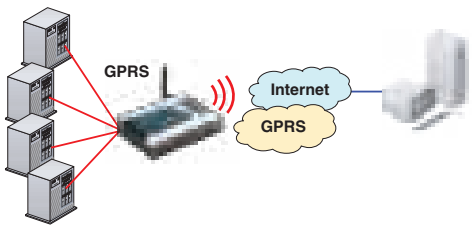
Real COM Mode

NPort® products come with Real COM drivers for Windows operating systems and Real TTY drivers for Linux operating systems used in a GSM/GPRS network environment. In Real COM mode, the bundled drivers are able to establish a transparent connection between a host and a serial device by mapping the serial port on the NPort® to a local COM/TTY port on the host computer. One of the major conveniences of using Real COM mode is that it allows you to use software that was written for pure serial communication applications.



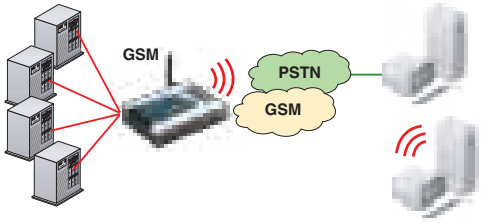
GSM CSD Data Connection

CSD (Circuit Switched Data) provides direct modem access to remote devices, and system extensions can be used without installing cables and data lines. CSD transmits data at 9.6 to 14.4 Kbps to both GSM networks and the PSTN switching subsystem by calling direct. CSD overcomes the limitations of hard wiring and inaccessible terrain for easier, more flexible data collection and monitoring of applications that use NPort® device servers.



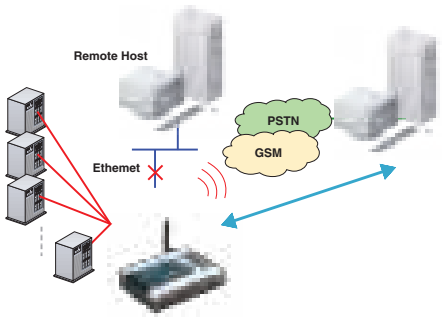
Overview

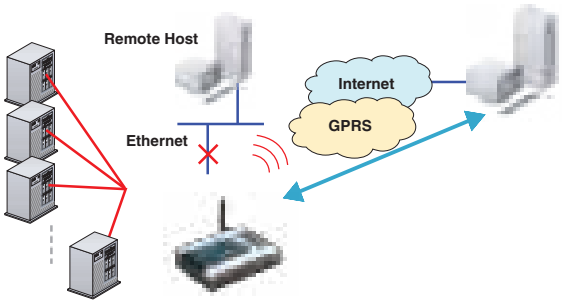
A GPRS packet-switched system can be viewed as a special IP network that offers IP connectivity to IP terminals. Devices without PPP or TCP/IP capability can be easily connected to the IP network and the Internet through GPRS by using the NPort® GSM/GPRS module.



GSM/GPRS Backup Application

The NM-GPRS/GSM module can be used to provide the NPort® with automatic backup capability. When the backup function is enabled, the NPort® will check the remote host's connection on the Ethernet side after power-on. If a connection failure occurs, data from the serial device will be sent out through the GSM/GPRS network. When the remote host on the Ethernet side returns to normal status, data will again be sent through the Ethernet connection. The NPort® backup function makes your data transmission safer and more reliable.

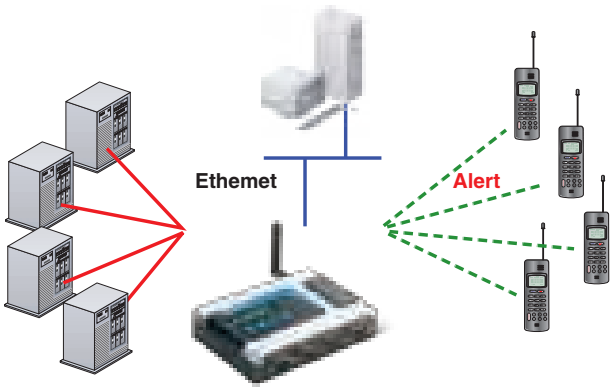




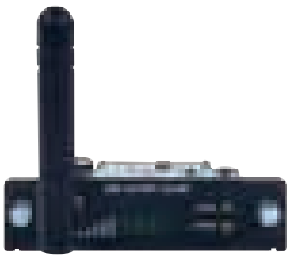
SMS Alerts by Event

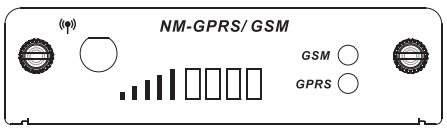
The NM-GPRS/GSM module provides the NPort® device server with an SMS alert function that support up to 4 phone numbers. As shown in the table, there are four event categories (System, Network, Configure, and Serial Port), and a total of eight different options that can be configured.

System Events	Network Events	Configure Events	Serial Port Events
Cold start	Ethernet link down	Console login authentication failure	DCD changed
Warm start	–	Ethernet IP changed	DSR changed
–	–	Password changed	–



Appearance





Cellular Status and Signal Strength LEDs	
GSM	Lights up when the GSM is connected
GPRS	Lights up when the GPRS is connected
Signal Strength	Number of lit LEDs indicates the signal strength

Specifications

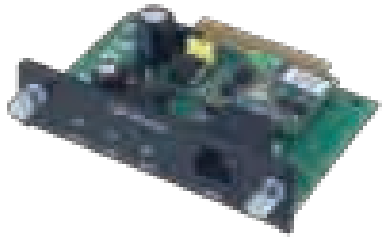
Cellular Interface

Standards: GSM and GPRS
Band Options: 850/900 MHz and 1800/1900 MHz quad-band
GPRS Multi-slot Class: Class 10
GPRS Terminal Device Class: Class B
GPRS Coding Schemes: CS1 to CS4
CSD Data Transmission Rate: Up to 14,400 bps
SIM Control: Point-to-point Text/PDU, Mobile Originated (MO) and Mobile Terminated (MT Cell Broadcast is in accordance with GSM 07.05)

Antenna: SMA female type connecter, 50 W impedance and 1 dBm peak gain
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

NM-Modem Module

PSTN modem network module (for the NPort® 6400/6600 series)



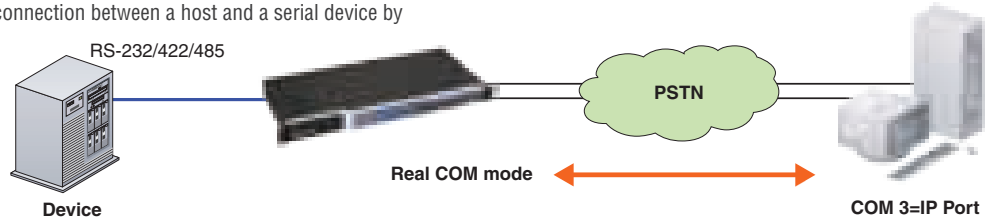
- Dial-in
- Dial-out
- Auto-answer
- PSTN leased-line mode (modem always on)
- PSTN economy-line mode (modem connects periodically)
- PSTN backup mode

Overview

The NM-Modem PSTN module can be used with any of the 4, 8, 16, and 32-port models. The module enables NPort® 6000 terminal servers to transmit data over PSTN networks.

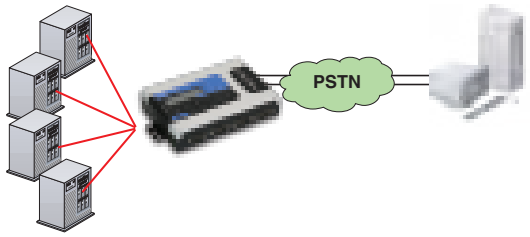
Real COM Mode Supported

NPort® 6000 device servers come with Real COM /TTY drivers for PSTN network applications. Real COM drivers are available for Windows operating systems and Real TTY drivers are available for Linux operating systems. In Real COM mode, the drivers can establish a transparent connection between a host and a serial device by mapping an NPort® 6000 serial port to a local COM/TTY port on the host computer. One of the major conveniences of using Real COM mode is that you can use software that was written for pure serial communication applications.



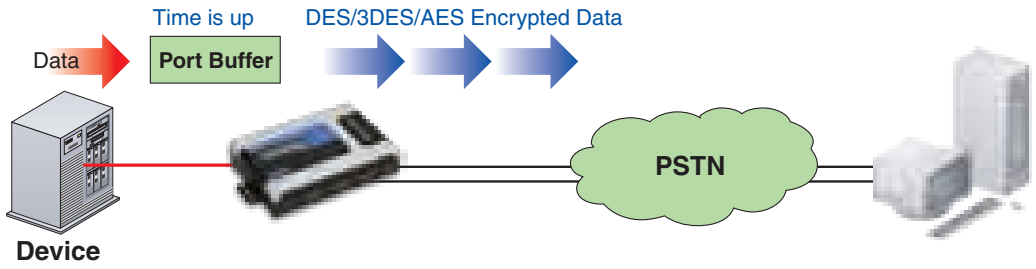
PSTN Leased-line Mode—Modem Always On

When Trunk-line mode is being used, the PSTN connection is always on, and data coming from the serial device will be sent out through the PSTN network as soon as the NPort® receives the data. In addition, the remote PC/Server will be able to manage the NPort® and poll for data from the serial device through the PSTN. Once the NPort® 6000 is powered on, the NM-Modem will always be on, making this operation mode suitable for applications that use a PSTN leased line.



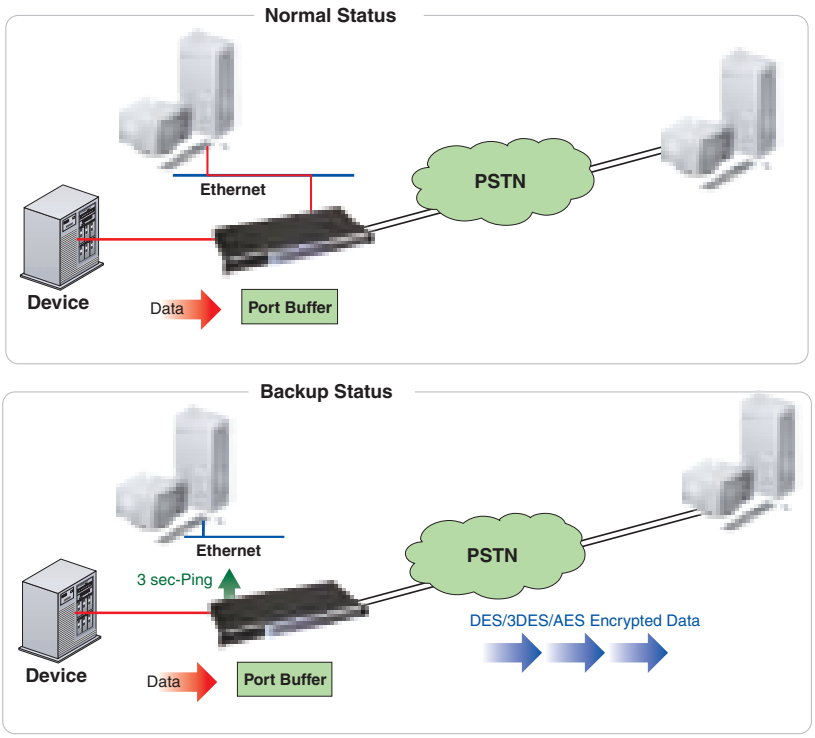
PSTN Economy-line Mode

When Economy-line mode is being used, the PSTN connection is activated periodically. In this case, data coming from the serial device will be stored in the NPort's buffer until the next PSTN activation time. Only then will the data be sent out through the PSTN network. In addition, when the PSTN connection is active, the remote PC/Server will be able to manage the NPort and poll for data from the serial device through the PSTN. When in Economy-line mode, the NPort® will de-activate the PSTN line if there is no data transmission activity for a preset idle time. Economy-line mode is suitable for non-urgent data transmission and message collection applications, and for applications that use a non-leased PSTN line.

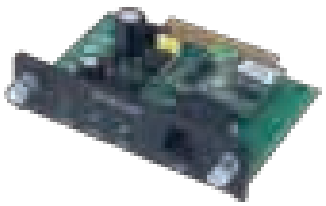


PSTN Backup Mode

The NM-Modem module can be used to provide the NPort® with an automatic backup over a PSTN. When the backup function has been enabled, the NPort® will activate the PSTN line whenever the Ethernet fails. The backup data can either be sent to the same PC/server, or to an alternate backup machine. While the PSTN is active, the NPort® will repeatedly ping the PC/Server host over the Ethernet until it receives a response. Once the NPort® determines that the Ethernet has been re-activated, the PSTN will be de-activated, and the NPort® will resume sending and receiving data over the Ethernet.



Appearance



LED Indicators

LED Name	Color	Meaning
DCD	Green	Carrier detected
	Off	No carrier detected
TxD	Green	Data is being transmitted to the PSTN
	Off	No data is being transmitted through the PSTN
RxD	Green	Data is being received from the PSTN
	Off	No data is being received through the PSTN

Specifications

Modem

Serial I/O Interface: 3 V TTL
Error Correction: V.42, MNP 2-4, 10-error
V92HM-RC Data Rate: 56 Kbps max.
Data Compression: V.42bis and MNP-5
336HM-RC Data Rate: 33.6 Kbps max.
FAX: 14.4K send/receive
144HM-RC Data Rate: 24.4 Kbps max.
Additional Features:
• Low Power Sleep Mode
• Caller ID and DTMF tone detection
• Digital Line Guardd Protection
• Extension Pickup, Line in Use Detection
• Completely Integrated On Board DAA

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 2/3,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 Level 1,
EN 61000-4-11
Vibration: IEC-68-2-6
Medical: EN 60601-1
Green Product: RoHS, CRoHS, WEEE

CN2600 Series

8 and 16-port RS-232/422/485 terminal servers with dual LAN redundancy



- LCD panel for easy IP address configuration (not included with wide temperature models)
- Dual-LAN cards with two independent MAC addresses and IP addresses
- Redundant COM function available when both LANs are active
- Dual-host redundancy can be used to add a backup PC to your system
- Dual AC power inputs
- Real COM/TTY drivers for Windows and Linux

Overview

Redundancy is an important issue for industry, and several different solutions have been developed to prevent damage caused by equipment or software failures. “Watchdog” hardware is required to utilize redundant hardware, and a “Token” switching mechanism is required for software. The CN2600 terminal server uses its built-in Dual-LAN ports to implement a “Redundant COM” mode that keeps your applications running smoothly.

Dual-LAN Redundancy

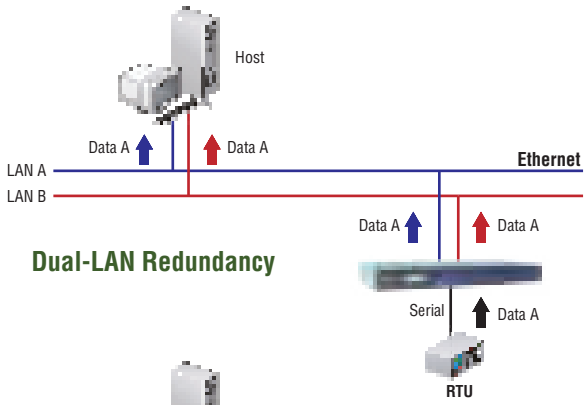
The CN2600 has two separate LAN ports that can be connected to separate LAN networks. Dual-LAN redundancy involves setting up two separate physical networks to connect the PC host with the CN2600. In this case, the PC host must also be installed with two LAN cards. If one of the networks fails, the PC host will still be able to communicate with your serial devices over the redundant LAN.

Redundant COM

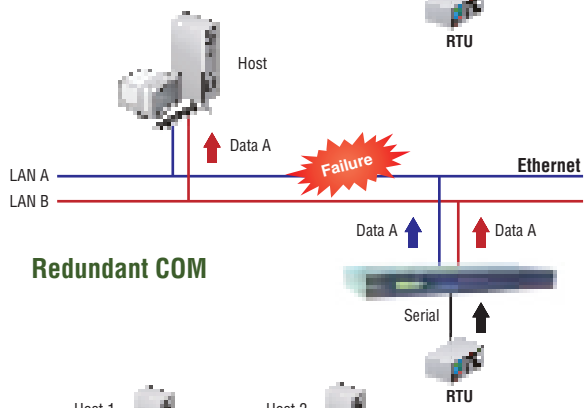
Moxa provides an easy-to-use function, called “Redundant COM,” for duplicating the CN2600’s data transmissions. In this case, when the CN2600 receives a data packet from a connected device, the CN2600 will automatically duplicate the packet and send both packets over separate LANs. If either of the two LANs fails, the other LAN will continue transmitting packets between the serial devices and the host to prevent lost packets. The Moxa driver is programmed to compare packets received from the two LANs, and then discard duplicate packets to prevent the host AP from receiving the same packet twice. The Redundant COM function not only prevents data loss when one of the LANs fails, but also prevents the host AP from receiving garbage data.

Dual-host Redundancy

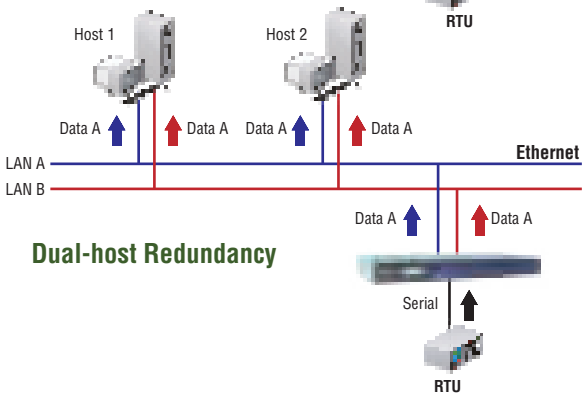
The CN2600’s dual LAN cards can also be used to set up “dual-host” redundancy. In this case, both networks (LAN A and LAN B in the figure) are connected to two different hosts. If either of the two hosts shuts down unexpectedly, the other host will continue transmitting packets to (and receiving packets from) the serial devices connected to the CN2600.



Dual-LAN Redundancy



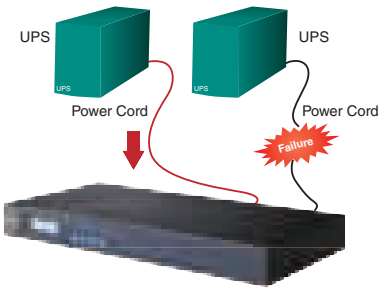
Redundant COM



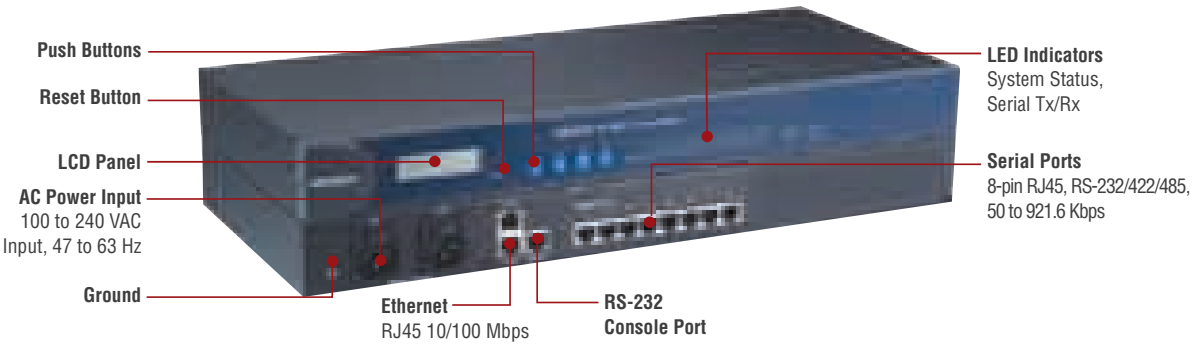
Dual-host Redundancy

Dual-AC Model Supported

Dual-power redundancy uses two power inputs and redundant internal power supplies to ensure that all of the CN2600's functions will be available, even in the event of power circuit failures.



Appearance



Note: Wide temp. models do not include LCD panel and push buttons.

Specifications

Ethernet Interface

Number of Ports: 2 (2 IPs)
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation: 1.5 KV built-in

Serial Interface

Number of Ports: 8 or 16
Serial Standards:
CN2610: RS-232
CN2650/2650I: RS-232/422/485
Connector:
CN2610/2650: 8-pin RJ45
CN2650I: DB9 male
RS-485 Data Direction Control: ADDC® (Automatic Data Direction Control)
Serial Line Protection:
15 KV ESD protection for all signals
2 KV optical isolation (CN2650I)
Console Port: Dedicated RS-232 console port on rear panel (8-pin RJ45)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ
Terminator for RS-485: 120 Ω

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP, PPPoE, DDNS
Security Protocols: RADIUS, HTTPS, SSH, PAP, CHAP
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Search Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Operation Modes

Standard: Real COM, TCP Server, TCP Client, UDP, RFC2217, Terminal, Reverse Telnet, PPP, DRDAS, Redundant COM, Disabled

Applications

Terminal Sessions: 8 sessions per port

Physical Characteristics

Housing: Metal, IP30 protection
Weight:
CN2610-8: 3525 g
CN2610-16: 3560 g
CN2610-8-2AC: 3760 g
CN2610-16-2AC: 3810 g
CN2650-8: 3740 g
CN2650-16: 3790 g
CN2650-8-2AC: 3900 g
CN2650-16-2AC: 3980 g
CN2650I-8: 3666 g
CN2650I-16: 3776 g
CN2650I-8-2AC: 3932 g
CN2650I-16-2AC: 4022 g
Dimensions:
Without ears: 440 x 198 x 45 mm (17.32 x 7.80 x 1.77 in)
With ears: 480 x 198 x 45 mm (18.9 x 7.80 x 1.77 in)

Environmental Limits

Operating Temperature:
Standare Models: 0 to 55°C (32 to 131°F)

Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 100 to 240 VAC, 47 to 63 Hz
Power Consumption: 235 mA @ 100 VAC, 145 mA @ 240 VAC
Power Line Protection: 1 KV burst (EN61000-4-4: EFT/B), 2 KV surge (EN61000-4-5)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 4,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 4,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 Level 4,
EN 61000-4-11
Freefall: IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6
Green Product: RoHS, CRoHS, WEEE

Reliability

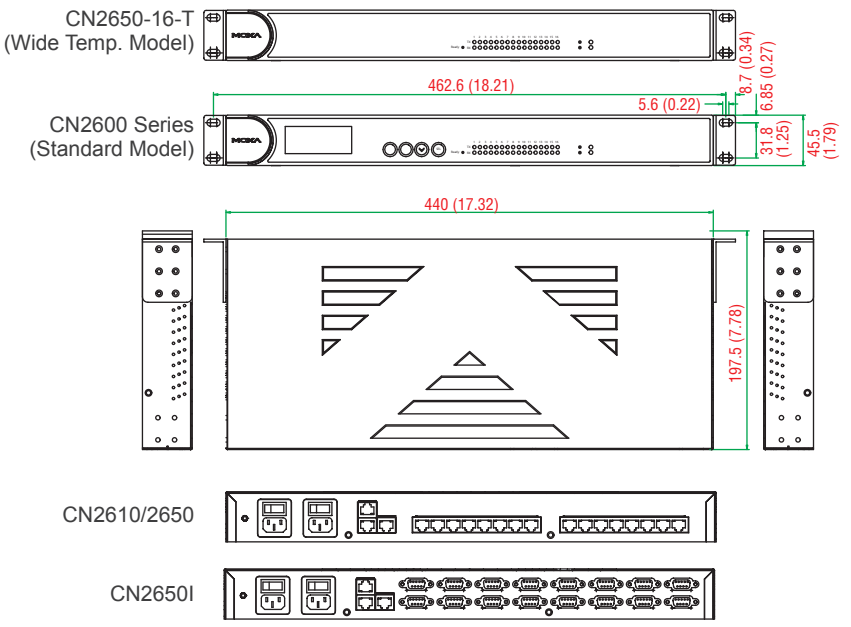
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures): 99,302 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

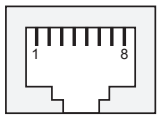
Dimensions

Unit: mm (inch)



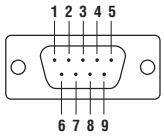
Pin Assignment

8-pin RJ45 connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	–	–
2	RTS	TxD+(B)	–
3	GND	GND	GND
4	TxD	TxD-(A)	–
5	RxD	RxD+(B)	Data+(B)
6	DCD	RxD-(A)	Data-(A)
7	CTS	–	–
8	DTR	–	–

DB9 male connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

CN2610-8: Dual-LAN terminal server with 8 RS-232 ports, 0 to 55°C operating temperature
CN2610-16: Dual-LAN terminal server with 16 RS-232 ports, 0 to 55°C operating temperature
CN2610-8-2AC: Dual-LAN, dual-AC-power terminal server with 8 RS-232 ports, 0 to 55°C operating temperature
CN2610-16-2AC: Dual-LAN, dual-AC-power terminal server with 16 RS-232 ports, 0 to 55°C operating temperature
CN2650-8: Dual-LAN terminal server with 8 RS-232/422/485 ports, 0 to 55°C operating temperature
CN2650-16: Dual-LAN terminal server with 16 RS-232/422/485 ports, 0 to 55°C operating temperature
CN2650-8-2AC: Dual-LAN, dual-AC-power terminal server with 8 RS-232/422/485 ports, 0 to 55°C operating temperature
CN2650-16-2AC: Dual-LAN, dual-AC-power terminal server with 16 RS-232/422/485 ports, 0 to 55°C operating temperature
CN2650I-8: Dual-LAN terminal server with 8 RS-232/422/485 ports and 2 KV optical isolation, 0 to 55°C operating temperature
CN2650I-16: Dual-LAN terminal server with 16 RS-232/422/485 ports and 2 KV optical isolation, 0 to 55°C operating temperature
CN2650I-8-2AC: Dual-LAN, dual-AC-power terminal server with 8 RS-232/422/485 ports and 2 KV optical isolation, 0 to 55°C operating temperature
CN2650I-16-2AC: Dual-LAN, dual-AC-power terminal server with 16 RS-232/422/485 ports and 2 KV optical isolation, 0 to 55°C operating temperature
CN2650-8-2AC-T: Dual-LAN, dual-AC-power terminal server with 8 RS-232/422/485 ports, -40 to 75°C operating temperature
CN2650-16-2AC-T: Dual-LAN, dual-AC-power terminal server with 16 RS-232/422/485 ports, -40 to 75°C operating temperature

Package Checklist

- 1 CN2600 terminal server
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female connection cable, 150 cm
- 2 power cords (AC models only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Serial Cables and Adaptors: See Appendix A for details



Serial-to-Ethernet Device Servers

Product Selection Guide

Combo Switch / Serial Device Servers 8-2
General-purpose Device Servers 8-3
Industrial-grade Device Servers 8-9
Wireless Device Servers 8-11

General-purpose Device Servers

Introduction to Serial Device Servers 8-12
NPort® S8455 Series: Combo switch / serial device servers 8-15
NPort® 5100A Series: 1-port RS-232/422/485 serial device servers 8-18
NPort® 5100 Series: 1-port RS-232/422/485 serial device servers. 8-21
NPort® DE-211/311: 1-port RS-232/422/485 serial device servers 8-24
NPort® 5200A Series: 2-port RS-232/422/485 serial device servers 8-26
NPort® 5200 Series: 2-port RS-232/422/485 serial device servers. 8-29
NPort® 5400 Series: 4-port RS-232/422/485 serial device servers. 8-33
NPort® 5600 Rackmount Series: 8 and 16-port RS-232/422/485 serial device servers 8-36
NPort® 5600 Desktop Series: 8-port RS-232/422/485 serial device servers 8-39
NPort® 5600-8-DT Lite: 8-port RS-232/422/485 serial device servers 8-42

Device Servers for Industrial Automation

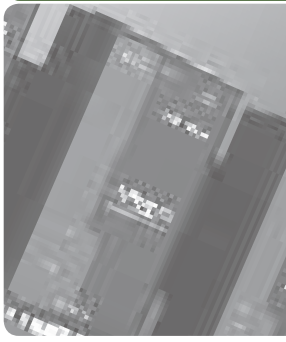
NPort® IA5000A Series: 1, 2, and 4-port serial device servers for industrial automation 8-45
NPort® IA5000 Series: 1 and 2-port serial device servers for industrial automation 8-49

Wireless Device Servers

NPort® W2150/2250 Plus: 1 and 2-port RS-232/422/485 IEEE 802.11a/b/g wireless device servers 8-53

8

Serial-to-Ethernet Device Servers



Combo Switch / Serial Device Servers



NPort S8000: Ethernet Switch Specifications	
Ethernet Interface	
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100Base FX IEEE 802.3x for Flow Control IEEE 802.1D for Spanning Tree Protocol IEEE 802.1w for Rapid STP IEEE 802.1Q for VLAN Tagging IEEE 802.1p for Class of Service IEEE 802.1X for Authentication IEEE 802.3ad for Port Trunk with LACP
Network Protocols	ICMP, IP, TCP, UDP, ARP, Telnet, DNS, HTTP, SMTP, SNTP, IGMPv1/v2 device, GVRP, SNMPv1/v2c/v3, DHCP Server/ Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON
MIB	MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control	IEEE 802.3x flow control, back pressure flow control interface
Switch Properties	
Priority Queues	4
Max. Number of Available VLANs	64
VLAN ID Range	VID 1 to 4094
IGMP Groups	256
Switch Interface	
Optical Fiber Interface	Multi-mode or Single-mode
RJ45 Ports	10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
DIP Switches	Turbo Ring, Master, Coupler, Reserve
Alarm Contact	2 relay outputs with current carrying capacity of 1A @ 24 VDC

NPort S8000: Device Server Specifications	
Serial Interface	
Number of Ports	4
Serial Standards	RS-232/422/485
Connectors	DB9 male
Serial Line Protection	15 KV ESD protection for all signals 2 KV isolation protection
RS-485 Data Direction Control	ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485	1 KΩ, 150 KΩ
Terminator for RS-485	55 Ω, 120 Ω
Console Port	Dedicated RS-232 console port (8-pin RJ45)
Serial Communication Parameters	
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS and XON/XOFF
Baudrate	50 bps to 921.6 Kbps
Serial Signals	
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Data+, Data-, GND
Software	
Configuration Options	Web Console, Telnet Console, Serial Console, Windows Search Utility
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers	2.4.x, 2.6.x
Operation Modes	Real COM, TCP Server, TCP Client, UDP, RFC2217
Management	SNMP MIB-II
IP Routing	Static, RIP-I, RIP-II
Reliability	
Alert Tools	Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger	Built-in WDT (watchdog timer)

NPort S8000: General Specifications		
Port Summary		
Serial Ports		4 RS-232/422/485 ports
Ethernet Switch Ports		3 RJ45 copper ports, 2 multi-mode fiber ports
Console Ports		1 (8-pin RJ45 connector)
LED Indicators		PWR1, PWR2, READY, MASTER, COUPLER, LINK4, LINK5
Physical Characteristics		
Housing		Metal
Weight		995 g
Dimensions		73.1 x 134 x 105 mm
Environmental Limits		
Operating Temperature	Standard Temperature	0 to 60°C
	Wide Temperature	-40 to 75°C
Operating Humidity		5 to 95% (non-condensing)
Storage Temperature		-40 to 85°C
Power Requirements		
Input Voltage		12 to 48 VDC
Power Consumption		935mA @ 12 V, 470 mA @ 24 V
Standards and Certifications		
Safety		UL 508, UL 60950-1, EN 60950-1
EMC		CE, FCC
EMI		EN 55022 Class A, FCC Part 15 SubpartB Class A
EMS		IEC 61000-4-2, Level 4 (ESD) IEC 61000-4-4, Level 4 (EFT) IEC 61000-4-5 for serial port, Level 1 (Surge) IEC 61000-4-5 for Power Line, Level 3 (Surge) IEC 61000-4-5 for LAN port, Level 2 (Surge)
Reliability		
Buzzer, RTC, WDT		✓
MTBF		200,951 hrs
Warranty		5 years (see www.moxa.com/warranty)

General-purpose Device Servers



	NPort 5110A NPort 5110A-T	NPort 5130A NPort 5130A-T	NPort 5150A NPort 5150A-T	NPort 5110 NPort 5110-T	NPort 5130	NPort 5150	NPort DE-211	NPort DE-311
Ethernet Interface								
10BaseT Ports	–	–	–	–	–	–	1	–
10/100BaseT(X) Ports	1	1	1	1	1	1	–	1
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface								
RS-232 Ports	1	–	–	1	–	–	–	–
RS-422/485 Ports	–	1	–	–	1	–	–	–
RS-232/422/485 Ports	–	–	1	–	–	1	1	1
Connector	DB9-M	DB9-M	DB9-M	DB9-M	DB9-M	DB9-M	DB25-F	DB9-F
15 KV ESD Protection	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF							
Baudrate	50 bps to 921.6 Kbps			110 bps to 230.4 Kbps	50 bps to 921.6 Kbps		50 bps to 230.4 Kbps	150 bps to 230.4 Kbps
Software								
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2			ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP			DHCP, BOOTP, Telnet, TCP, UDP, IP, ICMP, ARP	
Web Console	✓	✓	✓	✓	✓	✓	–	–
Serial Console	✓	–	✓	✓	–	✓	✓	✓
Telnet Console	✓	✓	✓	✓	✓	✓	✓	✓
Windows Utility	✓	✓	✓	✓	✓	✓	✓	✓
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded							
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i							
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x							
Physical Characteristics								
Housing	Metal	Metal	Metal	Metal	Metal	Metal	Metal (IP30)	Metal (IP30)
Weight	340 g	340 g	340 g	340 g	340 g	340 g	480 g	480 g
Dimensions	52 x 80 x 22 mm						67 x 100.4 x 22 mm	
Environmental Limits								
Operating Temparture – Standard Temperature	0 to 60°C			0 to 55°C				
Operating Temparture – Wide Temperature	-40 to 75°C			-40 to 75°C				
Operating Humidity	5 to 95% (non-condensing)							
Storage Temperature	-20 to 85°C							
Power Requirements								
Input Voltage	12 to 48 VDC						12 to 30 VDC	9 to 30 VDC
Power Consumption @ 12/24/48 VDC	82.5 mA / 47.3 mA / –	89.1 mA / 49.5 mA / –	92.4 mA / 52.8 mA / –	128.7 mA / 72 mA / –	200 mA / 106 mA / –	200 mA / 106 mA / –	180 mA / 100 mA / –	– / 150 mA / –
Power Consumption @ 100/240 VAC	–	–	–	–	–	–	–	–
Standards and Certifications								
Safety	UL 60950-1, EN 60950-1							
EMC	CE, FCC							
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A							
EMS	EN 55024							
Medical	–	–	–	–	–	–	–	EN60601-1-2 Class B, EN55011
Reliability								
Buzzer, RTC, WDT	WDT only	WDT only	WDT only	WDT only	WDT only	WDT only	–	–
MTBF	2,231,530 hrs	2,231,530 hrs	2,231,530 hrs	279,122 hrs	246,505 hrs	246,034 hrs	347,822 hrs	225,529 hrs
Warranty	5 years (see www.moxa.com/warranty)							

General-purpose Device Servers



	NPort 5210A NPort 5210A-T	NPort 5230A NPort 5230A-T	NPort 5250A NPort 5250A-T	NPort 5210 NPort 5210-T	NPort 5230 NPort 5230-T	NPort 5232 NPort 5232-T	NPort 5232I NPort 5232I-T
Ethernet Interface							
10/100BaseT(X) Ports	1	1	1	1	1	1	1
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface							
RS-232 Ports	2	–	–	2	1	–	–
RS-422/485 Ports	–	2	–	–	1	2	2
RS-232/422/485 Ports	–	–	2	–	–	–	–
Connector	DB9-M	TB	DB9-M	RJ45	TB	TB	TB
15 KV ESD Protection	✓	✓	✓	✓	✓	✓	✓
2 KV Isolation Protection	–	–	–	–	–	–	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF						
Baudrate	50 bps to 921.6 Kbps			110 bps to 230.4 Kbps			
Software							
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2						
Web Console	✓	✓	✓	✓	✓	✓	✓
Serial Console	✓	–	✓	✓	✓	–	–
Telnet Console	✓	✓	✓	✓	✓	✓	✓
Windows Utility	✓	✓	✓	✓	✓	✓	✓
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x						
Onsite Configuration							
Mini Screen with Push Buttons	–	–	–	–	–	–	–
Physical Characteristics							
Housing	Metal	Metal	Metal	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	340 g	340 g	340 g	340 g	360 g	360 g	380 g
Dimensions	52 x 80 x 22 mm			67 x 100.4 x 22 mm			67 x 100.4 x 35 mm
Environmental Limits							
Operating Temparture – Standard Temperature	0 to 60°C			0 to 55°C			
Operating Temparture – Wide Temperature	-40 to 75°C			-40 to 75°C			
Operating Humidity	5 to 95% (non-condensing)			5 to 95% (non-condensing)			
Storage Temperature	-20 to 85°C			-40 to 85°C			
Power Requirements							
Input Voltage	12 to 48 VDC						
Power Consumption @ 12/24 VDC	119 mA / 65 mA	119 mA / 65 mA	119 mA / 65 mA	325 mA / 190 mA	325 mA / 190 mA	280 mA / 150 mA	509.4 mA / 200 mA
Standards and Certifications							
Safety	UL 60950-1, EN 60950-1						
EMC	CE, FCC						
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A						
EMS	EN 55024						
Power Line Protection	Level 2 Burst (EFT), EN 61000-4-4 (Surge) Level 3, EN 61000-4-5			–	–	–	–
Marine	–	–	–	DNV	DNV	DNV	DNV
Medical	–	–	–	EN 60601-1-2 Class B, EN 55011	–	–	–
Reliability							
Buzzer, RTC, WDT	WDT only	WDT only	WDT only	✓	✓	✓	✓
MTBF	847,750 hrs	847,750 hrs	847,750 hrs	134,850 hrs	106,955 hrs	102,344 hrs	87,083 hrs
Warranty	5 years (see www.moxa.com/warranty)						

General-purpose Device Servers



	NPort 5410	NPort 5430	NPort 5430I	NPort 5450 NPort 5450-T	NPort 5450I NPort 5450I-T
Ethernet Interface					
10BaseT Ports	–	–	–	–	–
10/100BaseT(X) Ports	1	1	1	1	1
100BaseFX	–	–	–	–	–
Connector	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface					
RS-232 Ports	4	–	–	–	–
RS-422/485 Ports	–	4	4	–	–
RS-232/422/485 Ports	–	–	–	4	4
Connector	DB9-M	TB	TB	DB9-M	DB9-M
15 KV ESD Protection	✓	✓	✓	✓	✓
2 KV Isolation Protection	–	–	✓	–	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark				
Flow Control	RTS/CTS, XON/XOFF				
Baudrate	50 bps to 921.6 Kbps				
Software					
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, Rtelnet, ARP				
Web Console	✓	✓	✓	✓	✓
Serial Console	–	–	–	–	–
Telnet Console	✓	✓	✓	✓	✓
Windows Utility	✓	✓	✓	✓	✓
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded				
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i				
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x				
Onsite Configuration					
Mini Screen with Push Buttons	✓	✓	✓	✓	✓
Physical Characteristics					
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	740 g	740 g	740 g	740 g	740 g
Dimensions	158 x 103 x 33 mm	158 x 103 x 33 mm	158 x 103 x 33 mm	158 x 103 x 33 mm	158 x 103 x 33 mm
Environmental Limits					
Operating Temparture	0 to 55°C			0 to 55°C	
Operating Humidity	5 to 95% (non-condensing)			5 to 95% (non-condensing)	
Storage Temperature	-20 to 70°C			0 to 55°C or -40 to 75°C	
Power Requirements					
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption @ 12/24 VDC	350 mA / 190 mA	320 mA / 175 mA	530 mA / 280 mA	350 mA / 190 mA	554 mA / 294 mA
Standards and Certifications					
Safety	UL 60950-1, EN 60950-1				
EMC	CE, FCC				
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A				
EMS	EN 55024				
Marine	DNV (standard temp. models only)				
Medical	EN 60601-1-2 Class B, EN 55011				
Reliability					
Buzzer, RTC, WDT	✓	✓	✓	✓	✓
MTBF	206,903 hrs	206,903 hrs	206,903 hrs	206,903 hrs	206,903 hrs
Warranty	5 years (see www.moxa.com/warranty)				

General-purpose Device Servers



	NPort 5610-8	NPort 5610-8-48V	NPort 5630-8	NPort 5650-8	NPort 5650-8-M-SC	NPort 5650-8-S-SC	NPort 5610-16	NPort 5610-16-48V
Ethernet Interface								
10BaseT Ports	–	–	–	–	–	–	–	–
10/100BaseT(X) Ports	1	1	1	1	–	–	1	1
100BaseFX Ports	–	–	–	–	1 (multi-mode)	1 (single-mode)	–	–
Connector	RJ45	RJ45	RJ45	RJ45	SC	SC	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	–	–	1.5 KV	1.5 KV
Serial Interface								
RS-232 Ports	8	8	–	–	–	–	16	16
RS-422/485 Ports	–	–	8	–	–	–	–	–
RS-232/422/485 Ports	–	–	–	8	8	8	–	–
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
15 KV ESD Protection	✓	✓	✓	✓	✓	✓	✓	✓
2 KV Isolation Protection	–	–	–	–	–	–	–	–
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF							
Baudrate	50 bps to 921.6 Kbps							
Software								
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RTelnet, RFC2217							
Web Console	✓	✓	✓	✓	✓	✓	✓	✓
Serial Console	–	–	–	–	–	–	–	–
Telnet Console	✓	✓	✓	✓	✓	✓	✓	✓
Windows Utility	✓	✓	✓	✓	✓	✓	✓	✓
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded							
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i							
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x							
Onsite Configuration								
Mini Screen with Push Buttons	✓	✓	✓	✓	✓	✓	✓	✓
Physical Characteristics								
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3340 g	3160 g	3380 g	3360 g	3380 g	3380 g	3420 g	3260 g
Dimensions	440 x 45 x 198 mm							
Environmental Limits								
Operating Temparture	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C
Power Requirements								
Input Voltage	100 to 240 VAC, 47 to 63 hz	±48 VDC	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	±48 VDC
Power Consumption @ 12/24/48 VDC		– / – / 135 mA	–	–	–	–	–	– / – / 135 mA
Power Consumption @ 100/240 VAC	141/93 mA	–	152/98 mA	158/102 mA	174/113 mA	164/110 mA	141/93 mA	–
Standards and Certifications								
Safety	UL 60950-1, EN 60950-1							
EMC	CE, FCC							
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A							
EMS	EN 55024, IEC 61000-4-12	EN 55024, IEC 61000-4-12	EN 55024	EN 55024	EN 55024	EN 55024	EN 55024, IEC 61000-4-12	EN 55024, IEC 61000-4-12
Medical	EN 60601-1-2 Class B, EN 55011							
Reliability								
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓
MTBF	97,294 hrs	96,758 hrs	118,405 hrs	117,584 hrs	116,914 hrs	116,914 hrs	94,928 hrs	94,417 hrs
Warranty	5 years (see www.moxa.com/warranty)							

General-purpose Device Servers



	NPort 5630-16	NPort 5650-16	NPort 5650-16-M-SC	NPort 5650-16-S-SC	NPort 5610-8-DT	NPort 5610-8-DT-J	NPort 5650-8-DT	NPort 5650I-8-DT	NPort 5650-8-DT-J
Ethernet Interface									
10BaseT Ports	–	–	–	–	–	–	–	–	–
10/100BaseT(X) Ports	1	1	–	–	2 (1 IP)	2 (1 IP)	2 (1 IP)	2 (1 IP)	2 (1 IP)
100BaseFX Ports	–	–	1 (multi-mode)	1 (single-mode)	–	–	–	–	–
Connector	RJ45	RJ45	SC	SC	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	–	–	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface									
RS-232 Ports	–	–	–	–	8	8	–	–	–
RS-422/485 Ports	16	–	–	–	–	–	–	–	–
RS-232/422/485 Ports	–	16	16	–	–	–	8	8	8
Connector	RJ45	RJ45	RJ45	RJ45	DB9-M	RJ45	DB9-M	DB9-M	RJ45
15 KV ESD Protection	✓	✓	✓	✓	✓	✓	✓	✓	✓
2 KV Isolation Protection	–	–	–	–	–	–	–	√	–
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF								
Baudrate	50 bps to 921.6 Kbps								
Software									
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RTelnet, RFC2217				ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, Rtelnet, ARP, RFC2217				
Web Console	✓	✓	✓	✓	✓	✓	✓	✓	✓
Serial Console	–	–	–	–	✓	✓	✓	✓	✓
Telnet Console	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows Utility	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded								
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i								
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x								
Onsite Configuration									
Mini Screen with Push Buttons	✓	✓	✓	✓	✓	✓	✓	✓	✓
Physical Characteristics									
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	3400 g	3460 g	3440 g	3440 g	1760 g	1170 g	1770 g	1850 g	1710 g
Dimensions	440 x 45 x 198 mm				197 x 44 x 125 mm				
Environmental Limits									
Operating Temparture	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Power Requirements									
Input Voltage	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	100 to 240 VAC, 47 to 63 hz	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption @ 12/24/48 VDC	–	–	–	–	611/300/140 mA	611/300/140 mA	615/300/156 mA	1066/510/200 mA	615/300/156 mA
Power Consumption @ 100/240 VAC	152/98 mA	158/102 mA	174/113 mA	164/110 mA	–	–	–	–	–
Standards and Certifications									
Safety	UL 60950-1, EN 60950-1								
EMC	CE, FCC								
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A								
EMS	EN 55024								
Medical	EN 60601-1-2 Class B, EN 55011				–	–	–	–	–
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
MTBF	91,483 hrs	104,767 hrs	87,528 hrs	87,528 hrs	163,356 hrs	163,356 hrs	163,356 hrs	163,356 hrs	163,356 hrs
Warranty	5 years (see www.moxa.com/warranty)								

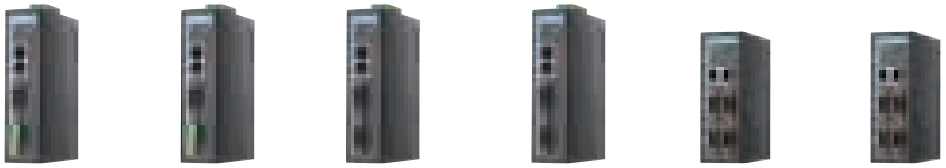
General-purpose Device Servers





		NPort 5610-8-DTL NPort 5610-8-DTL-T	NPort 5650-8-DTL NPort 5650-8-DTL-T	NPort 5650I-8-DTL NPort 5650I-8-DTL-T
Ethernet Interface				
10BaseT Ports		–	–	–
10/100BaseT(X) Ports		1	1	1
100BaseFX Ports		–	–	–
Connector		RJ45	RJ45	RJ45
Magnetic Isolation Protection		1.5 KV	1.5 KV	1.5 KV
Serial Interface				
RS-232 Ports		8	–	–
RS-422/485 Ports		–	–	–
RS-232/422/485 Ports		–	8	8
Connector		DB9-M	DB9-M	DB9-M
15 KV ESD Protection		✓	✓	✓
2 KV Isolation Protection		–	–	✓
Serial Communication Parameters		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		
Flow Control		RTS/CTS, XON/XOFF		
Baudrate		50 bps to 921.6 Kbps		
Software				
Network Protocols		ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP		
Web Console		✓	✓	✓
Serial Console		✓	✓	✓
Telnet Console		✓	✓	✓
Windows Utility		✓	✓	✓
Windows Real COM Drivers		Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 50/60, Windows XP Embedded		
Fixed TTY Drivers		SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i		
Linux Real TTY Drivers		Linux 2.4.x, 2.6.x		
Physical Characteristics				
Housing		Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight		1760 g	1770 g	1850 g
Dimensions		197 x 44 x 125 mm		
Environmental Limits				
Operating Temparture	Standard Temperature	0 to 60°C		
	Wide Temperature	-40 to 75°C		
Operating Humidity		5 to 95% (non-condensing)		
Storage Temperature		-20 to 85°C		
Power Requirements				
Input Voltage		12 to 48 VDC		
Power Consumption @ 12/24 VDC		340 mA / 180 mA	470 mA / 250 mA	740 mA / 370 mA
Standards and Certifications				
Safety		UL 60950-1, EN 60950-1		
EMC		CE, FCC		
EMI		EN 55022 Class A, FCC Part 15 Subpart B Class A		
EMS		EN 55024		
Reliability				
Buzzer, RTC, WDT		WDT only	WDT only	WDT only
MTBF		163,356 hrs	163,356 hrs	163,356 hrs
Warranty		5 years (see wwwmoxacom/warranty)		

Industrial-grade Device Servers



	NPort IA5150A NPort IA5150A-T	NPort IA5150AI NPort IA5150AI-T	NPort IA5250A NPort IA5250A-T	NPort IA5250AI NPort IA5250AI-T	NPort IA5450A NPort IA5450A-T	NPort IA5450AI NPort IA5450AI-T
Ethernet Interface						
10/100BaseT(X) Ports	2 (1 IP)	2 (1 IP)	2 (1 IP)	2 (1 IP)	2 (1 IP)	2 (1 IP)
Connector	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface						
RS-232/422/485 Ports	1	1	2	2	4	4
Connector	DB9-M	DB9-M	DB9-M	DB9-M	DB9-M	DB9-M
15 KV ESD Protection	✓	✓	✓	✓	✓	✓
2 KV Isolation Protection	–	✓	–	✓	–	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, XON/XOFF					
Baudrate	50 bps to 921.6 Kbps					
Software						
Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, Rtelnet, DNS, SNMP V1, HTTP, SMTP, SNTP, IGMP					
Configuration Options	Web Console, Serial Console, Telnet Console, Windows Utility					
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 50/60, Windows XP Embedded					
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i					
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x					
Physical Characteristics						
Housing	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)	Metal (IP30)
Weight	475 g	475 g	485 g	485 g	560 g	560 g
Dimensions	36 x 105 x 140 mm	36 x 105 x 140 mm	36 x 105 x 140 mm	36 x 105 x 140 mm	45.8 x 134 x 105 mm	45.8 x 134 x 105 mm
Environmental Limits						
Operating Temparture – Standard Temperature	0 to 60°C					
Operating Temparture – Wide Temperature	-40 to 75°C					
Operating Humidity	5 to 95% (non-condensing)					
Storage Temperature	-20 to 85°C					
Power Requirements						
Input Voltage	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption @ 12/24 VDC	220 mA / 110 mA	225 mA / 130 mA	250 mA / 125 mA	290 mA / 150 mA	374 mA / 184 mA	512 mA / 242 mA
Standards and Certifications						
Safety	UL 508 (Pending)					
Hazardous Location	UL/cUL Class I Division 2 Groups A/B/C/D (Pending), ATEX Class I Zone 2					
EMC	CE, FCC					
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A					
EMS	EN 55024, EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-11					
Shock	IEC 60068-2-27					
Freefall	IEC 60068-2-32					
Vibration	IEC 60068-2-6					
Reliability						
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓
MTBF	262,805 hrs	262,805 hrs	262,805 hrs	262,805 hrs	262,805 hrs	262,805 hrs
Warranty	5 years (see www.moxa.com/warranty)					

Industrial-grade Device Servers



		NPort IA5150 NPort IA5150-T	NPort IA5150I NPort IA5150I-T	NPort IA5150-M-SC NPort IA5150-M-SC-T	NPort IA5150I-M-SC NPort IA5150I-M-SC-T	NPort IA5150-S-SC NPort IA5150-S-SC-T	NPort IA5150I-S-SC NPort IA5150I-S-SC-T	NPort IA5250 NPort IA5250-T
Ethernet Interface								
10/100BaseT(X) Ports		2 (1 IP)	2 (1 IP)	–	–	–	–	2 (1 IP)
100BaseFX Ports		–	–	1 (multi-mode)	1 (multi-mode)	1 (single-mode)	1 (single-mode)	–
Connector		RJ45	RJ45	SC	SC	SC	SC	RJ45
Magnetic Isolation Protection		1.5 KV	1.5 KV	–	–	–	–	1.5 KV
Serial Interface								
RS-232/422/485 Ports		1	1	1	1	1	1	2
Connector		DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M/TB	DB9-M
15 KV ESD Protection		✓	✓	✓	✓	✓	✓	✓
2 KV Isolation Protection		–	✓	–	✓	–	✓	–
Serial Communication Parameters		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control		RTS/CTS, XON/XOFF						
Baudrate		110 bps to 230.4 Kbps						
Software								
Network Protocols		ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, Rtelnet, DNS, SNMP V1, HTTP, SMTP, SNTP						
Configuration Options		Web Console, Serial Console, Telnet Console, Windows Utility						
Windows Real COM Drivers		Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows Embedded CE 5.0/6.0, Windows XP Embedded						
Fixed TTY Drivers		SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i						
Linux Real TTY Drivers		Linux 2.4.x, 2.6.x						
Physical Characteristics								
Housing		Plastic (IP30)						
Weight		360 g						
Dimensions		29 x 89.2 x 118.5 mm						
Environmental Limits								
Operating Temparture	Standard Temperature	0 to 55°C						
	Wide Temperature	-40 to 75°C						
Operating Humidity		5 to 95% (non-condensing)						
Storage Temperature		-40 to 85°C						
Power Requirements								
Input Voltage		12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC
Power Consumption		360 mA @ 12 V, 195 mA @ 24 V	420 mA @ 12 V, 215 mA @ 24 V	500 mA @ 12 V, 250 mA @ 24 V	510 mA @ 12 V, 260 mA @ 24 V	470 mA @ 12 V, 210 mA @ 24 V	490 mA @ 12 V, 250 mA @ 24 V	440 mA @ 12 V, 200 mA @ 24 V
Standards and Certifications								
Safety		UL 508, UL 60950-1, EN 60950-1						
Hazardous Location		UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2						
EMC		CE, FCC						
EMI		EN 55022 Class A, FCC Part 15 Subpart B Class A						
EMS		EN 55024, EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-11						
Marine		DNV						
Shock		IEC 60068-2-27						
Freefal		IEC 60068-2-32						
Vibration		IEC 60068-2-6						
Reliability								
Buzzer, RTC, WDT		✓	✓	✓	✓	✓	✓	✓
MTBF		183,747 hrs	195,614 hrs	183,747 hrs	195,614 hrs	183,747 hrs	195,614 hrs	194,765 hrs
Warranty		5 years (see www.moxa.com/warranty)						

Wireless Device Servers





		NPort® W2150 Plus NPort® W2150 Plus-T	NPort® 2250 Plus NPort® 2250 Plus-T
WLAN Interface			
IEEE 802.11b/g		–	–
IEEE 802.11a/g/b		✓	✓
Radio Frequency Type		DSSS/OFDM	DSSS/OFDM
WEP			
WPA, WPA2, 802.11i			
Encryption		128-bit TKIP/AES-CCMP EAP-TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPV2, EAP-TTLS/PAP, EAP-TTLS/CHAP, EAP-TTLS/MSCHAP, EAP-TTLS/MSCHAPV2, EAP-TTLS/EAP-MSCHAPV2, EAP-TTLS/EAP-GTC, EAP-TTLS/EAP-MD5, LEAP	
Max. Transmission Rate		54 Mbps	54 Mbps
Max. Transmission Distance		100 m	100 m
LAN Interface			
Ethernet Ports		1 x 10/100 Mbps (RJ45)	1 x 10/100 Mbps (RJ45)
1.5 KV Magnetic Isolation Protection		✓	✓
Serial Interface			
Number of Ports		1	2
Serial Standards		RS-232/422/485	RS-232/422/485
Connector		DB9-M	DB9-M
Console Port		–	–
Serial Communication Parameters		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark
Flow Control		RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF
Baudrate		50 bps to 921.6 Kbps	50 bps to 921.6 Kbps
Serial Data Log		64 KB	64 KB
Software			
Network Protocols		ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, SNTP, SSH, HTTPS	
Configuration Options		Web Console, Serial Console, Telnet Console, Windows Utility	
Management		SNMP MIB-II	SNMP MIB-II
Secure Configuration Options		HTTPS, SSH	HTTPS, SSH
Utilities		NPort Search Utility and NPort Windows Driver Manager	
Windows Real COM Drivers		Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/ 7 x86/x64, Embedded CE 5.0/6.0, XP Embedded	
Fixed TTY Drivers		SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i	
Linux Real TTY Drivers		Linux 2.4.x/2.6.x	
Physical Characteristics			
Housing		Aluminum	
Weight		780 g	
Dimensions		77 x 111 x 26 mm	
Environmental Limits			
Operating Temperature	Standard Temperature	0 to 55°C	
	Wide Temperature	-40 to 75°C	
Operating Humidity		5 to 95% (non-condensing)	
Storage Temperature		-40 to 85°C	
Power Requirements			
Input Voltage		12 to 48 VDC	
Power Consumption		560 mA @ 12 V, 294 mA @ 24 V, 162 mA @ 48 V	
Standards and Certifications			
Safety		UL 60950-1, EN 60950-1	
EMC		CE, FCC	
EMI		FCC Part 15 (Subpart B Class A, Subpart C, Subpart E), VCCI	
EMS		EN 55022 Class A	
Radio		CE (ETSI EN 301 893, ETSI EN 300 328), ARIB RCR STD-33, ARIB STD-66	
Reliability			
MTBF		352,547 hrs	352,034 hrs
Warranty		5 years (see www.moxa.com/warranty)	

Introduction to Serial Device Servers

Device server technology makes device networking easy

Device servers are used to connect serial devices to Ethernet LANs, and are able to transmit data both to and from the serial device. Moxa's NPort® line of device servers are essentially pre-programmed computers that have a real-time OS and built-in TCP/IP protocol suite that allows you to access, manage, and configure remote facilities and equipment from anywhere in the world over the Internet.



No Restrictions on Host Type or Operating System

Any host computer that supports the TCP/IP protocol can access the NPort®'s serial ports, eliminating the need for special-purpose drivers. In addition, you will not be held back by your PC's limited number of serial bus slots.

Real COM/TTY Drivers for Existing Software

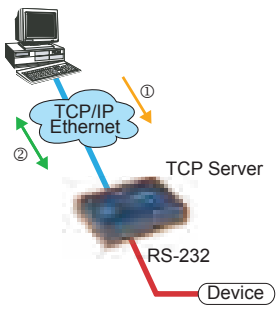
NPort® device servers also come with Real COM/TTY drivers for accessing devices through a "virtual" COM or TTY port.

NPort® Provides a Wide Choice of Operation Modes

Socket Modes

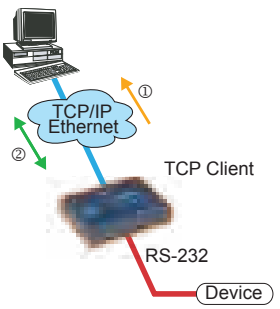
TCP Server Mode

When the NPort® is configured for TCP Server Mode, each serial port is assigned a unique IP:Port combination on the TCP/IP network, and the NPort® waits passively for a host computer to establish a connection with the attached serial device. TCP Server mode supports up to 4 simultaneous connections, allowing multiple hosts to collect data from the same serial device at the same time.



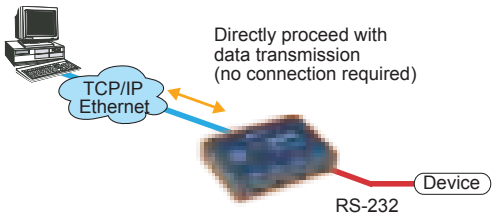
TCP Client Mode

When the NPort® is configured for TCP Client mode and data is received from the attached device the NPort® establishes a TCP connection between the attached device a specified host computer. After the data has been transferred, the NPort® automatically closes the connection. TCP Client mode supports up to 4 simultaneous connections, allowing multiple hosts to collect data from the same serial device at the same time.



UDP Mode

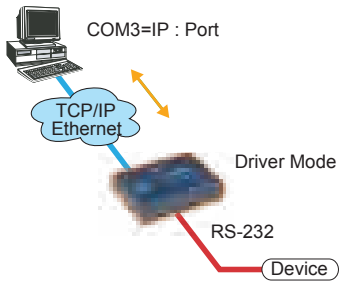
UDP mode supports up to 4 IP groups. In UDP mode, the attached device can exchange data simultaneously with up to 4 network destinations, and at a higher speed than when using TCP. This mode is ideal for message display applications.



Driver Modes

Real COM Mode

When configured for Real COM mode, each serial port is assigned an IP:Port combination that is mapped to a host computer's local COM or TTY port using Moxa's NPort® drivers. Legacy applications can access the attached serial device using the host's local COM or TTY port, without the need to modify serial COM software to account for network protocols.



RFC2217 Mode

When the NPort® is configured for RFC2217 mode, each serial port is assigned an IP:Port combination that is mapped by RFC2217-compliant drivers to a virtual COM port. The RFC2217 protocol defines general COM port control options based on the Telnet protocol. The NPort® supports any third party driver that is RFC2217-compliant.

Other Modes

Pair Connection Mode

When configured for Pair Connection mode, two NPort® device servers can be used to transmit RS-232 signals over Ethernet, and in this way overcome the 15-meter limitation imposed by the RS-232 standard. One NPort® connects to the PC's COM port, and the other NPort® connects to the serial device. The two NPort® device servers are either connected to each other with a cross-over Ethernet cable, or are each connected to an Ethernet LAN or WAN. Both data and modem control signals can be exchanged between the PC and device over Ethernet, but DCD signals are not supported.

Ethernet Modem Mode

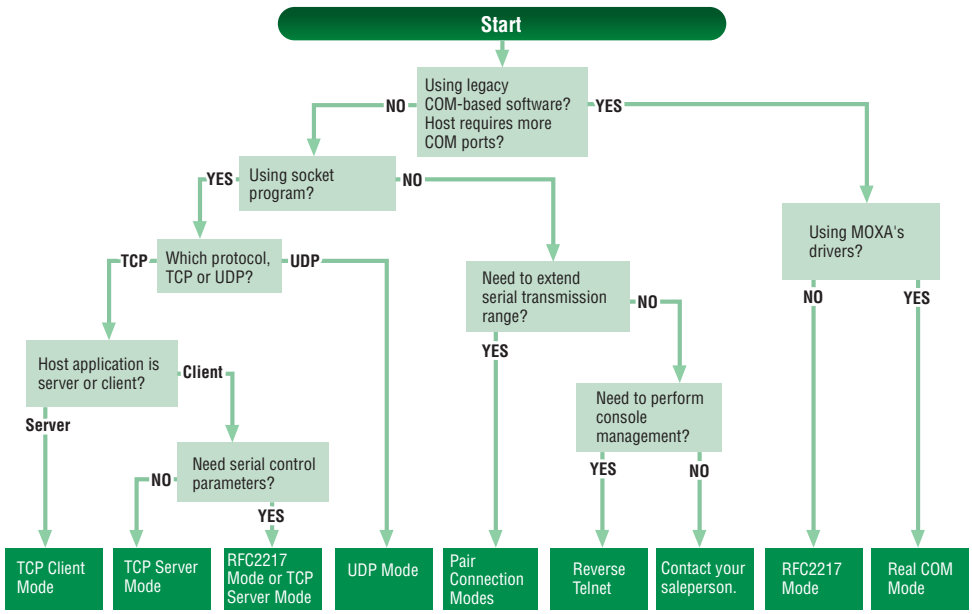
When configured for Ethernet Modem mode, the serial port on the NPort® behaves as if it were attached to a modem, except that data is transmitted over a network instead of over phone lines. Ethernet Modem Mode enables network access for legacy software that was originally designed to transmit data by modem.

Reverse Telnet Mode

When configured for Reverse Telnet mode, the NPort® device server's serial ports provide a connection to a server, with connections initiated by a host over Ethernet. This is similar to TCP server mode, except that Reverse Telnet mode also provides Telnet-style CR/LF conversion. Reverse Telnet mode can be used for remote console management, in which the NPort® is used to enable network access to the serial console ports of different equipment, such as routers, switches, and servers.



Mode Selection Flowchart

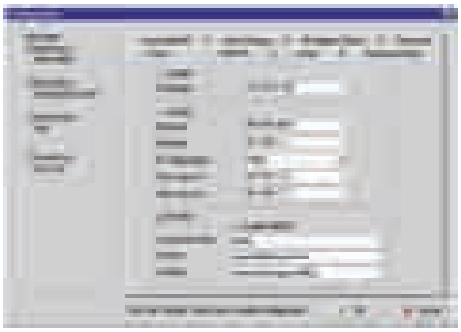


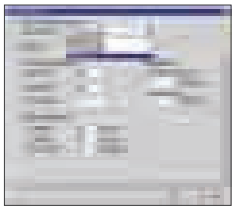
NPort® Administrator Makes Installation Easy

NPort® Administrator is designed to make it easy to install and configure NPort® 5000 device servers over the network. Five groups of functions are supported to allow off-line COM mapping, device monitoring, and searching for NPort® device severs over the network. Both NPort® Administrator and an IP Serial Library are bundled with NPort®'s integrated software suite, giving you everything you need to manage, monitor, and reconfigure your NPort® from remote locations.

Configuration Features

- Broadcast search over the LAN for NPort® device servers
- Select and configure the NPort®'s operation mode
- Upgrade the NPort®'s firmware
- Export and import the NPort®'s configurations
- Monitor the NPort®'s status
- Auto IP report





Web Console Provides Exceptional Convenience

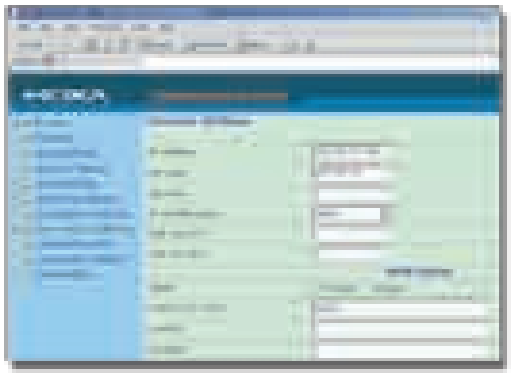
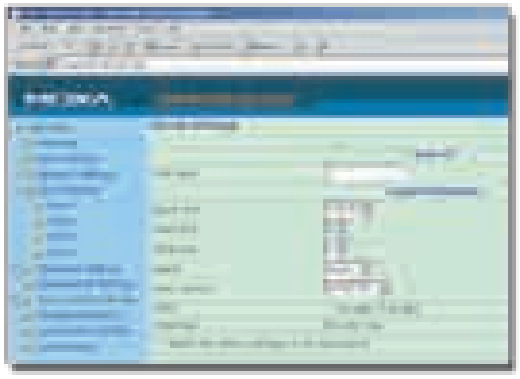
NPort® 5000 device servers are easily configured over the network with the web console or Telnet console.

Network Settings

- IP, netmask, gateway
- Static IP, DHCP, BOOTP
- DNS server

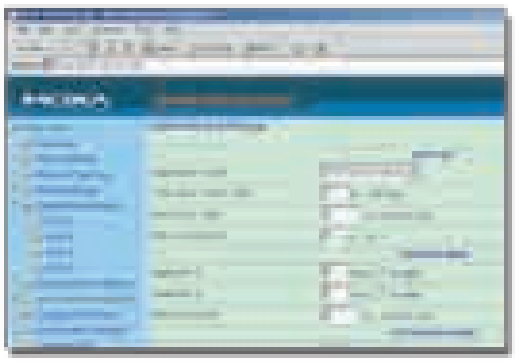
Serial Settings

- Baudrate
- Data bits, stop bit, parity
- Flow control
- Communication interface

Operation Settings

- Operation mode
- TCP alive check time
- Inactivity time
- Delimiter
- Force transmit
- Packet length
- Allow driver control
- Maximum connection



NPort® S8455 Series

Combo switch / serial device servers



- 4-port RS-232/422/ 485 serial device server
  - Serial QoS for configuring serial data transmission priority
  - 2 KV (DC) isolation protection for each serial port
  - Adjustable pull high/low resistor for RS-485 ports
- 5-port managed Ethernet switch built in
  - Two fiber Ethernet ports and three Ethernet ports
  - Ethernet redundancy with Turbo Ring (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D) supported
  - QoS, IGMP-snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
  - Surge protection for serial, power, and Ethernet

Overview

The NPort® S8455 series combines an industrial device server with a full-function managed Ethernet switch by integrating 2 fiber ports, 3 Ethernet ports, and 4 RS-232/422/485 serial ports, allowing you to easily install, manage, and maintain the product. Combining a device server and switch in one product allows you to save space in your cabinet, reduce overall power consumption, and reduce costs, since you will not need to purchase a switch and serial device server separately.

Supports the Full Range of NPort® 5000 Series Device Server Functions

The NPort® S8455 series supports the complete array of NPort® 5000 series device server functions. You can network your existing serial devices by connecting up to 4 serial devices through each of the 5 Ethernet ports, with only basic configuration required. In addition, data transmission between the serial and Ethernet interfaces is bi-directional.

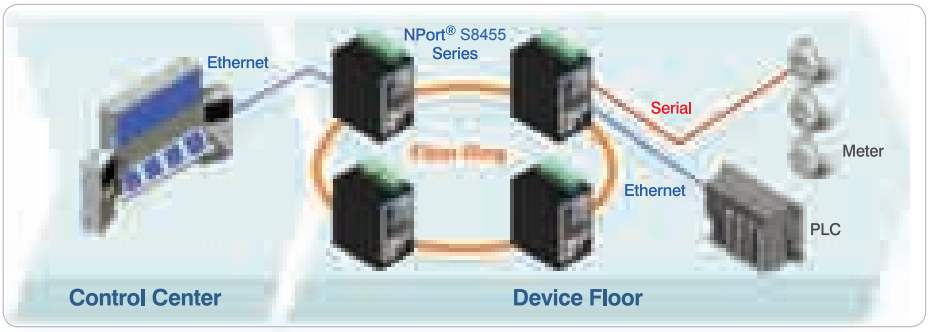
Full-function Managed Ethernet Switch

The NPort® S8455 series has a built-in full-function managed Ethernet switch that supports QoS, IGMP-snooping/GMRP, VLAN, Port Trunking, SNMPv1/v2c/v3, and IEEE 802.1X, allowing you to handle virtually any kind of application. Ethernet redundancy, which is used to increase the reliability and availability of your industrial Ethernet network, is provided by Moxa's own Turbo Ring® technology (recovery time < 20 ms) or RSTP/STP (IEEE 802.1w/D).

Ring Redundancy at the Device Level

Device level communication networks for industrial automation are very critical since they are used to control and monitor device processes. The reliability of these communications depends on ring redundancy at the device level. which is designed to provide fast network fault detection and reconfiguration in order to support the most demanding control applications.

The NPort® S8455 series integrates a full function NPort® device server with an industrial switch to carry serial and Ethernet devices at the same time. In addition, the NPort® S8455 can also achieve ring redundancy with standard STP/RSTP and Moxa's proprietary Turbo Ring or Turbo Ring 2 redundancy protocols. This all-in-one design can be used to optimize and simplify your device network, and enhance reliability.



Rugged Design with Complete Protection



UL508 Safety

The NPort® S8455 series complies with the UL 508 standard, which covers safety requirements for industrial control equipment.



Level 4 ESD

The NPort® S8455 series supports high level, 8/15 KV, ESD protection to prevent damage from static electricity.



Full Surge Protection

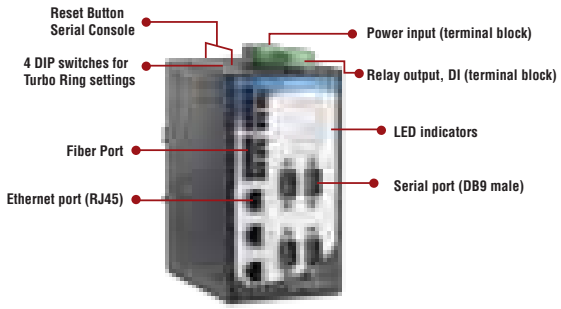
The NPort® S8455 series is equipped with surge protection for power, Ethernet interface, and serial interface to protect against voltage spikes.



2 KV Serial Isolation

Each serial port is protected by 2 KV of isolation protection to guard against harmful currents.

Appearance



General Specifications

Port Summary

Serial Ports: 4 RS-232/422/485 ports
Ethernet Switch Ports: 3 RJ45 copper ports, 2 fiber ports
Console Ports: 1 (8-pin RJ45 connector)

Physical Characteristics

Housing: Metal
Weight: 995 g
Dimensions: 73.1 x 134 x 105 mm (2.88 x 5.27 x 4.13 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption: 935 mA @ 12 V, 470 mA @ 24 V

Standards and Certifications

Safety: UL 508, UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
IEC 61000-4-2 (ESD) Level 4,
IEC 61000-4-4 (EFT) Level 4,
IEC 61000-4-5 (Surge)
Level 1 for serial ports,
Level 2 for LAN ports,
Level 3 for power lines

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Device Server Specifications

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Connector: DB9 male
Serial Line Protection:
• 15 KV ESD protection for all signals
• 2 KV isolation protection
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ
Terminator for RS-485: 55 Ω, 120 Ω
Console Port: Dedicated RS-232 console port (8-pin RJ45)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web Console, Telnet Console, Serial Console, Windows Search Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x
Operation Modes: Real COM, TCP Server, TCP Client, UDP, RFC2217
Management: SNMP MIB-II
IP Routing: Static, RIP-I, RIP-II

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures): 200,951 hrs

Ethernet Switch Specifications

Ethernet Interface

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1x for Authentication
IEEE 802.3ad for Port Trunk with LACP
Network Protocols: ICMP, IP, TCP, UDP, ARP, Telnet, DNS, HTTP, SMTP, SNTP, IGMPv1/v2 device, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control interface

Optical Fiber Interface

Distance:
- Multi-mode: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
- Single-mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))

Min. TX Output:
- Multi-mode: -20 dBm
- Single-mode: - 5 dBm

Max. TX Output:
- Multi-mode: -14 dBm
- Single-mode: 0 dBm

Sensitivity:
- Multi-mode: -34 to -30 dBm
- Single-mode: -36 to -32 dBm

Switch Properties

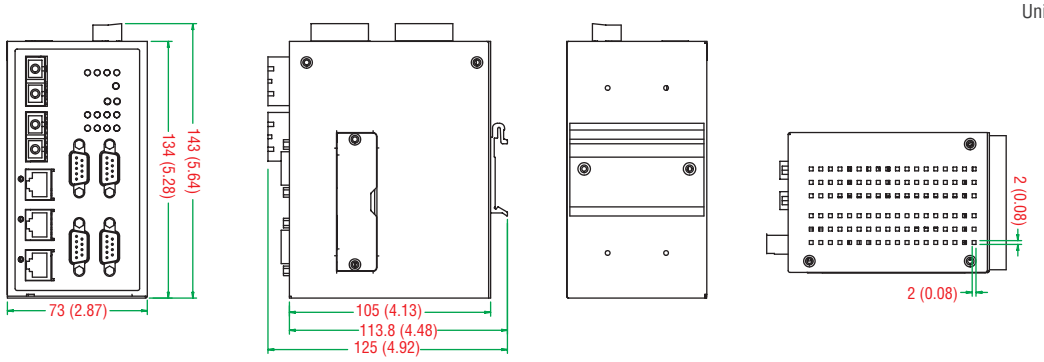
Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Switch Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 2 relay outputs with current carrying capacity of 1A @ 24 VDC

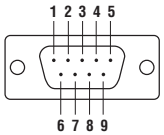
Dimensions

Unit: mm (inch)



Pin Assignment

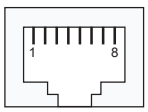
DB9 male connector



Serial Port (DB9 male connector)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

8-pin RJ45 connector



Console Port (RJ45)

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	RTS

Ethernet Port (RJ45)

PIN	Signal
1	RXD+
2	RXD-
3	TXD+
4	–
5	–
6	TXD-
7	
8	

Ordering Information

Available Models

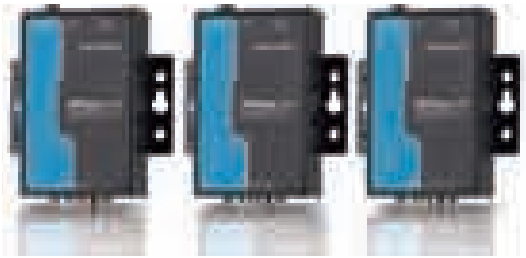
NPort S8455I-MM-SC: 4 RS-232/422/485 ports, 3 10/100M Ethernet ports, 2 100M multi-mode fiber ports with SC connector, 15 KV ESD, 12-48 VDC, 2 KV isolation protection, 0 to 60°C operating temperature
NPort S8455I-SS-SC: 4 RS-232/422/485 ports, 3 10/100M Ethernet ports, 2 100M single-mode fiber ports with SC connector, 15 KV ESD, 12-48 VDC, 2 KV isolation protection, 0 to 60°C operating temperature
NPort S8455I-MM-SC-T: 4 RS-232/422/485 ports, 3 10/100M Ethernet ports, 2 100M multi-mode fiber ports with SC connector, 15 KV ESD, 12-48 VDC, 2 KV isolation protection, -40 to 75°C operating temperature
NPort S8455I-SS-SC-T: 4 RS-232/422/485 ports, 3 10/100M Ethernet ports, 2 100M single-mode fiber ports with SC connector, 15 KV ESD, 12-48 VDC, 2 KV isolation protection, -40 to 75°C operating temperature

Package Checklist

- NPort S8455 device server
- Two power jack to TB power cables
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® 5100A Series

1-port RS-232/422/485 serial device servers



- World's lowest power consumption, only 1 W
- Speedy 3-step web-based configuration
- Surge protection for serial, Ethernet, and power lines
- COM port grouping and UDP multicast applications
- Screw connectors for secure installation
- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile TCP and UDP operation modes

Overview

The NPort® 5100A device servers are designed to make serial devices network-ready in an instant and give your PC software direct access to serial devices from anywhere on the network. The NPort® 5100A device servers are ultra lean, ruggedized, and user friendly, making simple and reliable serial to Ethernet solutions possible.

A Greener Serial-to-Ethernet Solution

The Moxa MiiNe is a small but powerful ARM-based serial-to-Ethernet SoC with RAM and Flash embedded. With the MiiNe inside, the NPort® 5100A series becomes the world's only device server with power consumption less than 1 W. The NPort® 5100A series saves at least 50% on power consumption compared to existing solutions on the market, helping engineers meet the tough environmental compliance challenges found in today's industrial environments.



Surge-protected Serial, Ethernet, and Power Lines

Surge, which is typically caused by high voltages that result from switching and lightning transients, is a common threat to all electrical devices. Moxa's leading-edge surge immunity solution, which is applied to the NPort® 5100A's serial, power, and Ethernet lines, is tested and proven compliant with IEC 61000-4-5. This state-of-the-art surge protection provides a robust serial-to-Ethernet solution that can protect electrical devices from voltage spikes and withstand electrically noisy environmental conditions.



3-step Web-based Configuration

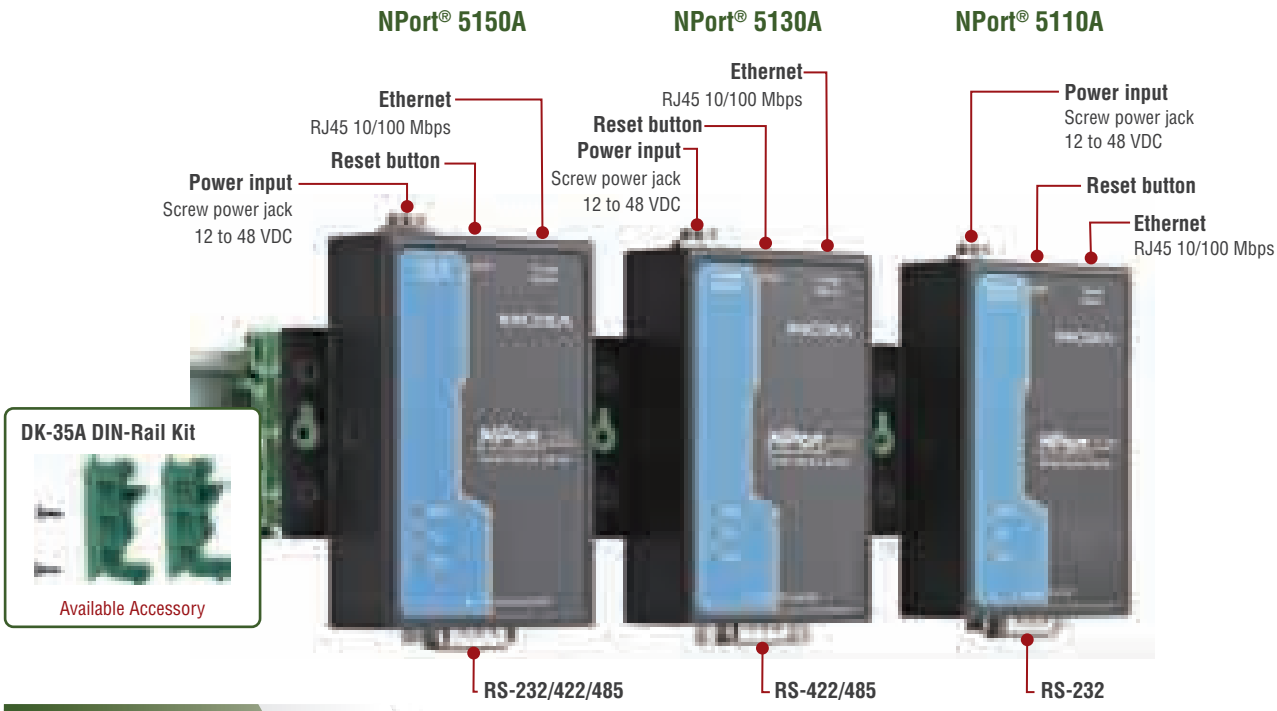
The NPort® 5100A's 3-step web-based configuration tool is straightforward and user-friendly. The NPort® 5100A's web console guides users through 3 simple configuration steps that are necessary to activate the serial-to-Ethernet application. With this speedy 3-step web-based configuration, a user only needs to spend an average of 30 seconds to complete the NPort® settings and enable the application, saving a great amount of time and effort.



Easy to Troubleshoot

NPort® 5100A device servers support SNMP, which can be used to monitor all units over Ethernet. Each unit can be configured to send trap messages automatically to the SNMP manager when user-defined errors are encountered. For users who do not use SNMP manager, an e-mail alert can be sent instead. Users can define the trigger for the alerts using Moxa's Windows utility, or the web console. For example, alerts can be triggered by a warm start, a cold start, or a password change.

Appearance



DK-35A DIN-Rail Kit

Available Accessory

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 1
Serial Standards:
NPort 5110A: RS-232
NPort 5130A: RS-422/485
NPort 5150A: RS-232/422/485
Connector: DB9 male
Serial Line Protection: 15 KV ESD protection for all signals, Level 1 Surge, EN61000-4-5
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2
Configuration Options: Web Console (with new Quick Setup), Serial Console (NPort 5110A/5150A only), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac 10.3
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal
Weight: 340 g
Dimensions:
Without ears: 52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)
With ears: 75.2 x 80 x 22 mm (2.96 x 3.15 x 0.87 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
NPort 5110A: 82.5 mA @ 12 V, 47.3 mA @ 24 V
NPort 5130A: 89.1 mA @ 12 V, 49.5 mA @ 24 V
NPort 5150A: 92.4 mA @ 12 V, 52.8 mA @ 24 V

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024
Power Line Protection: Level 2 Burst (EFT), EN 61000-4-4 (Surge) Level 3, EN 61000-4-5

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures): 2,231,530 hrs

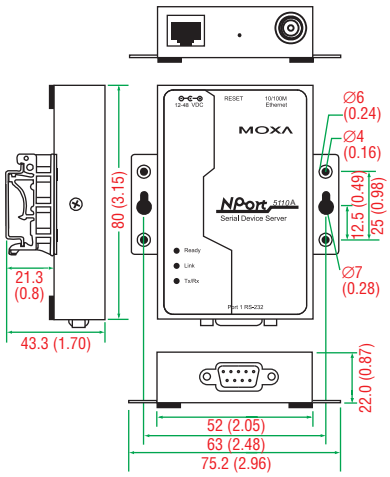
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

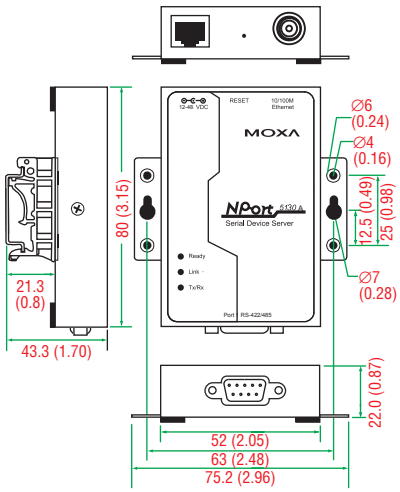
Dimensions

Unit: mm (inch)

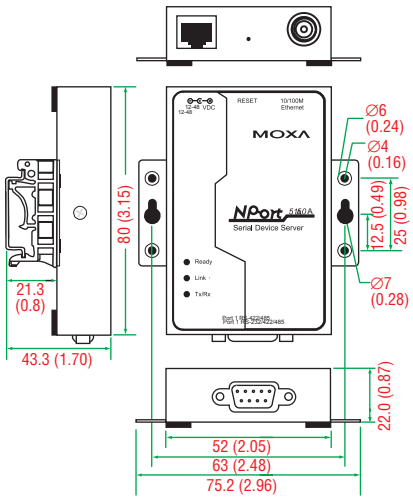
NPort® 5110A



NPort® 5130A

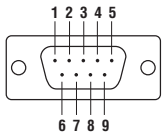


NPort® 5150A



Pin Assignment

DB9 male connector



NPort® 5110A (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5130A (RS-422/485)

PIN	RS-422/485-4w	RS-485-2w
1	TxD-(A)	–
2	TxD+(B)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND
6	–	–
7	–	–
8	–	–

NPort® 5150A (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort 5110A: 1-port RS-232 device server, 0 to 60°C operating temperature
NPort 5130A: 1-port RS-422/485 device server, 0 to 60°C operating temperature
NPort 5150A: 1-port RS-232/422/485 device server, 0 to 60°C operating temperature
NPort 5110A-T: 1-port RS-232 device server, -40 to 75°C operating temperature
NPort 5130A-T: 1-port RS-422/485 device server, -40 to 75°C operating temperature
NPort 5150A-T: 1-port RS-232/422/485 device server, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- NPort 5100A device server
- Power adaptor (only for non-T models)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® 5100 Series

1-port RS-232/422/485 serial device servers



- Small size for easy installation
- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile operation modes
- Easy-to-use Windows utility for configuring multiple device servers
- Built-in 15 KV ESD protection for all serial signals
- SNMP MIB-II for network management
- Configure by Telnet or web browser
- Adjustable termination resistor for RS-485 ports

See also NPort 5100A, p. 8-18

Overview

NPort® 5100 device servers are designed to make serial devices network-ready in an instant. The small size of the servers makes them ideal for connecting devices such as card readers and payment terminals to an IP-based Ethernet LAN. Use the NPort® 5100 device servers to give your PC software direct access to serial devices from anywhere on the network.

Most Cost-effective Serial-to-Ethernet Solution

Using serial device servers to connect legacy serial devices to Ethernet is now commonplace, and users expect device servers to be cost-effective and to provide a broad selection of useful functions. With their full support of Microsoft and Linux operating systems and solid 5-year warranty, the NPort® 5100 series device servers provide the best choice for serial-to-Ethernet converters.

Standard TCP/IP Interface and Broad Choice of Operation Modes

The NPort® 5100 device servers can be configured for TCP Server, TCP Client, UDP Server/Client, Pair Connection, or Ethernet Modem mode, ensuring compatibility with software based on a standard network API (e.g., Winsock or BSD Sockets).

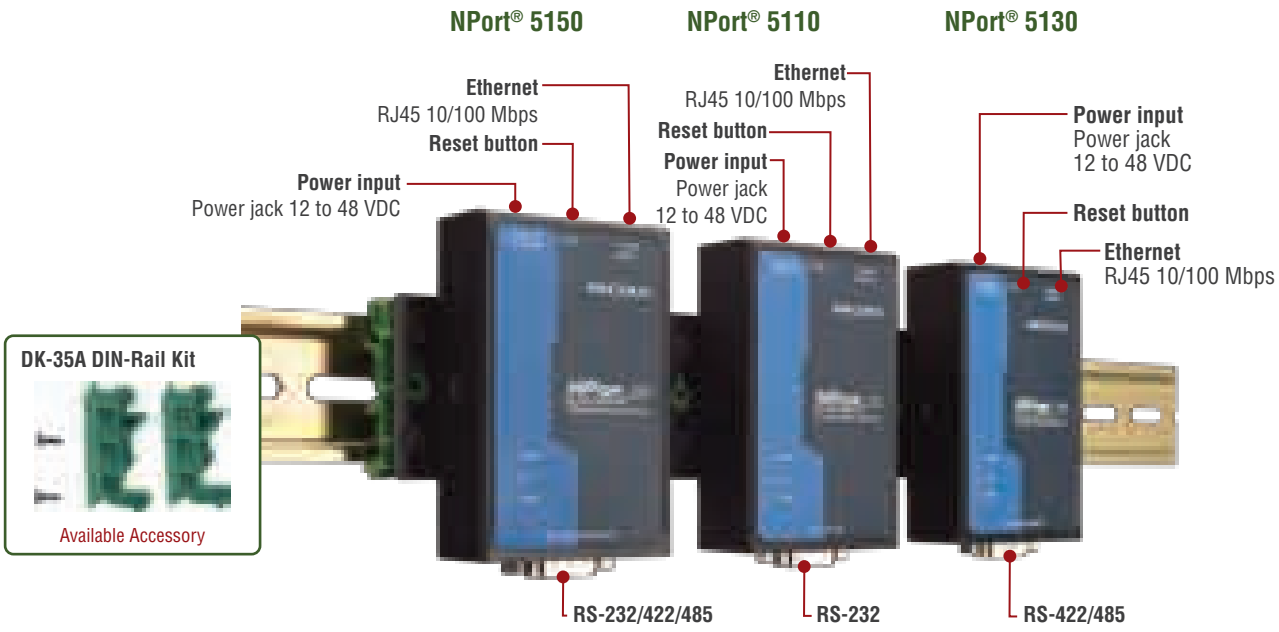
Real COM/TTY Drivers for Existing Software

The Real COM/TTY drivers provided with the NPort® 5100 device servers allow you to continue using software designed for communicating through COM/TTY ports. Installation and configuration is painless, and allows your serial devices and PC to communicate seamlessly over a TCP/IP network. Using Moxa's Real COM/TTY drivers is an excellent way to preserve your software investment, while still allowing you to enjoy the benefits of networking your serial devices.

Easy to Troubleshoot

NPort® 5100 device servers support SNMP, which can be used to monitor all units over Ethernet. Each unit can be configured to send trap messages automatically to the SNMP manager when user-defined errors are encountered. For users who do not use SNMP manager, an e-mail alert can be sent instead. Users can define the trigger for the alerts using Moxa's Windows utility, or the web console. For example, alerts can be triggered by a warm start, a cold start, or a password change.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 1
Serial Standards:
NPort 5110: RS-232
NPort 5130: RS-422/485
NPort 5150: RS-232/422/485
Connector: DB9 male
Serial Line Protection: 15 KV ESD protection for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate:
NPort 5110: 110 bps to 230.4 Kbps
NPort 5130/5150: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP
Configuration Options: Web Console, Serial Console (NPort 5110/5150 only), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal
Weight: 340 g
Dimensions:
Without ears: 52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)
With ears: 75.2 x 80 x 22 mm (2.96 x 3.15 x 0.87 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
NPort 5110: 128.7 mA @ 12 V, 72 mA @ 24 V
NPort 5130/5150: 200 mA @ 12 V, 106 mA @ 24 V

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
NPort 5110: 279,122 hrs
NPort 5130: 246,505 hrs
NPort 5150: 246,034 hrs

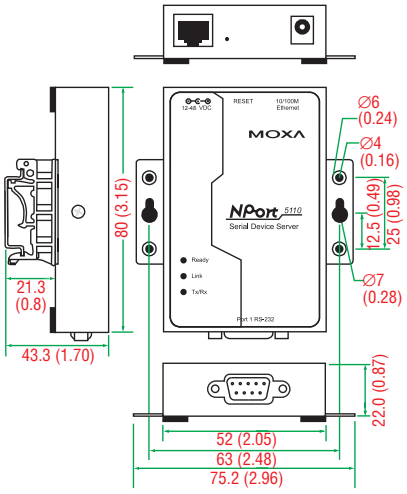
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

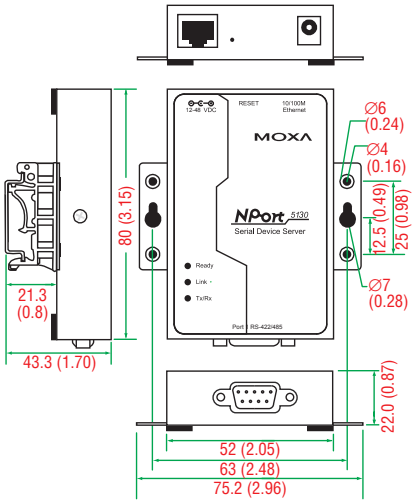
Dimensions

Unit: mm (inch)

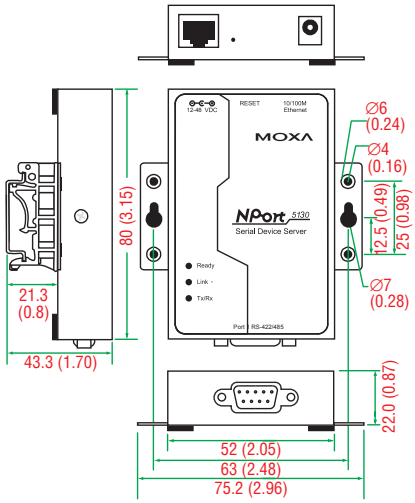
NPort® 5110



NPort® 5130

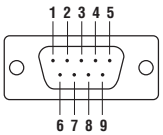


NPort® 5150



Pin Assignment

DB9 male connector



NPort® 5110 (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5130 (RS-422/485)

PIN	RS-422/485-4w	RS-485-2w
1	TxD-(A)	–
2	TxD+(B)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND
6	–	–
7	–	–
8	–	–

NPort® 5150 (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort 5110: 1-port RS-232 device server, 0 to 55°C operating temperature
NPort 5130: 1-port RS-422/485 device server, 0 to 55°C operating temperature
NPort 5150: 1-port RS-232/422/485 device server, 0 to 55°C operating temperature
NPort 5110-T: 1-port RS-232 device server, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- NPort 5100 device server
- Power adaptor (only for non-T models)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® DE-211/311

1-port RS-232/422/485 serial device servers



NPort® DE-311

NPort® DE-211

- 3-in-1 serial port: RS-232, RS-422, or RS-485
- Versatile operation modes, including TCP Server, TCP Client, UDP, Ethernet Modem, and Pair Connection
- Real COM/TTY drivers for Windows and Linux
- 10M and 100M Ethernet speeds detected automatically
- 2-wire RS-485 with patented Automatic Data Direction Control (ADDC®)
- Built-in 15 KV ESD protection for all serial signals

See also NPort 5100A, p. 8-18

Overview

The NPort® DE-211 and DE-311 are 1-port serial device servers that support RS-232, RS-422, 4-wire RS-485, and 2-wire RS-485. The DE-211 supports 10 Mbps Ethernet connections and has a DB25 female connector for the serial port. The DE-311 supports 10/100 Mbps Ethernet connections and has a DB9 female connector for the serial port.

Both device servers are ideal for applications that involve information display boards, PLCs, flow meters, gas meters, CNC machines, and biometric identification card readers.

Specifications

Ethernet Interface

Number of Ports: 1
Speed:
NPort DE-211: 10 Mbps, auto MDI/MDIX
NPort DE-311: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 1
Serial Standards: RS-232/422/485 (selectable by DIP Switch)
Connector:
NPort DE-211: DB25 female
NPort DE-311: DB9 female
Serial Line Protection: 15 KV ESD protection for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 150 bps to 230.4 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, RTS+, RTS-, CTS+, CTS-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND (DE-211 only)
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: DHCP, BOOTP, Telnet, TCP, UDP, IP, ICMP, ARP
Configuration Options: Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 480 g
Dimensions:
Without ears: 67 x 100.4 x 22 mm (2.64 x 3.95 x 0.87 in)
With ears: 90.2 x 100.4 x 22 mm (3.55 x 3.95 x 0.87 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage:
DE-211: 12 to 30 VDC
DE-311: 9 to 30 VDC
Power Consumption:
NPort DE-211: 180 mA @ 12 V, 100 mA @ 24 V
NPort DE-311: 300 mA @ 9 V, 150 mA @ 24 V

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024
Medical: EN 60601-1-2 Class B, EN 55011 (DE-311 only)

Reliability

MTBF (mean time between failures):
NPort DE-211: 347,822 hrs
NPort DE-311: 225,529 hrs

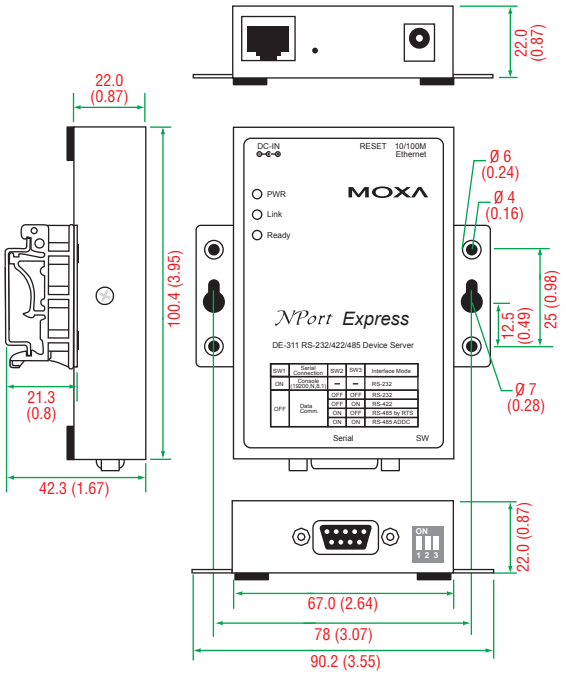
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

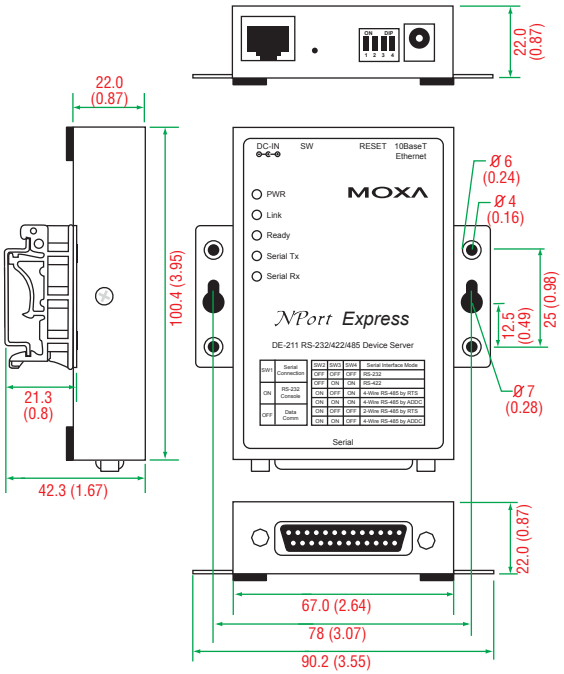
Dimensions

Unit: mm (inch)

NPort® DE-311

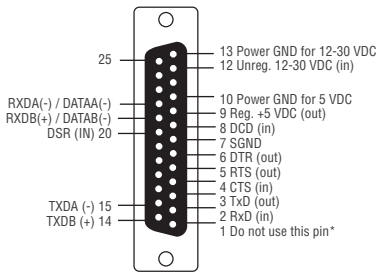


NPort® DE-211

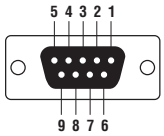


Pin Assignment

NPort® DE-211
(RS-232/422/485, DB25 female connector)



NPort® DE-311
(RS-232/422/485, DB9 female connector)



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	RxD-(A)	---
2	TxD	RxD+(B)	---
3	RxD	TxD+(B)	Data+(B)
4	DSR	TxD-(A)	Data-(A)
5	GND	GND	GND
6	DTR	CTS-(A)	---
7	CTS	CTS+(B)	---
8	RTS	RTS+(B)	---
9	---	RTS-(A)	---

Ordering Information

Available Models

NPort DE-211: 1-port RS-232/422/485 device server with 10 Mbps Ethernet connection
NPort DE-311: 1-port RS-232/422/485 device server with 10/100 Mbps Ethernet connection

Optional Accessories (can be purchased separately)

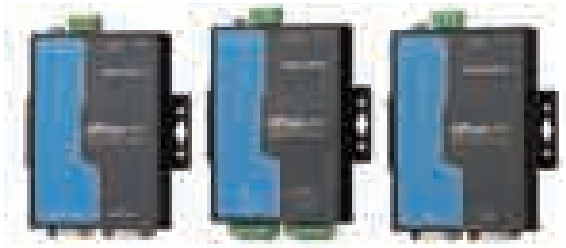
NP21101: DB25 male to DB9 female cable for RS-232 transmission, 30 cm (for DE-211)
NP21102: DB25 male to DB9 male cable for RS-232 transmission, 30 cm (for DE-211)
NP21103: DB25 male terminal block kit for RS-422/485 transmission (for DE-211)
TB-M25: DB25 male DIN-Rail wiring terminal (for DE-211)
TB-M9 (for DE-311): DB9 male DIN-Rail wiring terminal (for DE-311)
DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- NPort DE-211 or DE-311 device server
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® 5200A Series

2-port RS-232/422/485 serial device servers



- World's lowest power consumption
- Speedy 3-step web-based configuration
- Surge protection for serial, Ethernet, and power lines
- COM port grouping and UDP multicast applications
- Screw connectors for secure installation
- Dual DC power inputs with power jack and terminal block
- Versatile TCP and UDP operation modes

Overview

The NPort® 5200A device servers are designed to make serial devices network-ready in an instant and give your PC software direct access to serial devices from anywhere on the network. The NPort® 5200A device servers are ultra lean, ruggedized, and user friendly, making simple and reliable serial to Ethernet solutions possible.

A Greener Serial-to-Ethernet Solution

The Moxa MiiNe is a small but powerful ARM-based serial-to-Ethernet SoC with RAM and Flash embedded. With the MiiNe inside, the NPort® 5200A series becomes the lowest power consumption device server in the world. The NPort® 5200A series saves at least 50% on power consumption compared to existing solutions on the market, helping engineers meet the tough environmental compliance challenges found in today's industrial environments.



Surge-protected Serial, Ethernet, and Power Lines

Surge, which is typically caused by high voltages that result from switching and lightning transients, is a common threat to all electrical devices. Moxa's leading-edge surge immunity solution, which is applied to the NPort® 5200A's serial, power, and Ethernet lines, is tested and proven compliant with IEC 61000-4-5. This state-of-the-art surge protection provides a robust serial-to-Ethernet solution that can protect electrical devices from voltage spikes and withstand electrically noisy environmental conditions.



3-step Web-based Configuration

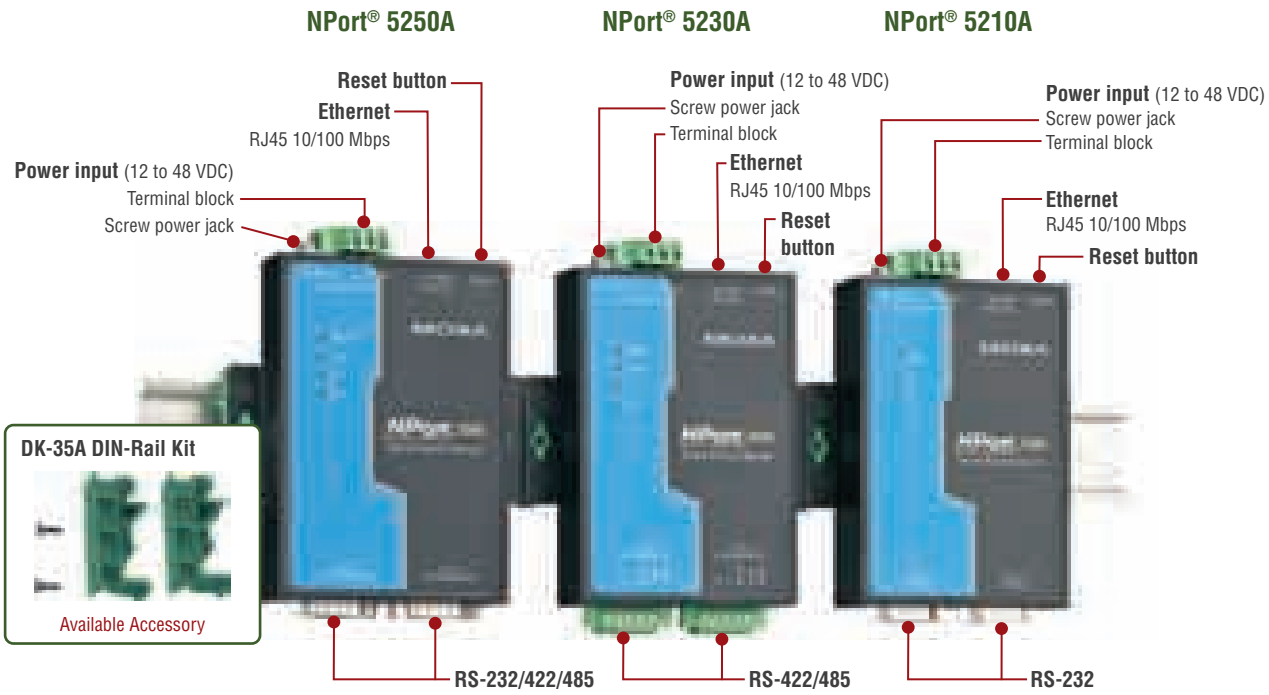
The NPort® 5200A's 3-step web-based configuration tool is straightforward and user-friendly. The NPort® 5200A's web console guides users through 3 simple configuration steps that are necessary to activate the serial-to-Ethernet application. With this speedy 3-step web-based configuration, a user only needs to spend an average of 30 seconds to complete the NPort® settings and enable the application, saving a great amount of time and effort.



COM Port Grouping

The NPort® 5200A's COM Grouping function allows you to create a COM Group and redirect data from it to several physical COM ports on NPort device servers. With COM Grouping, you will be able to control multiple physical serial ports simultaneously by operating only one COM port.

Appearance



Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in
Ethernet Line Protection: Level 2 Surge, EN61000-4-5

Serial Interface

Number of Ports: 2
Serial Standards:
NPort 5210A: RS-232
NPort 5230A: RS-422/485
NPort 5250A: RS-232/422/485
Connector:
NPort 5210A/5250A: DB9 male
NPort 5230A: Terminal Block (5 pins per port)
Serial Line Protection: 15 KV ESD protection for all signals, Level 1 Surge, EN61000-4-5
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, IGMP V1/2
Configuration Options: Web Console (with new Quick Setup), Serial Console (NPort 5210A/5250A only), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i, Mac 10.3
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal
Weight: 340 g
Dimensions:
Without ears: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
With ears: 100 x 111 x 26 mm (3.94 x 4.37 x 1.02 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption: 119 mA @ 12V, 65 mA @ 24V

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024
Power Line Protection: Level 2 Burst (EFT), EN 61000-4-4 (Surge) Level 3, EN 61000-4-5

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures): 847,750 hrs

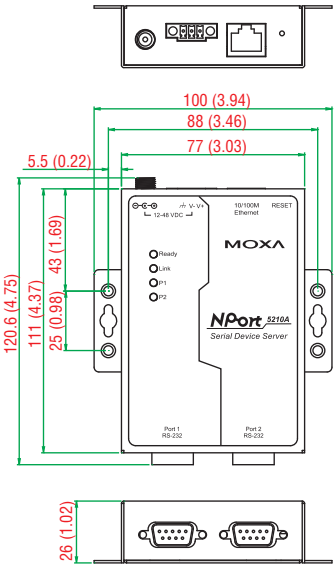
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

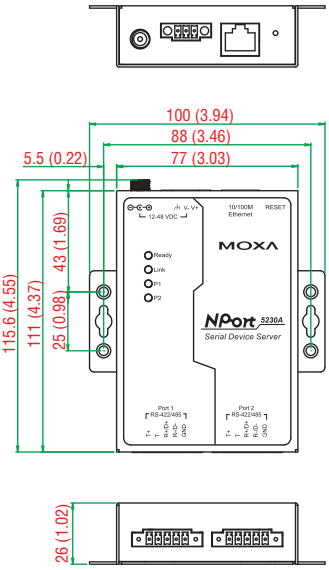
Dimensions

Unit: mm (inch)

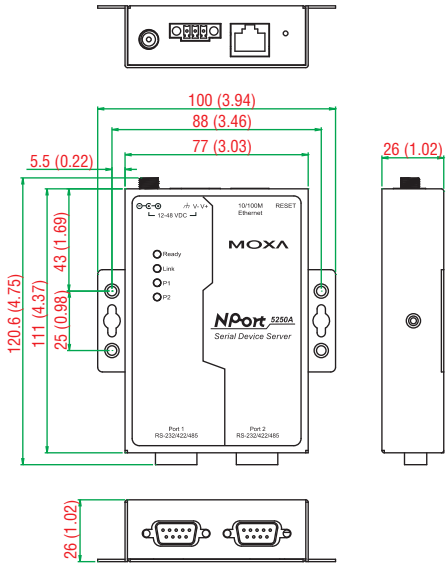
NPort® 5250A



NPort® 5230A



NPort® 5210A

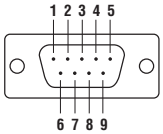


Pin Assignment

NPort® 5250A (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

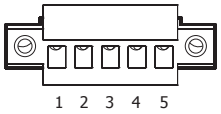
DB9 male connector



NPort® 5230A (RS-422/485)

PIN	RS-422/485-4w	RS-485-2w
1	TxD+(B)	–
2	TxD-(A)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND

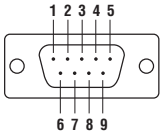
5-contact terminal block



NPort® 5210A (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

DB9 male connector



Ordering Information

Available Models

NPort 5210A: 2-port RS-232 device server, 0 to 60°C operating temperature
NPort 5230A: 2-port RS-422/485 device server, 0 to 60°C operating temperature
NPort 5250A: 2-port RS-232/422/485 device server, 0 to 60°C operating temperature
NPort 5210A-T: 2-port RS-232 device server, -40 to 75°C operating temperature
NPort 5230A-T: 2-port RS-422/485 device server, -40 to 75°C operating temperature
NPort 5250A-T: 2-port RS-232/422/485 device server, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

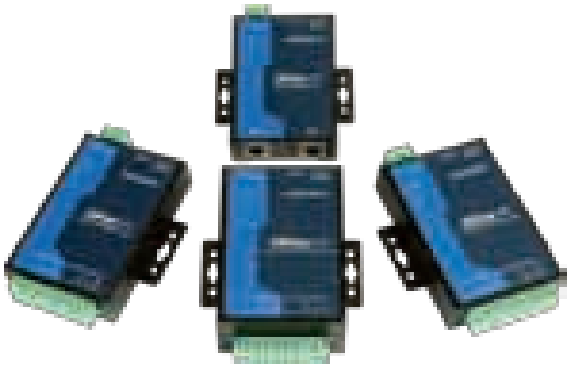
DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- NPort 5200A Series device server
- Power adaptor (only for non-T models)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® 5200 Series

2-port RS-232/422/485 serial device servers



- Small size for easy installation
- Versatile socket operation modes, including TCP Server, TCP Client, and UDP
- Easy-to-use Windows utility for configuring multiple device servers
- Supports 10/100M Ethernet
- Patented ADDC® (Automatic Data Direction Control) for 2-wire and 4-wire RS-485
- Built-in 15 KV ESD protection for all serial signals
- SNMP MIB-II for network management

See also NPort 5200A, p.8-26

Standard TCP/IP Protocols and Choice of Operation Modes

NPort® 5200 device servers can operate in TCP Server, TCP Client, or UDP operation mode, ensuring compatibility with software based on a standard network API (Winsock, BSD Sockets).

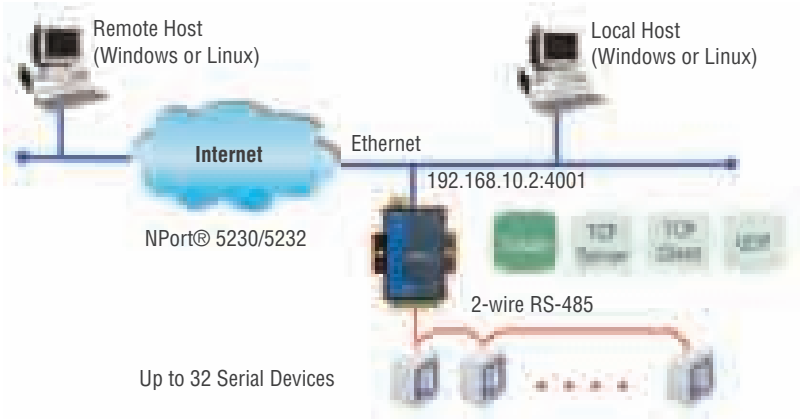
Real COM/TTY Drivers for Existing Software

With the Real COM/TTY drivers that are provided with each NPort®, software designed for communication with COM/TTY ports can be instantly and seamlessly integrated into a TCP/IP network. This is an excellent "no fuss" way to preserve your software investment and enjoy the benefits of networking your serial devices.

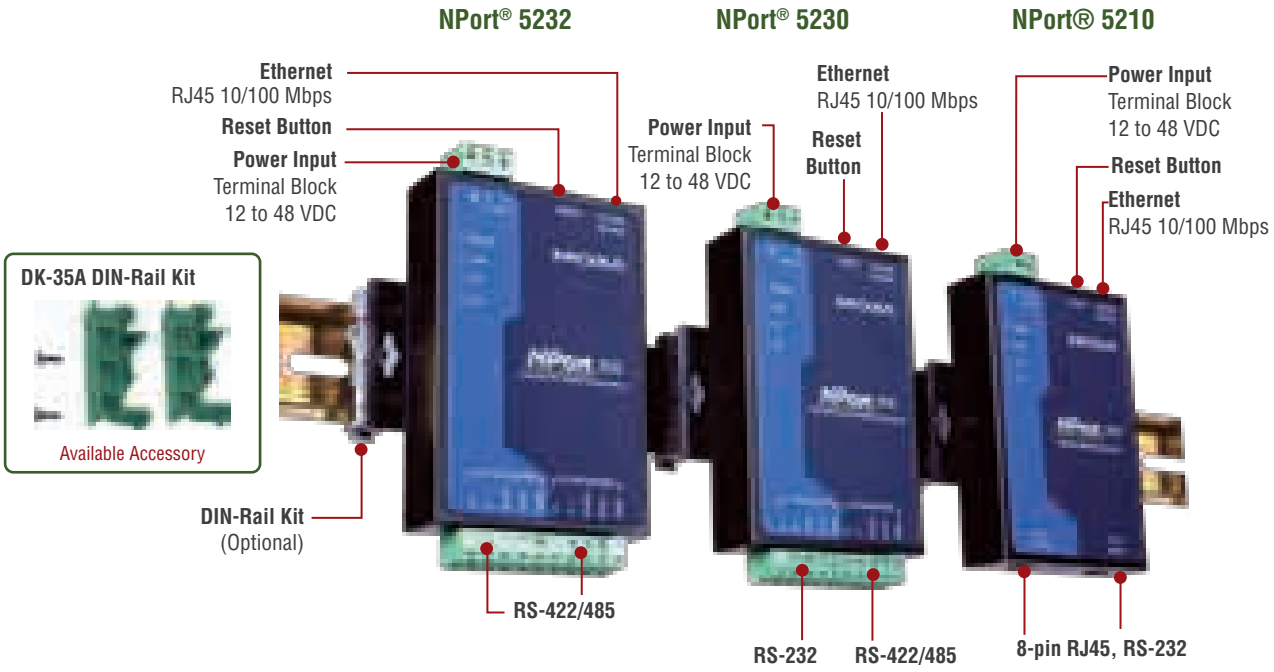
Control Remote Serial Devices with TCP/IP or Traditional COM/TTY Port

By specifying the NPort® 5200's IP address and port number, a network sockets API can obtain access to the attached serial device over the network, from any host computer that supports TCP/IP. For legacy Windows or Linux software that is COM or TTY-based, Moxa's COM/TTY drivers provide a seamless way of operating over the network.

COM Driver or Network Socket Operation



Appearance



Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 2
Serial Standards:
NPort 5210: RS-232
NPort 5230: 1 RS-232 port, 1 RS-422/485 port
NPort 5232/5232I: RS-422/485
Connector:
NPort 5210: RJ45 (8 pins)
NPort 5230/5232/5232I: Terminal Block (5 contacts per port)
Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort 5232I/5232I-T)
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS (RS-232 only), DTR/DSR (NPort 5210 only), XON/XOFF
Baudrate: 110 bps to 230.4 Kbps

Serial Signals

RS-232:
NPort 5210: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
NPort 5230: TxD, RxD, RTS, CTS, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP
Configuration Options: Web Console, Serial Console (NPort 5210/5230 only), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal, IP30 protection
Weight:
NPort 5210: 340 g
NPort 5230/5232: 360 g
NPort 5232I: 380 g
Dimensions:
NPort 5210/5230/5232:
Without ears: 67 x 100.4 x 22 mm (2.64 x 3.95 x 0.87 in)
With ears: 90 x 100.4 x 22 mm (3.54 x 3.95 x 0.87 in)
NPort 5232I:
Without ears: 67 x 100.4 x 35 mm (2.64 x 3.95 x 1.37 in)
With ears: 90 x 100.4 x 35 mm (3.54 x 3.95 x 1.37 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
NPort 5210: 325 mA @ 12 V, 190 mA @ 24 V
NPort 5230: 325 mA @ 12 V, 190 mA @ 24 V
NPort 5232: 280 mA @ 12 V, 150 mA @ 24 V
NPort 5232I: 509.4 mA @ 12 V, 200 mA @ 24 V

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024
Marine: DNV
Medical:
EN 60601-1-2 Class B, EN 55011 (NPort 5210/5210-T only)

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (meantime between failures):
NPort 5210: 134,850 hrs
NPort 5230: 106,955 hrs
NPort 5232: 102,344 hrs
NPort 5232I: 87,083 hrs

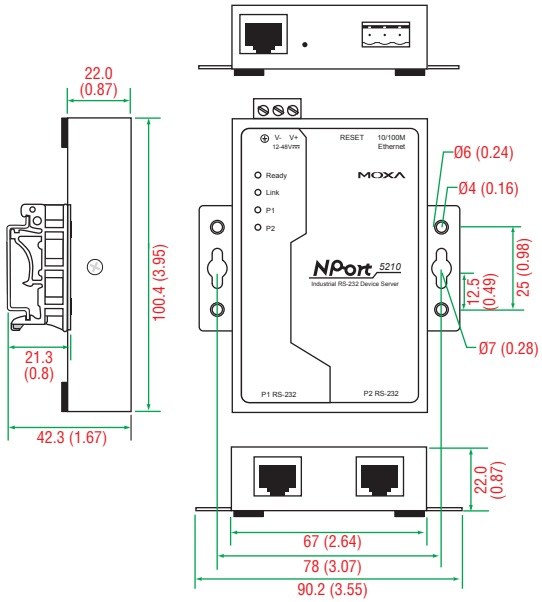
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

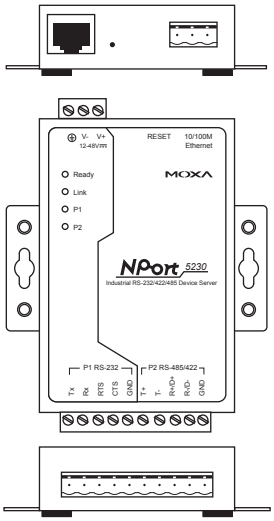
Dimensions

Unit: mm (inch)

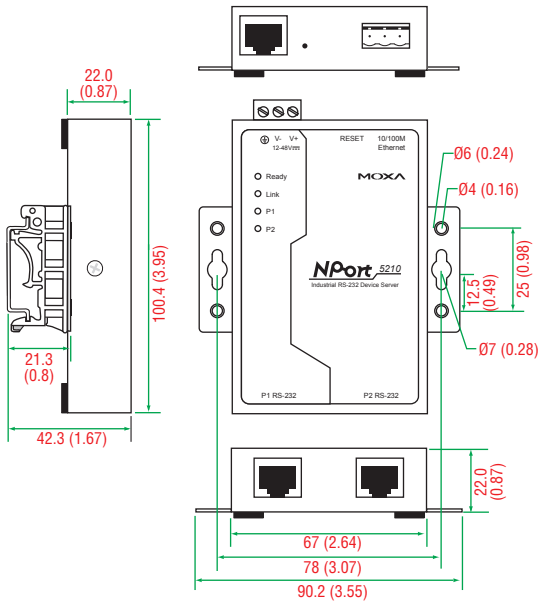
NPort® 5210



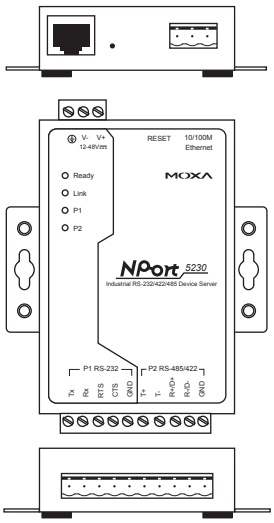
NPort® 5230



NPort® 5232

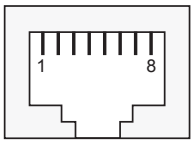


NPort® 5232I



Pin Assignment

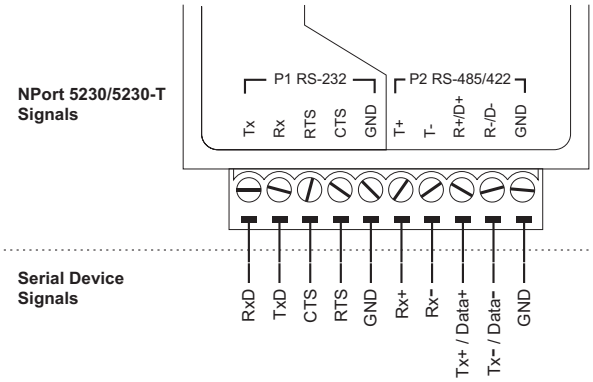
8-pin RJ45 connector



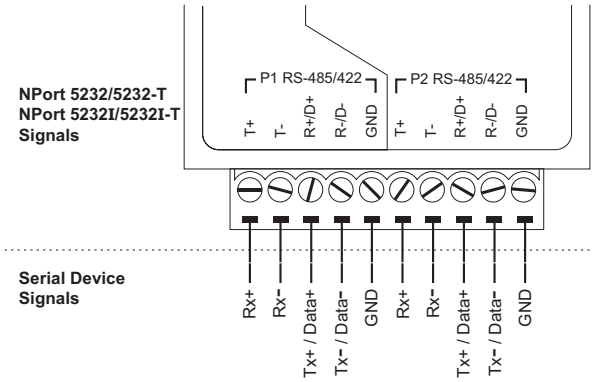
NPort® 5210/5210-T (RS-232)

PIN	RS-232
1	DSR (in)
2	RTS (out)
3	GND
4	TxD (out)
5	RxD (in)
6	DCD (in)
7	CTS (in)
8	DTR (out)

NPort® 5230/5230-T
(RS-232/422/485, terminal block connector)



NPort® 5232/5232I/5232-T/5232I-T
(RS-422/485, terminal block connector)



Ordering Information

Available Models

NPort 5210: 2-port RS-232 device server, 0 to 55°C operating temperature
NPort 5230: 2-port device server with 1 RS-232 port and 1 RS-422/485 port, 0 to 55°C operating temperature
NPort 5232: 2-port RS-422/485 device server, 0 to 55°C operating temperature
NPort 5232I: 2-port RS-422/485 device server with 2 KV optical isolation, 0 to 55°C operating temperature
NPort 5210-T: 2-port RS-232 device server, -40 to 75°C operating temperature
NPort 5230-T: 2-port device server with 1 RS-232 port and 1 RS-422/485 port, -40 to 75°C operating temperature
NPort 5232-T: 2-port RS-422/485 device server, -40 to 75°C operating temperature
NPort 5232I-T: 2-port RS-422/485 device server with 2 KV optical isolation, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail
DIN-Rail Power Supply: See page A-8 for details
Terminal Block: See page A-7 for details

Package Checklist

- NPort 5200 device server
- Power jack to a 3-pin terminal block adaptor
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® 5400 Series

4-port RS-232/422/485 serial device servers



- 10/100M auto-sensing Ethernet
- 4 serial ports, with support for RS-232, RS-422, and RS-485
- Built-in 15 KV ESD surge protection for all serial signals
- Versatile socket operation modes, including TCP Server, TCP Client, and UDP
- Choice of configuration methods: Web console, Telnet console, and Windows utility
- SNMP MIB-II for network management
- 2 KV isolation protection for NPort 5430I/5450I/5450I-T
- -40 to 75°C operating temperature range (T model)

Network Readiness for up to Four Serial Devices

NPort® 5400 device servers can conveniently and transparently connect up to four serial devices to an Ethernet network, allowing you to network your existing serial devices with only basic configuration. Data transmission between the serial and Ethernet interfaces is bi-directional. By using NPort® device servers, you not only protect your current hardware investment, but also allow for future network expansion. You can both centralize the management of your serial devices, and distribute management hosts over the network.

Independent Operation Mode for Each Serial Port

NPort® 5400 device servers can be used to connect different devices for remote data polling or event handling over a TCP/IP network. Each serial port on the NPort® 5400 operates independently to provide maximum versatility. For example, port 1 can operate in Driver mode, port 2 in TCP Server mode, and ports 3 and 4 in TCP Client mode.

User-friendly LCD Panel for Easy Installation

An LCD panel is built into the NPort® 5400's top panel, with four buttons for inputting data, configuration, and selecting the operation mode. The LCD panel displays the server name, serial number, and IP address, and can be used to enter or modify parameters such as IP address, netmask, and gateway. (The LCD panel is not available on wide temperature models.)



Dual DC Power Inputs

NPort® 5400 device servers support dual power sources by providing both a DC terminal block input and a DC power jack input. Providing two types of power input gives users greater flexibility for use with different applications.

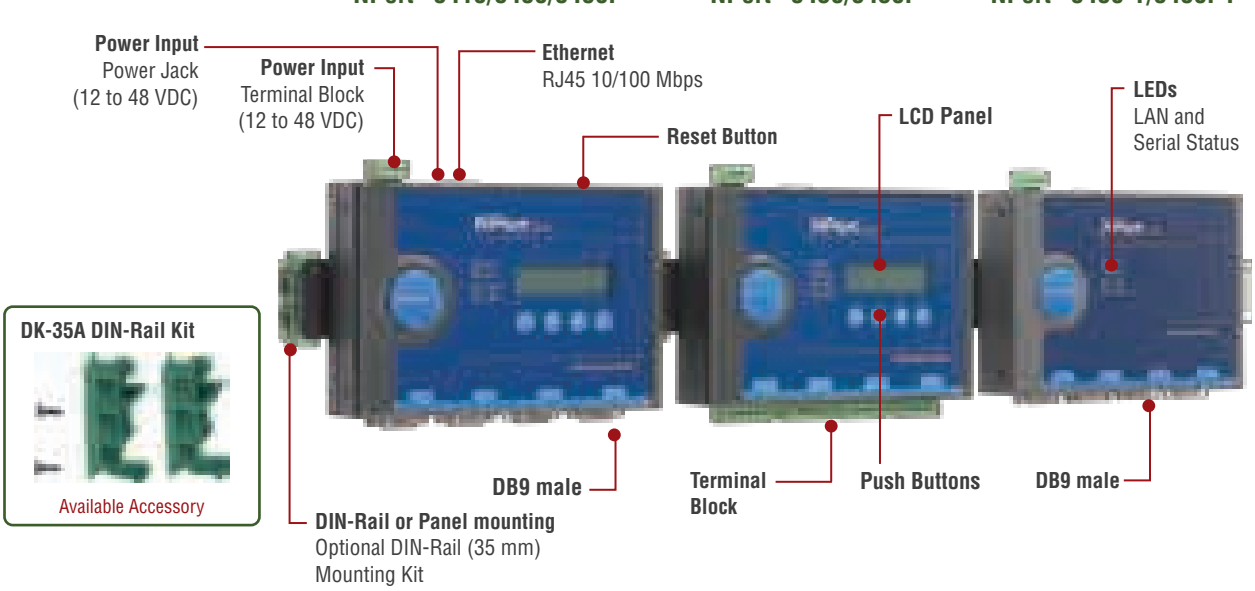


Adjustable Termination and Pull High/Low Resistors

The NPort 5400 series provides adjustable termination and pull high/low resistors for RS-485 applications. In some critical environments, termination resistors may be needed to prevent the reflection of serial signals, and the pull high/low resistors may need adjusting to maintain the integrity of the electrical signal. Since no set of resistor values is universally compatible with all environments, the NPort® 5400 has four sets of DIP switches on the bottom panel to set the termination and pull high/low resistor values.



Appearance



Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Number of Ports: 4
Serial Standards:
NPort 5410: RS-232
NPort 5430/5430I: RS-422/485 (software selectable)
NPort 5450/5450I/5450-T/5450I-T: RS-232/422/485 (software selectable)
Connector:
NPort 5410/5450/5450I/5450-T/5450I-T: DB9 male
NPort 5430/5430I: Terminal block
Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort 5430I/5450I/5450I-T)
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ
Terminator for RS-485: 120 Ω

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, Rtelnet, ARP
Configuration Options: Web Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Mini Screen with Push Buttons (standard temp. models only)

LCD Panel: Liquid Crystal Display on the case
Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics

Housing: Metal, IP30 protection
Weight: 740 g
Dimensions:
Without mounting kit: 158 x 103 x 33 mm (6.22 x 4.06 x 1.30 in)
With mounting kit: 176 x 103 x 33 mm (6.93 x 4.06 x 1.30 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
NPort 5410: 350 mA @ 12 V, 190 mA @ 24 V
NPort 5430: 320 mA @ 12 V, 175 mA @ 24 V
NPort 5430I: 530 mA @ 12 V, 280 mA @ 24 V
NPort 5450/5450-T: 350 mA @ 12 V, 190 mA @ 24 V
NPort 5450I/5450I-T: 554 mA @ 12 V, 294 mA @ 24 V

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024
Marine: DNV (standard temp. models only)
Medical: EN 60601-1-2 Class B, EN 55011

Reliability

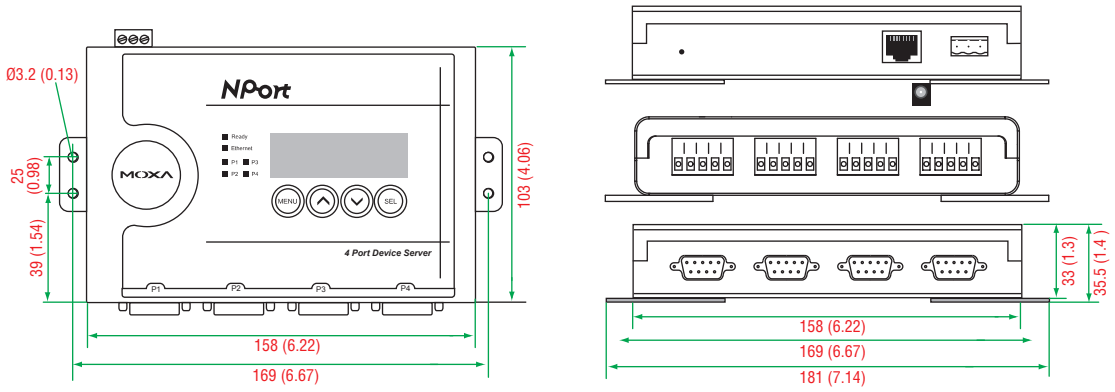
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
NPort 5410: 205,153 hrs
NPort 5430: 201,699 hrs
NPort 5430I: 114,540 hrs
NPort 5450/5450I: 206,903 hrs
NPort 5450-T/5450I-T: 206,903 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

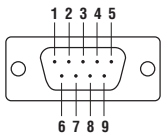
Dimensions

Unit: mm (inch)



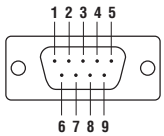
Pin Assignment

NPort® 5410
(RS-232, DB9 male connector)



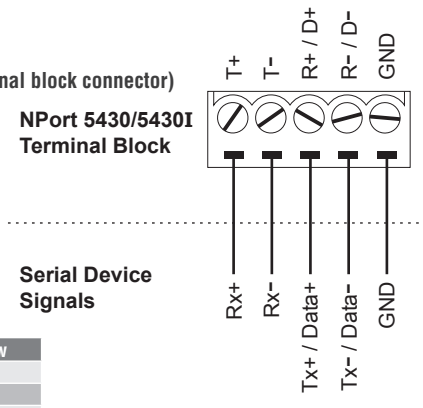
PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	–

NPort® 5450/5450I/5450-T/5450I-T
(RS-232/422/485, DB9 male connector)



PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

NPort® 5430/5430I
(RS-422/485, terminal block connector)



Ordering Information

Available Models

NPort 5410: 4-port RS-232 device server
NPort 5430: 4-port RS-422/485 device server
NPort 5430I: 4-port RS-422/485 device server with 2 KV isolation protection
NPort 5450: 4-port RS-232/422/485 device server
NPort 5450I: 4-port RS-232/422/485 device server with 2 KV isolation protection
NPort 5450-T: 4-port RS-232/422/485 device server, -40 to 75°C operating temperature (without LCM)
NPort 5450I-T: 4-port RS-232/422/485 device server with 2KV isolation protection, -40 to 75°C operating temperature (without LCM)

Package Checklist

- NPort 5400 device server
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail
DIN-Rail Power Supply: See page A-8 for details
Terminal Block: See page A-7 for details
Power Adaptor: See page A-9 for details

NPort® 5600 Rackmount Series

8 and 16-port RS-232/422/485 serial device servers



- 8 or 16 serial ports supporting RS-232/422/485
- Standard 19-inch rackmount size
- 10/100M auto-sensing Ethernet
- Built-in 15 KV ESD protection for all serial signals
- Easy IP address configuration with LCD panel
- Choice of configuration methods: Web console, Telnet console, and Windows utility
- Versatile socket operation modes, including TCP Server, TCP Client, UDP, and Real COM
- SNMP MIB-II for network management

Overview

With the NPort® 5600 rackmount series, you not only protect your current hardware investment, but also allow for future network expansion by centralizing the management of your serial devices and distributing management hosts over the network.

Network Readiness for up to 16 Serial Devices

Only basic configuration is needed with the NPort® 5600 to connect up to 16 serial devices to an Ethernet network.

19-inch Rackmount Device Server

NPort® 5600 device servers come with Tx/Rx LEDs for the serial ports on the front panel, and 8 or 16 RJ45 serial port connectors on the rear panel. This makes the NPort® 5600 device servers suitable for standard 19-inch rack mounting, allowing you to simplify operational, maintenance, and administrative tasks.

Real COM/TTY Ports

Real COM/TTY drivers are provided to make the serial ports on the NPort® 5600 recognizable as Real COM ports by Windows, or Real TTY ports by Linux. In addition to supporting basic data transmission and reception, the NPort® drivers also support the RTS, CTS, DTR, DSR, and DCD control signals.

LED Indicators to Ease Your Maintenance Tasks

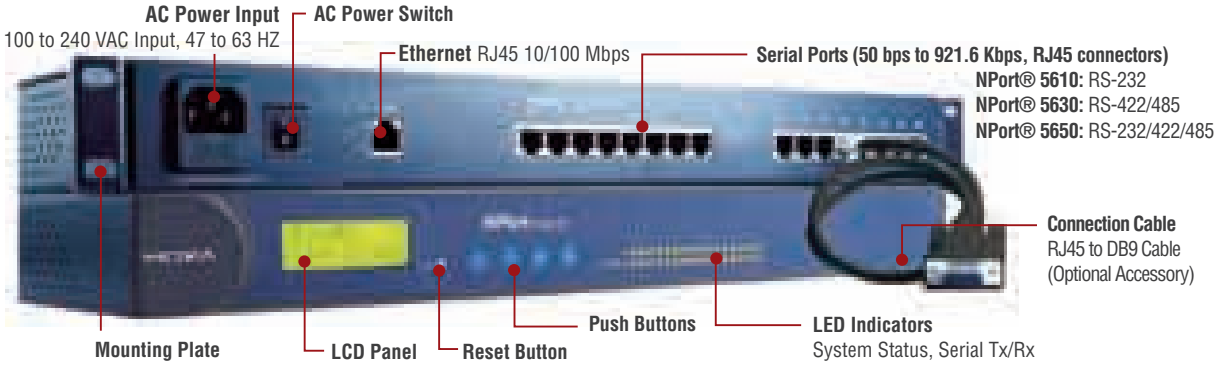
The System LED, serial Tx/Rx LEDs, and Ethernet LEDs (located on the RJ45 connector) provide a great tool for basic maintenance tasks, and help engineers analyze problems in the field. The LEDs not only indicate current system and network status, but also help field engineers monitor the status of attached serial devices.

Adjustable Termination and Pull High/Low Resistors

When using termination resistors to prevent serial signal reflection, it is important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible for all environments, the NPort® 5600 has DIP switches on the bottom panel for setting the termination and pull high/low resistor values.



Appearance



Specifications

Ethernet Interface
Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Optical Fiber Interface
Distance:
Multi mode: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))
Min. TX Output: -20 dBm (Multi mode), -5 dBm (Single mode)
Max. TX Output: -14 dBm (Multi mode), 0 dBm (Single mode)
Sensitivity: -34 to -30 dBm (Multi mode), -36 to -32 dBm (Single mode)

Serial Interface
Number of Ports: 8 or 16
Serial Standards:
NPort 5610: RS-232
NPort 5630: RS-422/485
NPort 5650: RS-232/422/485
Connector: RJ45 (8 pins)
Serial Line Protection:
15 KV ESD protection for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software
Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, ARP, PPP, SLIP, RTelnet, RFC2217
Configuration Options: Web Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Mini Screen with Push Buttons
LCD Panel: Liquid Crystal Display on the case
Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics
Housing: Metal, IP30 protection
Weight:
NPort 5610-8: 3340 g
NPort 5610-8-48V: 3160 g
NPort 5630-8, 5650-8-S-SC, 5650-8-M-SC: 3380 g
NPort 5650-8: 3360 g
NPort 5610-16: 3420 g
NPort 5610-16-48V: 3260 g
NPort 5630-16: 3400 g
NPort 5650-16: 3460 g
NPort 5650-16-S-SC, 5650-16-M-SC: 3440 g
Dimensions:
Without ears: 440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
With ears: 480 x 45 x 198 mm (18.90 x 1.77 x 7.80 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage:
NPort 5610/5630/5650: 100 to 240 VAC, 47 to 63 hz
NPort 5610-48V: ±48 VDC (20 to 72 VDC, -20 to -72 VDC)
Power Consumption:
NPort 5610-8/16: 141 mA @ 100 VAC, 93 mA @ 240 VAC
NPort 5630-8/16: 152 mA @ 100 VAC, 98 mA @ 240 VAC
NPort 5610-8/16-48V: 135 mA @ 48 VDC
NPort 5650-8/16: 158 mA @ 100 VAC, 102 mA @ 240 VAC
NPort 5650-8/16-S-SC: 164 mA @ 100 VAC, 110 mA @ 240 VAC
NPort 5650-8/16-M-SC: 174 mA @ 100 VAC, 113 mA @ 240 VAC

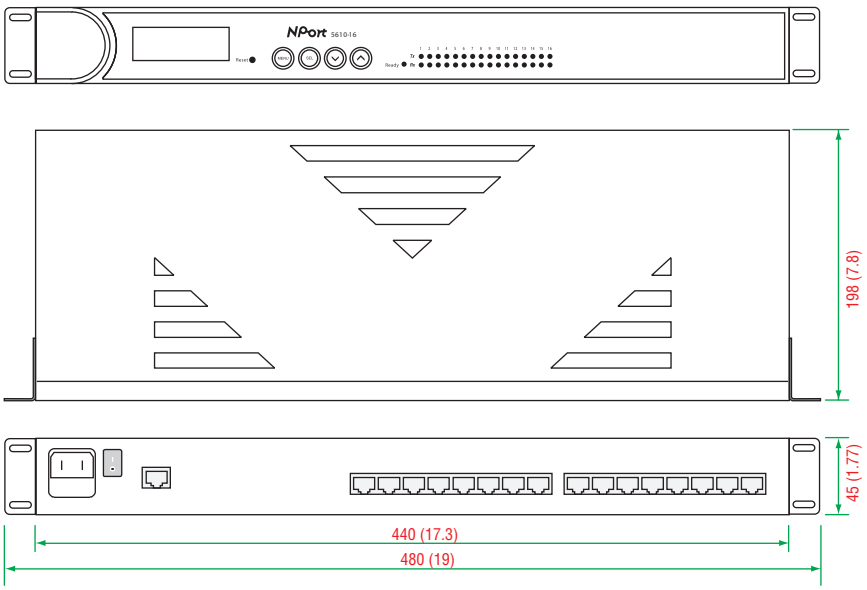
Standards and Certifications
Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024 (NPort 5610 only: IEC 61000-4-12)
Medical: EN 60601-1-2 Class B, EN 55011

Reliability
Alert Tools: RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
NPort 5610-8: 97,294 hrs
NPort 5610-16: 94,928 hrs
NPort 5610-8-48V: 96,758
NPort 5610-16-48V: 94,417 hrs
NPort 5630-8: 118,405 hrs
NPort 5630-16: 91,483 hrs
NPort 5650-8: 117,584 hrs
NPort 5650-16: 104,767 hrs
NPort 5650-S-SC-8: 116,914 hrs
NPort 5650-S-SC-16: 87,528 hrs
NPort 5650-M-SC-8: 116,914 hrs
NPort 5650-M-SC-16: 87,528 hrs

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

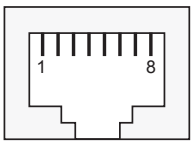
Dimensions

Unit: mm (inch)



Pin Assignment

(8-pin RJ45 connector)



NPort® 5610: RS-232

PIN	RS-232
1	DSR
2	RTS
3	GND
4	TXD
5	RxD
6	DCD
7	CTS
8	DTR

NPort® 5630: RS-422/485

PIN	RS-422/485-4w	RS-485-2w
1	–	–
2	–	–
3	TxD+	–
4	TxD-	–
5	RxD-	Data-
6	RxD+	Data+
7	GND	GND
8	–	–

NPort® 5650: RS-232/422/485

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	–	–
2	RTS	TxD+	–
3	GND	GND	GND
4	TXD	TxD-	–
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	–	–
8	DTR	–	–

Ordering Information

Available Models

NPort 5610-8: 8-port RS-232 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5610-8-48V: 8-port RS-232 rackmount device server with RJ45 connectors and 48 VDC power input
NPort 5630-8: 8-port RS-422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5650-8: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5650-8-M-SC: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) multi-mode fiber (SC connector)
NPort 5650-8-S-SC: 8-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) single-mode fiber (SC connector)
NPort 5610-16: 16-port RS-232 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5610-16-48V: 16-port RS-232 rackmount device server with RJ45 connectors and 48 VDC power input
NPort 5630-16: 16-port RS-422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5650-16: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100-240 VAC power input
NPort 5650-16-M-SC: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) multi-mode fiber (SC connector)
NPort 5650-16-S-SC: 16-port RS-232/422/485 rackmount device server with RJ45 connectors and 100BaseF(X) single-mode fiber (SC connector)

Optional Accessories (can be purchased separately)

CBL-RJ45F25-150: 8-pin RJ45 to DB25 female cable, 150 cm
CBL-RJ45M25-150: 8-pin RJ45 to DB25 male cable, 150 cm
CBL-RJ45F9-150: 8- pin RJ45 to DB9 female cable, 150 cm
CBL-RJ45M9-150: 8-pin RJ45 to DB9 male cable, 150 cm

Package Checklist

- NPort 5600 series device server
- Power cord
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® 5600 Desktop Series

8-port RS-232/422/485 serial device servers



- 8 serial ports supporting RS-232/422/485
- Compact desktop design
- 10/100M auto-sensing Ethernet
- Built-in 15 KV ESD protection for all serial signals
- Easy IP address configuration with LCD panel
- Choice of configuration methods: Web console, Telnet console, and Windows utility
- Versatile socket operation modes, including TCP Server, TCP Client, UDP, and Real COM
- SNMP MIB-II for network management

Overview

NPort® 5600-8-DT device servers can conveniently and transparently connect 8 serial devices to an Ethernet network, allowing you to network your existing serial devices with only basic configuration. You can both centralize management of your serial devices and distribute management hosts over the network. Since the NPort® 5600-8-DT device servers have a smaller form factor compared to our 19-inch models, they are a great choice for applications that need additional serial ports, but for which mounting rails are not available.

Convenient Design for RS-485 Applications

The NPort® 5650-8-DT device servers support selectable 1 KΩ and 150 KΩ pull high/low resistors and a 120 Ω terminator. In some critical environments, termination resistors may be needed to prevent the reflection of serial signals. When using termination resistors, it is also important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible with all environments, NPort® 5600-8-DT device servers use DIP switches to allow users to adjust termination and pull high/low resistor values manually for each serial port.

Convenient Power Inputs

The NPort® 5650-8-DT device servers support both power terminal blocks and power jacks for ease of use and greater flexibility. Users can connect the terminal block directly to a DC power source, or use the power jack to connect to an AC circuit through an adaptor.

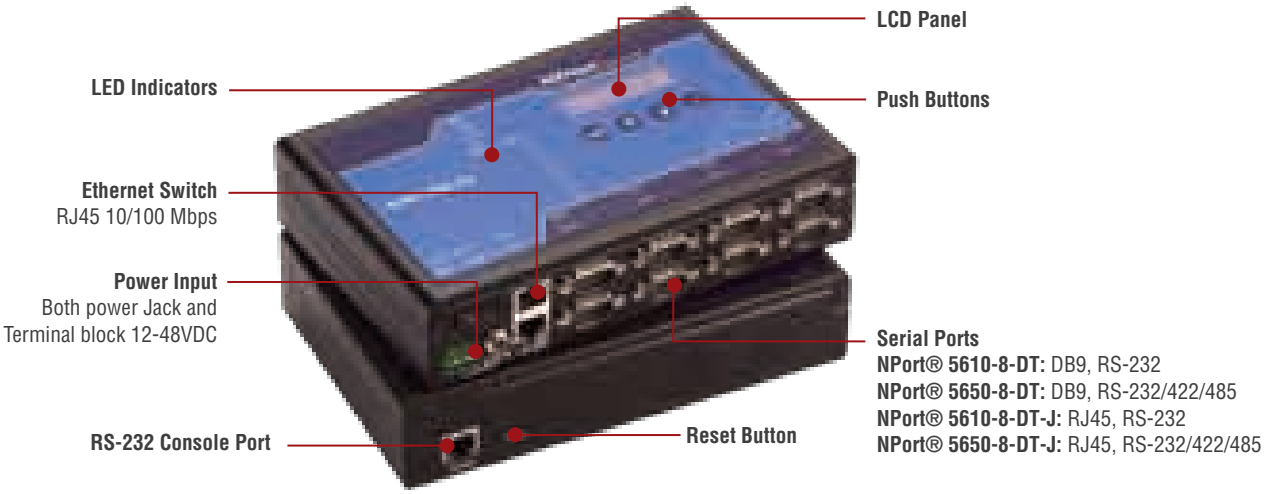
LED Indicators to Ease Your Maintenance Tasks

The System LED, Serial Tx/Rx LEDs, and Ethernet LEDs (located on the RJ45 connector) provide a great tool for basic maintenance tasks and help engineers analyze problems in the field. The NPort® 5600's LEDs not only indicate current system and network status, but also help field engineers monitor the status of attached serial devices.

Two Ethernet Ports for Convenient Cascade Wiring

The NPort® 5600-8-DT device servers come with two Ethernet ports that can be used as Ethernet switch ports. Connect one port to the network or server, and the other port to another Ethernet device. The dual Ethernet ports eliminate the need to connect each device to a separate Ethernet switch, reducing wiring costs.

Appearance



Specifications

Ethernet Interface
Number of Ports: 2 (1 IP)
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface
Number of Ports: 8
Serial Standards:
NPort 5610-8-DT: RS-232
NPort 5650-8-DT: RS-232/422/485
Connector:
NPort 5610-8-DT/5650-8-DT/5650I-8-DT: DB9 male
NPort 5610-8-DT-J/5650-8-DT-J: RJ45 (8 pins)
Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort 5650I-8-DT only)
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ
Terminator for RS-485: 120 Ω

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software
Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, Rtelnet, ARP, RFC2217
Configuration Options: Web Console, Telnet Console, Serial Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Mini Screen with Push Buttons
LCD Panel: Liquid Crystal Display on the case
Push Buttons: Four push buttons for convenient on-site configuration

Physical Characteristics
Housing: Metal, IP30 protection
Weight:
NPort 5610-8-DT: 1760 g
NPort 5610-8-DT-J: 1170 g
NPort 5650-8-DT: 1770 g
NPort 5650-8-DT-J: 1710 g
NPort 5650I-8-DT: 1850 g
Dimensions:
Without ears: 197 x 44 x 125 mm (7.76 x 1.73 x 4.92 in)
With ears: 229 x 46 x 125 mm (9.01 x 1.81 x 4.92 in)
With DIN-Rail kit on bottom panel: 197 x 53 x 125 mm (7.76 x 2.09 x 4.92 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: 12 to 48 VDC
Power Consumption:
NPort 5610-8-DT:
611 mA @ 12 V, 300 mA @ 24 V, 140 mA @ 48 V
NPort 5610-8-DT-J:
611 mA @ 12 V, 300 mA @ 24 V, 140 mA @ 48 V
NPort 5650-8-DT:
615 mA @ 12 V, 300 mA @ 24 V, 156 mA @ 48 V
NPort 5650I-8-DT:
1066 mA @ 12 V, 510 mA @ 24 V, 200 mA @ 48 V
NPort 5650-8-DT-J:
615 mA @ 12 V, 300 mA @ 24 V, 156 mA @ 48 V

Standards and Certifications
Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024

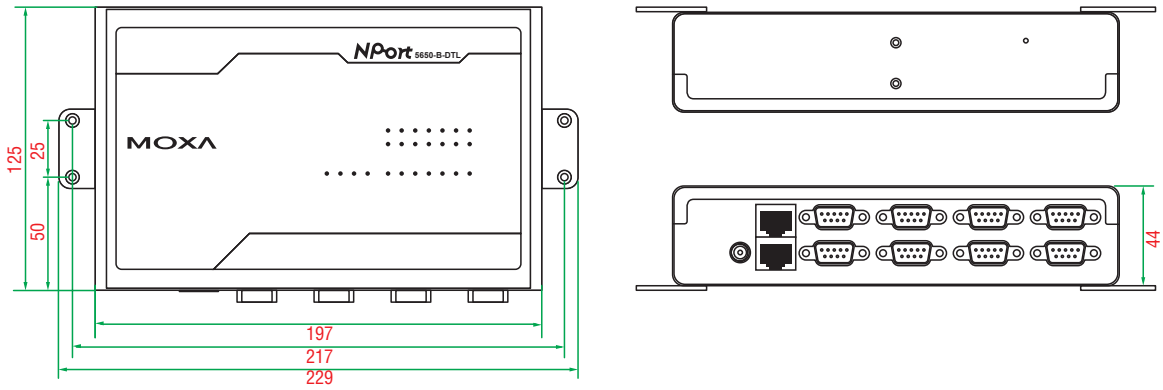
Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures): 163,356 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

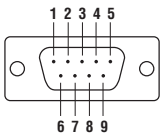
Dimensions

Unit: mm (inch)



Pin Assignment

DB9 male connector



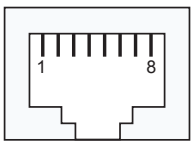
NPort® 5610-8-DT (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5650-8-DT/5650I-8-DT (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

8-pin RJ45 connector



NPort® 5610-8-DT-J (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5650-8-DT-J (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	–	–
2	RTS	TxD+	–
3	GND	GND	GND
4	TXD	TxD-	–
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	–	–
8	DTR	–	–

Ordering Information

Available Models

NPort 5610-8-DT: 8-port RS-232 desktop device server with DB9 male connectors and 48 VDC power input
NPort 5610-8-DT-J: 8-port RS-232 desktop device server with RJ45 connectors and 48 VDC power input
NPort 5650-8-DT: 8-port RS-232/422/485 desktop device server with DB9 male connectors and 48 VDC power input
NPort 5650-8-DT-J: 8-port RS-232/422/485 desktop device server with RJ45 connectors and 48 VDC power input
NPort 5650I-8-DT: 8-port RS-232/422/485 desktop device server with DB9 male connectors, 48 VDC power input, and 2 KV optical isolation

Optional Accessories (can be purchased separately)

CBL-RJ45F25-150: 8-pin RJ45 to DB25 female cable, 150 cm
CBL-RJ45M25-150: 8-pin RJ45 to DB25 male cable, 150 cm
CBL-RJ45F9-150: 8-pin RJ45 to DB9 female cable, 150 cm
CBL-RJ45M9-150: 8-pin RJ45 to DB9 male cable, 150 cm

Package Checklist

- NPort 5600 device server
- Power adaptor
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort 5600-8-DT Lite

8-port RS-232/422/485 serial device servers



- 8 serial ports supporting RS-232/422/485
- Compact desktop design
- 10/100M auto-sensing Ethernet
- Built-in 15 KV ESD protection for all serial signals
- Choice of configuration methods: Web console, Telnet console, and Windows utility
- Versatile socket operation modes, including TCP Server, TCP Client, UDP, and Real COM
- SNMP MIB-II for network management

Overview

NPort® 5600-8-DTL device servers can conveniently and transparently connect 8 serial devices to an Ethernet network, allowing you to network your existing serial devices with only basic configuration. You can both centralize management of your serial devices and distribute management hosts over the network. Since the NPort® 5600-8-DTL device servers have a smaller form factor compared to our 19-inch models, they are a great choice for applications that need additional serial ports, but for which mounting rails are not available.

Convenient Design for RS-485 Applications

The NPort® 5650-8-DTL device servers support selectable 1 KΩ and 150 KΩ pull high/low resistors and a 120 Ω terminator. In some critical environments, termination resistors may be needed to prevent the reflection of serial signals. When using termination resistors, it is also important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible with all environments, NPort® 5600-8-DTL device servers use DIP switches to allow users to adjust termination and pull high/low resistor values manually for each serial port.

LED Indicators to Ease Your Maintenance Tasks

The System LED, Serial Tx/Rx LEDs, and Ethernet LEDs (located on the RJ45 connector) provide a great tool for basic maintenance tasks and help engineers analyze problems in the field. The NPort® 5600's LEDs not only indicate current system and network status, but also help field engineers monitor the status of attached serial devices.

Appearance



Specifications

Ethernet Interface
Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface
Number of Ports: 8
Serial Standards:
NPort 5610-8-DTL: RS-232
NPort 5650-8-DTL/5650I-8-DTL: RS-232/422/485
Connector: DB9 male
Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort 5650I-8-DTL only)
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 KΩ, 150 KΩ
Terminator for RS-485: 120 Ω

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software
Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP V1, HTTP, SMTP, SNTP, Rtelnet, ARP, RFC2217
Configuration Options: Web Console, Telnet Console, Serial Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics
Housing: Metal, IP30 protection
Weight:
NPort 5610-8-DTL: 1760 g
NPort 5650-8-DTL: 1770 g
NPort 5650I-8-DTL: 1850 g
Dimensions:
Without ears: 197 x 44 x 125 mm (7.76 x 1.73 x 4.92 in)
With ears: 229 x 46 x 125 mm (9.01 x 1.81 x 4.92 in)
With DIN-Rail kit on bottom panel: 197 x 53 x 125 mm (7.76 x 2.09 x 4.92 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: 12 to 48 VDC
Power Consumption:
NPort 5610-8-DTL:
340 mA @ 12 V, 180 mA @ 24 V, 110 mA @ 48 V
NPort 5650-8-DTL:
470 mA @ 12 V, 250 mA @ 24 V, 140 mA @ 48 V
NPort 5650I-8-DTL:
740 mA @ 12 V, 370 mA @ 24 V, 220 mA @ 48 V

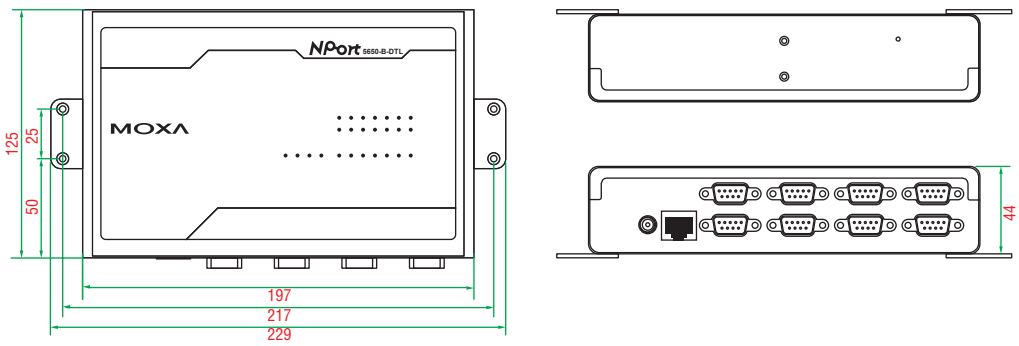
Standards and Certifications
Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS: EN 55024

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

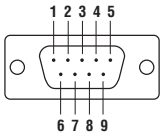
Dimensions

Unit: mm (inch)



Pin Assignment

DB9 male connector



NPort® 5610-8-DTL (RS-232)

PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

NPort® 5650-8-DTL/5650I-8-DTL (RS-232/422/485)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Ordering Information

Available Models

NPort 5610-8-DTL: 8-port RS-232 desktop device server with DB9 male connectors, 0 to 60°C operating temperature
NPort 5650-8-DTL: 8-port RS-232/422/485 desktop device server with DB9 male connectors, 0 to 60°C operating temperature
NPort 5650I-8-DTL: 8-port RS-232/422/485 desktop device server with DB9 male connectors and 2 KV isolation, 0 to 60°C operating temperature
NPort 5610-8-DTL-T: 8-port RS-232 desktop device server with DB9 male connectors, -40 to 75°C operating temperature
NPort 5650-8-DTL-T: 8-port RS-232/422/485 desktop device server with DB9 male connectors, -40 to 75°C operating temperature
NPort 5650I-8-DTL-T: 8-port RS-232/422/485 desktop device server with DB9 male connectors and 2 KV isolation, -40 to 75°C operating temperature

Package Checklist

- NPort 5600-8-DTL device server
- Power cord and adaptor (standard temp. models only)
- 2 metal plates (wall mount kit)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® IA5000A Series

1, 2, and 4-port serial device servers for industrial automation



- Enhanced surge protection for serial, LAN, and power
- 2 KV isolation for serial signals
- Rugged screw-type terminal blocks for power and serial connectors
- C1D2 and ATEX certified for harsh industrial environments
- Cascading Ethernet ports for easy wiring
- Redundant DC power inputs
- Warning by relay output and email
- Low power consumption with built-in MiiNe CPU
- -40 to 75°C operating temperature range (T models)

Overview

The NPort IA5000A series device servers are designed for connecting industrial automation serial devices, such as PLCs, sensors, meters, motors, drives, barcode readers, and operator displays. The device servers are ultra rugged with a metal housing, screw connectors, and full surge protection. The NPort IA5000A series device servers are extremely user-friendly, making simple and reliable serial to Ethernet solutions possible.

Cascading Ethernet Ports Make Wiring Easy (10/100BaseTX models only)

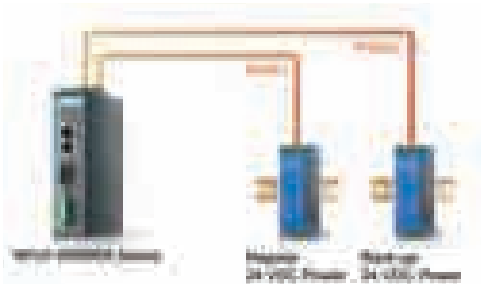
The NPort IA5000A series device servers each have two Ethernet ports that can be used as Ethernet switch ports. One port connects directly to the network or server, and the other port can be connected to another NPort IA device server or another Ethernet device. The dual Ethernet ports help reduce wiring costs by eliminating the need to connect each device to a separate Ethernet switch.



Redundant Power Inputs

The NPort IA5000A series device servers have two power inputs that can be connected simultaneously to live DC power sources. If one power source fails, the other source takes over automatically. Redundant power inputs help ensure that your device server will operate non-stop.

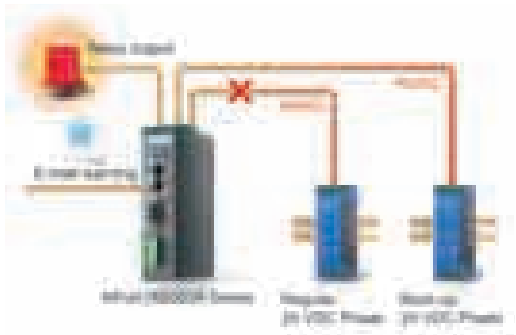
Dual Power Inputs



Relay Output Warning and E-mail Alerts

The built-in relay output can be used to alert administrators when the Ethernet is down, when problems with the power inputs arise, or when there is a change in the DCD or DSR serial signals. An e-mail warning can also be issued when an exception is detected. These functions are valuable tools that enable maintenance engineers to react promptly to emergency situations.

Power Failure Alarm



Surge Protection for Serial, LAN, and Power

Moxa's leading-edge surge immunity solution, which is applied to the NPort® IA5000A's serial, power, and Ethernet lines, is tested and proven compliant with IEC 61000-4-5. This state-of-the-art surge protection provides a robust serial-to-Ethernet solution that can protect electrical devices from voltage spikes and withstand electrically noisy environmental conditions, such as oil and gas, and power automation applications.

Industrial-grade Certification

To ensure safe and reliable operation in industrial environments, the NPort® IA5000A device servers have obtained various industrial certifications, including an IP30 rating for mechanical protection and UL508 safety certification for industrial control equipment. In addition, these device servers are UL/cUL Class 1 Division 2 Groups A, B, C, D certified for explosion-safe usage, and with ATEX Class 1 Zone 2 certification, are suitable for use in hazardous locations.

Specifications

Ethernet Interface

Number of Ports: 2
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in
Ethernet Line Protection: 1 KV (level 2) surge protection

Serial Interface

Number of Ports:
NPort IA5150A: 1
NPort IA5250A: 2
NPort IA5450A: 4
Serial Standards: RS-232/422/485
Connector:
NPort IA5150A: DB9 for RS-232, terminal block for RS-422/485
NPort IA5250A/IA5450A: DB9 for RS-232/422/485
Serial Line Protection:
• 15 KV ESD protection for all signals
• 2 KV isolation protection for isolation models
• 1 KV (level 2) surge protection
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 50 to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, Rtelnet, DNS, SNMP, HTTP, SMTP, SNTP, IGMP
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Metal
Weight:
NPort IA5150A: 475 g
NPort IA5250A: 485 g
NPort IA5450A: 560 g
Dimensions:
NPort IA5150A/IA5250A: 36 x 105 x 140 mm (1.42 x 4.13 x 5.51 in)
NPort IA5450A: 45.8 x 134 x 105 mm (1.8 x 5.28 x 4.13 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
NPort IA5150A: 12 to 48 VDC; 220 mA @ 12 VDC, 110 mA @ 24 VDC
NPort IA5150AI: 12 to 48 VDC; 255 mA @ 12 VDC, 130 mA @ 24 VDC
NPort IA5250A: 12 to 48 VDC; 250 mA @ 12 VDC, 125 mA @ 24 VDC
NPort IA5250AI: 12 to 48 VDC; 290 mA @ 12 VDC, 150 mA @ 24 VDC
NPort IA5450A: 12 to 48 VDC; 374 mA @ 12 VDC, 184 mA @ 24 VDC
NPort IA5450AI: 12 to 48 VDC; 512 mA @ 12 VDC, 242 mA @ 24 VDC

Standards and Certifications

Safety: UL 508 (Pending)
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D (Pending), ATEX Class I Zone 2
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 4,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Reliability

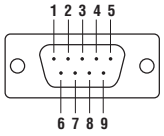
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
262,805 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

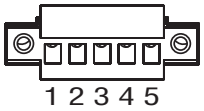
Pin Assignment

RS-232/422/485 DB9 male port



PIN	RS-232	RS-422/RS-485-4w	RS-485-2W
1	DCD	TxD-(A)	–
2	RXD	TxD+(B)	–
3	TXD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

RS-422/485 Terminal Block Wiring

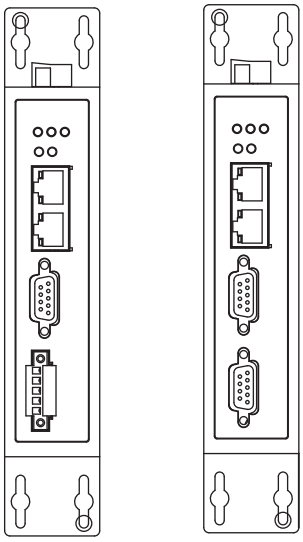


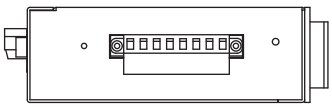
PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD+(B)	–
2	TxD-(A)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND

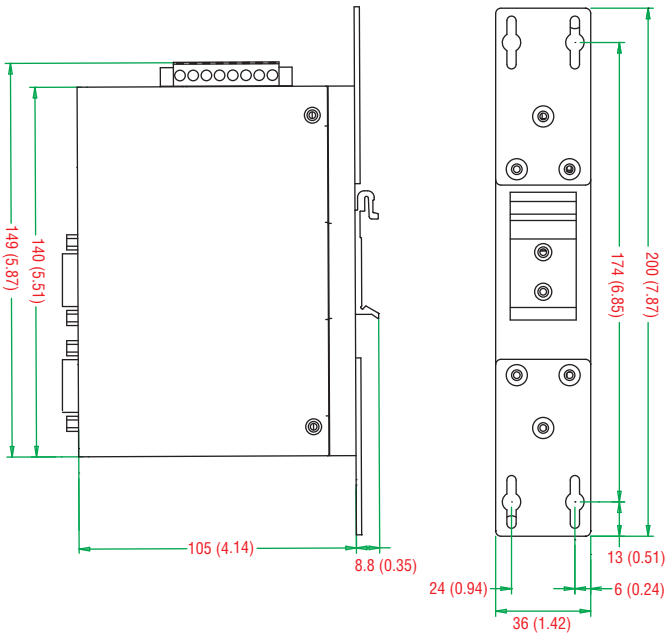
Dimensions

Unit: mm (inch)

NPort IA5150A **NPort IA5250A**
NPort IA5150AI **NPort IA5250AI**



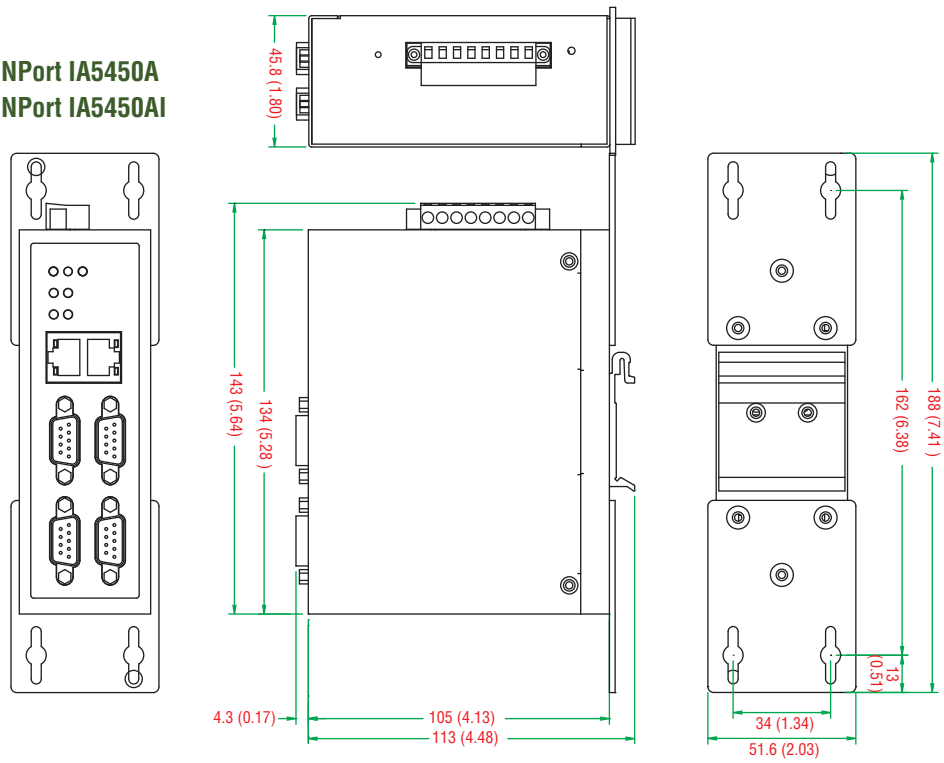




Dimensions

Unit: mm (inch)

NPort IA5450A
NPort IA5450AI



Ordering Information

Available Models

NPort IA5150A: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 0 to 60°C operating temperature
NPort IA5150AI: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 KV isolation, 0 to 60°C operating temperature
NPort IA5250A: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 0 to 60°C operating temperature
NPort IA5250AI: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 KV isolation, 0 to 60°C operating temperature
NPort IA5450A: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 0 to 60°C operating temperature
NPort IA5450AI: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 KV isolation protection, 0 to 60°C operating temperature
NPort IA5150A-T: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, -40 to 75°C operating temperature
NPort IA5150AI-T: 1-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 KV isolation, -40 to 75°C operating temperature
NPort IA5250A-T: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, -40 to 75°C operating temperature
NPort IA5250AI-T: 2-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 KV isolation, -40 to 75°C operating temperature
NPort IA5450A-T: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, -40 to 75°C operating temperature
NPort IA5450AI-T: 4-port RS-232/422/485 industrial automation device server with serial/LAN/power surge protection, two 10/100BaseT(X) ports with single IP, 2 KV isolation protection, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

8-contact screw-type terminal block: Power inputs and relay output
3-contact screw-type terminal block: For the NPort IA5150A's RS-422/485 port
WK-36-01: Wall mounting kit for the NPort IA5150A/IA5250A
WK-51-01: Wall mounting kit for the NPort IA5450A

Package Checklist

- NPort IA5000A series device server
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® IA5000 Series

1 and 2-port serial device servers for industrial automation



- Versatile socket operation modes, including TCP Server, TCP Client, UDP
- Patented ADDC® (automatic data direction control) for 2-wire and 4-wire RS-485
- Cascading Ethernet ports for easy wiring (applies only to RJ45 connectors)
- Redundant DC power inputs
- Warning by relay output and e-mail
- 10/100BaseTX (RJ45) or 100BaseFX (single mode or multi-mode with SC connector)
- IP30-rated housing

See also NPort IA5000A, p. 8-45

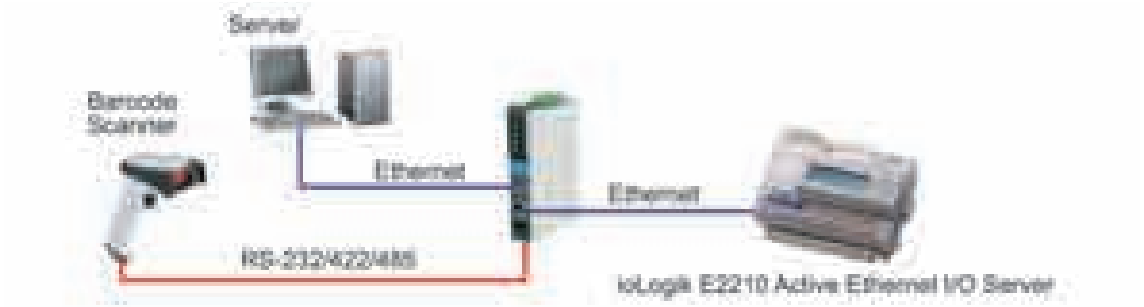
Overview

NPort® IA device servers provide easy and reliable serial-to-Ethernet connectivity for industrial automation applications. The device servers can connect any serial device to an Ethernet network, and to ensure compatibility with network software, they support a variety of port operation modes, including TCP Server, TCP Client, and UDP. The rock-solid reliability of the NPort® IA device servers makes them an ideal choice for establishing network access to RS-232/422/485 serial devices such as PLCs, sensors, meters, motors, drives, barcode readers, and operator displays. All models are housed in a compact, rugged housing that is DIN-rail mountable.



Cascading Ethernet Ports Make Wiring Easy (10/100BaseTX models only)

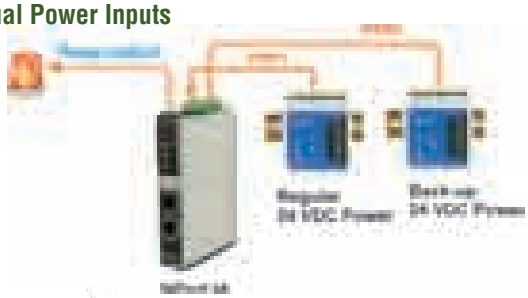
The NPort® IA5150 and IA5250 device servers each have two Ethernet ports that can be used as Ethernet switch ports. One port connects directly to the network or server, and the other port can be connected to another NPort® IA device server or another Ethernet device. The dual Ethernet ports help reduce wiring costs by eliminating the need to connect each device to a separate Ethernet switch.



Redundant Power Inputs

The NPort® IA5000 device servers have two power inputs that can be connected simultaneously to live DC power sources. If one power source fails, the other source takes over automatically. Redundant power inputs help assure that your device server will operate non-stop.

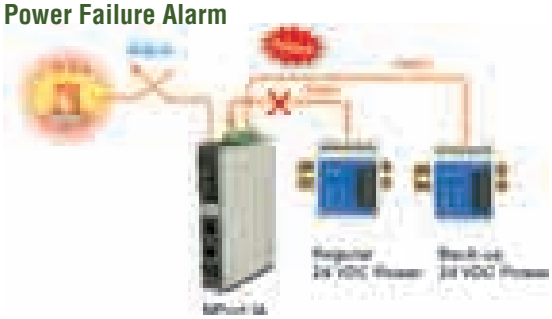
Dual Power Inputs



Relay Output Warning and E-mail Alerts

The built-in relay output can be used to alert administrators of problems with the Ethernet links or power inputs, or when there is a change in the DCD or DSR serial signals. The web console indicates which Ethernet link or power input has failed, or which serial signal has changed. An e-mail warning can also be issued when an exception is detected. These functions are valuable tools that enable maintenance engineers to react promptly to emergency situations.

Power Failure Alarm





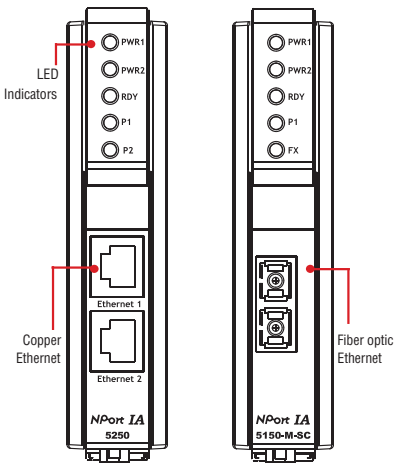
Optical Fiber for Ethernet Communication

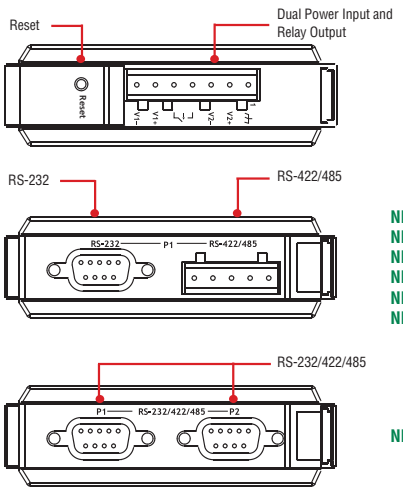
The NPort® IA5000 series includes 100BaseFX fiber models that support transmission distances up to 2 km for multi-mode models, and up to 40 km for single-mode models. Optical fiber is well-suited for industrial applications because it is immune to electromagnetic noise and interference. For environments that experience high ground loop voltages, fiber provides the best isolation protection, and because there is no danger of sparking, optical fiber is safer than copper wire to use in hazardous environments.

Industrial-grade Certification

To ensure safe and reliable operation in industrial environments, the NPort® IA5000 device servers have obtained various industrial certifications, including an IP30 rating for mechanical protection, UL508 safety certification for industrial control equipment, and explosion-safe certifications for hazardous locations. Certifications include UL/cUL Class 1 Division 2 Groups A, B, C, D, and ATEX Class 1 Zone 2.

Appearance





NPort IA5150
NPort IA5150I
NPort IA5150-S-SC
NPort IA5150-M-SC
NPort IA5150I-S-SC
NPort IA5150I-M-SC

NPort IA5250

Specifications

Ethernet Interface (NPort IA5150/5150I/5250)

Number of Ports: 2
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 KV built-in

Optical Fiber Interface (-M-SC and -S-SC models)

Fiber Port: 100 BaseFX, SC connector
Distance:
Multi mode: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Single mode: 0 to 40 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))
Min. TX Output: -20 dBm (Multi mode), -5 dBm (Single mode)
Max. TX Output: -14 dBm (Multi mode), 0 dBm (Single mode)
Sensitivity: -34 to -30 dBm (Multi mode), -36 to -32 dBm (Single mode)

Serial Interface

Number of Ports:
NPort IA5150: 1
NPort IA5250: 2
Serial Standards: RS-232/422/485
Connector:
NPort IA5150: DB9 male for RS-232, terminal block for RS-422/485
NPort IA5250: DB9 male for RS-232/422/485
Serial Line Protection:
15 KV ESD protection for all signals
2 KV isolation protection (NPort IA5150I, NPort 5150I-M-SC, NPort 5150I-S-SC)
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS and DTR/DSR (RS-232 only), XON/XOFF
Baudrate: 110 bps to 230.4 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, Rtelnet, DNS, SNMP V1, HTTP, SMTP, SNTP
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x

Physical Characteristics

Housing: Plastic, IP30 protection
Weight:
NPort IA5150: 360 g
NPort IA5250: 380 g
Dimensions: 29 x 89.2 x 118.5 mm (0.82 x 3.51 x 4.57 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
NPort IA5150: 360 mA @ 12 V, 195 mA @ 24 V
NPort IA5150I: 420 mA @ 12 V, 215 mA @ 24 V
NPort IA5250: 440 mA @ 12 V, 200 mA @ 24 V
NPort IA5150-S-SC: 470 mA @ 12 V, 210 mA @ 24 V
NPort IA5150I-S-SC: 490 mA @ 12 V, 250 mA @ 24 V
NPort IA5150-M-SC: 500 mA @ 12 V, 250 mA @ 24 V
NPort IA5150I-M-SC: 510 mA @ 12 V, 260 mA @ 24 V

Standards and Certifications

Safety: UL 508, UL 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 4,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Marine: DNV
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Reliability

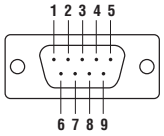
Water and Dust Proof: IP30
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
NPort IA5150 Series: 183,747 hrs
NPort IA5150I Series: 195,614 hrs
NPort IA5250 Series: 194,765 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

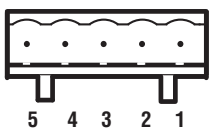
Pin Assignment

RS-232/422/485 DB9 male port



PIN	RS-232	RS-422/RS-485-4w	RS-485-2W
1	DCD	TxD-(A)	–
2	RXD	TxD+(B)	–
3	TXD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

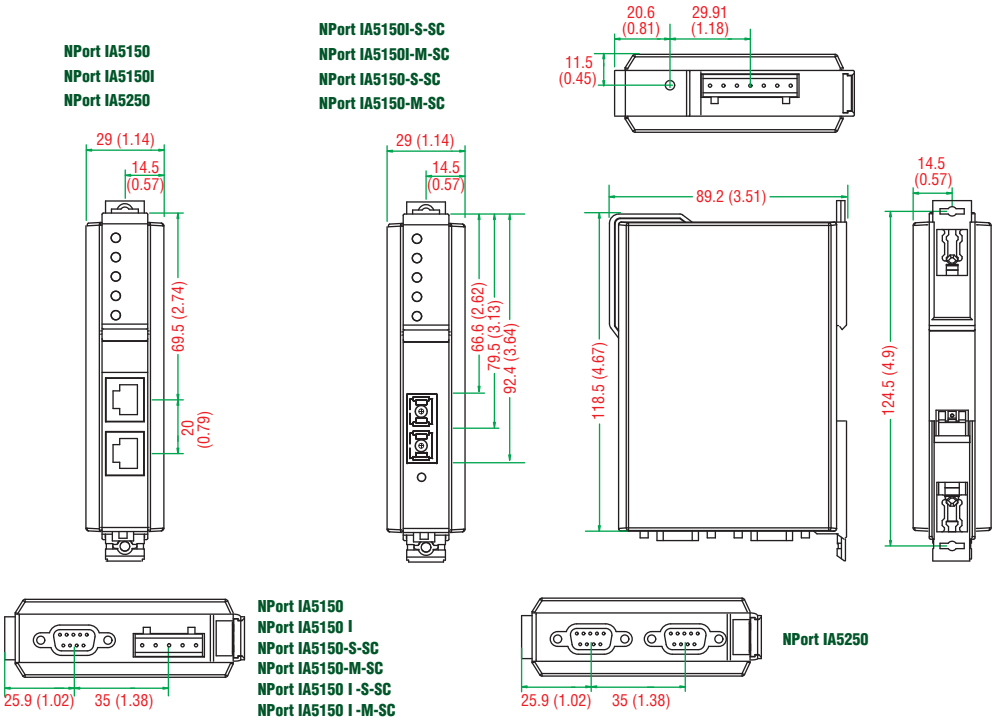
RS-422/485 Terminal Block Wiring



PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD+(B)	–
2	TxD-(A)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

NPort IA5150: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), 0 to 55°C operating temperature
NPort IA5150I: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP) and 2 KV optical isolation, 0 to 55°C operating temperature
NPort IA5150-M-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors), 0 to 55°C operating temperature
NPort IA5150I-M-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors) and 2 KV optical isolation, 0 to 55°C operating temperature
NPort IA5150-S-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors), 0 to 55°C operating temperature
NPort IA5150I-S-SC: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors) and 2 KV optical isolation, 0 to 55°C operating temperature
NPort IA5250: 2-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), 0 to 55°C operating temperature
NPort IA5150-T: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), -40 to 75°C operating temperature
NPort IA5150I-T: 1-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP) and 2 KV optical isolation, -40 to 75°C operating temperature
NPort IA5150-M-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors), -40 to 75°C operating temperature
NPort IA5150I-M-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) multi-mode fiber port (SC connectors) and 2 KV optical isolation, -40 to 75°C operating temperature
NPort IA5150-S-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors), -40 to 75°C operating temperature
NPort IA5150I-S-SC-T: 1-port RS-232/422/485 device server with 1 100BaseF(X) single-mode fiber port (SC connectors) and 2 KV optical isolation, -40 to 75°C operating temperature
NPort IA5250-T: 2-port RS-232/422/485 device server with 2 10/100BaseT(X) ports (RJ45 connectors, single IP), -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

Optical Fiber Patch Cord: See page A-14
Terminal Block for RS-422/485 ports: See page A-7
Power Jack to Terminal Block Cable: See page A-7

Package Checklist

- NPort IA5000 series device server
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NPort® W2150/2250 Plus

1 and 2-port RS-232/422/485 IEEE 802.11a/b/g wireless device servers



- Link any serial device to an IEEE 802.11a/b/g network
- 921.6 Kbps baudrate for RS-232/422/485 transmissions
- Web-based configuration using built-in Ethernet or WLAN
- Enhanced remote configuration with HTTPS, SSH
- Secure data access with WEP, WPA, WPA2
- Built-in WLAN site survey tool
- Wireless roaming with user-defined signal strength threshold
- Off-line port buffering and serial data log
- Dual power inputs (1 power jack, 1 terminal block)

Overview

The NPort® W2150 Plus and W2250 Plus are the ideal choice for connecting your serial devices, such as PLCs, meters, and sensors, to a wireless LAN. Your communications software will be able to access the serial devices from anywhere over a wireless LAN. Moreover, the wireless device servers require fewer cables and are ideal for applications that involve difficult wiring situations. In Infrastructure Mode or Ad-Hoc Mode, the NPort® W2150 Plus and NPort® W2250 Plus can connect to Wi-Fi networks at offices and factories to allow users to move, or "roam," between several APs (Access Points), and offer an excellent solution for devices that are frequently moved from place to place.

802.11a/b/g Wireless Connectivity to Serial Devices

Wireless device servers require fewer cables and are ideal for applications that involve difficult wiring situations. In Infrastructure Mode or Ad-Hoc Mode, the NPort® W2150 Plus and NPort® W2250 Plus can communicate with any host computer through an access point, or with another NPort® W2150 Plus or NPort® W2250 Plus located up to 100 meters away.

Wireless Roaming Function

Wi-Fi networks at offices and factories allow users to move, or "roam," between several APs (Access Points). The NPort® W2150 Plus and NPort® W2250 Plus include a "Connect rule" setting to allow wireless roaming.



The "Connect rule" field is only available in Infrastructure Mode and is used to specify the NPort®'s roaming behavior. When "Signal strength of AP" is selected, if more than one AP is detected, the NPort® will connect to the AP that has the highest signal strength, regardless of priority as set in the Priority field. When "Priority sequential" is selected, the NPort® will always try to connect to APs in order of priority, as set in the Priority field, regardless of signal strength. When "Fixed on 1st priority" is selected, the NPort® is only allowed to connect to the first priority AP, as set in the "Priority" field.

This "Priority" field is only available in Infrastructure Mode, and is used to set the priorities of the three available profiles.

Off-line Port Buffering and Serial Data Log for Each Port

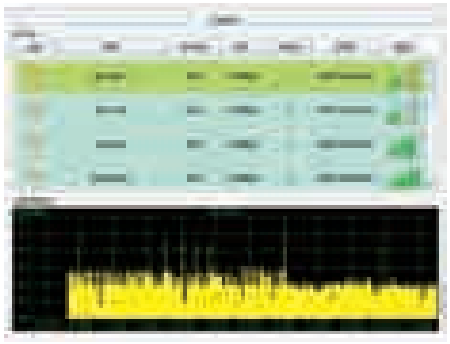
For mission-critical applications, data from the serial device must not be lost if the wireless connection goes down. The NPort® W2150 Plus and NPort® W2250 Plus are designed to continue operating if the wireless connection is disconnected temporarily. If the wireless connection is retraining, or if the connection fails, the serial data from the serial device will be queued in the 10 MB port buffer built into the device server. As soon as the wireless connection returns to normal, the data stored in the buffer will be sent to its destination. In addition, a serial data log can be enabled to make troubleshooting easier.

The serial data log buffer for both the NPort® W2150 Plus and NPort® W2250 Plus is 64 KB per port.

Built-in WLAN Site Survey Tool

The NPort® W2150 Plus and NPort® W2250 Plus both have a built-in WLAN site survey tool. Additional software is NOT required to complete the site survey.

The purpose of conducting a WLAN site survey is to determine how many access points are required, and where the access points should be placed. For most implementations, the number and placement of access points is designed to guarantee a minimum data rate. With wireless systems, it is often necessary to perform a WLAN site survey before installing the access points in order to understand how radio waves behave within the facility.



Secure Remote Management and Configuration with SSH/SSL

Unauthorized access is one of the biggest headaches for system managers. In addition to IP filtering and password protection, the NPort® W2150 Plus and NPort® W2250 Plus also support SSH and SSL to provide protection from hackers. To transmit control messages securely, open the web console using a web browser that supports https (Internet Explorer, for example). You may also open the serial or Telnet console, such as PuTTY, using a terminal emulator that supports SSH.

Select "Any Baudrate" between 50 bps and 921.6 Kbps



Most device servers only support a fixed number of serial baudrates. However, some applications require special baudrates, such as 250 Kbps or 500 Kbps. With the NPort® W2150 Plus and NPort® W2250 Plus, you can enter any baudrate between 50 and 921.6 Kbps.

If your device's baudrate is not a standard baudrate, select "other" from the drop-down list and then enter the baudrate.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: RJ45
Magnetic Isolation Protection: 1.5 KV built-in

WLAN Interface

Standard Compliance: 802.11a/b/g
Network Modes: Infrastructure, Ad-Hoc
Transmit Power:
802.11a: 14 dBm (typical)
802.11b: 17 dBm (typical)
802.11g: 15 dBm (typical)
Receive Sensitivity: -80 dBm
Radio Frequency Type: DSSS/OFDM
Transmission Rate:
802.11a: 54 Mbps
802.11b: 11 Mbps
802.11g: 54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps)
Transmission Distance: Up to 100 meters (in open areas)
Wireless Security:
• WEP: 64-bit/128-bit data encryption
• WPA, WPA2, 802.11i: Enterprise mode and Pre-Share Key (PSK) mode
• Encryption: 128-bit TKIP/AES-CCMP EAP-TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPV2, EAP-TTLS/PAP, EAP-TTLS/CHAP, EAP-TTLS/MSCHAP, EAP-TTLS/MSCHAPV2, EAP-TTLS/EAP-MSCHAPV2, EAP-TTLS/EAP-GTC, EAP-TTLS/EAP-MD5, LEAP
Antenna Connector: Reverse SMA

Serial Interface

Number of Ports:
NPort W2150 Plus: 1
NPort W2250 Plus: 2
Serial Standards: RS-232/422/485 (DB9 male connector)
Off-line Port Buffering:
NPort W2150 Plus: 20 MB
NPort W2250 Plus: 10 MB

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps
Serial Data Log: 64 KB

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, SNTP, SSH, HTTPS
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Secure Configuration Options: HTTPS, SSH
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/ 7 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x, HP-UX 11i
Linux Real TTY Drivers: 2.4.x/2.6.x
Utilities: NPort Search Utility and NPort Windows Driver manager
Management: SNMP MIB-II

Physical Characteristics

Housing: Aluminum sheet metal (1 mm)
Weight: 780 g
Dimensions:
Without ears or antenna: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
With ears, without antenna: 100 x 111 x 26 mm (3.94 x 4.37 x 1.02 in)
Antenna Length: 109 mm (4.29 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption: 560 mA @ 12 V, 294 mA @ 24 V, 162 mA @ 48 V

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class A, FCC Subpart C/E, VCCI
EMS: EN 55022 Class A
Radio: EN55024 Class A, EN 300 328, EN 301 489-1, EN 301 489-17, EN 301 893, ARIB RCR STD-33/T66

Reliability

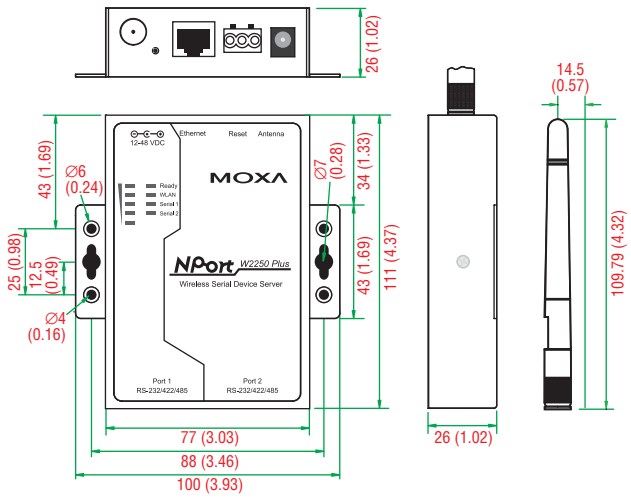
Alert Tool: RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
NPort W2150 Plus: 352,547 hrs
NPort W2250 Plus: 352,034 hrs

Warranty

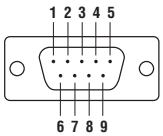
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Pin Assignment, DB9 Male



PIN	RS-232	RS-422/485-4W	RS-485-2W
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–

Ordering Information

Available Models

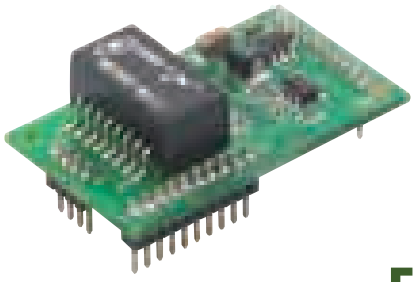
NPort W2150 Plus-US: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, US band, US plug, 0 to 55°C operating temperature
NPort W2150 Plus-EU: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Euro plug, 0 to 55°C operating temperature
NPort W2150 Plus-CN: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, US plug, CCC, 0 to 55°C operating temperature
NPort W2150 Plus-UK: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, UK plug, 0 to 55°C operating temperature
NPort W2150 Plus-SAA: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Australia plug, 0 to 55°C operating temperature
NPort W2150 Plus-JP: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Japan band, Japan plug, 0 to 55°C operating temperature
NPort W2250 Plus-US: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, US band, US plug, 0 to 55°C operating temperature
NPort W2250 Plus-EU: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Euro plug, 0 to 55°C operating temperature
NPort W2250 Plus-CN: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, US plug, CCC
NPort W2250 Plus-UK: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, UK plug, 0 to 55°C operating temperature
NPort W2250 Plus-SAA: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Euro band, Australian plug, 0 to 55°C operating temperature
NPort W2250 Plus-JP: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN, antenna, Japan band, Japan plug, 0 to 55°C operating temperature
NPort W2150 Plus-T: 1-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN (includes US, Euro, Japan band), -40 to 75°C operating temperature
NPort W2250 Plus-T: 2-port RS-232/422/485 wireless device server with 802.11a/b/g WLAN (includes US, Euro, Japan band), -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

Serial Cables and Adaptors: See page A-6 for details
DK-35A: 35 mm DIN-Rail Mounting Kit

Package Checklist

- NPort W2150 Plus or NPort W2250 Plus wireless device server
- Power adaptor (non-T models only)
- Antenna
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card



Embedded Device Servers

Product Selection Guide

Embedded Device Servers. 9-2

Embedded Device Servers

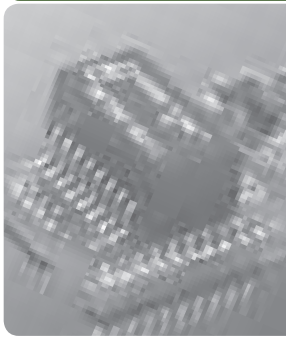
Go Ethernet with Thumb-sized Serial-to-Ethernet Solutions. 9-3

Introduction to Embedded Device Servers 9-4

MiiNePort E2 Series: 10/100 Mbps embedded serial device servers without RJ45. 9-6

NE-4100 Series: 10/100 Mbps embedded serial device servers. 9-10

WE-2100T Series: Wireless LAN embedded serial device servers 9-12



Embedded Device Servers







	MiiNePort E2/E2-T MiiNePort E2-H/E2-H-T	NE-4110S	NE-4110A	NE-4120S	NE-4120A	NE-4100T	WE-2100T
Form Factor							
Type	Drop-in module	Stand-alone module				Drop-in module	
Dimensions	29 x 17 x 12.6 mm	57 × 40 mm	57 × 40 mm	57 × 40 mm	57 × 40 mm	45 × 36 mm	54 x 40 x 13.3 mm
Ethernet Interface							
10/100BaseT(X) Ports	1	1	1	1	1	1	1
Connector	6-pin pin header	RJ45	RJ45	5-pin pin header		26-pin dual-in-line	44-pin dual-in-line
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
WLAN Interface							
Standard Compliance	–	–	–	–	–	–	IEEE 802.11a/b/g
Radio Frequency Type	–	–	–	–	–	–	DSSS, CCK, DFDM
Wireless Security	–	–	–	–	–	–	SEP, SPA, SPA2, 802.11i
Network Modes	–	–	–	–	–	–	Infrastructure (a/b/g), Ad Hoc (b/g)
Serial Interface							
TTL Ports	1 (data port)	1 (console port)				2 (1 data port, 1 console port)	
RS-232 Ports	–	1 (data port)	–	1 (data port)	–	–	–
RS-232/422 Ports	–	–	1 (data port)	–	1 (data port)	–	–
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF					
Baudrate	MiiNePort E2: 50 bps to 230.4 Kbps (non-standard baudrates supported) MiiNePort E2-H: 50 bps to 921.6 Kbps (non-standard baudrates supported)	110 bps to 230.4 Kbps					50 bps to 921.6 Kbps
Programmable GPIO Pins	4	4	4	4	4	4	9
Software							
Network Protocols	ICMP, IP, TCP, UDP, DHCP, Telnet, HTTP, SNMP V1/V2c, SMTP						
	ARP, TFTP, Auto IP, BOOTP	ARP					DNS, SNTP, SSH, HTTPS
Configuration Options	Web/Serial/Telnet Console, Windows Search Utility						
Serial Command Mode	✓	✓	✓	✓	✓	✓	✓
Windows Real COM Drivers	Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CD 5.0/6.0, XP Embedded						
Fixed TTY Drivers	SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x						
Linux Real TTY Drivers	Linux 2.4.x, 2.6.x						
Operation Modes	TCP Server, TCP Client, UDP, Real COM, Modem, RFC2217	Real COM, TCP Server, TCP Client, UDP					Real COM, TCP Server, TCP Client, UDP, RFC2217
NetEZ Technology	EZPower, EZPage, SCM, AutoCFG, MCSC	–	–	–	–	–	–
Environmental Limits							
Operating Temparture – Standard Temperature	0 to 55°C	0 to 55°C					0 to 55°C
Operating Temparture – Wide Temperature	-40 to 85°C	-40 to 75°C					–
Operating Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Storage Temperature	-40 to 85°C	-40 to 75°C					-20 to 70°C
Power Requirements							
Input Voltage	3.3 to 5 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	5 VDC (±5%)	3.3 VDC (±5%)
Power Consumption	140 mA @ 3.3 VDC input max., 92 mA @ 5 VDC input max.	290 mA @ 5 VDC max.					540 mA (at full speed)
Standards and Certifications							
Safety	–	–	–	–	–	–	UL 60950-1, EN 60950-1
EMC	CE, FCC	CE, FCC	CE, FCC	CE, FCC	CE, FCC	CE, FCC	CE, FCC
EMI	EN 55022 Class B, FCC Part 15 Subpart B Class B	EN 55022 Class B, FCC Part 15 Subpart B Class A					EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS	EN 55024, EN 61000-4-2 (ESD), EN 61000-4-3 (RS), EN 61000-4-4 (EFT), EN 61000-4-5 (Surge), EN 61000-4-6 (CS), EN 61000-4-8, EN 61000-4-11	EN 55024, EN 61000-4-2 (ESD), EN 61000-4-3 (RS), EN 61000-4-4 (EFT), EN 61000-4-5 (Surge), EN 61000-4-6 (CS), EN 61000-4-11					
Radio	–	–	–	–	–	–	EN 300 328, EN 301 489-1, EN 301 489-17, EN 301 893
Shock	IEC-68-2-27	–	–	–	–	–	–
Freefall	IEC-68-2-34, IEC-68-2-32	–	–	–	–	–	–
Vibration	IEC-68-2-6	–	–	–	–	–	–
Green Product	RoHS, CRoHS, WEEE						
Reliability							
Watchdog Timer	✓	✓	✓	✓	✓	✓	✓
MTBF	5,696,350 hrs	290,276 hrs	289,573 hrs	289,573 hrs	289,573 hrs	288,173 hrs	505,288 hrs
Warranty	5 years (see www.moxa.com/warranty)						

Go Ethernet with Thumb-sized Serial-to-Ethernet Solutions

Are you concerned about cost, design flexibility, and power consumption? Moxa understands what you need! To serve this demand, Moxa developed the MiiNePort series family, the world's tiniest and most innovative embedded serial-to-Ethernet device server.

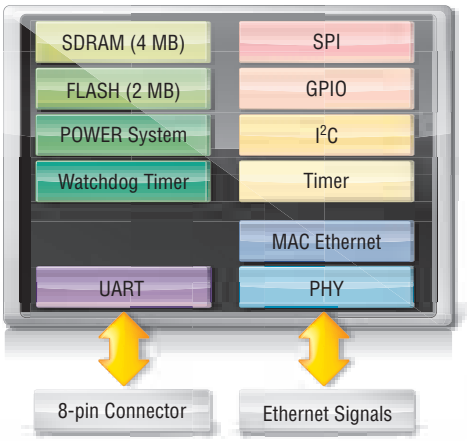
Moxa's MiiNePort series embedded device servers are designed for manufacturers who want to add sophisticated network connectivity to their serial devices with minimal integration effort.

The MiiNe is a Lean yet Powerful Serial-to-Ethernet Solution

Moxa's second generation SoC, the MiiNe, was created to provide device manufacturers with a competitive embedded serial-to-Ethernet solution. MiiNePort embedded device servers, which use the MiiNe for their SoC, are the world's tiniest embedded device servers, and have the lowest power consumption of any similar product. The MiiNe SoC has the following features:

- Designed for 1 or 2-port serial-to-Ethernet applications
- Uses a 32-bit ARM core
- Uses Moxa's own advanced UART technology
- Has 2 MB Flash and 4 MB SDRAM memory built in

MOXA MiiNe (196 pins CPU)

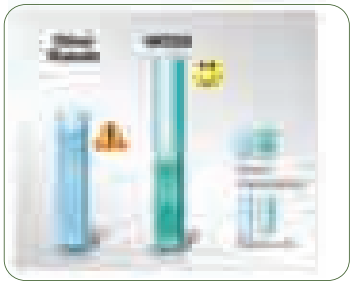




Powered by the MiiNe, Moxa's 2nd generation SoC, the MiiNePort makes your device more powerful and cost-effective.



As the world's smallest serial-to-Ethernet module, the thumb-sized MiiNePort maximizes your design flexibility.



Want to minimize the power consumption of your device while maximizing its strength? The MiiNePort can help.

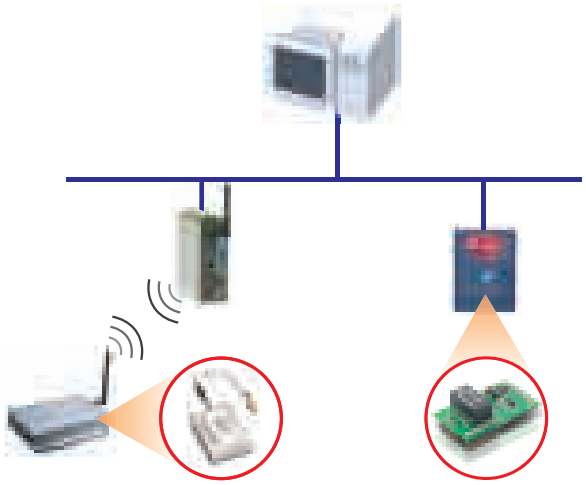
NetEZ™ It's That Easy! EZPower | EZPage | SCM | AutoCFG | MCSC

Moxa's NetEZ technology gives serial device manufacturers a range of powerful tools for integrating Ethernet capability into serial devices.

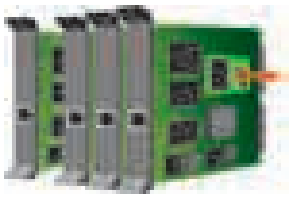
Introduction to Embedded Device Servers

Embedded device servers give serial device manufacturers a cost-effective means of making serial devices network-ready. Moxa provides a wide range of embedded device servers with products available to provide either wired or wireless Ethernet communication capability. With Moxa's embedded device servers, device manufactures can easily turn their legacy serial devices into network devices with a minimum of investment and effort. In fact, since TCP/IP expertise is not required, time-to-market can be reduced to the three to six month range. Compared with other solutions on the market, Moxa's embedded device server products give serial device manufacturers ready access to a unique set of features:

- Different form factors for different installation types
- Versatile, ready-to-use operation modes
- Thumb-sized footprint minimizes overall device size
- Low power consumption maximizes device system stability
- NetEZ technology makes device manufacturers' job and life easier



Different form factors for different installation types



MiiNePort E2



NE-4110



NE-4120

Drop-in Form Factor: Drop-in modules come with DIP pins or pin-headers to make assembly easy. This kind of module has a smaller footprint, and is perfect for device manufacturers who have size concerns for their devices.

Moxa's Drop-in Modules: MiiNePort E2, NE-4100T, WE-2100T.

Stand-alone Form Factor: Stand-alone modules come with pin-headers and screw mounting holes for device manufactures to connect and fix the modules to the device's main board. This kind of module has a bigger footprint compared to the drop-in form factor, but still provides sufficient flexibility for placing the module in the device without making large changes to the device's original main board design.

Moxa Stand-alone Modules: NE-4110, NE-4120.

NetEZ Technology

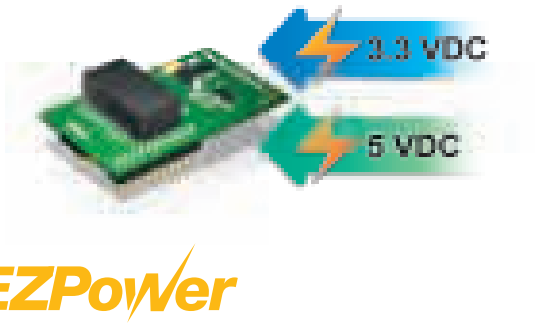
NetEZ™ It's That Easy! SCM | AutoCFG | MCSC | EZPower | EZPage

Moxa's NetEZ technology gives serial device manufacturers a range of powerful tools for integrating Ethernet capability into serial devices:

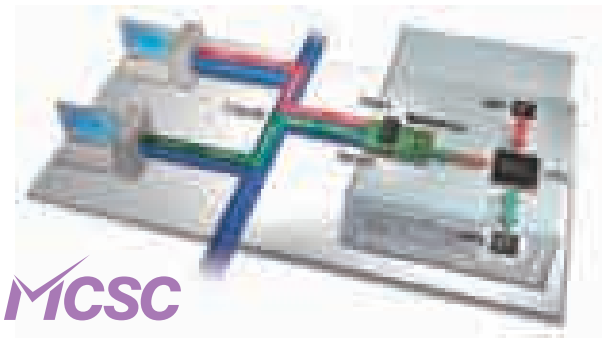
- **EZPage:** Need a module that allows direct communication with the attached serial device? Use the MiiNePort's EZPage Java Applet to create a visual webpage for configuring and communicating with the attached serial device.



- **EZPower:** Need a module that provides a versatile system power input voltage? Use the MiiNePort E2's EZPower to switch automatically between a 3.3 and 5 VDC system power input.



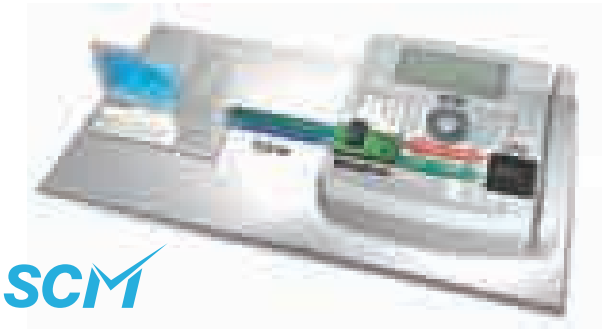
- **MCSC:** Ever wanted your device to be a server and client at the same time? The MiiNePort's MCSC (Multi-channel Serial Communication) provides dual connections and dual channels for multi-task applications.



- **AutoCFG:** Tired of spending a large amount of time and effort setting up a network? Not anymore! The MiiNePort's AutoCFG makes auto-configuration during manufacturing possible.



- **SCM:** Need an easy tool to configure the network through serial communication inside the device? Try MiiNePort's friendly SCM (Serial Command Mode).



MiiNePort E2 Series

10/100 Mbps embedded serial device servers



- Smallest embedded device server on the market—only 29 x 17 x 12.6 mm
- EZPower for 3.3 to 5 VDC system power input supported
- Extremely low power consumption—only 140 mA @ 3.3 VDC or 92 mA @ 5 VDC
- Uses the MiiNe, Moxa's second generation SoC
- NetEZ technology makes integration incredibly easy
- Versatile choice of operation modes: Real COM, TCP, UDP, RFC2217, and MCSC

Overview

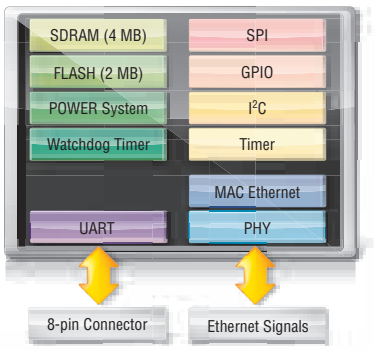
Moxa's MiiNePort E2 series embedded device servers are designed for manufacturers who want to add sophisticated network connectivity to their serial devices with minimal integration effort. The MiiNePort E2 is empowered by the MiiNe, Moxa's second generation SoC, which supports 10/100 Mbps Ethernet, up to 921.6 Kbps serial baudrate, a versatile selection of ready-to-use operation modes, and requires only a small amount of power. By using Moxa's innovative NetEZ technology, the MiiNePort E2 can be used to convert any device with a standard serial interface to an Ethernet enabled device in no time. In addition, the MiiNePort E2 is the smallest embedded device server without an RJ45 connector, making it easy to fit into virtually any existing serial device.

The MiiNe—Moxa's 2nd Generation SoC

The MiiNe was created to provide manufacturers with a competitive embedded serial-to-Ethernet solution. The MiiNePort E2, which uses the MiiNe for its SoC, is one of the world's tiniest embedded device servers, and has the lowest power consumption of any similar product. The MiiNe has the following features:

- Designed for serial-to-Ethernet applications
- Uses an ARM core
- Uses Moxa's own advanced UART technology
- 2 MB Flash and 4 MB SDRAM memory built in

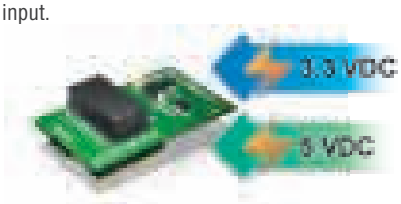
MOXA MiiNe (196 pins CPU)



NetEZ Technology

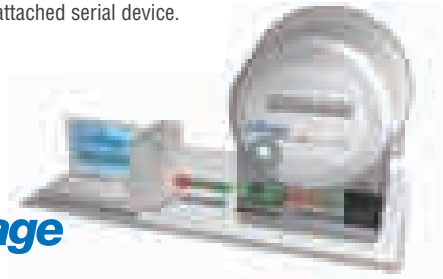
Moxa's NetEZ technology gives serial device manufacturers a range of powerful tools for integrating Ethernet capability into serial devices:

- **EZPower:** Need a module with a versatile system power input voltage? Use the MiiNePort E2's EZPower for 3.3 to 5 VDC system power input.



EZPower

- **EZPage:** Need a module that allows direct communication with the attached serial device? Use the MiiNePort E2's EZPage with Java Applet to create a visual webpage for configuring and communicating with the attached serial device.



EZPage

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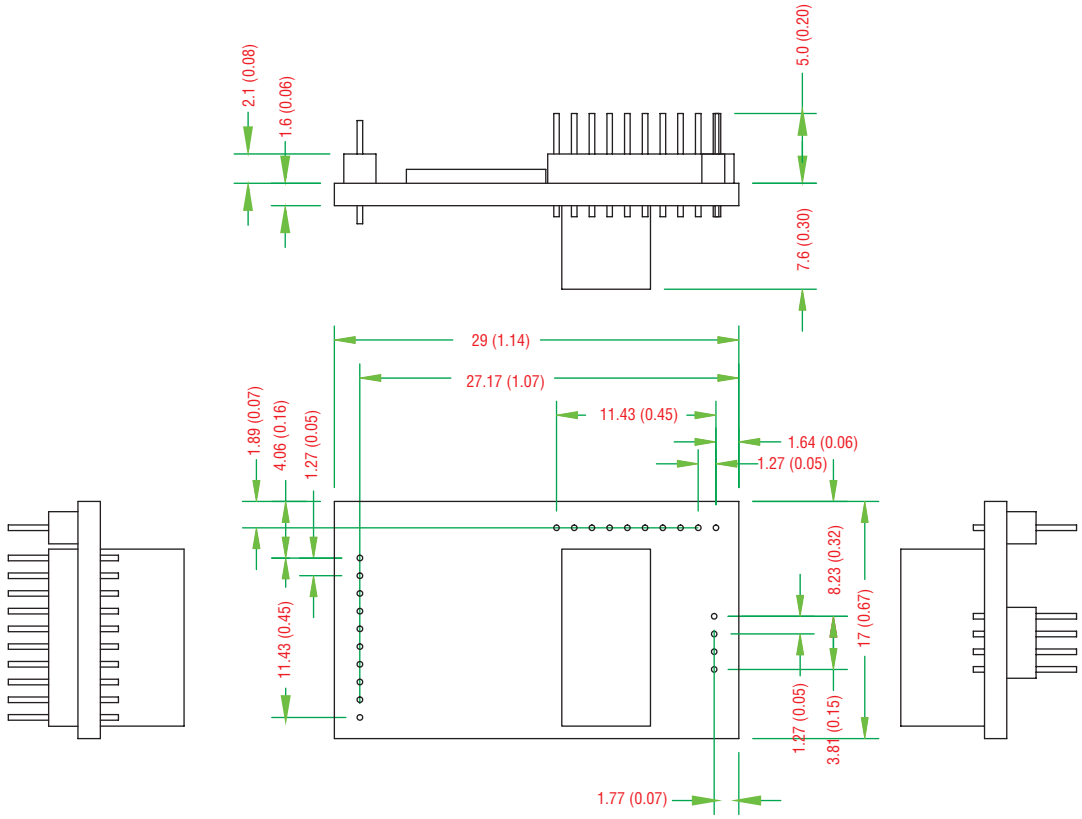
- **MCSC:** Ever wanted your device to be a server and client at the same time? The MiiNePort's MCSC (Multi-channel Serial Communication) provides dual connections and dual channels for multi-task applications!.



Moxa's NetEZ technology makes the MiiNePort E2 the world's most user-friendly embedded device server by promising ease-of-use with minimal integration work required.

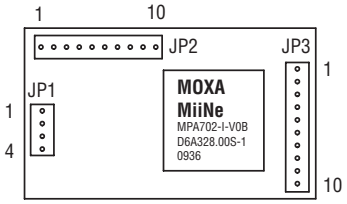
Dimensions

Unit: mm (inch)



Pin Assignment

JP1			JP2			JP3		
Pin	Signal Name	Function	Pin	Signal Name	Function	Pin	Signal Name	Function
1	Ethernet Tx+	Ethernet Transmit Data+	1	100M LED	Ethernet 100M LED	1	DIO0	Programmable Input/Output
2	Ethernet Tx-	Ethernet Transmit Data-	2	10M LED	Ethernet 10M LED	2	DIO1	Programmable Input/Output
3	Ethernet Rx+	Ethernet Receive Data+	3	LRXD	Receive Serial Data	3	DIO2	Programmable Input/Output
4	Ethernet Rx-	Ethernet Receive Data-	4	LTXD	Transmit Serial Data	4	DIO3	Programmable Input/Output
			5	LDCD	Data Carrier Detect	5	Reserved	N/A
			6	RS485_EN	RS-485 Enable	6	Reserved	N/A
			7	LRTS	Request To Send	7	SW_Reset	Reset to Factory Default
			8	LDTR	Data Terminal Ready	8	GND	Circuit Ground
			9	LDSR	Data Set Ready	9	Ready LED	System is Ready LED
			10	LCTS	Clear To Send	10	VCC	Power Supply



Specifications

Form Factor
Type: Drop-in module
Dimensions: 29 x 17 x 12.6 mm (1.14 x 0.67 x 0.50 in)
Weight: 5 g

System Information
CPU: 32-bit ARM Core
RAM: 4 MB built in
Flash: 2 MB built in

Ethernet Interface
Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 6-pin pin header
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface
Number of Ports: 1
Transmission Format: Standard TTL

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, XON/XOFF
Baudrate:
MiiNePort E2: 50 bps to 230.4 Kbps (suports non-standard baudrates)
MiiNePort E2-H: 50 bps to 921.6 Kbps (supports non-standard baudrates)

Serial Signals
TTL: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RST (reset circuit), GND

Digital I/O Pins
GPIO: 4 programmable I/O pins

Software
Network Protocols: ICMP, ARP, IP, TCP, UDP, DHCP, HTTP, SNMP V1, SMTP, TFTP, Auto IP, Telnet, BOOTP
Configuration Options: Web Console, Serial Console (Serial Command Mode), Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x
Operation Modes: Real COM, TCP Server, TCP Client, UDP, Ethernet Modem, RFC2217, MCSC

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: 3.3 to 5 VDC (±5%)
Power Consumption: 140 mA @ 3.3 VDC max., 92 mA @ 5 VDC input max.

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022 Class B, FCC Part 15 Subpart B Class B
EMS:
EN 55024,
EN 61000-4-2 (ESD),
EN 61000-4-3 (RS),
EN 61000-4-4 (EFT),
EN 61000-4-5 (Surge),
EN 61000-4-6 (CS),
EN 61000-4-8,
EN 61000-4-11
Shock: IEC-68-2-27
Freefall: IEC-68-2-34, IEC-68-2-32
Vibration: IEC-68-2-6
Green Product: RoHS, CRoHS, WEEE

Reliability
MTBF (mean time between failures): 5,696,350 hrs

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Modules

MiiNePort E2: Embedded device server for TTL devices, drop-in module, 10/100M without RJ45 connector, 50 bps to 230.4 Kbps baudrate, 0 to 55°C operating temperature
MiiNePort E2-H: Embedded device server for TTL devices, drop-in module, 10/100M without RJ45 connector, 50 bps to 921.6 Kbps baudrate, 0 to 55°C operating temperature
MiiNePort E2-T: Embedded device server for TTL devices, drop-in module, 10/100M without RJ45 connector, 50 bps to 230.4 Kbps baudrate, -40 to 85°C operating temperature
MiiNePort E2-H-T: Embedded device server for TTL devices, drop-in module, 10/100M without RJ45 connector, 50 bps to 921.6 Kbps baudrate, -40 to 85°C operating temperature

Available Starter Kits

MiiNePort E2-ST: Starter kit for the MiiNePort E2 Series, module included
MiiNePort E2-H-ST: Starter kit for the MiiNePort E2-H Series, module included

Package Checklist (modules)

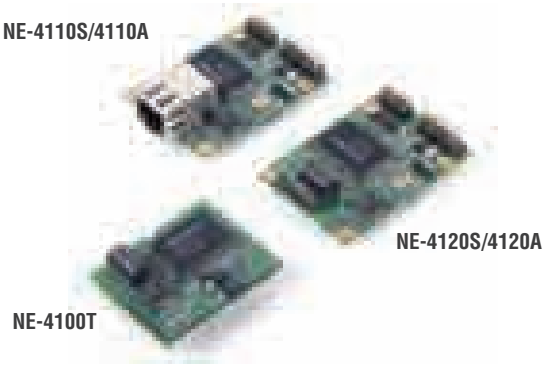
- MiiNePort E2 module

Package Checklist (starter kits)

- MiiNePort E2 module
- MiiNePort E2 evaluation board
- Universal power adaptor
- 2 power cords
- Null modem cable
- Cross-over Ethernet cable
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NE-4100 Series

10/100 Mbps embedded serial device servers



- 10/100 Mbps Ethernet interface
- Up to 230.4 Kbps baudrate support
- Choice of operation modes: Real COM, TCP Server, TCP Client, and UDP
- DHCP, BootP, Static IP, and ARP supported
- SNMP and e-mail alerts for event trapping and notification
- Half the size of a credit card—only 57 × 40 mm
- Low power consumption at 1.5W, with single +5V input

Overview

Moxa's NE-4100 embedded device servers are designed for manufacturers who want to add sophisticated network connectivity to their serial devices. Moxa's embedded device servers can be used to convert any device with a standard serial interface to an Ethernet-enabled device in no time. The NE-4100 embedded device servers support 10/100 Mbps Ethernet, and provide ready-to-use operation modes, including TCP Server, TCP Client, and UDP. In addition, a Real COM driver is included for backward compatibility with legacy software.

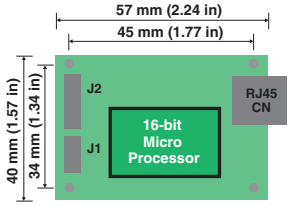
SNMP and E-mail Alerts for Event Trap and Notification

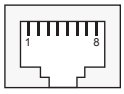
NE-4100 embedded device servers can be configured to send an SNMP trap or e-mail under the following conditions:

- Cold/warm start
- Password authentication failure
- Change in DSR/DCD line signal
- Change in IP address
- Change in password

Dimensions and Pin Assignment

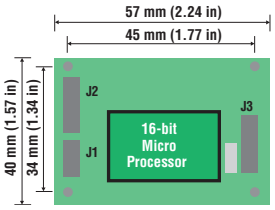
NE-4110S/4110A





PIN	Signals
1	Tx+
2	Tx-
3	Rx+
6	Rx-

NE-4120S/4120A



J3
Ethernet
Pin-header

1	Tx+
2	Tx-
3	
4	Rx+
5	Rx-

NE-4110/4120 Series

J2

GND	14	13	VCC(+5V)
GND	12	11	VCC(+5V)
DIO0	10	9	10M_LED
DIO1	8	7	100M_LED
DIO2	6	5	Ready_LED
DIO3	4	3	Reset
TxD1	2	1	RxD1

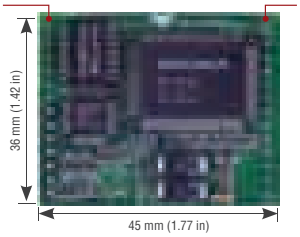
NE-4110S/4120S

J1

NC	10	9	NC
CTS0	8	7	RTS0
DSR0	6	5	GND
DTR0	4	3	TxD0
RxD0	2	1	DCD0

NE-4110T

Pin No.	Signal
1	ETx+
2	ETx-
3	ERx+
4	ERx-
5	LED 10M
6	TxD0
7	RxD0
8	RTS0
9	CTS0
10	Reset
11	GND
12	GND
13	TxD1



Pin No.	Signal
14	PIO0
15	PIO1
16	PIO2
17	PIO3
18	LED 100M
19	DCD0
20	DSR0
21	DTR0
22	GND
23	Ready LED
24	+5V
25	+5V
26	RxD1

(45 × 36 mm, 26-pin DIL package, 2.54 mm pitch)

NE-4110A/4120A

J1

NC	10	9	NC
NC	8	7	NC
NC	6	5	GND
RxD- (Data-)	4	3	RxD+ (Data+)
TxD+	2	1	TxD-

For 2-wire RS-485 mode, Pin 3 is Data+, Pin 4 is Data-

Specifications

Form Factor
Type:
NE-4110/4120: Ready-to-go stand-alone modules
NE-4100T: 26-pin dual-in-line package
Dimensions:
NE-4110/4120: 57 × 40 mm (2.24 x 1.57 in)
NE-4100T: 45 × 36 mm (1.77 x 1.42 in)
Weight:
NE-4110S/4110A: 40 g
NE-4120S/4120A/4100T: 20 g

Ethernet Interface
Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector:
NE-4110 Series: RJ45
NE-4120 Series: 5-pin pin header
NE-4100T: 26-pin dual-in-line
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface
Number of Ports: 2
Serial Standards:
• Port 1:
NE-4110S/4120S: RS-232
NE-4110A/4120A: RS-422, RS-485-4w, RS-485-2w
NE-4100T: TTL
• Port 2:
TTL console port
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF
Baudrate: 110 bps to 230.4 Kbps

Serial Signals
TTL:
• Port 1: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
• Port 2: TxD, RxD, GND
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Digital I/O Pins
GPIO: 4 programmable I/O pins

Software
Network Protocols: ICMP, ARP, IP, TCP, UDP, DHCP, Telnet, HTTP, SNMP V1/V2c, SMTP
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Windows Real COM Drivers: Windows 95/98/ME/NT/ 2000, Windows XP/2003/Vista/2008/7 x86/64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x
Operation Modes: Real COM, TCP Server, TCP Client, UDP

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Input Voltage: 5 VDC (±5%)
Power Consumption: 290 mA @ 5 VDC max.

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022 Class B, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD),
EN 61000-4-3 (RS),
EN 61000-4-4 (EFT),
EN 61000-4-5 (Surge),
EN 61000-4-6 (CS),
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE

Reliability
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
NE-4100T: 288,173 hrs
NE-4110A: 289,573 hrs
NE-4110S: 290,276 hrs
NE-4120A: 289,573 hrs
NE-4120S: 285,874 hrs

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Modules
NE-4110S: Device server module for RS-232 devices, supports 10/100BaseT(x) with RJ45 connector
NE-4110A: Device server module for RS-422/485 devices, supports 10/100BaseT(x) with RJ45 connector
NE-4120S: Device server module for RS-232 devices, supports 10/100BaseT(x) with 5-pin Ethernet pin header
NE-4120A: Device server module for RS-422/485 devices, supports 10/100BaseT(x) with 5-pin Ethernet pin header
NE-4100T: Device server module for TTL devices, supports 10/100BaseT(x) with DIL package

Available Starter Kits
NE-4110-ST: Starter kit for the NE-4110S and NE-4110A (module not included)
NE-4120-ST: Starter kit for the NE-4120S and NE-4120A (module not included)
NE-4100-ST: Starter kit for the NE-4100T (module not included)
Note: Starter kits do not include the module. Please order modules and evaluation kits separately.

Package Checklist (modules)
- NE-4100 series module

Package Checklist (starter kits)
- Evaluation board
- Universal power adaptor
- 2 power cords
- Null modem cable
- Cross-over Ethernet cable
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

WE-2100T Series

Wireless LAN embedded serial device servers



- Connects serial devices to IEEE 802.11a/b/g networks
- Choice of operation modes: Real COM, TCP Server, TCP Client, UDP, and RFC2217
- Windows real COM and Linux fixed TTY drivers provided
- Wireless security with WEP, WPA, and WPA2
- Select any baudrate between 50 bps and 921.6 Kbps
- 9 programmable digital I/O channels
- SSL/SSH encryption for configuration
- Compact size and easily mounted housing

Overview

The WE-2100T is a secure and compact embedded wireless module for connecting serial devices to access points in infrastructure mode, or to other WE-2100T's in ad-hoc mode. When using the WE-2100T, complex RF know-how is not needed to connect serial devices to a wireless Ethernet network. Encryption for secure data transfer is supported, along with the 802.11a/b/g radio specifications.

Operation Modes for Embedded Applications

The WE-2100T supports Real COM, TCP Server, TCP Client, UDP, and RFC 2217 operation modes, which are designed to fulfill the requirements of embedded module applications. Complete driver support for Real COM mode is included and easy to install.

On-site Configuration with Serial Command Mode

- Easy on-site configuration of network settings
- Simple command frame format
- Comprehensive command set for serial and network configuration
- Easily switch between software and hardware triggers
- Software reset

Specifications

Form Factor

Type: Small metal housing that encloses advanced ARM-based 32-bit processor; supports both wireless and Ethernet connections
Dimensions: 54 x 40 x 13.3 mm (2.13 x 1.57 x 0.52 in)
Weight: 100 g

Automatic Network Selection

Wireless or Ethernet: The WE-2100T will activate the Ethernet connection if detected at boot-up. If an Ethernet connection is not detected, the WE-2100T will choose wireless as the communication interface. Which interface to use can also be configured with the WE-2100T's configuration utilities.

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, auto MDI/MDIX
Connector: 44-pin dual-in-line
Magnetic Isolation Protection: 1.5 KV built-in

WLAN Interface

Standard Compliance: IEEE 802.11a/b/g
Network Modes: Infrastructure mode (a/b/g), Ad-Hoc mode (b/g)
Spread Spectrum Technology: DSSS, CCK, OFDM
Transmit Power:
5.15 to 5.25 GHz: 15 dBm @ 6 Mbps; 12 dBm @ 54 Mbps 5.725 to 5.825 GHz: 15 dBm @ 6 Mbps; 12 dBm @ 54 Mbps
2.412 to 2.483 GHz: 17 dBm @ 6 Mbps; 15 dBm @ 54 Mbps
2.412 to 2.472 GHz: 18 dBm @ 1 to 11 Mbps
Receive Sensitivity:
5.15 to 5.25 GHz: 6 Mbps @ -90 dBm; 54 Mbps @ -72 dBm
5.725 to 5.825 GHz: 6 Mbps @ -89 dBm; 54 Mbps @ -72 dBm
2.412 to 2.483 GHz: 6 Mbps @ -90 dBm; 54 Mbps @ -73 dBm
2.412 to 2.472 GHz: 11 Mbps @ -87 dBm; 1 Mbps @ -94 dBm
Transmission Rate:
802.11a: 54 Mbps
802.11b: 11 Mbps
802.11g: 54 Mbps
Transmission Distance: Up to 100 meters (in open areas)
Wireless Security: AES, WEP 64/128-bit, WPA, WPA2, PSK, 802.11i
802.11i Authentication: TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPv2, TTLS/PAP, TTLS/CHAP, TTLS/MSCHAP, TTLS/MSCHAPv2, TTLS/EAP-MSCHAPv2, TTLS/EAP-GTC, TTLS/EAP-MD5, LEAP

Channels:
North America: CH1 to CH11, 5150-5825 MHz
Europe: CH1 to CH13, 5150-5875 MHz
Japan: CH1 to CH14, 5150-5350 MHz
Antenna Connector: Reverse SMA
Antenna Gain: 2 DBi

Serial Interface

Number of Ports: 1
Serial Standards:
• Port 1: TTL
• Port 2: TTL console port

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 Kbps (non-standard buadrates supported)

Serial Signals

TTL:
• Port 1: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
• Port 2: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c, HTTP, SMTP, SNTP, SSH, HTTPS
Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility, Serial command mode (configured through the data port)
Windows Real COM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded
Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x
Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x
Operation Modes: Real COM, TCP Server, TCP Client, UDP, RFC2217

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Surface Temperature (at full baudrate of 921.6 Kbps)

Top Panel:
43.0°C, when air temp = 25°C
55.0°C, when air temp = 55°C
Bottom Panel:
44.5°C, when air temp = 25°C
67.0°C, when air temp = 55°C

Power Requirements

Input Voltage: 3.3 VDC (±5%)
Power Consumption:
921.6 Kbps (full speed): 540 mA
Idle: 190 mA
Ethernet mode: 670 mA
Inrush current: 2100 mA

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 55024,
EN 61000-4-2 (ESD),
EN 61000-4-3 (RS),
EN 61000-4-4 (EFT),
EN 61000-4-5 (Surge),
EN 61000-4-6 (CS),
EN 61000-4-11
Radio: EN 300 328, EN 301 489-1, EN 301 489-17, EN 301 893
Green Product: RoHS, CRoHS, WEEE

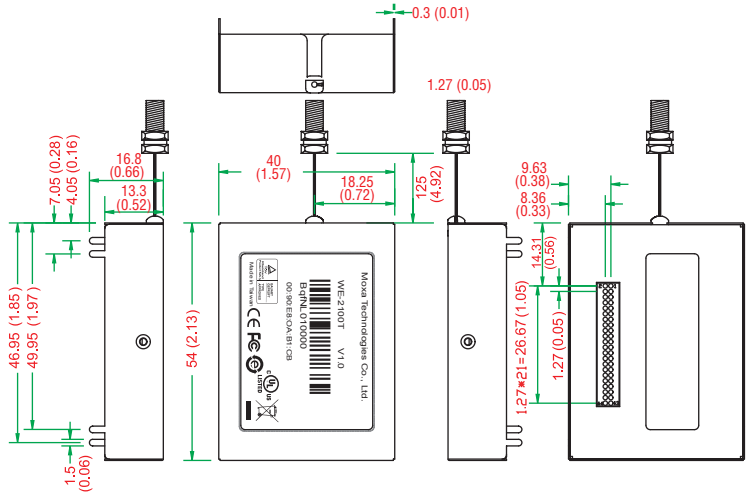
Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
WE-2100T: 505288 hrs

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions and Pin Assignment



3.3V	1	2	GND
3.3V	3	4	GND
3.3V	5	6	GND
Console_TxD	7	8	Console_RxD
Console_RTS	9	10	Console_CTS
Console_DTR	11	12	Console_DSR
PIO0	13	14	Console_DCD
PIO1	15	16	PIO4(WLAN strength 1)
PIO2	17	18	PIO5(WLAN strength 2)
PIO3	19	20	PIO6(WLAN strength 3)
Data_TxD	21	22	PIO7(WLAN strength 4)
Data_RTS	23	24	Data_RxD
Data_DTR	25	26	Data_CTS
Ready_LED	27	28	Data_DSR
Fault_LED	29	30	Data_DCD
Eth_Tx+	31	32	WLAN_Active_LED
Eth_Tx-	33	34	SW_RESET
Eth_Center_TAP	35	36	HW_RESET
Eth_Center_TAP	37	38	Eth_100M_LED
Eth_Rx+	39	40	Eth_10M_LED
Eth_Rx-	41	42	Reserved
PIO8(WLAN strength 0)	43	44	Reserved

Ordering Information

Available Modules

WE-2100T: 1-port wireless module supporting IEEE 802.11a/b/g

Available Starter Kits

WE-2100T-ST: Starter Kit for the WE-2100T (module not included)
Note: Starter kits do not include the WE-2100T module. Please order modules and evaluation kits separately.

Package Checklist (modules)

- WE-2100T wireless module
- IEEE 802.11a/b/g Antenna

Package Checklist (starter kits)

- WE-2100T-ST evaluation board
- Power adaptor
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

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Multiport Serial Boards

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10

Multiport Serial Boards



PCI Express Serial Boards



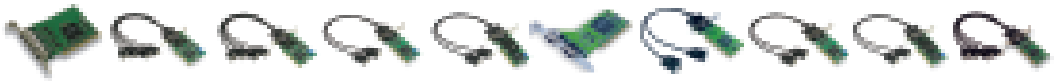
	CP-118EL-A	CP-168EL-A	CP-114EL	CP-114EL-I	CP-104EL-A	CP-102E	CP-102EL	CP-132EL	CP-132EL-I
Hardware									
Comm. Controller	16C550C compatible								
Bus	PCI Express x1								
Connector	VHDCI 68		DB44 female			DB9 male	DB25 female		
Serial Interface									
RS-232 Ports	–	8	–	–	4	2	2	–	–
RS-422 Ports	–	–	–	–	–	–	–	–	–
RS-422/485 Ports	–	–	–	–	–	–	–	2	2
RS-232/422/485 Ports	8	–	4	4	–	–	–	–	–
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF							XON/XOFF	
Baudrate	50 bps to 921.6 Kbps								
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	–	–	–	2 KV	–	–	–	–	2 KV
Driver Support									
Windows 9X/ME/NT	–	–	–	–	–	–	–	–	–
Windows 2000	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP/2003/Vista x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2008 x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 7 x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows CE 5.0	✓	✓	–	–	✓	–	–	–	–
Windows CE 6.0	–	–	–	–	–	–	–	–	–
Windows XP Embedded	✓	✓	✓	✓	✓	✓	✓	✓	✓
DOS	✓	✓	✓	✓	✓	✓	✓	✓	✓
Linux 2.4/2.6	✓	✓	✓	✓	✓	✓	✓	✓	✓
FreeBSD 4/5	✓	✓	–	–	✓	–	–	–	–
QNX 4	–	–	–	–	–	–	–	–	–
QNX 6	✓	✓	✓	✓	✓	✓	✓	✓	✓
SCO Open Server 5/6	✓	✓	✓	✓	✓	✓	✓	✓	✓
UnixWare 7	✓	✓	✓	✓	✓	✓	✓	✓	✓
Environmental Limits									
Dimensions (mm)	64.4 x 132	62.7 x 102	67.2 x 136.9	67.2 x 136.9	62.7 x 100	85.0 x 100	67.2 x 102.0	67.2 x 102.0	67.2 x 104.0
Operating Temperature	0 to 55°C								
Storage Temperature	-20 to 85°C								
Ambient Relative Humidity	5 to 95% RH (non-condensing)								
Standards and Certifications									
FCC Part 15 Subpart B Class	B	B	B	B	B	B	B	B	B
EN 55022	✓	✓	✓	✓	✓	✓	✓	✓	✓
EN 55024	✓	✓	✓	✓	✓	✓	✓	✓	✓
EN 61000-3-2	✓	✓	✓	✓	✓	✓	✓	✓	✓
EN 61000-3-3	✓	✓	✓	✓	✓	✓	✓	✓	✓
EN 61000-6-2	–	–	–	–	✓	–	–	–	–
EN 61000-6-4	–	–	–	–	✓	–	–	–	–
IEC 61000-4-2	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-3	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-4	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-5	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-6	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-8	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-11 (DIPS)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reliability									
Warranty	5 years (see www.moxa.com/warranty)								

Universal PCI Serial Boards



		C320Turbo/PCI	C218Turbo/PCI	CP-118U CP-118U-T	CP-138U CP-138U-T	CP-118U-I CP-118U-I-T	CP-138U-I CP-138U-I-T	CP-168U CP-168U-T	CP-114UL CP-114UL-T	CP-114UL-I CP-114UL-I-T	CP-104UL CP-104UL-T
Hardware											
Comm. Controller		MU860 (16C550C compatible)									
Bus		32-bit Universal PCI									
Connector		DB25 female	DB62 female			DB78 female		DB62 female	DB44 female		
Serial Interface											
RS-232 Ports		32	8	–	–	–	–	8	–	–	4
RS-422 Ports		–	–	–	–	–	–	–	–	–	–
RS-422/485 Ports		–	–	–	8	–	8	–	–	–	–
RS-232/422/485 Ports		–	–	8	–	8	–	–	4	4	–
Communication Parameters		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control		–	–	RTS/CTS, XON/XOFF				RTS/CTS, XON/XOFF			
Baudrate		50 bps to 460.8 Kbps	50 bps to 921.6 Kbps								
ESD Protection		–	Optional	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation		–	Optional	–	–	2 KV	2 KV	Optional	–	2 KV	–
Driver Support											
Windows 9X/ME/NT		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2000		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP/2003/Vista x86/x64		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2008 x86/x64		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 7 x86/x64		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows CE 5.0		–	–	✓	✓	✓	✓	✓	✓	✓	✓
Windows CE 6.0		–	–	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP Embedded		–	–	✓	✓	✓	✓	✓	✓	✓	✓
DOS		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Linux 2.4/2.6		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FreeBSD 4/5		–	–	✓	✓	✓	✓	✓	✓	✓	✓
QNX 4		✓	✓	–	–	–	–	–	–	–	–
QNX 6		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SCO Open Server 5/6		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UnixWare 7		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Environmental Limits											
Dimensions (mm)		90 x 120	105 x 180	82 x 135	82 x 135	105 x 133	105 x 133	82 x 120	64.4 x 120	64.4 x 120	64.4 x 120
Operating Temperature	Standard Temperature	0 to 55°C		0 to 55°C							
	Wide Temperature	–		-40 to 85°C							
Storage Temperature		-20 to 85°C		-40 to 85°C							
Ambient Relative Humidity		5 to 95% (non-condensing)		5 to 95% (non-condensing)							
Standards and Certifications											
FCC Part 15 Subpart B Class		A	A	B	B	B	B	B	B	B	B
EN 55022		✓	–	✓	✓	✓	✓	✓	✓	✓	✓
EN 55024		–	–	✓	✓	✓	✓	✓	✓	✓	✓
EN 61000-3-2		–	✓	✓	✓	✓	✓	✓	✓	✓	✓
EN 61000-3-3		–	✓	✓	✓	✓	✓	✓	✓	✓	✓
EN 61000-4-2		✓	✓	–	–	–	–	–	–	–	–
EN 61000-4-3		✓	✓	–	–	–	–	–	–	–	–
EN 61000-4-4		✓	✓	–	–	–	–	–	–	–	–
EN 61000-4-5		–	✓	–	–	–	–	–	–	–	–
EN 61000-4-6		–	✓	–	–	–	–	–	–	–	–
EN 61000-4-11 (DIPS)		–	✓	–	–	–	–	–	–	–	–
EN 61000-6-1		–	✓	–	–	–	–	–	–	–	–
EN 61000-6-3		–	✓	–	–	–	–	–	–	–	–
IEC 61000-4-2		–	–	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-3		–	–	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-4		–	–	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-5		–	–	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-6		–	–	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-8		–	–	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-11 (DIPS)		–	–	✓	✓	✓	✓	✓	✓	✓	✓
Reliability											
Warranty		5 years (see www.moxa.com/warranty)									

Universal PCI Serial Boards



	CP-104JU CP-104JU-T	CP-134U CP-134U-T	CP-134U-I CP-134U-I-T	CP-112UL CP-112UL-T	CP-112UL-I CP-112UL-I-T	CP-102U CP-102U-T	CP-102UL CP-102UL-T	CP-132UL CP-132UL-T	CP-132UL-I CP-132UL-I-T	POS-104UL POS-104UL-T
Hardware										
Comm. Controller	MU860 (16C550C compatible)									
Bus	32-bit Universal PCI									
Connector	RJ45 x 4	DB44 female		DB25 female		DB9 male x 2	DB25 female			DB44 female
Serial Interface										
RS-232 Ports	4	–	–	–	–	2	2	–	–	4
RS-422 Ports	–	–	–	–	–	–	–	–	–	–
RS-422/485 Ports	–	4	4	–	–	–	–	2	2	–
RS-232/422/485 Ports	–	–	–	2	2	–	–	–	–	–
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF							XON/XOFF		RTS/CTS, XON/XOFF
Baudrate	50 bps to 921.6 Kbps									
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	–	–	2 KV	–	2 KV	–	–	–	2 KV	–
Driver Support										
Windows 9X/ME/NT	✓	✓	✓	–	–	✓	✓	✓	✓	✓
Windows 2000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP/2003/Vista x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2008 x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 7 x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows CE 5.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows CE 6.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP Embedded	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DOS	✓	✓	✓	–	–	✓	✓	✓	✓	✓
Linux 2.4/2.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FreeBSD 4/5	✓	✓	✓	–	–	✓	✓	✓	✓	✓
QNX 4	–	–	–	–	–	–	–	–	–	–
QNX 6	✓	✓	✓	–	–	✓	✓	✓	✓	✓
SCO Open Server 5/6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UnixWare 7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Environmental Limits										
Dimensions (mm)	83 x 120	82.5 x 120	115 x 120	–	–	120 x 120	64.5 x 120	64.5 x 120	64.5 x 120	64.4 x 120
Operating Temperature – Standard Temperature	0 to 55°C									
Operating Temperature – Wide Temperature	-40 to 85°C									
Storage Temperature	-40 to 85°C									
Ambient Relative Humidity	5 to 95% (non-condensing)									
Standards and Certifications										
FCC Part 15 Subpart B Class	B	B	B	B	B	B	B	B	B	B
EN 55022	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EN 55024	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
EN 61000-3-2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EN 61000-3-3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EN 61000-6-2	–	–	–	–	–	–	–	–	–	✓
EN 61000-6-4	–	–	–	–	–	–	–	–	–	✓
IEC 61000-4-2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEC 61000-4-11 (DIPS)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reliability										
Warranty	5 years (see www.moxa.com/warranty)									

ISA Serial Boards

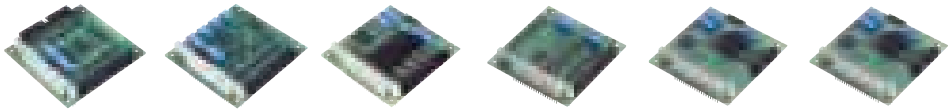






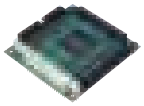
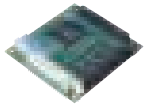
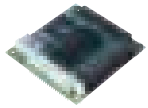

	C320Turbo	C218Turbo	C168H/C168HS	C104H/C104HS	CI-134/CI-134I/CI-134IS	CI-132/CI-132I/CI-132IS
Hardware						
Comm. Controller	16C550C compatible					
Bus	16-bit ISA					
Connector	DB25 female	DB62 female		DB37 female	DB37 female	DB9 male x 2
Serial Interface						
RS-232 Ports	32	8	8	4	–	–
RS-422 Ports	–	–	–	–	–	–
RS-422/485 Ports	–	–	–	–	4	2
RS-232/422/485 Ports	–	–	–	–	–	–
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark				Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark	
Flow Control	–	–	–	–	–	–
Baudrate	50 bps to 460.8 Kbps	50 bps to 921.6 Kbps			50 bps to 921.6 Kbps	
ESD Protection	–	Optional	– / 25 KV	– / 25 KV	– / – / 25 KV	– / – / 25 KV
Optical Isolation	–	Optional	Optional	–	– / 2 KV / 2 KV	– / 2 KV / 2 KV
Driver Support						
Windows 9X/ME/NT	✓	✓	✓	✓	✓	✓
Windows 2000	✓	✓	✓	✓	✓	✓
Windows XP/2003/Vista x86/x64	✓	✓	✓	✓	✓	✓
Windows 2008 x86/x64	✓	✓	✓	✓	✓	✓
Windows 7 x86/x64	✓	✓	✓	✓	✓	✓
Windows CE 5.0	–	–	–	–	–	–
Windows CE 6.0	–	–	–	–	–	–
Windows XP Embedded	–	–	✓	✓	✓	✓
DOS	✓	✓	✓	✓	✓	✓
Linux 2.4/2.6	✓	✓	✓	✓	✓	✓
FreeBSD 4/5	–	–	✓	✓	✓	✓
QNX 4	✓	✓	✓	✓	✓	✓
QNX 6	✓	✓	✓	✓	✓	✓
SCO Open Server 5/6	✓	✓	✓	✓	✓	✓
UnixWare 7	✓	✓	✓	✓	✓	✓
Environmental Limits						
Dimensions (mm)	107 x 158	105 x 180	93 x 157	83 x 157	85 x 160	75 x 157
Operating Temperature	0 to 55°C					
Storage Temperature	-20 to 85°C					
Ambient Relative Humidity	5 to 95% RH (non-condensing)					
Standards and Certifications						
FCC Part 15 Subpart B Class	A	A	A	A	B	B
EN 55022	✓	–	✓	✓	✓	✓
EN 61000-3-2	–	✓	–	–	–	–
EN 61000-3-3	–	✓	–	–	–	–
EN 61000-4-2	✓	✓	✓	✓	✓	✓
EN 61000-4-3	✓	✓	✓	✓	✓	✓
EN 61000-4-4	✓	✓	✓	✓	✓	✓
EN 61000-4-5	–	✓	–	–	–	–
EN 61000-4-6	–	✓	–	–	–	–
EN 61000-4-11 (DIPS)	–	✓	–	–	–	–
EN 61000-6-1	–	✓	–	–	–	–
EN 61000-6-3	–	✓	–	–	–	–
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

PC/104 Modules



	CA-108 CA-108-T	CA-114 CA-114-T	CA-134I CA-134I-T	CA-104 CA-104-T	CA-132 CA-132-T	CA-132I CA-132I-T
Hardware						
Comm. Controller	MU860 (16C550C compatible)					
Bus	PC/104 bus					
Box Header Connector	40-pin				20-pin	
Serial Interface						
RS-232 Ports	8	–	–	4	–	–
RS-422 Ports	–	–	–	–	–	–
RS-422/485 Ports	–	–	4	–	2	2
RS-232/422/485 Ports	–	4	–	–	–	–
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	–	–	–	–	–	–
Baudrate	50 bps to 921.6 Kbps					
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	–	–	2 KV	–	–	2 KV
Driver Support						
Windows 9X/ME/NT	✓	✓	✓	✓	✓	✓
Windows 2000	✓	✓	✓	✓	✓	✓
Windows XP/2003/Vista x86/x64	✓	✓	✓	✓	✓	✓
Windows 2008 x86/x64	–	–	–	–	–	–
Windows CE 5.0	✓	✓	✓	✓	✓	✓
Windows CE 6.0	✓	✓	✓	✓	✓	✓
Windows XP Embedded	✓	✓	✓	✓	✓	✓
DOS	✓	✓	✓	✓	✓	✓
Linux 2.4/2.6	✓	✓	✓	✓	✓	✓
FreeBSD 4/5	–	–	–	–	–	–
QNX 4	✓	✓	✓	✓	✓	✓
QNX 6	✓	✓	✓	✓	✓	✓
SCO Open Server 5/6	–	–	–	–	–	–
UnixWare 7	–	–	–	–	–	–
Environmental Limits						
Dimensions (mm)	90 x 96					
Operating Temperature – Standard Temperature	0 to 55°C					
Operating Temperature – Wide Temperature	-40 to 85°C					
Storage Temperature	-40 to 85°C					
Ambient Relative Humidity	5 to 95% (non-condensing)					
Standards and Certifications						
FCC Part 15 Subpart B Class	A	A	A	A	A	A
EN 55022	✓	✓	✓	✓	✓	✓
EN 55024	✓	✓	✓	✓	✓	✓
EN 61000-3-2	✓	✓	✓	✓	✓	✓
EN 61000-3-3	✓	✓	✓	✓	✓	✓
IEC 61000-6-2	✓	✓	✓	✓	✓	✓
IEC 61000-6-4	✓	✓	✓	✓	✓	✓
IEC 61000-4-2	✓	✓	✓	✓	✓	✓
IEC 61000-4-3	✓	✓	✓	✓	✓	✓
IEC 61000-4-4	✓	✓	✓	✓	✓	✓
IEC 61000-4-5	✓	✓	✓	✓	✓	✓
IEC 61000-4-6	✓	✓	✓	✓	✓	✓
IEC 61000-4-8	✓	✓	✓	✓	✓	✓
IEC 61000-4-11 (DIPS)	✓	✓	✓	✓	✓	✓
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					

PC/104-Plus Modules

	CB-108 CB-108-T	CB-114 CB-114-T	CB-134I CB-134I-T
Hardware			
Comm. Controller	MU860 (16C550C compatible)		
Bus	PC/104-Plus bus		
Box Header Connector	40-pin	40-pin	40-pin
Serial Interface			
RS-232 Ports	8	–	–
RS-422 Ports	–	–	–
RS-422/485 Ports	–	–	4
RS-232/422/485 Ports	–	4	–
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		
Flow Control	–	–	–
Baudrate	50 bps to 921.6 Kbps		
ESD Protection	15 KV	15 KV	15 KV
Optical Isolation	–	–	2 KV
Driver Support			
Windows 9X/ME/NT	–	–	–
Windows 2000	✓	✓	✓
Windows XP/2003/Vista x86/x64	✓	✓	✓
Windows 2008 x86/x64	✓	✓	✓
Windows 7 x86/x64	✓	✓	✓
Windows CE 5.0	✓	✓	✓
Windows CE 6.0	✓	✓	✓
Windows XP Embedded	✓	✓	✓
DOS	✓	✓	✓
Linux 2.4/2.6	✓	✓	✓
FreeBSD 4/5	–	–	–
QNX 4	–	–	–
QNX 6	✓	✓	✓
SCO Open Server 5/6	–	–	–
UnixWare 7	–	–	–
Environmental Limits			
Dimensions (mm)	90 x 96		
Operating Temperature – Standard Temperature	0 to 55°C		
Operating Temperature – Wide Temperature	-40 to 85°C		
Storage Temperature	-40 to 85°C		
Ambient Relative Humidity	5 to 95% (non-condensing)		
Standards and Certifications			
FCC Part 15 Subpart B Class	A	A	A
EN 55022	✓	✓	✓
EN 55024	✓	✓	✓
EN 61000-3-2	✓	✓	✓
EN 61000-3-3	✓	✓	✓
IEC 61000-6-2	✓	✓	✓
IEC 61000-6-4	✓	✓	✓
IEC 61000-4-2	✓	✓	✓
IEC 61000-4-3	✓	✓	✓
IEC 61000-4-4	✓	✓	✓
IEC 61000-4-5	✓	✓	✓
IEC 61000-4-6	✓	✓	✓
IEC 61000-4-8	✓	✓	✓
IEC 61000-4-11 (DIPS)	✓	✓	✓
Reliability			
Warranty	5 years (see www.moxa.com/warranty)		

Fiber Optic Serial Boards






	CP-102UF-M-ST	CP-102UF-M-ST-T	CP-102UF-S-ST	CP-102UF-S-ST-T
Hardware				
Bus	32-bit Universal PCI			
Optical Fiber Interface				
Mode	Multi-mode		Single-mode	
Fiber Connectors	ST type			
Cable Requirements	50/125, 62.5/125, or 100/140 µm		8.3/125, 8.75/125, 9/125 or 10/140 µm	
Transmission Distance	Max. 5 km		Max. 40 km	
Wavelength	820 nm		1310 nm	
Tx Output	-5 dBm			
Rx Sensitivity	-20 dBm		-24 dBm	
Point-to-Point Transmission	Half or full duplex			
Ring Transmission	Half duplex			
Serial Interface				
Number of Ports	2	2	2	2
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			
Flow Control	XON/XOFF			
Baudrate	50 bps to 921.6 Kbps			
Driver Support				
Windows 9X/ME/NT	–	–	–	–
Windows 2000	✓	✓	✓	✓
Windows XP/2003/Vista x86/x64	✓	✓	✓	✓
Windows 2008 x86/x64	✓	✓	✓	✓
Windows 7 x86/x64	✓	✓	✓	✓
Windows CE 5.0	✓	✓	✓	✓
Windows CE 6.0	✓	✓	✓	✓
Windows XP Embedded	✓	✓	✓	✓
DOS	✓	✓	✓	✓
Linux 2.4/2.6	✓	✓	✓	✓
FreeBSD 4/5	–	–	–	–
QNX 4	–	–	–	–
QNX 6	✓	✓	✓	✓
SCO Open Server 5/6	✓	✓	✓	✓
UnixWare 7	✓	✓	✓	✓
Environmental Limits				
Dimensions (mm)	64.4 x 120			
Operating Temperature	0 to 55°C	-40 to 85°C	0 to 55°C	-40 to 85°C
Storage Temperature	-40 to 85°C			
Ambient Relative Humidity	5 to 95% RH (non-condensing)			
Standards and Certifications				
FCC, Part 15 Class	B	B	B	B
EN55022	✓	✓	✓	✓
EN55024	✓	✓	✓	✓
EN61000-3-2	✓	✓	✓	✓
EN61000-3-3	✓	✓	✓	✓
IEC 61000-4-2	✓	✓	✓	✓
IEC 61000-4-3	✓	✓	✓	✓
IEC 61000-4-4	✓	✓	✓	✓
IEC 61000-4-5	✓	✓	✓	✓
IEC 61000-4-6	✓	✓	✓	✓
IEC 61000-4-8	✓	✓	✓	✓
IEC 61000-4-11 (DIPS)	✓	✓	✓	✓
Reliability				
Warranty	5 years (see www.moxa.com/warranty)			

CAN Interface Boards/Modules







		CP-602U-I CP-602U-I-T	CP-602E-I CP-602E-I-T	CB-602I CB-602I-T
Hardware				
CAN Controller		NXP SJA1000		
CAN Transceiver		PCA82C251		
Bus		32-bit Universal PCI	PCI Express x1	PC/104-Plus bus
Connectors		DB9 male x 2	DB9 male	20-pin
CAN Interface				
CAN Specification		CAN 2.0 A/B		
Signal Support		CAN _H, CAN_L, GND		
Ports		2		
Transfer Rate		1 Mbps		
Max Number of Boards per PC		4		
Optical Isolation		2 KV		
Termination Resistors		120 ohm (selected by jumper)		
Driver Support				
Windows 2000		✓	✓	✓
Windows XP/2003/Vista x86/x64		✓	✓	✓
Windows 2008 x86/x64		✓	✓	✓
Windows 7 x86/x64		✓	✓	✓
Visual Basic Library		✓	✓	✓
C/C++ Library		✓	✓	✓
Environmental Limits				
Dimensions (mm)		120 x 80	120 x 80	90 x 96
Operating Temperature	Standard Temperature	0 to 55°C		
	Wide Temperature	-40 to 85°C		
Storage Temperature		-40 to 85°C		
Ambient Relative Humidity		5 to 95% (non-condensing)		
Standards and Certifications				
FCC Part 15 Subpart B Class		B	B	B
EN 61000-3-2		✓	✓	–
EN 61000-3-3		✓	✓	✓
IEC 61000-4-2		✓	✓	✓
IEC 61000-4-3		✓	✓	✓
EC 61000-4-4		✓	✓	✓
IEC 61000-4-5		✓	✓	✓
IEC 61000-4-6		✓	✓	✓
IEC 61000-4-8		✓	✓	✓
IEC 61000-4-11 (DIPS)		✓	✓	✓
Reliability				
Warranty		5 years (see www.moxa.com/warranty)		

The Basics of RS-232/422/485

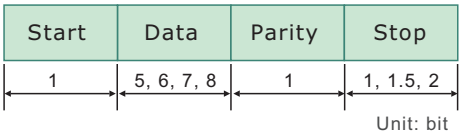
RS-232—the most common and easy-to-use communication interface

The RS-232 serial interface was developed for connecting a computer to common peripherals such as modems, overhead projectors, and the sensors and actuators used for industrial automation applications. Despite its limited 15 m transmission distance, RS-232 is low cost and easy-to-wire, making it the first choice for many applications.

RS-232 establishes full-duplex (2-way) communication, with signals represented by voltage levels measured with respect to a system common ground (power or logic ground). The "idle" state (MARK) is negative with respect to the common ground, and the "active" state (SPACE) is positive with respect to the common ground.

RS-232 Data Format

Start bit: 1 bit
Data bits: 5, 6, 7, or 8 bits
Parity: None, Odd, Even, Space, Mark
Stop bits: 1, 1.5 (if data bits = 5), or 2 bits



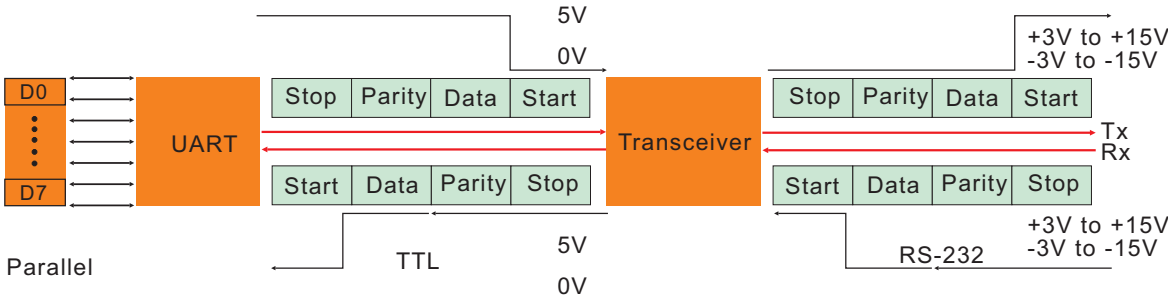
RS-232 Specifications

Standard	Connection Type	Operation Mode	Drivers per Line	Receivers per Line	Max. Cable Length	Max. Data Rate
EIA RS-232	Point-to-point	Single-ended	1	1	50 ft (15 m)	921.6 Kbps

RS-232 Signal Definition

The general relationship between the UART, TTL signal, transceiver, and RS-232 signal is illustrated in the following figure. UART is short for "universal asynchronous receiver transmitter," and TTL stands for "transistor to transistor logic." The UART, which is located on the serial board and stands between the computer's CPU and the transceiver, transmits signals at 0 and 5 volts. The RS-232 transceiver converts the signal voltage to +3V to +15V, and -3V to -15V.

TxD	Transmit Data
RxD	Receive Data
RTS	Request to Send
CTS	Clear to Send
DTR	Data Terminal Ready
DSR	Data Set Ready
DCD	Data Carrier Detect
GND	Ground

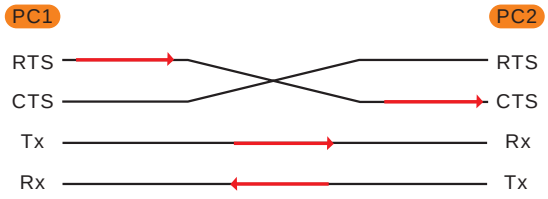


Flow Control

In RS-232 communications, one side of the connection sends a “flow control” signal to tell the other side to stop or start transmitting. Flow control signals are sent when the sender needs to take a break, such as when a data buffer is full.

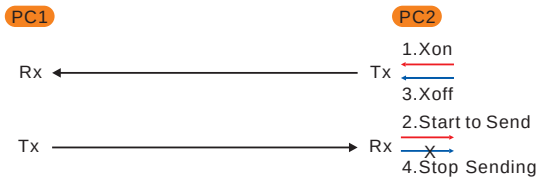
H/W Flow Control

Hardware flow control uses RS-232’s RTS and CTS signals to indicate when data transmission should be paused or re-started. For example, as indicated in the figure, when PC1 is ready to receive, it raises the RTS signal to request data from PC2.



S/W Flow Control

Software flow control works by sending an XON/XOFF signal through the data channels. For example, as indicated in the following figure, PC2 sends an XON pattern when it is ready to receive, and then when its Rx buffer is almost full, it sends an XOFF pattern to request that PC1 stop transmitting.



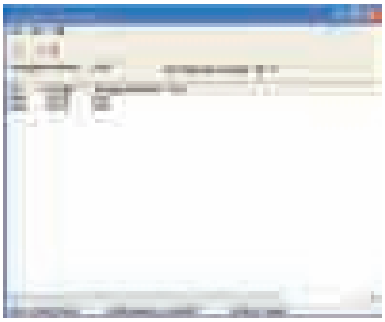
Use Moxa PComm Library to Make Serial Programming Easy

Moxa PComm Lite provides software developers with a complete library of intuitive function calls for developing serial comm applications under Windows NT, 95, 98, 2000, ME, XP, 2003, 2008, and 7. PComm Lite requires fewer lines of code than Microsoft’s more complex Win32 COMM API, allowing programmers to save time and reduce the number of bugs in their applications.

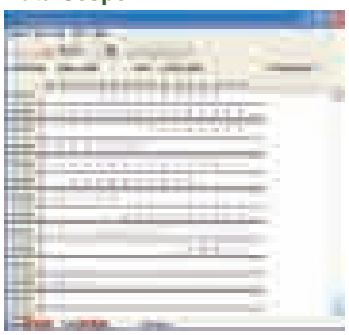
Features of Moxa PComm Library

- 50 easy-to-use API functions
- Superior troubleshooting utilities
- Supports multiple interfaces: VB, C/C++, Delphi
- Supports X/Y/ZModem, Kermit, and ASCII protocols
- Compatible with Win32 Comm API

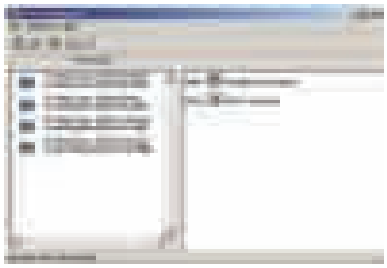
Performance Analyzer



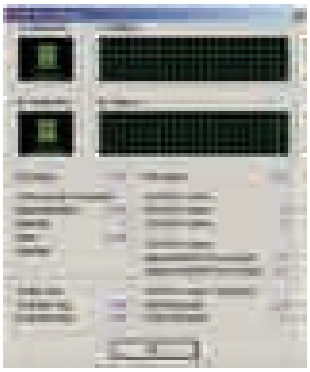
Data Scope



PComm Diagnostic



PComm Monitor





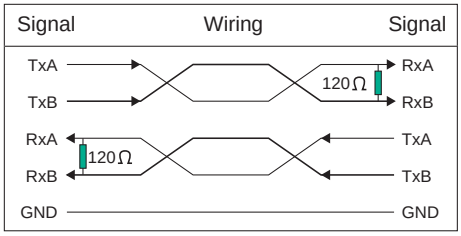
RS-422/485—tailor-made for industrial applications

Many of the devices used in today's industrial environments are designed for the RS-422 and RS-485 interfaces, both of which use "differential transmission" to "subtract out" external electronic and electromagnetic disturbances. For this reason, RS-422/485 can be used to transmit data up to 1.2 km. In addition to the need for long distance and multi-drop transmission, many industrial applications also require isolation, proper housing, heavy-duty wiring, a reliable power supply, and over-surge protection.

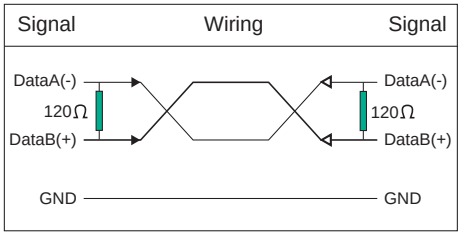
Differential Transmission

The RS-422 and RS-485 protocols use differential transmission to achieve high speed data transmission (up to 10 Mbps) over distances up to 4,000 feet (1.22 km). Differential transmission works by splitting each signal into two separate wires with opposite voltage states. The signals are subtracted at the receiving end, making this type of wiring configuration well-suited for noisy environments.

RS-422 Wiring



RS-485 Wiring



RS-422 vs. RS-485

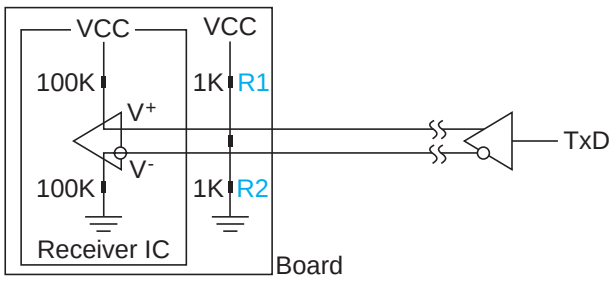
Standard	Connection Type	Operation Mode	Drivers per Line	Receivers per Line	Max. Cable Length	Max. Data Rate
EIA RS-422	Full-duplex, Point-to-point	Differential	1	10	4000 ft (1.22 km)	10 Mbps
EIA RS-485	Half-duplex, Multi-drop	Differential	32	31	4000 ft (1.22 km)	10 Mbps

Multi-drop Networks

RS-485 was designed for applications that require connecting multiple devices to a single data line. An RS-485 multi-drop network uses a balanced transmission system that can accept up to 32 devices on the same data line. This is achieved with tri-state drivers that are controlled by a programmable handshake line to ensure that only one device acts as a driver at any given time.

Termination

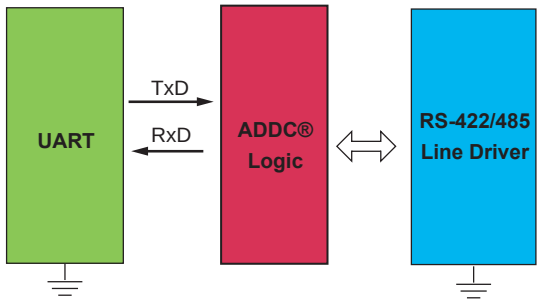
In order to prevent signal reflection, termination resistors are used to match the impedance of the receive and transmit nodes. The resistance needed to match the characteristic impedance is specified by the cable manufacturer. The most common value is 120 ohms.



ADDC® (Automatic Data Direction Control)

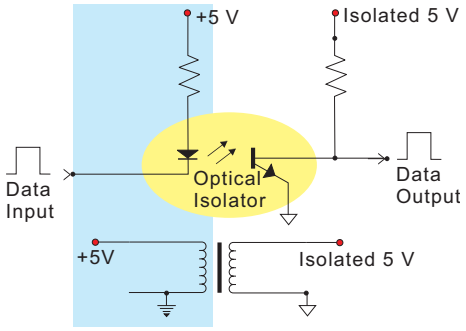
RS-485 uses differential data transmission over two wires to transmit data from one station to another, and allows multiple transmitters and receivers to be used on the same data line. RS-485 uses half-duplex transmission, which means that transmission and reception share the same data channels. For this reason, only one transmitter can be active at any given time.

Moxa's serial boards have a built-in circuitry to switch transmitters on and off automatically. We call this form of switching ADDC® (automatic data direction control). ADDC® is much easier to implement than the traditional "handshaking" method that uses the RTS signal.



Isolation Eliminates Ground Loops!

A common problem in many industrial applications is the disturbance caused by ground loop currents that flow through the ground line when ground voltages differ between connected devices. To overcome this problem, Moxa's industrial boards and full function converters use "optical isolation" to protect the boards against as much as 2000 volts.



Industrial Wiring Peripherals

Moxa provides an assortment of wiring peripherals that can be used to transform DB9 and DB25 connectors into terminal block connectors. The wiring peripherals shown below are DIN-Rail mountable.

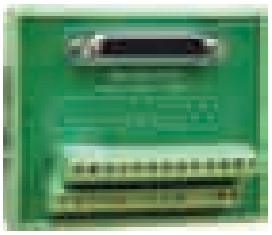
TB-F9



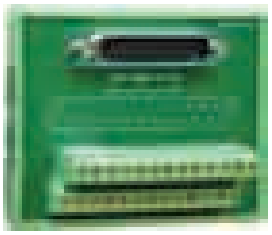
TB-M9



TB-F25



TB-M25



RS-422/485 Board Checklist

Be sure to answer the following questions before ordering your RS-422/485 board from Moxa:

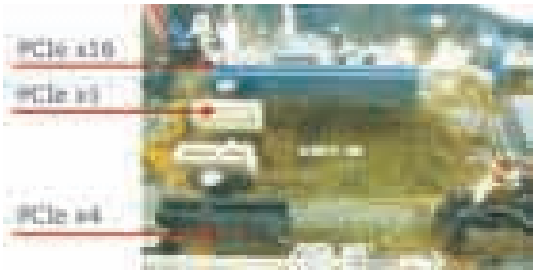
1. Does your system use RS-422, 2-wire RS-485, or 4-wire RS-485?
2. Does your application require "isolation protection" and/or "surge protection?"
3. What is the resistance of the termination resistors used by your application?
4. Is it easy to modify your application's resistor setup?
5. What range of baudrates does your application support?

Driver Support List

	Operating System																			
	DOS	Windows 3.x	Windows 9X	Windows NT	Windows 2000/XP/2003	Windows Vista/2008	Windows XP Embedded	Windows XP/2003/Vista/2008 x64	Windows 7 x86/x64	Windows CE 5.0	Windows CE 6.0	Linux 2.4/2.6	SCO OpenServer 5	SCO OpenServer 6	UnixWare 7	FreeBSD 4	FreeBSD 5	QNX4	QNX6	Solaris 10 x86/x64
C320Turbo/PCI	✓	–	✓	✓	✓	✓	–	✓	✓	–	–	✓	✓	✓	✓	–	–	✓	✓	–
C320Turbo	✓	✓	✓	✓	✓	✓	–	✓	✓	–	–	✓	✓	✓	✓	–	–	✓	✓	–
C218Turbo/PCI	✓	–	✓	✓	✓	✓	–	✓	✓	–	–	✓	✓	✓	✓	–	–	✓	✓	–
C218Turbo	✓	✓	✓	✓	✓	✓	–	✓	✓	–	–	✓	✓	✓	✓	–	–	✓	✓	–
CP-118EL-A	✓	–	–	–	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-168EL-A	✓	–	–	–	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-114EL	✓	–	–	–	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	–	–	–	✓	✓
CP-114EL-I	✓	–	–	–	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	–	–	–	✓	✓
CP-104EL-A	✓	–	–	–	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-102E	✓	–	–	–	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	–	–	–	✓	✓
CP-102EL	✓	–	–	–	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	–	–	–	✓	✓
CP-132EL	✓	–	–	–	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	–	–	–	✓	✓
CP-132EL-I	✓	–	–	–	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	–	–	–	✓	✓
CP-118U	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-138U	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-118U-I	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-138U-I	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-168U	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-114UL	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-114UL-I	✓	–	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	-	✓
CP-104UL	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-104JU	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
POS-104UL	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-134U	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-134U-I	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-112UL	✓	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	✓	✓
CP-112UL-I	✓	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	✓	✓
CP-132UL	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-132UL-I	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-102U	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-102UL	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
CP-102UF	✓	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	✓	✓
C168H Series	✓	–	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
C104H Series	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
CI-134 Series	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
CI-132 Series	✓	–	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
CA-108	✓	–	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	–	–	–	–	–	✓	✓	–
CA-114	✓	–	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	–	–	–	–	–	✓	✓	–
CA-134I	✓	–	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	–	–	–	–	–	✓	✓	–
CA-104	✓	–	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	–	–	–	–	–	✓	✓	–
CA-132/132I	✓	–	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	–	–	–	–	–	✓	✓	–
CB-108	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	✓	✓	✓
CB-114	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	✓	✓	✓
CB-134I	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	✓	✓	✓
CP-602E-I	–	–	–	–	✓	✓	–	✓	✓	–	✓	✓	–	–	–	–	–	–	–	–
CP-602U-I	–	–	–	–	✓	✓	–	✓	✓	–	✓	✓	–	–	–	–	–	–	–	–
CB-602I	–	–	–	–	✓	✓	–	✓	✓	–	✓	✓	–	–	–	–	–	–	–	–

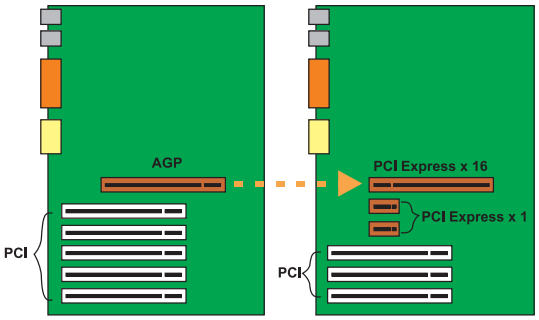
Introduction to PCI Express

The PCI Express serial interface is capable of transmitting data at 2.5 Gbps. This extremely high rate of data transmission is achieved by transmitting data bit-by-bit over "lanes" that consist of 2 pairs of wires (2 wires for transmitting and 2 wires for receiving). A single connection can achieve a burst mode transmission speed of 320 Mbps.



PCI Express to replace PCI, PCI-X, and AGP

The older PCI specification is based on a multi-drop parallel bus design. PCI Express, which will eventually replace PCI, PCI-X, and AGP, is a brand new I/O technology defined by the PCI-SIG. The PCI-SIG's stated goal is to create a unified standard that can handle a wide range of tasks.



Moxa's PCI Express Boards Fit Any PCI Express Slot

Multiple lanes are combined to create a PCI Express link, with the number of lanes used to label the connection by writing x1, x2, x4, x12, x16, or x32. Note that each lane uses 4 wires (e.g., a PCI Express x1 board uses 4 wires, and a PCI Express x16 board uses 64 wires). It should come as no surprise then that different sized connections use different sized slots. However, the beauty of the PCI Express design is that a PCI Express board can be installed in larger slots. This means that you can install Moxa's PCI Express x1 boards in any PCI Express slot.

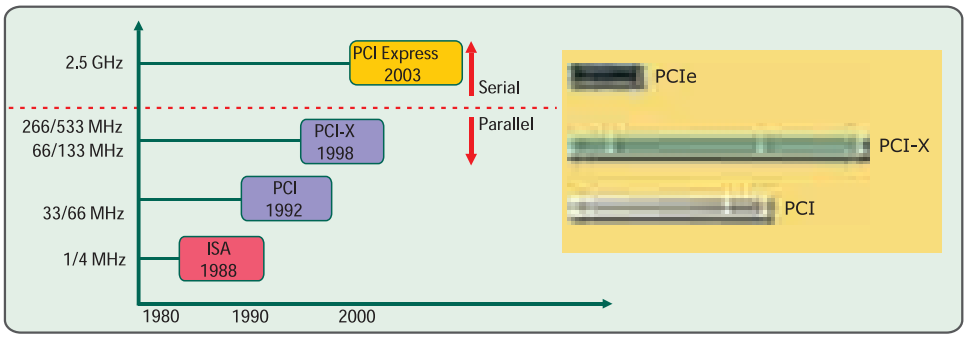
The difference between PCI and PCI Express

PCI Express is a serial interface that allows point-to-point connections between devices. This differs from the older PCI bus specification that uses a shared, parallel bus architecture.

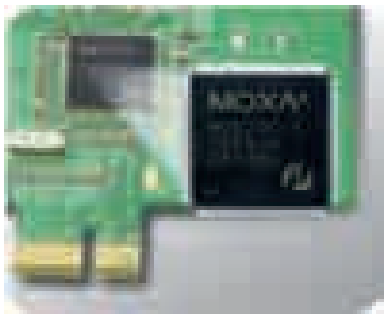
Bus Trend

ISA → PCI → PCI-X → PCI Express (PCIe)

Bus Transmission Speeds



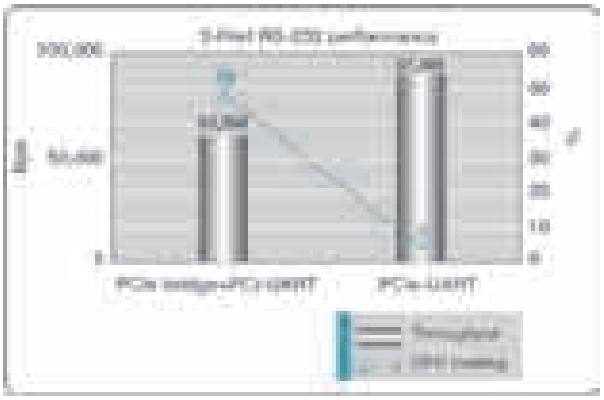
Another World First: Moxa Launches the "One-chip" PCI Express Board



For more than 20 years, Moxa has dedicated a large percentage of its R&D effort to the design of multiport serial boards, and this effort has paid off once again to the benefit of end-users around the world. Moxa's new "one-chip" PCI Express boards stand high above the crowd compared with other PCI Express boards on the market today. In fact, Moxa is the first manufacturer in the world to use an advanced one-chip PCIe-UART chip, which combines the PCIe bridge and UART on the same chip. The one-chip PCIe boards are designed for a longer MTBF and greater performance, and provide users with baudrates up to 921.6 Kbps and 15 KV ESD protection for greater reliability. Moreover, instead of requiring users to open up the computer to set DIP switches and jumpers manually, one-chip PCIe provides a convenient software solution for configuring the serial interface and termination resistors, giving users the benefit of easy maintenance.

One-chip Solution Optimizes CPU Performance

One-chip PCIe features a 33% higher throughput and decreases CPU load by 48%, outperforming traditional boards that use separate chips for the PCIe bridge and UART.



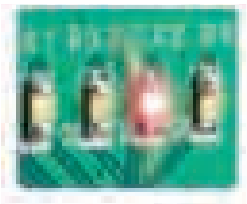
DIP Switch-less and Jumper-less Design

With this PCIe-UART, you can configure the serial interface and termination resistor by software instead of using a DIP switch and jumper. The absence of a DIP switch and jumper also makes these one-chip PCIe boards more user-friendly and easier to maintain, since there is no need to open up the computer to adjust the settings manually. Furthermore, the one-chip design reduces manufacturing time and costs since fewer components are required.



Onboard LEDs for Easy Maintenance

Moxa's multiport serial boards have onboard LEDs to clearly indicate data transmit/receive status. This is very helpful for users, especially since troubleshooting can be done without opening up the computer.



Drivers Galore

Moxa's PCI Express boards support a wide range of drivers for desktop solutions (Windows 2000, XP/Vista x86/x64) and server solutions (Windows 2003/2008, with certification). Moreover, we also provide drivers for Linux, SCO Open Server 5/6, QNX 6, Windows XP Embedded, UnixWare 7, and Windows 7.

CP-118EL-A

8-port RS-232/422/485 PCI Express serial board



- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Choose from a wide range of connection cables and boxes
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000), DOS, Linux 2.4/2.6,QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
- 15 KV ESD protection on the board

Overview

The CP-118EL-A is a smart, 8-port PCI Express board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 8 serial ports can be configured independently for RS-232, RS-422, or RS-485 (either 2-wire or 4-wire), and the ports supports a super fast 921.6 Kbps baudrate. The CP-118EL-A provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and its PCI Express "x1" classification allows it to be installed in any PCI Express slot.

Smaller Form Factor

The CP-118EL-A is a low profile board that is compatible with any PCI Express slot. The board requires only a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-118EL-A board is no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware
Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: VHDCI 68

Serial Interface
Number of Ports: 8
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support
Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, DOS, Linux 2.4, 2.6 x86/x64, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 68.9 x 88 mm (2.71 x 3.46 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

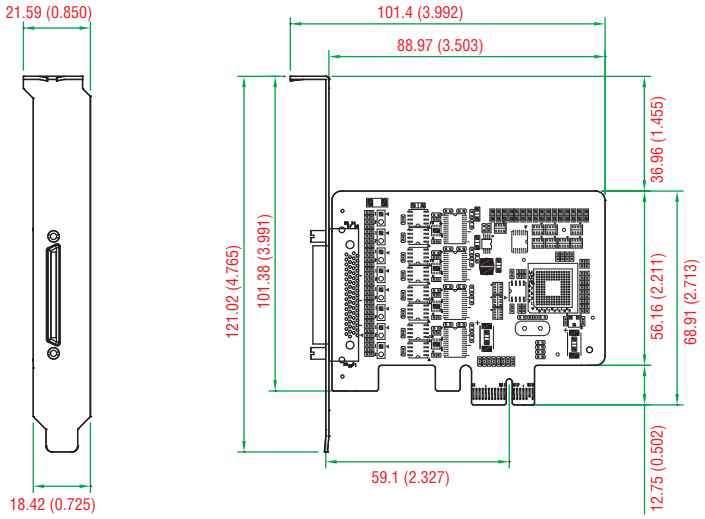
MTBF (mean time between failures)
Time: 2,079,962 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 1285 mA @ 3.3 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-118EL-A: 8-port RS-232/422/485 low profile PCI Express x1 serial board

Package Checklist

- 1 CP-118EL-A board
- Standard bracket and low profile bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

OPT8-M9+
DB9 male x 8 (150 cm cable)

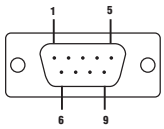


CBL-M68M9x8-100
DB9 male x 8 (100 cm cable)



PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

DB9 male



OPT8B+
DB25 male x 8 (150 cm cable)

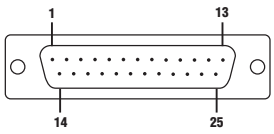


CBL-M68M25x8-100
DB25 male x 8, (100 cm cable)



PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	–
4	RTS	–	–
5	CTS	–	–
6	DSR	–	–
7	GND	GND	GND
8	DCD	TxD-(A)	–
20	DTR	RxD-(A)	Data-(A)

DB25 male



OPT8A+
DB25 female x 8 (150 cm cable)

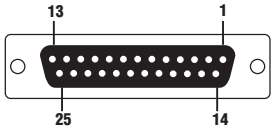


OPT8S+
DB25 female x 8 (150 cm cable)
25 KV ESD Surge Protection



PIN	RS-232	RS-422/RS-485-4w	RS-485-2w
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	CTS	–	–
5	RTS	–	–
6	DTR	RxD-(A)	Data-(A)
7	GND	GND	GND
8	DCD	TxD-(A)	–
20	DSR	–	–

DB25 female



CP-168EL-A

8-port RS-232 PCI Express serial board



- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Choose from a wide range of connection cables and boxes
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000), DOS, Linux 2.4/2.6,QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
- 15 KV ESD protection on the board

PComm Lite

Overview

The CP-168EL-A is a smart, 8-port PCI Express board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 8 RS-232 serial ports supports a super fast 921.6 Kbps baudrate. The CP-168EL-A provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and its PCI Express "x1" classification allows it to be installed in any PCI Express slot.

Smaller Form Factor

The CP-168EL-A is a low profile board that is compatible with any PCI Express slot. The board requires only a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-168EL-A board is no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware
Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: VHDCI 68

Serial Interface
Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support
Operating Sytems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, DOS, Linux 2.4, 2.6 x86/x64, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64

Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 64.42 x 102 mm (2.54 x 4.02 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

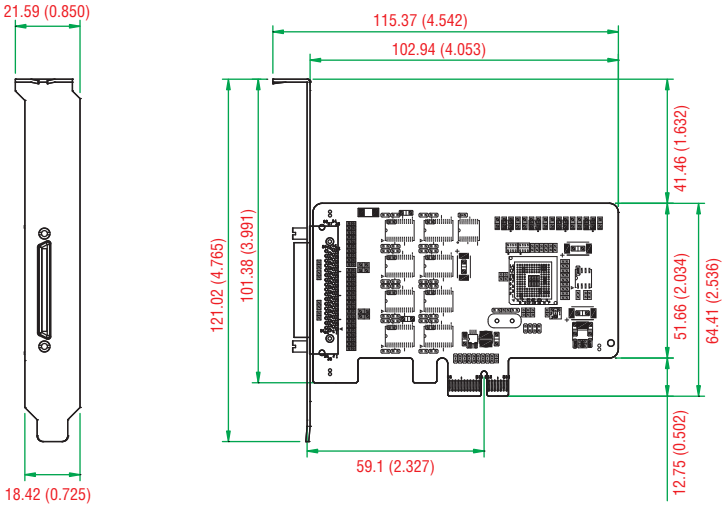
MTBF (mean time between failures)
Time: 6,824,634 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 1225 mA @ 3.3 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-168EL-A: 8-port RS-232 low profile PCI Express x1 serial board

Package Checklist

- 1 CP-168EL-A board
- Standard bracket and low profile bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

OPT8-M9+
DB9 male x 8 (150 cm cable)



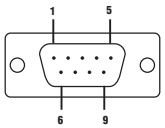
CBL-M68M9x8-100
DB9 male x 8 (100 cm cable)



PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR

PIN	RS-232
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



OPT8B+
DB25 male x 8 (150 cm cable)



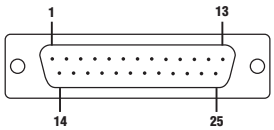
CBL-M68M25x8-100
DB25 male x 8 (100 cm cable)



PIN	RS-232
2	TxD
3	RxD
4	RTS
5	CTS

PIN	RS-232
6	DSR
7	GND
8	DCD
20	DTR

DB25 male



OPT8A+
DB25 female x 8, 150 cm Cable



OPT8S+
DB25 female x 8 (150 cm cable)
25 KV ESD protection



OPT8F+/Z+ (RS-422)
DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor
(115.2 Kbps max. baudrate)



OPT8F+ with 500 V isolation

OPT8K+ (RS-422/485)
DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor



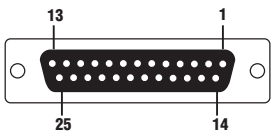
OPT8K+ with 2 KV isolation

PIN	RS-232
2	RxD
3	TxD
4	CTS
5	RTS

PIN	RS-232
6	DTR
7	GND
8	DCD
20	DSR

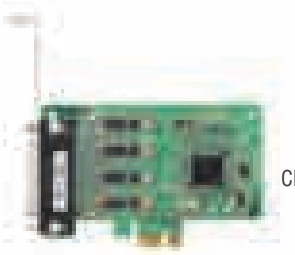
PIN	RS-422/RS-485-4w	RS-485-2w
2	RxD+(B)	Data+(B)
3	TxD+(B)	
7	GND	GND
14	RxD-(A)	Data-(A)
16	TxD-(A)	

DB25 female

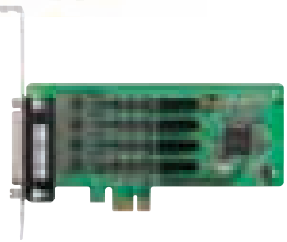


CP-114EL/EL-I

4-port RS-232/422/485 PCI Express boards with optional 2 KV isolation



CP-114EL



CP-114EL-I

PComm Lite

- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000), Linux 2.4, Linux 2.6 (x86/x64), QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7, Solaris 10 x86/x64
- 15 KV ESD protection on the board

Overview

The CP-114EL and CP-114EL-I are smart, 4-port PCI Express boards designed for POS and ATM applications. The boards are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows and Linux. In addition, each of the boards' 4 RS-232/422/485 serial ports supports a super fast 921.6 Kbps baudrate. The CP-114EL and CP-114EL-I provide full modem control signals to ensure compatibility with a wide range of serial peripherals, and their PCI Express "x1" classification allows the boards to be installed in any PCI Express slot.

Smaller Form Factor

The CP-114EL and CP-114EL-I are low profile boards that are compatible with any PCI Express slot. The boards require only a 3.3 VDC power supply, which means that the boards fit any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux

Moxa continues to support a wide variety of operating systems, and the CP-114EL/EL-I boards are no exception. Reliable Windows COM and Linux TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-114EL-I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions:
CP-114EL: 67.21 x 103 mm (2.69 x 4.06 in)
CP-114EL-I: 67.21 x 135 mm (2.69 x 5.31 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 684,289 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

Power Consumption:
CP-114EL: 835 mA @ 3.3 V
CP-114EL-I: 1170 mA @ 3.3 V

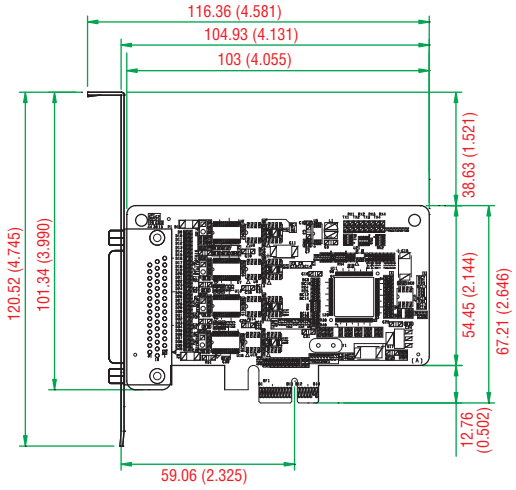
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

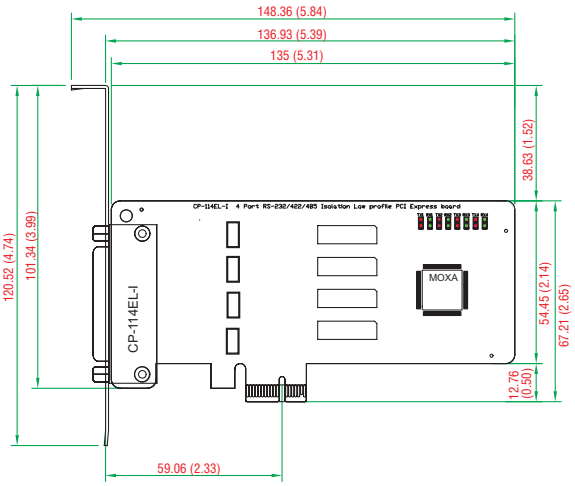
Dimensions

Unit: mm (inch)

CP-114EL



CP-114EL-I



Ordering Information

Available Models

CP-114EL: 4-port RS-232/422/485 low profile PCI Express x1 serial board
CP-114EL-I: 4-port RS-232/422/485 low profile PCI Express x1 serial board with optical isolation
CP-114EL-DB9M: 4-port RS-232/422/485 low profile PCI Express x1 serial board (includes DB9 male cable)
CP-114EL-DB25M: 4-port RS-232/422/485 low profile PCI Express x1 serial board (includes DB25 male cable)
CP-114EL-I-DB9M: 4-port RS-232/422/485 low profile PCI Express x1 serial board with optical isolation (includes DB9 male cable)
CP-114EL-I-DB25M: 4-port RS-232/422/485 low profile PCI Express x1 serial board with optical isolation (includes DB25 male cable)

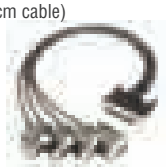
Package Checklist

- 1 CP-114EL or CP-114EL-I board
- Standard bracket and low profile bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

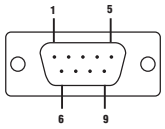
CBL-M44M9x4-50

DB44 male to DB9 male x 4 (50 cm cable)



PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD–(A)	TxD–(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD–(A)	RxD–(A)	Data–(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
9	–	–	–	–

DB9 male



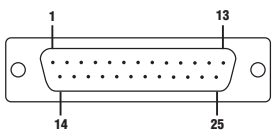
CBL-M44M25x4-50

DB44 male to DB25 male x 4 (50 cm cable)



PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	–
4	RTS	–	–	–
5	CTS	–	–	–
6	DSR	–	–	–
7	GND	GND	GND	GND
8	DCD	TxD–(A)	TxD–(A)	–
20	DTR	RxD–(A)	RxD–(A)	Data–(A)
22	–	–	–	–

DB25 male



CP-104EL-A

4-port RS-232 PCI Express serial board



- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000), DOS, Linux 2.4/2.6,QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
- Easy maintenance with on-board LEDs and management software
- 15 KV ESD protection on the board

PComm Lite

Overview

The CP-104EL-A is a smart, 4-port PCI Express board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 4 RS-232 serial ports supports a super fast 921.6 Kbps baudrate. The CP-104EL-A provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and its PCI Express "x1" classification allows it to be installed in any PCI Express slot.

Smaller Form Factor

The CP-104EL-A is a low profile board that is compatible with any PCI Express slot. The board requires only a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-104EL-A board is no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, DOS, Linux 2.4, 2.6 x86/x64, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions: 67.21 x 103 mm (2.65 x 4.06 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, EN 61000-6-2, EN 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 7,723,378 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

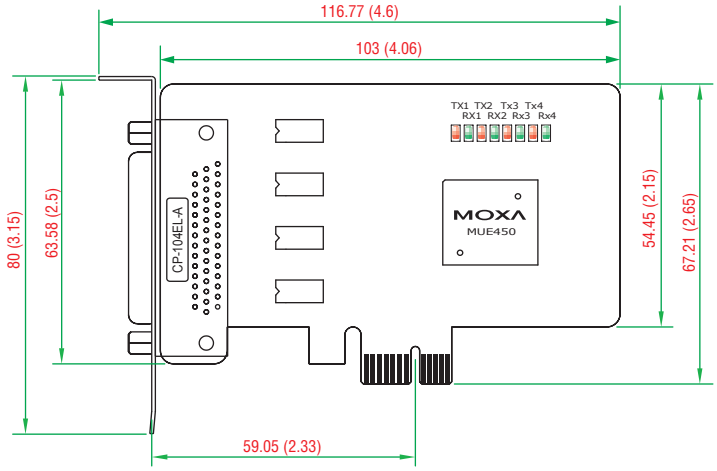
Power Consumption: 805 mA @ 3.3 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-104EL-A-DB9M: 4-port RS-232 PCI low profile Express x1 serial board (includes DB9 male cable)
CP-104EL-A-DB25M: 4-port RS-232 low profile PCI Express x1 serial board (includes DB25 male cable)

Package Checklist

- 1 CP-104EL-A board
- DB9-M or DB25-M connection cable
- Standard bracket and low profile bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

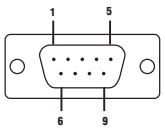
Connection Options (can be purchased separately)

CBL-M44M9x4-50
DB44 male to DB9 male x 4 (50 cm cable)



PIN	RS-232	PIN	RS-232
1	DCD	5	GND
2	RxD	6	DSR
3	TxD	7	RTS
4	DTR	8	CTS

DB9 male

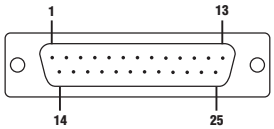


CBL-M44M25x4-50
DB44 male to DB25 male x 4 (50 cm cable)



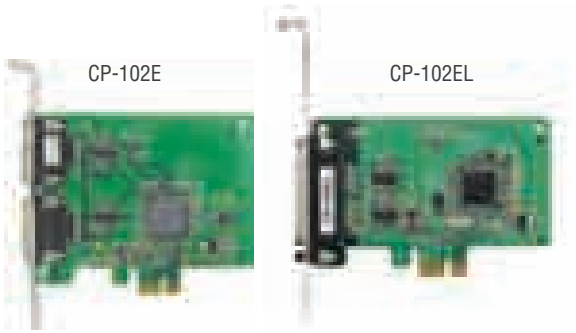
PIN	RS-232	PIN	RS-232
2	TxD	6	DSR
3	RxD	7	GND
4	RTS	8	DCD
5	CTS	20	DTR

DB25 male



CP-102E/EL

2-port RS-232 PCI Express boards



- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000), Linux 2.4, Linux 2.6 (x86/x64) QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7, Solaris 10 x86/x64
- 15 KV ESD protection on the board

PComm Lite

Overview

The CP-102E and low profile CP-102EL are 2-port PCI Express boards designed for POS and ATM applications. Moxa's PCI Express boards are a top choice of industrial automation engineers and system integrators, particularly since the boards support many different operating systems, including Windows and Linux. The CP-102E/EL's 2 RS-232 serial ports support a super fast 921.6 Kbps baudrate, and provide full modem control signals to ensure compatibility with a wide range of serial peripherals. In addition, the boards' x1 classification allows them to be installed in any PCI Express slot.

Smaller Form Factor

The CP-102EL is a low profile board that is compatible with any PCI Express slot. The CP-102EL board only requires a 3.3 VDC power supply, which means that the board fits any host computer, ranging from shoebox to standard-sized PCs.

Drivers Provided for Windows, Linux

Moxa continues to support a wide variety of operating systems, and the CP-102E/EL boards are no exception. Reliable Windows COM and Linux TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration applications.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connectors:
CP-102E: DB9 male
CP-102EL: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, Linux 2.4, Linux 2.6 x86/x64, QNX 6, Windows XP Embedded, DOS, SCO OpenServer 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions:
CP-102E: 85.04 x 100 mm (3.40 x 4.00 in)
CP-102EL: 67.21 x 101.97 mm (2.69 x 4.08 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B

EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 3,901,175 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

Power Consumption:
CP-102E: 520 mA @ 3.3 V
CP-102EL: 552 mA @ 3.3 V

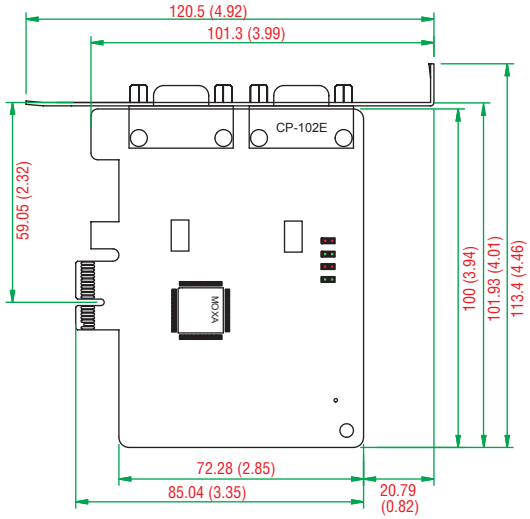
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

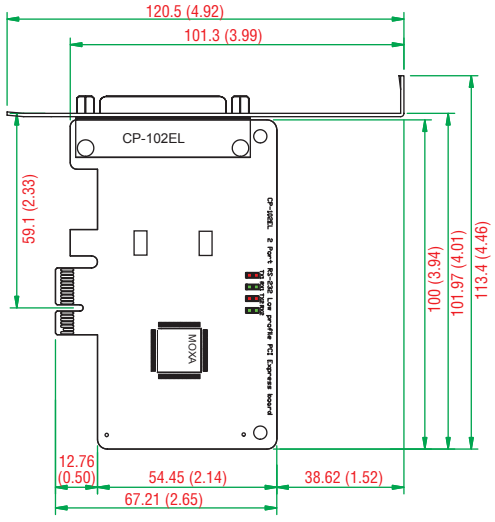
Dimensions

Unit: mm (inch)

CP-102E



CP-102EL



Ordering Information

Available Models

CP-102E: 2-port RS-232 PCI Express x1 serial board
CP-102EL-DB9M: 2-port RS-232 low profile PCI Express serial board (includes DB9 male cable)

Package Checklist

- 1 CP-102E or CP-102EL board
- Low profile bracket (CP-102EL only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

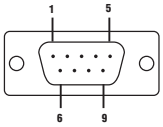
Connection Options (CP-102EL only, can be purchased separately)

CBL-M25M9x2-50
DB25 male to DB9 male x 2
(50 cm cable)



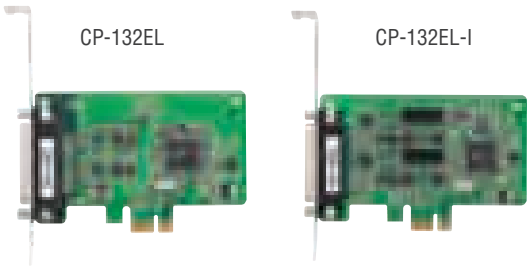
PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



CP-132EL/EL-I

2-port RS-422/485 PCI Express boards with optional 2 KV isolation



- PCI Express x1 compliant
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip S/W flow control
- Low profile form factor fits small-sized PCs
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000), Linux 2.4, Linux 2.6 (x86/x64), Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7, Solaris 10 x86/x64
- 15 KV ESD protection on the board

PComm Lite

Overview

The CP-132EL and CP-132EL-I are 2-port PCI Express boards designed for industrial automation applications that require a long distance, multi-point, PC-based data acquisition solution.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-132EL/EL-I boards have 2 RS-422/485 serial ports, each of which can achieve data rates up to 921.6 Kbps. In RS-485 mode, the boards can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, choose the CP-132EL-I model, which comes with 2 KV optical isolation protection to prevent equipment damage.

Drivers Provided for Windows and Linux

Moxa continues to support a wide variety of operating systems, and the CP-132EL/EL-I boards are no exception. Reliable Windows COM and Linux TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: 16C550C compatible
Bus: PCI Express x1
Connector: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-132EL-I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: XON/XOFF

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, Linux 2.4, Linux 2.6 x86/x64, QNX 6, Windows XP Embedded, SCO OpenServer 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions:
CP-132EL: 67.21 x 101.97 mm (2.65 x 4.08 in)
CP-132EL-I: 67.21 x 103.97 mm (2.65 x 4.16 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B

EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 1,530,088 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

Power Consumption:
CP-132EL: 548 mA @ 3.3 V
CP-132EL-I: 636 mA @ 3.3 V

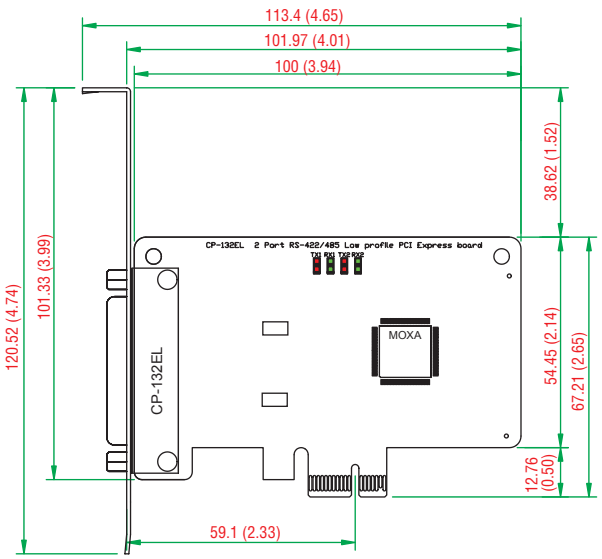
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

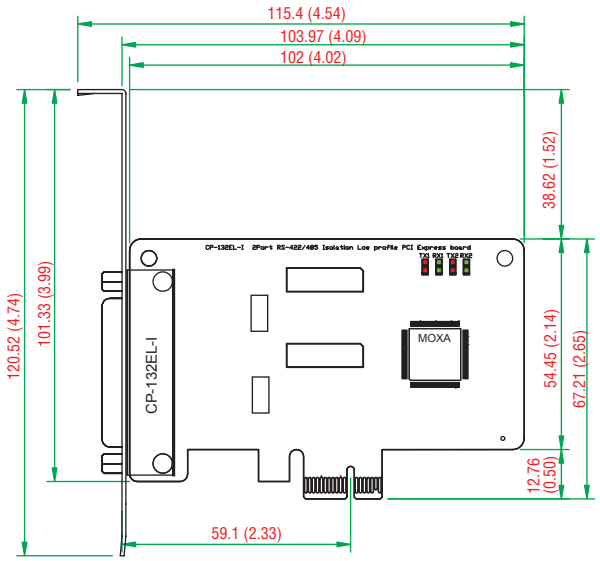
Dimensions

Unit: mm (inch)

CP-132EL



CP-132EL-I



Ordering Information

Available Models

CP-132EL-DB9M: 2-port RS-422/485 low profile PCI Express x1 serial board (includes DB9 male cable)
CP-132EL-I-DB9M: 2-port RS-422/485 low profile PCI Express x1 serial board with optical isolation (includes DB9 male cable)

Package Checklist

- 1 CP-132EL or CP-132EL-I board
- Low profile bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

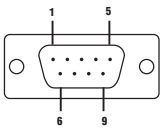
Connection Options (can be purchased separately)

CBL-M25M9x2-50
DB25 male to DB9 male x 2 (50 cm cable)



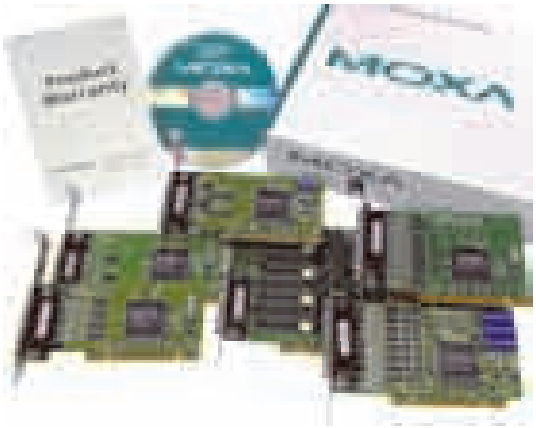
PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD–(A)	–
2	TxD+(B)	–
3	RxD+(B)	Data+(B)
4	RxD–(A)	Data–(A)
5	GND	GND
6	–	–
7	–	–
8	–	–

DB9 male



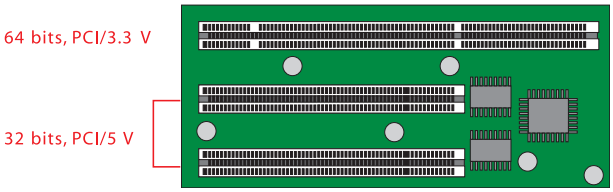
Introduction to Universal PCI

The universal PCI standard was created to give users greater versatility. Universal PCI boards can be used in either 3.3-volt or 5-volt PCI slots, which means that Moxa's universal PCI boards can be used in any PC that has a PCI slot. Choose from boards with 2, 4, or 8 independent serial ports (RS-232, RS-422, RS-485) for connecting data acquisition equipment and other serial devices to your PC.



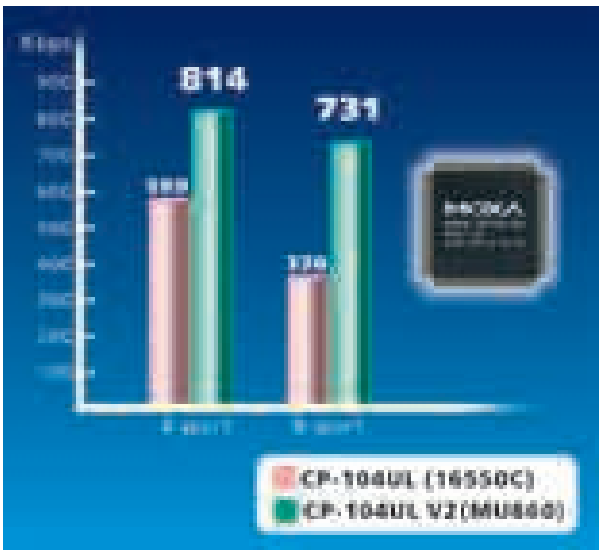
One of the drawbacks of the original PCI bus standard is that it only supports a 32-bit bus and 5V connector key. The need for increased bandwith, reduced power consumption, and high-speed transmission gave rise to a new 64-bit/3.3V PCI standard. Moxa's universal PCI boards have it all:

- Support for both 32-bit and 64-bit PCI buses
- Suport for both 3.3V and 5V connector keys



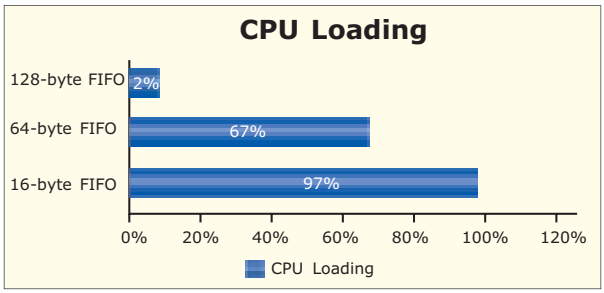
Increased FIFO Buffer for Better Performance

The larger FIFO buffer on Moxa's universal PCI boards takes a big load off your PC's CPU, resulting in better overall performance.



Testing Environment

CPU: AMD-K6-500
Main Board: GA-5AX
Memory: 128 MB
OS: Win2K
Products: CP-104UL (16550C), CP-104UL V2 (MU860)
Ports: 16 ports (4 boards)
Flow Control: Hardware Flow Control
Test Procedure: Performance Analyzer for burn-in test



Forward and Backward Compatibility

Compatible with all major operating systems

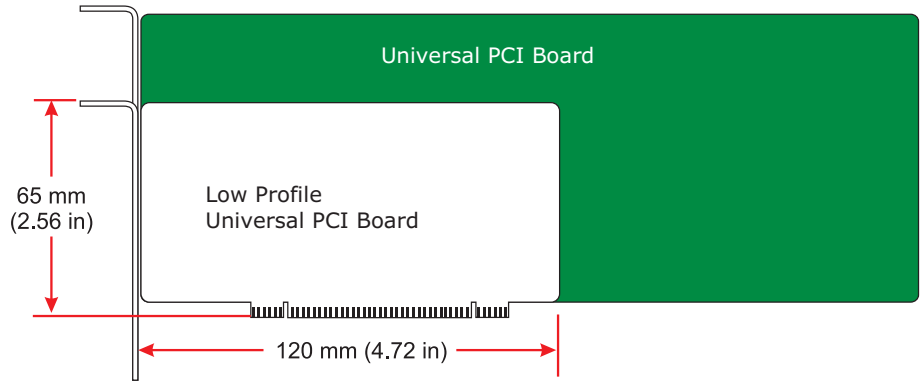
DOS — Win 95 — Win 98 — Win ME — Win NT

Win 2K — Win XP — Win XP Embedded — Win 2003 — Win 64-bit — WEPOS — Win Vista — Win 2008 — Win 7

Linux 2.4 — Linux 2.6 — Linux 64-bit

SCO Open Server 5 — SCO Unixware 7 — SCO Open Server 6

MD1 low profile boards fit most systems



Moxa's universal PCI boards are compatible with Moxa's PCI Boards

CP-168U = C168H/PCI
CP-134U Series = CP-114 Series
CP-104UL = C104H/PCI
CP-132UL Series = CP-132 Series

Universal PCI Board Quick Selection Guide

Interface	Ports	Product	Universal PCI	15 KV ESD Protection	2 KV Optical Isolation	Low Profile	Serial Port Power
RS-232	2	CP-102U	✓	✓	–	–	–
		CP-102UL	✓	✓	–	✓	–
	4	CP-104UL	✓	✓	–	✓	–
		CP-104JU	✓	✓	–	–	–
		POS-104UL	✓	✓	–	✓	✓
	8	CP-168U	✓	✓	–	–	–
RS-422/485	2	CP-132UL-I	✓	✓	✓	✓	–
		CP-132UL	✓	✓	–	✓	–
	4	CP-134U	✓	✓	–	–	–
		CP-134U-I	✓	✓	✓	–	–
	8	CP-138U	✓	✓	–	–	–
		CP-138U-I	✓	✓	✓	–	–
RS-232/422/485	2	CP-112UL	✓	✓	–	✓	–
		CP-112UL-I	✓	✓	✓	✓	–
	4	CP-114UL	✓	✓	–	✓	–
		CP-114UL-I	✓	✓	✓	✓	–
	8	CP-118U	✓	✓	–	–	–
		CP-118U-I	✓	✓	✓	–	–
Serial-over-Fiber	2	CP-102UF	✓	✓	–	–	–

Wide Temperature Models of Moxa's Universal PCI Boards Fit for Harsh Industrial Applications

Industrial applications are often associated with harsh, demanding environments, and of all the features that distinguish industrial products from commercial-grade products, the "Wide Temperature" feature is considered the most important. Facilities or key devices may be located at remote sites where there is no protection from severe weather conditions. For devices that are not designed to tolerate harsh conditions, this often presents significant limitations in how they can be used for the application.

Moxa offers wide temperature Universal PCI models that can operate reliably between -40 and 85°C. Wide temperature models present a much more reliable and affordable alternative to using regular industrial-grade devices. They are an ideal solution for any application that involves harsh industrial environments, such as power substation automation, intelligent transportation systems, environmental monitoring, manufacturing automation, and other similar systems.

- Outdoor applications, such as deserts or mountains, where it is difficult or costly to build a climate-controlled shelter for sensitive electronic equipment
- Indoor applications, such as in factories or laboratories, where equipment must be placed near machines that generate extreme heat or cold
- Mobile or mixed applications in harsh environments, such as in the military, where machines must operate reliably in low and high temperatures

Moxa's wide temperature Universal PCI boards support an operating temperature range from -40 to 85°C, which is one more reason why Moxa is a leading provider of multiport serial boards.

Wide Temperature Universal PCI Board Quick Selection Guide

Interface	Ports	Product
RS-232	2	CP-102U-T
		CP-102UL-T
	4	CP-104UL-T
		CP-104JU-T
		POS-104UL-T*
	8	CP-168U-T
RS-422/485	2	CP-132UL-T
		CP-132UL-I-T
	4	CP-134U-T
		CP-134U-I-T
	8	CP-138U-T
		CP-138U-I-T
RS-232/422/485 Serial-over-Fiber	2	CP-112UL-T
		CP-112UL-I-T
	4	CP-114UL-T
		CP-114UL-I-T
	8	CP-118U-T
		CP-118U-I-T
	2	CP-102UF-T

* Supports power over serial



C320Turbo Series

8 to 32-port intelligent RS-232 Universal PCI and ISA serial boards



PComm Lite

- Supports 128 high-performance serial ports per system
- Dramatically decreases host CPU load
- Modular design makes port expansion easy
- Monitor transmission status with LEDs on the module and two 7-segment displays
- Drivers provided for a broad selection of operating systems
- 460.8 Kbps maximum baudrate

Overview

The intelligent C320Turbo serial boards are expandable and flexible COM/TTY solutions for RS-232 applications that require connecting up to 128 serial devices to one computer. The C320Turbo's on-board CPU and large dual-port memory take the load off host systems whose performance and scalability are critical for large-scale systems.

Drivers Provided for Windows and Linux

In addition to providing COM port drivers for all major operating systems, Moxa also supports the following dedicated operating systems for customers' special needs.

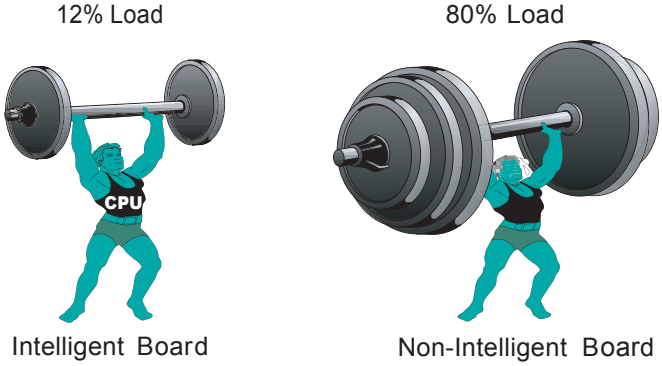
DOS
Windows
Windows (x64)
SCO UnixWare 7
SCO OpenServer 5/6
SCO UNIX SVR 4.2
QNX 4.2x
Linux 2.4/2.6
Linux (x64)

Dramatically Decreases Host Computer's CPU Load

The C320Turbo boards have a state-of-the-art onboard CPU that dramatically reduces the host computer's load by up to 68%* for applications that use 32 ports per board.

*Testing Environment

- Pentium 4, 1.8 GB CPU, 128 MB RAM
- Windows 2000 Professional
- Moxa PComm Pro Performance Analyzer
- 115.2 Kbps, full duplex, 24-hour burn-in



Specifications

Hardware

Comm. Controller: 16C550C or compatible x 8
Bus:
C320Turbo/PCI: 32-bit Universal PCI
C320Turbo: 16-bit ISA
Connector: DB25 female

Processor: TMS320BC52-40 RISC CPU
Memory: 512 KB

Serial Interface

Number of Ports: 32 per control board (max.)
Serial Standards: RS-232 (RS-422 available with desktop option)
Max. No. of Boards per PC: 4

Performance
Baudrate: 50 bps to 460.8 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ:
C32010T/PCI: Assigned by BIOS
C32010T: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+/-, RxD+/-, RTS+/-, CTS+/-, GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, DOS, Linux 2.4, Linux 2.6 x86/x64, SCO Open Server 5/6, UnixWare 7, QNX 4/6
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions:
C32010T/PCI: 90 x 120 mm (3.54 x 4.72 in)
C32010T: 107 x 158 mm (4.21 x 6.22 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, FCC Part 15 Subpart B Class A
EMS: EN 61000-4-2, EN 61000-4-3, EN 61000-4-4
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 305,270 hrs
Database: MIL-HDBK-217F, GB 25°C

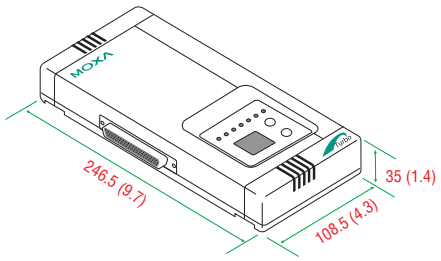
Power Requirements
Power Consumption:
C32010T/PCI: 500 mA max. @ +5 V
C32010T: 840 mA max. @ +5 V

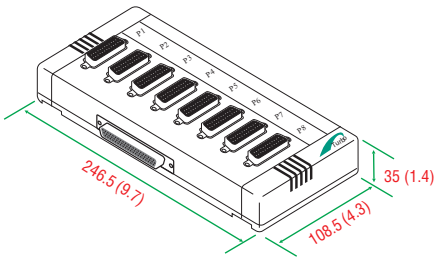
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

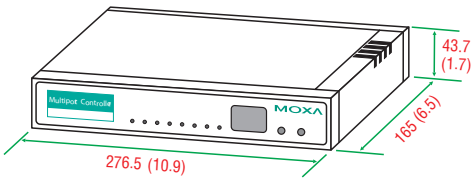
Unit: mm (inch)

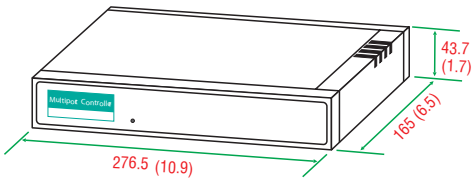
Desktop Solution





Rackmount Solution





	C32010T/ PCI	C32010T	C32030T	C32045T	C32047T	C32061T
Dimensions (mm)	120 x 90 x 15	158 x 107 x 15	247 x 108 x 35	247 x 108 x 35	247 x 108 x 35	247 x 108 x 35
Weight (g)	90	120	425	500	485	488
Power Requirements	0.5A (+5V)	0.84A (+5V)	0.59A (+5V)	0.28A (+5V) 0.095A (+12V) 0.06A (-12V)	0.28A (+5V) 0.095A (+12V) 0.06A (-12V)	0.485A (+5V)

	C32065T	C32071T	C32080T	C32081T	C32082T	C32083T
Dimensions (mm)	247 x 108 x 35	247 x 108 x 35	277 x 165 x 44	277 x 165 x 44	277 x 165 x 44	277 x 165 x 44
Weight (g)	525	525	1020	1120	920	1000
Power Requirements	1.32A (+5V)	0.28A (+5V) 0.095A (+12V) 0.06A (-12V)	0.88A (+5V) 0.095A (+12V) 0.06A (-12V)	1.22A (+5V) 0.19A (+12V) 0.12A (-12V)	0.34A (+5V) 0.095A (+12V) 0.06A (-12V)	0.67A (+5V) 0.19A (+12V) 0.12A (-12V)

Ordering Information

Package Checklist

- 1 C320Turbo/PCI or C320Turbo board
- 2-meter DB25-M to DB25-F connection cable
- Long-range extension kit (optional)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Available Models

Control Boards (must choose one)

C32010T/PCI: Universal PCI board
C32010T: ISA board

External Modules

Rackmount Option

Basic Modules (must choose one)
C32080T: 8 RS-232 ports, 10-pin RJ45 connectors
C32081T: 16-port, RS-232, 10-pin RJ45

Expansion Modules (optional)
C32082T: 8 RS-232 ports, 10-pin RJ45 connectors
C32083T: 16 RS-232 ports, 10-pin RJ45 connectors

Long-range Extension Kit (optional)

C32050T: Includes the following items
- 2 meter DB25-M to DB25-F 10-wire cable (generally used for set-up)
- 90-240 VAC switching power adaptor (0-30°C operating temperature)

NOTE: Build your own DB25-M to DB25-F 10-wire cable for connecting up to 100 meters.

Desktop Option
- CPU module
- One or more UART modules (32 ports maximum per board)

Rackmount Option
- Basic module
- Zero or more expansion modules (32 ports maximum per board)

Connection Cable (required)

C32020T: 2 meter DB25-M to DB25-F cable with 25 pins for short-range usage

Desktop Option

CPU Module (required)
C32030T: Connects directly to one UART module

8-port UART Modules (choose at least one)
C32045T: RS-232, DB25-F connectors
C32047T: RS-232, DB25-M connectors
C32071T: RS-232, DB25-F connectors (25 KV ESD surge protection)
C32061T: RS-422, DB25-F connectors
C32065T: RS-422, DB25-F connectors (2 KV optical isolation)

Ordering Examples

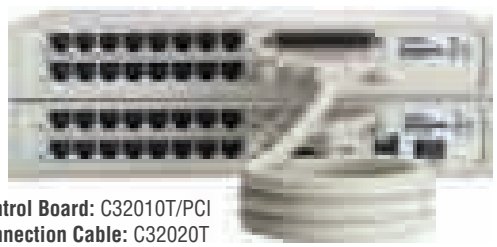
Rackmount Ordering Examples

16 RS-232 ports



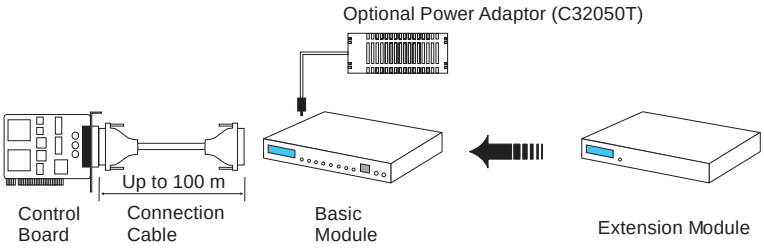
Control Board: C32010T/PCI
Connection Cable: C32020T
Basic Module: C32081T

32 RS-232 ports



Control Board: C32010T/PCI
Connection Cable: C32020T
Basic Module: C32081T x 1
Expansion Module: C32083T x 1

Rackmount Setup Diagram





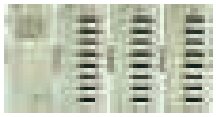
Desktop Ordering Examples

8 RS-232 ports



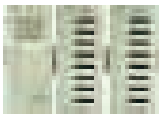
Control Board: C32010T/PCI
Connection Cable: C32020T
CPU Module: C32030T
UART Module: C32045T x 1

8 RS-232 ports + 16 RS-422 ports



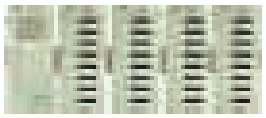
Control Board: C32010T/PCI
Connection Cable: C32020T
CPU Module: C32030T
UART Module: C32045T x 1 + C32061T x 2

16 RS-232 ports



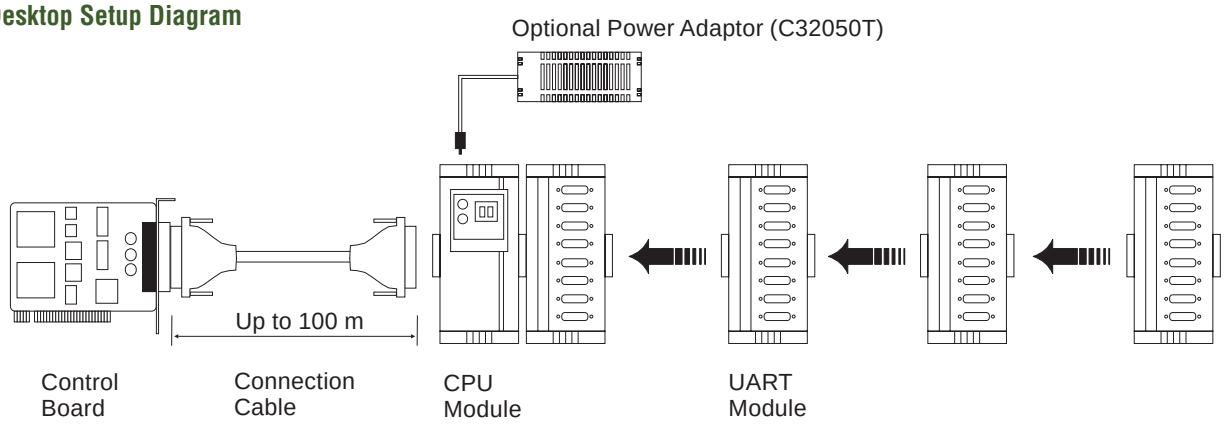
Control Board: C32010T/PCI
Connection Cable: C32020T
CPU Module: C32030T
UART Module: C32045T x 2 or C32047T x 2

32 RS-232 ports



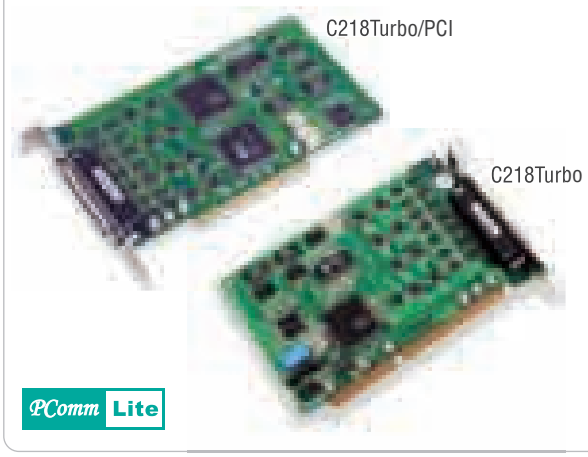
Control Board: C32010T/PCI
Connection Cable: C32020T
CPU Module: C32030T
UART Module: C32045T x 4 or C32047T x 4

Desktop Setup Diagram



C218Turbo Series

8-port RS-232 intelligent Universal PCI and ISA serial boards



PComm Lite

- Effectively reduces CPU loading
- Drivers provided for a variety of operating systems (Windows, Linux, and Unix)
- Choose from a wide range of connection cables and boxes
- 921.6 Kbps maximum baudrate for super fast data transmission
- Provides up to 512 KB of embedded memory
- High data throughput for great performance

Introduction

The 8-port C218Turbo RS-232 universal PCI and ISA boards come with an ASIC, RISC processor, and large I/O buffer to provide a sustained high throughput on all 8 ports simultaneously. Drivers are available for Windows, Linux, and Unix, making the boards suitable for a wide range of applications. Models are available for PCI, PCI-X, and ISA buses to provide reliable, high performance solutions for multiport serial communications.

Specifications

Hardware
Comm. Controller: 16C550C or compatible x 8
Bus:
C218Turbo/PCI: 32-bit Universal PCI
C218Turbo: 16-bit ISA
Connector: DB62 female
Processor: TMS320BC203-57 RISC CPU
Memory: 512 KB

Serial Interface
Number of Ports: 8
Serial Standards: RS-232 (RS-422/485 with optional accessory)
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 25 KV per port with connection box Opt8S (must be purchased separately)
Optical Isolation: 500 V with connection box Opt8F (must be purchased separately)

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, DOS, Linux 2.4, Linux 2.6 x86/x64, SCO Open Server 5/6, UnixWare 7, QNX 4/6
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 105 x 180 mm (4.13 x 7.09 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-3, FCC Part 15 Subpart B Class A
EMS: EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 303,325 hrs
Database: MIL-HDBK-217F, GB 25°C

Power Requirements
Power Consumption:
C218Turbo/PCI: 530 mA max. @ +5 V, 110 mA max. @ +12 V, 35 mA max. @ -12 V
C218Turbo: 400 mA max. @ +5 V, 100 mA max. @ +12 V, 60 mA max. @ -12 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

C218Turbo/PCI: 8-port RS-232 intelligent Universal PCI serial board
C218Turbo: 8-port RS-232 intelligent ISA serial board

Package Checklist

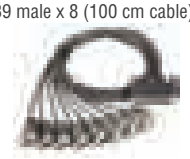
- 1 C218Turbo/PCI or C218Turbo board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

OPT8-M9
DB9 male x 8 (150 cm cable)



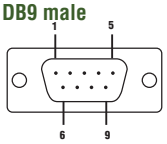
CBL-M62M9x8-100 (OPT8D)
DB9 male x 8 (100 cm cable)



PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR

PIN	RS-232
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



OPT8B
DB25 male x 8 (150 cm cable)



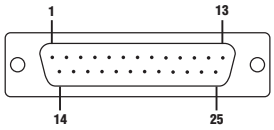
CBL-M62M25x8-100 (OPT8C)
DB25 male x 8 (100 cm cable)



PIN	RS-232
2	TxD
3	RxD
4	RTS
5	CTS

PIN	RS-232
6	DSR
7	GND
8	DCD
20	DTR

DB25 male



OPT8A
DB25 female x 8 (150 cm cable)



OPT8S
DB25 female x 8 (150 cm cable)
25 KV ESD Surge Protection



OPT8F/Z (RS-422)
DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor
(115.2 Kbps max. baudrate)



OPT8F with 500 V isolation

OPT8K (RS-422/485)
DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor

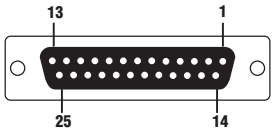


PIN	RS-232
2	RxD
3	TxD
4	CTS
5	RTS

PIN	RS-232
6	DTR
7	GND
8	DCD
20	DSR

PIN	RS-422/RS-485-4w	RS-485-2w
2	RxD+(B)	Data+(B)
3	TxD+(B)	–
7	GND	GND
14	RxD-(A)	Data-(A)
16	TxD-(A)	–

DB25 female



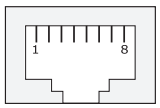
OPT8-RJ45
8-pin RJ45 x 8 (30 cm cable)



PIN	RS-232
1	DSR
2	RTS
3	GND
4	TxD

PIN	RS-232
5	RxD
6	DCD
7	CTS
8	DTR

8-pin RJ45



CP-118U/138U

8-port RS-232/422/485 Universal PCI serial boards



- Over 700 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000/9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
- Easy maintenance with on-board LED display, and management software
- 15 KV ESD protection on the board
- Wide temperature model available for -40 to 85°C environments

Overview

The CP-118U and CP-138U are smart, 8-port Universal PCI serial boards designed for POS and ATM applications and for use by industrial automation system manufacturers and system integrators. Both boards are compatible with all major operating systems. In addition, the CP-118U's 8 RS-232/422/485 ports and the CP-138U's 8 RS-422/485 ports support data rates up to 921.6 Kbps, and provide full modem control signals to ensure compatibility with a wide range of serial peripherals. The CP-118U and CP-138U support both 3.3V and 5V PCI buses, making them suitable for installation in most PC servers.

Drivers Provided for Windows and Linux

One of Moxa's highest priorities is to provide drivers for all mainstream operating systems. Reliable, well-tested Windows COM and Linux/Unix TTY drivers are available for use with the CP-118U and CP-138U serial boards. Other operating systems, such as Windows XP embedded and WEPOS, are also supported to accommodate embedded integration applications.

Specifications

Hardware
Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB62 female

Serial Interface
Number of Ports: 8
Serial Standards:
CP-118U: RS-232/422/485
CP-138U: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 82 x 135 mm (3.22 x 5.31 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 1,147,210 hrs
Database: Telcordia (Bellcore), GB

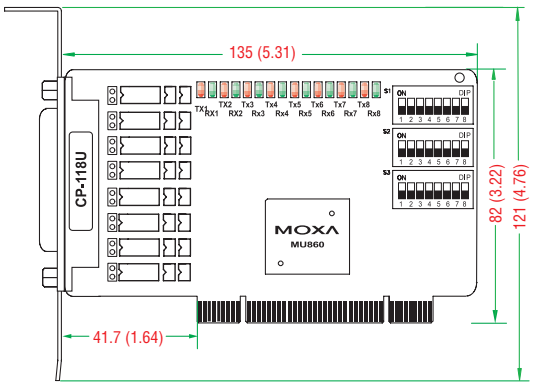
Power Requirements
Power Consumption:
CP-118U: 240 mA @ +5 V (RS-232), 300 mA @ +5 V (RS-422)
CP-138U: 135 mA @ +5V (RS-422)

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

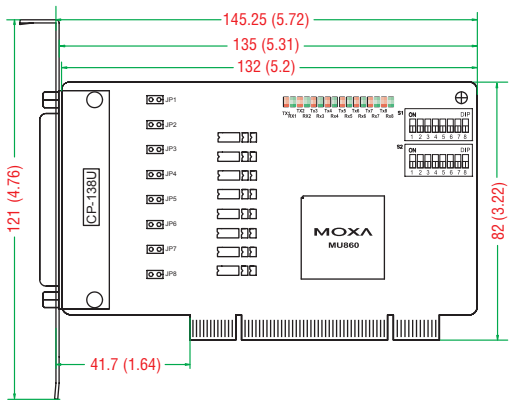
Dimensions

Unit: mm (inch)

CP-118U



CP-138U



Ordering Information

Available Models

CP-118U: 8-port RS-232/422/485 Universal PCI serial board, 0 to 55°C operating temperature
CP-138U: 8-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature
CP-118U-T: 8-port RS-232/422/485 Universal PCI serial board, -40 to 85°C operating temperature
CP-138U-T: 8-port RS-422/485 Universal PCI serial board, -40 to 85°C operating temperature

Package Checklist

- 1 CP-118U or CP-138U board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

OPT8-M9
DB9 male x 8 (150 cm cable)



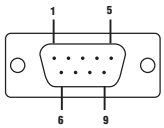
CBL-M62M9x8-100 (OPT8D)
DB9 male x 8 (100 cm cable)



PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR

PIN	RS-232
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



OPT8B
DB25 male x 8 (150 cm cable)



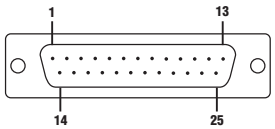
CBL-M62M25x8-100 (OPT8C)
DB25 male x 8 (100 cm cable)



PIN	RS-232
2	TxD
3	RxD
4	RTS
5	CTS

PIN	RS-232
6	DSR
7	GND
8	DCD
20	DTR

DB25 male



OPT8A
DB25 female x 8 (150 cm cable)



OPT8S
DB25 female x 8 (150 cm cable)
25 KV ESD Surge Protection



OPT8F/Z (RS-422)
DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor
(115.2 Kbps max. baudrate)



OPT8F with 500 V isolation

OPT8K (RS-422/485)
DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor



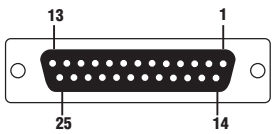
PIN	RS-232
2	RxD
3	TxD
4	CTS
5	RTS

PIN	RS-232
6	DTR
7	GND
8	DCD
20	DSR

PIN	RS-422
2	RxD+(B)
3	TxD+(B)
7	GND
14	RxD-(A)
16	TxD-(A)

PIN	RS-422/RS-485-4w	RS-485-2w
2	RxD+(B)	Data+(B)
3	TxD+(B)	
7	GND	GND
14	RxD-(A)	Data-(A)
16	TxD-(A)	

DB25 female



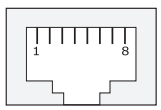
OPT8-RJ45
8-pin RJ45 x 8 (30 cm cable)



PIN	RS-232
1	DSR
2	RTS
3	GND
4	TxD

PIN	RS-232
5	RxD
6	DCD
7	CTS
8	DTR

8-pin RJ45



CP-118U-I/138U-I

8-port RS-232/422/485 Universal PCI serial boards with 2 KV isolation



- Over 700 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
- Easy maintenance with on-board LED display, and management software
- 15 KV ESD protection and 2 KV optical isolation on the board
- Wide temperature model available for -40 to 85°C environments

Overview

The CP-118U-I and CP-138U-I are 8-port serial boards designed for long distance, multi-point, PC-based data acquisition applications. Industrial automation system integrators will be eager to use these boards for many of their industrial automation projects.

On-chip ADDC® for precise RS-485 communication

RS-485 communication requires precise timing control to enable and disable the line driver, and the Moxa Turbo Serial Engine™ chip that powers the CP-118U-I and CP-138U-I boards come with on-chip ADDC® (automatic data direction control) to make RS-485 as easy to use as RS-232.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-118U-I's 8 RS-232/422/485 ports and the CP-138U-I's 8 RS-422/485 ports can achieve data rates up to 921.6 Kbps, and in RS-485 mode, one serial port can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. In addition, the 2 KV optical isolation protection on the CP-118U-I and CP-138U-I boards helps prevent equipment damage for long distance RS-485 communication.

Top Serial Performance

With 20-plus years of experience in serial board design, Moxa is now concentrating on a new high performance serial data transmission chip. The Turbo Serial Engine™ chip provides serial boards with a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode. Thanks to the Turbo Serial Engine™, Moxa is able to offer the world's best performing smart serial boards.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-118U-I and CP-138U-I boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for most Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB78 female

Serial Interface

Number of Ports: 8
Serial Standards:
CP-118U-I: RS-232/422/485
CP-138U-I: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64

Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions: 105 x 133 mm (4.13 x 5.23 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 1,147,210 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

Power Consumption:
CP-118U-I: 860 mA @ +5 V
CP-138U-I: 330 mA @ +5V

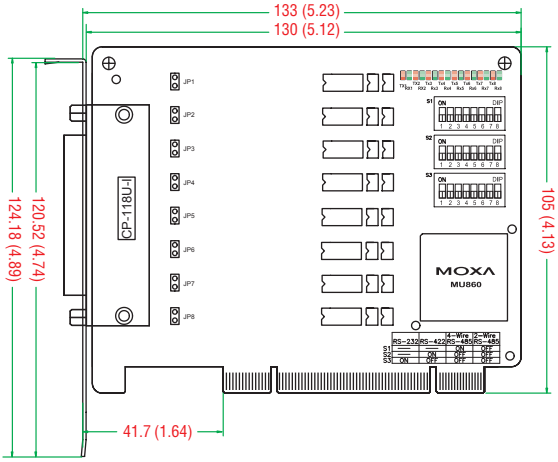
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

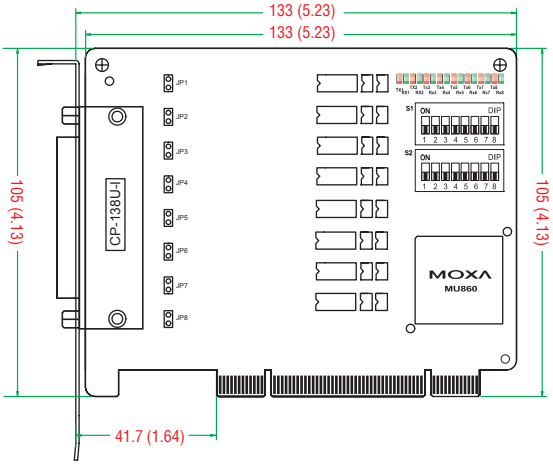
Dimensions

Unit: mm (inch)

CP-118U-I



CP-138U-I



Ordering Information

Available Models

CP-118U-I: 8-port RS-232/422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature
CP-138U: 8-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature
CP-118U-I-T: 8-port RS-232/422/485 Universal PCI serial board with optical isolation, -40 to 85°C operating temperature
CP-138U-T: 8-port RS-422/485 Universal PCI serial board with optical isolation, -40 to 85°C operating temperature

Package Checklist

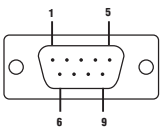
- 1 CP-118U-I or CP-138U-I board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

CBL-M78M9x8-100



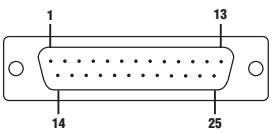
DB9 male



CBL-M78M25x8-100

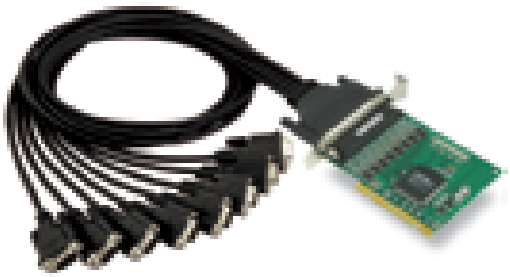


DB25 male



CP-168U

8-port RS-232 Universal PCI serial board



- Over 700 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Choose from a wide range of connection cables and boxes
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
- 15 KV ESD protection on the board
- Wide temperature model available for -40 to 85°C environments

Introduction

The CP-168U is a smart, 8-port universal PCI board designed for POS and ATM applications. It is a top choice of industrial automation engineers and system integrators, and supports many different operating systems, including Windows, Linux, and even Unix. In addition, each of the board's 8 RS-232 serial ports supports a super fast 921.6 Kbps baudrate. The CP-168U provides full modem control signals to ensure compatibility with a wide range of serial peripherals, and works with both 3.3V and 5V PCI buses, allowing the board to be installed in virtually any available PC server.

Specifications

Hardware
Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB62 female

Serial Interface
Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board
Optical Isolation: 500 V with connection box Opt8F (must be purchased separately)

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64

Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 82 x 120 mm (3.22 x 4.72 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

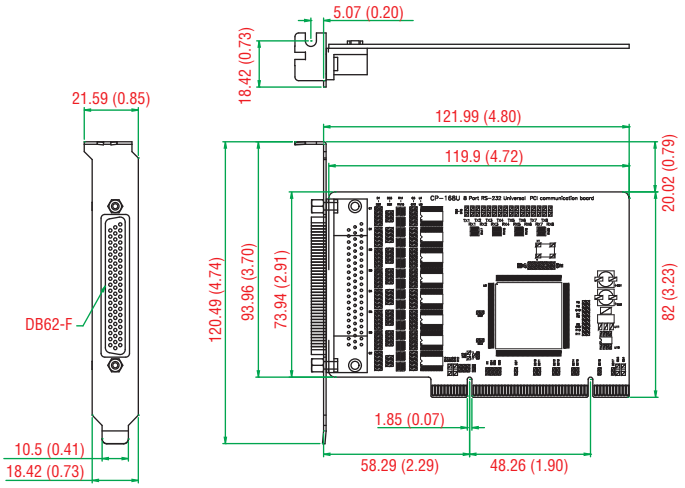
MTBF (mean time between failures)
Time: 280,854 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 180 mA @ +5 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-168U: 8-port RS-232 Universal PCI serial board, 0 to 55°C operating temperature
CP-168U-T: 8-port RS-232 Universal PCI serial board, -40 to 85°C operating temperature

Package Checklist

- 1 CP-168U board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

OPT8-M9

DB9 male x 8 (150 cm cable)



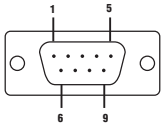
CBL-M62M9x8-100 (OPT8D)

DB9 male x 8 (100 cm cable)



PIN	RS-232	PIN	RS-232
1	DCD	5	GND
2	RxD	6	DSR
3	TxD	7	RTS
4	DTR	8	CTS

DB9 male



OPT8B

DB25 male x 8 (150 cm cable)



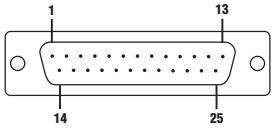
CBL-M62M25x8-100 (OPT8C)

DB25 male x 8 (100 cm cable)



PIN	RS-232	PIN	RS-232
2	TxD	6	DSR
3	RxD	7	GND
4	RTS	8	DCD
5	CTS	20	DTR

DB25 male



OPT8A

DB25 female x 8 (150 cm cable)



PIN	RS-232	PIN	RS-232
2	RxD	6	DTR
3	TxD	7	GND
4	CTS	8	DCD
5	RTS	20	DSR

OPT8S

DB25 female x 8 (150 cm cable)
25 KV ESD Surge Protection



OPT8F/Z (RS-422)

DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor
(115.2 Kbps max. baudrate)



OPT8F with 500 V isolation

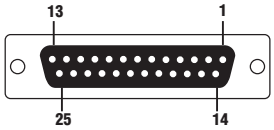
PIN	RS-422/RS-485-4w	RS-485-2w
2	RxD+(B)	Data+(B)
3	TxD+(B)	
7	GND	GND
14	RxD-(A)	Data-(A)
16	TxD-(A)	

OPT8K(RS-422/485)

DB25 female x 8 (150 cm cable)
110 or 230 VAC power adaptor



DB25 female



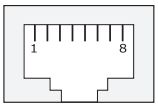
OPT8-RJ45

8-pin RJ45 x 8 (30 cm cable)



PIN	RS-232	PIN	RS-232
1	DSR	5	RxD
2	RTS	6	DCD
3	GND	7	CTS
4	TxD	8	DTR

8-pin RJ45



CP-114UL/UL-I

4-port RS-232/422/485 Universal PCI serial boards with optional 2 KV isolation



- Over 700 Kbps data throughput for top performance
- 128-byte FIFO and on-chip H/W, S/W flow control
- Universal PCI compatible with 3.3/5 V PCI and PCI-X
- Serial communication speed up to 921.6 Kbps
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000, 9X/ME/NT), Linux 2.4, Linux 2.6 (x86/x64), Solaris 10 x86/x64
- Easy maintenance with on-board LED display
- On-board 15 KV ESD and 2 KV optical isolation protection
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

Moxa's CP-114UL/UL-I series of multiport serial boards are designed to be used by industrial automation system integrators for long distance, multi-point, PC-based data acquisition applications. On-chip Automatic Data Direction Control for precision RS-485 communication requires precise timing control to enable and disable the line driver. The Moxa Turbo Serial Engine™ chip that powers the CP-114UL/UL-I boards come with on-chip ADDC®, which makes RS-485 as easy to use as RS-232. In RS-485 mode, the serial port can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, 2 KV optical isolation protections are available to prevent equipment damage.

Drives Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-114UL/UL-I boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware
Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB44 female

Serial Interface
Number of Ports: 4
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4
ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-114UL-I only)

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Linux 2.4, Linux 2.6 x86/x64, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions:
CP-114UL: 64.4 x 120 mm (2.53 x 4.72 in)
CP-114UL-I: 64.4 x 130 mm (2.53 x 5.12 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 114,223 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

Power Consumption:
CP-114UL: 320 mA @ 5 VDC
CP-114UL-I: 465 mA @ 5 VDC

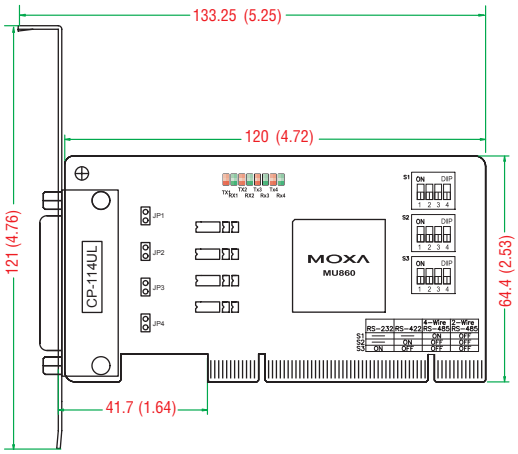
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

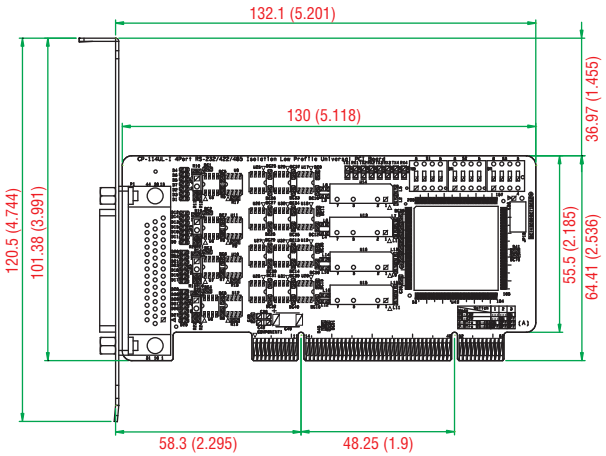
Dimensions

Unit: mm (inch)

CP-114UL



CP-114UL-I



Ordering Information

Available Models

CP-114UL: 4-port RS-232/422/485 low profile Universal PCI board, 0 to 55°C operating temperature
CP-114UL-DB9M: 4-port RS-232/422/485 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-114UL-DB25M: 4-port RS-232/422/485 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB25 male cable)
CP-114UL-I: 4-port RS-232/422/485 low profile Universal PCI serial board with optical isolation, 0 to 55°C operating temperature
CP-114UL-I-DB9M: 4-port RS-232/422/485 low profile Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)
CP-114UL-I-DB25M: 4-port RS-232/422/485 low profile Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB25 male cable)
CP-114UL-T: 4-port RS-232/422/485 low profile Universal PCI serial board, -40 to 85°C operating temperature
CP-114UL-I-T: 4-port RS-232/422/485 low profile Universal PCI serial board with optical isolation, -40 to 85°C operating temperature

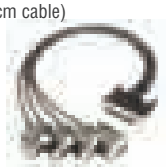
Package Checklist

- 1 CP-114UL or CP-114UL-I board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

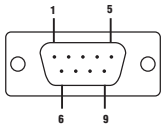
CBL-M44M9x4-50

DB44 male to DB9 male x 4
(50 cm cable)



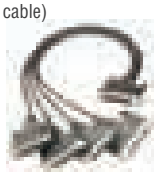
PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
9	–	–	–	–

DB9 male



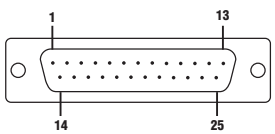
CBL-M44M25x4-50

DB44 male to DB25 male x 4
(50 cm cable)



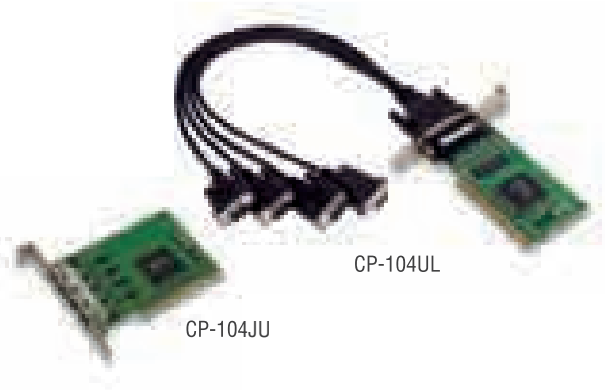
PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	–
4	RTS	–	–	–
5	CTS	–	–	–
6	DSR	–	–	–
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	–
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	–	–	–	–

DB25 male



CP-104UL/JU

4-port RS-232 smart Universal PCI serial boards



- Over 800 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
- 15 KV ESD protection on the board
- Wide temperature model available for -40 to 85°C environments

Introduction

The CP-104UL and CP-104JU 4-port universal PCI boards are designed for POS and ATM applications. They are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the boards' RS-232 serial ports supports a super fast 921.6 Kbps baudrate. The CP-104UL and CP-104JU provide full modem control signals to ensure compatibility with a wide range of serial peripherals, and they work with both 3.3V and 5V PCI buses, allowing the boards to be installed in virtually any available PC server.

Specifications

Hardware
Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connectors:
CP-104UL: DB44 female
CP-104JU: RJ45 x 4

Serial Interface
Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions:
CP-104UL: 64.4 x 120 mm (2.53 x 4.72 in)
CP-104JU: 83 x 120 mm (3.27 x 4.72 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 558,961 hrs
Database: MIL-HDBK-217F, GB 25°C

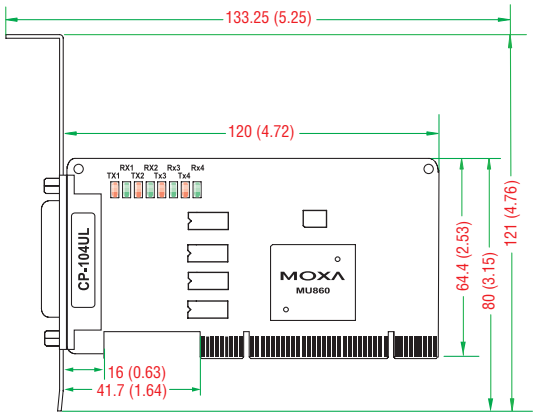
Power Requirements
Power Consumption:
CP-104UL: 120 mA @ +5 V
CP-104JU: 135 mA @ +5 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

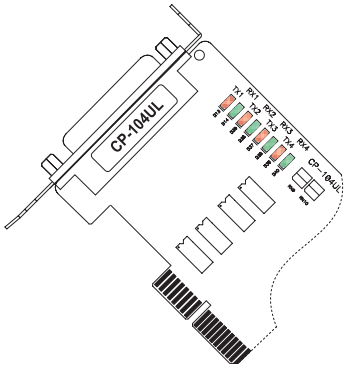
Dimensions

Unit: mm (inch)

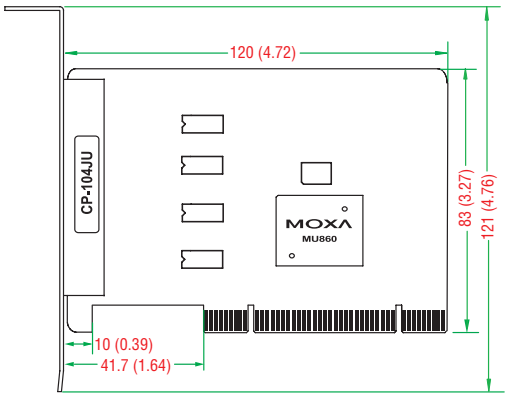
CP-104UL

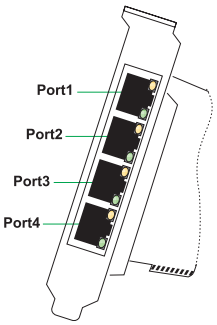


On-board LEDs



CP-104JU





Ordering Information

Available Models

CP-104UL-DB9M: 4-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-104UL-DB25M: 4-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB25 male cable)
CP-104JU: 4-port RS-232 Universal PCI serial board with RJ45 ports on the board, 0 to 55°C operating temperature
CP-104UL-T: 4-port RS-232 low profile Universal PCI serial board, -40 to 85°C operating temperature
CP-104JU-T: 4-port RS-232 Universal PCI serial board with RJ45 ports on the board, -40 to 85°C operating temperature

Package Checklist

- 1 CP-104UL or CP-104JU board
- Low profile bracket (CP-104UL only)
- DB9-M or DB25-M cable included (CP-104UL only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

CBL-M44M9x4-50
DB44 male to DB9 male x 4 (50 cm cable)

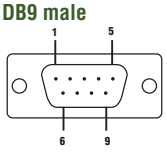


CBL-RJ45M9-150
8-pin RJ45 to DB9 male (150 cm cable)



PIN	RS-232	PIN	RS-232
1	DCD	5	GND
2	RxD	6	DSR
3	TxD	7	RTS
4	DTR	8	CTS

DB9 male



CBL-M44M25x4-50
DB44 male to DB25 male x 4 (50 cm cable)

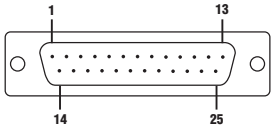


CBL-RJ45M25-150
8-pin RJ45 to DB25 male (150 cm cable)



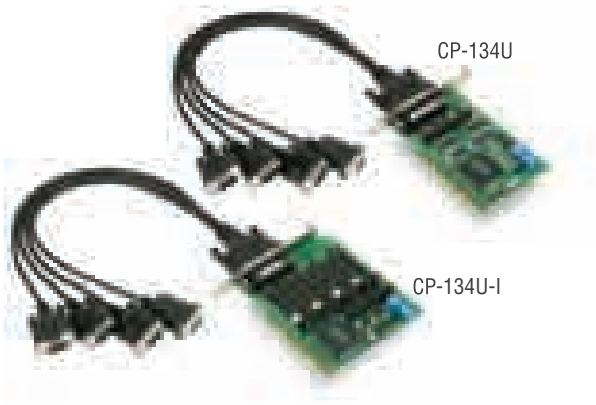
PIN	RS-232	PIN	RS-232
2	TxD	6	DSR
3	RxD	7	GND
4	RTS	8	DCD
5	CTS	20	DTR

DB25 male



CP-134U/U-I

4-port RS-422/485 Universal PCI serial boards with optional 2 KV isolation



- Over 700 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- ADDC® provides automatic data direction control for RS-485 signals
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO OpenServer 5/6, UnixWare 7, Solaris 10 x86/x64
- 15 KV ESD protection on the board
- Added bonus! Ports 1 and 2 support RS-232 and RS-422/485
- Wide temperature model available for -40 to 85°C environments

Overview

The CP-134U and CP-134U-I 4-port universal PCI boards are designed for industrial automation applications that require a long distance, multi-point, PC-based data acquisition solution.

On-chip Automatic Data Direction Control for precise RS-485 communication

RS-485 communication requires precise timing control to enable and disable the line driver. The Moxa Turbo Serial Engine™ chip that powers the CP-134U board comes with on-chip ADDC®, which makes RS-485 as easy to use as RS-232.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-134U universal PCI board has 4 RS-422/485 serial ports, each of which can achieve data rates up to 921.6 Kbps. In RS-485 mode, the board can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, choose the CP-134U-I, which comes with 2 KV optical isolation protection to prevent equipment damage.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-134U and CP-134U-I boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB44 female

Serial Interface

Number of Ports: 4
Serial Standards: 2 x RS-232/422/485, 2 x RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-134U-I configured for RS-422/485 only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, FreeBSD 4/5, QNX 6, SCO OpenServer 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions:
CP-134U: 82.5 x 120 mm (3.24 x 4.72 in)
CP-134U-I: 115 x 120 mm (4.52 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 480,209 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

Power Consumption:
CP-134U: 180 mA @ +5 V
CP-134U-I: 850 mA @ +5 V

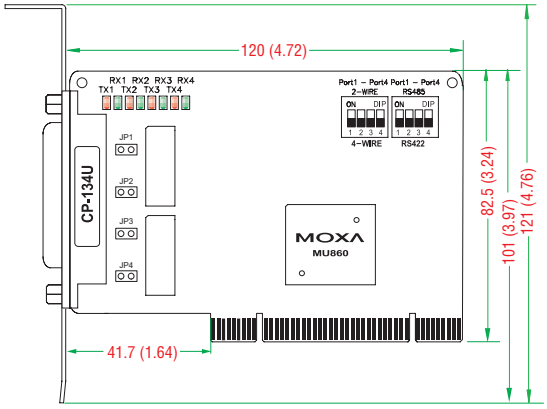
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

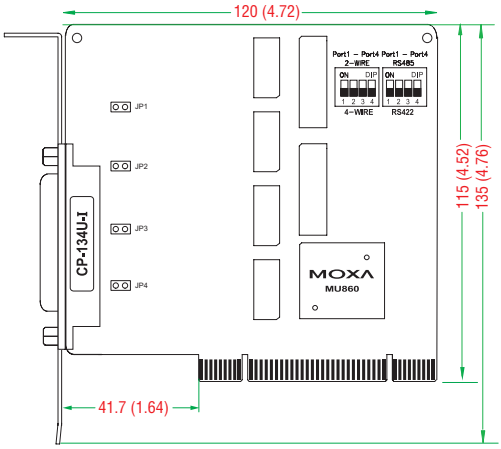
Dimensions

Unit: mm (inch)

CP-134U



CP-134U-I



Ordering Information

Available Models

CP-134U: 4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature
CP-134U-DB9M: 4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-134U-DB25M: 4-port RS-422/485 Universal PCI serial board, 0 to 55°C operating temperature (includes DB25 male cable)
CP-134U-I: 4-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature
CP-134U-I-DB9M: 4-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)
CP-134U-I-DB25M: 4-port RS-422/485 Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB25 male cable)
CP-134U-T: 4-port RS-422/485 Universal PCI serial board, -40 to 85°C operating temperature
CP-134U-I-T: 4-port RS-422/485 Universal PCI serial board with optical isolation, -40 to 85°C operating temperature

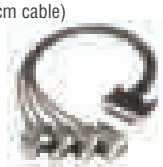
Package Checklist

- 1 CP-134U or CP-134U-I board
- DB9 or DB25 cable included
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

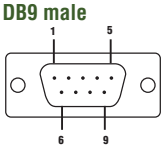
CBL-M44M9x4-50

DB44 male to DB9 male x 4 (50 cm cable)



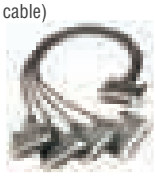
PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	RTS-(A)	–	–
7	RTS	RTS+(B)	–	–
8	CTS	CTS+(B)	–	–
9	–	CTS-(A)	–	–

DB9 male



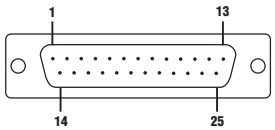
CBL-M44M25x4-50

DB44 male to DB25 male x 4 (50 cm cable)



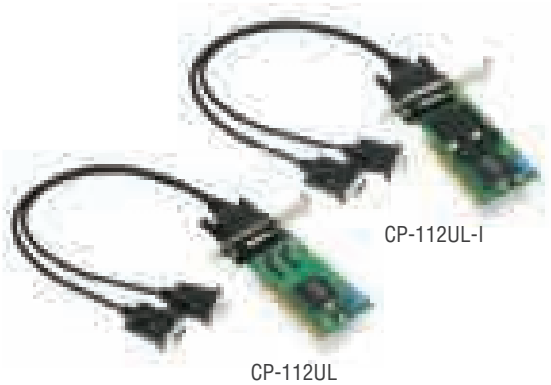
PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	–
4	RTS	RTS+(B)	–	–
5	CTS	CTS+(B)	–	–
6	DSR	RTS-(A)	–	–
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	–
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	–	CTS-(A)	–	–

DB25 male



CP-112UL/UL-I Series

2-port RS-232/422/485 Universal PCI serial boards with optional 2 KV isolation



CP-112UL-I

CP-112UL

- Over 700 Kbps data throughput for top performance
- 128-byte FIFO and on-chip H/W, S/W flow control
- Universal PCI compatible with 3.3/5 V PCI and PCI-X
- Serial communication speed up to 921.6 Kbps
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000), Linux 2.4, and Linux 2.6 (x86/x64), Solaris 10 x86/x64
- Easy maintenance with on-board LED display
- On-board 15 KV ESD and 2 KV optical isolation protection
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

Moxa's CP-112UL/UL-I series of multiport serial boards are designed to be used by industrial automation system integrators for long distance, multi-point, PC-based data acquisition applications. On-chip Automatic Data Direction Control for precision RS-485 communication requires precise timing control for enabling and disabling the line driver. Moxa's Turbo Serial Engine™ chip that powers the CP-112UL/UL-I boards comes with on-chip ADDC®, which makes RS-485 as easy to use as RS-232. The boards come with 2 RS-422/485 serial ports, both of which can achieve data rates up to 921.6 Kbps. In RS-485 mode, the serial port can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, 2 KV optical isolation protection is available to prevent equipment damage.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-112UL/UL-I boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4
ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-112UL-I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, DOS, Linux 2.4, Linux 2.6 x86/x64, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions: 64.4 x 120 mm (2.53 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 219,971 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

Power Consumption:
CP-112UL: 175 mA @ 5 VDC
CP-112UL-I: 290 mA @ 5 VDC

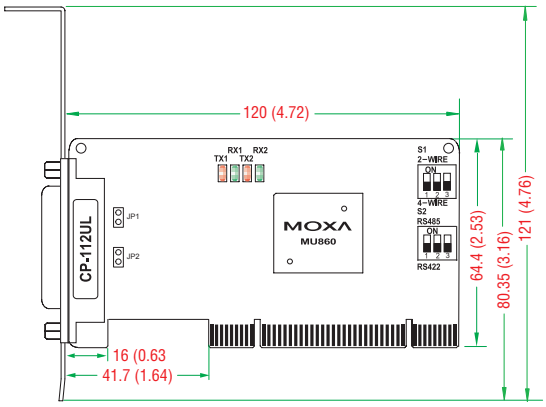
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

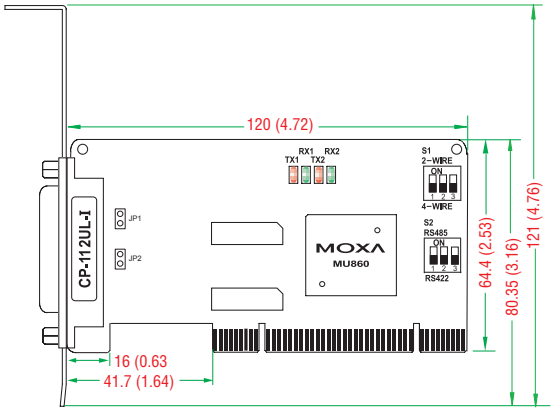
Dimensions

Unit: mm (inch)

CP-112UL



CP-112UL-I



Ordering Information

Available Models

CP-112UL-DB9M: 2-port RS-232/422/485 low profile Universal PCI board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-112UL-I-DB9M: 2-port RS-232/422/485 low profile Universal PCI board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)
CP-112UL-T: 2-port RS-232/422/485 low profile Universal PCI board, -40 to 85°C operating temperature
CP-112UL-I-T: 2-port RS-232/422/485 low profile Universal PCI board with optical isolation, -40 to 85°C operating temperature

Package Checklist

- 1 CP-112UL or CP-112UL-I board
- Low profile bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

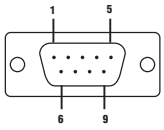
Connection Options (can be purchased separately)

CBL-M25M9x2-50
DB25 male to DB9 male x 2 (50 cm cable)



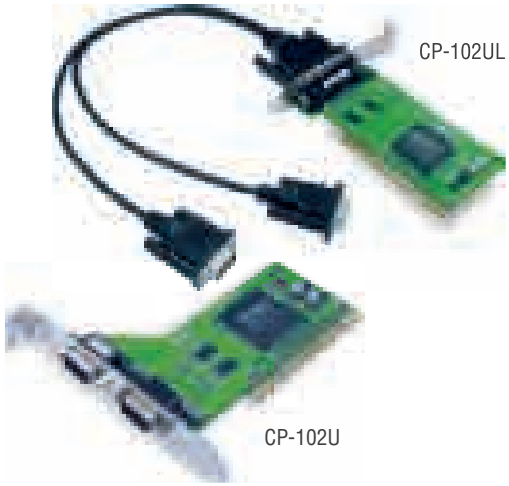
PIN	RS-232	RS-422	RS-485-4W	RS-485-2W
1	DCD	Txd-(A)	Txd-(A)	–
2	RxD	Txd+(B)	Txd+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data+(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
9	–	–	–	–

DB9 male



CP-102U/UL

2-port RS-232 Universal PCI serial boards



- Over 800 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
- 15 KV ESD protection on the board
- The CP-102UL's MD1 low profile form factor fits small-sized PCs
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

The CP-102U and CP-102UL are 2-port Universal PCI boards designed for POS and ATM applications. They are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the boards' RS-232 serial ports supports a super fast 921.6 Kbps baudrate. The CP-102U and CP-102UL provide full modem control signals to ensure compatibility with a wide range of serial peripherals, and they work with both 3.3V and 5V PCI buses, allowing the boards to be installed in virtually any available PC server.

Designed for Standard and Small-sized PCs

The CP-102UL is a low profile board that only requires a 5 VDC power supply. It is compatible with both a 3.3V and 5V PCI bus, which means that the CP-102UL fits any host computer, ranging from shoebox to standard-sized PCs.

Top Serial Performance

With 20-plus years of experience in serial board design, Moxa is now concentrating on a new high performance serial data transmission chip. The Turbo Serial Engine™ chip provides serial boards with a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode. Thanks to the Turbo Serial Engine™, Moxa is able to offer the world's best performing smart serial boards.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-102U/UL boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connectors:
CP-102U: DB9 male x 2
CP-102UL: DB25 female

Serial Interface

Number of Ports: 2 (only one IRQ required)
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions:
CP-102U: 120 x 120 mm (3.15 x 4.72 in)
CP-102UL: 64.5 x 120 mm (2.53 x 4.72 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

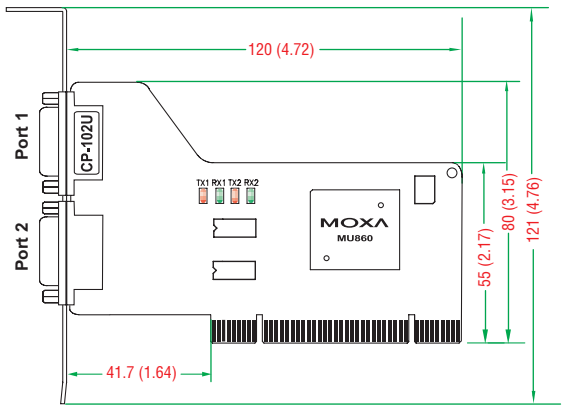
Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

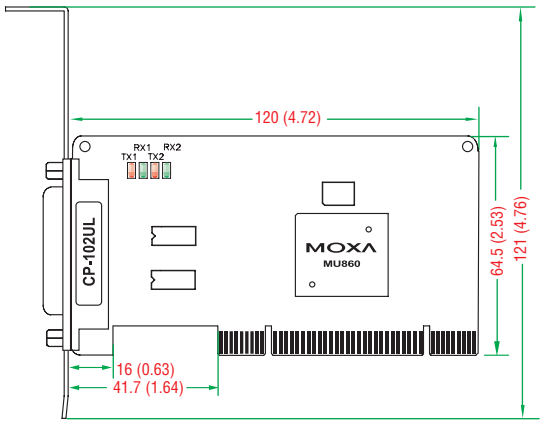
MTBF (mean time between failures)
Time: 219,971 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 93 mA @ +5 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions
Unit: mm (inch)

CP-102U


CP-102UL


Ordering Information

Available Models
CP-102U: 2-port RS-232 Universal PCI serial board, 0 to 55°C operating temperature
CP-102UL-DB9M: 2-port RS-232 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-102U-T: 2-port RS-232 Universal PCI serial board, -40 to 85°C operating temperature
CP-102UL-T: 2-port RS-232 low profile Universal PCI serial board, -40 to 85°C operating temperature

Package Checklist
- 1 CP-102U or CP-102UL board
- Low profile bracket (CP-102UL only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

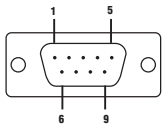
Connection Options (can be purchased separately)

CBL-M25M9x2-50
DB25 male to DB9 male x 2 (50 cm cable)



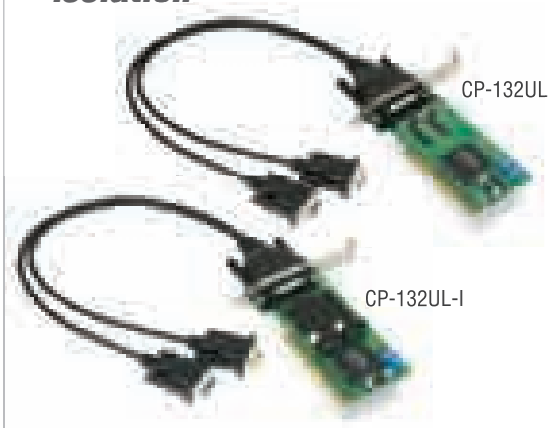
PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

DB9 male



CP-132UL/UL-I

2-port RS-422/485 Universal PCI serial boards with optional 2 KV isolation



- Over 800 Kbps data throughput for top performance
- 921.6 Kbps maximum baudrate for super fast data transmission
- ADDC® provides automatic data direction control for RS-485 signals
- Transmit data up to 1.2 km with RS-422/485
- 128-byte FIFO and on-chip S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000, 9X/ME/NT), Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO Open Server 5/6, and UnixWare 7, Solaris 10 x86/x64
- 15 KV ESD protection on the board
- MD1 low profile form factor fits small-sized PCs
- Wide temperature model available for -40 to 85°C environments

Overview

The CP-132UL and CP-132UL-I are 2-port Universal PCI boards designed for industrial automation applications that require a long distance, multi-point, PC-based data acquisition solution.

On-chip Automatic Data Direction Control for precise RS-485 communication

RS-485 communication requires precise timing control to enable and disable the line driver. Moxa's Turbo Serial Engine™ chip that powers the CP-132UL/UL-I boards comes with on-chip ADDC®, which makes RS-485 as easy to use as RS-232.

RS-485 multidrop for up to 31 devices within 1.2 km

The CP-132UL/UL-I Universal PCI boards have two RS-422/485 serial ports, both of which can achieve data rates up to 921.6 Kbps. In RS-485 mode, the boards can connect up to 31 daisy-chained RS-485 devices within a range of 1.2 km. For long distance RS-485 communication, choose the CP-132UL-I model, which comes with 2 KV optical isolation protection to prevent equipment damage.

Top Serial Performance

With 20-plus years of experience in serial board design, Moxa is now concentrating on a new high performance serial data transmission chip. The Turbo Serial Engine™ chip provides serial boards with a 128-byte FIFO, on-chip software flow control, and burst data mode. Thanks to the Turbo Serial Engine™, Moxa is able to offer the world's best performing smart serial boards.

Drivers Provided for Windows, Linux, and Unix

Moxa continues to support a wide variety of operating systems, and the CP-132UL/UL-I boards are no exception. Reliable Windows COM and Linux/Unix TTY drivers are provided for all Moxa boards, and other operating systems, such as WEPOS, are also supported for embedded integration.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB25 female

Serial Interface

Number of Ports: 2
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CP-132UL-I only)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark

Flow Control: XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, FreeBSD 4/5, QNX 6, SCO Open Server 5/6, UnixWare 7, Solaris 10 x86/x64

Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions:
CP-132UL: 64.4 x 120 mm (2.53 x 4.72 in)
CP-132UL-I: 64.4 x 120 mm (2.53 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 1,647,832 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

Power Consumption:
CP-132UL: 120 mA @ +5 V
CP-132UL-I: 490 mA @ +5 V

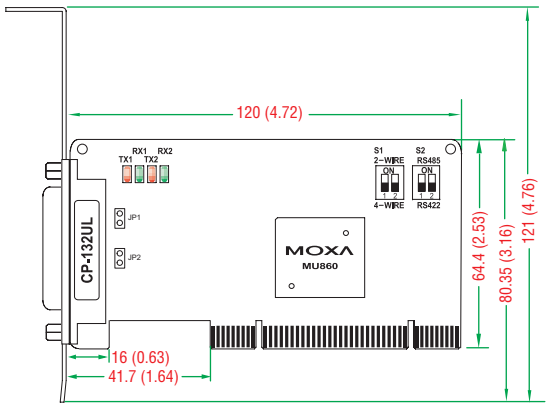
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

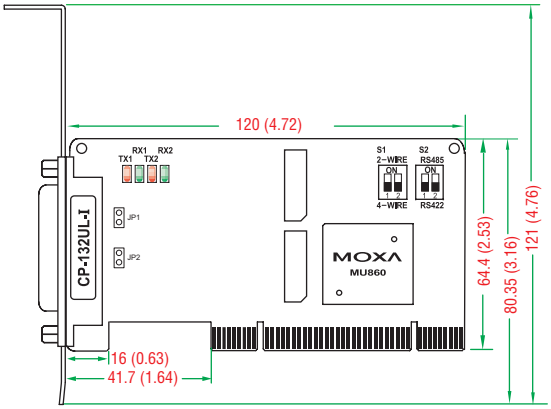
Dimensions

Unit: mm (inch)

CP-132UL



CP-132UL-I



Ordering Information

Available Models

CP-132UL-DB9M: 2-port RS-422/485 low profile Universal PCI serial board, 0 to 55°C operating temperature (includes DB9 male cable)
CP-132UL-I-DB9M: 2-port RS-422/485 low profile Universal PCI serial board with optical isolation, 0 to 55°C operating temperature (includes DB9 male cable)
CP-132UL-T: 2-port RS-422/485 low profile Universal PCI serial board, -40°C to 85 operating temperature
CP-132UL-I-T: 2-port RS-422/485 low profile Universal PCI serial board with optical isolation, -40°C to 85 operating temperature

Package Checklist

- 1 CP-132UL or CP-132UL-I board
- Low profile bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be purchased separately)

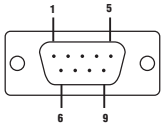
CBL-M25M9x2-50

DB25 male to DB9 male x 2 (50 cm cable)



PIN	RS-422	RS-485-4w	RS-485-2w
1	TxD-(A)	TxD-(A)	–
2	TxD+(B)	TxD+(B)	–
3	RxD+(B)	RxD+(B)	Data+(B)
4	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND
6	RTS-(A)	–	–
7	RTS+(B)	–	–
8	CTS+(B)	–	–
9	CTS-(A)	–	–

DB9 male



POS-104UL

4-port RS-232 Universal PCI boards with power over serial



- Over 800 Kbps data throughput, for top performance
- Power options for each port: 5V (output), 12V (output), and RI (input)
- Serial port power from bus or power supply
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Low profile board, suitable for compact-sized PCs
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000, 9X/ME/NT), Windows XP Embedded, Windows CE 5.0/6.0, DOS, Linux 2.4, Linux 2.6 (x86/x64), FreeBSD 4/5, QNX 6, SCO OpenServer 5/6, and UnixWare 7
- 15 KV ESD protection on the board
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Introduction

The POS-104UL is a smart, 4-port Universal PCI serial board designed for POS and ATM applications and for use by industrial automation system manufacturers and system integrators. The POS-104UL is compatible with all major operating systems. In addition, each of the 4 RS-232 serial ports supports data rates up to 921.6 Kbps, and provides full modem control signals to ensure compatibility with a wide range of serial peripherals. The POS-104UL supplies 5 or 12 volts of power to each serial port, and works with both 3.3V and 5V PCI buses, making it suitable for installation in most PC servers.

Specifications

Hardware
Comm. Controller: MU860 (16C550C compatible)
Bus: 32-bit Universal PCI
Connector: DB44 female

Serial Interface
Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND, RI (optional)

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows XP Embedded, Windows CE 5.0/6.0, DOS, Linux 2.4, Linux 2.6 x86/x64, FreeBSD 4/5, QNX 6, SCO OpenServer 5/6, UnixWare 7

Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 64.4 x 120 mm (2.53 x 4.72 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 61000-6-2, EN 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

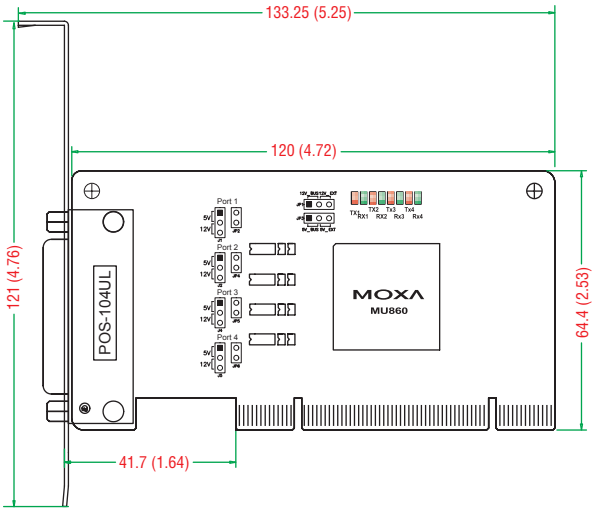
MTBF (mean time between failures)
Time: 2,124,022 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 145 mA @ +5 V
Power Output (per port): 1 A @ 5 V, 1 A @ 12 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

POS-104UL-DB9M: 4-port RS-232 low profile Universal PCI board with serial port power, 0 to 55°C operating temperature (DB9 male cable included)
POS-104UL-T: 4-port RS-232 low profile Universal PCI board with serial port power, -40 to 85°C operating temperature

Package Checklist

- 1 POS-104UL board
- Low profile bracket
- DB9 male cable (POS-104UL-DB9 only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

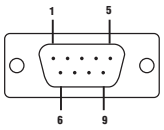
Connection Options (can be purchased separately)

CBL-M44M9x4-50 (POS)



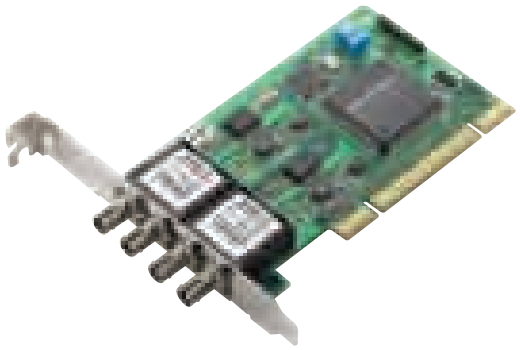
PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	5V/12V/RI

DB9 male



CP-102UF Series

2-port Universal PCI serial over fiber boards



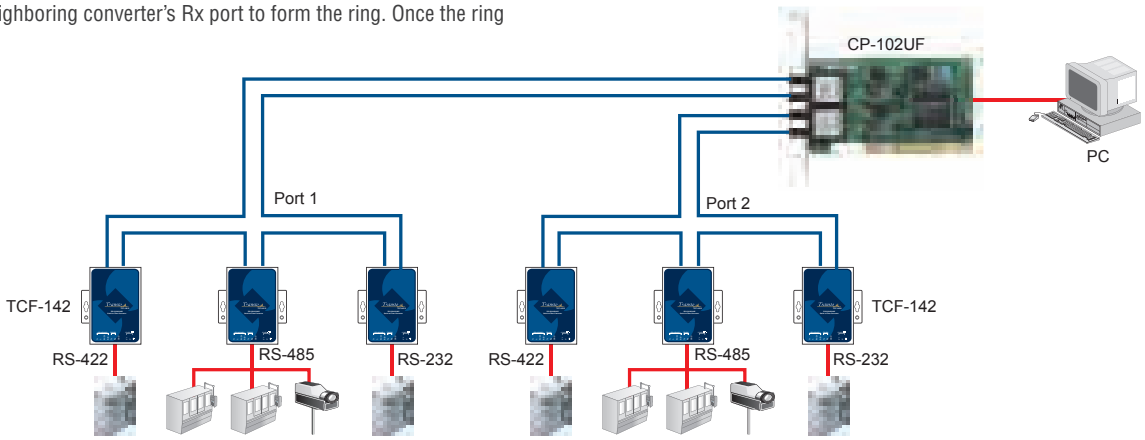
- Extend serial transmission distance up to:
  - 40 km with single-mode (CP-102UF-S-ST)
  - 5 km with multi-mode (CP-102UF-M-ST)
- Supports "Ring" and "Point-to-Point" transmission modes
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip S/W flow control
- Compatible with 3.3/5V PCI and PCI-X
- Drivers provided for Windows (7 x86/x64, XP/2003/Vista/2008 x86/x64, 2000), Windows XP Embedded, Windows CE 5.0/6.0, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 6, SCO OpenServer 5/6, and UnixWare 7
- Easy maintenance with on-board LED display and management software
- Immune from signal interference
- Guards against electronic degradation and chemical corrosion
- Wide temperature model available for -40 to 85°C environments

Overview

The CP-102UF Universal PCI boards are designed for industrial automation applications that require a long distance, multi-point, PC-based data acquisition solution. The boards are compatible with all popular operating systems, and each of the 2 serial ports support data rates up to 921.6 Kbps. In addition, the CP-102UF boards work with both 3.3V and 5V PCI buses, allowing them to be installed in virtually any available PC server. With a maximum data transmission distance of 40 km (with the single-mode model), the CP-102UF cards beat the 15 meter maximum for RS-232, and even the 1.2 km maximum for RS-422/485. For many industrial applications, an even bigger benefit is that optical fiber isolates the data from dangerous increases in ground potential, ground loops, and electrical EMI/RFI electromagnetic radiation.

Ring Operation

With the CP-102UF board, your PC can be included as one node of a fiber ring formed using Moxa's own TCF-142 serial-to-fiber converter. Since each TCF-142 has two fiber ports and one serial port, PCs that are part of the ring will be able to communicate with all serial devices connected to the ring. Note that the Tx port of the CP-102UF connects to a neighboring converter's Rx port to form the ring. Once the ring has been set up, simply use the DIP switches to configure the CP-102UF to "Ring mode." When one node transmits a signal, the signal travels around the ring until it returns back to the transmitting unit, which then blocks the signals. With the CP-102UF, you can set up fiber rings that are up to 100 km in total length.



Specifications

Hardware
Bus: 32-bit Universal PCI
Number of Ports: 2
Max. Number of Boards per PC: 4

Optical Fiber Interface
Mode:
CP-102UF-M: Multi-mode
CP-102UF-S: Single-mode
Fiber Connectors: ST type
Cable Requirements:
CP-102UF-M: 50/125, 62.5/125, or 100/140 µm
CP-102UF-S: 8.3/125, 8.75/125, 9/125 or 10/140 µm
Transmission Distance:
CP-102UF-M: Up to 5 km with multi-mode fiber
CP-102UF-S: Up to 40 km with single-mode fiber
Wavelength:
CP-102UF-M: 820 nm
CP-102UF-S: 1310 nm
Tx Output: -5 dBm
Rx Sensitivity:
CP-102UF-M: -20 dBm
CP-102UF-S: -24 dBm
Point-to-Point Transmission: Half or full duplex
Ring Transmission: Half duplex

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: XON/XOFF
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS

Driver Support
Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows XP Embedded, DOS, Windows CE 5.0/6.0, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 6, SCO OpenServer 5/6, UnixWare 7
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 70 x 120 mm (2.76 x 4.72 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

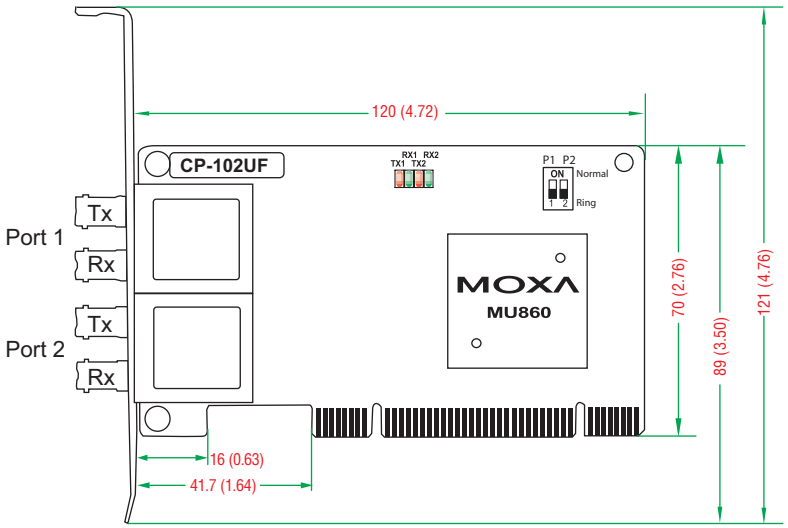
Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 591,349 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption:
CP-102UF-M: 429 mA @ +5V
CP-102UF-S: 424 mA @ +5V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions
Unit: mm (inch)



Ordering Information

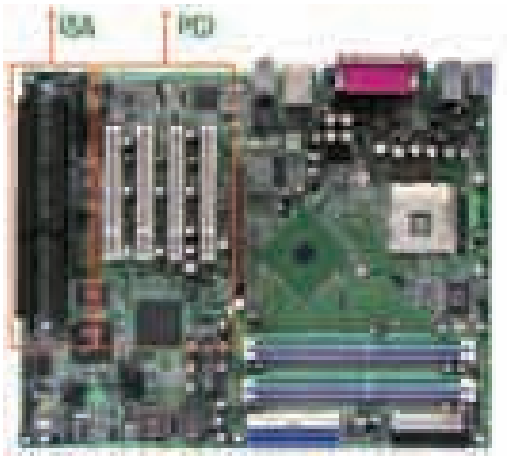
Available Models
CP-102UF-M-ST: 2-port Universal PCI serial over fiber board with multi-mode fiber for 5 km transmission (ST connector), 0 to 55°C operating temperature
CP-102UF-S-ST: 2-port Universal PCI serial over fiber board with single-mode fiber for 40 km transmission (ST connector), 0 to 55°C operating temperature
CP-102UF-M-ST-T: 2-port Universal PCI serial over fiber board with multi-mode fiber for 5 km transmission (ST connector), -40 to 85°C operating temperature
CP-102UF-S-ST-T: 2-port Universal PCI serial over fiber board with single-mode fiber for 40 km transmission (ST connector), -40 to 85°C operating temperature

Package Checklist
- 1 CP-102UF-M-ST or CP-102UF-S-ST board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Introduction to ISA

ISA, which stands for Industry Standard Architecture, is one of the original standards for PC serial boards. The original interface was developed in the early 1980s to run at an 8 Mhz speed. ISA cards were required to transmit data between the motherboard and peripheral devices in 16-bit chunks.

Since ISA boards run much more slowly than PCI boards, people buying new serial boards or designing new systems will undoubtedly choose PCI. However, many systems in use today still have ISA slots, and a wide range of ISA peripherals, such as LAN cards and sound cards, are still available on the market.



Features of Moxa's ISA Boards

Moxa's ISA boards are smart, multiport serial I/O solutions that are used for connecting terminals, modems, printers, data acquisition equipment, and other serial devices to a PC. Both 4-port and 8-port ISA boards are available. One of the most attractive features of Moxa's ISA boards are the device drivers, which are fine-tuned to make full use of the 16-byte Tx/Rx FIFO and on-chip H/W flow control. The boards can transfer data without data loss even at speeds as high as 921.6 Kbps. Moxa's ISA boards offer a reliable and high performance solution for multiport communication applications.

Moxa's ISA boards are equipped with a custom-designed ASIC chip that combines several chips into one and results in a board that's half the size of other ISA boards. The entire family of Moxa ISA boards supports a 16-bit architecture, and a full range of I/O addresses and IRQs are available. In addition, due to the on-board EEPROM that is used for storing configuration data, the boards do not need jumpers or DIP switches. The ports on Moxa's ISA boards run independent of each other, making the boards compatible with most existing multiport boards.

Moxa's ISA Boards are Ideal for POS and Hospitality Applications

Moxa's ISA boards are used by many of the world's top companies as part of POS (Point-Of-Sale) or POS-related systems. Moxa's products are highly successful and continue to be selected in large numbers by POS system providers.

A prime example is Delta Airlines, which uses more than 10,000 of Moxa's C168H ISA boards as part of its flight schedule display system. In addition, IBM uses thousands of Moxa's C168H ISA boards as part of their advanced MMS (Multi-Media Station) e-commerce technology that provides information about a location as well as other sales services.

Typical POS system applications are PC-based POS cash registers, PC-based kiosk machines, PC-based lottery machines, PC-based ticket vending machines, as well as any other self-service machine connection. Since POS machines are placed at many different locations, POS system providers demand a highly reliable solution to avoid maintenance problems. Furthermore, since a large number of multiport boards are usually needed for POS projects, POS system providers are also very concerned about cost. This means that reliability and competitive price are the two key factors that POS customers consider. Moxa's ISA boards are specially designed for these POS applications, and meet customers' many needs and concerns.

Drivers are provided for use with operating systems such as Windows NT, 2000, XP, and 2003. The boards are low cost, but provide high performance, and outrank similar products from all other major multiport serial product manufacturers.

C168H/HS

8-port RS-232 ISA serial boards



- Compact ISA boards with 8 RS-232 ports
- 921.6 Kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip H/W flow control
- Choose from a wide range of connection cables and boxes
- Drivers provided for Windows (2000/XP/2003/Vista/2008, 9X/ME/NT), Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6, FreeBSD 4/5, SCO OpenServer 5/6, UnixWare 7, Windows 7, Solaris 10 x86/x64
- Easy configuration, without switches or jumpers

PComm Lite

Overview

The 8-port C168H/HS ISA boards offer users a basic, high performance multiport serial communication solution for connecting terminals, modems, printers, data acquisition equipment, and other serial devices to a PC. The boards are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the 8 RS-232 ports supports a super fast 921.6 Kbps baudrate.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 8
Bus: 16-bit ISA
Connector: DB62 female

Serial Interface

Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 25 KV on the board (C168HS only)
Optical Isolation: 500 V with connector Opt8F (must be purchased separately)

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support

Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 4/6, FreeBSD 4/5, SCO OpenServer 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions: 93 x 157 mm (3.66 x 6.18 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, FCC Part 15 Subpart B Class A
EMS: EN 61000-4-2, EN 61000-4-3, EN 61000-4-4
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 601,501 hrs
Database: MIL-HDBK-217F, GB 25°C

Power Requirements

Power Consumption: 170 mA max. @ +5 V, 100 mA max. @ +12 V, 60 mA max. @ -12 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

C168H: 8-port RS-232 ISA serial board
C168HS: 8-port RS-232 ISA serial board with surge protection

Connection Options (can be purchased separately)

Choose from a wide selection of cables and boxes: See page 10-41 for details

Package Checklist

- 1 C168H or C168HS board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

C104H/HS

4-port RS-232 ISA serial boards



- Cost-effective, compact ISA boards with 4 RS-232 ports
- 921.6 Kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip H/W, S/W flow control
- Drivers provided for Windows (2000/XP/2003/Vista/2008, 9X/ME/NT, 3.x), Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 (x86/x64), QNX 4/6, FreeBSD 4/5, SCO OpenServer 5/6, UnixWare 7, Windows 7, Solaris 10 x86/x64
- Easy configuration, without switches or jumpers

PComm Lite

Overview

The 4-port C104H/HS ISA boards offer users an economical, high performance multiport serial communication solution for connecting terminals, modems, printers, data acquisition equipment, and other serial devices to a PC. The boards are a top choice of industrial automation engineers and system integrators, and support many different operating systems, including Windows, Linux, and even Unix. In addition, each of the 4 RS-232 ports supports a super fast 921.6 Kbps baudrate.

Specifications

Hardware
Comm. Controller: 16C550C or compatible x 4
Bus: 16-bit ISA
Connector: DB37 female

Serial Interface
Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 25 KV on the board (C104HS only)

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows 3.x, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 4/6, FreeBSD 4/5, SCO OpenServer 5/6, UnixWare 7, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 83 x 157 mm (3.27 x 6.18 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, FCC Part 15 Subpart B Class A
EMS: EN 61000-4-2, EN 61000-4-3, EN 61000-4-4
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 629,545 hrs
Database: MIL-HDBK-217F, GB 25°C

Power Requirements
Power Consumption: 100 mA max. @ +5 V, 100 mA max. @ +12 V, 60 mA max. @ -12 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
C104H: 4-port RS-232 ISA serial board
C104H-DB9M: 4-port RS-232 ISA serial board (includes DB9 male cable)
C104H-DB25M: 4-port RS-232 ISA serial board (includes DB25 male cable)
C104HS: 4-port RS-232 ISA serial board with surge protection
C104HS-DB9M: 4-port RS-232 ISA serial board with surge protection (includes DB9 male cable)
C104HS-DB25M: 4-port RS-232 ISA serial board with surge protection (includes DB25 male cable)

Connection Options (one cable is included with each board)
CBL-M37M9x4-30: DB37 male to DB9 male x 4 connection cable, 30 cm
CBL-M37M25x4-30: DB37 male to DB25 male x 4 connection cable, 30 cm

Package Checklist
- 1 C104H or C104HS board
- DB9 male or DB25 male connection cable
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CI-134 Series

4-port RS-422/485 ISA serial boards



PComm Lite

- Cost-effective ISA boards with 4 RS-422/485 ports
- RS-485 data direction control with ADDC® or by RTS
- 921.6 Kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip hardware flow control
- Surge protection and optical isolation available
- Built-in termination resistors

Overview

The CI-134 series ISA boards come with 4 independent RS-422/485 serial ports for connecting data acquisition equipment and other serial devices to a PC. Connect your devices over longer distances—up to 1.2 km (4000 ft)—and ensure greater reliability in industrial environments with on-board surge protection and optical isolation (available with some models). Enjoy greater versatility by using point-to-point full duplex connections, or set up a half duplex RS-485 multi-drop network.

Specifications

Hardware
Comm. Controller: 16C550C or compatible x 4
Bus: 16-bit ISA
Connector: DB37 female

Serial Interface
Number of Ports: 4
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 25 KV on the board (CI-134IS only)
Optical Isolation: 2 KV (CI-134I/IS only)

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows 3.x, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, SCO Open Server 5/6, UnixWare 7, QNX 4/6, FreeBSD 4/5, Solaris 10 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions:
CI-134: 85 x 160 mm (3.35 x 6.30 in)
CI-134I/IS: 110 x 180 mm (4.33 x 7.09 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, FCC Part 15 Subpart B Class B
EMS: EN 61000-4-2, EN 61000-4-3, EN 61000-4-4
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 424,655 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption:
CI-134: 450 mA max. @ +5 V
CI-134I: 610 mA max. @ +5 V
CI-134IS: 620 mA max. @ +5 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

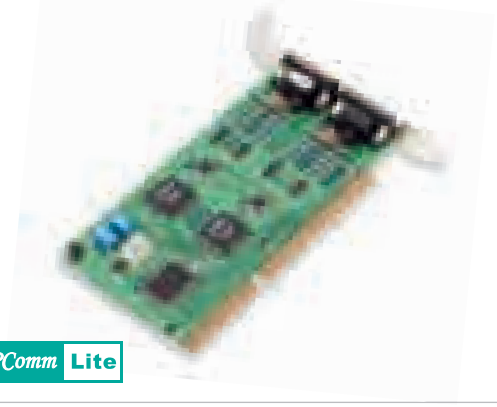
Available Models
CI-134-DB9M: 4-port RS-422/485 ISA serial board (includes DB9 male cable)
CI-134I-DB9M: 4-port RS-422/485 ISA serial board with optical isolation (includes DB9 male cable)
CI-134IS-DB9M: 4-port RS-422/485 ISA serial board with optical isolation and surge protection (includes DB9 male cable)

Connection Options (one cable is included with each board)
CBL-M37M9x4-30: DB37 male to DB9 male x 4 connection cable, 30 cm
CBL-M37M25x4-30: DB37 male to DB25 male x 4 connection cable, 30 cm

Package Checklist
- 1 CI-134 board
- DB9 male or DB25 male connection cable
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CI-132 Series

2-port RS-422/485 ISA serial boards



- Economical RS-422/485 ISA boards with two DB9 male connectors on the board for easy wiring
- RS-485 data direction control with ADDC® or by RTS
- 921.6 Kbps maximum baudrate for super fast data transmission
- 16-byte FIFO and on-chip hardware flow control
- Surge protection and optical isolation available
- Built-in termination resistors

PComm Lite

Overview

The CI-132 series ISA boards come with 2 independent RS-422/485 serial ports for connecting data acquisition equipment and other serial devices to a PC. Connect your devices over longer distances—up to 1.2 km (4000 ft)—and ensure greater reliability in industrial environments with on-board surge protection and optical isolation (available with some models). Enjoy greater versatility by using point-to-point full duplex connections, or set up a half duplex RS-485 multi-drop network.

Specifications

Hardware

Comm. Controller: 16C550C or compatible x 2
Bus: 16-bit ISA
Connectors: DB9 male x 2

Serial Interface

Number of Ports: 2
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 25 KV on the board (CI-132IS only)
Optical Isolation: 2 KV (CI-132I/IS only)

Performance

Baudrate: 50 bps to 921.6 Kbps
Built-in Termination Resistor: 120 ohm (enabled by jumper for RS-485-2w)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: 0x0000-0xFFFF (default = 0x180)
IRQ: 2 (9), 3, 4, 5, 7, 10 (default), 11, 12, 15

Serial Signals

RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), RTS+(B), RTS-(A), CTS+(B), CTS-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Control: ADDC® (automatic data direction control), or by RTS

Driver Support

Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 4/6, FreeBSD 4/5, SCO OpenServer 5/6, UnixWare 7
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions:
CI-132: 75 x 157 mm (2.95 x 6.18 in)
CI-132I/IS: 105 x 157 mm (4.13 x 6.18 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 85°C (-4 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, FCC Part 15 Subpart B Class B
EMS: EN 61000-4-2, EN 61000-4-3, EN 61000-4-4
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 441,015 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

Power Consumption:
CI-132: 240 mA max. @ +5 V
CI-132I/IS: 620 mA max. @ +5 V

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CI-132: 2-port RS-422/485 ISA serial board
CI-132I: 2-port RS-422/485 ISA serial board with optical isolation
CI-132IS: 2-port RS-422/485 ISA serial board with optical isolation and surge protection

Package Checklist

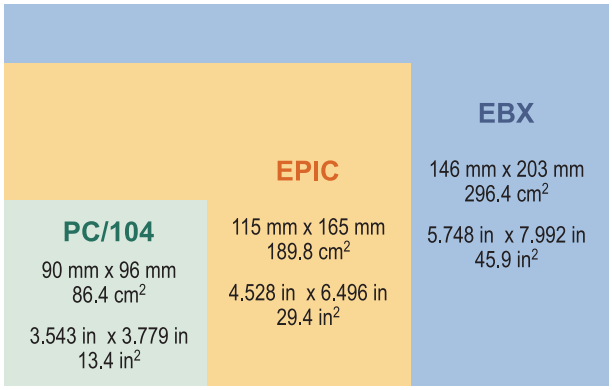
- 1 CI-132 board
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Introduction to PC/104 and PC/104-*Plus*

Using the PC and PC/AT architectures for both desktop and non-desktop applications is now well established, but using these architectures for embedded microcomputer applications was slow to take hold. The reason is that PC and PC/AT motherboards, as well as the accompanying expansion cards, are too large to be used with embedded applications.

This is where PC/104 comes in. The PC/104 architecture differs from the P996 standard in the following ways:

- Reduced form factor: 90 x 96 mm (3.543 x 3.779 in)
- Self-stacking bus that eliminates the need for backplanes or card cages
- Reduced bus drive power required for most signals (up to 4 mA), allowing fewer components and lower power consumption (typically just 1-2 watts per module)

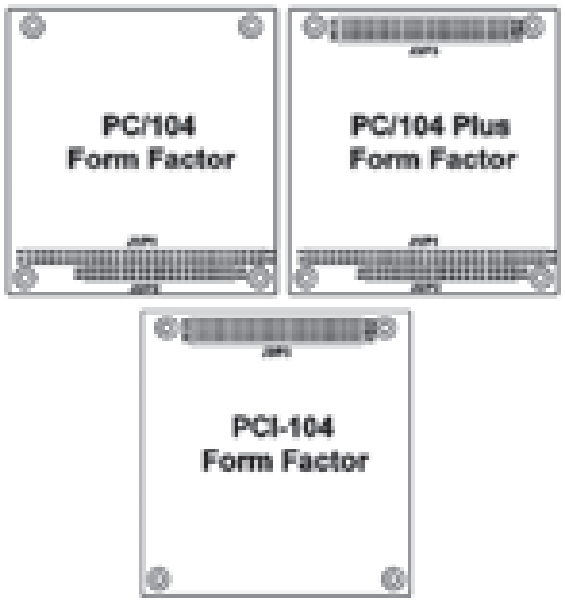


The three major form factors for embedded single-board computers.

Differences between PC/104, PC/104-Plus, and PCI-104

The ISA bus architecture has been a popular choice for embedded applications for a long time, and the publication of the PC/104 standard in 1992 made the ISA bus architecture available in a small, rugged form factor. Since that time, PC/104 has become an industry standard. As technological requirements advanced, a need arose for a higher bus throughput performance. This was especially true for graphics devices and other high-speed I/O devices such as networks. The PC/104 Consortium met this challenge by incorporating a PCI bus into the PC/104 form factor. This new standard has become known as PC/104-Plus. The architecture provides a link for versatile legacy hardware, and meets the high-speed requirements for both present and future hardware.

(This content is based on information from the PC/104 Org website.)



PC/104:

The PC/104 standard specifies the mechanical and electrical specifications for a compact version of the ISA (PC and PC/AT) bus, but is optimized for the unique requirements of embedded systems applications. The specification referred to here as “PC/104” is based on the 104 signal contacts on the two bus connectors (64 pins on P1, plus 40 pins on P2).

PC/104-*Plus*:

To accommodate the gradual replacement of ISA bus devices with PCI devices, the PC/104-Plus standard was approved by the PC/104 Consortium. The PC/104-Plus connector supports both ISA and PCI buses to accommodate PCI devices in small form factor embedded computers.

PCI-104:

To accommodate the gradual replacement of ISA bus devices with PCI devices, the PCI-104 standard was approved by the PC/104 Consortium. PCI-104 is a PCI-only architecture that accommodates the advances of PCI devices in a small rugged form factor.

Features of Moxa's PC/104 and PC-104-*Plus* Modules

Wide temperature for industrial applications



Industrial PCs were designed to work reliably in harsh industrial environments, and of all the features that distinguish industrial products from their commercial-grade cousins, the "wide temperature" feature is considered the most important.

Many industrial PCs now support a temperature range of -40 to 85°C, and Moxa's PC/104 and PC/104-Plus modules also support an operating temperature range of -40 to 85°C, making Moxa a leading provider of hardware for embedded systems.

Support for Windows CE 5.0 and Windows XP Embedded

Moxa's PC/104 and PC/104-Plus modules support a variety of operating systems that are used for industrial applications, including Windows CE 5.0 and Windows XP Embedded.

PC/104 Stack is Designed for Added Ruggedness

The PC/104 embedded computer standard is defined by the PC/104 Consortium, which has specified both the form factor and characteristics of the computer bus. The standard was created specifically to meet the special conditions encountered by many embedded computing applications, which require reliable data transfer in harsh, industrial-type environments.

The PC/104 stack design is one of the most recognizable differences between the PC/104 standard and PCI standard, which is the most common standard used by PCs. Not requiring a backplane, and allowing the PC/104 boards to be stacked one on top of the other solves two major problems: several PC/104 expansion cards can be added easily to the same embedded motherboard, and the resulting structure is more stable, making it suitable for rugged environments. Stacking is achieved by using the mounting-holes in the corners of each module.

PC/104 is Designed for Embedded Applications

The PC/104 standard was developed for embedded applications, which require a smaller, more robust board. Since the main difference with standard expansion boards is size, designers can use existing software resources to reduce the time-to-market of their embedded applications.

Applications

- KIOSKs
- Vending Machines
- Instruments
- Military Equipment
- Testing Equipment
- ATMs
- POS Devices
- Industrial Control Systems

Moxa's PC/104 Module Solution

Moxa's PC/104 serial modules meet the embedded PC standard, and work with PC/104 CPU boards that accept the PC/104 expansion interface. Moxa's PC/104 modules come with 2 to 8 serial ports, built-in 15 KV ESD protection, optional 2 KV optical isolation protection, and optional DB9 or DB25 connection cables to satisfy a variety of connection requirements.

Serial Interfae	No. of Ports	Moxa's PC/104 Models	Moxa's PC/104-Plus Models
RS-232	4	CA-104	–
	8	CA-108	CB-108
RS-422/485	2	CA-132/132I	–
	4	CA-134I	CB-134I
RS-232/422/485	4	CA-114	CB-114

CA-108 Series

8-port RS-232 PC/104 modules



- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip H/W and S/W flow control
- Built-in 15 KV ESD protection
- IRQ and I/O settings are jumper and DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

The CA-108 PC/104 modules are reliable, high performance, multiport serial communication solutions that have 8 RS-232 ports, and can be used with PC/104 CPU boards that accept the PC/104 expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CA-108s' versatile driver support makes the modules suitable for a wide range of applications.

Specifications

Hardware
Comm. Controller: 16C550C or compatible x 8
Bus: PC/104 bus
Connector: 40-pin box header
DIP Switches: I/O base address, interrupt vector

Serial Interface
Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ: 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 (shared for all ports)
FIFO: 64 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 4/6
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 408,357 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 265 mA @ 5 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
CA-108: 8-port RS-232 PC/104 module, 0 to 55°C operating temperature
CA-108-T: 8-port RS-232 PC/104 module, -40 to 85°C operating temperature

Connection Options (can be purchased separately)
CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist
- 1 CA-108 or CA-108-T module
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CA-114 Series

4-port RS-232/422/485 PC/104 modules



- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip H/W and S/W flow control
- Built-in 15 KV ESD protection
- IRQ settings, I/O settings, and serial interface are jumper and DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

The CA-114 PC/104 modules are reliable, high performance, multiport serial communication solutions that have 4 RS-232/422/485 ports, and can be used with PC/104 CPU boards that accept the PC/104 expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CA-114s' versatile driver support makes the modules suitable for a wide range of applications.

Specifications

Hardware
Comm. Controller: 16C550C or compatible x 4
Bus: PC/104 bus
Connector: 40-pin box header
DIP Switches: I/O base address, interrupt vector, serial interface

Serial Interface
Number of Ports: 4
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ: 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 (shared for all ports)
FIFO: 64 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 4/6
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 630,997 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 305 mA @ 5 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
CA-114: 4-port RS-232/422/485 PC/104 module, 0 to 55°C operating temperature
CA-114-T: 4-port RS-232/422/485 PC/104 module, -40 to 85°C operating temperature

Connection Options (can be purchased separately)
CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist
- 1 CA-114 or CA-114-T module
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CA-134I Series

4-port RS-422/485 PC/104 modules with 2 KV isolation



- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip S/W flow control
- Built-in 15 KV ESD protection
- IRQ settings, I/O settings, and serial interface are jumper and DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

Overview

The CA-134I PC/104 modules are reliable, high performance, multiport serial communication solutions that have 4 RS-422/485 ports, and can be used with PC/104 CPU boards that accept the PC/104 expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CA-134Is' versatile driver support makes the modules suitable for a wide range of applications.

Specifications

Hardware
Comm. Controller: 16C550C or compatible x 4
Bus: PC/104 bus
Connector: 40-pin box header
DIP Switches: I/O base address, interrupt vector, serial interface

Serial Interface
Number of Ports: 4
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board
Optical Isolation: 2 KV

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ: 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 (shared for all ports)
FIFO: 64 bytes

Serial Signals
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 4/6
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 339,822 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 220 mA @ 5 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
CA-134I: 4-port RS-422/485 PC/104 module with optical isolation, 0 to 55°C operating temperature
CA-134I-T: 4-port RS-422/485 PC/104 module with optical isolation, -40 to 85°C operating temperature

Connection Options (can be purchased separately)
CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist
- 1 CA-134I or CA-134I-T module
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CA-104 Series

4-port RS-232 PC/104 modules



- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip software flow control
- Built-in 15 KV ESD protection
- IRQ and I/O settings are jumper and DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

Overview

The CA-104 PC/104 modules are reliable, high performance, multiport serial communication solutions that have 4 RS-232 ports, and can be used with PC/104 CPU boards that accept the PC/104 expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CA-104s' versatile driver support makes the modules suitable for a wide range of applications.

Specifications

Hardware
Comm. Controller: 16C550C or compatible x 4
Bus: PC/104 bus
Connector: 40-pin box header
DIP Switches: I/O base address, interrupt vector

Serial Interface
Number of Ports: 4
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ: 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 (shared for all ports)
FIFO: 64 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 4/6

Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 897,459 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 210 mA @ +5 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
CA-104: 4-port RS-232 PC/104 module, 0 to 55°C operating temperature
CA-104-T: 4-port RS-232 PC/104 module, -40 to 85°C operating temperature

Connection Options (can be purchased separately)
CBL-F40M9x4-50: 40-pin box header to male DB9 x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist
- 1 CA-104 or CA-104-T module
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CA-132/132I Series

2-port RS-422/485 PC/104 modules with optional 2 KV isolation



- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip software flow control
- Built-in 15 KV ESD protection
- IRQ, I/O, and serial interface jumper and DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Supports RS-485 ADDC® (Automatic Data Direction Control)
- Windows CE 5.0/6.0 and Windows XP embedded operating systems supported
- Wide temperature models available for -40 to 85°C environments

PComm Lite

Overview

The CA-132/132I PC/104 modules are reliable, high performance, multiport serial communication solutions that have 2 RS-422/485 ports, and can be used with PC/104 CPU boards that accept the PC/104 expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CA-132/132Is' versatile driver support makes the modules suitable for a wide range of applications.

Specifications

Hardware
Comm. Controller: 16C550C or compatible x 2
Bus: PC/104 bus
Connector: 20-pin box header
LED Indicators: Built-in TX, RX LEDs for each port
DIP Switches: I/O base address, interrupt vector

Serial Interface
Number of Ports: 2
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board
Optical Isolation: 2 KV (CA-132I only)

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
IRQ: 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 (shared for all ports)
FIFO: 64 bytes

Serial Signals
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 4/6
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 536,288 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption:
CA-132: 155 mA @ +5 V
CA-132I: 190 mA @ +5 V

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
CA-132: 2-port RS-422/485 PC/104 module, 0 to 55°C operating temperature
CA-132I: 2-port RS-422/485 PC/104 module with optical isolation protection, 0 to 55°C operating temperature
CA-132-T: 2-port RS-422/485 PC/104 module, -40 to 85°C operating temperature
CA-132I-T: 2-port RS-422/485 PC/104 module with optical isolation protection, -40 to 85°C operating temperature

Connection Options (can be purchased separately)
CBL-F20M9x2-50: 20-pin box header to DB9 male x 2 connection cable, 50 cm
CBL-F20M25x2-50: 20-pin box header to DB25 male x 2 connection cable, 50 cm

Package Checklist
- 1 CA-132 or CA-132I module
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CB-108 Series

8-port RS-232 PC/104-Plus modules



- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip H/W and S/W flow control
- Built-in 15 KV ESD protection
- Onboard Tx and Rx LED indicators for each port
- Widows (XP/Vista/7), Windows CE 5.0/6.0, and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

The CB-108 PC/104-Plus modules come with 8 RS-232 ports, and can be used with PC/104-Plus CPU boards that accept the PC/104-Plus expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CB-108s' versatile driver support makes the modules suitable for a wide range of applications. The CB-108 modules can be used on the PC/104-Plus (PCI) bus, and provide a reliable, high performance solution for multiport serial communication.

Specifications

Hardware
Comm. Controller: MU860 (16C550C compatible)
Bus: PC/104-Plus bus
Connector: 40-pin box header

Serial Interface
Number of Ports: 8
Serial Standards: RS-232
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 128 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 6

Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 403,631 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 153 mA @ 5 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
CB-108: 8-port RS-232 PC/104-Plus module, 0 to 55°C operating temperature
CB-108-T: 8-port RS-232 PC/104-Plus module, -40 to 85°C operating temperature

Connection Options (can be purchased separately)
CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist
- 1 CB-108 or CB-108-T module
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CB-114 Series

4-port RS-232/422/485 PC/104-Plus modules



- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip H/W and S/W flow control
- Built-in 15 KV ESD protection
- Serial interface is DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows (XP/Vista/7), Windows CE 5.0/6.0, and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

The CB-114 PC/104-Plus modules come with 4 RS-232/422/485 ports, and can be used with PC/104-Plus CPU boards that accept the PC/104-Plus expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CB-114s' versatile driver support makes the modules suitable for a wide range of applications. The CB-114 modules can be used on the PC/104-Plus (PCI) bus, and provide a reliable, high performance solution for multiport serial communication.

Specifications

Hardware

Comm. Controller: MU860 (16C550C compatible)
Bus: PC/104-Plus bus
Connector: 40-pin box header
DIP Switches: Serial interface

Serial Interface

Number of Ports: 4
Serial Standards: RS-232/422/485
Max. No. of Boards per PC: 4

Serial Line Protection

ESD Protection: 15 KV on the board

Performance

Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 128 bytes

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support

Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 6
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 381,081 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

Power Consumption: 164 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

CB-114: 4-port RS-232/422/485 PC/104 module, 0 to 55°C operating temperature
CB-114-T: 4-port RS-232/422/485 PC/104 module, -40 to 85°C operating temperature

Connection Options (can be purchased separately)

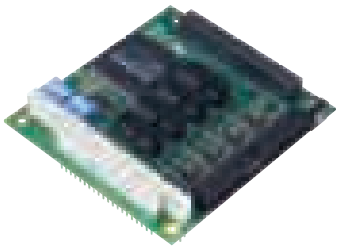
CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist

- 1 CB-114 or CB-114-T module
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

CB-134I Series

4-port RS-422/485 PC/104-Plus modules with 2 KV isolation



- 921.6 Kbps maximum baudrate for super fast data transmission
- On-chip S/W flow control
- Built-in 15 KV ESD protection
- Serial interface is DIP switch selectable
- Onboard Tx and Rx LED indicators for each port
- Windows XP/Vista/7, Windows CE 5.0/6.0, and Windows XP embedded operating systems supported
- Wide temperature model available for -40 to 85°C environments

PComm Lite

Overview

The CB-134I PC/104-Plus modules come with 4 RS-422/485 ports, and can be used with PC/104-Plus CPU boards that accept the PC/104-Plus expansion interface. Optional DB9 and DB25 connection cables are available for connecting to serial devices, and the CB-134Is' versatile driver support makes the modules suitable for a wide range of applications. The CB-134I modules can be used on the PC/104-Plus (PCI) bus, and provide a reliable, high performance solution for multiport serial communication.

Specifications

Hardware
Comm. Controller: MU860 (16C550C compatible)
Bus: PC/104-Plus bus
Connector: 40-pin box header
DIP Switches: Serial interface

Serial Interface
Number of Ports: 4
Serial Standards: RS-422/485
Max. No. of Boards per PC: 4

Serial Line Protection
ESD Protection: 15 KV on the board
Optical Isolation: 2 KV

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
I/O Address: Assigned by BIOS
IRQ: Assigned by BIOS
FIFO: 128 bytes

Serial Signals
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND

Driver Support
Operating Systems: Windows 9X/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Windows CE 5.0/6.0, Windows XP Embedded, DOS, Linux 2.4, Linux 2.6 x86/x64, QNX 6
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 534,809 hrs
Database: Telcordia (Bellcore), GB

Power Requirements
Power Consumption: 236 mA @ 5 VDC

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
CB-134I: 4-port RS-422/485 PC/104-Plus module with optical isolation protection, 0 to 55°C operating temperature
CB-134I-T: 4-port RS-422/485 PC/104-Plus module with optical isolation protection, -40 to 85°C operating temperature

Connection Options (can be purchased separately)
CBL-F40M9x4-50: 40-pin box header to DB9 male x 4 connection cable, 50 cm
CBL-F40M25x4-50: 40-pin box header to DB25 male x 4 connection cable, 50 cm

Package Checklist
- 1 CB-134I or CB-134I-T module
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Introduction to CAN

The CAN serial bus, which was developed for the automotive industry, was introduced in 1986 as the "Automotive Serial Controller Area Network." It was soon discovered that CAN worked extremely well in other embedded systems applications, and consequently its popularity increased. The list of applications that use CAN includes weaving machines, elevator systems in large buildings, all kinds of ships, trains, aircraft, x-ray machines and other medical equipment, logging equipment, tractors and combines, coffee makers, and major appliances.

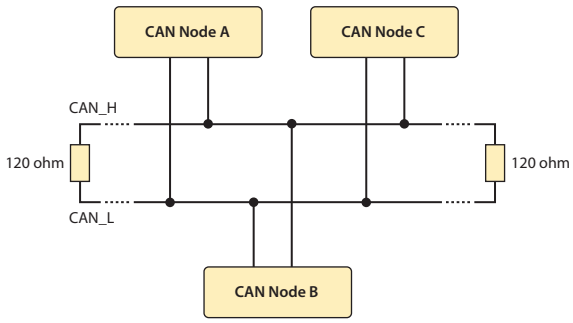
The Controller Area Network (CAN) is a serial protocol that allows multiple processors in a system to communicate with each other in an efficient manner. CAN is now the standard for high-speed, mission critical, real-time control networks for different types of machines, due to the fact that the networks are reliable, relatively simple, and inexpensive.

CAN systems are quite versatile and mechanics and technicians find it easy to repair or replace computer hardware in a CAN system, without affecting the rest of the network in any way. In addition, design engineers can easily modify existing CAN systems for other uses by adding or remove network nodes.

The CAN Physical Layer

The CAN serial protocol covers applications that range from high speed networks to low cost multiplex wiring. Automotive electronics, engine control units, sensors, and anti-skid-systems, for example, are connected using CAN with bitrates up to 1 Mbps.

CAN signals are typically transmitted differentially through a pair of wires, since doing so greatly improves the reliability of signal transmissions even when the network is subject to low signal levels or common mode errors. The two wires are called CAN_H and CAN_L and use 120-ohm termination resistors. Many CAN systems also use twisted pair wires to reduce the effects of electromagnetic interference. CAN systems are popular since they use an inexpensive bus topology, make it easy to connect additional nodes, and are less prone to network failures.



Layered Structure of a CAN Node

The specifications are designed to achieve compatibility between any two CAN implementations, where compatibility can refer to either electrical features or how transmitted data is interpreted. CAN is subdivided into different layers, as indicated in the accompanying table.

Application Layer
Object Layer
-Message Filtering
-Message and Status Handling
Transfer Layer
-Fault Confinement
-Error Detection and Signaling
-Message Validation
-Acknowledgement
-Arbitration
-Message Framing
-Transfer Rate and Timing
Physical Layer
-Signal Level and Bit Representation
-Transmission Medium

The object layer and the transfer layer comprise all services and functions of the data link layer defined by the ISO/OSI model

The physical layer specifies the physical properties for transferring bits between different nodes, and must be the same for all nodes belonging to the same network. The physical layer defines how signals are actually transmitted, but is not defined to allow transmission medium and signal level implementations to be optimized for their applications.

CP-602E-I Series

2-port CAN interface PCI Express boards with 2 KV isolation



- CAN 2.0A and CAN 2.0B supported
- Two independent CAN communication ports
- CAN transfer rate up to 1 Mbps
- 2 KV optical isolation protection
- LED for transmit/receive status on each port
- Optional 120 ohm terminal resistor for CAN bus network
- DLL library and examples included
- Windows driver provided

Overview

Moxa's new CP-602E-I CAN (Controller Area Network) interface board supports the PCI Express interface. As a stand-alone CAN controller, the CP-602E-I is a cost-effective solution that provides two active CAN controllers with a DB9 connector on the same board. The CP-602E-I CAN interface board uses the NXP SJA1000 and transceiver PCA82C251, which provide the bus arbitration and error detection. The -40 to 85°C wide operating temperature (CP-602E-I-T only) and 2 KV isolation make the boards suitable for use in harsh industrial environments.

Specifications

Hardware

Card Interface: PCI Express
Connectors: DB9 male x 2
Ports: 2
CAN Controller: NXP SJA1000
CAN Transceiver: PCA82C251
CAN Specification: CAN 2.0 A/B
Signal Support: CAN_H, CAN_L, GND
Transfer Rate: 1 Mbps
Max. Number of Boards per PC: 4
Optical Isolation: 2 KV
Termination Resistor: 120 ohm (selected by jumper)

Driver Support

Operating Systems: Windows XP/2003/Vista/2008/7 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Software

Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 (x86 and x64)
Libraries: Visual C/C++, Borland C/C++

Physical Characteristics

Dimensions: 85 x 100 mm (3.35 x 3.94 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 248,563 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

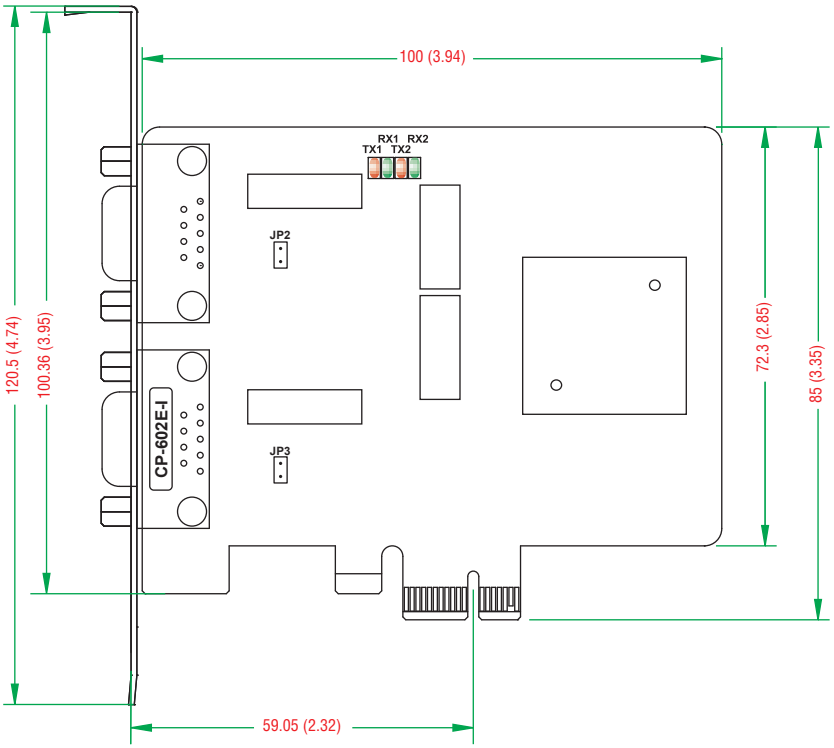
Power Consumption: 780 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-602E-I: 2-port CAN interface PCI Express board, with 2 KV optical isolation protection, 0 to 55°C operating temperature

CP-602E-I-T: 2-port CAN interface PCI Express board with 2 KV optical isolation protection, -40 to 85°C operating temperature

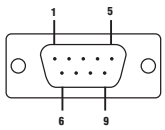
Package Checklist

- 1 PCI Express board with standard bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Pin Assignment

PIN	Signal
2	CAN L
3	CAN GND
5	Shield
7	CAN H

DB9 male



CP-602U-I Series

2-port CAN Interface Universal PCI boards with 2 KV isolation



- CAN 2.0A and CAN 2.0B supported
- Two independent CAN communication ports
- CAN transfer rate up to 1 Mbps
- 2 KV optical isolation protection
- LED for transmit/receive status on each port
- Optional 120 ohm terminal resistor for CAN bus network
- DLL library and examples included
- Windows driver provided

Overview

Moxa's new CP-602U-I CAN (Controller Area Network) interface board supports the Universal PCI interface. As a stand-alone CAN controller, the CP-602U-I is a cost-effective solution that provides two active CAN controllers with a DB9 connector on the same board. The CP-602U-I CAN interface board uses the NXP SJA1000 and transceiver PCA82C251, which provide the bus arbitration and error detection. The -40 to 85°C wide operating temperature (CP-602U-I-T only) and 2 KV isolation make the boards suitable for use in harsh industrial environments.

Specifications

Hardware

Card Interface: Universal PCI
Connectors: DB9 male x 2
Ports: 2
CAN Controller: NXP SJA1000
CAN Transceiver: PCA82C251
CAN Specification: CAN 2.0 A/B
Signal Support: CAN_H, CAN_L, GND
Transfer Rate: 1 Mbps
Max. Number of Boards per PC: 4
Optical Isolation: 2 KV
Termination Resistor: 120 ohm (selected by jumper)

Driver Support

Operating Systems: Windows XP/2003/Vista/2008/7 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Software

Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 (x86 and x64)
Libraries: Visual C/C++, Borland C/C++

Physical Characteristics

Dimensions: 80 x 120 mm (3.15 x 4.72 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 1,989,990 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

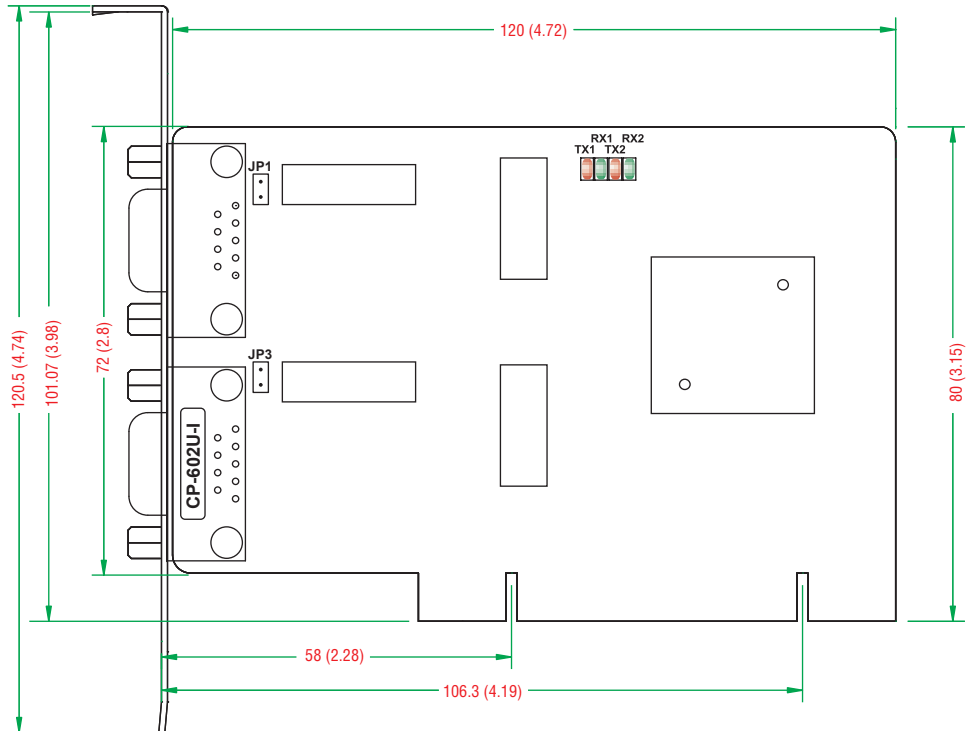
Power Consumption: 365 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CP-602U-I: 2-port CAN interface Universal PCI board, with 2 KV isolation protection, 0 to 55°C operating temperature

CP-602U-I-T: 2-port CAN interface Universal PCI board with 2 KV optical isolation protection, -40 to 85°C operating temperature

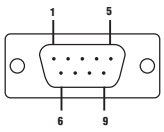
Package Checklist

- 1 Universal PCI board with standard bracket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Pin Assignment

PIN	Signal
2	CAN L
3	CAN GND
5	Shield
7	CAN H

DB9 male



CB-602I Series

2-port CAN interface PC/104-Plus modules with 2 KV isolation



- CAN 2.0A and CAN 2.0B supported
- Two independent CAN communication ports
- CAN transfer rate up to 1 Mbps
- 2 KV optical isolation protection
- LED for transmit/receive status on each port
- Optional 120 ohm terminal resistor for CAN bus network
- DLL library and examples included
- Windows drivers provided

Overview

Moxa's new CB-602I CAN (Controller Area Network) interface board supports the PC/104-Plus interface. Optional DB9 and DB25 connection cables are available for connecting to CAN interface device. The CB-602I CAN interface board uses the NXP SJA1000 and transceiver PCA82C251, which provide the bus arbitration and error detection. The -40 to 85°C wide operating temperature (CB-602I-T only) and 2 KV isolation make the boards suitable for use in harsh industrial environments.

Specifications

Hardware

Module Interface: PC/104-Plus bus
Connector: 20-pin box header
Ports: 2
CAN Controller: NXP SJA1000
CAN Transceiver: PCA82C251
CAN Specification: CAN 2.0 A/B
Signal Support: CAN_H, CAN_L, GND
Transfer Rate: 1 Mbps
Max. Number of Boards per PC: 4
Optical Isolation: 2 KV
Termination Resistor: 120 ohm (selected by jumper)

Driver Support

Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Software

Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 (x86 and x64)
Libraries: Visual C/C++, Borland C/C++

Physical Characteristics

Dimensions: 90 x 96 mm (3.55 x 3.78 in)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 55°C (32 to 131°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMC: CE, FCC
EMI: EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 248,563 hrs
Database: Telcordia (Bellcore), GB

Power Requirements

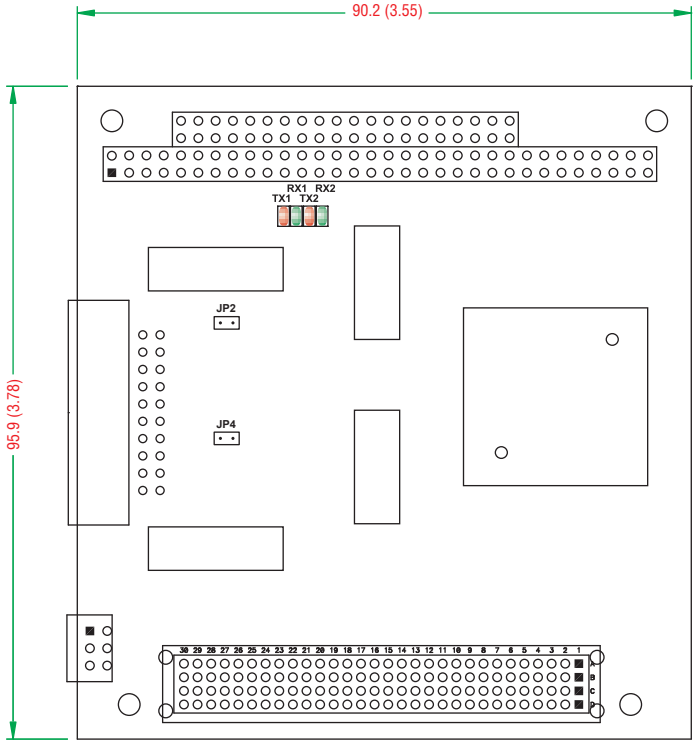
Power Consumption: 380 mA @ 5 VDC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

CB-602I: 2-port CAN interface PC/104-Plus module with 2 KV optical isolation protection, 0 to 55°C operating temperature

CB-602I-T: 2-port CAN interface PC/104-Plus module with 2 KV optical isolation protection, -40 to 85°C operating temperature

Package Checklist

- 1 PC/104-Plus Module
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Connection Options (can be ordered separately)

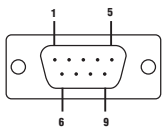
CBL-F20M9x2-50

20-pin box header to DB9 male x 2 connection cable, 50 cm



PIN	Signal
2	CAN L
3	CAN GND
5	Shield
7	CAN H

DB9 male



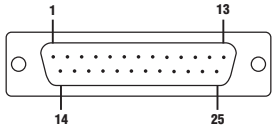
CBL-F20M25x2-50

20-pin box header to DB25 male x 2 connection cable, 50 cm



PIN	Signal
2	CAN GND
3	CAN L
4	CAN H
7	Shield

DB25 male



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Industrial USB

Product Selection Guide

USB-to-Serial Converters 11-2
USB Hubs 11-4

USB-to-Serial Converters

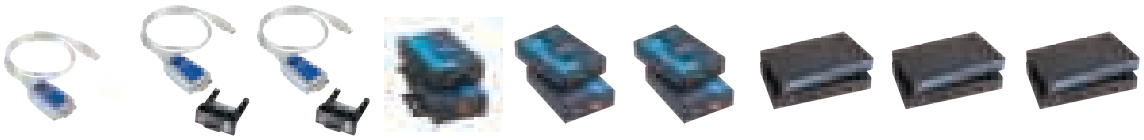
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USB-to-Serial Converters



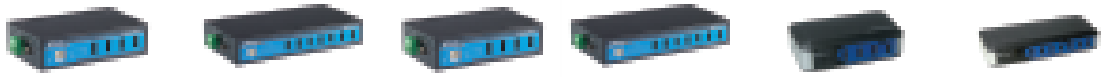
	UPort® 1110	UPort® 1130 UPort® 1130I	UPort® 1150	UPort® 1150I	UPort® 1250	UPort® 1250I	UPort® 1410	UPort® 1450	UPort® 1450I
USB Interface									
Compliance	USB 1.1/2.0 compliant								
Connector	USB type A			USB type B					
Speed	12 Mbps (Full-Speed USB)				480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)				
Serial Interface									
Number of Ports	1 x RS-232	1 x RS-422/485	1 x RS-232/422/485	1 x RS-232/422/485	2 x RS-232/422/485	2 x RS-232/422/485	4 x RS-232	4 x RS-232/422/485	4 x RS-232/422/485
Connector	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	Flow Control: RTS/CTS, XON/XOFF								
FIFO	64 bytes	64 bytes	64 bytes	64 bytes	128 bytes	128 bytes	128 bytes	128 bytes	128 bytes
Baudrate	50 bps to 921.6 Kbps								
Embedded ESD Protection	15 KV								
Optical Isolation	–	2 KV (UPort 1130I)	–	2 KV	–	2 KV	–	–	2 KV
Driver Support									
Windows 98/ME	✓	✓	✓	✓	–	–	–	–	–
Windows 2000	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows XP/2003 x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows Vista x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 2008 x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windows 7 x86/ x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
WinCE 5.0/6.0	✓	✓	✓	✓	✓	✓	✓	✓	✓
Linux 2.4	✓	✓	✓	✓	✓	✓	✓	✓	✓
Linux 2.6 x86/x64	✓	✓	✓	✓	✓	✓	✓	✓	✓
Physical Characteristics									
Housing	ABS + PC			SECC sheet metal (1 mm), IP30 protection					
Product Weight	65 g			75 g	180 g		720 g		
Packaged Weight	200 g			370 g	370 g	680 g	1320 g		
Dimensions (mm)	38.4 x 60 x 20			52 x 80 x 22	77 x 26 x 111		204 x 30 x 125		
Environmental Limits									
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Storage Temperature	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Standards and Certifications									
Safety	–	–	–	UL 60950-1	UL 60950-1				
EMI	EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B				EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A				
EMS	EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC-61000-4-6, IEC 61000-4-8, IEC-61000-4-11				EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, IEC 61000-4-8, IEC 61000-4-11				
Green Product	RoHS, CRoHS, WEEE				RoHS, CRoHS, WEEE				
Power Requirements									
Power Consumption	30 mA @ 5 VDC	60 mA @ 5 VDC	77 mA @ 5 VDC	260 mA @ 5 VDC	360 mA @ 5 VDC	200 mA @ 12 VDC	385 mA @ 5 VDC	300 mA @ 12 VDC	360 mA @ 12 VDC
Reliabilty									
Warranty	5 years (see www.moxa.com/warranty)								

USB-to-Serial Converters



	UPort® 1610-8	UPort® 1650-8	UPort® 1610-16	UPort® 1650-16	UPort® 2210	UPort® 2410
USB Interface						
Compliance	USB 1.1/2.0 compliant					
Connector	USB type B					
Speed	480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)					
Serial Interface						
Number of Ports	8 x RS-232	8 x RS-232/422/485	16 x RS-232	16 x RS-232/422/485	2 x RS-232	4 x RS-232
Connector	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male	DB9 male
Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, XON/XOFF					
FIFO	128 bytes	128 bytes	128 bytes	128 bytes	16 bytes	16 bytes
Baudrate	50 bps to 921.6 Kbps					
Embedded ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	–	–	–	–	–	–
Driver Support						
Windows 98/ME	–	–	–	–	–	–
Windows 2000	✓	✓	✓	✓	✓	✓
Windows XP/2003 x86/x64	✓	✓	✓	✓	✓	✓
Windows Vista x86/x64	✓	✓	✓	✓	✓	✓
Windows 2008 x86/x64	✓	✓	✓	✓	✓	✓
Windows 7 x86/ x64	✓	✓	✓	✓	✓	✓
WinCE 5.0/6.0	✓	✓	✓	✓	–	–
Linux 2.4	✓	✓	✓	✓	✓	✓
Linux 2.6 x86/x64	✓	✓	✓	✓	✓	✓
Physical Characteristics						
Housing	SECC sheet metal (1 mm), IP30 protection				Polycarbonate (PC)	
Product Weight	835 g	835 g	2475 g	2475 g	120 g	210 g
Packaged Weight	1440 g	1440 g	3440 g	3440 g	325 g	455 g
Dimensions (mm)	204 x 44 x 125	204 x 44 x 125	440 x 45.5 x 198.1	440 x 45.5 x 198.1	70 x 35 x 120	80 x 35 x 185
Environmental Limits						
Operating Temperature	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C
Operating Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Storage Temperature	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C	-20 to 70°C
Standards and Certifications						
Safety	UL 60950-1				UL 60950-1	
EMI	EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A				EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B	
EMS	EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11				EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC-61000-4-6, IEC 61000-4-8, IEC-61000-4-11	
Green Product	RoHS, CRoHS, WEEE				RoHS, CRoHS, WEEE	
Power Requirements						
Power Consumption	230 mA @ 12 VDC	340 mA @ 12 VDC	130 mA @ 100 VAC	150 mA @ 100 VAC	140 mA @ 5 VDC	240 mA @ 5 VDC
Reliabilty						
Warranty	5 years (see www.moxa.com/warranty)					

USB Hubs



	UPort® 404	UPort® 407	UPort® 404-T	UPort® 407-T	UPort® 204	UPort® 207
USB Interface						
Compliance	USB 1.1/2.0 compliant					
Upstream USB Ports	1 (Type B)					
Downstream USB Ports	4 (Type A)	7 (Type A)	4 (Type A)	7 (Type A)	4 (Type A)	7 (Type A)
Speed	480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)					
Supply Current	500 mA max. per channel					
Physical Characteristics						
Housing	Aluminum				Polycarbonate (PC)	
Dimensions (mm)	80 x 35 x 130	100 x 35 x 192	80 x 35 x 130	100 x 35 x 192	80 x 35 x 130	100 x 35 x 195
Environmental Limits						
Operating Temperature	0 to 60°C	0 to 60°C	-40 to 85°C	-40 to 85°C	0 to 60°C	0 to 60°C
Operating Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Storage Temperature	-20 to 75°C	-20 to 75°C	-40 to 85°C	-40 to 85°C	-20 to 75°C	-20 to 75°C
Standards and Certifications						
Safety	UL 508, LVD					
EMI	EN 61000-3-2, EN 61000-3-3, EN 61000-6-2, EN 61000-6-4, FCC Part 15 Subpart B Class A					
EMS	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11					
Green Product	RoHS, CRoHS, WEEE					
Power Requirements						
Power Consumption	1300 mA @ 12 VDC	2300 mA @ 12 VDC	1300 mA @ 12 VDC	2300 mA @ 12 VDC	1210 mA@ 12 VDC	2170 mA @ 12 VDC
Reliabilty						
Warranty	5 years (see www.moxa.com/warranty)					

Introduction to USB Connectivity

Moxa's UPort® line of USB connectivity products include a wide range of solutions for connecting COM ports or USB ports to a PC through the PC's USB port. Moxa's UPort® products are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, come with LED indicators for easy monitoring, and are even suitable for heavy-load applications. The UPort® product line includes USB-to-serial converters with 1, 2, 4, 8, or 16 independent RS-232, RS-422/485, and RS-232/422/485 serial ports for connecting data acquisition equipment and many other types of serial devices to notebooks and desktop PCs, and USB hubs with 4 or 7 USB ports for expanding the number of built-in USB ports on a host PC.



Available Products

USB-to-serial converters: UPort® 1000 and UPort® 2000 series
USB hubs: UPort® 200 and UPort® 400 series

Instant Plug & Play

UPort® products allow you to connect serial devices or USB devices to your laptop or workstation through a USB (Universal Serial Bus) port. These plug & play USB solutions are perfect for mobile, instrumentation, and point-of sale applications.

USB-IF Certified

Moxa's UPort® 200 and UPort® 400 series of USB 2.0 hubs have passed USB-IF (USB Implementers Forum) certification, which verifies that products meet a number of strict electrical requirements for Hi-Speed USB operation designed to the USB 2.0 specifications. This means that the UPort® 200/400 series support Hi-Speed USB 2.0 for up to 480 Mbps USB transmission, are fully compliant with the requirements for interoperability, provide enough power to attached devices, and can transition back to high-speed operation from the suspend state.

Reduce Short and Long Term Costs

For many applications, system integrators are moving towards using either serial-to-Ethernet or USB-to-serial products to connect serial devices to a PC. The overall costs of setting up an application is reduced, not only from a short term hardware investment perspective, but also by reducing costs associated with long term management and integration. Another big plus to using Moxa's USB-to-serial solutions is that each product supports a broad range of operating systems. Drivers are available for Windows 7 x86/x64, Windows XP/2003/Vista /2008 x86/x64, Windows 98/ME/2000, WinCE 5.0/6.0, and Linux 2.4, and Linux 2.6 x86/x64.

ESD Level 4 Protection

Electrostatic discharge (ESD) could be as severe as having more than one thousand volts of ESD with a high rise time (dv/dt) break through the junction layer of protective devices. In order to avoid serious damage, Moxa's UPort® 404/407 USB hubs provide ESD level 4 (contact 8 KV, air 15 KV) protection, which increases the quality and value of the user's end-product.

RS-232/422/485 Support

Moxa's UPort® 1000/2000 series of USB-to-serial products include models that support some or all of the RS-232/422/485 serial interfaces. The full slate of RS-232 signals (TxD, RxD, DTR, DSR, RTS, CTS, DCD) are supported, and both 2-wire and 4-wire RS-485 can be used. Many of Moxa's USB-to-serial products use DB9 male connectors for the serial ports, and for industrial applications, the DB9 female to terminal block accessory can be used. In addition, users can select baudrates up to 921.6 Kbps, and make use of the 128-byte FIFO.

Always Enough Power

Some UPort® models support both bus power and external power through the power adaptor. Bus power can be used with laptop and workstation connections that support a 500 mA output for USB devices. An external power adaptor can be used if your computer's USB port does not provide enough amperage to run the UPort®.

Top Serial Performance

Moxa's 20-plus years of experience in serial board design is now built into a new top performance CPU called MOXA ART. This chip equips the UPort® converters with USB 2.0 (Hi-Speed 480 Mbps), a 128-byte FIFO, on-chip hardware and software flow control, and burst data mode, making Moxa's UPort® converters perform far better than the competition.

Patented COM Preserver

Serial transmission applications use names such as COM3 and COM4 to identify COM ports. Unfortunately, most USB-to-serial products are unable to use fixed COM names on the host PC. This means that the names of the COM ports change when the USB-to-serial device is plugged into a different USB port, either on the same or a different PC, forcing the user to reconfigure the COM names manually from within the application.

Moxa's UPort® 1200/1400/1600 USB-to-serial hubs have an advanced feature that allows them to use fixed COM names. When the user enables the "COM Preserver™" function, the COM names "go with" the UPort® device. In fact, Moxa's drivers can even create the same COM port names on a different host PC. With this feature, you do not need to modify application programs, or rebuild the entire project every time you install a new operating system or upgrade the computer. Don't worry about moving the UPort® from one USB hub to another, or even from one computer to another. Once the COM Preserver™ function is enabled, the names of the USB-to-serial COM ports will go with the UPort® wherever it is used.

Note that the COM Preserver™ function is disabled by default. Users can use the traditional method of enumerating COM ports, or enable the COM Preserver™ function to make use of this great new feature.

Scenario 1

COM port assignment is maintained across different PCs



Scenario 2

COM port assignment is maintained across different USB ports

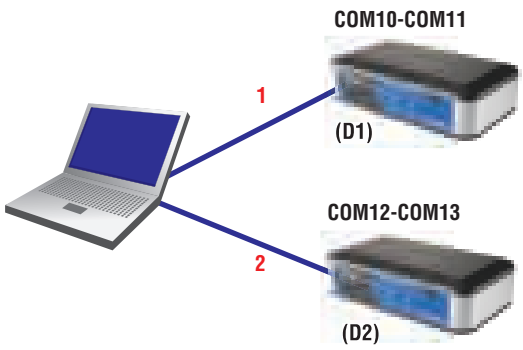


Fixed-base COM Mode

Moxa's UPort® 1000 series, and UPort® 2000 series of products provide a unique fixed-base COM function that allows users to set a specific initial COM port number. Regardless of which UPort® is plugged into the host, the COM port numbers for the UPort®'s serial ports will be numbered sequentially starting with the initial COM port number.

For example, assume that you have set COM10 as the first COM number that will be assigned. If UPort® D1 is plugged into your computer first, your computer will assign COM10 and COM11 to the UPort®'s serial ports. When UPort® D2 is plugged in, the computer will assign COM numbers COM12 and COM13.

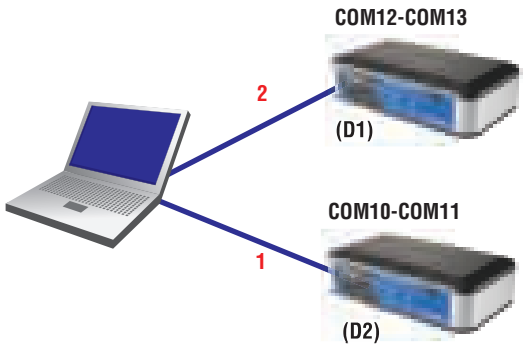
Scenario 3



If both UPorts are unplugged from the computer, and then UPort® D2 is plugged back in, the computer will now assign COM10 and COM11 to the UPort's serial ports. When UPort® D1 is plugged back in, COM numbers COM12 and COM13 will be assigned the UPort's serial ports.

When "Fixed-base COM Mode" is enabled for the first time, all COM port numbers and serial port parameters will be reset to their default values. You can then set the COM numbers and configuration parameters to the values needed for your application.

Scenario 4



Function Support Table

Model	Fixed-based COM	COM Preserver
UPort® 1100 Series	✓	–
UPort® 1200/1400/1600 Series	✓	✓
UPort® 2000 Series	✓	–

Magnet Accessory for Attaching to PC Housing

The typical way to use a device such as the UPort® 1400/1610-8/1650-8 is to place the UPort® on the desk near the laptop or desktop PC. However, placing the UPort® in this way wastes space, and due to the nature of USB, makes it more likely that the connection between the PC and UPort® will get disconnected. The "magnet" solution introduced by Moxa is simple, but innovative. The solution uses magnet accessories that come with the product to attach the UPort® to the host PC's housing. Not only do you save space, but you can also fix the position of the USB cable that attaches the UPort® to the PC.

COM Port Numbers Displayed in Windows System Tray

When using a UPort® to connect a serial device to your PC, it may be necessary to determine the COM port number assigned to the serial device. A new tool provided by Moxa gives engineers a handy means of monitoring the COM port number of the device. When the UPort® is plugged into your computer's USB port, a UPort® icon will be placed in the Windows System Tray located in the lower right corner of the desktop. Simply position the cursor over the UPort® icon, and an information window showing the COM port number will pop up. When two or more UPorts are connected to the same computer, the pop-up window will show the COM numbers for all of the UPorts.

UPort® Models Listed by Interface and Number of Ports

USB-to-Serial Converters

Interface	No. of Ports	Model Name
RS-232	1	UPort® 1110
	2	UPort® 2210
	4	UPort® 1410
		UPort® 2410
	8	UPort® 1610-8
	16	UPort® 1610-16
RS-422/485	1	UPort® 1130/1130I
RS-232/422/485	1	UPort® 1150/1150I
	2	UPort® 1250/1250I
	4	UPort® 1450/1450I
	8	UPort® 1650-8
	16	UPort® 1650-16

USB Hubs

Interface	No. of Ports	Model Name
USB	4	UPort® 204
	4	UPort® 404
	7	UPort® 207
	7	UPort® 407
	4	UPort® 404-T
	7	UPort® 407-T

Important Considerations for USB Devices in Industrial Applications

USB (Universal Serial Bus) is the most popular interface in the IT industry today, In recent years, USB has also gained popularity in industrial applications as more and more devices support the interface. But industrial operations are more demanding than your typical office application and require additional considerations. For example, a factory floor may be subject to extreme temperatures that are too hot for a consumer-grade USB hub to handle. Industrial applications also require a higher level of reliability because system downtime is not only costly but potentially dangerous. To ensure that your USB devices meet these demands, system engineers should consider the following factors when selecting a USB device for industrial environments.

USB-IF Certification

Although any vendor can design a USB product that meets the USB specifications, the product may not have been tested for flaws. When considering which USB product to buy, you should check to make sure that the product has received USB-IF certification, and that the product is listed in the USB-IF Integrators List on the USB-IF website. Products that are certified to carry the USB logo have been tested for both reliability and interoperability.

Moxa's USB 2.0 Hubs First to Receive USB-IF Certification

Moxa's new line of industrial-grade USB hubs, the UPort® 200 and UPort® 400 series, are the world's first to receive USB-IF certification for reliable peripheral plug-and-play devices. The hubs are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, even for heavy-load applications. As USB-IF certified products, the UPort® 200 and UPort® 400 series have passed high speed compliance testing and are eligible to bear the official USB logo.

The UPort® 200 and UPort® 400 series are external plug-and-play hubs that can be plugged into a standard USB port for instant peripheral device connectivity. For industrial networks, high reliability can never be compromised. As defined by the USB-IF (USB Implementers Forum), certification for Moxa's UPort® USB hubs guarantees:

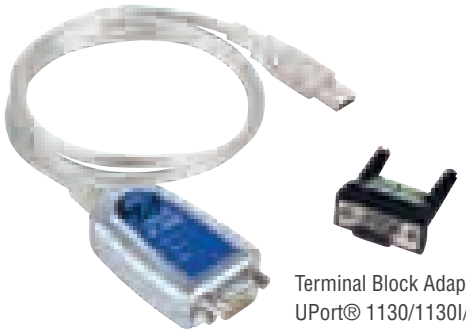
- 480 Mbps USB 2.0 transmissions
- Device accessibility
- Full power for connected devices
- High-speed operation from suspend mode



To guard against serious damage, the UPort® 200 and UPort® 400 series have doubled their ESD protection from Level 2 (4 KV) to Level 4 (8 KV) to provide 8 KV of ESD protection for direct contact and 15 KV of ESD protection for contact through the air. Wide temperature models (UPort® 200-T and UPort® 400-T) are also available for use in extreme temperatures ranging anywhere from -40 to 85°C.

UPort® 1100 Series (cable-type)

1-port RS-232, RS-422/485, and RS-232/422/485 USB-to-serial converters



Terminal Block Adaptor for UPort® 1130/1130I/1150

- Compatible with USB 2.0
- 12 Mbps USB data rate
- 921.6 Kbps maximum baudrate for super fast data transmission
- Drivers provided for Windows, WinCE, and Linux
- Mini DB9 female to terminal block adaptor for easy wiring
- LEDs for indicating USB and TxD/RxD activity
- 15 KV ESD protection for all serial ports
- 2 KV optical isolation protection (UPort 1130I only)

Overview

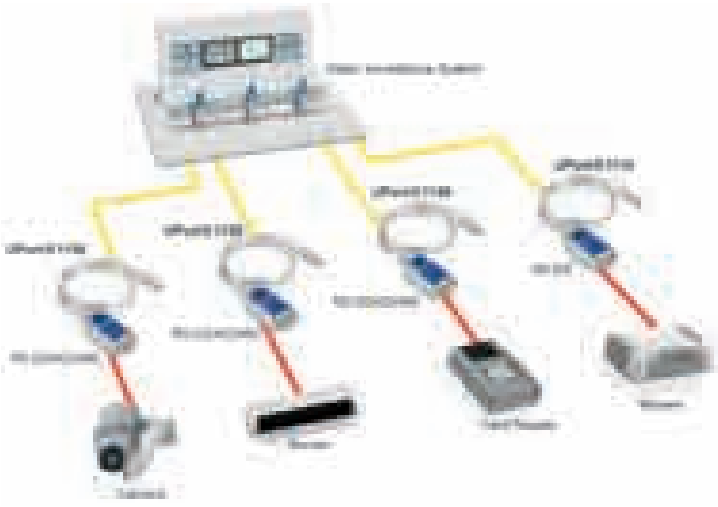
The UPort® 1100 series USB-to-serial converters are the perfect accessory for laptop computers that do not have a serial port, and are essential for engineers who need to connect different serial devices in the field or separate interface converters for devices without a standard COM port or DB9 connector. The UPort® 1110 converts from USB to RS-232, the UPort® 1130/1130I from USB to RS-422/485, and the UPort® 1150 from USB to RS-232/422/485. All products are compatible with new and legacy serial devices, and can be used with mobile, instrumentation, and point-of-sale applications.

Typical Application—Surveillance Monitoring System

The most basic video surveillance setup is a single camera connected directly to a monitor and recording device. However, many businesses require video surveillance on a larger scale, which often requires a dedicated management system. These management systems are unable to include every possible type of device port, and for this reason, converters are often necessary when attaching different devices. A client that designs video surveillance systems needed USB-to-serial converters to connect devices to the management system. Their system needed to be able to connect to serial devices such as card readers, modems, video cameras, and sensors. Moxa's UPort® 1110 and UPort® 1150 USB-to-serial converters, which provide 1 RS-232 or RS-232/422/485 port for connecting devices to a PC without needing to open the computer's chassis to install a board, fit the bill. The UPort® 1110/1150 have the following features:

- USB 2.0 compatibility
- RS-232 or RS-422/485 interface
- Stability and reliability
- Cost-effectiveness
- Plug-and-play ability
- Easy to use

In addition, a special driver allows the UPort® 1110/1150 to remember the original COM port number when the UPort® is unplugged and then re-plugged into a different USB port.



Specifications

USB Interface
Compliance: USB 1.0/1.1 compliant, USB 2.0 compatible
Connector: USB type A
Speed: 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports: 1
Serial Standards:
UPort 1110: RS-232
UPort 1130/1130I: RS-422/485
UPort 1150: RS-232/422/485
Connector: DB9 male

Serial Line Protection
ESD Protection: 15 KV embedded
Optical Isolation: 2 KV (UPort 1130I only)

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 64 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Driver Support
Operating Systems: Windows 9X/ME/2000, Windows XP/2003/Vista/2008/7 x86/x64, WinCE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Housing: ABS + PC
Weight:
Product only: 65 g (0.14 lb)
Packaged: 200 g (0.44 lb)
Dimensions: 38.4 x 60 x 20 mm (1.51 x 2.36 x 0.79 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

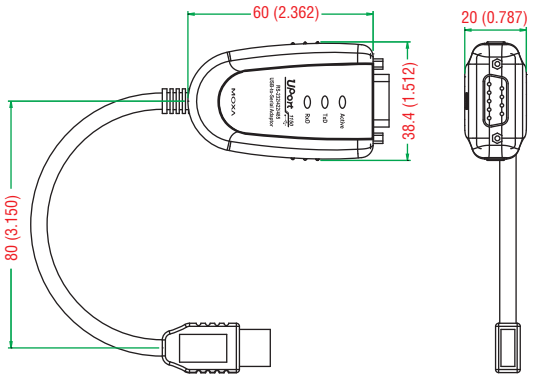
Standards and Certifications
EMC: CE, FCC
EMI: EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC-61000-4-6, IEC 61000-4-8, IEC-61000-4-11
Green Product: RoHS, CRoHS, WEEE

Power Requirements
Power Consumption:
UPort 1110: 30 mA @ 5 VDC
UPort 1130: 60 mA @ 5 VDC
UPort 1130I: 65 mA @ 5 VDC
UPort 1150: 77 mA @ 5 VDC

MTBF (mean time between failures)
Time: 1,949,025 hrs
Database: Telcordia (Bellcore), GB

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions
Unit: mm (inch)



Ordering Information

Available Models
UPort 1110: 1-port RS-232 USB-to-serial converter
UPort 1130: 1-port RS-422/485 USB-to-serial converter
UPort 1130I: 1-port RS-422/485 USB-to-serial converter with 2 KV optical isolation
UPort 1150: 1-port RS-232/422/485 USB-to-serial converter

Package Checklist
- 1 UPort 1110 or 1130 or 1130I or 1150 USB-to-serial converter
- 1 mini DB9 female to terminal block adaptor (UPort 1130, 1130I, and 1150 only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 1150I

1-port RS-232/422/485 USB-to-serial converter with 2 KV isolation



- Compatible with USB 2.0
- 12 Mbps USB data rate
- 15N high retention USB type B connector
- Software selectable RS-232, RS-422, 4-wire RS-485, and 2-wire RS-485
- Drivers provided for Windows, WinCE, and Linux
- 15 KV ESD protection for all serial ports
- 2 KV optical isolation protection
- Full modem status LEDs

Overview

The UPort® 1150I is a USB-to-serial converter with one 3-in-1 RS-232/422/485 serial port, transmission speed up to 921.6 Kbps, and 15 KV ESD protection. For industrial and commercial applications that require enhanced reliability, it is also equipped with 2 KV DC optical isolation protection, providing PCs with both COM port expansion and protection from potentially damaging electrical spikes. Adjustable RS-485 pull high/low resistors are built in for daisy-chained RS-485 networks, allowing engineers to connect to any serial device quickly and easily.

Typical Application—Mini Testers

Many engineers use a combination of USB-to-serial converter plus mini tester to check serial device connections during routine inspections. However, mini testers are inconvenient to use, particularly when you need to connect directly through a device's DB9 connector, and purchasing mini testers for all inspectors in a factory increases the overall operating expense. To get around these problems, Moxa designed the UPort® 1150I, which is an external USB-to-serial converter with 1 RS-232/422/485 DB9 connector and a built-in mini tester. The UPort® 1150I has the following features:

- USB 2.0 compatibility
- RS-232 and RS-422/485 interfaces
- Built-in mini tester function
- Built-in modem status LED indicators for easy diagnosis
- Competitive pricing

Specifications

USB Interface
Compliance: USB 1.0/1.1 compliant, USB 2.0 compatible
Connector: USB type B
Speed: 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports: 1
Serial Standards: RS-232/422/485
Connector: DB9 male

Serial Line Protection
ESD Protection: 15 KV embedded
Optical Isolation: 2 KV

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 64 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Driver Support
Operating Systems: Windows 9X/ME/2000, Windows XP/2003/Vista/2008/7 x86/x64, WinCE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Housing: SECC sheet metal (1 mm), IP30 protection
Weight:
Product only: 75 g (0.65 lb)
Packaged: 320 g (0.72 lb)
Dimensions: 52 x 80 x 22 mm (2.05 x 3.15 x 0.87 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1
EMC: CE, FCC
EMI: EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC-61000-4-6, IEC 61000-4-8, IEC-61000-4-11
Green Product: RoHS, CRoHS, WEEE

Power Requirements

Power Consumption: 260 mA @ 5 VDC

MTBF (mean time between failures)

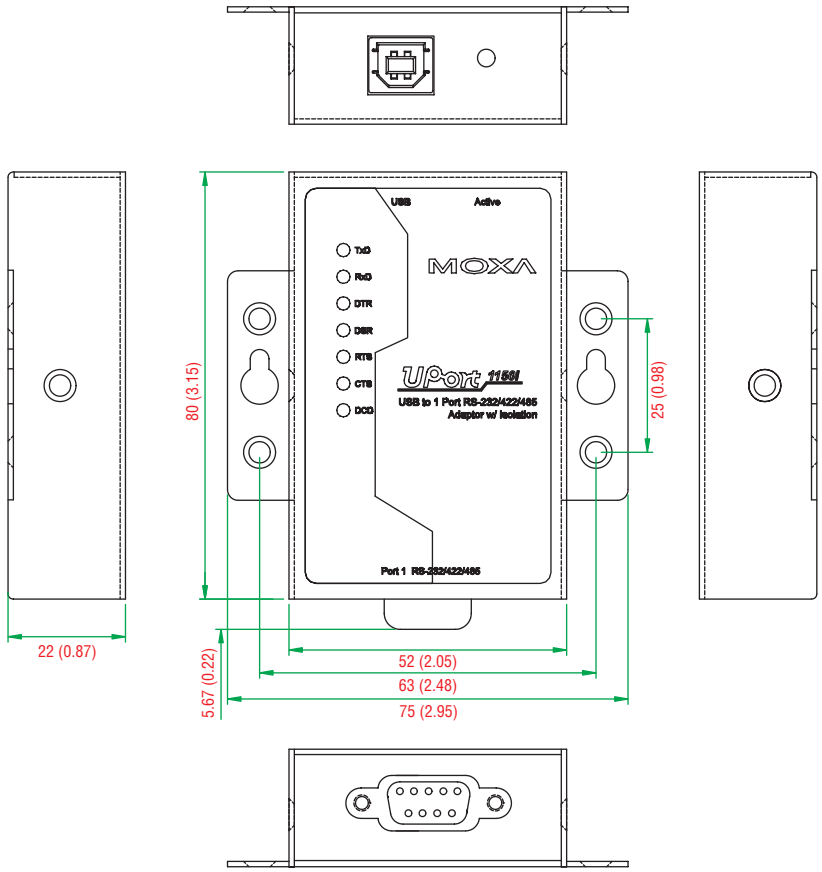
Time: 1,949,025 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

UPort 1150I: 1-port RS-232/422/485 USB-to-serial converter with 2 KV optical isolation

Optional Accessories (can be purchased separately)

DK35A: Mounting kit for 35-mm DIN-Rail

Package Checklist

- 1 UPort 1150I USB-to-serial converter
- USB-IF certified cable
- 1 mini DB9 female to terminal block adaptor
- Velcro lock-down strap for the USB cable
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 1250/1250I

2-port RS-232/422/485 USB-to-serial converters with optional 2 KV isolation



UPort® 1250



UPort® 1250I

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 Kbps maximum baudrate for super fast data transmission
- 128-byte FIFO and on-chip H/W, S/W flow control
- 15N high retention type B connector
- Drivers provided for Windows, WinCE, and Linux
- LEDs for easy monitoring
- 15 KV ESD protection for all serial ports
- Locking power cord for the UPort 1250I

Overview

The UPort® 1250/1250I USB-to-serial converters allow you to connect 2 RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. These plug & play USB solutions are perfect for mobile, instrumentation, and point-of sale applications.

Typical Application—Connecting Instruments in a Medical Lab

In medical labs, research scientists typically collect large quantities of data from many samples using a variety of different instruments. Most research devices have parameters that can be accessed via a serial port for convenient reconfiguration. Laptops are often used as convenient and space-efficient computing solutions in medical labs, but most modern laptops no longer offer serial ports and only come equipped with USB ports. This presents a connectivity issue unless the USB ports can be expanded into serial ports.

Moxa's solution is the UPort® 1250, which is an RS-232/422/485 USB-to-serial converter that can be used to connect 2 serial interface instruments to a computer's USB port, and is particularly convenient for medical researchers since advanced technical expertise is not required. The UPort® 1250 has the following features:

- 2 serial ports for easy USB-to-serial expansion
- True USB 2.0 high-speed transmission
- 128-byte FIFO and on-chip hardware and software flow control to ensure stable data transmission
- Easy troubleshooting with LED indicators for each serial port
- Compatible with both laptops and desktop PCs

Specifications

USB Interface
Compliance: USB 1.1/2.0 compliant
Connector: USB type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports: 2
Serial Standards: RS-232/422/485
Connector: DB9 male

Serial Line Protection
ESD Protection: 15 KV embedded
Optical Isolation: 2 KV (UPort 1250I only)

Performance
Baudrate: 50 bps to 921.6 Kbps (including 500 Kbps)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 128 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Driver Support
Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, Win CE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics

Housing: SECC sheet metal (1 mm), IP30 protection
Weight:
Product only: 180 g (0.40 lb)
Packaged:
UPort 1250: 370 g (0.82 lb)
UPort 1250I: 680 g (1.5 lb)
Dimensions: 77 x 26 x 111 mm (3.03 x 1.02 x 4.37 in)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, IEC 61000-4-8, IEC 61000-4-11

Green Product: RoHS, CRoHS, WEEE

Power Requirements

Power Consumption:
UPort 1250 (bus power): 360 mA @ 5 VDC
UPort 1250I (12 to 48 VDC external power): 200 mA @ 12 VDC

MTBF (mean time between failures)

Time: 563,179 hrs
Database: Telcordia (Bellcore), GB

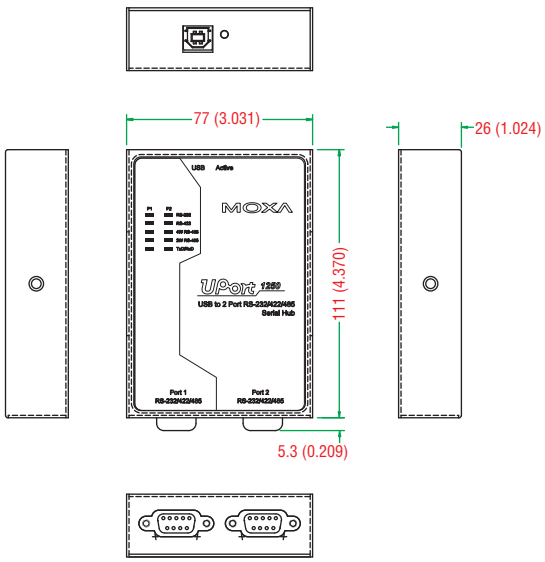
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

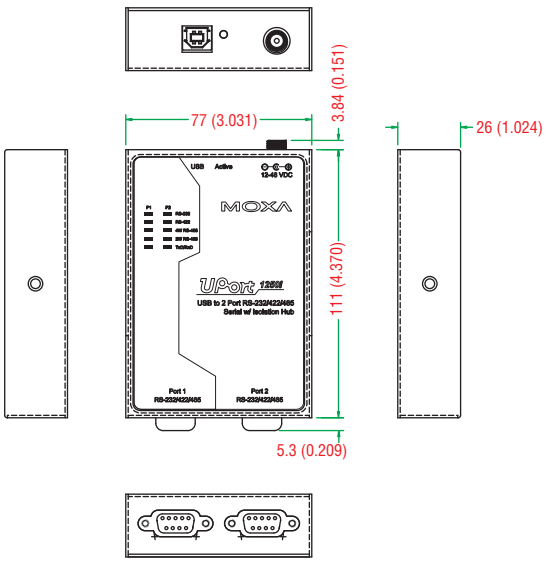
Dimensions

Unit: mm (inch)

UPort® 1250



UPort® 1250I



Ordering Information

Available Models

UPort 1250: 2-port RS-232/422/485 USB-to-serial converter
UPort 1250I: 2-port RS-232/422/485 USB-to-serial converter with 2 KV optical isolation, adaptor included

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB Adaptor: DB9 female to terminal block adaptor for RS-422/485 applications
Wall Mount Kit: Metal plates and screws
DK35A: Mounting kit for 35-mm DIN-Rail

Package Checklist

- 1 UPort 1250 or 1250I USB-to-serial converter
- USB-IF certified cable
- 1 mini DB9 female to terminal block adaptor
- Power adaptor (UPort 1250I)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 1400 Series

4-port RS-232 and RS-232/422/485 USB-to-serial converters with optional 2 KV isolation



- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 Kbps maximum baudrate for super fast data transmission
- 15N high retention USB type B connector
- 128-byte FIFO and on-chip H/W, S/W flow control
- Built-in 15 KV ESD protection for all serial ports
- 2 KV optical isolation protection (UPort 1450I only)
- IP30-rated, rugged metal housing
- COM port assignments maintained across different PCs
- Drivers provided for Windows, WinCE, and Linux
- Choose bus power or external power (UPort 1410/1450 only)
- Locking power jack

Overview

The UPort® 1400 USB-to-serial converters allow you to connect 4 RS-232 or RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort® 1400 converters are compatible with new and legacy serial devices, and are perfect for mobile, instrumentation, and point-of-sale applications.

Typical Application—Military Satellite Truck

Before the arrival of mobile satellite technology, military applications relied on terrestrial communication systems to collect data in remote locations and broadcast the signals to a geostationary communications satellite. Satellite trucks, which are commonly used in modern Satellite News Gathering (SNG), allow military command centers to gather intelligence and other data with greater mobility and flexibility than before. Due to the mobile nature of SNG technology, onboard data acquisition equipment needs to be highly portable yet provide seamless and reliable communication. In addition, satellite trucks are outfitted with various degrees of video production and editing gear that need to be readily available and connected at all times. One of our military clients uses Moxa's UPort® 1450 converter as their solution of choice for reliable device connectivity in their fleet of satellite trucks. The UPort® 1450 has the following features:

- No data loss with 128-byte FIFO and on-chip flow control for hardware and software
- Electrostatic protection and LED indicators designed for critical environments
- Small form factor and wall-mountable to save space
- Easy COM port configuration and plug & play capability
- 3-in-1 RS-232/422/485 support for connecting any serial interface device



Specifications

USB Interface
Compliance: USB 1.1/2.0 compliant
Connector: USB type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports: 4
Serial Standards:
UPort 1410: RS-232
UPort 1450/1450I: RS-232/422/485
Connector: DB9 male

Serial Line Protection
ESD Protection: 15 KV embedded
Optical Isolation: 2 KV (UPort 1450I only)

Performance
Baudrate: 50 bps to 921.6 Kbps (including 500 Kbps)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 128 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Driver Support
Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, WinCE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Housing: SECC sheet metal (1 mm), IP30 protection
Weight:
Product only: 720 g (1.59 lb)
Packaged: 1320 g (2.91 lb)
Dimensions: 204 x 30 x 125 mm (8.03 x 1.18 x 4.92 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

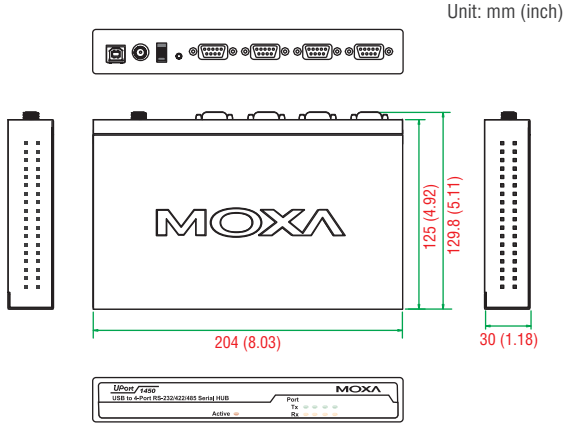
Standards and Certifications
Safety: UL 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE

Power Requirements
Power Consumption:
- Bus power:
  UPort 1410: 385 mA @ 5 VDC
- 12 to 48 VDC external power:
  UPort 1410: 180 mA @ 12 VDC
  UPort 1450: 385 mA @ 12 VDC
  UPort 1450I: 360 mA @ 12 VDC

MTBF (mean time between failures)
Time:
UPort 1410: 394,441 hrs
UPort 1450: 546,770 hrs
Database:
UPort 1410: MIL-HDBK-217F
UPort 1450: Telcordia (Bellcore), GB

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions
Unit: mm (inch)



Ordering Information

Available Models
UPort 1410: 4-port RS-232 USB-to-serial converter
UPort 1450: 4-port RS-232/422/485 USB-to-serial converter, adaptor included
UPort 1450I: 4-port RS-232/422/485 USB-to-serial converter with 2 KV optical isolation, adaptor included

Optional Accessories (can be purchased separately)
Mini DB9F-to-TB adaptor: DB9 female to terminal block adaptor for RS-422/485 applications
Magnet Accessory: Magnets for attaching the UPort 1400 to the PC's housing
Wall Mount Kit: Metal plates and screws
DIN-Rail Kit: DIN-Rail kit for the UPort 1400 series
DK35A: Mounting kit for 35-mm DIN-Rail

Power Adaptors (can be purchased separately)
Note: Available for the UPort 1410 if the USB port does not provide enough power. You must purchase the adaptor plus one power cord.
PWR-12120-DT-S2: 100-240 VAC to 12 VDC @ 1.2 A power adaptor
PWC-C7US-2B-183: US plug, 2-pin power cord
PWC-C7UK-2B-183: UK plug, 2-pin power cord
PWC-C7EU-2B-183: EU plug, 2-pin power cord
PWC-C7JP-2B-183: JP plug, 2-pin power cord
PWC-C7AU-2B-183: SAA plug, 2-pin power cord

Package Checklist
- 1 UPort 1400 USB-to-serial converter
- USB-IF certified cable
- 1 mini DB9 female to terminal block adaptor (UPort 1450 and 1450I only)
- Power adaptor (UPort 1450 and 1450I only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 1600-8 Series

8-port RS-232 and RS-232/422/485 USB-to-serial converters



- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 Kbps maximum baudrate for super fast data transmission
- 15N high retention USB type B connector
- 128-byte FIFO and on-chip H/W, S/W flow control
- Built-in 15 KV ESD protection for all serial ports
- IP30-rated, rugged metal housing
- COM port assignments maintained across different PCs
- Mini DB9 female to terminal block adaptor for easy wiring
- Drivers provided for Windows, WinCE, and Linux
- Locking power cord

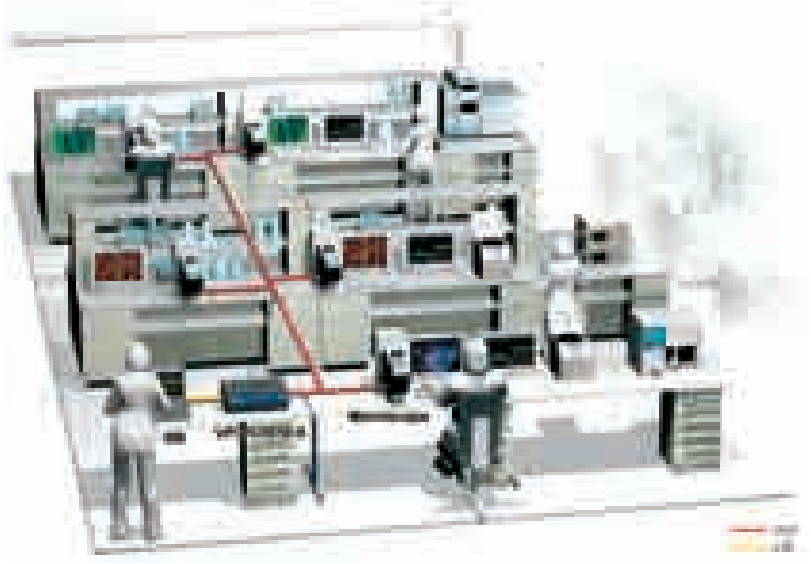
Overview

The UPort® 1600-8 USB-to-serial converters allow you to connect 8 RS-232 or RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort® 1600-8 converters are compatible with new and legacy serial devices, and are perfect for instrumentation and manufacturing applications.

Typical Application— Application Topology

Medical scientists and pharmaceutical researchers rely on sophisticated laboratory equipment to discover new treatments for patients. Most research is carried out in teams given the complex and collaborative nature of medical science. Scientists often transfer images and data from microscopes and other equipment to each other's laptops or desktop computers. Connecting all of these pieces of equipment usually requires multiple serial ports, one for each peripheral device. Since computers are only equipped with a limited number of serial ports, expanding a USB connection into multiple serial ports can provide researchers with the connectivity they need to make their next scientific breakthrough. Moxa's solution is the UPort® 1610-8, which is an RS-232 USB-to-serial converter that can be used to connect multiple serial interface microscopes and other equipment to a computer's USB port. The UPort® 1610-8 provides the following benefits:

- Up to 8 ports for easy USB-to-serial expansion
- True USB 2.0 high-speed transmission for large data transmission
- 128-byte FIFO and on-chip hardware and software flow control to ensure stable data transmission
- Easy troubleshooting with LED indicators for each serial port
- Compatibility with both laptop and desktop PCs



Specifications

USB Interface
Compliance: USB 1.1/2.0 compliant
Connector: USB type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports: 8
Serial Standards:
UPort 1610-8: RS-232
UPort 1650-8: RS-232/422/485
Connector: DB9 male

Serial Line Protection
ESD Protection: 15 KV embedded

Performance
Baudrate: 50 bps to 921.6 Kbps (including 500 Kbps)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 128 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Driver Support
Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, WinCE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Housing: SECC sheet metal (1 mm), IP30 protection
Weight:
Product only: 835 g (1.84 lb)
Packaged: 1440 g (3.17 lb)
Dimensions: 204 x 44 x 125 mm (8.03 x 1.73 x 4.92 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

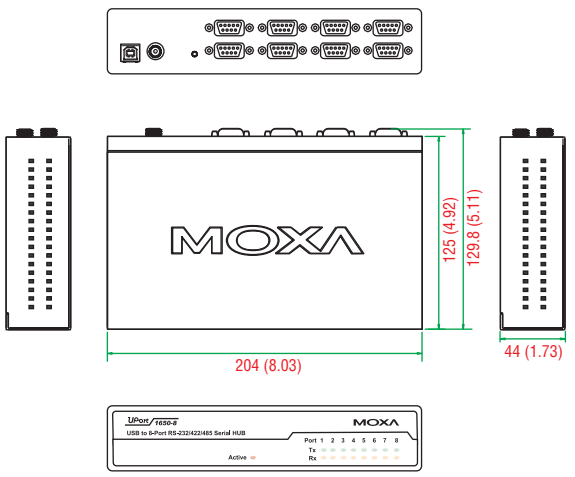
Standards and Certifications
Safety: UL 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE

Power Requirements
Power Consumption:
UPort 1610-8 (12 to 48 VDC external power): 230 mA @ 12 VDC
UPort 1650-8 (12 to 48 VDC external power): 340 mA @ 12 VDC

MTBF (mean time between failures)
Time:
UPort 1610-8: 208,413 hrs
UPort 1650-8: 186,567 hrs
Database: MIL-HDBK-217F

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions
Unit: mm (inch)



Ordering Information

Available Models
UPort 1610-8: 8-port RS-232 USB-to-serial converter, adaptor included
UPort 1650-8: 8-port RS-232/422/485 USB-to-serial converter, adaptor included

Optional Accessories (can be purchased separately)
Mini DB9F-to-TB Adaptor: DB9 female to terminal block adaptor for RS-422/485 applications
Magnet Accessory: Magnets for attaching the UPort 1600-8 to the PC's housing
Wall Mount Kit: Metal plates and screws
DIN-Rail Kit: DIN-Rail kit for the UPort 1600-8 series
DK35A: Mounting kit for 35-mm DIN-Rail

Package Checklist
- 1 UPort 1600-8 USB-to-serial converter
- USB-IF certified cable
- Power adaptor
- 1 mini DB9 female to terminal block adaptor (UPort 1650-8 only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 1600-16 Series

16-port RS-232 and RS-232/422/485 USB-to-serial converters



- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 Kbps maximum baudrate for super fast data transmission
- 15N high retention USB type B connector
- 128-byte FIFO and on-chip H/W, S/W flow control
- Standard 19-inch rack-mountable
- Built-in 15 KV ESD protection on all serial ports
- IP30-rated, rugged metal housing
- COM port assignments maintained across different PCs
- Mini DB9 female to terminal block adaptor for easy wiring
- Drivers provided for Windows, WinCE, and Linux

Overview

The UPort® 1600-16 USB-to-serial converters allow you to connect 16 RS-232 or RS-232/422/485 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort® 1600-16 converters are compatible with new and legacy serial devices, and are perfect for instrumentation, and manufacturing applications.

Typical Application—TFT-LCD Manufacturing

Manufacturing TFT-LCD (thin film transistor liquid crystal display) panels is a complicated and highly technical process. The three major stages in TFT-LCD panel production are the array, LC cell, and module assembly processes. In addition, each finished panel must also pass a series of quality inspection tests, which include defect inspection and lighting tests. The most challenging part of the TFT-LCD manufacturing process is achieving zero fault tolerance for high quality and productivity. One of our customers needed a USB-to-serial solution to transmit data between a host and quality inspection equipment in the TFT-LCD manufacturing process. In such a demanding manufacturing environment, adopting multiple ports and Moxa's ruggedly designed UPort® 1650-16 USB-to-serial converter proved to be the best option.

The UPort® 1650-16 has the following features:

- Standard 19-inch rackmount size and metal housing for industrial-grade requirements
- Up to 16 ports for easy USB-to-serial expansion
- 3-in-1 serial ports for a cost-effective solution
- True USB 2.0 Hi-Speed transmission for greater productivity
- 128-byte FIFO and on-chip hardware and software flow control to ensure stable data transmission during inspection
- Each serial port has its own LED indicator for easy troubleshooting



Specifications

USB Interface
Compliance: USB 1.1/2.0 compliant
Connector: USB type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports: 16
Serial Standards:
UPort 1610-16: RS-232
UPort 1650-16: RS-232/422/485
Connector: DB9 male

Serial Line Protection
ESD Protection: 15 KV embedded

Performance
Baudrate: 50 bps to 921.6 Kbps (including 500 Kbps)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
FIFO: 128 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-4w: TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485-2w: Data+(B), Data-(A), GND
RS-485 Data Direction: ADDC® (Automatic Data Direction Control)

Driver Support
Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, Win CE 5.0/6.0, Linux 2.4, Linux 2.6 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Housing: SECC sheet metal (1 mm), IP30 protection
Weight:
Product only: 2475 g (5.45 lb)
Packaged: 3440 g (7.58 lb)
Dimensions: 440 x 45.5 x 198.1 mm (17.32 x 1.79 x 7.80 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

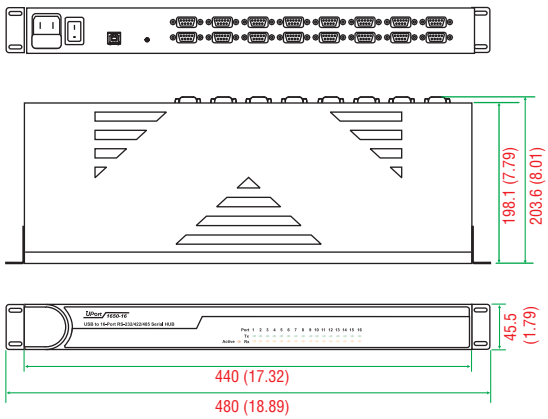
Standards and Certifications
Safety: UL 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE

Power Requirements
Input Voltage: 100 to 240 VAC external power
Power Consumption:
UPort 1610-16: 130 mA @ 100 VAC
UPort 1650-16: 150 mA @ 100 VAC

MTBF (mean time between failures)
Time:
UPort 1610-16: 138,704 hrs
UPort 1650-16: 120,001 hrs
Database: MIL-HDBK-217F

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions
Unit: mm (inch)



Ordering Information

Available Models
UPort 1610-16: 16-port RS-232 USB-to-serial converter
UPort 1650-16: 16-port RS-232/422/485 USB-to-serial converter

Optional Accessories (can be purchased separately)
Mini DB9F-to-TB Adaptor: DB9 female to terminal block adaptor for RS-422/485 applications
Rackmount Kit: Metal plates and screws

Package Checklist
- 1 UPort 1600-16 USB-to-serial converter
- USB-IF certified cable
- Power cord
- 1 mini DB9 female to terminal block adaptor (UPort 1650-16 only)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 2210/2410

2 and 4-port RS-232 USB-to-serial converters



- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- 921.6 Kbps maximum baudrate for super fast data transmission
- Built-in 15 KV ESD protection for all serial ports
- Drivers provided for Windows and Linux
- Supports Fixed-Base COM Utility for setting the initial extended COM port number
- LEDs for easy monitoring

Overview

The UPort® 2210/2410 USB-to-serial converters allow you to connect 2 or 4 RS-232 devices to your laptop or workstation through the USB (Universal Serial Bus) port. The UPort® 2210 and UPort® 2410 are cost-effective solutions for both new and legacy RS-232 devices, and are perfect for mobile, instrumentation, and point-of sale applications.

Specifications

USB Interface
Compliance: USB 1.1/2.0 compliant
Connector: USB type B
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)

Serial Interface
Number of Ports:
UPort 2210: 2
UPort 2410: 4
Serial Standards: RS-232
Connector: DB9 male

Serial Line Protection
ESD Protection: 15 KV embedded

Performance
Baudrate: 50 bps to 921.6 Kbps

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Mark, Space
Flow Control: RTS/CTS, XON/XOFF
FIFO: 16 bytes

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Driver Support
Operating Systems: Windows 2000, Windows XP/2003/Vista/2008/7 x86/x64, Linux 2.6 x86/x64
Note: Please refer to Moxa's website for the latest driver support information.

Physical Characteristics
Housing: Polycarbonate (PC)
Weight:
Product only:
UPort 2210: 120 g (0.26 lb)
UPort 2410: 210 g (0.46 lb)
Packaged:
UPort 2210: 325 g (0.72 lb)
UPort 2410: 455 g (1 lb)
Dimensions:
UPort 2210: 70 x 35 x 120 mm (2.76 x 1.38 x 4.72 in)
UPort 2410: 80 x 35 x 185 mm (3.15 x 1.38 x 7.28 in)

Environmental Limits
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 60950-1
EMC: CE, FCC
EMI: EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class B
EMS: EN 55024, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC-61000-4-6, IEC 61000-4-8, IEC-61000-4-11
Green Product: RoHS, CRoHS, WEEE

Power Requirements
Power Consumption:
UPort 2210: 140 mA @ 5 VDC
UPort 2410: 240 mA @ 5 VDC

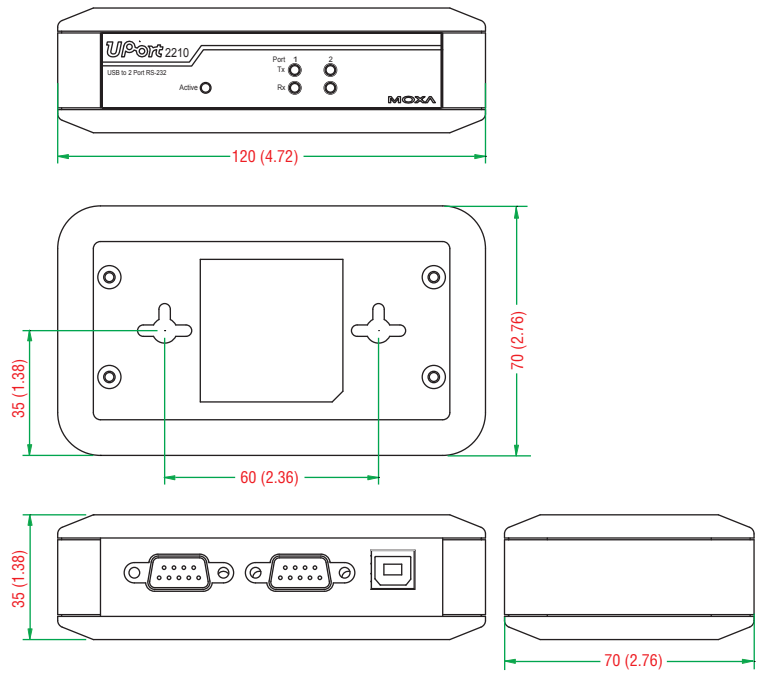
MTBF (mean time between failures)
Time:
UPort 2210: 4,221,778 hrs
UPort 2410: 3,901,775 hrs
Database: Telcordia (Bellcore), GB

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

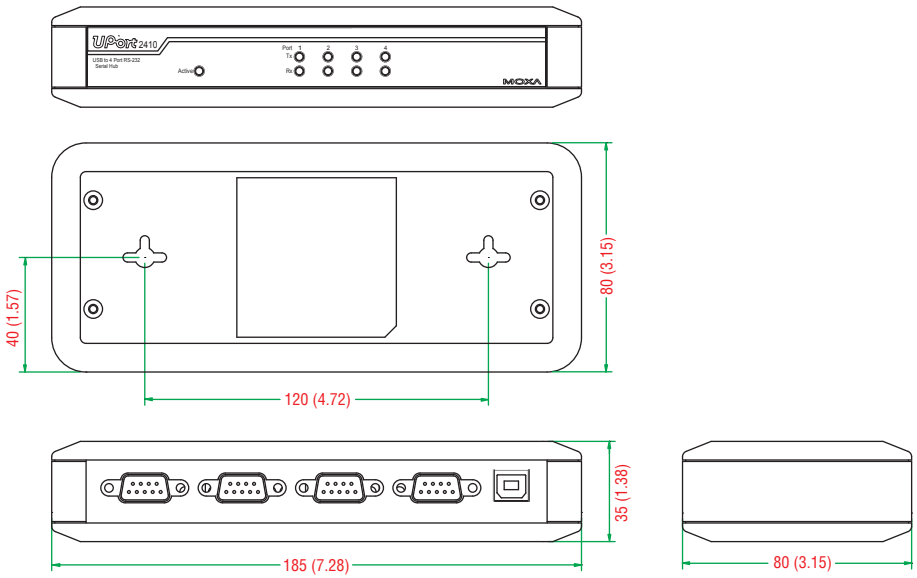
Dimensions

Unit: mm (inch)

UPort® 2210



UPort® 2410



Ordering Information

Available Models

UPort 2210: 2-port RS-232 USB-to-serial converter
UPort 2410: 4-port RS-232 USB-to-serial converter

Package Checklist

- 1 UPort 2210 or UPort 2410 USB-to-serial converter
- USB-IF certified cable
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UPort® 404/407

4 and 7-port industrial-grade USB hubs



- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- USB-IF certification
- Dual power inputs (power jack and terminal block)
- 15 KV ESD Level 4 protection for all USB ports
- Rugged metal housing
- DIN-Rail and wall mountable
- Comprehensive diagnostic LEDs
- Choose bus power or external power (UPort 404)

Introduction

The UPort® 404 and UPort® 407 are industrial-grade USB 2.0 hubs that expand 1 USB port into 4 and 7 USB ports, respectively. The hubs are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, even for heavy-load applications. The UPort® 404/407 have received USB-IF Hi-Speed certification, which is an indication that both products are reliable, high quality USB 2.0 hubs.In addition, the hubs are fully compliant with the USB Plug & Play spec and provide a full 500 mA of power per port, ensuring that your USB devices will function properly. The UPort® 404/407 hubs' support of 12-40 VDC power makes them ideal for mobile applications. Externally powered USB hubs are the only way to guarantee the broadest compatibility with USB devices.

USB-IF Certification

The UPort® 404 and UPort® 407 USB 2.0 industrial-grade USB hubs have passed USB-IF (USB Implementers Forum) certification. USB-IF verifies a number of strict electrical requirements for the high-speed USB operation of USB hubs designed to the USB 2.0 specification. This means that the UPort® 404/407 support Hi-Speed USB 2.0 for up to 480 Mbps USB transmission, which is fully compliant with interoperability requirements, is enough power for devices to function, and provides for a successful transition back to high-speed operation from the suspend state.

ESD Level 4 Protection

Electrostatic discharge (ESD) could be as severe as having more than one thousand volts of ESD with a high rise time (dv/dt) break through the junction layer of protective devices. In order to avoid serious damage, Moxa's UPort® 404/407 USB hubs provide ESD level 4 (contact 8 KV, air 15 KV) protection, which increases the quality and value of the user's end-product.

Specifications

USB Interface
Compliance: USB 1.1/2.0 compliant
Upstream: 1 USB port, Type B connector
Downstream:
UPort 404: 4 USB ports, Type A connectors
UPort 407: 7 USB ports, Type A connectors
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)
Supply Current: 500 mA max. per channel

Physical Characteristics
Housing: Aluminum
Weight: (product only)
UPort 404: 850 g (1.87 lb)
UPort 407: 950 g (2.1 lb)
Dimensions:
UPort 404: 80 x 35 x 130 mm (3.15 x 1.38 x 5.12 in)
UPort 407: 100 x 35 x 192 mm (3.94 x 1.38 x 7.55 in)

Environmental Limits
Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temperature Models: -40 to 85°C (-40 to 185°F)
Storage Temperature:
Standard Models: -20 to 75°C (-4 to 167°F)
Wide Temperature Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508, LVD
EMC: CE, FCC
EMI: EN 61000-3-2, EN 61000-3-3, EN 61000-6-2, EN 61000-6-4, FCC Part 15 Subpart B Class A
EMS: EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE

Power Requirements
Input Voltage: 12 to 40 VDC external power
Power Consumption:
UPort 404: 1300 mA @ 12 VDC, 690 mA @ 24 VDC, 470 mA @ 36 VDC
UPort 407: 2300 mA @ 12 VDC, 1130 mA @ 24 VDC, 790 mA @ 36 VDC

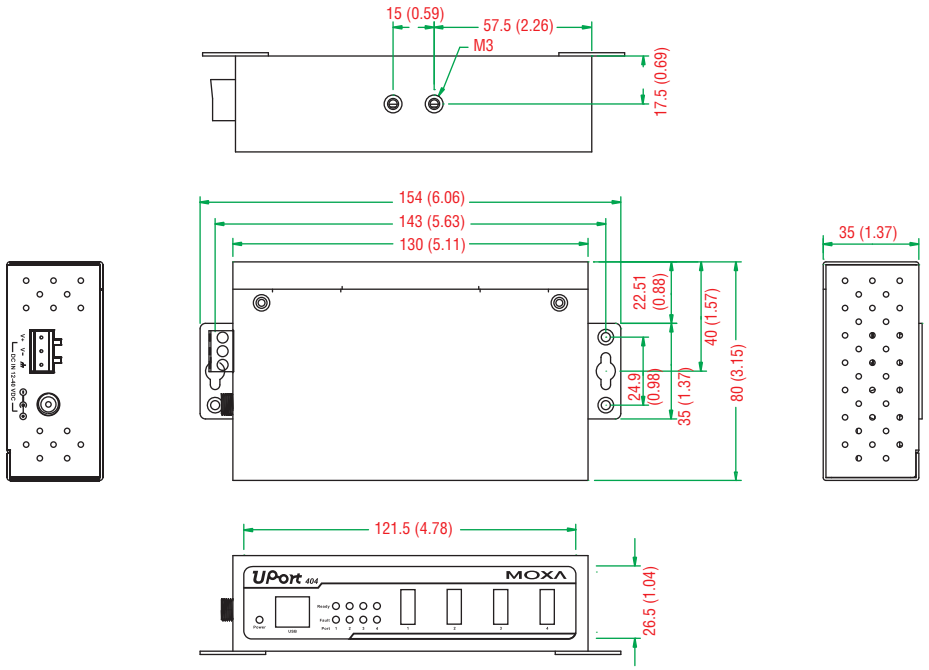
MTBF (mean time between failures)
Time:
UPort 404: 1,490,340 hrs
UPort 407: 1,111,361 hrs
Database: Telcordia (Bellcore), GB

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

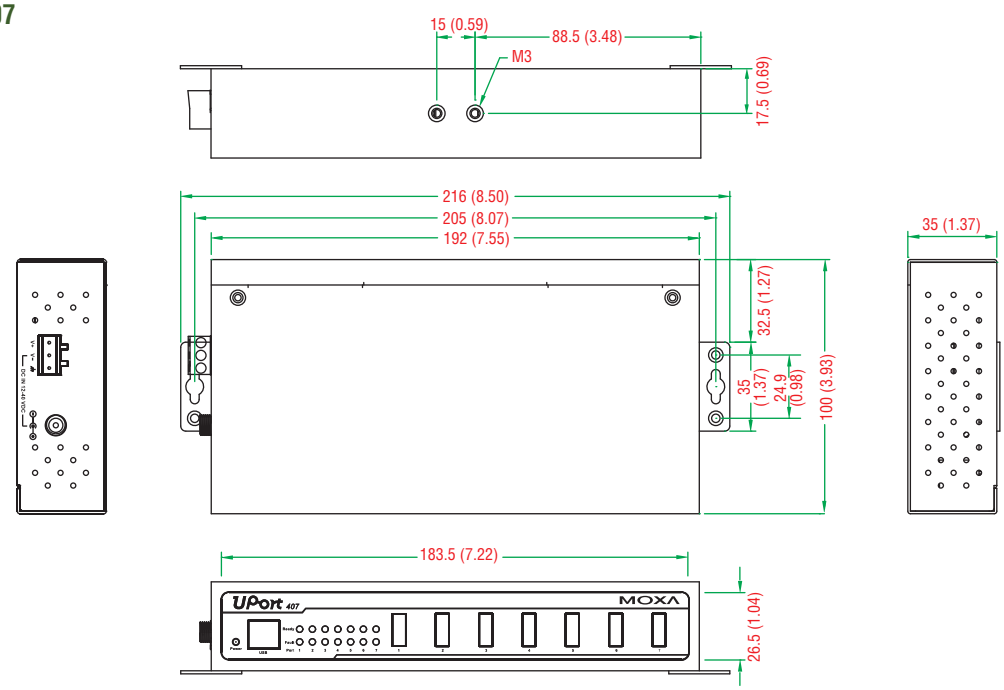
Dimensions

Unit: mm (inch)

UPort® 404



UPort® 407



Ordering Information

Available Models

UPort 404: 4-port industrial USB hub, adaptor included, 0 to 60°C operating temperature
UPort 407: 7-port industrial USB hub, adaptor included, 0 to 60°C operating temperature
UPort 404-T: 4-port industrial USB hub, -40 to 85°C operating temperature
UPort 407-T: 7-port industrial USB hub, -40 to 85°C operating temperature

Optional Accessories (can be purchased separately)

Wall Mount Kit: Metal plates and screws
DK-35A: Mounting Kit for 35-mm DIN-Rail
Din-Rail Kit: Din-Rail kit for the UPort 400 Series

Package Checklist

- 1 UPort 404 or UPort 407 industrial-grade USB hub
- USB-IF certified cable
- Power adaptor (UPort 404/407 only)
- Quick installation guide (printed)
- Warranty card

UPort® 204/207

4 and 7-port entry-level USB hubs



- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- USB-IF Certification
- Compatible with USB 1.1 devices
- 15 KV ESD Level 4 protection for all USB ports
- Wall mountable
- Comprehensive diagnostic LEDs
- Full 500 mA of power per port
- Choose bus power or external power (UPort 204 only)

Introduction

The UPort® 204 and UPort® 207 are entry-level USB 2.0 hubs that expand 1 USB port into 4 and 7 USB ports, respectively. The hubs are designed to provide true USB 2.0 Hi-Speed 480 Mbps data transmission through each port, even for heavy-load applications. The UPort® 204/207 have received USB-IF Hi-Speed certification, which is an indication that both products are reliable, high quality USB 2.0 hubs. In addition, the hubs are fully compliant with the USB Plug & Play spec and provide a full 500 mA of power per port, ensuring that your USB devices will function properly. The UPort® 204/207 hubs' support of 12-40 VDC power makes them ideal for mobile applications. Externally powered USB hubs are the only way to guarantee the broadest compatibility with USB devices.

USB-IF Certification

The UPort® 204/207 USB 2.0 entry-level USB hubs have passed USB-IF (USB Implementers Forum) certification. USB-IF verifies a number of strict electrical requirements for the Hi-Speed USB operation of USB hubs designed to the USB 2.0 specification. This means that the UPort® 204/207 support Hi-Speed USB 2.0 for up to 480 Mbps USB transmission, which is fully compliant with interoperability requirements, is enough power for devices to function, and provides for a successful transition back to high-speed operation from the suspend state.

ESD Level 4 Protection

Electrostatic discharge (ESD) could be as severe as having more than one thousand volts of ESD with a high rise time (dv/dt) break through the junction layer of protective devices. In order to avoid serious damage, Moxa's UPort® 204/207 USB hubs provide ESD level 4 (contact 8 KV, air 15 KV) protection, which increases the quality and value of the user's end-product.

Specifications

USB Interface
Compliance: USB 1.1/2.0 compliant
Upstream: 1 USB port, Type B connector
Downstream:
UPort 204: 4 USB ports, Type A connectors
UPort 207: 7 USB ports, Type A connectors
Speed: 480 Mbps (Hi-Speed USB) and 12 Mbps (Full-Speed USB)
Supply Current: 500 mA max. per channel

Physical Characteristics
Housing: Polycarbonate (PC)
Weight: (product only)
UPort 204: 800 g (1.76 lb)
UPort 207: 875 g (1.93 lb)
Dimensions:
UPort 204: 70 x 35 x 120 mm (2.76 x 1.38 x 4.72 in)
UPort 207: 80 x 35 x 185 mm (3.15 x 1.38 x 4.72 in)

Environmental Limits
Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508, LVD
EMC: CE, FCC
EMI: EN 61000-3-2, EN 61000-3-3, EN 61000-6-2, EN 61000-6-4, FCC Part 15 Subpart B Class A
EMS: EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE

Power Requirements
Input Voltage: 12 to 40 VDC external power
Power Consumption:
UPort 204: 1210 mA @ 12 VDC, 610 mA @ 24 VDC, 430 mA @ 36 VDC
UPort 207: 2170 mA @ 12 VDC, 1070 mA @ 24 VDC, 730 mA @ 36 VDC

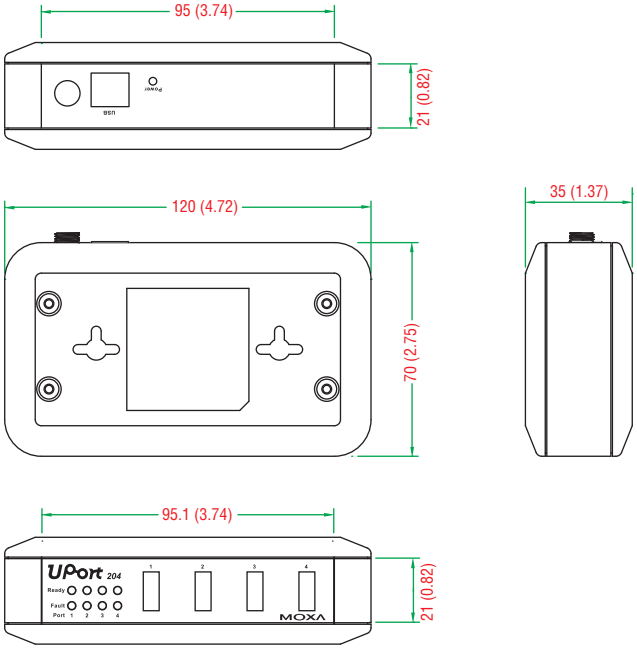
MTBF (mean time between failures)
Time:
UPort 204: 1,577,573 hrs
UPort 207: 1,059,201 hrs
Database: Telcordia (Bellcore), GB

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

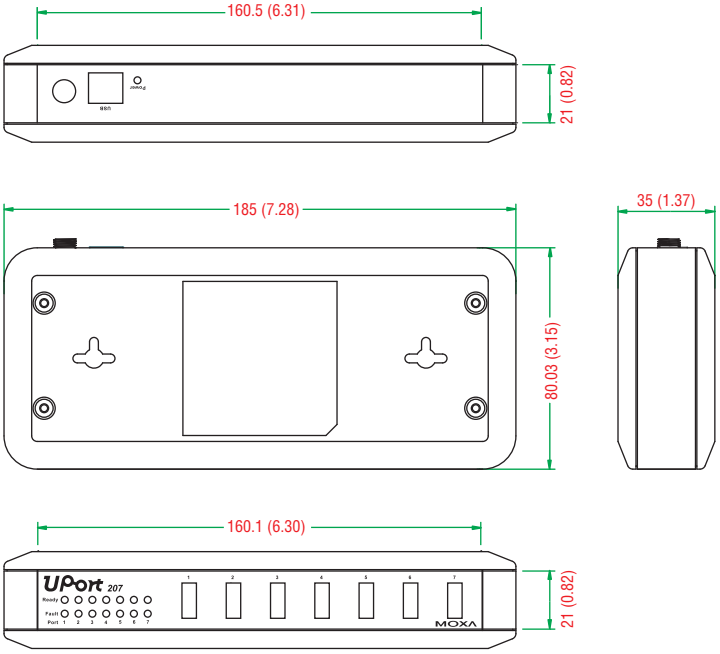
Dimensions

Unit: mm (inch)

UPort® 204



UPort® 207



Ordering Information

Available Models

UPort 204: 4-port entry-level USB hub, adaptor included
UPort 207: 7-port entry-level USB hub, adaptor included

Package Checklist

- 1 UPort 204 or UPort 207 entry-level USB hub
- USB-IF certified cable
- Power adaptor
- Quick installation guide (printed)
- Warranty card



Serial Media Converters

Product Selection Guide

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Serial-to-Fiber Media Converters 12-3
Serial Converters and Repeaters 12-4
CAN-to-Fiber Converters 12-5

NRack Systems

TRC-190 Series: Rackmount chassis for the NRack System™ 12-6
TCF-142-RM Series: RS-232/422/485 to fiber slide-in modules for the NRack System™ 12-8

Serial-to-Fiber Media Converters

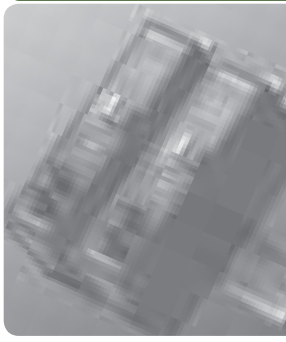
ICF-1150 Series: Industrial serial-to-fiber converters 12-10
TCF-142 Series: RS-232/422/485 to optical fiber media converters 12-13
TCF-90 Series: Port-powered RS-232 to optical fiber media converters 12-16

Standalone Converters

TCC-100/100I Series: Industrial RS-232 to RS-422/485 converters with optional 2 KV isolation 12-18
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TCC-120/120I: Industrial RS-422/485 converters/repeaters with optional 2 KV isolation 12-22
TCC-82: Port-powered RS-232 4-channel isolator 12-23

CAN-to-Fiber Converters

Introduction to CAN-to-Fiber Media Converters 12-25
ICF-1170I Series: Industrial CAN-to-fiber converters 12-27



Chassis Media Converters





	TRC-190-AC TRC-190-DC	TCF-142-M-SC-RM TCF-142-M-ST-RM	TCF-142-S-SC-RM TCF-142-S-ST-RM
Optical Fiber Side			
Fiber Connector	–	SC or ST	SC or ST
Cables Requirements	–	50/125, 62.5/125, or 100/140 µm	8.3/125, 8.7/125, 9/125, or 10/125 µm
Transmission Distance	–	5 km	40 km
Wavelength	–	850 nm	1310 nm
Tx Output	–	> -5 dBm	> -5 dBm
Rx Sensitivity	–	-20 dBm	-25 dBm
Point-to-Point Transmission	–	Point-to-Point Transmission: Half-duplex or full-duplex	Point-to-Point Transmission: Half-duplex or full-duplex
RS-232/422/485 Side			
Connector	–	DB9	
RS-232 Signals	–	TxD, RxD, GND	
RS-422 Signals	–	TxD+, TxD-, RxD+, RxD-, GND	
RS-485-4w Signals	–	TxD+, TxD-, RxD+, RxD-, GND	
RS-485-2w Signals	–	Data+, Data-, GND	
Baudrate	–	50 bps to 921.6 Kbps	
ESD Protection	–	15 KV	15 KV
Physical Characteristics			
Housing	SECC (1.2 mm)	–	–
Dimensions (mm)	440 x 260 x 77 mm	86.8 x 136.5 x 21 mm	86.8 x 136.5 x 21 mm
Weight	5.2 kg (11.4 lbs), with one power module installed	–	–
Number of Slots	19 slots in the front for slide-in modules, 2 slots in the back for power supply modules	–	–
Environmental Limits			
Operating Temperature	0 to 60°C	0 to 60°C	0 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C
Power Requirements			
Input Voltage	100 to 240 VAC or 36 to 72 VDC	12 VDC	12 VDC
Power Consumption	5.4 A @ 12 V (max. output)	150 mA @ 12 V	150 mA @ 12 V
Standards and Certifications			
Safety	UL 60950-1, EN 60950-1		
EMC	CE, FCC		
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A		
EMS	EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 2, EN 61000-4-4 (EFT) Level 2, EN 61000-4-5 (Surge) Level 2, EN 61000-4-6 (CS) Level 2, EN 61000-4-8 (PFMF) Level 3, EN 61000-4-11 (DIPS)		
Freefall	–	IEC 60068-2-32	
Green Product	RoHS, CRoHS, WEEE		
Reliability			
Warranty	5 years (see www.moxa.com/warranty)		

Serial-to-Fiber Media Converters



	ICF-1150-M-SC/ST ICF-1150-M-SC/ST-T	ICF-1150I-M-SC/ST ICF-1150I-M-SC/ST-T	ICF-1150-S-SC/ST ICF-1150-S-SC/ST-T	ICF-1150I-S-SC/ST ICF-1150I-S-SC/ST-T	TCF-142-M-SC/ST TCF-142-M-SC/ST-T	TCF-142-S-SC/ST TCF-142-S-SC/ST-T	TCF-90-M/S
Optical Fiber Side							
Fiber Connector	SC or ST	SC or ST	SC or ST	SC or ST	SC or ST	SC or ST	ST
Cables Requirements	Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm Multi-mode: 50/125, 62.5/125, or 100/140 µm						
Transmission Distance	Single-mode: 40 km Multi-mode: 5 km						
Wavelength	Single-mode: 1310 nm Multi-mode: 850 nm						
Tx Output	Single-mode: > -5 dBm Multi-mode: > -5 dBm						
Rx Sensitivity	Single-mode: -25 dBm Multi-mode: -20 dBm						
Point-to-Point Transmission	Half-duplex or full-duplex						–
Multi-drop Transmission	Half-duplex, fiber ring						–
RS-232 Side							
Connector	DB9 female	DB9 female	DB9 female	DB9 female	Terminal block	Terminal block	DB9 female
Signals	Tx, Rx, GND	Tx, Rx, GND	Tx, Rx, GND	Tx, Rx, GND	Tx, Rx, GND	Tx, Rx, GND	TxD, RxD, GND (Loop-back wiring: RTS to CTS, DTR to DSR and DCD)
Baudrate	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	300 bps to 115.2 Kbps
RS-232/422/485 Side							
Connector	Terminal Block						–
RS-232 Signals	TxD, RxD, GND						
RS-422 Signals	TxD+, TxD-, RxD+, RxD-, GND						–
RS-485-4w Signals	TxD+, TxD-, RxD+, RxD-, GND						–
RS-485-2w Signals	Data+, Data-, GND						–
Baudrate	50 bps to 921.6 Kbps						–
ESD Protection	15 KV for all signals						–
Isolation	–	2 KV	–	2 KV	–	–	–
Physical Characteristics							
Housing	Aluminum (1 mm)						ABS + PC
Dimensions (mm)	30.3 x 70 x 115 mm				67 x 100 x 22 mm		42 x 80 x 22 mm
Environmental Limits							
Operating Temperature	0 to 60°C or -40 to 85°C (for T models)						0 to 60°C
Operating Humidity	5 to 95% RH						5 to 95% RH
Storage Temperature	-40 to 85°C						-20 to 75°C
Power Requirements							
Source of Input Power	–	–	–	–	–	–	RS-232 port (TxD, RTS, DTR) or power input jack
Input Voltage	12 to 48 VDC				12 to 48 VDC		12 to 48 VDC
Power Consumption	127 mA @ 12 V	163 mA @ 12 V	127 mA @ 12 V	163 mA @ 12 V	140 mA @ 12 V		20 mA @ 5 V
Voltage Reversal Protection	Protects against V+/V- reversal				Protects against V+/V- reversal		–
Over Current Protection	1.1 A				1.1 A		–
Standards and Certifications							
Safety	UL 508				UL 60950-1		UL 60950-1
Hazardous Location	Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 EEx nC IIC				–	–	–
EMC	CE, FCC						
EMI	EN 55022 Class B, FCC Part 15 Subpart B Class B						FCC Part 15 Subpart B Class B
EMS	EN 61000-4-2 (ESD) Level 4, EN 61000-4-3 (RS) Level 2, EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 2, EN 61000-4-8 (PFMF) Level 3				EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 2, EN 61000-4-4 (EFT) Level 2, EN 61000-4-5 (Surge) Level 2, EN 61000-4-6 (CS) Level 2, EN 61000-4-8 (SFMF) Level 1		IEC 61000-4-2 (ESD) Level 2, IEC 61000-4-3 (RS) Level 2, IEC 61000-4-4 (EFT) Level 2, IEC 61000-4-5 (Surge) Level 3, IEC 61000-4-6 (CS) Level 2, IEC 61000-4-8 (SFMF) Level 1
Freefall	IEC 60068-2-32				–	–	–
Green Product	RoHS, CRoHS, WEEE				RoHS, CRoHS, WEEE		RoHS, CRoHS, WEEE
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						

Serial Converters and Repeaters



	TCC-100 TCC-100-T	TCC-100I TCC-100I-T	TCC-80	TCC-80I	TCC-120	TCC-120I	TCC-82
RS-232 Side							
Connector	DB9 female		DB9 female		–	–	DB9 male/female
Signals	TxD, RxD, RTS, CTS, GND (Loop-back wiring: DTR to DSR and DCD)		TxD, RxD, GND (Loop-back wiring: RTS to CTS, DTR to DSR and DCD)		–	–	TxD, RxD, RTS, CTS, GND (Loop-back wiring: DTR to DSR and DCD)
RS-422/485 Side							
Connector	Terminal Block		Terminal Block or DB9 male		Terminal block on both ends		–
Signals	(interface selected by DIP switch) RS-422: TxD+, TxD-, RxD+, RxD-, GND RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND RS-485-2w: Data+, Data-, GND		(interface selected by DIP switch) RS-422: TxD+, TxD-, RxD+, RxD-, GND RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND RS-485-2w: Data+, Data-, GND		(interface selected by DIP switch) RS-422: TxD+, TxD-, RxD+, RxD-, GND RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND RS-485-2w: Data+, Data-, GND		–
RS-485 Data Direction Control	ADDC®		ADDC®		ADDC®		–
Serial Communication							
Baudrate	50 bps to 921.6 Kbps		50 bps to 115.2 Kbps		50 bps to 921.6 Kbps		50 bps to 115.2 Kbps
Pull High Resistance	1K/150K ohm		1K ohm	4.7K ohm	1K/150K ohm		–
Pull Low Resistance							
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	–	2 KV	–	2.5 KV	–	2 KV	4 KV
Physical Characteristics							
Housing	Aluminum		ABS + PC		Aluminum		ABS
Dimensions (mm)	67 x 100.4 x 22 mm		42 x 80 x 22 mm		67 x 100.4 x 22 mm		42 x 80 x 23.6 mm
Weight	148 ± 5 g		50 ± 5 g		148 ± 5 g		60 ± 5 g
Environmental Limits							
Operating Temperature	-20 to 60°C, or -40 to 85°C		0 to 60°C		-20 to 60°C		0 to 60°C
Operating Humidity	5 to 95% RH		5 to 95% RH		5 to 95% RH		5 to 95% RH
Storage Temperature	-40 to 85°C		-20 to 75°C		-20 to 85°C		-20 to 75°C
Power Requirements							
Source of Input Power	Power input jack		RS-232 port (TxD, RTS, DTR) or power input jack		Power input jack		RS-232 port (TxD, RTS, DTR) or power input jack
Input Voltage	12 to 48 VDC		5 to 12 VDC		12 to 48 VDC		5 to 12 VDC
Power Consumption	300 mA @ 12 V	400 mA @ 12 V	10 mA @ 5 V	20 mA @ 5 V	98 mA @ 12 V	234 mA @ 12 V	20 mA @ 5 V
Voltage Reversal Protection	Protects against V+/V- reversal		–	–	Protects against V+/V- reversal		–
Over Current Protection	✓	✓	–	–	✓	✓	–
Standards and Certifications							
Safety	UL 60950-1						
EMC	CE, FCC						
EMI	FCC Part 15 Subpart B Class B						
EMS	IEC 61000-4-2 (ESD) Level 2, IEC 61000-4-3 (RS) Level 2, IEC 61000-4-4 (EFT) Level 2, IEC 61000-4-5 (Surge) Level 2, IEC 61000-4-6 (CS) Level 2, IEC 61000-4-8 (SFMF) Level 1		EN 61000-4-2 (ESD) Level 2, EN 61000-4-3 (RS) Level 2, EN 61000-4-4 (EFT) Level 2, EN 61000-4-5 (Surge) Level 2, EN 61000-4-6 (CS) Level 2, EN 61000-4-8 (SFMF) Level 1				
Green Product	RoHS, CRoHS, WEEE						
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						

CAN-to-Fiber Converters





	ICF-1170I-M-ST	ICF-1170I-M-ST-T
Optical Fiber Side		
Fiber Connector	ST	
Cables Requirements	Multi-mode: 50/125, 62.5/125, or 100/140 µm	
Transmission Distance	Up to 2 km	
Wavelength	Multi-mode: 850 nm	
Tx Output	Multi-mode: > -5 dBm	
Rx Sensitivity	Multi-mode: -20 dBm	
CAN Interface		
Connector	3-pin removable screw terminal	
CAN Specification	CAN 2.0 A and 2.0B (ISO 11898-2)	
Signal Support	CAN _H, CAN_L, CAN_GND	
Optical Isolation	2 KV	
Transfer rate	Up to 1 Mbps	
Termination Resistors	120 ohms (selected by DIP switch)	
Physical Characteristics		
Housing	Aluminum (1 mm)	
Dimensions (mm)	30.3 x 70 x 115 mm (11.9 x 27.6 x 45.3 in)	
Environmental Limits		
Operating Temperature	0 to 60°C	-40 to 85°C
Operating Humidity	5 to 95% RH	
Storage Temperature	-40 to 85°C	
Power Requirements		
Input Voltage	12 to 48 VDC dual power inputs for redundant power	
Power Consumption	221 mA @ 12 V	
Voltage Reversal Protection	Protects against V+/V- reversal	
Over Current Protection	1.1 A (protects against two signals shorted together)	
Standards and Certifications		
Safety	UL 508, EN 60950-1	
EMC	CE, FCC	
EMI	EN 55022 Class A, FCC Part 15 Subpart B Class A	
EMS	EN 61000-4-2 (ESD) Level 4, EN 61000-4-3 (RS) Level 2, EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 3, EN 61000-4-6 (CS) Level 2, EN 61000-4-8 (PFMF) Level 3	
Freefall	IEC 60068-2-32	
Green Product	RoHS, CRoHS, WEEE	
Reliability		
Warranty	5 years (see www.moxa.com/warranty)	

TRC-190 Series

Rackmount chassis for the NRack System™



- 19-inch chassis for rackmount use
- 19 slots for high density applications
- Supports hot-swap and dual power input with redundancy
- Fan-less chassis design reduces repair time

Introduction

The TRC-190 series provides 19 slots for media converter modules from the CSM-200 series of Ethernet-to-fiber modules and TCF-142-RM series of serial-to-fiber modules. A TRC-190 chassis comes with one AC or DC power input, with an optional redundant power expansion module available for greater reliability. The TRC-190 series' power input module supports the hot-swap feature.

Specifications

Physical Characteristics

Housing: SECC (1.2 mm)
Dimensions: 440 x 260 x 77 mm (18.6 x 11 x 3.3 in)
Weight: 5.2 kg (11.4 lbs), with one power module installed
Number of Slots: 19 slots in the front for slide-in modules, 2 slots in the back for power supply modules

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: Universal 100 to 240 VAC (47 to 63 Hz) or 36 to 72 VDC
Power Consumption:
Max. Output: 5.4 A @ 12 V

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (PFMF) Level 3,
EN 61000-4-11 (DIPS)
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

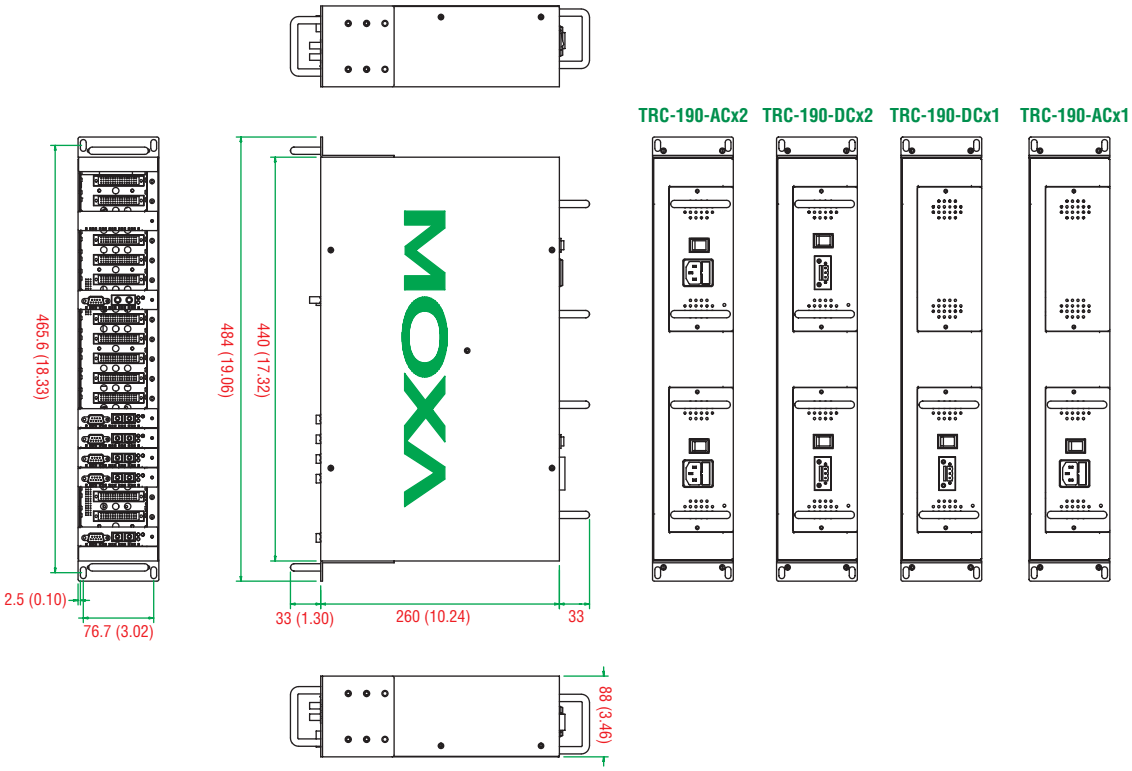
Time: 1,055,112 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TRC-190-AC: Rack chassis, 2U, single 110 to 240 VAC input, with 19 slots on front panel
TRC-190-DC-48: Rack chassis, 2U, single 36 to 72 VDC input, with 19 slots on front panel

Available Slide-in Modules

CSM-200-1213: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector
CSM-200-1214: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector
CSM-200-1218: 10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector
TCF-142-M-SC-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM: RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM: RS-232/422/485 to single-mode fiber slide-in module converter, ST connector

Optional Accessories (can be purchased separately)

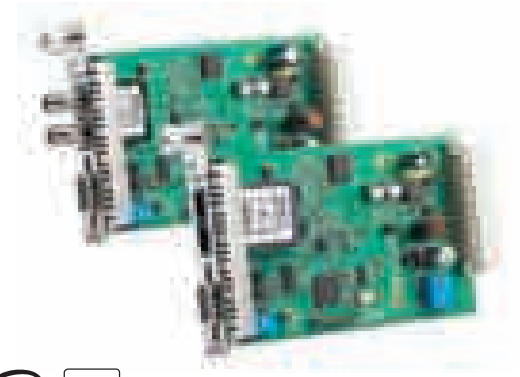
PWR-190-AC: Redundant power supply, 110 to 240 VAC
PWR-190-DC-48: Redundant power supply, 36 to 72 VDC
Plate-1: Face plate to cover unused front panel slots (required for all unused slots)

Package Checklist

- 1 TRC-190 with single power input
- Power cord (for TRC-190-AC only)
- 18 face plates
- User's Manual (printed)
- Warranty card

TCF-142-RM Series

RS-232/422/485 to fiber slide-in modules for the NRack System™



- Extend RS-232/422/485 transmission up to:
  - 40 km with single mode
  - 5 km with multi-mode
- 1K or 150K ohm adjustable pull high/low resistor
- "Ring" and "Point-to-Point" transmission supported

Fiber Ring | 15 KV ESD

RoHS | c UL us LISTED | CE | FC

Introduction

The TCF-142-RM series of serial-to-fiber converters are slide-in modules that work with the TRC-190 chassis. The modules convert from the RS-232, RS-422, or RS-485 signal to a fiber optic signal.

Automatic Baudrate Detection

The TCF-142-RM series can automatically detect the serial baudrate. This is an extremely convenient feature. Even if a device's baudrate is changed, the signal will still be transmitted through the media converter without any problem.

Specifications

Optical Fiber Side

Fiber Connector: SC or ST
Cable Requirements:
Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Multi-mode: 50/125, 62.5/125, or 100/140 µm
Transmission Distance:
Single-mode: 40 km
Multi-mode: 5 km
Wavelength:
Single-mode: 1310 nm
Multi-mode: 850 nm
Tx Output:
Single-mode: > -5 dBm
Multi-mode: > -5 dBm
Rx Sensitivity:
Single-mode: -25 dBm
Multi-mode: -20 dBm
Point-to-Point Transmission: Half-duplex or full-duplex
Ring Transmission: Half-duplex

RS-232/422/485 Side

Connector: DB9
RS-232 Signals: TxD, RxD, GND
RS-422 Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w Signals: Data+, Data-, GND
Baudrate: 50 bps to 921.6 Kbps
ESD Protection: 15 KV for all signals

Physical Characteristics

Dimensions: 86.8 x 136.5 x 21 mm (3.42 x 5.37 x 0.83 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 VDC
Power Consumption: 150 mA @ 12 V

Standards and Certifications

EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (PFMF) Level 3
Freefall: IEC 60068-2-32
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 514,926 hrs
Database: Telcordia (Bellcore), GB

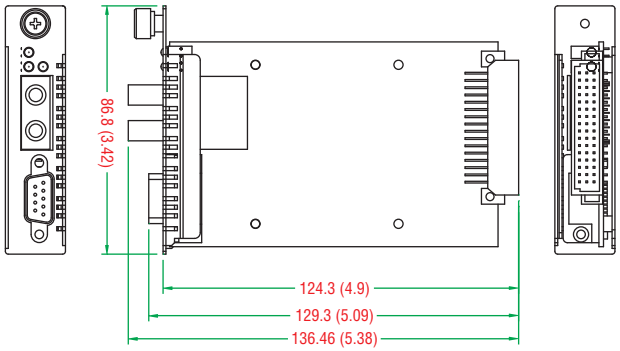
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

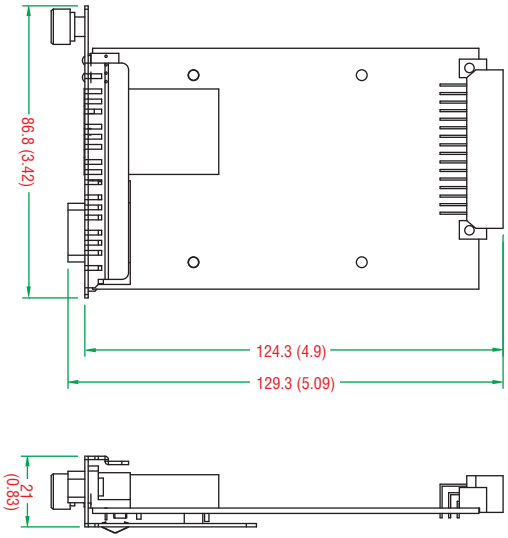
Dimensions

Unit: mm (inch)

TCF-142-M/S-ST-RM Series

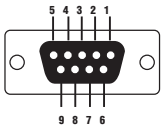


TCF-142-M/S-SC-RM Series



Pin Assignment

DB9 female connector



Pin	RS-232	RS-422/485-4w	RS-485-2w
1	–	RxD-(A)	Data-(A)
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	–
4	–	TxD-(A)	–
5	GND	GND	GND
6	–	–	–
7	–	–	–
8	–	–	–
9	–	–	–

Ordering Information

Available Models

TCF-142-M-SC-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM: RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM: RS-232/422/485 to single-mode fiber slide-in module converter, ST connector

Package Checklist

- 1 TCF-142-RM fiber converter
- Quick installation guide (printed)
- Warranty card

ICF-1150 Series

Industrial serial-to-fiber converters



- 3-way communication: RS-232, fiber, and RS-422/485
- Rotary switch to change the pull high/low resistor value
- Extend RS-232/422/485 transmission up to:
  - 40 km with single-mode
  - 5 km with multi-mode
- 3-way Galvanic Isolation (for "I" model only)
- -40 to 85°C wide temperature models available
- Class I, Div. II certification

Fiber Ring | 15 KV ESD

RoHS | c UL us LISTED | CE | FC

Three-Way Communication

The ICF-1150 series support 2 serial ports, with a D-sub9 connector for RS-232 communication and a removable terminal block for RS-422 or RS-485 communication. The 3 ports (2 serial ports and one fiber port) are completely independent. When an ICF-1150 converter receives data from any one port, it will send the data out through the other 2 ports. For example, once the ICF-1150 converter receives a command from the remote master through the fiber port, it will convert the signal and send the command through the RS-232 and RS-422/485 ports at the same time. If the user is monitoring a system running on an RS-485 network, there is no need to use an additional RS-232 to RS-485 converter to connect the laptop computer's serial port to the RS-485 bus.

Rotary Switch for Setting the Pull High/Low Resistor

The RS-485 interface supports multi-drop or daisy-chain connections, which system engineers will use to connect serial devices such as meters, RTUs, and readers together on the same bus. Since the number of serial devices on the same bus will cause the impedance of the data line to increase, the ICF-1150 allows users to tune the pull high/low resistor. Just rotate the switch to the appropriate value without removing the ICF-1150 from the DIN-rail.

Pull High/Low Resistor Values

Position	0	1	2	3	4	5	6	7	8	9
ohms	150K	10K	4.7K	3.3K	1K	909	822	770	500	485

Specifications

Optical Fiber Side

Fiber Connector: SC or ST
Cable Requirements:
Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Multi-mode: 50/125, 62.5/125, or 100/140 µm
Transmission Distance:
Single-mode: 40 km
Multi-mode: 5 km
Wavelength:
ICF-1150-S (single-mode): 1310 nm
ICF-1150-M (multi-mode): 850 nm
Tx Output:
ICF-1150-S (single-mode): > -5 dBm
ICF-1150-M (multi-mode): > -5 dBm
Rx Sensitivity:
ICF-1150-S (single-mode): -25 dBm
ICF-1150-M (multi-mode): -20 dBm
Point-to-Point Transmission: Half-duplex or full-duplex
Ring Transmission: Half-duplex

RS-232/422/485 Side

RS-232 Signals: TxD, RxD, GND
RS-422 Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w Signals: Data+, Data-, GND
Baudrate: 50 bps to 921.6 Kbps
ESD Protection: 15 KV for all signals
Isolation: 2 KV RMS isolation per I/O port for 1 minute

Physical Characteristics

Housing: Aluminum (1 mm)
Dimensions: 30.3 x 70 x 115 mm (1.19 x 2.76 x 4.53 in)
Weight: 330 g

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
ICF-1150: 127 mA @ 12 V
ICF-1150I: 163 mA @ 12 V
Voltage Reversal Protection: Protects against V+/V- reversal
Over Current Protection: 1.1 A (protects against two signals shorted together)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 EEx nC IIC
EMC: CE, FCC
EMI: EN 55022 Class B, FCC Part 15 Subpart B Class B
EMS:
EN 61000-4-2 (ESD) Level 4,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 4,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (PFMF) Level 3
Freefall: IEC 60068-2-32
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

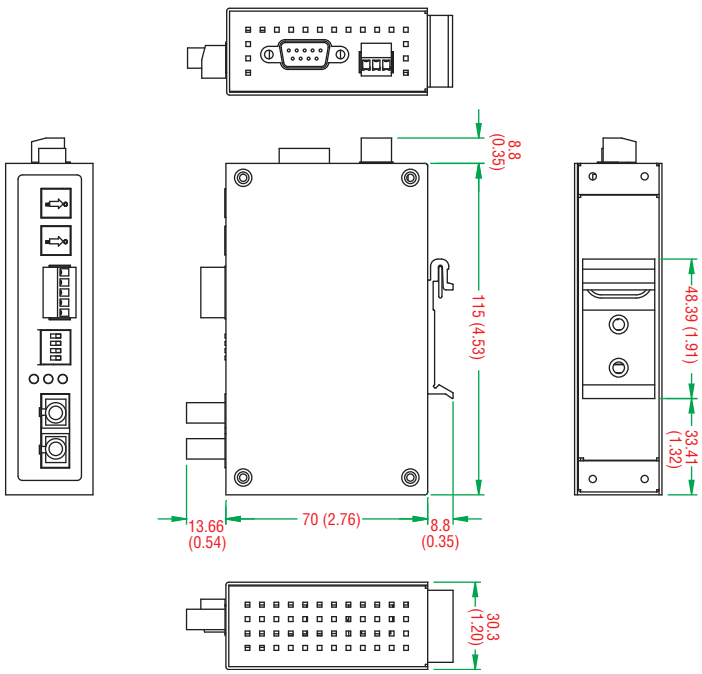
Time: 792,085 hrs
Database: Telcordia (Bellcore), GB
Water and Dust Proof: IP30

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

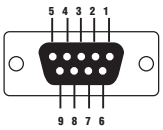
Dimensions

Unit: mm (inch)



Pin Assignment

DB9 female connector



Pin	RS-232
1	–
2	TxD
3	RxD
4	–
5	GND
6	–
7	–
8	–

Ordering Information

Available Models

ICF-1150-M-SC: Industrial RS-232/422/485 to multimode fiber converter, SC connector, 0 to 60°C operating temperature
ICF-1150-M-ST: Industrial RS-232/422/485 to multimode fiber converter, ST connector, 0 to 60°C operating temperature
ICF-1150-S-SC: Industrial RS-232/422/485 to single mode fiber converter, SC connector, 0 to 60°C operating temperature
ICF-1150-S-ST: Industrial RS-232/422/485 to single mode fiber converter, ST connector, 0 to 60°C operating temperature
ICF-1150I-M-SC: Industrial RS-232/422/485 to multimode fiber converter, SC connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150I-M-ST: Industrial RS-232/422/485 to multimode fiber converter, ST connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150I-S-SC: Industrial RS-232/422/485 to single mode fiber converter, SC connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150I-S-ST: Industrial RS-232/422/485 to single mode fiber converter, ST connector, 2 KV isolation, 0 to 60°C operating temperature
ICF-1150-M-SC-T: Industrial RS-232/422/485 to multimode fiber converter, SC connector, -40 to 85°C operating temperature
ICF-1150-M-ST-T: Industrial RS-232/422/485 to multimode fiber converter, ST connector, -40 to 85°C operating temperature
ICF-1150-S-SC-T: Industrial RS-232/422/485 to single mode fiber converter, SC connector, -40 to 85°C operating temperature
ICF-1150-S-ST-T: Industrial RS-232/422/485 to single mode fiber converter, ST connector, -40 to 85°C operating temperature
ICF-1150I-M-SC-T: Industrial RS-232/422/485 to multimode fiber converter, SC connector, 2 KV isolation, -40 to 85°C operating temperature
ICF-1150I-M-ST-T: Industrial RS-232/422/485 to multimode fiber converter, ST connector, 2 KV isolation, -40 to 85°C operating temperature
ICF-1150I-S-SC-T: Industrial RS-232/422/485 to single mode fiber converter, SC connector, 2 KV isolation, -40 to 85°C operating temperature
ICF-1150I-S-ST-T: Industrial RS-232/422/485 to single mode fiber converter, ST connector, 2 KV isolation, -40 to 85°C operating temperature

Optional Accessories

DR-4524: 45 W, 2 A Din-Rail 24 VDC power supply with universal 85 to 264 VAC input

Package Checklist

- 1 ICF-1150 series fiber converter
- Quick installation guide (printed)
- Warranty card

TCF-142 Series

RS-232/422/485 to optical fiber media converters



TCF-142-S-ST TCF-142-S-SC

- "Ring" and "Point- to-Point" transmission
- Extends RS-232/422/485 transmission up to:
  - 40 km with single-mode—TCF-142-S
  - 5 km with multi-mode—TCF-142-M
- Decreases signal interference
- Protects against electrical interference and chemical corrosion
- Supports baudrates up to 921.6 Kbps
- Wide temperature models available (-40 to 75°C)

Fiber Ring | 15 KV ESD | RoHS | c UL us LISTED | CE | FC

Introduction

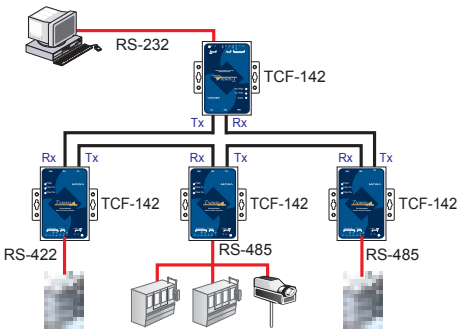
The TCF-142 media converters are equipped with a multiple interface circuit that can handle RS-232 or RS-422/485 serial interfaces and multi-mode or single-mode fiber. TCF-142 converters are used to extend serial transmission up to 5 km (TCF-142-M with multi-mode fiber) or up to 40 km (TCF-142-S with single-mode fiber). The TCF-142 converters can be configured to convert either RS-232 signals, or RS-422/485 signals, but not both at the same time.

Automatic Baudrate Detection

The TCF-142 converters can automatically detect the serial baudrate. This is an extremely convenient feature. Even if a device's baudrate is changed, the signal will still be transmitted through the media converter without any data loss.

Ring Operation

The TCF-142 converters can be used to connect serial devices to a fiber ring. To form the ring, connect the Tx port of one TCF-142 to the Rx port of a neighboring converter. Once the ring is set up, simply use the DIP switches to configure the TCF-142 converters for "ring mode." When one node transmits a signal, the signal travels around the ring until it returns back to the transmitting unit, which then blocks the signal. With the TCF-142, you can set up fiber rings that have a total circumference of up to 100 km.



Automatic Data Direction Control (ADDC®)

ADDC® is a patented hardware data flow solution developed by Moxa to handle RS-485 data direction control. ADDC® senses and controls RS-485 data direction automatically, making it unnecessary to use the hand shaking signal.

Specifications

Optical Fiber Side

Fiber Connector: SC or ST
Cable Requirements:
Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Multi-mode: 50/125, 62.5/125, or 100/140 µm
Transmission Distance:
Single-mode: 40 km
Multi-mode: 5 km
Wavelength:
Single-mode: 1310 nm
Multi-mode: 850 nm
Tx Output:
Single-mode: > -5 dBm
Multi-mode: > -5 dBm
Rx Sensitivity:
Single-mode: -25 dBm
Multi-mode: -20 dBm
Point-to-Point Transmission: Half-duplex or full-duplex
Ring Transmission: Half-duplex

RS-232/422/485 Side

Connector: Terminal Block
RS-232 Signals: Tx, Rx, GND
RS-422 Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w Signals: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w Signals: Data+, Data-, GND
Baudrate: 50 bps to 921.6 Kbps
ESD Protection: 15 KV for all signals

Physical Characteristics

Housing: Aluminum (1 mm)
Dimensions:
Without ears: 67 x 100 x 22 mm (2.64 x 3.94 x 0.87 in)
With ears: 90 x 100 x 22 mm (3.54 x 3.94 x 0.87 in)
Weight: 320 g

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption: 140 mA @ 12 V
Power Line Protection:
2 KV Burst (EFT), EN61000-4-4
2 KV Surge, EN61000-4-5
Voltage Reversal Protection: Protects against V+/V- reversal
Over Current Protection: 1.1 A (protects against two signals shorted together)

Standards and Certifications

Safety: UL 60950-1
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class B, EN 55022 Class B
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (SFMF) Level 1
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 780,480 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

DIP Switch Settings

Serial Connection	SW1	SW2
RS-232	ON	OFF
RS-422	ON	ON
RS-485-4w	OFF	OFF
RS-485-2w	OFF	ON

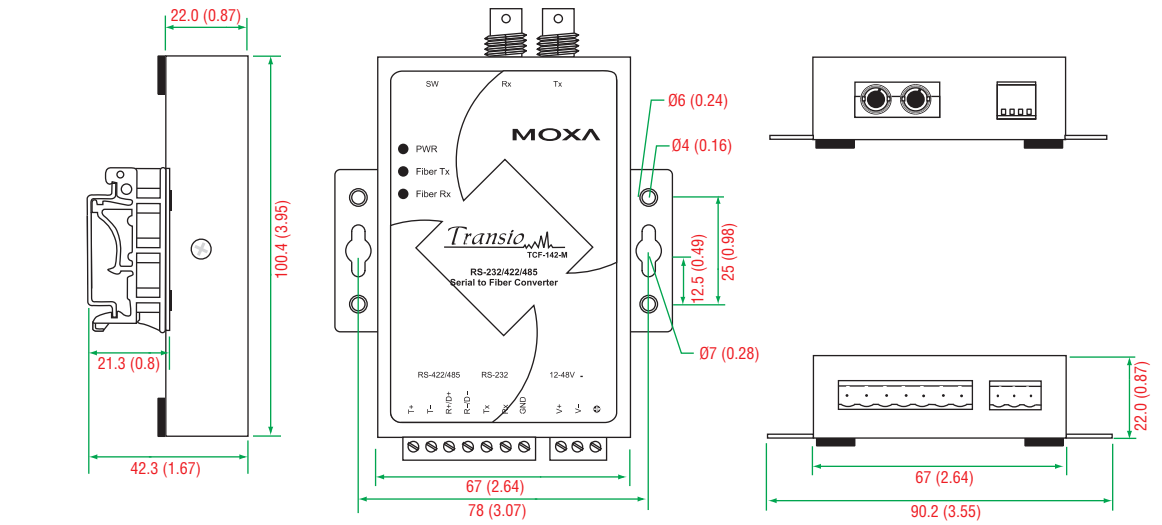
Built-in 120-ohm Terminator	SW3
Enable	ON
Disable	OFF

Fiber Mode	SW4
Ring mode	ON
Point-to-Point mode	OFF

Dimensions

TCF-142-M/S-ST

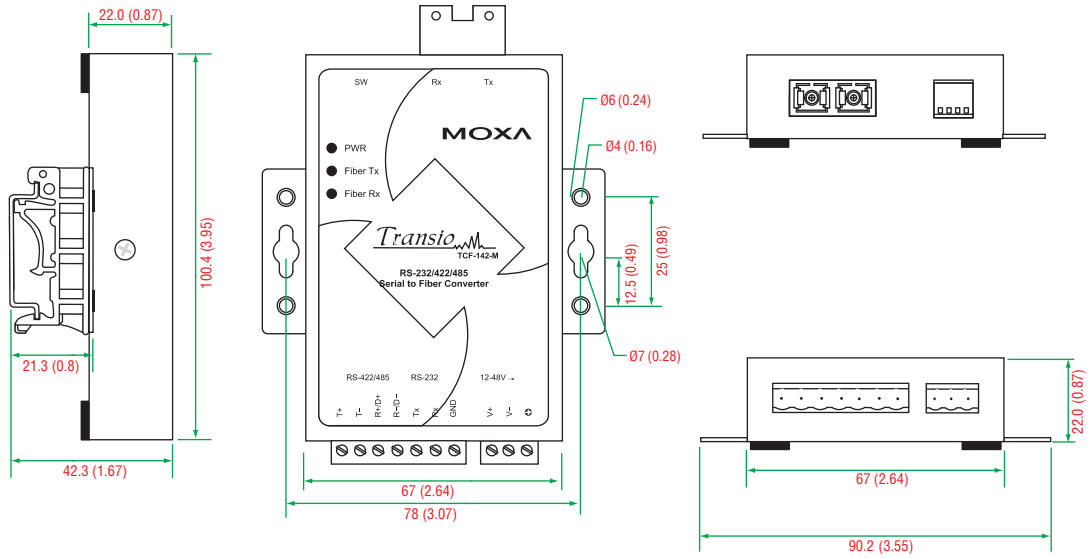
Unit: mm (inch)



Dimensions

TCF-142-M/S-SC

Unit: mm (inch)



Ordering Information

Available Models

TCF-142-M-SC: RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and SC connector, 0 to 60°C operating temperature
TCF-142-M-ST: RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and ST connector, 0 to 60°C operating temperature
TCF-142-S-SC: RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and SC connector, 0 to 60°C operating temperature
TCF-142-S-ST: RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and ST connector, 0 to 60°C operating temperature
TCF-142-M-SC-T: RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and SC connector, -40 to 75°C operating temperature
TCF-142-M-ST-T: RS-232/422/485 to multi-mode optical fiber media converter with fiber ring support and ST connector, -40 to 75°C operating temperature
TCF-142-S-SC-T: RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and SC connector, -40 to 75°C operating temperature
TCF-142-S-ST-T: RS-232/422/485 to single-mode optical fiber media converter with fiber ring support and ST connector, -40 to 75°C operating temperature

Package Checklist

- 1 TCF-142 media converter
- Power jack to 3-pin terminal block adaptor
- Stick-on pads
- Quick installation guide (printed)
- Warranty card

TCF-90 Series

Port-powered RS-232 to optical fiber media converters



USB Power | Port Power | Ext. Power | 15 KV ESD

- Use either external power or power over serial
- Extends RS-232 transmission up to:
  - 40 km with single-mode—TCF-90-S
  - 5 km with multi-mode—TCF-90-M
- Reduces signal interference
- Protects against electrical interference or chemical corrosion
- 15 KV ESD protection for serial signals
- Compact size

RoHS | c UL us LISTED | CE | FC

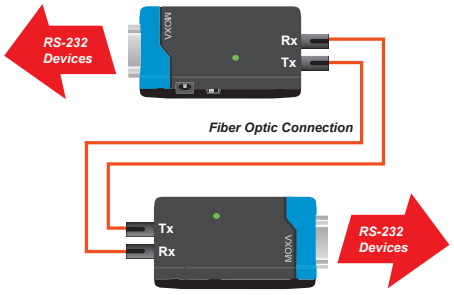
Specifications

The TCF-90 is a compact media converter that transmits RS-232 signals over optical fiber. Power is derived from either the serial port or an external power source. The TCF-90 extends RS-232 transmission up to 5 km with multi-mode fiber, or up to 40 km with single-mode fiber. A pair of TCF-90 converters can be used to connect two RS-232 devices with optical fiber in full duplex mode. The optical fiber isolates the data signals from dangerous increases in ground potential, ground loops, and electrical EMI/RFI noise, and enhances data security by eliminating the harmful effects of RF radiation and susceptibility to electromagnetic radiation.

Self-powered RS-232 to Optical Fiber

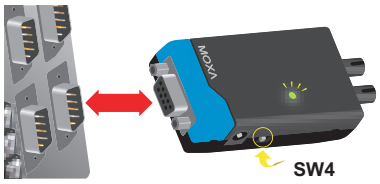
Connecting RS-232 devices to the TCF-90 is easy. The ST-type optical fiber connector is designed especially for data communication applications that transmit data either between or within buildings. The TCF-90 can be used for industrial applications and for applications that require secure data transfer.

The RS-232 port on the TCF-90 uses a DB9 female socket to connect directly to the host PC, with power drawn from the TxD, RTS, and DTR lines. Although the TCF-90 can obtain enough power from the three data/handshake lines whether the signal is high or low, we strongly recommend setting either the RTS or DTR signal to ON.



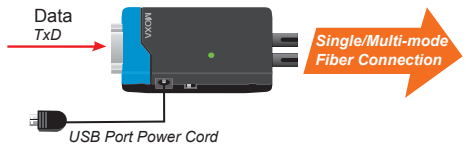
LED Port Power Indicator

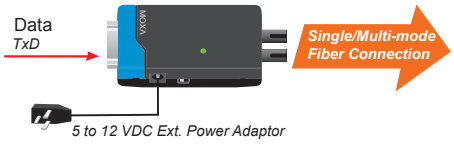
It's easy enough to use a multimeter to test if the serial device is supplying the TCF-90 with enough power through the serial connection, but why bother when the TCF-90 can do the testing for you? Connect the TCF-90 to the device's RS-232 port and set the SW4 switch to Test mode. If the port power LED indicator lights up, the TCF-90 is receiving enough power. If the LED does NOT light up, you will need to attach an external power source to the TCF-90.



Optional External Power Source

In most circumstances, the TCF-90 should be able to operate without using an external power source. However, an external USB power cord or DC power supply can be used in situations where the handshake lines are not available, both the RTS/DTR signals are set to OFF, or the attached device's serial interface chip provides less power than required.





Specifications

Optical Fiber Side

Fiber Connector: ST
Cable Requirements:
Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Multi-mode: 50/125, 62.5/125, or 100/140 µm
Transmission Distance:
Single-mode: 40 km
Multi-mode: 5 km
Wavelength:
Single-mode: 1310 nm
Multi-mode: 850 nm
Tx Output:
Single-mode: > -5 dBm
Multi-mode: > -5 dBm
Rx Sensitivity:
Single-mode: -24 dBm
Multi-mode: -20 dBm

RS-232 Side

Connector: DB9 female
Signals:
RS-232 Tx, Rx, GND (Loop-back wiring: RTS to CTS, DTR to DSR and DCD)
Baudrate: 300 bps to 115.2 Kbps

Physical Characteristics

Housing: ABS + PC
Dimensions: 42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)
Weight: 150 g

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Source of Input Power: RS-232 port (TxD, RTS, DTR) or power input jack
Input Voltage: 5 to 12 VDC
Power Consumption: 20 mA @ 5 V (with termination disabled)

Standards and Certifications

Safety: UL 60950-1
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class B
EMS:
IEC 61000-4-2 (ESD) Level 2,
IEC 61000-4-3 (RS) Level 2,
IEC 61000-4-4 (EFT) Level 2,
IEC 61000-4-5 (Surge) Level 3,
IEC 61000-4-6 (CS) Level 2,
IEC 61000-4-8 (SFMF) Level 1
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

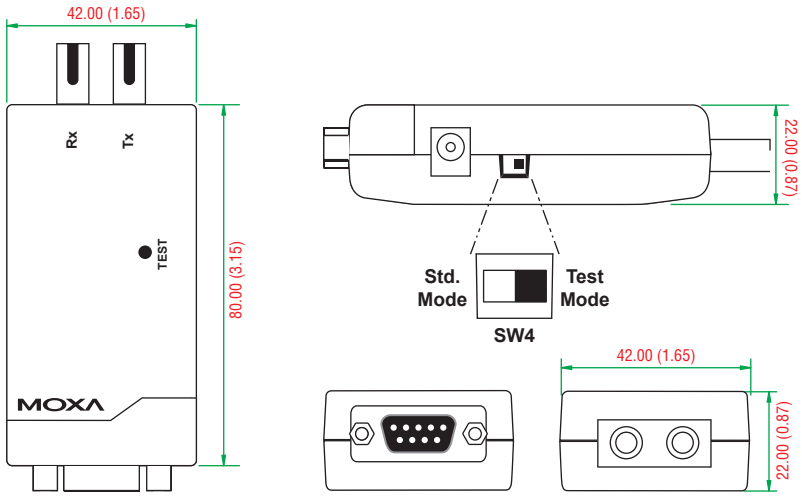
Time: 2,272,562 hrs
Database: MIL-HDBK-217F

Warranty

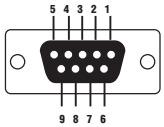
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



DB9 female connector



PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

Ordering Information

Available Models

TCF-90-M: Port-powered RS-232 to multi-mode optical fiber converter with ST connector for 5 km transmission
TCF-90-S: Port-powered RS-232 to single-mode optical fiber converter with ST connector for 40 km transmission
Note: Models with SC/FC connectors or a 60 km range are available by request.

Optional Accessories (can be purchased separately)

Power Adaptor: See Appendix A for details
CBL-F9M9-20: DB9 male to DB9 female RS-232 cable (20 cm)

Package Checklist

- 1 TCF-90 series media converter
- USB power cord (50 cm)
- Quick installation guide
- Warranty card

TCC-100/100I Series

Industrial RS-232 to RS-422/485 converters with optional 2 KV isolation



Ext. Power | 2 KV Isolation | 15 KV ESD

- RS-232 to RS-422 conversion with RTS/CTS support
- RS-232 to 2-wire or 4-wire RS-485 conversion
- 2 KV isolation protection (TCC-100I)
- Wall and DIN-Rail mounting
- Plug-in terminal block for easy RS-422/485 wiring
- LED indicators for power, Tx, Rx
- Wide temperature model available (-40 to 85°C)

Introduction

The TCC-100/100I series RS-232 to RS-422/485 converters increase networking capability by extending the RS-232 transmission distance. Both converters have a superior industrial-grade design that includes DIN-rail mounting, terminal block wiring, external terminal block for power, and optical isolation (TCC-100I and TCC-100I-T only). The TCC-100/100I series converters are ideal solutions for converting RS-232 signals to RS-422/485 in critical industrial environments.

Specifications

RS-232 Side
Connector: DB9 female
Signals: TxD, RxD, RTS, CTS, GND

RS-422/485 Side
Connector: Terminal Block
Signals:
(interface selected by DIP switch)
RS-422: TxD+, TxD-, RxD+, RxD-, RTS, CTS, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication
Baudrate: 50 bps to 921.6 Kbps
ESD Protection: 15 KV
Optical Isolation: 2 KV (TCC-100I/100I-T)

Physical Characteristics
Housing: Aluminum
Dimensions: 67 x 100.4 x 22 mm (2.64 x 3.93 x 0.87 in)
Weight: 148 ± 5 g

Environmental Limits
Operating Temperature:
Standard Models: -20 to 60°C (-4 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements
Source of Input Power: Power input jack
Input Voltage: 12 to 48 VDC
Power Consumption:
TCC-100/100-T: 300 mA @ 12 V
TCC-100I/100I-T: 400 mA @ 12 V
Voltage Reversal Protection: Protects against V+/V- reversal
Over Current Protection: Protects against two signals shorted together

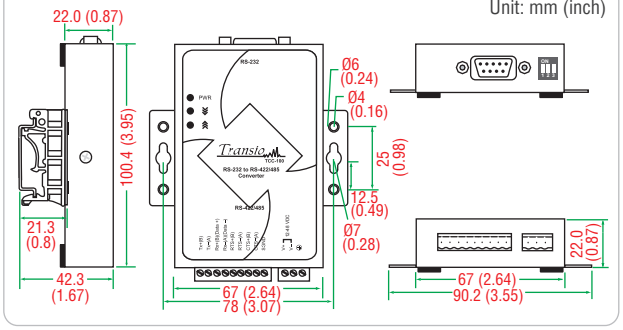
Standards and Certifications
Safety: UL 60950-1
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class B
EMS:
IEC 61000-4-2 (ESD) Level 2,
IEC 61000-4-3 (RS) Level 2,
IEC 61000-4-4 (EFT) Level 2,
IEC 61000-4-5 (Surge) Level 2,
IEC 61000-4-6 (CS) Level 2,
IEC 61000-4-8 (SFMF) Level 1
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)
Time: 3,017,857 hrs
Database: MIL-HDBK-217F

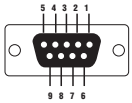
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



DB9 female connector



PIN	RS-232
1	–
2	TxD
3	RxD
4	–

PIN	RS-232
5	GND
6	–
7	CTS
8	RTS

Ordering Information

Available Models
TCC-100: RS-232 to RS-422/485 converter, -20 to 60°C operating temperature
TCC-100I: RS-232 to RS-422/485 converter with optical isolation, -20 to 60°C operating temperature
TCC-100-T: RS-232 to RS-422/485 converter, -40 to 85°C operating temperature
TCC-100I-T: RS-232 to RS-422/485 converter with optical isolation, -40 to 85°C operating temperature

Package Checklist
- 1 TCC-100/100I media converter
- DK-35A: DIN-Rail mounting kit
- Power jack to 3-pin terminal block adaptor
- Quick installation guide (printed)
- Warranty card

TCC-80/80I Series

Port-powered RS-232 to RS-422/485 converters with optional 2.5 KV isolation

TCC-80-DB9 TCC-80



TCC-80I-DB9 TCC-80I



USB Power | Port Power | Ext. Power | 2.5KV Isolation | 15 KV ESD

- External power source supported but not required
- Compact size
- Converts RS-422, and both 2-wire and 4-wire RS-485
- RS-485 automatic data direction control
- Automatic baudrate detection
- 15 KV serial ESD protection
- Built-in 120-ohm termination resistors
- 2.5 KV isolation (for TCC-80I only)
- LED port power indicator

Introduction

The TCC-80/80I media converters provide complete signal conversion between RS-232 and RS-422/485, without requiring an external power source. The converters support both half duplex 2-wire RS-485 and full duplex 4-wire RS-422/485, either of which can be converted between RS-232's TxD and RxD lines. In addition,the TCC-80/80I's 15 KV ESD protection guards against damage from electrostatic discharge, and the TCC-80I is the world's first high-speed, port-powered converter with 2.5 KV isolation.

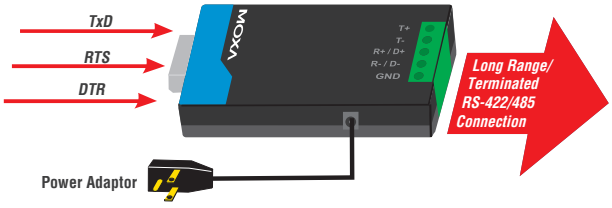
Automatic data direction control is provided for RS-485. In this case, the RS-485 driver is enabled automatically when the circuitry senses the TxD output from the RS-232 signal. This means that no programming effort is required to control the transmission direction of the RS-485 signal. Moreover, the TCC-80I's patented LED port power indicator lets you check whether or not the TCC-80I is receiving enough power.

Port Power over RS-232

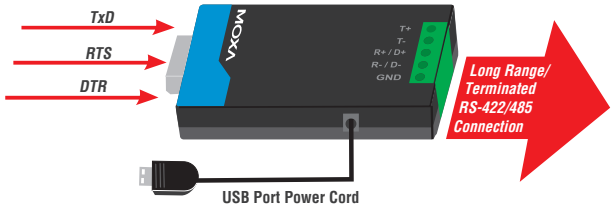
The RS-232 port of the TCC-80/80I is a DB9 female socket that can connect directly to the host PC, with power drawn from the TxD line. Regardless of whether the signal is high or low, the TCC-80/80I can obtain enough power from the data line. However, external power can be used if the handshake line is not available, if the serial cable is too long, or if the RS-232 device is a low power device. For external power, a 5 to 12 VDC power supply can be connected using an adaptor or a USB power cord.



External Power Adaptor



USB Power

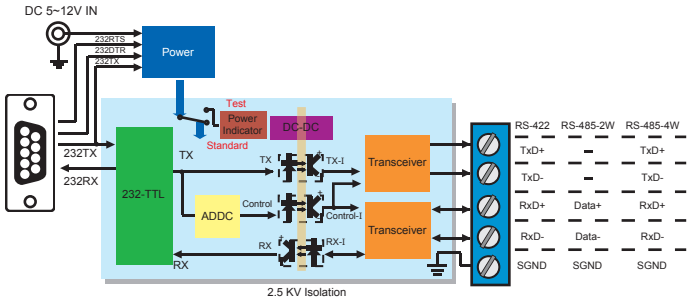


Port Power Dissipation

When installing a TCC-80 or TCC-80I converter, it is important to pay attention to power consumption, RS-232 cable length, and RS-422/485 transmission distance. In general, the TCC-80 and TCC-80I obtain 50 mW of power from the power source. Standard PC COM ports can provide 70 to 90 mW of power if the TxD, RTS, and DTR lines are connected. Moreover, the RS-232 cable should be shorter than 15 m (@ 9600 bps) to ensure that less power is lost from the host/device to the TCC-80. The remainder of the supplied power is used for transmitting the RS-422/485 signal.

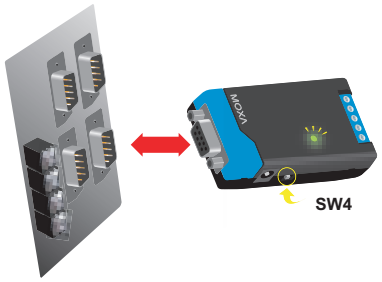
Port Power and Optical Isolation

The RS-232 port of the TCC-80/80I is a DB9 female socket that can connect directly to the host PC, with power drawn from the TxD line. Electrical 2.5 KV isolation for the TCC-80I is achieved with a photo coupler that transforms the electrical signal into light, and then re-transforms the light back into an electrical signal on the other side. In this way, the two electrical circuits are completely isolated from each other. This also protects the devices from ground loop currents, reduces damage caused by data loss, and prevents damage to the communication interfaces.



LED Port Power Indicator

It's easy enough to test the serial device with a multimeter to determine that the serial device will provide enough power to the media converter. However, it's even easier to let the TCC-80/80I test the device for you. Simply connect the TCC-80/80I to the device's RS-232 port and set the SW4 switch to Test mode. If the patented port power LED indicator lights up, the TCC-80/80I is receiving enough power. If the LED does not light up, you will need to attach an external power source to the TCC-80/80I.



Specifications

RS-232 Side

Connector: DB9 female
Signals:
RS-232: TxD, RxD, GND
(Loop-back wiring: RTS to CTS, DTR to DSR and DCD)

RS-422/485 Side

Connector: Terminal Block or DB9 male
Signals:
(interface selected by DIP switch)
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication

Baudrate: 50 bps to 115.2 Kbps
ESD Protection: 15 KV
Optical Isolation: 2.5 KV rms for 1 minute (TCC-80I only)

Physical Characteristics

Housing: ABS + PC
Dimensions: 42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)
Weight: 50 ± 5 g

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-14 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Source of Input Power: RS-232 port (TxD, RTS, DTR) or power input jack
Input Voltage: 5 to 12 VDC
Power Consumption:
TCC-80: 10 mA @ 5 V (with termination disabled)
TCC-80I: 20 mA @ 5 V (with termination disabled)

Standards and Certifications

Safety: UL 60950-1
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class B
EMS:
EN 61000-4-2 (ESD) Level 2,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (SFMF) Level 1
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

Time: 2,781,161 hrs
Database: Telcordia (Bellcore), GB

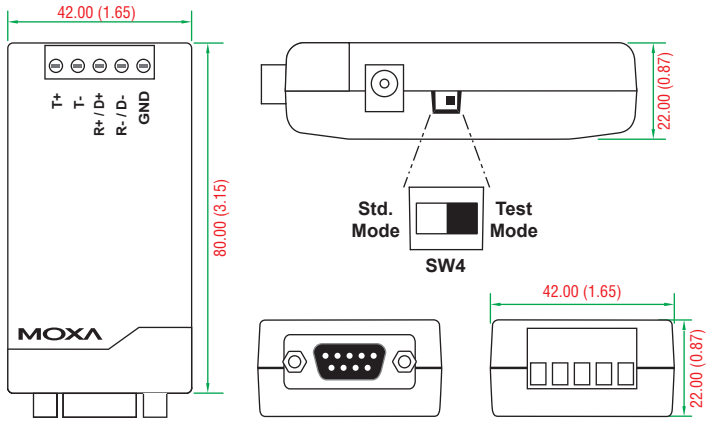
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

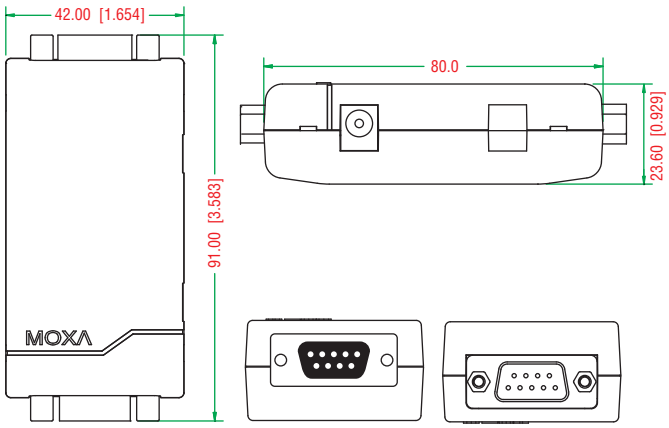
Dimensions

Unit: mm (inch)

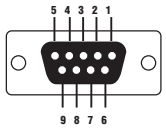
TCC-80/80I



TCC-80-DB9, TCC-80I-DB9



DB9 female connector



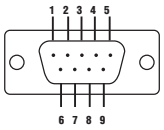
PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

DIP Switch Settings



DIP Switch Settings			
RS-422 with Terminator	SW1	SW2	SW3
	OFF	OFF	ON
RS-422	SW1	SW2	SW3
	OFF	OFF	OFF
4-wire RS-485 with Terminator	SW1	SW2	SW3
	ON	OFF	ON
4-wire RS-485	SW1	SW2	SW3
	ON	OFF	OFF
2-wire RS-485 with Terminator	SW1	SW2	SW3
	ON	ON	ON
2-wire RS-485	SW1	SW2	SW3
	ON	ON	OFF

DB9 male RS-422/485 port



PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD+(B)	–
2	TxD-(A)	–
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND
6	–	–
7	–	–
8	–	–

Ordering Information

Available Models

TCC-80: Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection and terminal block on the RS-422/485 side
TCC-80-DB9: Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection and DB9 male connector on the RS-422/485 side
TCC-80I: Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection, terminal block on the RS-422/485 side, and 2.5 KV optical isolation
TCC-80I-DB9: Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection, DB9 male connector on the RS-422/485 side, and 2.5 KV optical isolation

Optional Accessories (can be purchased separately)

CBL-F9M9-20: DB9 male to DB9 female RS-232 cable (20 cm)
Power Adaptor: See Appendix A for details

Package Checklist

- 1 TCC-80 or TCC-80I media converter
- USB power cord (50 cm)
- Quick installation guide (printed)
- Warranty card

TCC-120/120I

Industrial RS-422/485 converters/repeaters with optional 2 KV isolation



- Boost serial signal to extend transmission distance
- Wall or DIN-Rail mounting
- Terminal block for easy wiring
- Power input from terminal block
- DIP switch setting for built-in terminator (120 ohm)
- Boost RS-422 or RS-485 signal, or convert RS-422 to RS-485
- 2 KV isolation protection (TCC-120I)

2 KV Isolation | 15 KV ESD

Introduction

The TCC-120 and TCC-120I are RS-422/485 converters/repeaters designed to extend RS-422/485 transmission distance. Both products have a superior industrial-grade design that includes DIN-rail mounting, terminal block wiring, and external terminal block for power. In addition, the TCC-120I supports optical isolation for system protection. The TCC-120 and TCC-120I are ideal RS-422/485 converters/repeaters for critical industrial environments.

Specifications

Serial Communication

Connectors: Terminal Block on both ends
Baudrate: 50 bps to 921.6 Kbps
Signals:
RS-422/485-4w: TxD+, TxD-, RxD+, RxD-
RS-485-2w: Data+, Data-
RS-485 Data Direction Control: ADDC® (automatic data direction control)
ESD Protection: 15 KV for all signals
Optical Isolation: 2 KV (TCC-120I only)

Physical Characteristics

Housing: Aluminum
Dimensions: 67 x 100.4 x 22 mm (2.64 x 3.93 x 0.87 in)
Weight: 148 ± 5 g

Environmental Limits

Operating Temperature: -20 to 60°C (-4 to 140°F)
Storage Temperature: -20 to 85°C (-4 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Source of Power Input: Power input jack
Input Voltage: 12 to 48 VDC
Power Consumption:
TCC-120: 98 mA @ 12 V
TCC-120I: 234 mA @ 12 V
Voltage Reversal Protection: Protects against V+/V- reversal
Over Current Protection: Protects against two signals shorted together

Standards and Certifications

Safety: UL 60950-1
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class B
EMS:
EN 61000-4-2 (ESD) Level 2,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (SFMF) Level 1
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

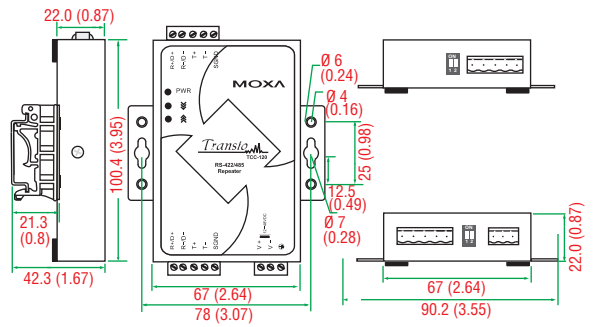
Time: 1,949,025 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TCC-120: RS-422/485 converter/repeater
TCC-120I: RS-422/485 converter/repeater with 2 KV optical isolation

Package Checklist

- 1 TCC-120 or TCC-120I media converter
- DK-35A: DIN-Rail mounting kit
- Quick installation guide (printed)
- Warranty card

TCC-82

Port-powered RS-232 4-channel isolator



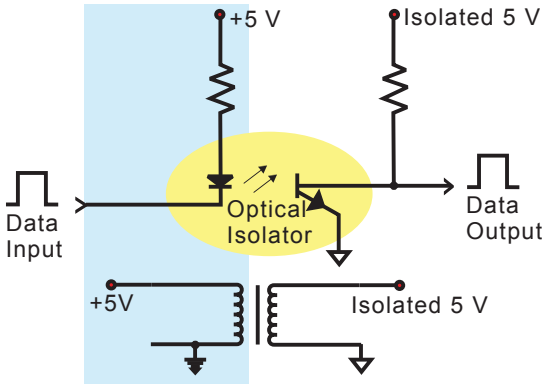
- 4 channels of 4 KV RMS isolation for 1 minute
- External power source supported but not required
- 15 KV serial ESD protection
- Automatic baudrate detection
- Compact size

USB Power | Port Power | Ext. Power | 4 KV Isolation | 15 KV ESD

RoHS | WEEE | c UL us LISTED | CE | FC

Introduction

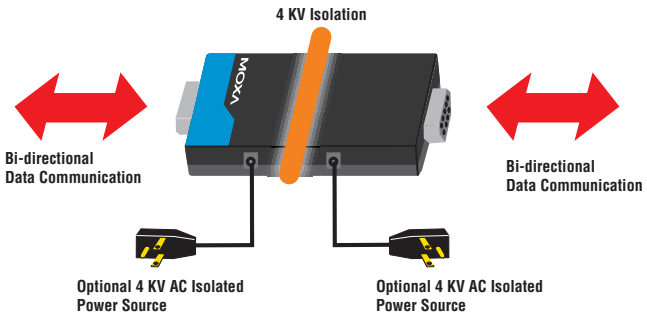
The TCC-82 provides full electrical isolation for bi-directional serial communication between two RS-232 devices in a compact, industrial-grade package. Both sides of an RS-232 connection are isolated optically to provide perfect protection against lightning surges, accidental high voltage shorts, and ground loops. The built-in, wide range isolators are tested to ensure that they can withstand more than 4 KV rms input to output for 1 minute. This means that the TCC-82 not only meets the requirements of general serial data communications, but also the high standards required by industrial automation and medical applications. The TCC-82 protects the TxD and RxD data lines, and also protects the RTS and CTS handshake lines for a total of 4 isolated channels to provide complete protection of your RS-232 applications.



External Power Source Not Required

The TCC-82 supports port-powered operation, which means that it can obtain power directly from the attached serial devices. Power is obtained from the RS-232 TxD, RTS, or DTR lines, regardless of whether the signal is high or low, eliminating the need for an external power supply. However, external power can be used if handshake lines are not available, if the serial cable is too long, or if the serial device is a low powered device. For external power, the TCC-82 can use a 5 to 12 VDC adaptor or a USB power cord. Note that both sides of the connection are powered independently, so if necessary, one side can rely on port power and the other on an external power source.

When installing the TCC-82, we recommend that you connect all output signals. The TCC-82 obtains power from these signals even if they are not used by your system. Care should be taken when choosing the external power supply if your application requires the full 4 KV of isolation. Most commercial power supplies provide only 1500 VAC isolation between the primary and secondary windings. If you are using external power for both sides of the TCC-82, make sure that separate power sources are used, each with sufficient isolation protection.



Specifications

Serial Communication

Connectors: DB9 male and DB9 female
Baudrate: 50 bps to 921.6 Kbps
Signals:
RS-232: TxD, RxD, RTS, CTS, GND
(Loop-back wiring: DTR to DSR and DCD)
ESD Protection: 15 KV for all signals
Optical Isolation: 4 KV for 1 minute

Physical Characteristics

Housing: ABS
Dimensions: 42 x 80 x 23.6 mm (1.65 x 3.15 x 0.93 in)
Weight: 60 ± 5 g

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Source of Input Power: RS-232 port (TxD, RTS, DTR) or power input jack
Input Voltage: 5 to 12 VDC
Power Consumption: 20 mA @ 5 V

Standards and Certifications

Safety: UL 60950-1
EMC: CE, FCC
EMI: FCC Part 15 Subpart B Class B
EMS:
EN 61000-4-2 (ESD) Level 2,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 2,
EN 61000-4-5 (Surge) Level 2,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (SFMF) Level 1
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

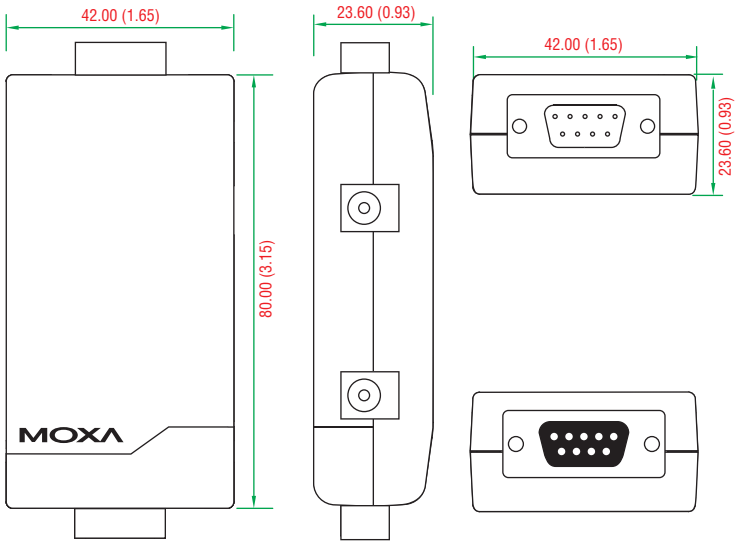
Time: 959,780 hrs
Database: MIL-HDBK-217F

Warranty

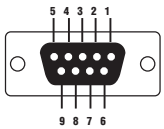
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

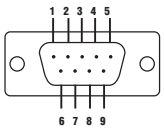


DB9 female connector



PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

DB9 male connector



PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

Ordering Information

Available Models

TCC-82: Port-powered RS-232 isolator with 4 KV isolation and 15 KV serial ESD protection

Optional Accessories (can be purchased separately)

Power Adaptor: See Appendix A for details
CBL-F9M9-20: DB9 male to DB9 female RS-232 cable (20 cm)

Package Checklist

- 1 TCC-82 RS-232 isolator
- USB power cord (50 cm) x 2
- Quick installation guide (printed)
- Warranty card

Introduction to CAN-to-Fiber Media Converters

Introduction to CAN

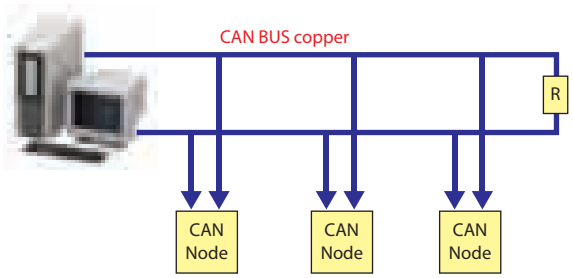
CAN is a serial communications bus defined by the International Standardization Organization (ISO). The CAN serial bus was introduced in 1986 as the "Automotive Serial Controller Area Network," a multimaster message broadcast system that specifies a maximum signaling rate of 1 Mbps. It was soon discovered that CANbus worked extremely well for many other applications, including weaving machines, elevator systems in large buildings, ships, trains, aircraft, x-ray machines and other medical equipment, logging equipment, tractors and combines, coffee makers, and major appliances. CAN systems are extremely versatile. Technicians find it easy to repair or replace computer hardware in a CAN system without affecting the rest of the network in any way, and design engineers can easily modify existing CAN systems for other uses by adding or remove network nodes.

Why CAN-to-Fiber Media Converters?

Many applications require connecting large numbers of CAN devices in a complex environment. However, since there is a limit to the driving capability of CANbus, users may not be able to set up as many CAN devices as they would like. In addition, variations in the allowed segment lengths, which result from the fact that different types of wire are used, poses additional limitations. Note that device numbers and segment lengths are dictated by the ISO 11898-2 standard.

CAN converters are used to get around the limitation on the number of CAN devices and the upper limit of segment lengths. Most installers use optical fiber to extend to longer transmission distances since the fiber will not corrupt the CANbus signal. CAN-to-fiber converters not only can solve the problem of extending transmission distance, but will also guarantee more secure data transmission and will not limit the number of CAN devices that can be used. The ICF-1170I is a CAN-to-fiber converter that secures data transmission by using fiber optic transmission to provide complete isolation and protection against EMI. The ICF-1170I series can separate and protect critical segments of the system from the rest of the CAN network and is protocol independent, allowing it to work with all of the different CAN protocols and frame lengths.

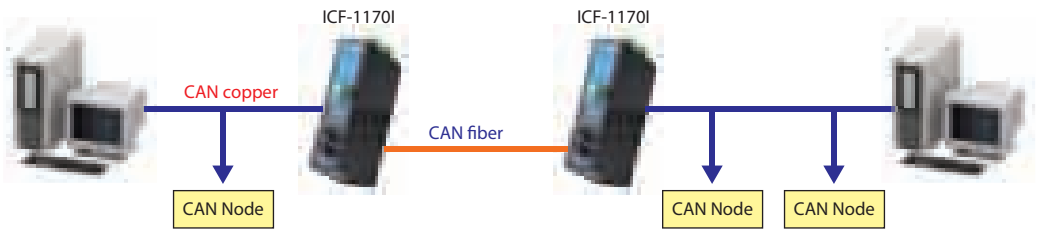
Typical Installation



Overview of the ICF-1170I CAN-to-Fiber Converter

The ICF-1170I series CAN-to-fiber converters provide secures data transmission by using fiber optic transmission to provide complete isolation and protection against EMI. The ICF-1170I series can separate and protect critical segments of the system from the rest of the CAN network and is protocol independent, allowing it to work with all of the different CAN protocols and frame lengths.

Typical CAN application that uses a CAN-to-fiber converter



Special Features

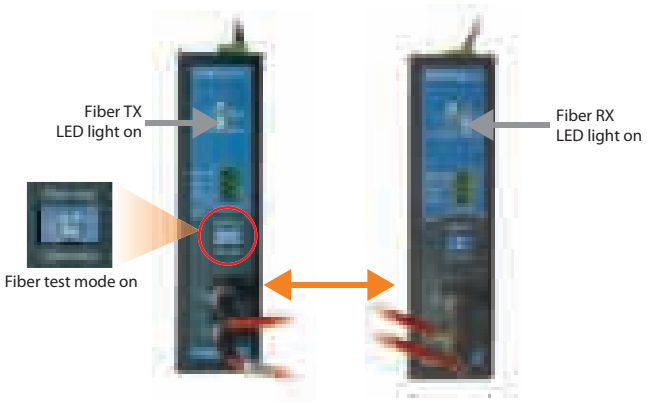
Fiber Test Mode

The ICF-1170I supports a special feature called Fiber Test Mode, which is easily activated with a DIP switch on the ICF-1170I's outer panel. Fiber Test Mode can be used to test the fiber cable between two ICF-1170I units, and provides a simple way to determine if the fiber cable is transmitting data correctly.

When in Fiber Test Mode, the fiber transceiver (TX) will continuously send out a data signal and the "Fiber TX" LED will light up. On the other side of the connection, when the ICF-1170I fiber transceiver (RX) receives the data signal from the TX side, the "Fiber RX" LED will light up.

If both the "Fiber TX" and "Fiber RX" LEDs light up at the same time, it means the fiber transmission between the two converters is okay, and the fiber cable is connected properly. If the test fails, you should check the fiber cable and fiber connectors to determine the cause of the transmission error.

Fiber optic communication is working properly when both the TX and RX LEDs will light up.



Redundant Power

To help ensure that your system works non-stop, the ICF-1170I CAN-to-fiber converter comes with a built-in redundant power input that is activated automatically when the primary power input fails. In addition, an alarm contact will be activated when the redundant power input is activated.

Isolation Protection

A special feature of the ICF-1170I CAN-to-fiber converter is its 2 KV isolation protection to protect the converter in environments with high electromagnet activity.

ICF-1170I Series

Industrial CAN-to-fiber converters



- Transmits up to 2 km over optical fiber
- Converts CAN signals to fiber and fiber to CAN signals
- Baudrate up to 1 Mbps
- Dual power inputs for redundancy
- DIP switch for 120 ohm terminal resistance
- DIP switch for fiber test mode
- LEDs for Fiber TX, Fiber RX, Power 1, Power 2
- Wide temperature model available for -40 to 85°C environments
- Fully compatible with the ISO 11898 standard

15 KV ESD

Introduction

The ICF-1170I series CAN-to-fiber converters are used to convert CAN signals from copper to optical fiber. The converters come with 2 KV optical isolation for the CANbus system and dual power inputs with alarm contact relay to ensure that your CANbus system will remain online.

Fiber Test Mode

Fiber Test Mode can be used to test the fiber cable between two ICF-1170I units, and provides a simple way to determine if the fiber cable is transmitting data correctly. When in Fiber Test Mode, the fiber transceiver (TX) will continuously send out a data signal and the "Fiber TX" LED will light up. On the other side of the connection, when the ICF-1170I fiber transceiver (RX) receives the data signal form the TX side, the "Fiber RX" LED will light up.

Specifications

CAN Communication

CAN Interface: ISO 11898-2, Terminals (CAN_H, CAN_L,CAN_GND)
Protocols: CAN 2.0A and 2.0B (ISO 11898-2)
Connector Type: 3-pin removable screw terminal x1
Termination Resistor: Dip switch selector for 120 Ω terminal resistor
Transfer Rate: Up to 1 Mbps
System Delay: 150 ns
Isolation Protection: 2 KV
ESD Protection: Supports 15 KV
Transmission Distance: Max 2 km (depends on the data rate and the protocol used)
Note: The transmission distance is limited by the signal rate, as indicated in the ISO 11898-2 standard.
LED Indicators: PWR1, PWR2, Fiber TX, Fiber RX

Fiber Communication

Connector Type: ST (multi-mode) fiber ports
Support Cable: 50/125, 62.5/125, or 100/140 µm (multi-mode)
Wavelength: 850 nm
TX Output: Multi-mode (> -5 dBm)
Rx Sensitivity: Multi-mode (-20 dBm)

Physical Characteristics

Housing: Aluminum (1 mm)
Dimensions: 30.3 x 70 x 115 mm (1.19 x 2.76 x 4.53 in)
Weight:
Product only: 175 g (0.39 lb)
Packaged: 320 g (0.71 lb)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC dual power inputs for redundant power
Power Consumption:
ICF-1170I: 221 mA @ 12 V
Alarm Contact: 1 relay output with current carrying of 1 A @ 24 VDC
Voltage Reversal Protection: Protects against V+/V- reversal
Over Current Protection: 1.1 A (protects against two signals shorted together)

Standards and Certifications

Safety: UL 508, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 61000-4-2 (ESD) Level 4,
EN 61000-4-3 (RS) Level 2,
EN 61000-4-4 (EFT) Level 4,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8 (PFMF) Level 3
Freefall: IEC 60068-2-32
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

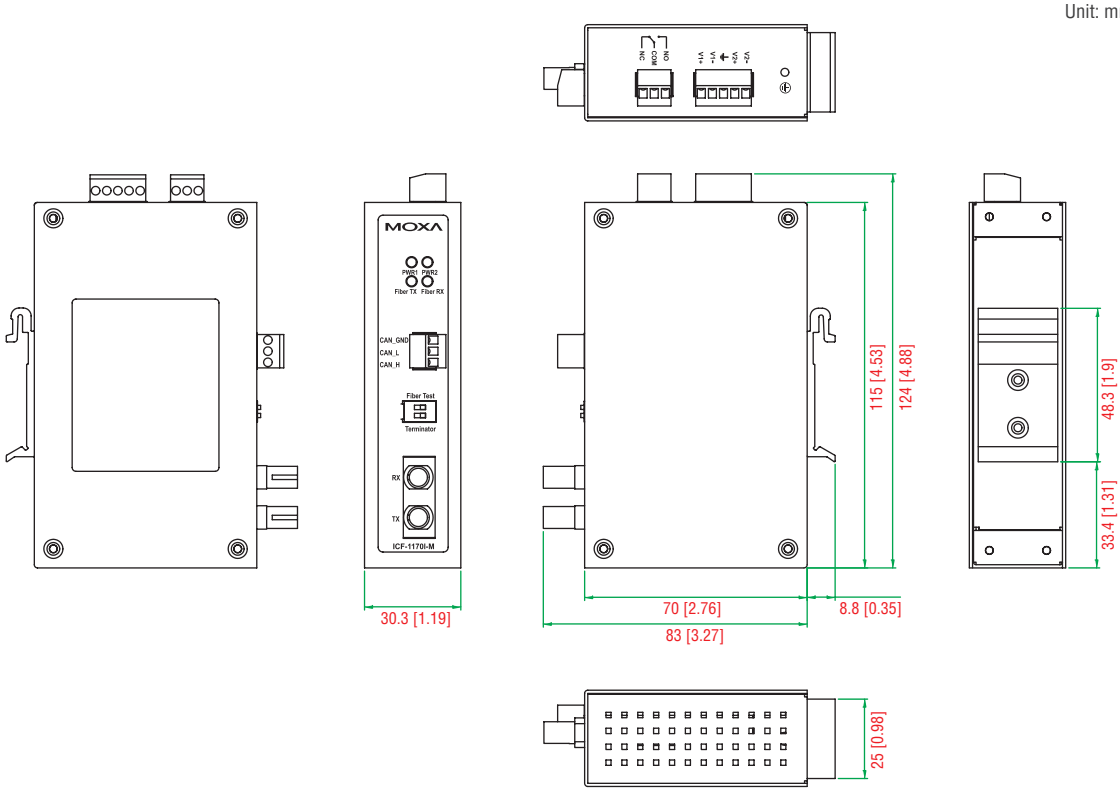
Time: 792,085 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

ICF-1170I-M-ST: CAN-to-fiber converter, multi-mode, ST connector, 0 to 60°C
ICF-1170I-M-ST-T: CAN-to-fiber converter, multi-mode, ST connector, -40 to 85°C

Package Checklist

- 1 ICF-1170I CAN-to-fiber converter
- Quick installation guide (printed)
- Warranty card



RTU Controllers

Product Selection Guide

Modular and Cellular RTU Controllers 13-2
Ethernet RTU Controllers 13-3

Introduction

Introduction to RTU Controllers 13-4

Modular RTU Controller

ioPAC 8000 Series: Rugged modular RTU controller 13-13
I/O Modules for ioPAC Products 13-18

Cellular Micro RTU Controller

ioLogik W5300 Series: Cellular micro RTU controllers 13-20

Ethernet Micro RTU Controller

ioLogik E2200 Series: Ethernet micro RTU controllers 13-23
LDP1602 LCD Module: Snap-on module for the ioLogik E2200 and R2100 series 13-27



Modular and Cellular RTU Controllers







	ioPAC 8020-5	ioPAC 8020-9	ioLogik W5312	ioLogik W5340	ioLogik W5340-HSDPA
Inputs/Outputs					
Digital Inputs	–	–	Up to 8	–	–
Digital Outputs	–	–	Up to 8	–	–
Relay Outputs	–	–	–	2	2
DI/DO Configurable	–	–	4	8	8
Analog Inputs	–	–	–	4	4
Cellular					
GPRS	–	–	✓	✓	✓
UMTS/HSDPA	–	–	–	–	✓
Ethernet					
Ports (Connector)	2 (M12 or RJ45)		1 (RJ45)		
Speed	10/100 Mbps		10/100 Mbps		
Switch (Daisy Chain)	✓	✓	–	-	-
Protocols	–		Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP, SNTP, SMTP		
Serial					
Ports (Connector)	1 (DB9-M)		1 (DB9-M or TB)		
Interface	RS-232/422/485		RS-232/422/485		
Protocols	Modbus/RTU Gateway, Transparent Serial Tunnel		Modbus/RTU Gateway, Transparent Serial Tunnel		
Physical Characteristics					
I/O Module Slots	5	9	–	–	–
Environmental Limits					
Standard Operating Temp.	-40 to 75°C		-10 to 55°C		
Wide Operating Temp.	-40 to 75°C		-30 to 70°C		-20 to 70°C
Storage Temp.	-40 to 85°C		-40 to 85°C		
Ambient Relative Humidity	5 to 95% RH (non-condensing)		5 to 95% RH (non-condensing)		
Software					
Programmability	Click&Go, C/C++, IEC-61131-3		Click&Go		
Active OPC	C and ISaGRAF models only		✓	✓	✓
DA-Center	C and ISaGRAF models only		✓	✓	✓
MXIO	✓	✓	✓	✓	✓
Configuration Utility	✓	✓	✓	✓	✓
Standards and Certifications					
Safety	UL 508 (Pending)				
EMI	FCC Part 15 Subpart B Class A, EN 55022 Class A				
EMS	IEC 61000-4, IEC 61000-6				
Shock	IEC 60068-2-27				
Freefall	IEC 60068-2-32				
Vibration	IEC 60068-2-6				
Rail Traffic	EN 50155/50121-3-2/50121-4		–	–	–
Reliability					
Warranty	5 years	5 years	5 years	2 years*	2 years*

*Because of the limited lifetime of power relays, products that use this component are still covered by a 2-year warranty.

Modules for Modular RTU Controllers



	Digital Input		Digital Output	Analog Input		Power Input	
	RM-1050-T	RM-1602-T	RM-2600-T	RM-3802-T	RM-3810-T	RM-7200	RM-7250
Module Properties							
Channels	10	16	16	8	8	–	–
Input	110 VDC	24 VDC	24 VDC	4-20 mA	0-10 VDC	24 VDC	110/220 VAC/VDC
Type	sink	sink/source	sink	–	–	–	–
Environmental Limits							
Operating Temperature	-40 to 75°C						
Storage Temperature	-40 to 85°C						
Ambient Relative Humidity	5 to 95% RH (non-condensing)						
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						

Ethernet RTU Controllers



	ioLogik E2210	ioLogik E2212	ioLogik E2214	ioLogik E2240	ioLogik E2242	ioLogik E2260	ioLogik E2262
Inputs/Outputs							
Digital Inputs	12	8	6	–	–	–	–
Digital Outputs	8	8	–	–	–	4	4
Relay Outputs	–	–	6	–	–	–	–
DI/DO Configurable	–	4	–	–	12	–	–
Analog Inputs	–	–	–	8	8	–	–
Analog Outputs	–	–	–	2	–	–	–
RTD Inputs	–	–	–	–	–	6	–
Thermocouple Inputs	–	–	–	–	–	–	8
Ethernet							
Ports (connector type)	1 (RJ45)						
Speed	10/100 Mbps						
Protocols	Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP, HTTP, CGI, SNTP, SMTP						
Serial							
Ports (connector type)	1 (TB)						
Interface	RS-485						
Protocols	Modbus/RTU Gateway						
Environmental Limits							
Standard Operating Temp.	-10 to 60°C						
Storage Temperature	-40 to 85°C						
Ambient Relative Humidity	5 to 95% RH (non-condensing)						
Software							
Programmability	Click&Go	Click&Go	Click&Go	Click&Go	Click&Go	Click&Go	Click&Go
Active OPC	✓	✓	✓	✓	✓	✓	✓
DA-Center	✓	✓	✓	✓	✓	✓	✓
MXIO	✓	✓	✓	✓	✓	✓	✓
ioAdmin	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications							
Safety	UL 508	UL 508	UL 508	UL 508	UL 508 (Pending)	UL 508	UL 508
EMI	FCC Part 15 Subpart B Class A, EN 55022 Class A						
EMS	IEC 61000-4, IEC 61000-6						
Shock	IEC 60068-2-27						
Freefall	IEC 60068-2-32						
Vibration	IEC 60068-2-6						
Reliability							
Warranty	5 years	5 years	2 years*	5 years	5 years	5 years	5 years

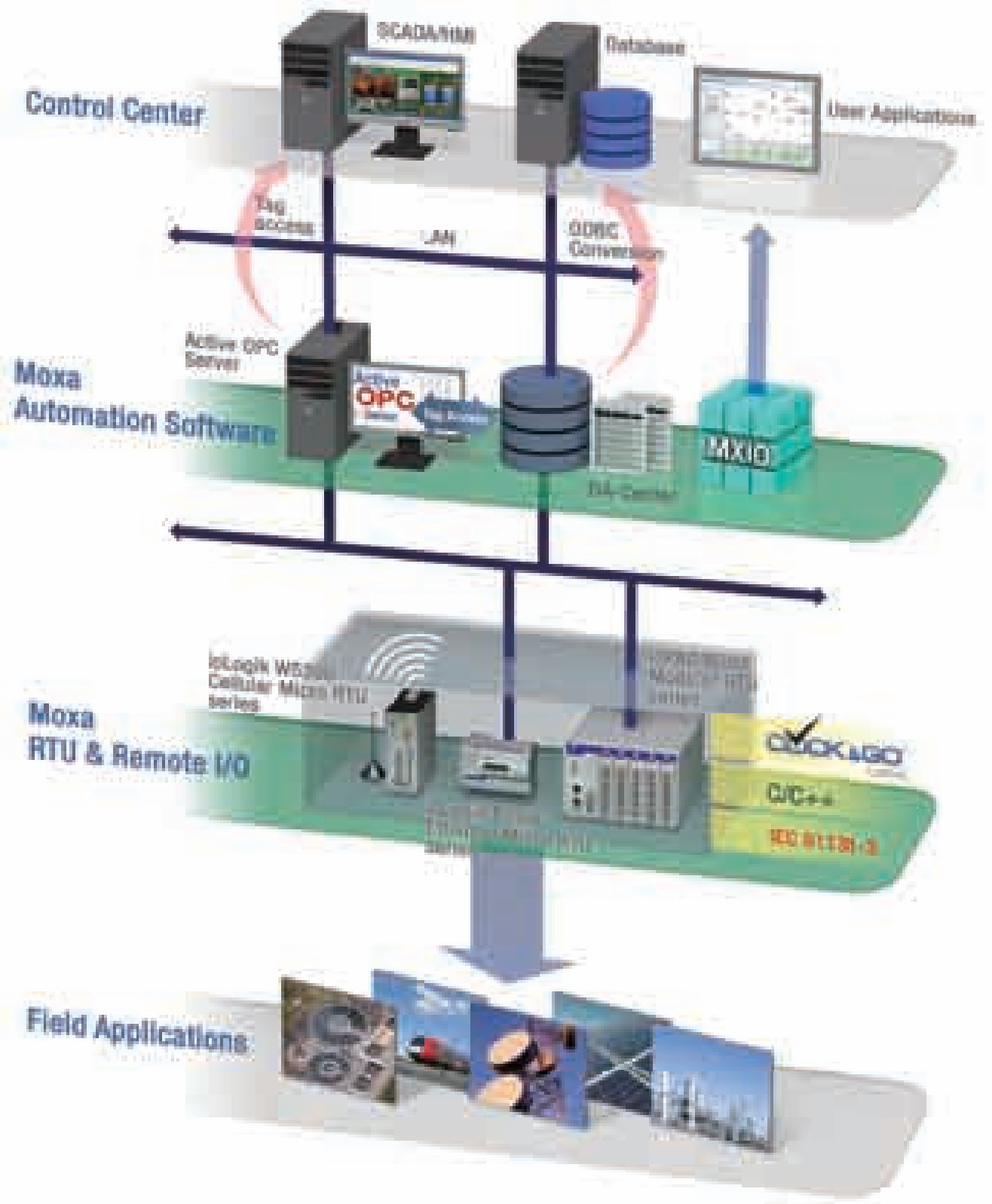
*Because of the limited lifetime of power relays, products that use this component are still covered by a 2-year warranty.

RTU Model Naming Rule

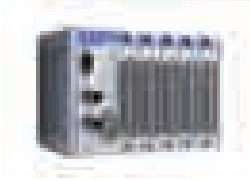
RTU Family	A	B	C	D	E
ioPAC 8020-A-B-C-E	5 (5 slots) 9 (9 slots)	RJ45 (RJ45 Ethernet connectors) M12 (M12 Ethernet connectors)	None (Click&Go version) C (C/C++ programmable) ISaGRAF (IEC-61131 programmable)		T (Wide Temp.)
ioLogik W53AB-C-D-E ioLogik E22AB-E	1 (Digital I/O) 4 (Analog I/O) 6 (Temperature Input)	Serial Number	None (GPRS) HSDPA (3G)	None (Click&Go version) C (C/C++ programmable) ISaGRAF (IEC-61131 programmable)	None (Standard) T (Wide Temp.)

RTU Module Family	A	B	CD	E
RM-ABCD-E	1 (Digital Input) 2 (Digital Output) 3 (Analog Input) 4 (Analog Output) 6 (Temperature Input) 7 (Power Input)	0 (10 Channels) 2 (2 channels) 4 (4 Channels) 6 (16 Channels) 8 (8 Channels)	Serial Number	T (Wide Temp.)

Introduction to RTU Controllers



Moxa RTU Controller Solutions



- ioPAC 8000 modular RTUs incorporate powerful computing capability, modular flexibility, unbeatable reliability, and programmable control logics to meet the demands of large scale applications in harsh environments.



- ioLogik E2200 micro RTUs double as intelligent micro I/O controllers by offering an easy-to-use local control logic and Ethernet interface.



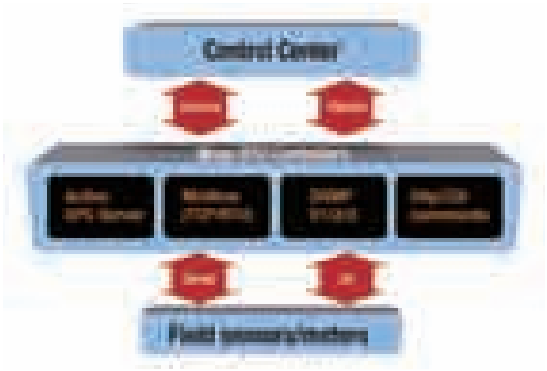
- ioLogik W5300 cellular RTUs are GPRS/3G HSDPA mobile modem, I/O controller, and data logger, all rolled into one, and are perfect for distributed wireless telemetry networks.

Interoperable and Versatile Remote Communications

Moxa RTU controllers provide a direct interface between field devices and the control center for data collection, remote site monitoring, and alarm distribution.

Moxa's RTU products are specifically designed for remote data transmission between complex virtual networks that are widely dispersed. Moxa enhances automation communications with versatile protocols that support Modbus/TCP for easy SCADA/HMI communication, HTTP for Internet access, SNMP I/O communication for IT-friendly network management, 3G wireless interface for mobile communications, and patented Active OPC Server™ for faster data access for SCADA/HMI systems.

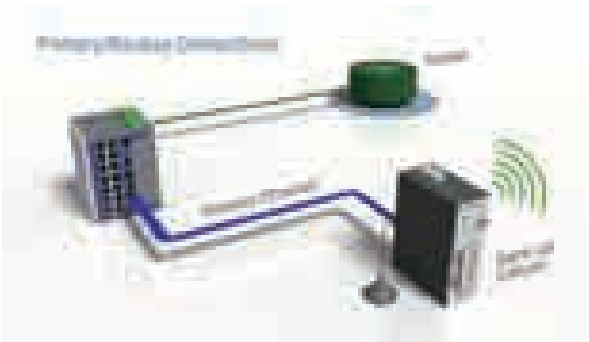
Moxa offers the innovative MXIO library, which supports both passive Modbus/TCP mode and Moxa's patented active communication for non-OPC users using ioPAC and ioLogik RTU products. This type of event-based active communication can reduce the response time and bandwidth usage by a significant amount.



Through intuitive Click&Go™ control logic and a software utility, Moxa RTUs can remotely manage and configure devices, reboot devices, and upgrade firmware to save users a great deal of time and reduce overhead costs.

Redundant Networking for Maximum Reliability

Moxa RTUs offer network redundancy to ensure maximum uptime and availability. The ioLogik W5300 cellular RTU offers redundant network connectivity through the detachable 3G antenna and RJ45 port. Moxa's industrial switches, Turbo Ring / Turbo Chain technology, and RTU products can be combined to create remote industrial automation solutions that provide high network availability and cost-effective redundancy.



Industry-proven Ruggedness

Remote automation applications are expected to perform just as well as their counterparts, even if they are deployed in harsh environments. Moxa's RTU solutions combine both hardware and software innovations to take industrial-grade to new heights by overcoming environmental challenges such as extreme temperatures, limited bandwidth, severe vibrations, and unstable power/network connections. Users can count on Moxa's remote automation solutions to provide stable and reliable operations; these solutions encompass industrial features such as, wide operating temperatures, vibration resistance, M12 Ethernet interface, IP30-rated metal housing, backup power solution, and "active" communications. The ioPAC 8000 series products are perfectly suited for rolling stock and tough industrial applications thanks to EN 50155 and EN 50121 compliance.



Modular RTUs for Mission-Critical Industrial Automation Applications



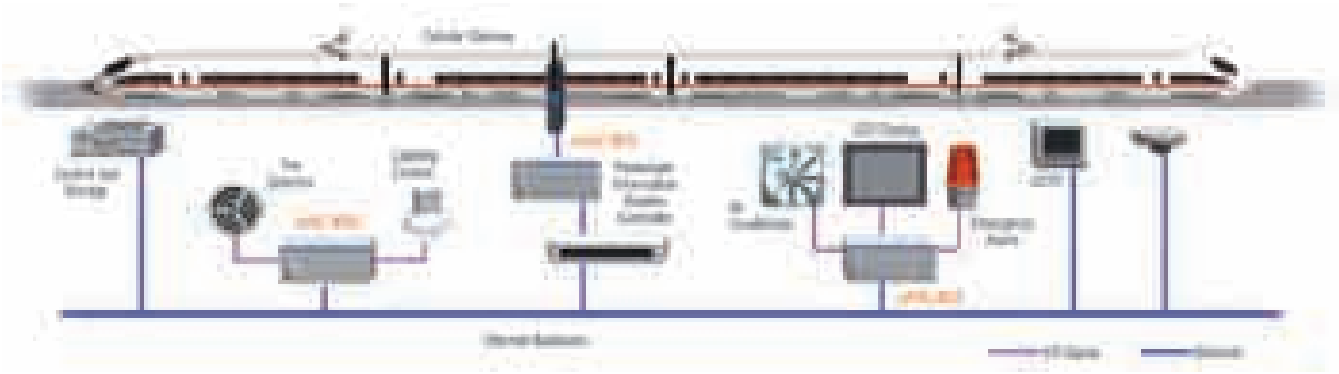
The ioPAC 8000 series products are rugged RTU controllers that are designed to perform in harsh environments. Consisting of a powerful CPU module and a variety of I/O module options, the ioPAC RTU presents an open, modular, programmable field-mount controller that supports data collection, processing, logging, and protocol conversion, to provide versatile communications for industrial automation applications.

Compliant with the EN 50155 standard, the ioPAC RTU can maintain stable operations under violent vibrations and extreme temperature conditions to protect your applications, regardless of whether they are deployed on a rolling vehicle, in a mine, in a wind turbine farm, or in outdoor cabinets.

Modular I/O for Versatility, Flexibility, and Scalability

ioPAC 8000 series RTU controllers come with either 5 or 9 I/O slots. The ioPAC offers a selection of I/O modules for future development and flexible configuration; both models are equipped with a fanless ARM9 CPU module, dual power inputs, dual M12/RJ45 Ethernet connectors, 1 serial port, and 1 SD card slot. The ioPAC controller can connect through the RS-232/422/485 serial interface to field devices such as PLCs, smart meters, controllers, and other serial devices. The SD card slot allows local storage of data logs and historical data analysis. In addition, the ioPAC also supports hot-swappable I/O slots for sensor signals, allowing you to choose from a variety of I/O modules for accessing sensor signals, and to keep services up and running.

Tailor-made for EN 50155 Rolling Stock Applications

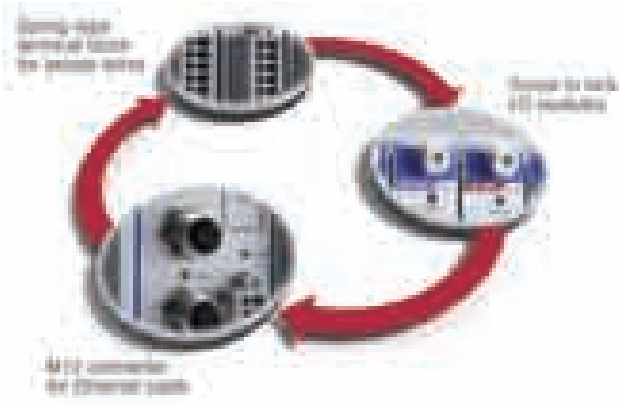


Full EN 50155 Compliance

The ioPAC RTU is fully compliant with EN 50155 and EN 50121 standards, both of which are essential for electronic equipment used in rolling stock applications. The ioPAC RTU adheres to strict EN conformities, which encompass not only EMC requirements but also shock, vibration, extended temperature range, humidity, and power supply variations.

Anti-vibration Design

The DIN-Rail mount of the ioPAC RTU is specifically designed to withstand severe vibrations; features include an IP30-rated aluminum chassis for vandal protection, spring-type terminal blocks for gas-tight and vibration resistant wire contacts, and optional M12 connectors to ensure a stable Ethernet connection. In the event of a power failure, the ioPAC controller will automatically activate its redundant power input to prevent interruptions to your applications.



Proficient Alarms and Communications

Embedded with the simple yet powerful Click&Go™, the ioPAC RTU is able to execute local control logic and alarm alerts in response to user-configured settings. The menu-configured front-end intelligence allows the ioPAC RTU to identify unusual events and actively send triggered exception messages with real-time stamp though UDP, TCP, email, and SNMP trap. The independent operation of I/O control and handling is particularly critical for fast-moving railroad vehicles, unmanned track-side signaling, and control cabinet applications when there is a need to send out an alarm or when the network connection is interrupted.



Programmable for the Ultimate in Versatility

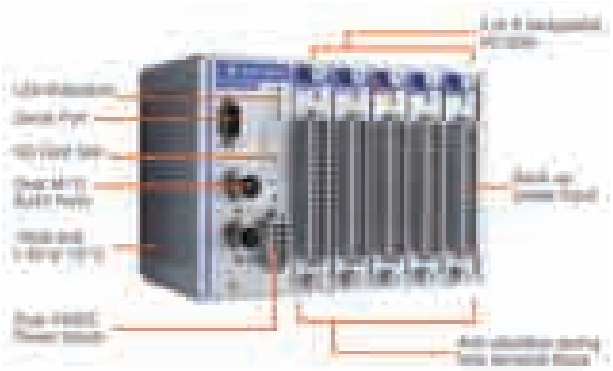
The ioPAC RTU is a programmable controller that supports a variety of logic programming languages, such as Click&Go™, C/C++, and 61131-3 programming to construct customized control systems. With the additional benefits of vibration resistance and built-in configurable logic, this modular RTU integrates easily with major subsystems such as passenger information systems, and trackside signaling and maintenance systems.



Industrial Reliability to Keep Services Up and Running

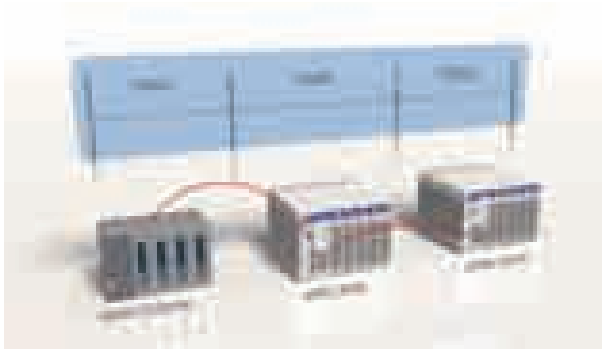
The ioPAC is designed to provide continuous connectivity for mission-critical applications. The following features ensure the ioPAC's reliability:

- A wide -40 to 75°C operating temperature range to ensure the ioPAC operates reliably under extreme temperature fluctuations.
- Dual-power inputs to ensure non-stop service during power failures.
- An SD card for backup and local data storage so that removal of the CPU module is not necessary, and system downtime for downloading data log files is drastically reduced (C and ISaGRAF models).
- Hot-swappable I/O modules allow you to replace I/O modules without interrupting network connectivity—services remain up and running.
- A metal chassis, which provides better protection than plastic, to help reduce the effect of electronic noise.



Proficient Network Connectivity

The ioPAC provides two Ethernet switch ports to enable daisy-chaining of multiple devices with minimal hassle and cascade wiring. Together with the power-off bypass mechanism, the ioPAC RTU is able to maintain continuous data transmissions even when a linked device fails.

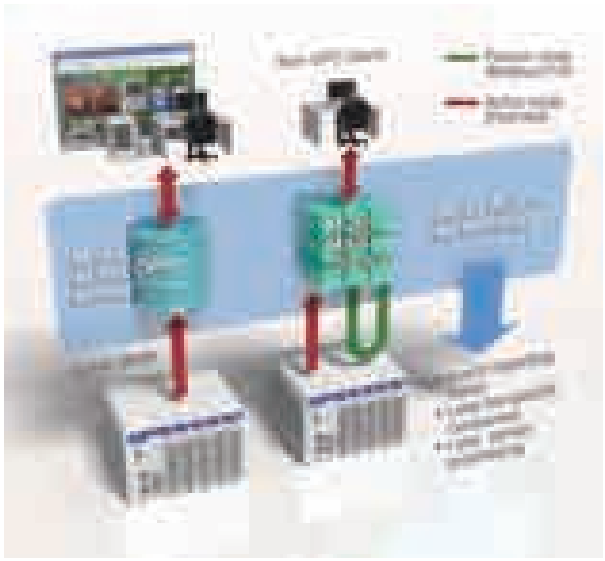


Active Technology for Better Productivity (C and ISaGRAF Models)

The combination of Moxa's patented active communication technology and easy-to-use automation software faciliates RTU application deployment and maximizes data transfer efficiency.

Moxa's Active OPC Server and DA-Center software, which are available free of charge, provide extremely efficient data transfer from front-end devices to the central SCADA system or IT database. Active OPC Server delivers event-driven push-type communication that allows the ioPAC RTU to send I/O status reports using TCP or UDP messages. Compared with the traditional passive poll-type communication, this push-type communication allows Moxa's ioPAC and ioLogik RTU to deliver an I/O response that's 7 times faster. Moxa's DA-Center forms a ready-to-run data gateway between RTU controllers and databases. Through the use of proficient database transformation and analysis, Moxa's DA-center allows RTU solutions to increase system trend predictability and facilitate faster process improvement to enhance productivity.

Moxa's RTU lines also support the push-type MXIO library, which benefits non-OPC users. The event-based MXIO library helps deploy active Modbus/TCP communication between non-OPC application platforms and Moxa's RTU controllers, which reduces data response time and bandwidth usage by a significant amount.



3G Cellular RTU for Reliable and Cost Effective Remote Automation



Moxa's ioLogik W5300 series introduces a next generation cellular RTU that combines the I/O controller, cellular modem, and data logger into a compact box design that reduces deployment time and cost, and simplifies operation and maintenance. The ioLogik W5300 series comes with a cellular interface that supports tri-band HSDPA/UMTS and quad-band GSM/GPRS/EDGE frequencies, offering a full spectrum of 3G mobile communication services. The cellular RTU is a rugged, wide-temperature remote terminal unit well suited for hard-to-wire remote monitoring and alarm applications, such as unmanned site monitoring, riverside monitoring, and pipeline monitoring.

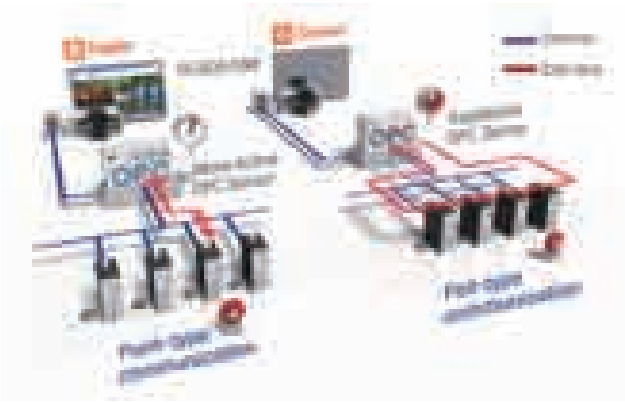
Smart Mobile Communication through Dynamic IP Connectivity

An ioLogik W5300 can be easily deployed and managed in a dynamic IP environment with full support for Moxa's Active OPC Server, which performs as a cellular device gateway for mobile IP management. The remote ioLogik W5300 units will automatically establish communications with an Active OPC Server using a fixed IP. The Active OPC Server will receive and register the ioLogik W5300's IP address, and receive and record tag updates accordingly.



Seamless SCADA Connectivity

For uplink communication, Active OPC Server helps the ioLogik W5300 RTU build seamless connectivity with SCADA master systems. Compared with other 3rd party OPC servers, Active OPC Server offers event-driven push communications between Moxa's RTU products and HMI/SCADA systems, with instant I/O status at a speed that is 7 times faster and saves 80% on bandwidth.



Optimized Data Transmission Rate Saves on Communication Costs

The ioLogik W5300 series offers an extremely cost-effective solution for mobile remote monitoring applications in which cellular communications charges are determined by data packet size. With the ioLogik W5300 series, users can easily switch between Always-On and Wake-On-Demand mobile modes to achieve an optimum transmission rate for different application scenarios. Moxa's "push-based" Active OPC Server conserves data transmission volume when communicating with SCADA systems, and the front-end data logging and report-by-exception functions minimize unnecessary data transmission.

Intuitive Menu-driven Front-end Intelligence

It is easy unlock the full functionality of the ioLogik W5300 with a few mouse clicks thanks to patented Click&Go™ control logic, which makes local I/O control and alarm configuration extremely simple. With the built-in "IF-THEN-ELSE" Click&Go logic, the ioLogik W5300 RTU has front-end intelligence for event response and alarm messaging. When a pre-defined event is triggered, various alarms can be actively sent out by SMS, e-mail, TCP/UDP packets, or SNMP Trap with real-time stamps.



Intelligent Alarms with Mobile SMS Escalation and SMS Commands

By leveraging mobile SMS, the ioLogik W5300 RTU introduces alarm escalation technology to assure that alarm notifications and responses are simple and fast. The escalation process can be configured in the Click&Go interface. Moreover, an SMS command set allows users to monitor and control the I/O remotely via cellphones. Using the cellular ioLogic W5300 RTU's bidirectional SMS communications, recipients may acknowledge alarms by sending a simple SMS from their mobile phones to the ioLogik W5300 cellular RTU. The acknowledgment may terminate the alarm notification escalation process to ensure proper event management.



Network Redundancy

The ioLogik W5300 RTU offers network redundancy to keep services running over an IP network. The cellular RTU can go wireless with its 3G antenna, and also get an easily wired connection through the RJ45 port. Alternatively, the ioLogik W5300 can tightly collaborate with Moxa Ethernet switches to delivery Turbo-ring enabled network redundancy that assures fast fault recovery, flexible ring topology, and uninterrupted network communications.

WAN-to-LAN Extension with Port Forwarding

Using the 3G antenna and the RJ45 connector, the cellular W5300 RTU supports port forwarding technology that enables WAN-to-LAN communication with port redirection settings. Through port forwarding, the ioLogik W5300 allows external WAN hosts such as SCADA/HMI systems to connect to specific field devices within the LAN by linking with the ioLogik W5300.



Local Network Expansion to More Wired Devices

The ioLogik W5300 RTU can externally expand the local network to more wired clients through daisy-chained ioLogik E1200 I/O modules. The ioLogik E1200 supports daisy chained simple wiring and peer-to-peer cost free I/O extension. Through the RJ45 Ethernet port, the ioLogik W5300 RTU can support up to three connected ioLogik E1200 series I/O modules with 9 different model options to enforce a flexible and scalable network expansion that best fits customers' needs.



Extensive Data logging

In addition to remote data collection, the ioLogic W5300 RTU supports stand-alone data logging with one expandable SD card slot that can provide up to 2 GB of storage space. The wireless RTU harbors a built-in FTP client and e-mail attachments to support remote data log retrieval. Through the ioAdmin utility, the RTU unit supports log rate adjustment that allows more specific and precise configuration of logging intervals, providing flexibility and making it easy to adjust the log rate for any output set.



Friendly Serial Communications

The ioLogik W5300 RTU is equipped with one 3-in-1 serial port that supports RS-232/422/485, making it more convenient to connect field serial devices. The ioLogik W5300 comes with a transparent serial tunnel that brings legacy serial devices to 3G wireless networks, and works with customers' existing applications.

In addition, the ioLogik W5300 supports Modbus RTU communications for establishing direct connectivity between field devices and central control systems. With ioAdmin, the ioLogik W5300 can create user-defined Modbus serial tags to drive and translate serial data from remote serial meters and flow sensors into OPC tags for use with a master SCADA system.



Intelligent Micro RTU for Remote Monitoring and Alarm Applications



Moxa's ioLogik E2200 series micro RTU offers proactive, event-driven reporting and logic control over remote I/O devices for PC-based data acquisition and control applications.

PC-free Alarm and Control Intelligence

The ioLogik E2200 Micro RTU supports simple and powerful Click&Go™ technology to deliver event-driven reports and allow alarm messages to be sent by email, TCP/UDP, and SMNP Trap with real-time stamps. With built-in Click&Go™ intelligence, the ioLogik E2200 micro RTU can be used for simple output control when it is triggered by input status, without the need for a PC controller. The ioLogik E2200 micro RTU reports I/O status automatically based on user-specified conditions. This report by-exception approach requires far less bandwidth than the traditional polling approach.



Use SNMP Protocol to Manage All Devices over Ethernet

In addition to Modbus/TCP, ioLogik E2200 RTUs support the widely used SNMP and CGI (Common Gateway Interface) protocols, giving IT engineers easy access to unfamiliar control and monitoring systems with their familiar SNMP protocols and knowledge. The ioLogik E2200 micro RTU can send out SNMP trap alarms and also accept SNMP as a means of reading or writing to I/Os. To protect network communications, the ioLogik E2200 micro RTU also supports SNMP v3 for message authentication and encryption. With Moxa's SNMP-capable ioLogik RTU controllers, even IT customers can easily integrate any connected sensors and devices into an Ethernet backbone, and achieve proficient network management for many other applications, such as environmental monitoring, telecom, power, and transportation.



Push Technology for Events and Alarms

The ioLogik E2200 micro RTU supports the free, push-based Active OPC Server utility to build seamless connections with any SCADA system. Using active communications, Moxa Active OPC Server is extremely efficient at "pushing" event-triggered data from the ioLogik RTU to the SCADA system or IT database. In a test of network performance, Active OPC Server and Moxa's ioLogik RTUs demonstrated proven performance in delivering an I/O response that's 7 times faster and 80% of the normal bandwidth usage, compared with a traditional OPC server polling architecture.



ioPAC 8000 Series

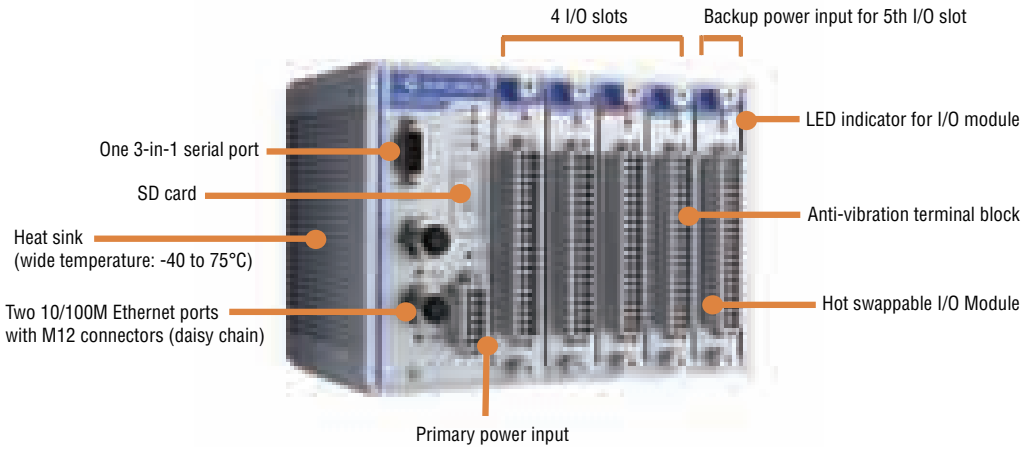
Rugged modular RTU controllers



- Robustness and compact design for harsh environment
- -40 to 75°C operating temperature range
- Redundant power inputs with additional AC/DC modules
- Anti-vibration: EN 50155 and EN 50121-3/4 compliant for rail applications
- Modular, hot-swap design for versatile I/O module connectivity
- 2 Ethernet M12 or RJ45 switch ports with by-pass function
- Front-end intelligence with versatile programming options:
  - Intuitive, menu-driven Click&Go Logic model–ioPAC 8020
  - C programming model–ioPAC 8020-C (coming soon)
  - IEC 61131-3 model–ioPAC 8020-ISaGRAF (coming soon)
- 3-in-1 serial port and SD data logging function for C and isaGraf models (coming soon)

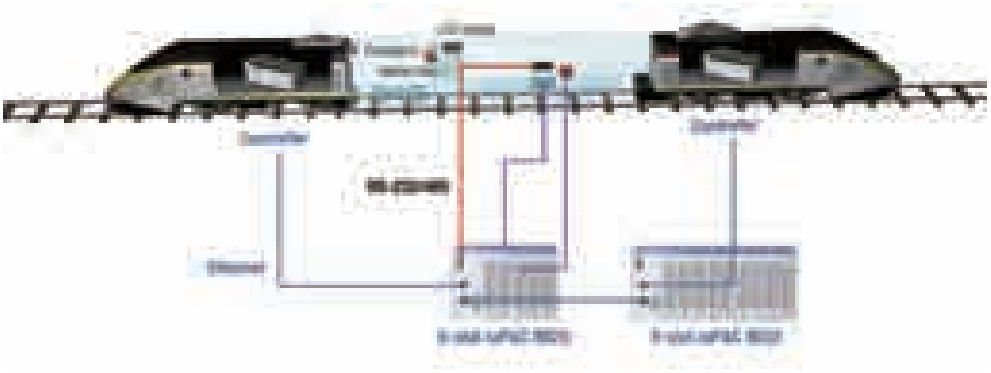
Introduction

The ioPAC 8000 modular RTU controllers are designed for remote data acquisition and monitoring, and are suitable for applications in harsh environments that require a rugged and reliable design. With a powerful processor and a variety of interfaces, the ioPAC 8000 can connect to devices such as PLCs, smart meters, and other serial devices. In addition, the ioPAC 8000 also supports hot-swappable I/O and power module slots for redundant power inputs and sensor signals, allowing users to choose from a variety of I/O modules accessing sensor signals. The aluminum housing for this product is optimized for robustness and compactness, and provides better protection for rolling stock, wayside, roadside, environmental monitoring, wind turbine, and other outdoor applications. In addition, the ultra-wide temperature design is suitable for both tropical and high altitude environments. With two M12 Ethernet connectors for stress relief, and a spring lock terminal block, the ioPAC 8000 is ideal for high anti-vibration requirements.



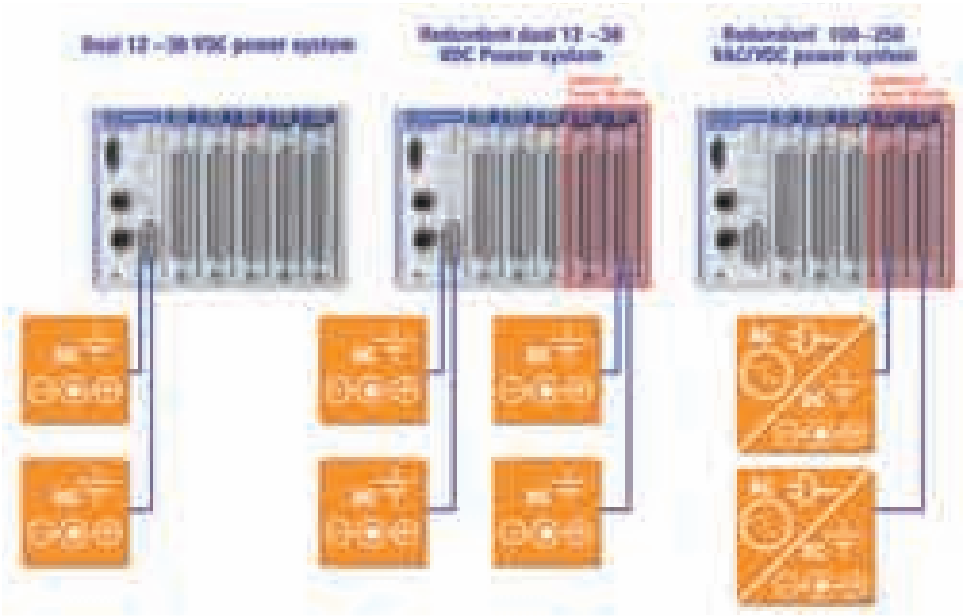
Rugged, Reliable Modular Design

The ioPAC 8000 provides good environmental protection. The metal housing with M12/RJ45 connectors for stress relief and spring-type connectors protect the sensor and network wiring from being damaged by vibrations. The fanless design and wide -40 to 75°C operating temperature range ensure that the ioPAC can be used in wayside cabinets that do not have air conditioning. The modular design not only provides greater flexibility in choosing I/O combinations, but also supports hot-swap capability for replacing defective modules.





In addition, the ioPAC 8000's main CPU adaptor has dual power inputs. By installing additional power modules you can create a 24 VDC or 100/220 VAC/VDC redundant power system to prevent downtime from power failures.



Front-end Intelligence with Versatile Programming Options

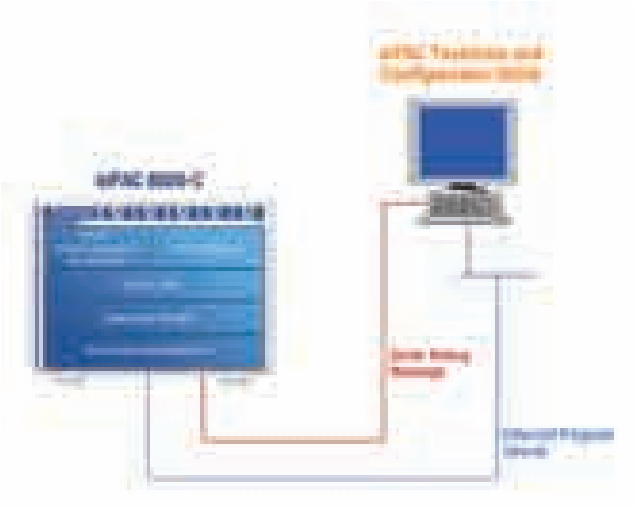
ioPAC 8020: Patented menu-driven Click&Go Logic

The ioPAC 8020 benefits from Moxa's patented Click&Go control logic, which bridges the gap between information technology and industrial automation. With this intuitive IF-THEN-ELSE style control logic, configuration is the only thing users need to learn. With the ability to select multiple conditions and actions embedded in the product, users only need a few clicks and a couple of minutes to program simple I/O control tasks, send out messages, or create alarms.



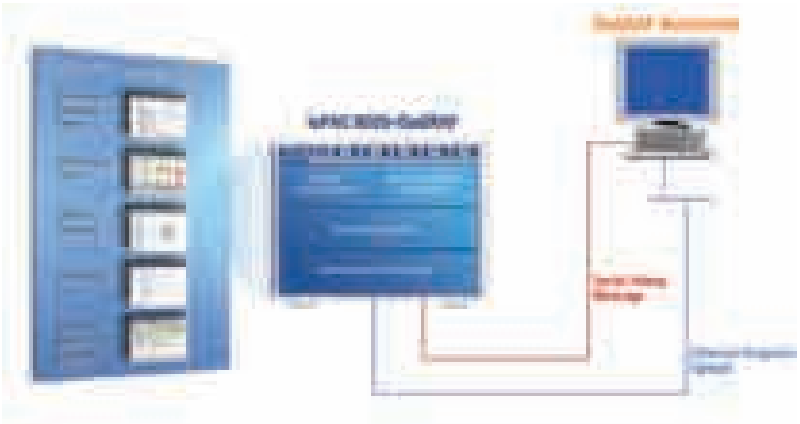
ioPAC 8020-C: High Efficient I/O Access with C Programmability

The ioPAC 8020-C delivers the flexibility needed for users to create imaginative user-defined programs that can be uploaded to the ioPAC. The embedded platform with toolchain developing tools not only supports the most standard C programming, but also makes I/O access and control easier and more precise compared to other embedded systems. In addition to the toolchain APIs for system status (e.g., Real Time Clock, RTC) networking, serial port access, SD storage/file systems, and I/O control, you can also make use of daemons for fast installation and configuration. For example, users can configure multiple routes to form a redundant or backup path using the configuration utility instead of batches or configuration text files.



ioPAC 8020-ISaGRAF: Automation-centric IEC-61131-3 Compliant Programming

The ioPAC 8020-ISaGRAF model allows engineers to use familiar programming environments designed to mimic traditional controllers, such as PLCs. The ioPAC 8020-ISaGRAF model has all the popular programming languages built in—Ladder Diagrams, Sequential Function Charts, Structured Text, Instruction Lists, and Function Block Diagrams. Moreover, special function blocks can be coordinated with users' e-mail, SMS service, and the patented Active OPC Server Tags for I/O and serial data. This is something that traditional controllers simply cannot do without investing in a herculean development effort.



Specifications

Computer
CPU: ARM9 based CPU, 32-bit/160 Mhz
SDRAM/Flash:
• ioPAC 8020: 8 MB / 4 MB
• ioPAC 8020-C: 64 MB / 32 MB
• ioPAC 8020-ISaGRAF: 64 MB / 32 MB
I/O Scan Time: 100 ms
Program Cycle Time: 100 ms

Ethernet Interface
LAN: 2 auto-sensing 10/100 Mbps switch ports (M12 or RJ45)
Ethernet Relay Function: Hardware Normal Close

Serial Interface
Serial COM1: RS-232/422/485 (DB9 male)
Serial Debug Port: RS-232 (4-pin connector for ioPAC 8020-C and 8020-ISaGRAF)

Serial COM1 Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Power Requirements
Input Voltage: 12 to 36 VDC
Power Consumption:
CPU Module: 4.40 W @ 24 VDC

Physical Characteristics
Housing: Aluminum
Mounting: DIN-Rail, wall, rack mounting (with optional kit)
Dimensions:
5-slot Version: 191 x 135 x 100 mm (7.52 x 5.31 x 3.94 in)
9-slot Version: 292 x 135 x 100 mm (11.52 x 5.31 x 3.94 in)
I/O Module Slots: 5 or 9 slots

Environmental Limits
Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

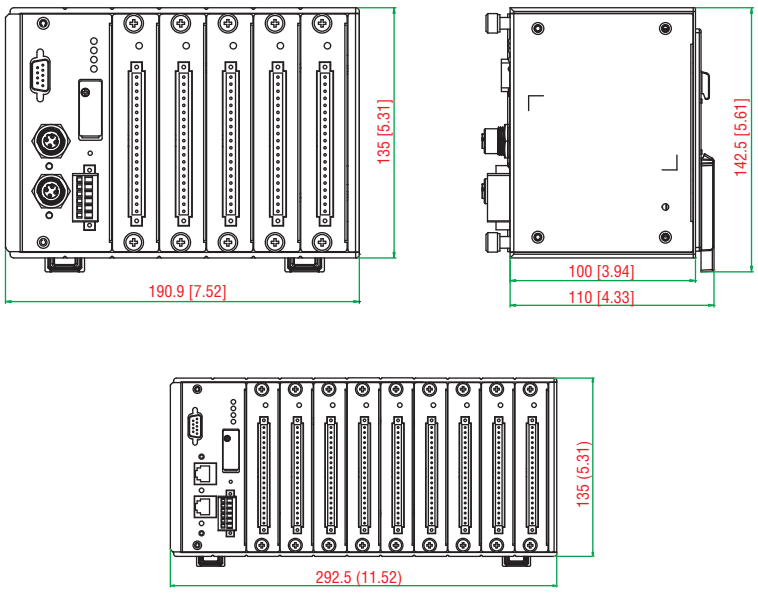
Standards and Certifications
Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 (ESD) Level 2/3,
IEC 61000-4-3 (RS) Level 2,
IEC 61000-4-4 (EFT) Level 2,
IEC 61000-4-5 (Surge) Level 3,
IEC 61000-4-6 (CS) Level 2,
IEC 61000-4-8 (PM) Level 1,
IEC 61000-4-11 (DIPS),
IEC 61000-6-2 (ESD) Level 2/3,
IEC 61000-6-4 (EFT) Level 2
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Rail Traffic: EN 50155, EN 50121-3-2, EN 50121-4
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

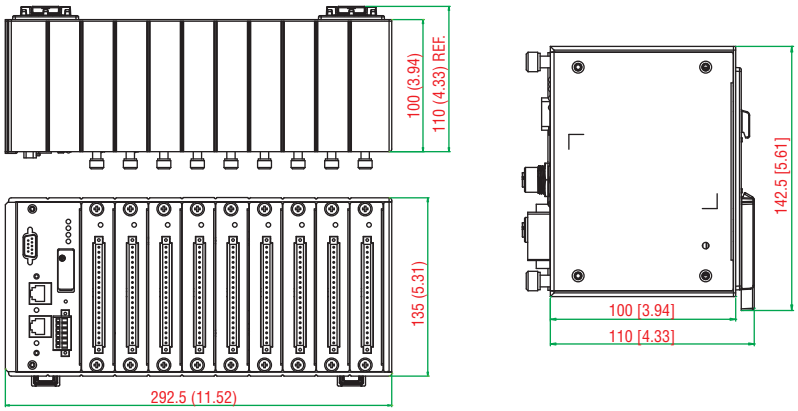
ioPAC 8020-5



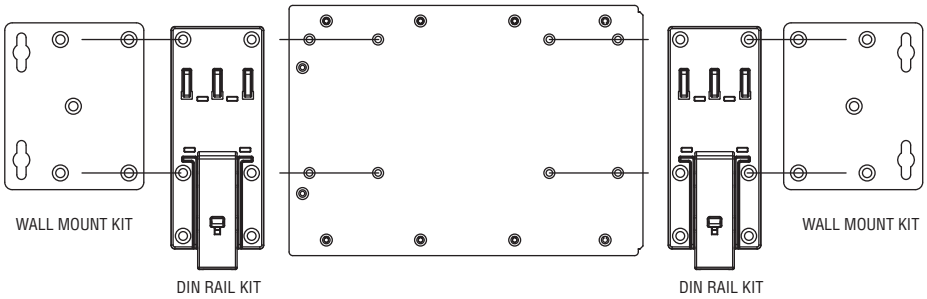
Dimensions

Unit: mm (inch)

ioPAC 8020-9



DIN-Rail mounting kit (optional)



Ordering Information

Available Models

ioPAC 8020-5-RJ45-T: Modular RTU controller with RJ45 connectors and 5 I/O slots, -40 to 75°C operating temperature
ioPAC 8020-5-M12-T: Modular RTU controller with M12 connectors and 5 I/O slots, -40 to 75°C operating temperature
ioPAC 8020-9-RJ45-T: Modular RTU controller with RJ45 connectors and 9 I/O slots, -40 to 75°C operating temperature
ioPAC 8020-9-M12-T: Modular RTU controller with M12 connectors and 9 I/O slots, -40 to 75°C operating temperature
ioPAC 8020-5-RJ45-C: Modular RTU controller with RJ45 connectors and 5 I/O slots, supports C programming, -40 to 75°C operating temperature
ioPAC 8020-5-M12-C: Modular RTU controller with M12 connectors and 5 I/O slots, supports C programming, -40 to 75°C operating temperature
ioPAC 8020-9-RJ45-C: Modular RTU controller with RJ45 connectors and 9 I/O slots, supports C programming, -40 to 75°C operating temperature
ioPAC 8020-9-M12-C: Modular RTU controller with M12 connectors and 9 I/O slots, supports C programming, -40 to 75°C operating temperature
ioPAC 8020-5-RJ45-ISaGRAF: Modular RTU controller with RJ45 connectors and 5 I/O slots, supports ISaGRAF programming, -40 to 75°C operating temperature
ioPAC 8020-5-M12-ISaGRAF: Modular RTU controller with M12 connectors and 5 I/O slots, supports ISaGRAF programming, -40 to 75°C operating temperature
ioPAC 8020-9-RJ45-ISaGRAF: Modular RTU controller with RJ45 connectors and 9 I/O slots, supports ISaGRAF programming, -40 to 75°C operating temperature
ioPAC 8020-9-M12-ISaGRAF: Modular RTU controller with M12 connectors and 9 I/O slots, supports ISaGRAF programming, -40 to 75°C operating temperature

Accessories (can be purchased separately)

RK-4U: Rack mounting kit for 19" rack

I/O Modules (can be purchased separately)

RM-1602-T: ioPAC I/O module with 16 digital inputs, 24 VDC sink/source type, -40 to 75°C operating temperature
RM-1050-T: ioPAC I/O module with 10 digital inputs, 110 VDC sink type, -40 to 75°C operating temperature
RM-2600-T: ioPAC I/O module with 16 digital outputs, 24 VDC sink type, -40 to 75°C operating temperature
RM-3802-T: ioPAC I/O module with 8 analog inputs, 4 to 20 mA, -40 to 75°C operating temperature
RM-3810-T: ioPAC I/O module with 8 analog inputs, 0 to 10 V, -40 to 75°C operating temperature
RM-7200: ioPAC power module, dual 24 VDC inputs (available Q2, 2011)
RM-7250: ioPAC power module, isolated 110/220 VAC input (available Q2, 2011)

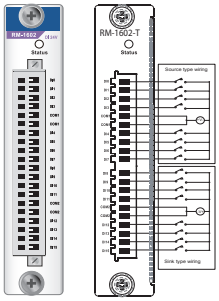
Package Checklist

- ioPAC 8000
- Documentation and software CD
- Quick installation guide (printed)



I/O Modules for ioPAC Products

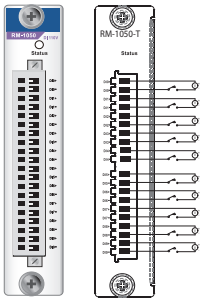
16-channel 24 VDC digital input module



RM-1602-T: 16 digital inputs, 24 VDC, sink/source type

Inputs per Module: 16 channels, sink/source type
On-state Voltage: 24 VDC nominal, 10 VDC min.
OFF-state Voltage: 0 to 3 VDC, 3 VDC max.
Input Impedance: 3K ohms (typical)
Common Type: 16 channels / 2 DI_COMs
Response Time: 100 ms
Over Current Protection: 200 mA per channel
Isolation: I/O to logic (photocoupler isolation)
Operating Temperature: -40 to 75°C
Power Consumption: 7 mA @ 24 VDC (typical)
I/O Cable Wire: AWG 14 (2.0 mm x mm) max.

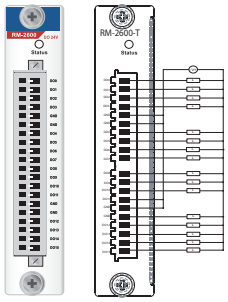
10-channel 110 VDC digital input module



RM-1050-T: 10 digital inputs, 110 VDC, isolated

Inputs per Module: 10 channels, 110 VDC, channel-to-channel isolated
On-state Voltage: 72 VDC nominal, 50 VDC (min.) to 175 VDC (max.)
Off-state Voltage: 0 to 15 VDC, 15 VDC max.
Input Impedance: 120K ohms (typical)
Common Type: None
Response Time: 100 ms
Over Current Protection: 200 mA per channel
Isolation: I/O to logic (photocoupler isolation)
Channel-to-Channel Isolation: 2.5K VDC
Operating Temperature: -40 to 75°C
Power Consumption: 7 mA @ 24 VDC (typical)
I/O Cable Wire: AWG 14 (2.0 mm x mm) max.

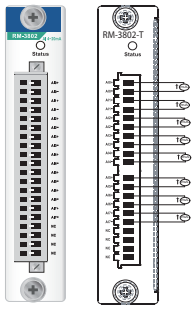
16-channel digital output module



RM-2600-T: 16 digital outputs, 24 VDC, sink type, 0.2 A

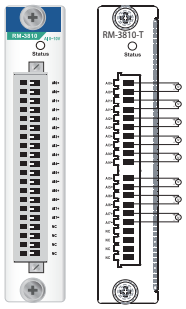
Outputs per Module: 16 channels, 24 VDC, sink type
Output Impedance: 120m ohms (typical)
Off-state Resistance: 500K ohms (typical)
Response Time: 100 ms
Over Current Protection: 200 mA per channel
Isolation: I/O to logic (photocoupler isolation)
Channel-to-Channel Isolation: 2.5K VDC
Operating Temperature: -40 to 75°C
Power Consumption: 10 mA @ 24 VDC (typical)
I/O Cable Wire: AWG 14 (2.0 mm x mm) max.

8-channel analog input modules, 16-bit resolution



RM-3802-T: 8 analog inputs, 4 to 20 mA, 16 bits

Inputs per Module: 8 channels, differential
Input Current Range: 4 to 20 mA
Input Impendence: 120 ohms
Resolution Range: 16 bits, 0.24 μA/bit
Accuracy:
±0.1%, FSR @ 25°C
±0.3%, FSR @ -40°C, 75°C
Response Time: 100 ms for all channels
Over Current Protection: 200 mA per channel
Isolation: I/O to logic (photocoupler isolation)
Channel-to-Channel Isolation: 2.5K VDC
Operating Temperature: -40 to 75°C
Power Consumption: 78 mA @ 24 VDC (typical)
I/O Cable Wire: AWG 14 (2.0 mm x mm) max.



RM-3810-T: 8 analog inputs, 0 to 10 V, 16 bits

Inputs per Module: 8 channels, differential
Input Current Range: 0 to 10 VDC
Input Impendence: > 10M ohms
Resolution Range: 16 bits, 0.15 μA/bit
Data Format: 16-bit integer (2's complement)
Accuracy:
±0.1%, FSR @ 25°C
±0.3%, FSR @ -40°C, 75°C
Response Time: 100 ms for all channels
Over Current Protection: 200 mA per channel
Isolation: I/O to logic (photocoupler isolation)
Channel-to-Channel Isolation: 2.5K VDC
Operating Temperature: -40 to 75°C
Power Consumption: 78 mA @ 24 VDC (typical)
I/O Cable Wire: AWG 14 (2.0 mm x mm) max.

ioLogik W5300 Series

Cellular micro RTU controllers



- Integrated, compact box solution for cellular telemetry applications
- Definable cellular connection strategy to optimize data transmission
- Intuitive menu driven front-end intelligence
- Flexible, Unicode alarm system supporting SMS, email, SNMP Trap, TCP, UDP
- One RS-232/422/485 serial port built in for connecting to field serial devices
- Backup and sustainable data logging function
- Seamless SCADA connectivity by Active OPC technology
- Configure, update firmware, and program over the air via ioAdmin
- MXIO programming library for Windows, WinCE VB/VC.NET, and Linux C APIs

Introduction

The ioLogik W5300 series cellular micro RTU controllers are rugged, compact solutions for remote monitoring and alarm systems. With the ioLogik W5300 series, you can define a cellular connection strategy, including Always-On and Wake-On-Demand, to optimize data transmission rates for different applications. In addition, the operational cost of cellular communication depends on the data transmission rate. With Moxa's Active technology, you can expect to cut transmission costs in half and offer different cellular connection strategies to achieve better data transmission fees.

This rugged, compact solution is suitable for the following applications.

- Water and wastewater industries
- Broadcast and telecom radio tower monitoring
- Infrastructure management
- Oil & gas, power, and transportation
- Lighting control monitoring

ioLogik W5300 Series Selection Table

Models		I/O Combinations				
Standard Temperature (-10 to 55°C)	Wide Temperature (-30 to 70°C)	Digital Inputs	Digital Outputs	Analog Inputs	Relay Outputs	Configurable DIOs
ioLogik W5312	ioLogik W5312-T	8	8	–	–	4
ioLogik W5340	ioLogik W5340-T	–	–	4	2	8
ioLogik W5340-HSDPA	ioLogik W5340-HSDPA-T (-20 to 70°C)	–	–	4	2	8

ioLogik W5312 Specifications

DI/DO Configurable Channels

Channels: 4
I/O Mode:
• DI or Event Counter (up to 900 Hz)
• DO or Pulse Output (up to 100 Hz)

Digital Input

Channels: Up to 12, source/sink selectable
Sensor Type: NPN/PNP type
I/O Mode: DI or Event Counter (up to 900 Hz)
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:

DI Type / Status	Source	Sink
ON	0 to 3 VDC	10 to 30 VDC
OFF	10 to 30 VDC	0 to 3 VDC

Common Type: 6 points per COM
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 900 Hz, power off storage
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC
Poweroff Counter: Supports poweroff counter storage function

Digital Output

Channels: Up to 12, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 100 Hz)
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 600 mA
Over-temperature Shutdown: 160°C
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Power Requirements

Power Consumption: 156 mA @ 24 VDC

MTBF (mean time between failure)

Time: 407,406 hrs
Database: Telcordia (Bellcore)

ioLogik W5340 Specifications

Analog Input

Channels: 4 differential analog inputs
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: 0 to 10 V, ±10 V, ±5 V, 0 to 20 mA, 4 to 20 mA
Accuracy:
• ±0.1% FSR @ 25°C
• ±0.3% FSR @ -10 and 55°C
Sampling Rate (all channels): 100 samples/sec
Input Impedance: 200K ohms (min.)
Built-in Resistor for Current Input: 102 ohms

DI/DO Configurable Channels

Channels: 8
I/O Mode:
• DI or Event Counter (up to 900 Hz)
• DO or Pulse Output (up to 100 Hz)

Digital Input

Channels: Up to 8, source/sink selectable
Sensor Type: NPN/PNP type
I/O Mode: DI or Event Counter (up to 900 Hz)
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:

DI Type / Status	Source	Sink
ON	0 to 3 VDC	10 to 30 VDC
OFF	10 to 30 VDC	0 to 3 VDC

Common Type: 4 points per COM
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 900 Hz, power off storage
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC
Poweroff Counter: Supports poweroff counter storage function

Digital Output

Channels: Up to 8, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 100 Hz)
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 600 mA
Over-temperature Shutdown: 160°C
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Relay Output

Channels: 2 Form A (Normal Open) relay outputs, 5 A
Contact Rating: 5 A @ 30 VDC, 5 A @ 240 VAC, 5 A @ 110 VAC
Inductance Load: 2 A
Resistance Load: 5 A
Breakdown Voltage: 500 VAC
Relay On/Off Time: 10 ms, 5 ms (max.)
Initial Insulation Resistance: 1G min. @ 500 VDC
Expected Life: 100,000 times (Typical)
Initial Contact Resistance: 30 milli-ohms (max.)
Pulse Output: 20 operation times per minutes at rated load
Isolation: 3K VDC or 2K Vrms

Power Requirements

Power Consumption: (always on)
ioLogik W5340: 195 mA @ 24 VDC
ioLogik W5340-HSDPA: 196 mA @ 24 VDC

MTBF (mean time between failure)

Time:
ioLogik W5340: 196,561 hrs
ioLogik W5340-HSDPA: 280,739 hrs
Database: Telcordia (Bellcore)

Common Specifications

Cellular
Interface: GSM/GPRS/EDGE/UMTS/HSDPA
Band Options:
• Tri-band UMTS/HSDPA 850/1900/2100 MHz
• Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
GPRS Multi-Slot Class: Class 10
GPRS Terminal Device Class: Class B
SMS: Point-to-Point Text/PDU
SIM Control Voltage: 3 V

LAN
Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP, SNTP

Serial Communication
Interface: 1 x RS-232/422/485, software selectable (9-pin D-Sub male, or 5-contact terminal block)
Baudrate: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps

Power Requirements
Power Input: 24 VDC nominal, 12 to 36 VDC

Physical Characteristics
Dimensions: 46.8 x 135 x 105 mm (1.84 x 5.31 x 4.13 in)
Weight: 495 g

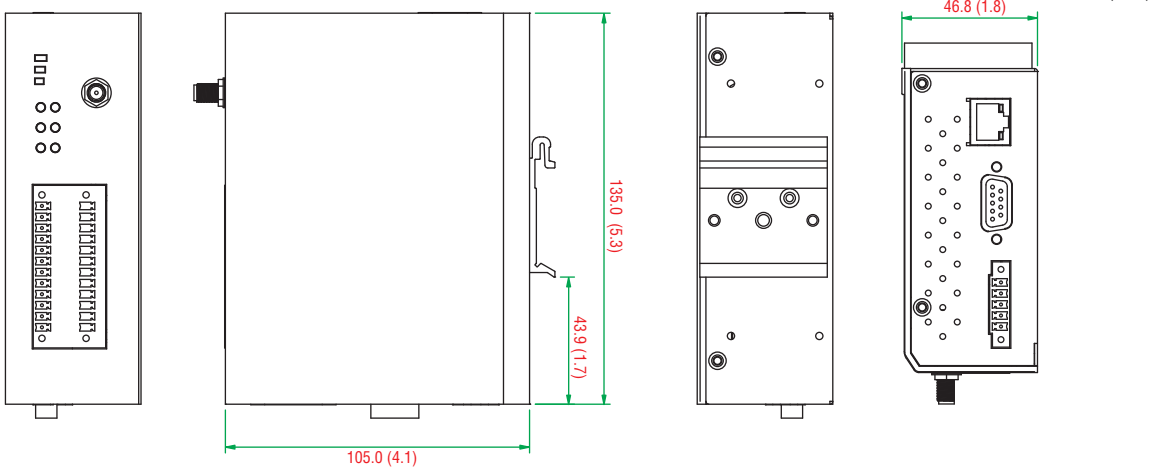
Environmental Limits
Operating Temperature:
Standard Models: -10 to 55°C (14 to 131°F)
Wide Temp. Models:
ioLogik W5312/W5340: -30 to 70°C (-22 to 158°F)
ioLogik W5340-HSDPA: -20 to 70°C (-4 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 (ESD) Level 2/3,
IEC 61000-4-3 (RS) Level 2,
IEC 61000-4-4 (EFT) Level 2,
IEC 61000-4-5 (Surge) Level 3,
IEC 61000-4-6 (CS) Level 2,
IEC 61000-4-8 (PM) Level 1,
IEC 61000-4-11 (DIPS),
IEC 61000-6-2 (ESD) Level 2/3,
IEC 61000-6-4 (EFT) Level 2
Mobile Network: PTCRB
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty
Warranty Period: 2* or 5 years
*Because of the limited lifetime of power relays, products that use this component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Front View | Side View | Rear View | Top View

Ordering Information

Available Models
ioLogik W5312: GPRS micro RTU controller with 8 DIs, 4 DIOs, and 8 DOs, -10 to 55°C operating temperature
ioLogik W5340: GPRS micro RTU controller with 4 AIs, 8 DIOs, and 2 relay outputs, -10 to 55°C operating temperature
ioLogik W5340-HSDPA: HSDPA micro controller with 4 AIs, 8 DIOs, and 2 relay outputs
ioLogik W5312-T: GPRS micro RTU controller with 8 DIs, 4 DIOs, and 8 DOs, -30 to 70°C operating temperature
ioLogik W5340-T: GPRS micro RTU controller with 4 AIs, 8 DIOs, and 2 relay outputs, -30 to 70°C operating temperature
ioLogik W5340-HSDPA-T: HSDPA micro controller with 4 AIs, 8 DIOs, and 2 relay outputs, -20 to 70°C operating temperature

Package Checklist
- ioLogik W5312 or W5340 or W5340-HSDPA
- ANT-CQB-AHSM-00-3m (W5312/W5340 only): Quad-band antenna with GSM/GPRS, omnidirection, 0 dBi, magnetic SMA, 3M
- ANT-WCDMA-AHSM-04-2.5m (W5340-HSDPA only): Five-band antenna with GSM/GPRS/UMTS/HSDPA, omnidirection, 4 dBi, magnetic SMA, 2.5M
- Document and software CD

ioLogik E2200 Series

Ethernet micro RTU controllers



- Front-end intelligence that supports 24 Click&Go rules
- Active Messaging with real-time stamp, including SMS, SNMP Trap with I/O status, TCP, and email
- Supports SNMPv1/v2c/v3 protocol
- I/O peer-to-peer function
- Built-in web console
- PC utility: auto detection of installed modules
- MXIO programming library for Windows, WinCE VB/VC.NET, and Linux C APIs
- -40 to 75°C operating temperature range (T models)

Introduction

Moxa's ioLogik E2200 is a new type of Ethernet micro RTU controller, which is a PC-based data acquisition and control device that uses proactive, event-based reporting to control I/O devices. Unlike traditional RTUs, which are passive and must poll for data, Moxa's Active OPC Server makes seamless connection with SCADA systems a reality. In addition, SNMP is used for communicating with an NMS (Network Management System) for IT field users. The I/O status of an Ethernet micro RTU controller can be reported and controlled automatically on-site based on user specified conditions. This report-by-exception approach, which is new to PC-based monitoring, requires far less bandwidth than traditional polling methods.

ioLogik E2210 Specifications

Digital Input

Channels: 12, source type
Sensor Type: NPN, Dry contact
I/O Mode: DI or Event Counter (up to 1 kHz)
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact: (source type)
• Logic 0 (On): 0 to 3 VDC
• Logic 1 (Off): 10 to 30 VDC
Common Type: 12 points per COM
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 900 Hz
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC

Digital Output

Channels: 8, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 100 Hz)
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 400 mA (typical)
Over-temperature Shutdown: 175°C (min.)
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Power Requirements

Power Consumption: 203 mA @ 24 VDC

MTBF (mean time between failure)

Time: 213,673 hrs
Database: Telcordia (Bellcore)

ioLogik E2212 Specifications

Digital Input

Channels: 8, source/sink selectable
Sensor Type: NPN, PNP, and Dry contact
I/O Mode: DI or Event Counter (up to 900 Hz)
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:

DI Type / Status	Source	Sink
ON	0 to 3 VDC	10 to 30 VDC
OFF	10 to 30 VDC	0 to 3 VDC

Common Type: 6 points per COM
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 900 Hz, power off storage
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC
Poweroff Counter: Supports poweroff counter storage function

Digital Output

Channels: 8, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 100 Hz)
Pulse Wave Width/Frequency: 10 ms / 1 kHz
Over-voltage Protection: 45 VDC
Over-current Limit: 400 mA (typical)
Over-temperature Shutdown: 175°C (min.)
Output Current Rating: Max. 200 mA per channel
Isolation: 2K Vrms or 3K VDC (Magnetic)

DI/DO Configurable Channels

Channels: 4
I/O Mode:
• DI or Event Counter (up to 900 Hz)
• DO or Pulse Output (up to 1 kHz)

Power Requirements

Power Consumption: 136 mA @ 24 VDC

MTBF (mean time between failure)

Time: 217,722 hrs
Database: Telcordia (Bellcore)

ioLogik E2214 Specifications

Digital Input

Channels: 6, source/sink selectable
Sensor Type: NPN, PNP, and Dry contact
I/O Mode: DI or Event Counter (up to 900 Hz)
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:

DI Type / Status	Source	Sink
ON	0 to 3 VDC	10 to 30 VDC
OFF	10 to 30 VDC	0 to 3 VDC

Common Type: 3 points per COM
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 900 Hz, power off storage
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC
Poweroff Counter: Supports poweroff counter storage function
Relay Counter: Supports relay counter storage function

Relay Output

Channels: 6 Form A (N.O.) relay outputs, 5A
Contact Rating: 5 A @ 30 VDC, 5 A @ 250 VAC, 5 A @ 110 VAC
Inductance Load: 2 A
Resistance Load: 5 A
Breakdown Voltage: 500 VAC
Relay On/Off Time: 10 ms, 5 ms (Max.)
Initial Insulation Resistance: 1G min. @ 500 VDC
Expected Life: 100,000 times (Typical)
Initial Contact Resistance: 30 milli-ohms (Max.)
Pulse Output: 0.3 Hz at rated load

Power Requirements

Power Consumption: 170 mA @ 24 VDC

MTBF (mean time between failure)

Time: 307,239 hrs
Database: Telcordia (Bellcore)

ioLogik E2240 Specifications

Analog Input

Channels: 8 analog inputs with differential input
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: ±150 mV, ±500 mV, ±5 V, ±10 V, 0 to 20 mA, 4 to 20 mA
Data Format: 16-bit integer (2's complement)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Sampling Rate (all channels):
• 10 samples/sec for voltage
• 6 samples/sec for current
Input Impedance: 900K ohms (min.)
Built-in Resistor for Current Input: 120 ohms
CMR @ 50/60 Hz: 95 dB min.
Zero Drift: ±9 μV/°C
Span Drift: ±25 ppm/°C
Isolation: 3K VDC or 2K Vrms

Analog Output

Channels: 2
Resolution: 12 bits
Output Range: 0 to 10 V, 4 to 20 mA
Drive Voltage: 15 VDC for current output
Accuracy:
±0.1% FSR @ 25°C,
±0.3% FSR @ -10 and 60°C
Zero Drift: ±9 μV/°C
Span Drift: ±25 ppm/°C
Load Resistor: Less than 250 ohms

Power Requirements

Power Consumption: 198 mA @ 24 VDC

MTBF (mean time between failure)

Time: 155,941 hrs
Database: Telcordia (Bellcore)

ioLogik E2242 Specifications

Analog Input
Channels: 4 analog inputs with differential input
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: ±150 mV, 0 to 150 mV, ±500 V, 0 to 500 mV, ±5 V, 0 to 5 V, ±10 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Sampling Rate (all channels): 100 samples/sec
Input Impedance: 200K ohms (min.)
Built-in Resistor for Current Input: 120 ohms

DI/DO Configurable Channels
Channels: 12
I/O Mode:
• DI or Event Counter (up to 900 Hz)
• DO or Pulse Output (up to 1 kHz)

Digital Input
Channels: Up to 12, source/sink selectable
Sensor Type: NPN, PNP, and Dry contact
I/O Mode: DI or event counter (up to 900 Hz)
Dry Contact:
• Logic 0: short to GND
• Logic 1: Open

Wet Contact:

DI Type / Status	Source	Sink
ON	0 to 3 VDC	10 to 30 VDC
OFF	10 to 30 VDC	0 to 3 VDC

Common Type: 6 points per COM
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 900 Hz, power off storage
Digital Filtering Time Interval: Software selectable
Over-voltage Protection: 36 VDC
Poweroff Counter: Supports poweroff counter storage function

Digital Output
Channels: Up to 12, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 100 Hz)
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 400 mA (typical)
Over-temperature Shutdown: 175°C (min.)
Output Current Rating: Max. 200 mA per channel
Isolation: 2K Vrms or 3K VDC (Magnetic)

Power Requirements
Power Consumption: 178 mA @ 24 VDC

MTBF (mean time between failure)
Time: 204,391 hrs
Database: Telcordia (Bellcore)

ioLogik E2260 Specifications

RTD
Channels: 6
Input Type: Pt, JPt, Ni, RTD sensor, resistor
Sampling Rate: 12 samples/sec (all channels)
Resolution: 0.1°C or 0.1 ohm
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Input Impedance: 625K ohms (min.)

Digital Output
Channels: 4, sink, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 750 mA
Over-temperature Shutdown: 175°C
Isolation: 3K VDC or 2K Vrms

Power Requirements
Power Consumption: 95 mA @ 24 VDC

MTBF (mean time between failure)
Time: 327,282 hrs
Database: Telcordia (Bellcore)

ioLogik E2262 Specifications

Thermocouple Input
Channels: 8
Sensor Type: J, K, T, E, R, S, B, N type TC and mV mode
Conversion Time: Less than 90 ms
Effective Resolution: 16 bits
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Input Impedance: 1 M ohm or better

Digital Output
Channels: 4, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 100 Hz)
Pulse Wave Width/Frequency: 10 ms/100 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 750 mA
Over-temperature Shutdown: 175°C
Isolation: 3K VDC or 2K Vrms

Power Requirements
Power Consumption: 160 mA @ 24 VDC

MTBF (mean time between failure)
Time: 341,063 hrs
Database: Telcordia (Bellcore)

Common Specifications

LAN
Ethernet: 1 x 10/100 Mbps, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP, HTTP, CGI, SNTP

Serial Communication
Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Power Requirements
Power Input: 24 VDC nominal, 12 to 36 VDC

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 115 x 79 x 45.6 mm (4.53 x 3.11 x 1.80 in)
Weight: under 250 g

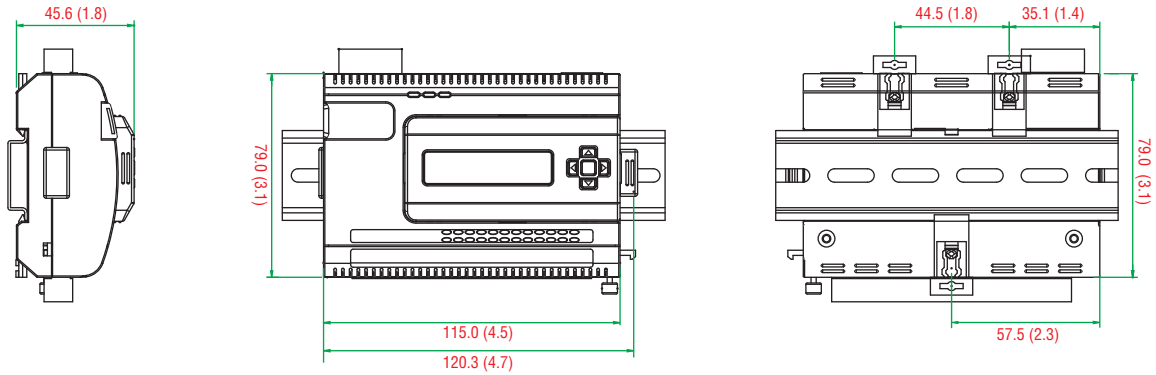
Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty
Warranty Period: 5 years (excluding E2214*)
*Because of the limited lifetime of power relays, products that use this component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View

Ordering Information

Available Models
ioLogik E2210: Ethernet micro RTU controller with 12 digital inputs and 8 digital outputs, -10 to 60°C operating temperature
ioLogik E2212: Ethernet micro RTU controller with 8 digital inputs, 8 digital outputs, and 4 DIOs, -10 to 60°C operating temperature
ioLogik E2214: Ethernet micro RTU controller with 6 digital inputs and 6 relay outputs, -10 to 60°C operating temperature
ioLogik E2240: Ethernet micro RTU controller with 8 analog inputs and 2 analog outputs, -10 to 60°C operating temperature
ioLogik E2242: Ethernet micro RTU controller with 4 analog inputs and 12 configurable DIOs, -10 to 60°C operating temperature
ioLogik E2260: Ethernet micro RTU controller with 6 RTD inputs and 4 digital outputs, -10 to 60°C operating temperature
ioLogik E2262: Ethernet micro RTU controller with 8 thermocouple inputs and 4 digital outputs, -10 to 60°C operating temperature
ioLogik E2242-T: Ethernet micro RTU controller with 4 analog inputs and 12 configurable DIOs, -40 to 75°C operating temperature

Accessories (can be purchased separately)
LDP1602: LCD module with 16 x 2 text and 5 buttons

Package Checklist
- 1 ioLogik E2200 series RTU controller
- Document and software CD

LDP1602 LCD Module

Snap-on module for the ioLogik E2200 and R2100 series



- Hot-pluggable display module for ioLogik Ethernet micro RTU controllers
- Easy, portable configuration kit for IP display and configuration
- Direct display for analog value and digital input, counter status
- No battery required (powered through the I/O)

Installing the LCD Module

1. Remove the ioLogik's top cover.



2. Plug in the LCD module.



3. Check and configure the IP address.



4. Check IP and I/O status.



Specifications

LCD Screen: 16 x 2 text display (in English)
Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Power Consumption: 15 mA @ 24 VDC

Warranty

Warranty Period: 2 years
*Because of the limited lifetime of the LCD module, products that usis the component are still covered by a 2-year warranty.

Ordering Information

Available Models

LDP1602: LCD module with 16 x 2 text display and 5 buttons

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Remote I/O

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Ethernet Remote I/O

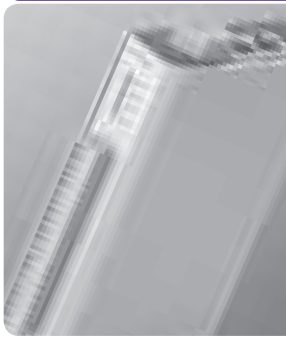
ioLogik E1200 Series: Ethernet remote I/O with 2-port Ethernet switches 14-9

Serial Remote I/O

ioLogik R2110: RS-485 remote I/O with 12 digital inputs and 8 digital outputs 14-13
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Modular Remote I/O

ioLogik E4200: Modular Ethernet remote I/O adaptor 14-15
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Ethernet Remote I/O



	ioLogik E1210	ioLogik E1211	ioLogik E1212	ioLogik E1214	ioLogik E1240	ioLogik E1241	ioLogik E1242	ioLogik E1260	ioLogik E1262
Input/Output									
Digital Inputs	16	–	8	6	–	–	4	–	–
Digital Outputs	–	16	–	–	–	–	–	–	–
Relay Outputs	–	–	–	6	–	–	–	–	–
Configurable DI/DOs	–	–	8	–	–	–	4	–	–
Analog Inputs	–	–	–	–	8	–	4	–	–
Analog Outputs	–	–	–	–	–	4	–	–	–
RTD Inputs	–	–	–	–	–	–	–	6	–
Thermocouple Inputs	–	–	–	–	–	–	–	–	8
Ethernet									
Ports (Connector)	2 (RJ45)								
Speed	10/100 Mbps								
Switch (Daisy Chain)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Protocols	Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, HTTP								
Environmental Limits									
Standard Models	-10 to 60°C								
Wide Temp. Models	-40 to 75°C								
Storage Temperature	-40 to 85 °C								
Operating Humidity	5 to 95% RH (non-condensing)								
Software									
Active OPC	✓	✓	✓	✓	✓	✓	✓	✓	✓
DA-Center	✓	✓	✓	✓	✓	✓	✓	✓	✓
ioSearch	✓	✓	✓	✓	✓	✓	✓	✓	✓
MXIO	✓	✓	✓	✓	✓	✓	✓	✓	✓
Peer-to-peer	✓	✓	✓	✓	✓	✓	✓	–	–
Standards and Certifications									
Safety	UL 508	UL 508	UL 508	UL 508 (Pending)	UL 508	UL 508	UL 508	UL 508	UL 508
EMI	FCC Part 15 Subpart B Class A, EN 55022 Class A								
EMS	IEC 61000-4 IEC 61000-6								
Shock	IEC 60068-2-27								
Freefall	IEC 60068-2-32								
Vibration	IEC 60068-2-6								
Reliability									
Warranty	5 years	5 years	5 years	2 years*	5 years	5 years	5 years	5 years	5 years

*Because of the limited lifetime of power relays, products that use this component are covered by a 2-year warranty.

I/O Model Naming Rule

Remote I/O Family	A	B	C
ioLogik E42AB-C ioLogik R21AB-C ioLogik E12AB-C	0 (No I/O) 1 (Digital I/O) 4 (Analog I/O) 6 (Special I/O)	Serial Number	None (Standard) T (Wide Temp.)
NA-40AB	1 (Ethernet Port) 2 (Serial Port)	Serial Number	–

I/O Module Family	A	B	CD
M-ABCD	1 (Digital Input) 2 (Digital Output) 3 (Analog Input) 4 (Analog Output) 6 (Temperature Input) 7 (System module)	0 (0 Channels) 2 (2 Channels) 4 (4 Channels) 6 (16 Channels) 8 (8 Channels)	Serial Number

Modular and Serial Remote I/O

	Modular Remote I/O				Serial Remote I/O	
						
	NA-4010	NA-4020	NA-4021	ioLogik E4200	ioLogik R2110	ioLogik R2140
Inputs/Outputs						
Digital Inputs	–	–	–	–	12	–
Digital Outputs	–	–	–	–	8	–
Analog Inputs	–	–	–	–	–	8
Analog Outputs	–	–	–	–	–	2
Ethernet						
Ports (connector)	1 (RJ45)	–	–	2 (RJ45)	–	–
Speed	10/100 Mbps	–	–	10/100 Mbps	–	–
Protocols	Modbus/TCP, Bootp, HTTP	–	–	Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP, HTTP, SNTP	–	–
Serial						
Ports (connector)	–	1 (DB9-M)	1 (DB9-M)	1 (DB9-M)	1 (terminal block)	1 (terminal block)
Interface	–	RS-232	RS-485	RS-232	RS-485	RS-485
Protocols	–	Modbus/RTU, Modbus/ASCII	Modbus/RTU, Modbus/ASCII	Modbus/RTU Gateway	Modbus/RTU Gateway	Modbus/RTU Gateway
Physical Characteristics						
I/O Module Slots	32	32	32	16	–	–
Environmental Limits						
Operating Temperature	-10 to 60°C					
Storage Temperature	-40 to 85°C					
Ambient Relative Humidity	5 to 95% RH (non-condensing)					
Software						
Click&Go	–	–	–	✓	–	–
Active OPC	–	–	–	✓	–	–
DA-Center	–	–	–	✓	–	–
MXIO	✓	✓	✓	✓	✓	✓
ioAdmin	✓	✓	✓	–	✓	✓
Modular ioAdmin	–	–	–	✓	–	–
Standards and Certifications						
Safety	UL 508					
EMI	–	–	–	FCC Part 15 Subpart B Class A, EN 55022 Class A		
EMS	IEC 61000-4, IEC 61000-6					
Shock	IEC 60068-2-27					
Freefall	IEC 60068-2-32					
Vibration	IEC 60068-2-6					
Reliability						
Warranty	2 years*	2 years*	2 years*	2 years*	5 years	5 years

*Because of the limited lifetime of power relays, products that use this component are covered by a 2-year warranty.

Digital I/O Modules



	M-1450	M-1451	M-1600	M-1601	M-1800	M-1801	M-2450	M-2600	M-2601	M-2800	M-2801
Inputs/Outputs											
Digital Inputs	4 (110 VAC)	4 (220 VAC)	16 (Sink)	16 (Source)	8 (Sink)	8 (Source)	–	–	–	–	–
Digital Outputs	–	–	–	–	–	–	–	16 (Sink)	16 (Source)	8 (Sink)	8 (Source)
Relay Outputs	–	–	–	–	–	–	4	–	–	–	–
Warranty	2 years (see www.moxa.com/warranty)										

Analog I/O Modules



	M-3802	M-3810	M-4402	M-4410	M-6200	M-6201
Inputs/Outputs						
Analog Inputs	8 (4-20 mA)	8 (0-10 V)	–	–	–	–
Analog Outputs	–	–	4 (4-20 mA)	4 (0-10 V)	–	–
RTD Inputs	–	–	–	–	2	–
Thermocouple Inputs	–	–	–	–	–	2
Warranty	2 years (see www.moxa.com/warranty)					

Power Modules



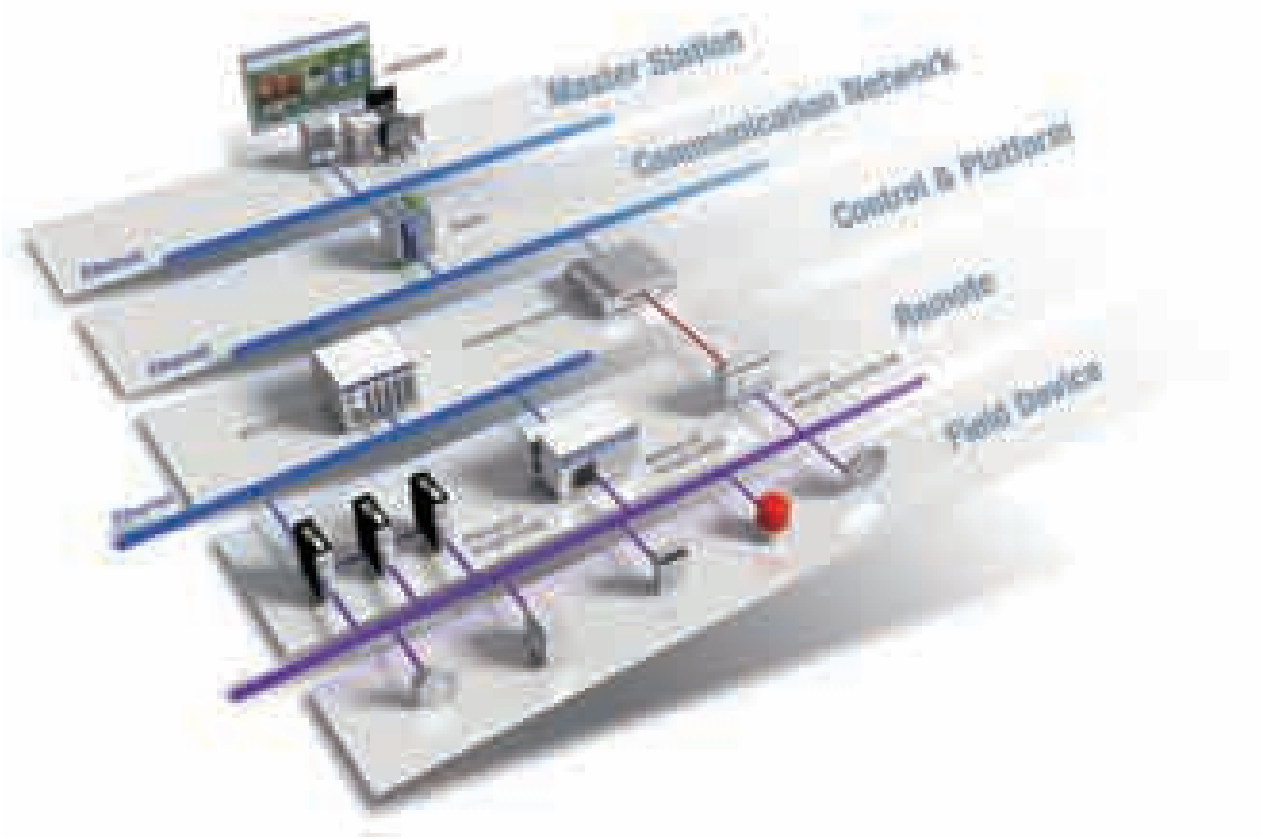
	M-7001	M-7002	M-7804	M-7805
Power				
VDC	21	5/24/48	0	24
VAC	–	110/220	–	–
Purpose	System	Field	Field	Field
Warranty	2 years (see www.moxa.com/warranty)			

Introduction to Remote I/O

Moxa's remote I/O modules are compact and highly reliable, and can be easily connected to a broad array of analog and digital I/O devices. Moxa's remote I/O solutions support the standard Modbus/TCP protocol, which is compliant with most SCADA software, to facilitate integration with existing systems. For real-time communication with the remote control center, the patented Active OPC Server's push-based technology allows instant reports from the remote I/O to the HMI/SCADA systems via "active" tags. With the built-in web console, setup is quick and easy; a web browser is the only software you will need to set the monitoring and control parameters. Moxa offers three different types of remote I/O products: Ethernet remote I/Os, serial remote I/Os, and modular remote I/Os.

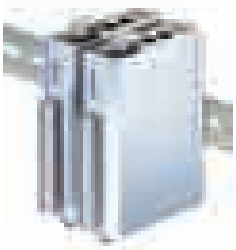
Remote Data Acquisition Solution

Visits to remote control and monitoring sites are not only time-consuming and inefficient, but also costly. With Moxa's remote I/O solutions, visits to the remote sites are no longer necessary, and if your equipment is down you will be immediately notified—even if you are miles away from the remote site. For the majority of distributed systems, cable deployment can be a nightmare; with Moxa's ioLogik E1200 series, wiring has never been easier thanks to its daisy-chain topology ability. ioLogik 4200 products support up to 256 DI/DO points or 64 AI/AO points and are perfect for applications that require flexible I/O combinations.



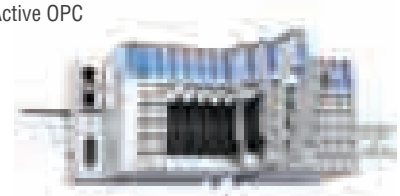
Ethernet Remote I/O—E1200 Series

- Daisy-chain topology
- Peer-to-peer communication
- User definable Modbus/TCP addressing
- Push-based Active OPC



Modular Remote I/O—E4200

- Slice-type form factor
- Flexible I/O combinations, up to 256 I/O channels
- Click&Go local intelligent control
- Dual-LAN redundancy
- Push-based Active OPC



Ethernet Remote I/O E1200 Series

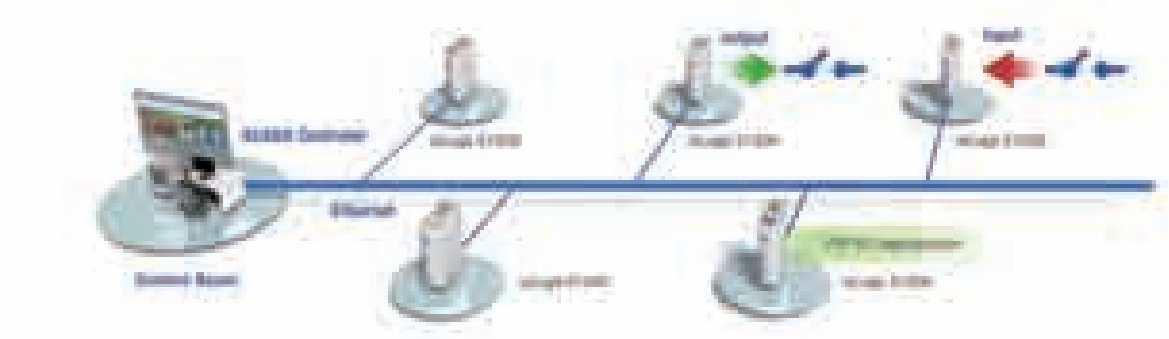
Daisy-Chain Topology Reduces Deployment Costs

Thanks to two embedded Ethernet switch ports, the ioLogik E1200 remote Ethernet I/O allows you to create daisy-chain topologies for flexible device cabling. In a distributed Ethernet data acquisition application, panels, units, and cabinets are often located at remote sites where space is limited. Daisy-chaining ioLogik E1200 units to each other or other nearby Ethernet devices not only saves space, but also drastically reduces cabling and deployment time.



Peer-to-Peer Cable Replacement Solution

For some remote automation applications, the control room and sensors are located far away from each other, and often a single remote I/O module is deployed to collect data from all the sensors. Peer-to-peer communication has little or no limitations as it replaces cables by integrating multiple I/O signals over a single network cable to transmit input-to-output controls without the aid of PLCs or controllers. With the peer-to-peer communication feature, which supports channel-to-channel mapping, the ioLogik E1200 allows simultaneous multiple target transmissions. In addition, the ioLogik E1200 supports up to 16 channels for transmission over Ethernet (based on an emitter and receiver I/O pair).



User-definable Modbus/TCP Addressing for Painless Upgrading of Existing Systems

For Modbus devices that are controlled and detected by fixed addresses, users need to spend a vast amount of time researching and verifying the configurations. Users need to locate each device's detailed information, such as the I/O channel and the addresses as defined by the vendors to enable the initial address or the start address of a SCADA system or PLC. The ioLogik E1200, with user-definable Modbus/TCP addressing, offers greater flexibility, and setup is easy. Instead of worrying about the definitions, users simply configure the function and address map to fit their needs.



Push-based Active OPC Server for Seamless Connections to SCADA Systems

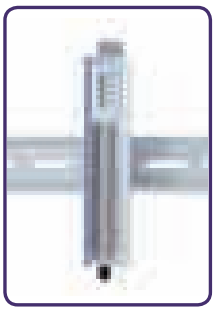
Active OPC Server Lite™ is Moxa's free software package that operates as an OPC driver for HMI/SCADA systems to achieve faster response time with low network bandwidth consumption. Conventional OPC servers typically use a polling method to connect to Ethernet I/O devices, which continuously send commands to collect relevant data. Moxa's Active OPC Server Lite offers active, or "push" communications, which enables Moxa's remote I/O products to provide HMI/SCADA systems with instant I/O status reports by using "Active Tags," and use less bandwidth compared to the polling method.

Active MXIO Library for Effortless Programming

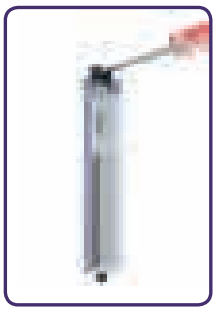
Moxa's MXIO library supports the Windows, WinCE and Linux operating systems, as well as the C++, VB/VC, and .NET development platforms. The library's large repository of C# and Visual Basic sample code makes it easy to use high-level computer languages to manage I/O devices and data transfer operations over an Ethernet network. In addition, the MXIO library's active communication feature allows customized software developers to enjoy the benefit of push technology to receive I/O tags actively and reduce network traffic up to 80%.

Easy Maintenance

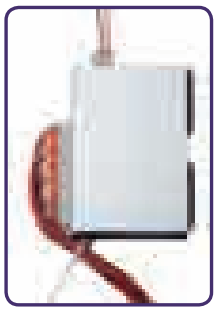
The ioLogik E1200 is designed with a vertical form factor, and can be either DIN-Rail or wall mounted. A stress-relief connector at the bottom of the ioLogik E1200 prevents the wiring from being inadvertently pulled out.



DIN-Rail Mounting



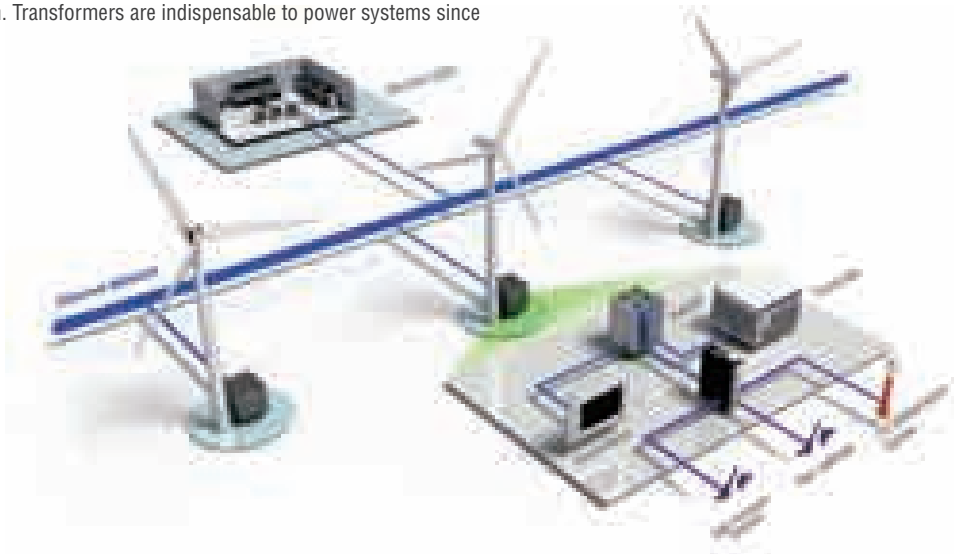
Wall Mounting



Stress-relief Connector

Applications—Wind Power Transformer Room Monitoring

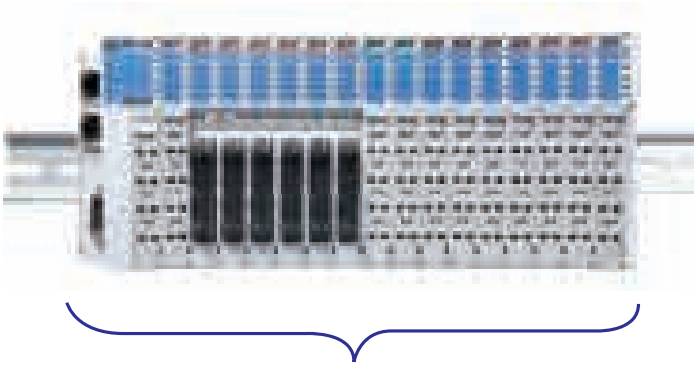
In recent years, renewable energy such as wind power has become more ubiquitous than ever. However, electricity from wind turbines is erratic, and such fluctuations and interruptions can cause instability of the power grid. The reason is that a drop in power at one point can cause power surges elsewhere, which causes switches to short circuit to counterbalance for the surges, which can result in blackouts. To neutralize these fluctuations, wind-generated electricity must first go through a transformer to even out the power voltage prior to transmission. Transformers are indispensable to power systems since they ensure reliable operations. To avoid power failures, it is imperative to monitor the status of the transformers; Moxa's ioLogik E1200 series is perfect for monitoring transformers, oil temperature, and gas pressure release and leaks thanks to its mixed I/O combination. The ioLogik E1200 series comes in a compact form factor, enjoys a wide operating temperature to ensure reliable performance in harsh environments, and has a unique active tag function that reduces the PC's workload.



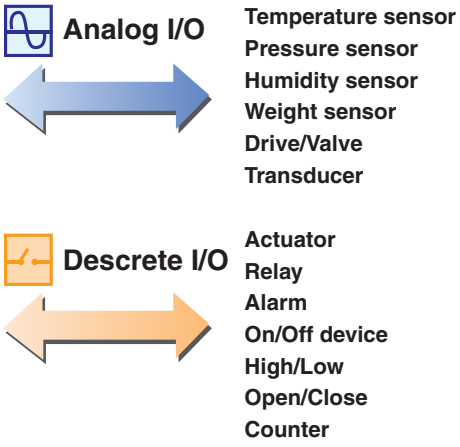
Modular Remote I/O ioLogik E4200

Slice Form Factor and Flexible I/O Combination

The unique modular construction of the ioLogik E4200 allows the mixing and matching of modules to achieve the best combination of I/O modules to meet the needs of a wide range of remote automation applications. The ioLogik E4200 features an industrial modular housing that allows up to 16 I/O modules to be added to the base unit without a backplane. The size of each module is merely 12 mm, and at a full load of 16 modules, the total size is less than 25 cm—perfect for space-limited applications. The ioLogik E4200 provides up to 256 DI/DO points or 64 AI/AO points for greater flexibility and expandability. The modules can connect to virtually any type of sensor, including temperature, pressure, flow, voltage, current, and contact closure sensors.

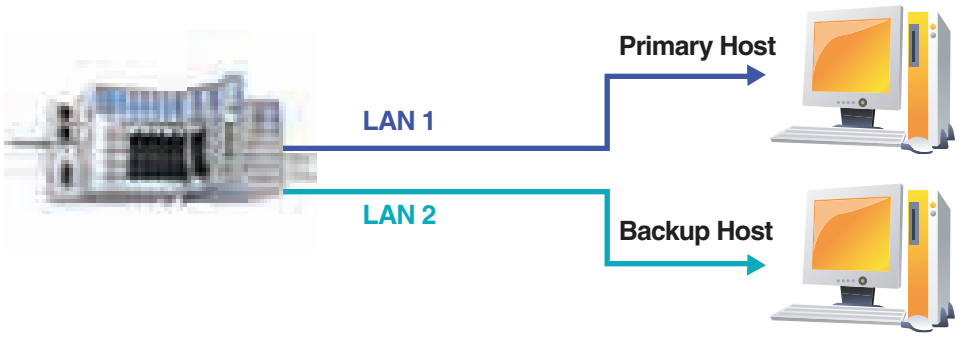


Can add up to 16 modules, total size less than 25cm



Reliable Dual-LAN Redundancy

The ioLogik E4200 modular remote I/O comes with dual network interfaces, which have separate MAC and IP addresses for connecting to different network segments. Redundancy to improve system reliability can be easily implemented by allowing hosts located on different networks to control or monitor the systems.



Click&Go™ Code-free Local Intelligent Control

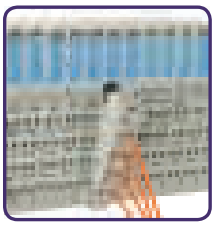
The patented Click&Go event-based control logic offers local control without the need to communicate with the remote host. Click&Go's intuitive, graphical interface and simple IF-THEN-ELSE control logic, which defines how the ioLogik E4200 will respond to different events, is easy and straightforward to set up. Click&Go supports active communication methods, including TCP, UDP, SNMP Trap, email, and CGI commands, making it extremely easy to integrate Click&Go with any monitoring system.

Easy Maintenance

The ioLogik E4200 and ioLogik 4000 series come with removable spring-type terminal blocks (RTBs) that allow you to conserve field wiring for future use. Each I/O expansion module can be quickly and easily replaced.



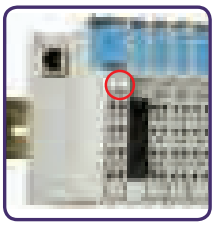
Slice Type I/O Modules



Removable Terminal Block



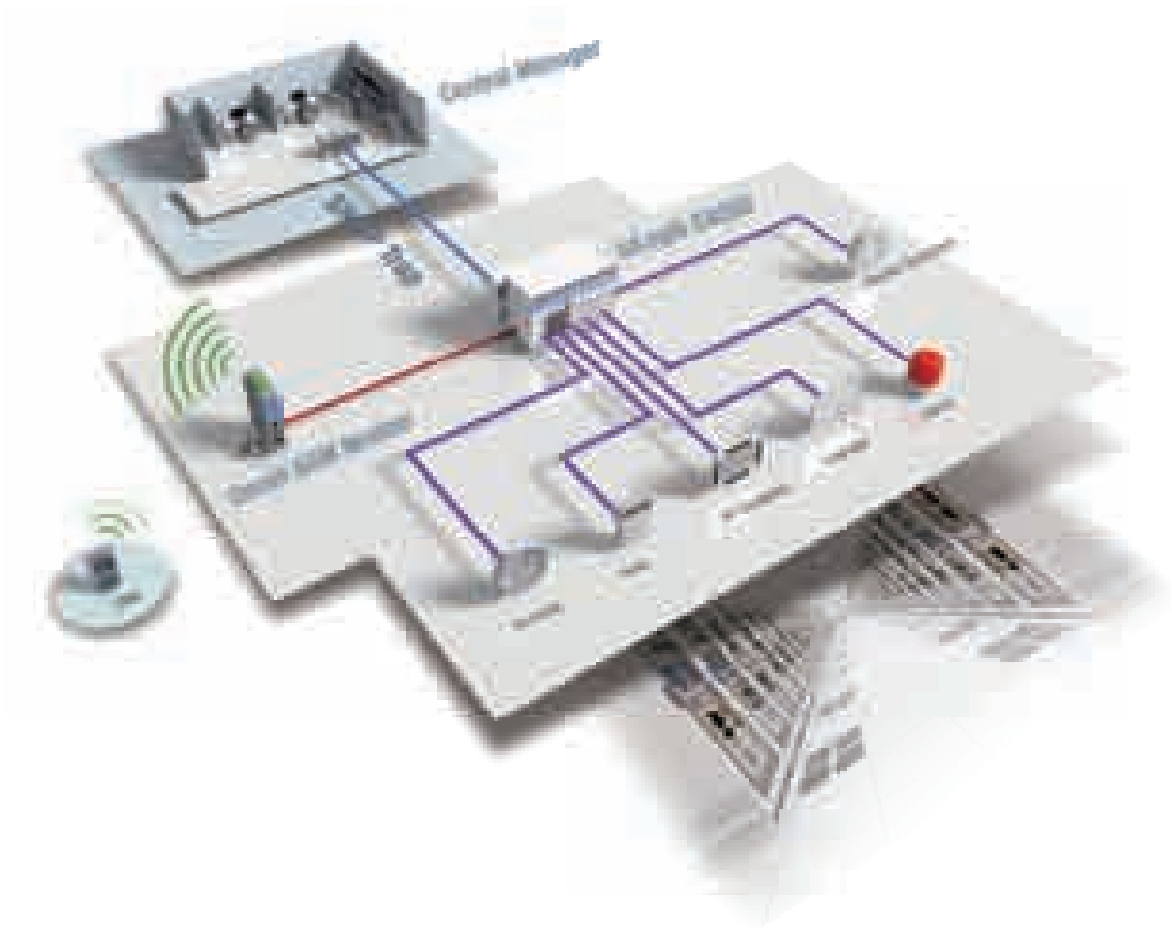
Spring Type Terminal Block



Module Coding Tag

Applications: Unmanned Server Room Monitoring

Unmanned server room monitoring, which helps to reduce downtime and operational expenses, is typically a top priority for most businesses. Using proper remote monitoring devices will not only protect your servers but also ensure immediate notification when there is a threat. In a server room, there are many critical environmental parameters such as, temperature, humidity, leakage, and smoke that need to be monitored to prevent damage to equipment and to avoid downtime. The ioLogik E4200 modular I/O offers superb flexibility with features such as the analog and digital I/O combination for connecting various sensors and the exclusive free SMS alarm notification. The ioLogik E4200 has built-in SMS capability that is simple to configure using the intelligent Click&Go control logic. In addition, the ioLogik E4200 supports most commonly used SNMP protocols to allow the use of user-definable SNMP traps.



ioLogik E1200 Series

Ethernet remote I/O with 2-port Ethernet switches

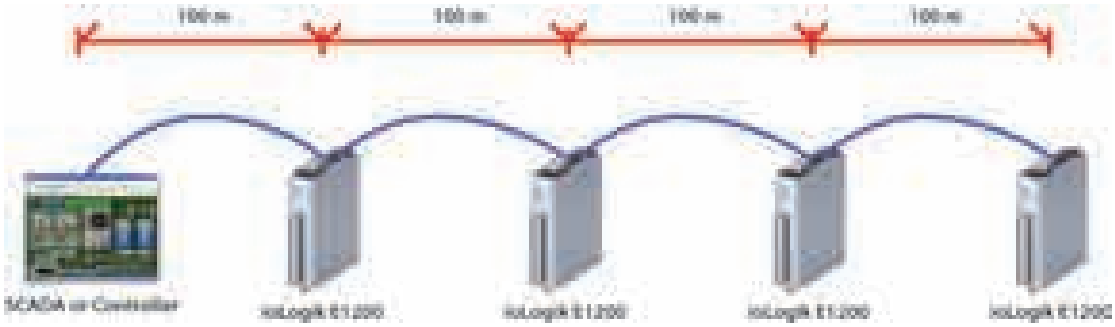


- Built-in 2-port Ethernet switch for daisy-chain topologies
- Free support of Moxa's push-based Active OPC Server Lite
  - Seamlessly connect to any SCADA system
  - Save 80% on network bandwidth
  - I/O response that's 7 times faster
- User-defined Modbus/TCP addressing
- I/O peer-to-peer function
- MXIO programming library for Windows and WinCE VB/VC.NET and Linux C APIs
- Web configuration with Import/Export function

Introduction

Daisy-chained Ethernet I/O Connection

A new daisy-chained Ethernet I/O concept is now available. The ioLogik E1200 industrial Ethernet remote I/O has two embedded Ethernet switch ports that allow information to flow to another local Ethernet device or connect to the next ioLogik in the daisy-chain. Applications such as factory automation, security and surveillance systems, and tunnel monitoring, can make use of daisy-chained Ethernet for building multi-drop I/O networks over standard Ethernet cables. Many industrial automation users are familiar with the multi-drop configuration typically used in fieldbus applications. The daisy-chain function on the Ethernet remote I/O ioLogik E1200 not only increases the connection between machines and panels, but also lowers the cost of buying separate Ethernet switches, and at the same time reduces labor fees and cabling by a large percentage. For example, if a production facility contains 700 stations (20 points per station), the wiring cost reduction can reach 15% of the total implementation cost.



ioLogik E1200 Series Selection Table

Models	I/O Combinations							
	Digital Inputs	Digital Outputs	Analog Inputs	Analog Outputs	RTD Inputs	TC Inputs	Relay Outputs	Configurable DIOs
ioLogik E1210	16	–	–	–	–	–	–	–
ioLogik E1211	–	16	–	–	–	–	–	–
ioLogik E1212	8	–	–	–	–	–	–	8
ioLogik E1214	6	–	–	–	–	–	6	–
ioLogik E1240	–	–	8	–	–	–	–	–
ioLogik E1241	–	–	–	4	–	–	–	–
ioLogik E1242	4	–	4	–	–	–	–	4
ioLogik E1260	–	–	–	–	6	–	–	–
ioLogik E1262	–	–	–	–	–	8	–	–

ioLogik E1210 Specifications

Digital Input
Sensor Type: NPN, PNP, and Dry contact
I/O Mode: DI or Event Counter
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:
• Logic 0: 0 to 3 VDC
• Logic 1: 10 to 30 VDC (DI COM to DI)
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 250 Hz, power off storage

Power Requirements
Power Consumption: 110 mA @ 24 VDC

MTBF (mean time between failures)
Time: 671,345 hrs
Database: Telcordia (Bellcore)

ioLogik E1211 Specifications

Digital Output
I/O Mode: DO or Pulse Output
Pulse Wave Width/Frequency: 1 ms/500 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 600 mA per channel
Over-temperature Shutdown: 175°C (typical), 150°C (min.)
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Power Requirements
Power Consumption: 208 mA @ 24 VDC

MTBF (mean time between failures)
Time: 221,662 hrs
Database: Telcordia (Bellcore)

ioLogik E1212 Specifications

Digital Input
Sensor Type: NPN, PNP, and Dry contact
I/O Mode: DI or Event Counter
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:
• Logic 0: 0 to 3 VDC
• Logic 1: 10 to 30 VDC (DI COM to DI)
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 250 Hz, power off storage

Digital Output
I/O Mode: DO or Pulse Output
Pulse Wave Width/Frequency: 1 ms/500 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 600 mA per channel
Over-temperature Shutdown: 175°C (typical), 150°C (min.)
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Power Requirements
Power Consumption: 155 mA @ 24 VDC

MTBF (mean time between failures)
Time: 179,098 hrs
Database: Telcordia (Bellcore)

ioLogik E1214 Specifications

Digital Input
Sensor Type: NPN, PNP, and Dry contact
I/O Mode: DI or Event Counter
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:
• Logic 0: 0 to 3 VDC
• Logic 1: 10 to 30 VDC (DI COM to DI)
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 250 Hz, power off storage

Relay Output
Type: Form A (N.O.) relay outputs, 5A
Contact Rating: 5 A @ 30 VDC, 5 A @ 250 VAC, 5 A @ 110 VAC
Inductance Load: 2 A
Resistance Load: 5 A
Breakdown Voltage: 500 VAC
Relay On/Off Time: 1500 ms (Max.)
Initial Insulation Resistance: 1G min. @ 500 VDC
Expected Life: 100,000 times (Typical)
Initial Contact Resistance: 30 milli-ohms (Max.)
Pulse Output: 0.3 Hz at rated load

Power Requirements
Power Consumption: 188 mA @ 24 VDC

MTBF (mean time between failures)
Time: 808,744 hrs
Database: Telcordia (Bellcore)

ioLogik E1240 Specifications

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: 0 to 10 VDC, 4 to 20 mA
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Sampling Rate (all channels): 12 samples/sec
Input Impedance: 10M ohms (minimum)
Built-in Resistor for Current Input: 120 ohms

Power Requirements
Power Consumption:121 mA @ 24 VDC

MTBF (mean time between failures)
Time: 474,053 hrs
Database: Telcordia (Bellcore)

ioLogik E1241 Specifications

Analog Output
Resolution: 12 bits
Output Range: 0 to 10 VDC, 4 to 20 mA
Voltage Output: 10 mA (Max.)
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Load Resistor:
• Internal power: 400 ohms
• External 24V power: 1000 ohms

Power Requirements
Power Consumption: 194 mA @ 24 VDC

MTBF (mean time between failures)
Time: 888,656 hrs
Database: Telcordia (Bellcore)

ioLogik E1242 Specifications

Analog Input
Type: Differential input
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: 0 to 10 VDC, 4 to 20 mA
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Sampling Rate (all channels): 12 samples/sec
Input Impedance: 10M ohms (minimum)
Built-in Resistor for Current Input: 120 ohms

Digital Input
Sensor Type: NPN, PNP, and Dry contact
I/O Mode: DI or Event Counter
Dry Contact:
• Logic 0: short to GND
• Logic 1: open
Wet Contact:
• Logic 0: 0 to 3 VDC
• Logic 1: 10 to 30 VDC (DI COM to DI)
Isolation: 3K VDC or 2K Vrms
Counter/Frequency: 250 Hz, power off storage

Digital Output
I/O Mode: DO or Pulse Output
Pulse Wave Width/Frequency: 1 ms/500 Hz
Over-voltage Protection: 45 VDC
Over-current Limit: 600 mA per channel
Over-temperature Shutdown: 175°C (typical), 150°C (min.)
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms

Power Requirements
Power Consumption:139 mA @ 24 VDC

MTBF (mean time between failures)
Time: 502,210 hrs
Database: Telcordia (Bellcore)

ioLogik E1260 Specifications

RTD
Input Type: PT50, PT100, PT200, PT500, PT1000;
Resistance of 10 ohms, 20 ohms, and 100 ohms
Sampling Rate: 12 samples/sec (all channels)
Resolution: 16 bits
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Input Impedance: 625K ohms

Power Requirements
Power Consumption: 110 mA @ 24 VDC

MTBF (mean time between failures)
Time: 660,260 hrs
Database: Telcordia (Bellcore)

ioLogik E1262 Specifications

Thermocouple Input
Sensor Type: J, K, T, E, R, S, B, N
Mili Volt Type: ±78.126 mV, ±39.062 mV, ±19.532 mV
Fault and Overvoltage protection: ±35 VDC (power off); +30 VDC, -25 VDC (power on)
Sampling Rate: 12 samples/sec (all channels)
Resolution: 16 bits
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Input Impedance: 10M ohms

Power Requirements
Power Consumption: 118 mA @ 24 VDC

MTBF (mean time between failures)
Time: 631,418 hrs
Database: Telcordia (Bellcore)

Common Specifications

LAN
Ethernet: 2 x 10/100 Mbps switch ports, RJ45
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, HTTP

Power Requirements
Power Input: 24 VDC nominal, 12 to 36 VDC

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 27.8 x 124 x 84 mm (1.09 x 4.88 x 3.31 in)
Weight: under 200 g

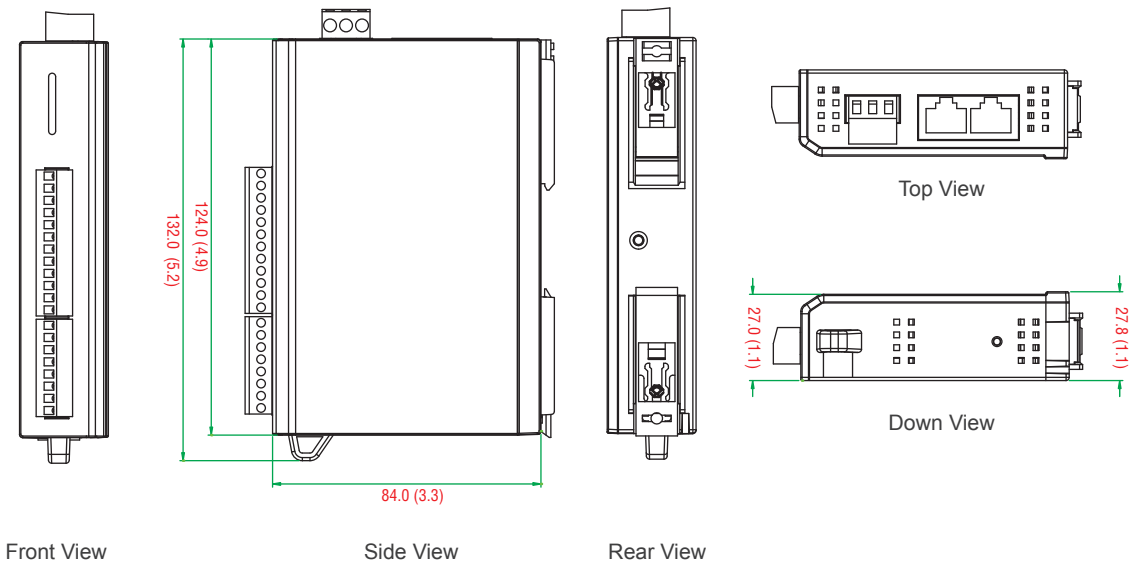
Environmental Limits
Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models:-40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508
EMI: FCC Part 15 Subpart B Class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty
Warranty Period: 5 years (excluding ioLogik E1214)
Details: See www.moxa.com/warranty
*Note: Because of the limited lifetime of power relays, products that use this component are covered by a 2-year warranty.

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

ioLogik E1210: Ethernet remote I/O with 2-port Ethernet switch and 16 DIs
ioLogik E1211: Ethernet remote I/O with 2-port Ethernet switch and 16 DOs
ioLogik E1212: Ethernet remote I/O with 2-port Ethernet switch, 8 DIs, and 8 DIOs
ioLogik E1214: Ethernet remote I/O with 2-port Ethernet switch, 6 DIs, and 6 Relays
ioLogik E1240: Ethernet remote I/O with 2-port Ethernet switch and 8 AIs
ioLogik E1241: Ethernet remote I/O with 2-port Ethernet switch and 4 AOs
ioLogik E1242: Ethernet remote I/O with 2-port Ethernet switch, 4 AIs, 4 DIs, and 4 DIOs
ioLogik E1260: Ethernet remote I/O with 2-port Ethernet switch and 6 RTDs
ioLogik E1262: Ethernet remote I/O with 2-port Ethernet switch and 8 TCs
ioLogik E1210-T: Ethernet remote I/O with 2-port Ethernet switch and 16 DIs, -40 to 75°C operating temperature
ioLogik E1211-T: Ethernet remote I/O with 2-port Ethernet switch and 16 DOs, -40 to 75°C operating temperature
ioLogik E1212-T: Ethernet remote I/O with 2-port Ethernet switch, 8 DIs, and 8 DIOs, -40 to 75°C operating temperature
ioLogik E1214-T: Ethernet remote I/O with 2-port Ethernet switch, 6 DIs, and 6 Relays, -40 to 75°C operating temperature
ioLogik E1240-T: Ethernet remote I/O with 2-port Ethernet switch and 8 AIs, -40 to 75°C operating temperature
ioLogik E1241-T: Ethernet remote I/O with 2-port Ethernet switch and 4 AOs , -40 to 75°C operating temperature
ioLogik E1242-T: Ethernet remote I/O with 2-port Ethernet switch, 4 AIs, 4 DIs, and 4 DIOs, -40 to 75°C operating temperature
ioLogik E1260-T: Ethernet remote I/O with 2-port Ethernet switch and 6 RTDs, -40 to 75°C operating temperature
ioLogik E1262-T: Ethernet remote I/O with 2-port Ethernet switch and 8 TCs, -40 to 75°C operating temperature

Package Checklist

- ioLogik E1210(-T) or E1211(-T) or E1212(-T) or E1214(-T) or E1240(-T) or E1241(-T) or E1242(-T) or E1260(-T) or E1262(-T)
- Documentation and software CD
- Quick installation guide (printed)

ioLogik R2110

RS-485 remote I/O with 12 digital inputs and 8 digital outputs



- 12-channel 24 VDC digital inputs with DI Event Counter mode, and software selectable filtering time
- 8-channel 24 VDC digital outputs with pulse output mode and software selectable pulse width LED indicators for all I/O channels
- Over-temperature protection (up to 175°C)
- Over-current protection (400-mA/channel)
- Easy-to-use, quick programming library for VB, VC++, BCB, .NET
- Firmware upgradable over RS-485

Specifications

Serial Communication
Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters
Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Digital Input
Channels: 12, source type
I/O Mode: DI or Event Counter (up to 50 Hz)
Dry Contact:
Logic 0: short to GND
Logic 1: open
Wet Contact:
Logic 0: 0 to 3 VDC
Logic 1: 10 to 30 VDC
(DI COM to DI)
Common Type: 12 points per COM
Isolation: 3K VDC or 2K Vrms

Digital Output
Channels: 8, sink type, 36 VDC, 200 mA
I/O Mode: DO or Pulse Output (up to 50 Hz)
Output Current Rating: Max. 200 mA per channel
Isolation: 3K VDC or 2K Vrms
Output Frequency: 50 Hz

Power Requirements
Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 177 mA @ 24 VDC

Physical Characteristics
Wiring: I/O cable max. 14 AWG
Dimensions: 115 x 79 x 45.6 mm (4.53 x 3.11 x 1.80 in)
Note: Please see page 13-26 for this product's dimensions diagram.
Weight: 200 g

Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)
Time: 197,972 hrs
Database: Telcordia (Bellcore)

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models
ioLogik R2110: RS-485 remote I/O with 12 digital inputs and 8 digital outputs

Accessories (can be purchased separately)
LDP1602: LCD module with 16 x 2 text display and 5 buttons

Package Checklist
- ioLogik R2110
- Documentation and software CD

ioLogik R2140

RS-485 remote I/O with 8 analog inputs and 2 analog outputs



- 8 analog input channels for millivolts (mV), voltage, and current signal with wire-off detection (at 4 to 20 mA)
- 2-channel analog outputs for voltage, current actuator control
- 16-bit resolution analog inputs, 12-bit resolution analog output
- Easy-to-use, quick programming library for VB, VC++, BCB, .NET
- NIST-Traceability calibration for analog I/O channels
- Firmware upgradable over RS-485

Specifications

Serial Communication

Interface: RS-485-2w: Data+, Data-, GND
Serial Line Protection: 15 KV ESD for all signals

Serial Communication Parameters

Parity: None
Data Bits: 8
Stop Bits: 1
Flow Control: None
Baudrate: 1200 to 115200 bps
Protocol: Modbus/RTU

Analog Input

Channels: 8, sink type, 45 VDC, 200 mA
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: ±150 mV, ±500 mV, ±5 V, ±10 V, 0 to 20 mA, 4 to 20 mA
Data Format: 16-bit integer
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -10 and 60°C
Sampling Rate (all channels):
10 samples/sec (voltage)
6 samples/sec (current)
Built-in Resistor for Current Input: 106 ohms
CMR @ 50/60 Hz: 95 dB min.
Isolation: 3K VDC or 2K Vrms

Analog Output

Channels: 2
Resolution: 12 bits
Output Range: 0 to 10 V, 4 to 20 mA
Drive Voltage: 15 VDC for current output
Accuracy:
±0.1% FSR @ 25°C,
±0.3% FSR @ -10 and 60°C
Zero Drift: ±9 μV/°C
Span Drift: ±25 ppm/°C
Load Resistor: Less than 250 ohms

Power Requirements

Power Input: 24 VDC nominal, 12 to 48 VDC
Power Consumption: 170 mA @ 24 VDC

Physical Characteristics

Wiring: I/O cable max. 14 AWG
Dimensions: 115 x 79 x 45.6 mm (4.53 x 3.11 x 1.80 in)
Note: Please see page 13-26 for this product's dimensions diagram.
Weight: 200 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS: IEC 61000-4, IEC 61000-6
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 280,923 hrs
Database: Telcordia (Bellcore)

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Ordering Information

Available Models

ioLogik R2140: RS-485 remote I/O with 8 analog inputs and 2 analog outputs

Accessories (can be purchased separately)

LDP1602: LCD module with 16 x 2 text display and 5 buttons

Package Checklist

- ioLogik R2140
- Documentation and software CD

ioLogik E4200

Modular Ethernet remote I/O adaptor



- Easy expansion; supports up to 16 I/O modules
- Dual Ethernet LANs and one RS-232 port
- Front-end intelligence that supports 80 Click&Go rules
- Unicode Active Messaging with real-time stamp, including SMS, SNMP Trap with I/O status, TCP, email
- Built-in web console
- PC utility: auto detection of installed modules
- Windows/WinCE VB/VC.NET and Linux C APIs

Introduction

The ioLogik E4200 is suitable for remote monitoring and alarm systems, such those used for water treatment systems, water supply systems, wastewater treatment systems, and power monitoring systems. These kinds of applications need more I/O points and a variety of I/O types, including temperature sensors, gas detectors, and water quality detectors, all of which can benefit from the versatile mixture of I/O features supported by the ioLogik E4200.

Specifications

LAN
Ethernet: 2 x 10/100 Mbps (2 MACs, 2 IPs, RJ45 connectors)
Protection: 1.5 KV magnetic isolation
Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, Bootp, SNMP, HTTP, SNTP

Serial Communication
Interface: 1 x RS-232 (9-pin D-Sub, male)
Parameters: N, 8, 1
Baudrate: 115,200 bps

Power Requirements
Power Input: 24 VDC nominal, 12 to 36 VDC
Power Consumption: 175 mA @ 24 VDC
Current for I/O Modules: Max. 1.5A @ 5 VDC

Field Power
Rated Voltage: 11 to 28.8 VDC, 24 VDC typical
Current in Field Power Contact: Max. 10 A

Isolation
System Power to I/O Driver: Optical isolation

Physical Characteristics
Dimensions: 45 x 99 x 70 mm (1.77 x 3.90 x 2.76 in)
Note: Please see page 14-17 for the dimensions diagram.
Weight: 180 g

Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 (ESD) Level 2/3,
IEC 61000-4-3 (RS) Level 2,
IEC 61000-4-4 (EFT) Level 2,
IEC 61000-4-5 (Surge) Level 3,
IEC 61000-4-6 (CS) Level 2,
IEC 61000-4-8 (PM) Level 1,
IEC 61000-4-11 (DIPS),
IEC 61000-6-2 (ESD) Level 2/3,
IEC 61000-6-4 (EFT) Level 2
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failure)
Time: 357,000 hrs
Database: Telcordia (Bellcore)

Warranty
Warranty Period: 2 years
Details: See www.moxa.com/warranty

Ordering Information

Step 1: Select a network adaptor module
ioLogik E4200

Step 2: Select I/O modules
M-1000/2000/3000/4000/6000 Series

Step 3: Select power modules
M-7000 series

Available Models
ioLogik E4200: Modular Ethernet remote I/O adaptor
Note: The ioLogik E4200 Active Ethernet network adaptor can be expanded by adding up to 16 I/O modules.
See pages 14-18 to 14-27 to select the M-series modules for your application.

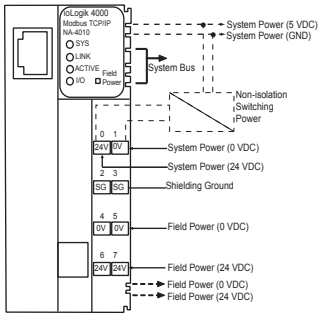
Package Checklist
- ioLogik E4200 remote I/O adaptor
- I/O modules ordered
- Power modules ordered
- Documentation and software CD
- Quick installation guide (printed)

NA-4010 and NA-4020/4021 Series

Ethernet and serial network adaptors

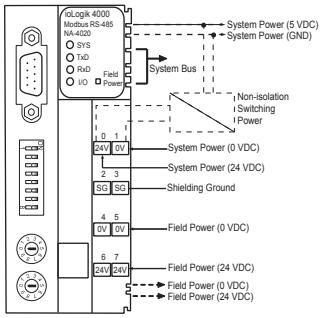
NA-4010 (Ethernet)





NA-4020 (RS-232)
NA-4021 (RS-485)





NA-4010 Specifications

LAN
Ethernet: 1 x 10/100 Mbps, RJ45

Software Features
Protocols: Modbus/TCP, HTTP, Bootp
IP Settings: ARP, Bootp, static IP
Programming Library: MXIO DLL library for Windows supporting Visual Basic, Visual C++, Borland C++ Builder, .NET
Number of I/O Modules Supported: Max. of 32

Power Requirements
Power Input: 11 to 28.8 VDC, 24 VDC typical
Power Consumption: 60 mA @ 24 VDC
Current for I/O Modules: Max. 1.5 A @ 5 VDC

NA-4020/4021 Specifications

Serial Communication Parameters
Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Baudrate: 1200 to 115200 bps
Signals:
• NA-4020: Data+, Data-, Gnd, DIR
• NA-4021: TxD, RxD, Gnd

Software Features
Protocols: Modbus/RTU, Modbus/ASCII
Modbus Address: 00 to 99 (set by rotary switches)
Programming Library: MXIO DLL library for Windows; Supports Visual Basic, Visual C++, Borland C++ Builder, .net, VB/VC.NET
Number of I/O Modules Supported: Max. of 32

Power Requirements
Power Input: 11 to 28.8 VDC, 24 VDC typical
Power Consumption: 70 mA @ 24 VDC
Current for I/O Modules: Max. 1.5 A @ 5 VDC

NA-4010 and NA-4020/4021 Common Specifications

Field Power
Rated Voltage: 11 to 28.8 VDC, 24 VDC typical
Current in Field Power Contact: Max. 10 A

Isolation
System Power to I/O Driver: Optical isolation

Physical Characteristics
Dimensions: 45 x 99 x 70 mm (1.77 x 3.90 x 2.76 in)
Weight: 150 g

Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

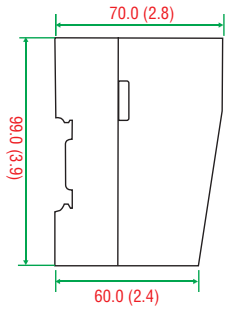
Standards and Certifications
Safety: UL 508
EMS: IEC 61000-6-2, IEC 61000-6-4
Vibration: IEC-68-2-6 (2 g's during operation)

Warranty
Warranty Period: 2 years
Details: See www.moxa.com/warranty

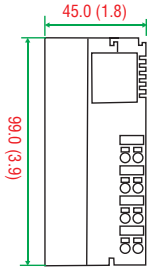
Dimensions

Unit: mm (inch)

I/O Network Adaptor

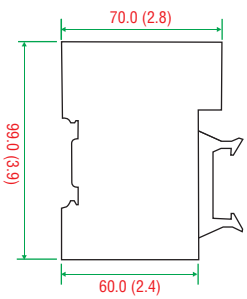


Side View

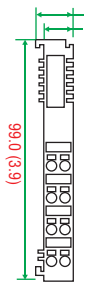


Front View

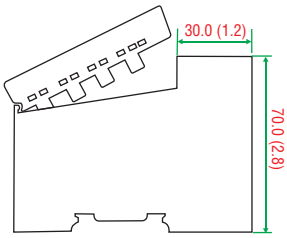
I/O Module



Side View



Front View



Removable View

Ordering Information

Step 1: Select a network adaptor module

NA-4000 series

Step 2: Select I/O modules

M-1000/2000/3000/4000/6000 series

Step 3: Select power modules (optional)

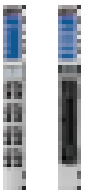
M-7000 series

Available Models
NA-4010: Ethernet modular remote I/O network adaptor (Modbus/TCP)
NA-4020: RS-485 modular remote I/O network adaptor (Modbus/RTU, Modbus/ASCII)
NA-4021: RS-232 modular remote I/O network adaptor (Modbus/RTU, Modbus/ASCII)
Note: The NA-4010 NA-4020/4021 network adaptors can be expanded by adding up to 32 I/O modules. See pages 14-18 to 14-27 to select the M-series modules for your application.

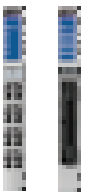
Package Checklist
- NA-4010 or NA-4020 or NA-4021
- I/O modules ordered
- Power modules ordered
- Documentation and software CD

I/O Module Selection Guide

I/O Modules



DC-Digital Inputs						AC-Digital Inputs	
Specs	Model	M-1800	M-1801	M-1600	M-1601	M-1450	M-1451
	Channels	8	8	16	16	4	4
	Sink/Source	Sink	Source	Sink	Source	–	–
	Connector	RTB	RTB	20-pin	20-pin	RTB	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	110 VAC	220 VAC
	Isolation	Optical isolation					



Digital Outputs						
Specs	Model	M-2800	M-2801	M-2600	M-2601	M-2450
	Channels	8	8	16	16	4
	Sink/Source	Sink	Source	Sink	Source	Relay
	Connector	RTB	RTB	20-pin	20-pin	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
	Current	0.5 A	0.5 A	0.3 A	0.3 A	2.0 A
	Isolation	Optical isolation				



Analog Inputs					
Specs	Model	M-3802	M-3810	M-6200	M-6201
	Channels	8	8	2	2
	Current	4 to 20 mA	–	–	–
	Voltage	–	0 to 10 V	–	–
	Connector	RTB	RTB	RTB	RTB
	Resolution	12-bit	12-bit	–	–
	Isolation	Optical isolation			
	Sensor Input	–	–	RTD(ohm)	Thermo-couple (mV)



Analog Outputs			
Specs	Model	M-4402	M-4410
	Channels	4	4
	Current	4 to 20 mA	–
	Voltage	–	0 to 10 V
	Connector	RTB	RTB
	Resolution	12-bit	12-bit
	Isolation	Optical isolation	

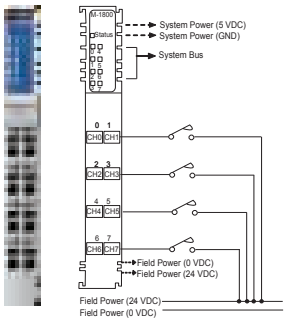
Power Modules

Power Modules					
Specs	Model	M-7001	M-7002	M-7804	M-7805
	Channels	0	0	8	8
	Voltage	24 VDC	DC: 5, 24, 48 VDC AC: 110/220 VAC	0 VDC	24 VDC
	Purpose	System Power	Field Power	Field Power	Field Power



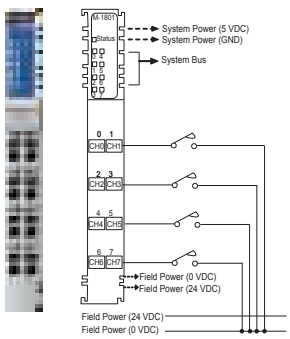
Digital Input Modules

8-channel 24 VDC digital input modules



M-1800: 8 digital inputs, sink, 24 VDC

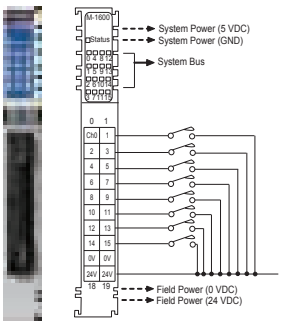
Inputs per Module: 8 channels, sink type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ. 1.5 ms
Common Type: External common
Power Consumption: 35 mA @ 5 VDC



M-1801: 8 digital inputs, source, 24 VDC

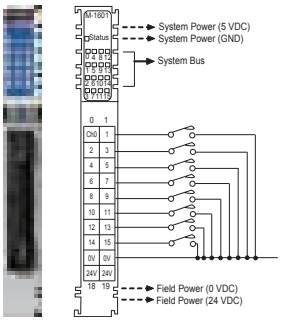
Inputs per Module: 8 channels, source type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ 1.5 ms
Common Type: External common
Power Consumption: 35 mA @ 5 VDC

16-channel 24 VDC digital input modules



M-1600: 16 digital inputs, sink, 24 VDC

Inputs per Module: 16 channels, sink type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ. 1.5 ms
Common Type: 16 channels for 2 COMs
Power Consumption: 40 mA @ 5 VDC

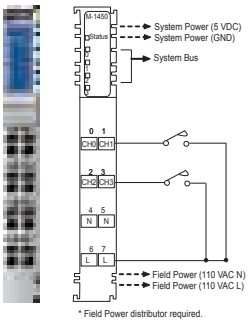


M-1601: 16 digital inputs, source, 24 VDC

Inputs per Module: 16 channels, source type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ. 1.5 ms
Common Type: 16 channels for 2 COMs
Power Consumption: 40 mA @ 5 VDC

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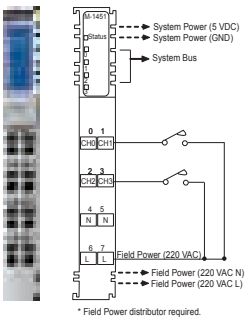
4-channel AC digital input modules



M-1450: 4 digital inputs, 110 VAC

Inputs per Module: 4 channels
On-state Voltage: 120 VAC nominal, min. 85 VAC to max. 132 VAC
Min. Off-state Voltage: Max. 45 VAC
On-state Current: Max. 8 mA/point @ 132 VAC
Input Impedance: Typ. 11K ohms
Common Type: 4 channels for 2 COMs (single common)
Power Consumption: 35 mA @ 5 VDC

c UL us LISTED CE



M-1451: 4 digital inputs, 220 VAC

Inputs per Module: 4 channels
On-state Voltage: 240 VAC nominal, min. 170 VAC to max. 264 VAC
Min. Off-state Voltage: Max. 45 VAC
On-state Current: Max. 12 mA/point @ 264 VAC
Input Impedance: Typ. 22K ohms
Common Type: 4 channels for 2 COMs (single common)
Power Consumption: 35 mA @ 5 VDC

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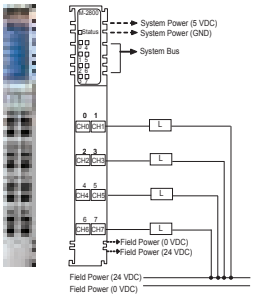
Ordering Information

		DC-Digital Input Modules				AC-Digital Input Modules	
Specs	Model	M-1800	M-1801	M-1600	M-1601	M-1450	M-1451
	Channels	8	8	16	16	4	4
	Sink/Source	Sink	Source	Sink	Source	–	–
	Connector	RTB	RTB	20-pin	20-pin	RTB	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	110 VAC	220 VAC
	Isolation	Optical Isolation					



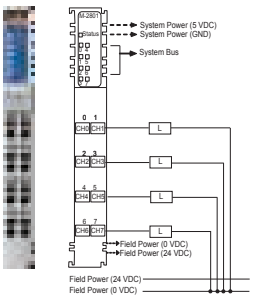
Digital Output Modules

8-channel 24 VDC digital output modules



M-2800: 8 digital outputs, sink, 24 VDC, 0.5 A

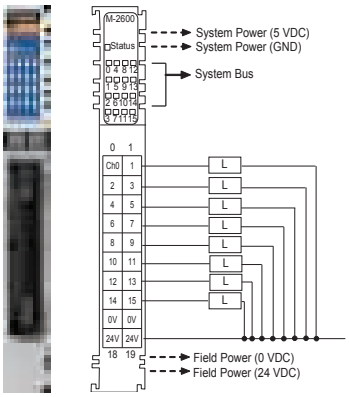
Outputs per Module: 8 channels, sink type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating: Max. 0.5 A per channel
Common Type: 8 channels per external common (single common)
Power Consumption: 60 mA @ 5 VDC



M-2801: 8 digital outputs, source, 24 VDC, 0.5 A

Outputs per Module: 8 channels, source type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating: Max. 0.5 A per channel
Common Type: 8 channels per external common (single common)
Power Consumption: 60 mA @ 5 VDC

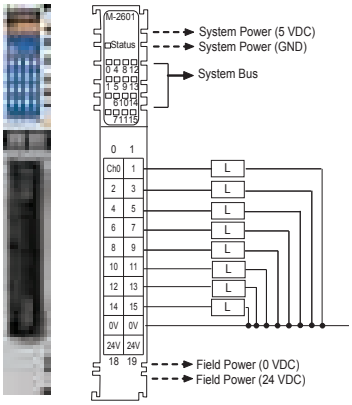
16-channel digital output modules



M-2600: 16 digital outputs, sink, 24 VDC, 0.3 A

Outputs per Module: 16 channels, sink type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating:
- Max. 0.3 A per channel
- Max. 4 A per common

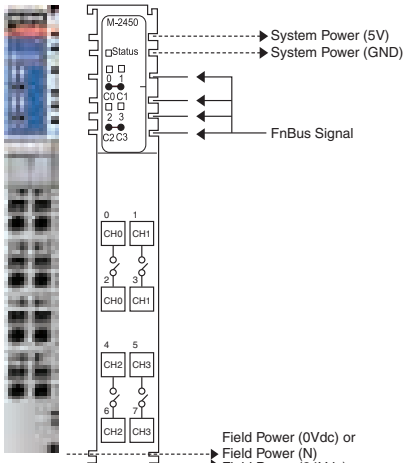
Common Type: 16 channels for 2 COMs (single common)
Power Consumption: 80 mA @ 5 VDC



M-2601: 16 digital outputs, source, 24 VDC, 0.3 A

Outputs per Module: 16 channels, source type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating:
• Max. 0.3 A per channel
• Max. 4 A per common
Common Type: 16 channels for 2 COMs (single common)
Power Consumption: 80 mA @ 5 VDC

4-channel relay output modules



M-2450: 4 relay outputs, 24-VDC/230-VAC, 2 A

Outputs per Module: 4 channels, relay
Relay Type:
• Form A, Normally Open (N.O.)
• Single Pole, Single Throw (SPST)
Output Voltage Range: Load dependent
• 5 to 28.8 VDC @ 2 A resistive
• 48 VDC @ 0.8 A resistive
• 110 VDC @ 0.3 A resistive
• 250 VAC @ 2 A resistive
Output Current Rating: At rated power
• 2 A @ 5 to 28.8 VDC
• 0.8 A @ 48 VDC
• 0.5 A @ 110 VDC
• 2 A @ 250 VAC
Min. Load: 100 μA, 100 m VDC per point
Max. On-state Voltage Drop: 0.5 V @ 2 A, resistive load, 24 VDC
Off-state Leakage Current: Max. 1.5 mA
Common Type: 1 channel for 1 COM
Power Consumption: 130 mA @ 5 VDC

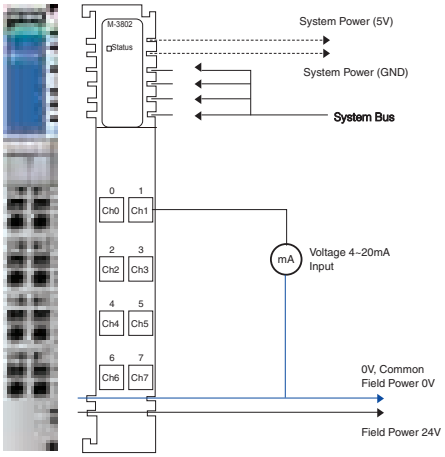
Ordering Information

Digital Output Modules						
Specs	Model	M-2800	M-2801	M-2600	M-2601	M-2450
	Channels	8	8	16	16	4
	Sink/Source	Sink	Source	Sink	Source	Relay
	Connector	RTB	RTB	20-pin	20-pin	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	230 VAC/ 24 VDC
	Current	0.5 A	0.5 A	0.3 A	0.3 A	2.0 A
	Isolation	Optical isolation				
	Diagnostics	–	–	–	–	–



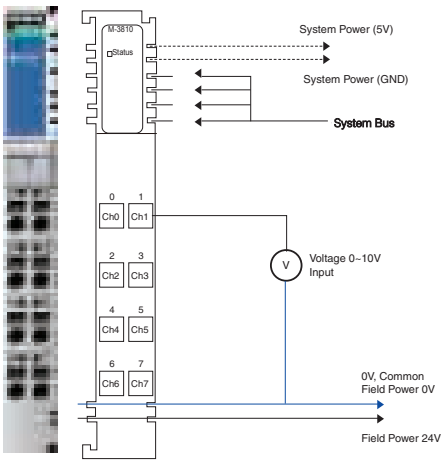
Analog Input Modules

8-channel analog input modules, 12-bit resolution



M-3802: 8 analog inputs, 4 to 20 mA, 12 bits

Resolution in Ranges: 12 bits, 3.91 μA/bit
Input Current Range: 4 to 20 mA (single-ended)
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Input Impedance: 120 ohms
Conversion Time: 4 ms for all channels
Power Consumption: 80 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14



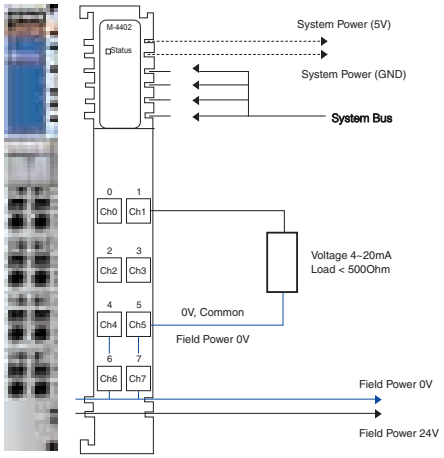
M-3810: 8 analog inputs, 0 to 10 V, 12 bits

Resolution in Ranges: 12 bits, 2.44 mV/bit
Input Current Range: 0 to 10 VDC (single-ended)
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Input Impedance: 500K ohms
Conversion Time: 4 ms for all channels
Power Consumption: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14



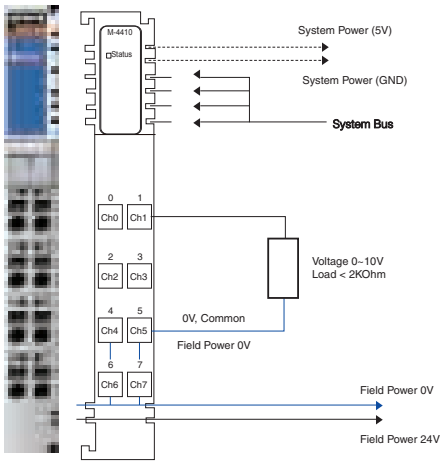
Analog Output Modules

4-channel analog output modules, 12-bit resolution



M-4402: 4 analog outputs, 4 to 20 mA, 12 bits

Resolution in Ranges: 12 bits, 3.91 μA/bit
Output Current Range: 4 to 20 mA
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Output Impedance: Max. 500 ohms
Conversion Time: 2 ms for all channels
Power Consumption: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14



M-4410: 4 analog outputs, 0 to 10 V, 12 bits

Resolution in Ranges: 12 bits, 2.44 mV/bit
Output Current Range: 0 to 10 VDC
Data Format: 16-bit integer (2's complement)
Accuracy:
• ±0.1%, FSR @ 25°C
• ±0.3%, FSR @ 0°C, 60°C
Output Impedance: Max. 5K ohms
Conversion Time: 2 ms for all channels
Power Consumption: 60 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14

Ordering Information

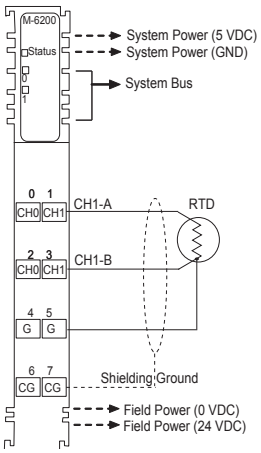
Analog Output Modules			
Specs	Model	M-4402	M-4410
	Channels	4	4
	Current	4 to 20 mA	–
	Voltage	–	0 to 10 V
	Connector	RTB	RTB
	Resolution	12-bit	12-bit
	Isolation	Optical Isolation	



Temperature Input Modules

2-channel temperature input modules, RTD or thermocouple input





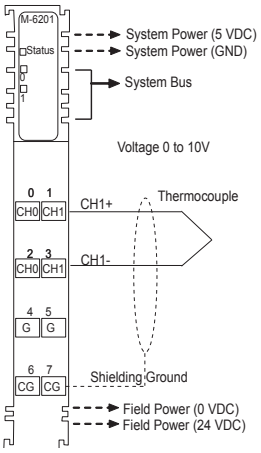
M-6200: 2 analog inputs, RTD: PT100, JPT100

Sensor Types:
- PT50, PT100, PT200, PT500, PT1000 (resistance 100 milli-ohms/bit)
- JPT100, JPT200, JPT500, JPT1000 (resistance 10 milli-ohms/bit)
- NI100, NI200, NI500, NI1000, NI120, CU10 (resistance 20 milli-ohms/bit)

Resolution: 0.1°C/10 milli-ohms
Data Format: 16-bit integer (2's complement)
Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Input Impedance: 500K ohms
Conversion Time: 200 ms for all channels
Diagnostics: Range over (if range over, data=Dx8000)
Power Consumption: 80 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14





M-6201: 2 analog inputs, thermocouple

Sensor Types:
Type J/K/T/E/R/S/B/N/L/U/C/D
(mV input 10 µV/bit, 2 µV/bit)
Resolution: 0.1°C/10 µV
Data Format: 16-bit integer (2's complement)
Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Input Impedance: 500K ohms
Conversion Time: 200 ms for all channels
Diagnostics: Range over (if range over, data=Dx8000)
Power Consumption: 80 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14

Ordering Information

Analog Input Modules					
Specs	Model	M-3802	M-3810	M-6200	M-6201
	Channels	8	8	2	2
	Current	4 to 20 mA	–	–	–
	Voltage	–	0 to 10 V	–	–
	Connector	RTB	RTB	RTB	RTB
	Resolution	12-bit	12-bit	–	–
	Isolation	Optical isolation			
	Sensor Input	–	–	RTD (ohm)	Thermo-couple (mV)

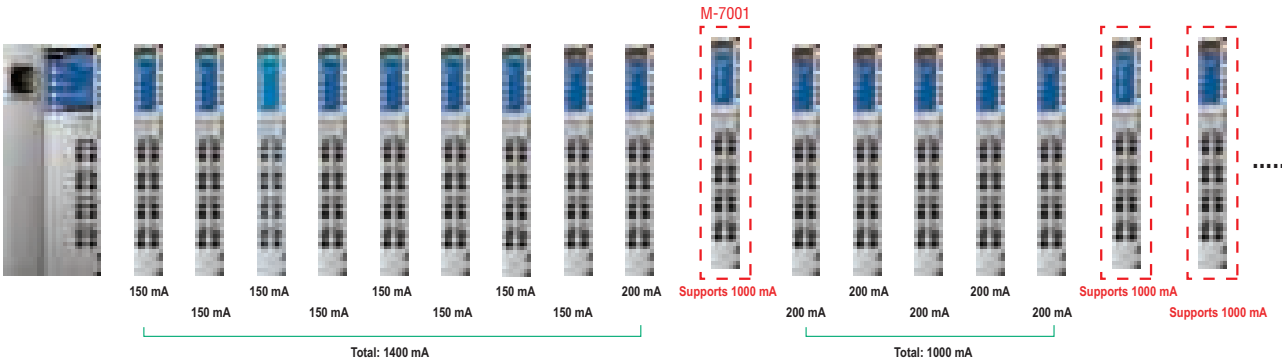


Power Modules

When to Use a Power Module

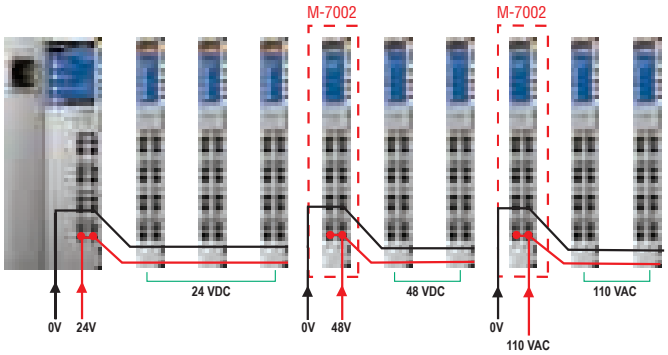
System Power Distributor

The system power expansion module is designed to provide extra power for connected I/O expansion modules. Each NA-4000 series network adaptor can provide 1.5 A @ 5 VDC. If you need more power for your installed I/O expansion modules, you will need to use an M-7001 module. However, note that the M-7001 can only provide 1 A @ 5 VDC.



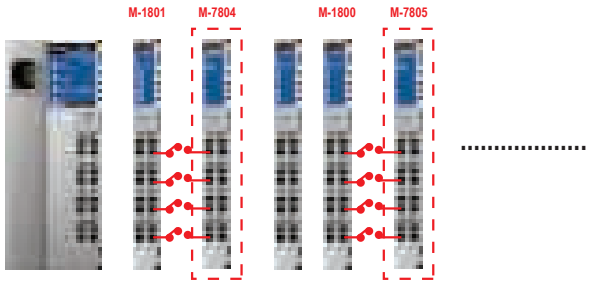
Field Power Distributor

The field power distributor is designed to isolate different field voltages. For example, before you connect a 48 VDC or 110 VAC DI/O module to a 24 VDC DI/O module, you will need an M-7002 field power distributor.



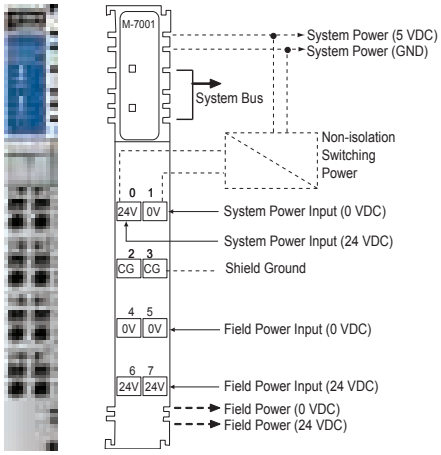
Potential Power Distributor

There are three types of potential distributor modules that provide extra wiring points, such as shielding ground, 0 V field power, and 24 V field power. For example, the 8-channel digital input (sink type) module by itself does not have a 24 V wiring point. In this case, you can add an M-7805 for easier wiring.



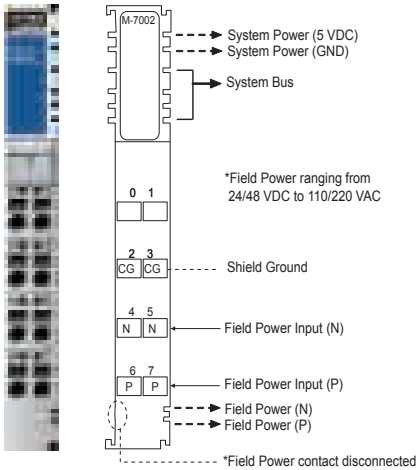
Power Modules

M-7001: System power module



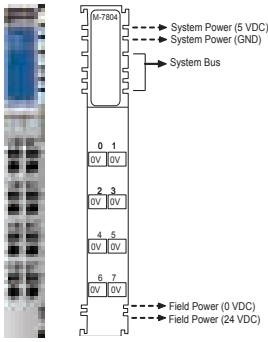
- **System Input Voltage:** 24 VDC, 11 to 28.8 VDC
- **Field Power Input Voltage:** 24 VDC (±20%)
- **Current for I/O Modules:** 1 A @ 5 VDC (Max.)
- **System Bus Output Voltage:** 5 VDC (Max.)
- **Field Power Contacts Current:** 10 A (Max.)

M-7002: Field power module



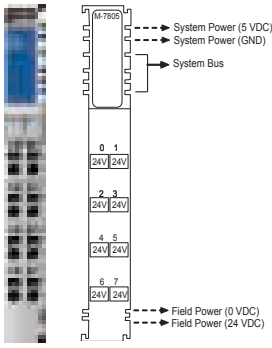
- **Field Power Input Voltage:**
  DC: 5 VDC, 24 VDC, 48 VDC
  AC: 110 VAC, 220 VAC
- **Current for Field Power Contacts:** 10 A (Max.)

M-7804: 0 VDC



Channels: 8
Mode: 0 VDC

M-7805: 24 VDC

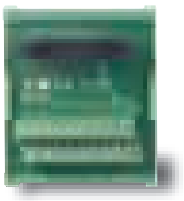


Channels: 8
Mode: 24 VDC

Ordering Information

Power Modules					
Specs	Model	M-7001	M-7002	M-7804	M-7805
	Channels	0	0	8	8
	Voltage	24 VDC	DC: 5, 24, 48 VDC AC: 110/220 VAC	0 VDC	24 VDC
	Purpose	System Power	Field Power	Field Power	Field Power

Modular I/O Accessories



TB 1600 DIN-Rail mounting screw terminal module with 20-pin connector

- 20 pins, one-to-one assignment
- Connector pitch: 3.81 mm
- DIN-Rail mounting type
- Dimensions: 77.5 x 67.5 x 51 mm (3.05 x 2.66 x 2.01 in)
- RoHS compliant



20-to-20-pin flat cable

- Connects between the TB 1600 and ioLogik 4000 series
- Length: 500 mm
- Number of Pins: 20



M-8001-PK Removable terminal block

- Terminal block for the ioLogik 4000 series
- Packaging: 9 pcs in one box



M-8003-PK Marker with 0 to 9 numbering

M-8004-PK Blank marker

- Marker for the ioLogik 4000 series
- Packaging: 100 pcs in one box

Ordering Information

- **TB 1600:** DIN-Rail mounting screw terminal module with 20-pin connector
- **20-to-20-pin flate cable:** 20-pin to 20-pin flat cable, 500 mm
- **M-8001-PK:** Removable terminal block, 9 pcs per pack
- **M-8003-PK:** Marker with 0 to 9 numbering, white color, 100 pcs
- **M-8004-PK:** Blank marker, 100 pcs



Automation Software

Automation Software

Active OPC Server Lite: Seamlessly connect ioLogik / ioPAC to your SCADA system. 15-2

DA-Center: Ready-to-run data gateway between remote devices and databases 15-5



Active OPC Server Lite

Seamlessly connect ioLogik / ioPAC to your SCADA system



- Patented event-driven tag update
  - I/O response that's 7 times faster
  - Save 80% on network bandwidth
- Firewall-friendly connection from remote ioLogik/ioPAC devices
  - Allows remote ioLogik/ioPAC units to use dynamic IPs
  - Allows remote ioLogik/ioPAC units to use private IPs
- Download free from Moxa's website
- OPC DA 3.0 supported

Introduction

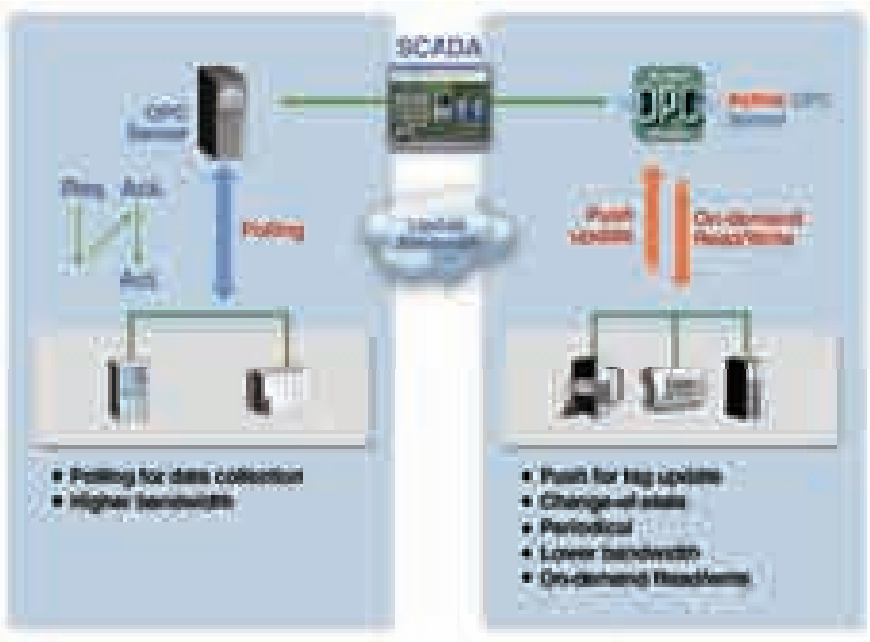
Active OPC Server Lite is a software package provided by Moxa that operates as an OPC driver for an HMI or SCADA system. It offers seamless connection from Moxa's ioLogik/ioPAC series products to popular SCADA systems, such as Wonderware, Citect, and iFix. Active OPC Server Lite meets the latest standard of OPC DA 3.0, which allows connections to various kinds of devices and host OPC machines.

Patented, Active Remote Data Acquisition

General OPC servers typically use the "poll/response," or so-called "pull" architecture, to connect to controllers or data acquisition devices, which involves an HMI/SCADA system continuously sending out commands to collect relevant data. Moxa's Active OPC Server, with its non-polling architecture, supports the standard OPC protocol, but also offers active (or "push") communication with Moxa's ioLogik/ioPAC series of RTU controller and remote I/O to HMI/SCADA systems, providing instant I/O status reports. This "active" technology makes data acquisition more efficient, especially when bandwidth is not that high (e.g., land lines, cellular, or via satellite) and the devices and sensors are located at the remote site.

OPC to Device Connection

	Active Technology	Traditional Polling
Response Time	Event-triggered, faster response	Need to wait for polling and timeout, slower
Bandwidth Usage	Lower	Higher
Internet Friendship	Support Dynamic, and Private IP Address for DAQ device	Requires fixed IP and Public IP Address



I/O Response that's 7 Times Faster and Provides 80% off Bandwidth Usage with Event-driven Tag Updates

Adding additional I/O channels will tend to bog down an HMI/SCADA system's operation, resulting in a longer response time and high network bandwidth occupation, all because of the traditional "pull" architecture. Active tags created by Active OPC Server Lite and ioLogik/ioPAC series products report the I/O status only by event, which means that the I/O status will be updated to the Active OPC Server when there is an I/O status change, a pre-configured interval is reached, or when requested by the user. The heartbeat design also checks if the connection is alive or not, preventing from no updates from the remote ioLogik/ioPAC devices.



This type of event-driven tag status update results in an I/O response time that is 7 times faster than other OPC Server packages (using a testing environment with 2,560 I/O channels). In a different test of network bandwidth usage, Active OPC Server Lite and the ioLogik/ioPAC caused an apparent 80% reduction in network traffic. The end result is that I/O access is more precise, and the cost of communicating with remote I/O devices is substantially lower, especially when the remote site has limited bandwidth (e.g., satellite, microwave, and cellular communication). At the same time, the CPU usage of the SCADA/HMI system is also reduced by 35% with this innovative push-based architecture, so that less maintenance effort and lower level hardware devices can be implemented.

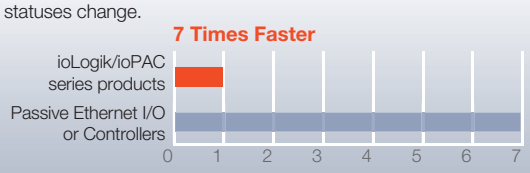
Test I: Network Traffic Comparison

This test used 32 ioLogik E2210 units with 640 DI/O points. As shown in the figure, ioLogik/ioPAC series products can save 80% on bandwidth consumption compared to passive I/O or controllers.



Test II: Response Time for I/O Status

This test used 128 ioLogik E2210 units with 2,560 I/O points. As shown in the figure, the active architecture is 7 times faster than the passive architecture in response time when the I/O or controllers statuses change.



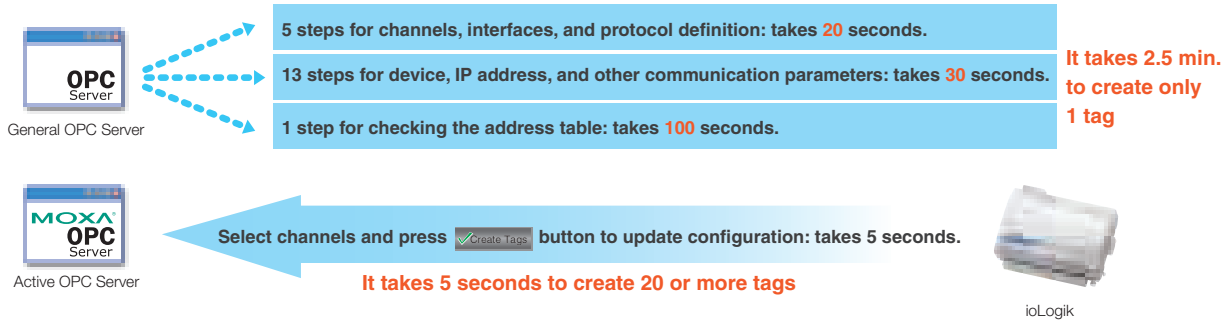
Solving the Dynamic/Private IP Issue on a Mobile Device or with Cellular Networking

Dynamic/private IP addresses are usually used for remote data acquisition devices, especially when connecting via cellular networks. Active OPC Server Lite and ioLogik/ioPAC products provide the flexibility of configuring the ioLogik/ioPAC to use dynamic IP addresses. The ioLogik/ioPAC connects directly to the Active OPC Server Lite instead of being polled, which makes dynamic IP addressing and WAN Access to the RTU and remote I/O device possible, and adds even greater flexibility by allowing connections across firewalls. I/O devices for traditional data acquisition applications are not capable of using this approach.



Automatic Tag Generation

Active OPC Server Lite and ioLogik/ioPAC series products support "Auto Tag Generation," which eliminates the headache of specifying target IP addresses, I/O channels, and data formats one by one, or editing and importing configuration text files, since Active OPC Server Lite creates the tags for the target ioLogik/ioPAC automatically. Simply select the channels that you need to update, and the tags are generated and configured automatically. Generally speaking, tag generation is 50 times faster with Active OPC Server Lite than with traditional OPC server packages. One of the biggest payoffs is that users will no longer need to be trained to install and configure your OPC.



Specifications

Hardware Requirements

CPU: Intel Pentium (Pentium 4 or above)
RAM: 512 MB (1024 MB recommended)
Network Interface: 10/100M Ethernet

Software Requirements

Operating System: Microsoft Windows 2000/XP/2003
Editor (optional): Microsoft Office 2003 (Access 2003) or above

OPC Server Specifications

OPC Data Access: 1.0a, 2.0, 2.05a, 3.0
Max. No. of Tags: 1200 (V1.7 and above)

Ordering Information

Available Models

Active OPC Server Lite: Free software package for integrating with SCADA/HMI systems

Can be used with the following products

ioLogik E1200 Series: Ethernet remote I/O
ioLogik E2200 Series: Ethernet micro RTU controller
ioLogik E4200: Modular Ethernet remote I/O
ioLogik W5300 Series: Cellular micro RTU controller
ioPAC 8000 Series: Modular RTU controller (C and ISaGRAF Models)

DA-Center

Ready-to-run data gateway between remote devices and databases



- Convert field data to ODBC compliant databases
- Convert field data to Excel or Access spreadsheets
- Flexible dataset configuration for connecting to multiple remote devices
- Embedded trend charts for historical analysis

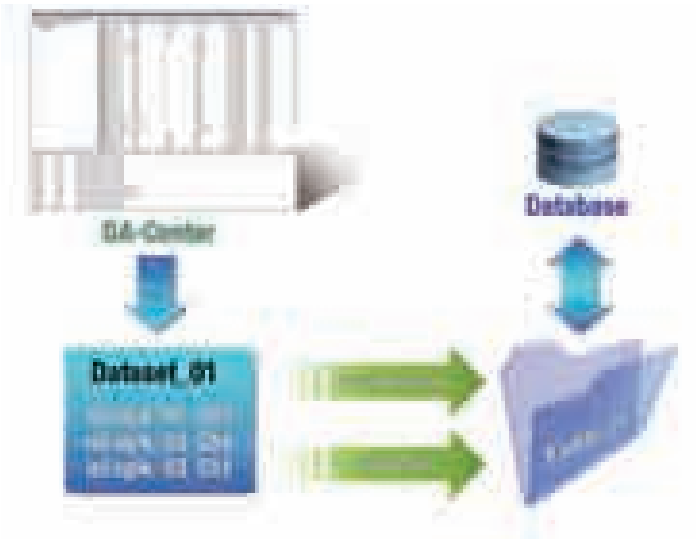
Introduction

In most remote data acquisition applications, users need additional human resources to collect data manually from remote storage and also to perform data logging and other analyses during daily operations. Moxa DA-Center, a ready-to-run data gateway, makes it must easier to perform these types of tasks. DA-Center provides a standard OPC interface that interacts with Moxa Active OPC Server for real-time data collection. The interface acts as bridge between field data and IT databases or spreadsheets, and a trend chart tool is also provided to perform historical analysis.



Smart Dataset Configuration to Log Multiple Devices and Channels at the Same Time

A DA-Center dataset defines an integration of selected tags from Active OPC Server, and converts this set of tags into tabular format for export to a database or spreadsheet. In other words, a dataset combines the selected remote I/O channels for different ioLogik/ ioPAC devices for application use. The mapping of the dataset to the database or spreadsheet can be configured to update automatically when there is a change in the mapped I/O channels, or periodically.



Embedded Trend Chart for Easy Historical Data Analysis

The DA-Center package includes several trend charts for historical data analysis. Users can retrieve data from a database table or a spreadsheet and convert it into chart format. In addition, charts can be zoomed in or out along the different axes, making it extremely easy to display and analyze historical data.



Specifications

Hardware Requirements

CPU: Intel Pentium (Pentium 4 or above)
RAM: 512 MB (1024 MB recommended)
Network Interface: 10/100M Ethernet

Software Requirements

Operating System: Microsoft Windows 2000/XP/2003

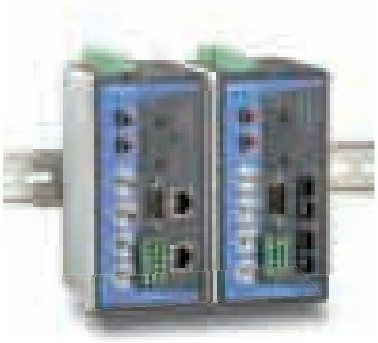
Ordering Information

Available Models

DA-Center: Free software package for integrating with Active OPC Server Lite

Can be used with the following products

ioLogik E1200 Series: Ethernet remote I/O
ioLogik E2200 Series: Ethernet micro RTU controller
ioLogik E4200: Modular Ethernet remote I/O
ioLogik W5300 Series: Cellular micro RTU controller
ioPAC 8000 Series: Modular RTU controller (C and ISaGRAF Models)



IP Surveillance

Product Selection Guide

Video Networking Products 16-2

Introduction

Introduction to Industrial Video Networking 16-4

Video Servers

VPort 461 Series: Excellent video performance, 1-channel H.264/MJPEG industrial video encoders 16-9
VPort 451 Series: Multiple stream, 1-channel MJPEG/MPEG4 industrial video encoders. 16-11
VPort 351 Series: Full motion, 1-channel MJPEG/MPEG4 industrial video encoders 16-13
VPort 251: Full motion, 1-channel MJPEG/MPEG4 video encoder 16-15
VPort 364 Series: Excellent video quality, 4-channel H.264/MJPEG industrial video encoders. 16-17
VPort 354 Series: Full motion, 4-channel MJPEG/MPEG4 industrial video encoders 16-19
VPort 254 Series: Rugged 4-channel MJPEG/MPEG4 industrial video encoders 16-21
VPort D361 Series: 1-channel H.264/MJPEG industrial video decoder 16-23
VPort D351: 1-channel MJPEG/MPEG4 industrial video decoder 16-25

IP Cameras

VPort 16-M12 Series: EN50155 compliance, High quality CCD image, compact IP cameras. 16-27

Multi-service Gateways

VPort 704-T: 4-slot modular industrial multi-service gateway 16-29
VPM-7304: 4-port MPEG4/MJPEG video encoder module for the VPort 700 series 16-31
VPM-7704: 4-port RS-232/422/485 serial device server module for the VPort 700 series 16-32

Industrial Video Recorder

MxNVR-IA8 Series: 8-channel industrial network video recorder for harsh environments 16-33

IP Surveillance Software

SoftNVR-IA: 32-channel IP video surveillance software for industrial automation systems 16-35
SoftNVR: Expandable IP surveillance software for managing up to 64 video channels 16-38
VPort SDK PLUS: User-friendly software development kits 16-40
VPort Video Gadget: Coding-free programming method specially designed for SCADA systems 16-41



Video Networking Products

	Industrial Video Encoders						
							
	VPort 364	VPort 354	VPort 254	VPort 461	VPort 451	VPort 351	VPort 251
Form Factor							
Protection Rating	IP30	IP30	IP30	IP30	IP30	IP30	–
DIN-Rail Mounting	✓	✓	✓	✓	✓	✓	w/ optional kit
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	✓
Audio/Video Channels							
Video Inputs	4	4	4	1	1	1	1
Video Outputs	0	0	0	0	0	1	0
Audio Inputs	1	1	1	1	1	1	1
Audio Outputs	1	1	1	1	1	1	1
Video Stream							
H.264	✓	–	–	✓	–	–	–
MJPEG	✓	✓	✓	✓	✓	✓	✓
MPEG4	–	✓	✓	–	✓	✓	✓
No. of Streams	2	2	1	3	3	1	1
DynaStream	✓	–	–	✓	–	–	–
Video Performance							
Max. Resolution	NTSC: 720 x 480 PAL: 720 x 576	NTSC: 704 x 480 PAL: 704 x 576	NTSC: 720 x 480 PAL: 720 x 576	NTSC: 720 x 480 PAL: 720 x 576	NTSC: 720 x 480 PAL: 720 x 576	NTSC: 720 x 480 PAL: 720 x 576	NTSC: 720 x 480 PAL: 720 x 576
Max. FPS	NTSC: 30 PAL: 25	NTSC: 30 PAL: 25	NTSC: 30 (at CIF) PAL: 25 (at CIF)	NTSC: 30 PAL: 25	NTSC: 30 PAL: 25	NTSC: 30 PAL: 25	NTSC: 30 PAL: 25
Quad View	30 FPS (max.)	30 FPS (max.)	30 FPS (max.)	–	–	–	–
Connections (Max.)	8 unitcast 50 mulitcast RTSP	8 unitcast 12 mulitcast RTSP	8 unitcast 12 mulitcast RTSP	10 unitcast 50 mulitcast RTSP	10 unitcast 50 mulitcast RTSP	10 unicast 20 mulitcast RTSP	10 unicast 20 mulitcast RTSP
Multicast Push	✓	✓	✓	✓	✓	–	–
Network Connections							
10/100BaseT(X) Ports	1	2	1	2	2	1	1
100BaseFX Ports (optional)	1	2	1	–	–	1	–
Peripherals							
PTZ Ports	1	1	1	1	1	1	1
COM Ports	–	1	1	1	1	–	–
RS-232 Console Ports	1	1	1	1	1	1	1
SDHC Slot	–	1	–	1	1	–	–
Network Management and Control							
Web Browser	✓	✓	✓	✓	✓	✓	✓
SNMP Protocols	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3	v1/v2c/v3
RTSP (Real Time Streaming Protocol)	✓	✓	✓	✓	✓	✓	✓
Modbus/TCP	✓	✓	✓	✓	✓	–	–
Multicast (IGMP)	v3	v3	v3	v3	v3	v3	v3
QoS	✓	✓	✓	✓	✓	✓	✓
UPnP	✓	✓	✓	✓	✓	✓	✓
DDNS	✓	✓	✓	✓	✓	✓	✓
IP Filtering	✓	✓	✓	✓	✓	✓	✓
Power Requirements							
Power Redundancy	✓	✓	✓	✓	✓	✓	–
Power Inputs	2	2	2	2	2	2	1
Power Outputs	0	0	0	0	0	0	1
Alarms							
VMD (Video Motion Detection)	✓	✓	–	✓	✓	✓	✓
Digital Inputs	4	4	4	2	2	2	1
Relay (Digital) Outputs	2	2	2	2	2	2	1
Alarm Video Recording	–	–	–	–	–	✓	–
Alarm Snapshot Image	✓	✓	✓	✓	✓	✓	✓
Supported Operating Temperature Ranges							
0 to 60°C	✓	✓	✓	✓	✓	✓	✓
-30 to 70°C	–	✓	–	–	–	–	–
-40 to 75°C	✓	–	✓	✓	✓	✓	–
Standards and Certifications							
CE/FCC	✓	✓	✓	✓	✓	✓	✓
UL 508	–	–	✓	–	–	✓	–
Class I Div. 2	–	–	–	–	–	UL/cUL Class I Division 2 Groups A/B/C/D	–
DNV	–	–	–	–	–	✓	–

Video Networking Products

Industrial Video Decoders



	VPort D351	VPort D361
Form Factor		
Protection Rating	IP30	IP30
DIN-Rail Mounting	✓	✓
Panel Mounting	w/ optional kit	w/ optional kit
Audio/Video Channels		
Video Inputs	0	0
Video Outputs	1	1
Audio Inputs	1	1
Audio Outputs	1	1
Video Stream		
H.264	–	✓
MJPEG	✓	✓
MPEG4	✓	–
Network Connections		
10/100BaseT(X) Ports	1	1
Peripherals		
PTZ Ports	1	1
RS-232 Console Ports	1	1
Network Management and Control		
Web Browser	✓	✓
SNMP Protocols	v1/v2c/v3	v1/v2c/v3
RTSP (Real Time Streaming Protocol)	✓	✓
Modbus/TCP	–	✓
UPnP	✓	✓
DDNS	✓	✓
IP Filtering	✓	✓
Power Requirements		
Power Redundancy	✓	–
Power Inputs	2	1
Power Outputs	0	0
Alarms		
Digital Inputs	2	2
Relay (Digital) Outputs	2	2
Supported Operating Temperature Ranges		
0 to 60°C	✓	✓
-40 to 75°C	–	✓
Standards and Certifications		
CE/FCC	✓	✓
UL 508	✓	–

Network Video Recorders



	MxNVR-IA8
Form Factor	
Size	19", 1 U height
Rackmount	✓
Video Recording	
Video Channels	8
Capability	• Up to 240 FPS at 720x480 video resolutions; • Up to 200 FPS at 720x576 video resolutions;
Video Streams	H.264, MJPEG, MPEG4
Video File Format	AVI
Recording Modes	Manual, Scheduled Event
Pre-alarm Recording	Up to 30 sec
Post-alarm Recording	Up to 60 sec
Search	
Search Modes	Camera, Date/Time, Event
Playback	
Remote Playback	Web browser, client software
File Download	FTP
Polular Media Player	Requires FFDshow
Network Connections	
10/100/1000BaseT(X) Ports	1
Storage	
SATA Interfaces	2 (2.5")
Network Management and Control	
Web Browser	✓
SNMP Protocols	v1/v2c/v3
RTSP (Real Time Streaming Protocol)	✓
Modbus/TCP	✓
Multicast (IGMP)	v3
QoS	✓
UPnP	✓
DDNS	✓
IP Filtering	✓
802.1X	✓
Connections	10
Peripherals	
COM Ports	2
USB Ports	1
Digital Inputs	6
Digital Outputs	2
Power Requirements	
Power Inputs	1
Supported Operating Temperature Ranges	
0 to 60°C	✓
-40 to 75°C	✓
Regulatory Approvals	
CE/FCC	✓
UL 60950-1	✓

IP Cameras



	VPort 16-M12
Form Factor	
Protection Rating	IP66
Surface/Ceiling Mounting	✓
Embedded Mount	✓
Camera	
Image Sensor	1/3" CCD
Modulation	NTSC/PAL
Lens (mm)	3.0, 3.6, 6.0, 8.0, 16
Minimum Illumination	0.02 Lux @ F2.0, color
Horizontal Resolution	540 TVL
White Balance	ATW/AWC
Electronic Shutter	Auto (NTSC: 1/60 to 1/120,000 sec PAL:1/50 to 1/120,000 sec)
Slow Shutter	✓
AGC Control	✓
Backlight Compensation	✓
Flicker Control	✓
Auto Exposure	✓
Image Rotation	Flip, mirror, and 180° rotation
3D-deinterlace	✓
Video Stream	
H.264	✓
MJPEG	✓
No. of Streams	3
DynaStream	✓
Video Performance	
Max. Resolution	800 x 600
Max. FPS	NTSC: 30 PAL: 25
Connections (Max.)	8 unitcast 50 mulitcast RTSP
Multicast Push	✓
Network Connections	
10/100 Mbps, M12 Connector	1
Peripherals	
SDHC Slots	1
Network Management and Control	
Web Browser	✓
SNMP Protocols	v1/v2c/v3
RTSP (Real Time Streaming Protocol)	✓
Multicast (IGMP)	v3
QoS	✓
UPnP	✓
DDNS	✓
IP Filtering	✓
Automatic Configuration	DHCP Opt 66/67
Power Requirements	
Power-over-Ethernet (PoE)	✓
Alarms	
VMD (Video Motion Detection)	✓
Alarm Snapshot Image	✓
Supported Operating Temperature Ranges	
-25 to 55°C	✓
Regulatory Approvals	
CE/FCC	✓
UL 508	Pending
EN 50155:2007	✓

Industrial Video Networking

Empower Your Video Network System with Industrial-grade Reliability

Leading the Industrial IP Video Revolution

Thanks to the ever-increasing popularity of IP networks, transmitting video, voice, and data simultaneously over Ethernet networks, and even over the Internet, is now standard at locations around the world. Because of this, CCTV surveillance systems are also becoming more commonplace. Versatile and advanced video digitization and compression technologies, such as MJPEG, MPEGx, and H.264, make it possible to migrate CCTV surveillance systems to IP-based platforms. This means that IP video solutions, which include IP cameras, video servers, and NVRs (Network Video Recorders), are used by some of the hottest products in the CCTV surveillance market. However, most IP video solutions on the market today are designed for general purpose applications, which means they are not suitable for unpredictable industrial environments. In fact, some seemingly commonplace applications, such as road traffic control and monitoring, oil and gas refineries and pipelines, and mining pits, should be classified as industrial-grade, and as such require using rugged, well-designed video-over-IP solutions to ensure that the video surveillance system works properly. To meet these stringent requirements, Moxa's industrial video networking solutions feature an industrial-grade rugged design and extra-high reliability.



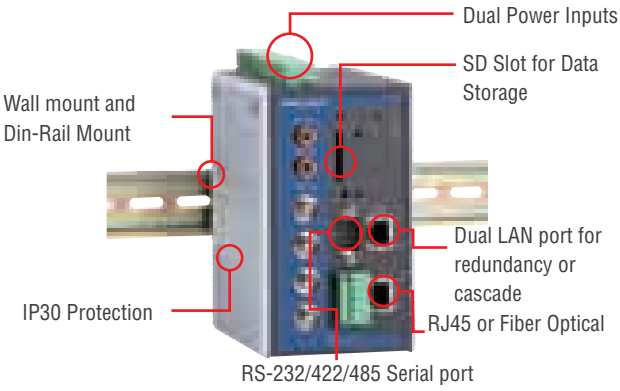
Industrial-grade Rugged Design and Reliability

Products used in industrial environments must have a rugged design to provide better protection against adverse conditions. Moxa's VPort video servers and IP cameras are designed with rugged features for outdoor or harsh environments.

VPort Industrial Video Servers

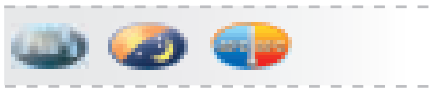
- 12/24 VDC or 24 VAC redundant power inputs
- DIN-Rail mounting and panel mounting accessories available
- IP30 protected housing
- -40 to 75°C operating temperature range for T models
- Choose either RJ45 or fiber optic Ethernet ports
- MTBF of over 200,000 hours
- Industrial EMI/ESD protection and UL508, ATEX Class 1 Div. 2 and DNV certifications

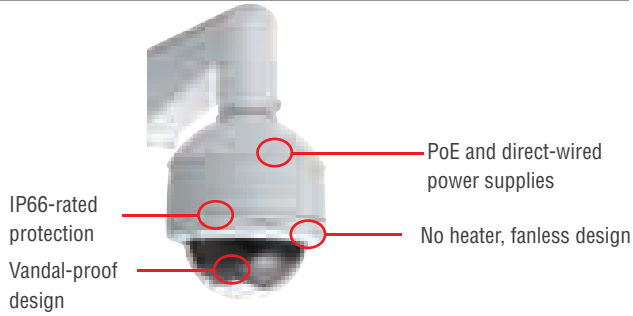




VPort IP Camera

- Wide operating temperature; heater and fan NOT required
- IP66-rated for protection from rain and dust
- PoE (Power-over-Ethernet) supported
- Vandal-proof form factor for preventing damage from unexpected external forces
- Versatile installation options for outdoor environments



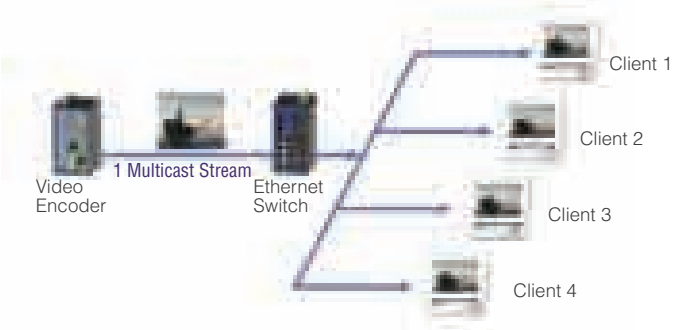


Advanced and Efficient Networking Capability

Moxa's VPort series industrial video encoders allow users to deploy video surveillance network systems with versatile network connectivity for high-performance transmissions.

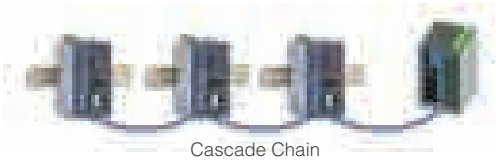
Advanced Network Protocols

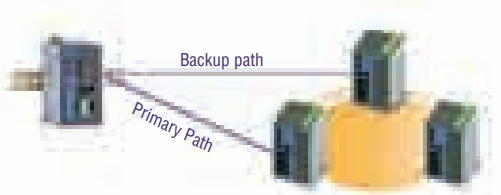
- Modbus/TCP for easy communication with SCADA software
- Standard RTSP (real-time streaming protocol) video streaming for easy integration
- Multicast (IGMP) protocols for efficient network transmission
- SNMPv1/v2c/v3 MIB-II for easy network management
- QoS (ToS) for configuring the transmission priority of video streams
- UPnP, DDNS, and IP filtering supported



Two Ethernet Ports for Cascading and Port Redundancy

Some VPort products have two built-in 10/100 Mbps Ethernet ports for cascading multiple VPort units. With the cascade feature, you'll need fewer switch ports, and also reduce your cable layout effort. In addition, Ethernet port redundancy can be used to build a backup path for video transmission in case the primary path is broken.


Cascade Chain



Port Redundancy

RS-232/422/485 COM Port for Serial-to-Ethernet Connectivity

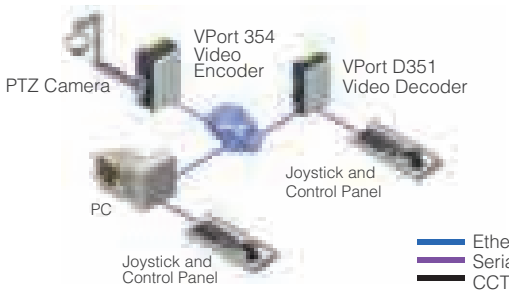
A surveillance system not only includes video cameras but also other devices, and for the convenience of connecting these devices to an IP network, some VPort products support 1 RS-232/422/485 COM port that can transmit serial data via a TCP/IP network to remote sites. By using Moxa's own Real COM technology, serial data can be converted from the IP-packet format back to the original serial data format.



☑ 3-in-1 RS-232/422/485 port
☑ Operation mode
•Real COM •TCP Server •TCP Client

Transparent PTZ Control for Easy Control of PTZ Cameras

VPort products use Moxa's Real COM technology to implement transparent communication for RS-232/422/485 PTZ control. The benefit of the transparent PTZ control function is that it eliminates the need to build the PTZ control driver into the VPort product, allowing the use of a legacy PTZ control panel or keyboard to control a PTZ camera directly.

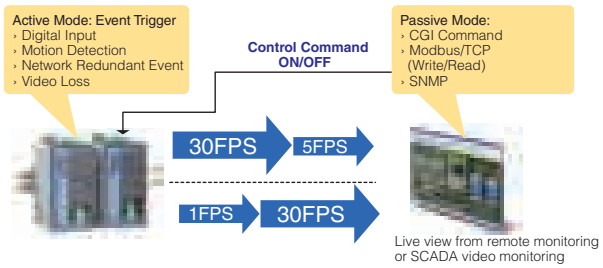


Flexible and Systematic Video Streaming Optimization

Video streaming is always an issue for IP surveillance systems due to the fact that it is related to video and network performance. For versatile video streaming requirements, Moxa's IP video solution features flexible and systematic methods for optimizing video streaming.

DynaStream™ for System and Network Efficiency

With hundreds of cameras in an integrated system with IP surveillance and other systems (such as SCADA), it is important to control the size of a video stream so that it does not flood over to the common shared network and consume too many system resources, which could disrupt critical system operation or data transmission. Moxa has developed a revolutionary DynaStream™ function, which can control the video frame rate, and has introduced it into all VPort series products automatically. Once an event is detected, such as a DI alarm, network traffic jam, etc., the system can automatically reduce all VPort's video frame rates so that they will consume fewer resources and less bandwidth, or increase all VPort's video frame rates to increase video performance. This is done with CGI commands, SNMP, or Modbus/TCP. This new tool is extremely flexible. Not only can it change system resources and network bandwidth so that critical data systems can maintain Quality of Service (QoS), in addition it can guarantee that system performance will not be impacted by video streams.



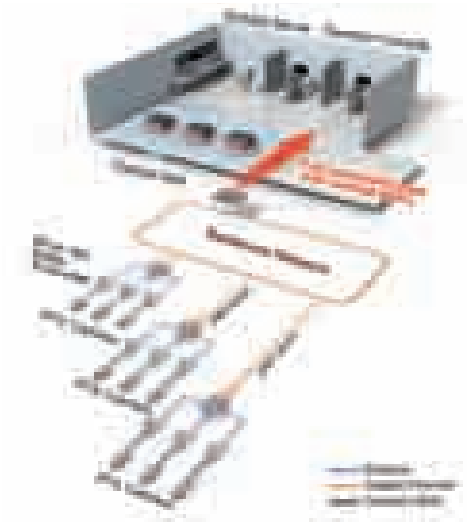
Multiple Video Streams for Versatile Applications

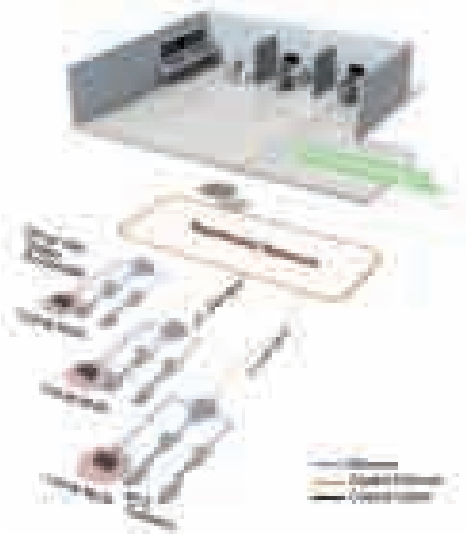
Different applications, such as live view, video recording, and image analysis, may have different video performance requirements. For this reason, Moxa's VPort products provide multiple video streams for different application requirements.



Minimize Network Bandwidth with Distributed Video Recording

Moxa provides a distributed network video recording (NVR) solution to decentralize video storage and reduce network bandwidth demands. Instead of transmitting all recorded videos to the control center, the system uses scalable NVR products at field sites for video data storage. With this distributed approach network resources are conserved, since only video data that is actually needed will be transmitted over the network. NVR, SCADA, and Center Management System (CMS) engineers can all benefit by being able to view live video feeds or playback recorded video, while leaving more bandwidth available and improving surveillance efficiency.





Activate SCADA Surveillance

Visualization using an IP surveillance system is an important and valuable tool for automation systems, which are often described as consisting of three separate layers: the information layer, the control layer, and the device layer. We have found that when integrating IP surveillance systems with automation systems, it is also useful to describe the surveillance system as consisting of three layers: the management layer, the operation layer, and the device layer. In what follows, we describe each of these layers in greater detail.

Architectural Layers of an Integrated Automated System

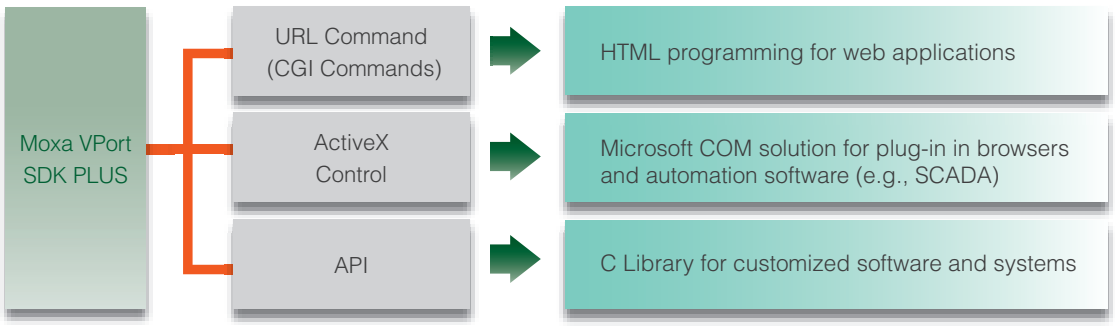


Management Layer

A video central management system, or video CMS for short, consists of a centralized network video recorder, an extreme space storage system (e.g., IP NAS), and a virtual matrix, all of which are part of the management layer. By design, the video CMS can communicate with the SCADA system to integrate event management. In addition, the video CMS can be used to collect information such as network traffic and performance reports, as well as network video recordings, from the network management system. In some cases, the video CMS will also have access to remote video devices.

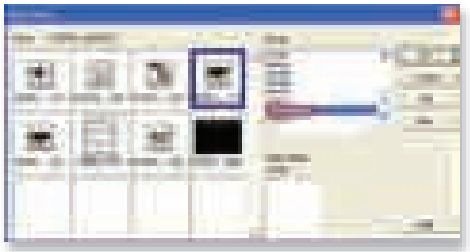
In order to streamline the process of integrating a video CMS with an automation system, Moxa provides a user-friendly software development kit, called VPort SDK PLUS, which is being used by third-part system integrators and software developers to develop special purpose video surveillance functions.

Free Software Development Kit—VPort SDK PLUS



VPort Video Gadget Tools for Embedding Video into SCADA System

Moxa's VPort SDK PLUS includes the coding-free programming tool VPort Video Gadget, which is specially designed for automation systems. The main purpose of VPort Video Gadget is to eliminate the programming effort often required when integrating IP video with a SCADA system.

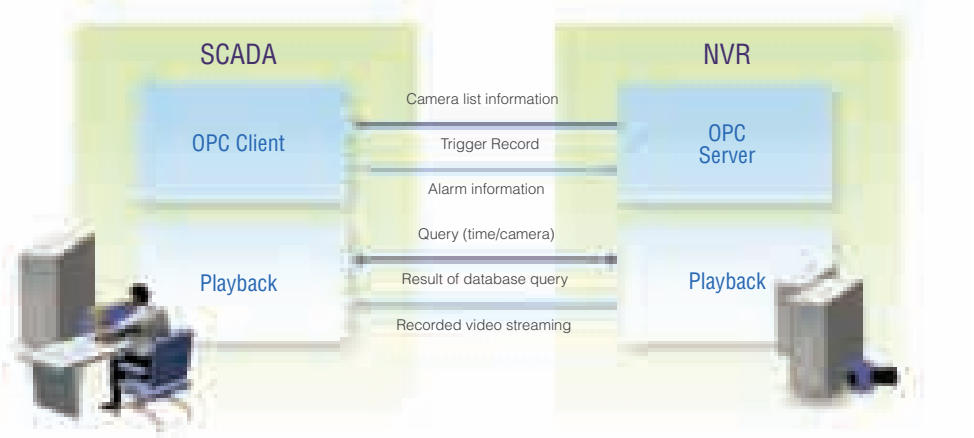


VPort Video Gadget

Operation Layer

Both the network video recorder and local operation console belong to the operation layer, which allows the SCADA system to communicate with the network video recorder to record events, analyze events, and perform other similar tasks. Since OPC (OLE for Process Control) is commonly used by automation systems to communicate with other systems, we can use OPC communication to bridge the video system with the automation system. One of the important applications of the OPC bridge is to conduct event-trigger video recording.

OPC interoperation between SCADA & NVR



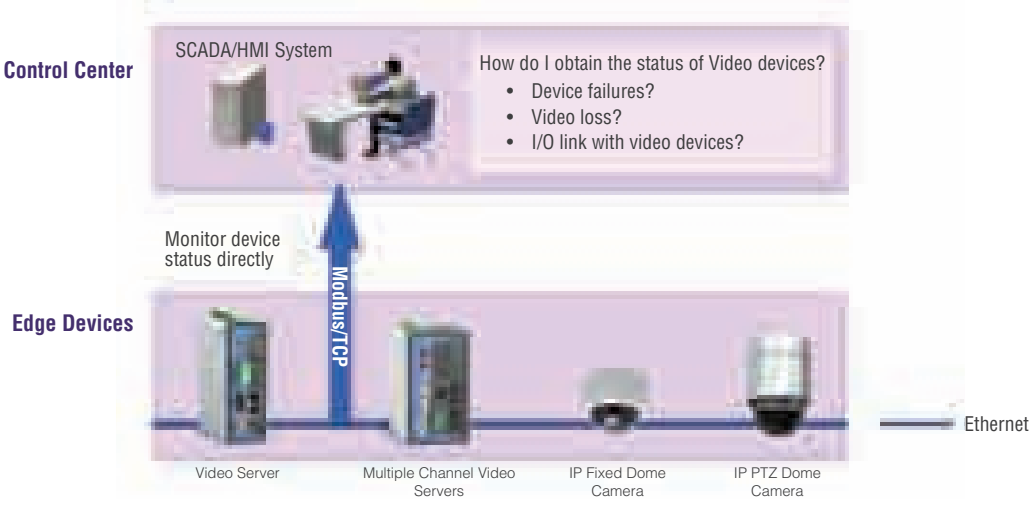
User-friendly IP Surveillance Software

SoftNVR-IA, Moxa's own 32-channel IP video surveillance software, is specially designed for industrial automation systems. The key feature of the software is a built-in OPC server, which simplifies communications with automation systems. In fact, both video recording and PTZ control can be triggered by the automation system in reaction to different types of events.



Device Layer

Many video devices, including IP cameras and analog cameras with video encoders, can be installed from the device layer. Currently, Moxa's IP video VPort series products support Modbus/TCP, which can transmit the Modbus protocol over a TCP/IP network. With Modbus/TCP support, SCADA systems and other automation management systems can include VPort products directly in their device monitoring system. Using the automation system to monitor a VPort's status makes the administrator's job that much easier.



VPort 461 Series

Excellent video performance, 1-channel H.264/MJPEG industrial video encoders



- 3 simultaneous video streams for H.264 and MJPEG
- Video latency under 200 ms
- 2 Ethernet ports for cascade and Ethernet port redundancy
- Moxa DynaStream™ function supported for network efficiency
- OnVIF supported for standardization and interoperability
- 802.1X and SSL/SSH for advanced network security
- Local storage capability with SD card slot
- Industrial design with -40 to 75°C operating temperature
- Free VPort SDK PLUS supported

Introduction

The VPort 461 1-channel industrial video encoder with H.264 video compression algorithm provides the best video quality on the market, but with a smaller bandwidth requirement than other video compression standards. In addition, to meet various video stream requirements, the VPort 461 can provide up to 3 video streams simultaneously with H.264 and MJPEG compression format. Video streams can be used for different purposes, such as viewing, recording, and analyzing, and the industrial rugged design, which includes a -40 to 75°C operating temperature, IP30 form factor protection, and industrial certifications, make the VPort 461 suitable for harsh environments.

The VPort 461 is equipped with Moxa's innovative DynaStream™ function for decreasing the bandwidth consumption of your video transmissions. DynaStream™ can reduce or increase the video frame rate automatically to make the video stream controllable by the system and system adminstrator.



Specifications

Video

Video Compression: H.264 (MPEG4 part 10), MJPEG
Video Inputs: 1, BNC connector
Video Outputs: over Ethernet
Video Streams: Max. of 3 video streams (2 encoders: 1 for H.264, 1 for H.264 and MJPEG)
NTSC/PAL: Auto-sensing or manual
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25

Video Viewing:
- Dynastream supported for changing the video frame rate automatically
- Adjustable image size and quality
- Timestamp and text overlay

Audio

Audio Inputs: 1 Line-in or MIC-in with 3.5 mm phone jack
Audio Outputs: 1 Line-out with 3.5 mm phone jack
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS, Modbus/TCP, 802.1X (Pending), SSL/SSH (Pending)
Ethernet: 2 10/100BaseT(X) auto negotiating RJ45 ports

Serial Port

PTZ Ports: 1, RS-232/422/485 port (terminal block connector), max. speed of 115.2 Kbps
COM Ports: 1, RS-232/422/485 (DB9 female connector), max. speed of 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 2, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

PWR1: Power 1
PWR2: Power 2
FAULT: Can be configured to correspond to system alarm, power failure, or disconnected network
VIDEO: Video input signal
PTZ: PTZ control signal
SD: SD card operation

Local Storage

SD Socket: Standard SD socket, V2.0 (SDHC)

Power Requirements

Input Voltage: 2 24 VDC/VAC power inputs for redundancy
Power Consumption: Approx. 5.5 W

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 52.98 x 135 x 105 mm (2.09 x 5.31 x 4.13 in)
Weight: 900 g

Installation: DIN-Rail mounting, wall mounting (with optional kit)

Alarms

Video Motion Detection: Includes sensitivity tuning
Video Loss: Video loss alarm
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions
Custom Alarms: HTTP event servers and CGI events for setting customized alarm actions
Pre-alarm Buffer: 9 MB for JPEG snapshot images

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port or COM port
PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 24 custom commands
PTZ Function Updates: Driver upload supported
Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Cohu, Custom Camera
Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection
Filtering: By IP address
Authentication: 802.1X (Pending)
Encryption: SSL/SSH (Pending)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 375,000 hours
Database: Telcordia (Bellcore), GB 25°C

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

System Requirements

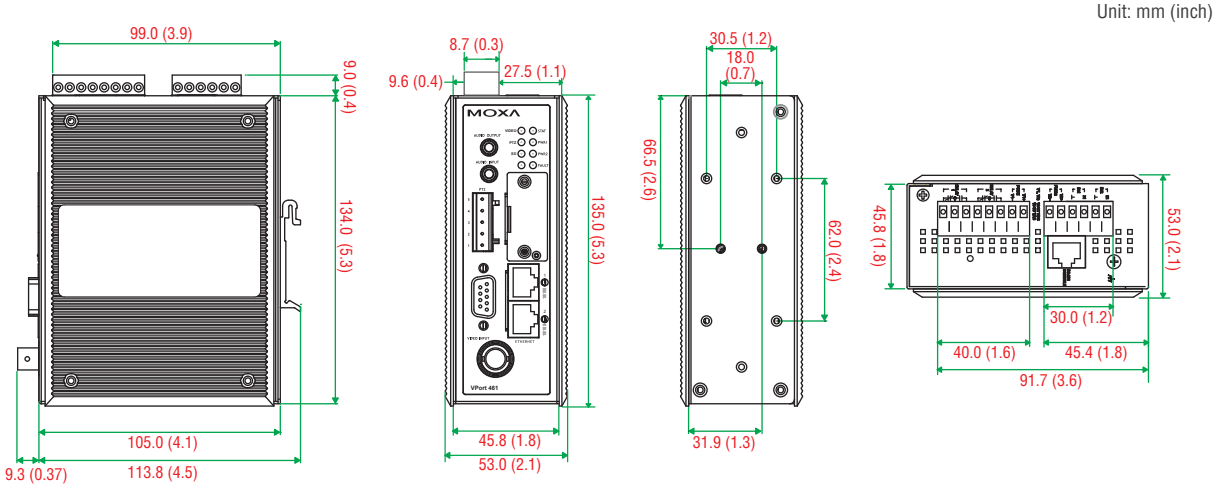
CPU: Pentium 4, 2.4 GHz or above
Memory: 512 MB memory or above
OS: Windows XP/2000 with SP2 or above
Browser: Internet Explorer 6.x or above
Multimedia: DirectX 9.0c or above

Software Development Kit

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).
Standard: OnVIF (Pending)

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top View

Ordering Information

Available Models

VPort 461: 1-channel H.264/MJPEG industrial video encoder with 2 10/100BaseT(X) ports, 0 to 60°C operating temperature
VPort 461-T: 1-channel H.264/MJPEG industrial video encoder with 2 10/100BaseT(X) ports, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

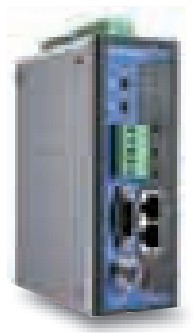
SoftNVR-IA: 32-channel IP surveillance software for industrial automation applications
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- VPort 461 video encoder
- 6-pin terminal block for 1 power input and 2 digital inputs
- 8-pin terminal block for the other power input and 2 relay outputs
- 5-pin terminal block for the RS-232/422/RS-485 PTZ control port
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

VPort 451 Series

Multiple stream, 1-channel MJPEG/MPEG4 industrial video encoder



- 3 simultaneous video streams for MJPEG and MPEG4
- Video stream up to 30/25 frames/sec at full D1 (NTSC:720 x 480; PAL:720x576) resolution
- Video latency under 200 ms
- 2 Ethernet ports for cascade and Ethernet port redundancy
- Local storage capability with SD card slot
- Industrial design with -40 to 75°C operating temperature
- Free VPort SDK PLUS supported

Introduction

The VPort 451 is a 1-channel industrial video encoder with MJPEG and MPEG4 video compression that provides up to 3 video streams (2 MPEG4, 1 MJPEG) simultaneously. The video streams can be used for different purposes, such as viewing, recording, and analyzing. In addition, a video latency under 200 milliseconds makes the VPort 451 the optimal solution for mission-critical video applications, for which a real-time video display is key. In addition, the industrial rugged design, which includes a -40 to 75°C operating temperature, built-in fiber Ethernet ports, IP30 form factor protection, and industrial certifications, makes the VPort 451 superbly suitable for harsh environments.



Specifications

Video

Video Compression: MJPEG, MPEG4 (ISO/ IEC 14496-2)
Video Inputs: 1, BNC connector
Video Outputs: over Ethernet
Video Streams: Max. of 3 video streams (2 encoders: 1 for MPEG4, 1 for MPEG4 and MJPEG)
NTSC/PAL: Auto-sensing or manual
Video Resolution and FPS (frames per second) for a single stream:

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25

Note: The resolutions of the MPEG4 and MJPEG video streams from the 2nd encoder engine are the same, with a total FPS of 30 for NTSC and 25 for PAL.

Video Viewing:
- Adjustable image size and quality
- Timestamp and text overlay

Audio

Audio Inputs: 1 Line-in or MIC-in with 3.5 mm phone jack
Audio Outputs: 1 Line-out with 3.5 mm phone jack
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS, Modbus/TCP
Ethernet: 2 10/100BaseT(X) auto negotiating RJ45 ports

Serial Port

PTZ Ports: 1, RS-232/422/485 port (terminal block connector), max. speed of 115.2 Kbps
COM Ports: 1, RS-232/422/485 (DB9 female connector), max. speed of 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 2, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

PWR1: Power 1
PWR2: Power 2
FAULT: Can be configured to correspond to system alarm, power failure, or disconnected network
VIDEO: Video input signal
PTZ: PTZ control signal
SD: SD card operation

Local Storage

SD Socket: Standard SD socket, V2.0 (SDHC)

Power Requirements

Input Voltage: 2 24 VDC/VAC power inputs for redundancy

Power Consumption: Approx. 5.5 W

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 52.98 x 135 x 105 mm (2.09 x 5.31 x 4.13 in)
Weight: 900 g
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Alarms

Video Motion Detection: Includes sensitivity tuning
Video Loss: Video loss alarm
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions
Custom Alarms: HTTP event servers and CGI events for setting customized alarm actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port or COM port
PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 24 custom commands
PTZ Function Updates: Driver upload supported
Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Cohu, Custom Camera
Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection
Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 375,000 hours
Database: Telcordia (Bellcore), GB 25°C

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

System Requirements

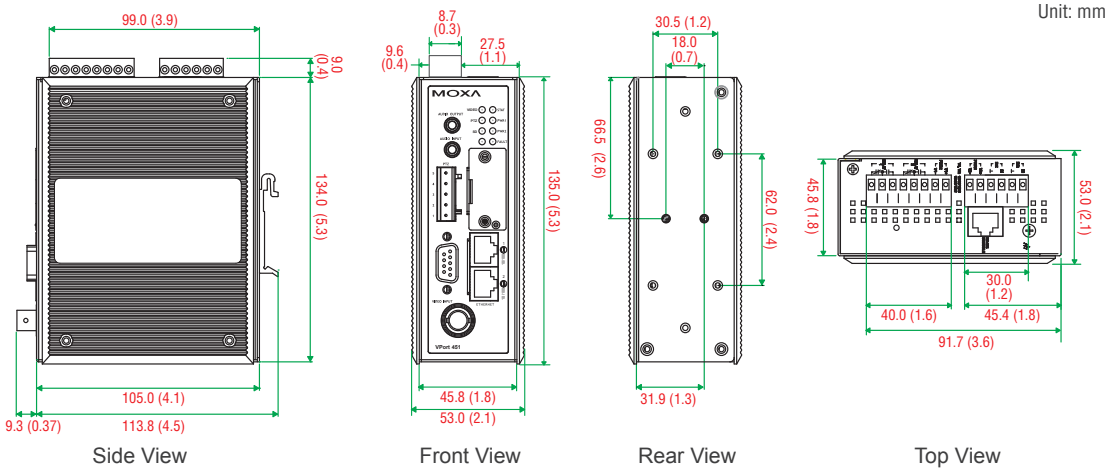
CPU: Pentium 4, 2.4 GHz or above
Memory: 512 MB memory or above
OS: Windows XP/2000 with SP2 or above
Browser: Internet Explorer 6.x or above
Multimedia: DirectX 9.0c or above

Software Bundled Free

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

VPort 451: 1-channel MJPEG/MPEG4 industrial video encoder with 2 10/100BaseT(X) ports, 0 to 60°C operating temperature
VPort 451-T: 1-channel MJPEG/MPEG4 industrial video encoder with 2 10/100BaseT(X) ports, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

SoftNVR-IA: 32-channel IP surveillance software for industrial automation applications
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- VPort 451 video encoder
- 6-pin terminal block for 1 power input and 2 digital inputs
- 8-pin terminal block for the other power input and 2 relay outputs
- 5-pin terminal block for the RS-232/422/RS-485 PTZ control port
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

VPort 351 Series

Full motion, 1-channel MJPEG/MPEG4 industrial video encoders



- Industrial design with -40 to 75°C operating temperature and fiber optic Ethernet port
- Video stream up to 30 frames/sec at full D1 (720 x 480) resolution
- Pre/post-alarm video recording function for advanced surveillance
- Transparent PTZ control for legacy PTZ control panels and keyboards
- 2-way (1 in, 1 out) audio supported
- Free VPort SDK PLUS supported

Introduction

The VPort 351 is a high performance, 1-channel industrial video encoder that provides up to full D1, full frame rate performance (NTSC: 720 x 480 @ 30 FPS; PAL: 720 x 576 @ 25 FPS) and supports a dual MJPEG/MPEG4 algorithm, making it especially well-suited for use with distributed surveillance systems in critical industrial applications. In addition, a continuous pre/post event trigger video record function can help system administrators determine why an alarm was triggered, and 2-way audio is provided for the convenience of real-time communication between system administrators located at the central site, and engineers in the field.

Specifications

Video

Video Compression: MJPEG or MPEG4 (ISO/IEC 14496-2)
Video Inputs: 1, BNC connector (1.0 Vpp, 75 ohm)
Video Outputs: 1, loop-through BNC connector (1.0 Vpp, 75 ohm)
NTSC/PAL: Auto-sensing or manual
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QVGA	320 x 240	30	320 x 288	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 576	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25

Video Viewing:
• Adjustable image size and quality
• Timestamp and text overlay

Audio

Audio Inputs: 1 Line-in or MIC-in with 3.5 mm phone jack
Audio Outputs: 1 Line-out with 3.5 mm phone jack
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS
Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port, or 1 100BaseFX fiber port (Single/multi mode, SC connector)

Serial Port

PTZ Ports: 1, RS-232/422/485 port (terminal block connector), max. speed of 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 2, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system booted properly or not
PWR1: Power 1
PWR2: Power 2
FAULT: Can be configured to correspond to system alarm, power failure, or disconnected network
VIDEO: Video input signal active
AUDIO TEST: Audio input signal in test mode
PTZ: PTZ control signal active

Power Requirements

Input Voltage: 2 12/24 VDC or 24 VAC inputs for redundancy
Power Consumption: Max. 8 W

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 52.98 x 135 x 105 mm (2.09 x 5.31 x 4.13 in)
Weight: 960 g (2.11 oz)
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Alarms

Pre/Post Alarm: 9 MB memory for video recordings
Video Motion Detection: Includes sensitivity tuning
Video Loss: Video loss alarm
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions
Custom Alarms: HTTP event servers for setting customized alarm actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port
PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 10 custom commands
PTZ Function Updates: Driver upload supported
Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Custom Camera
Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection
Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 2,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 272,000 hrs
Database: Telcordia (Bellcore), GB 25°C

Warranty

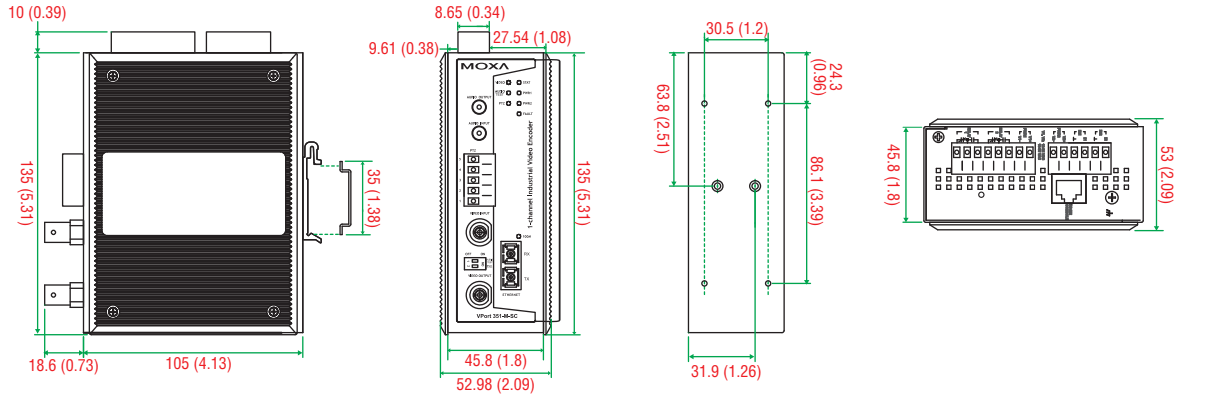
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Software Development Kit

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top View

Ordering Information

Available Models		Port Interface		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Single-mode, SC Connector
VPort 351	VPort 351-T	1	–	–
VPort 351-M-SC	VPort 351-M-SC-T	–	1	–
VPort 351-S-SC	VPort 351-S-SC-T	–	–	1

Optional Accessories (can be purchased separately)

SoftNVR-IA: 32-channel IP surveillance software for industrial automation applications
SoftNVR: Expandable IP surveillance software for managing up to 64 video channels
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- VPort 351 video encoder
- 6-pin terminal block for 1 power input and 2 DIs
- 8-pin terminal block for the other power input and 2 relay outputs
- 5-pin terminal block for the RS-232/422/RS-485 PTZ control port
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

VPort 251

Full motion, 1-channel MJPEG/MPEG4 video encoder



- Compress analog video/audio signals into MJPEG/MPEG4 video streams
- Video stream up to 30 frames/sec at full D1 (720 x 480) resolution
- 2-way (1 in, 1 out) audio supported
- Transparent PTZ control for using legacy PTZ control panel or keyboard
- Loop-through power output for powering an analog camera
- Free VPort SDK PLUS and 4-channel video surveillance software

Introduction

The VPort 251 is a high performance, 1-channel video encoder with compact form factor that is suitable for installation in a variety of locations, including outdoor camera cabinets. To make installation easier, the VPort 251 supports both panel mounting and DIN-Rail mounting (with DK-35A accessory), and 1 loop-through power output for powering an analog camera. In addition, the VPort 251 provides up to full D1, full frame rate video performance (NTSC: 720 x 480 up to 30 FPS; PAL: 720 x 576 up to 25 FPS) and supports both MJPEG or MPEG4, making it especially well-suited for use with distributed video surveillance systems. A 2-way audio function is also provided for the convenience of real-time communication between system administrators located at the central site, and engineers in the field.

Specifications

Video

Video Compression: MJPEG or MPEG4 (ISO/IEC 14496-2)
Video Inputs: 1, BNC connector (1.0 Vpp, 75 ohm)
Video Outputs: Via Ethernet port
NTSC/PAL: Auto-sensing or manual
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QVGA	320 x 240	30	320 x 288	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 576	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25

Video Viewing:
- Adjustable image size and quality
- Timestamp and text overlay

Audio

Audio Inputs: 1 Line-in or MIC-in with 3.5 mm phone jack
Audio Outputs: 1 Line-out with 3.5 mm phone jack
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, DDNS, SNMPv1/v2c/v3
Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port

Serial Port

PTZ Ports: 1, RS-232/422/485 (terminal block connector), max. 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 1, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 1, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system booted properly or not
VIDEO: Video input signal active
PTZ: PTZ control signal active

Power Requirements

Input Voltage: 12/24 VDC or 24 VAC input
Power Consumption: Approx. 6 W
Power Output: 2-pin terminal block connector for loop-through from power input

Physical Characteristics

Housing: Metal
Dimensions: 88.2 x 106 x 50 mm (3.47 x 4.17 x 1.97 in)
Weight: 850 g (1.87 oz)
Installation: DIN-Rail mounting (with optional kit), wall mounting

Alarms

Video Motion Detection: Includes sensitivity tuning
Video Loss: Video loss alarm
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port
PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 10 custom commands
PTZ Function Updates: Driver upload supported
Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Custom Camera
Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection
Filtering: By IP address

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A

EMS:
EN 61000-4-2 (ESD) Level 2,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 281,000 hrs
Database: Telcordia (Bellcore), GB 25°C

Warranty

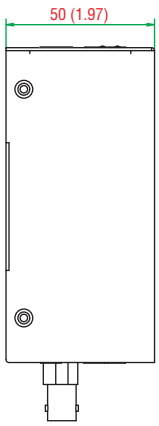
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Software Development Kit

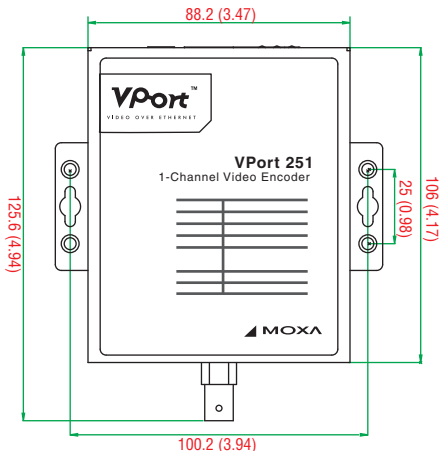
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions

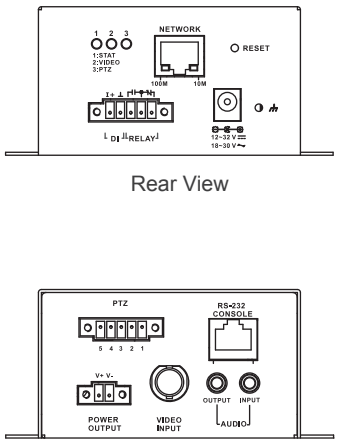
Unit: mm (inch)



Side View



Top View



Rear View

Front View

Ordering Information

Available Models

VPort 251: 1-channel MJPEG/MPEG4 video encoder, 0 to 60°C operating temperature

Optional Accessories (can be purchased separately)

SoftNVR-IA: 32-channel IP surveillance software for industrial automation applications
SoftNVR: Expandable IP surveillance software for managing up to 64 video channels
Power Adaptors (required for powering the VPort 251):
• PWR-12120-USJP-S2: L-type (5.5/2.1/9.5) power adaptor, 1.2 A @ 12 VDC output, US/JP plug
• PWR-12120-AU-S2: L-type (5.5/2.1/9.0) power adaptor, 1.2 A @ 12 VDC output, AU plug
• PWR-12150-EU-S2: L-type (5.5/2.1/9.0) power adaptor, 1.5 A @ 12 VDC output, Euro plug
• PWR-12150-UK-S2: L-type (5.5/2.1/9.0) power adaptor, 1.5 A @ 12 VDC output, UK plug
DK-35A: DIN-Rail mounting kit (35 mm)

Package Checklist

- VPort 251 video encoder
- 5-pin terminal block for 1 DI and 1 relay output
- 2-pin terminal block for loop-through power output
- 5-pin terminal block for RS-232/422/485 PTZ control port
- 4 pads
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

VPort 364 Series

Excellent video quality, 4-channel H.264/MJPEG industrial video encoders



- Dual simultaneous H.264 and MJPEG video streams
- Video latency under 200 ms
- Moxa DynaStream™ function supported for network efficiency
- OnVIF supported for standardization and interoperability
- 802.1X and SSL/SSH for advanced network security
- Industrial design with -40 to 75°C operating temperature
- VPort SDK PLUS provided free

Introduction

The VPort 364 is a 4-channel industrial video encoder that supports the H.264 video compression algorithm, which uses less bandwidth than other video compression standards; the VPort 364 provides the best video quality available on the market today. In addition, the VPort 364 supports simultaneous dual video streams with different formats: H.264 and MJPEG. The two video streams can be used for different purposes, such as viewing, recording, or analysis. In addition, the rugged industrial design with -40 to 75°C operating temperature, built-in fiber Ethernet ports, IP30 form factor protection, and industrial certifications, make the VPort 364 highly suitable for use in harsh environments.

Specifications

Video

Video Compression: H.264 (MPEG4 part 10, AVC) or MJPEG
Video Inputs: 4, BNC connector (1.0 Vpp, 75 ohm)
Video Streams: Dual streams (one for H.264, the other for MJPEG)
NTSC/PAL: Manual
Video Resolution and FPS (frames per second) in single video stream:

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25

Note: When enabling H.264 and MJPEG video streaming simultaneously, the total FPS of these 2 video streams will be approximately 30 FPS. For example, if MJPEG is configured at 10 FPS, then H.264 will be configured at 20 FPS.

Video Viewing:
- DynaStream supported for changing the video frame rate automatically
- Adjustable image size and quality
- Timestamp and text overlay

Audio

Audio Inputs: 1, Line-in or MIC-in with RCA connector
Audio Outputs: 1, Line-out with RCA connector
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS, Modbus/TCP, 802.1X (Pending), SSL/SSH (Pending)
Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port, or 1 100BaseFX fiber port (single/multi-mode, SC connector)

Serial Port

PTZ Ports: 1, RS-232/422/485 port (5-pin terminal block connector), max. speed of 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 4, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: System status
PWR1: Power 1
PWR2: Power 2
FAULT: Can be configured to correspond to system alarm, power failure, or disconnected network
V1, V2, V3, V4: Video input signal activity for channels 1 to 4

Power Requirements

Input Voltage: 2 12 VDC or 24 VDC/VAC inputs for redundancy, terminal block connector
Power Consumption: Max. 7.5 watts

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
Weight: 1110 g
Installation: DIN-Rail mounting or panel mounting (with optional mounting kit)

Alarms

Video Motion Detection: Includes sensitivity tuning
Video Loss: Video loss alarm
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions
Custom Alarms: HTTP event servers and CGI events for setting customized alarm actions
Pre-alarm Buffer: 24 MB per channel for JPEG snapshot images

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port
PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 24 custom commands
PTZ Function Updates: Driver upload supported
Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Cohu, Custom Camera
Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection
Filtering: By IP address
Authentication: 802.1X (Pending)
Encrytpion: SSL/SSH (Pending)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 2,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11

MTBF (mean time between failures)

Time: 465,000 hrs
Database: Telcordia (Bellcore), GB 25°C

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

System Requirements

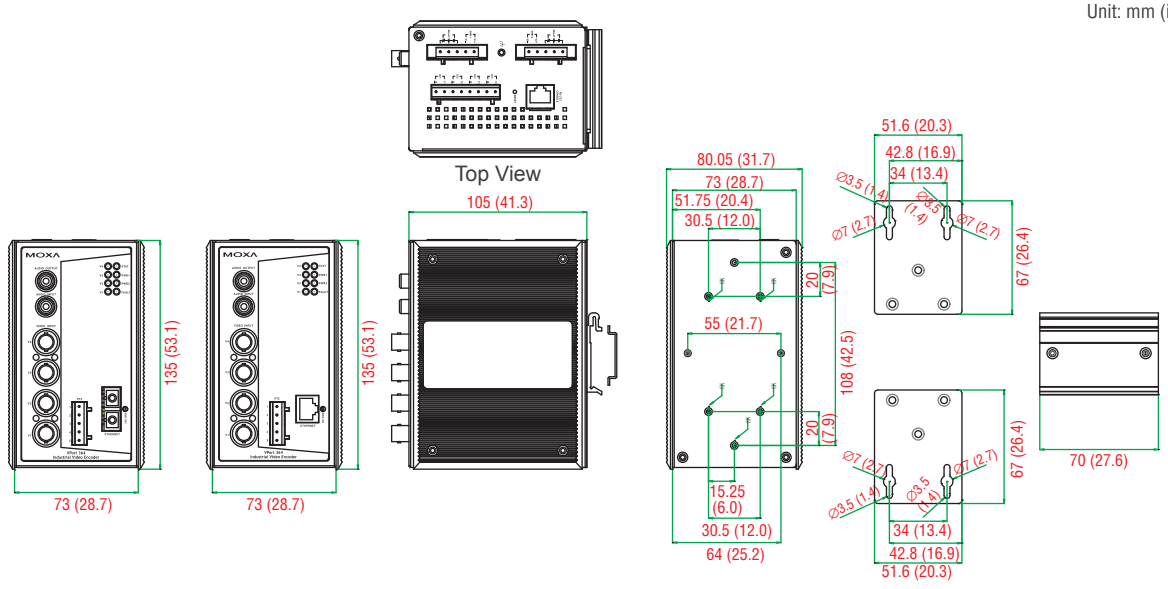
CPU: Pentium 4, 2.4 GHz or above
Memory: 512 MB memory or above
OS: Windows XP/2000 with SP2 or above
Browser: Internet Explorer 6.x or above
Multimedia: DirectX 9.0c or above

Software Development Kit

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).
Standard: OnVIF (Pending)

Dimensions

Unit: mm (inch)



Ordering Information

Available Models		Port Interface		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000 BaseT(X)	Multi-mode, SC Connector	Single-mode, SC Connector
VPort 364	VPort 364-T	1	–	–
VPort 364-M-SC	VPort 364-M-SC-T	–	1	–
VPort 364-S-SC	VPort 364-S-SC-T	–	–	1

Optional Accessories (can be purchased separately)

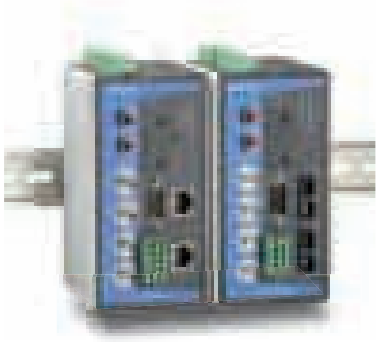
SoftNVR-IA: 32-channel IP surveillance software for industrial automation applications
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK4U:4U-high 19" rack mounting kit

Package Checklist

- VPort 364 video encoder
- 2 5-pin terminal blocks for 2 power inputs and 2 relay outputs
- 1 8-pin terminal block for 4 DIs
- 1 5-pin terminal block for the RS-232/422/RS-485 PTZ control port
- Quick installation guide (printed)
- Documentation and software CD
- Warranty Card

VPort 354 Series

Full motion, 4-channel MJPEG/MPEG4 industrial video encoders



- Industrial design with -30 to 70°C operating temperature and fiber optic Ethernet port
- 2 Ethernet ports for cascade and port redundancy
- SD card slot for local storage capability
- Modbus/TCP supported for easy communication with SCADA software
- Video stream up to 120 frames/sec at 4CIF (704 x 480) resolution
- Free VPort SDK PLUS supported

Introduction

The VPort 354 is a high performance, 4-channel industrial video encoder that provides up to 4CIF full frame rate performance (NTSC: 704 x 480 @ 30 FPS; PAL: 704 x 576 @ 25 FPS) for each channel, and supports a dual MJPEG/MPEG4 algorithm, making it especially well-suited for use with distributed surveillance systems in critical industrial applications. In addition to the rugged-design features, the Modbus/TCP and serial-to-Ethernet connectivity make the VPort 354 more suitable for industrial applications. The two built-in Ethernet ports can be cascaded as a daisy-chain or used for port redundancy, making network communication more safe and reliable. To prevent video loss when the network is down, the VPort 354 can automatically record video on an SD card, and once the network is back up, the recorded video can be downloaded via FTP access.

Specifications

Video

Video Compression: MJPEG or MPEG4 (ISO/IEC 14496-2)
Video Inputs: 4, BNC connector (1.0 Vpp, 75 ohm)
Video Outputs: Via Ethernet port
Video Streams: Dual streams (one for MJPEG, the other for MPEG4) at the same video resolution (note that MJPEG only has one quality setting)
NTSC/PAL: Manual
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
2CIF	704 x 240	30	704 x 288	25
4CIF	704 x 480	30	704 x 576	25

Video Viewing:
• Adjustable image size and quality
• Timestamp and text overlay

Audio

Audio Inputs: 1 Line-in or MIC-in with RCA connector
Audio Outputs: 1 Line-out with RCA connector
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS, Modbus/TCP
Ethernet: 2 10/100BaseT(X) auto negotiating RJ45 ports, or 2 100BaseFX fiber ports (single/multi-mode, SC connector)

Serial Port

PTZ Ports: 1, RS-232/422/485 port (terminal block connector), max. speed of 115.2 Kbps
COM Ports: 1, RS-232/422/485 (DB9 female connector), max. speed of 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 4, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

PWR1: Power 1
PWR2: Power 2
FAULT: Can be configured to correspond to system alarm, power failure, or disconnected network
V1, V2, V3, V4: Video input signal activity

Local Storage

SD Socket: Standard SD socket, SDHC, with SD LED indicator

Power Requirements

Input Voltage: 2 12/24 VDC or 24 VAC inputs for redundancy
Power Consumption: Approx. 12 W

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
Weight: 1200 g (2.64 oz)
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Alarms

Video Motion Detection: Includes sensitivity tuning
Video Loss: Video loss alarm
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions
Custom Alarms: HTTP event servers and CGI events for setting customized alarm actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port or COM port
PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 10 custom commands
PTZ Function Updates: Driver upload supported
Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Cohu, Custom Camera
Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection
Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -30 to 70°C (-22 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8,
EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 271,000 hrs
Database: Telcordia (Bellcore), GB 25°C

Warranty

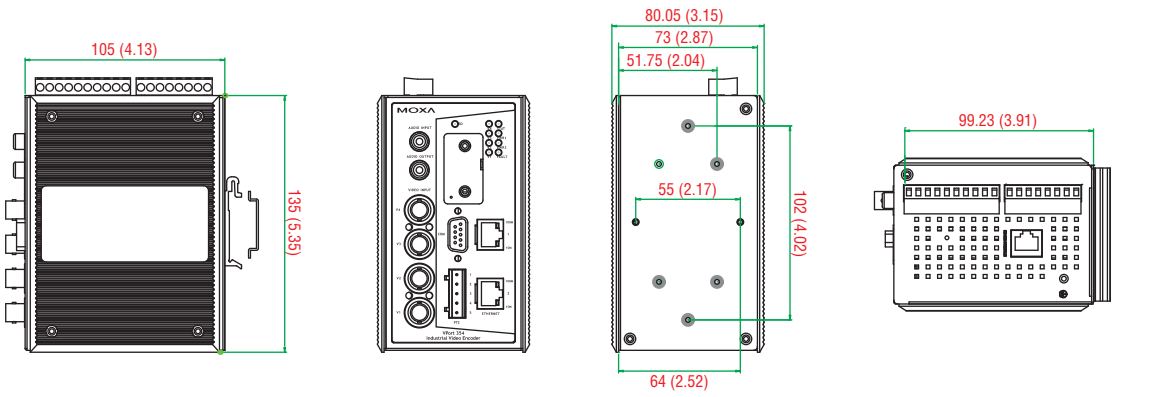
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Software Development Kit

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions

Unit: mm (inch)



Ordering Information

Available Models		Port Interface		
Standard Temperature (0 to 60°C)	Wide Temperature (-30 to 70°C)	10/100BaseT(X)	Multi-mode, SC Connector	Single-mode, SC Connector
VPort 354	VPort 354-T	2	–	–
VPort 354-MM-SC	-	–	2	–
VPort 354-SS-SC	-	–	–	2

Optional Accessories (can be purchased separately)

SoftNVR-IA: 32-channel IP surveillance software for industrial automation applications
SoftNVR: Expandable IP surveillance software for managing up to 64 video channels
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- VPort 354 video encoder
- 10-pin terminal block for 1 power input and 4 digital inputs
- 8-pin terminal block for the other power input and 2 relay outputs
- 5-pin terminal block for the RS-232/422/RS-485 PTZ control port
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

VPort 254 Series

Rugged 4-channel MJPEG/MPEG4 industrial video encoders



- Industrial design with -40 to 75°C operating temperature and fiber optic Ethernet port
- Video stream up to 120 frames/sec at CIF (352 x 240) resolution
- Modbus/TCP supported for easy communication with SCADA software
- One RS-232/422/485 COM port for controlling external serial devices over Ethernet
- Free VPort SDK PLUS supported

Introduction

The rugged VPort 254 is a 4-channel industrial video encoder that provides up to 120 FPS at CIF resolution (NTSC: 352 x 240; PAL: 352 x 288), and supports an optional MJPEG/MPEG4 algorithm, making it especially well suited for use with distributed surveillance systems in critical industrial applications. In addition, the VPort 254 supports serial-to-Ethernet and Modbus/TCP communications for integrating automation systems, and 2-way audio is provided to allow real-time communication between system administrators located at a central site and engineers in the field.

Specifications

Video

Video Compression: MJPEG or MPEG4 (ISO/IEC 14496-2)
Video Inputs: 4, BNC connector (1.0 Vpp, 75 ohms)
Video Outputs: via Ethernet port
NTSC/PAL: Auto-sensing or manual
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QVGA	320 x 240	30	320 x 288	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	7	640 x 576	7
4CIF	704 x 480	7	704 x 576	7
Full D1	720 x 480	7	720 x 576	7

Video Viewing:
• Adjustable image size and quality
• Timestamp and text overlay

Audio

Audio Inputs: 1 Line-in or MIC-in with RCA connector
Audio Outputs: 1 Line-out with RCA connector
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS (ToS), SNMPv1/v2c/v3, DDNS, Modbus/TCP
Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port, or 1 100BaseFX fiber port (single/multi-mode, SC connector)

Serial Port

PTZ Ports: 1, RS-232/422/485 port (terminal block connector), max. speed of 115.2 Kbps
COM Ports: 1, RS-232/422/485 port (DB9 female connector), max. speed of 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 4, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system booted properly or not
PWR1: Power 1
PWR2: Power 2
FAULT: Can be configured to correspond to system alarm, power failure, or disconnected network
V1, V2, V3, V4: Video input signal activity

Power Requirements

Input Voltage: 2 12/24 VDC or 24 VAC inputs for redundancy
Power Consumption: Approx. 10 W

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
Weight: 1100 g (2.42 oz)
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Alarms

Video Loss: Video loss alarm
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Email/FTP Messaging: Automatic transfer of stored images via email or FTP with event-triggered actions

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port or COM port
PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed,

preset position (max. 25 positions), and 10 custom commands
PTZ Function Updates: Driver upload supported
Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome, Custom Camera
Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection
Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 2,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 197,000 hrs
Database: Telcordia (Bellcore), GB 25°C

Warranty

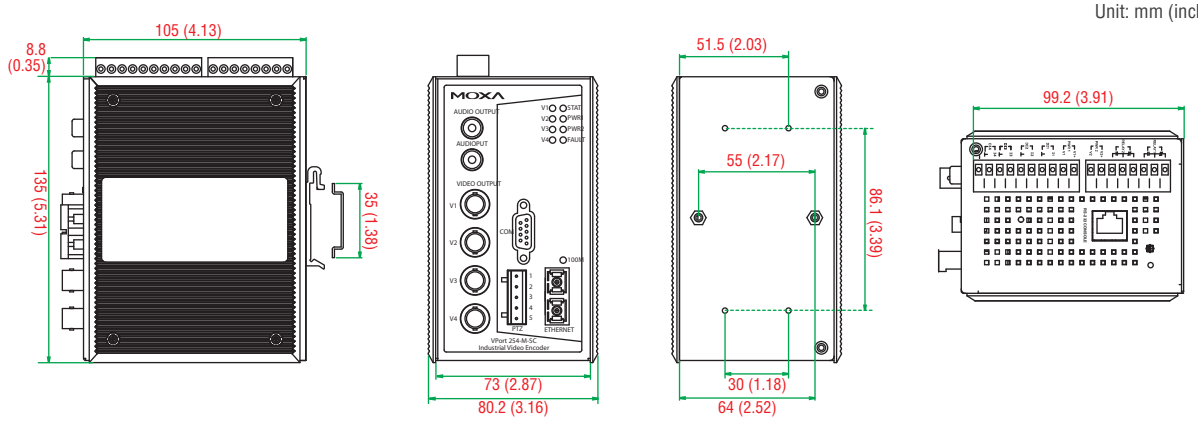
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Software Development Kit

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top View

Ordering Information

Available Models		Port Interface		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Single-mode, SC Connector
VPort 254	VPort 254-T	1	–	–
VPort 254-M-SC	VPort 254-M-SC-T	–	1	–
VPort 254-S-SC	VPort 254-S-SC-T	–	–	1

Optional Accessories (can be purchased separately)

SoftNVR-IA: 32-channel IP surveillance software for industrial automation applications
SoftNVR: Expandable IP surveillance software for managing up to 64 video channels
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- VPort 254 video encoder
- 10-pin terminal block for 1 power input and 4 digital inputs
- 8-pin terminal block for the other power input and 2 relay outputs
- 5-pin terminal block for the RS-232/422/RS-485 PTZ control port
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

VPort D361 Series

1-channel H.264/MJPEG industrial video decoder



- Decode H.264 and MJPEG video streams to an analog video signal automatically
- Manual selection or automatic scan with maximum of 64 video sources
- 2-way (1 in, 1 out) audio supported
- Transparent PTZ control with legacy PTZ controller
- SNMP for network management

Introduction

The VPort D361 is a 1-channel video decoder for decoding H.264/MJPEG video streams from VPort series video encoders and VPort IP cameras back to analog video signals. The analog video signal can be sent to legacy CCTV devices, such as monitors, multiplexers, and matrix switches, which can be used as originally intended as part of CCTV systems. In addition, bi-directional audio enables ready-to-use voice-over-IP communication between the video encoder and decoder.

Monitoring your cameras that are part of a large CCTV system is easy with the VPort D361, which can be set up to switch between different video sources either manually or automatically within a given time interval. Up to 64 video sources can be included in the list. In addition, the 2 DIs located on the top panel of the VPort D361 can be used to create 2 control buttons for up and down video source selection.

Specifications

Video

Video Decoding: H.264 (MPEG4 part 10), MJPEG (auto-detecting)
Video Inputs: Accepts video streams from H.264/MJPEG VPort series video encoders and IP cameras over TCP/IP networks
Video Outputs: 1, BNC connector (1.0 Vpp, 75 ohms), NTSC or PAL
Video Resolution: Max. of 540 TVL lines
Video Sources: Up to 64, selected manually by web server or digital inputs, or selected automatically by scanning within a set time interval
Video Viewing:
• Max. 30/25 FPS (NTSC/PAL) can be decoded
• OSD (on-screen display) with video source, video source IP, date/time, and customized information

Audio

Audio Inputs: 1 Line-in or Mic-in with 3.5 mm phone jack
Audio Outputs: 1 Line-out with 3.5 mm phone jack
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, SNMPv1/v2c/v3, Modbus/TCP
Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port

Serial Port

PTZ Ports: 1, RS-232/422/485 (terminal block connector), max. 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 2, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system booted properly or not
PWR: Power Input
FAULT: Can be configured to correspond to system alarm or disconnected network

Power Requirements

Input Voltage: 1 12/24 VDC or 24 VAC input
Power Consumption: Max. 6.5 W

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 52.98 x 135 x 105 mm (2.09 x 5.31 x 4.13 in)
Weight: 890 g (1.96 oz)
Installation: DIN-Rail mounting, wall mounting (with optional kit)

PAN/TILT/ZOOM

PTZ Camera Control: Transparent PTZ camera control with legacy PTZ controller through the RS-232/422/485 PTZ port

Security

Password: User level password protection
Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

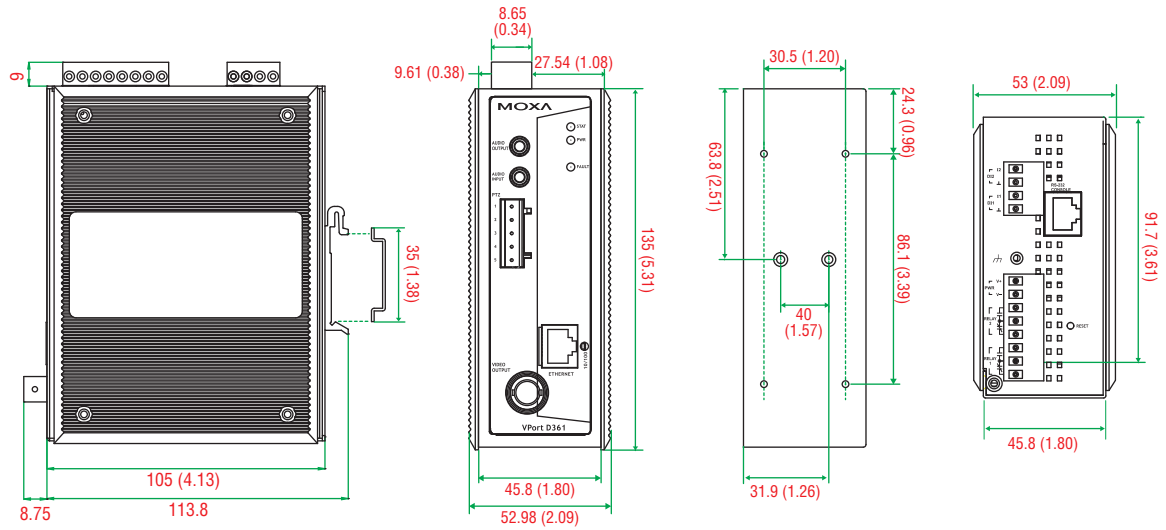
Time: 541,000 hrs
Database: Telcordia (Bellcore), GB 25°C

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top View

Ordering Information

Available Models

VPort D361: 1-channel H.264/MJPEG industrial video decoder, 0 to 60°C operating temperature
VPort D361-T: 1-channel H.264/MJPEG industrial video decoder, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- VPort D361 video decoder
- 4-pin terminal block for 2 digital inputs
- 8-pin terminal block for 1 power input and 2 relay outputs
- 5-pin terminal block for the RS-232/422/RS-485 PTZ control port
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

VPort D351

1-channel MJPEG/MPEG4 industrial video decoder



- Decode MJPEG and MPEG4 video streams to an analog video signal automatically
- Manual selection or automatic scan with maximum of 64 video sources
- 2-way (1 in, 1 out) audio supported
- Transparent PTZ control with legacy PTZ controller
- SNMP for network management

Introduction

The VPort D351 is a 1-channel video decoder for decoding MPEG4/MJPEG video streams from the the VPort 25 IP camera and VPort 251, VPort 254, VPort 351, and VPort 354 video encoders back to analog video signals. The analog video signal can be sent to legacy CCTV devices, such as monitors, multiplexers, and matrix switches, which can be used as originally intended as part of CCTV systems. In addition, bi-directional audio enables ready-to-use voice-over-IP communication between the video encoder and decoder. Monitoring your cameras that are part of a large CCTV system is easy with the VPort D351, which can be set up to switch between different video sources either manually or automatically within a given time interval. Up to 64 video sources can be included in the list. In addition, the two DIs located on the top panel of the VPort D351 can be used to create two control buttons for up and down video source selection.

Specifications

Video

Video Decoding: MPEG4, MJPEG (auto-detecting)
Video Inputs: Accepts video streams from VPort series video encoders (VPort 251, VPort 254, VPort 351, VPort 354) and the VPort 25 IP camera over TCP/IP networks
Video Outputs: 1, BNC connector (1.0 Vpp, 75 ohms), NTSC or PAL
Video Resolution: Max. of 540 TVL lines
Video Sources: Up to 64, selected manually by web server or digital inputs, or selected automatically by scanning within a set time interval
Video Viewing:
- Max. 30/25 FPS (NTSC/PAL) can be decoded
- OSD (on-screen display) with video source, video source IP, date/time, and customized information

Audio

Audio Inputs: 1 Line-in or Mic-in with 3.5 mm phone jack
Audio Outputs: 1 Line-out with 3.5 mm phone jack
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, SNMPv1/v2c/v3
Ethernet: 1 10/100BaseT(X) auto negotiating RJ45 port

Serial Port

PTZ Ports: 1, RS-232/422/485 (terminal block connector), max. 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 2, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system booted properly or not
PWR1: Power 1
PWR2: Power 2
FAULT: Can be configured to correspond to system alarm, power failure, or disconnected network

Power Requirements

Input Voltage: 2 12/24 VDC or 24 VAC inputs for redundancy
Power Consumption: Max. 8 W

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 52.98 x 135 x 105 mm (2.09 x 5.31 x 4.13 in)
Weight: 910 g (2.00 oz)
Installation: DIN-Rail mounting, wall mounting (with optional kit)

PAN/TILT/ZOOM

PTZ Camera Control: Transparent PTZ camera control with legacy PTZ controller through the RS-232/422/485 PTZ port

Security

Password: User level password protection
Filtering: By IP address

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 2,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 2,
EN 61000-4-8,
EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

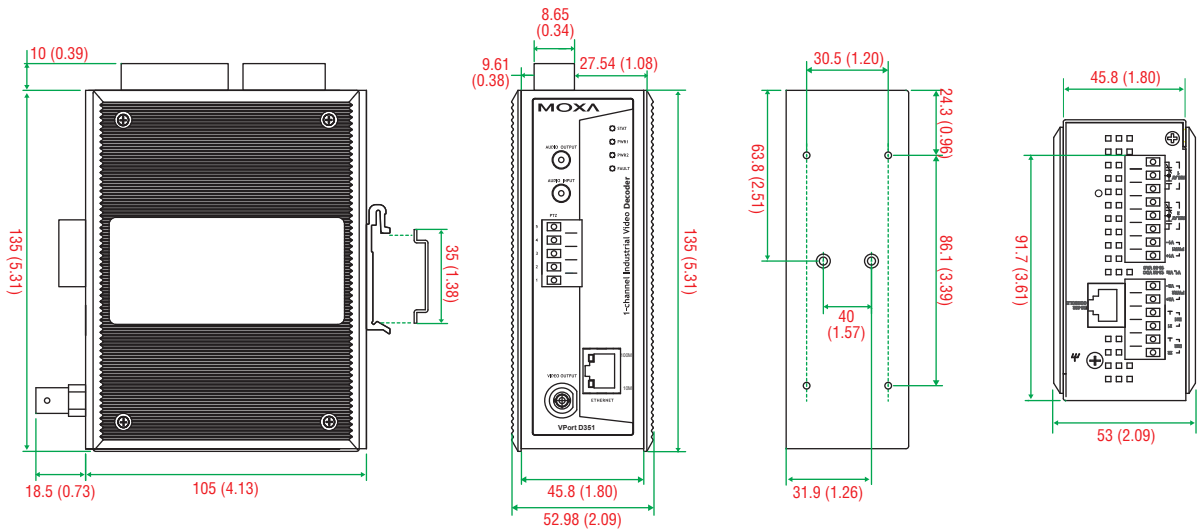
Time: 275,000 hrs
Database: Telcordia (Bellcore), GB 25°C

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top View

Ordering Information

Available Models

VPort D351: 1-channel MJPEG/MPEG4 industrial video decoder, 0 to 60°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist

- VPort D351 video decoder
- 6-pin terminal block for 1 power input and 2digital inputs
- 8-pin terminal block for the other power input and 2 relay outputs
- 5-pin terminal block for the RS-232/422/RS-485 PTZ control port
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

VPort 16-M12 Series

Award-winning Product

EN 50155 compliant, high quality CCD image, compact IP cameras



- 1/3" CCD camera with maximum resolution of 800 x 600
- Up to 3 H.264 and MJPEG video streams
- Built-in 3D-deinterlace for progressive video image
- IP66 rain and dust protection with dehumidifying membrane
- Supports DHCP Opt 66/67 for auto-configuration
- DynaStream™ supported for network efficiency
- Built-in SDHC slot for local storage
- OnVIF supported for standardization and interoperability

Introduction

Rugged Design

The VPort 16-M12 is a compact, fixed-IP camera with EN 50155:2007 compliance that is specially designed for rolling stock CCTV applications. In addition to the -25 to 55°C operating temperature, IP66 rain and dust protection, anti-vibration M12 Ethernet connector, Power-over-Ethernet (PoE), and metal housing with glass lens cover, the VPort 16-M12 also has a built-in dehumidifying membrane for dissipating moisture trapped inside the camera and keeping other moisture out. This innovative design greatly reduces the impact of moisture on the lens.

Good Video Quality

To provide good video quality, the VPort 16-M12 adopts the 1/3" CCD image sensor and advanced 3D-deinterlacing hardware enhancement, making it suitable for most lighting conditions. A maximum of 2 H.264 and 1 MJPEG video streams are provided by the VPort 16-M12. In addition, Moxa's DynaStream™ function allows you to change the video frame rate automatically, which can help you control your network bandwidth budget and ease network system management. The VPort 16-M12 also has a built-in SDHC slot for installing an SD card to provide up to 32 GB of local storage.

Convenient Installation

The VPort 16-M12 supports both surface mounting and embedded mounting, and for different viewing angles and distance requirements, 5 lens types with focal length from 3 mm to 16 mm are provided. Moreover, the camera head can be calibrated according to the scale on the camera and can be rotated 360° horizontally and 90° vertically, and DHCP opt 66/67 is also supported for automatic configuration, making mass installation a much easier task.

Specifications

Camera

Sensor: 1/3" CCD
Lens: 3, 3.6, 6, 8, and 16 mm fixed
Angle of View:
• 3.0 mm / F2.0: 120°
• 3.6 mm / F2.0: 92°
• 6.0 mm / F1.8: 53°
• 8.0 mm / F2.0: 40°
• 16 mm / F2.5: 19°
Modulation: NTSC or PAL
Camera Angle: Pan 360°, Tilt 90° (controlled manually)
Illumination (low light sensitvity): 0.02 Lux at F2.0, color
Synchronization: Internal
White Balance: ATW/AWC
Auto Electronic Shutter:
• NTSC: 1/60 to 1/120,000 sec.
• PAL:1/50 to 1/120,000 sec.
S/N Ratio: 50 dB (MIN) / 58 dB (TYP) (Gamma, Aperture, AGC, OFF)
AGC Control: On/Off
Flickerless Control: On/Off
Backlight Compensation: On/Off
Auto Exposure: On/Off
Image Rotation: Flip, Mirror, and 180° rotation
Image Setting:
• Manually tuning with brightness, saturation, contrast and hue
• Built-in 3D-deinterlacing and 3DNR (3D noise reduction)
Horizontal Resolution: 540 TVL

Video

Video Compression: H.264 (ISO/IEC 14496-10) or MJPEG
Video Outputs: Via Ethernet
Video Streams: Maximum of 3 video streams (2 H.264 and 1 MJPEG)
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QCIF	176 x 112	30	176 x 144	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	30	640 x 480	25
4CIF	704 x 480	30	704 x 576	25
Full D1	720 x 480	30	720 x 576	25
SVGA	800 x 600	30	800 x 600	25

Video Viewing:
• DynaStream™ supported for changing the video frame rate automatically

- Adjustable image size and quality
- Timestamp and text overlay
- Maximum of 10 simultaneous unicast connections

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, Telnet, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, QoS, SNMPv1/v2c/v3, DDNS, TFTP, OPT 66/67
Ethernet: 1 10/100BaseT(X) Ethernet port, M12 D-code connector

Local Storage

SD Socket: Standard SD socket (SDHC)

Power Requirements

Input: Power-over-Ethernet (IEEE 802.3af)

Physical Characteristics

Housing: Metal and glass, IP66-rated
Dehumidifying Membrane: GORE protective vent
Dimensions: 125 x 125 x 87.5 mm (5.6 x 5.6 x 3.5 in)
Installation: Surface (ceiling) or embedded (recessed) mounting

Security

Password: User level password protection
Filtering: By IP address

Alarms

Intelligent Video: Tamper alarm
Video Motion Detection: Includes sensitivity tuning
Video Loss: Video loss alarm
Scheduling: Daily repeat timing schedule
Imaging: JPEG snapshots for pre/trigger/post alarm images
Custom Alarms: HTTP event servers for setting customized alarm actions

Environmental Limits

Operating Temperature: -25 to 55°C (-13 to 131°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Rolling Stock: EN 50155:2007 compliance (shock, vibration, temperature, EMC)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty

Minimum Viewing System Requirements

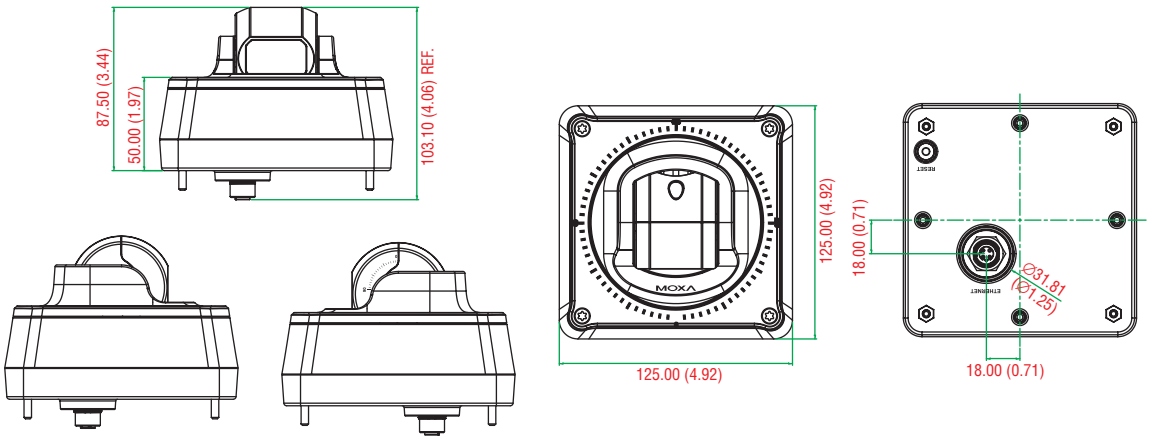
CPU: Pentium 4, 2.4 GHz
Memory: 512 MB of memory
OS: Windows XP/2000 with SP4 or above
Browser: Internet Explorer 6.x or above
Multimedia: DirectX 9.0c or above

Software Development Kit

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).
Standard: OnVIF (Pending)

Dimensions

Unit: mm (inch)



Side Views | Top View | Bottom View

Ordering Information

Available Models	Lens	Modulation	
		NTSC	PAL
VPort 16-M12-CAM3L5430N	3.0 mm	✓	–
VPort 16-M12-CAM3L5430P	3.0 mm	–	✓
VPort 16-M12-CAM3L5436N	3.6 mm	✓	–
VPort 16-M12-CAM3L5436P	3.6 mm	–	✓
VPort 16-M12-CAM3L5460N	6.0 mm	✓	–
VPort 16-M12-CAM3L5460P	6.0 mm	–	✓
VPort 16-M12-CAM3L5480N	8.0 mm	✓	–
VPort 16-M12-CAM3L5480P	8.0 mm	–	✓
VPort 16-M12-CAM3L54160N	16 mm	✓	–
VPort 16-M12-CAM3L54160P	16 mm	–	✓

Package Checklist

- VPort 16-M12 IP camera
- L-type Torx screw driver
- L-type Hexagon screw driver
- Installation stick
- Quick installation guide (printed)
- Documentation and software CD
- Warranty card

VPort 704-T

4-slot modular industrial multi-service gateway



- Hot-swappable capability for versatile modules
- -40 to 75°C operating temperature
- High MTBF with passive backplane and fanless design
- Automatically detect and configure the module's IP address
- Moxa Turbo Ring supported (recovery time < 50 ms)

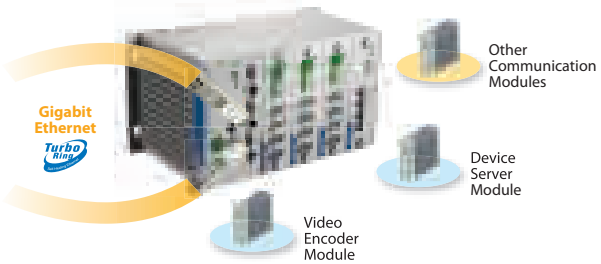
Introduction

The VPort 704-T series modular industrial multi-service gateways come with 3 built-in Gigabit ports, 3 10/100 Mbps fast Ethernet ports, and 4 slots for installing Ethernet, serial, or power interface modules. The 4 slots accept a versatile assortment of communications modules, including a serial-to-Ethernet module (VPM-7704), and other modules that adhere to the design rules for VPort 704-T modules. The modular design turns the VPort 704-T into an extremely versatile communications interface, and makes the VPort 704-T particularly well suited for use at field sites.

The VPort 704-T's -40 to 75°C wide operating temperature, metal housing, passive backplane, and fanless design make it particularly well suited for harsh industrial environments and mission-critical applications, including oil and gas, trackside, and city traffic monitoring systems.

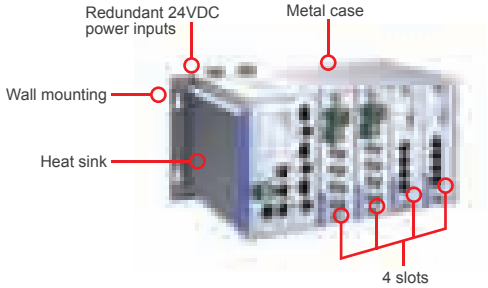
Modular, Integrated Solutions

The VPort 704-T industrial multi-service gateway can be used with a variety of modules for field site device communication applications.



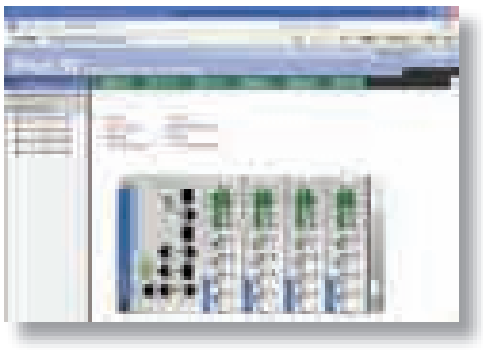
Rugged Design

- Passive backplane and fanless design for high MTBF
- Hot swappable for low MTBR
- -40 to 75°C wide operating temperature
- Rugged aluminum housing
- Redundant 24 VDC power inputs
- CE and FCC compliance



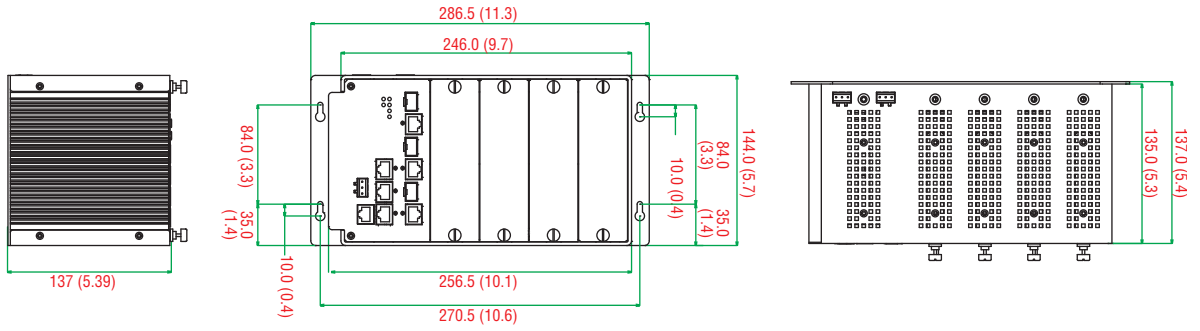
Easy to Use

- Visual GUI for system and connection status
- Easy IP configuration
- One web console for configuring all modules
- System diagnosis for easy maintenance



Dimensions

Unit: mm (inch)



Side View | Front View | Top View

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, Telnet, Syslog, DHCP Option 66/67/82, SSH, SNMP Inform, Modbus/TCP, LLDP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: 3 10/100BaseT(X) RJ45 ports
Gigabit Ethernet: 3 10/100/1000BaseT(X) ports, auto negotiation speed, or 3 1000BaseSFP slots for fiber ports
Console Port: RS-232 (RJ45 connector)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Power Requirements

Input Voltage: Dual 24 VDC power inputs for reduncancy
Power Consumption: 14.5 watts (without modules)
Overload Current Protection: Present
Connection: 2 removable 3-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
Dimensions: 286.5 x 144 x 137 mm (11.26 x 5.67 x 5.39 in)
Weight: 2790 g (6.15 oz) (includes four slot covers)
Installation: Wall mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 2,
EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Shock: IEC60068-2-27
Freefall: IEC60068-2-32
Vibration: IEC60068-2-6

Ordering Information

Available Models

VPort 704-T: 4-slot industrial multi-service gateway, 3 combo Gigabit ports, 3 10/100baseT(x) ports, -40 to 75°C operating temperature

Communication Modules (can be purchased separately)

VPM-7304: 4-channel MPEG4/MJPEG video encoder module
VPM-7704: 4-port RS-232/422/485 3-in-1 device server module

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

Package Checklist

- VPort 704-T multi-service gateway
- Two 3-pin terminal blocks for 2 redundant power inputs
- One 3-pin terminal block for 1 relay output
- RJ45 to DB9 console port cable
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

VPM-7304

4-port MPEG4/MJPEG video encoder module for the VPort 700 series



- 4-channel video input
- Video streams up to 120 frames/second at CIF resolution
- Dual codec with MJPEG and MPEG4
- 2-way (1 in, 1 out) audio supported
- 1 RS-232/422/485 PTZ port
- 4 digital inputs, 1 relay output

Note: The VPM-7304 module must be used with a VPort 700 series industrial multi-service gateway.

Specifications

Video

Video Compression: MJPEG or MPEG4 (ISO/IEC 14496-2)
Video Inputs: 4, BNC connector (1.0 Vpp, 75 ohms)
NTSC/PAL: Auto-sensing or manual
Video Resolution and FPS (frames per second):

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
QVGA	320 x 240	30	320 x 288	25
CIF	352 x 240	30	352 x 288	25
VGA	640 x 480	7	640 x 576	7
4CIF	704 x 480	7	704 x 576	7
Full D1	720 x 480	7	720 x 576	7

Video Viewing: Adjustable image size and quality

Audio

Audio Inputs: 1 Line-in or MIC-in with 3.5 mm phone jack
Audio Outputs: 1 Line-out with 3.5 mm phone jack
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, SNMPv1/v2c/v3, DDNS, Modbus/TCP

Serial Port

PTZ Ports: 1, RS-232/422/485 port (terminal block connector), max. speed of 115.2 Kbps

GPIO

Digital Inputs: 4, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 1, max. 24 VDC @ 1 A

LED Indicators

STAT: Indicates if the system boots properly or not
FAULT: Can be configured to correspond to system alarm, power failure, video loss, or disconnected network

Power Requirements

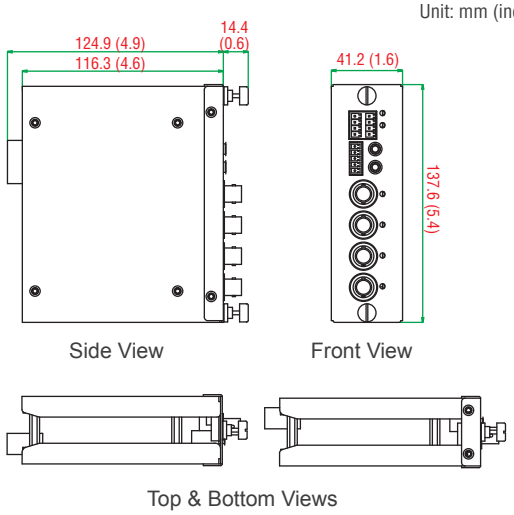
Power Consumption: 7.2 W

Physical Characteristics

Housing: Metal
Dimensions: 41 x 138 x 139 mm (1.61 x 5.43 x 5.47 in)
Weight: 560 g
Installation: Mounted in a VPort 700 series slot

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

VPM-7304: 4-channel MPEG4/MJPEG video encoder module

Package Checklist

- VPM-7304 video encoder module
- Documentation and software CD

VPM-7704

4-port RS-232/422/485 serial device server module for the VPort 700 series



- 4 serial ports supporting RS-232, RS-422, and RS-485
- Versatile socket operation modes, including TCP Server, TCP Client, and UDP
- SNMP MIB-II for network management
- Baudrates up to 921.6 Kbps (nonstandard baudrates supported)

Note: The VPM-7704 module must be used with a VPort 700 series industrial multi-service gateway.

Specifications

Serial Interface

Serial Standards: RS-232/422/485
Number of Ports: 4 (RJ45 connectors)
Serial Line Protection: 15 KV ESD protection for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: DSR/DTR and RTS/CTS (RS-232 only), XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signal

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Power Requirements

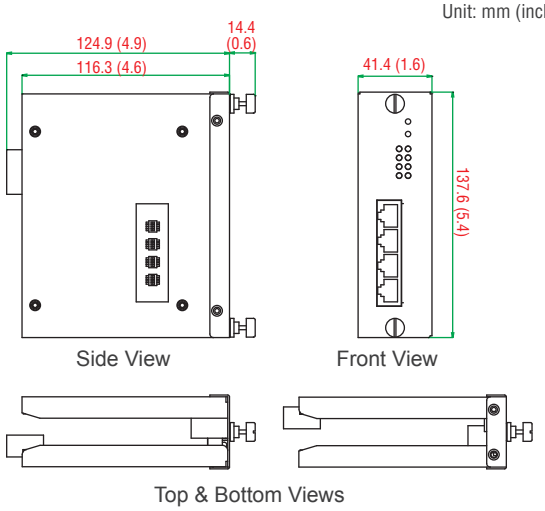
Power Consumption: Approx. 5 W

Physical Characteristics

Housing: Metal
Dimensions: 41 x 138 x 139 mm (1.61 x 5.43 x 5.47 in)
Weight: 530 g (1.16 oz)
Installation: Mounted in a VPort 700 series slot

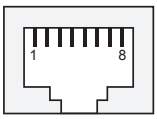
Dimensions

Unit: mm (inch)



Pin Assignment

8-pin RJ45 connector



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DSR	–	–
2	RTS	TxD+	–
3	GND	GND	GND
4	TxD	TxD-	–
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	–	–
8	DTR	–	–

Ordering Information

Available Models

VPM-7704: 4-port RS-232/422/485 device server module

Package Checklist

- VPM-7704 serial device server module
- Documentation and software CD

MxNVR-IA8 Series

8-channel industrial network video recorder for harsh environments



- Supports H.264, MPEG4, and MJPEG video recording
- Can record up to 8 VPort video stream channels
- Supports video recording by schedule and event record
- Built-in 2x2.5" SATA hard disk interface for storage hard disks
- -40 to 75°C operating temperature (with solid state disk)
- Modbus/TCP supported for direct communication with SCADA systems
- Supports IEEE 802.1X for high network security
- Robust, fanless, 19" rackmount design

Introduction

The MxNVR-IA8 is a revolutionary new 8-channel industrial network video recorder designed for recording the VPort's MJPEG, MPEG4, and H.264 video streams in harsh environments. With rugged design features, such as no heater or fan, a -40 to 75°C operating temperature, and protection against high EMI and surges, as well as the ability to save bandwidth when transmitting video streams back to the remote control center or machine room for video recording, the MxNVR-IA8 is tailor-made for field site applications. Since videos are only transmitted when remote live view and video playback are required, you will see an improvement in network transmission efficiency and a noticeable reduction in your bandwidth investments.

Specifications

Recording
No. of Streams: 8 VPort video/audio streams
Stream Types: H.264, MPEG4, MJPEG
Video Input: via Ethernet
Video File Format: AVI
Record Modes: Manual, schedule, alarm
Pre-alarm Recording: Up to 30 sec.
Post-alarm Recording: Up to 60 sec.

Searching
Search Modes: Camera, date/time, event

Playback
Method: Remote access, FTP file download
Remote Access: Playback via web browser or client software
FTP File Downloads: Playback via popular media player (requires FFDShow)

Storage
Disk Interface: 2 2.5" SATAII sockets
Note: Storage disks are not included. Users will need to purchase 2.5" hard disks or SSDs (solid state disks) from a hard disk vendor.

Network
Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, SNMPv1/v2c/v3, DDNS, FTP, Modbu/TCP, 802.1X
Ethernet: 1 auto-sensing 10/100/1000BaseT(X) RJ45 connector
Connections: 10

Data Ports
COM Ports: 2 RS-232/422/485 ports, with DB9 male connectors (for external devices)
USB Ports: 1 USB 2.0 port

GPIO
Digital Inputs: 6, source type, 0 to 5 VDC at 15 Hz
Level 0: Close to GND
Level 1: Open
Digital Outputs: 2, source type, 0 to 5 VDC, max. 20 mA
Level 0: 0 to 0.55 V
Level 1: 4.2 to 5.0 V

LED Indicators
STAT: Indicates if system has booted up and is operating properly
PWR: Power
HDD: Indicates if the hard disk is or is not working
FAULT: Can be set up to correspond with system alarms—video loss or network down
Video 1/2/3/4/5/6/7/8: The status of video channels 1 to 8

Power Requirements
Input Voltage: 1 24 VDC power input with 3-pin terminal block connector
Power Consumption: Max. of 20 watts (with 2 2.5" hard disks)

Physical Characteristics
Housing: Metal
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.8 in)
Installation: 19" rackmount

Security
Password: User level password protection
Filtering: By IP address
Authentication: 802.1X

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN61000-4-2 (ESD) Level 3,
EN61000-4-3 (RS) Level 3,
EN61000-4-4 (EFT) Level 2,
EN61000-4-5 (Surge) Level 3,
EN61000-4-6 (CS) Level 3,
EN61000-4-8,
EN61000-4-11

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

System Requirements

CPU: Pentium 4, 2.4 GHz or above
Memory: 512 MB memory or above
OS: Windows XP/2000 with SP2 or above
Browser: Internet Explorer 6.x or above
Multimedia: DirectX 9.0c or above

Software Development Kit

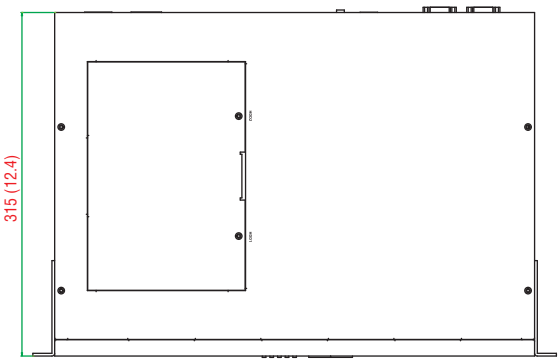
VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions

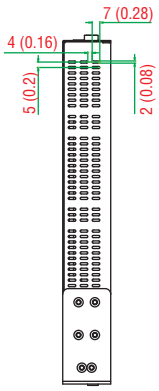
Unit: mm (inch)



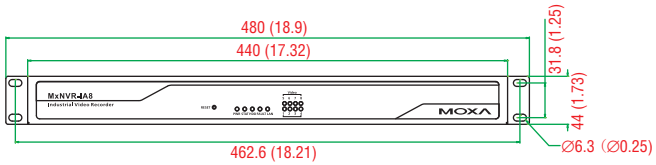
Rear View



Top View



Side View



Front View

Ordering Information

Available Models

MxNVR-IA8: 8-channel industrial network video recorder, 1 10/100/1000BaseT(X) Ethernet port, 24 VDC power input, 0 to 60°C operating temperature
MxNVR-IA8-T: 8-channel industrial network video recorder, 1 10/100/1000BaseT(X) Ethernet port, 24 VDC power input, -40 to 75°C operating temperature
Note:
• The storage hard disk is not included with the product shipment. You will need to purchase the hard disk separately and install it yourself.
• The MxNVR-IA8-T must use SSDs (Solid State Disks) capable of working in a -40 to 75°C temperature range.

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

Package Checklist

- MxNVR-IA8 network video recorder
- 2 rackmount ears with screws
- 4 pads
- 1 3-pin terminal block for power input
- 2 5-pin terminal blocks for 6 DIs and 2 DOs
- Quick installation guide (printed)
- Documentation and software CD
- Warranty Card

SoftNVR-IA

32-channel IP video surveillance software designed for industrial automation systems



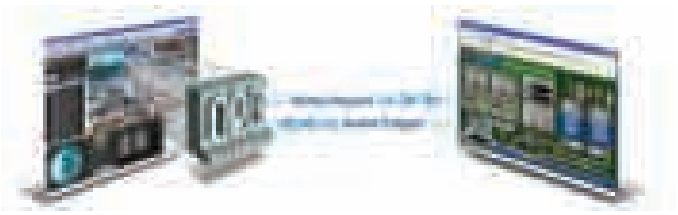
- Up to 32 channels in one system
- Built-in OPC server for easy communication with automation systems
- Live view with H.264, MPEG4, and MJPEG, from VPort products
- Dual monitor display capability
- i-frame (key frame) decode only to save system resources for higher priority tasks
- Video recording with manual, event-triggered, and scheduled recording
- Playback system with event and time-based search functionality
- Supports remote live view and remote playback via web access
- Supports English, Traditional Chinese, and Simplified Chinese

Introduction

The SoftNVR-IA 32-channel IP surveillance software is designed for use with industrial applications. One of the key features of SoftNVR-IA is a built-in OPC server, which can communicate directly with industrial automation systems (SCADA, HMI, etc.). To enhance system intelligence, video recording and alarms can be triggered by events such as Digital Input and Video Loss that are supported by SoftNVR-IA, as well as events in automation systems. Most importantly, SoftNVR-IA gives industrial system integrators unlimited capability for integrating IP surveillance systems with automation systems.

OPC communication

- Can receive event tags sent from the automation system to trigger video recording and other actions
- Can send event tags to the automation system with system information and the status of each channel



Live View

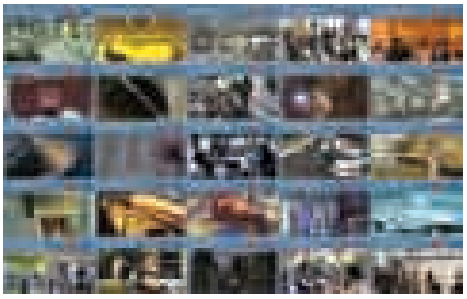
- Supports 1, 4, 6, 9, 10, 13, 16, 25, 32 live display
- Supports MJPEG, MPEG4, and H.264 video streams (only supports VPort models)
- Supports up to 32 channels in the camera list
- Easy-to-use with drag and drop video display selection
- Can provide snapshot images in JPEG format
- Supports image tuning, including brightness, saturation, contrast, and hue
- Supports 2-way audio for voice communication between field sites and the control center
- Supports dual monitor and full screen display
- Supports display screen rotation
- Supports the PTZ control panel defined in VPort products
- Supports i-frame (key frame) decode only, which lowers displayed frame rate immediately to save system resources for other higher priority tasks



Dual monitor display

Video Record

- Video recording can be triggered manually or by event
- Video files are in AVI format, and can be played back on all popular media players (requires SoftNVR-IA codec)
- The storage hard disk can be selected from network hard drives
- Supports the FIFO recycle function for long time video recording
- Can configure the number of days recorded video files will be stored
- Supports pre-event video recording for up to 30 seconds



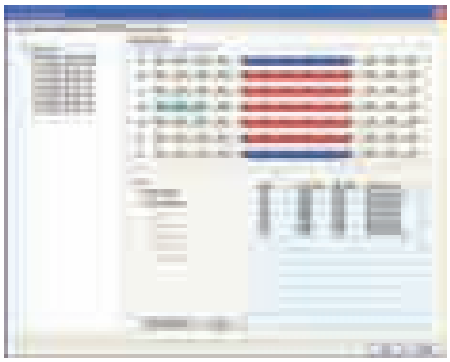
Playback & Search

- Can play back up to 4 recorded videos simultaneously
- Supports timeline selection when in video playback mode
- Supports stop, speed up, slow down, rewind frame-by-frame, and forward frame-by-frame
- Search video records by camera, time, or event
- Can take snapshot images when in video playback mode



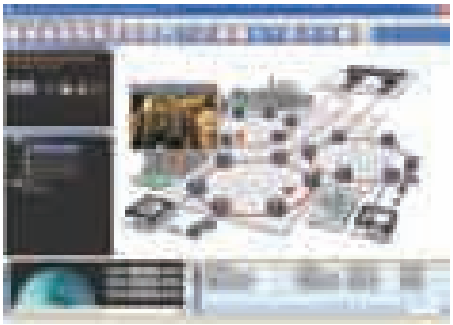
Schedule

- Can set up a weekday schedule
- Schedule settings can be based on camera and event



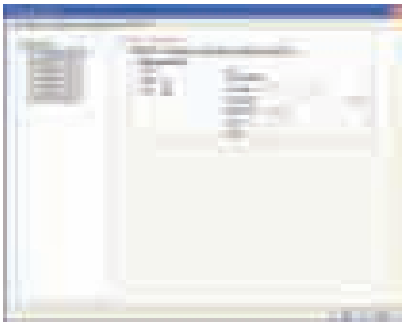
e-Map

- Can load BMP emap for easy camera location identification
- Maximum 32 emaps can be built in the list
- Video image can be pop out when targeting the cursor on the camera icon
- 3 types camera icon and maximum 8 lens direction can be selected
- Double click on the camera can open the camera's live display video
- Camera icon can be configured in flash once an alarm is happened



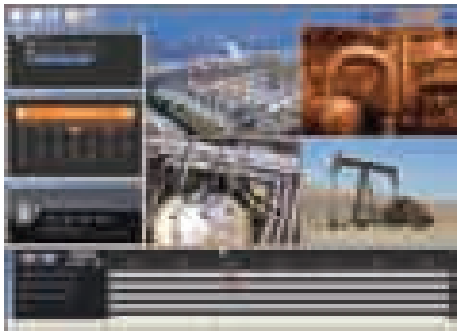
Alarm Events

- Alarm events: Digital input and Video Loss
- Can accept events from the automation system via OPC communication
- Alarm triggered actions: popup display, go preset, play sound, trigger DO (relay)



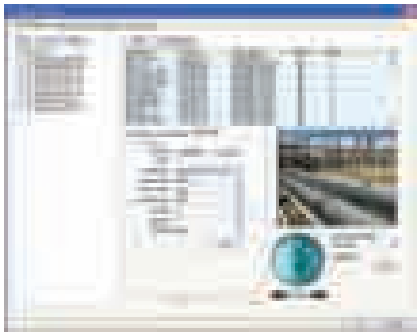
Remote Access

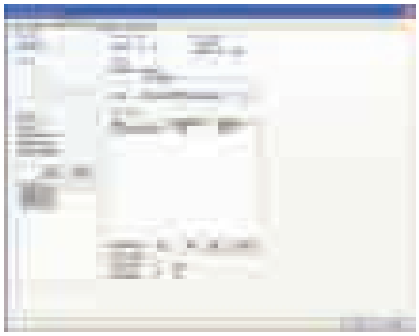
- Remote live view via web access
- Remote playback of recorded video via web access
- Capable of searching a specified recorded video by event, time, and camera
- Remote control of PTZ camera



System

- Automatically search or manually detect the IP address of a video device on the LAN
- Can configure the server name
- Can configure multiple email addresses for receiving alarm messages
- Folder and file names of snapshot images can be customized
- Maximum 4 groups and 32 users privileges can be setup for different operation purpose





Recommended System Requirements

- Intel Core 2 Duo QX6700 or above
- 2 GB RAM or above
- Windows XP with SP3
- Motherboard: Intel chipset recommended
- Display card: ATI Radeon 9200, nVIDIA GeForce GT220, or above (dual monitors require 2 outputs); 1 GB DDR3 recommended

Ordering Information

Available Models

SoftNVR-IA V2.0: 32-channel IP video surveillance software for industrial automation systems

Package Checklist

- SoftNVR-IA CD (includes the SoftNVR-IA software and related documents)
- Key Pro (plugs into the USB port)
- Quick installation guide (printed)

SoftNVR

Expandable IP surveillance software for managing up to 64 video channels



Moxa's SoftNVR IP surveillance software can be used to record video over the network and manage up to 64 video stream channels generated by Moxa's video encoders (VPort 351, VPort 354, VPort 254, VPort 251) and IP cameras (VPort 25 series) simultaneously. Features include dual monitor display, video analysis, instant alarm, event recording, and video enhancement tools. SoftNVR gives users an advanced video management tool for medium to large video surveillance networking systems.

Features

- Up to 64 channels in one system



- Dual monitor display capability for convenient viewing



- Video analysis with moving objects, and video loss detection



- Instant response for alarm notification



- Simple and user-friendly setup for recording schedules



- Multifunction playback system with intelligent search



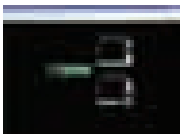
- Video enhancement tools for image quality tuning



- I/O device integration



- Live viewing from popular web browsers



Introduction

Live Display

- Display a maximum of 64 channels, which can be configured for different modes, and in full screen.
- Dual monitor support:
  - Focus on important areas: Users can set one screen to monitor general cameras and the other to monitor important cameras.
  - Live view and playback at the same time: Users can set one screen to watch a live view, and use the other to play back images.
  - A "Detected Event" for the spot monitor application can pop up in the secondary monitor while the primary one is viewing live video.
- Adjustable monitor windows: Supports 1, 4, 6, 9, 10, 13, 16, 25, 36, 49, or 64 divided windows in full screen and when using the "display in turns" function.
- Multiple views: Show images from one video source on multiple screens.

PTZ Control

- PTZ preset point: Save the definition of PTZ camera lens as a preset point and allow camera to move quickly to that location.
- Patrol: Allow camera to patrol an area based on a combined set of preset points.
- Digital PTZ:
  - Focus on any location you would like to highlight.
  - "Digital PTZ" and "Multiple Show" allow you to put the focus from single video resource anywhere you want.

Smart Detection

- Smart detection of 9 different events
  - General Motion
  - Object Disappears
  - Object Appears
  - Lost Focus
  - Camera Occlusion
  - Lost Signal
  - Signal Digital Input
  - System alarm when Disk Space Exhausted
  - System alarm when System Health Unusual
- Instant response for event alarms
  - On Screen Display
  - Play Sound
  - Send Email
  - PTZ Preset Go
  - Signal Digital Output

Recording and Schedule

- Video compression with MPEG4 and MJPEG.
- Record synchronized audio and video.
- Auto recycling when storage disk is full.
- Recording modes: Continuous record, record by event, record by digital input, record by motion, record by schedule, and manual recording.
- Recording schedule: Record daily, weekly, or by repeat schedule.
- Videos and images can be saved in outer storage devices such as DAS, NAS, or SAN without any limitations; useful if you need to increase your storage space in the future.

Remote Access

- Remote Live View by client program and web browser.
- Remote Playback by client program and web browser.
- Remote control PTZ camera.

Playback & Search

- Play back a maximum of 16 channels under different modes and in full screen.
- Intelligent search and smart search modes by event, area, camera, date, time, or log file.
- Administrator can configure the path to the recording database, without limitation. Unlimited support for additional storage devices.
- A search for a recorded video is based on the time period and event, which is the easiest and most efficient way to find the target recorded video.
- Complete playback control: Playback, reverse playback, fast forward.
- Digital zoom in to a specific area.
- Export video to AVI or ASF files.
- Export a single frame to a BMP or JPEG file and print it out.
- Back up the video by burning it to a disc and onto the hard disk.
- Video enhancement: Visibility, sharpness, brightness, contract, grayscale.

System

- User-friendly control interface; no complicated control window, making it easy for anyone with basic computer knowledge to use.
- Administrator can auto log in from a certain account, and enable, add, edit, and delete users without limitation. Configure access rights for users.
- Only the users in the administrator group can exit the Main Console.
- Can monitor connection conditions, such as Account, login time, flow rate, and IP address. Includes remote control information for analyzing data and sorting out responsibilities.
- Log data: Unusual event, system log, counting application can export to “xls” or “txt” file.
- Execute recording, smart guard, and other functions in the background after logging out of the system.
- Supports 22 languages: English, Tranditional Chinese, Simplified Chinese, Japanese, Franch, Spanish, German, Italian, Turkish, Danish, Hungarian, Greece, Finnish, Russian, Thai, Czech, Slovak, Korean, Portuguese, Portuguese (Brazil), Hebrew, Persian

System Requirements

Total FPS at CIF	600 or more	480 to 600	240 to 480	120 to 240	less than 120
CPU	Intel Core 2 Duo QX6700	Intel Core 2 Duo E6400	Intel Pentium D 930	Intel P4 2.8 GHz	Intel P4 2.4 GHz
RAM	2 GB	1 GB	1 GB	512 MB	512 MB
Motherboard	Intel 945 or 965 chip, Intel chipset recommended				
Display	ATI Radeon 9200, nVIDIA GeForce FX-5200, Intel 945 / 965, or above (ATI recommended)				
Ethernet	100BaseT(X) or above, Gigabit LAN recommended				
Hard Disk	80 GB or above				
OS	MS Windows 2000/XP Pro SP2/2003				

Ordering Information

Available Models

SoftNVR-4/8/16/25/32/64: SoftNVR with 4/8/16/25/32/64-channel license Key Pro

Package Checklist

- SoftNVR CD (includes the SoftNVR software and related documents)
- Key Pro (plugs into the USB port)
- Quick installation guide (printed)

VPort SDK PLUS

User-friendly software development kits for third-party developers to customize IP video management systems

Introduction

Moxa IVN (Industrial Video Networking) solutions, which include VPort series IP video products and IP surveillance software solutions, are future-proof, ready-to-use IP video solutions for video surveillance applications. With the growing popularity of IP networks, more and more users need to integrate their video management system with other monitoring and control systems (e.g., SCADA or HMI) to get the benefits of centralization and inter-operation. To assist third-party developers with this intergration,we are providing Moxa VPort SDK PLUS, which supports VPort series video server and IP cameras, for building customized video management systems and for integrating VPort series products into comprehensive monitoring and control systems.

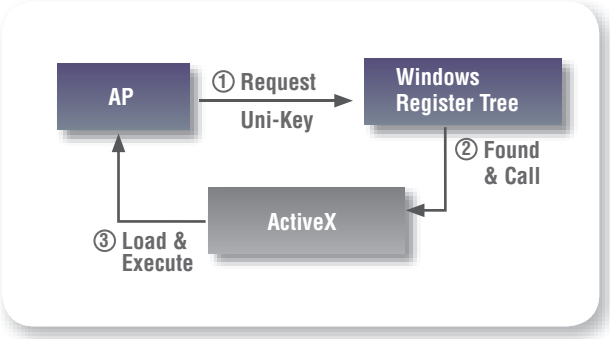
URL Commands

URL commands are easy-to-use CGI commands used with HTML programming for web systems. Users can acquire video images and control VPort series products from their own customized web pages by embedding these CGI commands into the HTML source code. All of the URL commands are listed in the VPort user's manual, or a CGI command manual.

ActiveX Control SDK PLUS

ActiveX Control is an OCX component that uses Microsoft COM (Component Object Model) technology to enable software components to communicate. ActiveX Control is used widely with platforms that support WIN32, IE Plug-in, and Visual Basic, and is also popular in automation system software, such as SCADA systems. Moxa ActiveX Control SDK PLUS is a user-friendly, customized tool for programmers that supports versatile parameters for customized viewing, recording, PTZ camera control, event triggering, and recorded video playback. Moxa ActiveX Control SDK PLUS is provided free of charge, and supports VB, VC, and C# developing environments, as well as plug-ins for web applications and automation tools (e.g., SCADA software). Third-party developers who want to use ActiveX SDK can download it from Moxa's website.

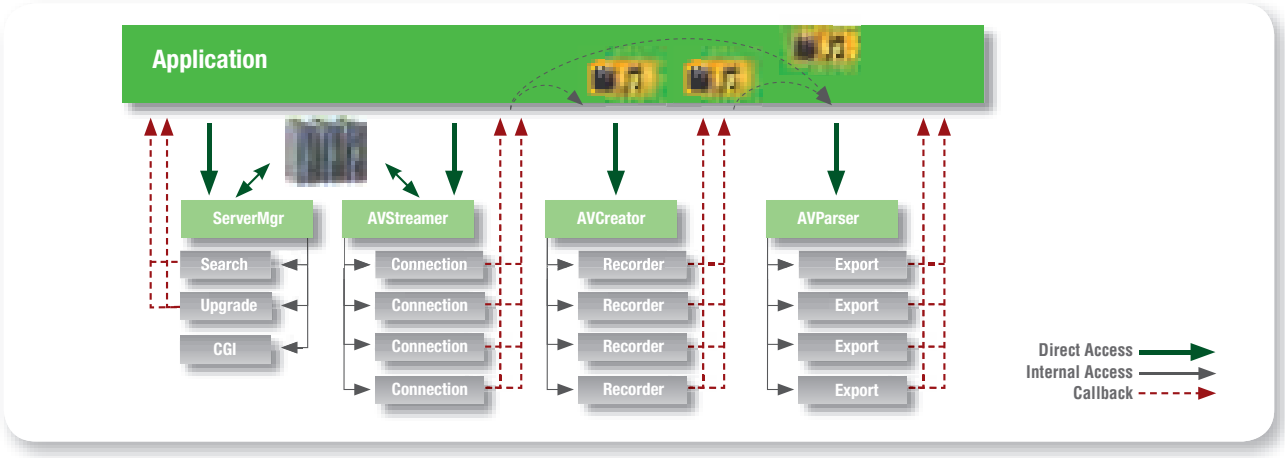
ActiveX Work Process



API SDK PLUS

For some video management applications, ActiveX Control SDK PLUS may not provide users with enough functionality. In this case, API SDK PLUS, which includes a detailed C library, can be used to program customized solutions in a Visual C++ or C# environment. API SDK PLUS includes a total of 4 DLL modules, and currently supports the WIN32, Linux, and WIN CE pocket 2003 platforms. API SDK PLUS is provided free of charge. However, since API SDK PLUS uses proprietary technology and the programmer must be an experienced, professional C programmer, we are not releasing API SDK PLUS for general use. Third-party developers who would like to use API SDK PLUS should request support on Moxa's website to apply for a free copy. Some verification is required.

API Module Structure



VPort Video Gadget

Coding-free programming method specially designed for SCADA systems

Introduction

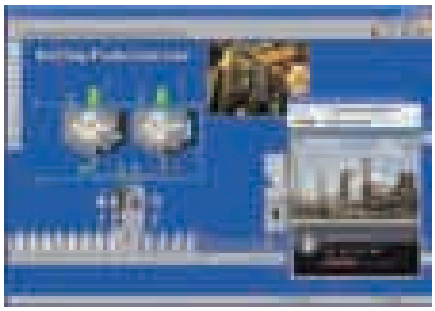
Embedding video into a SCADA system has always been a big hassle for system integrators, since they needed to invest the time and effort to study the IP video device's ActiveX SDK (software development kit), and then struggle to write bug-free code. In order to reduce the amount of programming effort required, Moxa has created a coding-free programming tool, called VPort Video Gadget, which is included with VPort ActiveX SDK PLUS. VPort Video Gadget has the potential to save system engineers an enormous amount of programming time and effort.

About VPort Video Gadget

VPort Video Gadget is basically a collection of pre-programmed function objects for embedding video into a SCADA system. Functions include connecting/disconnecting the VPort, displaying a video, closing a video, controlling PTZ, enabling/disabling audio, and taking snapshot images. There is no need for the system engineer to spend time writing the code, which is a huge benefit since it can save a lot of time and engineering resources.

For videos recorded with Moxa SoftNVR-IA or MxNVR-IA, VPort video gadget provides a remote playback function object for playing recorded videos on a SCADA HMI. The SCADA system integrator can easily design the search and playback of recorded videos using this remote playback function.





Using VPort Video Gadget

Only and few steps are required to use VPort Video Gadget:

- Drag & drop the selected function object
- Input the required parameters into the appropriate columns
- Save, and the function programming task is done
- Supports Citect, InTouch, and Cimplicity third-party SCADA systems



Note: The precise way to use VPort Video Gadget may be different for different SCADA systems. However, regardless of which SCADA system you use, VPort Video Gadget will be 100% coding-free.

A Great Tool for Automation Systems

Obviously, the key benefit provided by VPort Video Gadget is to greatly reduce the amount of programming effort required to integrate IP video into SCADA software. But more than that, with VPort Video Gadget your IP video system will no longer be separate from your automation system. Instead, it will just be one more element of the automation system, on the same par as I/O sensor alarms, motors, and other items.

To get VPort Video Gadget, download Moxa VPort ActiveX SDK PLUS from the download center on Moxa's website.

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Industrial Computing

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For detailed product specifications see Moxa's Industrial Computing product catalog, or visit our corporate website at www.moxa.com/industrialcomputing.htm.

Rolling Stock and Marine Computers



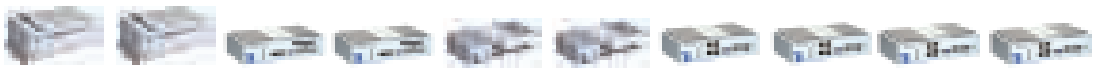
	V2406-XPE V2406-T-XPE	V2406-LX V2406-T-LX	V2416-XPE V2416-T-XPE	V2416-LX V2416-T-LX	V2426-XPE V2426-T-XPE	V2426-LX V2426-T-LX	MPC-122X-K	MPC-122Y-K	MC-4510-C23
Computer									
CPU Speed	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	2.26 GHz	2.26 GHz	2.26 GHz
OS (pre-installed)	Win Embedded Stand. 2009	Linux	Win Embedded Stand. 2009	Linux	Window Embedded Standard 2009	Linux	–	–	–
FSB	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	1066 MHz	1066 MHz	1066 MHz
System Memory	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	2 GB (4 GB max.)	2 GB (4 GB max.)	2 GB (2 GB max.)
USB Ports	3 (USB 2.0)	3 (USB 2.0)	3 (USB 2.0)	3 (USB 2.0)	3 (USB 2.0)	3 (USB 2.0)	7 (USB 2.0)	7 (USB 2.0)	6 (USB 2.0)
Digital I/O	6 DIs, 2 DOs	6 DIs, 2 DOs	6 DIs, 2 DOs	6 DIs, 2 DOs	6 DIs, 2 DOs	6 DIs, 2 DOs	–	–	–
Storage									
Built-in	2 GB	2 GB	2 GB	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	–	–	–
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓	✓	✓
HDD Support	✓	✓	–	✓	✓	✓	✓	✓	✓
Other Peripherals									
KB/MS	✓	✓	✓	✓	✓	✓	✓	✓	✓
Audio	Line-in/out	Line-in/out	Line-in/out	Line-in/out	Line-in/out	Line-in/out	Line-in/out	Line-in/out	Line-in/out
Display									
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓
VGA Output	✓	✓	✓	✓	✓	✓	✓	✓	✓
DVI Output	✓	✓	–	–	✓	✓	✓	✓	✓
LVDS Output	–	–	✓	✓	–	–	–	–	–
Display Characteristics									
Panel Size	–	–	–	–	–	–	22" wide-screen	22" wide-screen	–
Aspect Ratio	–	–	–	–	–	–	16:10	16:10	–
Pixels	–	–	–	–	–	–	1680 x 1050 (WSXGA+)	1680 x 1050 (WSXGA+)	–
Response Time	–	–	–	–	–	–	8 ms (gray to gray)	8 ms (gray to gray)	–
Contrast Ratio	–	–	–	–	–	–	1000:1	1000:1	–
Viewing Angles	–	–	–	–	–	–	178/178	178/178	–
Max Colors	–	–	–	–	–	–	16.7M (8 bits/ color)	16.7M (8 bits/ color)	–
Optical Bonding	–	–	–	–	–	–	–	✓	–
LAN Interface									
10/100/1000 Mbps Ethernet Ports	–	–	2 (M12)	2 (M12)	–	–	2 (RJ45)	2 (RJ45)	2 (RJ45)
10/100 Mbps Ethernet Ports	2 (M12)	2 (M12)	–	–	2 (M12)	2 (M12)	–	–	–
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface									
RS-232/422/485 Ports	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
ESD Protection	8 KV	8 KV	4 KV	4 KV	8 KV	8 KV	4 KV	4 KV	4 KV
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF, ADDC®								
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)								
LEDs									
System	Power, Storage								
LAN	10M, 100M	10M, 100M	100M, 1000M	100M, 1000M	10M, 100M	10M, 100M	100M, 1000M	100M, 1000M	100M, 1000M
Serial	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx
Physical Characteristics									
Housing	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Weight	2 kg	2 kg	4 kg	4 kg	4 kg	4 kg	15 kg	15 kg	3.75 kg
Dimensions	250 x 57 x 154 mm		250 x 86 x 154 mm				124 x 560 x 420 mm		302 x 70 x 279 mm
Mounting	DIN-Rail, wall, VESA						Flush		Wall
Environmental Limits									
Operating Temperature	-40 to 85°C or -25-60°C or -10 to 60°C						-15 to 55°C		
Storage Temperature	-40 to 85°C or -20 to 85°C						-20 to 60°C		
Ambient Relative Humidity	5 to 95% (non-condensing)								
Anti Vibration / Shock	EN 50155 standards						IEC 60945, DNV 2.4, Class A/C		2 g's / 50 g's
Standards and Certifications									
Safety	UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1, CCC (GB9254, GB17625.1)						UL 60950-1, IEC 60945 4th. IACS-E10, CCC (GB4943, GB9254, GB17625.1)		
EMC	EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A						EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B, IEC 60945 4th. IACS-E10		
Rail Traffic	EN 50155								
Green Product	RoHS, CRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)						1 year		3 years

Wallmount Computers



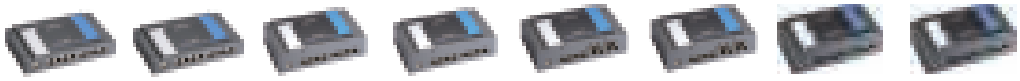
	V2101-T-CE	V2101-T-XPE	V2101-T-LX	V2401-CE	V2401-XPE	V2401-LX	V2402-CE	V2402-XPE	V2402-LX
Computer									
CPU Speed	1.1 GHz	1.1 GHz	1.1 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz
OS (pre-installed)	WinCE 6.0	Windows Embedded Standard 2009	Linux	WinCE 6.0	Window Embedded Standard 2009	Linux	WinCE 6.0	Windows Embedded Standard 2009	Linux
FSB	400 MHz	400 MHz	400 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz
Flash	–	–	–	–	–	–	–	–	–
System Memory	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)
USB Ports	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)
Digital I/O	3 DIs, 3 DOs	3 DIs, 3 DOs	3 DIs, 3 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs
Storage									
Built-in	2 GB	2 GB	2 GB	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)
CompactFlash Socket	–	–	–	✓	✓	✓	✓	✓	✓
SD Slot	✓	✓	✓	–	–	–	–	–	–
HDD Support	–	–	–	✓	✓	✓	✓	✓	✓
Other Peripherals									
KB/MS	–	–	–	✓	✓	✓	✓	✓	✓
Audio	line-in/out	line-in/out	line-in/out	line-in/out	line-in/out	line-in/out	line-in/out	line-in/out	line-in/out
Display									
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓
VGA Output	✓	✓	✓	✓	✓	✓	✓	✓	✓
DVI Output	–	–	–	✓	✓	✓	✓	✓	✓
LVDS Output	✓	✓	✓	✓	✓	✓	–	–	–
LAN Interface									
10/100/1000 Mbps Ethernet Ports	2	2	2	2	2	2	2	2	2
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface									
RS-232 Ports	–	–	–	8 (68-pin VHDC)	8 (68-pin VHDC)	8 (68-pin VHDC)	–	–	–
RS-232/422/485 Ports	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)
ESD Protection	2 KV	2 KV	2 KV	4 KV	4 KV	4 KV	4 KV	4 KV	4 KV
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF			RTS/CTS, XON/XOFF, ADDC®					
Baudrate	50 bps to 115.2 Kbps			50 bps to 921.6 Kbps (non-standard baudrates supported)					
LEDs									
System	Power, Storage								
LAN	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M
Serial	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx
Physical Characteristics									
Housing	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Weight	940 g	940 g	940 g	2.1 kg	2.1 kg	2.1 kg	2 kg	2 kg	2 kg
Dimensions	150 x 49 x 125 mm			250 x 57 x 152 mm					
Mounting	DIN-Rail, wall, VESA								
Environmental Limits									
Operating Temperature	-40 to 85°C			-10 to 60°C					
Storage Temperature	-40 to 85°C								
Ambient Relative Humidity	5 to 95% (non-condensing)								
Anti Vibration / Shock	2 g's / 20 g's			5 g's / 50 g's					
Standards and Certifications									
Safety	UL 508, UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1, CCC (GB9254, GB17625.1)								
EMC	EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A								
Green Product	RoHS, cRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)								

Wallmount Computers



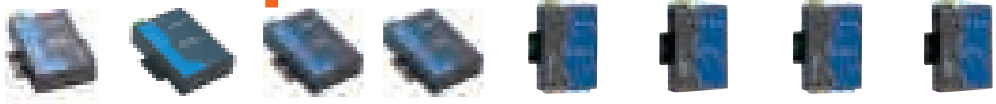
	V2422-XPE	V2422-LX	V462-CE	V462-XPE	V464-CE	V464-XPE	V466-CE	V466-XPE	V468-CE	V468-XPE
Computer										
CPU Speed	1.6 GHz	1.6 GHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz
OS (pre-installed)	Win. Embeddeded Stand. 2009	Linux	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.
SRAM	–	–	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB
FSB	533 MHz	533 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz
System Memory	1 GB (2 GB max.)	1 GB (2 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)
PCMCIA	–	–	✓	✓	–	–	–	–	–	–
Expansion Bus	–	–	PC/104-Plus onboard							
USB Ports	6 (USB 2.0)	6 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)
Digital I/O	4 DIs, 4 DOs	4 DIs, 4 DOs	–	–	–	–	–	–	8 DIs, 8 DOs	8 DIs, 8 DOs
Storage										
Built-in	2 GB (DOM)	2 GB (DOM)	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Other Peripherals										
KB/MS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Audio	Line-in/out		line-out							
Display										
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LAN Interface										
10/100 Mbps Ethernet Ports	–	–	2	2	4	4	4	4	4	4
10/100/1000 Mbps Ethernet Ports	2 (RJ45)	2 (RJ 45)	–	–	–	–	–	–	–	–
Switch Ports	–	–	–	–	–	–	8	8	–	–
Controller	–	–	Realtek RTL8100CL							
Magnetic Isolation Protection	–	–	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface										
RS-232 Ports	–	–	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
RS-485	–	–	–	–	–	–	–	–	–	–
RS-232/422/485 Ports	4 (DB9-M)	4 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
ESD Protection	8 KV	8 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF, ADDC®									
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)									
LEDs										
System	Power, Storage		Power, Battery, Storage							
LAN	100M, 1000M		10M, 100M				10M, 100M, Switch		10M, 100M	
Physical Characteristics										
Housing	Aluminum		Aluminum							
Weight	4 kg		1.32 kg							
Dimensions	154 x 250 x 86 mm		223 x 121 x 57 mm							
Mounting	DIN-Rail, wall, VESA		DIN-Rail, wall							
Environmental Limits										
Operating Temperature	-10 to 60°C		-10 to 60°C							
Storage Temperature	-20 to 80°C		-20 to 80°C or -40 to 85°C							
Ambient Relative Humidity	5 to 95% (non-condensing)		5 to 95% (non-condensing)							
Anti Vibration / Shock	EN 50155		5 g's / 50 g's							
Regulatory Approvals										
Safety	UL 508, UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1, CCC (GB9254, GB17625.1)		UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)							
EMC	EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A		EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A							
Rail Traffic	EN 50155		–	–	–	–	–	–	–	–
Green Product	RoHS, CRoHS, WEEE		RoHS, CRoHS, WEEE							
Reliability										
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)									

Wallmount Computers



	UC-8410-LX UC-8410-T-LX	UC-8410-CE UC-8410-T-CE	UC-8416-LX UC-8416-T-LX	UC-8416-CE UC-8416-T-CE	UC-8418-LX UC-8418-T-LX	UC-8418-CE UC-8418-T-CE	UC-8430-LX UC-8430-T-LX	UC-8430-CE UC-8430-T-CE
Computer								
CPU Speed	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz
OS (pre-installed)	Linux	Windows Embedded CE 6.0	Linux	Windows Embedded CE 6.0	Linux	Windows Embedded CE 6.0	Linux	Windows Embedded CE 6.0
DRAM	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB
SRAM	256 KB	256 KB	256 KB	256 MB	256 KB	256 MB	256 MB	256 MB
Flash	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	32 MB (OS); 32 MB (data)	32 MB (OS); 32 MB (data)
Expansion Bus	PCI/104	PCI/104	PCI/104	PCI/104	PCI/104	PCI/104	PCI/104	PCI/104
USB Ports	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)
Digital I/O	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	12 DIs, 12 DOs	12 DIs, 12 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs
Storage								
CompactFlash Socket	✓	✓	✓	–	✓	✓	✓	✓
LAN Interface								
10/100 Mbps Ethernet Ports	3	3	3	3	3	3	3	3
Switch Ports	–	–	8	8	–	–	–	–
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface								
RS-232/422/485 Ports	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Console Port	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF, ADDC®							
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)							
CANbus	–	–	–	–	2 (DB9-M)	2 (DB9-M)	–	–
LEDs								
System	Power, Ready, Storage, Battery							
LAN	10M, 100M							
Serial	TxD, RxD							
Physical Characteristics								
Housing	SECC sheet metal (1 mm)							
Weight	850 g	850 g	1 kg					
Dimensions	200 x 37 x 120 mm		200 x 56 x 120 mm					
Mounting	DIN-Rail, wall							
Environmental Limits								
Operating Temperature	-10 to 60°C or -40 to 75°C							
Storage Temperature	-20 to 80°C or -40 to 85°C							
Ambient Relative Humidity	5 to 95% (non-condensing)							
Anti Vibration / Shock	2 g's / 20 g's							
Standards and Certifications								
Safety	UL 60950-1, EN 60950-1, CCC (GB9254, GB17625.1)							
EMC	EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B							
Green Product	RoHS, cRoHS, WEEE							
Reliability								
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)							

Wallmount Computers



	UC-7101-LX UC-7101-T-LX	UC-7110-LX UC-7110-T-LX	UC-7112-LX	UC-7112-LX Plus	UC-7122-CE	UC-7124-CE	UC-7122-T-CE	UC-7124-T-CE
Computer								
CPU Speed	192 MHz	192 MHz	192 MHz	192 MHz	200 MHz	200 MHz	200 MHz	200 MHz
OS (pre-installed)	µClinux	µClinux	µClinux	Linux	Windows Embedded CE 5.0	Windows Embedded CE 5.0	Windows Embedded CE 5.0	Windows Embedded CE 5.0
DRAM	16 MB	16 MB	16 MB	32 MB	32 MB	32 MB	32 MB	32 MB
Flash	8 MB	8 MB	8 MB	16 MB	16 MB	16 MB	16 Mb	16 MB
USB Ports	–	–	–	–	1 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)
Storage								
SD Slot	✓	–	✓	✓	✓	✓	✓	✓
LAN Interface								
10/100 Mbps Ethernet Ports	1	2	2	2	2 (RJ45)	2 (RJ45)	2 (RJ45)	2 (RJ45)
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface								
RS-232/422/485 Ports	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	4 (RJ45)	2 (DB9-M)	4 (RJ45)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 Kv	15 KV
Console Port	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF, ADDC®							
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)							
LEDs								
System	Ready, SD	Ready	Ready	Ready	Ready, SD	Ready, SD	Ready, SD	Ready, SD
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M/100M	10M/100M	10M/100M	10M/100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics								
Housing	Aluminum (1 mm)							
Weight	130 g	190 g	190 g	190 g	190 g	200 g	190 g	200 g
Dimensions	67 x 22 x 100.4 mm	197 x 44 x 125 mm	197 x 44 x 125 mm	77 x 111 x 26 mm				
Mounting	DIN-Rail, wall			DIN-Rail, wall				
Environmental Limits								
Operating Temperature	-10 to 60°C or -40 to 75°C		-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-40 to 75°C	-40 to 75°C
Storage Temperature	-20 to 80°C or -40 to 85°C		-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-40 to 85°C	-40 to 85°C
Ambient Relative Humidity	5 to 95% (non-condensing)							
Anti Vibration / Shock	–	1 g	1 g	–	1 g / 2 g's			
Regulatory Approvals								
Safety	UL 60950, CSA-C22.2 No. 60950-1, EN 60950-1							
EMC	EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A							
Green Product	RoHS, CRoHS, WEEE							
Reliability								
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)							

Rackmount Computers



	DA-710-XPE	DA-710-LX	DA-681-I-SP-CE	DA-681-I-SP-XPE	DA-681-I-SP-LX	DA-681-I-DP-CE	DA-681-I-DP-XPE	DA-681-I-DP-LX	DA-681-I-DPP-T-CE	DA-681-I-DPP-T-XPE	DA-681-I-DPP-T-LX
Computer											
CPU Speed	2/2.2 GHz	2/2.2 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz
OS (pre-installed)	Win. Embedded Standard 2009	Linux	WinCE 6.0	WinXP Emb.	Linux	WinCE 6.0	WinXP Emb.	Linux	WinCE 6.0	WinXP Emb.	Linux
FSB	533 MHz	533 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz
System Memory	1 GB (2 GB max.)	1 GB (2 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)
Expansion Bus	4 slots	4 slots	PC/104 onboard						–	–	–
USB Ports	4 (USB 2.0)	4 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)
Digital I/O	4 DIs, 4 DOs	4 DIs, 4 DOs	–	–	–	–	–	–	–	–	–
Storage											
Built-in	2 GB	1 GB	1 GB	2 GB	1 GB	1 GB	2 GB	1 GB	256 MB	1 GB	1 GB
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HDD Support	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Other Peripherals											
KB/MS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Display											
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LAN Interface											
10/100 Mbps Ethernet Ports	–	–	6	6	6	6	6	6	–	–	–
10/100/1000 Mbps Ethernet Ports	4	4	–	–	–	–	–	–	4	4	4
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface											
RS-232 Ports	2 (DB9-M)	2 (DB9-M)	4 (DB9-M)								
RS-485	–	–	8 (TB)								
ESD Protection	4 KV	4 KV	15 KV								
Digital Isolation	–	–	2 KV								
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF		RTS/CTS, XON/XOFF, ADDC®								
Baudrate	50 bps to 115.2 Kbps		50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)								
LEDs											
System	Power, Storage, Power Failure		Ready, Storage, Power Failure (for dual power models only)								
LAN	100M, 1000M		10M, 100M								
Serial	TX, RX (for 4 modules), Programmable		TX, RX								
Physical Characteristics											
Housing	SECC sheet metal (1 mm)		SECC sheet metal (1 mm)								
Weight	14 kg		4.5 kg								
Dimensions	400 x 480 x 180 mm		440 x 315 x 45 mm								
Mounting	Standard 19-in rachmount		Standard 19-inch rackmount								
Environmental Limits											
Operating Temperature	-10 to 50°C		0 to 60°C						-40 to 75°C		
Storage Temperature	-20 to 80°C		-20 to 75°C						-40 to 85°C		
Ambient Relative Humidity	5 to 95% (non-condensing)		5 to 95% (non-condensing)								
Standards and Certifications											
Safety	UL 60950-1, CSA C22.2 No. 60950-1-07, CCC (GB4943, GB9254, GB17625.1)		UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)								
EMC	EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A		EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A								
Green Product	RoHS, CRoHS, WEEE		RoHS, CRoHS, WEEE								
Reliability											
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)										

Rackmount Computers



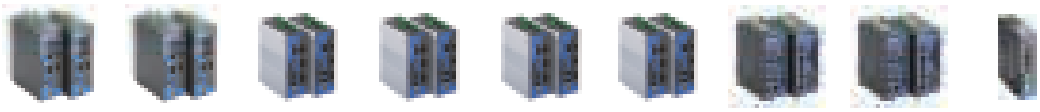
	DA-682-CE	DA-682-XPE	DA-682-LX	DA-683-SP-XPE	DA-683-SP-LX	DA-683-DPP-T-LX	DA-683-DPP-T-XPE
Computer							
CPU Speed	1 GHz	1 GHz	1 GHz	1.66 GHz	1.66 GHz	1.66 GHz	1.66 GHz
OS (pre-installed)	WinCE 6.0	WinXP Emb.	Linux	Win. Embedded Standard 2009	Linux	Linux	Win. Embedded Standard 2009
FSB	400 MHz	400 MHz	400 MHz	667	667	667	667
System Memory	256 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 G (2GB max.)	1 GB (2 GB max.)
Expansion Bus	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots
USB Ports	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)
Digital I/O	–	–	–	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs
Storage							
Built-in	256 MB	1 GB	1 GB	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓
HDD Support	✓	✓	✓	✓	✓	✓	✓
Other Peripherals							
KB/MS	✓	✓	✓	✓	✓	✓	✓
Display							
Graphics Controller	✓	✓	✓	✓	✓	✓	✓
LAN Interface							
10/100/1000 Mbps Ethernet Ports	4	4	4	6 (RJ45)	6 (RJ45)	6 (RJ45)	6 (RJ45)
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface							
RS-232 Ports	–	–	–	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
Serial Communication Parameters	–	–	–	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI			
LEDs							
System	Power, Storage						
LAN	100M, 1000M						
Serial	TX, RX (for 2 modules)			Tx, Rx			
Physical Characteristics							
Housing	SECC sheet metal (1 mm)			SECC sheet metal (1 mm)			
Weight	7 kg			4 kg			
Dimensions	440 x 315 x 90 mm	–	–	315 x 440 x 90 mm			
Mounting	Standard 19-inch rackmount						
Environmental Limits							
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C		-40 to 70°C	
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C		-40 to 85°C	
Ambient Relative Humidity	5 to 95% (non-condensing)						
Standards and Certifications							
Safety	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)			UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)			
EMC	EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A			CE (EN55022, EN61000-3-2, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class), CCC (GB9254, GB 17625.1), IEC 61850-3 (DPP-T models only)			
Green Product	RoHS, CRoHS, WEEE						
Reliability							
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)						

Rackmount Computers



	DA-660-8-LX	DA-660-8-CE	DA-660-16-LX	DA-660-16-CE	DA-661-16-LX	DA-661-16-CE	DA-662-16-LX	DA-662-16-CE	DA-662-I-16-LX	DA-662-I-16-CE
Computer										
CPU Speed	266 MHz	266 MHz	266 MHz	266 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz
OS (pre-installed)	Emb. Linux	WinCE 5.0	Emb. Linux	Emb. Linux	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0
DRAM	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB
Flash	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
PCMCIA	–	–	–	–	✓	✓	✓	✓	✓	✓
USB Ports	–	–	–	–	2	2	2	2	2	2
Storage										
CompactFlash Socket	–	–	–	–	✓	✓	✓	✓	✓	✓
Display										
Mini Screen with Push Buttons	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LAN Interface										
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	4	4	4	4
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Digital Isolation Protection	–	–	–	–	–	–	–	–	2 KV	2 KV
Serial Interface										
RS-232/422/485 Ports	8 (RJ45)	8 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Console Port	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	–	–	–	–	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	–	–	–	–	RTS/CTS, XON/XOFF, ADDC®					
Baudrate	–	–	–	–	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)					
LEDs										
System	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics										
Housing	SECC sheet metal (1 mm)								SECC sheet metal (1mm)	
Weight	2.6 kg								2.94 kg	
Dimensions	440 x 45 x 198 mm								440 x 45 x 228 mm	
Mounting	Standard 19-inch rackmount								Standard 19-inch rackmount	
Environmental Limits										
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C
Ambient Relative Humidity	5 to 95% (non-condensing)									
Standards and Certifications										
Safety	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1									
EMC	EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A									
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)									

DIN-Rail Computers



	IA260-LX IA260-T-LX	IA260-CE IA260-T-CE	IA261-I-LX IA261-I-T-LX	IA261-I-CE IA261-I-T-CE	IA262-I-LX IA262-I-T-LX	IA262-I-CE IA262-I-T-CE	IA240-LX IA240-T-LX	IA241-LX IA241-T-LX	IA3341
Computer									
CPU Speed	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz	192 MHz	192 MHz	192 MHz
OS (pre-installed)	Linux	WinCE 6.0	Linux	WinCE 6.0	Linux	WinCE 6.0	Embedded Linux		Embedded Linux
DRAM	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	64 MB	64 MB	64 MB
Flash	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	16 MB
PCMCIA	–	–	–	–	–	–	–	✓	–
USB Ports	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)
AI/Thermocouples	–	–	–	–	–	–	–	–	2 AIs, 2 thermocouples
Digital I/O	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 Dos
Storage									
CompactFlash Socket	✓	✓	✓	✓	✓	✓	–	–	–
SD Slot	–	–	–	–	–	–	✓	✓	✓
Display									
Graphics Controller	✓	✓	✓	✓	✓	✓	–	–	–
LAN Interface									
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	2	2	2
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface									
RS-232/422/485 Ports	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	2 (DB9-M)	2 (DB9-M)	4 (RJ45)	4 (RJ45)	2 (DB9-M)
ESD Protection	4 KV	4 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Digital Isolation	–	–	2 KV	2 KV	2 KV	2 KV	–	–	–
Console Port	✓	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF, ADDC®								
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)								
CANbus	–	–	–	–	2 (DB9-M)	2 (DB9-M)	–	–	
LEDs									
System	Power, Ready, Storage								Power, Ready, Storage
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics									
Housing	Aluminum, industrial vertical form factor						SECC sheet metal (1 mm)		SECC sheet metal (1 mm)
Weight	1 kg	1 kg	950 g	950 g	950 g	950 g	430 g	500 g	585 g
Dimensions	52 x 113 x 162 mm	52 x 113 x 162 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 137 x 100 mm	60 x 137 x 100 mm	116 x 35 x 146 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Environmental Limits									
Operating Temperature	-10 to 60°C or -40 to 75°C								-10 to 60°C
Storage Temperature	-20 to 80°C or -40 to 85°C								-20 to 80°C
Ambient Relative Humidity	5 to 95% (non-condensing)								
Regulatory Approvals									
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)						CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)		EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)						UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)		UL 60950-1, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)
Green Product	RoHS, CRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)								5 years

Wireless Computers



	W406-LX	W406-CE	W406-T-LX	W406-T-CE	W315A-LX	W325A-LX	W311-LX	W321-LX	W341-LX
Computer									
CPU Speed	200 MHz	200 MHz	200 MHz	200 MHz	192 MHz	192 MHz	192 MHz		
OS (pre-installed)	Embedded Linux	WinCE 6.0	Embedded Linux	WinCE 6.0	Embedded Linux	Embedded Linux	Embedded Linux with MMU support		
DRAM	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB		64 MB
Flash	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB		16 MB
USB Ports	1 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)	–	–	–	–	2 (USB 2.0)
Relay Outputs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	–	–	–	–	1
Storage									
SD Slot	✓	✓	✓	✓	✓	✓	✓	✓	✓
LAN Interface									
10/100 Mbps Ethernet Ports	1	1	1	1	1	1	1	1	1
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
WLAN Interface									
Standard Compliance	–	–	–	–	–	–	802.11a/b/g		
Radio Frequency Type	–	–	–	–	–	–	DSSS, CCK, OFDM		
Transmission Rate	–	–	–	–	–	–	54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps) • 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11b: 1, 2, 5.5, 11 Mbps		
Transmission Distance	–	–	–	–	–	–	Up to 100 meters (@ 11 Mbps in open areas)		
Wireless Security	–	–	–	–	–	–	WEP: 64-bit/128-bit, WPA, WPA2 data encryption		
WLAN Modes	–	–	–	–	–	–	Ad-hoc (802.11b/g), Infrastructure		
Cellular Interface									
Cellular Modes	GSM, GPRS, EDGE	GSM/GPRS/EDGE	GSM/GPRS/EDGE	GSM/GPRS/EDGE	GSM, GPRS	GSM, GPRS	–	–	–
Radio Frequency Bands	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	–	–	–
GPRS Class	12	12	12	12	10	10	–	–	–
EDGE Class	12	12	12	12	–	–	–	–	–
Coding Schemes	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	–	–	–
Serial Interface									
RS-232/422/485 Ports	2 (DB9-M)	1 (DB9-M)	2 (DB9-M)	1 (DB9-M)	1 (DB9-M)	2 (DB9-M)	1 (DB9-M)	2 (DB9-M)	4 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Console Port	✓	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF, ADDC™								
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)								
LEDs									
System	Ready, SD						Ready, SD		
LAN	10M, 100M						10M, 100M		
WLAN	–	–	–	–	–	–	Enable, Signal Strength		
Cellular	Enable, Signal Strength						–	–	–
Serial	TxD, RxD						TxD, RxD		
Physical Characteristics									
Housing	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)
Weight	1 kg	1 kg	195 g	195 g	195 g	195 g	170 g	185 g	390 g
Dimensions	144 x 119 x 40 mm	144 x 119 x 40 mm	144 x 119 x 40 mm	144 x 119 x 40 mm	77 x 111 x 26 mm	77 x 111 x 26 mm	77 x 111 x 26 mm	77 x 111 x 26 mm	150 x 100 x 38 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Antenna Length	85 mm	85 mm	85 mm	85 mm	84 mm	84 mm	–	–	–
Environmental Limits									
Operating Temperature	-10 to 60°C		Wide temperature (by request)		-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C
Storage Temperature	-20 to 80°C		Wide temperature (by request)		-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C
Ambient Relative Humidity	5 to 95% (non-condensing)								
Anti Vibration / Shock	6 g's with DIN-Rail / 20 g's with wall mount		2/6 g's with DIN-Rail / 20 g's with wall mount		5 g's / 50 g's	5 g's / 50 g's	5 g's / 50 g's	5 g's / 50 g's	5 g's / 50 g's
Standards and Certifications									
Safety	EN 60950-1, CSA C22.2 No. 60950-1-03				UL 60950-1, EN 60950-1, CSA C22.2 No. 60950-1-03		UL 60950-1, EN 60950-1		
EMC	EN 55022 Class B, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B				EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A		EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 55024		
Radio	EN 301 489-1, EN 301 489-7, EN 301 511				EN 301 489-1, EN 301 489-7, EN 301 511		EN 301 489-1/17, EN 301 893, EN 300 328, EN 50392, FCC Part 15, Subpart C/E		
Wheeled Vehicles	–	–	–	–	–	–	e-Mark (e13)		–
Green Product	RoHS, CRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)								

Modules and Boards



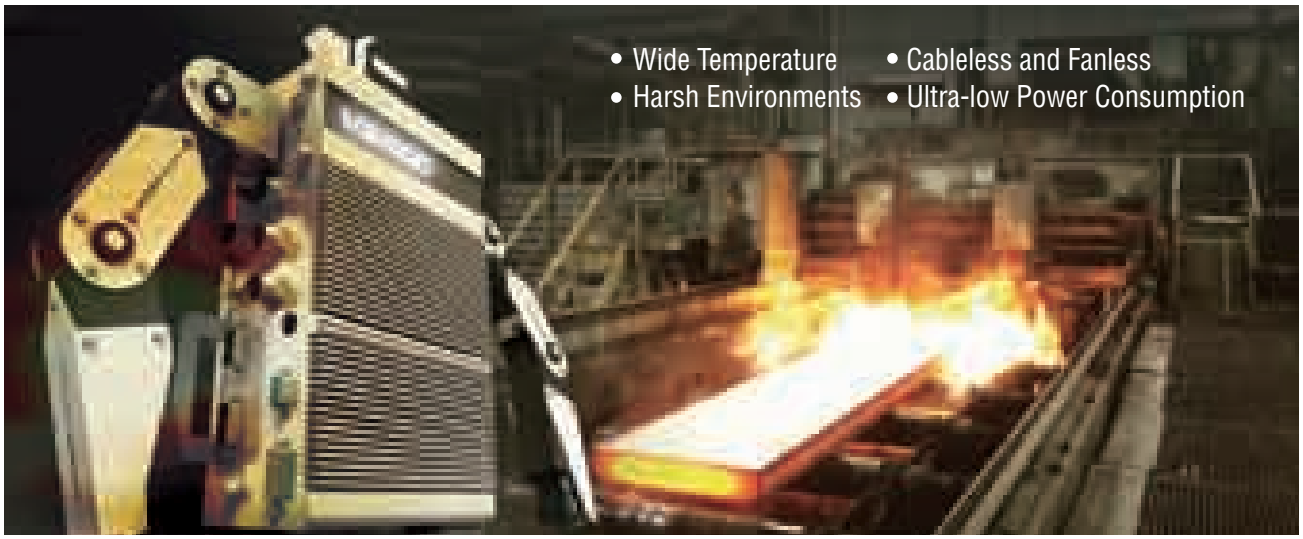





	EM-2260-CE	EM-2260-LX	EM-1240-LX	EM-1240-T-LX	EM-1220-LX	EM-1220-T-LX
Computer						
CPU Speed	200 MHz	200 MHz	192 MHz	192 MHz	192 MHz	192 MHz
OS (pre-installed)	WinCE 6.0	Linux	Embedded µClinux			
DRAM	128 MB	128 MB	16 MB	16 MB	16 MB	16 MB
Flash	32 MB	32 MB	8 MB	8 MB	8 MB	8 MB
Digital I/O	8 DIs, 8 DOs	8 DIs, 8 DOs	10 GPIOs	10 GPIOs	10 GPIOs	10 GPIOs
Storage						
SD Slot	–	–	✓	✓	✓	✓
EIDE Interface	✓	✓	–	–	–	–
Display						
Graphics Controller	✓	✓	–	–	–	–
LAN Interface						
10/100 Mbps Ethernet Ports	2	2	2	2	2	2
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface						
RS-232/422/485 Ports	4	4	4	4	2	2
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Console Port	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, XON/XOFF, ADDC®					
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)					
Physical Characteristics						
Weight	70 g	70 g	50 g	50 g	40 g	40 g
Dimensions	106 x 87 mm	106 x 87 mm	90 x 80 mm	90 x 80 mm	80 x 50 mm	80 x 50 mm
Module Interface	–	–	Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)			
Environmental Limits						
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	-40 to 75°C	-10 to 60°C	-40 to 75°C
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C or -40 to 85°C			
Ambient Relative Humidity	5 to 95% (non-condensing)					
Standards and Certifications						
EMC	EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A					
Green Product	RoHS, CRoHS, WEEE					
Reliability						
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)					

Introduction to Moxa's Industrial Computers

Industrial Grade—Rugged Design



Moxa's industrial computers are cableless, fanless, and are subjected to rigorous testing to verify their fitness for harsh environments. Moxa's industrial computers meet industry certifications for ruggedness in specific applications, such as IEC 61850-3, EN 50155 and DNV. We consider excellence an ongoing pursuit, and Moxa constantly develops and implements innovative new technologies for wide operating temperature computing.

Wide Temperature

Moxa's industrial computers easily handle extremely hot or cold environments and can withstand temperatures ranging from -40 to 75°C. This makes it possible to deploy computers in harsh environments such as roadside cabinets or remote field sites. To achieve this level of ruggedness, Moxa's sophisticated hardware and software solutions are built with high-quality components, advanced heat dissipation design, system throttling software, and self-warming systems. Then, all of our products must prove their endurance in dynamic burn-in and dynamic chamber tests conducted at both high and low temperatures. The result is a product ready to take on severe temperatures.

Wide Operating Temperature

Moxa Industrial Grade		Conventional
-40-75°C Operating Temp.		-10-60°C or -40-75°C Storage Temp.
40 hours uninterrupted burn in		N/A
Rigorous Chamber Testing Forced-convection & Natural-convection thermal chamber to test in real-world conditions	VS	Standard Chamber Testing Forced-convection thermal chamber
BIOS Dynamic Throttling Technology		N/A

Special Heat Dissipation Design



Innovative Heat Dissipation Design

Traditional externally-attached heat sinks can only go so far. For even more robust heat dissipation, Moxa has patented an innovative "H-type" heat sink that makes direct contact with the major inner heat sources to cool down a device's internal temperature.

System Throttling Design



BIOS Dynamic Throttling Technology

BIOS throttling efficiently cools down the system, but also lowers system performance. Moxa's dynamic throttling technology optimizes throttling behavior for maximum reliable performance.

Harsh Environments

In industry, operating in harsh environments is just all in a day's work. That's why Moxa's computers are designed to shrug off adversity that would hobble less rugged machines: vibration, power failure, electrostatic discharge, and electromagnetic interference.

Moxa's industrial-grade systems are backed up by 5G vibration and 50G anti-shock guarantees and are ideal for moving locations such as automobiles or rolling stock. Safeguarding the data is important to any data acquisition system's storage devices, such as CF, SD, and Flash memory, are similarly protected from detachment.

Industrial-grade products also require strong power input design to guarantee continuous operations. Dual power inputs or power input protection with screwed terminal blocks allow Moxa's systems to circumvent power interruptions.

Isolation protection is another key part of creating a secure communication platform. All of Moxa's communication interfaces are well-protected with different isolation standards. All serial ports come with ESD protection for all signals, Ethernet ports come with magnetic protection, and DI/DO channels have optical isolation protection.

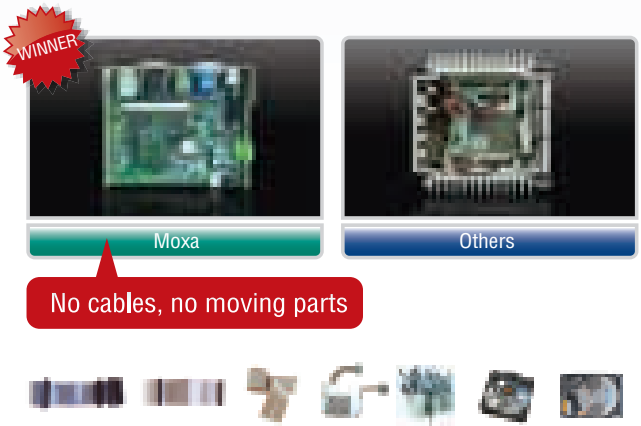
Electromagnetic interference presents a further challenge for engineers who design and develop embedded systems. Moxa's embedded computers use industrial-grade components that meet all international EMI standards and directives to reduce radiation effects and provide a reliable embedded platform for any industrial applications.

Anti-vibration and Anti-shock



Cableless/Fanless

Cables and fans are additional components that increase the complexity of a hardware device. This weakens the overall resilience of the system by adding more moving parts and points of failure. Moxa's design philosophy emphasizes compact and elegant architectures that do not use cables or fans. Forgoing cables increases vibration tolerance and avoids signal interference issues. Meanwhile, a fanless design reduces size, complexity, susceptibility to dust, and wear and tear. Instead of taking shortcuts by using these two problematic components, Moxa selects components that generate less heat but can still maintain high system performance. The result is a more stable, reliable, and cost effective system that dramatically reduces total cost of ownership.



Ultra-low Power Consumption

The components of Moxa's embedded computers are chosen to meet industrial-grade demands. To achieve this task, Moxa uses a fanless, cable-less, no hard disk design that guarantees stable system operation, but without generating too much heat.

UC-7100
RISC-based Wallmount Embedded Computers

Consumes 4.1 watts



W315A
RISC-based Wireless Embedded Computer

Consumes 4.8 watts



V2101
x86-based Wallmount Embedded Computer

Consumes 17 watts



DA-681
x86-based Rackmount Embedded Computer

Consumes 26 watts



Industrial Grade—Reliable Design



Reliable Design

Any product is only as good as its components, and Moxa has chosen only the best. IPC providers typically offer warranties of only 1 to 3 years and the average RMA rate is 2%. Moxa confidently guarantees the quality of its industrial computers with a solid 3 or 5-year warranty. Our products can boast a longer MTBF and an RMA rate under 1.5%.

Flexible Design

Moxa has over 20 years of experience in device networking. Our experience in computer peripheral solutions is evident in the rich integrated connectivity options of our embedded computers, creating designs that are both widely versatile and expandable.

Components

Moxa selects the highest quality components when manufacturing embedded computers. To maximize the cost-performance ratio, we rigorously test all components and find the optimal price point in order to deliver reliable and cost-effective industrial solutions.

3 or 5-year Warranty

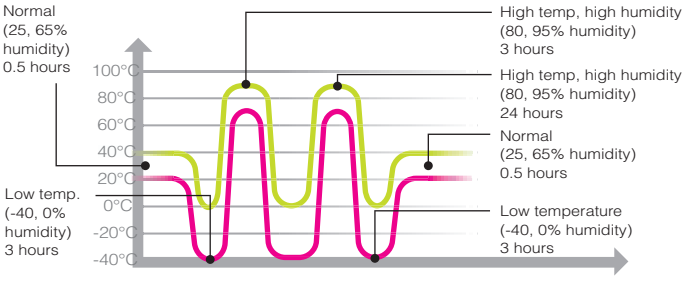
Moxa's embedded computers are backed by a solid 5-year (3-year for x86-based computers) warranty; this is longer than other IPC providers who can only offer a 2-year warranty. This reflects our confidence in the reliability of our products, even when used for demanding industrial applications.

Moxa Industrial Grade		Conventional
Fan and cable free		Fans and cables often used
5-year Warranty (RISC) 3-year Warranty (x86)		2-year Warranty (Extended warranty extra)
RMA Rate: Under 1.5%	VS	RMA Rate: Over 2%
Longer MTBF: x86 W/T Product > 8 years RISC W/T Product > 13 years		N/A
Special Certification: DNV, IEC 61850-3, EN 50155, e/E Mark		Special Certification: N/A

Longer MTBF / Lower RMA Rate

With a 40-hour burn-in chamber test, Moxa's embedded computers are verified to offer longer MTBF. This translates to fewer parts to replace and lower overall cost for industrial systems. In addition, the low RMA rate (under 1.5%) guarantees that the applications can operate with low maintenance effort.

Model Name	UC-7112 Series	W406 Series	IA260 Series	DA-681 Series	V481 Series
Platform	RISC	RISC	RISC	x86	x86
Temperature	0 to 60°C	0 to 60°C	-40 to 75°C	0 to 60°C	-35 to 75°C
Failure Rate	6.717319	5.878760	6.880977	9.915992	13.93070
MTBF (hrs)	148980 (13.9 years)	170162 (19.4 years)	145328 (16.6 years)	100847 (11.7 years)	71784 (8.2 years)



Industrial Grade—Flexible Design

Rich Connectivity

Over the past 23 years, Moxa's expertise with venerable serial communications technology has connected millions of serial devices to industrial networks. The patented ADDC (Automatic Data Direction Control) system used in RS-485 communication can precisely switch the transmitter on and off by hardware, effectively simplifying the complexity of software timing control. Moxa also provides wide non-standard baudrate selection from 50 bps to 921.6 Kbps, allowing flexible serial port configurations.

Ethernet ports, including LAN ports and switch ports, are also available to offer a diverse range of network communication options, allowing you to easily create an integrated industrial application including Ethernet protocols.

Moreover, some models offer digital input and digital output channels with 3 KV optical isolation for when you need to safely and reliably activate remote motion triggers. These DI/DO channels are useful for applications in security and environmental monitoring markets. Some models are even equipped with CAN ports to conveniently connect the CANbus devices to manufacturing automation networks.

Moxa Industrial Grade		Conventional
Integrated Peripherals: CAN, Serial, Switch, LAN, DI/DO		Integrated Peripherals: Serial, LAN, DI/DO
Switch Ports		No Switch Ports
Redundancy	VS	No Redundancy
Multiple LANs (2-12)		Multiple LANs (2-4)
CAN + Isolation		CAN
Serial Baud rate : 50 bps to 921.6 Kbps		Serial Baud rate : 50 bps to 115.2 Kbps

Modular Design

The DA-710, DA-682 and DA-683 computers feature flexible modular expandability. You can mix and match modules to create fine-tuned custom solutions off-the-shelf. Serial, LAN, switchs and universal PCI port modules allow you to create the perfect connectivity suite for your specific industrial application. Meanwhile, our panel computers are designed for modular docking, enabling easy integration of the panel into the computer. These features make our computers cost-effective and best-fit solutions for many industrial applications.

Modular Docking Design
(Panel Computers)

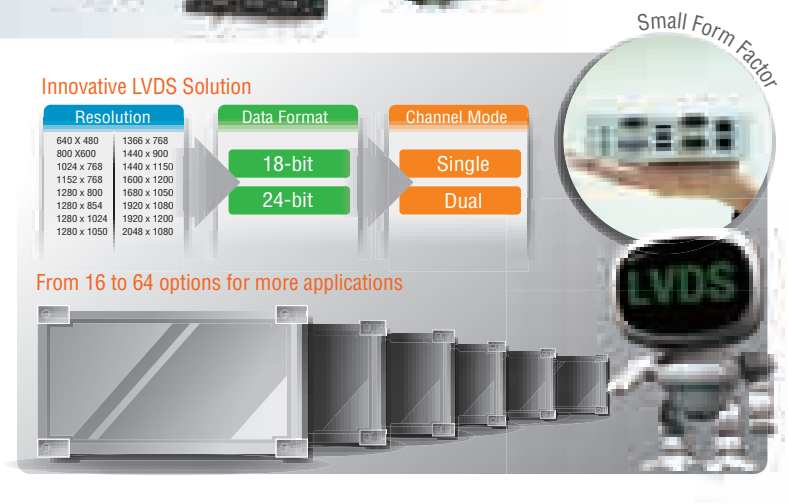


DA Series Expansion Modules



Friendly Design

Moxa's embedded computers have a user-centric design. We constantly strive to make it easier for you to deploy new hardware. For instance, small form factors allow the computers to be installed at any field site. Also, their low power consumption makes them an economical solution when establishing an industrial application. Meanwhile, Moxa's panel computer dimming technology enables simple adjustments of the brightness range from 0% to 100%--particularly convenient for harsh industrial field sites. In addition, you can choose any screen resolution you like with our innovative LVDS technology for data format and channel mode selection. This maximizes the flexibility of LVDS panels, and effectively reduces the workload of specific CV requests.



x86-based Wallmount Embedded Computers



x86-based Processor with Powerful Performance

These V Series computers feature either Intel or AMD processors, offering powerful performance for sophisticated industrial applications, such as data acquisition, data computing and protocol conversion.

Display Output for Field Site Monitoring

All V series computers are equipped with a VGA output, providing an ideal solution for applications that involve field site monitoring. Some models even come with LVDS output, offering more display connection flexibility.

Multiple Communication Interfaces

All V series computers feature a variety of communication interfaces, such as serial ports, DI/DO channels, LAN ports, switch ports, PCMCIA slots, USB hosts, and CompactFlash sockets. This wide range of interface options make Moxa's V series computers perfect solutions for industrial automation, such as in factory automation, production lines, and even mining facilities.

Model Name	Serial Ports		LAN Ports		Storage			PCMCIA	DI/DO	Switch	OS		Wide Temp.
	RS-232	RS-232/ 422/485	10/100 Mbps	Gigabit	CF	USB	IDE		30 VDC		CE	XPE	
V462	2	2	2	–	✓	4	–	✓	–	–	✓	✓	–
V464	2	2	4	–	✓	4	–	–	–	–	✓	✓	–
V466	2	2	4	–	✓	4	–	–	–	8	✓	✓	–
V468	2	2	4	–	✓	4	–	–	8/8	–	✓	✓	–
V481	–	8	1	1	✓	2	✓	–	–	–	✓	✓	✓

Model Name	Serial Ports		LAN Ports		Storage					DI/DO	Display			Wide Temp.
							USB							
	RS-232	RS-232/ 422/485	10/100 Mbps	10/100/ 1000 Mbps	CF	SD	M12	Type A	SATA		VGA	DVI	LVDS	
V2101	–	2	–	2	✓	✓	–	4	–	3/3 (30 VDC)	✓	–	✓	✓
V2401	8	4	–	2	✓	–	–	4	✓	4/4 (5 VDC)	✓	✓	✓	–
V2402	–	4	–	2	✓	–	–	4	✓	4/4 (5 VDC)	✓	✓	–	–
V2406	–	4	2 (M12)	–	✓	–	1	2	✓	6/2 (30 VDC)	✓	✓	–	✓
V2422	–	4	–	2	✓	–	–	6	✓	4/4 (5 VDC)	✓	✓	–	–
V2426	–	4	2 (M12)	–	✓	–	1	2	✓	6/2 (30 VDC)	✓	✓	–	✓



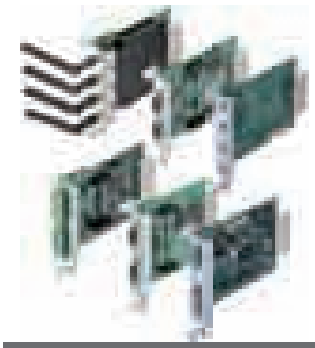
Moxa's products are designed with efficient operation and high reliability in mind. This is why Moxa offers EN 50155 and EN 50121 certified solutions that incorporate extensive future-proof features and functions specifically for railway applications.

Brand New Computers for AFC and Rolling Stock

Low Power Consumption

All V series computers feature sophisticated power-saving designs. For example, Moxa's V2100 and V2400 series Intel Atom computers consume less than 30 W of power, yet feature powerful performance. This combination of low power requirements and high performance is particularly helpful for industrial applications such as Automatic Fare Collection (AFC) and rolling stock.

V Series Expansion Modules



Modules	Description
EPM-3337	Wireless module with GSM, GPRS, EDGE, HSDPA, GPS, WLAN 802.11 a/b/g/n
EPM-3112	2 isolated CAN ports with DB9 connectors
EPM-3438	8 DIs and DOs with 3KV digital isolation protection, 2 KHz counter
EPM-3032	2 isolated RS-232/422/485 ports with DB9 connectors
EPM-DK01	1-slot mini PCI & mini PCIe expansion module
EPM-3552	VGA and DVI-I

Product Spotlight



V2416

x86-based wallmount embedded computer

- Intel Atom N270 1.6 GHz, 512K Level 2 cache
- Dual independent displays (VGA, DVI-I selectable)
- 4 RS-232/422/485 serial ports, supporting non-standard baudrates
- 3 USB 2.0 hosts, 6 DIs, 2 DOs, CompactFlash socket
- 2 removable and hot swappable trays for storage expansion
- 2 SATA-150 connectors for HDD/SSD expansion
- Non-symmetric leveraged storage socket design (patent pending)

Rackmount Embedded Computers



IEC 61850-3 & IEEE 1613 Certified

The IEC 61850-3 and IEEE 1613 standards define the highest standard of EMI immunity and error free communication requirements for network equipment used in substations. Moxa's substation Ethernet switches and embedded computers comply with the IEC 61850-3 and IEEE 1613 standards, guaranteeing that the computers are protected against various environmental factors.

Power Applications Evolve

- A powerful controller with multiple serial ports for legacy devices
- Multiple LAN ports for network redundancy
- Carry out front-end tasks or remote monitoring and management

19-inch Rackmount Installation for Easy Deployment

All DA series computers come in a 19-inch rackmount design that is well-suited for data collection and computing in power automation. These computers are also the ideal front-end controllers for dealing with complicated protocol conversion scenarios in substation automation.

Powerful Serial and Network Communication

Multiple serial ports and network interfaces allow more options for device connections. They also offer a convenient way to build a redundant system architecture. You can also easily add WLAN/Cellular connections by adding the appropriate interface card into the PCMCIA slot.

Dual Power Input for Reliable Operation

With dual power inputs featuring 100-240 VAC/VDC compatibility, DA series computers are resistant to power interruptions.

Versatile Storage Options for Data Logging

DA series computers come with Compact Flash sockets, USB ports, and even additional hard disk expansion slots, which provide many convenient options for storage expansion and data options.

Industrial-grade Design for Stable System Operations

The industrial-grade design of DA series computers ensure reliable and stable operations for various industrial applications. The DA design philosophy forgoes fans and cables in order to reduce part count, wear and tear, and points of failure. The DA-681-I-DPP-T is even IEC 61850-3 certified, making it the optimal solution for power substation applications that require IEC 61850.

Multiple Expansion Modules for Great Flexibility

The DA-682 and DA-710 offer two or four expansion slots that can be used with the seven available DA series expansion modules, allowing you to tailor the perfect communications suite for your specific application. Expansion modules include 8-port RS-232/422/485 modules, 4-port 10/100 Mbps LAN modules, 8-port RS-422/485 modules, 8-port switch modules, and universal PCI expansion modules. The modules include a user-centric design that allows you to swap modules quickly and easily.

Product Spotlight



DA-683

x86-based rackmount embedded computer

- Intel Dual Core Atom D510 1.66GHz processor with 1MB L2 cache
- 6 10/100/1000 Mbps Ethernet ports, 2 RS-232 serial ports and 4 DIs, 4 DOs
- 2 PCI expansion slots for inserting expansion modules
- IEC 61850-3 and IEEE 1613 certified (DPP-T models only)
- IEEE 1588 supported (Linux models only)



DA Series Expansion Modules



DA-SP08-DB
8 RS-232/422/485 ports with DB9 connectors



DA-SP08-I-DB
8 RS-232/422/485 ports with DB9 connectors, 2 KV isolation



DA-SP38-I-TB
8 RS-422/485 ports, terminal block, 2 KV Isolation



DA-LN04-RJ
4-port 10/100 Mbps LAN module with RJ45 connectors



DA-SW08-RJ
8-port 10/100 Mbps switch module with RJ45 connectors



DA-SP08-I-TB
8 RS-232/422/485 ports, terminal block, 2 KV isolation



DA-UPCI-DK
1-slot Universal PCI expansion adaptor

Model Name	Serial Ports	LAN Ports	Storage			DI/DO	OS			PCI Slot	Power		IEC 61850-3
		10/100 Mbps	SATA	CF	USB	30 VDC	CE	XPE	Linux		Single	Dual	Certified
DA-681	RS-232: 4 (isolated) RS-485: 8 (isolated)	6	✓	✓	2	–	✓	✓	✓	–	✓	✓	✓
DA-682	–	4 (Gigabit)	✓	✓	4	–	✓	✓	✓	2	✓	✓	–
DA-710	RS-232:2	4 (Gigabit)	✓	✓	4	4/4	–	✓	✓	4	✓	✓	–
DA-683	RS-232:2	6 (Gigabit)	✓	✓	4	4/4	–	✓	✓	2	✓	✓	✓

Model Name	Serial Ports		Isolation	Switch	LAN	Connector			PCI
	RS-232/422/485	RS-232/485	2 KV Digital	10/100 Mbps	10/100 Mbps	DB9	RJ-45	Terminal Block	3.3/5 V
DA-SP08-I-DB	8	–	✓	–	–	✓	–	–	–
DA-SP08-DB	8	–	✓	–	–	✓	–	–	–
DA-SP08-I-TB	8	–	✓	–	–	–	–	✓	–
DA-SP38-I-TB	–	8	✓	–	–	–	–	✓	–
DA-SW08-RJ	–	–	–	8	–	–	✓	–	–
DA-LN04-RJ	–	–	–	–	4	–	✓	–	–
DA-UPCI-DK	–	–	–	–	–	–	–	–	✓

Marine Computers



Overview

Moxa's MC-4510-C23 Master series computers are first-class marine computers specifically designed to deliver the perfect combination of high performance and reliability for marine bridge systems. The Master series combines stable marine operations with high performance thanks to its Intel Core 2 Duo CPU and Moxa's unique HDD socket, which provides exceptional anti-vibration and anti-shock protection.

The MC-4510-C23 allows great flexibility in system integration thanks to its advanced modular design and support for Windows 7, XPE, and CE. These features allow you to perfectly integrate the Master series marine computer with your choice of panel display. The MC-4510-C23 comes in a compact form factor and its unique fanless and rugged design enables it to excel in all bridge system applications.

Speed Up Your Bridge Systems—Extreme Performance that Surpasses Existing Marine Requirements

- Extreme performance thanks to Intel Core 2 Duo 2.26 GHz processor, 6 MB L2 cache, and 2 GB of built-in DDR3 memory upgradable to 4 GB for multi-tasking in bridge systems.
- Features 2 Gigabit Ethernet ports for fast and powerful network redundancy.
- Two optically isolated RS-232/422/485 serial ports to ensure the bridge system operates in a safe and stable communications infrastructure.

Bridge Systems that Are Stronger Than Ever—Compact and Rugged Design

- Moxa's unique HDD socket design offers ultimate anti-vibration and anti-shock protection.
- The fanless design reduces the risks of overheating, and increases system stability.
- The compact and rugged design makes it ideal for bridge systems.

Raise Your Expectations—System Flexibility that Fulfills Your Needs

- The MC-4510-C23 Master series offers both DVI-D and VGA signal output for dual independent displays.
- An onboard PCIe slot is available for future expansions and upgrades.
- Six USB 2.0 ports for connecting high-speed peripherals
- CompactFlash card socket and optional hard disk drive support for storage expansions.
- Modular design for easy integration with display panels, and the PC case is changeable.
- Windows 7, Windows XP SP3, Windows XP Embedded, and Windows CE 6.0 supported.

Expect More—IEC 60945 4th/DNV/E-10 Certifications

Moxa's priority is to deliver industry-leading certified products that exceed customer expectations. The MC-4510-C23 Master series computers are compliant with IEC 60945 4th, DNV, and E-10 standards for maritime navigation and radio communication equipment, making these computers ideal for maritime bridge systems.

Marine Panel Computers



Overview

Moxa's 20-plus years as a leader in industrial-grade products is evident in the MPC-122-K FirstMate™ series ECDIS panel computers for modern and advanced bridge applications.

The FirstMate is a series of ECDIS panel computers capable of supporting all kinds of marine bridge applications. With an InteL Core 2 Duo processor and up to 4 GB of system memory, FirstMate computers have enough computing muscle to tackle the most demanding bridge operations. The FirstMate series is specifically designed to be compatible with all the different types of navigation applications, such as ECDIS. It features a 22-inch screen that is equipped with full range dimming and wide angle viewing for crystal-clear clarity. In addition, the FirstMate uses Moxa's innovative Optical Bonding design, which eliminates fogging and glare to provide optimal viewability in harsh marine environments.

The FirstMate series is fanless thanks to Moxa's innovative thermal technology, and is vibration and shock-proof thanks to the 2.5" SATA storage socket design. With two RS-232/422/485 isolated serial ports and two Gigabit LAN ports to provide high speed Ethernet transmission and network redundancy, the MPC-112-K provides the most reliable and ruggedized bridge system available for the marine industry. In addition, the FirstMate is IEC 60945, DNV, E10, and ECDIS compliant, and IP66-rated—exceeding common maritime standards.

Integrated ship systems are complex: they need to receive input from many ship sensors, display positioning information electronically, and provide control signals to ensure a vessel continues on its preset course. Moxa's panel computers are specifically designed for ECDIS, conning, and radar systems, allowing the navigator to configure system presets, interpret system outputs, and monitor vessel response, essentially enabling the navigator to become the system manager.

Conning System

The FirstMate™ series provides accurate navigation information as well processing and recording parameters that are supplied from external sources via different channels. This system will significantly simplify the work of watch officers by providing them with non-stop, reliable information about the operation/status of the ship's systems.

Radar System

The FirstMate™ series has isolated 3-in-1 software selectable serial ports, and displays ship radar scanners for ship navigation and to avoid collisions. The FirstMate system works alongside marine radar systems to provide useful radar navigation to onboard navigators. In addition, the ship's position can be fixed by the bearing and distance information of land targets on radar screens.

Electronic Chart Display and Information System (ECDIS)

The FirstMate™ series features high display resolution and exceptional CPU performance to support an Electronic Chart Display and Information System (ECDIS). ECDIS is a high performance computer-based navigation information system that complies with International Maritime Organization (IMO) regulations and can be used as an alternative to paper navigation charts. An ECDIS system displays the information from electronic navigational charts (ENC) and integrates position information from the Global Positioning System (GPS) and other navigational sensors, such as radars and automatic identification systems (AIS). In addition, the FirstMate™ series allow you to easily display all kinds of navigation related information, such as sailing directions and fathometer data.

Wireless Embedded Computers



WLAN Solution for Short-range Communication

802.11a/b/g

The embedded 802.11a/b/g module provides a stable wireless network connection and reliable communication, enabling the wireless computers to be used as control units for short-range communication.

Dual Network Mode

The W311/W321/W341 embedded computers support Infrastructure Mode and Ad-hoc Mode for added flexibility when constructing a wireless architecture.

Full Encryption for Data Transmission Security

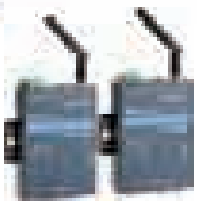
The WEP, WPA, and WPA2 designs provide safe and reliable wireless communication and data acquisition for remote devices.

Repeater Function

The W311/W321/W341 computers can be used as a repeater to relay communications from wireless embedded computers, providing a cost-effective solution when building a WLAN architecture for industrial applications.



W311/321/341



W315A/325A

Cellular Solution for Long-range Communication

Quad Band GSM/GPRS/EDGE Service

When used with the embedded GSM/GPRS 900/1800/850/1900 MHz module, the W315A/W325A/W406 computers provide long-range communication that is suitable for industrial applications where wired and wireless LAN services are impossible or extremely costly.

Stable and Reliable Wireless Communication

Support for GPRS multi-slot Class 10 and GPRS mobile station Class B standards allows these wireless computers to offer quick and reliable wireless communication for any industrial M2M application.

Model Name	Serial Ports	WLAN	Cellular	LAN Ports	DI/DO	Storage		OS	
	RS-232/422/485	802.11 a/b/g	850/900/1800/ 1900 MGz	10/100 Mbps		SD	USB	Linux	CE
W311	1	✓	–	1	–		–	–	–
W321	2	✓	–	1	–		–	–	–
W341	4	✓	–	1	1 x Relay Output		2	–	–
W315A	1	–	GSM/GPRS	1	–		–	–	–
W325A	2	–	GSM/GPRS	1	–		–	–	–
W406	2	–	GSM/GPRS/EDGE	1	4 (30 VDC)		1	–	–

RISC-based Wallmount Embedded Computers



Overview

UC series computers include multiple connection options for data communication, such as serial ports, PCMCIA, SD, DI/DO, and USB hosts. These products work well as front-end controllers for demanding applications including data acquisition, data computing, and protocol conversion.

RISC-based Processor for Optimal Solutions

UC Series computers all come with RISC-based processors, offering the most cost-effective solutions for building various industrial applications.

Model Name	Serial Ports	CAN Ports		LAN Ports	Storage		DI/DO	Switch	OS		Wide Temp.
	RS-232/422/485	No. of Ports	Optical Isolation	10/100 Mbps	CF	USB	30 VDC		CE	Linux	
UC-8410	8	–	–	3	✓	2	4/4	–	✓	✓	✓
UC-8416	8	–	–	3	✓	2	4/4	8	✓	✓	✓
UC-8418	8	2	2 KV	3	✓	2	12/12	–	✓	✓	✓
UC-8430	8	–	–	3	✓	6	4/4	–	✓	✓	✓

Model Name	Serial Ports	LAN Ports	Storage		OS			Wide Temp.
	RS-232/422/485	10/100 Mbps	SD	USB	CE	Linux	µClinux	
UC-7101	1	1	✓	–	–	✓	✓	✓
UC-7110	2	2	–	–	–	✓	✓	✓
UC-7112	2	2	✓	–	✓	✓	✓	–
UC-7122	2	2	✓	1	–	–	✓	✓
UC-7124	4	2	✓	1	–	–	✓	✓

Model Name	Serial Ports	LAN Ports	PCMICA	Storage		DI/DO	OS	Wide Temp.
	RS-232/422/485	10/100 Mbps		CF	USB	3.3 VDC	Linux	
UC-7402 Plus	8	2	✓	✓	1.1: 1 2.0: 2	–	✓	–
UC-7408 Plus	8	2	–	–	1.1: 1	–	✓	–
UC-7410 Plus	8	2	✓	✓	1.1: 1	8/8	✓	✓
UC-7420 Plus	–	2	✓	✓	–	–	✓	–

Product Spotlight



UC-8430

RISC-based wallmount embedded computer

- Intel XScale IXP435 533 MHz processor
- Dual VGA displays
- 8 RS-232/422/485 serial ports, 3 10/100 Mbps Ethernet Ports
- 6 USB, 4 DIs, 4 DOs
- -40 to 75°C wide temperature model available

DIN-Rail Embedded Computers



Rugged and DIN-Rail Mountable for Easy Installation

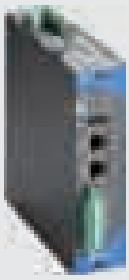
IA series systems are all designed with a rugged vertical DIN-Rail form factor. This makes them easy to install in small cabinets, making the IA series a cost effective solution for industrial automation applications such as manufacturing automation and mining.

Ideal Harsh Environments

Wide operating temperature models of the IA series feature a -40 to 75°C operating temperature range, and can serve as reliable solutions for harsh industrial automation environments.

Model Name	Serial Ports	CAN	LAN Ports	PCMCIA	Storage			DI/DO	VGA	OS		Wide Temp.
	RS-232/422/485	Ports	10/100 Mbps		CF	SD	USB			CE	Linux	
IA240	4	–	2	–	–	✓	1	4/4 (5 VDC)	–	–	✓	✓
IA241	4	–	2	✓	–	✓	1	4/4 (5 VDC)	–	–	✓	✓
IA260	4	–	2	–	✓	✓	2	8/8 (30 VDC)	✓	✓	✓	✓
IA261-I	4	–	2	–	✓	–	2	8/8 (30 VDC)	✓	✓	✓	✓
IA262-I	2	2	2	–	✓	–	2	8/8 (30 VDC)	✓	✓	✓	✓

Product Spotlight



IA3341 Series

- Moxa ART 32-bit ARM 9 Industrial Processor
- 64 MB RAM, 16 MB Flash onboard
- 2 software selectable RS-232/422/485 serial ports
- 50 bps to 921.6 Kbps serial speed
- 4 DIs and 4 DOs with 3 KV digital isolation protection
- 2 AIs and 2 thermocouple inputs
- Supports Modbus TCP server to provide AI and thermocouple data
- Provides TCP client library in C for Windows platform



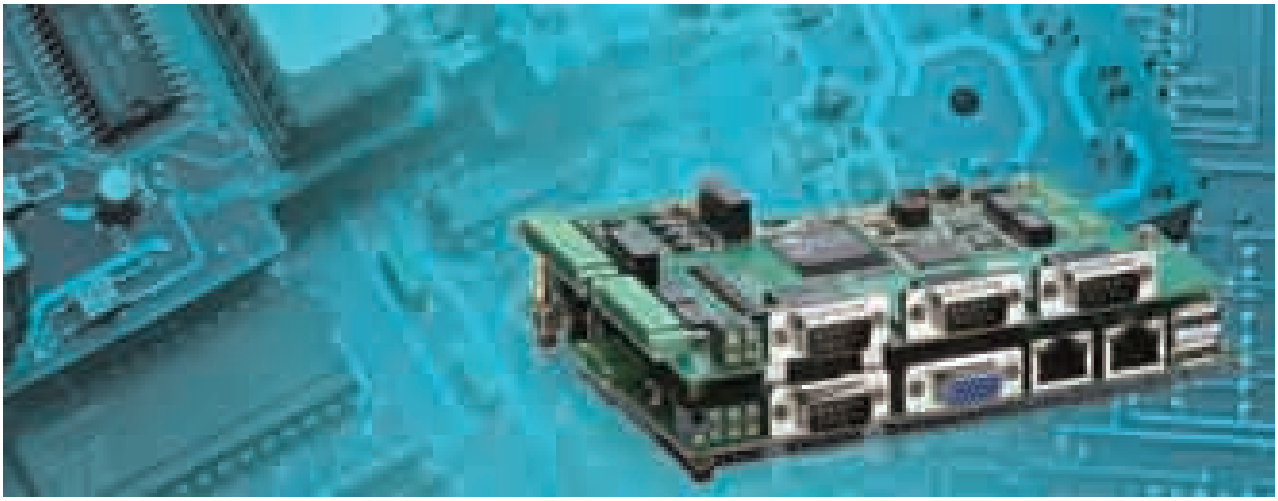
IA260 Series

- Patented "H-Type" heat dissipation
- 4 RS-232/422/485 serial ports, 8+8 DI/DO channels, up to 30 VDC
- VGA interface for field site monitoring

IA261/262-I Series

- 8+8 DI/DO with 3KV optical isolation and 20V output
- 2KV optical isolated RS-232/422/485 serial ports
- CANbus and CANopen protocol supported

Modular Embedded Computers



Reduce Your Time to Market

Moxa's embedded modules are available with the µClinux operating system pre-installed to help you minimize your system development time. In addition, the compact, all-in-one design provides all the components you need to get your products to market in no time—CPU, RAM, Flash, and even more complex components, such as an OS kernel, drivers, and middleware.

Easy-to-use Development Kit

The embedded module development kit is an invaluable tool for testing and evaluating Moxa's embedded modules. The kit can be ordered separately, and includes an embedded module, embedded module carrier board, relevant documents, a software CD, and the items needed to set up a basic layout. The kit makes it easy for users to evaluate the functionality of the embedded modules. Use the development kit to develop and integrate your specific hardware in advance to guarantee that the embedded modules fit seamlessly into your industrial systems and applications.

Model Name	Serial Ports	LAN Ports	GPIO	Storage			OS			Wide Temp.
	RS-232/422/485	10/100 Mbps		CF	SD	USB	CE	Linux	uClinux	
EM-1220	2	2	10	–	✓	–	–	–	✓	✓
EM-1240	4	2	10	–	✓	–	–	–	✓	✓
EM-2260	4	2	8 DIs, 8 DOs	✓	–	–	✓	✓	–	–

Product Spotlight



EM-1220/1240 Series

- MOXA ART ARM9 32-bit 192 MHz processor
- 16 MB RAM, 8 MB flash disk on-board
- 2 RS-232/422/485 serial ports (EM-1220 model)
- 4 RS-232/422/485 serial ports (EM-1240 model)
- Dual 10/100 Mbps Ethernet and SD socket
- Ready-to-run µClinux Kernel 2.6 platform
- Built-in RTC, buzzer
- 10 GPIOs reserved for system integration
- Full-function development kit for quick evaluatio and application development
- -40 to 75°C wide temperature model available



EM-2260 Series

- Cirrus Logic EP9315 ARM9 CPU, 200 MHz
- 128 MB RAM on-board, 32 MB flash disk
- Graphical interface for external VGA output connection
- 2 KV optically isolated RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet for network redundancy
- 8 DI and 8 DO channels
- Supports CompactFlash and USB 2.0 hosts
- Ready-to-run WinCE 6.0 or Linux platform
- Full-function development kit for quick evaluation and application development

Rcore—Embedded Software Platform



The high reliability and stability of Moxa's embedded computers give our customers an edge over the competition. Moxa's Rcore embedded software platform further hones your competitiveness with faster time to market for your embedded computing systems. The Rcore software platform turbocharges system deployment at all tiers of project development by providing this suite of useful benefits:

- Easy-to-use application libraries
- Tested, and bug-free sample code
- Consulting-level advice for application development
- Fast concept validation and development cycle

BIOS and Boot Loader

Moxa provides full-featured BIOS and boot loader solutions both for x86-based and RISC-based systems. The wide range of options and extensions provide an answer to any potential need. Key features include:

Boot Loader

- External disk boot option
- MDM remote management tool to remotely update firmware or recover
- Fast boot
- Boot loader customization and consulting

BIOS

- Power failure recovery
- LVDS innovation: various resolutions supported (up to 64 options)
- Dynamic throttling technology
- Remote system wake-up
- Remote LAN boot
- Wide compatibility with peripheral devices
- Secure software protocols
- Fast boot
- BIOS code customization and consulting
- Secured pen drive boot

Operating Systems

Moxa's x86 and ARM industrial computers offer a powerful computing environment and stable system for a variety of industrial applications. These computers use either a Linux or Windows (CE and XPe) operating system to provide programmers with a familiar environment for application development, and help reduce the effort required for system integration. Moxa continues to look for real-time operating systems that are suitable for mission critical applications.

In addition, Moxa supports RISC porting which helps customers save 70% of development time. In addition, RISC and x86 systems both have file protection systems that preserves data during power failures.

Middleware

Moxa offers a variety of middleware to help you easily integrate these application modules into your system. This allows you to take advantage of these modules' rich features without complicating the development process.

VPN

The VPN (OpenVPN, L2TP, and IPSec) middleware makes it easy for user applications to create secure tunnels between communication parties.

Firewall

The firewall (iptables) middleware protects enterprise information from unauthorized access.

Database

The database system (MySQL and MSSQL) middleware can be used to manage field-data acquisition, with web services (Web, PHP, ASP) included to give programmers an integration framework for building Internet accessible field applications, such as WebSCADA.

Sample Code

In addition to being part of the Linux community, the Moxa embedded computer family also includes models running the Microsoft® Windows® Embedded operating system. Adopting a widely used programming environment makes our embedded computers suitable for software development and legacy system migration.

Keypad



The Keypad Programming function helps developers easily program keypad buttons on the UC-7410/7420 and DA-660 series computers. In addition to the primary function, additional API functions are provided, such as a callback function defined by programmers to associate with an event.

LCM



The LCM Programming function helps developers easily program LCM displays on the UC-7410/7420 and DA-660 series computers.

Socket



Moxa embedded computers come with network interfaces that allow client-server applications to communicate with each other across a computer network. A Socket Programming function helps developers implement socket programming with TCP or UDP protocols.

Serial



In addition to the primary Serial Port Programming function, Moxa embedded computers offer higher level APIs for serial connections.

Real Time Clock



Developers can use the RTC Programming function to get the current time, set the hardware clock time to a specified time, set the hardware clock time to the system time, and set the system time from the hardware clock, by use of the function sample codes.

Buzzer



A Buzzer Programming function allows developers to trigger alarm beep for unusual events.

Watchdog Timer



Moxa's embedded computers are also equipped with a Watchdog Timer Programming function that sets the system back to normal if applications don't acknowledge.

Moxa Device Manager



Moxa Device Manager (MDM for short) is an easy-to-use remote management tool for managing Moxa's ready-to-run embedded computers on the Internet. Moxa's embedded computers make excellent front-end computers at remote sites for onsite data collection and industrial control applications. Simply put, MDM makes it easy for system administrators to manage remote computers.

Features

User-friendly GUI

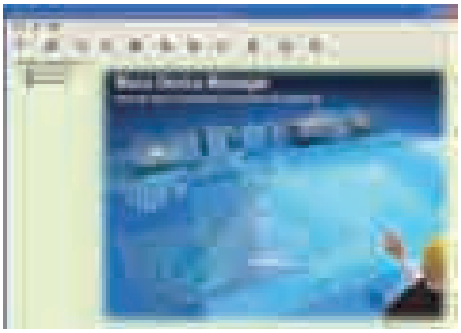
- Easy to use graphical user interface gives users "click and operate" management over remote devices
- Friendly window-based utilities make configuration easy

Easy Installation and Setup

- MDM Agent program running on an embedded computer can be started automatically at boot-up
- MDM Tool and Gateway can be installed on any PC running Windows XP

Command-line Free Configuration and Maintenance

- Launch programs automatically at boot-up
- One-to-multiple file transfers including firmware upgrade (excluding EM-2260-CE, IA26X-CE, UC-712X-CE, DA-68X-LX, and XPe models) and file uploads
- Perform remote file system management
  - Download/upload files
  - Rename a file or directory
  - Run/delete a file
  - Create a directory
  - Get the file list of a directory
  - Change file mode (Linux only)
- Remote program monitoring and process control
- Remote system administration
  - Network configuration settings
  - Launch programs automatically at boot-up
  - System time set up
  - Reboot devices





Features

Remote Control Management

- Supports all of Moxa's embedded computers and all operating systems (Linux, CE, XPe)
- Control and monitor remote devices over the Internet
- Broadcast search for Moxa embedded computers on the same subnet
- Get instant device status
- Get device system information (IP, model name, product image, firmware version, OS, hostname, CPU type, memory information, and storage information) of all devices, all from the main page

Mobile Configuration (for W406 Series)

- User friendly configuration for mobile setup, including GSM/GPRS/EDGE connection, and reconnection
- nterval setup, and reconnection enable/disable
- Security authentication enabler for PIN and PUK
- Disconnection diagnosis display
- Short Message Service (SMS) management, including Send & Receive SMS, SMS storage
- 10 sets of preinstalled phone books
- AT command console allows users to produce AT commands for operations such as dialing, hanging up, and changing the parameters of the connection

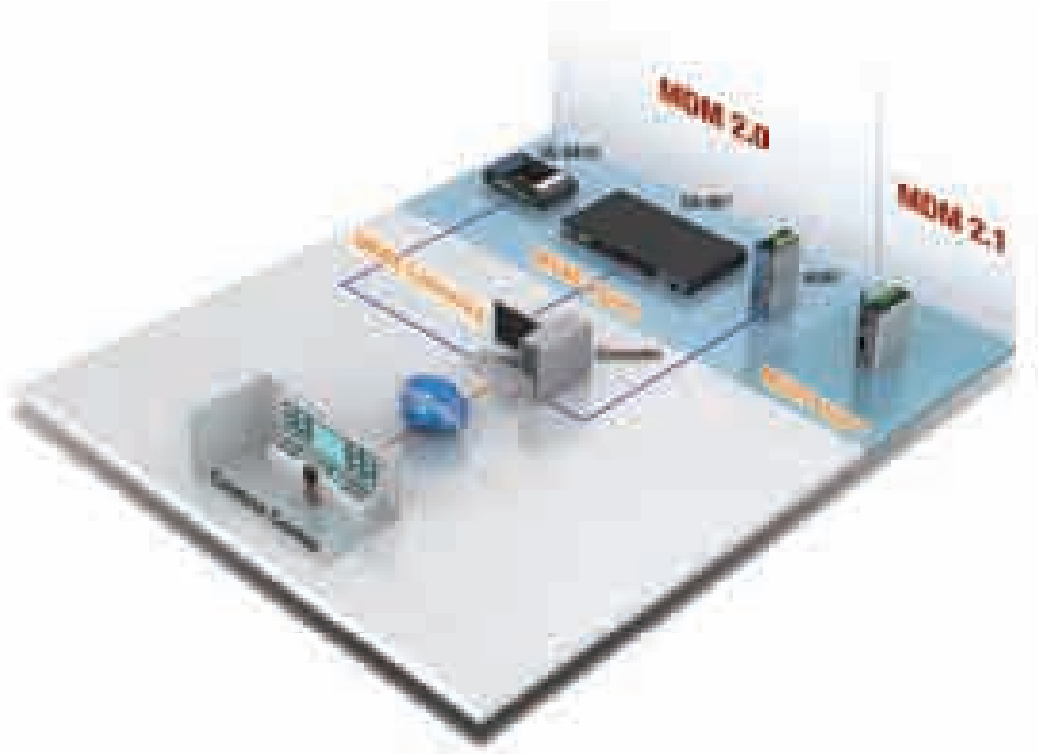
System Requirements

- CPU: Intel Pentium 4 processor or higher
- RAM: 1 GB (Gateway, 512 MB)
- OS: Windows XP

Free Download Information

Moxa device manager comes with MDM Agent, MDM Tool, and MDM Gateway. Users can download the package from the Moxa website in the Support/Software section.

- MDM 2.0 Tool Software
- MDM 2.1 Tool Software (W406)
- MDM 2.0 Agent Software
- MDM 2.1 Agent Software (W406)
- MDM 2.0 Gateway Software



MDM API

MDM API Features

- The MDM API provides developers with a framework to write code to manage Moxa embedded computers remotely.
- The MDM API can be integrated with users' applications.
- The MDM API provides a 3-tier system architecture to support Internet access.
- MDM Agent functions created with the MDM API are dynamically linked and loaded to provide the functions dynamically.

MDM API Functions

- Functions by MDM Core
  - Get DLL Name
  - Configuration File Management
  - File Transfer
  - System Executon
- Functions by MDM Agent
  - Auto-launch
  - File Manager
  - Network Management
  - Process Management
  - System Information
  - Shell Execution
  - Time Management

Supported Platforms

- MDM Client: Windows XP on x86 PC
- Development Tool: Visual Studio 2005
- Programming Language Interface: C/C++
- MDM Gateway: Linux and Windows
- MDM Agent
- All product models of Moxa embedded computers for Linux and Windows XPe and CE except UC-71xx-LX series running uClinux

Mass Configuration Tool

Mass Configuration Tool

Moxa Mass Configuration Tool is a convenient tool that helps customers deploy various tasks to Moxa's embedded computers simultaneously. This tool is particularly helpful when wishing to deploy the programs or the tasks to the great amount of the embedded computers with the same models. Users can configure the settings at the control center, and then deploy them to all computers at one time. This essentially helps save time for system configurations and program settings for Moxa's embedded computers. After being completely configured with Mass Configuration Tool, these computers can be installed at the remote field site.

The Beauty of Mass Configuration Tool

- Easy-to-conduct 1st configuration (within 15 minutes)
- Power on then DONE
- Report applicable for management purpose





Rcore Community

Ready-to-run embedded software center



For many years now, Moxa has been dedicated to providing customers with integrated embedded computing solutions. The high reliability and stability of Moxa's embedded computers give our customers an extra advantage over the competition. Moxa has created the Rcore Community to further empower our customers' competitiveness for a faster time-to-market.

Rcore Community Download Center

In the Rcore Community Download Center, you can research and collaborate using the latest embedded solution resources, such as sample code, learning documents, and application material, with a worldwide community of embedded computing professionals. The Rcore Community will help you discover development techniques, learn about advanced technologies, and connect with Moxa product experts working on similar applications.

Rcore Community Forum

The Rcore Community Forum is the place where many embedded software fans gather together to share their ideas or to seek answers about embedded software topics from other experts in the forum. The forum is moderated by colleagues at Moxa to help members answer and resolve basic technical questions. It's the perfect place to participate, even if you are not a Moxa customer; everyone is welcome to share their ideas in the Rcore Community Forum.

Rcore Community E-newsletter

The Rcore Community e-newsletter provides the most up-to-date information on the Rcore Community website, including technical documents, software sample code, successful applications, white papers, campaigns and promotions, and the hottest forum topics and discussions. This is an exclusive benefit to our Rcore Community membership and is distributed monthly worldwide.

Membership Benefits

The Rcore Community features a new, easier-to-navigate interface for an improved browsing experience. The site now offers more value-added and interactive content than before, and includes quick-response consulting services, open communication channels, and much more. Existing APC members will be automatically enrolled. Join the Rcore Community to get access to following exclusive benefits:

- Free access to many embedded solution knowledge documents, such as sample code, libraries, and applications
- Free subscription to Moxa's product and embedded technology newsletter
- Interactive communication with embedded solution experts
- Become a forum manager to showcase your knowledge
- A chance to win a free trip to tradeshows
- Rcore community campaigns and promotions
- More to come…



Visit Rcore Community at

http://rcorecommunity.moxa.com

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Serial Connection Options

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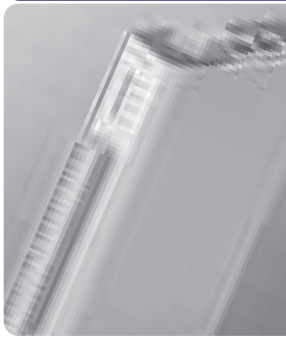
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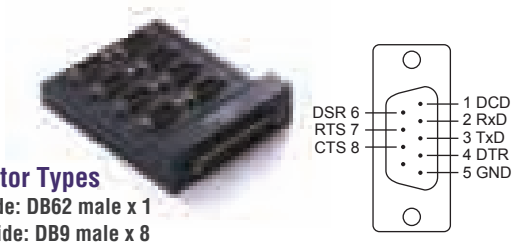
Serial Connection Options

Serial Board Connection Box/Cable Usage Chart

Serial Board Model Name	Connection Boxes								Connection Cables																
	8-port								8-port						4-port							2-port			
	OPT8-M9	OPT8-RJ45	OPT8A/B/S	OPT8F/Z	OPT8-M9+	OPT8A+/B+/S+	OPT8F+/K+/Z+	OPT8-RJ45+	CBL-M68M25x8-100 (OPT8C+)	CBL-M68M9x8-100 (OPT8D+)	CBL-M62M25x8-100 (OPT8C)	CBL-M62M9x8-100 (OPT8D)	CBL-M78M25x8-100	CBL-M78M9x8-100	CBL-M44M9x4-50	CBL-M44M9x4-50(POS)	CBL-M44M25x4-50	CBL-M37M9x4-30 (OPT4C)	CBL-M37M9x4-30 (OPT4D)	CBL-F40M9x4-50	CBL-F40M25x4-50	CBL-M25M9x2-50	CBL-F20M9x2-50	CBL-F20M25x2-50
C218Turbo Series	✓	✓	✓	✓	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
C104H Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–
CP-114 Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–
CI-134 Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–
CP-118U	✓	✓	✓	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
CP-138U	✓	✓	✓	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
CP-168U	✓	✓	✓	✓	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
C168H Series	✓	✓	✓	✓	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
CP-104UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–	–	–
CP-134U Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–	–	–
CP-114UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–	–	–
CP-114UL-I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–	–	–
CP-104EL-A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–	–	–
CP-114EL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–	–	–
CP-114EL-I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–	–	–
CP-112UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CP-112UL-I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CP-132UL Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CP-102UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CP-102EL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CP-132EL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CP-132EL-I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CP-118EL-A	–	–	–	–	✓	✓	–	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CP-168EL-A	–	–	–	–	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CP-118U-I	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
CP-138U-I	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
POS-104UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–	–	–	–	–	–	–
CA-108	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–
CB-108	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–
CA-114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–
CB-114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–
CA-134I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–
CB-134I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–
CA-104	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–
CA-132	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓
CA-132I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓

8-port RS-232 Connection Boxes

OPT8-M9

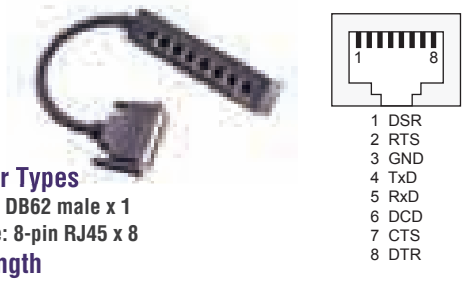


Connector Types
Board-side: DB62 male x 1
Device-side: DB9 male x 8

Specifications
LEDs: TxD, RxD indicators for each device-side port
Dimensions: 90 x 110 x 27 mm (3.5 x 4.3 x 1.1 in)

Included Accessories
Connection Cable: DB62 male to DB62 female 150 cm connection cable for connecting to the serial board

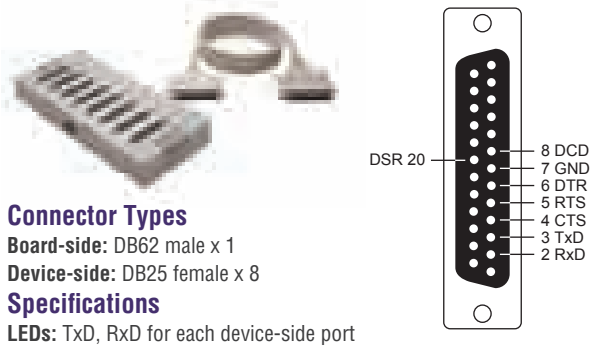
OPT8-RJ45



Connector Types
Board-side: DB62 male x 1
Device-side: 8-pin RJ45 x 8

Cable Length
30 cm

OPT8A/S



Connector Types
Board-side: DB62 male x 1
Device-side: DB25 female x 8

Specifications
LEDs: TxD, RxD for each device-side port
Baudrate: 50 bps to 921.6 Kbps
Dimensions: 247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)
Protection: 25 KV ESD, 2 KV EFT surge protection (Opt8S only)

Included Accessories
Connection Cable: DB62 male to DB62 female 150 cm connection cable for connecting to the serial board

OPT8B



Connector Types
Board-side: DB62 male x 1
Device-side: DB25 male x 8

Specifications
LEDs: TxD, RxD indicators for each device-side port
Baudrate: 50 bps to 921.6 Kbps
Dimensions: 247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)

Included Accessories
Connection Cable: DB62 male to DB62 female 150 cm connection cable for connecting to the serial board

8-port RS-422 Connection Boxes

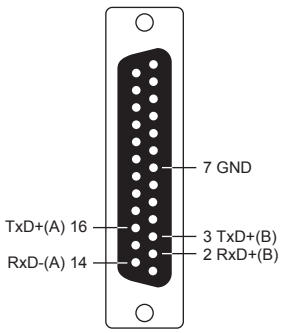
OPT8F/Z

Connector Types
Board-side: DB62 male x 1
Device-side: DB25 female x 8

Specifications
LEDs: TxD, RxD indicators for each device-side port
Baudrate: 50 bps to 115.2 Kbps
Dimensions: 247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)
Optical Isolation: 500 V (Opt8F only)
Power Consumption: 0.8 A max. @ 5 VDC

Included Accessories
Connection Cable: DB62 male to DB62 female 150 cm connection cable for connecting to the serial board
Power Adaptor: 100/110/220 VAC





8-port RS-232 Connection Cables

CBL-M62M25x8-100 (OPT8C)

Connector Types

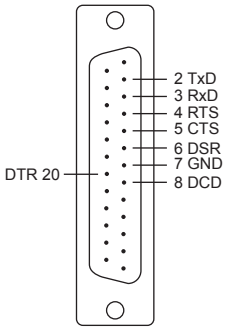
Board-side: DB62 male x 1

Device-side: DB25 male x 8

Cable Length

100 cm





CBL-M62M9x8-100 (OPT8D)

Connector Types

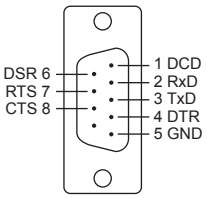
Board-side: DB62 male x 1

Device-side: DB9 male x 8

Cable Length

100 cm





CBL-M68M25x8-100 (OPT8C+)

Connector Types

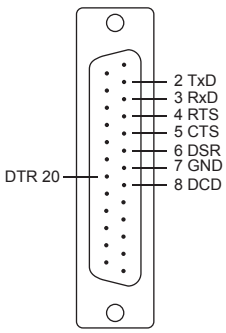
Board-side: VHDCI 68 x 1

Device-side: DB25 male x 8

Cable Length

100 cm





CBL-M68M9x8-100 (OPT8D+)

Connector Types

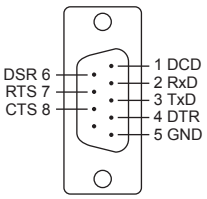
Board-side: VHDCI 68 x 1

Device-side: DB9 male x 8

Cable Length

100 cm





CBL-M78M25x8-100

Connector Types

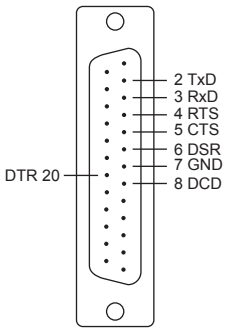
Board-side: DB78 male x 1

Device-side: DB25 male x 8

Cable Length

100 cm





CBL-M78M9x8-100

Connector Types

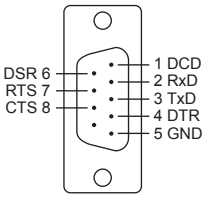
Board-side: DB78 male x 1

Device-side: DB9 male x 8

Cable Length

100 cm



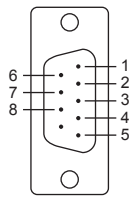


4-port Connection Cables

CBL-F40M9x4-50

40-pin box header to 4-port DB9 male cable

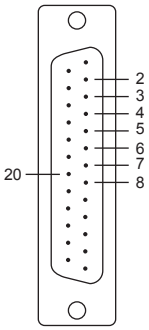
PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
9	–	–	–	–



CBL-F40M25x4-50

40-pin box header to 4-port DB25 male cable

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	–
4	RTS	–	–	–
5	CTS	–	–	–
6	DSR	–	–	–
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	–
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	–	–	–	–

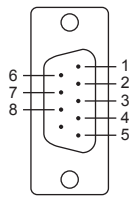


2-port Connection Cables

CBL-F20M9x2-50

20-pin box header to 2-port DB9 male cable

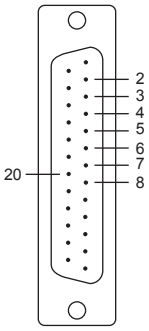
PIN	RS-422	RS-485-4w	RS-485-2w
2	RxD+(B)	RxD+(B)	Data+(B)
3	TxD+(B)	TxD+(B)	–
4	–	–	–
5	–	–	–
6	–	–	–
7	GND	GND	GND
8	TxD-(A)	TxD-(A)	–
20	RxD-(A)	RxD-(A)	Data-(A)
22	–	–	–



CBL-F20M25x2-50

20-pin box header to 2-port DB25 male cable

PIN	RS-422	RS-485-4w	RS-485-2w
1	TxD-(A)	TxD-(A)	–
2	TxD+(B)	TxD+(B)	–
3	RxD+(B)	RxD+(B)	Data+(B)
4	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND
6	–	–	–
7	–	–	–
8	–	–	–
9	–	–	–



10-pin RJ45 to DB9/DB25 Connection Cables

These cables can be used with the following products: C320Turbo Series, CP-204J, CI-104J, A52, A53, A60

CN20030

Connector Types

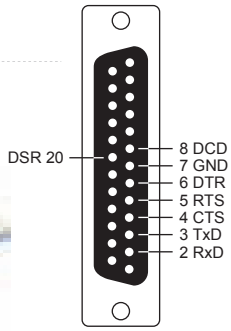
Board-side: 10-pin RJ45 x 1

Device-side: DB25 female x 1

Cable Length

150 cm





CN20060

Connector Types

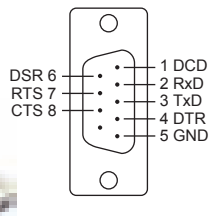
Board-side: 10-pin RJ45 x 1

Device-side: DB9 male x 1

Cable Length

150 cm





CN20040

Connector Types

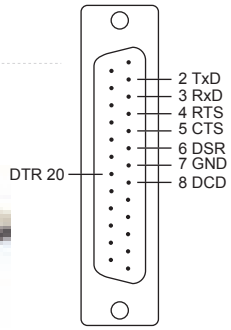
Board-side: 10-pin RJ45 x 1

Device-side: DB25 male x 1

Cable Length

150 cm





CN20070

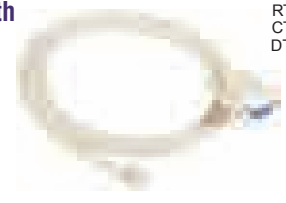
Connector Types

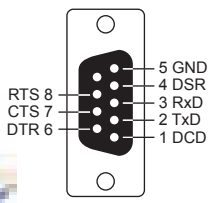
Board-side: 10-pin RJ45 x 1

Device-side: DB9 female x 1

Cable Length

150 cm





8-pin RJ45 to DB9/DB25 Connection Cables

These cables can be used with the following products: CP-104JU, OPT8-RJ45, NPort® 5210, NPort® 5600, NPort® 6600, CN2510/2600, NPort® W2004, UC-7410/7420

CBL-RJ45F25-150

Connector Types

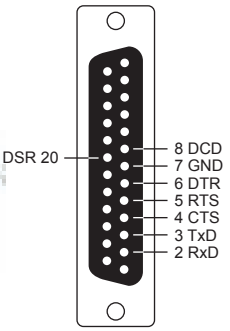
Board-side: 8-pin RJ45 x 1

Device-side: DB25 female x 1

Cable Length

150 cm





CBL-RJ45F9-150

Connector Types

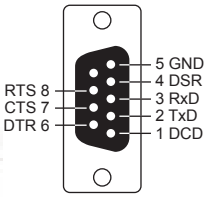
Board-side: 8-pin RJ45 x 1

Device-side: DB9 female x 1

Cable Length

150 cm





CBL-RJ45M25-150

Connector Types

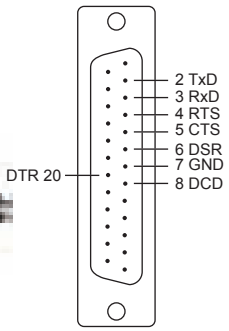
Board-side: 8-pin RJ45 x 1

Device-side: DB25 male x 1

Cable Length

150 cm





CBL-RJ45M9-150

Connector Types

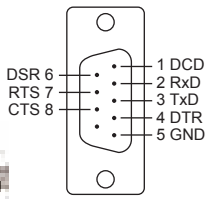
Board-side: 8-pin RJ45 x 1

Device-side: DB9 male x 1

Cable Length

150 cm





CBL-RJ45SF25-150

Cable Type: Shielded

Connector Types

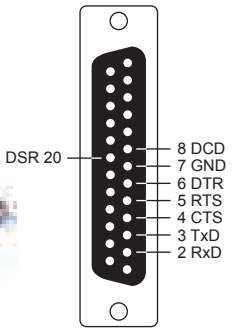
Board-side: 8-pin RJ45 x 1

Device-side: DB25 female x 1

Cable Length

150 cm





CBL-RJ45SF9-150

Cable Type: Shielded

Connector Types

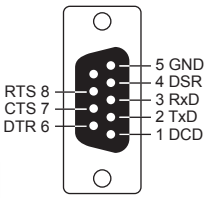
Board-side: 8-pin RJ45 x 1

Device-side: DB9 female x 1

Cable Length

150 cm





CBL-RJ45SM25-150

Cable Type: Shielded

Connector Types

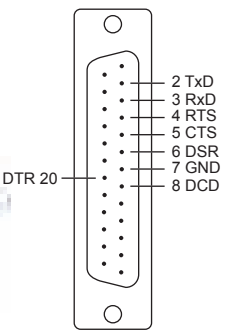
Board-side: 8-pin RJ45 x 1

Device-side: DB25 male x 1

Cable Length

150 cm





CBL-RJ45SM9-150

Cable Type: Shielded

Connector Types

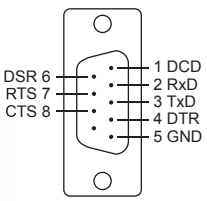
Board-side: 8-pin RJ45 x 1

Device-side: DB9 male x 1

Cable Length

150 cm





Wiring Kits

TB-M9

Type: DB9 male DIN-rail wiring terminal



Use with these products

Device Servers: NPort® DE-311/304/334

Specifications

Connector: DB9 male
Rating: 300 V, 20 A (IEC250V 10A)
Operating Temperature: -40 to 105°C (-40 to 221°F)
Suitable Wiring: 24-12 AWG (IEC 0.5-2.5 mm2)
Dimensions: 77.5 x 45 x 51 mm (3.05 x 1.77 x 2.01 in)

TB-M25

Type: DM25 male DIN-rail wiring terminal



Use with these products

Device Servers: NPort® DE-211
Serial Boards: CP-102UL, CP-132UL-I, CP-102EL, CP-132EL-I, CP-132EL

Specifications

Connector: DB25 male
Rating: 300 V, 20 A (IEC250V 10A)
Operating Temperature: -40 to 105°C (-40 to 221°F)
Suitable Wiring: 24-12 AWG (IEC 0.5-2.5 mm2)
Dimensions: 77.5 x 90 x 51 mm (3.05 x 3.54 x 2.01 in)

RJ45 to DB9 Adaptor

Model Name: ADP-RJ458P-DB9M
Type: RJ45 to DB9 male



TB-F9

Type: DB9 female DIN-rail wiring terminal



Use with these products

Device Servers: NPort® DE-311/304/334
Serial Boards: CI-132 Series, CP-132 Series, CP-102U

Specifications

Connector: DB9 female
Rating: 300 V, 20 A (IEC250V 10A)
Operating Temperature: -40 to 105°C (-40 to 221°F)
Suitable Wiring: 24-12 AWG (IEC 0.5-2.5 mm2)
Dimensions: 77.5 x 45 x 51 mm (3.05 x 1.77 x 2.01 in)

TB-F25

Type: DB25 female DIN-rail wiring terminal



Use with these products

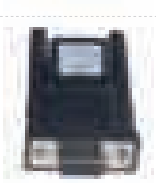
Device Servers: NPort® DE-211

Specifications

Connecctor: DB25 female
Rating: 300 V, 20 A (IEC250V 10A)
Operating Temperature: -40 to 105°C (-40 to 221°F)
Suitable Wiring: 24-12 AWG (IEC 0.5-2.5 mm2)
Dimensions: 77.5 x 90 x 51 mm (3.05 x 3.54 x 2.01 in)

RJ45 to DB9 Adaptor

Model Name: ADP-RJ458P-DB9F
Type: RJ45 to DB9 female



Power Supplies

24/48 VDC power supplies for installation on a DIN-Rail

	24 VDC DIN-Rail Power Supplies					48 VDC DIN-Rail Power Supplies	
	DR-4524	DR-75-24	DR-120-24	MDR-40-24	MDR-60-24	DR-75-48	DR-120-48
							
Physical Characteristics and Temperature Limits							
Dimensions (mm)	78 x 67 x 93	55.5 x 100 x 125.2	65.5 x 100 x 125.2	40 x 90 x 100	40 x 90 x 100	55.5 x 100 x 125.2	65.5 x 100 x 125.2
Weight	400 g	550 g	650 g	260 g	280 g	550 g	650 g
Operating Temperature	-10 to 50°C (14 to 122°F)	-10 to 60°C (14 to 140°F)		-20 to 70°C (-4 to 158°F)		-10 to 60°C (14 to 140°F)	
Relative Humidity	20 to 90% RH	20 to 90% RH		20 to 90% RH		20 to 90% RH	
Power Requirements							
Wattage	45 W	75 W	120 W	40 W	60 W	75 W	120 W
Input	85-264 VAC (47-63 Hz), or 120-370 VDC		88-132 VAC, or 176-264 VAC (47-63 Hz) by switch, or 248-370 VDC	85-264 VAC (47-63 Hz) or 120-370 VDC		85-264 VAC (27-63 Hz) or 120-370 VDC	88-132 VAC, or 176-264 VAC (47-63 Hz) by switch, or 248-370 VDC
Output	48 W (24 VDC @ 0-2 A)	76.8 W (24 VDC @ 0-3.2 A)	120 W (24 VDC @ 0-5 A)	40 W (24 VDC @ 0-1.7 A)	60 W (24 VDC @ 0-2.5 A)	76.8 W (48 VDC @ 0-1.6 A)	120 W (48 VDC @ 0-2.5 A)
Over-voltage Protection	27.6-32.4 V	29-33 V		31.2-36 V		58-65 V	
Overload Protection	105-150%						
Type	Constant Current Limiting						
Reset	Auto Recovery						
Inrush Current	30 A and 115 V, or 60 A and 230 V						
Reliability							
Safety Standards	EN 60950-1, UL 508 approved						
EMC Standards	EN 55022 Class B, EN 61000-4-2/3/4/5/6/8/11, ENV 50204, EN 61000-3-2, EN 50082-2						
Warranty	3 years (see www.moxa.com/warranty)						

Ordering Information

24 VDC DIN-Rail Power Supplies

DR-4524: 45W/2A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -10 to 50°C operating temperature
DR-75-24: 75W/3.2A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -10 to 60°C operating temperature
DR-120-24: 120W/5A DIN-Rail 24 VDC power supply with universal 88 to 132 VAC or 176 to 264 VAC input by switch, -10 to 60°C operating temperature
MDR-40-24: 40W/1.7A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -20 to 70°C operating temperature
MDR-60-24: 60W/2.5A DIN-Rail 24 VDC power supply with universal 85 to 264 VAC input, -20 to 70°C operating temperature

48 VDC DIN-Rail Power Supplies

DR-75-48: 75W/1.6A DIN-Rail 48 VDC power supply with universal 85 to 264 VAC input, -10 to 60°C operating temperature
DR-120-48: 120W/2.5A DIN-Rail 48 VDC power supply with universal 88 to132 VAC or 176 to 264 VAC input by switch, -10 to 60°C operating temperature

Power Adaptors

The following power adaptors can be used with these products: NPort® DE-211/311, NPort® 5100/5200/5400/6150/6250/6450, NPort® W2004, NPort® 2150/2250 Plus, UC-7110/7410/7420, VPort 251







	PWR-12150-CN-S1	PWR-12120-USJP-S2	PWR-12200-DT-S1	PWR-12150-EU-S2	PWR-12150-UK-S2
Input Rating					
I/P	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz
Input Plug					
Plug Type	CN	US/JP	–	Euro	UK
Output Rating					
O/P	1.5 A @ 12 VDC	1.2 A @ 12 VDC	2 A @ 12 VDC	1.5 A @ 12 VDC	1.5 A @ 12 VDC
Output Plug					
Connector Type	L-type 5.5/2.1/9.0	L-type 5.5/2.1/9.5	S-type 5.5/2.1/7.5	L-type 5.5/2.1/9.0	L-type 5.5/2.1/9.0
Outer Diameter	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm	5.5 ± 0.1 mm
Inner Diameter	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm	2.1 ± 0.1 mm
Physical Characteristics					
Dimensions	70 x 45 x 54 mm	75 x 34 x 72 mm	110.8 x 51.8 x 32 mm	70 x 45 x 66.5 mm	70 x 45 x 60 mm
Weight	200 g	130 g	200 g	200 g	200 g
Cord Length	1800 ± 200 mm	1830 to 1950 mm	1800 ± 200 mm	1800 ± 200 mm	1800 ± 200 mm
Environmental Limits					
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Regulatory Approvals					
Safety	UL/PSE	UL/PSE	UL/CE/FCC/GS/CCC	FCC/ELT/PSE/CE	CE/GS/FCC/PSE/ETL

Power Cords

The following power cords can be used with these products: CN2510, CN2600 Series, NPort® 5600 Series, NPort® 6600 Series, IKS-6500 series, IKS-G6500 series, ICS-G7800 series, ICS-G7700 series, ICS-G7500 series

PWC-C13US-3B-183



US Plug (110 V)
Thickness: 6.8 mm
Max. Current: 10 A
Length: 1830 mm

PWC-C13EU-3B-183



Euro Plug (250 V)
CEE 7/7 to IEC C13
Thickness: 6.8 mm
Max. Current: 10 A
Length: 1830 mm

PWC-C13UK-3B-183



UK Plug (250 V)
Thickness: 6.8 mm
Max. Current: 5 A
Length: 1830 mm

PWC-C13JP-3B-183



Japan Plug (125 V)
Thickness: 7.0 mm
Max. Current: 7 A
Length: 1830 mm

PWC-C13AU-3B-183



AU Plug (250 V)
Thickness: 6.0 mm
Max. Current: 10 A
Length: 1830 mm

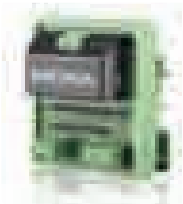
PWC-C13CN-3B-183



CN Plug (250 V)
Thickness: 6.0 mm
Max. Current: 10 A
Length: 1830 mm

TK-485 Tuning Kit

Pull high/low resistance tuner with termination resistor



The TK-485, which has both a termination resistor and tuning resistor, is a great tool for engineers who build networks of daisy-chained 2-wire RS-485 devices. You no longer need to open up your RS-485 devices to add a termination resistor, and then add another resistor to tune the pull high/low resistance. Instead, simply connect the TK-485 to your RS-485 network, activate the termination resistor, and then tune the pull high/low resistor on the TK-485 until the RS-485 signal is transmitted intact.

Specifications

Serial Protection
Isolation: 2 KV isolation protection
ESD Protection: ±4 KV protection from ESD due to contact discharge

Power Requirements
Power Input:
• 12 to 48 VDC input through power jack
• ±12 to ±48 VDC input through terminal block, with polarity protection

Resistance Options
Pull High: 600 Ω, 1 KΩ, 2 KΩ, 4.7 KΩ, 10 KΩ
Pull Low: 600 Ω, 1 KΩ, 2 KΩ, 4.7 KΩ, 10 KΩ
Terminator: 120 Ω

Connectors
Signal Inputs: D+, D-, GND
Signal Outputs: D+, D-, GND

Environmental Limits
Operating Temperature: 0 to 55°C
Operating Humidity: 95% RH max., non-condensing
Storage Temperature: -20 to 70°C

Fiber Optic Adaptors

SC male to ST female duplex adaptors



These SC male to ST female duplex adaptors are provided as an optional accessory to give users of Moxa industrial Ethernet switches more fiber optic connection options. Simply plug the adaptors directly into the SC connector of any Moxa industrial Ethernet switch to convert the original SC connector into an ST connector. This allows you to use an ST connector with any MOXA industrial Ethernet switch, but without the need for an extra patchcord.

ADP-SCm-STf-S

SC male to ST female duplex adaptor for single-mode fiber

Specifications

Single-mode: 9/125 µm
Ferrules and Sleeves: Zirconia Ceramic
Body Color: Blue
Insertion Loss: 0.5/1.1 (TYP/MAX)
SC-side Connector: SC male
ST-side Connector: ST female

ADP-SCm-STf-M

SC male to ST female duplex adaptor for multi-mode fiber

Specifications

Multi-mode: 62.5/125 µm
Ferrules and Sleeves: Zirconia Ceramic
Body Color: Gray
Insertion Loss: 0.1/0.3 (TYP/MAX)
SC-side Connector: SC male
ST-side Connector: ST female

Mounting Kits

Wall Mounting Kits

WK-30

Dimensions: 40 x 30 x 1 mm



Use with these products

Unmanaged Ethernet Switches: EDS-205A, EDS-G205

WK-32

Dimensions: 30.3 x 140 x 12.3 mm



Use with these products

Modular Ethernet Switches: EDS-828, EDS-728

WK-46

Dimensions: 51.6 x 66.8 x 1 mm



Use with these products

Managed Ethernet Switches: EDS-400A, EDS-500A, EDS-G509, EDS-P510, PT-500 series
Unmanaged Ethernet Switches: EDS-208A series, EDS-300 series, EDS-G308, EDS-P308, EDS-P206A-4PoE
Media Converter: IMC-101G/101 series
Video Servers: VPort 254, VPort 351, VPort 354, VPort 461, VPort 3310, VPort D351

WK-51-01

Dimensions: 55 x 67 x 1 mm



Use with these products

Media Converters: IMC-P101 series, PTC-101 series
Managed Ethernet Switches: EDS-P506A-4PoE, EDS-316 V2.0
Wireless AP/Bridge/Client: AWK-3121 series, AWK-3131 series
Dual-RF Wireless AP/Bridge/Client: AWK-5222 series
Secure Routers: EDR-G903 Series

WK-75

Dimensions: 75 x 90 x 2.5 mm



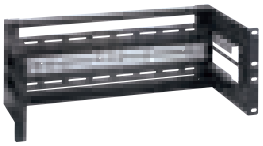
Use with these products

Modular Ethernet Switches: EDS-600 series

Rack Mounting Kits

RK-4U (19")

Dimensions: 481 x 177.8 x 202.4 mm



Use with these products

Managed Ethernet Switches: EDS-400A, EDS-500A, EDS-728, EDS-828, EDS-G509, EDS-P510, EDS-P506A-4PoE, TN-5500, PowerTrans PT-500 series
Unmanaged Ethernet Switches: EDS-200, EDS-200A, EDS-300, EDS-G205, EDS-G308, EDS-P308, EDS-P206A-4PoE, ToughNet TN-5300 series
Media Converters: IMC-21, IMC-101, IMC-101G
Video Servers: VPort 351, VPort D351, VPort 361, VPort 451, VPort 461, VPort 254, VPort 354, VPort 364, VPort 3310
Secure Routers: EDR-G903 Series

DIN-Rail Mounting Kits

DK-DC50131

Dimensions: 50 x 131 x 1 mm



Use with these products

Managed Ethernet Switches: TN-5500 series
Wireless AP/Bridge/AP Clients: AWK-4121 series, AWK-6222 series, AWK-4131 series
Modular RTU Controller: ioPAC 8020

DK-TN-5308

Dimensions: 66 x 174 x 12.8 mm



Use with these products

Unmanaged Ethernet Switches: TN-5308 series

DK-M12-305

Dimensions: 60 x 125 x 12.8 mm



Use with these products

Unmanaged Ethernet Switches: TN-5305 series

DK-35A

Dimensions: 42.5 x 10 x 19.34 mm



Use with these products

Video Server: VPort 251

Ordering Information

Available Models

WK-30: Wall mounting kit for the EDS-205A/G205 series
WK-32: Wall mounting kit for the EDS-728/828 series
WK-46: Wall mounting kit
WK-51-01: Wall mounting kit
WK-75: Wall mounting kit for the EDS-600 series
RK-4U: 4U-high 19" rack mounting kit
DK-DC50131: DIN-Rail mounting kit
DK-TN-5308: DIN-Rail mounting kit for the TN-5308 series
DK-M12-305: DIN-Rail mounting kit for the TN-5305 series
DK-35A: DIN-Rail mounting kit for the VPort 251/2141 series

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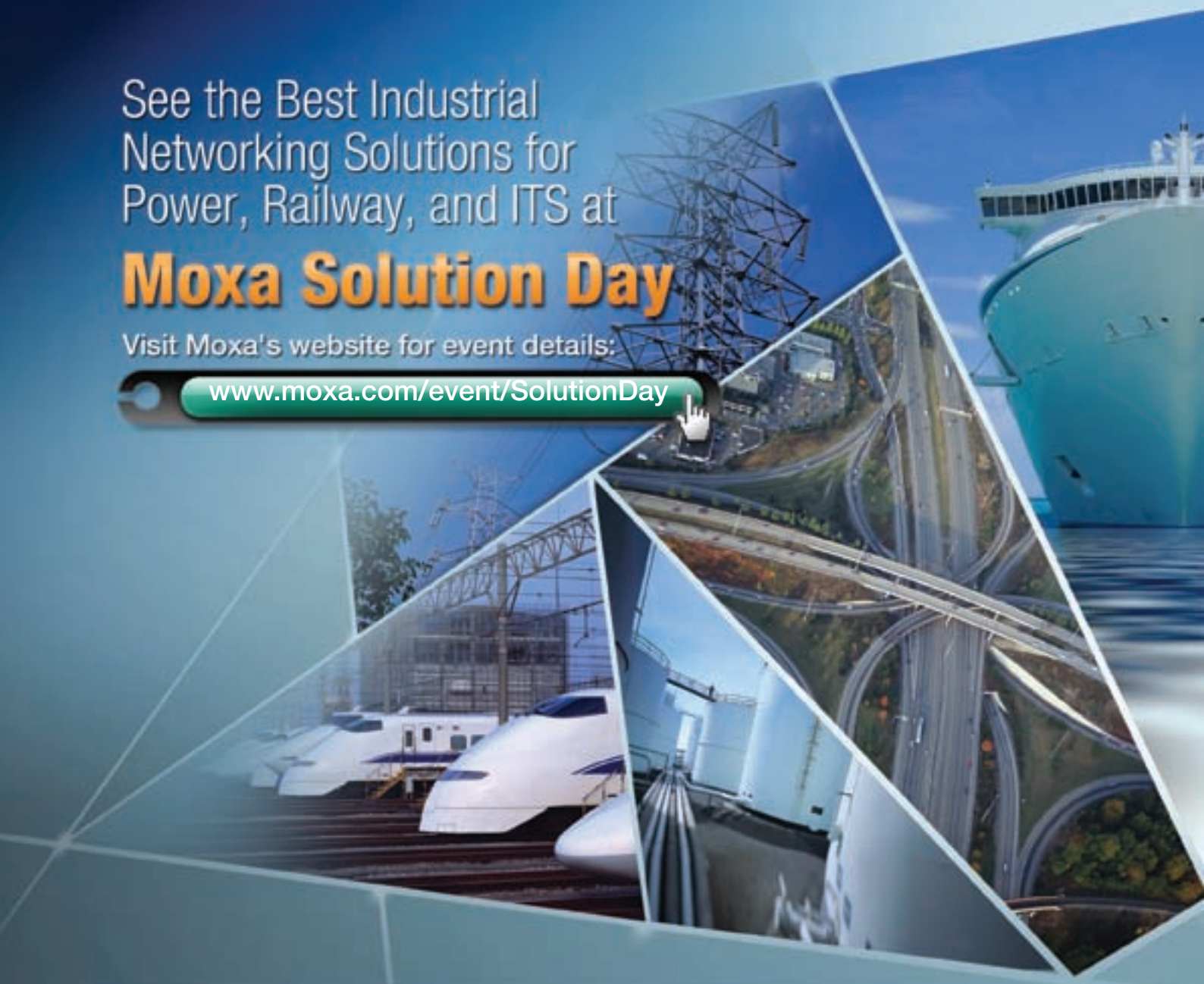
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- Design engineers
- System integrators
- Network infrastructure engineers for mission-critical industries
- Third-party developers
- Regional and local media







For more information about Moxa Solution Day, visit the official Solution Day website listed above and check the schedule for events in your area.

MOXA SOLUTION DAY



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P/N: 1900001101010