

Industrial Computing Solutions

- Embedded Computers
- Power Substation Computers
- Railway Computers
- Marine Displays and Computers
- Rcore Software

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 25 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

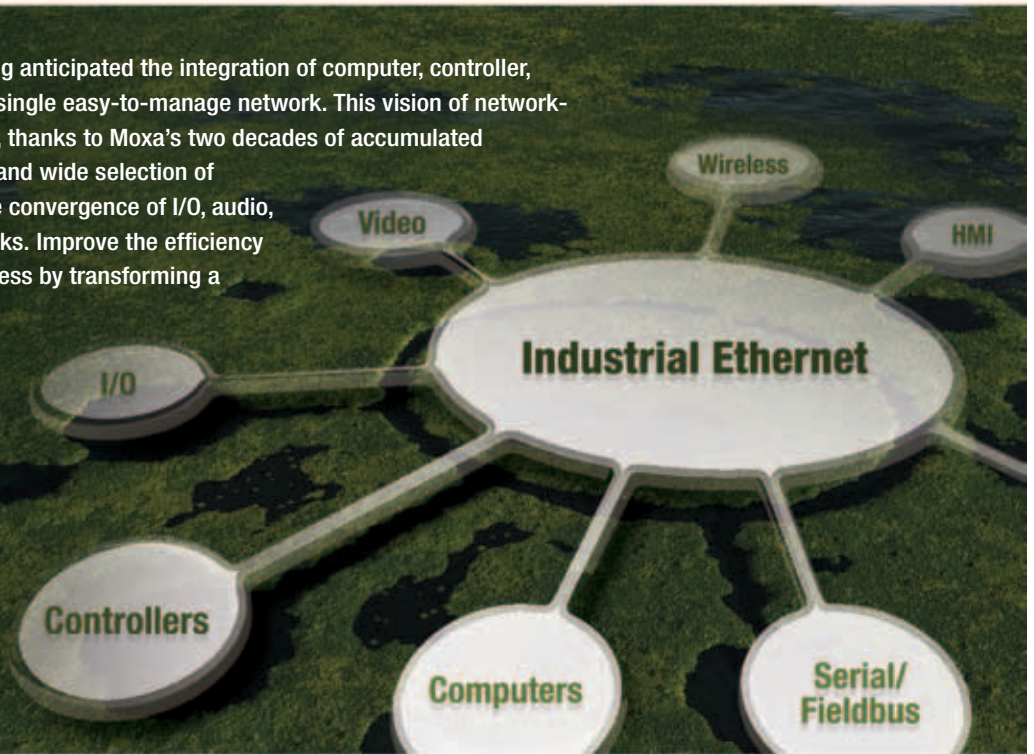
As a world-class leader and a trusted partner in industrial-grade device networking solutions for automation, Moxa proudly provides quality products and value-added service to establish win-win business relationships based on mutual trust and integrity. Moxa works closely with customers, channel-partners,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

Delivering on Commitments

Moxa talented design team, which is experienced in networking technology and solution development, offers quick, flexible, and comprehensive R&D service to meet customers' specific expectations and exacting requirements. Moxa collaborates closely with customers to drive advancements and achieve a faster time-to-market, and 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 industrial Ethernet networks.



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 edge-to-core 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



Moxa's remote automation solutions empower control and monitoring systems in remote locations with the latest technology and industry expertise. Our product portfolio includes programmable RTU controllers, remote I/O devices, IP surveillance solutions and easy-to-configure automation and video software. Both network and cellular communication interfaces are available to meet the needs of a variety of applications and to simplify long-range host-to-device communications around a standard industry protocol. Including Moxa's SCADA-compatible IP surveillance solutions which enable your network video monitoring system, Moxa's remote automation solutions enhance the safety and security of remote industrial facilities. With their robust, wide temperature design, all of the products can be used in harsh, industrial environments.

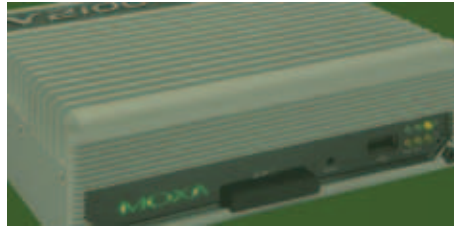
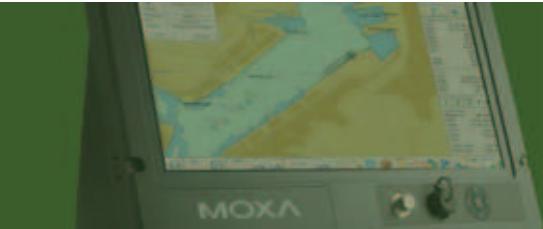
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Complete Automation Solutions

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.

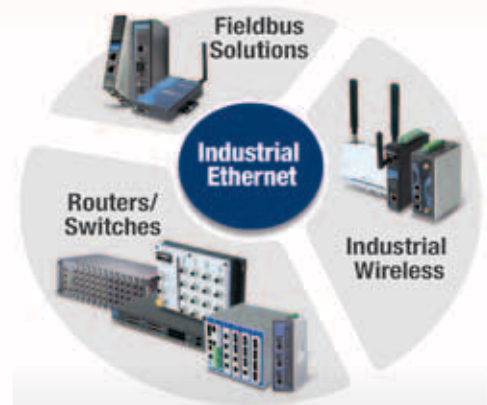
Vertical Solutions for Mission Critical Applications

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, EN 50155 and EN 50121 for railway applications, DNV, GL, LR, ABS, and NK 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 25 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

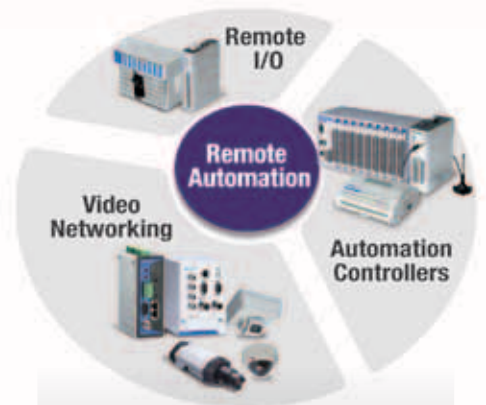
- Router, Switch, Firewall, VPN, NMS
- Wireless Ethernet, GPRS
- IP67, M12, PoE/PoE+
- Turbo Ring and Turbo Chain Redundancy, Turbo Roaming
- OPC, Industrial Ethernet Protocol Support



Solutions



Products



Technology

Device Connectivity

- Serial-to-Ethernet/Wifi/ZigBee
- Serial-to-USB
- Serial Boards
- Media Converters
- USB-IF and WHQL Certifications
- ProCOM, QuickLink, and SmartLink
- 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 Displays and Computers

Remote Automation

- Rugged design
- Front-end intelligence for easy monitoring and control
- Ethernet & Cellular Communication
- IP Cameras, Industrial Video/Audio Servers
- Automation software package for faster SCADA communication and easy data collection and conversion



 Use customer feedback and input to inspire new product ideas.

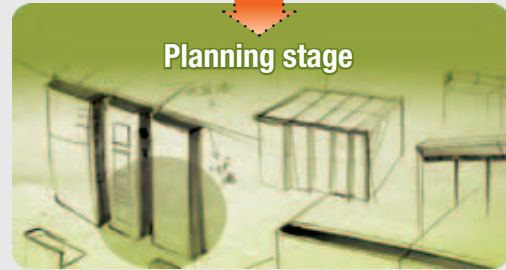
New Product Development Process >>>

How innovation and quality are integrated into our development process.




Idea stage

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.



Planning stage

 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 reliability and efficiency of operations 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.

At Moxa, we continually fine-tune and optimize 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 >>>



Best Product Award, Control Engineering China Magazine

- ICS-G7852 industrial core switch (2011)



Engineer's Choice Award, Control Engineering Magazine

- EDR-G903 industrial Gigabit secure router (2011)
- ToughNet TN-5518 EN 50155 Ethernet switch (2010)
- W345 RISC-based wireless computer (2007)
- ioLogik E2210 Ethernet RTU controller (2006)

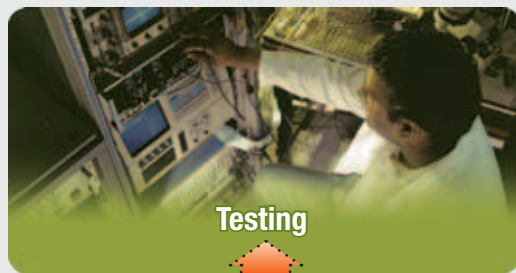


Embedded Award 2007, Embedded World Exhibition and Conference

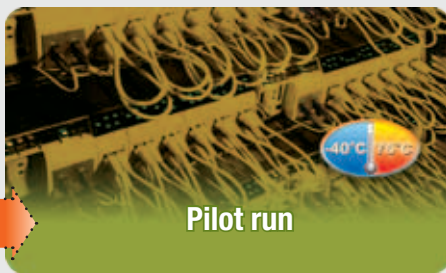
- W315/325/345 wireless embedded computers (2007)

4 Test all functions in a simulated industrial networking environment.

5 Plan production and rigorously test product samples.



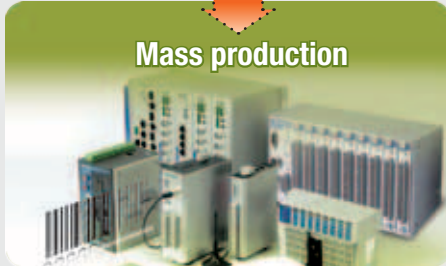
Testing



Pilot run



Design stage



Mass production

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

7 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. Most Moxa products carry a 5-year warranty, and with offices in Taiwan, the US, Europe, 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 (2007)



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

- VPort 16-M12 EN 50155 IP Camera (2011)
- ToughNet TN-5518 EN 50155 Ethernet switch (2010)
- EDS-726 industrial Gigabit modular Ethernet switch (2006)

Connect to Moxa Anytime, Anywhere

Take advantage of Moxa's professionalism and 25 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, India, and the Asia Pacific region. The Moxa.com site is an additional knowledge resource that can be accessed globally at any time.



America Headquarters
Los Angeles, USA



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 70 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.

Europe Headquarters

Munich, Germany
St. Rémy lès Chevreuse Cedex, France



China Headquarters
Shanghai, Beijing, Shenzhen, China



Global and Asia Headquarters
Taipei, Taiwan

India Headquarters
Bangalore, India



■ Global Headquarters ■ Regional Headquarters ■ Distributors

Moxa Online—The Fastest and Easiest Way to Evaluate Moxa Products

The Moxa Online service makes it possible for end users to acquire evaluation units of Moxa products in as little as 48 hours. The online ordering platform is designed for user-friendliness and easy navigation, so users can find the exact model they need and complete their purchase with a minimum of hassle. Since a broad selection of products is kept in stock, purchases can often be shipped out before the day is over. When it is time to make a larger purchase, friendly reps can guide you to an authorized Moxa distributor for special pricing and delivery arrangements.



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.



Smart Rail



Ride the Rails, Roll with Moxa

Overview

Modern railway networks demand high reliability, availability, and cost-effectiveness. However, the conventional train communication networks (TCN) commonly available today use a mix of different proprietary technologies and create unnecessary costs, limit the bandwidth, and impose constraints on the ability to improve passenger comfort and security.

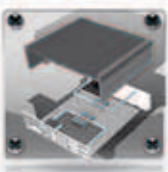
Moxa's railway solutions can be used to upgrade railway infrastructure operations and maintenance to deliver improved passenger security, enhanced traffic safety, and higher operational efficiency for next generation railway networks. Moxa's products are designed with efficient operations and high reliability in mind. The rolling stock embedded computers comply with EN 50155 and EN 50121 standards and incorporate extensive future-proof features specifically for railway applications.

In Depth

As the main part of a railway system, rolling stock applications present unique hardware design and protocol integration challenges, and require a steady, reliable, and consistent platform. EN 50155 certification applies to the class of electronic equipment installed on rail vehicles that use either an accumulator battery or a low voltage power supply source, with the exception of electronic power circuits, which are covered by EN 50207. EN 50155 sets a consistent benchmark for equipment operation, design, construction, and testing conditions, as well as basic hardware and software requirements.

The EN 50155 standard governs the operation, design, construction, and testing of electronic equipment used on rail vehicles and in railway applications. Moxa's railway computers are EN 50155 certified and undergo environmental testing to ensure reliable performance under a variety of power supply conditions, such as voltage variations, power interruptions, and supply changeover. The computers can also withstand disturbances common to railway environments, including vibration, shock, and extreme temperature. Moxa's embedded computers achieve this level of performance by meeting, and exceeding EN 50155 requirements.

Moxa's Value Proposition



Railway-grade Hardware

- EN 50155, EN 50121-2-3, IEC 61373 certified
- Conformal coating
- Power isolation
- High performance with a fanless, thermal design
- Anti-vibration and anti-shock for commercial storage protection
- Wide-range computing solution (x86 + RISC)



Add-on Software Value

- Moxa Intelligent Routing Framework (MIRF) tool
- S.M.A.R.T storage diagnostics
- Pro-active storage protection
- High availability storage management



Professional Design Service

- Co-design services
- Proposal system
- Project management
- Integrated H/W and S/W solutions
- After-sales service
- Global technical support

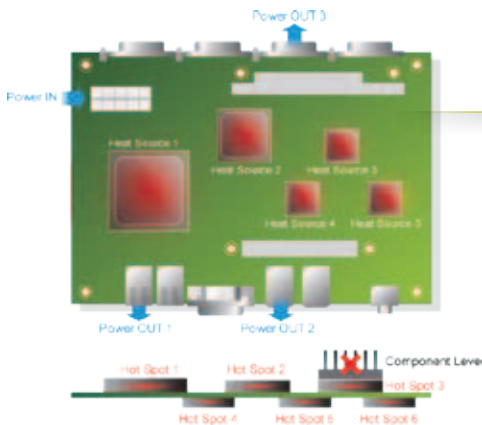
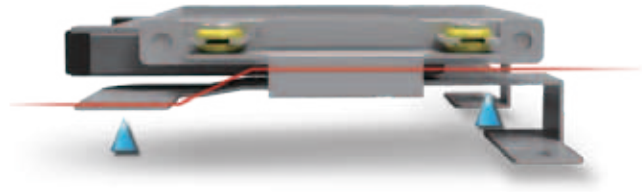
Moxa's Breakthrough Technology

■ Innovative Anti-vibration and Anti-shock Technology for Hard Disks

Constant vibration and shock are a fact of life in rolling stock operations, and vibration and shock resistance is particularly for storage devices. To reduce the impact of vibration and shock, some computers use solid state memory options such as CompactFlash, SD, or DOM disks. However, conventional hard disk drives are the inevitable choice to meet larger storage capacity demands, making vibration and shock resistance even more critical.

Moxa has developed an innovative anti-shock and antishock strategy uses a cleverly designed bracket. The bracket protects the hard disk by directly absorbing vibration energy and balancing the hard disk to avoid excessive vibration and shock.

The bracket acts like a seesaw, and by intentionally avoiding a symmetric structure, the design effectively reduces vibrations by disrupting the sinusoidal nature inherent in all vibrational motion. With this technology, Moxa's industrial computers easily meet EN 50155 certification for use in industrial applications such as trains or vehicles.



■ System-wide Design Achieves the Highest EN 50155 Temperature Standard

The rolling stock computer should be tested to conform to the classification level required by the specific application. Currently, a -40 to 70°C operating temperature range is the highest standard possible under the EN 50155 Tx Class. Moxa's railway computers conform to this standard.

Moxa's industrial computers are conceived and designed at the system level. Compared to designing at the component level, this more thorough process is complicated and time-consuming. However, the approach creates comprehensive system-wide solutions that can guarantee system stability, reliability, ruggedness, and longevity.

■ Innovative MIRF Solution for Seamless Wireless Communications

MIRF (Moxa Intelligent Routing Framework) is an innovative solution for wireless railway passenger network applications. In order to provide commercial-grade multimedia service, system integrators need to develop more value-added software. Unfortunately, open programmable platforms for development may not be readily available.

MIRF is an open and customizable application software that can reduce development time and achieve faster time-to-market. Advantages of MIRF include the following:

- Middleware, sample code, and tools provide a friendly environment for programmers to develop software and applications with minimal effort, less cost, and faster time-to-market.
- With intelligent policy configuration, users can easily automate system configuration for heterogeneous networks. In addition, system customization is easier since users can choose the optimal configuration method for various requirements.
- With multiple routing technology, network bandwidth efficiency is easily optimized and network traffic jams are easily avoided.



Smart Rail Solutions

A Complete Railway Solution

Moxa's embedded computer products have been used in a number of railway automation applications around the world. The embedded computer plays an important role in railway automation by acting as a front-end computer, data acquisition workhorse, or even serving as the central controller and management computer for an entire system. The diagram shown below provides typical applications of embedded computers in railway automation, including network video recording systems, passenger infotainment systems, control center systems, turnstile systems, and ticketing systems.

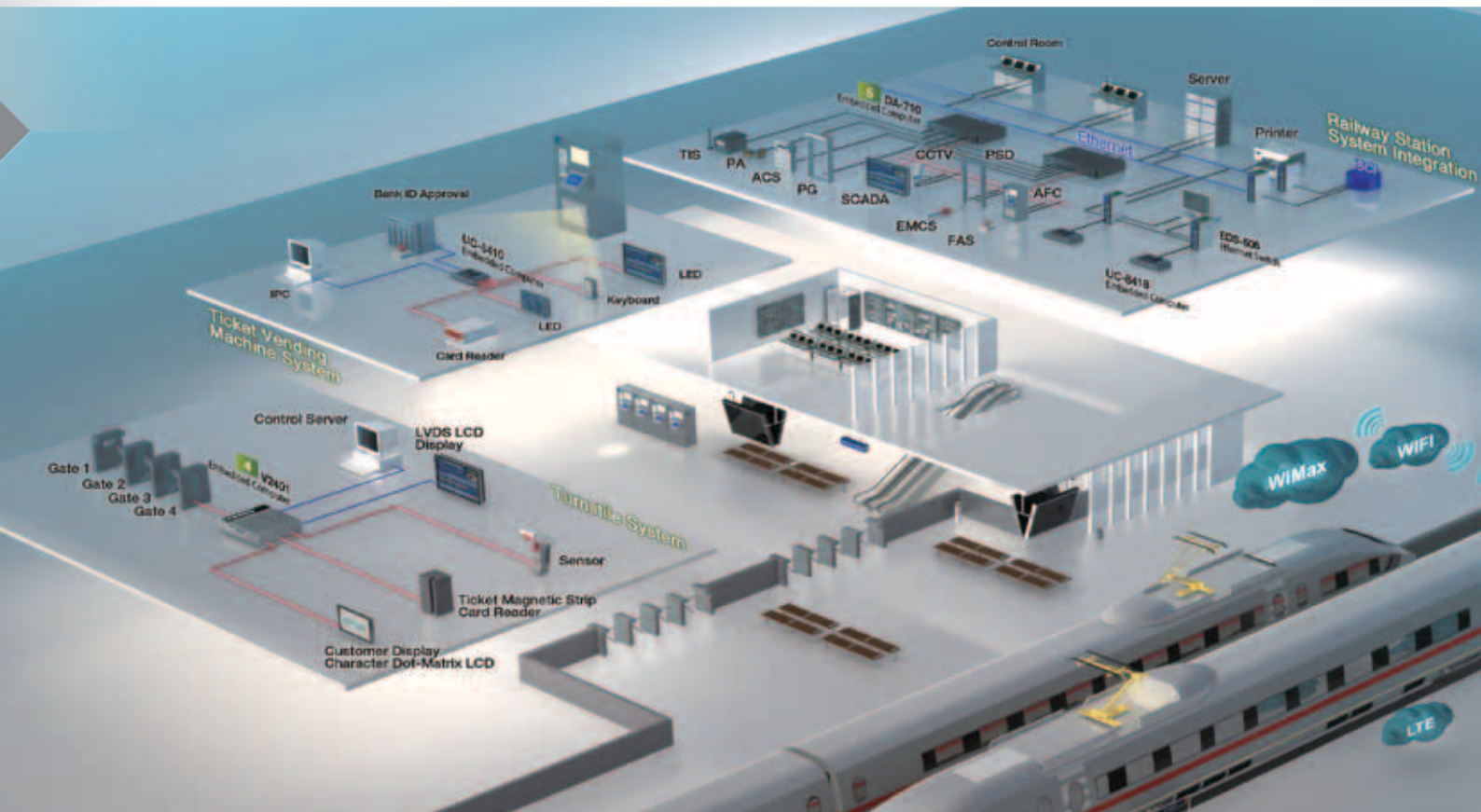
Embedded Computing from Ticket Booth to Track

▪ Railway Ground Station Systems

In this segment, the railway ground station systems cover the ticketing system, turnstile system, and railway station system integration. **Ticketing System:** One of the most important components of a ticket vending machine is the bank confirmation process that checks the customer's bank ID and account status and processes debits for ticket purchases from an ATM card or credit card. An embedded computer located on-site can communicate directly with local devices. **Turnstile System:** The embedded computer for the turnstile system serves as the central controller and manager. Except to support multiple interfaces to connect various devices, the system must be rugged enough to resist vibration and shock while passengers pass through. **Railway Station System Integration:** A railway line is composed of several stations that communicate by sending data to local devices, a remote management center, and/or third parties. The main issue faced when creating a railway station monitoring system is integrating and communicating between different, remote systems. The embedded computers are ideal as a front-end processor for collecting data from peripheral systems.

▪ Network Video Recording System

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. The nodes at the front and rear of the train (driver's cab) need a higher level of performance in order to support NVR playback and live view. In addition, entry-level embedded computers in each passenger car are responsible for monitoring and recording the images from the cameras, allowing the engineer to simultaneously view the entire train.



Application	Recommended Products
Mobility Control Unit	<ul style="list-style-type: none"> ● V2426
Network Video Recorder	<ul style="list-style-type: none"> ● TC-6100 ● V2616 ● V2416
Passenger Information and Infotainment System	<ul style="list-style-type: none"> ● V2406 ● V2426 ● UC-8481

Passenger Infotainment

Uninterrupted communications, which is the most important component of a passenger infotainment system, ensures that passengers can enjoy stable wireless communications while the train travels through different regions. The wireless mobile computers used with Moxa Intelligent Routing Framework (MIRF) help enable seamless WiFi service for train passengers as the train travels through different regions. MIRF is an open-platform multiple WAN management tool. As a train enters a new region, it often faces different wireless interface switches, such as WiFi, UMTS, HSPA, WiMax, and LTE. By supporting multiple WANs and backup, Moxa's wireless mobile computers help ensure an unbroken wireless connection for 100% wireless quality, stability, and reliability.



Key Products

1

TC-6100 Series x86 Intel Duo Core Atom D525 1.8 GHz rackmount computers



- Multiple expansion modules with PoE switch, wireless and cellular communication
- Smart-Monitoring, Analysis, and Report Technology (S.M.A.R.T) for system maintenance
- Modular design for easy storage and peripheral expansion

EN 50155 | EN 50121-3

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2

V2616 Series x86-based Intel Core 2 Duo NVR computers



- 3 SATA-150 connectors for hard drive disk expansion (1 built-in and 2 removable storage trays for 2.5" SSDs or HDDs)
- 24 VDC M12 DC power with 1,500 VDC power isolation
- 2 GB M12 Ethernet ports, 3 USB 2.0, 6 DIs, 2 DOs, 2 RS-232/422/485 optical isolated serial ports

EN 50155 | EN 50121-3

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3

UC-8481 RISC-based wireless mobile computer



- Supports Moxa Intelligent Routing Framework for seamless wireless communication
- Wireless and GPS modules for multiple communications
- 2 LANs, 2 serial ports, 2 USB 2.0 hosts, cellular, CF, Wi-Fi, 3 Mini PCIe sockets

EN 50155 | EN 50121-3

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4

V2401 Series x86-based Atom 1.6 GHz embedded computers



- Dual independent displays (VGA, DVI-I, or LVDS selectable)
- 4 RS-232/422/485 and 8 RS-232 serial ports, 2 Gigabit Ethernet LANs, 6 USB ports, 4 DIs, 4 DOs
- Flexible storage expansion

e Mark

Page 5-6

5

DA-710 Series x86-based Intel Core 2 Duo rackmount computers



- 4 PCI slots for expansion modules
- 4 Gigabit Ethernet ports for network redundancy
- Dual 100/240 VAC/VDC wide range power input provided

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ECDIS Marine



Make Your Marine Visions a Reality

Vertical Market Solutions

Overview

The marine industry faces significant challenges from critical environmental effects and maintenance difficulties, making reliable and rugged systems extremely essential. In addition, reliable systems reduces the risk of accidents when out to sea.

Moxa provides professional industrial-grade marine computers, panel PCs, and standalone displays that use leading technologies and reliable designs perfect for applications on the dock, on an open deck, or in the control room and bridge. Moxa's marine solutions pass strict tests and follow critical industrial standards to ensure compliance with international marine standards, such as ECDIS, DNV, IEC 60945, and IACS-E10. Furthermore, using a high performance, IP66/67, fanless, compact, rugged design helps reduce cost and the time required for system integration. A rich assortment of I/Os, such as serial ports and NMEA ports, allow the computers to be used in different parts of a vessel, making Moxa's marine computers, displays, and panel PC the best solution for marine applications.

In Depth

Marine Type Approvals: IEC 60945, DNV, IACS-E10

Moxa has invested tremendous resources to provide the maritime community with marine computers and displays that comply with IEC 60945, DNV, and IACSE10 marine regulations.

IEC 60945 defines the testing methods and performance requirements for maritime navigation and radio communication equipment and systems, including radio and navigational equipment used onboard; EMC requirements apply to all other bridge-mounted equipment, equipment in close proximity to receiving antennas, and equipment capable of interfering with the safe navigation of the ship and radio communications.

The goal of DNV regulations is to safeguard life, property, and the environment, and the DNV has identified special risk management regulations for management systems used by the maritime industry. DNV certified solutions are expected to be stable and reliable, and can be used safely on vessels sailing on the open ocean.

IACS defines marine regulations for promoting the safety of life, property, and the environment primarily through the verification of technical and engineering standards for the design, construction, and life-cycle maintenance of vessels. IACS-E10 specifically defines the test procedure for electronically controlled equipment and instrumentation, as well as marine computers and peripherals.

All marine certifications require sophisticated testing procedures, particularly because the marine industry is faced with a number of challenges that include critical environmental influences and long offshore shipping periods, both of which pose severe risks and safety concerns. You can rest assured that Moxa's IEC 60945, DNV, IACS-E10 certified marine computers, standalone panels, and panel PCs will provide reliable and rugged solutions for your marine applications.

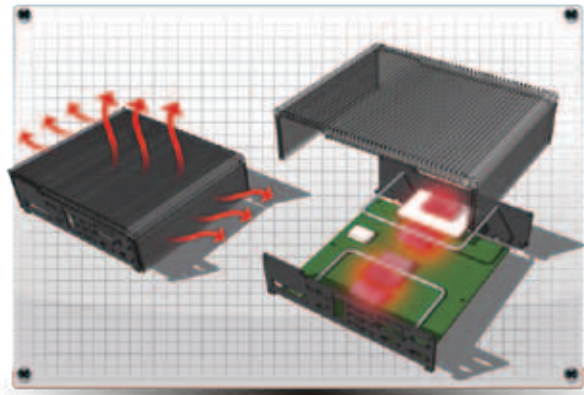


Moxa Breakthrough Technology

Thermal Design with High Performance CPU

A major goal of IPC manufacturers is to provide compact, high performance computers designed to generate substantially less heat than commercial computers. Moxa's new product development process considers heat generation and heat transfer of the entire computer from the start of the design process. For this reason, Moxa's marine computers exhibit outstanding heat dispatch performance, but still provide a powerful computing capability. This is done in part by placing the hottest components at the center of the computer, which allows the heat to flow efficiently and equally in all directions. Moxa's special heat pipe design enhances the heat dispatch process, and components that generate less heat are specially selected for use with Moxa's marine computers.

Moxa's fanless marine computers range from models with the Core 2 Duo to models with Intel's latest second generation i5 CPU. Fanless computers generate less noise, are less susceptible to damage from dust, and require less maintenance.



ECDIS

An Electronic Chart Display and Information System (ECDIS) is a computer-based navigation information system that complies with International Maritime Organization (IMO) regulations and can be used to replace paper nautical charts. An ECDIS system displays electronic navigational charts (ENC) and integrates position information from the global positioning system (GPS) and other navigational sensors, such as radar and automatic identification systems (AIS).

To meet ECDIS requirements, all of the displays used in marine applications must comply with color calibration regulations. The basic process of generating the calibration includes several steps, such as RGB color collection and luminance value collection. Moxa's ECDIS-type approved displays have been thoroughly tested with the color calibration process, and include a reliable and fine-tuned color calibration library.

These requirements ensure that all the information shown on the displays is "correct," and that the displays are fully compliant with ECDIS standards for color definition, guaranteeing the safety of your marine applications.

NMEA

The National Marine Electronics Association (NMEA) defines electrical and data specifications for communications between marine devices and equipment used for radar, GPS, echo-sounders, gyrocompasses, autopilots, sonar, and anemometers.

To simplify the process of integrating peripheral equipment into a bridge system, Moxa's MC-5150-AC/DC computers have 12 NMEA ports for connecting a variety of marine equipment, without the need for external converters.



ECDIS Marine Solutions

A Complete Marine Solution

Moxa's marine computers, displays, and panel PCs have been adopted around the world for use on numerous marine vessels, including oil tankers, cruise liners, cargo ships, and yachts. Moxa's marine products are used for data acquisition, communication, and control—on the bridge, in the control room, on deck, and on the dock. The diagram below illustrates typical applications of embedded computers in marine applications, including radar systems, navigation systems, conning systems, and communication systems between marine facilities.

Embedded Computing for Integrated Marine Solutions

Bridge

For all ships, general operations, as well as the management and monitoring of conning systems, radar systems, and navigation systems, are all handled from the bridge.

Conning systems gather multiple processing parameters from other marine equipment, receive information from the network, indicate temperature and pressure, and monitor the status of various facilities. Moxa's MC-5150 computers have an advanced fanless design, and use the Intel i5 CPU, making them a perfect choice for the heavy loading experienced by conning systems.

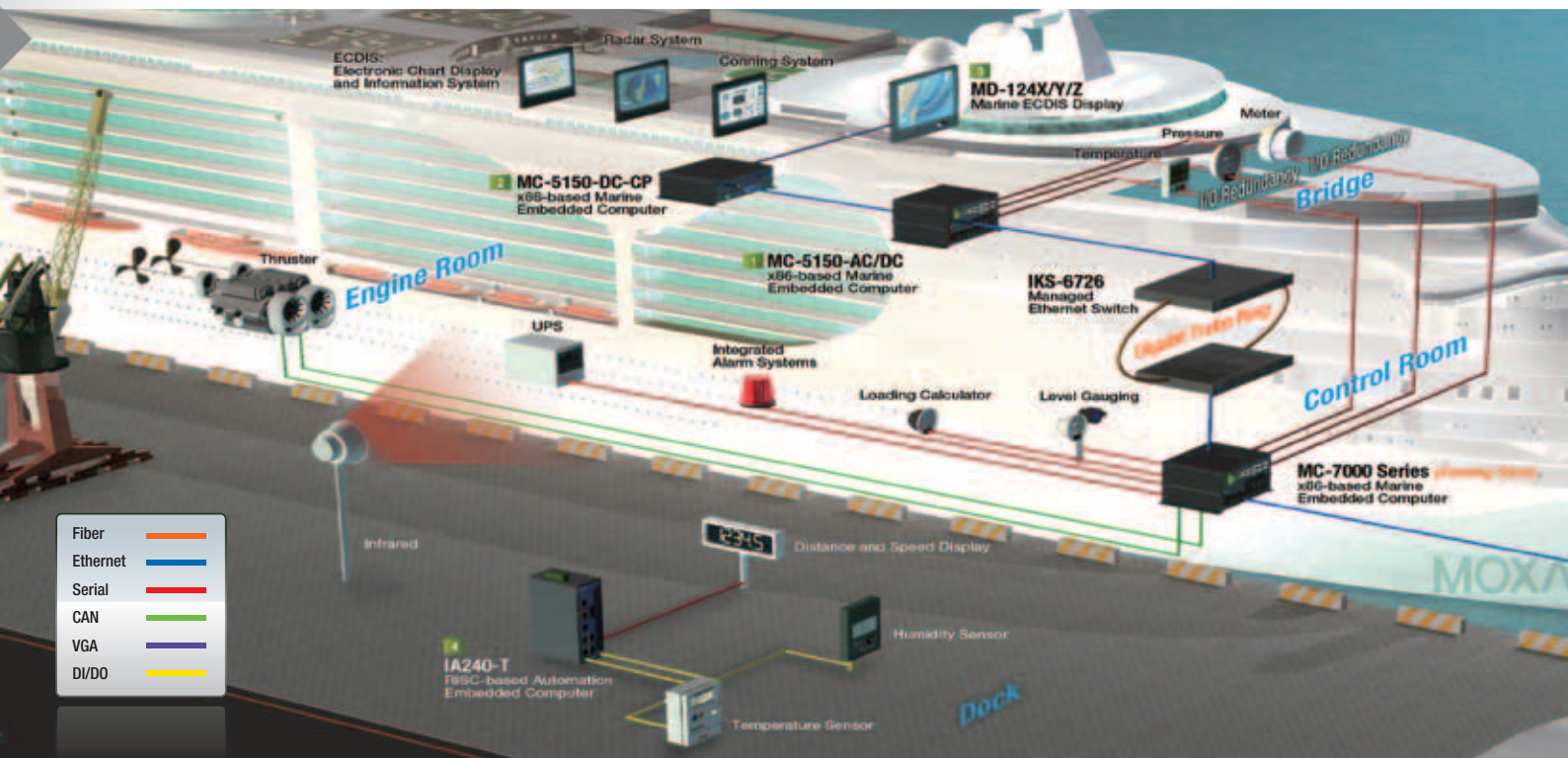
Radar systems must be able to work reliably even when bombarded by internal and external noise, which could combine with and corrupt the true signal. The ability of a radar system to overcome signal interruptions is measured by the SNR (signal-to-noise ratio). Moxa's marine computers follow marine regulations IEC-60945, DNV, and IACS-E10, and also adhere to global CE and FCC EMI regulations.

Navigation systems typically use different colors to represent different types of information, making accurate color calibration essential. In fact, viewers must be able to see the intended color even when the panel is affected by bright lights, light reflections, or low light conditions. Moxa's ECDIS-compliant computers are up to the task, and can be relied on to show the intended colors.

Control Room and Open Deck

An embedded CANbus computer is used in the control room to control thrusters, which are essential to ship navigation, and serial ports are used to connect a loading calculator, level gauge for measuring fluid levels, UPS (uninterrupted power supply) for battery backup, and an integrated alarm system for emergencies.

To help ensure that cargo is loaded and unloaded efficiently and accurately on a ship's open deck, a computer with a CANbus interface is used to connect and control on-board deck cranes. The MC-7000 series x86-based computers provide marine applications with fast and stable performance, and can be used in both the control room and on the open deck. The MC-7000's CANbus connection and multiple serial ports provide fast I/O communication, and support a variety of configurations.



Application	Recommended Products
General Purpose	<ul style="list-style-type: none"> ● MC-5157 (coming soon) ● MC-4510-C23 ● MC-5150-DC-CP ● IA240/IA241 ● UC-7112/UC-7110
IBS ECDIS (Advanced)	<ul style="list-style-type: none"> ● MD-124 (coming soon) ● MC-5157 (coming soon) ● MC-5150-AC/DC (i5/i7) ● MPC-122-K
IBS ECDIS (Entry-level)	<ul style="list-style-type: none"> ● MC-5157 (coming soon) ● MC-5150-AC/DC (Celeron/i3)
Control Room	<ul style="list-style-type: none"> ● MC-5150-DC-CP ● MC-4510-C23

■ Dock

A real-time, efficient berthing and warning system is essential for protecting both vessels and landing docks. The real-time BAS (berthing aid system) continuously detects the position of vessels and uses embedded computers to process data and deliver vessel position information to large displays on the dock and in the control center simultaneously. In addition, operators can send pre-warning signals through the system to enhance safety protection. Because of the harsh environmental conditions on the dock, a rugged, wide temperature embedded system is required, in addition to a DI/DO interface for connecting humidity and temperature sensors.

Moxa's RISC based IA240-T embedded computer is perfect for dock solutions that require wide temperature support (-40 to 75°C), dual LANS, 4+4 DI/DO, and 4 serial ports provide



Key Products

1

MC-5150-AC/DC X86-based Intel® Core i5 processor marine computer



- 12 NMEA ports
- 2 Gigabit Ethernet ports
- Dual Independent displays (DVI-I + VGA)
- 2 RS-232/422/485 serial ports
- 2 RS-232 ports
- 6 USB 2.0 hosts
- 1 external storage slot with 60 GB SSD pre-installed

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2

MC-5150-DC-CP X86-based Intel® Core i5 processor marine computers



- 2 Gigabit Ethernet ports
- Dual independent displays (DVI-I + VGA)
- 2 RS-232/422/485 serial ports
- 2 RS-232 ports
- 6 USB 2.0 hosts
- 1 external storage slot with 60 GB SSD pre-installed

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3

MD-124X/Y/Z 24" wide viewing angle panel



- LED backlighting
- 16:9 aspect ratio (1920 x 1080)
- ECDIS color calibration (by request)
- Optical bonding (Y model)
- Touch panel (Z model)
- IP66 (console mounted)
- Multiple power supplies (AC and DC)

Page 4-2

MPC-122-K FirstMate™ Series X86 marine panel computers with Intel Core 2 Duo 2.26 GHz



- 22" viewable image size with 16:10 aspect ratio and 1680 x 1050 pixel resolution
- Full range dimming, optical bonding (optional), and wide view angle (178/178)
- ECDIS color calibration (by request)
- IP67 (console mounted)
- Dual independent displays (DVI-D + VGA)
- 2 Gbps Ethernet ports, 2 RS-232/422/485 isolated serial ports, 7 USB 2.0 ports

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4

IA240-T RISC-based industrial computer with MOXA ART 32-bit ARM 9 industrial processor



- Ready to run linux Kernel 2.6 platform
- Redundant 10/100 Mbps Ethernet
- PCMCIA slot for wireless expansion (802.11b/g, GPRS/UMTS/HSDPA)
- 4 RS-232/422/485 serial ports
- 4-ch DI/DO (TTL signal)
- Wide temperature (-40 to 75°C)

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Smart Substation



IEC 61850-3 Certified and IEEE 1588 v2 Solutions in Smart Substations

Overview

Exceeds Substation Standards

Moxa offers IEC 61850-certified industrial Ethernet switches and industrial computers that meet the requirements of various substation segments, including generation, transmission, and distribution. The substation computers are IEC 61850-3 certified and EMC Level 4 approved for reliable and stable operations in IEC 61850 standards-compliant substation applications.

Value-Added Software and Service

IEEE 1588 v2 is a precision time synchronization technology that enables synchronization accuracy to the nanosecond level. For reliable and precise time synchronization over the substation Ethernet network, the Moxa IEEE 1588 v2 compliant computers support precision time protocol and clock synchronization to provide highly precise time accuracy required by event loggers in power substation systems. Moxa's innovative IEEE 1588v2 technology delivers time synchronization that's precise to the nanosecond level. This is especially useful in substation systems, which need consistent time stamps on their event logs for later analysis.

Comprehensive Solution

Whether your application is extra-high voltage, high voltage, or medium voltage, Moxa's portfolio includes a computer that will deliver stable and reliable operations. Moxa's products also meet the different requirements at each substation level—both front-end data acquisition and back-end data analysis are easily processed and managed. With different models for substation system applications, Moxa's substation portfolio includes a flexible selection of both RISC-based and x86-based systems with a variety of interfaces for reliable industrial network communications. A wide selection of expansion modules is also available so you can easily customize and expand your computers to create the most cost-effective solution.

In Depth

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). In addition, the IEC-61850-3 standard is also a must for the computers and devices within a substation that can withstand the EMC Level 4 requirements, providing a reliable operation for the substation automation system. Moreover, the IEEE 1588 v2 Precision Time Protocol (PTP) is also critical for a substation that requires precise event loggers that operate at the nanosecond level.

Moxa provides a suite of networking and computing solutions for constructing smart substations.

Three Growth Engines in the Substation Sector



Moxa Breakthrough Technology

IEC 61850-3 and IEEE 1613 Standards

Substation LANs and serial port requirements place heavy demands on the physical and functional reliability of all of the hardware used in the system. 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 computers are IEC 61850-3 and IEEE 1613 certified, guaranteeing that our products are protected against a variety of environmental factors.

The IEC 61850-3 standard specifies general requirements for the hardware design of IEC 61850 devices used in substations. IEC 61850-3 embedded computers must meet the following requirements:

- Strong EMC Level 4 design to protect against EMI
- -40 to 75°C operating temperature range
- Anti-vibration and anti-shock

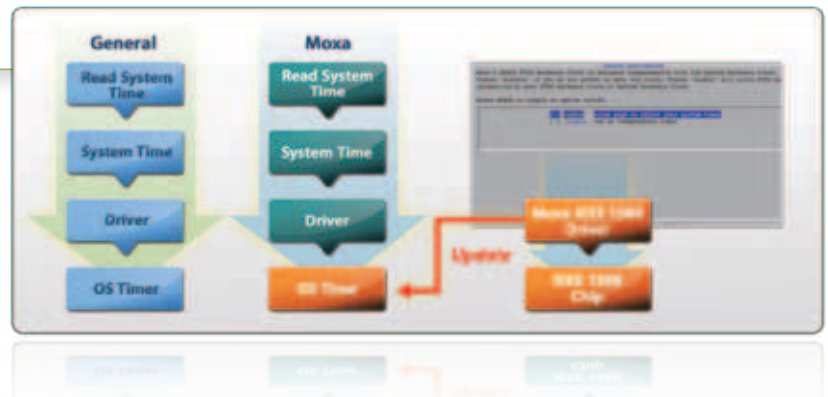
EMC Level 4 and EMS Level 4 Certifications

One of the main requirements for embedded computers deployed in an intelligent substation is a strong EMC design for electromagnetic interference protection. For example, if the computer is subjected to a 4 KV electromagnetic current, the voltage is stepped down to 75 V, and then the current is limited to isolate both the high voltage and current. Next, the voltage is stepped down a second time to 12 V. A solid EMC design, such as the design of Moxa's computers, provides devices with full protection from electromagnetic interference.



IEEE 1588 v2 Precision Time Protocol

The IEEE 1588 v2 Precision Time Protocol (PTP) is designed specifically for industrial network measurement and control systems. In a network based on IEEE 1588 v2, the grandmaster clock determines the reference time for the entire substation automation system. The Ethernet switch acts as the boundary or transparent clock, and additional devices (such as merging units, IEDs, and protection devices), and the embedded computers are designated ordinary clocks. All of these devices are organized into a master-slave synchronization hierarchy with the grandmaster clock at the top.



An Ethernet switch that supports IEEE 1588v2 can guarantee time-stamping accuracy to within 1 μ s, and be configured for master, boundary, or transparent clock functionality. To achieve true precision time, the rest of the network needs to support IEEE 1588v2 as well. In an industrial computing network, IEEE 1588v2-compliant computers play the role of the ordinary clock that receives synchronized time data from the Ethernet switch. Moxa's IEEE 1588 v2 compliant computers make it easy to add IEEE 1588 v2 time synchronization. Once Moxa's IEEE 1588 v2 driver is activated, it can automatically update the OS time and the chipset of the computer.

Smart Substation Solutions

IEC 61850-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 subject 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).

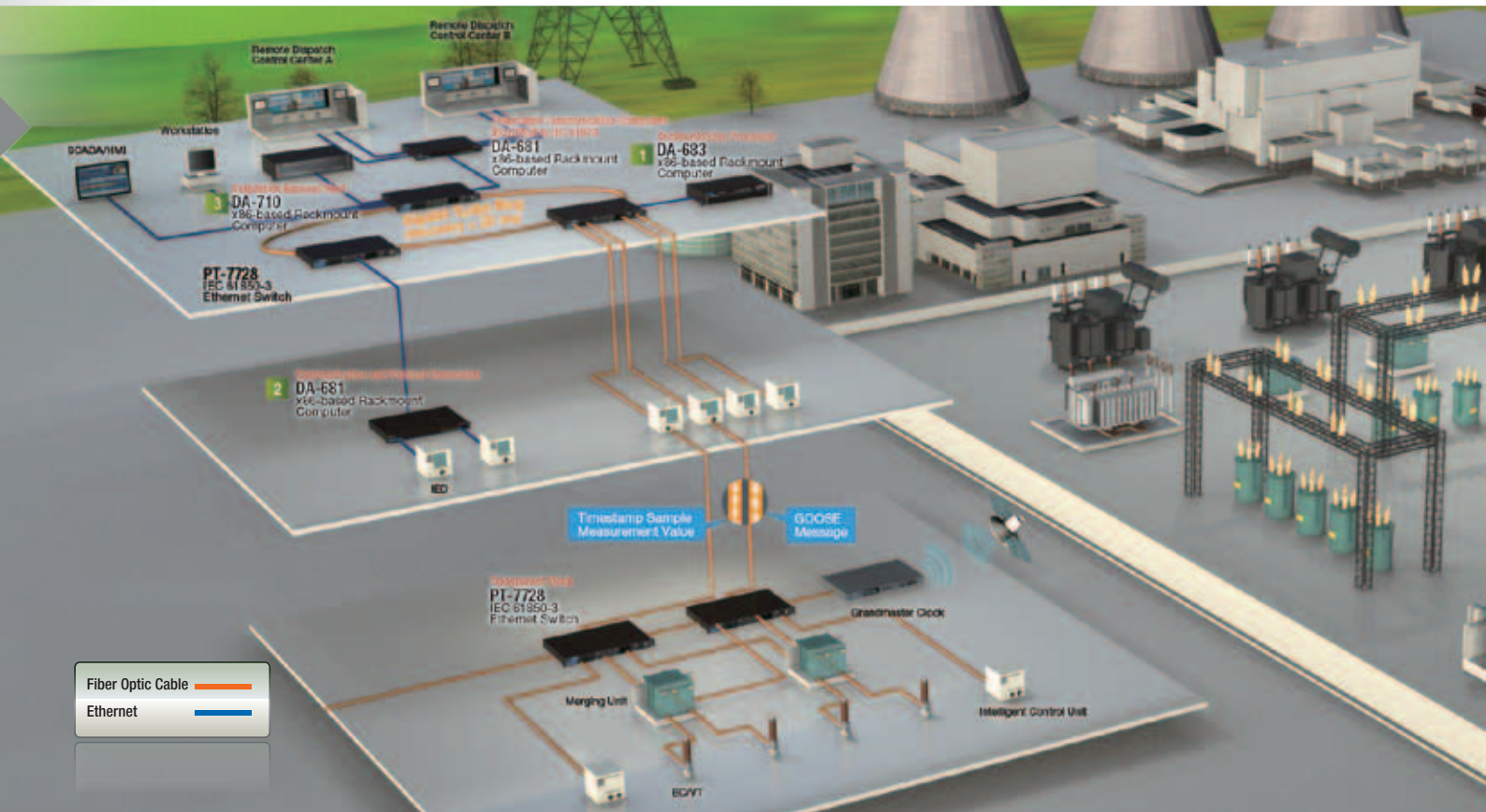
Strengths of Moxa's Industrial Networking and Computing Solutions

Enables 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.

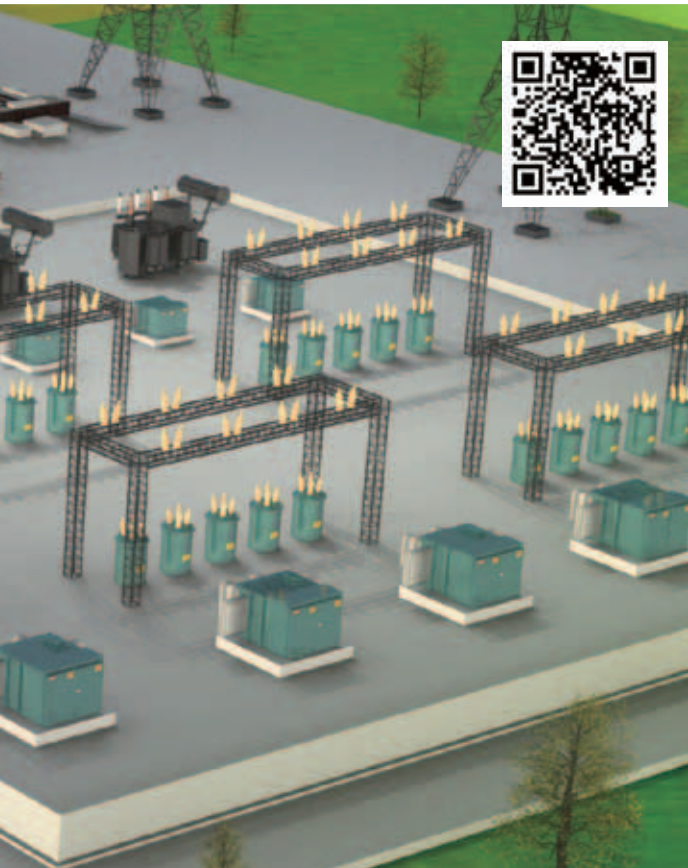


Vertical Market Solutions

Application	Recommended Products
Protocol Conversion	<ul style="list-style-type: none"> DA-660
Protection Management Computer	<ul style="list-style-type: none"> DA-681 DA-682 DA-685 (Coming Soon)
Front-end Communication Computer	<ul style="list-style-type: none"> DA-681 DA-682 DA-685 (Coming Soon)
Backend Host	<ul style="list-style-type: none"> DA-683 DA-685 (Coming Soon) DA-710
Tele-control Computer	<ul style="list-style-type: none"> DA-681 DA-683 DA-685 (Coming Soon) DA-710

Confirmed Expertise and Trusted Partnership

- Over 300 successful substation deployments of IEC 61850 Ethernet switches and industrial embedded computers
- Moxa substation products are successfully integrated into different level power substations



Key Products

1

DA-683 Series x86-based rackmount fanless computer



- IEC 61850-3 and IEEE 1613 certified (DPP-T models only)
- IEEE 1588v2 supported
- 2 PCI expansion slots for inserting expansion modules

IEC 61850-3 | IEEE 1588 v2

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2

DA-681 Series x86-based rackmount fanless computer



- 1 CompactFlash socket, 1 IDE, and serial ATA-150 connectors for storage expansion
- 4 RS-232 and 8 RS-485 ports with 2 KV isolation protection
- Dual 100/240 VAC/VDC power inputs

IEC 61850-3

Page 2-9

3

DA-710 Series x86-based Intel Core 2 Duo rackmount computers



- 4 PCI slots for expansion modules
- 4 Gigabit Ethernet ports for network redundancy
- Dual 100/240 VAC/VDC wide range power input provided

Page 2-5

DA-682 Series x86-based rackmount fanless computer



- PCI expansion slots for inserting expansion modules
- Quad Gigabit Ethernet ports for network redundancy
- 100/240 VAC/VDC power inputs

Page 2-13

DA-660 Series RISC-based rackmount computers



- 8 or 16 RS-232/422/485 serial ports
- Standard 19-inch rackmount installation, 1U height
- AC/DC power inputs ranging from 100 to 240 V

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Solar Power



Integrated and Industry-proven Solar Energy Solutions

Overview

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.

An intelligent solar power system has the following features:

- Low power consumption and compact form factor for easy installation
- Versatile communication interfaces for various device connections
- Real-time intelligent software management for remote device monitoring

For current solar power systems, users find it hard to use a single unit to construct a complete architecture, and instead usually combine a computer with an I/O module to connect solar units, such as inverters, sensors, and alarms. This type of solution can be costly and takes more effort for system maintenance. Another critical issue is management, since the units could be located at different remote field sites. How to control and manage these remote devices has become a critical challenge, and providing an easy-to-use and programmable platform for users to easily develop related programs is a necessary and useful element for an ideal solar architecture.

In Depth

Solar energy is often regarded as the most efficient renewable energy source for generating electricity. However, constructing a solar energy system requires the sophisticated integration of a variety of systems. Currently, the Renewable and Distributed Systems Integration Program (RDSI) is helping alleviate congestion, reduce greenhouse gas emissions, and improve reliability in specific areas, such as microgrid technologies, distributed generation systems, bi-directional communications, and demand response programs. It is estimated that by 2015 the RDSI program can help reduce peak load on distribution feeders by 20%.

You should be aware of the following important requirements before constructing a solar power system:

- There is a great demand for easy-to-use and ready-to-run platforms
- A variety of interfaces to connect various devices
- Intelligent online management for remote inverters
- DIN-Rail installation and compact form factor are highly recommended
- Programmable computing platform with integrated communication I/Os
- Built-in Modbus TCP library to streamline time-consuming tasks

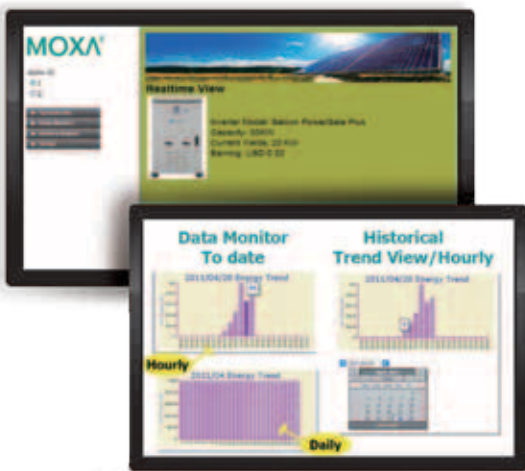
Moxa Breakthrough Technology

▪ Solar Power Inverter Web Enabler Gets Your Inverter Online

Using the Moxa web enabler for solar inverters to connect to a network reduces the time needed to set up a system, and helps streamline online real-time device management. This is particularly helpful when users want to centralize inverter management and real-time monitoring for data analysis, event logging, and fault recording.

New Concept for Getting Inverters Online

- Gives you the ability to view and monitor your PV inverters
- PV system performance can be accessed from a web browser and downloaded from anywhere in the world



Solution Features

Monitoring

- The web enabler can periodically query the inverter energy values of different makes of inverter
- The web enabler is able to support extended storage of energy values by overwriting the oldest values

Visibility

- PV inverter values, including energy yield by day, month, year, money saved, and historic energy trend can be accessed in one of three ways:
- Option 1: Use SCADA tools to read values in real-time
- Option 2: From web pages provided by a service company
- Option 3: From web pages via a browser

More

- Up to 10 users can access the web enabler simultaneously
- Use account and password management to control who has access
- The web enabler supports products with customized hardware and software, regardless of the scale of customization

▪ Variety of Interfaces

Moxa's industrial embedded computers come with a variety of communication interfaces, such as serial ports, digital input/output channels, and AI/thermocouple channel. This is particularly helpful for connecting the various devices used in the solar power industry. In addition, both WiFi and cellular solutions are available for field site installation.



▪ Compact, DIN-Rail Mounting Form Factor for Easy Installation

Moxa's industrial embedded computers have a compact form factor and rugged DIN-Rail design, making them easy to install in small cabinets and a cost-effective solution ideal for solar power applications. One of the biggest advantages is that the computers can be easily installed at field sites where space is limited, and Moxa has made its mark in the embedded computer market by providing compact computers that are also powerful.



Solar Power Solutions

A Complete Solar Power 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, solar power has been recognized as a viable energy alternative. Moxa's products have been used in a number of solar energy applications around the world. Some typical solar energy applications, including commercial roof top, solar transportation grids, and solar tracking systems, are illustrated below.

Strengths of Moxa's Industrial Networking and Computing Solutions

Get Your Inverter Online

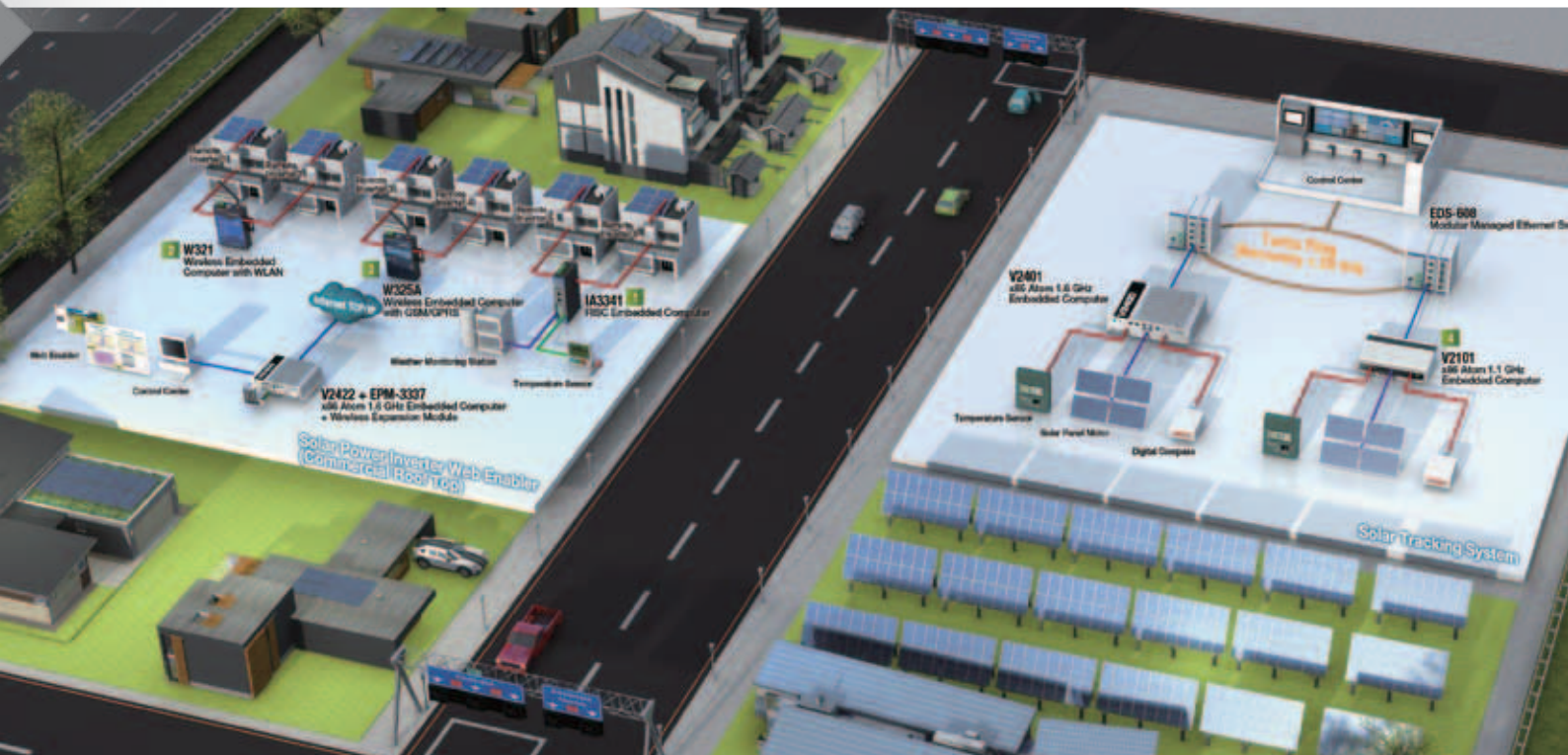
Although inverters are a key component of solar power applications, monitoring and maintaining inverters can pose quite a challenge to users. The modern solution for monitoring and maintaining solar power inverters is to connect the inverters to a network, and Moxa offers several embedded computers that make this task easy. Since Moxa's computers support FTP clients, web servers, data logging, and Modbus protocol communication, users can easily monitor their field site inverters over the network. This is done with real-time queries using a Modbus TCP protocol to get a batch push from the FTP client and acquire the data from a web server.

Key Requirements

- Versatile communication interfaces
- Comprehensive I/O connectivity
- Rugged hardware design for outdoor implementation
- Smart Software for remote communication

Variety of Interface for Connecting Different Devices

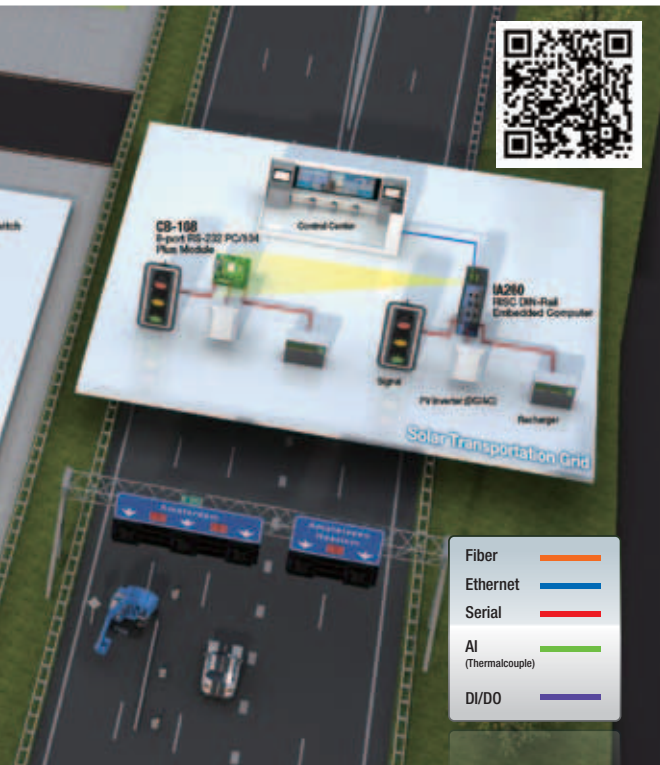
Moxa's x86-based embedded computers are extremely stable and reliable and can be used as high performance solar tracking systems for mapping and tracking the Sun. For example, IA3341 embedded computers come with different interfaces, including serial ports, Ethernet ports, digital input/output channels, and even analog input channels and two thermocouple channels. These features make the IA3341 the perfect computer-plus-I/O combination for solar and environmental monitoring applications.



Application	Recommended Products
Gateway	<ul style="list-style-type: none"> ● UC-7110/UC-7112/UC-7112 Plus ● IA3341 ● W311/W321/W341 ● W315A/W325A ● W406
Data Logger	<ul style="list-style-type: none"> ● UC-8410 ● V2101
Controller	<ul style="list-style-type: none"> ● V2422 + EPM-3337 ● DA-660/DA-661/DA-662 ● DA-681

Tiny Yet Mighty Computers Well Suited for Solar Applications

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 option. These tiny yet mighty computers are designed for solar power solutions that require a tiny form factor with high performance.



Key Products

1

IA3341 RISC-based embedded computer



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

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2

W321 RISC-based embedded Linux computer with WLAN



- 802.11a/b/g WLAN with repeater function
- 2 software-selectable RS-232/422/485 serial ports
- 10/100 Mbps Ethernet for network redundancy
- WEP, WPA, and WPA2 encryption

Page 8-9

3

W325A RISC-based embedded computer with GSM/GPRS



- Built-in quad band GSM/GPRS 850/900/1800/1900 MHz
- 2 software-selectable RS-232/422/485 serial ports
- 10/100 Mbps Ethernet for network redundancy

Page 8-6

4

V2101 x86-based Atom 1.1 GHz embedded computer



- 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 5-2

UC-8410 RISC ready-to-run embedded computers with 8 serial ports, 3 LANs, USB, CompactFlash



- 8 RS-232/422/485 serial ports
- 4 digital input and 4 digital output channels
- 3 10/100 Mbps Ethernet ports
- Supports IPv6 function (Linux model only)
- DIN-Rail or wall mount installation

Page 5-18

▶ PAGE 2-16

Power Up With IEC 61850-3 and IEEE 1588 v2

- Powerful Intel Atom D510 CPU for complicated computing tasks
- Multiple interfaces for different industrial communications needs
- Ready-to-run Embedded Linux, or Windows Embedded platform



DA-683 Series

x86-based Rackmount Computers

- IEC 61850-3-certified for substation automation
- Modular design with great flexibility for system expansion
- IEEE 1588v2-compliant with reliable Precision Time System (PTS)
- Wide range power input
- Multiple storage sockets for storage expansion



Product Family



DA-681

1U Rackmount Power Computer

- IEC 61850-3 certified for substation automation
- 1U, 19-inch rackmount installation
- Dual power input models available

DA-682

2U Rackmount Power Computer

- 2 PCI expansion slots for system expansion
- 2U, 19-inch rackmount installation
- Wide range power input

DA-710

4U Rackmount Power Computer

- 4 PCI expansion slots for system expansion
- 4U, 19-inch rackmount installation
- Multiple sockets for storage expansions

▶ PAGE 2-9

▶ PAGE 2-13

▶ PAGE 2-5

▶ PAGE 6-11

Go Solar with Smart Ideas

- Multiple interfaces for different communications needs
- Supports Modbus TCP library to retrieve analog input and thermocouple data
- Ready-to-run Linux platform for easy development



IA3341

RISC-based Industrial Embedded Computer

- Programmable computing platform with integrated communication I/Os
- Built-in Modbus TCP Library to streamline time-consuming tasks
- Multiple I/O design for easy and quick system establishment
- Rugged design with longer MTBF



Application



▶ PAGE 6-11

ECDIS Computers Tailor-made for Marine Application

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



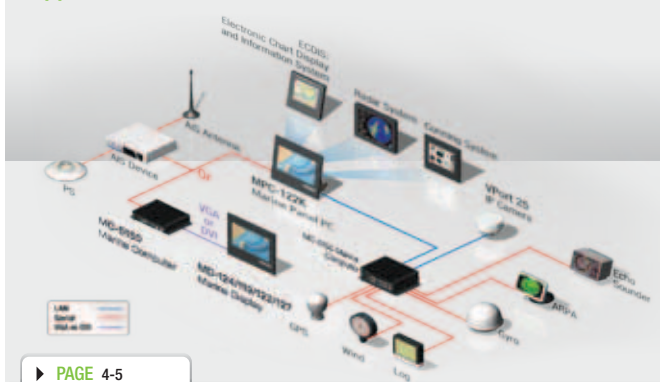
MC-5150 Series

x86-based Marine Computers

- High performance Intel® Core™ i5 520E processor, 3 MB L2 cache
- Dual independent displays (DVI-I + VGA)
- 12 NMEA ports (AC/DC models only)
- SATA storage slot for SSD
- 24 VDC or 100 to 240 VAC power input models available



Application



Set Sail with ECDIS Color Calibration

- Marine-grade design for reliable operation
- Multiple display outputs
- Wide viewable image size



MD-124/MPC-122K

MD-124 Marine Display

- 24-inch wide viewable image size
- IP66-rated front panel
- AC and DC power input models available

MPC-122-K Marine Panel Computers

- 22-inch wide viewable image size
- ECDIS-compliant models available
- IP67-rated enclosure for water and dust proof



Technology

ECDIS



IP67-rated



Optical Bonding



LED Backlighting



▶ PAGE 3-12

EN 50155-certified Computers for Reliable Railway Application

- High performance network video recorder for rolling stock applications
- EN 50155 certified for temperature ranges up to Class T1
- Supports RAID 1/0 functions for data reliability



V2616 Series

x86-based Railway Computers

- EN 50155 certified for railway applications
- IEC 61373 certified for shock and vibration resistance
- Two removable storage trays for 2.5" SSDs or HDDs
- Supports RAID 1/0 functions for data reliability



Product Family



V2416

x86-based Railway Computer

- 2 removable, hot swappable trays for storage expansion

- Anti-vibration/shock design for stable and reliable operation
- Multiple interface connections

EPM-3032/3112/3337/3438/3552/DK01/DK02

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
- 2-slot mini PCIe expansion module

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▶ PAGE 3-4

Find Your Perfect Wireless Mobile Computer

- Moxa Intelligent Routing Framework for optimal wireless communication
- Multiple WAN support and backup
- Intelligent policy settings for "auto best" WAN selection



UC-8481 Series

RISC-based Wireless Mobile Computers

- Wireless and GPS modules for multiple communications
- CompactFlash socket for storage expansion
- Ready-to-run Embedded Linux
- -40 to 70°C wide temperature model available
- Support Moxa Intelligent Routing Framework for seamless wireless communication

Application



▶ PAGE 3-4

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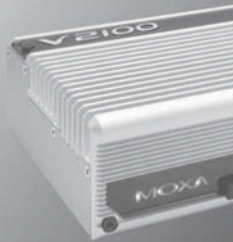
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1

Introduction



Rugged Computers

1

Introduction > Rugged Computers



Industrial Grade Rugged Design

- ▶ Suitable for harsh environments
- ▶ Industrial-proven certifications
- ▶ Quality control

Harsh Environments

Fanless Design for Wide Operating Temperatures

Creating a fanless design presents many challenges for developers of wide temperature products. Not only do the components need to meet wide temperature requirements, but the hardware layout design that integrates all peripheral computers must fulfill wide temperature demands as well.

One of the major challenges faced by IPC manufacturers is to provide a fanless computer that meets industrial standards and works well in wide temperatures and harsh environments. Moxa's design philosophy

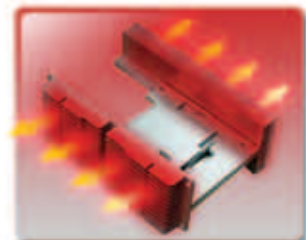
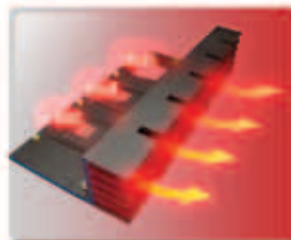
emphasizes compact and elegant architectures that do not use fans. A fanless design reduces size, complexity, susceptibility to dust, and wear and tear. Instead of taking shortcuts by using problematic components, Moxa selects components that generate less heat but can still maintain high system performance. The result is a more stable, reliable, and cost effective system that dramatically reduces total cost of ownership.

Moxa's Industrial-grade Design	Conventional Design
-40 to 75°C <i>operating temp.</i>	-10 to 60°C or -40 to 75°C <i>storage temp.</i>
40-hour uninterrupted burn-in	N/A
Rigorous chamber testing: Forced-convection and natural-convection thermal chambers simulate real-world conditions	Standard chamber testing: Forced-convection thermal chamber
BIOS Dynamic Throttling Technology	N/A

VS

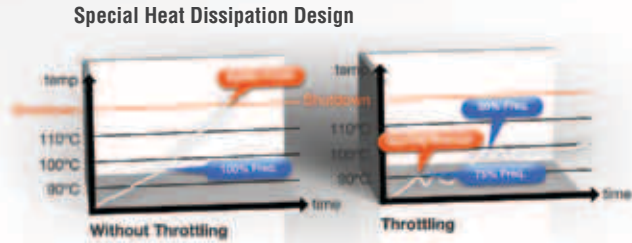
Patented Heat Dissipation Design

Traditional externally-attached heat sinks can only go so far. For even more robust heat dissipation, Moxa has patented an innovative "L and H-type" heat sink that makes direct contact with the major inner heat sources to cool down a device's internal temperature.



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.



Rigorous Thermal Performance Testing

Design is only half of the thermal picture: the device ultimately must also be tested in order to verify its performance. However, not all tests are equal: test parameters and conditions directly effect how accurately the test simulates real world conditions. There are two types of test chambers used by industrial computing providers:

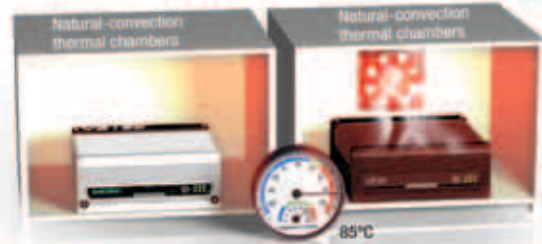
Forced Convection Chamber (FCC)

This type of chamber, which uses slow airflow to heat the chamber, produces less reliable results since it poorly simulates the actual environmental conditions of industrial applications.

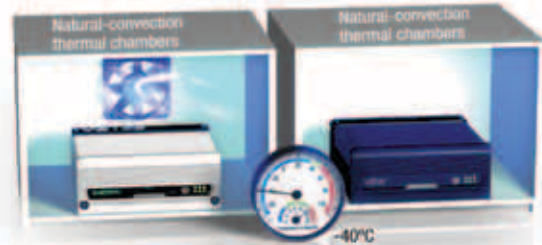
Natural Convection Chamber (NCC)

This type of chamber, which simulates a windless environment, more closely resembles actual industrial application settings. Results from these tests are more reliable because the static airflow is a closer simulation of real-life industrial environments.

At High Temperatures Rigorous Chamber Testing



At Low Temperatures Rigorous Chamber Testing



Anti-vibration and Anti-shock

Protecting and safeguarding data is vital for all storage devices, particularly those deployed in harsh environments such as moving vehicles where vibration and shock are frequent and unpredictable.

Safeguarding a data acquisition system's storage devices, such as CFs, SDs, and Flash memories, from the effects of excessive motion and detachment is extremely important. Many of Moxa's industrial-grade systems are backed by 5G anti-vibration and 50G anti-shock guarantees, making them ideal for rolling stock and other mobile applications.

It is important to realize that there can be a big difference between the protection provided by products from different companies. With Moxa's unique and innovative bracket design, and our knowledge of which materials to select, we are able to provide a range of anti-vibration and anti-shock grades to ensure compliance with maritime testing standards. Our anti-vibration and anti-shock technology reduces data loss to a minimum and provides a safe and sound storage environment for deployment in transportation vehicles and other highly mobile applications.

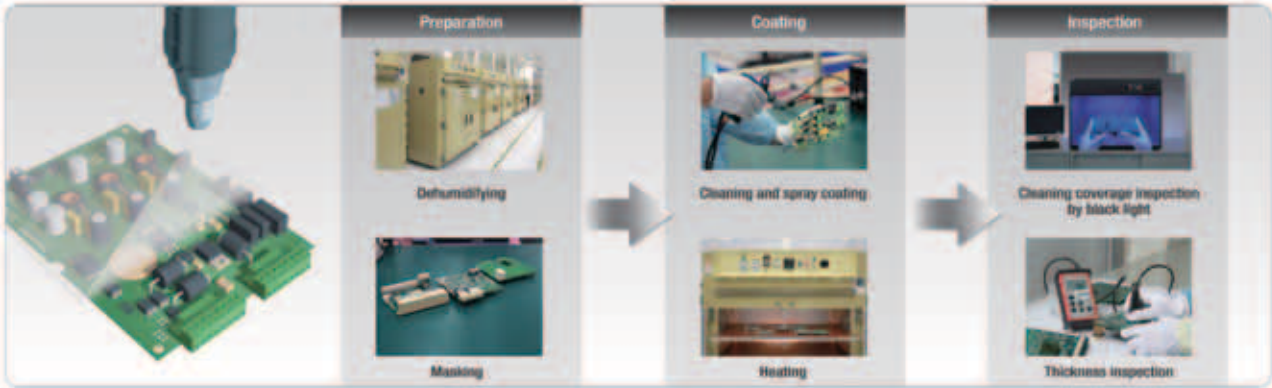


Conformal Coating

Protective conformal coating on PCBs and other electronic circuitry isolates components from the effects of moisture, dust, corrosion, vibration, and shock, all of which are present in harsh maritime environments. Moxa's conformal coating method ensures a reliable and rugged system by reducing the effects of mechanical stress and vibration on the circuitry, and also improves the circuitry's ability to resist extreme temperatures, vibration, and chemical vapors.

Reasons to Choose Moxa for Conformal Coating

- Our products use Dow Corning 1-2577 silicon resin coating, which forms a firm, abrasion-resistant surface after curing
- All products with conformal coating are tested and inspected in accordance with the strict IPC-A-610D 10.5.2.2 Class 1/2/3 standard under black light
- Conforms to IPC-CC-830 SR type thickness requirements (50 to 210 μm)
- Additional full-function testing and quality assurance prior to shipment



Industrial-proven Certification

IEC 60945/61174/61162 and DNV, IACS-E10 Type Approvals

IEC 60945/61174/61162 and DNV, IACS-E10 type approvals attest that Moxa's marine computers operate reliably in marine applications, and help create a solid computing infrastructure for various navigation, radar, and conning tasks. Marine computers are also used in the control room to process applications such as the positioning system and automation control system.

The ECDIS (Electronic Chart Display & Information System) delivers precise positioning information and intuitive route and navigation planning functions to improve the safety and efficiency of seagoing vessels. Moxa's ECDIS compliant computers help mariners handle a variety of navigation-related tasks, and ECDIS digital charts, displays, and data make marine navigation easy and reliable.



IEC 61850-3/IEEE 1613 Certified and IEEE 1588 Compliant

The IEC 61850-3 and IEEE 1613 standards define the strictest requirements for EMI immunity and error free communications for equipment used in substations. Due to the nature of substation environments, it is imperative that all hardware used in the system be highly functional and reliable. Embedded computers must perform consistently, for both front-end computing and backbone hosting. As a

leading manufacturer of industrial-grade embedded computers, Moxa has a vast selection of IEC 61850-3 certified computers and products.

IEEE 1588 v2 compliant precision time protocol and clock synchronization ensure precise time accuracy for event loggers in power substation systems.



EN 50155 and e Mark Certified

The EN 50155 standard governs the operation, design, construction, and testing of electronic equipment used on rail vehicles and in railway applications. Moxa's railway computers are EN 50155 certified and undergo environmental testing to ensure reliable performance under a variety of power supply conditions, such as voltage variations, power interruption, and supply changeover. The computers can also withstand environmental disturbances, including vibration, shock, and extreme temperature.

A product that displays the e-mark ensures that automobile and motorcycle products sold by manufacturers and operated by users conform to basic safety and environmental standards. Moxa's e Mark certified products covered by regulatory controls are tested and certified which are ideal for vehicular applications.



Quality Control

Longer MTBF and low RMA rate

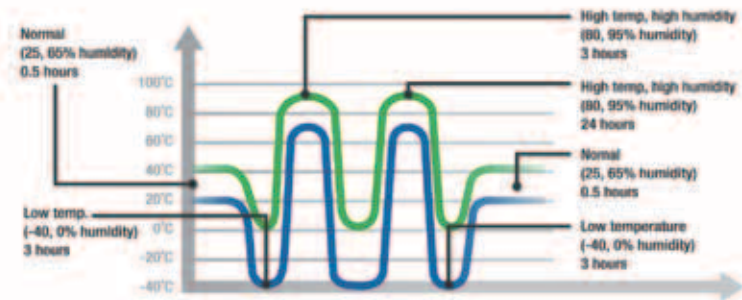
Moxa's embedded computers undergo a 40-hour burn-in chamber test and offer a longer MTBF. This translates to fewer parts to replace and lower overall cost for industrial systems. In addition, the low RMA rate (under 1.5%) guarantees that the applications can operate with low maintenance effort.

3 or 5-year warranty

Moxa's embedded computers are backed by a solid 3 or 5-year warranty, which is longer than other IPC providers who only offer a 2-year warranty. The longer warranties reflect our confidence in the reliability of our products, even when used for demanding industrial applications.

MTBF of Embedded Products

Product Name	UC-7112 Series	W406 Series	IA260 Series	V2406 Series	MC-5150 Series
Platform	RISC	RISC	RISC	x86	x86
Operating Temp.	0 to 60°C	0 to 60°C	-40 to 75°C	-40 to 70°C	-15 to 55°C
Failure Rate	6.717319	5.878760	6.880077	3.62	4.54
MTBF (hrs)	148990 (13.9 years)	170162 (19.4 years)	145326 (16.6 years)	278294 (31.5 years)	220490 (25.1 years)



Moxa (industrial-grade)	Other Brands (conventional)
Fan and cable-free	Fans and cables often used
5-year warranty (RISC) 3-year warranty (x86)	2-year warranty (extended warranty costs extra)
RMA Rate: under 1.5%	RMA Rate: over 2%
Longer MTBF: x86 wide temp. > 8 years RISC wide temp. > 13 years	Longer MTBF: N/A
Special Certifications: DNV, IEC 61850-30, EN 50155, e/E Mark	Special Certifications: N/A

Substation Computers



	DA-685	DA-710-XPE DA-710-LX	DA-681-I-SP-XPE DA-681-I-SP-LX	DA-681-I-DP-XPE DA-681-I-DP-LX	DA-681-I-DPP-T- XPE DA-681-I-DPP-T- LX	DA-682-XPE DA-682-LX	DA-683-SP-XPE DA-683-SP-LX	DA-683-DPP-T- XPE DA-683-DPP-T-LX	
Computer									
CPU Speed	1.66 GHz	2 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1.66 GHz	1.66 GHz	
OS (pre-installed)	–	WinXP Emb. or Linux	WinXP Emb. or Linux	WinXP Emb. or Linux	WinXP Emb. or Linux	WinXP Emb. or Linux	WinXP Emb. or Linux	WinXP Emb. or Linux	
DRAM	–	–	–	–	–	–	–	–	
FSB	667 MHz	533 MHz	400 MHz	400 MHz	400 MHz	400 MHz	667 MHz	667 MHz	
Flash	–	–	–	–	–	–	–	–	
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.)	1 GB (2 GB max.)	1 GB (2 GB max.)	
PCMCIA	–	–	–	–	–	–	–	–	
Expansion Bus	–	4 slots	–	–	–	2 slots	2 slots	2 slots	
USB Ports	2 (USB 2.0)	4 (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	–	–	–	–	4 Dis, 4 DOs	4 Dis, 4 DOs	
Storage									
Built-in	2 GB (DOM)	2 GB	2 GB	2 GB	2 GB	1 GB	2 GB (DOM)	2 GB (DOM)	
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓	✓	
HDD Support	✓	✓	✓	✓	✓	✓	✓	✓	
Other Peripherals									
KB/MS	✓	✓	✓	✓	✓	✓	✓	✓	
Display									
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	✓	
LAN Interface									
10/100 Mbps Ethernet Ports	–	–	6	6	6	–	–	–	
10/100/1000 Mbps Ethernet Ports	6	4	–	–	–	4	6	6	
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	2 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	–	2	2	
RS-485 Ports	6	–	8 (TB)	8 (TB)	8 (TB)	–	–	–	
RS-232/422/485 Ports	–	–	–	–	–	–	–	–	
ESD Protection	–	4 KV	15 KV	15 KV	15 KV	–	–	–	
Digital Isolation	–	–	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	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	–	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	
Baudrate	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	–	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	
LEDs									
System	Power, Storage, Power Failure	Power, Storage, Power Failure	Power, Storage, Power Failure	Power, Storage, Power Failure	Power, Storage, Power Failure	–	Power, Storage, Power Failure	Power, Storage, Power Failure	
LAN	100M, 1000M	100M, 1000M	10M, 100M	10M, 100M	10M, 100M	100M, 1000M	100M, 1000M	100M, 1000M	
Serial	TX, RX	TX, RX (for 4 modules), Programmable	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX	Tx, Rx	
Physical Characteristics									
Housing	SECC sheet metal (1 mm)						SECC sheet metal (1 mm)		SECC sheet metal (1 mm)
Weight	4 kg	14 kg	4.5 kg	4.5 kg	4.5 kg	7 kg	4 kg	4 kg	
Dimensions	315 x 440 x 90 mm	400 x 480 x 180 mm	440 x 315 x 45 mm			440 x 315 x 90 mm	440 x 315 x 90 mm		
Mounting	Standard 19-in rackmount	Standard 19-in rackmount	Standard 19-in rackmount	Standard 19-in rackmount	Standard 19-in rackmount	Standard 19-in rackmount	Standard 19-in rackmount	Standard 19-in rackmount	
Environmental Limits									
Operating Temperature	-10 to 60°C	-10 to 50°C	0 to 60°C	0 to 60°C	-40 to 75°C	-10 to 60°C	-10 to 60°C	-40 to 75°C	
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 75°C	-20 to 75°C	-40 to 85°C	-20 to 80°C	-20 to 80°C	-40 to 85°C	
Ambient Relative 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	5 to 95% RH	
Regulatory Approvals									
EMC	FCC, CE (Class A)	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, IEC 61850-3 (DPP-T models only)			EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A	CE (EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024), FCC (Part 15 Subpart B, CISPR 22 Class), CCC (GB9254, GB 17625.1), IEC 61850-3 (DPP-T models only)		
Safety	LVD, UL, cUL, CCC	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)			UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)	UL/cUL (UL 60950-1, CSA C22.2 No. 60950-1-03), LVD (EN 60950-1), CCC (GB4943)		
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	
Warranty	3 years (see www.moxa.com/warranty)								

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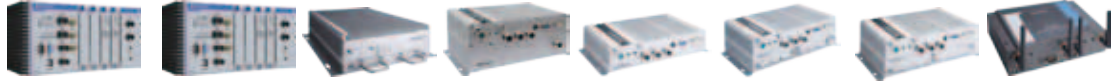
Introduction > Product Selection Guide

Substation 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	WinCE 5.0	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
FSB	-	-	-	-	-	-	-	-	-	-
Flash	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
System Memory	-	-	-	-	-	-	-	-	-	-
PCMCIA	-	-	-	-	✓	✓	✓	✓	✓	✓
Expansion Bus	-	-	-	-	-	-	-	-	-	-
USB Ports	-	-	-	-	2	2	2	2	2	2
Storage										
Built-in	-	-	-	-	-	-	-	-	-	-
CompactFlash Socket	-	-	-	-	✓	✓	✓	✓	✓	✓
HDD Support	-	-	-	-	-	-	-	-	-	-
Other Peripherals										
KB/MS	-	-	-	-	-	-	-	-	-	-
Display										
Graphics Controller	-	-	-	-	-	-	-	-	-	-
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
Digital Isolation	-	-	-	-	-	-	-	-	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; 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)									
Weight	2.6 kg	2.6 kg	2.6 kg	2.6 kg	2.6 kg	2.6 kg	2.6 kg	2.6 kg	2.94 kg	2.94 kg
Dimensions	440 x 45 x 198 mm								440 x 45 x 228 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	-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% 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	5 to 95% RH	5 to 95% RH	5 to 95% RH
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)									
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)									
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)									

Railway Computers



	TC-6110-24I-CT-XPE TC-6110-24I-CT-LX	TC-6110-24I-CT-T- XPE TC-6110-24I-CT-T-LX	V2616-XPE V2616-LX	V2406-24I-XPE, V2406-24I-T-XPE, V2406-24I-LX, V2406-24I-T-LX	V2406-XPE, V2406-T-XPE, V2406-LX, V2406-T-LX	V2416-XPE, V2416-T-XPE, V2416-LX, V2416-T-XPE	V2426-XPE V2426-LX	UC-8481-LX UC-8481-T-LX
Computer								
CPU Speed	1.8 GHz	1.8 GHz	2.26 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	533 MHz
OS (pre-installed)	WinXP Emb. or Linux	WinXP Emb. or Linux	WinXP Emb. or Linux	WinXP Emb. or Linux	WinXP Emb. or Linux	WinXP Emb. or Linux	Windows Embedded Standard 2009	Linux
FSB				533 MHz	533 MHz	533 MHz	533 MHz	512 MB
Flash	-	-	-	-	-	-	-	32 MB (OS); 512 MB (data)
System Memory	2 GB (4 GB max.)	2 GB (4 GB max.)	2 GB (4 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 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)	3 (USB 2.0)	2 (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	4 Dis, 4 Dos
Storage								
Built-in	4 GB (DOM)	4 GB (DOM)	2 GB (CF)	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	-
CompactFlash Socket	-	-	2 GB	✓	✓	✓	✓	✓
SD Slot	-	-	-	-	-	-	-	-
HDD Support	✓	✓	✓	✓	✓	✓	✓	-
Other Peripherals								
KB/MS	-	-	✓	✓	✓	✓	✓	-
Audio	✓	✓	✓	✓	✓	✓	✓	-
Display								
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	-
VGA Output	✓	✓	✓	✓	✓	✓	✓	-
DVI Output	-	-	✓	✓	✓	✓	✓	-
LVDS Output	-	-	-	-	-	-	-	-
LAN Interface								
10/100/1000 Mbps Ethernet Ports	2	2	2	2	2	2	2	8 (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 (DB9)	1 (DB9)	-	-	-	-	-	-
RS-485 Ports	-	-	-	-	-	-	-	-
RS-232/422/485 Ports	-	-	2 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)
ESD Protection	4 KV	4 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	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF
Baudrate	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps
LEDs								
System	Storage, Power	Storage, Power	Storage, Power	Storage, Power	Storage, Power	Storage, Power	Storage, Power	Storage, Power
LAN	10M, 1000M	100M, 1000M	100M, 1000M	10M, 100M	10M, 100M	100M, 1000M	10M, 100M	10M, 100M
Serial	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
Weight	5 kg	5 kg	5 kg	4 kg	2 kg	4 kg	4 kg	1.8 kg
Dimensions	287 x 250 x 101 mm	287 x 250 x 101 mm	287 x 250 x 101 mm	250 x 98 x 154 mm	250 x 57 x 154 mm	250 x 86 x 154	250 x 86 x 154	200 x 57 x 120
Mounting	Wallmount	Wallmount	Wallmount	Wallmount	Wallmount	Wallmount	Wallmount	Wallmount
Environmental Limits								
Operating Temperature	-25 to 55°C	-40 to 70°C	-25 to 55°C	-25 to 60°C or -40 to 70°C	-25 to 60°C or -40 to 70°C	-25 to 60°C or -40 to 70°C	-25 to 60°C or -40 to 70°C	-25 to 55°C or -40 to 70°C
Storage Temperature	-40 to 85°C	-40 to 85°C	-30 to 60°C	-40 to 85°C	-40 to 85°C	-40 to 85°C	-40 to 85°C	-25 to 75°C or -40 to 80°C
Ambient Relative 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%
Anti Vibration/Shock	EN 50155 standard	EN 50155 standard	EN 50155 standard	EN 50155 standard	EN 50155 standard	EN 50155 standard	EN 50155 standard	EN 50155 standard
Regulatory Approvals								
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 50155, EN 50121-2-3, EN 50121-4, IEC 61373							
Safety	UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1							
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Reliability								
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)							

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Introduction > Product Selection Guide

Marine Displays Computers



	MD-124X/Y/Z	MC-5150-DC-CP	MC-5150-AC/DC	MC-5157-AC/DC	MC-4510-C23	MPC-122-K
Computer						
CPU Speed	–	2.4 GHz	2.4 GHz	2.4 GHz	2.26 GHz	2.26 GHz
OS (pre-installed)	–	–	–	–	–	–
FSB	–	1066 MHz	1066 MHz	1066 MHz	1066 MHz	1066 MHz
Flash	–	–	–	–	–	–
System Memory	–	2 GB (4 GB max.)	2 GB (4 GB max.)	2 GB (4 GB max.)	2 GB (2 GB max.)	2 GB (4 GB max.)
USB Ports	–	6 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)	7 (USB 2.0)
Digital I/O	–	–	–	–	–	–
Storage						
Built-in	–	✓	✓	✓	–	–
CompactFlash Socket	–	–	–	–	✓	✓
SD Slot	–	–	–	–	–	–
HDD Support	–	✓	✓	✓	✓	✓
Other Peripherals						
KB/MS	–	–	–	–	–	–
Audio	✓	✓	✓	✓	✓	✓
PCI Slot	–	–	–	2	–	–
Display						
Graphics Controller	✓	✓	✓	✓	✓	✓
VGA Output	✓	✓	✓	✓	✓	✓
DVI Output	✓	–	–	–	✓	✓
Display Characteristics						
Panel Size	24" wide-screen	–	–	–	–	22" wide-screen
Aspect Ratio	16:09	–	–	–	–	16:10
Pixels	1920 x 1080	–	–	–	–	1680 x 1050
Response Time	25 ms	–	–	–	–	8 ms (gray to gray)
Contrast Ratio	5000:1	–	–	–	–	1000:1
Viewing Angles	178/178	–	–	–	–	178/178
Max Colors	16.7 M (8 bits/color)	–	–	–	–	16.7M (8-bit/color)
Optical Bonding	Y model	–	–	–	–	✓
Touch	✓	–	–	–	–	–
LAN Interface						
10/100/1000 Mbps Ethernet Ports	–	2	2	2	2	2
Magnetic Isolation Protection	–	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface						
RS-232 Ports	1 (DB9)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	–	–
RS-485	–	–	–	–	–	–
RS-232/422/485 Ports	–	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
NMEA Ports	–	–	12 (terminal block)	12 (terminal block)	–	–
ESD Protection	–	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					
Baudrate	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps	50 bps to 115.2 Kbps
LEDs						
System	–	Storage, Power	Storage, Power	Storage, Power	Storage, Power	Storage, Power
LAN	–	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M
Serial	–	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx
Physical Characteristics						
Housing	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Weight	10.5 kg	3.75 kg	6.85 kg	7.85 kg	3.75 kg	15 kg
Dimensions	380 x 590 x 90 mm	287 x 250 x 70 mm	287 x 250 x 140 mm	320 x 300 x 171 mm	302 x 70 x 279 mm	124 x 560 x 420 mm
Mounting	Flush	Wall	Wall	Wall	Wall	Flush
Environmental Limits						
Operating Temperature	-15 to 55°C	-15 to 55°C	-15 to 55°C	-15 to 55°C	-15 to 55°C	-15 to 55°C
Storage Temperature	-20 to 60°C	-20 to 60°C	-20 to 60°C	-20 to 60°C	-20 to 60°C	-20 to 60°C
Ambient Relative Humidity	5 to 95%	5 to 95%	5 to 95%	5 to 95%	5 to 95%	5 to 95%
Anti Vibration/Shock	IEC 60945, DNV 2.4, Class A/Class C	0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis, 1 grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis, 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis, 50 g @ IEC 60068-2-27, half sine wave, 11 ms				
Regulatory Approvals						
EMC	EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A, IEC 60945 4th. (Pending), DNV (Pending), IACS-E10 (Pending)	EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B			EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B	EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A
Safety	UL/cUL, CCC	UL 60950-1, DNV 2.4 (Pending), IEC 60945 (4th) (Pending), IACS-E10 (Pending) EMC: EN 55022 Class			UL 60950-1, IEC 60945 4th. IACS-E10, CCC (GB4943, GB9254, GB17625.1)	IEC 60945 4th. (Pending), DNV (Pending), IACS-E10 (Pending)
Green Product	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE
Reliability						
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓
Warranty	By request	3 years	3 years	3 years	3 years	1 year



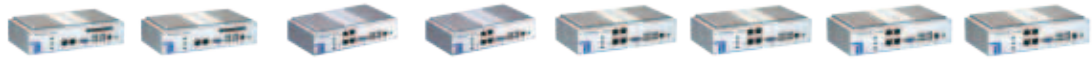
Wallmount Computers



	V2101-T-CE	V2101-T-XPE	V2101-T-LX	V2401-CE	V2401-XPE	V2401-LX	V2402-CE	V2402-XPE	V2402-LX	V2422-LX V2422-XPE	
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	1.6 GHz	
OS (pre-installed)	WinCE 6.0	Windows Embedded Standard 2009	Linux	WinCE 6.0	Windows Embedded Standard 2009	Linux	WinCE 6.0	Windows Embedded Standard 2009	Linux	WinXPE Emb. or Linux	
FSB	400 MHz	400 MHz	400 MHz	533 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.)	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)	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	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)	2 GB (DOM)	
CompactFlash Socket	✓ (for storing OS)	✓ (for storing OS)	✓ (for storing OS)	✓	✓	✓	✓	✓	✓	✓	
SD Slot	✓	✓	-	-	-	-	-	-	-	-	
HDD Support	-	-	-	✓	✓	✓	✓	✓	✓	✓	
Other Peripherals											
KB/MS	-	-	-	1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable							
Audio	AC97 audio, with line-in/out interface			HD audio, with line-in/out interface							
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	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	1.5 KV	
Serial Interface											
RS-232 Ports	-	-	-	8 (68-pin VHDC)	8 (68-pin VHDC)	8 (68-pin VHDC)	-	-	-	-	
RS-485	-	-	-	-	-	-	-	-	-	-	
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)	4 (DB9-M)	
ESD Protection	2 KV	2 KV	2 KV	4 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, ADCC®							
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	100M, 1000M	
Serial	Tx, Rx	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	Aluminum	
Weight	940 g	940 g	940 g	2.1 kg	2.1 kg	2.1 kg	2 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									Wall	
Environmental Limits											
Operating Temperature	-40 to 85°C			-10 to 60°C							
Storage Temperature	-40 to 85°C									-20 to 80°C	
Ambient Relative Humidity	5 to 95% RH										
Anti Vibration/Shock	2g/20g			5g/50g				5g/50g			
Regulatory Approvals											
EMC	CE (EN55022 Class A, EN61000-3-2 Class D, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)									EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A, e-Mark (e4)	
Safety	UL/cUL (UL508, UL609500-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)									UL 508, UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1, CCC (GB9254, GB17625.1)	
Green Product	RoHS, cROHS, WEEE	RoHS, cROHS, WEEE								EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A	
Reliability											
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Warranty	3 years (see www.moxa.com/warranty)										

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Wallmount Computers



	V462-CE	V462-XPE	V464-CE	V464-XPE	V466-CE	V466-XPE	V468-CE	V468-XPE
Computer								
CPU Speed	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz
OS (pre-installed)	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.
DRAM	-	-	-	-	-	-	-	-
SRAM	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB
FSB	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz
Flash	-	-	-	-	-	-	-	-
System Memory	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	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	-	-	-	-	-	-	8 Dis, 8 DOs	8 Dis, 8 DOs
Storage								
Built-in	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓	✓
Other Peripherals								
KB/MS	1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable							
Audio	AC97 audio, with line-out interface							
Display								
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	✓
Mini Screen with Push Buttons	-	-	-	-	-	-	-	-
LAN Interface								
10/100 Mbps Ethernet Ports	2	2	4	4	4	4	4	4
10/100/1000 Mbps Ethernet Ports	-	-	-	-	-	-	-	-
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	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	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)							
CANbus	-	-	-	-	-	-	-	-
LEDs								
System	Power, Battery, Storage							
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M, Switch	10M, 100M	10M, 100M	10M, 100M
Physical Characteristics								
Housing	Aluminum							
Weight	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg
Dimensions	223 x 121 x 57 mm							
Mounting	DIN-Rail, wall							
Environmental Limits								
Operating Temperature	-10 to 60°C							
Storage Temperature	-20 to 80°C or -40 to 85°C							
Ambient Relative Humidity	5 to 95% RH							
Anti Vibration / Shock	5 g / 50 g	5 g / 50 g	5 g / 50 g	5 g / 50 g	5 g / 50 g	5 g / 50 g	5 g / 50 g	5 g / 50 g
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)							
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)							
Green Product	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-8418-T-LX	UC-8430-CE UC-8430-T-CE	UC-7410-LX Plus
Computer									
CPU Speed	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz
OS (pre-installed)	Linux	Windows CE 6.0	Linux	Windows CE 6.0	Linux	Windows CE 6.0	Linux	Windows CE 6.0	Linux
DRAM	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	128 MB
SRAM	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	–
FSB	–	–	–	–	–	–	–	–	–
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)	32 MB
System Memory	–	–	–	–	–	–	–	–	–
PCMCIA	–	–	–	–	–	–	–	–	–
Expansion Bus	–	–	–	–	–	–	–	–	–
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)	1 (USB 1.1)
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									
Built-in	–	–	–	–	–	–	–	–	–
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓	✓	–
SD Slot	–	–	–	–	–	–	–	–	–
Display									
Mini Screen with Push Buttons	–	–	–	–	–	–	–	–	✓
LAN Interface									
10/100 Mbps Ethernet Ports	3	3	3	3	3	3	3	3	2
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	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)	8 (RJ45)
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)								
CANbus	–	–	–	–	2 (DB9-M)	2 (DB9-M)	–	–	–
LEDs									
System	Power, Ready, Storage, Battery								OS Ready, Console
LAN	10M, 100M								10M/100M
Serial	TxD, RxD								TxD, RxD
Physical Characteristics									
Housing	SECC sheet metal (1 mm)								
Weight	850 g	850 g	930 g	930 g	1 kg	1 kg	1 kg	1 kg	810 g
Dimensions	200 x 37 x 120 mm	200 x 37 x 120 mm	200 x 56 x 120 mm						197 x 44 x 125 mm
Mounting	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% RH								5 to 95% RH
Anti Vibration/Shock	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g
Regulatory Approvals									
EMC	CE (EN55022 Class B, EN55024-4-2, EN55024-4-3, EN55024-4-4), FCC (Part 15 Subpart B, Class B)								UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
Safety	UL/cUL (UL60950-1), CCC, LVD								UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
Green Product	RoHS, CRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)								

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Introduction > Product Selection Guide

Wallmount Computers



	UC-7420-LX Plus	UC-7122-GE UC-7122-T-CE	UC-7124-GE UC-7124-T-CE	UC-7110-LX UC-7110-T-LX	UC-7112-LX	UC-7112-LX Plus	UC-7101-LX UC-7101-T-LX
Computer							
CPU Speed	533 MHz	200 MHz	200 MHz	192 MHz	192 MHz	192 MHz	192 MHz
OS (pre-installed)	Embedded Linux	Windows CE 5.0	Windows CE 5.0	µClinux		Linux	µClinux
DRAM	128 MB	32 MB	32 MB	16 MB	16 MB	32 MB	16 MB
SRAM	-	-	-	-	-	-	-
FSB	-	-	-	-	-	-	-
Flash	32 MB	16 MB	16 MB	8 MB	8 MB	16 MB	8 MB
System Memory	-	-	-	-	-	-	-
PCMCIA	✓	-	-	-	-	-	-
Expansion Bus	-	-	-	-	-	-	-
USB Ports	2 (USB 2.0), 1 (USB 1.1)	-	-	-	-	-	-
Digital I/O	-	-	-	-	-	-	-
Storage							
Built-in	-	-	-	-	-	-	-
CompactFlash Socket	✓	-	-	-	-	-	-
SD Slot	-	✓	✓	-	✓	✓	✓
Display							
Graphics Controller	-	-	-	-	-	-	-
Mini Screen with Push Buttons	✓	-	-	-	-	-	-
LAN Interface							
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	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
Serial Interface							
RS-232/422/485 Ports	8 (RJ45)	2 (DB9-M)	4 (RJ45)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	-	-	-	-	-	-	-
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)						
CANbus	-	-	-	-	-	-	-
LEDs							
System	OS Ready	Ready, SD		Ready			Ready, SD
LAN	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
Physical Characteristics							
Housing	SECC sheet metal (1 mm)	Aluminum (1 mm)					
Weight	875 g	190 g	200 g	190 g	190 g	190 g	130 g
Dimensions	197 x 44 x 125 mm	77 x 111 x 26 mm					67 x 22 x 100.4 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall					DIN-Rail, wall
Environmental Limits							
Operating Temperature	-10 to 60°C	-10 to 60°C or -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% 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
Anti Vibration/Shock	1g/5g	-	-	-	-	-	-
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)						
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)	LVD (EN60950-1), UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03)		UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)			LVD (EN60950-1), UL/cUL (UL60950, CAN/CSA-C22.2 No. 60950-00)
Green Product	RoHS, CrOHS, WEEE						
Reliability							
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)						



DIN-rail Computers



	IA3341-LX	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	
Computer										
CPU Speed	192 MHz	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz	192 MHz	192 MHz	
OS (pre-installed)	Linux	Linux	WinCE 6.0	Linux	WinCE 6.0	Linux	WinCE 6.0	Embedded Linux		
DRAM	64 MB	128 MB (256 MB max.)						64 MB	64 MB	
Flash	16 MB	32 MB (64 MB max.)		32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	
PCMCIA	–	–	–	–	–	–	–	–	✓	
USB Ports	1 (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)	1 (USB 2.0)	1 (USB 2.0)	
Digital I/O	4 DIs, 4 DOs	8 DIs, 8 DOs	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	
AI/Thermocouples	2/2	–	–	–	–	–	–	–	–	
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	2 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	2 (DB9-M)	2 (DB9-M)	4 (RJ45)	4 (RJ45)	
ESD Protection	4 KV	4 KV	4 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, ADCC®									
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)									
CANbus	–	–	–	–	–	2 (DB9-M)	2 (DB9-M)	–	–	
LEDs										
System	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)		
Weight	585 g	1 kg	1 kg	950 g	950 g	950 g	950 g	430 g	500 g	
Dimensions	116 x 35 x 146	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	
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	-10 to 60°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	5 to 95% RH	5 to 95% RH	
Storage Temperature	-20 to 80°C	-20 to 80°C or -40 to 85°C								
Regulatory Approvals										
EMC	EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)						CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)		
Safety	UL 60950-1, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)	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)		
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Warranty	5 years (see www.moxa.com/warranty)									

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Introduction > Product Selection Guide

Modules Boards Computers



	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 or -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% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Regulatory Approvals						
EMC	EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A		CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)			
Green Product	RoHS, CRoHS, WEEE					
Reliability						
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)					

Wireless Embedded Computers



	W406-CE	W406-T-CE	W406-LX	W406-T-LX	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	192 MHz	192 MHz	
OS (pre-installed)	WinCE 6.0	WinCE 6.0	Embedded Linux	Embedded Linux	Embedded Linux		Embedded Linux with MMU support			
DRAM	32 MB	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	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		–	–	–	
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		–	–	–	
GPRS Class	12	12	12	12	10		–	–	–	
EDGE Class	12	12	12	12	–		–	–	–	
Coding Schemes	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)	2 (DB9-M)	2 (DB9-M)	2 (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						Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			
Flow Control	RTS/CTS, XON/XOFF, ADDCTM						RTS/CTS, XON/XOFF, ADDCTM			
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)						50 bps to 921.6 Kbps (non-standard baudrates supported)			
LEDs										
System	Ready, Storage	Ready, Storage	Ready, Storage	Ready, Storage	Ready, SD	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	10M, 100M	
WLAN	–	–	–	–	–	–	Enable, Signal Strength		–	
Cellular	Cellular Enabled, Signal Strength	Cellular Enabled, Signal Strength	Cellular Enabled, Signal Strength	Cellular Enabled, Signal Strength	GPRS Enabled, GSM Signal Strength		–	–	–	
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	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)			
Weight	1 kg	1 kg	1 kg	1 kg	195 g	195 g	170 g	185 g	390 g	
Dimensions	44 x 119 x 40 mm	44 x 119 x 40 mm	44 x 119 x 40 mm	44 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	110 mm	110 mm	150 mm	150 mm	150 mm	
Environmental Limits										
Operating Temperature	-10 to 60°C or wide temperature (by request)	By request	-10 to 60°C	By request	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°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	5 to 95% RH	5 to 95% RH	
Storage Temperature	-20 to 80°C or wide temperature (by request)	-20 to 80°C	-20 to 80°C	-20 to 80°C or by request	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	
Anti Vibration/Shock	2g/6g with DIN-rail/20g with wall mount	2g/6g with DIN-rail/20g with wall mount	2g/6g with DIN-rail/20g with wall mount	2g/6g with DIN-rail/20g with wall mount	5g/50g	5g/50g	5g/50g	5g/50g	5g/50g	
Regulatory Approvals										
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) (W311/321 only)		–	
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE			
Reliability										
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Warranty	5 years (see www.moxa.com/warranty)									

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Introduction > Product Selection Guide



Power Substation Computers

DA-685 x86 rackmount embedded computer with VGA, 2 RS-232/422/485 and 6 RS-485 serial ports, 6 LANs, CompactFlash, USB	2-2
DA-710 Series x86 computers—serial, quad LANs, VGA, DI/DO, USB, expansion slots	2-5
DA-681 Series x86 computers—isolated RS-232/485, VGA, CF, USB	2-9
DA-682 Series x86 computers—VGA, Gigabit ports, expansion slots, CF, USB	2-13
DA-683 Series x86 computers--serial, VGA, Gigabit ports, expansion slots, CF, USB	2-16
DA-660/661/662/662-I Series RISC rackmount computers—serial, PCMCIA, CF, USB	2-20
DA Series Expansion Modules Serial, 10/100M LAN, unmanaged switch ports	2-24

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Power Substation Computers



DA-685

x86 rackmount embedded computer with VGA, 2 RS-232/422/485 and 6 RS-485 serial ports, 6 LANs, CompactFlash, USB



- > Intel Duo Core Atom D510 1.66 GHz processor
- > 2 DDR2 SODIMM sockets supporting DDR2 667 up to 4 GB (max.)
- > 6 10/100/1000 Mbps Ethernet ports
- > 2 RS-232/422/485 serial ports (DB9 male)
- > 6 RS-485 serial ports (terminal block)
- > 2 USB 2.0 ports for high speed peripherals
- > CompactFlash socket for storage expansion
- > 2 SATA-300 connectors for hard disk drive expansion
- > EMC Level 4 certified



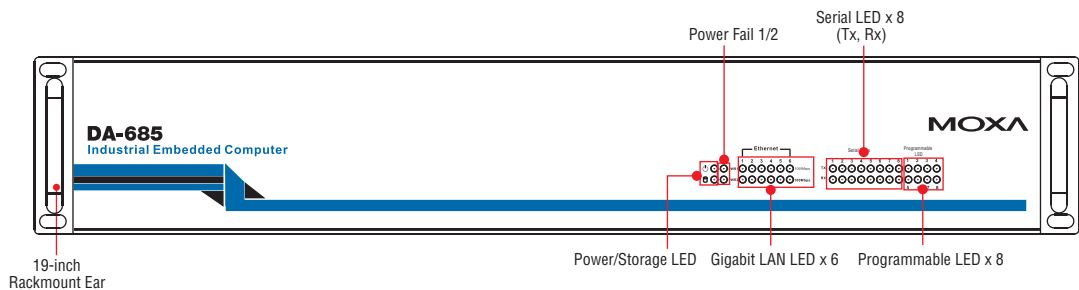
Overview

DA-685 industrial computers excel in a wide array of power automation applications. The DA-685 series is based on the Intel x86 processor and supports DVI-I, 6 Gigabit Ethernet ports, 2 RS-232/422/485 and 6 RS-485 serial ports, CompactFlash, and USB. The computers come standard in a 19-inch, 2U high form factor, and the Intel Core Duo processor gives them enough punch to perform demanding industrial tasks without consuming a lot of power.

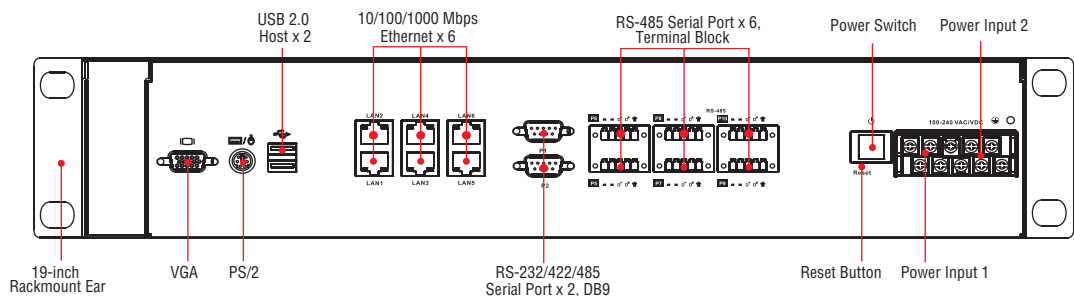
The DA-685 computer can support Windows 7, Windows XP Embedded, Windows XP Professional, and Linux operating systems, providing a familiar environment for developing sophisticated application software.

Appearance

Front View

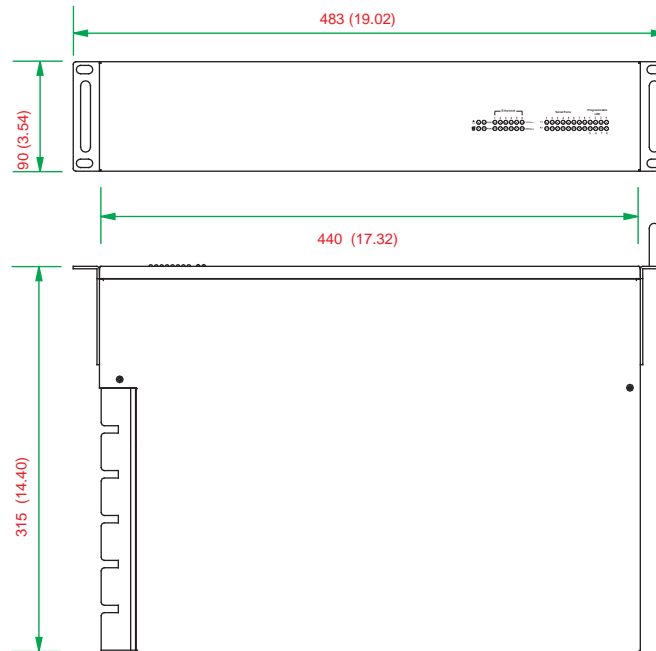


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel Duo Core Atom D510 1.66 GHz processor
OS: Linux, Windows 7, Windows XP Professional, or Windows Embedded Standard 2009 (must be installed by the user)
System Chipset: Intel Pineview-D + ICH8M
BIOS: 16 Mbit Flash BIOS, PCI Plug & Play, ACPI function support
FSB: 667 MHz
System Memory: 2 x 200-pin DDR2 SODIMM sockets supporting DDR2 667; up to 4 GB, with 1 GB built in
Expansion Bus: PCI/104 interface reserved
USB: USB 2.0 compliant hosts, Type A connector x 2, supports system boot up

Storage

Built-in: 2 GB industrial DOM onboard to store OS
Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II
HDD Support: 2 SATA-300 connectors for HDD expansion

Other Peripherals

KB/MS: 1 PS/2 interface, supports standard PS/2 keyboard and mouse through Y-type cable

Display

Graphics Controller: Intel® GMA3150 graphics controller on Intel D510 card
Display Interface: CRT interface for VGA output (DB15 female connector)
Resolution: CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz

Ethernet Interface

LAN: 6 auto-sensing 10/100/1000 Mbps Gigabit ports
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards:

- 2 RS-232/422/485 ports (DB9 male)
- 6 RS-485-2W ports (terminal block)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Power, Storage
Gigabit LAN: 100M x 6, 1000M x 6
Serial: TX/RX
Programmable: LED x 8

Switches and Buttons

Power Switch: on/off (on rear panel)
Reset Button: To reset system hardware (on front panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 4 kg
Dimensions: 315 x 440 x 90 mm (12.40 x 17.32 x 3.54 in) (without rackmount ears)
Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature: -10 to 55°C (14 to 131°F)
Storage Temperature: -20 to 80°C (-4 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis
Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 100 to 240 VAC, 50/60 Hz, 0.9-0.4 A

Power Consumption: 40 W

Standards and Certifications

Safety: LVD, UL, cUL, CCC

EMC: FCC, CE (Class A)

Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with lithium backup battery

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

: Ordering Information

Available Models

DA-685: x86 rackmount embedded computer with VGA, 2 RS-242/6 RS-485 serial ports, 6 LANs, 4 DIs, 4 DOs, CompactFlash, USB

Package Checklist

- DA-685 embedded computer
- Rackmount kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Documentation CD or DVD
- Quick installation guide (printed)
- Warranty card

DA-710 Series

x86 embedded computers with 2 serial ports, quad LANs, VGA, 4 DIs, 4 DOs, USB, and 4 peripheral expansion slots



- > Intel Celeron M 2.0 GHz processor with 533 MHz FSB
- > 1 x 200-pin DDR2 SODIMM socket supporting DDR2 533 up to 2 GB
- > 4 PCI slots for expansion modules
- > Quad 10/100/1000 Mbps Ethernet for network redundancy
- > 1 CompactFlash socket, 1 IDE, and 2 serial ATA-150 connectors for storage expansion
- > 4 USB 2.0 ports for high speed peripherals
- > 4 DIs, 4 DOs
- > Ready-to-Run Linux or Windows Embedded Standard 2009 platform
- > 19-inch rackmount model, 4U high
- > Fanless design
- > Dual 100/240 VAC/VDC power input



2

Power Substation Computers > DA-710 Series

Overview

The DA-710 computer is based on the Intel x86 processor, supports VGA, and comes with 4 Ethernet ports, 2 RS-232 serial ports, CompactFlash, and USB. The DA-710 comes in a standard 19-inch, 4U high form factor, making it an ideal platform for industrial applications.

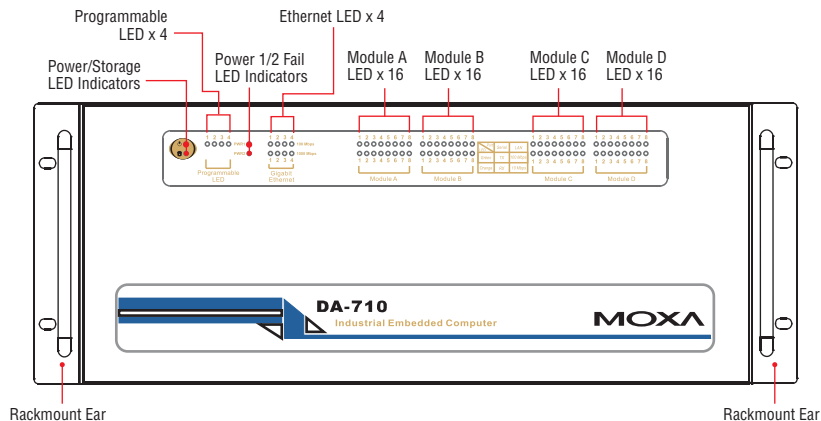
The DA-710 comes with 4 PCI slots for inserting expansion modules. Moxa provides a variety of communication modules, including an 8-port RS-232/422/485 module, a 4-port 10/100 Mbps LAN module, an 8-port RS-422/485 module, an 8-port switch module, a 4-port 100

Mbps fiber LAN module, and a universal PCI expansion module. The friendly modular design gives users the advantage of being able to swap out modules quickly and easily.

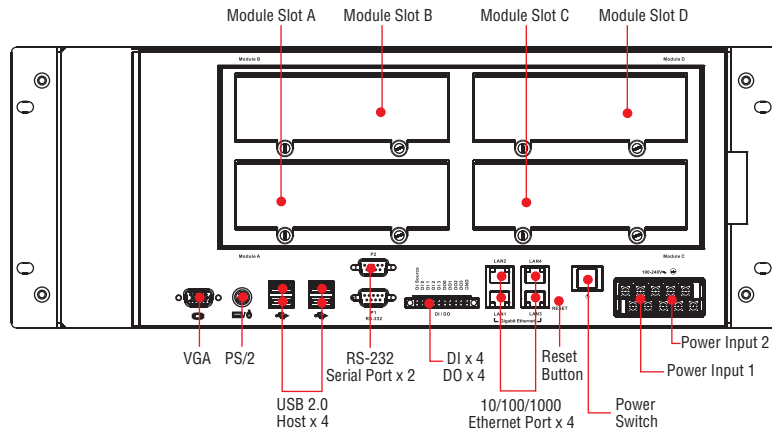
The DA-710 runs Linux, or Windows Embedded Standard 2009 (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower cost.

Appearance

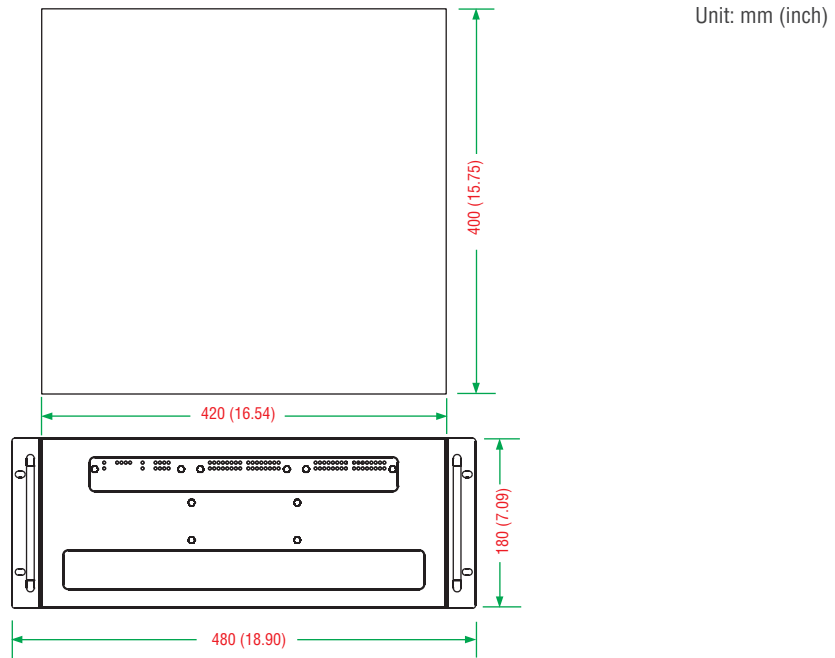
Front View



Rear View



Dimensions



Hardware Specifications

Computer

CPU:

- Intel Celeron M 2.0 GHz processor (standard version)
- Intel Core 2 Duo T7500 2.2 GHz processor (upgrade version; available by request)

OS (pre-installed): Windows Embedded Standard 2009, Linux 2.6

System Chipset: Intel GME965 + ICH8M

BIOS: 8 Mbit SPI Serial Flash, PCI Plug & Play, ACPI function support

FSB: 533 MHz

System Memory: 1 x 200-pin DDR2 SODIMM socket supporting DDR2 533; up to 2 GB max. (1 GB built-in)

USB: USB 2.0 compliant hosts x 4, type A connector, supports system boot up

Storage

Built-in: 2 GB industrial DOM onboard to store OS

Storage Expansion: CompactFlash socket

HDD Support: 2 x SATA connector, 1 x IDE connector

Other Peripherals

KB/MS: 1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse

Display

Graphics Controller: Integrated Intel graphics media accelerator (GMA X3100)

Display Memory: Dynamic video memory technology

Intel Clear Video Technology: MPEG-2 hardware accelerator, Microsoft DirectX 9

Display Interface: CRT interface for VGA output (DB15 female connector)

Resolution: QXGA maximum with resolution up to 2048 x 1536 at 60 Hz

Ethernet Interface

LAN: 4 auto-sensing 10/100/1000 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 RS-232 ports (DB9 male)

ESD Protection: 4 KV for all signals

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

Baudrate: 50 bps to 115.2 Kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 to +30 V (DI Source to DI)

Connector Type: 6-pin screw terminal block (4 points, DI Source, GND)

Isolation: 4 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 5-pin screw terminal block (4 points, GND)

Isolation: 4 KV optical isolation

LEDs

System: Power x 1, Storage x 1

LAN: 100M x 4, 1000M x 4

Power Failure: LED x 2

Programmable: LED x 4

Module: Module A x 16, Module B x 16, Module C x 16, Module D x 16

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 14 kg

Dimensions:

- Without ears: 400 x 420 x 180 mm (15.75 x 16.54 x 7.09 in)
- With ears: 400 x 480 x 180 mm (15.75 x 18.90 x 7.09 in)

Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature: -10 to 50°C (14 to 122°F)

Storage Temperature: -20 to 80°C (4 to 176°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: Single or dual inputs, 100 to 240 VAC/VDC auto-ranging, 47 to 63 Hz, terminal block

Power Consumption: 60 W

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, 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

Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock) with backup lithium battery

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 time interval levels for system reset, software programmable

MTBF (mean time between failures): 118,815 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Linux 2.6.26, Debian 5 (Lenny)

File System: EXT2

Internet Protocol Suite: TCP, UDP, IPv4, SNMP v1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: iptables firewall, OpenVPN

Web Server (Apache): Allows you to create and manage Web sites, supporting PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network.

Dial-up Networking: PPP Daemon for Linux allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a software function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library
- GNU C/C++ compiler
- GNU C library

Windows XP Embedded

OS: Windows Embedded Standard 2009

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SNTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 2.0: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Write Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

: Ordering Information**Available Models**

DA-710-XPE: x86-based rackmount embedded computer with 2 RS-232 ports, 4 LANs, 4 peripheral expansion slots, 4 DIs, 4 DOs, VGA, CompactFlash, USB, Windows Embedded Standard 2009

DA-710-LX: x86-based rackmount embedded computer with 2 RS-232 ports, 4 LANs, 4 peripheral expansion slots, 4 DIs, 4 DOs, VGA, CompactFlash, USB, Linux 2.6

Expansion Modules (can be purchased separately)

DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation

DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector

DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation

DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation

DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module

DA-LN04-RJ: 4-port 10/100 Mbps LAN module

DA-UPCI-DK: Universal PCI development kit

DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

Package Checklist

- DA-710 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

DA-681 Series

x86 rackmount embedded computers with 4 isolated RS-232 and 8 isolated RS-485 ports, 6 LANs, VGA, CompactFlash, USB



- > EC 61850-3 certified for power substation automation systems (DPP-T models only)
- > Intel Celeron M 1 GHz processor with 400 MHz FSB
- > 1 x 200-pin DDR2 SODIMM socket supporting DDR2 400 up to 1 GB (512 MB built-in)
- > Six 10/100 Mbps Ethernet ports
- > 1 CompactFlash socket, 1 IDE ATA-150 connector for storage expansion
- > USB 2.0 ports for high speed peripherals
- > 4 isolated RS-232 and 8 isolated RS-485 ports
- > Serial port speed from 50 bps to 921.6 Kbps (nonstandard baudrates supported)
- > Embedded Linux or WinXPe platform
- > 19-inch rackmount model, 1U height
- > Dual 100/240 VAC/VDC power input (single power and dual power models available)
- > Fanless design



Overview

The DA-681 computer is based on the Intel x86 processor and supports VGA, 6 Ethernet ports, 4 RS-232 and 8 RS-485 serial ports with isolation, CompactFlash, and USB. The DA-681 comes in a standard 19-inch, 1U high form factor, making it an ideal platform for industrial applications.

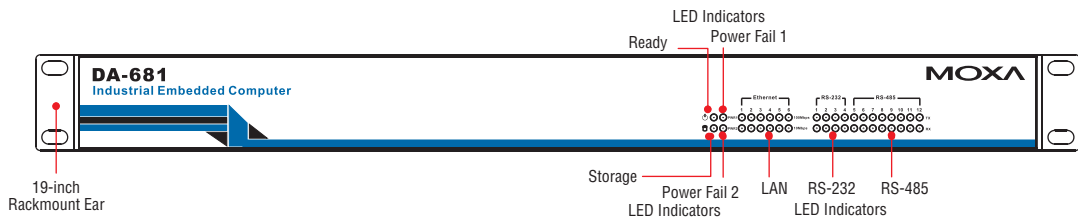
With its robust design, the DA-681 is suitable for industrial automation applications that require standard 19-inch rackmount solutions, such as power automation, transportation, and oil and gas. Another plus is that the serial ports come with 2 KV digital galvanic isolation

protection to guarantee communication reliability in harsh industrial environments. In addition, the DPP-T models have been certified to meet the IEC 61850-3 standard, making them ideal for power substation automation systems.

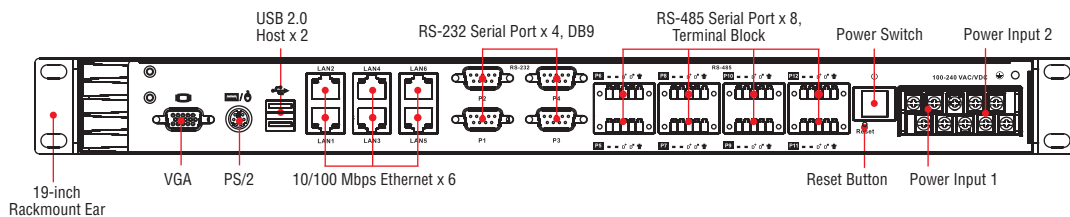
The DA-681 runs Linux or Windows XP Embedded (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower cost.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: Intel Celeron M 1 GHz processor

OS (pre-installed): WinCE 6.0, Windows XP Embedded SP3, Linux 2.6

System Chipset: Intel 910GML E + ICH6M chipset

BIOS: 4 mega-bit Flash BIOS, PCI Plug & Play, ACPI function support

FSB: 400 MHz

System Memory: 1 x 200-pin DDR2 SODIMM socket supporting DDR2 400; up to 1 GB max. (512 MB built-in)

Expansion Bus: PCI/104 onboard (DPP-T models only)

USB: USB 2.0 compliant hosts x 2, Type A connector, supports system boot up

Storage

Built-in: 1 GB (2 GB for DA-681-XPE) industrial DOM onboard to store OS via IDE interface

Storage Expansion: CompactFlash socket

HDD Support: SATA connector for HDD expansion

Other Peripherals

KB/MS: 1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse

Display

Graphics Controller: Integrated graphics with built-in Intel 910GME, and built-in Intel extreme Graphics 2 technology

Display Memory: Dynamic video memory (shares up to 32 MB of system memory)

Display Interface: CRT Interface for VGA output (DB15 female connector)

Resolution: CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz

Ethernet Interface

LAN: 6 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards:

- 4 RS-232 ports (DB9 male)
- 8 RS-485 ports (terminal block)

ESD Protection: 15 KV for all signals

Isolation: 2 KV digital galvanic isolation (DA-681-I-DPP-T only)

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-232: Tx, Rx, DTR, DSR, RTS, CTS, DCD, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Power x 1, Storage x 1

LAN: 10M x 6, 100M x 6

Serial:

RS-232: 4 x Tx, 4 x Rx

RS-485: 8 x Tx, 8 x Rx

Power Failure: LED x 2 (dual power models)

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 4.5 kg

Dimensions: 440 x 315 x 45 mm (17.32 x 12.40 x 1.77 in), 19 inch 1U height

Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature:

SP and DP models: -10 to 60°C (14 to 140°F)

DPP-T models: -40 to 75°C (-40 to 167°F)

Storage Temperature:

SP and DP models: -20 to 80°C (4 to 176°F)

DPP-T models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: 7 mm (2-9 Hz), 20 m/s/s (9-200 Hz), 15 m/s/s (200-500 Hz) @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), sine wave, 2-500 Hz, 1 Oct/min, 10 cycles, 2 hrs 40 mins per axis

Anti-shock: 300 m/s² @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), half sine wave, 11 ms

Power Requirements

Input Voltage: Single or dual inputs, 100 to 240 VAC/VDC auto-ranging, 47 to 63 Hz, terminal block

Power Consumption: 26 W

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)

EMC: EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A

Power Automation: IEC 61850-3 (DPP-T models only)

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

MTBF (mean time between failures): 100,847 hrs

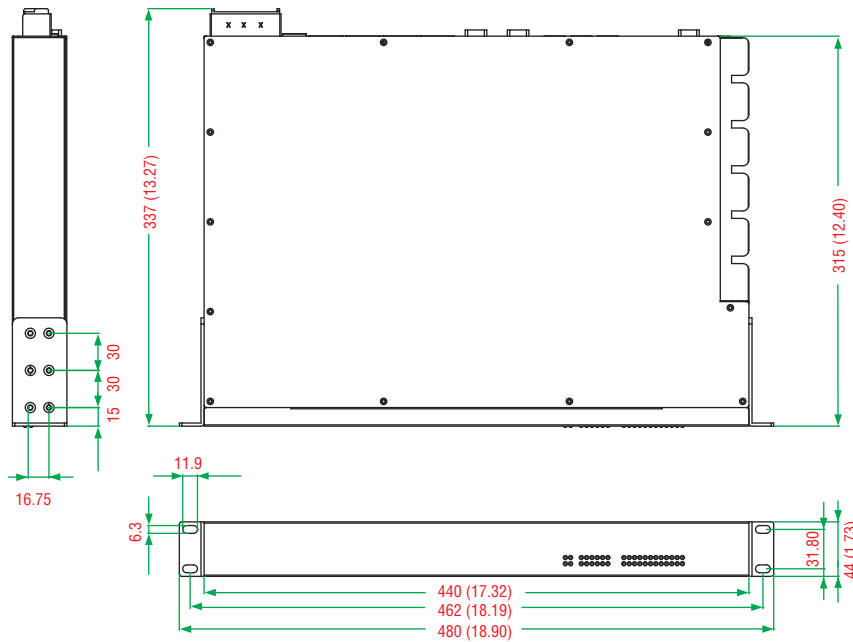
Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux 2.6.18, Debian Etch 4.0

File System: EXT2

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control)
- GNU C/C++ cross-compiler
- GNU C library
- Perl

Windows XP Embedded

OS: Windows XP Embedded

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Remote Registry Service: Enables remote users to modify registry settings on this computer

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 2.0 with SP 2
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

: Ordering Information

Available Models

DA-681-I-SP-XPE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, WinXP SP3, -10 to 60°C operating temperature

DA-681-I-SP-LX: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, Linux 2.6, -10 to 60°C operating temperature

DA-681-I-DP-XPE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, WinXP SP3, -10 to 60°C operating temperature

DA-681-I-DP-LX: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, Linux 2.6, -10 to 60°C operating temperature

DA-681-I-DPP-T-XPE: IEC 61850-3 x86 ready-to-run rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, dual power, WinXP SP3, -40 to 75°C operating temperature

DA-681-I-DPP-T-LX: IEC 61850-3 x86 ready-to-run rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, dual power, Linux 2.6, -40 to 75°C operating temperature

Package Checklist

- DA-681 embedded computer
- Rackmount kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Model Name	Serial Ports		LAN Ports	Storage			OS	Power	IEC 61850-3 Certified
	RS-232	RS-485	10/100 Mbps	SATA	CF	USB			
DA-681-I-SP-XPE	4	8	6	✓	✓	✓	XPE	Single	–
DA-681-I-SP-LX	4	8	6	✓	✓	✓	Linux	Single	–
DA-681-I-DP-XPE	4	8	6	✓	✓	✓	XPE	Dual	–
DA-681-I-DP-LX	4	8	6	✓	✓	✓	Linux	Dual	–
DA-681-I-DPP-T-XPE	4	8	6	✓	✓	✓	XPE	Dual	✓
DA-681-I-DPP-T-LX	4	8	6	✓	✓	✓	Linux	Dual	✓

DA-682 Series

x86 rackmount embedded computers with VGA, 4 Gigabit Ethernet ports, 2 peripheral expansion slots, CompactFlash, USB



- > Intel Celeron M 1 GHz processor with 400 MHz FSB
- > Built-in DDR2 SDRAM and industrial flash disk module
- > Quad Gigabit Ethernet ports for network redundancy
- > Software selectable RS-232/422/485 with 2 KV isolation protection
- > 2 PCI expansion slots for expansion modules
- > 1 CompactFlash socket for storage expansion
- > USB 2.0 ports for high speed peripherals supporting system bootup
- > 19-inch rackmount, 2U high form factor
- > 100/240 VAC/VDC power inputs
- > Ready-to-Run Linux or Windows XP Embedded platform
- > Fanless design



2

Power Substation Computers > DA-682 Series

Overview

The DA-682 computers are based on the Intel x86 processor and support VGA, 4 Gigabit Ethernet ports, 8 RS-232/422/485 serial ports with optical isolation, CompactFlash, and USB. The DA-682 comes in a standard 19-inch, 2U high form factor.

With their robust design, the DA-682 computers are suitable for industrial automation applications that require standard 19-inch rackmount solutions, such as power automation, transportation, and oil and gas. Another plus is that the serial ports come with 2 KV optical isolation protection to guarantee communication reliability in harsh industrial environments.

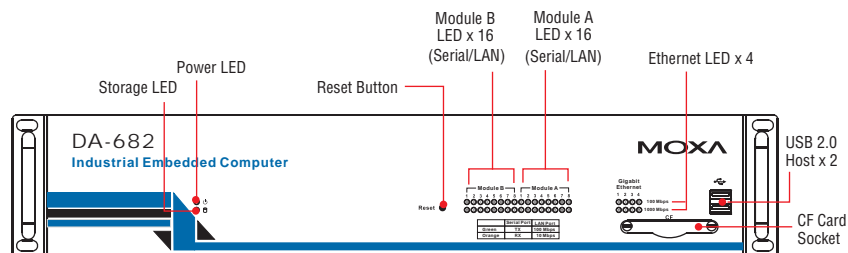
The DA-682 computers run Linux or Windows XP Embedded (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower cost.

The DA-682 comes with 2 PCI slots for inserting expansion modules. Moxa provides a variety of communication modules, including an 8-port RS-232/422/485 module, a 4-port 10/100 Mbps LAN module, an 8-port switch module, a 4-port 100 Mbps fiber LAN module, and a universal PCI expansion module. The friendly design gives users the advantage of being able to swap out modules quickly and easily.

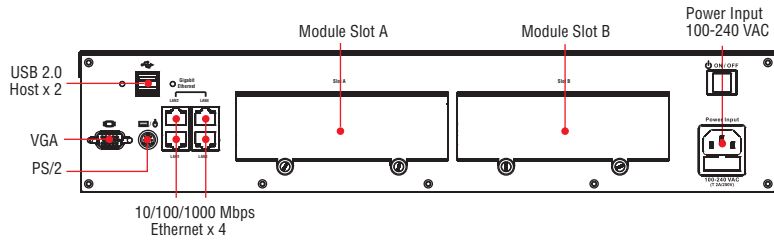
These features make the DA-682 an ideal solution for use with a wide array of industrial automation applications.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: Intel Celeron M 1 GHz processor
OS (pre-installed): Linux, WinCE 6.0, or Windows XP Embedded SP2
System Chipset: Intel 915GME + ICH6M chipset
BIOS: 4 mega-bit Flash BIOS, PCI Plug & Play, ACPI function support
FSB: 400/533 MHz
System Memory: 1 x 200-pin DDR2 SODIMM socket supporting DDR2 400/533; up to 1 GB max. (512 MB for WinXPe/Linux, 256 MB for WinCE 6.0)
USB: USB 2.0 compliant hosts x 4, Type A connector, supports system boot up

Storage

Built-in: 256 MB (CE) or 1 GB (WinXPe/Linux) industrial DOM for OS
Storage Expansion: CompactFlash socket

Other Peripherals

KB/MS: 1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse

Display

Graphics Controller: Integrated graphics with built-in Intel 915GME, and built-in Intel extreme Graphics 2 technology
Display Memory: Dynamic video memory (shares up to 32 MB of system memory)
Display Interface: CRT Interface for VGA output (DB15 female connector)
Resolution: CRT display mode with pixel resolution up to 2548 x 1536 at 75 Hz

Ethernet Interface

LAN: 4 auto-sensing 10/100/1000 Mbps Gigabit ports (Realtek RTL8110SC controller)

Magnetic Isolation Protection: 1.5 KV built-in

LEDs

System: Power, Storage
Gigabit LAN: 100M x 4, 1000M x 4
LAN: 10/100M mode
Serial: TX/RX
Communication: Module A x 16, Module B x 16

Switches and Buttons

Power Switch: on/off (on rear panel)
Reset Button: To reset system hardware (on front panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 7 kg
Dimensions: 440 x 315 x 90 mm (17.32 x 12.40 x 3.54 in) (without rackmount ears)
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)
Anti-vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis
Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 100 to 240 VAC/VDC auto-ranging (47 to 63 Hz for AC input)
Power Consumption: 30 W (full loading)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)
EMC: EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
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
MTBF (mean time between failures): 134,407 hrs

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Linux 2.6.18, Debian Etch 4.0
File System: EXT2, JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control)
- GNU C/C++ cross-compiler
- GNU C library
- Perl

Windows XP Embedded

OS: Windows XP Embedded

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Remote Registry Service: Enables remote users to modify registry settings on this computer

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

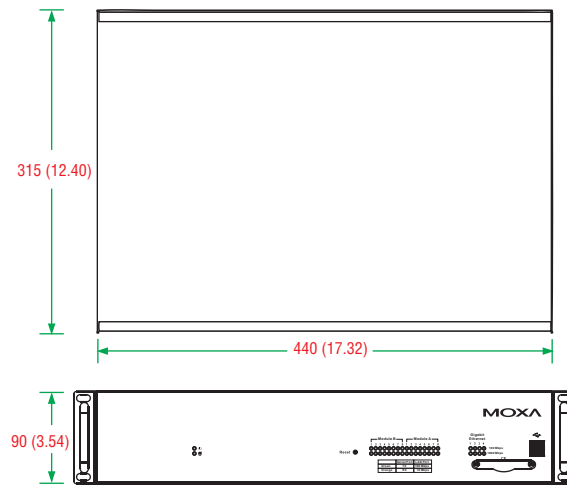
Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 2.0 with SP 2
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

DA-682-XPE: x86 rackmount computer with VGA, 4 Gigabit Ethernet ports, 2 PCI slots, CompactFlash, USB, WinXPe

DA-682-LX: x86 rackmount computer with VGA, 4 Gigabit Ethernet ports, 2 PCI slots, CompactFlash, USB, Linux

Expansion Modules (can be purchased separately)

DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation

DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector

DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation

DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation

DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module

DA-LN04-RJ: 4-port 10/100 Mbps LAN module

DA-UPCI-DK: Universal PCI development kit

DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

Package Checklist

- DA-682 embedded computer
- Rackmount kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- AC power cable
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

DA-683 Series

x86 ready-to-run embedded computers with Intel Atom D510, DVI-I, 6 LANs, 2 serial ports, 4 Dis, 4 DOs, 4 USB 2.0 ports, CompactFlash, 2 peripheral expansion slots

- > Intel Duo Core Atom D510 1.66 GHz processor
- > DDR2 SODIMM socket, supporting DDR2 667 up to 2 GB (max.)
- > 6 10/100/1000 Mbps Ethernet ports
- > 2 RS-232 serial ports
- > 4 USB 2.0 ports for high speed peripherals
- > 4 Dis, 4 DOs
- > CompactFlash socket for storage expansion
- > 2 SATA-300 connectors for hard disk drive expansion
- > 2 PCI expansion slots for inserting expansion modules
- > IEC 61850-3 certified (DPP-T models only)
- > IEEE 1588 compliance for Precision Time Protocol (Linux models only)
- > Dual power input models available
- > Ready-to-run Embedded Linux, or Windows Embedded Standard 2009 platform
- > -40 to 70°C wide temperature models available



Overview

DA-683 industrial computers excel in a wide array of power automation applications. The DA-683 series is based on the Intel x86 processor and supports DVI-I, 6 Gigabit Ethernet ports, 2 RS-232 serial ports, CompactFlash, and USB. They come standard in a 19-inch, 2U high form factor. The Intel Core Duo processor gives the DA-683 enough punch to perform demanding industrial tasks without consuming a lot of power, for a highly cost-effective overall system. DA-683 computers are IEEE 1588 compliant and support precision time protocol and clock synchronization to provide the time accuracy required for event logging in power substation systems.

IEC-61850-3 certification confirms that the DA-683 can deliver stable and reliable system operations in power applications. Additional value and convenience is provided through a modular design with two independent slots for flexible system integration and expansion. Users

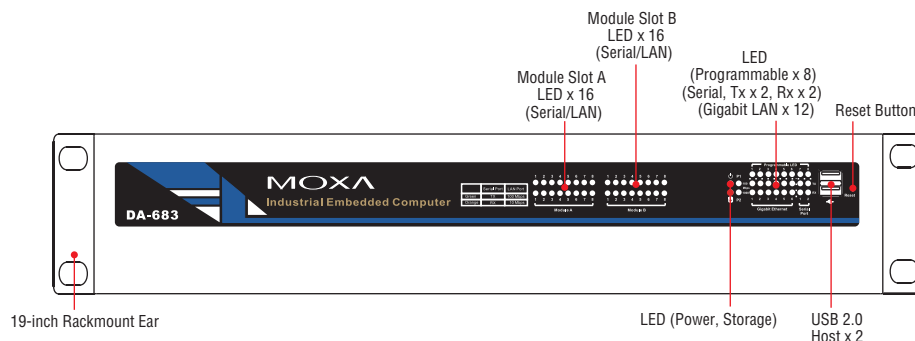
have the option to add a variety of different communications modules, including an 8-port RS-232/422/485 module, 8-port RS-422/485 module, 4-port 10/100 Mbps LAN module, an 8-port switch module, a 4-port 100 Mbps fiber LAN module, and a universal PCI expansion module.

The DA-683 series includes wide temperature models that operate reliably in a -40 to 70°C operating temperature range for the same great performance in applications in extremely harsh environments.

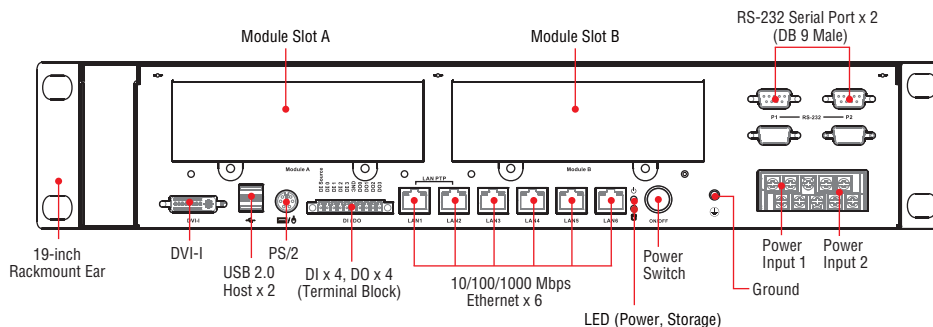
DA-683 computers run Linux or Windows Embedded Standard 2009 (pre-installed), providing a familiar environment for developing sophisticated application software. Moxa provides comprehensive software support to help programmers develop bug-free code quickly and at a lower cost.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: Intel Duo Core Atom D510 1.66 GHz processor
OS (pre-installed): Linux or Windows Embedded Standard 2009
System Chipset: Intel Pineview-D + ICH8M
BIOS: 16 Mbit Flash BIOS, PCI Plug & Play, ACPI function support
FSB: 667 MHz
System Memory: 1 x 200-pin DDR2 SODIMM socket supporting DDR2 667; up to 2 GB, with 1 GB built in
Expansion Bus: PCI/104 interface reserved
USB: USB 2.0 compliant hosts, Type A connector x 4, supports system boot up

Storage

Built-in: 2 GB industrial DOM onboard to store OS
Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II
HDD Support: 2 SATA-300 connectors for HDD expansion

Other Peripherals

KB/MS: 1 PS/2 interface, supports standard PS/2 keyboard and mouse through Y-type cable

Display

Graphics Controller: Intel® GMA3150 graphics controller in Intel D510 card

DVI Interface:

- Analog RGB display; output resolution up to 2048 x 1536 @ 60 Hz
- Digital DVI display; output resolution up to 1024 x 768 @ 60 Hz

Ethernet Interface

LAN: 6 auto-sensing 10/100/1000 Mbps Gigabit ports
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standard: 2 RS-232 ports (DB9 male)

Serial Signals

RS-232: Tx/D, Rx/D, DTR, DSR, RTS, CTS, DCD, GND, RI

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (source to DI)

Connector Type: 10-pin screw terminal block (4 DI points, 4 DO points, DI source, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 10-pin screw terminal block (4 DI points, 4 DO points, DI source, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power, Storage

Gigabit LAN: 100M x 6, 1000M x 6

Serial: TX/RX

Communication: Module A x 16, Module B x 16

Programmable: LED x 8

Switches and Buttons

Power Switch: on/off (on rear panel)

Reset Button: To reset system hardware (on front panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 4 kg

Dimensions: 315 x 440 x 90 mm (12.40 x 17.32 x 3.54 in) (without rackmount ears)

Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature:

Standard models: -10 to 60°C (14 to 140°F)

DPP-T models: -40 to 70°C (-40 to 158°F)

Storage Temperature:

Standard models: -20 to 80°C (-4 to 176°F)

DPP-T models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: 7 mm (2-9 Hz), 20 m/s/s (9-200 Hz), 15 m/s/s (200-500 Hz) @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), sine wave, 2-500 Hz, 1 Oct/min, 10 cycles, 2 hrs 40 mins per axis

Anti-shock: 300 m/s² @ IEC-61850-3, IEC 60870-2-2/Cm/(3M6)/(4M6), half sine wave, 11 ms

Power Requirements

Input Voltage: 100 to 240 VAC, 50/60 Hz, 0.9-0.4 A

Power Consumption: 40 W

Standards and Certifications

Safety: UL/cUL (UL 60950-1, CSA C22.2 No. 60950-1-03), LVD (EN 60950-1), CCC (GB4943)

EMC: CE (EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024), 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

Alert Tools: Built-in buzzer and RTC (real-time clock) with lithium backup battery

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

MTBF (mean time between failures): 134,407 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

: Software Specifications

Linux

OS: Linux 2.6.18, Debian Etch 5

File System: EXT2, JFFS2

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE, PTP

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control)
- GNU C/C++ cross-compiler
- GNU C library
- Perl

Windows XP Embedded

OS: Windows Embedded Standard 2009

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS, PTP

Web Server (IIS): Allows users to create and manage websites

Remote Registry Service: Enables remote users to modify registry settings on this computer

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

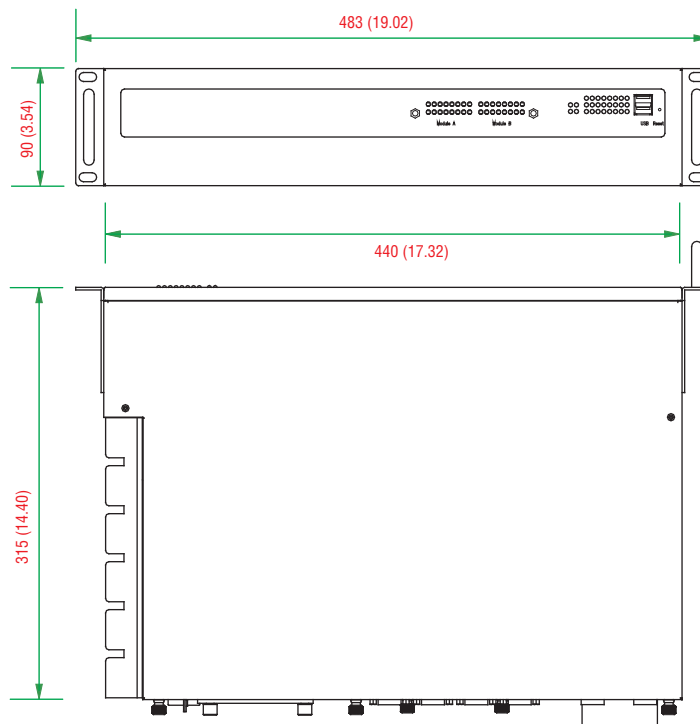
File-based Writer Filter: Redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL)
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

DA-683-SP-XPE: x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, single power, Windows Embedded Standard 2009, -10 to 60°C operating temperature

DA-683-SP-LX: x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, single power, Linux, -10 to 60°C operating temperature

DA-683-DPP-T-XPE: IEC 61850-3 x86 ready-to-run rackmount computer with 1.66 GHz CPU, DVI-I, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, dual power, Windows Embedded Standard 2009, -40 to 70°C operating temperature

DA-683-DPP-T-LX: IEC 61850-3 x86 ready-to-run rackmount computer with 1.66 GHz CPU, VGA, 6 Giga LANs, 2 RS-232 serial ports, 4 DIs, 4 DOs, 2 peripheral expansion slots, CompactFlash, 4 USB ports, dual power, Linux, -40 to 70°C operating temperature

Expansion Modules (can be purchased separately)

DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation

DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector

DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation

DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation

DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module

DA-LN04-RJ: 4-port 10/100 Mbps LAN module

DA-UPCI-DK: Universal PCI development kit

DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

Optional Accessories (can be purchased separately)

FK-76127-01: Hard disk installation package

Package Checklist

- DA-683 embedded computer
- Rackmount kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

DA-660/661/662/662-I Series

RISC 19-inch rackmount data acquisition computers with 8 or 16 serial ports, Ethernet/fiber LAN, PCMCIA, CompactFlash, USB



- > Intel XScale IXP422/425 266/533 MHz processor
- > 128 MB RAM onboard, 32 MB flash
- > 8 or 16 software-selectable RS-232/422/485 serial ports
- > 15 KV ESD protection for all serial signals
- > Dual or quad 10/100 Mbps Ethernet ports
- > PCMCIA CardBus for WLAN 802.11b/g wireless network supported
- > CompactFlash and USB slots for storage expansion supported
- > Standard 19-inch rackmount installation, 1U height
- > Wide range of power input voltages from 100 to 240 V, both AC and DC
- > LCM display and keypad for HMI
- > Ready-to-Run Linux, Windows CE 5.0 OS platform
- > Robust, fanless design



: Overview

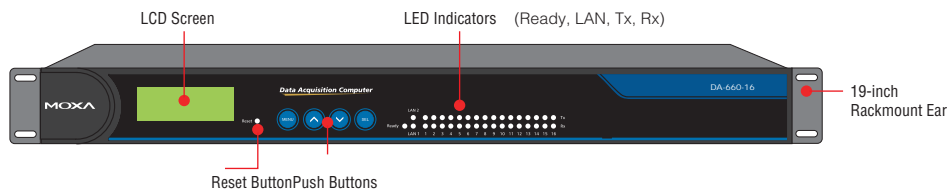
The DA-660/661/662/662-I embedded computers come with 8 or 16 software-selectable RS-232/422/485 serial ports, making them suitable for a variety of industrial applications. Models are available with either 2 or 4 10/100 Mbps Ethernet ports. Most models come with a PCMCIA socket to provide 802.11 b/g wireless LAN card expansion, and a CompactFlash socket and USB ports to make it easy to add additional

memory. The computers are designed with a standard 19-inch, rugged 1U rackmount case, and are embedded with a 100-240V AC/DC power input. This combination of features gives users a robust and reliable ready-to-run solution for applications such as data acquisition and power substations.

Model Name	RS-232/422/485 Serial Ports		Wired LAN		Wireless LAN	Memory Expansion	
	No. of Ports	Digital Isolation	10/100M	100BaseFX multi-mode	PCMCIA Socket	CompactFlash Socket	USB
DA-660	8 or 16	–	2 ports	–	–	–	–
DA-661	16	–	2 ports	–	✓	✓	2 ports
DA-662	16	–	4 ports	–	✓	✓	2 ports
DA-662-I	16	2 KV per port	4 ports	–	✓	✓	2 ports

: Appearance

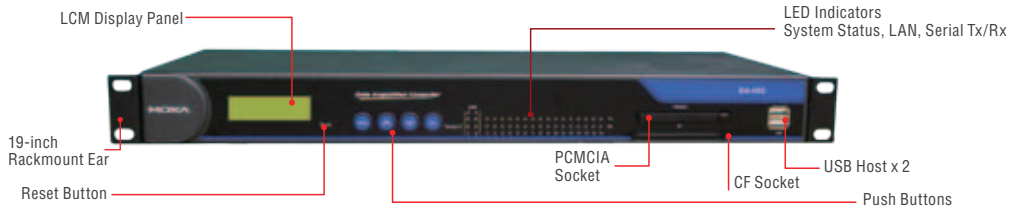
Front View (DA-660)



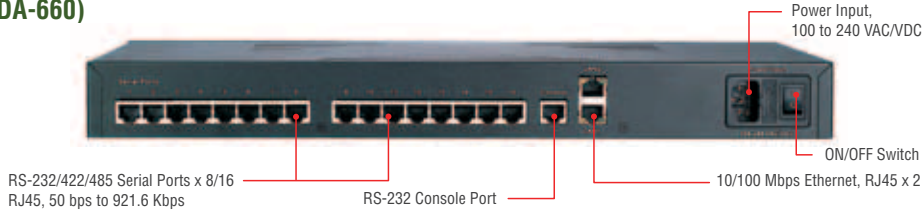
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Power Substation Computers > DA-660/661/662/662-I Series

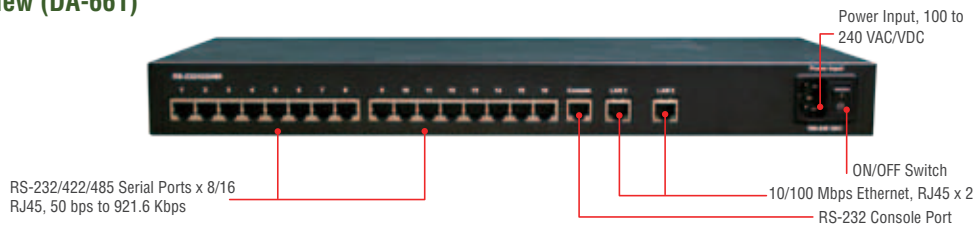
Front View (DA-661/662/662-I)



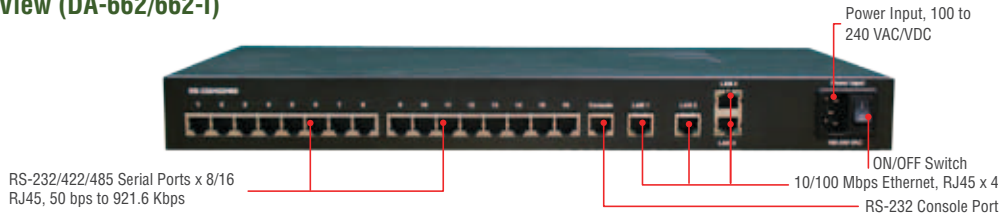
Rear View (DA-660)



Rear View (DA-661)



Rear View (DA-662/662-I)



: Hardware Specifications

Computer

CPU:

DA-660: Intel XScale IXP422 266 MHz

DA-661/662/662-I: IXP425 533 MHz

OS (pre-installed): Embedded Linux or Windows CE 5.0

DRAM: 128 MB onboard

Flash: 32 MB onboard

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1 or JEIDA 4.2 card (DA-661/662/662-I only)

Storage

Storage Expansion: CompactFlash Socket (DA-661/662/662-I only)

Ethernet Interface

LAN: 2 or 4 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 or 16 RS-232/422/485 ports, software selectable (8-pin RJ45)

ESD Protection: 15 KV for all signals

Isolation: 2 KV digital isolation (DA-662-I only)

Console Port: RS-232 (all signals), RJ45 connector, supports PPP

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, ADCC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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: OS Ready

LAN:

DA-660/661: 10/100M x 2

DA-662/662-I: 10/100M x 4

Serial: TxD, RxD (8 or 16 of each)

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case, 2 x 16 text mode
Push Buttons: Four membrane buttons for convenient on-site configuration

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight:

DA-660/661/662: 2.6 kg

DA-662-I: 2.94 kg

Dimensions:

DA-660/661/662:

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)

DA-662-I:

Without ears: 440 x 45 x 228 mm (17.32 x 1.77 x 8.98 in)

With ears: 480 x 45 x 224 mm (18.90 x 1.77 x 8.82 in)

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)

Anti-vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 Cycle, 13 mins 17 sec per axis

Power Requirements

Input Voltage: 100 to 240 VAC/VDC auto ranging (47 to 63 Hz for AC input)

Power Consumption:

DA-660: 12 W

DA-661/662/662-I: 20 W

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

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures):

DA-660: 124,323 hrs

DA-661: 89,885 hrs

DA-662: 85,193 hrs

DA-662-I: 85,193 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

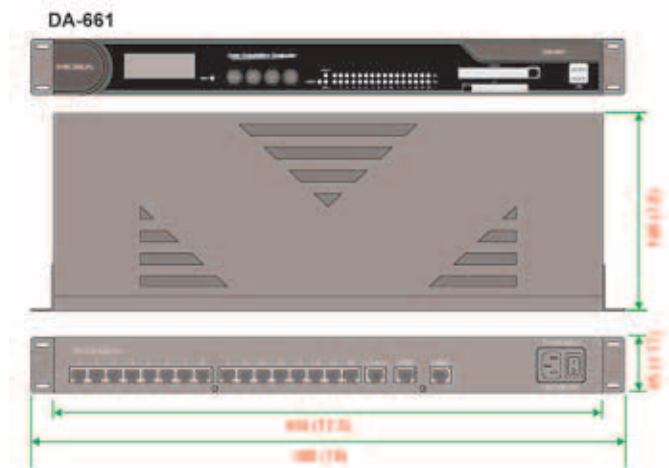
2

Power Substation Computers > DA-660/661/662/662-I Series

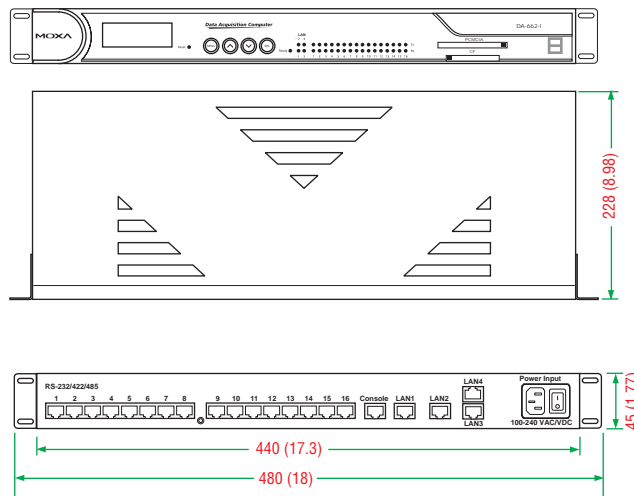
Dimensions

Unit: mm (inch)

DA-660/661/662



DA-662-I



Software Specifications

Linux

OS:

DA-660: Linux 2.4.18

DA-661/662/662-I: Linux 2.6.10

File System: JFFS2 (on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, LCM, keypad, Moxa serial I/O control)
- GNU C/C++ cross-compiler
- GNU C library
- GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 5.0

OS: Windows Embedded CE 5.0

File System: FAT (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SMTP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

File Server: Enables remote clients to access files and other resources over the network (DA-662-I only)

Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 5.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 with SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit
- Winsock 2.2

Ordering Information

Available Models

DA-660-8-LX: RISC-based 19-inch rackmount data acquisition computer with 8 serial ports, dual LANs, Linux OS

DA-660-8-CE: RISC-based 19-inch rackmount data acquisition computer with 8 serial ports, dual LANs, WinCE 5.0 OS

DA-660-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, Linux OS

DA-660-16-CE: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, WinCE 5.0 OS

DA-661-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, PCMCIA, CompactFlash, USB, Linux OS

DA-661-16-CE: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, dual LANs, PCMCIA, CompactFlash, USB, WinCE 5.0 OS

DA-662-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, quad LANs, PCMCIA, CompactFlash, USB, Linux OS

DA-662-16-CE: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, quad LANs, PCMCIA, CompactFlash, USB, WinCE 5.0 OS

DA-662-I-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 digitally isolated serial ports, quad LANs, PCMCIA, CompactFlash, USB, Linux 2.6

DA-662-I-16-CE: RISC-based 19-inch rackmount data acquisition computer with 16 digitally isolated serial ports, quad LANs, PCMCIA, CompactFlash, USB, WinCE 5.0



Package Checklist

- DA-660 embedded computer
- 19-inch rackmount kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- Power cord
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

DA Series Expansion Modules

Expansion modules with RS-232/422/485 and RS-232/485 serial ports, 10/100 Mbps LAN and unmanaged switch ports, 100 Mbps fiber LAN ports, and PCI development kit



- > PCI slots for interface expansion
- > 8-port RS-232/422/485 software-selectable serial modules with isolation protection
- > 4-port 10/100 Mbps LAN module
- > 4-port 100 Mbps fiber LAN module
- > 8-port 10/100 Mbps unmanaged switch module
- > Universal PCI expansion module
- > 8-port RS-422/485 serial module with terminal block connectors
- > Fully compatible with Moxa embedded computers that have peripheral expansion slots



Overview

Moxa's peripheral expansion modules, which come with serial ports, LAN ports, switch ports, and PCI slots, give end-users the greatest flexibility for setting up industrial applications.

Different types of modules are available, including serial port modules, LAN port modules, switch port modules, and PCI modules, and all are fully compatible with Moxa's embedded computers that come with peripheral expansion slots.

The serial port modules include an 8-port RS-232/422/485 module with either DB9 or terminal block connectors, and an 8-port RS-422/485 module with terminal block connectors. Some modules are even designed with 2 KV digital isolation, making them fully suitable

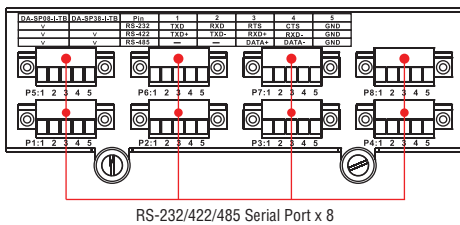
for the great demands of industrial applications that use serial communication.

In addition, a 4-port LAN module, 8-port switch module, and 4-port fiber LAN module are available for setting up industrial communication applications with Ethernet-based devices. A universal PCI development kit is also available for PCI-based devices for expanding industrial applications at a reasonable cost.

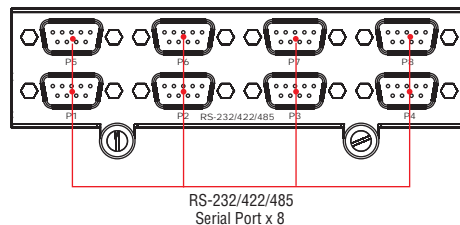
All modules are designed to offer the greatest flexibility for setting up applications and performing industrial tasks. In particular, users can swap out modules quickly and easily.

Appearance

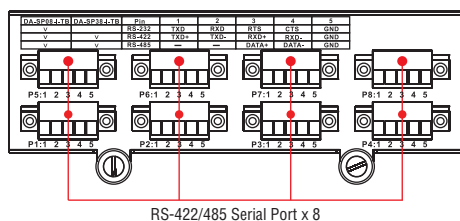
DA-SP08-I-TB



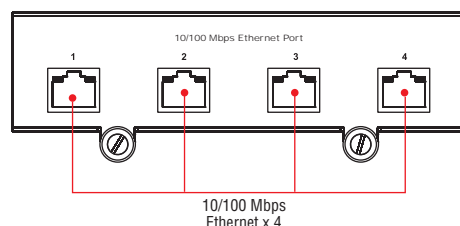
DA-SP08-DB/DA-SP08-I-DB



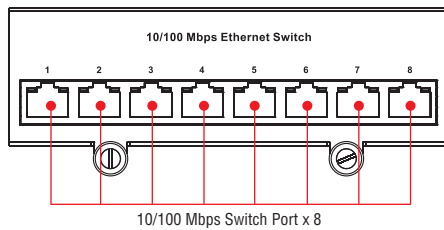
DA-SP38-I-TB



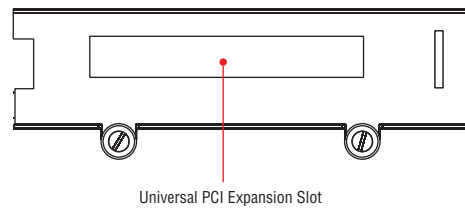
DA-LN04-RJ



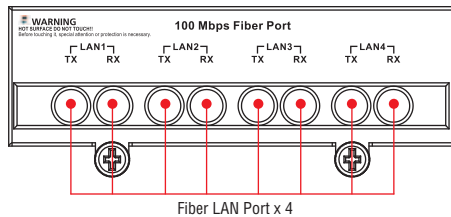
DA-SW08-RJ



DA-UPCI-DK



DA-FX04-MM-ST-T



: DA-SP08-DB, DA-SP08-I-DB, DA-SP08-I-TB Hardware Specifications

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software selectable (DB9 male or terminal block connector)

ESD Protection: 15 KV for all signals

Isolation: 2 KV digital isolation (DA-SP08-I-DB and DA-SP08-I-TB only)

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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

Physical Characteristics

Weight: 290 g

Dimensions: 130 x 150 x 42 mm (5.12 x 5.91 x 1.65 in)

MTBF (mean time between failures): 1,753,143 hrs

: DA-SP38-I-TB Hardware Specifications

Serial Interface

Serial Standards: 8 RS-422/485 ports, software selectable (DB9 male or terminal block connector)

ESD Protection: 15 KV for all signals

Isolation: 2 KV digital isolation

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Physical Characteristics

Weight: 245 g

Dimensions: 130 x 150 x 42 mm (5.12 x 5.91 x 1.65 in)

: DA-LN04-RJ Hardware Specifications

Ethernet Interface

LAN: 4 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Physical Characteristics

Weight: 198 g

Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

: DA-SW08-RJ Hardware Specifications

Ethernet Interface

LAN: 8 auto-sensing 10/100 Mbps unmanaged Ethernet switch ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Physical Characteristics

Weight: 200 g

Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

: DA-UPCI-DK Hardware Specifications

Universal PCI Expansion Adaptor

PCI Slots: 1

Interface Bus: 32-bit Universal PCI (3.3 V and 5 V)

Physical Characteristics

Weight: 195 g

Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

MTBF (mean time between failures): 11,053,266 hrs

: DA-FX04-MM-ST-T Hardware Specifications

Fiber Interface

Number of Ports: 4 (100BaseFX)

Fiber Mode: Multi-mode

Connector Type: ST

Optical Wavelength: 0 to 2 km, 1310 nm (62.5/125 μm, 500 MHz*km)

Min-TX Output: -20 dBm

Max-TX Output: -14 dBm

RX Sensitivity: -34 dBm

Physical Characteristics

Weight: 495 g

Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)

Software Functions

IEEE 1588 or IP Teaming Selectable (Default =IP Teaming): Supports 4 modes

AFT: Adaptor Failover Teaming

SFT: Switch Fault Tolerance

ALB: Adaptor Failover and Load Balancing

Link Aggregation: supported

: Compatibility Chart for Peripheral Expansion Modules and Embedded Computers

All expansion modules can be used on any of Moxa's embedded computers that come with the peripheral expansion slots, such as the

Module Models	DA-682	DA-710	DA-683
DA-SP08-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓
DA-SP08-I-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓
DA-SP08-I-TB 8-port Serial Module (RS-232/422/485)	✓	✓	✓
DA-SP38-I-TB 8-port Serial Module (RS-422/485)	✓	✓	✓
DA-LN04-RJ 4-port LAN Module (10/100 Mbps)	✓	✓	✓
DA-SW08-RJ 8-port Switch Module (10/100 Mbps)	✓	✓	✓
DA-UPCI-DK PCI Module	✓	✓	✓
DA-FX04-MM-ST-T 4-port Fiber LAN Module (100 Mbps)	✓	✓	✓

: Ordering Information

Available Models

DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation

DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector

DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation

DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation

DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module

DA-LN04-RJ: 4-port 10/100 Mbps LAN module

DA-UPCI-DK: Universal PCI development kit

DA-FB04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

Package Checklist

- 1 expansion module
- 8 terminal blocks (DA-SP08-I-TB, DA-SP38-I-TB)
- Product notes (printed, DA-SP38-I-TB)

Model Name	Serial Ports		Isolation	Switch	LAN		Connector Type				PCI
	RS-232/422/485	RS-232/485	2 KV Digital	10/100 Mbps	10/100 Mbps (RJ45)	Fiber 100 Mbps (ST)	DB9	RJ45	Terminal Block	Fiber	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	-	-	-	-	-	-	-	-	-	-	✓
DA-FX04-MM-ST-T	-	-	-	-	-	✓	-	-	-	✓	-



Railway Computers

MIRF Computers	3-2
UC-8481 Series RISC-based industrial wireless mobile computer with 2 LANs, 2 serial ports, 2 USB 2.0 hosts, Cellular, Wi-Fi, 2 Mini PCIe sockets, Linux	3-4
TC-6110-24I Series x86-based train computers with Intel Atom D525, dual LANs, 1 serial port, 4 USB ports, VGA, audio, 4 removable trays	3-8
V2616 Series x86 Atom computers—serial, VGA/DVI, audio, DI/DO, USB, CF.	3-12
V2406-24I Series x86 ready-to-run embedded computers with Intel Atom N270, VGA, DVI-I, audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CompactFlash, 24V power input	3-16
V2406 Series x86 Atom computers—VGA, DVI, audio, DI/DO, USB 2.0, SD	3-20
V2416 Series x86 Atom computers—serial, VGA/DVI, audio, DI/DO, USB, CF.	3-24
V2426 Series x86 Atom computers—serial, VGA/DVI, audio, DI/DO, USB, CF.	3-28
V2400 Series Expansion Modules Modules for V2400 Computers	3-32

3

Railway Computers



MIRF Computers



- > Seamless wireless transition
- > Multiple WANs Support and Backup
- > Intelligent policy settings for automatic best WAN selection
- > IP Bonding technology for traffic bandwidth
- > Open and customizable application software for easy integration

: Overview

Moxa Intelligent Routing Framework (MIRF) is an innovative solution for wireless railway passenger network applications. In order to provide commercial-grade multimedia service, system integrators need to develop more value-added software. Unfortunately, open programmable platforms for development may not be readily available.

MIRF is an open and customizable application software that can reduce development time and achieve faster time-to-market. Advantages of MIRF include the following:

- Middleware, example code, and tools are provided, resulting in a friendly environment for programmers to develop software and applications with minimal effort, less cost, and faster time-to-market.
- With intelligent policy configuration, users can easily automate system configuration for heterogeneous networks. In addition, system customization is easier since users can choose the optimal configuration method for various requirements.
- With multiple routing technologies, network bandwidth efficiency is easily optimized and network traffic jams are easily avoided.



: Seamless Wireless Transition

Support and Backup of Multiple WANs

MIRF helps enable seamless WiFi service for train passengers as the train travels across different regions. It is an open-platform tool for managing multiple WANs. When a train travels to a different region, it often faces different wireless interface switches, such as WiFi, UMTS,

HSPA, WiMax, and LTE. By providing support and backup of multiple WANs, MIRF helps ensure an unbroken wireless connection for 100% wireless quality, stability and reliability.

Intelligent Policy Settings: Auto Select the "Best" WAN

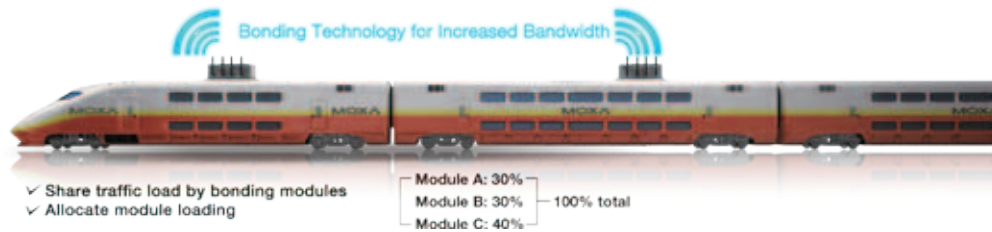
Pre-defined policy for large bandwidth, best signal, and lowest cost WANs

- By time: Specify a schedule for preferred WAN service.
- By geography: Specify a preferred WAN service within geographic coordinates.
- By train speed: Roaming method triggered by speed (e.g., cellular module service can be activated when the train's speed exceeds 30 km/h).
- By device connection:
 - By link up time: Module connection triggered by sustained ping requests.
 - By signal quality level: Module connection triggered by signal quality.

Traffic Optimization

MIRF comes with the IP bonding technology for traffic bandwidth, and can increase bandwidth to share traffic workload. Various modules can be pre-configured to fit the different scenarios and help share the wireless communication workload. System providers

can easily establish the most optimal architecture for the wireless data transmission; both WiFi and 3G communications can be easily integrated and optimized.

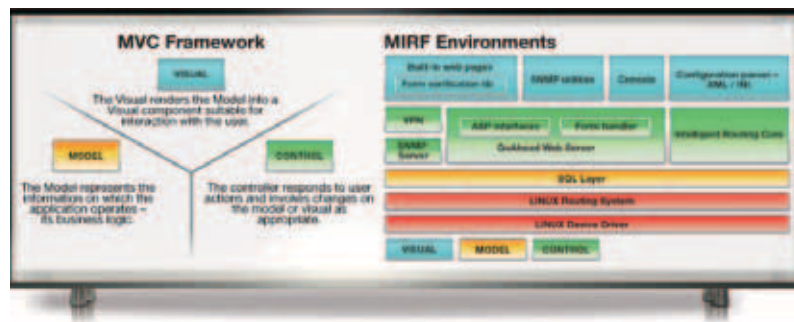


Open and Customizable Application Software

MIRF provides high flexibility for application software utility configuration and customization. Based on the MVC framework, MIRF allows users to configure the interface as needed. For example, the web browser, SNMP utilities, and console can all be customized for specific needs, and new functions can be easily added.

MIRF also provides an open platform for programmers to perform system development and configuration with less effort. Customization and system establishment can be easily and quickly achieved, making faster time-to-market possible.

- Ready to run with product software and component templates
- Easily leverage open source software packages
- Easily bundle customer applications
- Highly adaptable for different purposes
 - Applications
 - Visual components



Ordering Information

Available Models

V2426-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, 2 peripheral expansion slots, MIRF, Windows Embedded Standard 2009, -25 to 60°C operating temperature (EN 50155 Class T1)

UC-8481-LX: RISC-based industrial wireless mobile computer with 2 LANs, 2 serial ports, 4 DIs, 4 DOs, 2 USB 2.0 hosts, CF, cellular, WiFi, 2 Mini PCIe sockets, Linux, -25 to 55°C operating temperature (EN 50155 Class T1)

UC-8481 Series

RISC-based industrial wireless mobile computer with 2 LANs, 2 serial ports, 2 USB 2.0 hosts, Cellular, Wi-Fi, 2 Mini PCIe sockets, Linux



- > Intel XScale IXP435 533 MHz processor
- > 512 MB DDR2 SDRAM
- > 512 MB NAND Flash for data storage
- > 32 MB NOR Flash to store OS
- > Fanless and rugged design for rolling stock applications that require EN 50155 standards
- > Multiple wireless module capability for cross-operator applications
- > Wireless and GPS modules for multiple communications
- > Power cutoff of USB interface for individual WLAN and cellular modules
- > Ready-to-run Embedded Linux
- > -40 to 70°C wide temperature model available



Overview

The UC-8481 embedded computer comes with 2 RS-232/422/485 serial ports, 2 Ethernet ports, 4 digital input channels, 4 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts.

The computer uses the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 512 MB SDRAM give you enough memory to run your application software directly on the UC-8481, and the 512 MB NAND Flash can be used to provide additional data storage.

Mostly importantly, the UC-8481 series comes with seven connectors that allow users to connect various wireless and GPS modules. This is

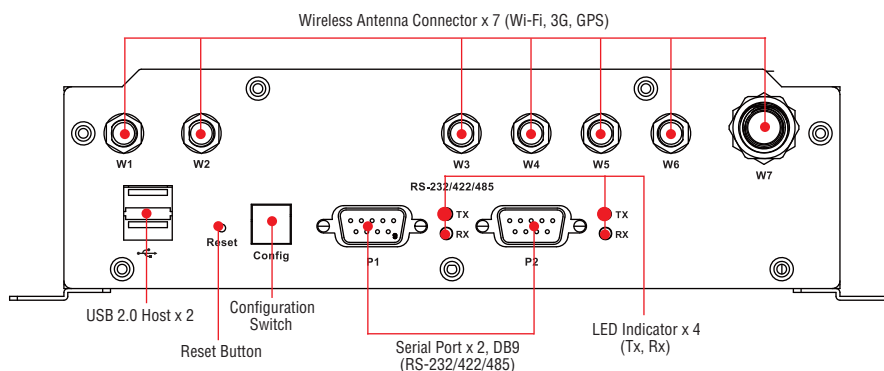
particularly useful and well-suited for rolling stock applications used on moving vehicles, and makes it easy to construct an intelligent, cost-effective wireless communication platform.

Pre-installed with the Linux 2.6 platform, the UC-8481 series provides an open software operating system for software program development. Software written for a desktop PC can be easily ported to the UC-8481 platform by using a common compiler, without needing to modify the code. This makes the UC-8481 an optimal solution for use with industrial applications, but with minimal cost and effort.

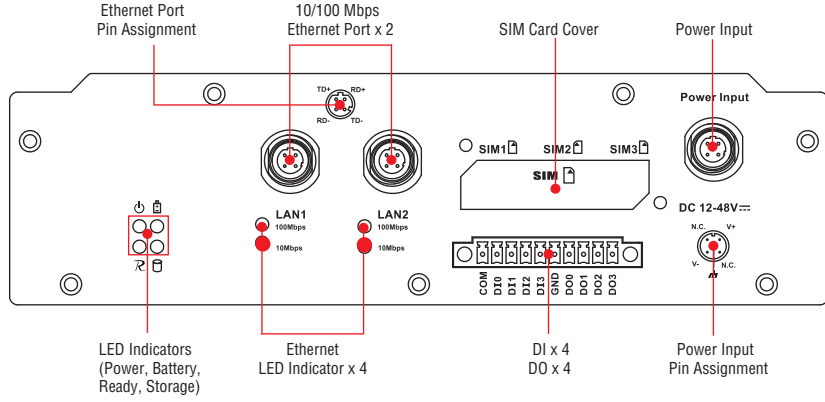
A wide temperature model of the UC-8481, designed to operate reliably in temperatures ranging from -40 to 70°C, is also available.

Appearance

Front View

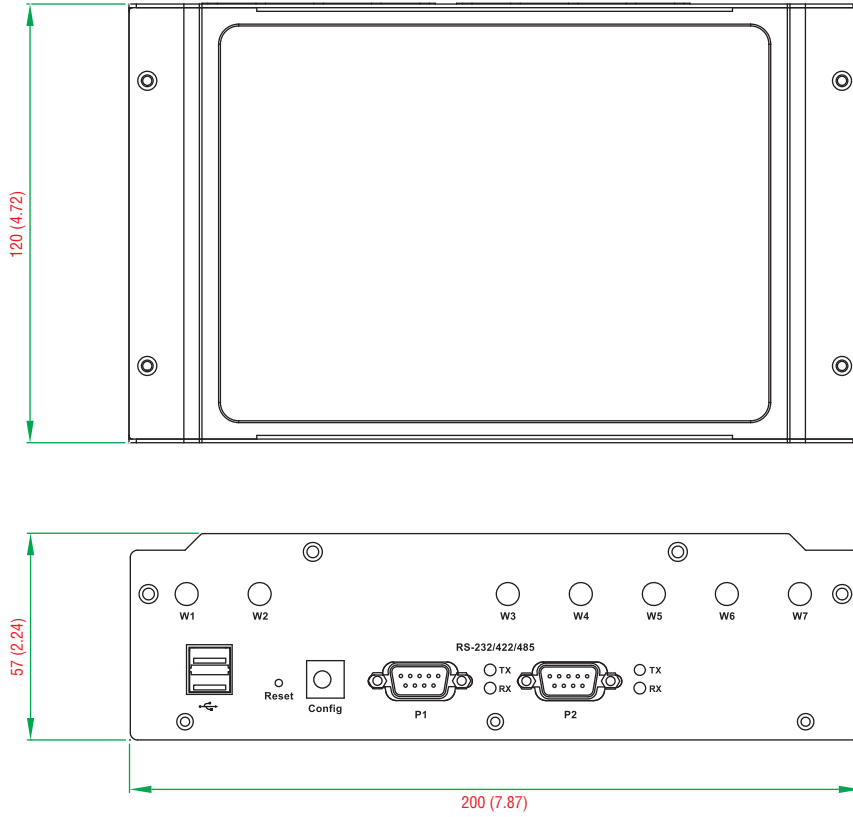


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux

DRAM: 512 MB DDR2 SDRAM onboard

Flash:

32 MB NOR Flash onboard to store OS

512 MB NAND Flash, up to 1 GB for OS file system, caching storage, and data logger

USB: USB 2.0 hosts x 2

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (M12)

Magnetic Isolation Protection: 1.5 KV built in

GPS Interface

Tracking: Tracks up to 13 satellites, L1 1575.42 MHz

Accuracy Position: 2.5 m CEP; 2.0 m SEP

Protocols: NMEA-0183 V2.3, E911 AGPS Control plane, GPS dedicated AT commands, Date WGS-84

Tracking Sensitivity: -160 dBm (with active antenna)

Start-up Time:

- Hot start: 1 s
- Cold start: 28 s
- Warm start: 28 s
- Aided start: 1 s

GPS Active Antenna Supply: 3.3 V

Connector Type: TNC

WLAN Module

WAPN001: IEEE802.11a/b/g/n wireless LAN module with TNC antenna connector

Standards: IEEE802.11a/b/g/n for wireless LAN

Connector Type: QMA connector (female type) x 2

Mode: Client

Cellular Module

Frequency Bands: GSM/GPRS/EDGE/UMTS/HSPA+

Band Options:

- Five band UMTS(WCDMA/FDD)
- 800/850/1900 AWS and 2100 MHz
- Quad-band GSM: 850/900/1800/1900 MHz

HSDPA/HSUPA Data Rates:

DL: 3.6/7.2/14.4 Mbps; UL: 2.0/5.76 Mbps

UMTS Data Rates:

DL: max 384 Kbps; UL: max 384 Kbps

EDGE Class 12:

DL: max 237 Kbps; UL: max 237 Kbps

GPRS Class 12:

DL: max 85.6 Kbps; UL: max 85.6 Kbps

Connector Type: QMA connector (female type) x 1

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9)

Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (4 points, COM, GND)

Isolation: 2 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 10-pin screw terminal block (4 points, GND)

LEDs

System: Power, Ready, Storage, Battery for SRAM

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 2, RxD x 2

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 1 kg

Dimensions: 200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:

Standard Models: -25 to 55°C (-13 to 131°F)

Wide Temp. Models: -40 to 70°C (-40 to 158°F)

Storage Temperature:

Standard Models: -25 to 75°C (-13 to 167°F)

Wide Temp. Models: -40 to 80°C (-40 to 176°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: IEC 61373 standard

Anti-shock: IEC 61373 standard

Power Requirements

Input Voltage: 24 VDC (9 to 48 V), M12 connector

Power Consumption: 14 W

- 533 mA @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, EN 60950-1

EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B

Rail Traffic: EN 50155, EN 50121-2-3, EN 50121-4, IEC 61373

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures): ?? hrs

Warranty

Warranty Period: 5 years (does not apply to cellular module)

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

: Software Specifications

Linux

OS: Linux 2.6.38

File System: JFFS2, NFS, Ext2, Ext3, YAFFS2

Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall, OpenSSL

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Wireless: wpa_supplicant is configured using a text file that lists all accepted networks and security policies, including pre-shared keys.

GPS: gpsd is a daemon that receives data from a GPS receiver, and provides the data back to multiple applications such as Kismet or GPS navigation software.

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)

- GNU C/C++ cross-compiler, supports EABI

- GNU C library

- GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

: Ordering Information

Available Models

UC-8481-LX: RISC-based industrial wireless mobile computer with 2 LANs, 2 serial ports, 4 DIs, 4 DOs, 2 USB 2.0 hosts, CF, cellular, Wi-Fi, 2 Mini PCIe sockets, Linux OS, -25 to 55°C operating temperature (EN 50155 Class T1)

UC-8481-T-LX: RISC-based industrial wireless mobile computer with 2 LANs, 2 serial ports, 4 DIs, 4 DOs, 2 USB 2.0 hosts, CF, cellular, Wi-Fi, 2 Mini PCIe sockets, Linux OS, -40 to 70°C operating temperature (EN 50155 Class TX)

Package Checklist

- UC-8481 embedded computer
- Wall mounting kit
- DIN-Rail mounting kit
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including power jack converter)
- Documentation and software CD or DVD
- Quick installation guide (printed)

TC-6110-24I Series

Preliminary

x86-based train computers with Intel Atom D525, dual LANs, 1 serial port, 4 USB ports, VGA, audio, 4 removable trays



- > Fanless and rugged design for rolling stock applications that require EN 50155 standards
- > Protective conformal coating to prevent moisture, dust, and corrosion
- > High performance platform supporting up to 8-channel IP camera with full D1 live view video
- > 3U high compact design, 24 VDC isolated power supply
- > Modular design for easy storage and peripheral expansion
- > HDD protection with Moxa SafeGuard Technology for wide temperature and high vibration environments
- > SNMP-based system configuration and monitoring supported

Introduction

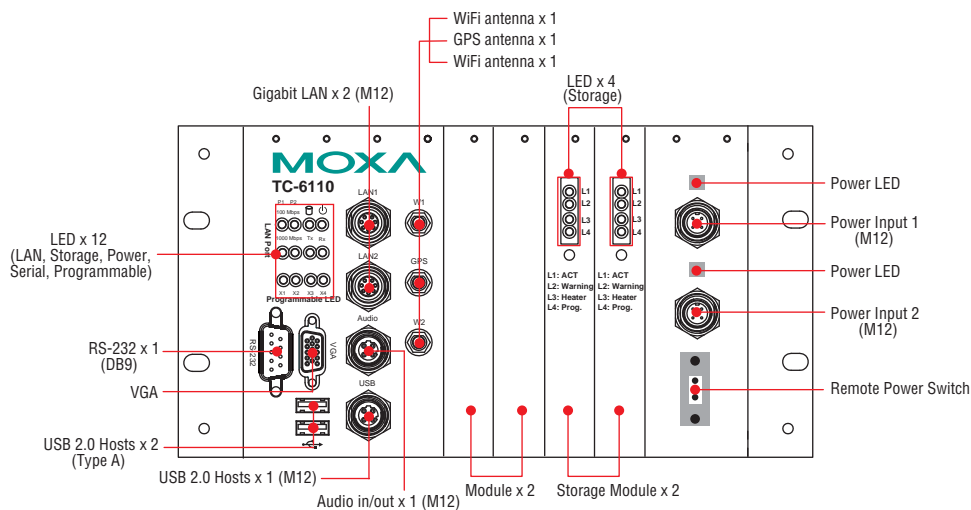
The TC-6110-24I train computers are specifically design for the applications used on trains. They comes with 2 Gigabit LAN ports, 1 RS-232 serial port, 4 USB 2.0 hosts, and 4 expansion slots for inserting various modules, offering the ideal solution for the train applications.

Providing the high reliability for train operation, the TC-6110-24I computers come with M12 connectors for Gigabit LAN ports, USB ports, and the dual power inputs. In addition, the expansion modules

offer high flexibility for system integration. Users can easily add the storage modules for additional data storage capacity; the Gigabit switch modules can also help expand the device connection; the wireless module can even help establish the wireless communication at the lower cost.

All TC-6110 Series computers comes with conformal coating design, promising the most reliable operation for component protection under harsh environment.

Appearance



: Hardware Specifications

Computer

CPU: Intel Atom D525 1.8 GHz, 1 MB for L2 cache

OS (pre-installed): Linux or Windows Embedded Standard 2009

System Chipset: Intel Pinview-D + ICH8-M

System Memory: 2 200-pin DDR3 SODIMM sockets supporting DDR3 up to 4 GB, with 2 GB built in

USB: 3 USB 2.0 compliant hosts; 2 with type A connectors supporting system bootup, 1 with M12 connector

Storage

Built-in: 4 GB onboard industrial CompactFlash card to store OS

HDD Support: Removable Trays: Supports storage trays for 2.5" SSD or HDD, with 2 built-in slots

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: Line-in, line-out interface

Display

Graphics Controller: Intel GS45 Integrated Graphics Engine

VGA Interface: DB15 female connector, up to 2048 x 1536 resolution

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (M12)

Serial Interface

Serial Standards: 2 software-selectable RS-232/422/485 ports* (DB9 male)

Optical Isolation Protection: 2 KV

ESD Protection: 4 KV for all signals

Magnetic Isolation Protection: 1.5 KV built-in

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxDA(-), TxDB(+), RxDB(+), RxDA(-), GND

RS-485-4w: TxDA(-), TxDB(+), RxDB(+), RxDA(-), GND

RS-485-2w: DataA(-), DataB(+), GND

LEDs

System: Power x 1, Storage x 1

LAN: 100M/Link x 2, 1000M/Link x 2

Serial: TX x 1, RX x 1

Other: Programmable x 4

Switches and Buttons

Power Switch: on/off (front panel)

Reset Button: For warm reboot (front panel)

Physical Characteristics

Housing: Aluminum

Weight: 5 kg

Dimensions:

Without ears: 287 x 250 x 101 mm (11.29 x 9.84 x 3.97 in)

With ears: 287 x 290 x 101 mm (11.29 x 11.41 x 3.97 in)

Mounting: wall

Environmental Limits

Operating Temperature:

• Standard models: -25 to 55°C (-13 to 140°F), (EN 50155 T1)

• Wide temp. models: -40 to 70°C (-40 to 158°F), (EN 50155 Tx)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: EN 50155 standard

Anti-shock: EN 50155 standard

Power Requirements

Input Voltage: 24 VDC (9 to 36 V), M12 connector

Power Consumption: 50 W

• 2 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1

EMC: EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN

55024, FCC Part 15 Subpart B Class A

Rail Traffic: EN 50155, EN 50121-2-3, EN 50121-4, IEC 61373

Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

: TC-SATA-T Storage Module Specifications

SATA Interface

Description: 2.5" SATA, hot swappable, with anti-vibration, G-sensor, temperature sensor

LEDs:

- Storage status x 1
- Warning x 1
- Heater x 1
- Programmable x 1

Physical Characteristics

Weight: 200 g

Dimensions: 160 x 30 x 100 mm (6.30 x 1.18 x 39.4 in)

Environmental Limits

Operating Temperature:

Standard Temp. Models: -25 to 55°C (-13 to 131°F) (EN 50155 T1)

Wide Temp. Models: -40 to 70°C (-40 to 158°F) (EN 50155 Tx)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

: TC-PoE04-M12 Switch Module Specification (Pending)

Ethernet Interface

Switch Ports: 4 auto-sensing 10/100/1000 Mbps PoE ports (M12), hot swappable

Standards: IEEE 802.3af/at for Power-over-Ethernet

PSE: Power Source Equipment

Power Consumption: 15.4 watts per port (up to 4 ports, needs 150 W power module)

Protection: 1.5 KV magnetic isolation protection built in

LEDs: 100M Link x 1 Act/Link; 1000M Act/Link x 1

Physical Characteristics

Weight: 220 g

Dimensions: 160 x 30 x 100 mm (6.30 x 1.18 x 39.4 in)

Environmental Limits

Operating Temperature:

Standard Temp. Models: -25 to 55°C (-13 to 131°F) (EN5 0155 T1)

Wide Temp. Models: -40 to 70°C (-40 to 158°F) (EN 50155 Tx)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

: TC-WL01 Wireless Communication Module (Pending)

Cellular Interface

Standards: GSM/GPRS/EDGE/UMTS/HSPA+

Band Options: Five band UMTS(WCDMA/FDD) 800/850/1900 AWS and 2100 MHz

Quad-band GSM: 850/900/1800/1900 MHz

HSDPA/HSUPA Data Rates:

- DL:3.6/7.2/14.4 Mbps , UL: 2.0/5.76 Mbps
- UMTS data rates
- DL: max 384kbps, UL: max 384kbps
- EDGE class 12
- DL: max 237kbps, UL: max 237kbps
- GPRS class 12
- DL: max 85.6kbps, UL: max 85.6kbps

Connector Type: QMA connector (female type) x 1

WLAN Interface

Standards: IEEE 802.11a/b/g/n

Connector Type: QMA x 2 (female type)

Physical Characteristics

Weight: 220 g

Dimensions: 160 x 30 x 100 mm (6.30 x 1.18 x 39.4 in)

Environmental Limits

Operating Temperature:

Standard Temp. Models: -25 to 55°C (-13 to 131°F) (EN5 0155 T1)

Wide Temp. Models: -40 to 70°C (-40 to 158°F) (EN 50155 Tx)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

: Software Specifications

Linux

OS: Linux 2.6.32, Debian Squeeze 6.0

File System: EXT2/EXT3

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ compiler
- GNU C library
- Perl

Windows XP Embedded

OS: Windows Embedded Standard 2009 SP3

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 4: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

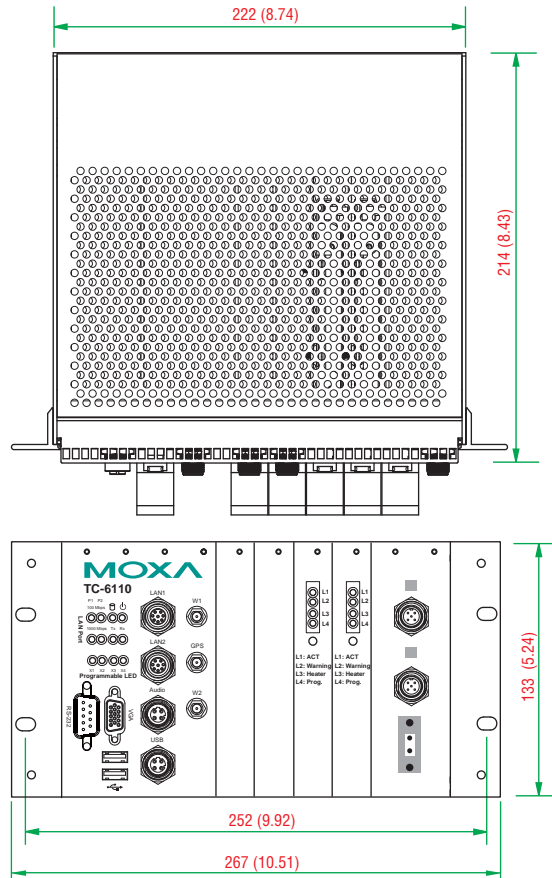
File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TC-6110-24I-CT-XPE: 3U/42HP train computer with Atom D525-1.8Ghz, 24 VDC isolated power, conformal coating, Windows Embedded Professional, EN 50155 T1

TC-6110-24I-CT-LX: 3U/42HP train computer with Atom D525-1.8Ghz, 24 VDC isolated power, conformal coating, Linux, EN 50155 T1

TC-6110-24I-CT-T-XPE: 3U/42HP train computer with Atom D525-1.8Ghz, 24 VDC isolated power, conformal coating, Windows Embedded Professional, EN 50155 TX

TC-6110-24I-CT-T-LX: 3U/42HP train computer with Atom D525-1.8Ghz, 24 VDC isolated power, conformal coating, Linux, EN 50155 TX

Optional Accessories (can be purchased separately)

PWR-24250-DT-S1: Power adaptor

PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug

PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug

PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug

PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug

PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

DK-DC50131-01: DIN-Rail mounting kit

Storage Modules

TC-SATA-T: 2.5-inch storage module with temperature management

TC-PoE04-M12: 4-port PoE Gigabit Ethernet switch module with M12 connector

Communication Modules

TC-WL01: Wireless module with WiFi and UMTS/HSPA+

Package Checklist

- TC-6110-24I train computer
- Rackmount kit
- Wallmount kit
- Quick installation guide (printed)
- Documentation and software CD or DVD
- Warranty card

V2616 Series

x86-based embedded computer with Intel Core 2 Duo, dual LANs (M12 connectors), serial ports, 6 DIs, 2 DOs, VGA, DVI-D, 3 USB ports, 1 SATA storage connector, 2 removable storage trays, CompactFlash



- > High performance network video recorder for rolling stock applications
- > EN 50155 certified for temperature ranges up to Class T1
- > EN 50121-3-2 certified for railway applications
- > IEC 61373 certified for shock and vibration resistance
- > One internal SATA II storage tray for 2.5" SSD or HDD
- > Two removable storage trays for 2.5" SSDs or HDDs
- > Supports RAID 1/0 functions for data reliability



Introduction

The V2616 Series EN 50155 certified embedded computers are based on the Intel Core 2 Duo SP9300 x86 processor and feature 2 RS-232/422/485 serial ports, dual LAN ports, and 3 USB 2.0 hosts. In addition, the V2616 computers provide VGA and DVI-D outputs and their EN 50155 certification makes them robust enough for railway and industrial applications.

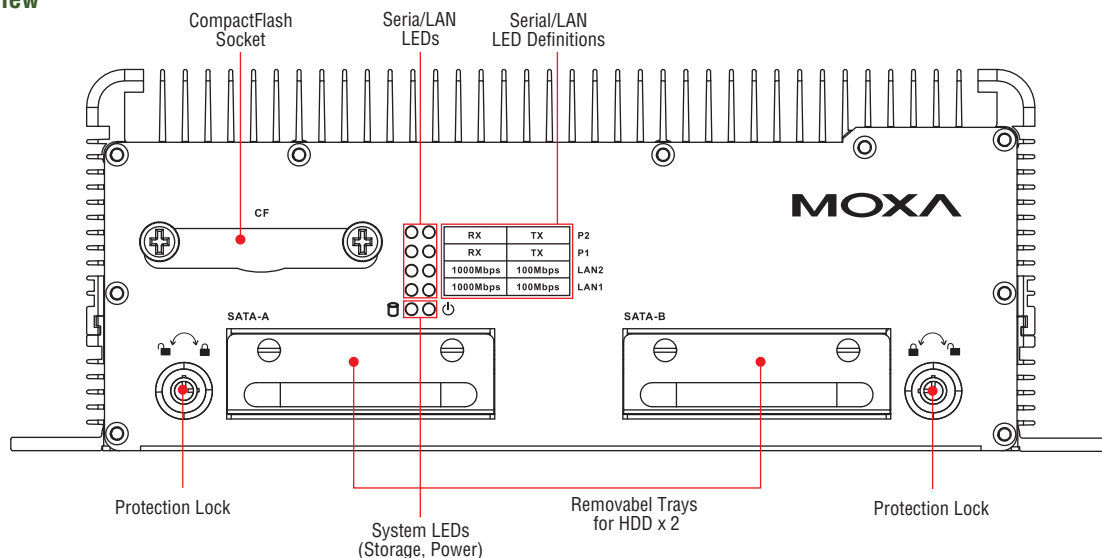
In addition, the CompactFlash socket and the internal SATA II storage tray provide the V2616 computers with the reliability needed

for industrial applications that require data buffering and storage expansion. Most importantly, the V2616 computers come with 2 removable slots for inserting additional storage media, such as hard disks or SSD drives, and can offer RAID 0 and RAID 1 functions for data reliability.

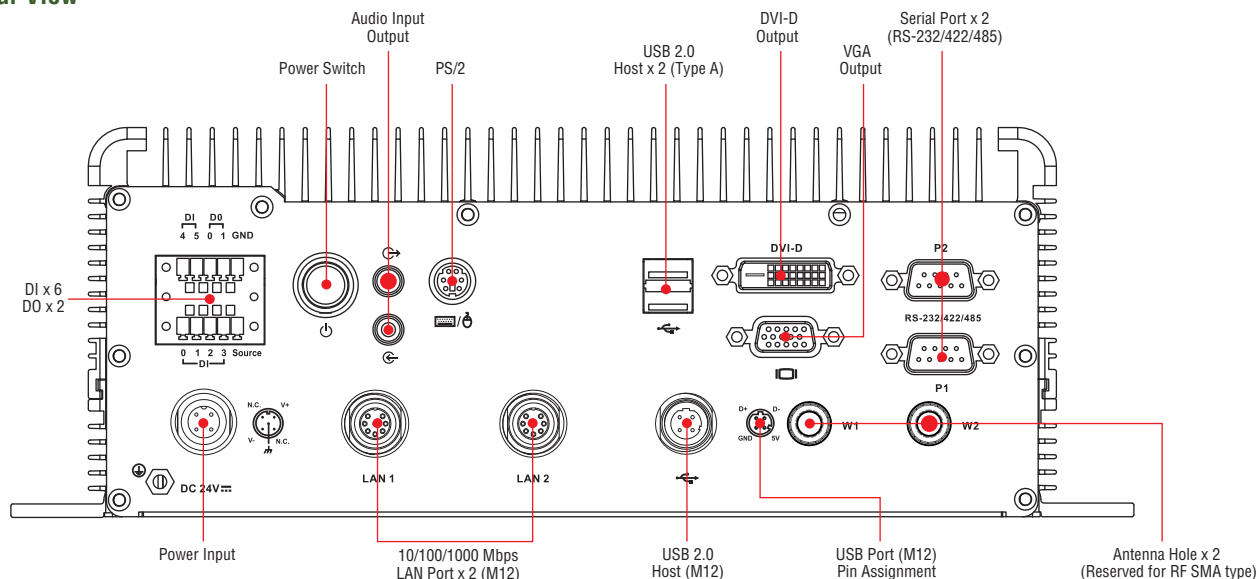
The V2616 series come pre-installed with Linux or Windows Embedded Standard 2009 to provide programmers with a familiar environment in which to develop sophisticated, bug-free application software at a low cost.

Appearance

Front View



Rear View



: Hardware Specifications

Computer

CPU: Intel Core 2 Duo SP9300 2.26 GHz, 6 MB for L2 cache

OS (pre-installed): Linux or Windows Embedded Standard 2009

System Chipset: Intel GS45 + ICH9-M

System Memory: 2 200-pin DDR3 SODIMM sockets supporting DDR3 up to 4 GB, with 2 GB built in

USB: 3 USB 2.0 compliant hosts; 2 with type A connectors supporting system bootup, 1 with M12 connector

Storage

Built-in: 2 GB onboard industrial CompactFlash card to store OS

HDD Support:

HDD: 1 internal SATA II storage tray for 2.5" SSD or HDD

Removable Trays: Support for 2 storage trays for 2.5" SSD or HDD

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: Line-in, line-out interface

Display

Graphics Controller: Intel GS45 Integrated Graphics Engine

VGA Interface: DB15 female connector, up to 2048 x 1536 resolution

DVI Interface: DVI-D connector (chrontel CH7307 SDVO to DVI transmitter), up to 1600 x 1200 resolution

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (M12)

Serial Interface

Serial Standards: 2 software-selectable RS-232/422/485 ports* (DB9 male)

Optical Isolation Protection: 2 KV

ESD Protection: 4 KV for all signals

Magnetic Isolation Protection: 1.5 KV built-in

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxDA(-), TxDB(+), RxDB(+), RxDA(-), GND

RS-485-4w: TxDA(-), TxDB(+), RxDB(+), RxDA(-), GND

RS-485-2w: DataA(-), DataB(+), GND

Digital Input

Input Channels: 6, source type

Input Voltage: 0 to 30 VDC at 25 Hz

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (Source to DI)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 2, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 VDC

Connector Type: 10-pin screw terminal block (6 DI points, 2 DO points, DI Source, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power x 1, Storage x 1

LAN: 100M/Link x 2, 1000M/Link x 2

Serial: TX x 2, RX x 2

Switches and Buttons

Power Switch: on/off (front panel)

Reset Button: For warm reboot (front panel)

Physical Characteristics

Housing: Aluminum

Weight: 5 kg

Dimensions:

Without ears: 287 x 250 x 101 mm (11.29 x 9.84 x 3.97 in)

With ears: 287 x 290 x 101 mm (11.29 x 11.41 x 3.97 in)

Mounting: wall

Environmental Limits

Operating Temperature: (with SSD installed) -25 to 55°C (-13 to 140°F)

Storage Temperature: (with SSD installed) -30 to 60°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: EN 50155 standard

Anti-shock: EN 50155 standard

Power Requirements

Input Voltage: 24 VDC (9 to 36 V), M12 connector

Power Consumption: 50 W

- 2 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1

EMC: EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A

Rail Traffic: EN 50155, EN 50121-2-3, EN 50121-4, IEC 61373

Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.32, Debian Squeeze 6.0

File System: EXT2/EXT3

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ compiler
- GNU C library
- Perl

Windows XP Embedded

OS: Windows Embedded Standard 2009 SP3

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SNMP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 4: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

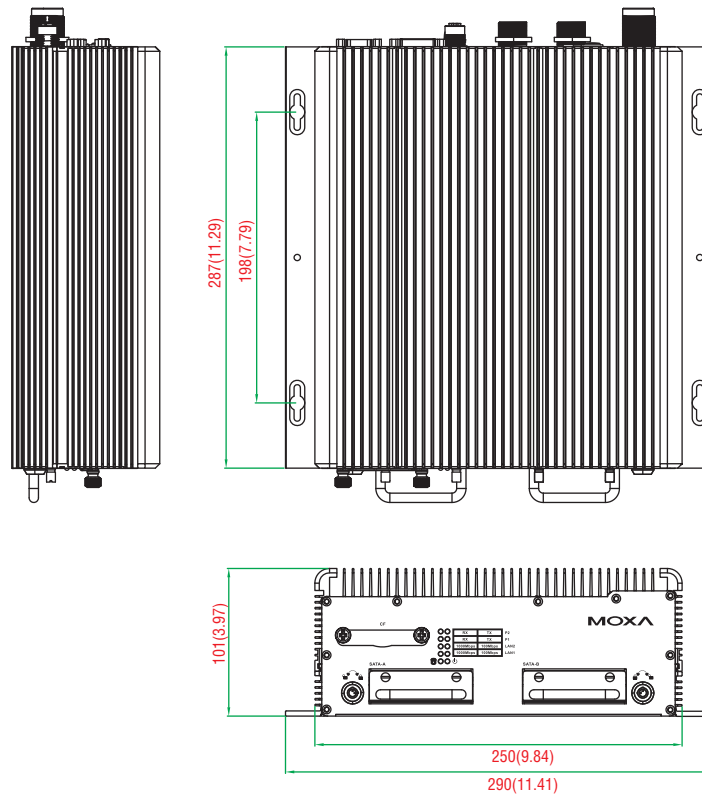
File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

V2616-XPE: x86 Embedded computer with Intel Core 2 Duo, VGA, DVI, 2 LANs, 2 Serial Ports, 6 DIs, 2 DOs, 3 USB 2.0 Ports, 24 VDC Power, Windows XPE, -25 to 55°C operating temperature (EN 50155 Class T1)

V2616-LX: x86 Embedded computer with Intel Core 2 Duo, VGA, DVI, 2 LANs, 2 Serial Ports, 6 DIs, 2 DOs, 3 USB 2.0 Ports, 24 VDC Power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1)

Optional Accessories (can be purchased separately)

PWR-24250-DT-S1: Power adaptor

PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug

PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug

PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug

PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug

PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

DK-DC50131-01: DIN-Rail mounting kit

M12 Connectors (can be purchased separately)

M12A-5P-IP68: Field-installation A-coded screw-in power connector, 5-pin female M12 connector, IP68-rated

M12A-8PMM-IP68: Field-installation A-coded screw-in Gigabit Ethernet connector, 8-pin female M12 connector, IP68-rated

M12A-5PMM-IP68: D-coded screw-in USB connector, 5-pin male M12 connector, IP68-rated

M12 Cables (can be purchased separately)

CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated

CBL-M12MM8PRJ45-BK-100-IP67: 1-meter A-coded M12-to-RJ45 Cat-5E UTP Gigabit Ethernet cable, 8-pin male M12 connector, IP67-rated

Package Checklist

- V2616 embedded computer
- Wall mounting Kit
- PS2 to KB/MS Y-type cable
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V2406-24I Series

x86 ready-to-run embedded computers with Intel Atom N270, VGA, DVI-I, audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CompactFlash, 24V power input



- > Intel Atom N270 1.6 GHz processor
- > DDR2 SODIMM socket supporting DDR2 533 up to 2 GB (max.)
- > Dual independent displays (VGA + DVI-I)
- > 2 10/100 Mbps Ethernet ports with M12 connectors
- > 4 RS-232/422/485 serial ports (non-standard baudrates supported)
- > 3 USB 2.0 ports for high speed peripherals
- > 6 DIs, 2 DOs
- > CompactFlash socket for storage expansion
- > 1 SATA-II connector for hard disk drive expansion
- > M12 power connector
- > EN 50155 certified
- > Ready-to-run Embedded Linux, or Windows Embedded Standard 2009 platform
- > -40 to 70°C wide temperature models available
- > Conformal coating models available



Introduction

The V2406-24I computers come with 4 RS-232/422/485 serial ports, making them ideal for connecting a wide range of serial devices, and the dual 10/100 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2406-24I computers have 6 DIs and 2 DOs for connecting digital input/output devices.

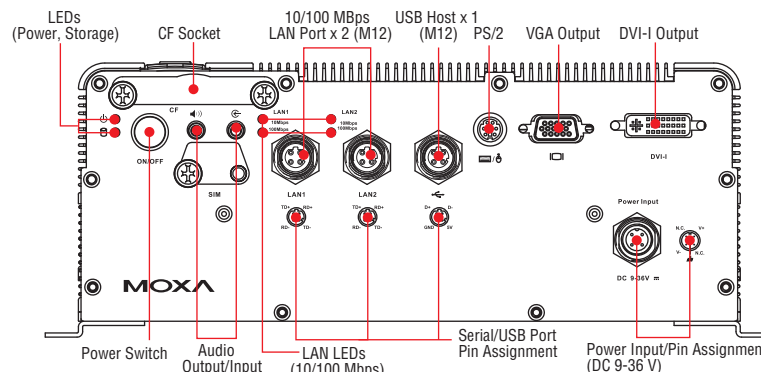
CompactFlash and USB sockets provide the V2406-24I computers with the reliability needed for industrial applications that require data buffering and storage expansion.

Pre-installed with Linux or Windows Embedded Standard 2009, the V2406-24I computers provide programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost.

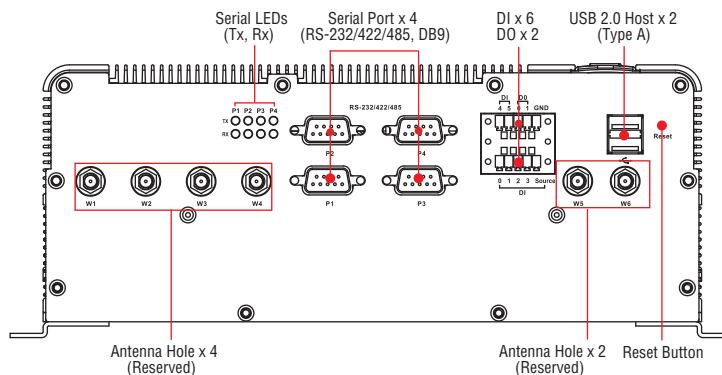
Models with conformal coating are also available to offer reliable operation during harsh environments for a variety of industrial applications.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: Intel Atom N270 1.6 GHz processor
OS (pre-installed): Linux or Windows Embedded Standard 2009
System Chipset: Intel 945GSE + ICH7-M
BIOS: 8 Mbit Flash BIOS, PLCC type, ACPI function supported
FSB: 533 MHz
System Memory: 1 x 200-pin DDR2 SODIMM socket supporting DDR2 533 up to 2 GB; 1 GB built in
USB: USB 2.0 compliant hosts, type A connectors x 2; supports system boot up, M12 connector x 1

Storage

Built-in: 2 GB onboard industrial DOM to store OS
Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II
HDD Support: 1 SATA-II connector for HDD expansion

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable
Audio: Line-in, line-out interface

Display

Graphics Controller: Intel Gen 3.5 Integrated Graphics Engine, 250 MHz core render clock and 200 MHz core display clock at 1.05-V core voltage
VGA Interface: DB15 female connector, up to 2048 x 1536 resolution
DVI Interface: DVI-I connector (chrontel CH7307 SDVO to DVI transmitter), up to 1600 x 1200 resolution

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (M12)

Serial Interface

Serial Standards: 4 RS-232/422/485 ports*, software selectable (DB9 male)

*COM1's pin 9 signal can be set by jumper as N/C (default), +5 V, or +12 V

ESD Protection: 8 KV for all signals

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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

Digital Input

Input Channels: 6, source type

Input Voltage: 0 to 30 VDC at 25 Hz

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (Source to DI)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 2, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 VDC

Connector Type: 10-pin screw terminal block (6 DI points, 2 DO points, DI Source, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power, Storage

LAN: 10M/Link x 2, 100M/Link x 2

Serial: TX x 4, RX x 4

Switches and Buttons

Power Switch: on/off (front panel)

Reset Button: For warm reboot (front panel)

Physical Characteristics

Housing: Aluminum

Weight: 4 kg

Dimensions:

Without ears: 250 x 98 x 154 mm (9.84 x 3.86 x 6.06 in)

With ears: 275 x 104 x 154 mm (10.83 x 4.09 x 6.06 in)

Mounting: DIN-Rail, wall, VESA

Environmental Limits

Operating Temperature:

Standard models: -25 to 60°C (-13 to 140°F)

Wide temp. models: -40 to 70°C (-40 to 158°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: EN 50155 standard

Anti-shock: EN 50155 standard

Power Requirements

Input Voltage: 12 to 48 VDC (M12 connector)

Power Consumption: 26 W

2.16 A @ 12 VDC

1.08 A @ 24 VDC

542 mA @ 48 VDC

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1
EMC: EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Rail Traffic: EN 50155, EN 50121-3-2, EN 50121-4, IEC 61373
Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.26, Debian Lenny 5.0

File System: EXT2

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ compiler
- GNU C library
- Perl

Windows XP Embedded

OS: Windows Embedded Standard 2009 SP3

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 2.0: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

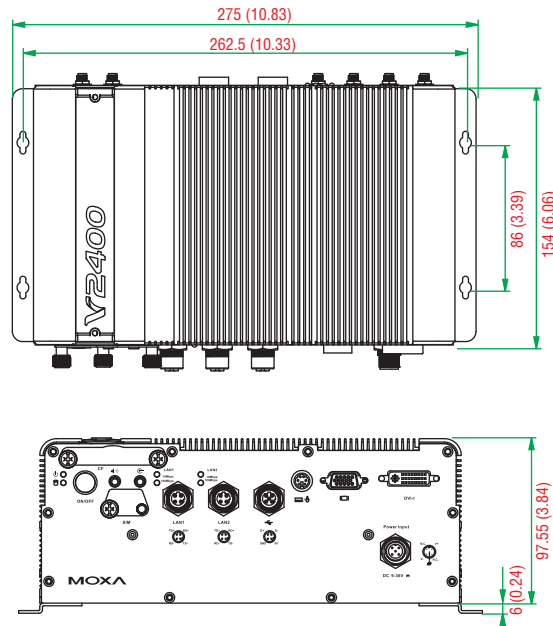
File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Dimensions

Unit: mm (inch)



: Ordering Information

Available Models

V2406-24I-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, Windows Embedded Standard 2009, -25 to 60°C operating temperature (EN 50155 Class T1)

V2406-24I-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, Linux 2.6, -25 to 60°C operating temperature (EN 50155 Class T1)

V2406-24I-T-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, Windows Embedded Standard 2009, -40 to 70°C operating temperature (EN 50155 Class TX)

V2406-24I-T-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, Linux 2.6, -40 to 70°C operating temperature (EN 50155 Class TX)

V2406-24I-CT-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, conformal coating, Windows Embedded Standard 2009, -25 to 60°C operating temperature (EN 50155 Class T1)

V2406-24I-CT-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, conformal coating, Linux 2.6, -25 to 60°C operating temperature (EN 50155 Class T1)

V2406-24I-CT-T-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, conformal coating, CF, Windows Embedded Standard 2009, -40 to 70°C operating temperature (EN 50155 Class TX)

V2406-24I-CT-T-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, conformal coating, Linux 2.6, -40 to 70°C operating temperature (EN 50155 Class TX)

Optional Accessories (can be purchased separately)

PWR-24250-DT-S1: Power adaptor

PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug

PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug

PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug

PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug

PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

FK-75125-02: Hard disk installation package (for HDD, SSD, EN 50155)

DK-DC50131-01: DIN-Rail mounting kit

M12 Connectors (can be purchased separately)

M12A-5P-IP68: Field-installation A-coded screw-in power connector, 5-pin female M12 connector, IP68-rated

M12D-4P-IP68: Field-installation D-coded screw-in Ethernet connector, 4-pin male M12 connector, IP68-rated

M12A-5PMM-IP68: D-coded screw-in USB connector, 5-pin male M12 connector, IP68-rated

M12 Cables (can be purchased separately)

CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated

CBL-M12D(MM4P)/RJ45-100 IP67: 1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated

V2406 Series

x86 ready-to-run embedded computers with Intel Atom N270, VGA, DVI-I, audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, Compact-Flash



- > Intel Atom N270 1.6 GHz processor
- > DDR2 SODIMM socket supporting DDR2 533 up to 2 GB (max.)
- > Dual independent displays (VGA + DVI-I)
- > 2 10/100 Mbps Ethernet ports with M12 connectors
- > 4 RS-232/422/485 serial ports (non-standard baudrates supported)
- > 3 USB 2.0 ports for high speed peripherals
- > 6 DIs, 2 DOs
- > CompactFlash socket for storage expansion
- > 1 SATA-II connector for hard disk drive expansion
- > M12 power connector
- > EN 50155 certified
- > Ready-to-run Embedded Linux, or Windows Embedded Standard 2009 platform
- > -40 to 70°C wide temperature models available



EN 50155



Overview

The V2406 Series embedded computers are based on the Intel Atom N270 x86 processor, and feature 4 RS-232/422/485 serial ports, dual LAN ports, and 3 USB 2.0 hosts. In addition, the V2406 computers provide VGA and DVI-I outputs, and are EN 50155 certified, making them particularly well-suited for railway and industrial applications.

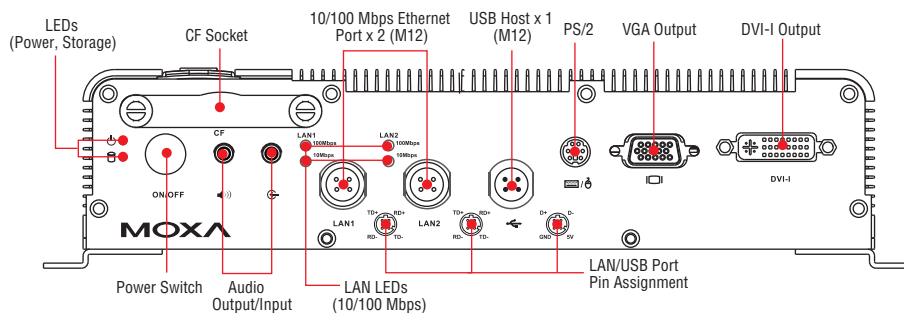
The dual 10/100 Mbps Ethernet ports with M12 connectors offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2406 computers have 6 DIs and 2 DOs for connecting digital input/output devices, and the CompactFlash feature

provides the reliability needed for industrial applications that require data buffering and storage expansion.

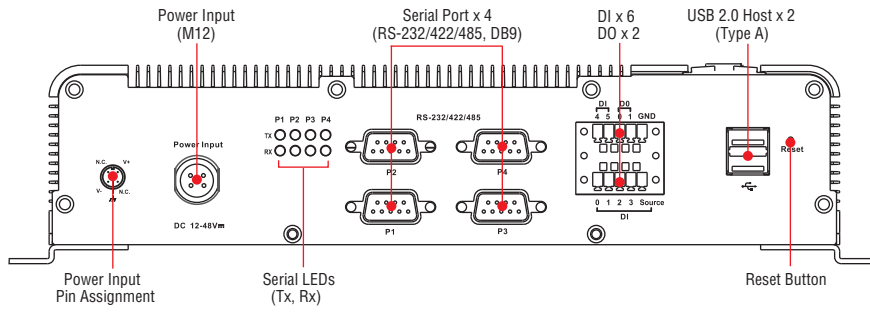
Pre-installed with Linux or Windows Embedded Standard 2009, the V2406 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost. Wide temperature models of the V2406 Series that operate reliably in a -40 to 70°C operating temperature range are also available, offering an optimal solution for applications subjected to harsh environments.

Appearance

Front View

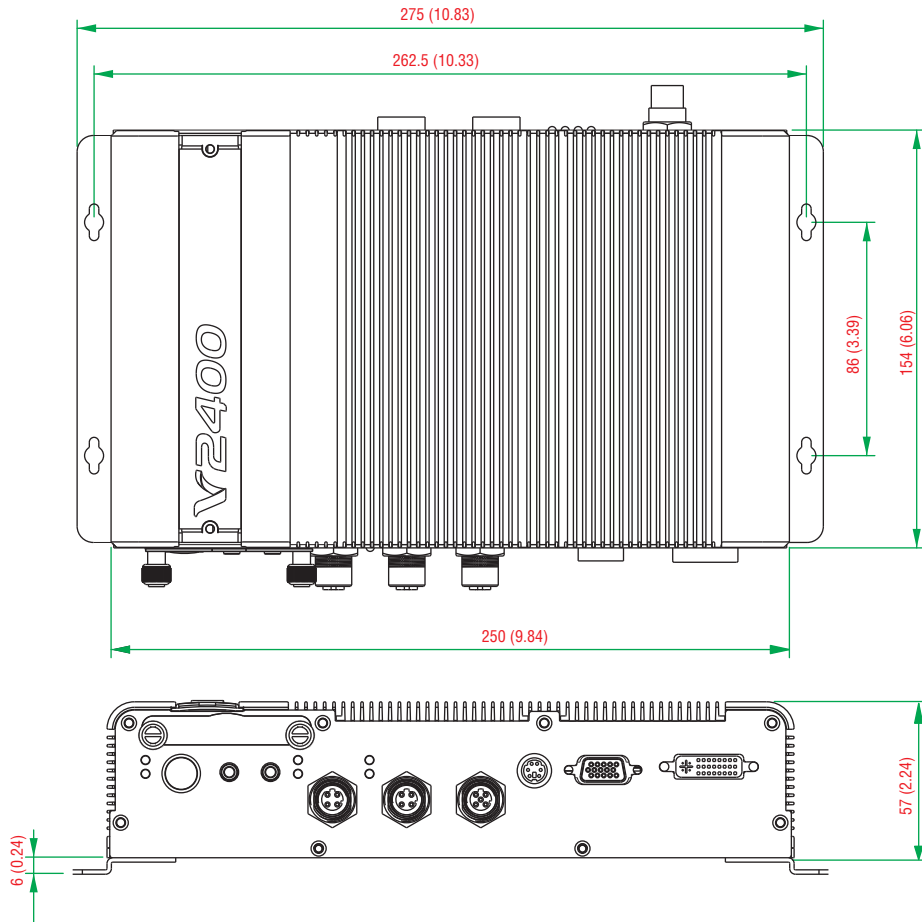


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel Atom N270 1.6 GHz processor
OS (pre-installed): Linux or Windows Embedded Standard 2009
System Chipset: Intel 945GSE + ICH7-M
BIOS: 8 Mbit Flash BIOS, PLCC type, ACPI function supported
FSB: 533 MHz
System Memory: 1 x 200-pin DDR2 SODIMM socket support DDR2 533 up to 2 GB, built-in 1 GB
USB: USB 2.0 compliant hosts, type A connector x 2, supports system boot up, M12 connector x 1

Storage

Built-in: 2 GB onboard industrial DOM to store OS
Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II
HDD Support: 1 SATA-II connector for HDD expansion

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable
Audio: Line-in, line-out interface

Display

Graphics Controller: Intel Gen 3.5 Integrated Graphics Engine, 250 MHz core render clock and 200 MHz core display clock at 1.05-V core voltage

VGA Interface: DB15 female connector, up to 2048 x 1536 resolution

DVI Interface: DVI-I connector (chrontel CH7307 SDVO to DVI transmitter), up to 1600 x 1200 resolution

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (M12)

Serial Interface

Serial Standards:
 4 RS-232/422/485 ports*, software selectable (DB9 male)
 *COM1's pin 9 signal can be set by jumper as N/C (default), +5 V, or +12 V
ESD Protection: 8 KV for all signals

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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

Digital Input

Input Channels: 6, source type

Input Voltage: 0 to 30 VDC at 25 Hz

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (Source to DI)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 2, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 VDC

Connector Type: 10-pin screw terminal block (6 DI points, 2 DO points, DI Source, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power, Storage

LAN: 10M/Link x 2, 100M/Link x 2

Serial: TX x 4, RX x 4

Switches and Buttons

Power Switch: on/off (front panel)

Reset Button: For warm reboot (front panel)

Physical Characteristics

Housing: Aluminum

Weight: 2 kg

Dimensions:

Without ears: 250 x 57 x 154 mm (9.84 x 2.24 x 6.06 in)

With ears: 275 x 63 x 154 mm (10.83 x 2.48 x 6.06 in)

Mounting: DIN-Rail, wall, VESA

Environmental Limits

Operating Temperature:

Standard models: -25 to 60°C (-13 to 140°F)

Wide temp. models: -40 to 70°C (-40 to 158°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: EN 50155 standard

Anti-shock: EN 50155 standard

Power Requirements

Input Voltage: 12 to 48 VDC (M12 connector)

Power Consumption: 26 W

2.16 A @ 12 VDC

1.08 A @ 24 VDC

542 mA @ 48 VDC

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1

EMC: EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN

55024, FCC Part 15 Subpart B Class A

Rail Traffic: EN 50155, EN 50121-3-2, EN 50121-4, IEC 61373

Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

MTBF (mean time between failures): 230,723 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.26, Debian Lenny 5.0

File System: EXT2

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ compiler
- GNU C library
- Perl

Windows XP Embedded

OS: Windows Embedded Standard 2009 SP3

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 2.0: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Ordering Information

Available Models

V2406-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, Windows Embedded Standard 2009, -25 to 60°C operating temperature (EN 50155 Class T1)

V2406-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, Linux 2.6, -25 to 60°C operating temperature (EN 50155 Class T1)

V2406-T-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, Windows Embedded Standard 2009, -40 to 70°C operating temperature (EN 50155 Class TX)

V2406-T-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, Linux 2.6, -40 to 70°C operating temperature (EN 50155 Class TX)

Optional Accessories (can be purchased separately)

PWR-24250-DT-S1: Power adaptor

PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug

PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug

PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug

PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug

PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

FK-75125-02: Hard disk installation package (for HDD, SSD, EN 50155)

DK-DC50131-01: DIN-Rail mounting kit

M12 Connectors (can be purchased separately)

M12A-5P-IP68: Field-installation A-coded screw-in power connector, 5-pin female M12 connector, IP68-rated

M12D-4P-IP68: Field-installation D-coded screw-in Ethernet connector, 4-pin male M12 connector, IP68-rated

M12A-5PMM-IP68: D-coded screw-in USB connector, 5-pin male M12 connector, IP68-rated

M12 Cables (can be purchased separately)

CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated

CBL-M12D(MM4P)/RJ45-100 IP67: 1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated

Package Checklist

- V2406 embedded computer
- Wall mounting kit
- PS2 to KB/MS Y-type cable
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V2416 Series

x86-based embedded computer with Intel Atom N270, dual LANs (M12 connectors), 4 serial ports, 6 DIs, 2 DOs, VGA, DVI-I, 3 USB ports, 2 SATA storage connectors, 2 removable storage trays, CompactFlash



- > High performance network video recorder for rolling stock applications
- > EN 50155 certified for temperature ranges up to Class TX
- > EN 50121-3-2 and EN 50121-4 certified for railway applications
- > IEC 61373 certified for shock and vibration resistance
- > Two SATA II connectors for commercial HDDs or industrial SSDs
- > Two hot-swappable trays for storage expansion
- > User-defined programmable LEDs and API for storage management
- > API Library for easy development and storage volume notification
- > Integrated MDM API for easy remote management
- > -40 to 70°C wide temperature models available



EN 50155



Introduction

The V2416 Series EN 50155-certified embedded computers are based on the Intel Atom N270 x86 processor and feature 4 RS-232/422/485 serial ports, dual LAN ports, and 3 USB 2.0 hosts. In addition, the V2416 computers provide VGA and DVI-I outputs and are EN 50155 certified to confirm their robustness for railway and industrial applications.

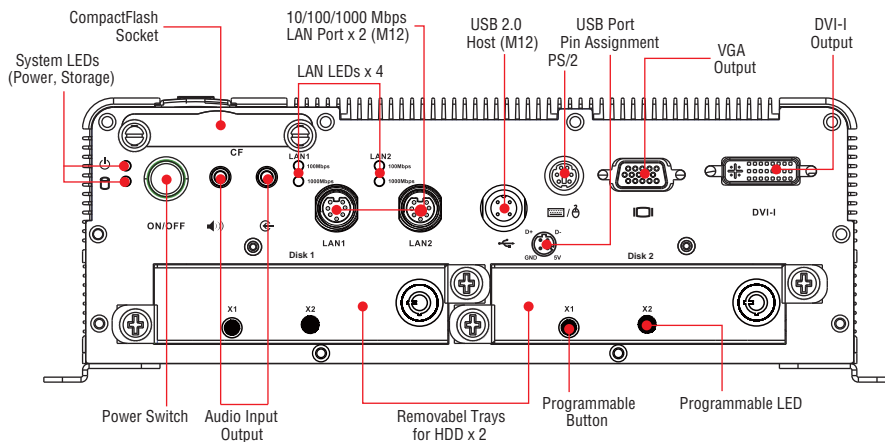
In addition, the CompactFlash socket, SATA connectors, and USB sockets provide the V2416 computers with the reliability needed for industrial applications that require data buffering and storage expansion. Most importantly, the V2416 computers come with 2 removable slots for inserting additional storage media, such as hard

disks or SSD drives; it also supports hot swapping for convenient, fast, and easy storage expansion. It also provides user-defined programmable LEDs and the related API for storage management, supporting storage plug/unplug functionality, automatic storage removal, and storage status display. Moreover, API Library is provided for easy development and storage capacity notification.

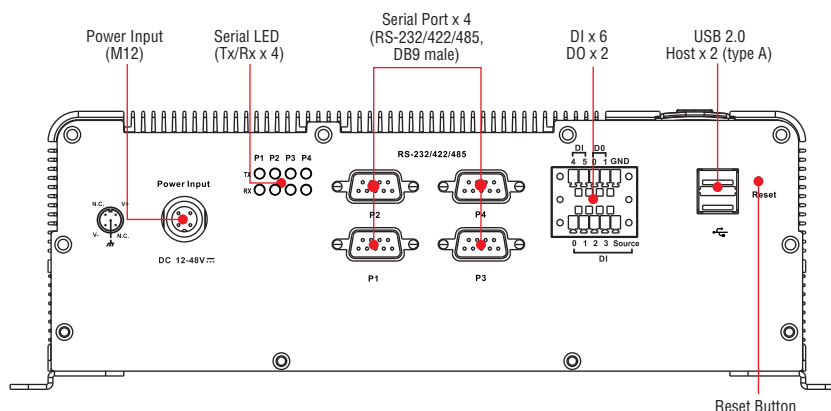
The V2416 series come pre-installed with Linux or Windows Embedded Standard 2009 to provide programmers with a familiar environment in which to develop sophisticated, bug-free application software at a low cost.

Appearance

Front View



Rear View



: Hardware Specifications

Computer

CPU: Intel Atom N270 1.6 GHz processor

OS (pre-installed): Linux or Windows Embedded Standard 2009

System Chipset: Intel 945GSE + ICH7-M

BIOS: 8 Mbit Flash BIOS, PLCC type, ACPI function supported

FSB: 533 MHz

System Memory: 1 x 200-pin DDR2 SODIMM socket supporting DDR2 533 up to 2 GB, with 1 GB built in

USB: 3 USB 2.0 compliant hosts; 2 with type A connectors supporting system bootup, 1 with M12 connector

Storage

Built-in: 2 GB onboard industrial DOM to store OS

Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II

HDD Support:

HDD: 2 SATA-II connectors for storage expansion

Removable Trays: Support for 2 additional connectors for storage expansion with hot-swappable function

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: Line-in, line-out interface

Display

Graphics Controller: Intel Gen 3.5 Integrated Graphics Engine, 250 MHz core render clock and 200 MHz core display clock at 1.05-V core voltage

VGA Interface: DB15 female connector, up to 2048 x 1536 resolution

DVI Interface: DVI-I connector (chrontel CH7307 SDVO to DVI transmitter), up to 1600 x 1200 resolution

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (M12)

Serial Interface

Serial Standards: 4 software-selectable RS-232/422/485 ports* (DB9 male)

*COM1's pin 9 signal can be set by jumper as N/C (default), +5 V, or +12 V

ESD Protection: 4 KV for all signals

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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

Digital Input

Input Channels: 6, source type

Input Voltage: 0 to 30 VDC at 25 Hz

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (Source to DI)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 2, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 VDC

Connector Type: 10-pin screw terminal block (6 DI points, 2 DO points, DI Source, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power x 1, Storage x 1, Programmable x 2 on the removable trays

LAN: 100M/Link x 2, 1000M/Link x 2

Serial: TX x 4, RX x 4

Switches and Buttons

Power Switch: on/off (front panel)

Reset Button: For warm reboot (front panel)

Programmable Button: on/off (on each removable tray)

Physical Characteristics

Housing: Aluminum

Weight: 4 kg

Dimensions:

Without ears: 250 x 57 x 154 mm (9.84 x 2.24 x 6.06 in)

With ears: 275 x 63 x 154 mm (10.83 x 2.48 x 6.06 in)

Mounting: DIN-Rail, wall, VESA

Environmental Limits

Operating Temperature: (without HDD installed)

Standard models: -25 to 60°C (-13 to 140°F)

Wide temp. models: -40 to 70°C (-40 to 158°F)

Storage Temperature: (without HDD installed)

-40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: EN 50155 standard

Anti-shock: EN 50155 standard

Power Requirements

Input Voltage: 12 to 48 VDC (M12 connector)

Power Consumption: 26 W

2.16 A @ 12 VDC

1.08 A @ 24 VDC

542 mA @ 48 VDC

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1

EMC: EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN

55024, FCC Part 15 Subpart B Class A

Rail Traffic: EN 50155, EN 50121-2-3, EN 50121-4, IEC 61373

Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.32, Debian Lenny 5.0

File System: EXT2/EXT3

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ compiler
- GNU C library
- Perl

Windows XP Embedded

OS: Windows Embedded Standard 2009 SP3

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 2.0: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

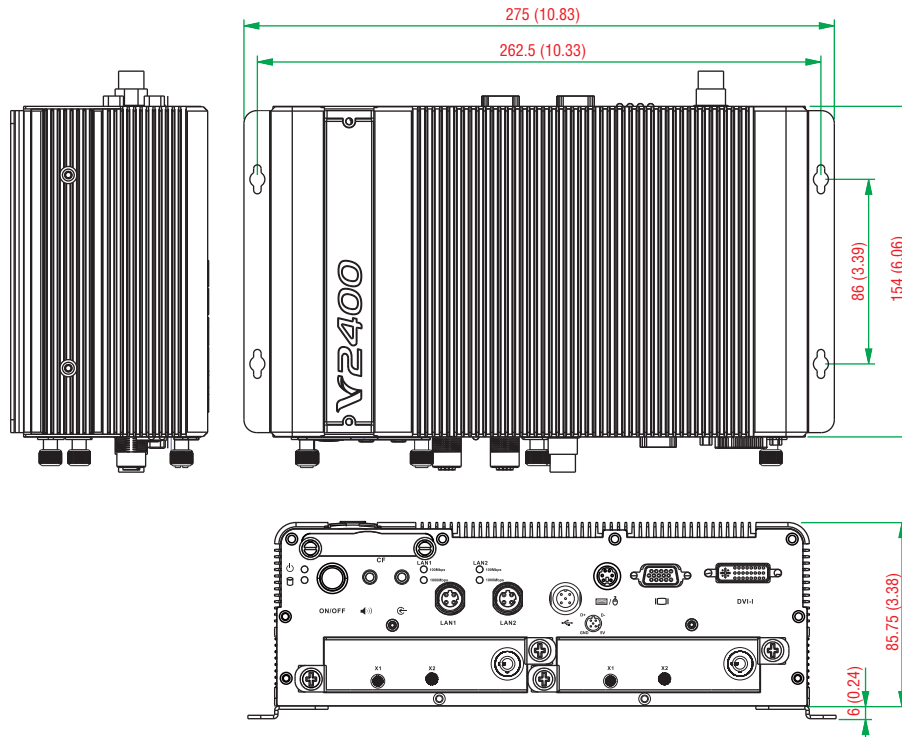
File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Dimensions

Unit: mm (inch)



: Ordering Information

Available Models

V2416-XPE: x86-based industrial computer with Intel Atom N270, dual LANs (M12 connectors), 4 serial ports, 6 DIs, 2 DOs, VGA, DVI-I, 3 USB ports, 2 SATA storage connectors, Windows Embedded Standard 2009, -25 to 60°C operating temperature (EN 50155 Class T1)

V2416-LX: x86-based industrial computer with Intel Atom N270, dual LANs (M12 connectors), 4 serial ports, 6 DIs, 2 DOs, VGA, DVI-I, 3 USB hosts, 2 SATA storage connectors, Linux 2.6, -25 to 60°C operating temperature (EN 50155 Class T1)

V2416-T-XPE: x86-based industrial computer with Intel Atom N270, dual LANs (M12 connectors), 4 serial ports, 6 DIs, 2 DOs, VGA, DVI-I, 3 USB ports, 2 SATA storage connectors, Windows Embedded Standard 2009, -40 to 70°C operating temperature (EN 50155 Class TX)

V2416-T-LX: x86-based industrial computer with Intel Atom N270, dual LANs (M12 connectors), 4 serial ports, 6 DIs, 2 DOs, VGA, DVI-I, 3 USB hosts, 2 SATA storage connectors, Linux 2.6, -40 to 70°C operating temperature (EN 50155 Class TX)

Optional Accessories (can be purchased separately)

PWR-24250-DT-S1: Power adaptor

PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug

PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug

PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug

PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug

PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

DK-DC50131-01: DIN-Rail mounting kit

M12 Connectors (can be purchased separately)

M12A-5P-IP68: Field-installation A-coded screw-in power connector, 5-pin female M12 connector, IP68-rated

M12A-8PMM-IP68: Field-installation A-coded screw-in Gigabit Ethernet connector, 8-pin female M12 connector, IP68-rated

M12A-5PMM-IP68: D-coded screw-in USB connector, 5-pin male M12 connector, IP68-rated

M12 Cables (can be purchased separately)

CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated

CBL-M12MM8PRJ45-BK-100-IP67: 1-meter A-coded M12-to-RJ45 Cat-5E UTP Gigabit Ethernet cable, 8-pin male M12 connector, IP67-rated

Package Checklist

- V2416 embedded computer
- Wall mounting Kit
- PS2 to KB/MS Y-type cable
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V2426 Series

x86 ready-to-run embedded computers with Intel Atom N270, VGA, DVI-I, audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CompactFlash, 2 peripheral expansion slots



- > Intel Atom N270 1.6 GHz processor
- > DDR2 SODIMM socket supporting DDR2 533 up to 2 GB (max.)
- > Dual independent displays (VGA + DVI-I)
- > 2 10/100 Mbps Ethernet ports with M12 connectors
- > 4 RS-232/422/485 serial ports (non-standard baudrates supported)
- > 3 USB 2.0 ports for high speed peripherals
- > 6 DIs, 2 DOs
- > CompactFlash socket for storage expansion
- > 1 SATA-II connector for hard disk drive expansion
- > M12 power connector
- > EN50155 certified
- > Ready-to-run Embedded Linux, or Windows Embedded Standard 2009 platform
- > -40 to 70°C wide temperature models available



EN 50155



3

Railway Computers > V2426 Series

Overview

The V2426 Series embedded computers are based on the Intel Atom N270 x86 processor, and feature 4 RS-232/422/485 serial ports, dual LAN ports, and 3 USB 2.0 hosts. In addition, the V2426 computers provide VGA and DVI-I outputs, and are EN 50155 certified, making them particularly well-suited for railway and industrial applications.

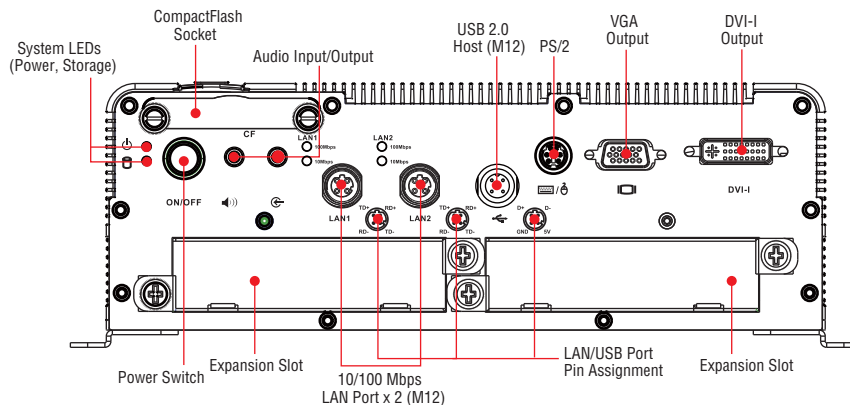
The dual 10/100 Mbps Ethernet ports with M12 connectors offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2426 computers have 6 DIs and 2 DOs for connecting digital input/output devices. In addition, the CompactFlash socket, SATA connector, and USB sockets provide the V2426 computers with the reliability needed for industrial applications that require data buffering and storage expansion. Moreover, the V2426

computers come with 2 peripheral expansion slots for inserting different communication modules, such as a 2-port CAN module, an HSDPA, GPS, WLAN module, an 8+8 port digital input/output module, a 2-port serial module, a mini PCI expansion module, and a mini-PCI Express module, giving greater flexibility for setting up different industrial applications at field sites.

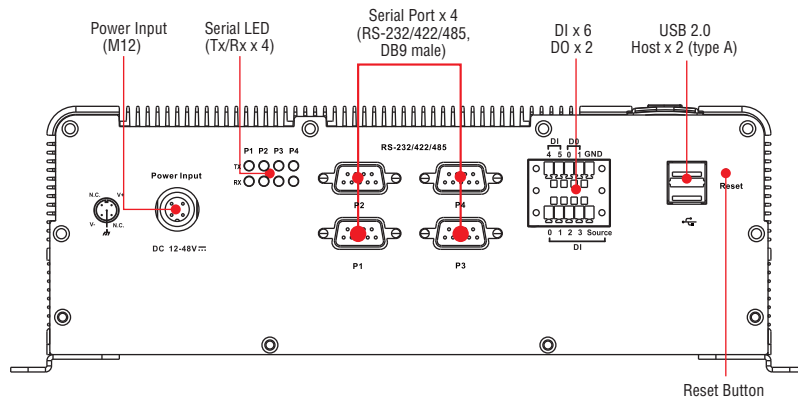
Pre-installed with Linux or Windows Embedded Standard 2009, the V2426 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost. Wide temperature models of the V2426 Series that operate reliably in a -40 to 70°C operating temperature range are also available, offering an optimal solution for applications subjected to harsh environments.

Appearance

Front View

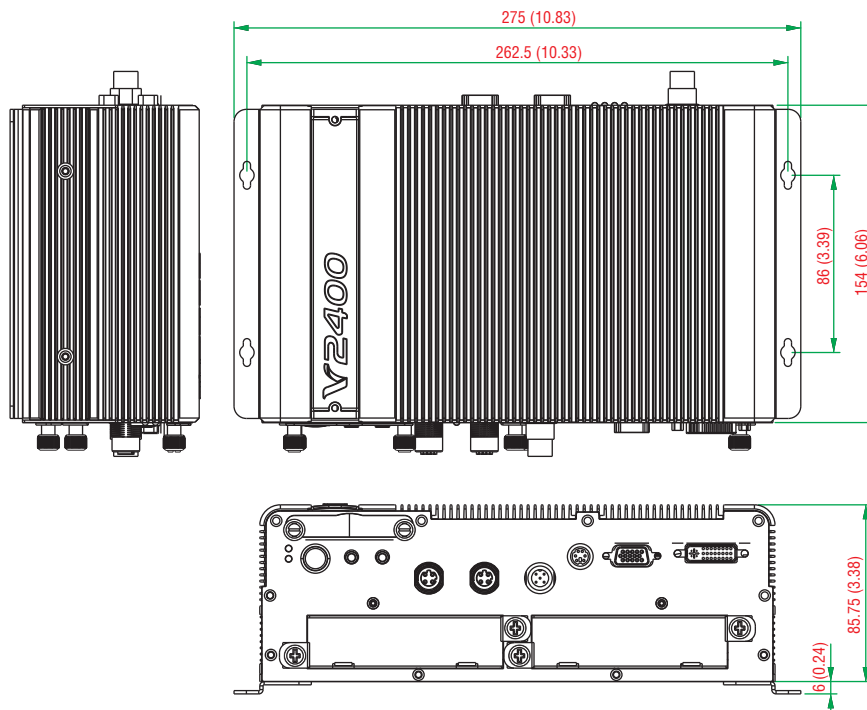


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel Atom N270 1.6 GHz processor

OS (pre-installed): Linux or Windows Embedded Standard 2009

System Chipset: Intel 945GSE + ICH7-M

BIOS: 8 Mbit Flash BIOS, PLCC type, ACPI function supported

FSB: 533 MHz

System Memory: 1 x 200-pin DDR2 SODIMM socket support DDR2 533 up to 2 GB, built-in 1 GB

Expansion Bus: PCI interface reserved

USB: USB 2.0 compliant hosts, type A connector x 2, supports system boot up, M12 connector x 1

Storage

Built-in: 2 GB onboard industrial DOM to store OS

Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II

HDD Support: 1 SATA-II connector for HDD expansion

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: Line-in, line-out interface

Display

Graphics Controller: Intel Gen 3.5 Integrated Graphics Engine, 250 MHz core render clock and 200 MHz core display clock at 1.05-V core voltage

VGA Interface: DB15 female connector, up to 2048 x 1536 resolution

DVI Interface: DVI-I connector (chrontel CH7307 SDVO to DVI transmitter), up to 1600 x 1200 resolution

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (M12)

Magnetic Isolation Protection: 1.5 KV

Serial Interface

Serial Standards: 4 RS-232/422/485 ports*, software selectable (DB9 male)

*COM1's pin 9 signal can be set by jumper as N/C (default), +5 V, or +12 V

ESD Protection: 8 KV for all signals

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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

Digital Input

Input Channels: 6, source type

Input Voltage: 0 to 30 VDC at 25 Hz

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (Source to DI)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 2, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 VDC

Connector Type: 10-pin screw terminal block (6 DI points, 2 DO points, DI Source, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power, Storage

LAN: 10M/Link x 2, 100M/Link x 2

Serial: TX x 4, RX x 4

Switches and Buttons

Power Switch: on/off (front panel)

Reset Button: For warm reboot (rear panel)

Physical Characteristics

Housing: Aluminum

Weight: 4 kg

Dimensions:

Without ears: 154 x 250 x 86 mm (6.06 x 9.84 x 3.39 in)

With ears: 154 x 275 x 92 mm (6.06 x 10.83 x 3.62 in)

Mounting: DIN-Rail, wall, VESA

Environmental Limits

Operating Temperature:

Standard models: -25 to 60°C (-13 to 140°F)

Wide temp. models: -40 to 70°C (-40 to 158°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: EN 50155 standard

Anti-shock: EN 50155 standard

Power Requirements

Input Voltage: 12 to 48 VDC (M12 connector)

Power Consumption: 48 W

4 A @ 12 VDC

2 A @ 24 VDC

1 A @ 48 VDC

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 D, EN 61000-3-3, EN

55024, FCC Part 15 Subpart B Class A

Rail Traffic: EN 50155, EN 50121-3-2, EN 50121-4, IEC 61373

Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

MTBF (mean time between failures): 192,308 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.26, Debian Lenny 5.0

File System: EXT2

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control)
- GNU C/C++ compiler
- GNU C library
- Perl

Windows XP Embedded

OS: Windows Embedded Standard 2009 SP3

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 2.0: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Ordering Information

Available Models

V2426-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, 2 peripheral expansion slots, Windows Embedded Standard 2009, -25 to 60°C operating temperature (EN 50155 Class T1)

V2426-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, 2 peripheral expansion slots, Linux 2.6, -25 to 60°C operating temperature (EN 50155 Class T1)

V2426-T-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, 2 peripheral expansion slots, Windows Embedded Standard 2009, -40 to 70°C operating temperature (EN 50155 Class TX)

V2426-T-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, CF, 2 peripheral expansion slots, Linux 2.6 -40 to 70°C operating temperature (EN 50155 Class TX)

Expansion Modules (can be purchased separately)

EPM-3112: 2 isolated CAN ports, DB9 connector

EPM-3337: HSDPA, GPS, WLAN (11a/b/g/n)

EPM-3438: 8+8 DI/DO with 3 KV digital isolation protection, 2 KHz counter

EPM-3032: 2 isolated RS-232/422/485 ports with DB9 connectors

EPM-DK01: 1-slot mini PCI and mini PCIe expansion module

EPM-3552: 1 VGA or DVI-I display connector

Optional Accessories (can be purchased separately)

PWR-24250-DT-S1: Power adaptor

PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug

PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug

PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug

PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug

PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

FK-75125-02: Hard disk installation package (for HDD, SSD, EN 50155)

DK-DC50131-01: DIN-Rail mounting kit

M12 Connectors (can be purchased separately)

M12A-5P-IP68: Field-installation A-coded screw-in power connector, 5-pin female M12 connector, IP68-rated

M12D-4P-IP68: Field-installation D-coded screw-in Ethernet connector, 4-pin male M12 connector, IP68-rated

M12A-5PMM-IP68: D-coded screw-in USB connector, 5-pin male M12 connector, IP68-rated

M12 Cables (can be purchased separately)

CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated

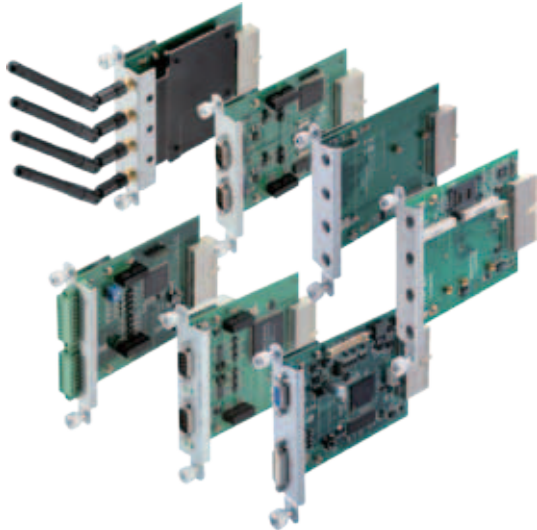
CBL-M12D(MM4P)/RJ45-100 IP67: 1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated

Package Checklist

- V2426 embedded computer
- Wall mounting kit
- PS2 to KB/MS Y-type cable
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V2400 Series Expansion Modules

Expansion peripheral modules (EPM) for the V2400 series



- > PCI slots for interface expansion
- > EPM-3032: 2 isolated RS-232/422/485 ports with DB9 connectors
- > EPM-3112: 2 isolated CAN ports with DB9 connectors
- > EPM-3337: HSDPA, GPS, WLAN (11a/b/g/n)
- > EPM-3438: 8+8 DI/DO with 3 KV digital isolation protection, 2 KHz counter
- > EPM-3552: VGA or DVI-I display module
- > EPM-DK01: mini PCI and mini PCIe expansion modules
- > EPM-DK02: 2-slot mini PCIe expansion module



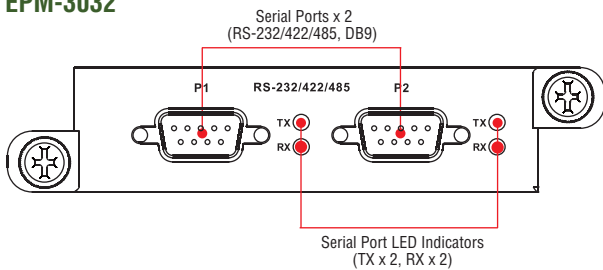
Introduction

Moxa's V2400 series expansion modules, which come with serial ports, CAN ports, wireless and GPS cards, digital input/output channel cards, mini PCI and PCIe modules, a 2-slot mini-PCIe module, and

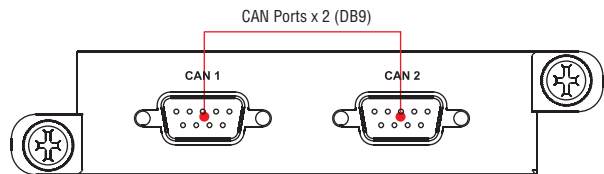
VGA or DVI-I display connectors, can be used with Moxa's V2422 and V2426 embedded computers, and give end-users the best flexibility for setting up and expanding a variety of industrial applications.

Appearance

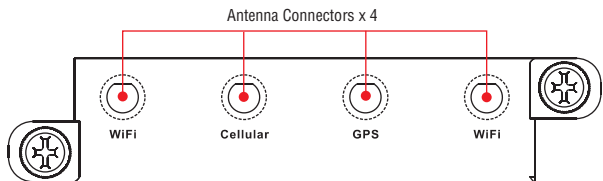
EPM-3032



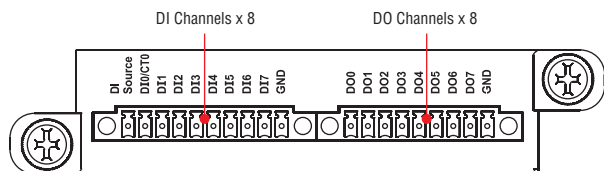
EPM-3112



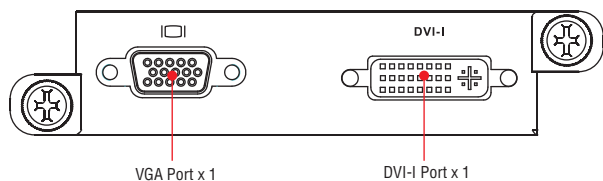
EPM-3337



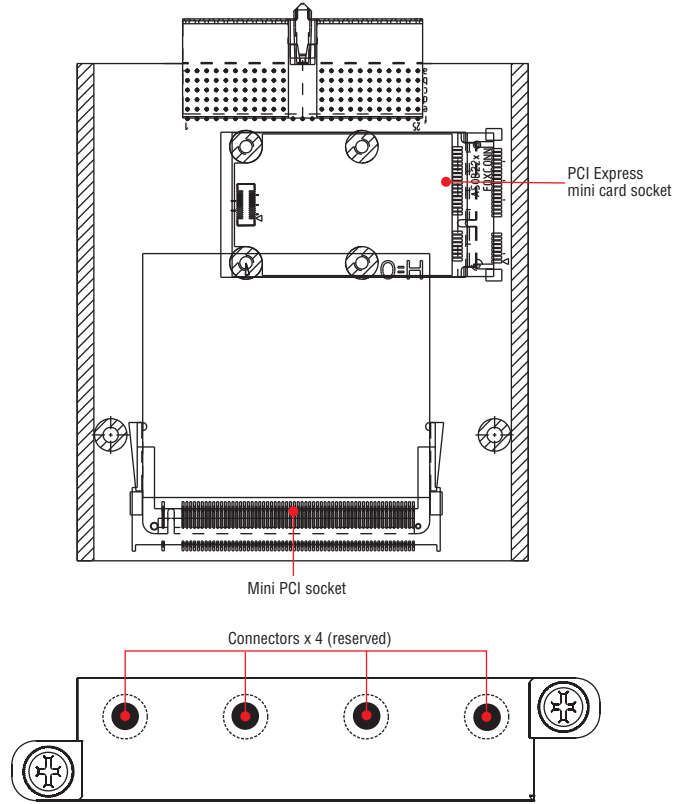
EPM-3438



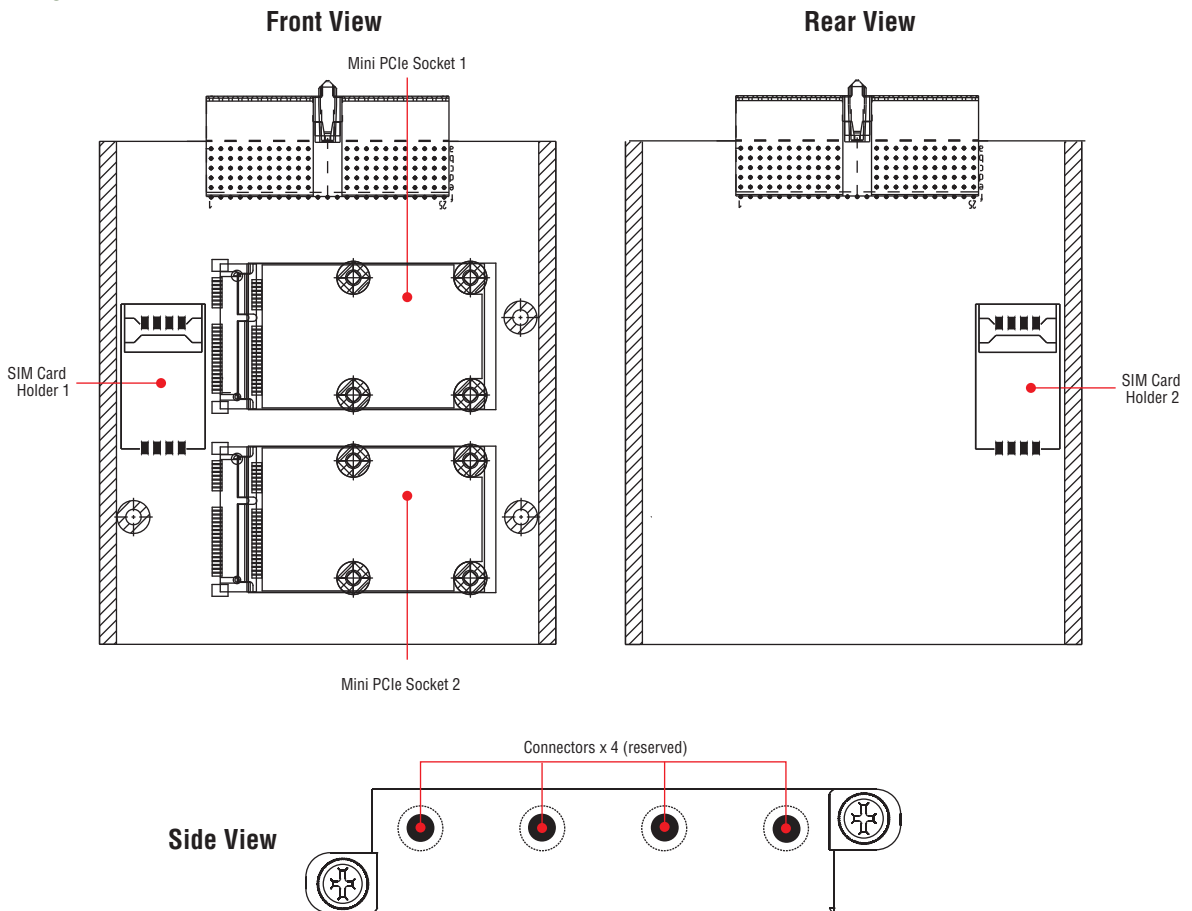
EPM-3552



EPM-DK01



EPM-DK02



⋮ EPM-3032 Specifications

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)

Isolation: 2 KV digital isolation

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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

Physical Characteristics

Weight: 137 g

Dimensions: 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F), EN 50155 Class TX

⋮ EPM-3112 Specifications

CANbus Communication

Interface: 2 optically isolated CAN2.0A/2.0B compliant ports

CAN Controller: Phillips SJA1000T

Signals: CAN-H, CAN-L

Isolation: 2 KV digital isolation

Speed: 1 Mbps

Connector Type: DB9 male

Physical Characteristics

Weight: 127 g

Dimensions: 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

Environmental Limits

Operating Temperature: -25 to 55°C (-13 to 131°F), EN 50155 Class T1

⋮ EPM-3337 Specifications

Cellular Interface

Frequency Bands:

- UMTS/HSDPA: Triple band, 850/1900/1900 MHz
- GSM/GPRS/EDGE: Quad band, 850/900/1800/2100 MHz
- GSM Dsss: Small MS

Output Power:

- Class 4 (2 W) for GSM850/900
- Class 3 (0.25 W) for UMTS/HSDPA
- Class E2 (0.5 W) for EDGE850/900
- Class E2 (0.4 W) for EDGE1800/1900
- Class 1 (1 W) for GSM1800/1900

HSDPA Interface

3GPP Release 5:

- 3.6 Mbps, UL 384 Kbps
- UE CAT. [1-6], 11, 12 supported
- Compressed mode (CM) supported according to 3GPP TS25.212

GPS Interface

Tracking: Tracks up to 13 satellites, L1 1575.42 MHz

Accuracy Position: 2.5 m CEP; 5.0 m SEP

Protocols: NMEA-0183 V2.3, E911 AGPS Control plane, GPS dedicated AT commands, Date WGS-84

Tracking sensitivity: -158 dBm (with active antenna)

Start-up Time:

- Hot start: <3s
- Cold start: 30s
- Warm start: 30s

GPS active antenna supply: 3.3 V

WLAN Interface

Supported Modes:

- IEEE 802.11a/b/g/n for client/bridge mode
- IEEE 802.11b/g/n for AP mode (Linux OS only)

Standards:

- IEEE 802.11a/b/g/n for Wireless LAN
- IEEE 802.11i for Wireless Security

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)
- USA: 1 to 11 (2400 to 2483.5 MHz)
- Europe: 1 to 13 (2400 to 2483.5 MHz)
- Japan: 1 to 14 (2400 to 2497 MHz)

802.11g:

- USA: 1 to 11 (2400 to 2483.5 MHz)
- Europe: 1 to 13 (2400 to 2483.5 MHz)
- Japan: 1 to 13 (2400 to 2497 MHz)

802.11a:

- USA: 36 to 165 (5180 to 5825 MHz)
- Europe: 36 140 (5180 to 5700 MHz)
- Japan: 7 to 11 (5035 to 5055MHz), 183 to 189 (4915 to 4945 MHz)

Security: 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

AP-only Protocols: ARP, BOOTP, DHCP, dynamic VLAN-Tags for 802.1X-Clients, STP/RSTP (IEEE 802.1D/w)

Default Antenna: 2 dBi dual-band omni-directional antenna, RP-SMA (male)

Connector for External Antennas: RP-SMA (female)

Physical Characteristics

Weight: 220 g
Dimensions: 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

Environmental Limits

Operating Temperature: -25 to 55°C (-13 to 131°F), EN 50155 Class T1

EPM-3438 Specifications

Digital Input

Input Channels: 8, source type
Input Voltage: 0 to 5 VDC at 15 Hz
Digital Input Levels:
• Logic level 0: Close to GND
• Logic level 1: Open

Connector Type: Terminal block

Counter Frequency: 2 KHz (DIO only)

Digital Output

Output Channels: 8, sink type, 0 to 5 VDC
Output Current: Max. 20 mA per channel

Output Voltage:

- Logic 0: 0 to 0.55 V
- Logic 1: 4.2 to 5.0 V

Connector Type: Terminal block

Physical Characteristics

Weight: 120 g
Dimensions: 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F), EN 50155 Class TX

EPM-3552 Specifications

Display

Graphics Controller: DisplayLink DL-195
VGA Interface: 15-pin D-sub connector (female)
DVI Interface: 24-pin DVI-I connector (female)
Resolution: Up to 1920 x 1600 (2048 x 1152 for wide screen) resolution

Physical Characteristics

Weight: 130 g
Dimensions: 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

Environmental Limits

Operating Temperature: -25 to 55°C (-13 to 131°F), EN 50155 Class T1

EPM-DK01 Specifications

PCI Express Mini Slot

Interface: PCI-Express V1.0 (one lane)
USB 2.0 Bus SIM Card Holder: Reserved for Cellular applications

Mini PCI Slot

Interface: PCI
Bus Frequency: 32-bit, 33 MHz PCI

Physical Characteristics

Weight: 117 g

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F), EN 50155 Class TX

EPM-DK02 Specifications

PCI Express Mini Slot

Interface:
Slot 1: PCI-Express V1.0 (one lane) / USB 2.0
Slot 2: USB 2.0
USB 2.0 Bus SIM Card Holder: Reserved for cellular applications

Physical Characteristics

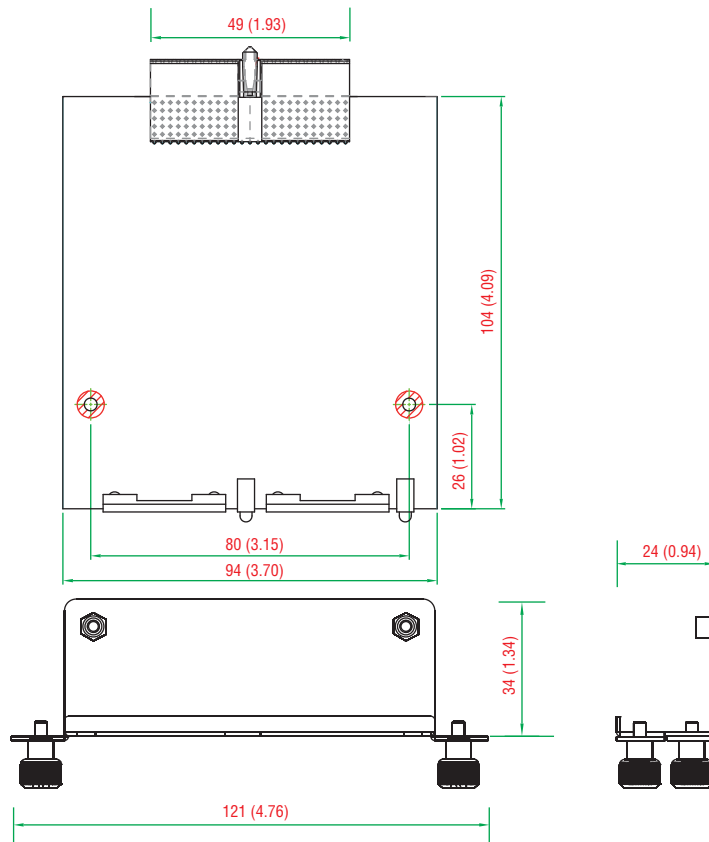
Weight: 125 g

Environmental Limits

Operating Temperature: -25 to 55°C (-13 to 131°F), EN 50155 Class T1

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

- EPM-3032:** 2 isolated RS-232/422/485 ports with DB9 connectors, -40 to 70°C operating temperature
- EPM-3112:** 2 isolated CAN ports with DB9 connectors, -25 to 55°C operating temperature
- EPM-3337:** HSDPA, GPS, WLAN (11a/b/g/n), -25 to 55°C operating temperature
- EPM-3438:** 8+8 DI/DO with 3 KV digital isolation protection, 2 KHz counter, -40 to 70°C operating temperature
- EPM-3552:** VGA or DVI-I display module, -25 to 55°C operating temperature
- EPM-DK01:** Mini PCI and Mini PCIe expansion module, -40 to 70°C operating temperature
- EPM-DK02:** 2-slot mini PCIe expansion module, -25 to 55°C operating temperature

Optional Accessories for the EMP-3337 (can be purchased separately)

- ANT-WDB-ARM-02:** 2.4/5 GHz, dual-band omni-directional antenna, 2 dBi, R-SMA (male), dipole
- ANT-WCDMA-ASM-1.5:** Five-band GSM/GPRS/UMTS/HSDPA, omni-directional antenna, 1.5 dBi, rubber SMA
- ANT-GPS-OSM-05-3M:** GPS antenna

Package Checklist

- EPM expansion module



Marine Displays and Computers

MD-124 Series 24-inch marine display with wide viewable image size (16:9 aspect ratio), 1920 x 1080 pixel resolution	4-2
MC-5150-DC-CP x86 industrial computer with Intel® Core™i5 520E, 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, storage, VGA/DVI	4-5
MC-5150-AC/DC x86 ready-to-run computers with Intel® Core™i5 520E, 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, 12 NMEA ports, storage, VGA/DVI	4-8
MC-5157-AC/DC x86 ECDIS computers with Intel® Core™ i5 520E, 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, 12 NMEA ports, 2 PCI slots, storage, VGA/DVI	4-12
MC-4510-C23 x86 marine computer—serial, VGA, DVI, audio, USB 2.0, CF storage	4-15
MPC-122-K Series x86 marine panel computer—serial, VGA/DVI, audio, USB, CF storage	4-18

4

Marine Displays and Computers



MD-124 Series

24-inch marine display with wide viewable image size (16:9 aspect ratio), 1920 x 1080 pixel resolution



- > 24-inch wide viewable image size with 16:9 aspect ratio and 1920 x 1080 pixel resolution
- > LED backlighting
- > Optical bonding (Y model)
- > Surface capacity touch (Z model)
- > ECDIS color calibration model available (by request)
- > PIP/PBP
- > Multi-power input (24 VDC, 110 to 230 VAC)
- > IP66 rated front panel



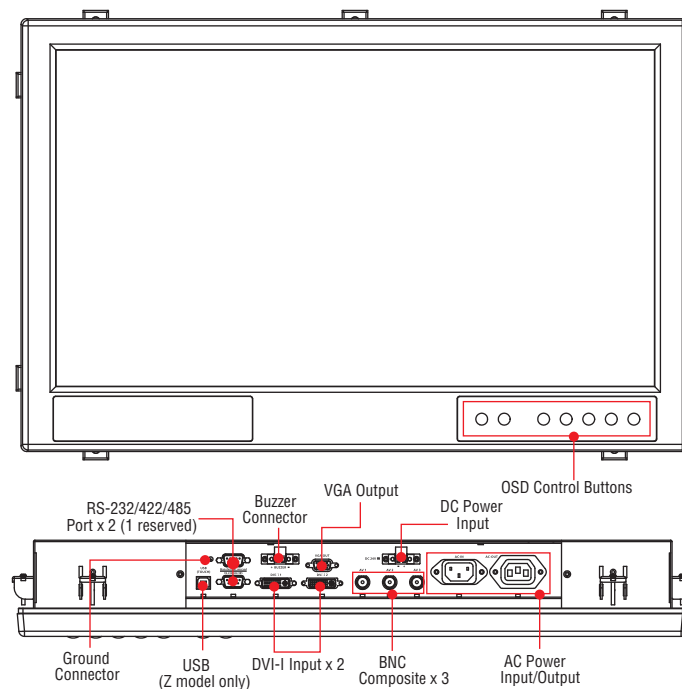
Overview

The MD-124 Series marine displays are designed to fit the great demands of the marine industry. The 24-inch wide viewable image size with 16:9 aspect ratio and 1920 x 1080 pixel resolution make the displays ideal for a variety of marine applications. In addition, the full range dimming, optical bonding (Y model only), and wide angle view functions are well-suited for a variety of marine applications, and meet the required marine standards.

The PIP (Picture-In-Picture) and PBP (Picture-By-Picture) functions are available to offer multiple selections for screen displays. Users can also use either AC or DC power inputs, simplifying the installation of the displays at field sites.

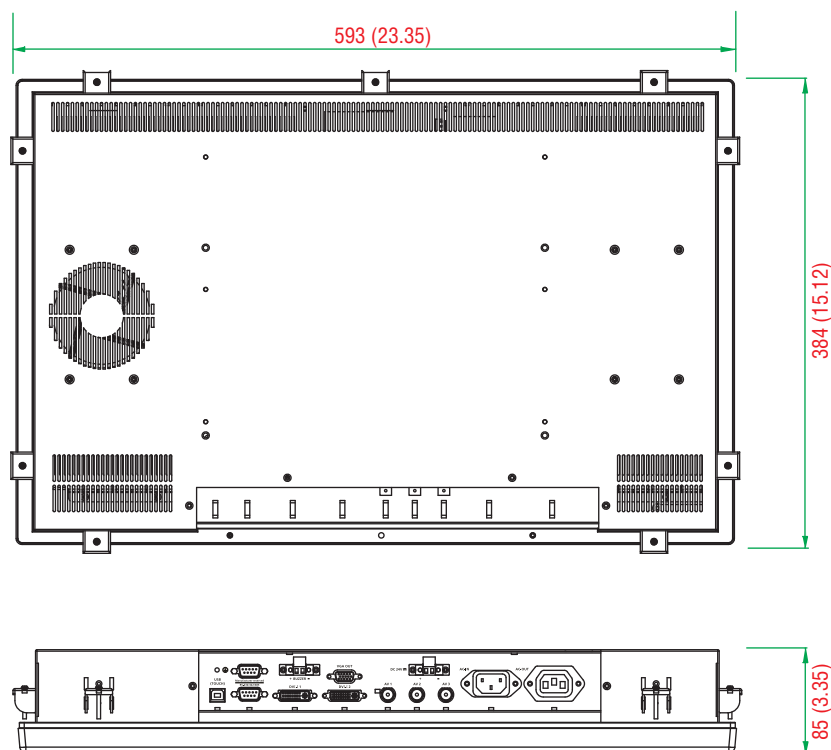
The MD-124 displays are compliant with many a variety of industrial marine standards, including IEC 60945, DNV, and IACS-E10, lending greater credence to their suitability for maritime operations.

Appearance



Dimensions

Unit: mm (inch)



Specifications

Display

Panel Size: 24" wide viewable image size**Panel Type:** MVA**Aspect Ratio:** 16:9**Pixels:** 1920 x 1080 (WSXGA+)**Pixel Pitch (RGB):** 0.282 (H) x 0.282 (V) mm**Response Time:** 8 ms (gray to gray)**Contrast Ratio:** 5000:1**Light Intensity:** 300 cd/m²mm**Viewing Angles:** 178/178**Active Display Area:** 531.36 (H) x 298.89 (V) mm**Max Colors:** 16.7M (8 bits/color)**Display Interface:** VGA x 1, DVI-I x 2, BNC composite x 3**Resolution:**

- VGA: 640 x 480
- SVGA: 800 x 600
- XGA: 1024 x 768
- SXGA: 1280 x 1024
- WSXGA+: 1680 x 1050 (optimal setting)

Serial Interface**Serial Standards:** 1 RS-232/422/485 ports, software-selectable (DB9 male)**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**Front Panel****LEDs:** Storage, Power**Physical Characteristics****Housing:** Aluminum sheet metal**Weight:** 12 kg**Dimensions:** 95 x 647 x 414 mm (3.74 x 25.47 x 16.30 in)**Mounting:** Console mounting**Environmental Limits****Operating Temperature:** -15 to 55°C (5 to 131°F)**Storage Temperature:** -20 to 60°C (-4 to 140°F)**Ambient Relative Humidity:** 5 to 95% (non-condensing)**Anti-Vibration:**

- IEC 60945
- DNV 2.4, Class A/Class C

Power Requirements**Input Voltage:**

- 24 VDC (with tolerance from 18 to 36 VDC, 2-pin terminal block)
- 110 to 230 VAC, 50/60 Hz

Power Consumption: 75 W (standard) to 90 W (full-loading)

- 6.21 A @ 18 VDC
- 4.55 A @ 24 VDC
- 2.95 A @ 36 VDC

Standards and Certifications**Safety:** UL/cUL, CCC**EMC:** EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A**Marine:** IEC 60945 4th. (Pending), DNV (Pending), IACS-E10 (Pending)**Green Product:** RoHS, cRoHS, WEEE**Warranty****Warranty Period:** By request**Details:** See www.moxa.com/warranty

We recommend taking the following precautions to minimize heat build-up within the display:

- Position the display within $\pm 40^\circ$ of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within $\pm 40^\circ$ of the vertical, (b) the operating temperature exceeds 25°C , or (c) the display is used in a location with minimal ventilation.

Important Safety Precaution:

Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C for bridge applications, it is best to ensure that the operating temperature does not exceed 25°C . Doing so will increase the life of your display and minimize service costs.

: Ordering Information

Available Models

MD-124X: 24-inch marine display with 16:9 aspect ratio, full HD (1920x1080), LED backlighting, multi-power supply (AC/DC) with tape bonding

MD-124Y: 24-inch marine display with 16:9 aspect ratio, full HD (1920x1080), LED backlighting, multi-power supply (AC/DC) with optical bonding

MD-124Z: 24-inch marine display with 16:9 aspect ratio, full HD (1920x1080), LED backlighting, multi-power supply (AC/DC) with touch

Package Checklist

- MD-124 panel
- Rubber waterproofing cushion
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MC-5150-DC-CP

x86 industrial computer with Intel® Core™ i5 520E, 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, storage, VGA/DVI



- > High performance Intel® Core™ i5 520E processor, 3 MB L2 cache
- > Built-in 2 GB DDR3 memory, supports up to 4 GB
- > Dual independent displays (DVI-I + VGA)
- > 2 Gigabit Ethernet ports for network redundancy
- > 2 RS-232/422/485 serial ports
- > 2 RS-232 ports
- > 6 USB 2.0 hosts
- > 1 internal SATA storage slot for SSD
- > 1 external storage slot with 60 GB SSD pre-installed
- > 1G anti-vibration and 5G anti-shock design for system reliability
- > Compact, fanless design
- > Supports Windows XP Embedded, XP Professional, Windows 7



Overview

The MC-5150-DC-CP computer features the Intel® Core™ i5 520E processor and come with 4 serial ports, 2 Gigabit Ethernet ports, and 6 USB hosts. The computer offers high performance and versatile peripherals for marine applications.

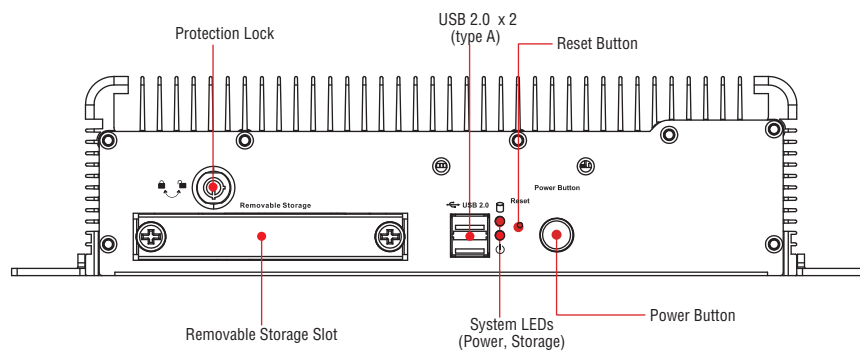
Designed with highest quality and durability in mind, the marine-grade MC-5150-DC-CP computer features a rugged chassis, 1G anti-vibration, and 5G anti-shock, which together provide the most reliable

operation in harsh environments and conditions. In addition, the compact size, fanless design, and low power consumption deliver an optimal thermal solution and make installation easy for bridge systems in marine applications.

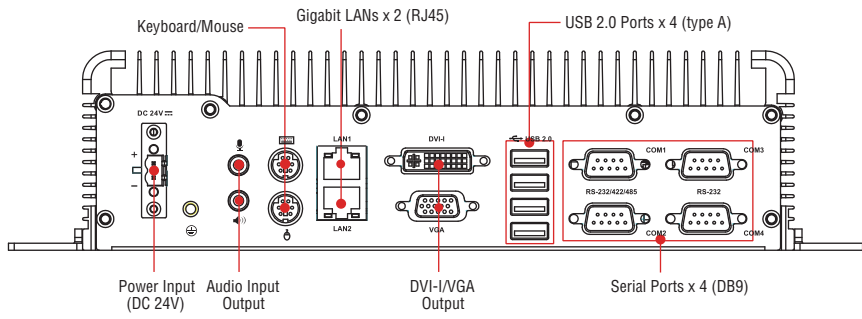
Users can easily install Windows XP Embedded, XP Professional, or Windows 7, to provide a flexible and friendly environment for system development and application implementation.

Appearance

Front View



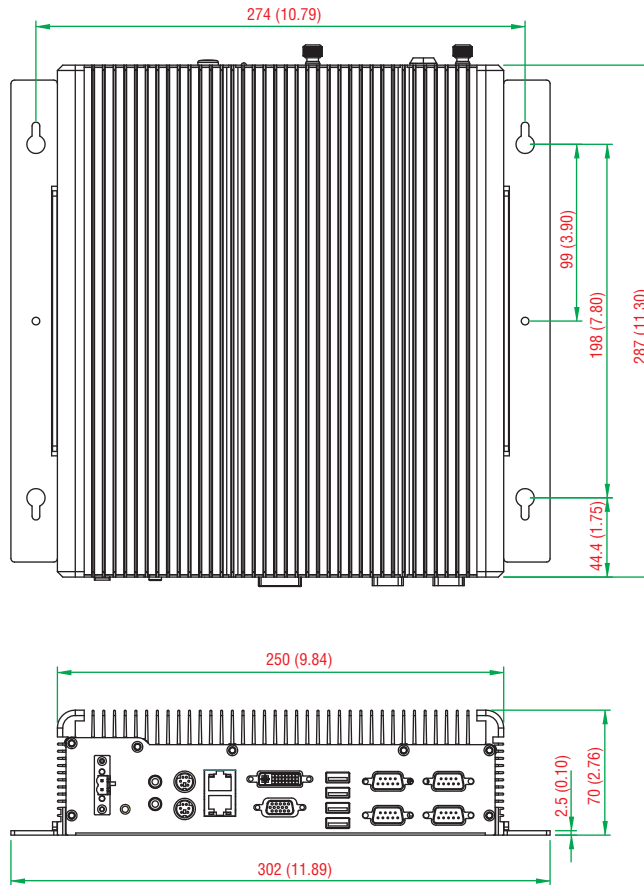
Rear View



Dimensions

Unit: mm (inch)

DC-CP Model



Specifications

Computer

CPU: Intel® Core™ i5 520E (BGA CPU package), 2.4 GHz processor
OS: Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)

System Chipset: Intel® QM57 Express Chipset

DRAM: 2 GB DDR3 SDRAM onboard

USB: USB 2.0 hosts x 6, Type A connectors

Storage

Storage Support:

- 1 internal SATA storage tray for SSD
- 1 removable SATA storage tray for storage expansion with 60 GB SSD

Other Peripherals

KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse

Audio: line-in/out interface

Display

Graphics Controller: Onboard Intel® HD graphics

Display Interface:

- VGA Interface: 15-pin D-Sub connector (female), with resolution up to 1920 x 1080
- DVI-I Interface: 29-pin DVI-I connector (female)

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built in

Serial Interface

Serial Standards:

- 2 RS-232/422/485 ports, software-selectable (DB9 male)
- 2 RS-232 ports (DB9)

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 230.4 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: Storage, Power

LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Physical Characteristics

Housing: Aluminum, sheet metal

Weight: 3.85 kg

Dimensions: 287 x 250 x 70 mm (11.30 x 9.84 x 2.76 in)

Mounting: Wall

Environmental Limits

Operating Temperature: -15 to 55°C (5 to 131°F)

Storage Temperature: -20 to 60°C (-4 to 131°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration:

- 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
- 1 grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
- 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Anti-shock: 50 g @ IEC 60068-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)

Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, DNV 2.4 (Pending), IEC 60945 (4th) (Pending), IACS-E10 (Pending)

EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B

Marine: IEC 60945 4th. (Pending), IACS-E10 (Pending)

Green Product: RoHS, cRoHS, WEEE

Reliability

MTBF (mean time between failures): 220,490 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Ordering Information

Available Models

MC-5150-DC-CP: x86-based industrial computer with Intel® Core™ i5 CPU processor, 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, storage, VGA/DVI, and DC power input

Package Checklist

- MC-5150 computer
- 2 removable storage protection keys
- Terminal block for power input
- Hard disk installation kit
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

MC-5150-AC/DC

x86 ECDIS computers with Intel® Core™ i5 520E, 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, 12 NMEA ports, storage, VGA/DVI



- > High performance Intel® Core™ i5 520E processor, 3 MB L2 cache
- > Built-in 2 GB DDR3 memory, supports up to 4 GB
- > Dual independent displays (DVI-I + VGA)
- > 2 Gigabit Ethernet ports for network redundancy
- > 2 RS-232/422/485 serial ports
- > 2 RS-232 ports
- > 12 NMEA ports
- > 6 USB 2.0 hosts
- > 1 internal SATA storage slot for SSD
- > 1 external storage slot with 60 GB SSD pre-installed
- > 1G anti-vibration and 5G anti-shock design for system reliability
- > Compact, fanless design
- > 24 VDC or 110 to 230 VAC power input models available
- > Supports Windows XP Embedded, XP Professional, Windows 7



Overview

The MC-5150-AC/DC computers feature the Intel® Core™ i5 520E processor and come with 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, and 12 NMEA ports. The computers offer high performance and versatile peripherals for marine applications.

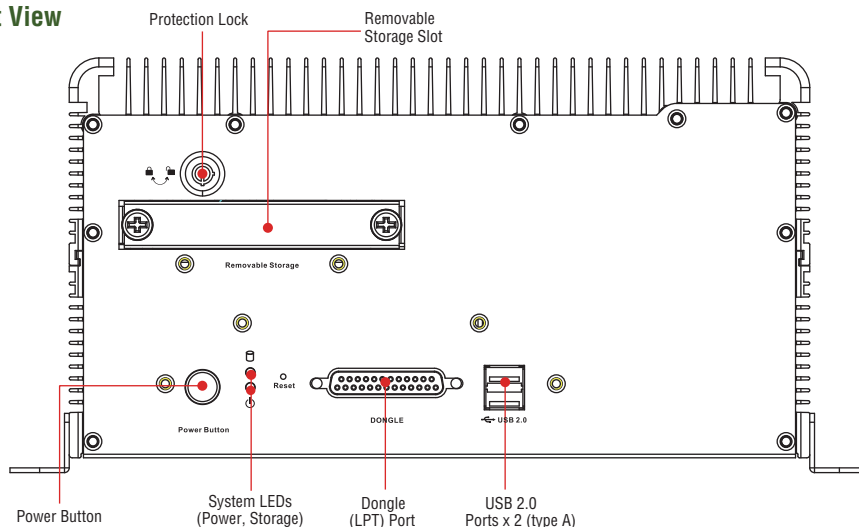
Designed with highest quality and durability in mind, the marine-grade MC-5150-AC/DC computers feature a rugged chassis, 1G anti-vibration, and 5G anti-shock, which together provide the most reliable

operation in harsh environments and conditions. In addition, the compact size, fanless design, and low power consumption deliver an optimal thermal solution and make installation easy for bridge systems in marine applications.

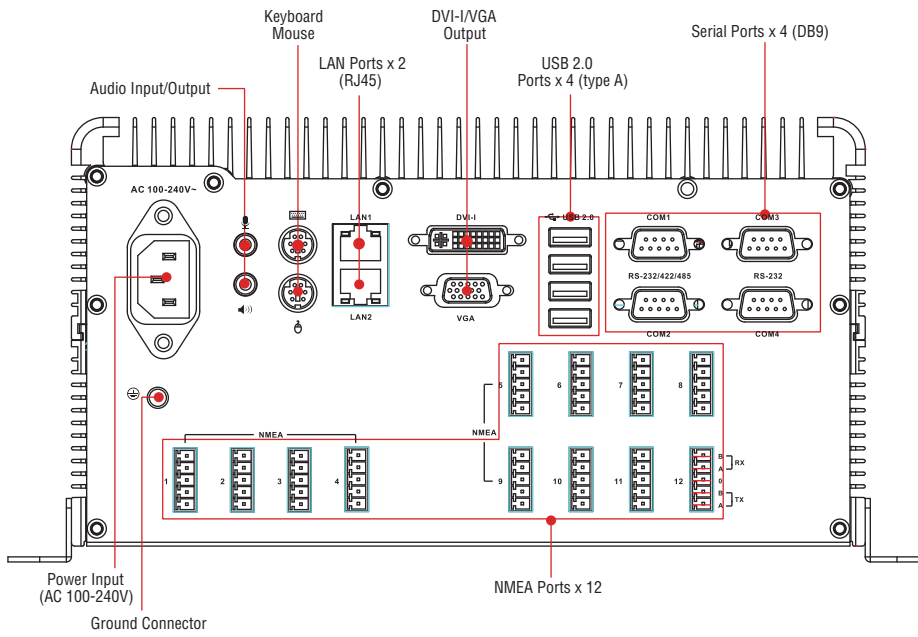
Users can easily install Windows XP Embedded, XP Professional, or Windows 7, to provide a flexible and friendly environment for system development and application implementation.

Appearance

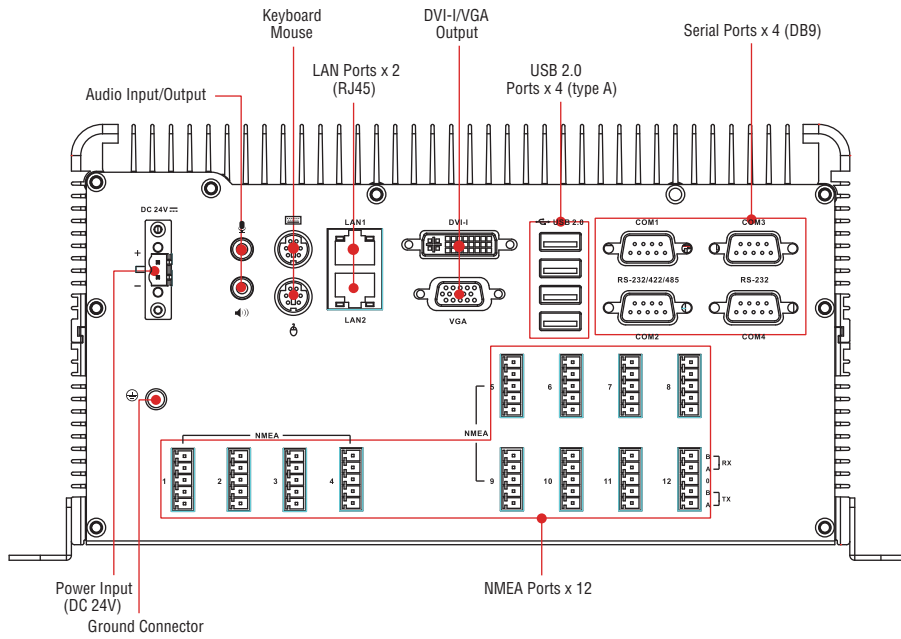
AC/DC Model Front View



AC Model Rear View

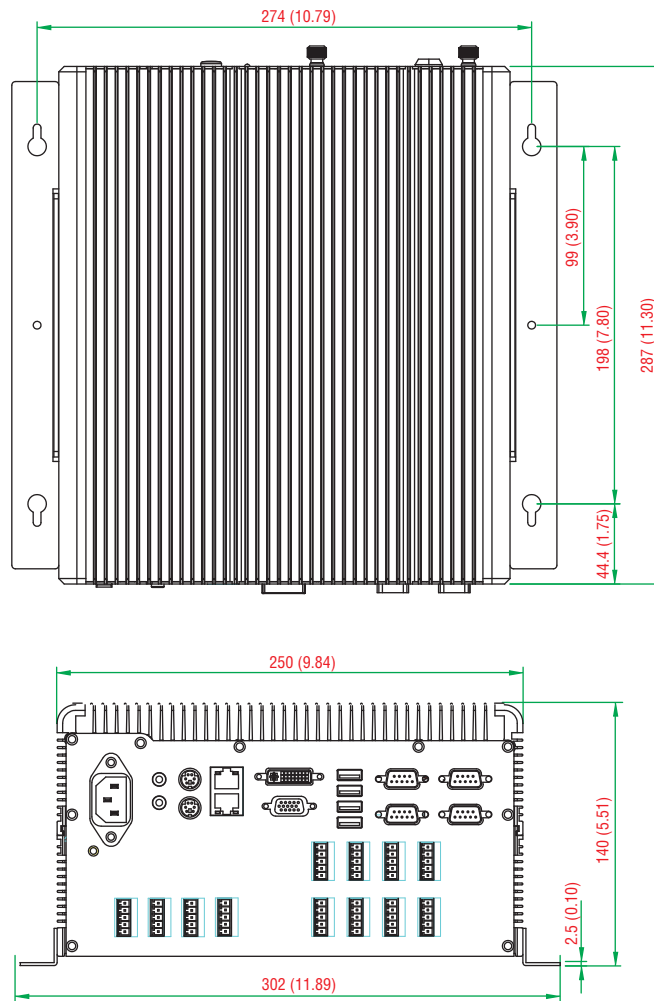


DC Model Rear View



Dimensions

Unit: mm (inch)



Specifications

Computer

- CPU:** Intel® Core™ i5 520E (BGA CPU package), 2.4 GHz processor
- OS:** Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)
- System Chipset:** Intel® QM57 Express Chipset
- DRAM:** 2 GB DDR3 SDRAM onboard
- USB:** USB 2.0 hosts x 6, Type A connectors

Storage

- Storage Support:**
 - 1 internal SATA storage tray for SSD
 - 1 removable SATA storage tray for storage expansion with 60 GB SSD

Other Peripherals

- KB/MS:** 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse
- Audio:** line-in/out interface

Display

- Graphics Controller:** Onboard Intel® HD graphics
- Display Interface:**
 - VGA Interface: 15-pin D-Sub connector (female), with resolution up to 1920 x 1080
 - DVI-I Interface: 29-pin DVI-I connector (female)

Ethernet Interface

- LAN:** 2 auto-sensing 10/100/1000 Mbps ports (RJ45)
- Magnetic Isolation Protection:** 1.5 KV built in

Serial Interface

- Serial Standards:**
 - 2 RS-232/422/485 ports, software-selectable (DB9 male)
 - 2 RS-232 ports (DB9)
 - 12 NMEA ports (Phoenix 3.81 mm compatible connector)

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® (automatic data direction control) for RS-485
- Baudrate:** 50 bps to 230.4 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: Storage, Power

LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Physical Characteristics

Housing: Aluminum, sheet metal

Weight: 6.85 kg

Dimensions: 287 x 250 x 140 mm (11.30 x 9.84 x 5.51 in)

Mounting: Wall

Environmental Limits

Operating Temperature: -15 to 55°C (5 to 131°F)

Storage Temperature: -20 to 60°C (-4 to 131°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration:

- 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis

- 1 grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis

- 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Anti-shock: 50 g @ IEC 60068-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage:

- DC Model: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)

- AC Model: 100 to 240 VAC

Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, DNV 2.4 (Pending), IEC 60945 (4th) (Pending), IACS-E10 (Pending)

EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B

Marine: IEC 60945 4th. (Pending), IACS-E10 (Pending)

Green Product: RoHS, cRoHS, WEEE

Reliability

MTBF (mean time between failures): 220,490 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Ordering Information

Available Models

MC-5150-AC: x86-based ECDIS computer with Intel® Core™ i5 CPU processor, 4 serial ports, 12 NMEA ports, 2 Gigabit Ethernet ports, 6 USB hosts, storage, VGA/DVI, and AC power input

MC-5150-DC: x86-based ECDIS computer with Intel® Core™ i5 CPU processor, 4 serial ports, 12 NMEA ports, 2 Gigabit Ethernet ports, 6 USB hosts, storage, VGA/DVI, and DC power input

Optional Accessories (for AC model only, can be purchased separately)

PWC-C13US-3B-183: Power cord with 3-pin connector, USA plug

PWC-C13EU-3B-183: Power cord with 3-pin connector, Euro plug

PWC-C13UK-3B-183: Power cord with 3-pin connector, British plug

PWC-C13AU-3B-183: Power cord with 3-pin connector, Australia plug

PWC-C13CN-3B-183: Power cord with 3-pin connector, China plug

Package Checklist

- MC-5150 computer
- 2 removable storage protection keys
- Terminal block for power input (DC model only)
- 12 terminal blocks for NMEA ports
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

MC-5157-AC/DC

x86 Bridge computers with Intel® Core™ i5 520E, 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, 12 NMEA ports, 2 universal PCI slots, storage, VGA/DVI



- > High performance Intel® Core™ i5 520E processor, 3 MB L2 cache
- > Built-in 2 GB DDR3 memory, supports up to 4 GB
- > Dual independent displays (DVI-I + VGA)
- > 2 Gigabit Ethernet ports for network redundancy
- > 2 RS-232/422/485 serial ports
- > 2 RS-232 ports
- > 12 NMEA ports
- > 2 universal PCI slots
- > 6 USB 2.0 hosts
- > 1 internal SATA storage slot for SSD/HDD
- > 1 external storage slot with 60 GB SSD pre-installed
- > 1G anti-vibration and 5G anti-shock design for system reliability
- > Compact, fanless design
- > 24 VDC or 110 to 230 VAC power input models available
- > Supports Windows XP Embedded, XP Professional, Windows 7



4

Marine Displays and Computers > MC-5157-AC/DC

Overview

The MC-5157-AC/DC computers feature the Intel® Core™ i5 520E processor and come with 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, and 12 NMEA ports. The computers offer high performance and versatile peripherals for marine applications.

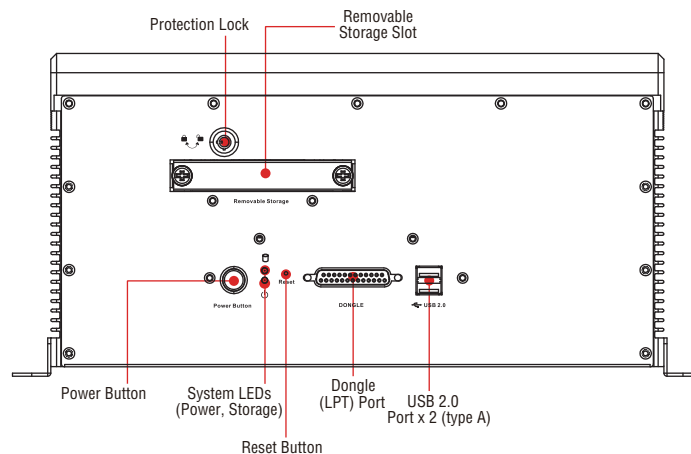
Designed with the highest quality and durability in mind, the marine-grade MC-5157-AC/DC computers feature a rugged chassis, 1G anti-vibration, and 5G anti-shock, which together provide the most reliable operation for harsh environments and conditions. In addition,

the compact size, fanless design, and low power consumption deliver an optimal thermal solution and make installation easy for bridge systems in marine applications. Another plus are the 2 universal PCI slots that allow users to install various adaptors, such as radar cards and Profitbus cards, fully satisfying marine needs.

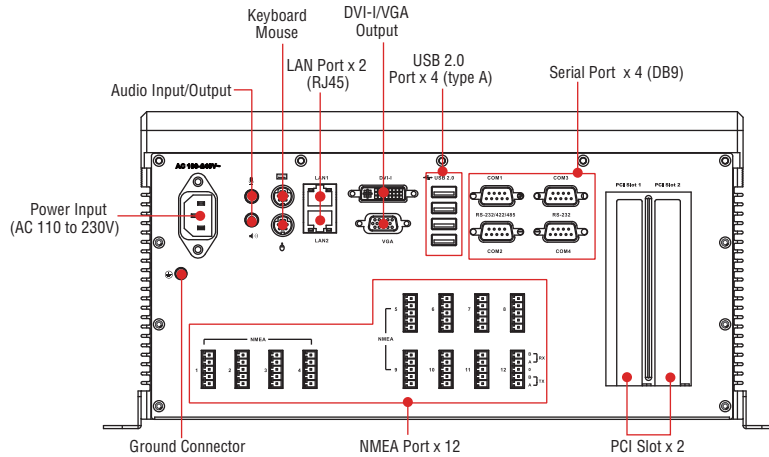
Users can easily install Windows XP Embedded, XP Professional, or Windows 7 to provide a flexible and friendly environment for system development and application implementation.

Appearance

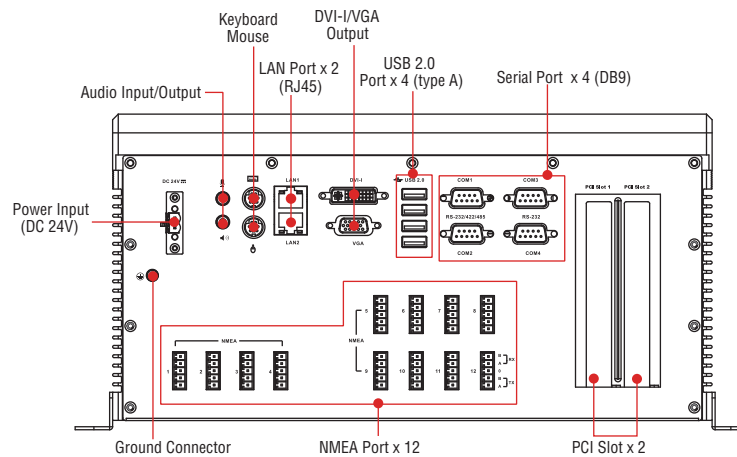
AC/DC Model Front View



AC Model Rear View



DC Model Rear View



Hardware Specifications

Universal PCI Expansion Adaptor

PCI Slots: 2

Computer

CPU: Intel® Core™ i5 520E (BGA CPU package), 2.4 GHz processor
OS: Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)

System Chipset: Intel® QM57 Express Chipset

DRAM: 2 GB DDR3 SDRAM onboard

USB: USB 2.0 hosts x 6, Type A connectors

Storage

Storage Support:

- 1 internal SATA storage tray for SSD/HDD
- 1 removable SATA storage tray for storage expansion with 60 GB SSD

Other Peripherals

KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse

Audio: line-in/out interface

Display

Graphics Controller: Onboard Intel® HD graphics

Display Interface:

- VGA Interface: 15-pin D-Sub connector (female), with resolution up to 1920 x 1080
- DVI-I Interface: 29-pin DVI-I connector (female)

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built in

Serial Interface

Serial Standards:

- 2 RS-232/422/485 ports, software-selectable (DB9 male)
- 2 RS-232 ports (DB9)
- 12 NMEA ports (Phoenix 3.81 mm compatible connector)

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 230.4 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: Storage, Power

LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Physical Characteristics

Housing: Aluminum, sheet metal

Weight: 8 kg

Dimensions: 320 x 300 x 171 mm (12.60 x 11.81 x 6.73 in)

Mounting: Wall

Environmental Limits

Operating Temperature: -15 to 55°C (5 to 131°F)

Storage Temperature: -20 to 60°C (-4 to 131°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration:

- 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
- 1 grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
- 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Anti-shock: 50 g @ IEC 60068-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage:

- DC Model: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
- AC Model: 100 to 240 VAC

Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, DNV 2.4 (Pending), IEC 60945 (4th) (Pending), IACS-E10 (Pending)

EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B

Marine: IEC 60945 4th. (Pending), IACS-E10 (Pending)

Green Product: RoHS, cRoHS, WEEE

Reliability

MTBF (mean time between failures): 220,490 hrs

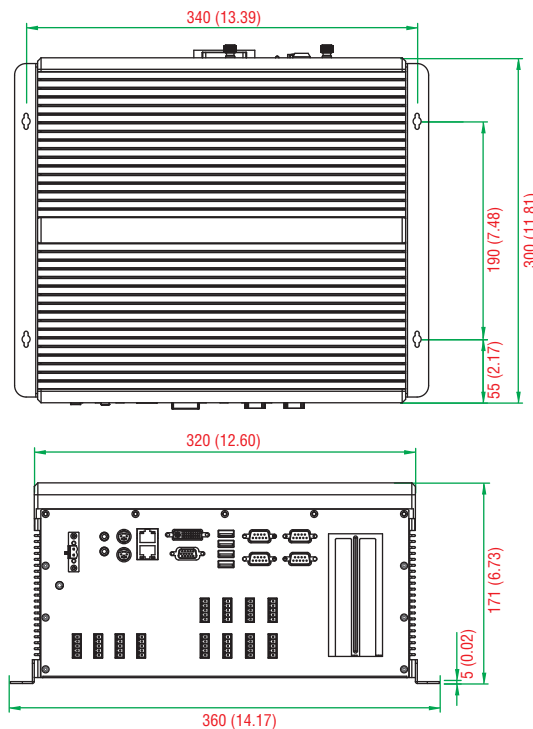
Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MC-5157-AC: x86-based bridge computer with Intel® Core™ i5 CPU processor, 4 serial ports, 12 NMEA ports, 2 Gigabit Ethernet ports, 6 USB hosts, 2 universal PCI slots, storage, VGA/DVI, and AC power input

MC-5157-DC: x86-based bridge computer with Intel® Core™ i5 CPU processor, 4 serial ports, 12 NMEA ports, 2 Gigabit Ethernet ports, 6 USB hosts, 2 universal PCI slots, storage, VGA/DVI, and DC power input

Optional Accessories (for AC model only, can be purchased separately)

PWC-C13US-3B-183: Power cord with 3-pin connector, USA plug

PWC-C13EU-3B-183: Power cord with 3-pin connector, Euro plug

PWC-C13UK-3B-183: Power cord with 3-pin connector, British plug

PWC-C13AU-3B-183: Power cord with 3-pin connector, Australia plug

PWC-C13CN-3B-183: Power cord with 3-pin connector, China plug

Package Checklist

- 1 MC-5157-AC/DC computer
- 2 removable storage protection keys
- Terminal block for power input (DC model only)
- 12 terminal blocks for NMEA ports
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

MC-4510-C23

x86-based industrial marine grade computer with Intel Core 2 Duo, 2 optically-isolated serial ports, 2 Gigabit LANs, CompactFlash, dual displays, audio, 6 USB ports



- > High performance with Intel Core 2 Duo 2.26 GHz processor, 6 MB L2 cache
- > Built-in 2 GB DDR3 memory supporting up to 4 GB
- > Dual independent displays (DVI-D + VGA)
- > 2 Gigabit Ethernet ports for network redundancy
- > 2 optically isolated RS-232/422/485 serial ports
- > Onboard mini-PCIe slot reserved for future expansions and upgrades
- > 6 USB 2.0 hosts for connecting peripheral devices
- > CompactFlash card socket and optional hard disk drive support for storage expansion
- > 1-g anti-vibration and 15-g anti-shock design
- > Fanless design with compact size
- > Low power consumption
- > Modular design for integration with Moxa panels
- > Supports Windows 7, Windows XP SP3, and Windows XP Embedded



Overview

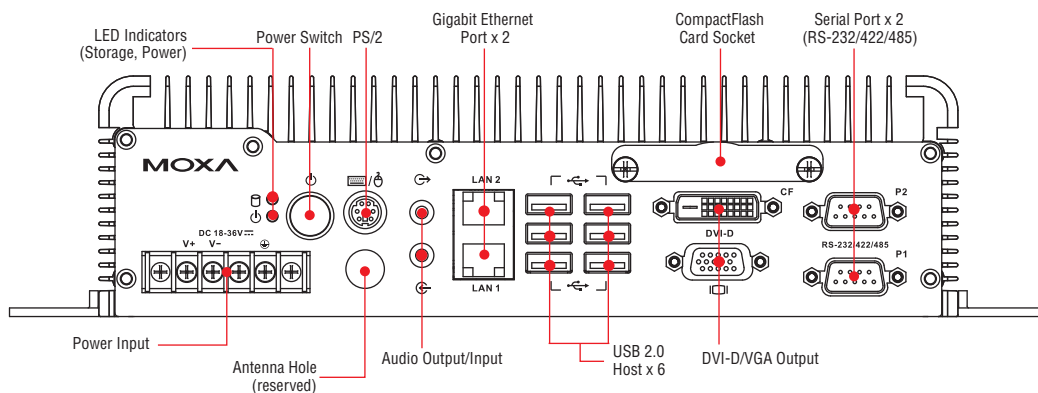
The MC-4510-C23 computer is based on the Intel Core 2 Duo mobile processor and comes with 2 RS-232/422/485 serial ports with optical isolation, 2 Gigabit Ethernet ports, 6 USB 2.0 hosts, and a CompactFlash socket, offering high performance and versatile peripherals for marine, railway, power, and other industrial applications.

The MC-4510-C23's rugged and fanless design and 1-g anti-vibration and 15-g anti-shock design makes it particularly well-suited for bridge

systems in marine applications. In addition, the compact size and low power consumption features ensure an easy installation and reliable system operation, and the modular design allows easy integration with the panel.

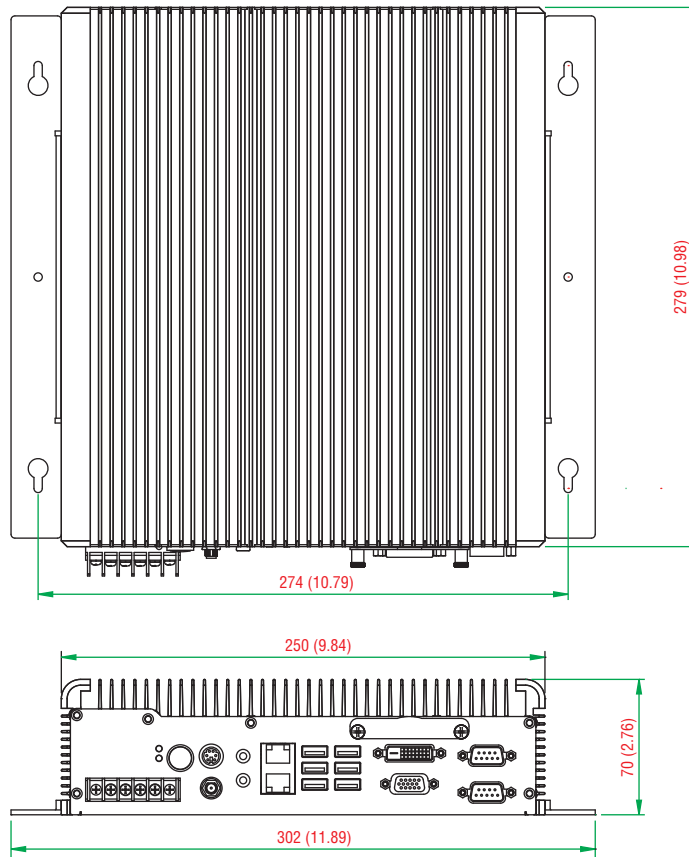
Users can easily install Windows 7, Windows XP SP3, or Windows XP Embedded to provide a flexible and friendly environment for system development and application implementation.

Appearance



Dimensions

Unit: mm (inch)



Specifications

Computer

CPU: Intel Core 2 Duo SP9300 2.26 GHz, 6 MB for L2 cache
OS: Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)
System Chipset: Intel GS45 + ICH9M
DRAM: 2 GB DDR3 SDRAM onboard (supports DDR3 up to 4 GB)
Expansion Bus: Mini-PCIe onboard
USB: USB 2.0 host x 6

Storage

Storage Expansion: CompactFlash socket
HDD Support: 2 SATA connectors for HDD expansion

Other Peripherals

Audio: line-in/out interface

Display

Graphics Controller: GMA 4500MHD (Intel GS45 built-in)
Display Interface: 15-pin D-Sub connector x 1 (female), 25-pin DVI-D connector x 1 (female)

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)
Optical Isolation Protection: 2 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® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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: Storage, Power
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Physical Characteristics

Housing: Aluminum, sheet metal
Weight: 3.75 kg
Dimensions: 302 x 70 x 279 mm (11.98 x 2.76 x 10.98 in)
Mounting: Wall

Environmental Limits

Operating Temperature: -10 to 55°C (14 to 131°F)

Storage Temperature: -20 to 60°C (-4 to 140°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration:

- 0.7 g, sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
- 1 grms, random wave, 3-100 Hz, 2.5 hr per axis
- 2.1 g, sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Anti-shock: 50 g @ IEC 60068-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 18 to 36 VDC (3-pin terminal block)

Power Consumption: 48.6 W

- 1.35 A @ 36 VDC
- 1.96 A @ 24 VDC
- 2.61 A @ 18 VDC

Standards and Certifications

Safety: UL 60950-1, IEC 60945 4th. IACS-E10, CCC (GB4943, 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

Marine: IEC 60945 4th. IACS-E10

Green Product: RoHS, cRoHS, WEEE

Reliability

MTBF (mean time between failures): 175,865 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

: Ordering Information

Available Models

MC-4510-C23: Industrial computer with Intel Core 2 Duo 2.26 GHz, 2 optically-isolated serial ports, 2 Gigabit LANs, dual displays, CompactFlash, USB, audio

Package Checklist

- MC-4510-C23 embedded computer
- PS/2 to KB/MS Y-type cable
- 2 sets of hard disk drive cables
- Hard disk drive ground sticker
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MPC-122-K Series

x86 marine panel computers with Intel Core 2 Duo 2.26 GHz, VGA, DVI, audio, 2 Gigabit LANs, 2 serial ports, 7 USB 2.0 ports, CompactFlash



- > 22" wide viewable image size with 16:10 aspect ratio and 1680 x 1050 pixel resolution
- > High performance with Intel Core 2 Duo 2.26 GHz processor
- > Full range dimming, optical bonding (optional), and wide angle view (178/178)
- > Dual independent displays (VGA + DVI-D)
- > Water and dust proof IP66-rated enclosure (flush mounting)
- > 2 Gigabits Ethernet LAN ports
- > 2 RS-232/422/485 optically-isolated serial ports
- > 7 USB 2.0 ports for high speed peripherals
- > CompactFlash socket for storage expansion
- > 2 SATA connectors for storage expansion
- > Supports Windows 7 and Windows XP SP3
- > Rugged and fanless design
- > ECDIS-compliant models available



Introduction

The MPC-122-K marine panel computer features a 2.26 GHz Intel Core 2 Duo processor with up to 4 GB of system memory to deliver a reliable high performance platform for marine system operations. Two RS-232/422/485 optically-isolated serial ports and two Gigabit LAN ports provide reliable serial communications and high speed Ethernet transmissions with network redundancy.

The panel is outfitted with a range of industrial features, such as optional optical bonding, wide view angles, and full range dimming. The panel is designed to modularly integrate with the computer to reduce system integration costs and reduce your time-to-market. Full

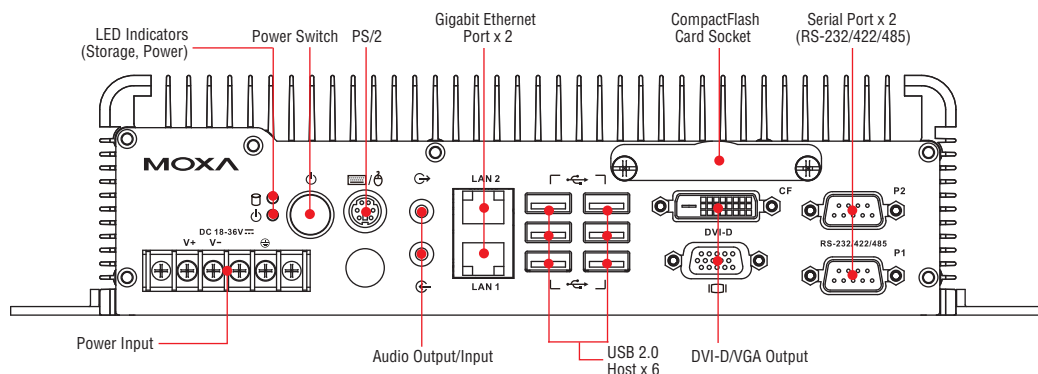
support is provided for a wide range of panel resolutions in order to meet the specific requirements of many different marine applications.

The MPC-122-K marine panel computers are compliant with many different industrial marine standards, such as IEC 60945, DNV, and IACS-E10, to verify their resilience in maritime operations. The IP66 rated enclosure provides additional protection against harsh marine environments.

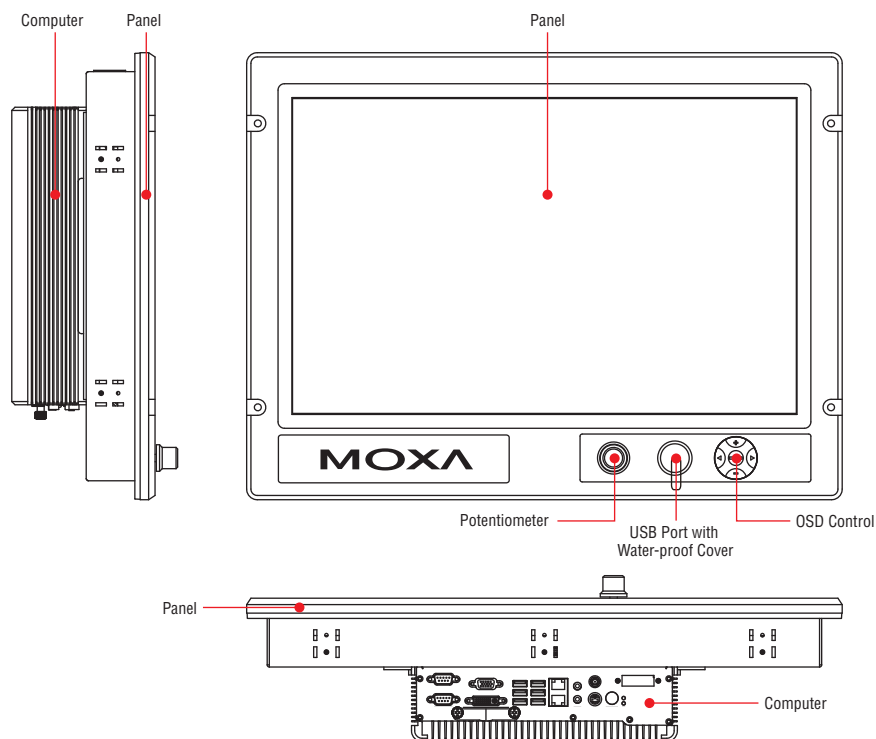
In addition, ECDIS-approved models are also available, offering the optimal solution for computers that meet the ECDIS requirements.

Appearance

Computer



Panel



: Specifications

Computer

CPU: Intel Core 2 Duo SP9300 2.26 GHz, 6 MB for L2 cache

OS: Windows 7, Windows XP SP3 (models with OS pre-installed available by request)

System Chipset: Intel GS45 + ICH9M

BIOS: 8 Mbit Flash BIOS SPI type, ACPI function supported

FSB: 1066 MHz

System Memory: 2 GB DDR3 SDRAM onboard (supports DDR3 up to 4 GB)

Graphics Controller: Intel GS45 built-in

Video Output: DVI-D x 1, VGA x 1 (female)

Expansion Bus: Mini-PCIe onboard

USB: USB 2.0 hosts x 7, type A connectors, supporting system boot up (6 ports on the computer, 1 port on the panel)

Storage

Storage Expansion: CompactFlash socket

SATA Storage Support: (models with SDD/HDD pre-installed available by request)

- 2.5-inch SSD
- 2.5-inch HDD

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: Line-in and line-out interface, with 3.5 mm mini jack

Display

Panel Size: 22" wide viewable image size

Panel Type: MVA

Aspect Ratio: 16:10

Pixels: 1680 x 1050 (WSXGA+)

Pixel Pitch (RGB): 0.282 (H) x 0.282 (V) mm

Response Time: 8 ms (gray to gray)

Contrast Ratio: 1000:1

Light Intensity: 300 cd/m²

Viewing Angles: 178/178

Active Display Area: 473.76 (H) x 296.1 (V) mm

Max Colors: 16.7M (8 bits/color)

Resolution:

- VGA: 640 x 480

- SVGA: 800 x 600

- XGA: 1024 x 768

- SXGA: 1280 x 1024

- WSXGA+: 1680 x 1050 (optimal setting)

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)

Optical Isolation Protection: 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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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: Storage, Power

LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Front Panel

LEDs: Storage, Power

OSD: 1 x OSD control

USB: 1 USB 2.0 host

Potentiometer: For brightness control

Physical Characteristics

Housing: Aluminum sheet metal

Weight: 15 kg

Dimensions: 124 x 560 x 420 mm (4.88 x 22.05 x 16.54 in)

Mounting: Flush mounting

Environmental Limits

Operating Temperature: -15 to 55°C (5 to 131°F)

Storage Temperature: -20 to 60°C (-4 to 140°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-Vibration:

- IEC 60945
- DNV 2.4, Class A/Class C

Power Requirements

Input Voltage: 24 VDC (18 to 36 VDC), screw-type terminal block

Power Consumption: 112 W

- 6.21 A @ 18 VDC
- 4.55 A @ 24 VDC
- 2.95 A @ 36 VDC

Standards and Certifications

Safety: UL/cUL, CCC

EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A

Marine: IEC 60945 4th. (Pending), DNV (Pending), IACS-E10 (Pending)

Green Product: RoHS, cRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 levels for time interval system reset, software programmable

MTBF (mean time between failures): 39,675 hrs

Warranty

Warranty Period: 1 year

Details: See www.moxa.com/warranty

We recommend taking the following precautions to minimize heat build-up within the display:

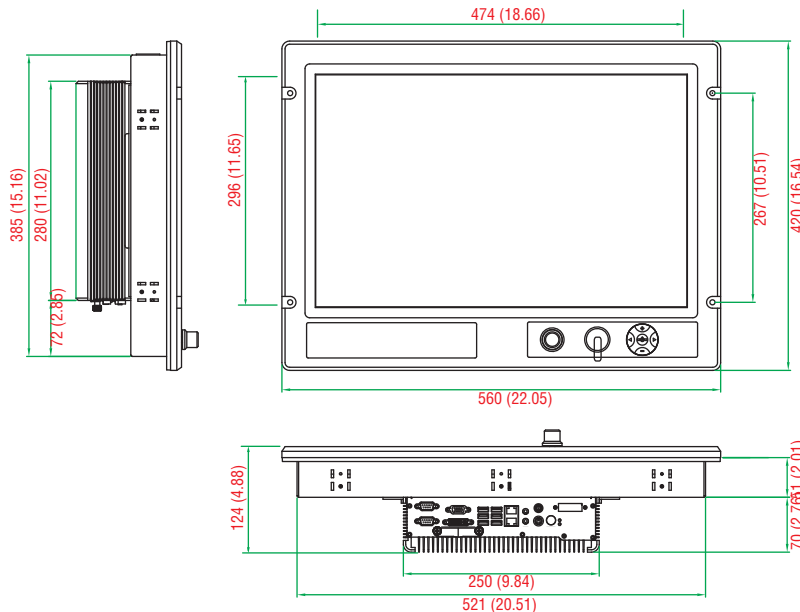
- Position the display within $\pm 40^\circ$ of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within $\pm 40^\circ$ of the vertical, (b) the operating temperature exceeds 25°C, or (c) the display is used in a location with minimal ventilation.

Important Safety Precaution:

Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C for bridge applications, it is best to ensure that the operating temperature does not exceed 25°C. Doing so will increase the life of your display and minimize service costs.

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MPC-122X-K: Intel Core 2 Duo 2.26 GHz panel computer with 22" screen, full-dimming, tape bonding glass

MPC-122Y-K: Intel Core 2 Duo 2.26 GHz panel computer with 22" screen, full-dimming, optical bonding glass

MPC-122X-K-ECDIS: Intel Core 2 Duo 2.26 GHz panel computer with 22" screen, full-dimming, tape bonding glass, ECDIS

MPC-122Y-K-ECDIS: Intel Core 2 Duo 2.26 GHz panel computer with 22" screen, full-dimming, optical bonding glass, ECDIS

Package Checklist

- MPC-122-K panel computer
- PS/2 to KB/MS Y-type cable
- 2 hard drive cables and 1 SATA disk power cable
- Rubber water proofing cushion
- Hard drive ground sticker
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card



Wallmount Computers

V2101 Series x86 Atom computers—VGA, LVDS, audio, DI/DO, USB 2.0, SD	5-2
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**Wallmount
Computers**



V2101 Series

x86 ready-to-run embedded computers with Intel Atom Z510PT, VGA, LVDS, audio, 2 LANs, 2 serial ports, 3 DIs, 3 DOs, 4 USB 2.0 ports, SD



- > Intel Atom Z510PT 1.1 GHz processor, 400 MHz FSB
- > DDR2 SODIMM socket supporting DDR2 400 up to 2 GB
- > Dual Independent Displays (VGA+ LVDS)
- > 2 Gigabit Ethernet ports
- > 4 USB 2.0 ports for high speed peripherals
- > 3 DIs, 3 DOs
- > 2 RS-232/422/485 ports
- > Built-in CompactFlash for storing OS
- > LED indicators for power, storage
- > Ready-to-run Embedded Linux, WinCE 6.0, or Windows Embedded Standard 2009 platform
- > -40 to 85°C wide operating temperature models available



5

Wallmount Computers > V2101 Series

Overview

The V2101 embedded computers are based on the Intel Atom Z510PT x86 processor, and feature 2 serial ports, dual Gigabit LAN ports, 4 USB 2.0 hosts, and SD socket. The V2100 Series offers both VGA and LVDS outputs, making it particularly well-suited for industrial applications, such as SCADA and factory automation.

The V2101 computers' 2 serial ports make them ideal for connecting a wide range of serial devices, and the dual 10/100/1000 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2101 computers have 3 DIs and 3 DOs for connecting digital input/output devices. In addition, the SD and

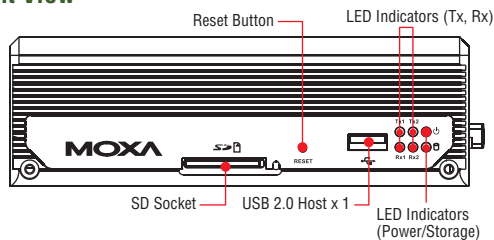
USB sockets provide the V2101 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

Pre-installed with Linux, Windows CE 6.0, or Windows Embedded Standard 2009, the V2101 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

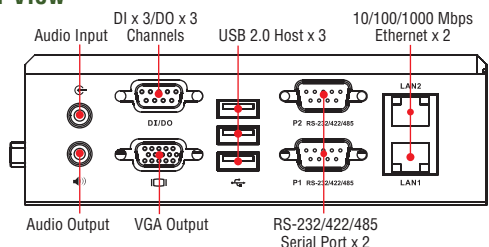
All V2101 models support a wide operating temperature range of -40 to 85°C for harsh industrial environments.

Appearance

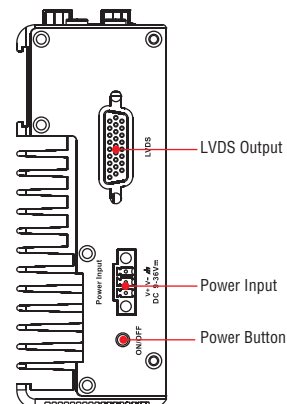
Front View



Rear View



Side View



Hardware Specifications

Computer

CPU: Intel Atom Z510PT 1.1 GHz processor

OS (pre-installed): Linux, Windows CE 6.0 or Windows Embedded Standard 2009

System Chipset: Intel US15WPT

BIOS: 8 Mbit Flash BIOS, ACPI function supported (XPe model only)

FSB: 400 MHz

System Memory: 1 x 200-pin DDR2 SODIMM socket support DDR2 400 up to 2GB max, 1 GB built-in

USB: USB 2.0 compliant hosts x 4, type A connector, supports system boot up

Storage

Built-in: 2 GB CompactFlash to store OS

Storage Expansion: SD socket for storage expansion

Other Peripherals

Audio: AC97 audio, with line-in and line-out interface

Display

Graphics Controller: Intel Graphics Media Accelerator, 500 Graphics, for 2D and 3D graphics

Video: The Poulsbo XL SCH supports full hardware acceleration of video decode standards such as H.264, MPEG2, MPEG4, and WMV9.

SDVO: Chrontel CH7317 for VGA output (1280 x 1024 @ 85 Hz)

VGA Interface: DB15 female connector

LVDS Interface: 18-bit or 24-bit single channel LVDS (1366 x 768 @ 85 Hz)

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (RJ45)

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software selectable (DB9 male)

ESD Protection: 2 KV for all signals

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 115.2 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

Digital Input

Input Channels: 3, source type

Input Voltage: 0 to 30 VDC at 5 KHz

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: DB9 female

Digital Output

Output Channels: 3, sink type

Output Current: Max. 200 mA per channel

Output Voltage:

- Logic 0: 0-0.55 V
- Logic 1: 2.5-3.3 V

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: DB9 female

LEDs

System: Power, Storage

LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Serial: Tx, Rx

Switches and Buttons

Power Switch: on/off (side)

Reset Button: For warm reboot (front side)

Physical Characteristics

Housing: Aluminum

Weight: 940 g

Dimensions:

Without ears: 150 x 49 x 125 mm (5.91 x 1.93 x 4.92 in)

With ears: 178 x 52 x 125 mm (7.01 x 2.05 x 4.92 in)

Mounting: DIN-Rail, wall, VESA

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)

Anti-vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: (without LVDS output)

With no load on 4 USB ports:

- 1.88 A @ 9 VDC, 17 W
- 583 mA @ 24 VDC 14 W
- 422 mA @ 36 VDC 15 W

With full load on 4 USB ports:

- 3 A @ 9 VDC, 27 W
- 1 A @ 24 VDC, 24 W
- 700 mA @ 36 VDC, 25.2 W

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

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

MTBF (mean time between failures): 231,633 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

: Software Specifications

Linux

OS: Linux 2.6.26, Debian Lenny 5.0

File System: EXT2

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ compiler
- GNU C library
- Perl

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0 R2

File System: FAT (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SMTP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 3.5
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Windows XP Embedded

OS: Windows Embedded Standard 2009 SP3

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 2.0: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

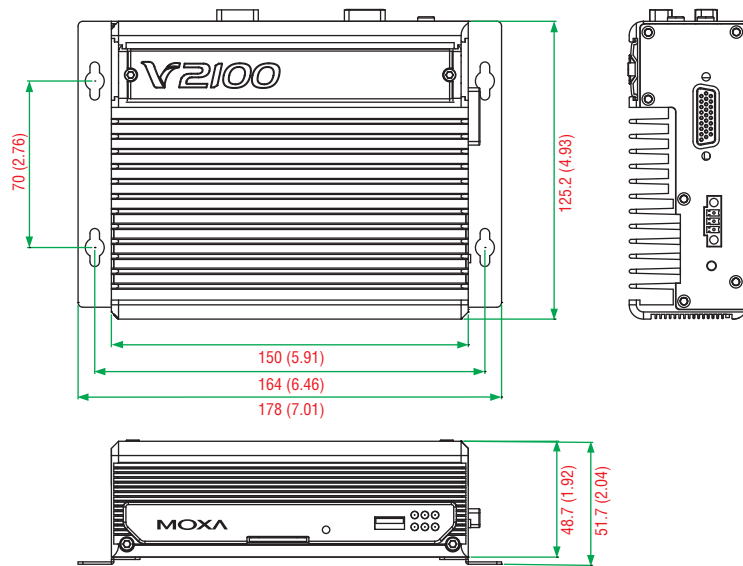
File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

V2101-T-CE: x86 ready-to-run embedded computer with Intel Atom Z510PT, VGA, LVDS, Audio, 2 LANs, 2 serial ports, 3 DIs, 3 DOs, 4 USB 2.0 ports, SD, WinCE 6.0, -40 to 85°C operating temperature

V2101-T-XPE: x86 ready-to-run embedded computer with Intel Atom Z510PT, VGA, LVDS,

Audio, 2 LANs, 2 serial ports, 3 DIs, 3 DOs, 4 USB 2.0 ports, SD, Windows Embedded Standard 2009, -40 to 85°C operating temperature

V2101-T-LX: x86 ready-to-run embedded computer with Intel Atom Z510PT, VGA, LVDS, Audio, 2 LANs, 2 serial ports, 3 DIs, 3 DOs, 4 USB 2.0 ports, SD, Linux 2.6, -40 to 85°C operating temperature

Optional Accessories (can be purchased separately)

PWR-24250-DT-S1: Power adaptor

PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug

PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug

PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug

PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug

PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

Package Checklist

- V2101 embedded computer
- Terminal block to power jack converter
- DIN-Rail mounting kit
- Wall mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V2401/2402 Series

x86 ready-to-run embedded computers with Intel Atom N270, VGA, DVI, LVDS, audio, 2 LANs, 12 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CompactFlash



- > Intel Atom N270 1.6 GHz processor
- > DDR2 SODIMM socket supporting DDR2 533 up to 2 GB (max.)
- > Dual independent displays (VGA, DVI, LVDS)
- > 2 Gigabit Ethernet ports
- > 4 RS-232/422/485 serial ports (non-standard baudrates supported)
- > 8 RS-232 serial ports
- > 6 USB 2.0 ports for high speed peripherals
- > 4 DIs, 4 DOs
- > CompactFlash socket for storage expansion
- > Ready-to-run Embedded Linux, Windows CE 6.0, or Windows Embedded Standard 2009 platform
- > -40 to 70°C operating temperature for harsh environment (V2402-T models only)

e Mark



Overview

The V2401/2402 Series embedded computers are based on the Intel Atom N270 x86 processor, and feature 4 RS-232/422/485 serial ports, 8 RS-232 serial ports, dual Gigabit LAN ports, 6 USB 2.0 hosts, and a CompactFlash socket. The V2401 computer provides VGA, DVI, and LVDS outputs, and the V2402 computer provides both VGA and DVI outputs, making them particularly well-suited for industrial applications such as SCADA and factory automation.

The V2401 and V2402 come with 4 RS-232/422/485 serial ports, and the V2401 has an additional 8 RS-232 ports, making them ideal for connecting a wide range of serial devices, and the dual 10/100/1000 Mbps Ethernet ports offer a reliable solution for network redundancy,

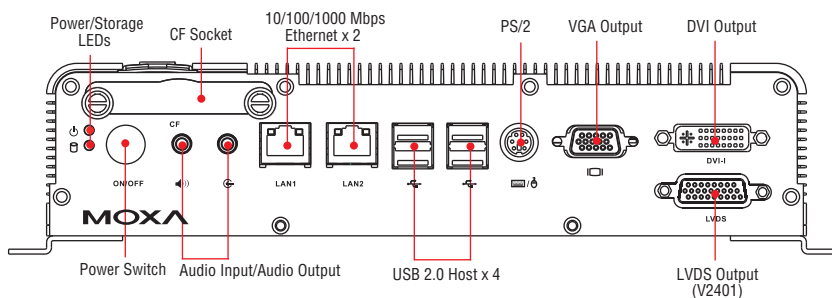
promising continuous operation for data communication and management. As an added convenience, the V2401/2402 computers have 4 DIs, and 4 DOs for connecting digital input/output devices. In addition, the CompactFlash and USB sockets provide the V2401/2402 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

Pre-installed with Linux, Windows CE 6.0, or Windows Embedded Standard 2009, the V2401/2402 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost.

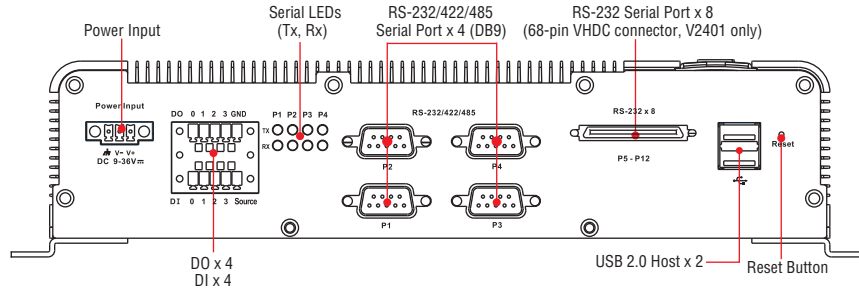
In addition, the V2402 series also offers -40 to 70°C wide temperature models for harsh environments.

Appearance

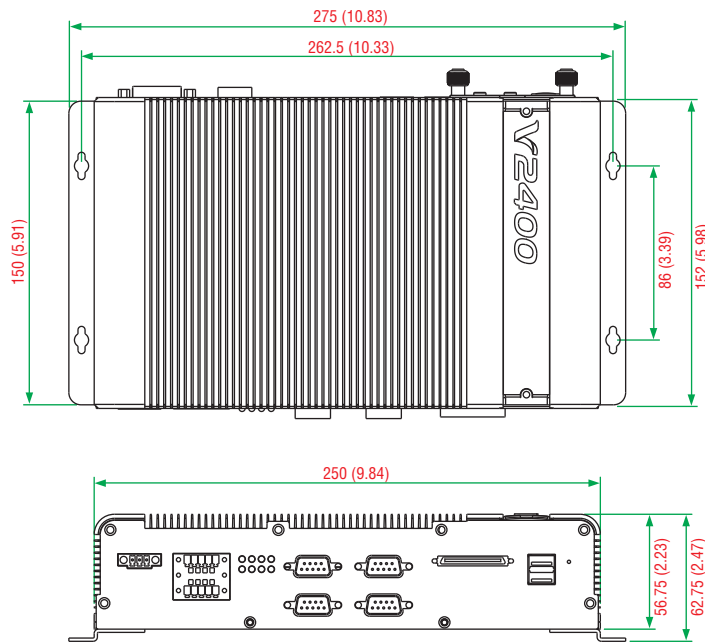
Front View



Rear View



Dimensions



Unit: mm (inch)

Hardware Specifications

Computer

CPU: Intel Atom N270 1.6 GHz processor
OS (pre-installed): Linux, Windows CE 6.0 or Windows Embedded Standard 2009
System Chipset: Intel 945GSE + ICH7-M
BIOS: 8 Mbit Flash BIOS, SPI type, ACPI function supported
FSB: 400/533 MHz
System Memory: 1 x 200-pin DDR2 SODIMM socket support DDR2 533 up to 2 GB, built-in 1 GB
USB: USB 2.0 compliant hosts x 6, type A connector, supports system boot up

Storage

Built-in: 2 GB onboard industrial DOM to store OS
Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II socket with DMA mode
HDD Support: 1 SATA-II connector for HDD expansion

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable
Audio: HD audio, with line-in and line-out interface

Display

Graphics Controller: Intel Gen 2.5 Integrated Graphics Engine, 250 MHz core render clock and 200 MHz core display clock at 1.05-V core voltage
VGA Interface: DB15 female connector
LVDS Interface: Onboard HIROSE DF13-40DP-1.25 V connector (V2401 only)
DVI Interface: DVI-connector (chrontel CH7307 SDVO to DVI transmitter)

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (RJ45)

Serial Interface

Serial Standards:
 • V2401/2402: 4 RS-232/422/485 ports*, software selectable (DB9 male connector)
 • V2401 only: 8 RS-232 ports (68-pin VHDC connector)
 *COM1's pin 9 signal can be set by jumper as N/C (default), +5 V, or +12 V
ESD Protection: 4 KV for all signals

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC at 25 Hz

Digital Input Levels for Dry Contacts:

• Logic level 0: Close to GND

• Logic level 1: Open

Digital Input Levels for Wet Contacts:

• Logic level 0: +3 V max.

• Logic level 1: +10 V to +30 V (Source to DI)

Isolation: 3 KV optical

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 VDC

Connector Type: 10-pin screw terminal block (4 DI points, 4 DO points, DI Source, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power, Storage

LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Switches and Buttons

Power Switch: on/off (front panel)

Reset Button: For warm reboot (rear panel)

Physical Characteristics

Housing: Aluminum

Weight:

• V2401: 2.1 kg

• V2402: 2 kg

Dimensions:

Without ears: 250 x 57 x 152 mm (9.84 x 2.24 x 5.98 in)

With ears: 275 x 63 x 152 mm (10.83 x 2.48 x 5.98 in)

Mounting: DIN-Rail, wall, VESA

Environmental Limits

Operating Temperature:

• Standard models: -10 to 60°C (14 to 140°F)

• Wide temp. models: -40 to 70°C (-40 to 158°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr/axis

Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 26 W (without LVDS output)

2.9 A @ 9 VDC

1.08 A @ 24 VDC

720 mA @ 36 VDC

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

Wheeled Vehicles: e-Mark (e4)

Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

MTBF (mean time between failures):

V2401: 238,762 hrs

V2402: 228,172 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Linux 2.6.26, Debian Lenny 5.0

File System: EXT2

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ compiler
- GNU C library
- Perl

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0 R3

File System: FAT (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Windows XP Embedded

OS: Windows Embedded Standard 2009 SP3

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 2.0: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay

cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Ordering Information

Available Models

V2401-CE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, LVDS, DVI, Audio, 2 LANs, 12 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, WinCE 6.0

V2401-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, LVDS, DVI, Audio, 2 LANs, 12 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Windows Embedded Standard 2009

V2401-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, LVDS, DVI, Audio, 2 LANs, 12 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Linux 2.6

V2402-CE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, WinCE 6.0

V2402-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Windows Embedded Standard 2009, -10 to 60°C operating temperature

V2402-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Linux 2.6, -10 to 60°C operating temperature

V2402-T-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Windows Embedded Standard 2009, -40 to 70°C operating temperature

V2402-T-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, Linux 2.6, -40 to 70°C operating temperature

Optional Accessories (can be purchased separately)

CBL-M68M9x8-100: 8-port RS-232 cable with VHDC connector

PWR-24250-DT-S1: Power adaptor

PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug

PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug

PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug

PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug

PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

FK-75125-01: Hard disk installation package (for SSD)

DK-DC50131-01: DIN-Rail mounting kit

Package Checklist

- V2401 or V2402 embedded computer
- Terminal block to power jack converter
- PS2 to KB/MS Y-type cable
- Wall mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V2422 Series

x86 ready-to-run embedded computers with Intel Atom N270, VGA, DVI-I, audio, 2 Gigabit LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CompactFlash, 2 peripheral expansion slots



- > Intel Atom N270 1.6 GHz processor
- > DDR2 SODIMM socket supporting DDR2 533 up to 2 GB (max.)
- > Dual independent displays (VGA + DVI-I)
- > 2 10/100/1000 Mbps Ethernet ports
- > 4 RS-232/422/485 serial ports (non-standard baudrates supported)
- > 6 USB 2.0 ports for high speed peripherals
- > 4 DIs, 4 DOs
- > CompactFlash socket for storage expansion
- > 1 SATA-II connector for hard disk drive expansion
- > Ready-to-run Embedded Linux, or Windows Embedded Standard 2009 platform

e Mark



Overview

The V2422 Series embedded computers are based on the Intel Atom N270 x86 processor, and feature 4 RS-232/422/485 serial ports, dual Gigabit LAN ports, and 6 USB 2.0 hosts. In addition, the V2422 computers provide VGA and DVI-I outputs, and are EN 50155 certified, making them particularly well-suited for railway and industrial applications.

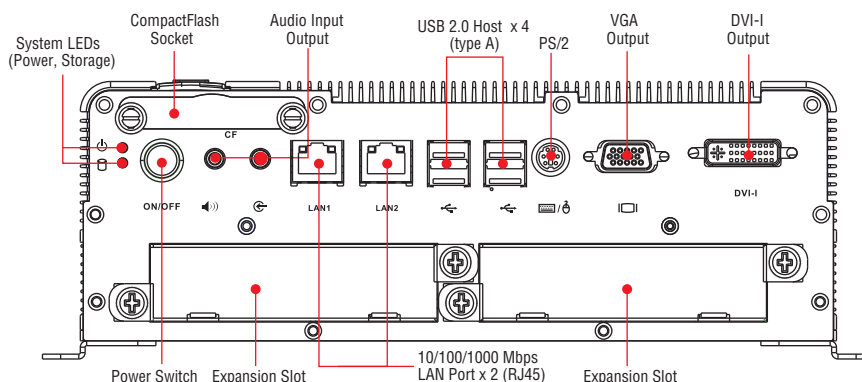
The dual 10/100/1000 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2422 computers have 4 DIs and 4 DOs for connecting digital input/output devices. In addition, the CompactFlash socket, SATA connector,

and USB sockets provide the V2422 computers with the reliability needed for industrial applications that require data buffering and storage expansion. Moreover, the V2422 computers come with 2 peripheral expansion slots for inserting different communication modules, such as a 2-port CAN module, an HSDPA, GPS, WLAN module, an 8+8 port digital input/output module, a 2-port serial module, a mini PCI expansion module, and a PCI Express module, providing greater flexibility for setting up different industrial applications at field sites.

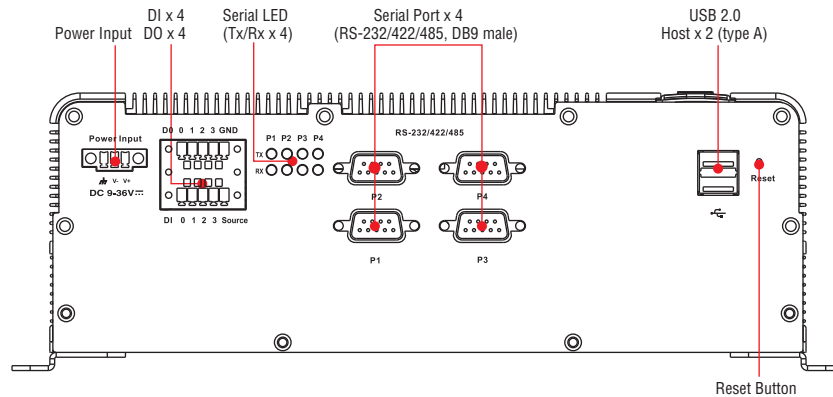
Pre-installed with Linux or Windows Embedded Standard 2009, the V2422 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost.

Appearance

Front View



Rear View



Dimensions



: Hardware Specifications

Computer

CPU: Intel Atom N270 1.6 GHz processor

OS (pre-installed): Linux or Windows Embedded Standard 2009

System Chipset: Intel 945GSE + ICH7-M

BIOS: 8 Mbit Flash BIOS, PLCC type, ACPI function supported

FSB: 533 MHz

System Memory: 1 x 200-pin DDR2 SODIMM socket support DDR2 533 up to 2 GB, built-in 1 GB

Expansion Bus: PCI interface reserved

USB: USB 2.0 compliant hosts, type A connector x 6, supports system boot up

Storage

Built-in: 2 GB onboard industrial DOM to store OS

Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II

HDD Support: 1 SATA-II connector for HDD expansion

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: Line-in, line-out interface

Display

Graphics Controller: Intel Gen 3.5 Integrated Graphics Engine, 250 MHz core render clock and 200 MHz core display clock at 1.05-V core voltage

VGA Interface: DB15 female connector, up to 2048 x 1536 resolution

DVI Interface: DVI-I connector (chrontel CH7307 SDVO to DVI transmitter), up to 1600 x 1200 resolution

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV

Serial Interface

Serial Standards:

4 RS-232/422/485 ports*, software selectable (DB9 male)

*COM1's pin 9 signal can be set as N/C (default), +5 V, or +12 V by jumper

ESD Protection: 8 KV for all signals

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC at 25 Hz

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (Source to DI)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 VDC

Connector Type: 10-pin screw terminal block (4 DI points, 4 DO points, DI Source, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power, Storage

LAN: 100M/Link x 2, 1000M/Link x 2

Serial: TX x 4, RX x 4

Switches and Buttons

Power Switch: on/off (front panel)

Reset Button: For warm reboot (rear panel)

Physical Characteristics

Housing: Aluminum

Weight: 4 kg

Dimensions:

Without ears: 154 x 250 x 86 mm (6.06 x 9.84 x 3.39 in)

With ears: 154 x 275 x 92 mm (6.06 x 10.83 x 3.62 in)

Mounting: DIN-Rail, wall, VESA

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: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr/axis

Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 48 W

5.3 A @ 9 VDC

2 A @ 24 VDC

1.3 A @ 36 VDC

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

Wheeled Vehicles: e-Mark (e4)

Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

MTBF (mean time between failures): 144,114 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Linux 2.6.26, Debian Lenny 5.0

File System: EXT2

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control)
- GNU C/C++ compiler
- GNU C library
- Perl

Windows XP Embedded

OS: Windows Embedded Standard 2009 SP3

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SMTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 2.0: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 3.5 with SP1
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs

- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Ordering Information

Available Models

V2422-XPE: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, 2 peripheral expansion slots, Windows Embedded Standard 2009

V2422-LX: x86 ready-to-run embedded computer with Intel Atom N270, VGA, DVI-I, Audio, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 6 USB 2.0 ports, CF, 2 peripheral expansion slots, Linux 2.6

Expansion Modules (can be purchased separately)

EPM-3112: 2 isolated CAN ports, DB9 connector

EPM-3337: HSDPA, GPS, WLAN (11a/b/g/n)

EPM-3438: 8+8 DI/DO with 2 KV digital isolation protection, 2 KHz counter

EPM-3032: 2 isolated RS-232/422/485 ports with DB9 connectors

EPM-DK01: 1-slot mini PCI and mini PCIe expansion module

EPM-3552: 1 VGA or DVI-I display connector

Optional Accessories (can be purchased separately)

PWR-24250-DT-S1: Power adaptor

PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug

PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug

PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug

PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug

PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

FK-75125-01: Hard disk installation package (for SSD)

DK-DC50131-01: DIN-Rail mounting kit

Package Checklist

- V2422 embedded computer
- Terminal block to power jack converter
- Wall mounting kit
- PS2 to KB/MS Y-type cable
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V460 Series

x86 embedded computers with 4 serial ports, dual or quad LANs, VGA, 8 DIs, 8 DOs, CompactFlash, PCMCIA, 8 unmanaged switch ports, USB



- > AMD Geode LX 800@0.9W CPU, 500 MHz
- > Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
- > Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
- > 256 KB of SRAM with battery backup
- > 2 RS-232 and 2 RS-232/422/485 serial ports (non-standard baudrates supported)
- > Dual or quad 10/100 Mbps Ethernet ports for network redundancy
- > PCMCIA socket for wireless network (V462 only)
- > 8 10/100 Mbps unmanaged switch ports (V466 only)
- > 8 DI and 8 DO channels (V468 only)
- > CompactFlash socket for storage expansion
- > 4 USB 2.0 hosts supporting system boot up
- > Ready-to-run WinCE 6.0 or Windows XP Embedded platform



Overview

The V460 Series embedded computers are based on the AMD x86 processor, and feature 4 serial ports, dual or quad LAN ports, 4 USB 2.0 hosts, and CompactFlash and PCMCIA sockets. A VGA interface is also included, making the V460 computers particularly well-suited for industrial applications such as SCADA and factory automation.

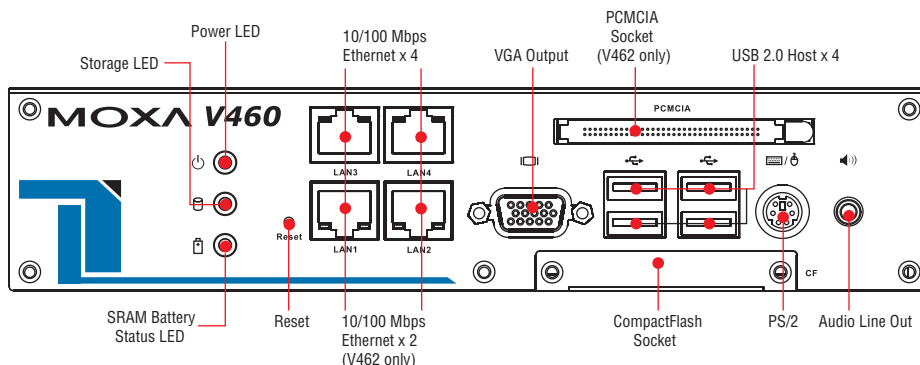
The V460 computers' 4 serial ports can be used to connect a wide range of serial devices, and the dual 10/100 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the 8 built-in 10/100 Mbps unmanaged switch ports

and the 8 DI and 8 DO channels can help connect network devices and digital input/output devices easily. In addition, the CompactFlash, PCMCIA, and USB sockets provide the V462 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

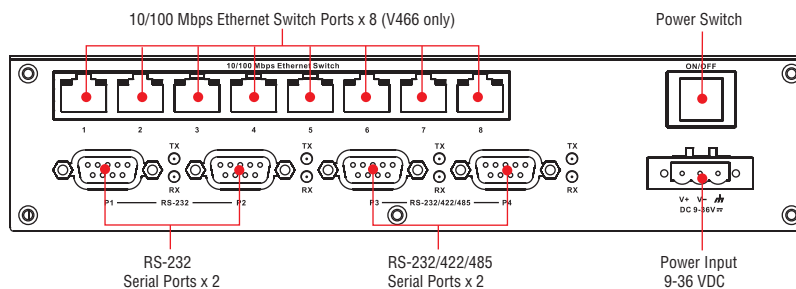
The V460 computers come with the WinCE 6.0 or WinXP Embedded operating system already installed. WinCE 6.0 and WinXP Embedded provide programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

Appearance

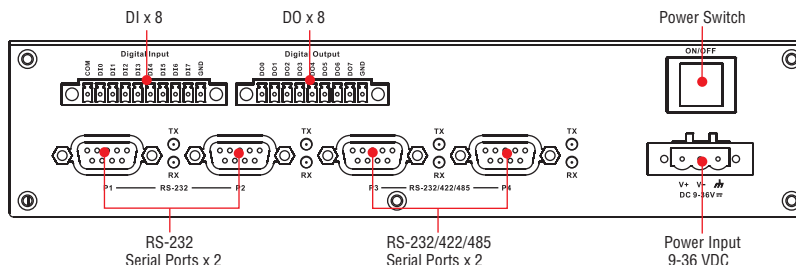
Front View



Rear View V462/V464/V466



Rear View V468



Hardware Specifications

Computer

CPU: AMD Geode LX 800@0.9W processor with 128K L2 Cache, 500 MHz

OS (pre-installed): Windows CE 6.0 or Windows XP Embedded

System Chipset: AMD CS5536

BIOS: 4 Mbit Flash BIOS, supporting Plug & Play, APM 1.2, ACPI 1.0

SRAM: 256 KB, battery backup

FSB: 400 MHz

System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR400 up to 1 GB

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1/JEIDA 4.2 card (V462 only)

Expansion Bus: PC/104-Plus onboard

USB: USB 2.0 compliant hosts x 4, type A connector, supports system boot up

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial DOM for OS

Storage Expansion: CompactFlash socket

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable

Audio: AC97 audio, with line-out interface

Display

Graphics Controller: CPU integrated 2D graphics

Display Interface: CRT interface for VGA output

Ethernet Interface

LAN: 10/100 Mbps, auto-sensing (RJ45)

- V462: 2 ports
- V464/466/468: 4 ports

Switch Ports: 8 unmanaged 10/100 Mbps built-in Ethernet switch ports (V462 only)

Controller: Realtek RTL8100CL

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards:

- 2 RS-232 ports (DB9 male)
- 2 RS-232/422/485 ports, software selectable (DB9 male)

ESD Protection: 15 KV for all signals

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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

Digital Input (V468 only)

Input Channels: 8, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (8 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output (V468 only)

Output Channels: 8, sink type

Output Current: Max. 200 mA per channel

Output Voltage:

- Logic 0: 0-0.55 V
- Logic 1: 2.5-3.3 V

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 9-pin screw terminal block

Isolation: 3 KV optical isolation

LEDs

System: Power, Battery, Storage

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum

Weight: 1.32 kg

Dimensions:

Without ears: 223 x 121 x 57 mm (8.78 x 4.76 x 2.24 in)

With ears: 248 x 140 x 70 mm (9.76 x 5.51 x 2.76 in)

Mounting: DIN-Rail, wall

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: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 26 W

- 730 mA @ 36 VDC
- 1080 mA @ 24 VDC
- 2820 mA @ 9 VDC

Standards and Certifications

Safety: 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 A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A

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) supporting 1-255 level time interval system reset, software programmable

MTBF (mean time between failures):

V462: 192,776 hrs

V464: 178,164 hrs

V466: 141,030 hrs

V468: 123,198 hrs

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Software Specifications

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0

File System: FAT

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNMP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0
- XML, including DOM, XQL, XPath, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Windows XP Embedded

OS: Windows XP Embedded

File System: NTFS

Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SNMP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS

Web Server (IIS): Allows users to create and manage websites

Silverlight 1.1: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework

Remote Registry Service: Enables remote users to modify registry settings on this computer

Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

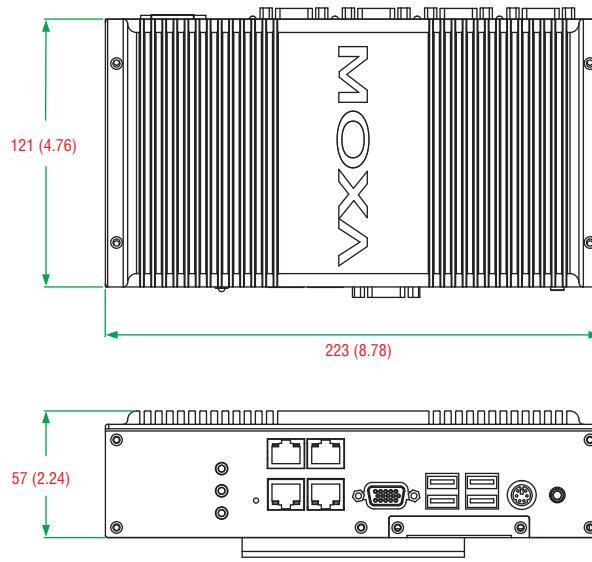
File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:

- Moxa API Library
- Microsoft .Net Framework 2.0 with SP 2
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL), ASP.NET 2.0
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow, and Direct show filters
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- RPC
- Windows API, Script Engines, and WMI

Dimensions

Unit: mm (inch)



Model Name	Serial Ports		LAN Ports	Storage			PCMCIA	DI/DO	Switch	OS	
	RS-232	RS-232/422/485	10/100 Mbps	CF	USB	IDE				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	–	✓	✓

Ordering Information

Available Models

- V462-CE:** x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and WinCE 6.0 OS
- V462-XPE:** x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and Windows XP Embedded OS
- V464-CE:** x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and WinCE 6.0 OS
- V464-XPE:** x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and Windows XP Embedded OS
- V466-CE:** x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and WinCE 6.0 OS
- V466-XPE:** x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and Windows XP Embedded OS
- V468-CE:** x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and WinCE 6.0 OS
- V468-XPE:** x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and Windows XP Embedded OS

Optional Accessories (can be purchased separately)

- PWR-24250-DT-S1:** Power adaptor
- PWC-C7US-2B-183:** Power cord with 2-pin connector, USA plug
- PWC-C7EU-2B-183:** Power cord with 2-pin connector, Euro plug
- PWC-C7UK-2B-183:** Power cord with 2-pin connector, British plug
- PWC-C7AU-2B-183:** Power cord with 2-pin connector, Australia plug
- PWC-C7CN-2B-183:** Power cord with 2-pin connector, China plug

Package Checklist

- V462 or V464 or V466 or V468 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- DIN-Rail mounting kit
- PS2 to KB/MS Y-type cable
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

UC-8410 Series

RISC ready-to-run embedded computers with 8 serial ports, 3 LANs, USB, CompactFlash



- > Intel XScale IXP435 533 MHz processor
- > 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
- > 32 MB NAND Flash for data storage
- > 256 KB battery backup SRAM
- > 8 RS-232/422/485 serial ports
- > 4 digital input and 4 digital output channels
- > 3 10/100 Mbps Ethernet ports
- > 2 USB 2.0 hosts for mass storage devices
- > CompactFlash socket for storage expansion
- > Supports IPv6 function (Linux model only)
- > DIN-Rail or wall mount installation
- > Robust, fanless design
- > -40 to 75°C wide temperature model available
- > Ready-to-run Embedded Linux or Windows CE 6.0



Overview

The UC-8410 Series embedded computers come with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 4 digital input channels, 4 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts.

The computers use the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8410, and the 32 MB NAND Flash can be used to provide additional data storage. Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss. The UC-8410 computers come with 8 RS-232/422/485 serial ports, digital I/O, and have 3 LAN ports, making them ideal

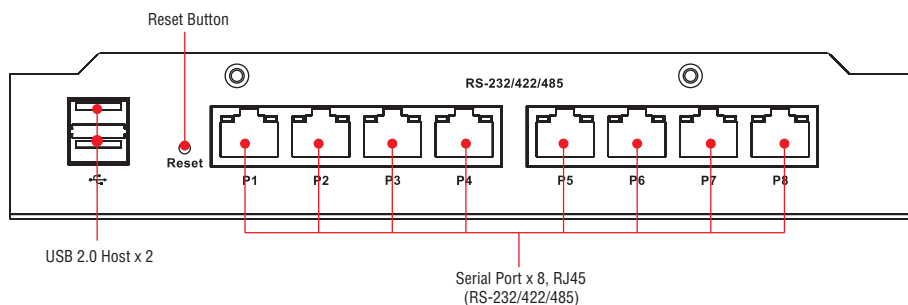
as a communication platform for industrial applications that require network redundancy.

The UC-8410 Series comes with the Linux 2.6 or Windows CE 6.0 platform pre-installed to provide an open software operating system for software program development. Software written for a desktop PC can be easily ported to the UC-8410 Series platform by using a common compiler, without needing to modify the code. This makes the UC-8410 an optimal solution for use with industrial applications, but with minimal cost and effort.

In addition to the standard model, a -40 to 75°C wide temperature model is also available for harsh industrial environments.

Appearance

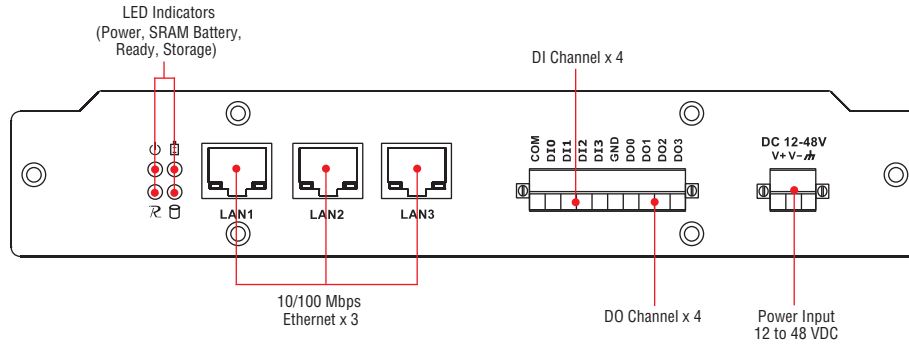
Front View



USB 2.0 Host x 2

Serial Port x 8, RJ45
(RS-232/422/485)

Rear View



Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux

DRAM: 256 MB DDR2 SDRAM onboard (512 MB max.)

SRAM: 256 KB, battery backup

Flash:

16 MB NOR Flash onboard to store OS (supports up to 32 MB)

32 MB NAND Flash onboard to store data

Expansion Bus: PCI/104 onboard

USB: USB 2.0 compliant hosts x 2, type A connector

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 3 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software-selectable (8-pin RJ45)

Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3V max.
- Logic level 1: +10V to +30V (COM to DI)

Connector Type: 10-pin screw terminal block (4 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 10-pin screw terminal block (4 points, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power, Ready, Storage, Battery for SRAM

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 8, RxD x 8

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 850 g

Dimensions: 200 x 37 x 120 mm (7.87 x 1.46 x 4.72 in)

Mounting: DIN-Rail, wall

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:

Standard Models: -20 to 75°C (-4 to 167°F)

Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption: 15 W

• 310 mA @ 48 VDC

• 625 mA @ 24 VDC

• 1350 mA @ 12 VDC

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

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures): 171,369 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.23

File System: JFFS2, NFS, Ext2, Ext3

Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ cross-compiler
- GNU C library
- GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0

File System: FAT

Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

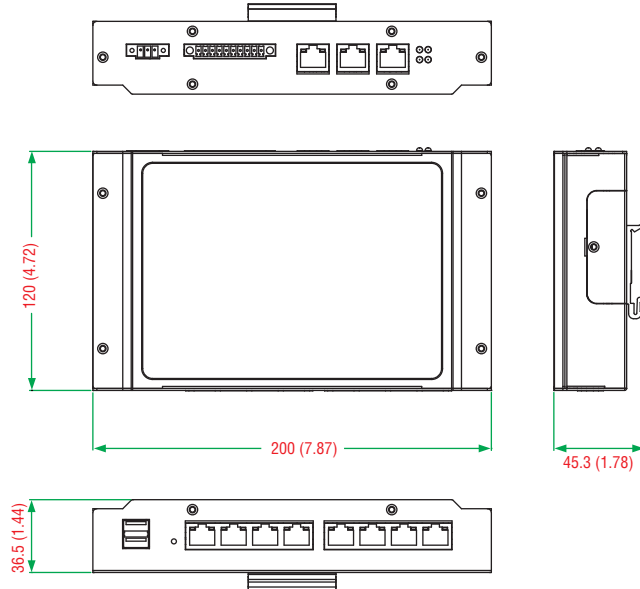
Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 3.5
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions

Unit: mm (inch)



: Ordering Information

Available Models

UC-8410-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

UC-8410-CE: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, USB, Windows CE 6.0 OS, -10 to 60°C operating temperature

UC-8410-T-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

UC-8410-T-CE: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, USB, Windows CE 6.0 OS, -40 to 75°C operating temperature

Package Checklist

- UC-8410 embedded computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UC-8416 Series

RISC ready-to-run embedded computers with 8 serial ports, 3 LANs, DIO, 8 Ethernet ports, USB, CompactFlash



- > Intel XScale IXP435 533 MHz processor
- > 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
- > 32 MB NAND Flash for data storage
- > 256 KB battery backup SRAM
- > 8 RS-232/422/485 serial ports
- > 8 10/100 Mbps unmanaged switch ports
- > 4 digital input and 4 digital output channels
- > 3 10/100 Mbps Ethernet ports
- > 2 USB 2.0 hosts for mass storage devices
- > CompactFlash socket for storage expansion
- > Supports IPv6 function (Linux model only)
- > DIN-Rail or wall mount installation
- > Robust, fanless design
- > -40 to 75°C wide temperature model available
- > Ready-to-run Embedded Linux or Windows CE 6.0



Overview

The UC-8416 Series embedded computers come with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 8 unmanaged switch ports, 4 digital input channels, 4 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts.

The computers use the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8416, and the 32 MB NAND Flash can be used to provide additional data storage. Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss. The UC-8416 computers come with 8 RS-232/422/485

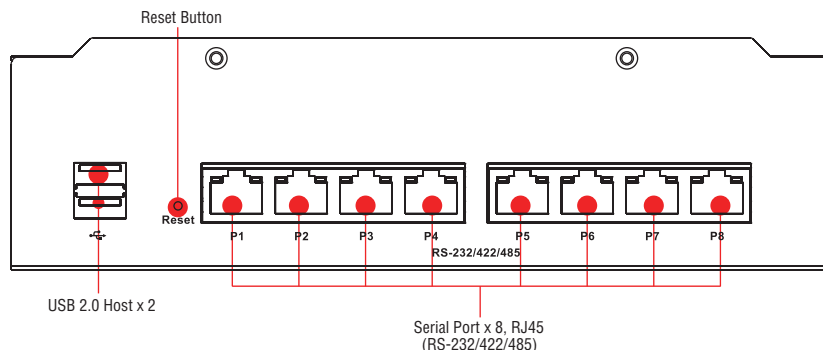
serial ports, switch ports, digital I/O, and have 3 LAN ports, making them ideal as a communication platform for industrial applications that require network redundancy.

The UC-8416 Series comes with the Linux 2.6 or Windows CE 6.0 platform pre-installed to provide an open software operating system for software program development. Software written for a desktop PC can be easily ported to the UC-8416 Series platform by using a common compiler, without needing to modify the code. This makes the UC-8416 an optimal solution for use with industrial applications, but with minimal cost and effort.

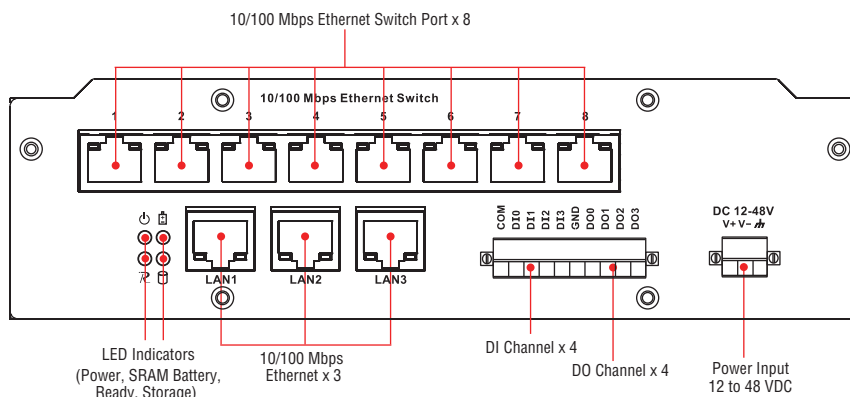
In addition to the standard model, a -40 to 75°C wide temperature model is also available for harsh industrial environments.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux

DRAM: 256 MB DDR2 SDRAM onboard (512 MB max.)

SRAM: 256 KB, battery backup

Flash:

16 MB NOR Flash onboard to store OS (supports up to 32 MB)

32 MB NAND Flash onboard to store data

Expansion Bus: PCI/104 onboard

USB: USB 2.0 compliant hosts x 2, type A connector

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 3 auto-sensing 10/100 Mbps ports (RJ45)

Switch Ports: 8 10/100 Mbps unmanaged ports

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software-selectable (8-pin RJ45)

Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3V max.
- Logic level 1: +10V to +30V (COM to DI)

Connector Type: 10-pin screw terminal block (4 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 10-pin screw terminal block (4 points, GND)

Isolation: 3 KV optical isolation

LEDs

System: Power, Ready, Storage, Battery for SRAM

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 8, RxD x 8

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 1 kg

Dimensions: 200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)

Mounting: DIN-Rail, wall

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:

Standard Models: -20 to 75°C (-4 to 167°F)

Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption: 15 W

• 310 mA @ 48 VDC

• 625 mA @ 24 VDC

• 1350 mA @ 12 VDC

Regulatory Approvals

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

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures): 156,942 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.23

File System: JFFS2, NFS, Ext2, Ext3

Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ cross-compiler
- GNU C library
- GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0

File System: FAT

Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

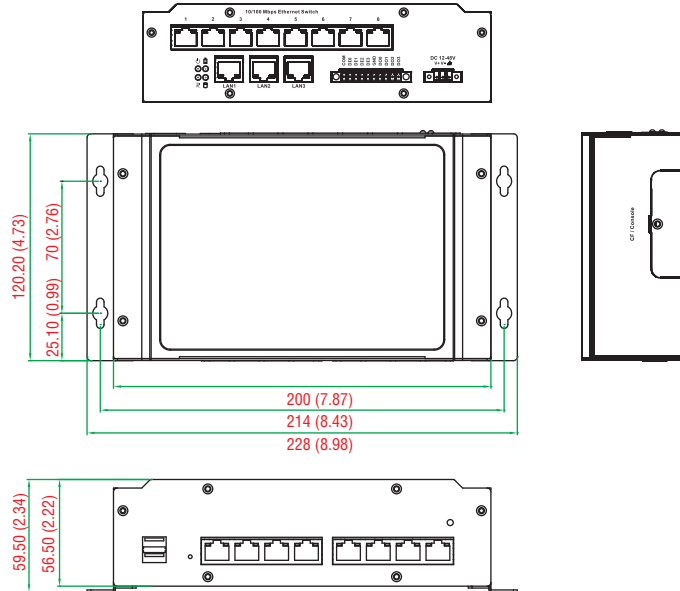
Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 3.5
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions

Unit: mm (inch)



: Ordering Information

Available Models

UC-8416-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

UC-8416-CE: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Windows CE 6.0 OS, -10 to 60°C operating temperature

UC-8416-T-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

UC-8416-T-CE: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, 8 switch ports, CompactFlash, USB, Windows CE 6.0 OS, -40 to 75°C operating temperature

Package Checklist

- UC-8416 embedded computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UC-8418 Series

RISC ready-to-run embedded computers with 8 serial ports, 3 LANs, DIO, 2 CAN ports, USB, CompactFlash

- > Intel XScale IXP435 533 MHz processor
- > 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
- > 32 MB NAND Flash for data storage
- > 256 KB battery backup SRAM
- > 8 RS-232/422/485 serial ports
- > 2 CANbus ports
- > 12 digital input and 12 digital output channels
- > 3 10/100 Mbps Ethernet ports
- > 2 USB 2.0 hosts for mass storage devices
- > CompactFlash socket for storage expansion
- > Supports IPv6 function (Linux model only)
- > DIN-Rail or wall mount installation
- > Robust, fanless design
- > -40 to 75°C wide temperature model available
- > Ready-to-run Embedded Linux or Windows CE 6.0



Overview

The UC-8418 Series embedded computers come with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 2 CAN ports, 12 digital input channels, 12 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts.

The computers use the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8418, and the 32 MB NAND Flash can be used to provide additional data storage. Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss. The UC-8418 computers come with 8 RS-232/422/485 serial

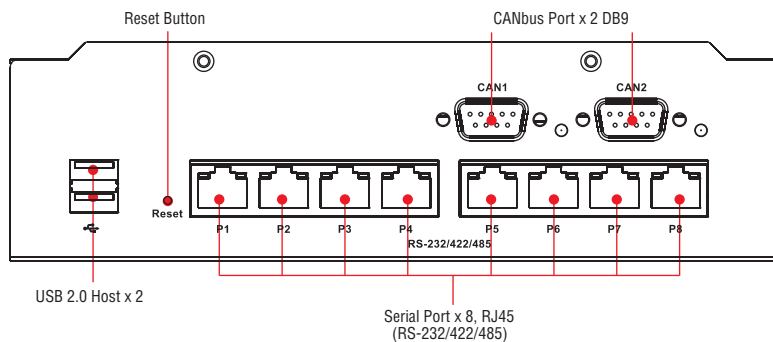
ports, digital I/O, and have 3 LAN ports and 2 CANbus ports, making them ideal as a communication platform for industrial applications that require network redundancy.

The UC-8418 Series comes with the Linux 2.6 or Windows CE 6.0 platform pre-installed to provide an open software operating system for software program development. Software written for a desktop PC can be easily ported to the UC-8418 Series platform by using a common compiler, without needing to modify the code. This makes the UC-8418 an optimal solution for use with industrial applications, but with minimal cost and effort.

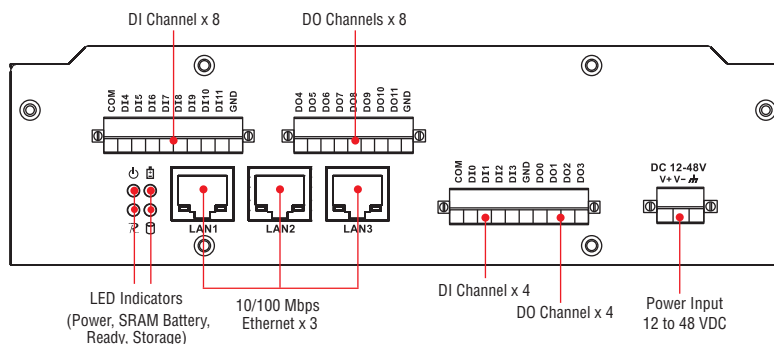
In addition to the standard model, a -40 to 75°C wide temperature model is also available for harsh industrial environments.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux

DRAM: 256 MB DDR2 SDRAM onboard (512 MB max.)

SRAM: 256 KB, battery backup

Flash:

16 MB NOR Flash onboard to store OS (supports up to 32 MB)

32 MB NAND Flash onboard to store data

Expansion Bus: PCI/104 onboard

USB: USB 2.0 compliant hosts x 2, type A connector

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 3 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software-selectable (8-pin RJ45)

Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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

Digital Input

Input Channels: 12, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3V max.
- Logic level 1: +10V to +30V (COM to DI)

Connector Type: 10-pin screw terminal block (4 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 12, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 10-pin screw terminal block (4 points, GND)

Isolation: 3 KV optical isolation

CANbus Communication

Interface: Dual optically isolated CAN2.0A/2.0B compliant ports

CAN Controller: Phillips SJA1000T

Signals: CAN-H, CAN-L

Isolation: 2 KV digital isolation

Speed: 10 Kbps to 1 Mbps

Connector Type: DB9 male

LEDs

System: Power, Ready, Storage, Battery for SRAM

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 8, RxD x 8

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 1 kg

Dimensions: 200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)

Mounting: DIN-Rail, wall

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:

Standard Models: -20 to 75°C (-4 to 167°F)

Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption: 15 W

• 310 mA @ 48 VDC

• 625 mA @ 24 VDC

• 1350 mA @ 12 VDC

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

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures): 149,140 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.23

File System: JFFS2, NFS, Ext2, Ext3

Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ cross-compiler
- GNU C library
- GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0

File System: FAT

Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

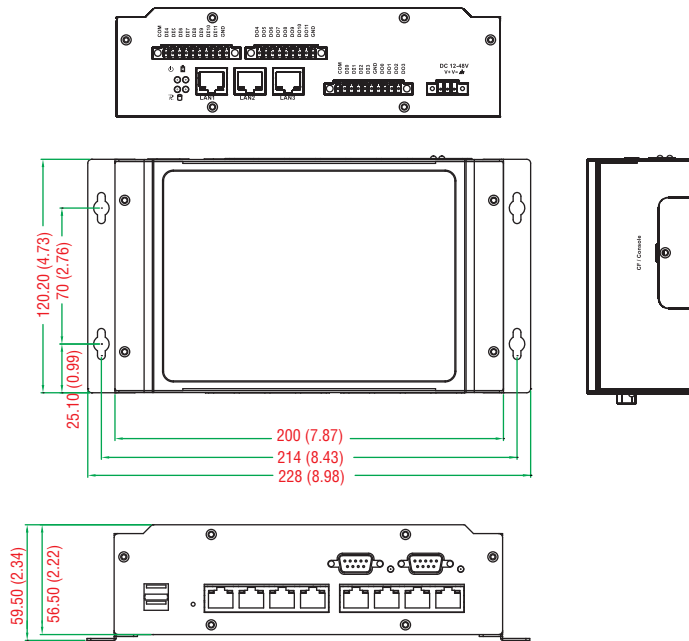
Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 3.5
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions

Unit: mm (inch)



: Ordering Information

Available Models

UC-8418-LX: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

UC-8418-CE: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Windows CE 6.0 OS, -10 to 60°C operating temperature

UC-8418-T-LX: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

UC-8418-T-CE: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Windows CE 6.0 OS, -40 to 75°C operating temperature

Package Checklist

- UC-8418 embedded computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

UC-8430 Series

RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, dual VGA, audio, 6 USB



- > Intel XScale IXP435 533 MHz processor
- > 256 MB DDR2 SDRAM
- > 32 MB NAND Flash for data storage
- > 32 MB NOR Flash to store OS
- > Dual VGA displays
- > 3 10/100 Mbps Ethernet Ports
- > 8 RS-232/422/485 serial ports (non-standard baudrates supported)
- > 6 USB 2.0 ports for high speed access to peripherals
- > 4 digital input channels and 4 digital output channels
- > Supports IPv6 function (Linux model only)
- > CompactFlash socket for storage expansion
- > Ready-to-run Embedded Linux or Windows CE 6.0
- > Robust, fanless design



Overview

The UC-8430 embedded computer comes with 8 RS-232/422/485 serial ports, 3 Ethernet ports, dual displays, 4 digital input channels, 4 digital output channels, a CompactFlash socket, and 6 USB 2.0 hosts.

The computer uses the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8430, and the 32 MB NAND Flash can be used to provide additional data storage.

Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss. The UC-8430 computer comes with 8 RS-232/422/485 serial ports, digital I/O, and has 3 LAN ports, making it ideal as a communication platform for industrial applications that

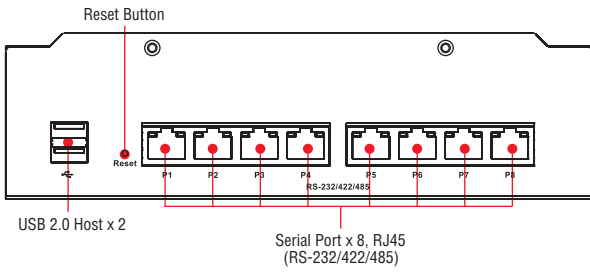
require network redundancy. As an added convenience, the UC-8430 comes with dual VGA outputs; this is particularly helpful when establishing an industrial application at a remote field site.

The UC-8430 comes with the Linux 2.6 or Windows CE 6.0 platform pre-installed to provide an open software operating system for software program development. Software written for a desktop PC can be easily ported to the UC-8430 platform by using a common compiler, without needing to modify the code. This makes the UC-8430 an optimal solution for use with industrial applications, but with minimal cost and effort.

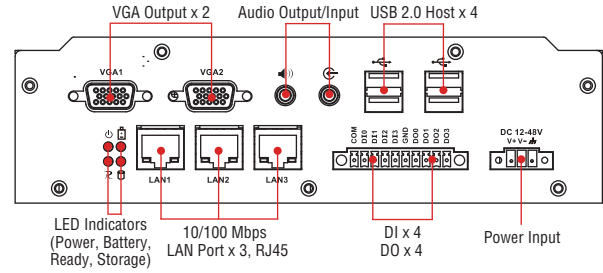
A wide temperature model of the UC-8430, designed to operate reliably in temperatures ranging from -40 to 75°C, is also available.

: Appearance

Front View

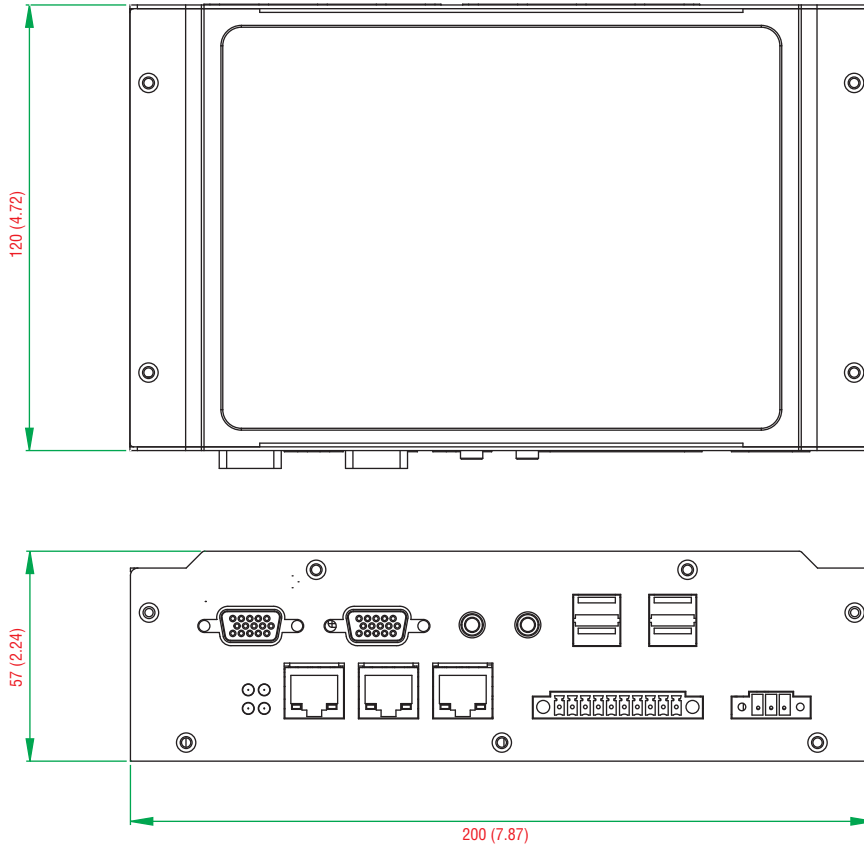


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux, Window CE 6.0

DRAM: 256 MB DDR2 SDRAM onboard (supports DDR2 up to 512 MB)

SRAM: 256 KB, battery backup

Flash:

32 MB NOR Flash onboard to store OS

32 MB NAND Flash onboard to store data

USB: USB 2.0 host x 6

Storage

Storage Expansion: CompactFlash socket

Expansion Bus: PCI/104

Other Peripherals

Audio: SM502 chip with line-in/out interface

Display

Graphics Controller: SM502 chip

Display Interface: 15-pin D-Sub connector x 2

Resolution: CRT display mode with pixel resolution up to 1024 x 768

Ethernet Interface

LAN: 3 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 8 RS-232/422/485 ports, software-selectable (8-pin RJ45)

Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND

- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.

- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (4 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

On-state Voltage: 24 VDC nominal, open collector to 30 V

Connector Type: 10-pin screw terminal block (4 points, GND)

LEDs

System: Power, Ready, Storage, Battery for SRAM

LAN: 10M/Link x 3, 100M/Link x 3 (on connector)

Serial: TxD x 8, RxD x 8

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 1 kg

Dimensions: 200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)

Mounting: DIN-Rail, wall

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:

Standard Models: -20 to 75°C (-4 to 167°F)

Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption: 14 W

- 270 mA @ 48 VDC

- 533 mA @ 24 VDC

- 1120 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1, EN 60950-1, CCC (GB9254, GB17625.1)

EMC: EN55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4,

FCC Part 15 Subpart B Class B

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures): 217,675 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.23

File System: JFFS2, NFS, Ext2, Ext3

Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ cross-compiler
- GNU C library
- GDB source-level debugging server

QT Embedded: Supports GUI development

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0 R3

File System: FAT

Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 3.5
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Ordering Information

Available Models

UC-8430-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, Dual VGA, Audio, 6 USB, Linux OS, -10 to 60°C operating temperature

UC-8430-CE: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, Dual VGA, Audio, 6 USB, Windows CE 6.0 OS, -10 to 60°C operating temperature

UC-8430-T-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, Dual VGA, Audio, 6 USB, Linux OS, -40 to 75°C operating temperature

UC-8430-T-CE: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, Dual VGA, Audio, 6 USB, Windows CE 6.0 OS, -40 to 75°C operating temperature

Package Checklist

- UC-8430 embedded computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including power jack converter)
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

UC-7410-LX Plus

RISC-based ready-to-run computer with 8 serial ports, dual LANs, USB



- > Intel XScale IXP425, 533 MHz processor
- > 128 MB RAM onboard, 32 MB flash
- > 8 RS-232/422/485 serial ports
- > Dual 10/100 Mbps LANs for network redundancy
- > USB 1.1 host
- > LCM display and keypad for HMI
- > Built-in firewall and VPN function
- > Apache web server supporting PHP and XML
- > Ready-to-run Linux platform
- > DIN-Rail or wall mount installation
- > Robust, fanless design



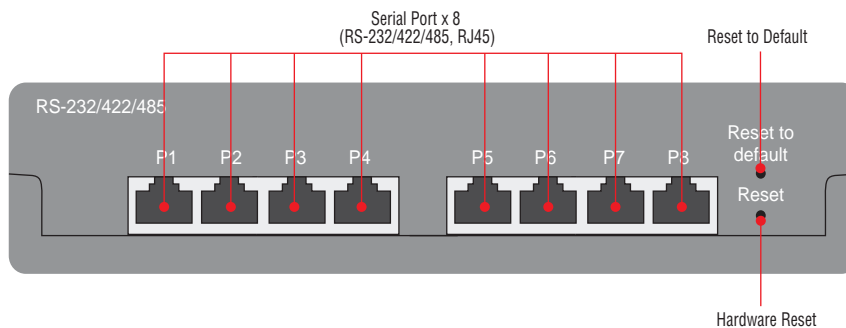
Overview

The UC-7410-LX Plus computers are RISC-based ready-to-run computer designed for embedded applications. The computers feature 8 RS-232/422/485 serial ports for device communication, and a USB port for adding external memory.

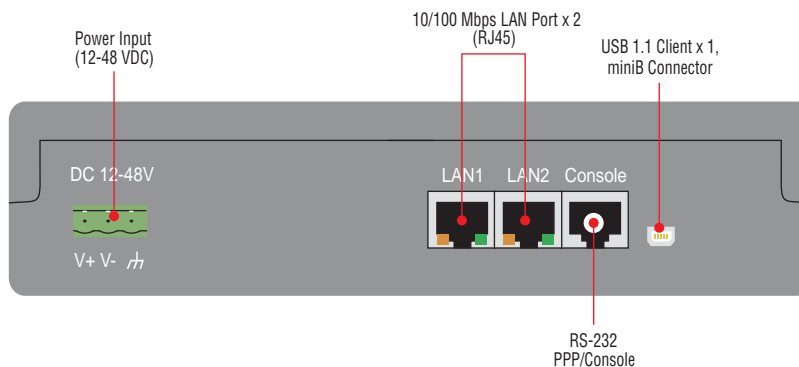
The pre-installed open-standard Linux operating systems make a convenient platform for software development. In fact, software written for a desktop PC can be ported as is to the computer's platform using readily available development tools, and the code can be stored in the UC-7410-LX Plus computer's Flash memory. System integrators use the UC-7410-LX Plus as part of distributed control systems based on embedded technology.

Appearance

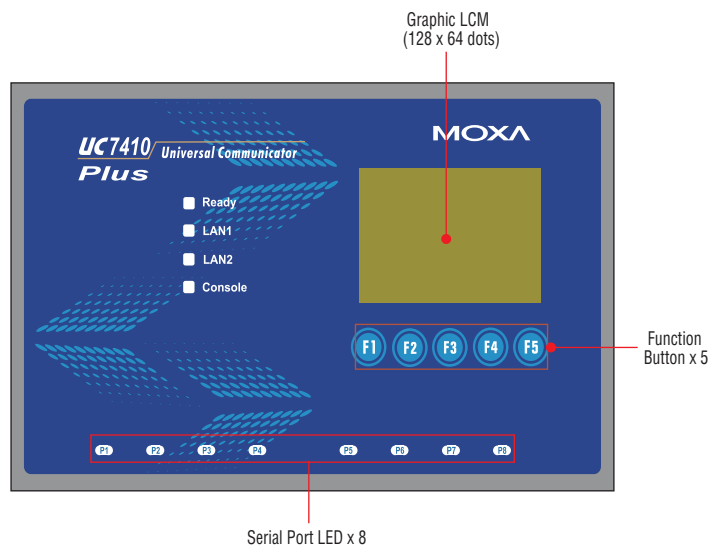
Front View



Rear View



Top View



Hardware Specifications

Computer

CPU: Intel XScale IXP425 533 MHz
OS (pre-installed): Embedded Linux
DRAM: 128 MB onboard
Flash: 32 MB onboard
USB: USB 1.1 client x 1, mini B connector

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: RS-232/422/485 software-selectable (8-pin RJ45), 8 ports

ESD Protection: 15 KV for all signals

Console Port: RS-232 (all signals), RJ45 connector, supports PPP

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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: OS Ready, Console

LAN: 10M/100M x 2

Serial: TxD x 8, RxD x 8

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 810 g

Dimensions: 197 x 44 x 125 mm (7.76 x 1.73 x 4.92 in)

Mounting: DIN-Rail, wall

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: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis

Anti-Shock: 5 g @ IEC-68-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 10 W

• 200 mA @ 48 VDC

• 415 mA @ 24 VDC

• 830 mA @ 12 VDC

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

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

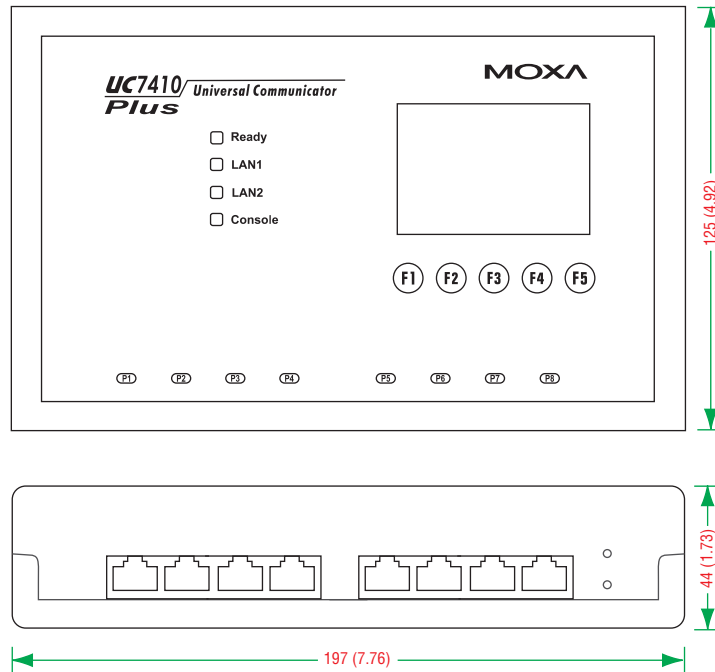
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Software Specifications

Linux

Kernel Version: 2.6.10

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:

- Moxa Linux API Library for device control
- Linux Tool Chain: Gcc, Glibc, GDB

Ordering Information

Available Models

UC-7410-LX Plus: RISC-based IXP425 embedded computer with 8 serial ports, dual LANs, Linux 2.6

Package Checklist

- UC-7410-LX Plus embedded computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to female DB9 console port cable, 100 cm
- CBL-RJ45M9-150: 8-pin RJ45 to male DB9 cable, 150 cm
- Universal power adaptor (including power jack converter)
- Documentation and software CD
- Quick installation guide (printed)

UC-7101/7110/7112 Series

RISC ready-to-run embedded computers with 1 or 2 serial ports, dual LANs, SD



- > MOXA ART ARM9 32-bit 192 MHz processor
- > 16 or 32 MB RAM
- > 8 or 16 MB Flash ROM
- > Dual or single 10/100 Mbps Ethernet for network redundancy
- > 1 or 2 software-selectable RS-232/422/485 ports
- > 50 bps to 921.6 Kbps baudrate (non-standard baudrates supported)
- > SD socket for storage expansion
- > Built-in real-time clock (RTC) and buzzer
- > Pre-installed Linux Kernel 2.6 platform
- > -40 to 75°C wide temperature models available



Overview

The UC-7101/UC-7110/UC-7112 mini RISC-based communication platforms are ideal for embedded applications. The computers come with 1 or 2 RS-232/422/485 serial ports and single or dual 10/100 Mbps Ethernet LAN ports to provide users with a versatile communication platform.

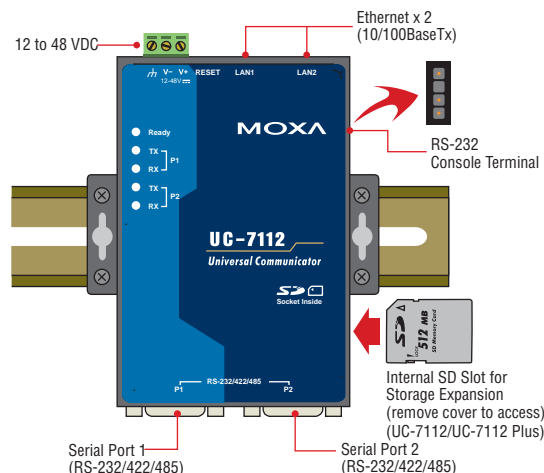
The UC-7101/UC-7110/UC-7112 use the ARM9 RISC CPU. Its design architecture and modern semiconductor technology provide the CPU with a powerful computing engine and communication functions, but without generating too much heat. The built-in 8 or 16 MB NOR Flash ROM and 16 or 32 MB SDRAM provide plenty of storage, and the SD socket (UC-7101 and UC-7112 only) provide users with flexible storage expansion to run applications that generate a lot of data. The dual or single LAN ports built into the ARM9 make the UC-

7101/7110/UC-7112 computers ideal communication platforms for data acquisition and protocol conversion applications, and the 1 or 2 RS-232/422/485 serial ports allow you to connect a variety of serial devices.

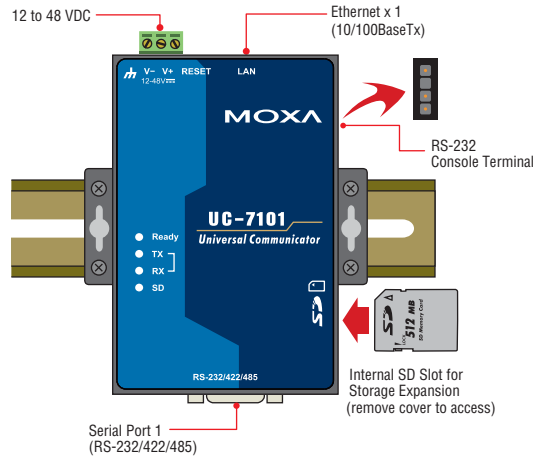
The pre-installed μ Linux or Linux operating system provides an open platform for software development. This means that software written for desktop PCs can be easily ported to a UC-7101, UC-7110 or UC-7112 embedded computer with a GNU cross compiler, eliminating the need to spend time modifying existing code. The operating system, device drivers, and your own software can all be stored in the UC-7101/UC-7110/UC-7112's flash memory.

Appearance

UC-7110/UC-7112



UC-7101



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz

OS (pre-installed): µClinux or Linux

DRAM:

UC-7101/7110/7112: 16 MB

UC-7112 Plus: 32 MB onboard

Flash:

UC-7101/7110/7112: 8 MB onboard

UC-7112 Plus: 16 MB onboard

Storage

Storage Expansion: SD slot (UC-7101, UC-7112, and UC-7112 Plus only)

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps (RJ45)

- UC-7101: 1 port
- UC-7110/7112/7112 Plus: 2 ports

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: RS-232/422/485 software-selectable (DB9 male)

- UC-7101: 1 port
- UC-7110/7112: 2 ports

ESD Protection: 4 KV ESD for all signals

Console Port: RS-232 (TxD, RxD, GND)

- UC-7101: 4-pin pin header output
- UC-7110/7112: 3-wire pin-header

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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: LED located on the RJ45 connector

- UC-7101: 10M/Link x 1, 100M/Link x 1
- UC-7110/7112: 10M/Link x 2, 100M/Link x 2

Serial:

- UC-7101: TxD x 1, RxD x 1
- UC-7110/7112: TxD x 2, RxD x 2

Physical Characteristics

Housing: Aluminum (1 mm)

Weight:

- UC-7101: 130 g
- UC-7110/7112: 190 g

Dimensions:

- UC-7101: 67 x 22 x 100.4 mm (2.64 x 0.87 x 3.95 in)
- UC-7110/7112: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)

Mounting: DIN-Rail, wall

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:

Standard Models: -20 to 80°C (-4 to 176°F)

Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-Vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis (UC-7101/7110 only)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 4.5 W

- 170 mA @ 24 VDC
- 340 mA @ 12 VDC

Standards and Certifications

Safety:

- UC-7101: UL 60950, CSA-C22.2 No. 60950-1, EN 60950-1
- UC-7110/7112: 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, DNV

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):

- UC-7101: 514,973 hrs
- UC-7110: 149,414 hrs
- UC-7112: 148,990 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux (UC-7112-LX Plus only)

Kernel Version: 2.6.9

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:

- Moxa Linux API Library for device control
- Linux Tool Chain: Gcc, Glibc, GDB

µClinux

Kernel Version: 2.6.19

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: msh, busybox, tinylogin, telnet, ftp

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

telnetd: Telnet Server daemon

inetd: TCP server manager program

ftpd: FTP server daemon

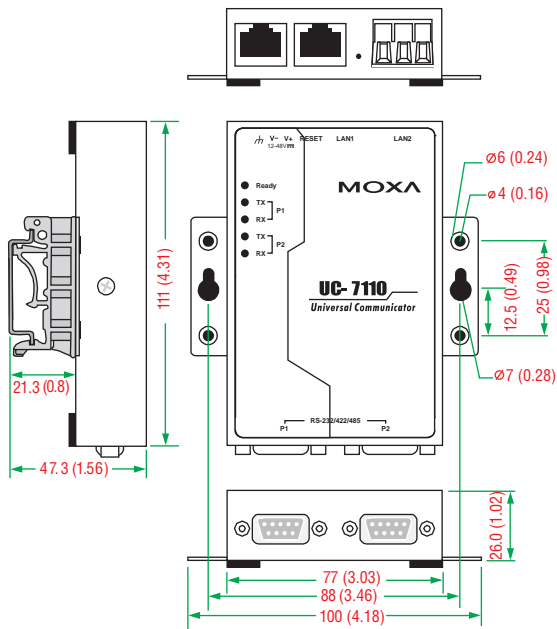
boa: Web server daemon

Application Development Software:

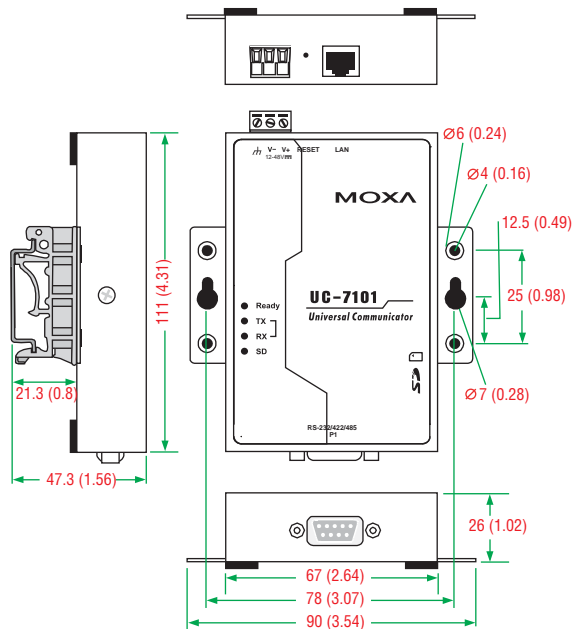
- Moxa Linux API Library for device control
- Linux Tool Chain:
- Arm-elf-gcc: C/C++ PC Cross Compiler
- µClibc: POSIX Standard Library

Dimensions

UC-7110/UC-7112



UC-7101



Model Name	Serial Ports	LAN Ports	Storage	OS		Wide Temp.
	RS-232/422/485	10/100 Mbps	SD	uClinux	Linux	
UC-7101	1	1	✓	✓	-	✓
UC-7110	2	2	-	✓	-	✓
UC-7112	2	2	✓	✓	✓	-

: Ordering Information

Available Models

UC-7101-LX: Mini RISC-based embedded computer with 1 serial port, LAN, µClinix OS, -10 to 60°C operating temperature

UC-7110-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, µClinix OS, -10 to 60°C operating temperature

UC-7112-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, µClinix 2.6 OS, -10 to 60°C operating temperature

UC-7112-LX Plus: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, Linux 2.6 OS, -10 to 60°C operating temperature

UC-7101-T-LX: Mini RISC-based embedded computer with 1 serial port, LAN, µClinix OS, -40 to 75°C operating temperature

UC-7110-T-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, µClinix OS, -40 to 75°C operating temperature

Package Checklist

- UC-7101 or UC-7110 or UC-7112 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including terminal block to power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

5

UC-7122/7124 Series

RISC ready-to-run embedded computers with dual LANs, 2 or 4 serial ports, SD, USB



- > Cirrus Logic EP9302 ARM9 32-bit 200 MHz processor
- > On-board 32 MB RAM, 16 MB flash disk
- > 2 or 4 software-selectable RS-232/422/485 serial ports
- > 50 bps to 921.6 Kbps baudrate (non-standard baudrates supported)
- > Dual 10/100 Mbps Ethernet for network redundancy
- > SD socket for storage expansion supported
- > Built-in real-time clock (RTC), buzzer, watchdog timer (WDT)
- > Ready-to-run WinCE 5.0 platform
- > -40 to 75°C wide temperature models available



5

Wallmount Computers > UC-7122/7124 Series

Overview

The UC-7122/7124 embedded computers come with 2 or 4 RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports to provide users with a versatile communication platform, making these RISC-based embedded computers ideal for your embedded applications.

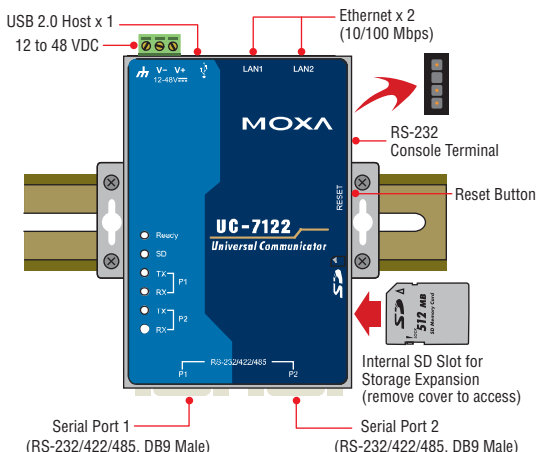
The UC-7122/7124 embedded computers use the Cirrus Logic EP9302 ARM9 200 MHz RISC CPU. Unlike the x86 CPU, which uses a CISC design, the ARM9's RISC design architecture and modern semiconductor technology provide the UC-7122/7124 with a powerful computing engine and communication functions, but without generating too much heat. Moreover, the built-in 16 MB NOR Flash ROM and 32 MB SDRAM give you enough storage capacity to run applications on the UC-7122/7124 computers. The additional SD socket provides the flexibility of adding storage expansion disks, and the dual LAN ports built into the ARM9 make the UC-7122/7124 ideal communication platforms for simple data acquisition and protocol

conversion applications. In addition, the RS-232/422/485 serial ports allow you to connect a variety of serial devices. Taken together, these features ensure that the UC-7122/7124 embedded computers are convenient and powerful central control units for industrial applications, such as data acquisition, remote device control and monitoring, and protocol conversion.

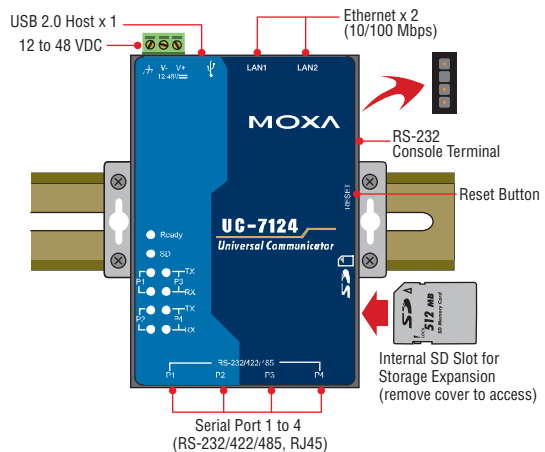
The pre-installed WinCE 5.0 operating system provides a common Windows-based software operating system for software program development. This means that software written in Visual C/C++ for desktop PCs is easily ported to the UC-7122/7124 computers with a general programming tool such as Microsoft Embedded Visual C++ or Microsoft Visual Studio 2005. You will not need to spend time modifying existing software code, and the operating system, device drivers, and your own software can all be stored in the UC-7122/7124's flash memory.

Appearance

UC-7122



UC-7124



Hardware Specifications

Computer

CPU: Cirrus EP9302 ARM9 CPU, 200 MHz
OS (pre-installed): Windows CE 5.0
DRAM: 32 MB onboard
Flash: 16 MB onboard

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards:
 UC-7122: 2 RS-232/422/485 ports, software-selectable (DB9 male)
 UC-7124: 4 RS-232/422/485 ports, software-selectable (RJ45)

ESD Protection: 4 KV for all signals

Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output

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® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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, SD
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)
Serial: TxD, RxD (2 or 4 of each)

Physical Characteristics

Housing: Aluminum (1 mm)
Weight:
 UC-7122: 190 g
 UC-7124: 200 g
Dimensions: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
Mounting: DIN-Rail, wall

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:
 Standard Models: -20 to 80°C (-4 to 176°F)
 Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
 UC-7122: 4.1 W UC-7124: 4.3 W
 • 170 mA @ 24 VDC • 180 mA @ 24 VDC
 • 340 mA @ 12 VDC • 360 mA @ 12 VDC

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

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures):
 UC-7122: 234,746 hrs
 UC-7124: 210,233 hrs

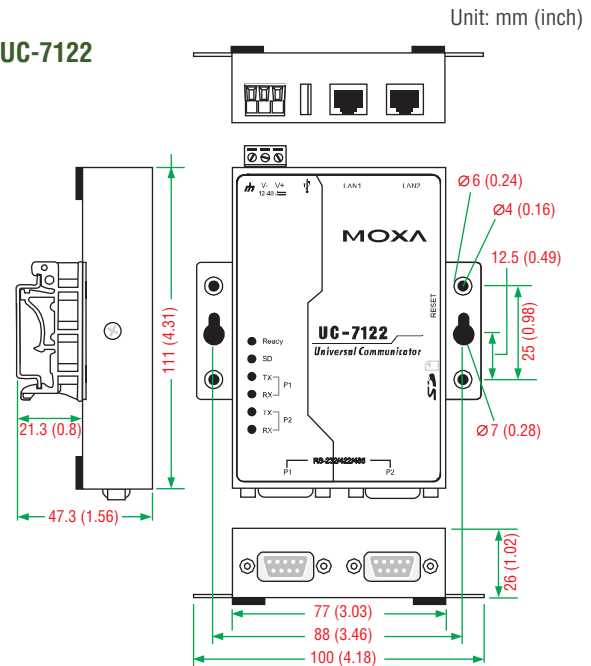
Warranty

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

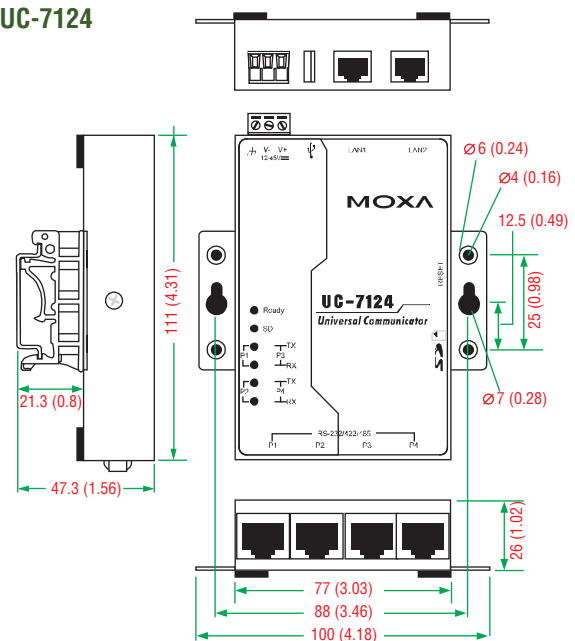
Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Dimensions

UC-7122

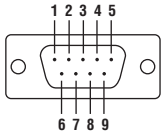


UC-7124



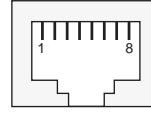
Pin Assignment

UC-7122 (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	—	—

UC-7124 (8-pin RJ45 connector)



PIN	RS-232	RS-422/485-4w	RS-485
1	DSR	—	—
2	RTS	TxD+	—
3	GND	GND	GND
4	TxD	TxD-	---
5	RxD	RxD+	Data+(B)
6	DCD	RxD-	Data-(A)
7	CTS	—	—
8	DTR	—	—

Software Specifications

Windows Embedded CE 5.0

OS: Windows Embedded CE 5.0

File System: FAT (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 5.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 with SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit
- Winsock 2.2

Ordering Information

Available Models

UC-7122-CE: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, USB, WinCE 5.0, -10 to 60°C operating temperature

UC-7124-CE: Mini RISC-based embedded computer with 4 serial ports, dual LANs, SD, USB, WinCE 5.0, -10 to 60°C operating temperature

UC-7122-T-CE: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, USB, WinCE 5.0, -40 to 75°C operating temperature

UC-7124-T-CE: Mini RISC-based embedded computer with 4 serial ports, dual LANs, SD, USB, WinCE 5.0, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-35A: Mounting Kit for 35-mm DIN-Rail

Package Checklist

- UC-7122 or UC-7124 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- CBL-RJ45M9-150: 8 pin RJ45 to DB9 male serial port cable, 150 cm
- Universal power adaptor (including terminal block to power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Model Name	Serial Ports	LAN Ports	Storage		OS		Wide Temp.
	RS-232/422/485	10/100 Mbps	SD	USB	CE 5.0	Linux	
UC-7122	2	2	✓	1	✓	—	✓
UC-7124	4	2	✓	1	✓	—	✓

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DIN-Rail Computers

IA261-I/262-I Series RISC computers—isolated serial, VGA, CAN, DI/DO, CF, USB	6-2
IA260 Series RISC computers—serial, VGA, DI/DO, CF, USB	6-5
IA240/241 Series RISC computers—serial, DI/DO, PCMCIA, SD	6-8
IA3341 RISC computers—serial, DI/DO, AI, thermalcouple.	6-11

6

DIN-rail Computers



IA261-I/262-I Series

RISC-embedded computers with 2 or 4 digitally isolated serial ports, dual LANs, VGA, CAN, DIO, CompactFlash, USB



- > Cirrus Logic EP9315 ARM9 CPU, 200 MHz
- > 128 MB RAM on-board, 32 MB flash disk
- > VGA interface for field site monitoring
- > 2 KV digitally isolated RS-232/422/485 serial ports
- > Dual 10/100 Mbps Ethernet for network redundancy
- > 8+8 DI/DO with 3 KV optical isolation protection
- > 12 to 48 VDC redundant power input design
- > Supports CompactFlash and USB 2.0 hosts
- > Ready-to-run Linux or WinCE 6.0 platform
- > -40 to 75°C wide temperature models available



Overview

The IA261-I/262-I embedded computers come with 2 (IA262-I) or 4 (IA261) RS-232/422/485 serial ports, dual CANbus ports (IA262-I only), dual Ethernet ports, 8 digital input channels, 8 digital output channels, VGA output, 2 USB hosts, and a CompactFlash socket. The computers are housed in a compact, IP40 protected, industrial-strength aluminum case.

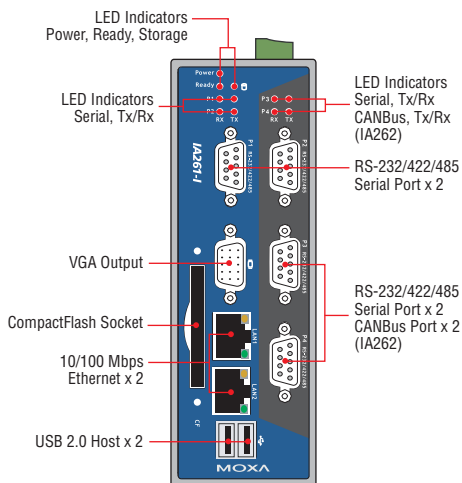
The IA261-I/262-I computers use the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM provide enough memory to run your application software directly on the IA261-I/262-I.

With its built-in VGA output interface, the IA261-I/262-I are suitable for use with SCADA systems in industrial applications, such as manufacturing automation, production line process monitoring, and mining automation, that require VGA and HMI features.

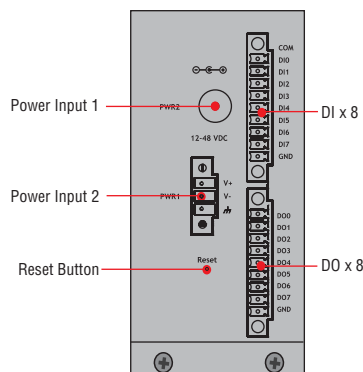
The IA261-I/262-I computers support RS-232/422/485, CANbus, digital I/O, come with 2 KV isolation protection, and have dual LAN ports, making them ideal as communication platforms for industrial applications that require network redundancy. In addition to the standard models, wide temperature (-40 to 75°C) models are available for use in harsh industrial automation environments.

Appearance

Front View



Top View



Hardware Specifications

Computer

CPU: Cirrus EP9315 ARM9 CPU, 200 MHz
OS (pre-installed): Windows CE 6.0 or Linux
DRAM: 128 MB onboard
Flash: 32 MB onboard
USB: USB hosts x 2, compliant with USB 2.0 (OHCI) type A connectors

Storage

Storage Expansion: CompactFlash slot

Display

Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support
Display Memory: Dynamic video memory (shares system memory)
Display Interface: CRT interface for VGA output, DB15 female connector
Resolution: 1024 x 768, 8 bits

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 or 4 RS-232/422/485 ports, software-selectable (DB9 male)
ESD Protection: 4 KV for all signals
Isolation: 2 KV digital isolation
Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

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® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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

Digital Input

Input Channels: 8, source type
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (8 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 8, sink type
Output Current: Max. 200 mA per channel
On-state Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 9-pin screw terminal block (8 points, GND)
Isolation: 3 KV optical isolation

CANbus Communication (IA262 CE models only)

Interface: Dual optically isolated CAN2.0A/2.0B compliant ports
CAN Controller: Phillips SJA1000T
Signals: CAN-H, CAN-L
Isolation: 2 KV digital isolation
Speed: 10 Kbps to 1 Mbps
Connector Type: DB9 male

LEDs

System: Power, Ready, Storage
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)
Serial: TxD x 4, RxD x 4
 IA261-I: P1 to P4 for serial ports
 IA262-I: P1 to P2 for serial ports, P3 to P4 for CAN ports

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum, industrial vertical form factor
Weight: 950 g
Dimensions: 60 x 115 x 152 mm (2.36 x 4.53 x 5.98 in)
Mounting: DIN-Rail, wall

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:
 Standard Models: -20 to 80°C (-4 to 176°F)
 Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis
Anti-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: Redundant power input design
 PWR1: 12 to 48 VDC (3-pin terminal block)
 PWR2: 12 to 48 VDC (power jack with thread)

Power Consumption:

With no load on USB ports: 5.8 W

- 240 mA @ 24 VDC
- 480 mA @ 12 VDC

With full load on USB ports: 11 W

- 450 mA @ 24 VDC
- 900 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC: EN 61000-6-4, EN 61000-3-2 Class D, EN 61000-3-3, EN 61000-6-2, FCC Part 15 Subpart B Class A
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):

IA261-I: 118,752 hrs
 IA261-I: 131,832 hrs

Warranty

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

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.23

File System: JFFS2, NFS, Ext2, Ext3

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ cross-compiler
- GNU C library
- GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0

File System: FAT (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNT, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

File Server: Enables remote clients to access files and other resources over the network

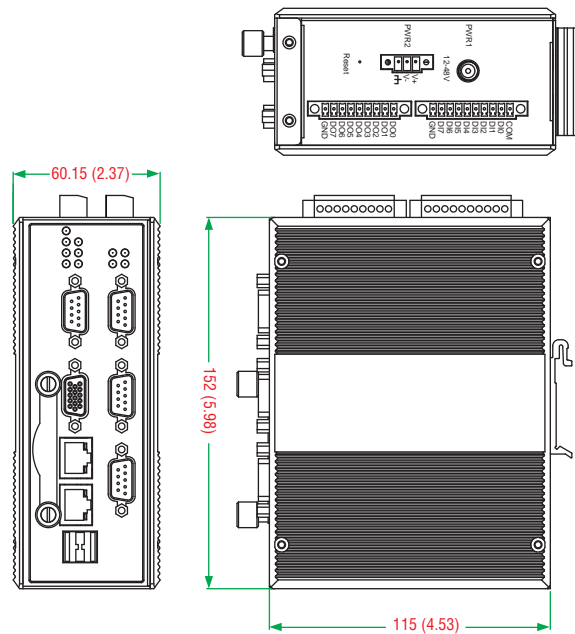
Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

IA261-I-LX: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

IA261-I-CE: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature

IA262-I-LX: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

IA262-I-CE: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature

IA261-I-T-LX: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

IA261-I-T-CE: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature

IA262-I-T-LX: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

IA262-I-T-CE: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature

Package Checklist

- IA261-I or IA262-I embedded computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- Universal power adaptor
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

IA260 Series

RISC-embedded computers with 4 serial ports, dual LANs, VGA, DIO, CompactFlash, USB



- > Cirrus Logic EP9315 ARM9 CPU, 200 MHz
- > 128 MB RAM on-board, 32 MB flash disk
- > 4 software-selectable RS-232/422/485 serial ports
- > VGA interface for field site monitoring
- > Dual 10/100 Mbps Ethernet for network redundancy
- > 8+8 DI/DO channels, up to 30 VDC
- > 12 to 48 VDC power input design
- > Supports CompactFlash and USB 2.0 hosts
- > Ready-to-run Linux or WinCE 6.0 platform
- > H-type heat dissipation design for system reliability
- > -40 to 75°C wide operating temperature model available



Overview

The IA260 embedded computers come with 4 RS-232/422/485 serial ports, dual Ethernet ports, 8 digital input channels, 8 digital output channels, a VGA output, 2 USB hosts, and a CompactFlash socket. The computers are housed in a compact, IP40 protected, industrial-strength aluminum case.

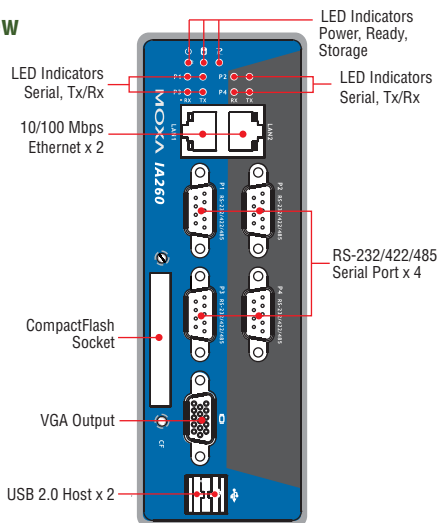
The IA260 computers use the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application software directly on the IA260.

The patented “H-Type” heat dissipation design makes the IA260 an ideal computing unit for applications in extremely hot field sites, since it can directly transmit heat from inside the housing to the air. With its built-in VGA output interface, the IA260 computers are suitable for use with SCADA systems in industrial applications, such as factory automation, production line process monitoring, and mining automation, that require VGA and HMI features.

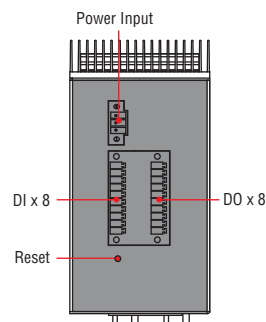
The IA260 computers support RS-232/422/485, digital I/O, and have dual LAN ports, making them ideal as communication platforms for industrial applications that require network redundancy. In addition to the standard model, a wide temperature (-40 to 75°C) model is available for use in harsh industrial automation environments.

Appearance

Front View



Top View



Hardware Specifications

Computer

CPU: Cirrus EP9315 ARM9 CPU, 200 MHz
OS (pre-installed): Windows CE 6.0 or Linux
DRAM: 128 MB onboard
Flash: 32 MB onboard
USB: USB 2.0 compliant hosts x 2, type A connector

Storage

Storage Expansion: CompactFlash slot

Display

Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support
Display Memory: Dynamic video memory (shares system memory)
Display Interface: CRT interface for VGA output, DB15 female connector
Resolution: 1024 x 768, 8 bits

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software-selectable (DB9 male)
ESD Protection: 4 KV for all signals
Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

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® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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

Digital Input

Input Channels: 8, source type
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (8 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 8, sink type
Output Current: Max. 200 mA per channel
On-state Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 9-pin screw terminal block
Isolation: 3 KV optical isolation

LEDs

System: Power, Ready, Storage
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)
Serial: TxD x 4, RxD x 4

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum, industrial vertical form factor
Weight: 1 kg
Dimensions: 52 x 112.6 x 162 mm (2.05 x 4.43 x 6.38 in)
Mounting: DIN-Rail, wall

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:
 Standard Models: -20 to 80°C (-4 to 176°F)
 Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 20 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption:

- With no load on USB ports: 5.8 W
- 240 mA @ 24 VDC
- 480 mA @ 12 VDC
- With full load on USB ports: 11 W
- 450 mA @ 24 VDC
- 900 mA @ 12 VDC

Standards and Certifications

Safety: 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 A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A

Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures): 145,328 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

Linux

OS: Linux 2.6.23

File System: JFFS2, NFS, Ext2, Ext3

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)

- GNU C/C++ cross-compiler

- GNU C library

- GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0

File System: FAT (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNT, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

File Server: Enables remote clients to access files and other resources over the network

Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK

- Moxa API Library

- C Libraries and Run-times

- Component Services (COM and DCOM)

- Microsoft® .NET Compact Framework 2.0

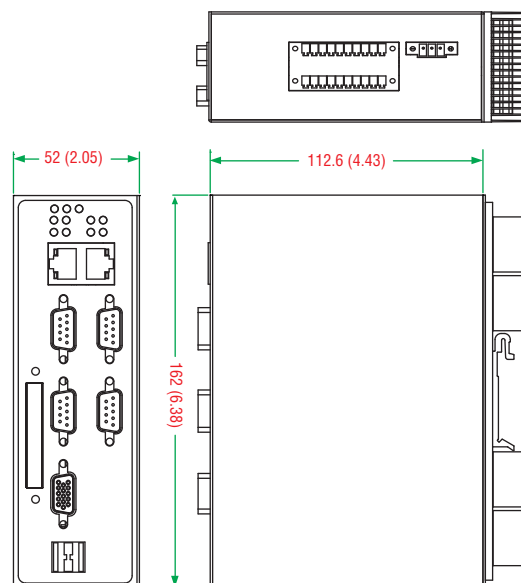
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2

- SOAP Toolkit Client

- Winsock 2.2

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

IA260-CE: RISC-based embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature

IA260-LX: RISC-based industrial embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

IA260-T-CE: RISC-based embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature

IA260-T-LX: RISC-based industrial embedded computer with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

Package Checklist

- IA260 or IA260-T embedded computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- Universal power adaptor
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

IA240/241 Series

RISC-embedded computers with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD



- > MOXA ART 32-bit ARM9 industrial processor
- > 64 MB RAM, 16 MB flash onboard
- > 4 RS-232/422/485 serial ports
- > 4 digital input and 4 digital output channels (TTL signal)
- > Dual 10/100 Mbps Ethernet for network redundancy
- > PCMCIA slot for wireless expansion (802.11b/g, GPRS/UMTS/HSDPA)
- > SD socket for storage expansion
- > Ready-to-run Linux Kernel 2.6 platform
- > Unique patented Software Encryption Lock
- > Installation options: DIN-Rail, wall mount (with accessory)
- > Robust, fanless design, IP30 protection mechanism
- > -40 to 75°C wide temperature models available



Overview

The IA240/241 embedded computers are designed for industrial automation applications. The computers feature 4 RS-232/422/485 serial ports, dual LANs, 4 digital input channels, 4 digital output channels, and a PCMCIA cardbus and SD socket in a compact, IP30 protected, industrial-strength rugged housing.

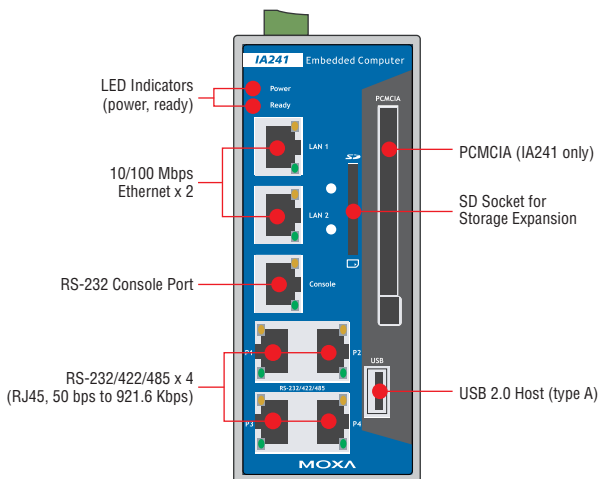
The IA240/241's vertical DIN-rail form factor makes it easy to install the computers in a small cabinet. This space-saving solution also facilitates easy wiring, making the IA240/241 a great choice as front-end embedded controllers for industrial applications.

Wide temperature models of the IA240/241 are also available. The IA240-T and IA241-T can operate reliably in a temperature range from -40 to 75°C, making them appropriate for harsh industrial automation environments.

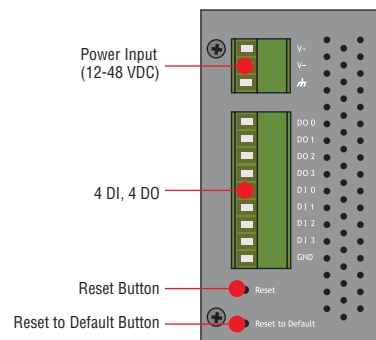
The industrial design of the IA240/IA241 provides a robust, reliable computing platform. Due to their RISC-based architecture, the IA240/IA241 computers will not generate a lot of heat, making them ideal for industrial automation environments.

Appearance

Front View



Top View



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz
OS (pre-installed): Embedded Linux
DRAM: 64 MB onboard
Flash: 16 MB onboard
PCMCIA: Cardbus card and 16-bit PCMCIA 2.1, JEIDA 4.2 card (IA241 only)
USB: USB 2.0 host

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software-selectable (8-pin RJ45)

ESD Protection: 4 KV for all signals

Console Port: RS-232, RJ45 connector, supports PPP

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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

Digital Input

Input Channels: 4

Input Voltage:

Logic 0: 0-0.8 V

Logic 1: 2.0-5.5 V

Over-current Limit: -24 mA

Digital Output

Output Channels: 4

Output Current: 24 mA

Output Voltage:

Logic 0: 0-0.55 V

Logic 1: 2.5-3.3 V

LEDs

System: Power, Ready, Storage

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 4, RxD x 4 (on connector)

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight:

IA240: 430 g

IA241: 500 g

Dimensions: 60 x 137 x 100 mm (2.36 x 5.39 x 3.94 in)

Mounting: DIN-Rail, wall

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:

Standard Models: -20 to 80°C (-4 to 176°F)

Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 mins 17 sec per axis

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 7 W

• 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: 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

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures):

IA240: 425,321 hrs

IA241: 306,453 hrs

Warranty

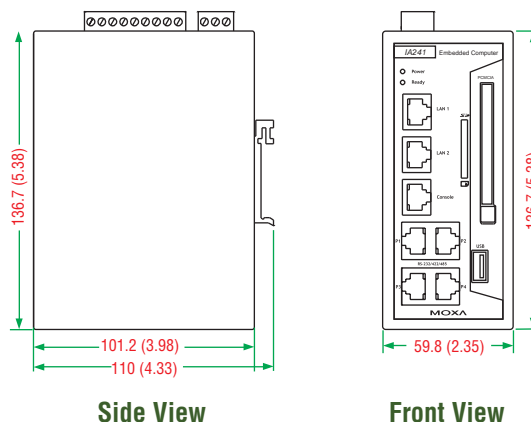
Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Dimensions

Unit: mm (inch)



: Software Specifications

Linux

OS: Linux 2.6.9

File System: JFFS2

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)

- GNU C/C++ cross-compiler

- GNU C library

- GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

: Ordering Information

Available Models

IA240-LX: RISC-based industrial computer with 4 serial ports, 4 DIs and 4 DO channels, dual LANs, SD, Linux OS, -10 to 60°C operating temperature

IA241-LX: RISC-based industrial computer with 4 serial ports, 4 DIs and 4 DO channels, dual LANs, PCMCIA, SD, Linux OS, -10 to 60°C operating temperature

IA240-T-LX: RISC-based industrial computer with 4 serial ports, 4 DIs and 4 DO channels, dual LANs, SD, Linux OS, -40 to 75°C operating temperature

IA241-T-LX: RISC-based industrial computer with 4 serial ports, 4 DIs and 4 DO channels, dual LANs, PCMCIA, SD, Linux OS, -40 to 75°C operating temperature

Package Checklist

- IA240 or IA241 embedded computer
- Wall mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- Universal power adaptor (including terminal block to power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

IA3341

RISC-based embedded computer with 2 serial ports, 4 DIs, 4 DOs, 2 AIs, 2 thermocouples, dual LANs, SD, Linux



- > 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 (non-standard baudrates supported)
- > 4 DIs and 4 DOs with 3 KV digital isolation protection
- > 2 AIs and 2 thermocouple inputs; sensor types J, K, T, E, R, S, B, N
- > Dual 10/100 Mbps Ethernet ports for network redundancy
- > SD socket for storage expansion
- > USB 2.0 host
- > Supports Modbus TCP library to retrieve AI and thermocouple data
- > Ready-to-run Linux Kernel 2.6 platform
- > DIN-Rail and wall mount installation
- > Robust, fanless design



: Overview

The IA3341, which is designed for solar power and environmental monitoring applications, is based on the MOXA ART ARM9 industrial processor, and features 2 RS-232/422/485 serial ports, dual LANs, 4 digital input channels, and 4 digital output channels. In addition, the IA3341 computer has 2 analog input channels and 2 thermocouple channels, making it the ideal solution for a variety of industrial applications.

By supporting multiple interfaces, the IA3341 can connect to different types of devices, making it particularly well-suited for solar power applications. Meters, sensors, and other devices can all connect easily to the IA3341, and with its powerful computing platform, the IA3341 can be used as a front-end controller to perform industrial tasks, such

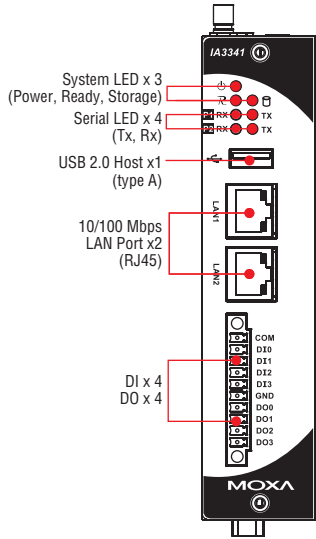
as data acquisition, data computing, protocol conversion, and data analysis.

The industrial-grade design of the IA3341 provides a robust, reliable computer that can fit any industrial environment, and the open source Linux platform gives programmers a convenient tool for developing sophisticated, bug-free application software at a lower cost.

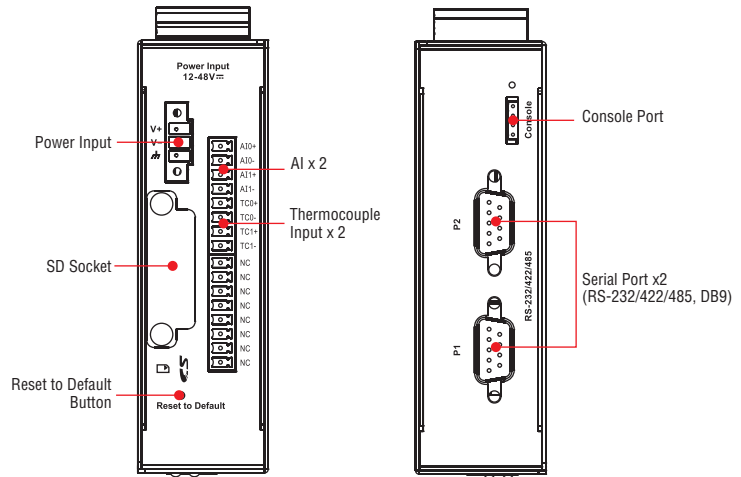
As an added plus, the IA3341 offers a Modbus TCP client library in C for Windows programmers. The library helps users to easily acquire AI and thermocouple data. This feature can efficiently accelerate remote device monitoring and data acquisition at a lower cost.

: Appearance

Front View



Top and Bottom Views



: Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz

OS (pre-installed): Embedded Linux

DRAM: 64 MB onboard

Flash: 16 MB onboard

USB: USB 2.0 host x 1 (type A connector)

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9 male)

ESD Protection: 4 KV for all signals

Console Port: RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +2 V max.
- Logic level 1: +4 V to +30 V

Connector Type: 10-pin screw terminal block (4 points, COM, GND)

Isolation: 3 KV digital isolation

Digital Output

Output Channels: 4, sink type, keeps output status after hot system reset

Output Range: 5 to 30 VDC at open collector to 30 V

Max. Load: 30 mA

Power Dissipation: 300 mW

Connector Type: 10-pin screw terminal block (4 points, GND)

Isolation: 3 KV digital isolation

Analog Input

Input Channels: 2

Resolution: 16 bits

I/O Mode: Voltage/Current

Input Range: 0-10 V, 4-20 mA

Accuracy:

- ±0.1% FSR @ 25°C
- ±0.3% FSR @ 10°C and 60°C

Sampling Rate: 12 samples/sec

Input Impedance: 200K ohms

Thermocouple Input

Input Channels: 2

Sensor Types: J, K, T, E, R, S, B, N

Sampling Rate: 12 samples/sec

Resolution: 16 bits

Accuracy:

- ±0.1% FSR @ 25°C
- ±0.3% FSR @ 10°C and 60°C

Input Impedance: 1M ohms

LEDs

System: Power, Ready, Storage

LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Serial: TxD x 2, RxD x 2

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 585 g

Dimensions: 116 x 35 x 146 mm (2.95 x 1.38 x 3.71 in)

Mounting: DIN-Rail, wall

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 rms @ IEC 60068-2-34, random wave, 5-500 Hz, 1 hr per axis

Anti-shock: 20 g @ IEC 60068-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block, V+, V-, SG)

Power Consumption:

5 W (with no load on the USB port)

• 106 mA @ 48 VDC

• 191 mA @ 24 VDC

• 351 mA @ 12 VDC

8.5 W (with load on the USB port)

• 176 mA @ 48 VDC

• 330 mA @ 24 VDC

• 661 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)

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

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures): 333,363 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Linux 2.6.9

File System: JFFS2 (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)

• GNU C/C++ cross-compiler

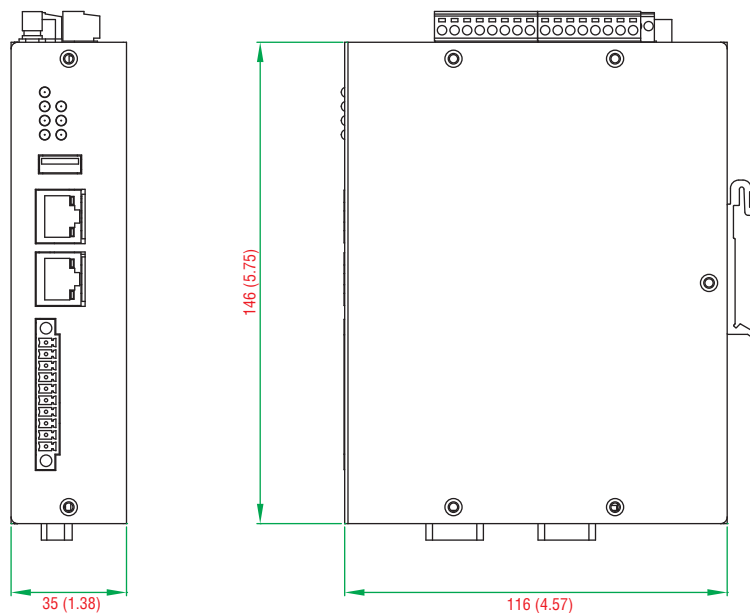
• GNU C library

• GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Dimensions

Unit: mm (inch)



: Ordering Information

Available Models

IA3341-LX: RISC-based embedded computer with 2 serial ports, 4 DIs, 4 DOs, 2 AIs, 2 thermocouples, dual LANs, SD, Linux

Package Checklist

- IA3341-LX embedded computer
- Wall mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Terminal block to power jack converter
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

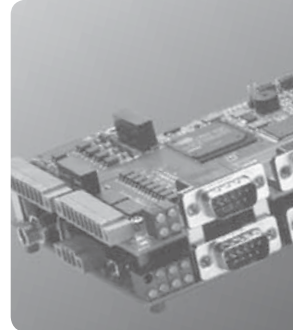


Modules and Boards

EM-2260 Series	RISC modules—4 serial ports, DI/DO, dual LANs, VGA, CF, USB	7-2
EM-1220 Series	RISC modules—2 serial ports, dual LANs, SD, GPIO	7-5
EM-1240 Series	RISC modules—4 serial ports, dual LANs, SD, GPIO	7-8

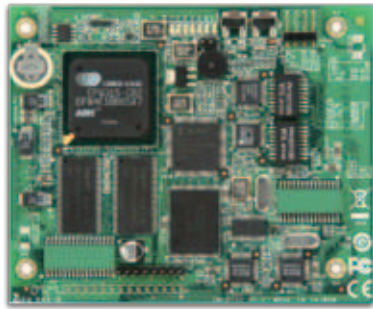
7

Modules and Boards



EM-2260 Series

RISC embedded core modules with 4 serial port DI/DO, dual LANs, VGA, CompactFlash, USB



- > 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 platform
- > Full-function development kit for quick evaluation and application development



Overview

The EM-2260 embedded module features 4 RS-232/422/485 serial ports, dual Ethernet ports, an EIDE interface for designing an external storage connection, such as a CompactFlash socket and USB port signals. The module has a compact design that is easily integrated with a variety of industrial applications, including gas stations, vending machines, and ticketing machines, and offers a powerful serial communication capability for better system integration. Programmers will find the pre-installed, ready-to-run Windows CE 6.0 platform and full-function development kit a great benefit to developing software and building reliable communication bases for industrial automation applications.

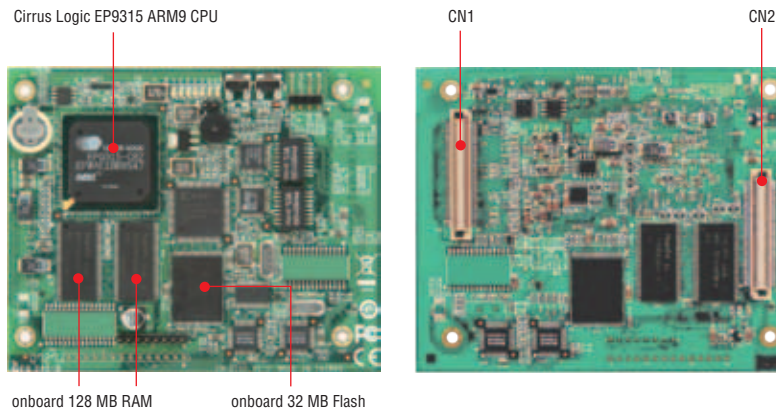
The EM-2260 embedded module uses the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports

several useful communication functions, but will not generate a lot of heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application software directly on the EM-2260. With its built-in VGA output interface, the EM-2260 is suitable for use with SCADA systems in industrial applications, such as manufacturing automation, production line process monitoring, and mining automation, that require VGA and HMI features.

The EM-2260 Development Kit provides users with a handy tool for first time evaluation to test the functionality of the embedded core module. It has several peripherals built-in, including RS-232/422/485 ports and digital input and output, making it suitable for developing a variety of industrial applications.

Appearance

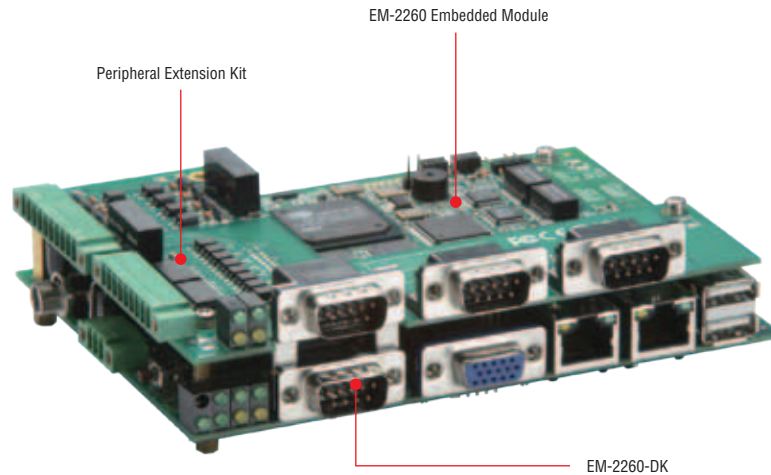
EM-2260 Embedded Module



EM-2260 Embedded Module

7

Modules and Boards > EM-2260 Series



: Hardware Specifications

Computer

CPU: Cirrus Logik EP9315 ARM9 CPU, 200 MHz
OS (pre-installed): Windows CE 6.0 or Linux
DRAM: 128 MB onboard
Flash: 32 MB

Storage

Storage Expansion: EIDE interface for connecting up to 2 external devices

Display

Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support
Display Memory: Dynamic video memory (shares system memory)
Resolution: 1024 x 768, 8 bits

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software-selectable
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

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® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals

TTL: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
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

Digital Input

Input Channels: 8
Input Voltage: 3.3 V, CMOS level

Digital Output

Output Channels: 8
Digital Output Levels: 3.3 V, CMOS level

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Weight: 70 g
Dimensions: 106 x 87 mm (4.17 x 3.43 in)

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: 12 VDC
Power Consumption: 5.8 W (480 mA @ 12 VDC)

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

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (meantime between failures): 131,832 hrs

Warranty

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

Software Specifications

Linux

OS: Linux 2.6.23

File System: JFFS2, NFS, Ext2, Ext3

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage web sites

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network

Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).

Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ cross-compiler
- GNU C library
- GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0

File System: FAT (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

File Server: Enables remote clients to access files and other resources over the network

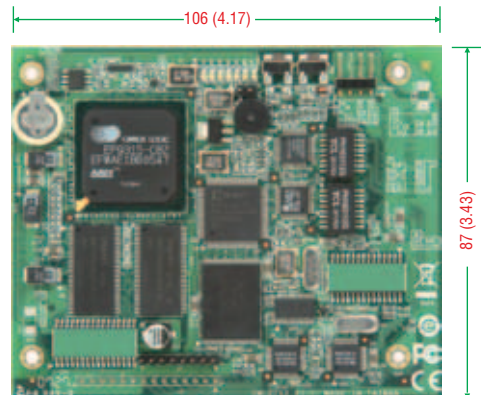
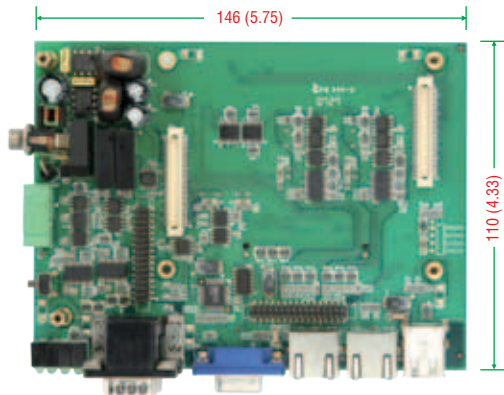
Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

EM-2260-CE: RISC-based embedded core module with 4 serial ports, 8 DI and 8 DO channels, dual LANs, VGA, CompactFlash, USB, WinCE 6.0 OS

EM-2260-LX: RISC-based embedded core module with 4 serial ports, 8 DI and 8 DO channels, dual LANs, VGA, CompactFlash, USB, Linux OS

Development Kits (can be purchased separately)

EM-2260-CE Development Kit: Includes the EM-2260-CE module and EM-2260-DK carrier board for testing and application development

EM-2260-LX Development Kit: Includes the EM-2260-LX module and EM-2260-DK carrier board for testing and application development

Package Checklist (modules)

- EM-2260-CE or EM-2260-LX module

Package Checklist (development kits)

- EM-2260 module
- EM-2260-DK, the carrier board for the EM-2260 module
- Universal power adaptor set
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

EM-1220 Series

RISC ready-to-run embedded core modules with 2 serial ports, dual LANs, SD



- > MOXA ART ARM9 32-bit 192 MHz processor
- > 16 MB RAM, 8 MB flash disk on-board
- > 2 software-selectable RS-232/422/485 serial ports
- > Dual 10/100 Mbps Ethernet for network redundancy
- > SD signals supported for external SD socket connection
- > Built-in RTC, buzzer
- > 10 GPIOs reserved for system integration
- > Ready-to-run µClinux Kernel 2.6 platform
- > Full-function development kit for quick evaluation and application development
- > -40 to 75°C wide temperature models available



Overview

The EM-1220 embedded module features 2 RS-232/422/485 serial ports, dual Ethernet ports, and an SD socket for external storage expansion. The module has a compact design that can be easily integrated with industrial applications such as gas stations, vending machines, and ticketing machines, and offer a powerful serial communication capability for better system integration. Programmers

will find that the pre-installed, ready-to-run µClinux platform and the full-function development kit make it easy to develop software and build a reliable communication base for industrial automation applications. In addition, a wide temperature model is also available to provide a reliable solution for any harsh environment.

Appearance

EM-1220 Embedded Module

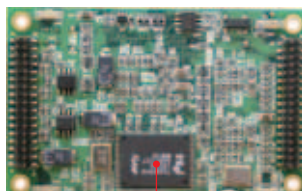
Top View

MOXA ART ARM9 32-bit
Communication Processor



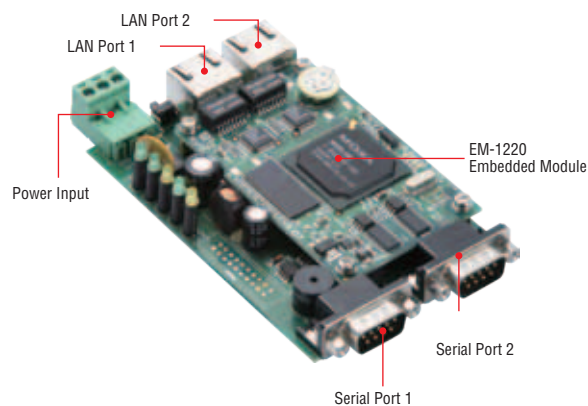
onboard 16 MB RAM

Bottom View



onboard Intel NOR
Flash 8 MB

Development Kit



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz processor
OS (pre-installed): Embedded µClinux (kernel 2.6.19)
DRAM: 16 MB onboard
Flash: 8 MB onboard

Storage

Storage Expansion: SD signals for external Secure Digital (SD) socket connection

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: RS-232/422/485, software-selectable, 2 ports

ESD Protection: 15 KV for all signals

Console Port: TTL signal, 4-pin pin header output

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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 x 2, 100M/Link x 2

Serial: TxD x 2, RxD x 2

Physical Characteristics

Weight:

- EM-1220 Module: 40 g
- EM-1220 Development Kit: 120 g

Dimensions:

- EM-1220 Module: 80 x 50 mm (3.15 x 1.97 in)
- EM-1220 Development Kit: 117 x 70 mm (4.61 x 2.76 in)

Module Interface: Two 2 x 17 pin-headers (2.5 x 2.5 mm pitch)

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:

Standard Models: -20 to 80°C (-4 to 176°F)

Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 3.3 VDC

Power Consumption: 2.1 W (625 mA @ 3.3 VDC)

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

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures): 405,735 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

µClinux

OS: µClinux 2.6.19

File System: JFFS2

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE

Web Server (boa): Allows you to create and manage web sites

Terminal Server (Telnet): Provides telnet communications between two hosts over the network

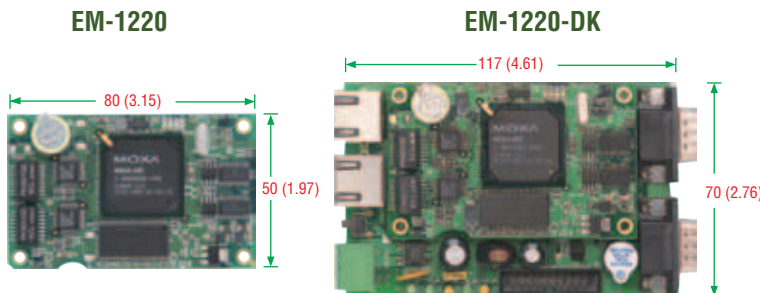
Dial-up Networking: PPP Daemon for Linux allows Unix machines to connect to the internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell)

Application Development Software:

- Moxa API Library (Watchdog timer, Moxa serial I/O control)
- arm-elf-gcc: C/C++ cross-compiler
- µClibc: POSIX standard C library

Dimensions

Unit: mm (inch)



: Ordering Information

Available Modules

EM-1220-LX: RISC-based embedded core module with 2 serial ports, dual LANs, SD, µClinux, -10 to 60°C operating temperature

EM-1220-T-LX: RISC-based embedded core module with 2 serial ports, dual LANs, SD, µClinux, -40 to 75°C operating temperature

Development Kits (can be purchased separately)

EM-1220 Development Kit: Includes the EM-1220-DK snap-on testing board with built-in RJ45 LAN ports and DB9 male serial ports

Package Checklist (modules)

- EM-1220 module

Package Checklist (development kits)

- EM-1220 module
- EM-1220-DK, the carrier board for the EM-1220 module
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including terminal block to power jack converter)
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

EM-1240 Series

RISC ready-to-run embedded core modules with 4 serial ports, dual LANs, SD



- > MOXA ART ARM9 32-bit 192 MHz processor
- > 16 MB RAM, 8 MB flash disk on-board
- > 4 software-selectable RS-232/422/485 serial ports
- > Dual 10/100 Mbps Ethernet for network redundancy
- > SD signals supported for external SD socket connection
- > Built-in RTC, buzzer
- > 10 GPIOs reserved for system integration
- > Ready-to-run μ Linux Kernel 2.6 platform
- > Full-function development kit for quick evaluation and application development
- > -40 to 75°C wide temperature models available



: Overview

The EM-1240 embedded module features 4 RS-232/422/485 serial ports, dual Ethernet ports, and an SD socket for external storage expansion. The modules have a compact design that can be easily integrated with industrial applications such as gas stations, vending machines, and ticketing machines, and offer a powerful serial communication capability for better system integration. Programmers

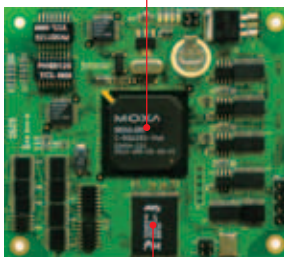
will find that the pre-installed, ready-to-run μ Linux platform and the full-function development kit make it easy to develop software and build a reliable communication base for industrial automation applications. In addition, a wide temperature model is also available to provide a reliable solution for any harsh environment

: Appearance

EM-1240 Embedded Module

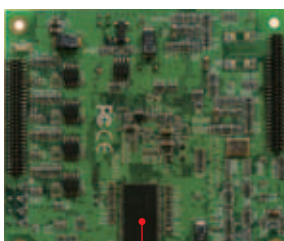
Top View

MOXA ART ARM9 32-bit
Communication Processor

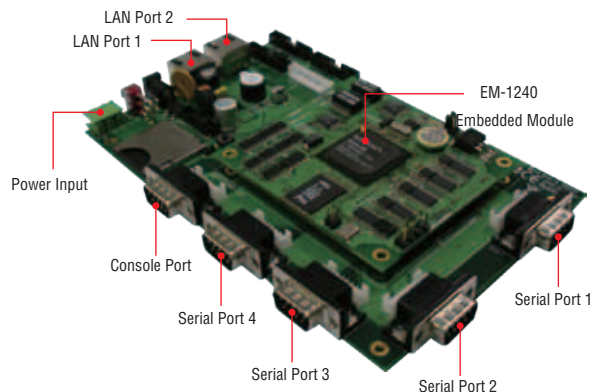


onboard Intel NOR Flash 8 MB

Bottom View



Development Kit



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz processor
OS (pre-installed): Embedded μ Clinux (kernel 2.6.19)
DRAM: 16 MB onboard
Flash: 8 MB onboard

Storage

Storage Expansion: SD signals for external Secure Digital (SD) socket connection

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: RS-232/422/485, software-selectable, 4 ports

ESD Protection: 15 KV for all signals

Console Port: RS-232 (all signals), RJ45 connector, supports PPP

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[®] (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (supports non-standard baudrates; see user's manual for details)

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 x 2, 100M/Link x 2

Serial: TxD x 2, RxD x 2

Physical Characteristics

Weight:

- EM-1240 Module: 50 g
- EM-1240 Development Kit: 200 g

Dimensions:

- EM-1240 Module: 90 x 80 mm (3.54 x 3.15 in)
 - EM-1240 Development Kit: 177 x 115 mm (6.97 x 4.53 in)
- Module Interface:** Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)

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:

Standard Models: -20 to 80°C (-4 to 176°F)
 Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 5 VDC

Power Consumption: 2.5 W (500 mA @ 5 VDC)

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

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures): 152,222 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

Software Specifications

μ Clinux

Kernel Version: 2.6.19

Protocol Stack: ARP, ICMP, IPV4, TCP, UDP, FTP, Telnet, SNMP V1, HTTP, CHAP, PAP, DHCP, NTP, NFS V2, SMTP, Telnet, PPP, PPPoE

File System: JFFS2, root file system (read only), and user directory (read/write)

System Utilities: msh, busybox, tinylogin, telnet, ftp

pppd: Dial in/out over serial port daemon, including PPPoE (Point-to-Point over Ethernet)

snmpd: SNMP V1 Agent daemon

telnetd: Telnet server daemon

inetd: TCP server manager program

ftpd: FTP server program

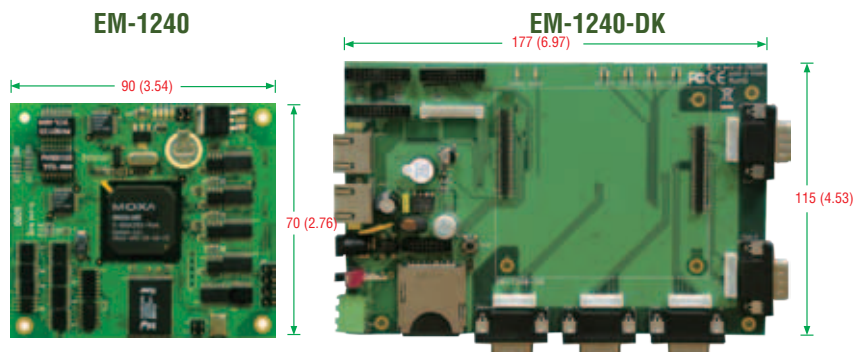
boa: Web server daemon

ntpd: Network Time Protocol client utility

Tool Chain:

- Arm-elf-gcc: C/C++ PC Cross Compiler
- μ CLIBC: POSIX standard C library

Dimensions



Unit: mm (inch)

▶ Ordering Information

Available Modules

EM-1240-LX: RISC-based embedded core module with 4 serial ports, dual LANs, SD, μClinix OS, -10 to 60°C operating temperature

EM-1240-T-LX: RISC-based embedded core module with 4 serial ports, dual LANs, SD, μClinix, -40 to 75°C operating temperature

Development Kits (can be purchased separately)

EM-1240 Development Kit: Includes the EM-1240-DK snap-on testing board with built-in RJ45 LAN ports and DB9 male serial ports

Package Checklist (modules)

- EM-1240 module

Package Checklist (development kits)

- EM-1240 module
- EM-1240-DK, the carrier board for the EM-1240 module
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including terminal block to power jack converter)
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card



Wireless Computers

W406 Series RISC modules—4 serial ports, DI/DO, LAN, VGA, SD, USB	8-2
W315A/325A RISC modules—1 or 2 serial ports, LAN, SD.	8-6
W311/321/341 RISC modules—1/2/4 serial ports, LAN, SD, relay output	8-9

8

Wireless Computers



W406 Series

RISC-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DOs, 2 serial ports, Ethernet, SD



- > Cirrus Logic EP9302 32-bit ARM9 processor
- > 32 MB RAM on-board (maximum 64 MB)
- > 16 MB Flash built in (maximum 32 MB)
- > Built-in GSM/GPRS/EDGE cellular communication
- > GSM 850/900/1800/1900 MHz supported
- > GPRS/EDGE Class 12 supported
- > SMS tunnel mode provided
- > 4 DIs, 4 DOs
- > Two software selectable RS-232/422/485 serial ports
- > 50 bps to 921.6 Kbps (non-standard baudrates supported)
- > 10/100M Ethernet for network redundancy
- > SD socket for storage expansion
- > WinCE 6.0 or Linux 2.6 platform
- > Din-Rail or wall mount installation
- > Robust, fanless design
- > Wide temperature models available by request



8

Wireless Computers > W406 Series

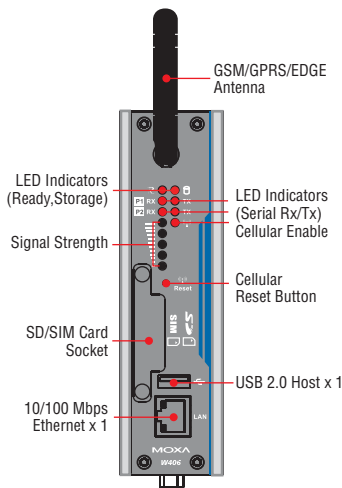
Overview

The W406 is an embedded Linux or WinCE computer that features 2 software selectable RS-232/422/485 ports, 1 Ethernet port, and quad-band GSM/GPRS/EDGE 900/1800/850/1900 MHz for cellular communication. It also comes with an SD socket, USB host, and 4 digital input and 4 digital output channels, making it the ideal computer for a variety of industrial applications such as data acquisition, data

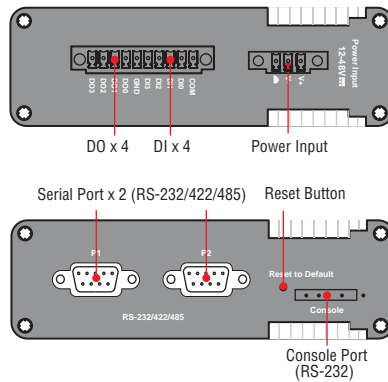
processing, protocol conversion, and remote device control and monitoring via wireless communication. The W406 comes pre-installed with either Linux or WinCE 6.0, and offers a reliable and powerful computing platform for industrial environments. Programmers will find that the W406 provides a convenient programming environment for producing bug-free industrial applications at a lower cost.

Appearance

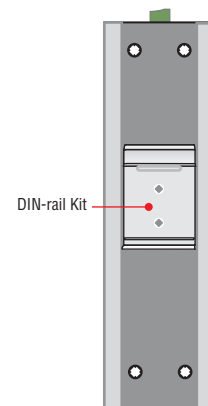
W406 Front View



W406 Top/Bottom View



W406 Rear View



Hardware Specifications

Computer

CPU: Cirrus Logic EP9302 ARM9 32-bit RISC CPU, 200 MHz
OS (pre-installed): WinCE 6.0/Embedded Linux with MMU support
DRAM: 32 MB (64 MB max.)
Flash: 16 MB (16 MB max.)
USB: USB 2.0 compliant hosts x 1, type A connector

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: 1 auto-sensing 10/100 Mbps port (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Cellular Interface

Cellular Modes: GSM, 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
Console Port: RS-232 interface (TxD, RxD, GND), with 4-pin pin header output

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® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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

Digital Input

Input Channels: 4, source type
Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:

- Logic level 0: Close to GND
- Logic level 1: Open

Digital Input Levels for Wet Contacts:

- Logic level 0: +3 V max.
- Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 6-pin screw terminal block (4 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 4, sink type
Output Current: Max. 200 mA per channel
On-state Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 5-pin screw terminal block (4 points, GND)
Isolation: 3 KV optical isolation

LEDs

System: Ready, Storage
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 (5.67 x 4.69 x 1.57 in)
Mounting: DIN-rail, wall (requires optional wall mount kit)
Antenna Length: 85 mm

Environmental Limits

Operating Temperature:
 Standard Models: -10 to 60°C (14 to 140°F)
 Wide Temp. Models: Available by request
Storage Temperature:
 Standard Models: -20 to 80°C (-4 to 176°F)
 Wide Temp. Models: -40 to 85°C (-40 to 185°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:

- 6 g's @ IEC-68-2-27, half sine wave, 11 ms (when attached to DIN-Rail kit)
- 20 g's @ IEC-68-2-27, half sine wave, 11 ms (when attached to optional wall mount kit)

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
 With no load on USB ports: 7.2 W
 • 300 mA @ 24 VDC
 • 600 mA @ 12 VDC
 With full load on USB ports: 14.4 W
 • 600 mA @ 24 VDC
 • 1200 mA @ 12 VDC

Standards and Certifications

Safety: EN 60950-1, CSA C22.2 No. 60950-1-03
EMC: EN 55022 Class B, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B
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)
MTBF (mean time between failures): 170,162 hrs

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Note: The Hardware Specifications apply to the embedded computer unit itself, but not to accessories. In particular, the wide temperature specification does not apply to accessories such as the power adaptor and cables.

: Software Specifications

Linux

OS: Linux 2.6.23

File System: JFFS2 (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE

Internet Security: OpenVPN, iptables firewall

Web Server (Apache): Allows you to create and manage Web sites, supporting PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network.

Dial-up Networking: PPP Daemon for Linux allows Unix machines to connect to the internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP and (for Linux) IPX (Novell).

Watchdog: Features a software function to trigger system reset in a user specified time interval. (MOXA API provided)

Application Development:

- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C/C++ Cross-Compiler
- GNU C library
- GDB source-level debugging server

Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0 R2

File System: FAT (for on-board flash)

Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions

Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting

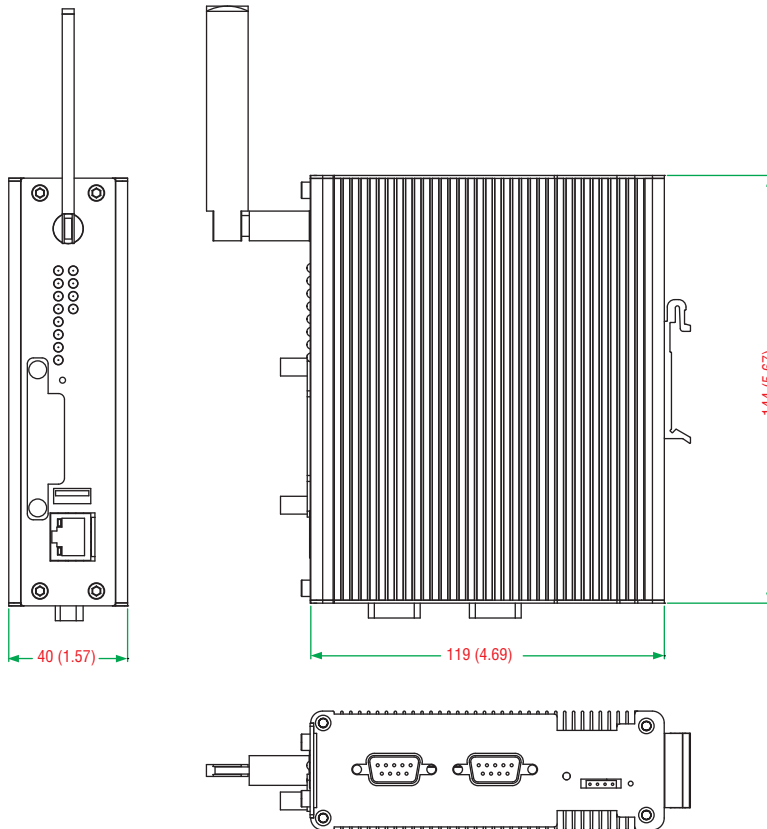
Watchdog: Features a hardware function to trigger system reset in a user specified time interval. (Moxa API provided)

Application Development Software:

- Moxa WinCE 6.0 SDK
- Moxa API Library
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 with SP2
- Winsock 2.2

Dimensions

Unit: mm (inch)



: Ordering Information

Available Models

W406-LX: RISC-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DO, 2 serial ports, Ethernet, SD, Linux 2.6 OS, -10 to 60°C operating temperature

W406-CE: RISC-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DO, 2 serial ports, Ethernet, SD, WinCE 6.0 OS, -10 to 60°C operating temperature

W406-T-LX: RISC-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DO, 2 serial ports, Ethernet, SD, Linux 2.6 OS (contact Moxa for details about this wide temp. computer)

W406-T-CE: RISC-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DO, 2 serial ports, Ethernet, SD, WinCE 6.0 OS (contact Moxa for details about this wide temp. computer)

Optional Accessories (can be purchased separately)

PPWR-24250-DT-ST: Power adaptor

PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug

PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug

PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug

PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug

PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug

Package Checklist

- W406 embedded computer
- Wall mounting kit (optional)
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- GSM/GPRS/EDGE Antenna
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

W315A/325A

RISC-based embedded computers with GSM/GPRS, LAN, and 1 or 2 serial ports



- > MOXA ART ARM9 32-bit 192 MHz processor
- > 32 MB RAM, and 16 MB flash disk onboard
- > Built-in quad band GSM/GPRS 850/900/1800/1900 MHz
- > GPRS Class 10, coding scheme from CS1 to CS4 supported
- > 1 or 2 software-selectable RS-232/422/485 serial ports
- > 10/100 Mbps Ethernet for network redundancy
- > Designed to withstand a continuous 5-g vibration and 50-g shocks
- > SD slot for storage expansion
- > Ready-to-run Linux Kernel 2.6 platform
- > DIN-Rail or wall mount installation
- > Robust, fanless design



Overview

The W315A/325A are embedded Linux computers that feature 1, 2, or 4 software selectable RS-232/422/485 ports, 1 Ethernet port, and quad-band GSM/GPRS 850/900/1800/1900 MHz for cellular communication. Both the W325A and W345A come with an SD socket for external storage expansion. The W315A/325A computers' Linux OS runs on the MOXA ART 32-bit ARM9 processor, which provides a powerful and reliable platform for harsh, industrial environments. You will find these computers ideal for a variety of machine-to-machine

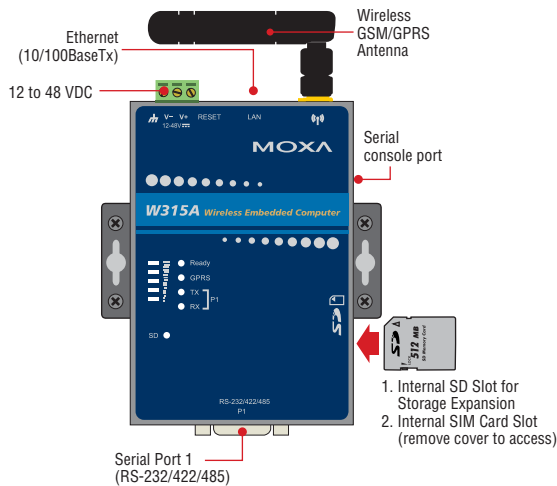
applications, including data acquisition, protocol conversion, and remote device control and monitoring.

The W315A and W325A, which are upgrades of the W315 and W325, provide the following benefits not provided by the W315 and W325:

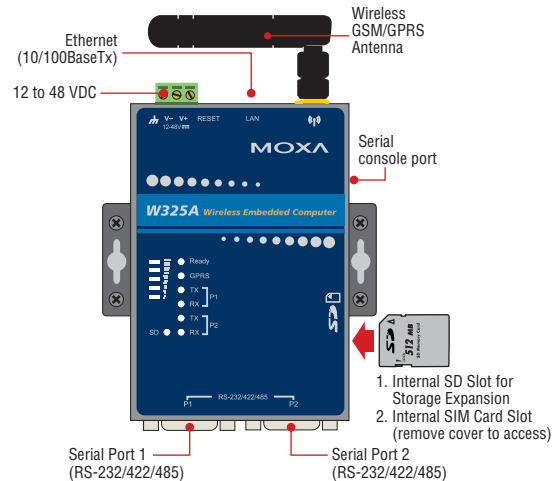
1. Users can execute commands while GPRS is connected
2. Application program development is much easier using the Rcore package

Appearance

W315A



W325A



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz
OS (pre-installed): Embedded Linux with MMU support
DRAM: 32 MB
Flash: 16 MB

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: 1 auto-sensing 10/100 Mbps port (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

Cellular Interface

Cellular Modes: GSM, GPRS
Radio Frequency Bands: 850/900/1800/1900 MHz
GPRS Class: 10
Coding Schemes: CS1 to CS4

Serial Interface

Serial Standards: 1 or 2 RS-232/422/485 ports, software-selectable (DB9 male)

ESD Protection: 15 KV ESD protection for all signals
Console Port: RS-232 interface (TxD, RxD, GND), with 4-pin pin header output

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® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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, SD
LAN: 10M/Link, 100M/Link (on connector)
Cellular: GPRS Enabled, GSM Signal Strength
Serial: TxD, RxD

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum (1 mm)
Weight: 195 g
Dimensions: (without ears or antenna)
 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
Mounting: DIN-rail (requires optional DK-35A DIN-rail kit), wall
Antenna Length: 84 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: 5 g's @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis
Anti-shock: 50 g's @ IEC-68-2-6, half-sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC
Power Consumption:
 Without GPRS loading: 4.8 W
 • 100 mA @ 48 VDC
 • 200 mA @ 24 VDC
 • 400 mA @ 12 VDC
 With GPRS loading: 12 W
 • 330 mA @ 48 VDC
 • 534 mA @ 24 VDC
 • 970 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1, EN 60950-1, CSA C22.2 No. 60950-1-03
EMC: EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
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)
MTBF (mean time between failures): 674,725 hrs

Warranty

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

Software Specifications

Linux

OS: Linux 2.6.9
File System: JFFS2 (for on-board flash)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage Web sites, supporting PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network.
Dial-up Networking: PPP Daemon for Linux allows Unix machines to connect to the internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP and (for Linux) IPX (Novell).
Watchdog: Features a software function to trigger system reset in a user specified time interval. (MOXA API provided)

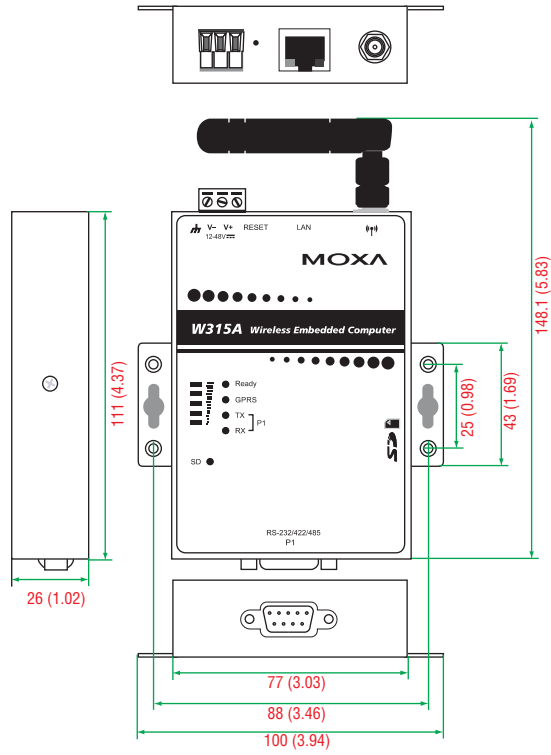
Application Development:

• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
 • GNU C/C++ Cross-Compiler
 • GNU C library
 • GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

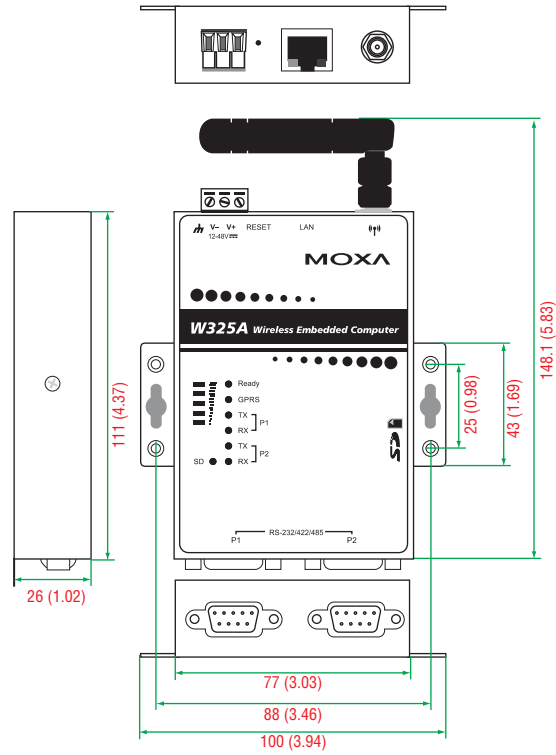
Dimensions

Unit: mm (inch)

W315A



W325A



Ordering Information

Available Models

W315A-LX: RISC-based wireless embedded computer with GSM/GPRS, 1 serial port, LAN, and SD
W325A-LX: RISC-based wireless embedded computer with GSM/GPRS, 2 serial ports, LAN, and SD

Optional Accessories (can be purchased separately)

DK-35A: Mounting kit for 35-mm DIN-Rail

Package Checklist

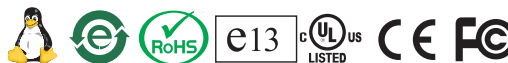
- W315A or W325A embedded computer
- Wall mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- GSM/GPRS antenna
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

W311/321/341

RISC-based embedded Linux computers with WLAN, LAN, and 1, 2, or 4 serial ports



- > MOXA ART ARM9 32-bit 192 MHz processor running Linux 2.6
- > 32 or 64 MB RAM, and 16 MB flash disk on board
- > 802.11a/b/g WLAN with repeater function
- > WEP, WPA, and WPA2 encryption
- > 10/100 Mbps Ethernet for network redundancy
- > Relay output for external alarm connection (W341 only)
- > SD socket for storage expansion
- > DIN-Rail or wall mount installation
- > Designed to withstand continuous 5-g vibration and 50-g shocks
- > Robust, fanless design



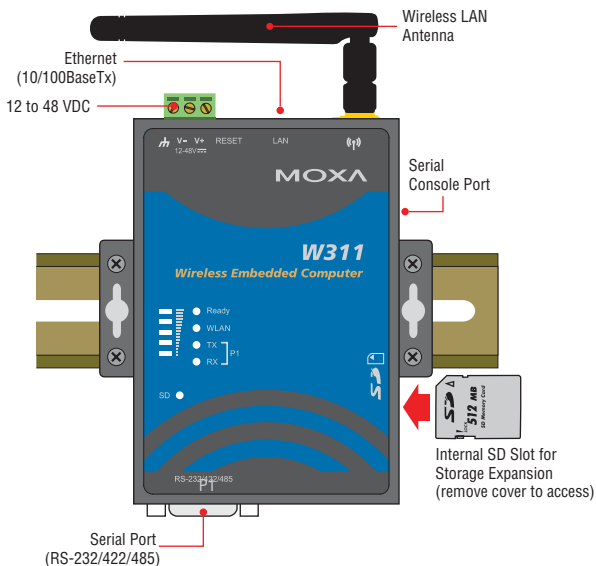
Overview

The W311/321/341 embedded Linux computers feature 1, 2, or 4 software selectable RS-232/422/485 ports, and support the IEEE 802.11a/b/g standards for WLAN connections. In addition, the computers have 1 Ethernet port, and some models come with USB 2.0 hosts and an SD socket for storage expansion. The W311/321/341

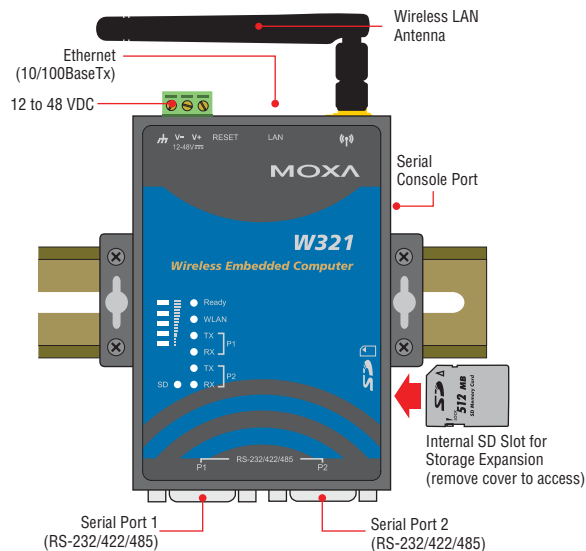
computers' Linux OS runs on the MOXA ART 32-bit ARM9 processor that provides a powerful and reliable platform for harsh, industrial environments. You will find these computers ideal for a variety of machine-to-machine applications, including data acquisition, protocol conversion, and remote device control and monitoring.

Appearance

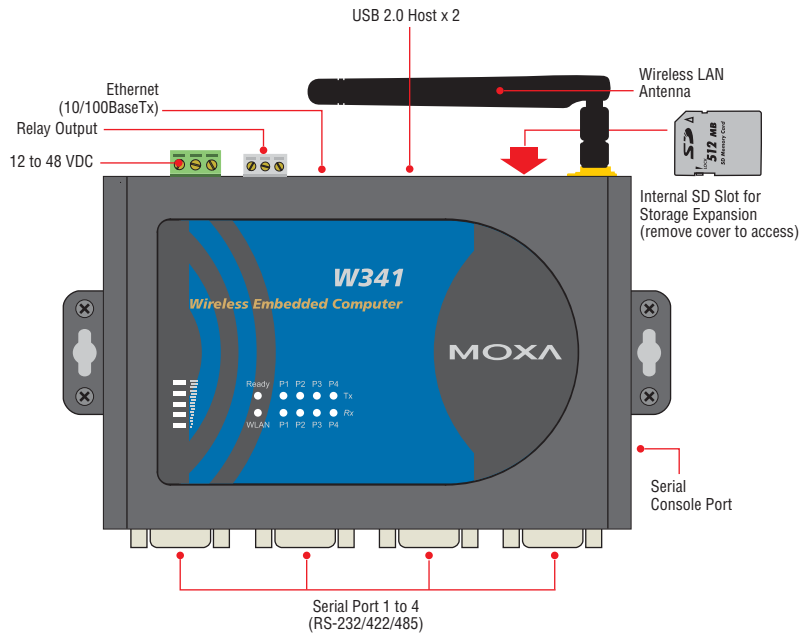
W311



W321



W341



Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz

OS (pre-installed): Embedded Linux with MMU support

DRAM:

W311/321: 32 MB

W341: 64 MB

Flash: 16 MB

USB: (W341 only) USB 2.0 compliant hosts x 2, type A connector

Relay Output: (W341 only)

- Form C, SPDT x 1
- Normal Switching Capacity: 2 A @ 30 VDC
- Switching Power: 60 W max.
- Switching Voltage: 220 VDC max.
- Switching Current: 2 A max.
- Operating Time: 4 ms @ 20°C
- Initial Contact Resistance: 100 milli-ohm max.

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: 1 auto-sensing 10/100 Mbps port (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

WLAN Interface

Standard Compliance: 802.11a/b/g

Radio Frequency Type: DSSS, CCK, OFDM

Media Access Protocol: CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance)

Tx Power (typical):

- 5.15-5.35 GHz: 14 dBm @ 6 Mbps, 14 dBm @ 54 Mbps
- 5.725-5.825 GHz: 14 dBm @ 6 Mbps, 13 dBm @ 54 Mbps
- 2.412-2.483 GHz (802.11g): 17 dBm @ 6 Mbps, 15 dBm @ 54 Mbps
- 2.412-2.472 GHz (802.11b): 18 dBm @ 1-11 Mbps

Rx Sensitivity (typical):

- 5.15-5.35 GHz: 6 Mbps @ -82 dBm, 54 Mbps @ -67 dBm
- 5.47-5.725 GHz: 6 Mbps @ -82 dBm, 54 Mbps @ -67 dBm

- 5.725-5.825 GHz: 6 Mbps @ -80 dBm, 54 Mbps @ -69 dBm
 - 2.412-2.472 GHz (802.11g): 6 Mbps @ -84 dBm, 54 Mbps @ -69 dBm
 - 2.412-2.472 GHz (802.11b): 11 Mbps @ -82 dBm, 1 Mbps @ -90 dBm
- 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)

Antenna Connector: Reverse SMA

Antenna: External 2 dbi dipole antenna

Wireless Security: WEP: 64-bit/128-bit, WPA, WPA2 data encryption

WLAN Modes: Ad-hoc (802.11b/g), Infrastructure

Serial Interface

Serial Standards: 1, 2, or 4 RS-232/422/485 ports, software-selectable (DB9 male)

ESD Protection: 15 KV ESD protection for all signals

Console Port: RS-232 interface (TxD, RxD, GND), with 4-pin pin header output

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® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

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, SD
LAN: 10M/Link, 100M/Link (on connector)
WLAN: Enable, Signal Strength
Serial: TxD, RxD

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum (1 mm)
Weight:
 W311: 170 g
 W321: 185 g
 W341: 390 g
Dimensions: (without ears or antenna)
 W311/W321: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
 W341: 150 x 100 x 38 mm (5.91 x 3.94 x 1.50 in)
Mounting: DIN-rail (requires optional DK-35A DIN-rail kit), wall

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: 5 g's @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis
Anti-shock: 50 g's @ IEC-68-2-6, half-sine wave, 30 ms

Power Requirements

Input Voltage:
 W311 and W321: 12 to 48 VDC
 W341: 12 to 48 VDC
Power Consumption:

W311/321: 4.8 W
 • 200 mA @ 24 VDC
 • 400 mA @ 12 VDC
 W341:
 With no load on USB ports: 7.2 W
 • 300 mA @ 24 VDC
 • 600 mA @ 12 VDC
 With full load on USB ports: 14.4 W
 • 600 mA @ 24 VDC
 • 1200 mA @ 12 VDC

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 55024
Radio: EN 301 489-1/17, EN 301 893, EN 300 328, EN 50392, FCC Part 15, Subpart C/E
Wheeled Vehicles: e-Mark (e13) (W311/321 only)
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) supporting 1-255 level time interval system reset, software programmable
MTBF (mean time between failures):
 W311: 501,331 hrs
 W321: 367,253 hrs
 W341: 284,702 hrs

Warranty

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

Software Specifications

Linux

OS: Linux 2.6.9
File System: JFFS2 (for on-board flash)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage Web sites, supporting PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network.
Dial-up Networking: PPP Daemon for Linux allows Unix machines to connect to the internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP and (for Linux) IPX (Novell).
Watchdog: Features a software function to trigger system reset in a user specified time interval. (MOXA API provided)

Application Development:

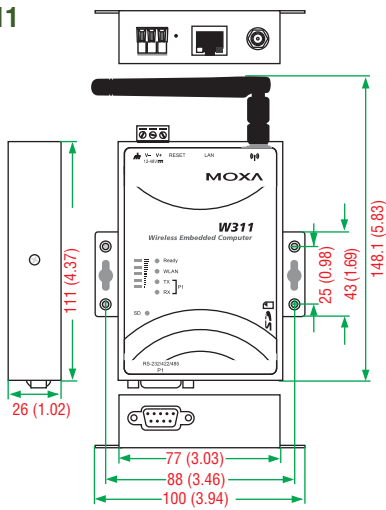
• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
 • GNU C/C++ Cross-Compiler
 • GNU C library
 • GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Model Name	Serial Ports	LAN Port	WLAN	Cellular	Relay Output	Storage		OS
	RS-232/422/485	10/100 Mbps	802.11a/b/g	GSM/GPRS Quad Band		SD	USB	
W311	1	1	✓	-	-	✓	-	Linux
W321	2	1	✓	-	-	✓	-	Linux
W341	4	1	✓	-	1	✓	2	Linux

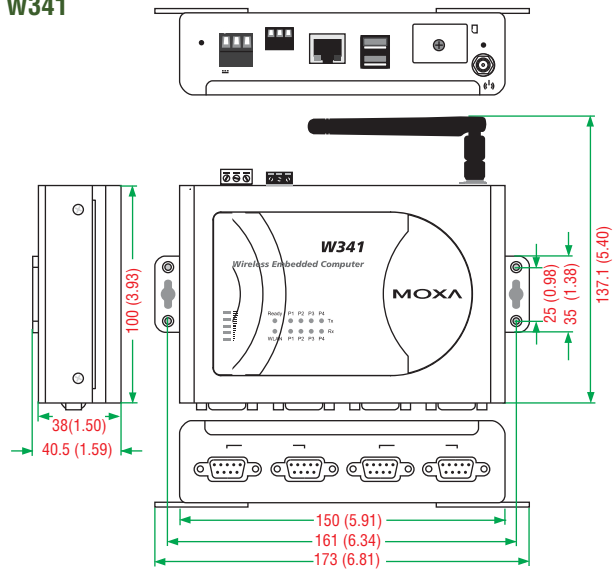
Dimensions

Unit: mm (inch)

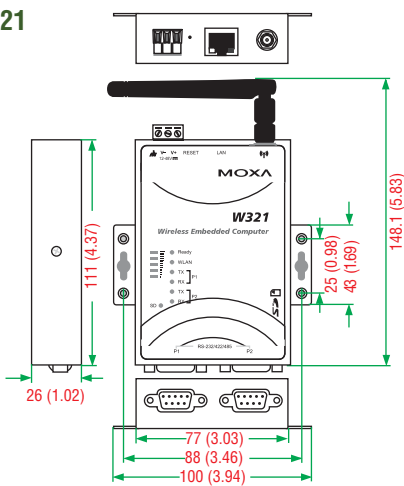
W311



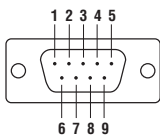
W341



W321



Pin Assignment Male DB9



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	-	-

Serial Console port



PIN	
1	TxD
2	RxD
3	NC
4	GND



Ordering Information

Available Models

W311-LX: RISC-based wireless embedded computer with WLAN, 1 serial port, LAN, and SD
W321-LX: RISC-based wireless embedded computer with WLAN, 2 serial ports, LAN, and SD
W341-LX: RISC-based wireless embedded computer with WLAN, 4 serial ports, LAN, SD, USB, and relay output

Optional Accessories (can be purchased separately)

DK-35A: Mounting kit for 35-mm DIN-Rail

Package Checklist

- 1 W311 or W321 or W341 computer
- Wall mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including terminal block to power jack converter)
- WLAN Antenna
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Rcore Software

Rcore—Embedded Software Platform	9-2
Moxa Device Manager	9-4
MDM API/Mass Configuration Tool	9-6
Mass Configuration Tool	9-7

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Rcore Software



Ready-to-Run Rcore Software Platform



Take advantage of Moxa's Rcore platform to increase your competitiveness and ensure a faster time-to-market. The Rcore platform provides the following hard-to-beat benefits:

- Easy-to-use application libraries
- Proven 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 for both x86-based and RISC-based systems. The wide range of options and extensions provide an answer to any potential need. Key features include:

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

Boot Loader

- External disk boot option
- MDM remote management tool to remotely update firmware or for system recovery
- Fast boot
- Boot loader customization and consulting



: Operating Systems

Moxa's x86 and RISC-based embedded 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) embedded operating system to provide programmers around the world with a user-friendly environment for application development, and help reduce the effort required for system integration. Moxa is continually on the lookout for real-time operating systems that are suitable for mission critical applications.



: Middleware

Moxa offers a variety of middleware to help you easily integrate these application modules into your system. This is essential for leveraging the key features of these modules and reducing the effort required for application development.

VPN

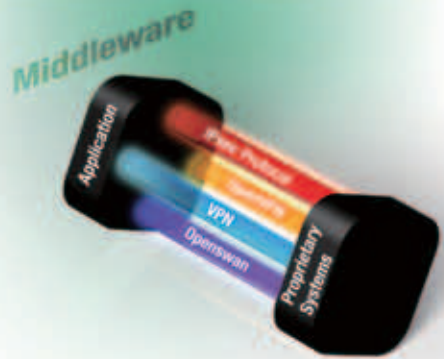
The VPN (OpenVPN, L2TP, and IPSec) middleware makes it easy for user applications to create secure tunnels between communication parties.

Firewall

The firewall (iptables) middleware protects enterprise information from un-friendly access.

Database

The database system (MySQL and MSSQL) middleware can be used to manage eld-data acquisition, with web services (Web, PHP, ASP) included to give programmers an integration framework for building Internet accessible eld applications, such as WebSCADA.



: VPN Middleware

Unbeatable middleware for integrating application modules into proprietary systems

Virtual Private Network (VPN)

A Virtual Private Network (VPN) allows the provisioning of private network services for an organization or organizations over a public infrastructure, such as the Internet, instead of with physical wires. The network is said to be “virtual” because it links two “physical” networks (local area networks) using an unreliable connection (the Internet), and “private” because only computers that belong to a local area network on either end of the VPN can “see” the data. The technologies introduced today are applied to IP-based VPNs rather than frame relay or ATM networks.

OpenVPN

OpenVPN is one of the virtual private network (VPN) solutions that establish secure tunnels between host computers. Two networking techniques are supported by OpenVPN: Ethernet bridging and IP routing. Moxa provides a ready-to-run OpenVPN middleware to enable Moxa embedded computers to be used as OpenVPN gateways with IP routing capability.

IPsec Protocol

Internet Protocol Security (IPsec) is a suite of protocols for securing Internet Protocol (IP) communications by authenticating and/or encrypting each IP packet in a data stream. IPsec protocols provide a set of security services to create secure channels between a pair of security gateways, such as a router or a firewall. Since IPsec provides reliable encryption, integrity, authentication, and replay protection, adding IPsec to Moxa's embedded computers helps prevent threats from intruders.

Openswan

Openswan is an implementation of Internet Protocol Security (IPsec) for Linux platforms. Moxa provides Openswan configuration examples for integrators who want to use RSA (Asymmetric key cryptography) and PSK (Symmetric key cryptography) authentication algorithms to create host-to-host, subnet-to-subnet, or host-to-subnet IPsec connections.

: Sample Code

To lower customers' development cost, Moxa provides sample code for a wide range of embedded applications, such as serial-to-Ethernet (S2E), serial-to-serial (S2S), and Modbus TCP and RTU. This high-level sample code or application libraries hide the details of implementing complex data communication by presenting relatively simple function prototypes for user applications. In addition, low-level libraries that manage direct access to peripheral I/O devices, such as LCM, key pad, digital IO signals, and watchdog functions, are also included. With ready access to such a rich assortment of embedded applications, programmers obtain much greater flexibility than would otherwise be possible. These libraries help programmers quickly grasp the full functionality of their applications, and in this way gain the condence needed to complete their project, speeding up product development and ensuring that code is efficient and bug-free.



Sample Code Makes Software Development a Piece of Cake!

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.

LCM



The LCM Programming function helps developers easily program LCM displays on the UC-7410/7420 and DA-660 series computers.

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.

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 specific time, set the hardware clock time to the system time, or set the system time from the hardware clock, by using the function sample codes.

Buzzer



A Buzzer Programming function allows developers to trigger alarm beeps 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.



Download

To download Sample Code, visit the following link:

<http://rcorecommunity.moxa.com/samplecodedownload>

: Tool

Moxa provides a Windows PC-based tool (MDM) that autodetects, configures, and manages Moxa's embedded computers over an Internet environment. This tool provides features for setting IP addresses, managing files, monitoring memory usage of computers, and helping application developers deploy their programs en masse to an entire army of computers.



: AP

Moxa's AP provides a flexible and customizable interface that can be easily implemented into a user's existing platform. The AP includes: (1) MIRF, an innovative platform for the rolling stock industry that allows users to easily configure their system with the most ideal and optimal settings, (2) Web Enabler, which offers an easy-to-use method for solar inverters to get online for remote monitoring, and (3) SSD Health Monitor, which enables users to easily monitor and detect the SSD status.



MIRF

MIRF (Moxa Intelligent Routing Framework) is an innovative solution for wireless railway passenger network applications. In order to provide commercial-grade multimedia service, system integrators need to develop more value-added software. Unfortunately, open programmable platforms for development may not be readily available.



Get your inverter online with Moxa's Solar Power Inverter Web Enabler

Moxa's Web Enabler makes it easy to get your solar power inverter online, and provides the following advantages:

- Both remote and real time views
- Periodically queries inverter energy values of different types
- Supports extended storage of energy values by overwriting the oldest values



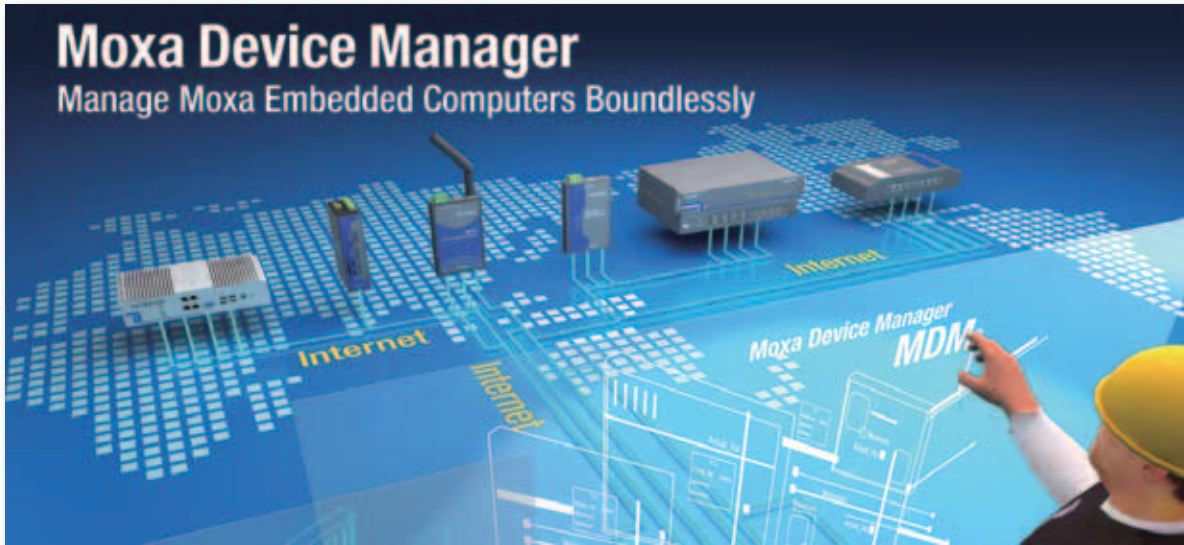
SSD Health Monitor

Moxa's SSD Health Monitor is a software tool that helps users detect and monitor the health status of SSDs and hard disk drives. The tool makes it easy to complete the following tasks:

- Instantly monitor SSD health status
- Detect bad sectors on the SSD
- Prevent the SSD from crashing and other risks

Moxa Device Manager

Unbounded management for Moxa embedded computers



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

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

Command-line Free Configuration and Maintenance

- Launch programs automatically at boot-up
- One-to-multiple file transfers including file uploads and file downloads
- 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

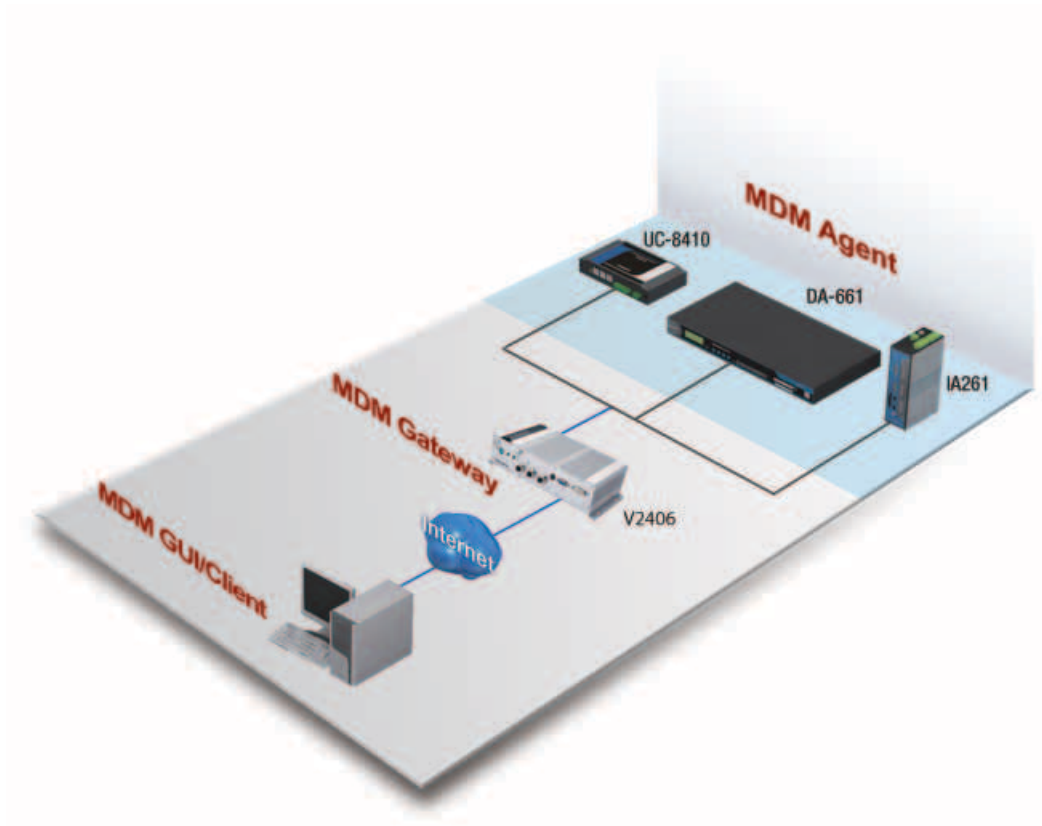
User-friendly GUI

- Easy to use graphical user interface gives users "click and operate" management capability of 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





System Requirements

Software Requirements

Operating System: Windows XP (MDM Tool and MDM Gateway only)

Hardware Requirements

CPU: Intel Pentium 4 processor or higher (MDM Tool and MDM Gateway only)

RAM: 1 GB

Gateway: 512 MB (MDM Tool and MDM Gateway only)

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)

All Items Include:

- MDM Tool Software
- MDM Agent & Gateway Software

MDM API

MDM API Features

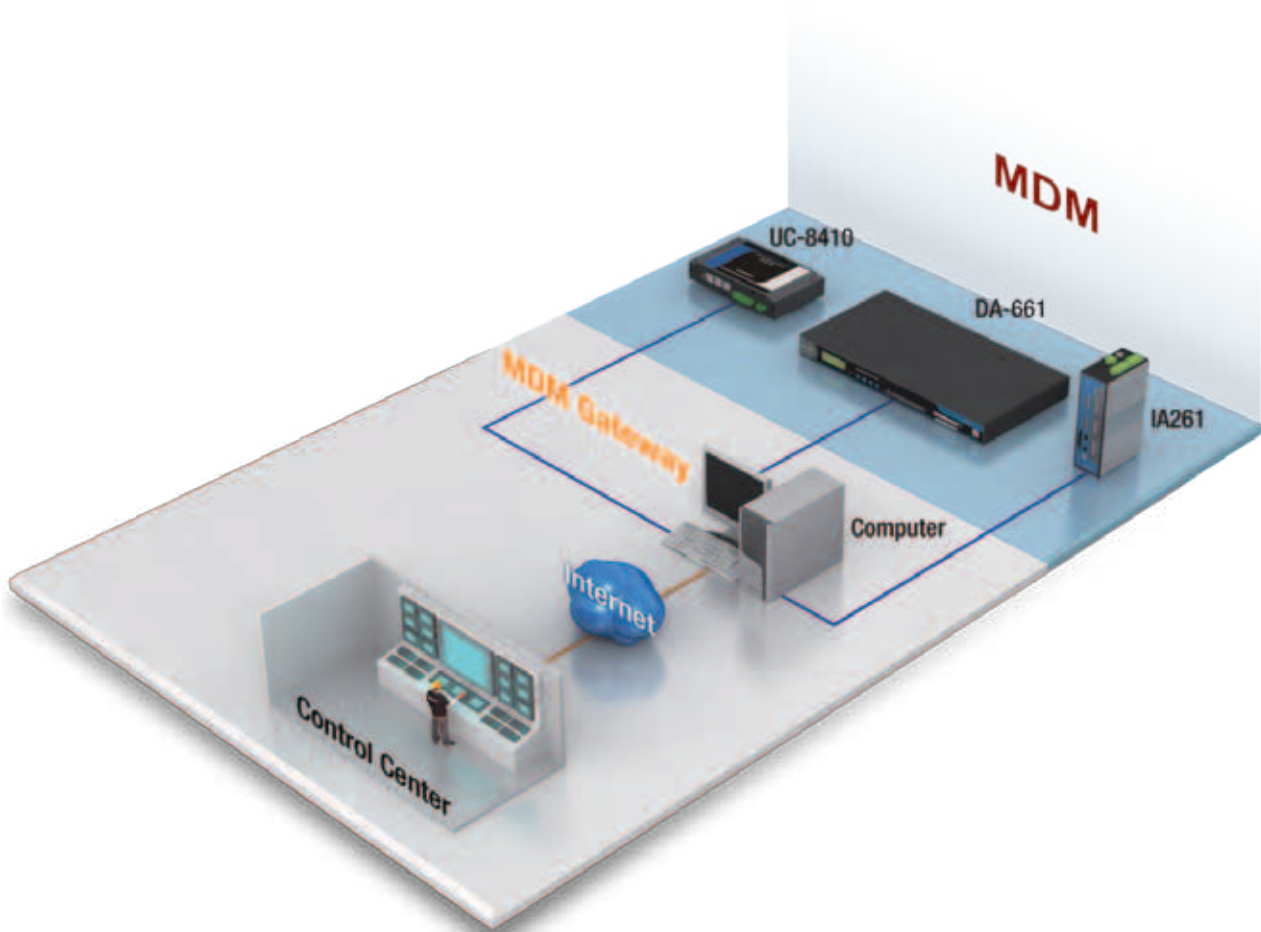
- The MDM API provides developers with a framework to write code to manage Moxa embedded computers remotely.
- The MDM API can be integrated with users' applications.
- The MDM API provides a 3-tier system architecture to support Internet access.
- MDM Agent functions created with the MDM API are dynamically linked and loaded to provide the functions.

MDM API Functions

- MDM Core Functions
 - Get DLL Name
 - Configuration File Management
 - File Transfer
 - System Execution
- MDM Agent Functions
 - 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 models of Moxa embedded computers for Linux, and Windows XPe and CE, except the UC-71xx-LX series



Mass Configuration Tool

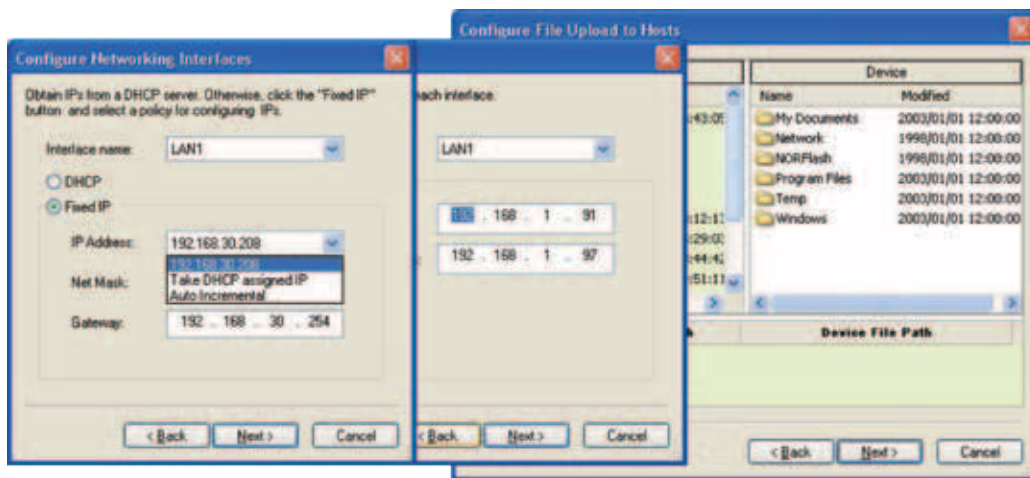
Mass Configuration Tool

Moxa Mass Configuration Tool is a time-saving tool that helps users simultaneously deploy many tasks to Moxa's embedded computers. This tool is particularly useful for deploying programs or tasks to a large number of identical devices. Users can configure the settings at the control center, and then deploy them to all computers at once. This mass deployment saves time on system configuration and program

settings. The more computers you have, the more time you save. After using Mass Deployment Tool to configure a computer, the computer can be installed at a remote site.

The Beauty of Mass Configuration Tool

- Fast and simple initial configuration (under 15 minutes)
- Power on then DONE
- Management reports available



Mass Configuration Tool

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 Moxa employees 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>

Customization Service

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10
Customization
Service



Customization Service



Professional Design Service
Better Value Through Differentiation

Overview

Professional Design Service (PDS)

Moxa's customization service for industrial computing products is based on the Professional Design Service (PDS) concept, which aims to provide customers with tailor-made solutions. Industrial applications often have specific requirements, and specialized

solutions are often needed. With 25 years of experience in the industrial networking and automation field, Moxa can offer professional, customized products and services that are ideal for your own industrial applications.

Customer Benefits

- Local single-point contact and exclusive key account service
- Accelerated time-to-market with Moxa's team of experienced engineers
- Global RMA and logistic support
- Quality solutions to meet corporate standards
- Customized and versatile systems to ensure customer satisfaction
- Cost reduction through Taiwan-based purchasing channels
- Reduce engineering costs with Moxa's extended industry experience
- Reduce investment on production assets and quality assurance system
- Enhanced efficiency through Moxa's global business presence

Core Technologies

Comprehensive Connectivity Solutions

- Versatile serial communication technology
- Ethernet ports, including LAN port, switch port
- Industrial-grade interface: CANBus, DI/DO, AI/AO
- Wireless technology: GSM, GPRS, EDGE, 802.11a/b/g
- Display functions: VGA, LVDS

Ready-to-run Rcore Software Value

- Custom programming libraries
- MIRF-Multi-Interface routing frame work
- Management software available

System-wide Thermal Technology

- High performance with fanless design
- -40 to 85°C wide-temperature design
- BIOS dynamic throttling technology

Industry Expertise

- DNV/IEC 60945/IACS-E10 certified and ECDIS compliant for marine applications
- IEC 61850-3/IEEE 1613 certified and IEEE 1588 compliant for power applications
- EN 50155/e Mark certified for railcar and railway applications

Highly Scalable

- Modular design
- Built-in HD slots for storage expansion
- Compact form factor design

Precise Conformal Coating

- Complete process to reduce the effects of mechanical stress and vibration on the circuitry
- Conforms to IPC-CC-830 SR type thickness requirements (50 to 210 μm)
- Additional full-function testing and quality assurance prior to shipment

Moxa creates "mutual value" by working closely with customers to meet their exact specifications!

Why Choose Moxa?

Processes and Quality Control

Moxa offers quality product designs for both hardware and software. As a professional industrial networking and computing automation solution provider, Moxa offers industrial-grade products that meet even the most severe industrial requirements. For example, fanless products need a sophisticated thermal design to dissipate heat from the inside of the products, and some products are even required to meet specific industrial certifications, such as EN 50155 for rolling stock applications, IEC 61850-3 and IEEE 1588 for power automation applications, and DNV for the marine industry. To meet these harsh requirements, Moxa's engineers are dedicated to providing high quality products that ensure reliable operation when used as part of a variety of industrial applications. Moxa also aims to provide a flexible

software platform that allows users to implement their own programs for specific applications, quickly and easily. This is particularly useful when you want to build applications that use existing software and platforms, such as APIs, sample code, libraries, and network services. With Moxa's help, you can expect to get your customization projects off the ground quickly, with minimal effort and cost. In addition, Moxa has implemented a sophisticated customization service SOP, that applies to both CVF (Customized Version with Full-scale Change) and CVS (Customized Version with Small-scale Change) projects.

Full-scale Change

Full-scale change projects require an entirely new hardware design and/or new software functions. Moxa is able to accept projects for a wide range of applications, including those that require rugged, industrial-grade solutions.

Small-scale Change

Small-scale change projects only need minor changes to hardware and/or software. For example, you may want the products to display your own company's logo, or need new interfaces for different device connections. Moxa can also provide project management and consulting services to help you with your own industrial applications.

In order to provide dedicated and customer-centric customization service, we follow a well-defined process for each project. The process guarantees that your requirements will be carefully considered so that we can provide reliable, tailor-made products.



Customization Service Timeline



● **Multi-faceted Approach to Design**

Compared to more traditional design approaches, Moxa's approach is based on platform and system instead of components. Traditional designs usually aim to provide products that emphasize hardware specifications, such as CPU, memory capacity, and numbers of communication interfaces. On the contrary, Moxa's "total platform and total system" designs result in ideal solutions

that fit customers' industrial application requirements, and make it possible for customers to quickly set up their applications with the most well-suited products. In addition, Moxa's 25 years of experience in the industrial automation industry makes it easy for us to offer customers suitable products and solutions.



● **Management Capability**

Moxa's KA (Key Account) strategy is to use an SME (Sales Management Excellence) system to establish mutual and reliable relationships with key customers. This system offers great service and support by providing the most ideal products and creating added value for key customers. In addition, after-sales service

is one of Moxa's strengths, and our 3 or 5-year warranty ensures the longevity of our products. Moxa also has a broad knowledge of vertical markets, and is always eager to share this knowledge with our key customers.



● **Integrated Solution**

Choosing Moxa means choosing the most experienced solution provider in the industrial automation market. Moxa can integrate a variety of industrial requirements for networking, computing, and data acquisition into a single platform and system for industrial automation. Both hardware and software requirements can be easily integrated to provide ideal solutions that fit customers' industrial application requirements, and make it possible for customers to quickly set up their applications with the most well-suited products. In addition, Moxa's 25 years of experience in the

industrial automation industry makes it easy for us to offer customers suitable products and solutions, and our strong after-sales service and 3 or 5-year warranty ensures the longevity of our products. Moxa's engineers have a broad knowledge of vertical markets, and are always eager to share this knowledge with our key customers. In addition, the software add-on value that Moxa brings offers customers a ready-to-run platform for system integration.



: Moxa Customization Service Case Studies

Small Scale



Product Model

V2406-XPE (TM) Computer

New Features

- Modified from the standard V2406 computer
- 2 hard disks for added storage capacity
- Dual independent displays (VGA + DVI-I)
- Dual LAN ports with M12 connectors
- Multiple digital input/output channels
- Multiple USB hosts for external storage or devices
- EN 50155 certified

Application

NVR application for cars in a Taipei Metro System train

Background

This product is based on the V2406 computer, and has been customized with M12 connectors for both the power input and LAN ports, and has a patented module with two removable hard disks that meet EN 50155 and EN 50121 standards for rolling stock and railway applications.

Full Scale



Product Model

EBC-2101-T Communication Module

New Features

- New hardware design
- New main board with V2101 CPU board
- Wireless module
- 1 LAN port with M12 connector
- Multiple LAN ports for network redundancy
- Multiple digital input/output channels
- Easy integration with existing systems

Application

Communication computer for railway digital cellular repeater system

Background

This product is based on the V2101 CPU board, has been designed to fit the user's blade board in a 19-inch rackmount chassis. It has screw-type M12 connectors for both LAN and switch ports, and built-in GPS and cellular communication modules.

Software Customization



Product Model

Windows FTU Tool and FTU Gateway Establishment with EM-1240 CPU Board

New Features

- Linux 2.6 ported
- Implements FTU Gateway
- Implements Windows FTU Tool

Application

Power Distribution

Background

Moxa provided assistance in this software customization project to run Linux 2.6 on the EM-1240 CPU board. The combination of network setup functions in Moxa Device Manager (MDM), FTU Gateway, and Windows FTU Tool provided a comprehensive solution for the client's requirements for a power distribution application.

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Optional Accessories Selection Guide









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11




**Optional
Accessories
Selection Guide**



Optional Accessories Selection Guide

	M12 Connectors				M12 Cables with Connectors			Power Adaptor
								
Model Name	M12A-5P-IP68	M12A-8PMM-IP68	M12A-5PMM-IP68	M12D-4P-IP68	CBL-M12(FF5P)/Open-100 IP67	CBL-M12MM8PRJ45-BK-100-IP67	CBL-M12D(MM4P)RJ45-100-IP67	PWR-24250-DT-S1
Description	Field-installation A-coded screw-in power connector, 5-pin female M12 connector, IP68-rated	Field-installation A-coded M12 screw-in Gigabit Ethernet 8-pin female connector IP68-rated	D-coded M12 screw-in USB connector, 5-pin male connector IP68-rated	Field-installation D-coded screw-in Ethernet connector, 4-pin male M12 connector, IP68-rated	M12 to 5-pin power cable with 5-pin A-coded M12 connector	M12-to-RJ45 Cat-5E UTP Gigabit Ethernet cable with IP67-rated male 8-pin A-coded M12 connector	1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated	Power adaptor
Cable Length	–	–	–	–	1 m	1 m	1 m	–
Related Products	V2406, V2416, V2426, V2616	V2416, V2426, V2616	V2406, V2416, V2426, V2616	V2406, V2406-241,	V2616, V2406, V2406-241, V2416, V2426, TC-6110	V2616, V2416, TC-6110	V2406, V2406-241, V2426	V2101, V2401, V2402, V2406, V2406-241, V2416, V2422, V2426

	Power Cords					DIN-Rail Installation Kits	
							
Model Name	PWC-C7US-2B-183	PWC-C7EU-2B-183	PWC-C7UK-2B-183	PWC-C7AU-2B-183	PWC-C7CN-2B-183	DK-DC50131-01	DK-35A
Description	Power cord with 2-pin connector, USA plug	Power cord with 2-pin connector, Euro plug	Power cord with 2-pin connector, British plug	Power cord with 2-pin connector, Australia plug	Power cord with 2-pin connector, China plug	DIN-rail mounting kit	DIN-rail mounting kit
Dimensions	–	–	–	–	–	50 x 131 x 1 mm	–
Related Products	V2101, V2401, V2402, V2406, V2406-241, V2416, V2422, V2426	V2101, V2401, V2402, V2406, V2406-241, V2416, V2422, V2426	V2101, V2401, V2402, V2406, V2406-241, V2416, V2422, V2426	V2101, V2401, V2402, V2406, V2406-241, V2416, V2422, V2426	V2101, V2401, V2402, V2406, V2406-241, V2416, V2422, V2426	V2401, V2402, V2406, V2406-241, V2416, V2426, V2616	UC-7122, UC-7124, W315A, W325A, W311, W321, W341

	Wireless Antennas		
			
Model Name	ANT-WDB-ARM-02	ANT-WCDMA-ASM-1.5	ANT-GPS-OSM-05-3M
Description	2.4 GHz, dual-band omni-directional antenna, 2 dBi, R-SMA, male, dipole	Five-band GSM/GPRS/UMTS/HSDPA, omni-directional antenna, 1.5 dBi, rubber SMA	GPS antenna
Dimensions	–	–	–
Related Products	EPM-337, UC-8481	EPM-337, UC-8481	EPM-3337, UC-8481

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Optional Accessories Selection Guide > Optional Accessories Selection Guide

Additional Moxa Products

Industrial Ethernet	12-2
Device Connectivity	12-4
Industrial Wireless	12-6
Industrial Cellular	12-7
IP Surveillance	12-8
Remote Automation	12-10

12

**Additional Moxa
Products**



Industrial Ethernet



Moxa is your one-stop shop for industrial Ethernet solutions. Choose from a vast array of industrial Ethernet switches, including Gigabit, rackmount, PoE/PoE+, IEC 61850-3/EN 50155 Ethernet switches, Ethernet-to-fiber media converters, industrial secure routers, and industrial network management software. Moxa's rugged switches feature industrial-grade reliability, an optimal price-to-performance ratio, and meet many hazardous industry standards, such as Class I, Div. 2/ATEX Zone 2, DNV/GL/ABS/LR/NK, NEMA TS2, EN 50155, EN 50121-4, and IEC 61850-3. In addition, Moxa's industrial secure routers will safeguard your sensitive control networks and mission-critical industrial assets from cyber attacks, and our MXview industrial network management software provides a simple, user-friendly browser UI through which to track network status in real-time, quickly identify failure points, and reduce troubleshooting response time in complex and critical network operations.

Product Portfolio

Industrial Ethernet Switches

- Rackmount Managed/Unmanaged Ethernet Switches
- DIN-Rail Managed/Unmanaged Ethernet Switches
- Power-over-Ethernet Switches
- Embedded Ethernet Switches
- Media Modules

Industry-specific Ethernet Switches

- IEC 61850-3 Ethernet Switches
- EN 50155 Ethernet Switches

Ethernet-to-Fiber Media Converters

Industrial Secure Routers

Industrial Network Management Software

Core Competence

High Network Availability and Resilience

- Turbo Ring™ self-healing technology for network redundancy (recovery time < 20 ms)
- Innovative Turbo Chain™ technology for flexible redundant network planning (recovery time < 20 ms)
- Line-swap fast recovery for quick response when devices change ports



Industrial-grade Reliability and Durability

- Industry proven standards: Class I, Div. 2/ATEX Zone 2, DNV/GL/ABS/LR/NK, NEMA TS2, EN 50155, EN 50121-4, e1, and IEC 61850-3 standards certified by KEMA
- Wide operating temperature range
- Dual redundant power inputs
- Fiber-optic cable for EMI shielding and long-haul transmission
- Fanless design and hardened housings

Intelligent Network Management and Security

- EtherNet/IP, Modbus/TCP, IEEE 1588 PTP V2, LLDP, DHCP Option 82, SNMP Inform, QoS, IGMP snooping, and VLAN supported
- Integrated security features: TACACS+, IEEE 802.1X, HTTPS, SSH, SNMPv3, and port security supported
- IPv6 compliant for next generation Internet technologies

Real-time Network Monitoring and Control

- MXview industrial network management software for visualizing and troubleshooting your networks
- Automatic email warnings and relay output alarms for port breaks and power failures

Application Markets



Rolling Stock



Wayside



Substations



Wind Power



Oil & Gas



Maritime & Offshore



Water & Wastewater

: Product Spotlight

Rackmount Ethernet Switches



ICS-G7848/G7850/G7852 Series
Up to 48G+4 10GbE-port Layer 3 full Gigabit modular industrial core switches



IKS-6726/6728 Series
24+2G/24+4G-port industrial rugged rackmount Ethernet switches for control rooms and outdoor cabinets

DIN-Rail Ethernet Switches



EDS-608/611/616/619 Series
Compact modular managed switches ideal for multiple fiber applications



EDS-205A/208A Series
Space-saving, cost-effective 5-port and 8-port unmanaged Ethernet switches

DIN-Rail PoE+ Switches



EDS-P506A-4PoE Series
Power up network devices with high power IEEE 803.2af/at PoE/PoE+ managed switches



EDS-G205A-4PoE Series
Full Gigabit 5-port IEEE 802.3af/at PoE/PoE+ unmanaged Ethernet switches

DIN-Rail Full Gigabit Ethernet Switches



EDS-G509 Series
9G-port full Gigabit managed Ethernet switches support superior data transmission performance



EDS-G308/G205 Series
8G and 5G-port full Gigabit unmanaged Ethernet switches with redundant 12/24/48 power inputs

IEC 61850-3 Ethernet Switches



PT-7728-PTP Series
IEC 61850-3 modular IEEE 1588 v2 rackmount managed Ethernet switches for substation automation

EN 50155 Ethernet Switches



TN-5518 Series
EN 50155 16+2G-port Gigabit managed Ethernet switches for rolling stock

Industrial Secure Routers



EDR-G902/G903 Series
Industrial Gigabit firewall/VPN secure routers for building trusted, secure industrial networks

Industrial Network Management Software



MXview
Stay in control of your networks with industrial NMS

Learn more about Industrial Ethernet on Moxa's website:

http://www.moxa.com/product/Industrial_Ethernet.htm

Device Connectivity



In industrial automation, reliability is a top priority for customers when choosing products. Moxa is a good choice since we are committed to offering the most reliable products and the best service for serial communications solutions. Moxa's serial connectivity products include multiport serial boards, serial device servers, USB-to-serial converters, and serial converters. In addition, we provide a robust series of industrial USB hubs that can be used with industrial computers in harsh environments. Our commitment to quality and 20-plus years of experience in serial communications is your guarantee that Moxa is the right choice.



Serial/USB Connectivity

Serial Device Servers

- NPort® Device Servers
- Wi-Fi Device Servers
- Industrial Device Servers
- ZigBee Device Servers

Multiport Serial Boards

- PCI Express Serial Boards
- Universal PCI Serial Boards
- PCI Serial Boards
- ISA Serial Boards
- PC/104 Serial Boards
- Serial Fiber Optic Boards

Terminal Servers

- Secure Terminal Servers
- Dual LAN Terminal Servers

Industrial USB

- USB-to-serial Converters
- USB Hubs

Media Converters

- Serial-to-serial Converters/Isolators
- Serial-to-fiber Converters
- Serial-to-ZigBee Converters
- Ethernet-to-fiber Converters

Product Spotlight



NPort® P5150A Series
1-port RS-232/422/485 PoE serial device servers



NPort® IA5000A Series
Industrial device servers with surge protection for serial/Ethernet/power lines



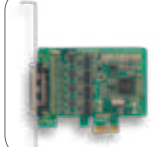
NPort® S8458 Series
Combo Ethernet switch and serial device servers



UPort 400 Series
USB-IF certified industrial-grade USB hubs



IMC-21A Series
Industrial 10/100BaseT(X) to 100BaseFX media converters



CP-118EL-A
One-chip PCI Express serial board with optimized CPU performance



NPort® Z3150 Series
ZigBee-to-Ethernet gateways



NPort® Z2150 Series
1-port RS-232/422/485 serial-to-ZigBee converters

: Embedded Device Networking

Serial-to-Ethernet Modules

- Embedded Serial Device Servers with NetEZ™ technology makes integration incredibly easy

Serial-to-WiFi Modules

- Wireless LAN embedded serial device servers offers easy operation modes for embedded applications

: Product Spotlight



MiiNePort E2 Series
Thumb-sized 10/100 Mbps embedded serial device servers



MiiNePort W1 Series
Wireless LAN embedded serial device servers



MiiNePort E3 Series
PoE pass-through 10/100 Mbps embedded serial device servers

: Fieldbus Gateways/Boards

Ethernet Fieldbus Gateways

- DF1-to-EtherNet/IP Gateways
- Serial-to-Ethernet Modbus Gateways
- Modbus-to-PROFIBUS Gateways

Fieldbus Boards

- CAN Interface Boards and Modules

: Product Spotlight



MGate™ 4101-MB-PBS Series
1-port Modbus RTU/ASCII to PROFIBUS slave gateways



CP-602E-I Series
CAN interface PCI Express boards with 2 KV isolation



MGate™ EIP3000 Series
Easy to use EtherNet/IP-to-DFI gateways



MGate™ MB3000 Series
Advanced Modbus RTU/ASCII to Modbus TCP gateways

Learn more about serial/USB/Fieldbus on Moxa's website:

http://www.moxa.com/product/Serial_USB_Fieldbus_1.htm

Industrial Wireless



Moxa's IEEE 802.11 solutions are wireless products designed for industry, giving you an innovative combination of reliability, redundancy, and throughput for secure wireless LANs.

MIMO and channel bonding technologies (802.11n) allow higher data throughput for reliable real-time video, voice, and data transmission. The dual-RF feature allows you to achieve a complete redundant network that delivers uninterrupted wireless communications, and faster secure roaming ensures seamless connectivity for mobile applications. Outdoor-rated features provide unparalleled reliability under extreme conditions, allowing you to extend your network wherever it is required. Application examples include shipyards, mining, onshore drilling, wind turbines, and rolling stock.



Industrial IEEE 802.11 Solutions

802.11n Network Solutions

Moxa's AWK-6232/5232/4131/3131 support 802.11n, have a maximum bandwidth of 300 Mbps, and support wireless communications in the 40 GHz spectrum. Your WLAN networks will have a higher data throughput, greater range, and increased reliability.

50 ms Turbo Roaming Solutions

Moxa's proprietary Turbo Roaming technology, which features a fast handover time of less than 50 ms, is available with Moxa's WAC-1001

wireless controller. The WAC-1001 is designed for the Moxa AWK-RTG/RTC series, which provides efficient, centralized management and control over a WLAN.

Wireless Redundancy Solutions

The AWK-5222 and AWK-6222 are equipped with Moxa's proprietary wireless redundancy technology, which has two independent RF modules, and allows you to set up independent wireless connections to avoid interruptions in transmission.

Product Spotlight

IEEE 802.11n Solutions



AWK-6232
Industrial IEEE 802.11a/b/g/n IP68 dual-RF wireless AP/bridge/client



AWK-5232
Industrial IEEE 802.11a/b/g/n dual-RF indoor wireless AP/bridge/client

Dual RF Solutions



AWK-6222
Industrial IEEE 802.11a/b/g IP68 dual-RF wireless AP/bridge/client



AWK-5222
IEEE 802.11a/b/g dual-RF indoor wireless AP/bridge/client

Cost-effective Solutions



AWK-1121/1127
Industrial IEEE 802.11a/b/g wireless client

Wireless Access Controller



WAC-1001
Industrial wireless access controller

Learn more about Industrial Wireless on Moxa's website:

http://www.moxa.com/product/Industrial_Wireless_LAN.htm

Industrial Cellular



Moxa's industrial cellular solutions provide enough coverage to connect remote serial and Ethernet devices to a central office over a cellular network. Moxa's GuaranLink ensures that your cellular connections operate uninterrupted, and the OnCell 5000's dual SIM card design allows you to establish both primary and backup WAN networks to ensure continuous your cellular transmission. Moxa's OnCell IP gateways are equipped with VPN functions to provide a secure extension of a private network into a non-secure network. In addition, OnCell Central Manager allows you to access, configure, manage, and monitor private network devices remotely with a web browser.



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Additional Moxa Products > Industrial Cellular

Industrial Cellular Products

Cellular Routers

The OnCell 5000 series can connect up to 4 Ethernet-based devices simultaneously over a single cellular data account for primary or backup network connectivity to remote sites and devices.

Cellular Modems

The OnCell G2000 series is designed for transmitting data and short messages (SMS) over GSM/GPRS mobile networks, and increases the efficiency of both maintenance and communications.

Cellular IP Gateways

OnCell G3000 units are equipped with a dial-up capability, making it easy to connect through a VPN to serial and Ethernet devices over a cellular network.

Product Spotlight

Cellular Routers



OnCell 5004/5104-HSPA Series
Industrial five-band GSM/GPRS/EDGE/UMTS/HSPA+ high speed routers

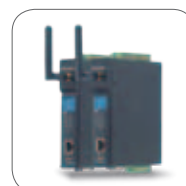


OnCell 5004/5104
Industrial quad-band GSM/GPRS routers

Cellular IP Gateways



OnCell G3110/G3150-HSPA Series
Industrial five-band GSM/GPRS/EDGE/UMTS/HSPA+ high performance IP gateways with VPN



OnCell G3110/G3150
Industrial quad-band GSM/GPRS/EDGE IP gateways with VPN



OnCell G3111/G3151/G3211/G3251
1 and 2-port RS-232 or RS-232/422/485 GSM/GPRS IP gateways

Cellular IP Modems



OnCell G2111/G2151
1-port RS-232 or RS-232/422/485 GSM/GPRS cellular modems

Learn more about Industrial Cellular on Moxa's website:

http://www.moxa.com/product/Industrial_Cellular.htm

Rugged IP Video Surveillance



Most CCTV systems must operate 24/7, so reliability is paramount. For harsh and mission-critical video surveillance applications, such as in oil/gas, ITS, railway, or city traffic systems, Moxa provides rugged IP cameras, video encoders and DVRs/NVRs robust enough to deliver non-stop IP video streaming and recording functionality: Moxa's surveillance products feature wide operating temperature (-40 to 75°C), high EMI/EMC protection (up to level 3), IP66 rain and dust protection, no additional heater or fan, and key industrial certifications (EN 50121/50155, NEMA TS2, ATEX Zone2/ Class 1 Div.2).



Product Portfolio

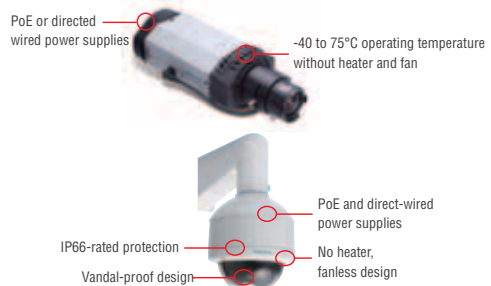
- **IP Cameras**
 - Mobile IP cameras
 - Industrial IP cameras
- **Industrial Video Servers**
 - Industrial Video Encoders
 - Industrial Video Decoders
- **Industrial Video Recorders**
 - Industrial NVRs
 - Mobile DVRs
- **IP Surveillance Software**
 - Network video recording software
 - Central/Video Management Software

Core Competence

Rugged Design

With more than 25-years of experience in industrial product design, Moxa's IP video surveillance solutions feature wide operating temperature, high EMI/EMC protection, and industrial certifications for reliable delivery of high quality video surveillance/recording.

- Extreme -40 to 75°C operating temperature; heater and cooling-fan not required.
- Solid EMI/EMC protection for non-stop operation
- IP66 rain and dust protection for outdoor application
- Vandal-resistant with EN 62262/Class IK10 certifications
- M12 connectors for anti-vibration protection
- Optional Ethernet-to-fiber converters for long-range transmission



Optimal Image Quality

Extreme operating environments can seriously compromise image quality. Moxa's IP solutions provide optimized image quality for demanding video surveillance applications, such as on-train cars, along roadsides, in tunnels, and for long distance object.

- HD (1280x720) resolution video image
- De-mist function for enhanced images in fog, rain and dusty environments
- High-quality WDR (wide dynamic range) for crisp imagery when dark and highly illuminated areas are in simultaneous presence
- ROI (region of interest) for increasing the image quality of the targeted region under limited bandwidth conditions
- Camera tamper alarm and optional IVA (intelligent video analysis) functions for efficient video management



Easy Integration

Moxa IP video surveillance solutions provide an user-friendly SDK (software development kit), which includes CGI commands (HTTP API), ActiveX Control components, and an API library, for simple system integration and third-party software compatibility.

In addition, the VPort video gadget is included for codelss integration with SCADA software, so the video can be integrated into the SCADA system in just a few clicks. Moxa IP cameras and video encoders also support ONVIF specifications, ensuring interoperability with other popular surveillance software, such as Milestone, Genetec, and Digiport.



Application Markets

Factory and Facility Management	Oil and Gas, Power, Water and Wastewater
Harsh Environment Applications	Mining, Military, Maritime
Transportation Automation	Rolling Stock, Highway, City Traffic, Road Traffic



Product Spotlight

IP Cameras



VPort 36-1MP Series
Rugged HD day-and-night box-type H.264 IP cameras



VPort 26 Series
IP66 day-and-night vandal-proof fixed dome IP camera for outdoors



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



VPort P06-1MP-M12 Series
EN 50155 compliant, HD video image, compact IP cameras

Industrial Video Encoders/Decoders



VPort 364 Series
4-channel H.264/MJPEG industrial video encoders, up to 120 FPS at 720 x 480 resolutions

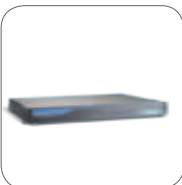


VPort 461 Series
1-channel H.264/MJPEG industrial video encoders, maximum of 3 video streams



VPort D361 Series
1-channel H.264/MJPEG industrial video decoder

Industrial Video Recorders



MxNVR-IA8 Series
8-channel industrial network video recorder for harsh environments



MxNVR-MO4 Series
4-channel H.264/MJPEG streaming video recorder for mobile surveillance

IP Surveillance Software



SoftNVR-IA
64-channel OPC-enabled IP video surveillance software delivers real-time video monitoring



SoftCMS
100/200/500-channel central management software for large scale surveillance systems



VPort SDK PLUS
User-friendly software development kits for third-party developers to customize video-over-IP management systems

Learn more about IP Surveillance Solutions on Moxa's website:

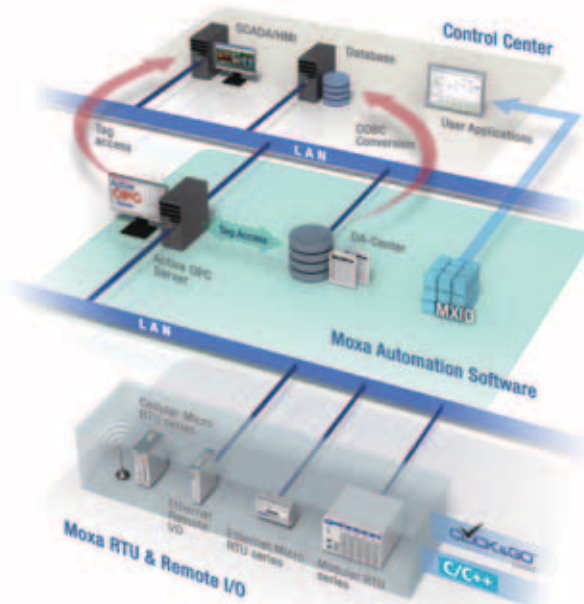
http://www.moxa.com/product/IP_Surveillance.htm

Remote Automation



Moxa's automation solutions empower remote control and monitoring systems with the latest in technology and industry expertise, providing programmable RTU controllers, remote I/O devices, and easy-to-configure automation software that will fit any application environment. With a full line of both Ethernet and cellular communication interfaces, Moxa's products will simplify long-range, host-to-device communications over any network, using established industry protocols that will enhance your operational and maintenance efficiency while giving system operators comprehensive awareness over field instruments.

Product Portfolio



Modular RTU Controllers

ioPAC 8000 series modular RTUs combine modular flexibility and unbeatable reliability with powerful computing capability and programmable control logic, giving you an adaptable tool that will reliably serve any application, no matter how harsh the working environment.

Cellular Micro RTU Controllers

ioLogik W5300 series cellular micro RTUs combine a cellular modem, an I/O controller, and a data logger into a single, next-generation cellular device; it is the perfect solution for distributed wireless telemetry networks.

Ethernet Micro RTU Controllers

The ioLogik E2200 micro-RTU doubles as an intelligent I/O micro-controller, offering easy-to-use local control logic with a built-in Ethernet interface.

Ethernet Remote I/O

Moxa's remote Ethernet I/O portfolio includes the ioLogik E1200 series and the rugged E1200H series. Both series come with various I/O combinations, along with two embedded Ethernet ports that can be used to build daisy-chain topologies, for easier cabling. For rolling stock applications that demand stricter environmental compatibility, the EN 50155/50121-compliant ioLogik E1500 series is an ideal solution.

Automation Software

Moxa's automation software portfolio includes three standard software packages: the push-based architecture, event-driven Active OPC Server; DA-Center, a combined database and software gateway for collecting real-time or historical data for analysis; and the MXIO library suite for Linux and windows programmers. When combined with ioLogik and ioPAC products, these three software solutions leverage the power of Moxa's patented "Active" communications technology to maximize data collection efficiency.

Product Spotlight

Modular RTU Controllers



ioPAC 8000 Series

- Compliant with EN 50121-3-2, EN 50121-4 and essential sections of EN 50155
- Support C/ C++ programming language
- Wide operating temperature: -40 to 75°C (-40 to 167°F)

Cellular Micro RTU Controllers



ioLogik W5300 Series

- Easily managed over dynamic/private IP cellular network
- Front-end intelligence options: C/C++ or patented Click&Go™
- Smart alarm management with SMS, e-mail, SNMP Trap, TCP and UDP

Ethernet Micro RTU Controllers



ioLogik E2200 Series

- Smart alarm management with e-mail, SNMP Trap, TCP, and UDP
- Save time and wiring cost with peer-to-peer communication
- Front-end intelligence with patented Click&Go™

Ethernet Remote I/O for Railway Application



ioLogik E1500 Series

- Compliant with EN 50121-3-2, EN 50121-4 and essential sections of EN 50155
- Channel-to-channel isolation
- Wide operating temperature: -40 to 85°C (-40 to 185°F)

Ethernet Remote I/O for Harsh Environment



ioLogik E1200H Series

- Class 1, Division 2 approval for hazardous location
- IEC 60945 approval for harsh maritime environment
- 3-in-1 RS-232/422/485 serial port
- Wide operating temperature: -40 to 75°C (-40 to 167°F)

Ethernet Remote I/O



ioLogik E1200 Series

- 2-port Ethernet switch for daisy-chain topologies
- Save time and wiring costs with peer-to-peer communication
- User-defined Modbus/TCP addressing
- Wide operating temperature: -40 to 75°C (-40 to 167°F)

Modular Remote I/O



ioLogik E4200

- Dual Ethernet LANs for network redundancy
- Allows as much as 16 expansion modules without needing a backplane
- Front-end intelligence with patented Click&Go™

Automation Software



Active OPC Server

- Active communication with Moxa RTUs & Remote I/O devices
- Faster and more accurate data collection
- Included in product package



DA-Center

- Collect real-time or historical data into database
- Automatically restore data collected during a period of disconnection from an internal SD card
- Embedded trend charts for historical analysis

Learn more about Remote Automation on Moxa's website:

http://www.moxa.com/product/remote_io.htm

Every effort is made to ensure that the information in this catalog is accurate. However, please note that no guarantee of legal contract is implied with the presentation of this information. This catalog is intended for informational purposes only, and Moxa reserves the right to update or modify this information at any time.

> **The latest product information can be found here: www.moxa.com/product**

See the Best Industrial Networking Solutions for Power, Railway, and ITS at **Moxa Solution Day**

Visit Moxa's website for event details:

www.moxa.com/event/SolutionDay

Moxa's Solution Day is a great opportunity to discover the latest trends and advances in industrial networking. Moxa's market experts will concentrate on the latest trends in the power, railway automation, and ITS markets, and examine several real-life applications in detail. You will learn about the latest applications used at key sites around the world, and see which products provide the most reliable and cost-effective networking, communication, and management solutions. Moxa Solution Day is a perfect learning opportunity for:

- 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.

The Moxa logo consists of the word "MOXA" in a bold, white, sans-serif font. The letter "O" is stylized with a horizontal line through its center. A registered trademark symbol (®) is located to the upper right of the "A".

Reliable Networks, Sincere Service

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