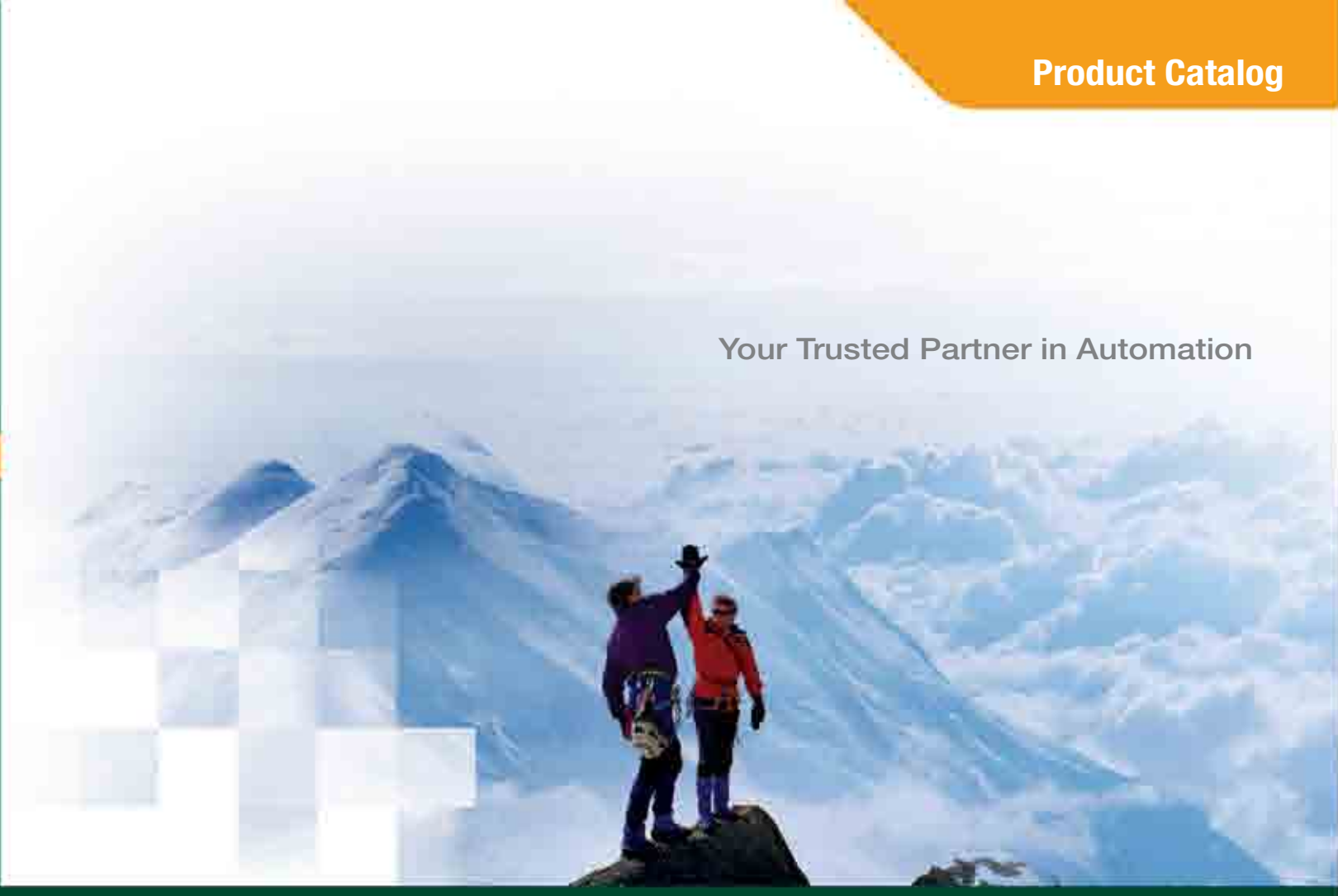
Product Catalog

Your Trusted Partner in Automation



Industrial Computing Solutions

- Embedded Computers
- Power Automation Computers
- Rolling Stock Computers
- Marine Computers and Displays
- Rcore Software

www.moxa.com

MOXA®

A Leader and Partner in Automation Solutions

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

Moxa: Your Trusted Partner in Automation

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

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

Mission and Vision

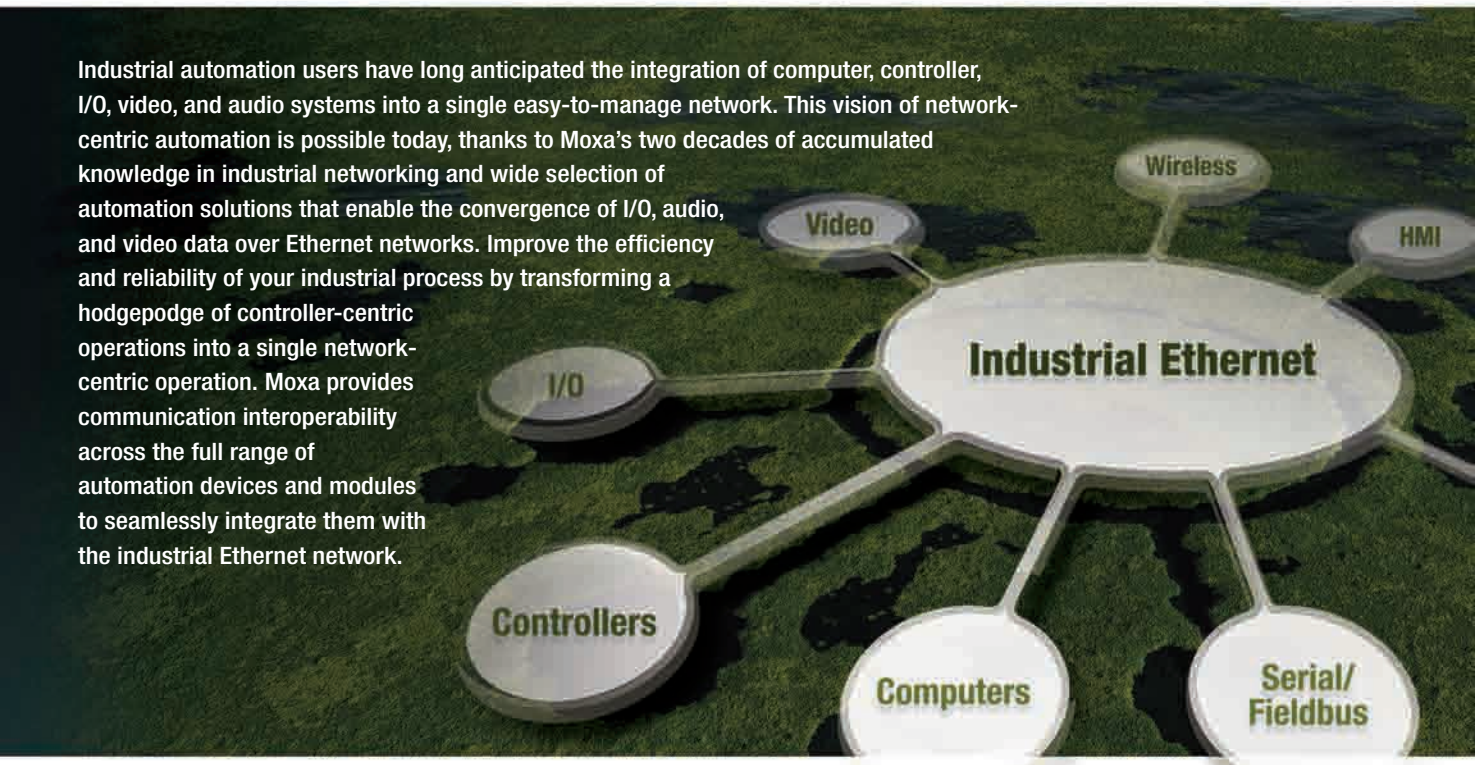
As a world-class leader and a trusted partner in industrial-grade device networking solutions for automation, Moxa proudly provides quality products and value-added service to establish win-win business relationships based on mutual trust and integrity. Moxa works closely as a team with our customers,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

Delivering on Commitments

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

Integrating Automation by Enabling Convergence

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



Industrial Networking Solutions

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

Industrial Computing Solutions

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

Remote Automation Solutions

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

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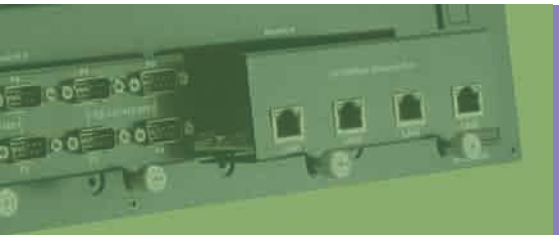


Complete Automation Solutions

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

Vertical Solutions for Mission Critical Applications

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

Diverse Products for Complete Solutions

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

The Convergence of IT and Automation Technology

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

Industrial Ethernet

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

Turbo Ring | Turbo Chain | Turbo Roaming

Solutions

Products

Technology

Device Connectivity

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

Industrial Computing

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

Remote Automation

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

New Product Development Process

How innovation and quality are integrated into our development process.

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.

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

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

The Moxa Process

Enhancing Customer Value with Every Step

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

Innovating to Maximize Customer Value

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

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

Global Recognition

Engineer's Choice Award, Control Engineering Magazine

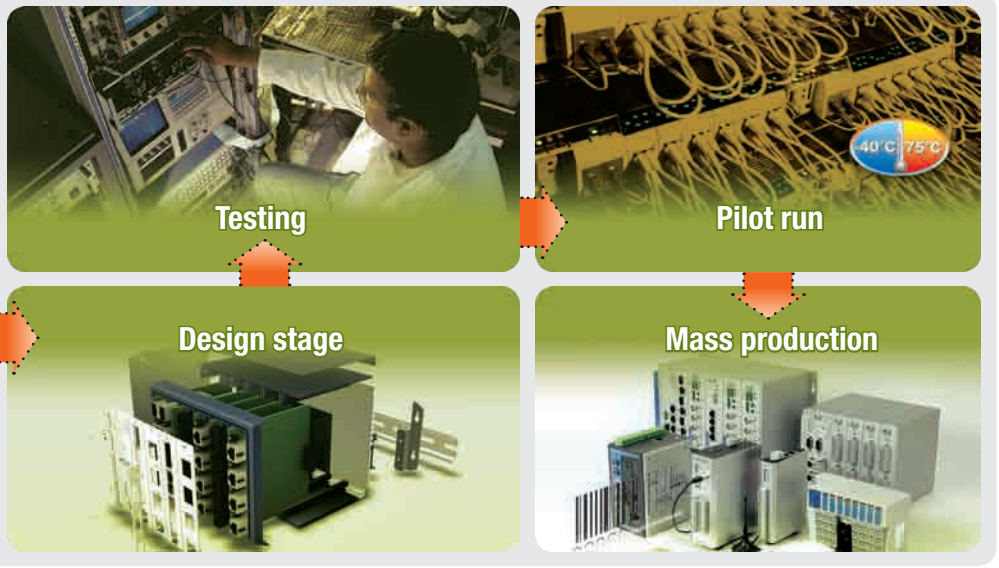
- EDR-G903 Industrial Gigabit secure router (2011)
- ToughNet TN-5518 EN50155 Ethernet switch (2010)
- W345 RISC-based wireless computer (2007)
- ioLogik E2210 Active Ethernet I/O (2006)

Embedded Award 2007, Embedded World Exhibition and Conference

- W315/325/345 wireless embedded computers

4 Test all functions in a simulated industrial networking environment.

5 Plan production and rigorously test product samples.



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

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

Service

Annual MTSC Training includes hands-on exercises.

Engineers receive MTSCs for specific product lines.

A Meticulous Commitment to Product Quality

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

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

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

Prompt and Professional Technical Service

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

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

Trend 100 Products, SPS Magazine

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

Product of the Year Finalist, Plant Engineering Magazine

- EDS-P308 industrial PoE switch

Good Design Award

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

Red Dot Award

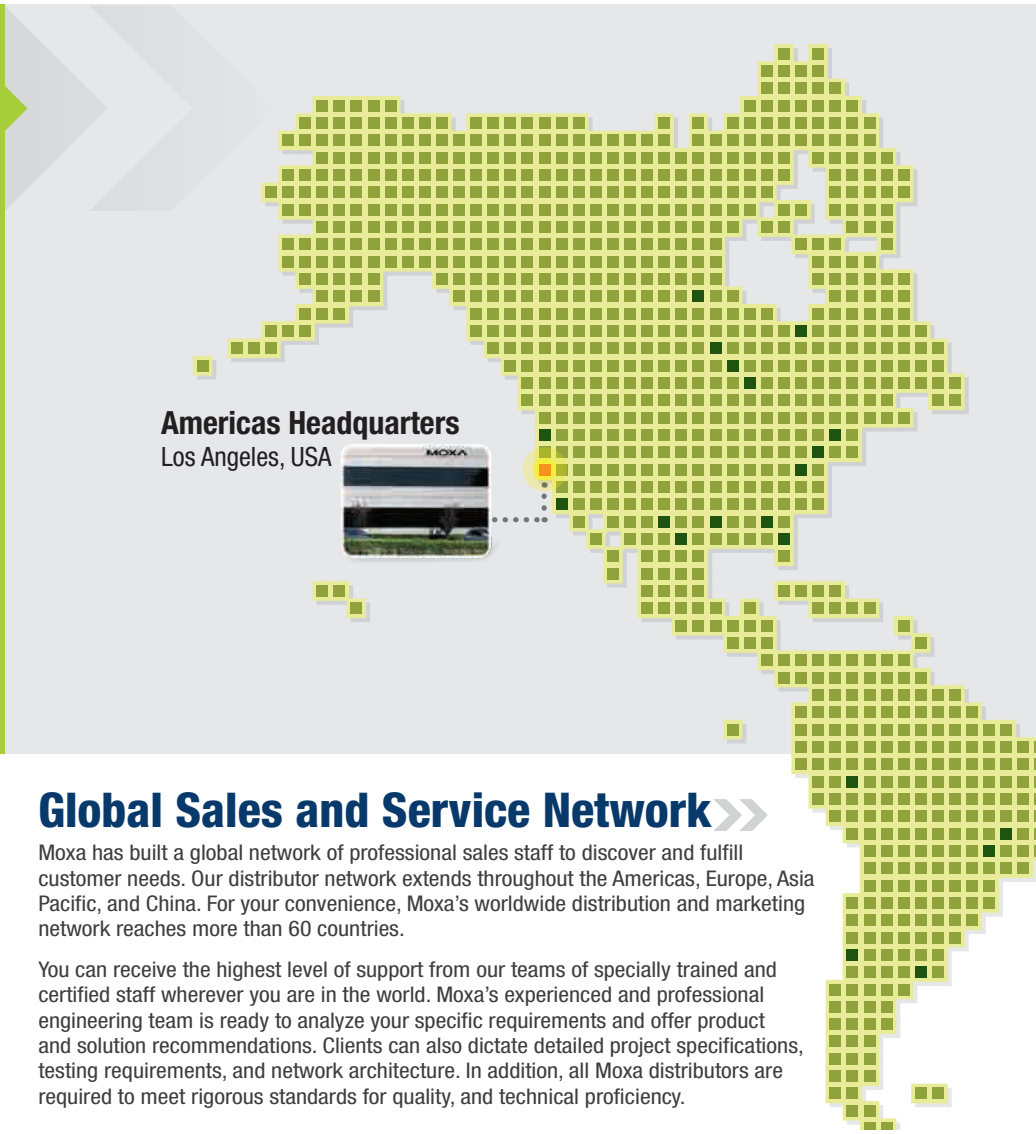
- EDS-619 compact modular Ethernet switch (2009)
- EDS-728 industrial Gigabit modular Ethernet switch (2008)

iF design

- ToughNet TN-5518 EN50155 Ethernet switch (2010)
- EDS-726 industrial Gigabit modular Ethernet switch (2006)
- VPort-16-M12 EN50155 IP Camera (2011)

Connect to Moxa Anytime, Anywhere

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



Global Sales and Service Network

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

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

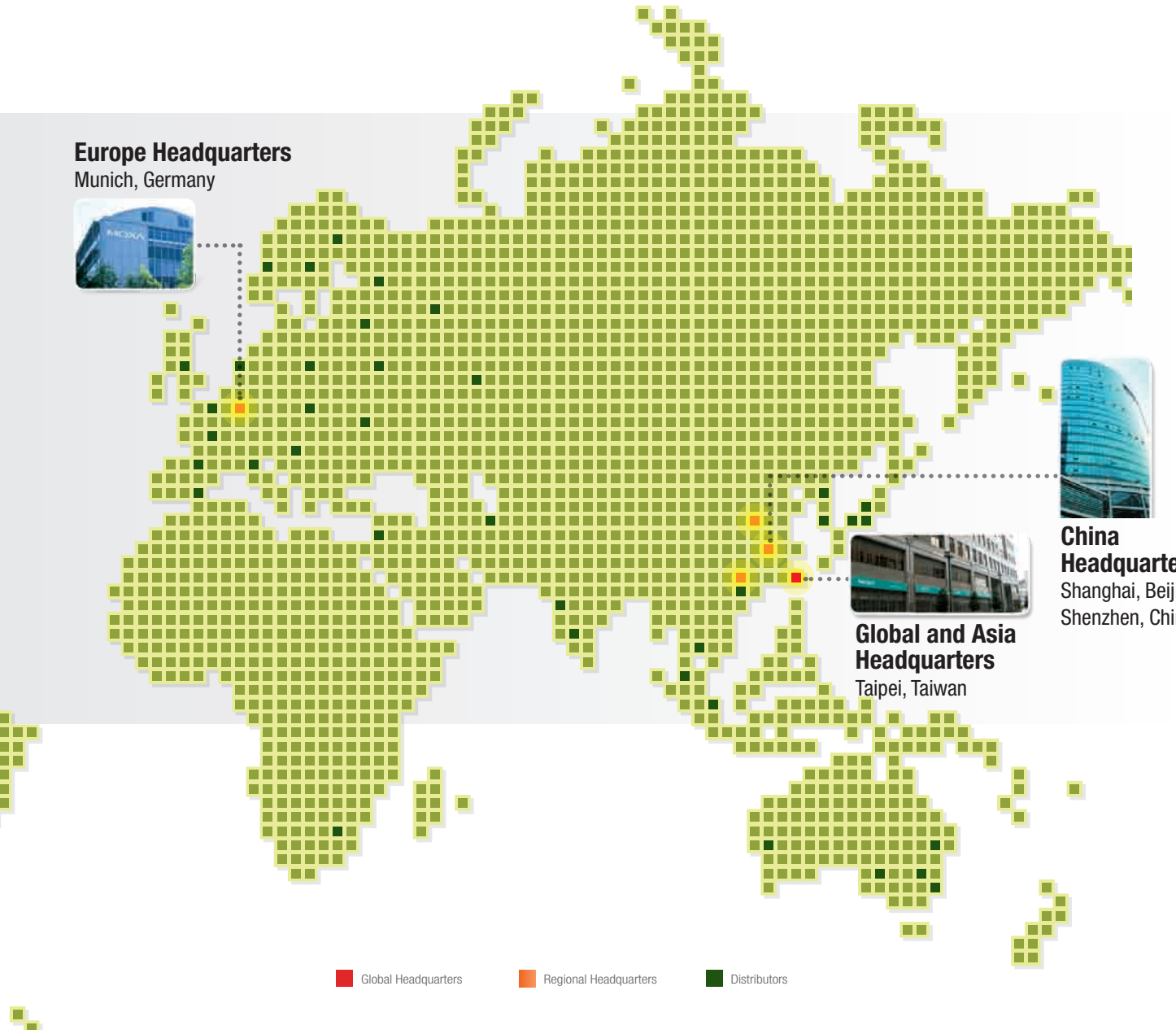
www.moxa.com

A Rich Knowledge Resource

Global Online Service

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

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



Moxa Online—A Convenient Ordering Service for Sample Products

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

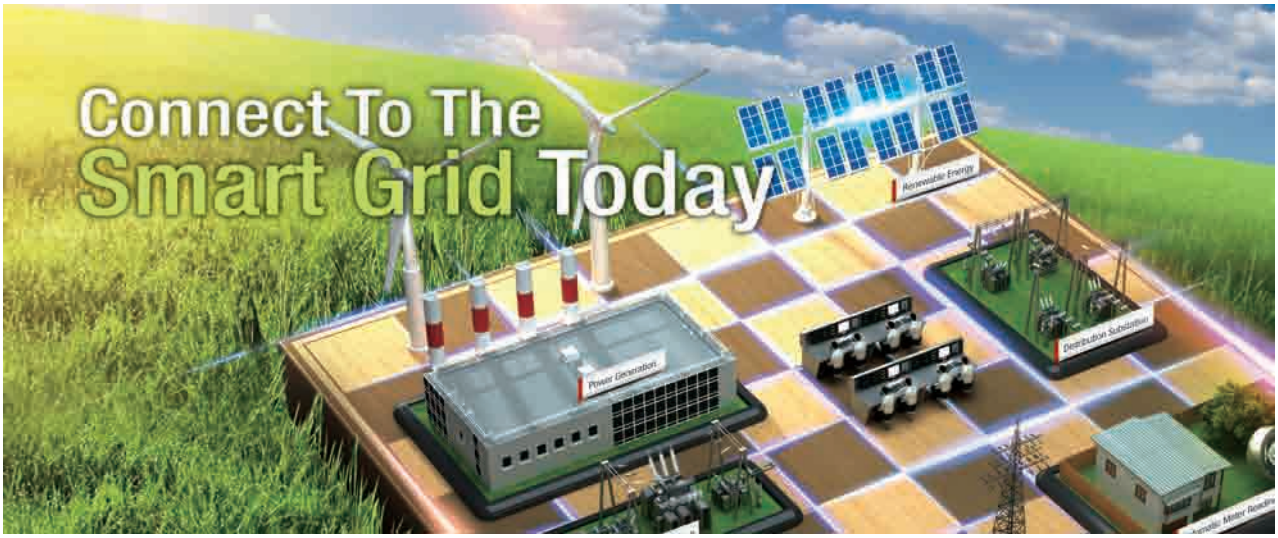
Moxa Partner Zone—Exclusive News, Marketing Resources, and Sales Tools

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

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

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

Power



What is a Smart Grid?

A "smart grid" is an electric power delivery system that stretches from point of generation to point of consumption. Integrated with advanced communications and information technology, all equipment and devices in a smart grid are connected by sensory elements to form a complete power network. The information is integrated and analyzed to optimize power resources, reduce costs, increase reliability, and enhance electric power efficiency.

A smart grid is an intelligent automated system for monitoring the flow of electricity and making the distribution of electricity more efficient. In a world where protecting the environment is a major concern, it is important to find cost-effective ways of reducing power usage and increasing energy independence.

Existing power supply systems implement a "centralized power supply" that often involves high voltages and large-scale electric power networks. With this type of power supply, failures in the electricity network can have a huge impact on the entire power supply system, and often cause widespread system shutdowns.

Because of the potential benefits, many governments are developing smart grid solutions and implementing a distributed power network instead of a centralized one. Distributed power networks are highly integrated and include power generation, power transmission, and power distribution, with power meters and home appliances, such as refrigerators, TV sets, washing machines, and personal computers also considered part of the network. Engineers who design and manage distributed power networks must handle a number of tasks, including energy management, data communication, and information analysis.

Smart Grid Architecture

By optimizing the electric power grid we can get more out of the existing infrastructure without needing to invest a lot of capital in new technology for generation, transmission, and distribution facilities. In fact, by making the grid smart, we can create a completely integrated system, from power generation to power distribution to power use in the household, and to a certain degree, the smart grid concept can get the most out of renewable energy operations by integrating the local micro-electricity grid to replace more traditional power supply sources such as carbon-fueled and nuclear power plants.

Why Get Smart?

Using a smart grid solution provides the following benefits:

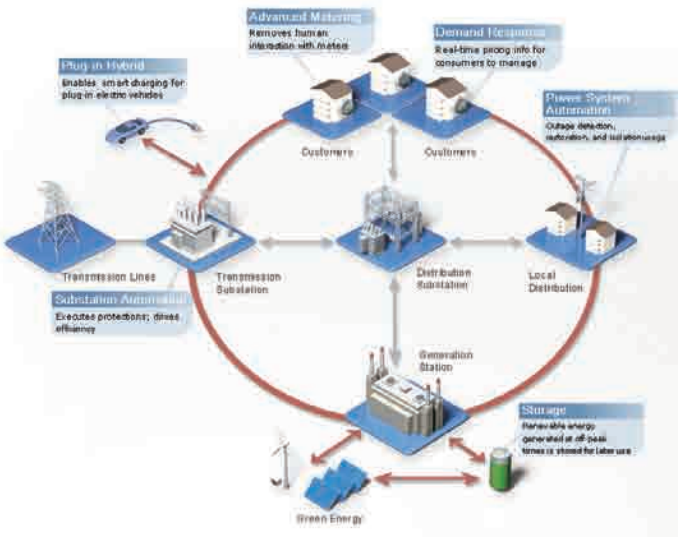
1. Enhances energy usage efficiency
2. Increases the proportion of distributed power generationsystems and renewable energy solutions
3. Enhances the flexibility of the power supply
4. Reduces the overall costs of delivering power to end users
5. Improves the stability and quality of the power supply
6. Makes all facets of energy distribution safer

Moxa's Complete Solution for Creating a Smarter Grid

1. Renewable Energy
- Ethernet Switch
- Industrial Network Management Software
- Embedded Computer
- Device Server
- Video Server
- Ethernet I/O

2. Intelligent Substation
- Ethernet Switch
- Embedded Computer
- Wireless Device Server

3. Automatic Meter Reading
- Ethernet Switch
- Embedded Computer
- Device Server



Intelligent Substation

Introduction

Adding locally intelligent nodes can create networks that are more efficient and reliable. The smart grid makes use of communications, computing, and power electronics to create a system that is self-healing and adaptive. The smart grid is also able to "interact" with end-users at the consumer, business, and industry level, and can be used to predict and prevent emergencies instead of just waiting around for something bad to happen.

How Do Intelligent Substations Fit into a Smart Grid?

The electric power dispatching control center supervises the grid while the automated management system for transmission and distribution is operating. Decision making and information is handled by the intelligent substation, which reports electric power consumption, operates the switchboard, and gathers information, with decision making sent back to the electric power dispatching control center.

IEC 61850 and IEEE 1613 Certified

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 Ethernet switches and embedded computers are IEC 61850-3 and IEEE 1613 certified, guaranteeing that our products are protected against a variety of environmental factors.

IEEE 1588

The IEEE 1588v2 Precision Time Protocol (PTP) is designed specifically for industrial networked measurement and control systems. In a network based on IEEE 1588v2, 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. As illustrated in the figure below, exchanging PTP packets between master and slave devices, and automatically adjusting the ordinary clocks, effectively synchronizes the entire network. Only the grandmaster clock needs a connection to GPS timekeeping; that data can be accurate distributed to the rest of the devices on the network.

Solid EMC Design

One of the main requirements for embedded computers to be deployed in the intelligent substation is the strong EMC design for electromagnetic interference protection. If subjected to a 4 KV electromagnetic current, for example, to begin with the voltage is stepped down to 75 V, and then current limitation is used 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 ours, offers devices full protection from electromagnetic interference.

The Important Role of Industrial Embedded Computers and Ethernet Switches

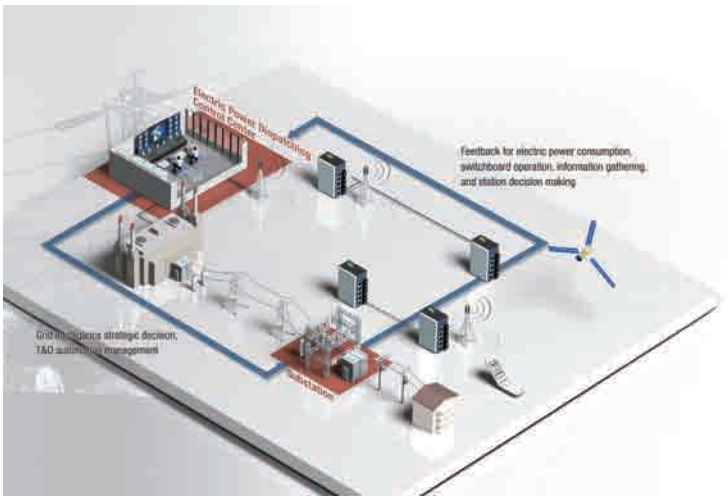
To achieve these missions, intelligent substations need powerful embedded computers with multiple serial ports for legacy device connectivity and to perform a multitude of front-end tasks, such as protocol conversion, data acquisition, numerical computing, data distribution, and remote device monitoring and management.

Industrial Ethernet switches are a fundamental building block of IEC 61850 based substation automation systems and must perform extremely reliably and continue to operate under challenging conditions, such as EMI threats.

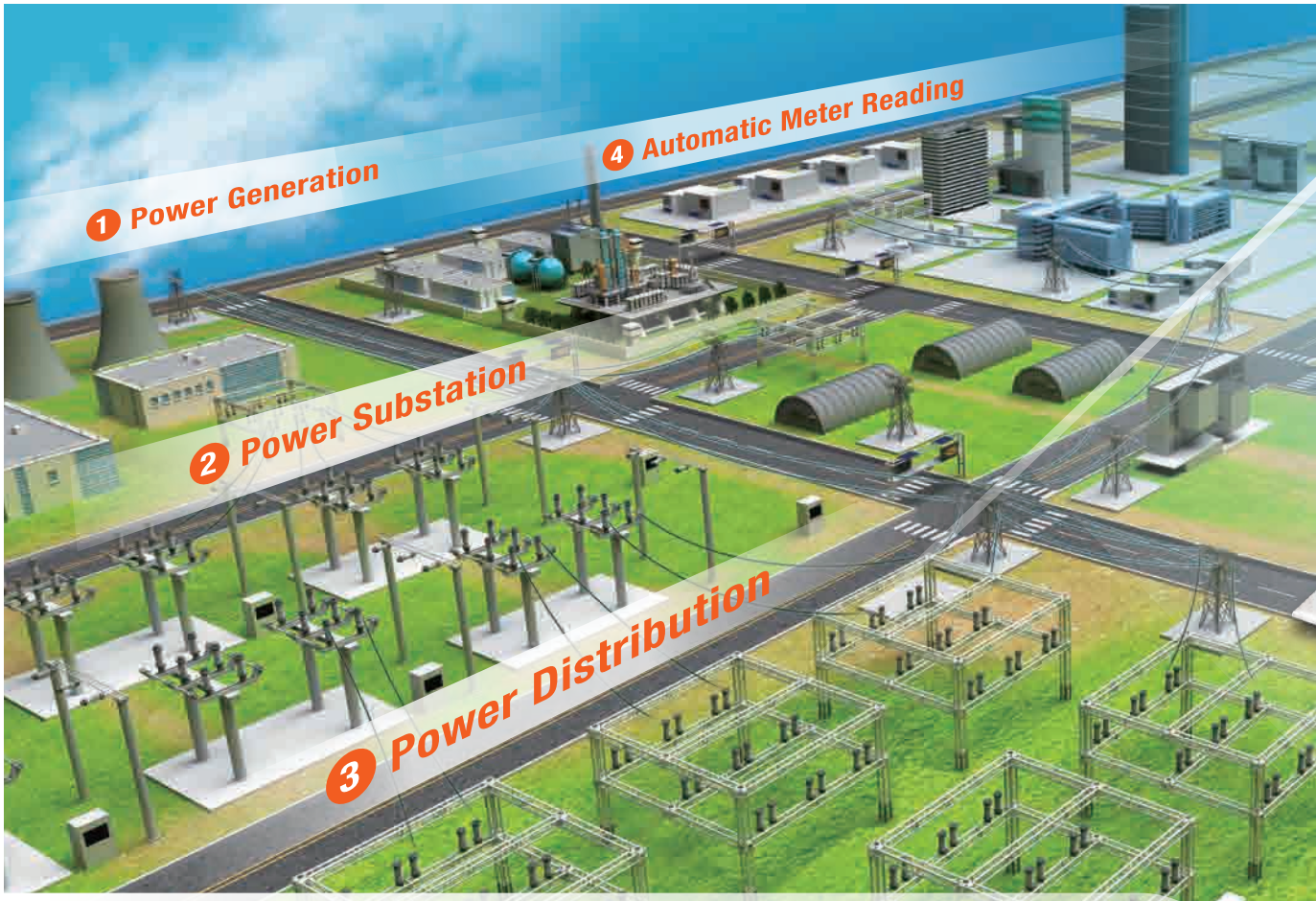
The Segments of an Intelligent Substation

Intelligent substations can be classified into three categories, utility substations, industry substations, and commercial substations, which are differentiated by voltage level and overall size.

- Utility Substations consume a high amount of voltage and require a large scale operation. The high voltage is often required for large factories or mass public transit systems and is the top phase of the power distribution process. The voltage could be as high as 500 KV. There are fewer substations of this type but they must satisfy a high demand.
- Industry Substations are the most common. The voltage required is around 220 KV, and is used for medium-sized factories or commercial buildings.
- Commercial Substations require a voltage level around 100 to 110 KV, and are used for small-scale operations, such as store buildings or residential areas.



Power Automation



DA-681

x86-based rackmount embedded computer

- World's first IEC 61850-3 certified rackmount computer
- Dual power inputs for redundancy (dual power and power protected models only)
- Multiple serial ports and LAN ports for network redundancy

DA-683

x86-based rackmount embedded computer

- 2 peripheral slots for expansion modules
- Built-in industrial-grade DOM, CF/SATA interface for storage expansion
- IEC 61850-3 certified for stable automation applications

DA-710

x86-based rackmount embedded computer

- 4 peripheral slots for expansion modules
- Quad 10/100/1000 Mbps Ethernet for network redundancy
- High performance Intel® processor with fanless design
- Dual 100 to 240 VAC/VDC wide range power input provided

1 Power Generation

Recommended Product: DA-681 or DA-662-I

Solution Requirements:

- Embedded computer as protocol conversion gateway
- Connections for multiple peripherals
- Strong EMC design to counter electromagnetic interface

Why Moxa?

- Effective and readily available protocol conversion facilitates seamless communications between legacy devices using different protocols
- Moxa's products have been proven effective in several power automation applications
- Multiple connection options for devices and network redundancy
- IEC 61850-3 certified

2 Power Substation

Recommended Product: DA-710 DA-683, DA-681

Solution Requirements:

- Rackmount computers for protocol conversion, front-end computing, protection management and tele-control communication
- Support for fast switching and system backup architecture
- Multiple LANs for network redundancy and communications with dispatch control center
- 100-240 AC/DC power input required
- 19-inch rackmount, fanless design

Why Moxa?

- Modular design with multiple connection options for network redundancy and centralized communication
- Dual power design to connect simultaneously to 100 VDC and 240 VAC power sources
- Dedicated customer service
- IEC 61850-3 certified

3 Power Distribution

Recommended Product: EM-2260

Solution Requirements:

- A gateway capable of handling multiple devices running different protocols via different interfaces
- Stable system with quick communication response and ultra-low power consumption
- An integrated system with a variety of communication interfaces, including CANBus, DI/DO, serial ports, and Ethernet LANs ports

Why Moxa?

- Moxa's integrated embedded system dramatically improves reliability and development time compared to a self-assembled system
- CANbus and multiple serial ports offer fast I/O communication and versatile configuration
- Prompt and customized service tailored to customer needs

4 Automatic Meter Reading

Recommended Product: W406 or DA-681

Solution Requirements:

- Embedded computers to improve legacy data collection to control networks and verifiable meter billing
- Front-end embedded computer for remote monitoring, data acquisition, data logging, reporting, and protocol conversion
- Ensure data accuracy, and reduce lead time and costs

Why Moxa?

- Sample code helps software developers simplify protocol conversion, expediting product development
- The IPSec function ensures network security both in wireline and wireless communication
- Allows multiple devices to use different protocols for data communication

Railway

See How We Passed EN 50155

EN 50155 certification is an essential passport to reliable and successful railway automation systems. Moxa's EN 50155-certified railway solutions have been successfully deployed in many railway automation applications around the world, such as trackside station networks, rolling stock systems, and automatic fare collection.

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 then exceeding EN 50155 requirements. Here's how we did it.

Mandatory EM 50155 Testing

Thermal Technology

EN 50155 Temperature Requirement

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 EN50155 Tx Class. Moxa's V2406 and V2426 computers conform to this standard.

How Moxa's Embedded Computers Achieved the Highest EN50155 Temperature Standard

1 System-wide Design

Moxa's industrial computers are conceived and designed at a big-picture, broad system level. Compared to simply designing on a narrow component level, this more thorough process is complicated and time-consuming—but it creates comprehensive system-wide solutions that can guarantee system stability, reliability, ruggedness, and longevity.

2 Staying Cool in High Temperatures

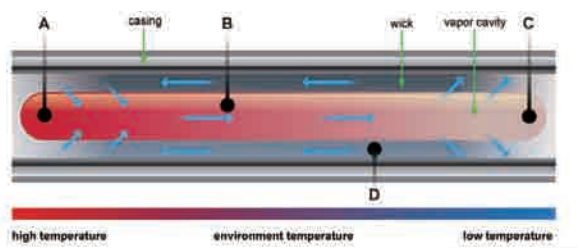
Unique Heat Dissipation

Moxa's thermal design centralizes heat on the PCB in the thermal module's center to optimize heat dissipation efficiency, and creates a large heat dissipation zone to maximize heat dissipation surface area.

Heat sink design must take hot spots and temperature endurance into consideration. Important design factors include fin height, fin gap, and fin thickness. All of these parameters must be balanced to optimize heat dissipation and maximize system efficiency.

Heat Pipe Technology

By leveraging on fundamental scientific principles—Capillarity Phenomena and the Phase Change Principle—Moxa developed an innovative solution that takes into consideration the specific physical characteristics of the heat pipe. This novel technology conducts heat more efficiently.



3 Staying Warm in Low Temperatures

Auto Temperature Gain Control System (ATGCS)

Moxa's Auto Temperature Gain Control System (ATGCS) intelligently adjusts the internal temperature of the computer. This new technology can adjust the internal temperature of the computer automatically to accommodate changes in the external temperature. For example, when the temperature drops below a certain point, such as -40°C, the variable power system can keep the internal temperature above a certain level, even in extremely cold environments.

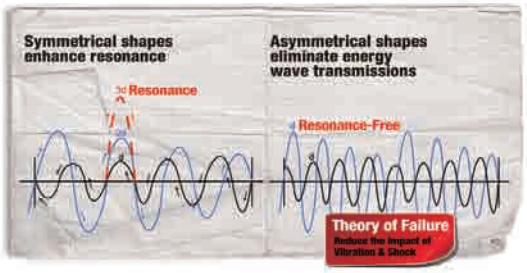
Vibration and Shock Resistance Technology

What Causes Vibration and Shock? What is Resonance? How Can We Avoid Resonance?

Symmetry Enhances Resonances

Resonance describes how a system can oscillate at large amplitudes at specific resonant frequencies. Even a low amplitude force acting at the system's resonant frequency can create extremely large displacements—which means a lot of vibration and shock.

Symmetrical shapes enhance resonance, as natural frequencies cause the system to oscillate



How Moxa Achieved Performance that Surpasses the Standard

1 Patented HD Bracket Design

Derived from Scientific Principles

Moxa developed an innovative bracket solution that takes into consideration the specific physical characteristics of hard disks. This new mechanism absorbs vibrations and maintains balance, so that the hard disk is not affected by excessive vibration and shocks. The bracket avoids resonance and reduces the impact of vibration and shock by 70%.

> **Based on the Theory of Failure**

- **Leverage** The most stable point of a see-saw is the pivot point. Engineers can use a similar principle when deciding where to place vulnerable system components, such as the hard drive. Because the fulcrum of the system board remains stable, components placed there will experience less vibration and shock no matter how much the board shakes.

- **Anti-resonance: Asymmetrical Balance** To avoid resonance, we use an asymmetrical bracket (remember: symmetrical shapes enhance resonance) to destroy energy wave transmission and filter out natural frequencies, effectively reducing vibrations. With this technology we can easily use inexpensive, off-the-shelf hard disks to create a cost-effective yet reliable storage solution for moving vehicles.

2 System-wide Level Design

An effective industrial computing system needs to approach anti-vibration and anti-shock from a comprehensive system-wide perspective. A thorough understanding of the narrow component perspective is important, but it is also important to understand how each component fits together into the big picture of a broader anti-vibration and anti-shock technology. This means that hardware, thermal design, and component engineers need to collaborate to create the optimal, integrated system solution.

3 An Unique Joint Mechanism

> **Mortise and Tenon**

- Simple, strong, and flexible
- Prevents excessive stress on fragile joints

4 Materials

> **Aluminum Alloy**

- Much stronger than commonly used sheet metal but more expensive
- Rugged & hardened exterior
- Strong heat conductivity
- Light mass
- Easy to shape

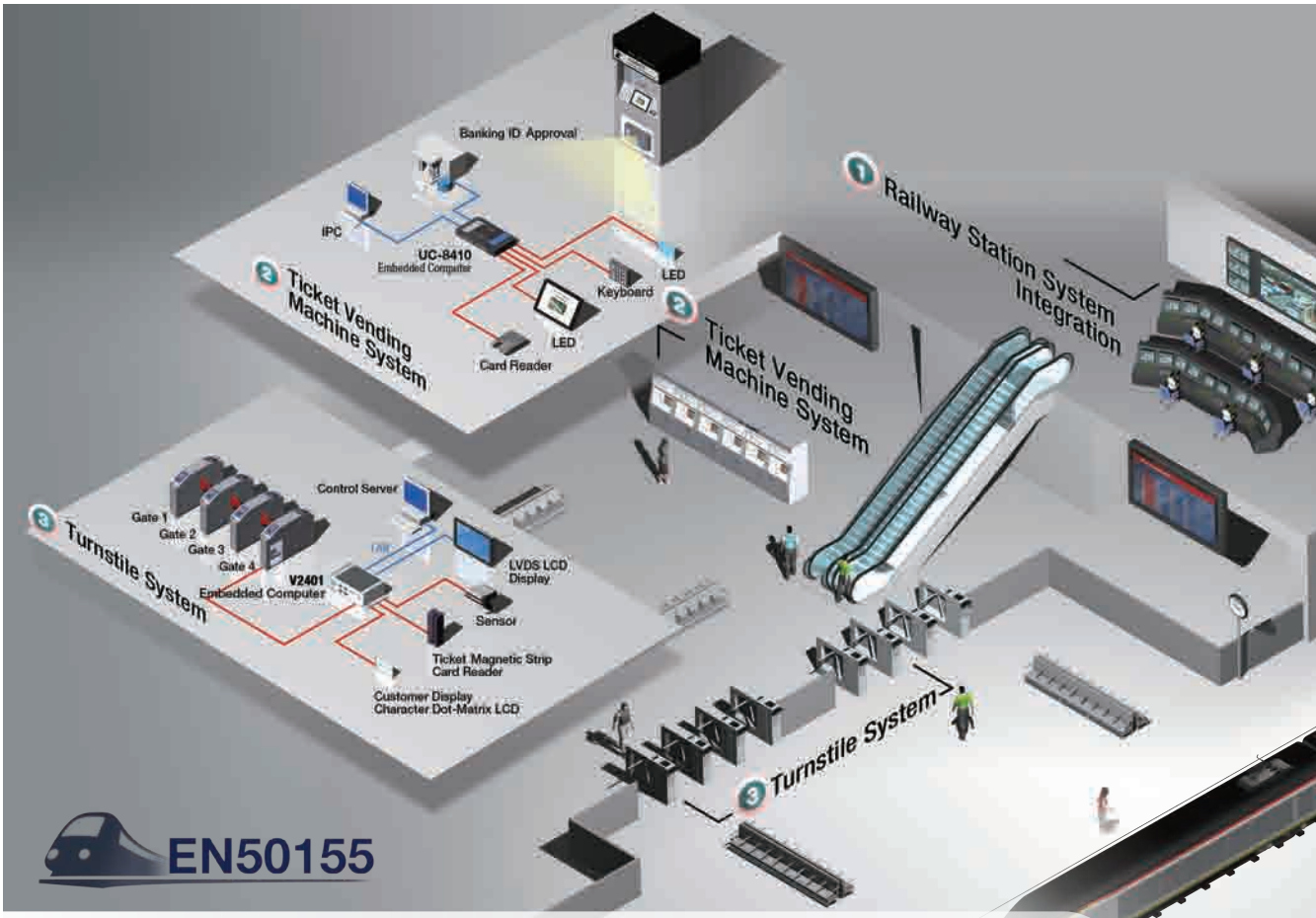
> **Damping Material**

- Absorbs vibration and shock

5 Components

Traditional computers usually use standard DIN 41612 connectors to connect the computer and its modules. However, the compact PCI connector is a better solution for industrial computers as it transmits signals more efficiently and is more resilient against vibration and shock.

Railway Automation



V2401
x86-based Atom embedded computer

- Rugged high-grade Intel Atom N270 x86 processor
- Dual independent displays (VGA, DVI, LVDS selectable)
- DDR2 SODIMM socket, supporting DDR2 533 up to 2 GB (max.)
- 4 RS-232/422/485 and 8 RS-232 serial ports; 6+2 DI/DO channels

V2406/V2426
x86-based Atom embedded computers

- Rugged high-grade Intel Atom N270 x86 processor
- Dual Independent displays (VGA + DVI)
- 4 Serial ports, 6 DIs+ 2 DOs, 4 USB 2 0 ports
- 2 10/100 Mbps Ethernet ports with M12 connector

V2416
x86-based Atom embedded computer

- Rugged high-grade Intel Atom N270 x86 processor
- Dual independent displays (VGA + DVI)
- 2 removable, hot-swappable trays supporting storage expansion
- 4 RS-232/422/485 and 6+2 DI/DO channels

1 Railway Station System Integration

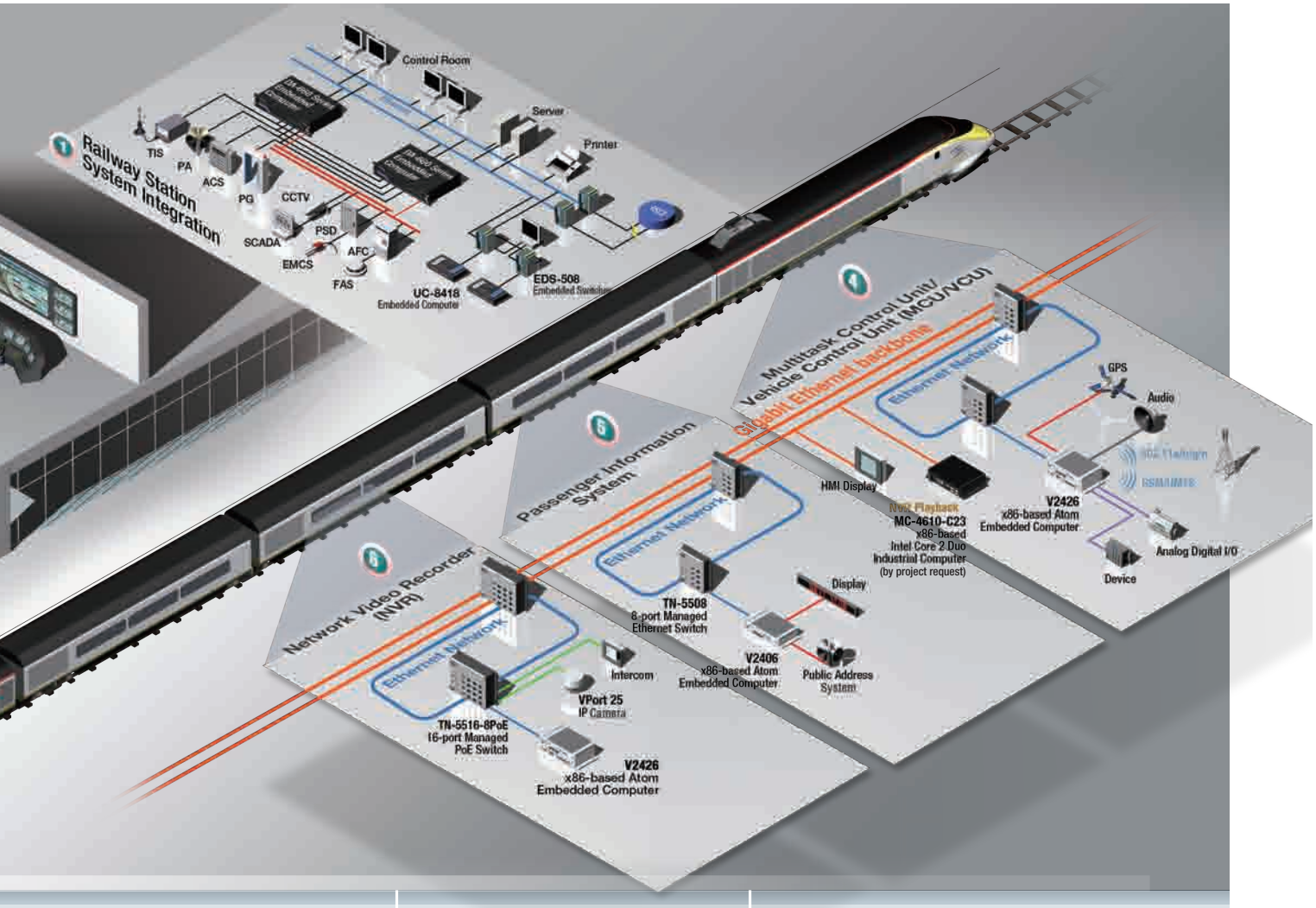
Recommended Product: DA-682

Solution Requirements:

- Multiple serial ports and Ethernet ports to integrate various end devices
- Computing capability
- High system reliability and stability

Why Moxa?

- DA-682 features modular flexibility for greater versatility
- High CPU performance
- Fanless design to provide a highly available system
- Two redundant LANs to provide high network availability



2 Turnstile System

Recommended Product: V2401

Solution Requirements:

- Multiple serial ports, Ethernet ports, IOs, and dual displays to integrate various end devices
- High computing performance for various applications
- High reliability to accommodate heavy passenger flow

Why Moxa?

- Supports serial, Ethernet, DI/DO, and dual displays for simple integration and improved communications
- Flexible and ready-to-run platform
- Fanless and cableless with no moving parts for high availability

3 Ticketing Vending Machine System

Recommended Product: UC-8410

Solution Requirements:

- Multiple serial ports, Ethernet ports, and IOs to integrate various end devices
- Compact rugged design for deployment in small spaces

Why Moxa?

- Supports 8 RS-232/422/485 serial ports, triple LAN ports, and DI/DO interface for simple integration and improved communications
- Fanless and cableless with no moving parts for high availability

4 5 6 MCU, NVR, Passenger Information System

Recommended Product: V2406/V2426

Solution Requirements:

- Wide range of power input options to satisfy various power requirements at different field sites
- Various industrial-grade certifications to meet industrial standards, such as EN 50155 and e-mark

Why Moxa?

- Versatile interfaces, including serial, Ethernet, switch, DI/DO, CAN, M12 connectors, and USB
- Flexile and modular design for easy future expansion
- Wide-temperature models available for operations in extreme environments
- Fanless and cableless with no moving parts for high availability

Marine

Moxa is a leading provider of computing solutions and services, with a broad portfolio that encompasses industrial networking and systems integration and a global reach that includes distributors in over 60 countries. Moxa's time-tested product expertise and international support network now extends to developing the most up-to-date marine automation solutions. Moxa's marine panel computers and marine-certified computers are specifically designed for the latest marine applications so you can make your marine visions a reality.

Industrial-grade Design for Reliable System Operations

Moxa's marine and panel computers feature sophisticated designs with industrial grade components, ensuring reliable system operation for various industrial applications.

Fan and Cable-free

Using fans and cables in a system increases the number of components and moving parts. This is antithetical to reliable system design, because it adds more potential points of failure and joints to suffer wear and tear. Instead of using fans, Moxa applies its expertise to select components that generate less heat but can still maintain high system performance. This makes Moxa's panel computers ideal solutions for applications in extremely hot or cold environments. Meanwhile, the elegant cable-free design reduces the noise produced and ensures reliable and stable operations.

Compact Size and Rugged Design

Moxa's marine and panel computers are compact in size, making them ideal for both indoor and outdoor industrial environments, especially at field sites that do not have a lot of extra space. Meanwhile, the rugged design and high-quality components allow the device to disdain the environmental hazards of those field sites..

High Performance

With the Intel Core 2 Duo processor, Moxa's marine and panel computers can bring high performance computing to a variety of industrial applications. They can handle complicated industrial tasks such as data acquisition, data computing and information analysis, serving well as front-end controllers that can reduce the load on the back-end servers

Sophisticated All-Aspect Display Technology

Moxa's marine and panel displays offer advanced technology:

1 Docking Design for Seamless Integration

These computers can be seamlessly docked with Moxa's panel displays to allow quick system deployment. The "dock" design eliminates the costs and hassles of display cables. The display and computer can also be used separately, as demanded by your specific scenario. Compared to an architecture that combines different computers with different displays, Moxa's pre-integrated solutions are more convenient, reliable, and durable.

2 Thermal Design

Moxa's marine and panel computers are designed to operate in the most advanced marine applications, such as integrated bridge, automation systems, and under the harshest marine environment. In order to succeed in this challenging environment, Moxa's products rely on cutting-edge thermal technology to create rugged and fanless computers with enough processing speed to support complex operations. Each Moxa computing device is the product of careful thermal optimization and fine-tuning to achieve high performance and efficient heat dissipation.

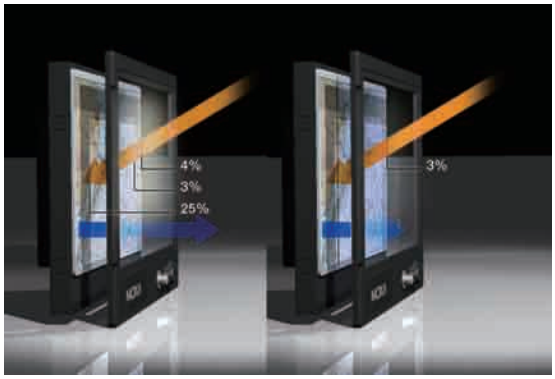
To verify the reliability of our products in a real-world environment, Moxa's solutions are thoroughly tested in a natural convection thermal chamber that simulates the windless hot and cold environments comparable to real-world industrial environments.

3 Wide Viewing Angle

The wide viewing angle guarantees that the displays can be clearly viewed from any angle without color washout. This is particularly helpful for field site applications where staff mobility is crucial.

4 Optical Bonding

Moxa's panel computers and displays deliver high performance in any harsh environment. Moxa's display use optical bonding technology to provide high visibility in a range of maritime conditions and increase the product's life-cycle. Optical bonding eliminates air gaps and prevents moisture, condensation, glare, and overheating from affecting display visibility. Moxa works closely with some of the world's largest TFT-LCD manufacturers to use the latest green and innovative display technologies to assemble complete display systems that excel in marine applications.



5 Full Dimming

Full dimming allows brightness ratio adjustment from nearly 0% to 100%. This provides the greatest possible range for heightened flexibility and convenience, particularly helpful for harsh environments.

Certified for Reliable Operation in Specific Markets

Moxa's marine and panel computers have achieved international certifications for various industrial markets.

IEC 60945/DNV/IACS E10

DNV 2.4, IEC 60945, and IACS E10 directive certifications attest that Moxa's marine computers operate reliably in marine applications. This creates a solid computing infrastructure for various navigation, radar and conning tasks. Another application for marine computers is in the control room to process applications such as the positioning system and automation control system.

ECDIS

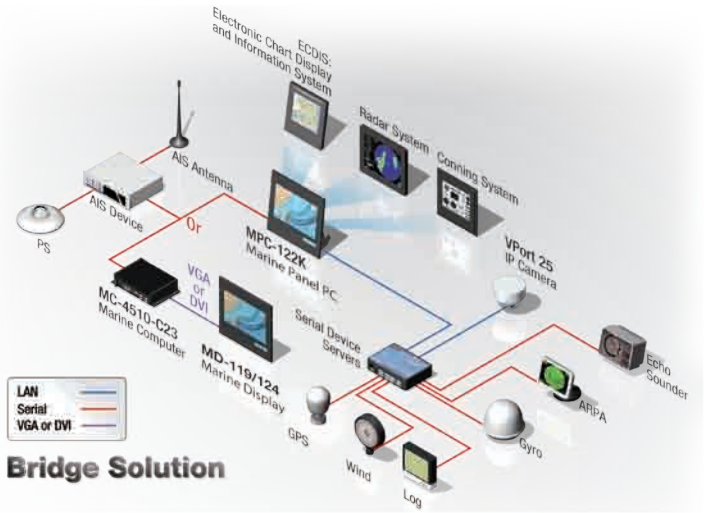
ECDIS is a computer-based navigation information system that complies with International Maritime Organization (IMO) regulations and replaces paper nautical charts. An ECDIS system displays the information from electronic navigational Charts (ENC) and integrates positioning information from the Global Positioning System (GPS) and other navigational technologies, such as radar and Automatic Identification Systems (AIS).

Moxa's panel computers and displays are calibrated and type-approved ECDIS products designed in full compliance with the latest IMO, IHO and IEC standards; they seamlessly fit into the most sophisticated integrated marine bridge, ECDIS and automation systems. Moxa is committed to the delivering the highest quality products that exceed customer expectations; which is why we devote resources to groundbreaking new research in thermal and optical bonding technology, color calibration, vibration proofing, and many other technologies.

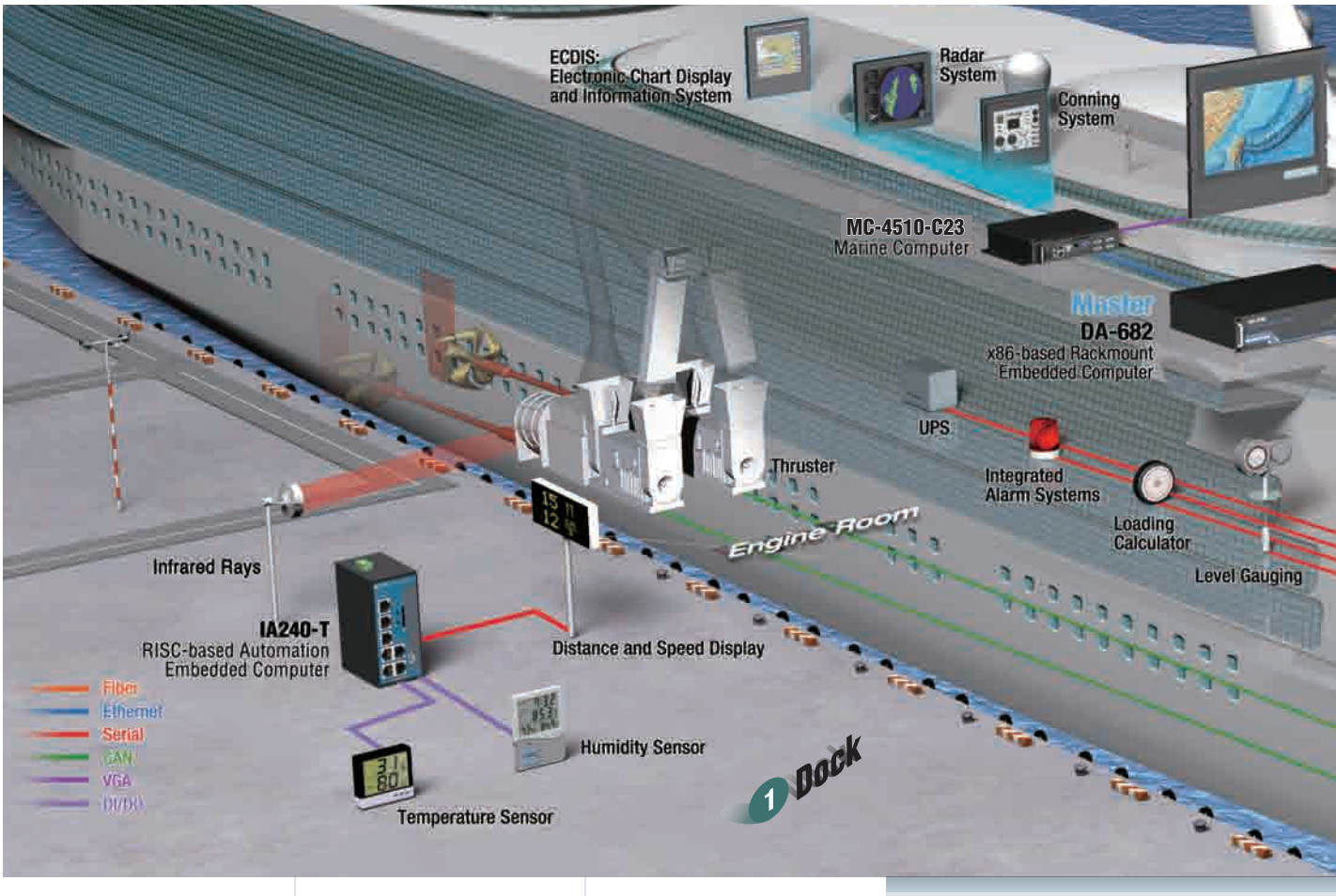
IP Proof

An "IP number" is used to specify the level of environmental protection provided by enclosures surrounding electronic equipment. The IP number consists of two digits. The first digit refers to protection against solid objects, and the second digit refers to protection against liquids. The higher the number, the better the protection. Moxa provides a variety of IP-proof product lines to fulfill different customer requirements.

Moxa also offers IP66-rated marine panel computers that exceed common maritime standards by providing protection from dust, water from heavy seas, and powerful jets.



Maritime



MPC-122-K

Marine Panel PC

- Superior computing performance
- Fanless design with compact size
- Full-dimming control
- State-of-the-art optical bonding
- Industrial-grade panel with super wide viewing angel
- Marine computer and display use a modular docking design

MC-4510-C23

x86-based Core 2 duo industrial computer

- Dual 10/100/1000 Mbps Ethernet ports with screwed RJ45 connector
- 3 USB 2.0 ports, 8x DI channels, 2 serial ports
- M23 tightened power connector
- Dual independent displays (VGA + DVI)

DA-682

x86-based rackmount embedded computer

- Variety of modules for greater versatility
- Built-in industrial-grade DOM, CF/SATA interface for storage expansion
- Built-in DDR2 SDRAM and industrial flash disk module

1 Dock

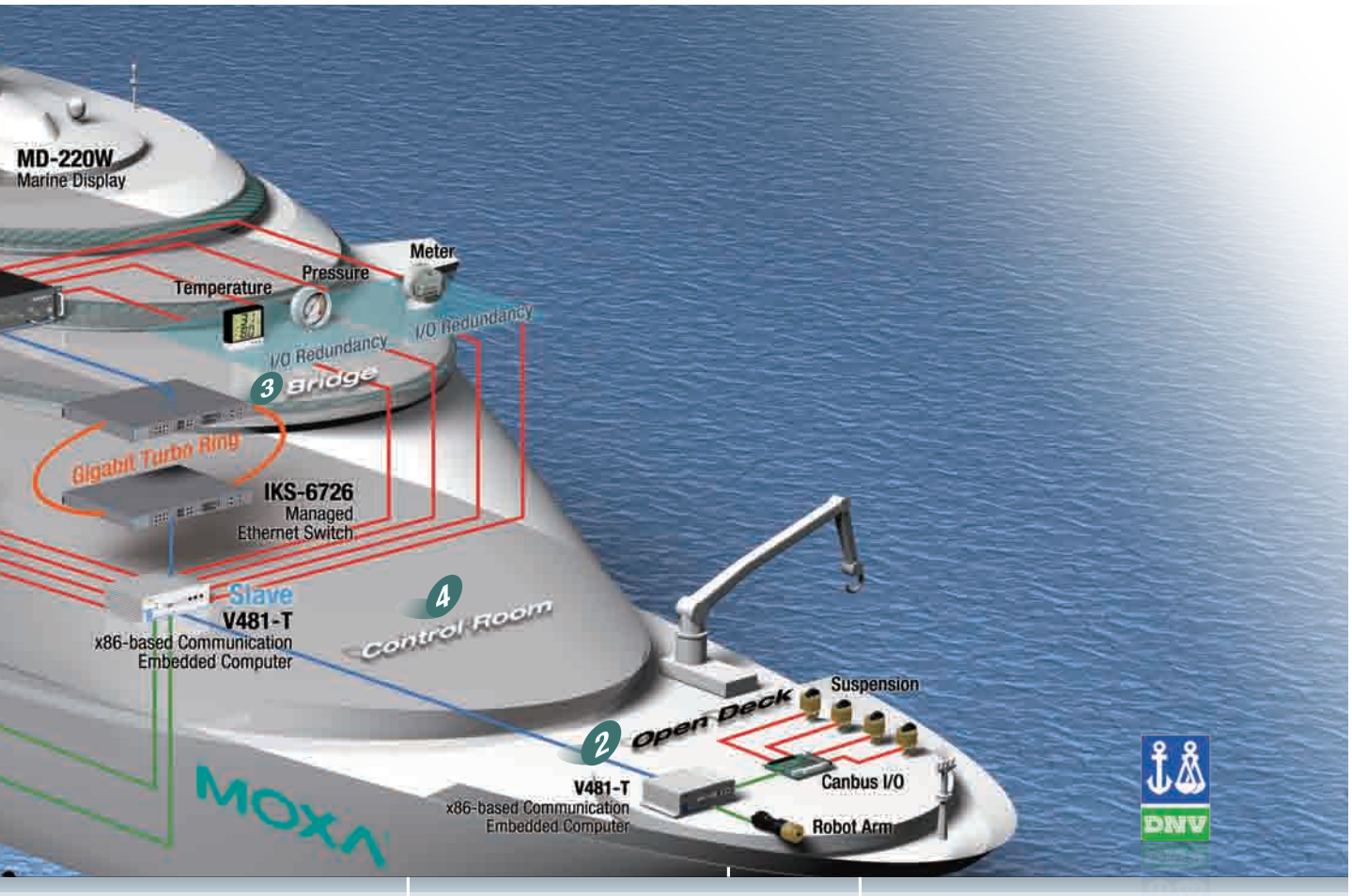
Recommended Product: IA240-T

Solution Requirements:

- RISC-based embedded computer with wide operating temperature range to manage the distance between the ship and harbor
- Digital Input/Output with humidity and temperature devices. Serial communications with display of distance and speed. LAN port for data transmission with control center.
- Wide operating temperature for harsh environments

Why Moxa?

- Compact RISC-based embedded computer
- Reliable systems with low RMA rate
- Moxa direct technical support for Linux kernel timers and local distributor service
- -40 to 75°C wide operating temperature and 5-year warranty



2 Open Deck

Recommended Product: V481-T

Solution Requirements: (Special models available by request)

- x86-based embedded computer with wide operating temperature range to manage the equipment on the open deck
- CANbus communication with robot arms. Serial communication with other open deck devices. Dual LAN port for data transmission with bridge systems.
- Wide operating temperature for harsh environments

Why Moxa?

- Moxa direct technical support for CANbus drivers and local distributor service
- -35 to 75°C wide operating temperature
- DNV certified

3 Bridge

Recommended Product: MPC-122-K

Solution Requirements:

- x86-based extreme performance CPU to ensure optimal and stable system performance
- Marine-grade display with wide viewing angle, optical bondings, and full-dimming control functions
- IP66, IEC 60945, DNV, E10, ECDIS compliant marine display.

Why Moxa?

- Increased reliability
- Competitive life-cycle support
- Simple upgrade solutions
- Modular panel computer system; the marine computer and marine display use a modular design for greater versatility
- Quick and customizable service tailored to the demands of key accounts
- OEM service available for key accounts
- IEC 60945/DNV/E10/ECDIS certified

4 Control Room

Recommended Product: V481-T (Special models available by request)

Solution Requirements:

- x86-based embedded computer with wide temperature range to manage control room and bridge equipment
- Serial communications for temperature, pressure, meter, UPS, integrated alarm systems, loading calculator, and level gauge devices. Dual LAN ports to support system redundancy between the bridge system and control room.
- Wide operating temperature range for harsh environments
- DNV certification

Why Moxa?

- x86-based high performance embedded computer
- Reliable system with low RMA rate
- Supports up to 8 serial ports
- Dual 10/100/1000 Mbps LAN redundancy
- Moxa direct technical support for serial drivers and local distributor service
- -35 to 75°C wide operating temperature
- DNV certified

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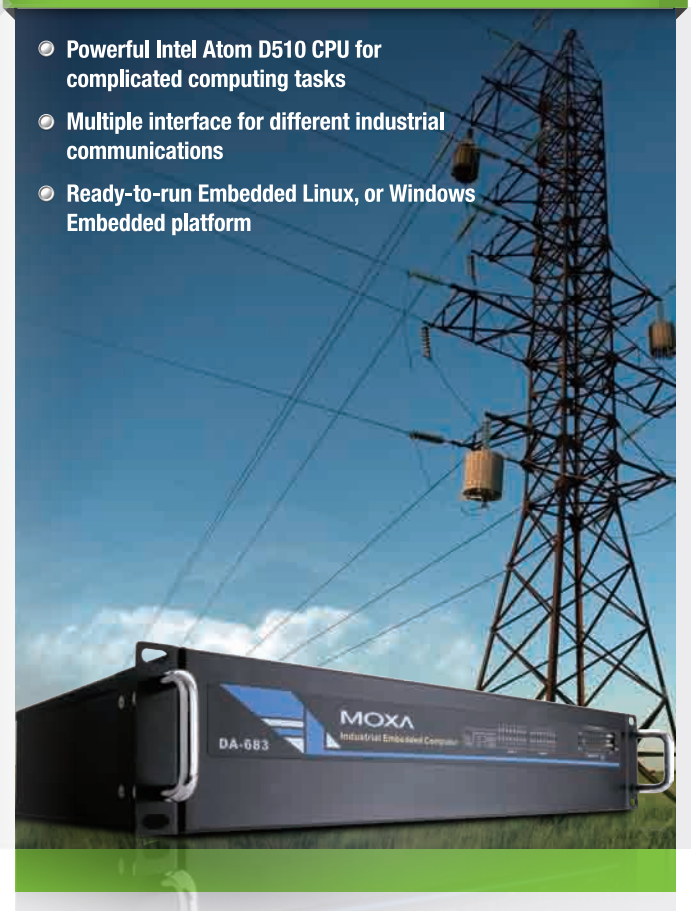
Modularize Your Computer System

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



DA-683

x86-based Rackmount Computer

- IEC 61850-3-certified for substation automation
- Modular design with great flexibility for system expansion
- IEEE 1588-certified 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

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DA-682
1U Rackmount Power Computer
- 2 PCI expansion slots for system expansion
- 2U, 19-inch rackmount installation
- Wide range power input

PAGE 05-10

DA-710
4U Rackmount Power Computer
- 4 PCI expansion slots for system expansion
- 4U, 19-inch rackmount installation
- Multiple sockets for storage expansions

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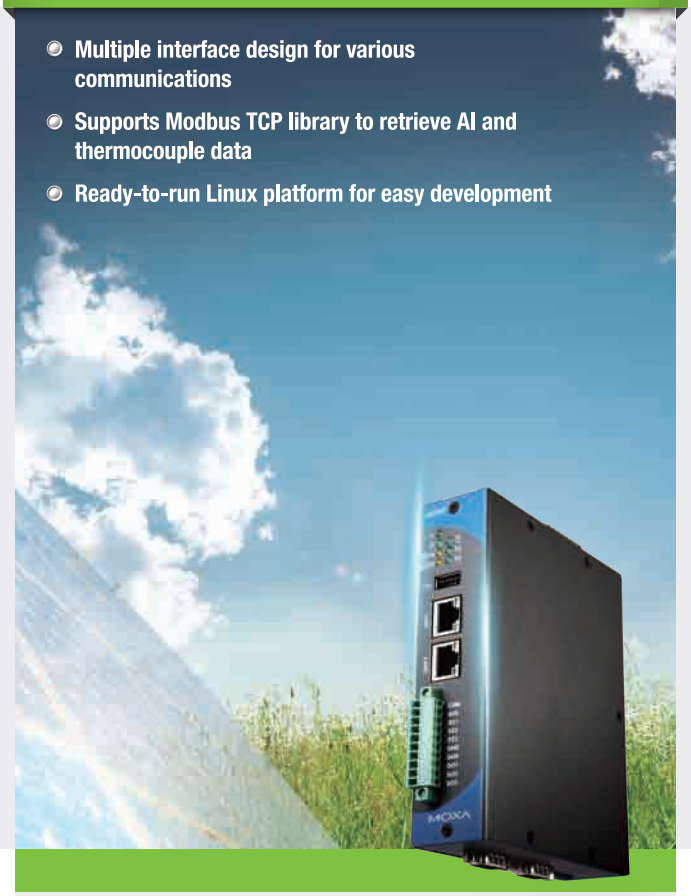
Go Solar with Smart Ideas

- Multiple interface design for various communications
- Supports Modbus TCP library to retrieve AI and thermocouple data
- Ready-to-run Linux platform for easy development

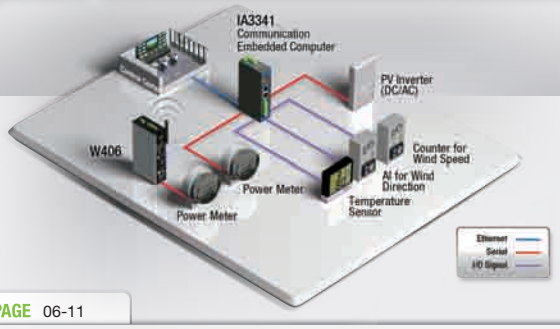


IA3341

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 an easy and quick system establishment
- Rugged design with longer MTBF

Application



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PAGE 03-02

Marine Panel Computers

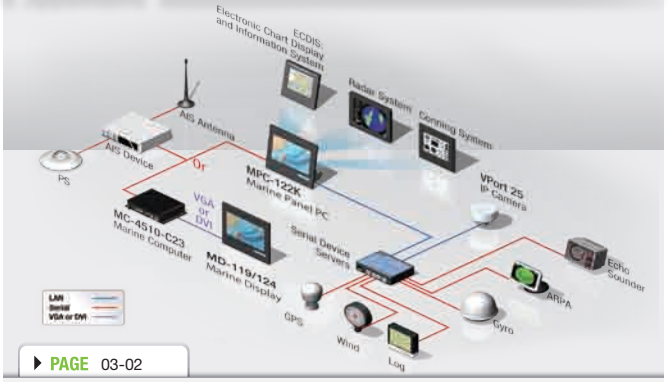
- Fanless design with low power consumption
- Marine-grade design for reliable operation
- Multiple display outputs

MPC-122-K / MC-4510-C23

Marine Panel Computer and Marine Computers

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

Application



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PAGE 02-02

EN 50155-certified Computers for Reliable Railway Applications

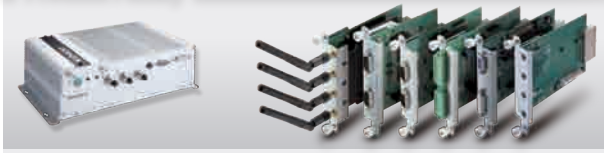
- Non-symmetric leveraged storage socket design for reducing vibration and shock
- Multiple interface communications for versatile device connectivity
- Multiple display outputs

V2406/2416/2422/2426

x86-based Railway Computers

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

Product Family



V2416

x86-based Railway Computer

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

PAGE 02-06

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

V Series Expansion Modules

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

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Introduction

1

Introduction

Introduction to Moxa's Industrial Computers

Industrial Grade — Rugged Design

Moxa's industrial computers are cableless, fanless, and are subjected to rigorous testing to verify their fitness for harsh environments. Moxa's industrial computers meet industry certifications for ruggedness in specific applications, such as IEC 61850-3, EN 50155 and DNV. We consider excellence an ongoing pursuit, and Moxa constantly develops and implements innovative new technologies for wide operating temperature computing.

Wide Temperature

Moxa's industrial computers easily handle extremely hot or cold environments and can withstand temperatures ranging from -40 to 75°C. This makes it possible to deploy computers in harsh locations such as roadside cabinets or remote field sites. To achieve this level of ruggedness, Moxa's sophisticated hardware and software solutions are built with high-quality components, advanced heat dissipation design, system throttling software, and self-warming systems. Then, all our products prove their mettle with dynamic burn-in and rigorous chamber testing for both high and low temperatures. The result is a product ready to take on severe temperatures.

Wide Operating Temperature

Moxa Industrial Grade	Conventional
-40-75°C Operating Temp.	-10-60°C or -40-75°C Storage Temp.
40 hours uninterrupted burn in	N/A
Rigorous Chamber Testing Forced-convection & Natural-convection thermal chamber to test in real-world conditions	Standard Chamber Testing Forced-convection thermal chamber
BIOS Dynamic Throttling Technology	N/A

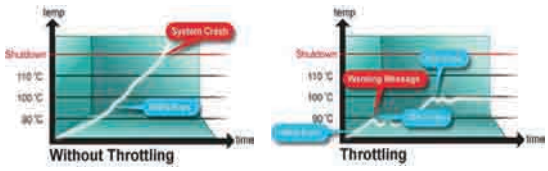
VS

Special Heat Dissipation Design

Innovative Heat Dissipation Design

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

System Throttling Design



BIOS Dynamic Throttling Technology

BIOS throttling efficiently cools down the system, but also lowers system performance. Moxa's dynamic throttling technology optimizes throttling behavior for maximum reliable performance.

Harsh Environments

In industry, operating in harsh environments is just all in a day's work. That's why Moxa's computers are designed to shrug off adversity that would hobble less rugged machines: vibration, power failure, electrostatic discharge, and electromagnetic interference.

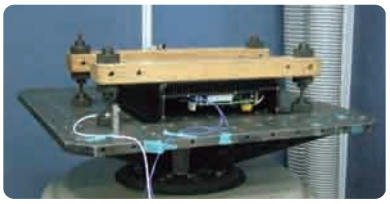
Moxa's industrial-grade systems are backed up by 5G vibration and 50G anti-shock guarantees and are ideal for moving locations such as automobiles or rolling stock. Safeguarding the data is important to any data acquisition system's storage devices, such as CF, SD, and Flash memory, are similarly protected from detachment.

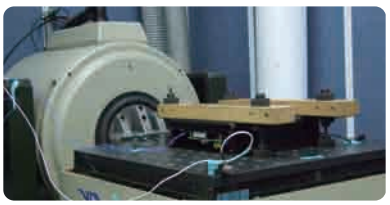
Industrial-grade products also require strong power input design to guarantee continuous operations. Dual power inputs or power input protection with screwed terminal blocks allow Moxa's systems to circumvent power interruptions.

Isolation protection is another key part of creating a secure communication platform. All of Moxa's communication interfaces are well-protected with different isolation standards. All serial ports come with ESD protection for all signals, Ethernet ports come with magnetic protection, and DI/DO channels have optical isolation protection.

Electromagnetic interference presents a further challenge for engineers who design and develop embedded systems. Moxa's embedded computers use industrial-grade components that meet all international EMI standards and directives to reduce radiation effects and provide a reliable embedded platform for any industrial applications.

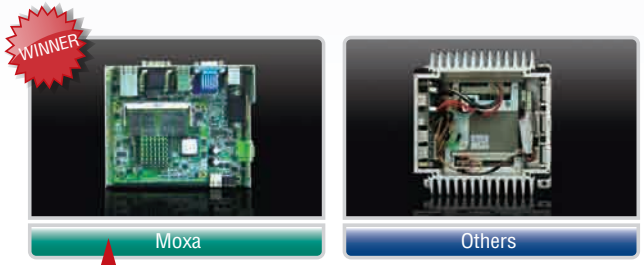
Anti-vibration and Anti-shock





Cableless / Fanless

Cables and fans are additional components that increase the complexity of a hardware device. This weakens the overall resilience of the system by adding more moving parts and points of failure. Moxa's design philosophy emphasizes compact and elegant architectures that do not use cables or fans. Forgoing cables increases vibration tolerance and avoids signal interference issues. Meanwhile, a fanless design reduces size, complexity, susceptibility to dust, and wear and tear. Instead of taking shortcuts by using these two problematic components, Moxa selects components that generate less heat but can still maintain high system performance. The result is a more stable, reliable, and cost effective system that dramatically reduces total cost of ownership.



Ultra-low Power Consumption

The components of Moxa's embedded computers are chosen to meet industrial-grade demands. To achieve this task, Moxa uses a fanless, cable-less, no hard disk design that guarantees stable system operation, but without generating too much heat.

UC-7100
RISC-based Wallmount Embedded Computers

Consumes 4.1 watts

W315A
RISC-based Wireless Embedded Computer

Consumes 4.8 watts

V2101
x86-based Wallmount Embedded Computer

Consumes 17 watts

DA-681
x86-based Rackmount Embedded Computer

Consumes 26 watts

Industrial Grade — Reliable Design

Reliable Design

Any product is only as good as its components, and Moxa has chosen only the best. IPC providers typically offer warranties of only 1 to 3 years and the average RMA rate is 2%. Moxa confidently guarantees the quality of its industrial computers with a solid 3 or 5-year warranty. Our products can boast a longer MTBF and an RMA rate under 1.5%.

Flexible Design

Moxa has over 20 years of experience in device networking. Our abundant experience in computer peripheral solutions is evident in the rich integrated connectivity options of our embedded computers, creating designs that are both widely versatile and expandable.

Components

Moxa selects the highest quality components when manufacturing embedded computers. To maximize the cost-performance ratio, we rigorously test all components and find the optimal price point in order to deliver reliable and cost-effective industrial solutions.

3 or 5-year Warranty

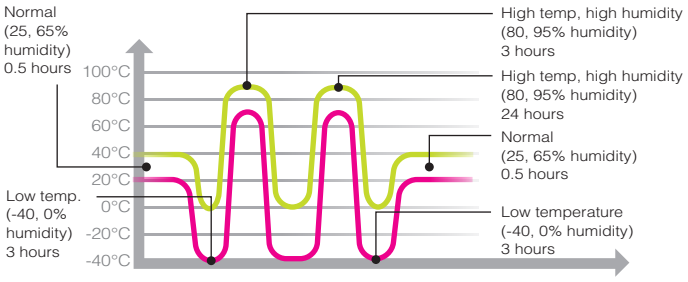
Moxa's embedded computers are backed by a solid 5-year (3-year for x86-based computers) warranty; this is longer than other IPC providers who can only offer a 2-year warranty. This reflects our confidence in the reliability of our products, even when used for demanding industrial applications.

Moxa Industrial Grade		Conventional
Fan and cable free		Fans and cables often used
5-year Warranty (RISC) 3-year Warranty (x86)		2-year Warranty (Extended warranty extra)
RMA Rate: Under 1.5%	VS	RMA Rate: Over 2%
Longer MTBF: x86 W/T Product > 8 years RISC W/T Product > 13 years		N/A
Special Certification: DNV, IEC 61850-3, EN 50155, e/E Mark		Special Certification: N/A

Longer MTBF / Lower RMA Rate

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

Model Name	UC-7112 Series	W406 Series	IA260 Series	DA-681 Series	V481 Series
Platform	RISC	RISC	RISC	x86	x86
Temperature	0 to 60°C	0 to 60°C	-40 to 75°C	0 to 60°C	-35 to 75°C
Failure Rate	6.717319	5.878760	6.880977	9.915992	13.93070
MTBF (hrs)	148980 (13.9 years)	170162 (19.4 years)	145328 (16.6 years)	100847 (11.7 years)	71784 (8.2 years)



Industrial Grade — Flexible Design

Rich Connectivity

Over the past 23 years, Moxa's expertise with venerable serial communications technology has connected millions of serial devices to industrial networks. The patented ADDC (Automatic Data Direction Control) system used in RS-485 communication can precisely switch the transmitter on and off by hardware, effectively simplifying the complexity of software timing control. Moxa also provides wide non-standard baudrate selection from 50 bps to 921.6 Kbps, allowing flexible serial port configurations.

Ethernet ports, including LAN ports and switch ports, are also available to offer a diverse range of network communication options, allowing you to easily create an integrated industrial application including Ethernet protocols.

Moxa Industrial Grade		Conventional
Integrated Peripherals: CAN, Serial, Switch, LAN, DI/DO		Integrated Peripherals: Serial, LAN, DI/DO
Switch Ports		No Switch Ports
Redundancy	VS	No Redundancy
Multiple LANs (2-12)		Multiple LANs (2-4)
CAN + Isolation		CAN
Serial Baud rate : 50 bps to 921.6 Kbps		Serial Baud rate : 50 bps to 115.2 Kbps

Moreover, some models offer digital input and digital output channels with 3 KV optical isolation for when you need to safely and reliably activate remote motion triggers. These DI/DO channels are useful for applications in security and environmental monitoring markets. Some models are even equipped with CAN ports to conveniently connect the CANbus devices to manufacturing automation networks.

Modular Design

The DA-710, DA-682, and DA-683 computers feature flexible modular expandability. You can mix and match modules to create fine-tuned custom solutions off-the-shelf. Serial, LAN, switches and universal PCI port modules allow you to create the perfect connectivity suite for your specific industrial application. Meanwhile, our panel computers are designed for modular docking, enabling easy integration of the panel into the computer. These features make our computers cost-effective and best-fit solutions for many industrial applications.

Modular
Docking Design
(Panel Computers)

DA Series Expansion Modules

Friendly Design

Moxa's embedded computers have a user-centric design. We constantly strive to make it easier for you to deploy new hardware. For instance, small form factors allow the computers to be installed at any field site. Also, their low power consumption makes them an economical solution when establishing an industrial application. Meanwhile, Moxa's panel computer dimming technology enables simple adjustments of the brightness range from 0% to 100%--particularly convenient for harsh industrial field sites. In addition, you can choose any screen resolution you like with our innovative LVDS technology for data format and channel mode selection. This maximizes the flexibility of LVDS panels, and effectively reduces the workload of specific CV requests.

Rolling Stock and Marine Computers

	V2406-XPE V2406-T-XPE	V2406-LX V2406-T-LX	V2416-XPE V2416-T-XPE	V2416-LX V2416-T-LX	V2426-XPE V2426-T-XPE	V2426-LX V2426-T-LX	MPC-122X-K	MPC-122Y-K	MC-4510-C23
Computer									
CPU Speed	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	2.26 GHz	2.26 GHz	2.26 GHz
OS (pre-installed)	Win Embedded Stand. 2009	Linux	Win Embedded Stand. 2009	Linux	Window Embedded Standard 2009	Linux	–	–	–
FSB	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	1066 MHz	1066 MHz	1066 MHz
System Memory	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	2 GB (4 GB max.)	2 GB (4 GB max.)	2 GB (2 GB max.)
USB Ports	3 (USB 2.0)	3 (USB 2.0)	3 (USB 2.0)	3 (USB 2.0)	3 (USB 2.0)	3 (USB 2.0)	7 (USB 2.0)	7 (USB 2.0)	6 (USB 2.0)
Digital I/O	6 DIs, 2 DOs	6 DIs, 2 DOs	6 DIs, 2 DOs	6 DIs, 2 DOs	6 DIs, 2 DOs	6 DIs, 2 DOs	–	–	–
Storage									
Built-in	2 GB	2 GB	2 GB	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	–	–	–
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓	✓	✓
HDD Support	✓	✓	–	✓	✓	✓	✓	✓	✓
Other Peripherals									
KB/MS	✓	✓	✓	✓	✓	✓	✓	✓	✓
Audio	Line-in/out	Line-in/out	Line-in/out	Line-in/out	Line-in/out	Line-in/out	Line-in/out	Line-in/out	Line-in/out
Display									
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓
VGA Output	✓	✓	✓	✓	✓	✓	✓	✓	✓
DVI Output	✓	✓	–	–	✓	✓	✓	✓	✓
LVDS Output	–	–	✓	✓	–	–	–	–	–
Display Characteristics									
Panel Size	–	–	–	–	–	–	22" wide-screen	22" wide-screen	–
Aspect Ratio	–	–	–	–	–	–	16:10	16:10	–
Pixels	–	–	–	–	–	–	1680 x 1050 (WSXGA+)	1680 x 1050 (WSXGA+)	–
Response Time	–	–	–	–	–	–	8 ms (gray to gray)	8 ms (gray to gray)	–
Contrast Ratio	–	–	–	–	–	–	1000:1	1000:1	–
Viewing Angles	–	–	–	–	–	–	178/178	178/178	–
Max Colors	–	–	–	–	–	–	16.7M (8 bits/ color)	16.7M (8 bits/ color)	–
Optical Bonding	–	–	–	–	–	–	–	✓	–
LAN Interface									
10/100/1000 Mbps Ethernet Ports	–	–	2 (M12)	2 (M12)	–	–	2 (RJ45)	2 (RJ45)	2 (RJ45)
10/100 Mbps Ethernet Ports	2 (M12)	2 (M12)	–	–	2 (M12)	2 (M12)	–	–	–
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface									
RS-232/422/485 Ports	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
ESD Protection	8 KV	8 KV	4 KV	4 KV	8 KV	8 KV	4 KV	4 KV	4 KV
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF, ADDC®								
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)								
LEDs									
System	Power, Storage								
LAN	10M, 100M	10M, 100M	100M, 1000M	100M, 1000M	10M, 100M	10M, 100M	100M, 1000M	100M, 1000M	100M, 1000M
Serial	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx
Physical Characteristics									
Housing	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Weight	2 kg	2 kg	4 kg	4 kg	4 kg	4 kg	15 kg	15 kg	3.75 kg
Dimensions	250 x 57 x 154 mm		250 x 86 x 154 mm				124 x 560 x 420 mm		302 x 70 x 279 mm
Mounting	DIN-Rail, wall, VESA						Flush		Wall
Environmental Limits									
Operating Temperature	-40 to 85°C or -25-60°C or -10 to 60°C						-15 to 55°C		
Storage Temperature	-40 to 85°C or -20 to 85°C						-20 to 60°C		
Ambient Relative Humidity	5 to 95% (non-condensing)								
Anti Vibration / Shock	EN 50155 standards						IEC 60945, DNV 2.4, Class A/C		2 g's / 50 g's
Standards and Certifications									
Safety	UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1, CCC (GB9254, GB17625.1)						UL 60950-1, IEC 60945 4th. IACS-E10, CCC (GB4943, GB9254, GB17625.1)		
EMC	EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A						EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B, IEC 60945 4th. IACS-E10		
Rail Traffic	EN 50155								
Green Product	RoHS, CRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)						1 year		3 years

Wallmount Computers

	V2101-T-CE	V2101-T-XPE	V2101-T-LX	V2401-CE	V2401-XPE	V2401-LX	V2402-CE	V2402-XPE	V2402-LX
Computer									
CPU Speed	1.1 GHz	1.1 GHz	1.1 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz	1.6 GHz
OS (pre-installed)	WinCE 6.0	Windows Embedded Standard 2009	Linux	WinCE 6.0	Window Embedded Standard 2009	Linux	WinCE 6.0	Windows Embedded Standard 2009	Linux
FSB	400 MHz	400 MHz	400 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz
Flash	–	–	–	–	–	–	–	–	–
System Memory	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)
USB Ports	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)
Digital I/O	3 DIs, 3 DOs	3 DIs, 3 DOs	3 DIs, 3 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs
Storage									
Built-in	2 GB	2 GB	2 GB	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)
CompactFlash Socket	–	–	–	✓	✓	✓	✓	✓	✓
SD Slot	✓	✓	✓	–	–	–	–	–	–
HDD Support	–	–	–	✓	✓	✓	✓	✓	✓
Other Peripherals									
KB/MS	–	–	–	✓	✓	✓	✓	✓	✓
Audio	line-in/out	line-in/out	line-in/out	line-in/out	line-in/out	line-in/out	line-in/out	line-in/out	line-in/out
Display									
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓
VGA Output	✓	✓	✓	✓	✓	✓	✓	✓	✓
DVI Output	–	–	–	✓	✓	✓	✓	✓	✓
LVDS Output	✓	✓	✓	✓	✓	✓	–	–	–
LAN Interface									
10/100/1000 Mbps Ethernet Ports	2	2	2	2	2	2	2	2	2
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface									
RS-232 Ports	–	–	–	8 (68-pin VHDC)	8 (68-pin VHDC)	8 (68-pin VHDC)	–	–	–
RS-232/422/485 Ports	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)
ESD Protection	2 KV	2 KV	2 KV	4 KV	4 KV	4 KV	4 KV	4 KV	4 KV
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF			RTS/CTS, XON/XOFF, ADDC®					
Baudrate	50 bps to 115.2 Kbps			50 bps to 921.6 Kbps (non-standard baudrates supported)					
LEDs									
System	Power, Storage								
LAN	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M	100M, 1000M
Serial	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx	Tx, Rx
Physical Characteristics									
Housing	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Weight	940 g	940 g	940 g	2.1 kg	2.1 kg	2.1 kg	2 kg	2 kg	2 kg
Dimensions	150 x 49 x 125 mm			250 x 57 x 152 mm					
Mounting	DIN-Rail, wall, VESA								
Environmental Limits									
Operating Temperature	-40 to 85°C			-10 to 60°C					
Storage Temperature	-40 to 85°C								
Ambient Relative Humidity	5 to 95% (non-condensing)								
Anti Vibration / Shock	2 g's / 20 g's			5 g's / 50 g's					
Standards and Certifications									
Safety	UL 508, UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1, CCC (GB9254, GB17625.1)								
EMC	EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A								
Green Product	RoHS, cRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)								

Wallmount Computers

	V2422-XPE	V2422-LX	V462-CE	V462-XPE	V464-CE	V464-XPE	V466-CE	V466-XPE	V468-CE	V468-XPE
Computer										
CPU Speed	1.6 GHz	1.6 GHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz
OS (pre-installed)	Win. Embeddeded Stand. 2009	Linux	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.
SRAM	–	–	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB
FSB	533 MHz	533 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz
System Memory	1 GB (2 GB max.)	1 GB (2 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)
PCMCIA	–	–	✓	✓	–	–	–	–	–	–
Expansion Bus	–	–	PC/104-Plus onboard							
USB Ports	6 (USB 2.0)	6 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)
Digital I/O	4 DIs, 4 DOs	4 DIs, 4 DOs	–	–	–	–	–	–	8 DIs, 8 DOs	8 DIs, 8 DOs
Storage										
Built-in	2 GB (DOM)	2 GB (DOM)	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Other Peripherals										
KB/MS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Audio	Line-in/out		line-out							
Display										
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LAN Interface										
10/100 Mbps Ethernet Ports	–	–	2	2	4	4	4	4	4	4
10/100/1000 Mbps Ethernet Ports	2 (RJ45)	2 (RJ 45)	–	–	–	–	–	–	–	–
Switch Ports	–	–	–	–	–	–	8	8	–	–
Controller	–	–	Realtek RTL8100CL							
Magnetic Isolation Protection	–	–	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface										
RS-232 Ports	–	–	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
RS-485	–	–	–	–	–	–	–	–	–	–
RS-232/422/485 Ports	4 (DB9-M)	4 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
ESD Protection	8 KV	8 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF, ADDC®									
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)									
LEDs										
System	Power, Storage		Power, Battery, Storage							
LAN	100M, 1000M		10M, 100M				10M, 100M, Switch		10M, 100M	
Physical Characteristics										
Housing	Aluminum		Aluminum							
Weight	4 kg		1.32 kg							
Dimensions	154 x 250 x 86 mm		223 x 121 x 57 mm							
Mounting	DIN-Rail, wall, VESA		DIN-Rail, wall							
Environmental Limits										
Operating Temperature	-10 to 60°C		-10 to 60°C							
Storage Temperature	-20 to 80°C		-20 to 80°C or -40 to 85°C							
Ambient Relative Humidity	5 to 95% (non-condensing)		5 to 95% (non-condensing)							
Anti Vibration / Shock	EN 50155		5 g's / 50 g's							
Regulatory Approvals										
Safety	UL 508, UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1, CCC (GB9254, GB17625.1)		UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)							
EMC	EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A		EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A							
Rail Traffic	EN 50155		–	–	–	–	–	–	–	–
Green Product	RoHS, CRoHS, WEEE		RoHS, CRoHS, WEEE							
Reliability										
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)									

Wallmount Computers

	UC-8410-LX UC-8410-T-LX	UC-8410-CE UC-8410-T-CE	UC-8416-LX UC-8416-T-LX	UC-8416-CE UC-8416-T-CE	UC-8418-LX UC-8418-T-LX	UC-8418-CE UC-8418-T-CE	UC-8430-LX UC-8430-T-LX	UC-8430-CE UC-8430-T-CE
Computer								
CPU Speed	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz
OS (pre-installed)	Linux	Windows Embedded CE 6.0	Linux	Windows Embedded CE 6.0	Linux	Windows Embedded CE 6.0	Linux	Windows Embedded CE 6.0
DRAM	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB
SRAM	256 KB	256 KB	256 KB	256 MB	256 KB	256 MB	256 MB	256 MB
Flash	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	32 MB (OS); 32 MB (data)	32 MB (OS); 32 MB (data)
Expansion Bus	PCI/104	PCI/104	PCI/104	PCI/104	PCI/104	PCI/104	PCI/104	PCI/104
USB Ports	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	6 (USB 2.0)	6 (USB 2.0)
Digital I/O	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	12 DIs, 12 DOs	12 DIs, 12 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs
Storage								
CompactFlash Socket	✓	✓	✓	–	✓	✓	✓	✓
LAN Interface								
10/100 Mbps Ethernet Ports	3	3	3	3	3	3	3	3
Switch Ports	–	–	8	8	–	–	–	–
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface								
RS-232/422/485 Ports	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Console Port	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF, ADDC®							
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)							
CANbus	–	–	–	–	2 (DB9-M)	2 (DB9-M)	–	–
LEDs								
System	Power, Ready, Storage, Battery							
LAN	10M, 100M							
Serial	TxD, RxD							
Physical Characteristics								
Housing	SECC sheet metal (1 mm)							
Weight	850 g	850 g	1 kg					
Dimensions	200 x 37 x 120 mm		200 x 56 x 120 mm					
Mounting	DIN-Rail, wall							
Environmental Limits								
Operating Temperature	-10 to 60°C or -40 to 75°C							
Storage Temperature	-20 to 80°C or -40 to 85°C							
Ambient Relative Humidity	5 to 95% (non-condensing)							
Anti Vibration / Shock	2 g's / 20 g's							
Standards and Certifications								
Safety	UL 60950-1, EN 60950-1, CCC (GB9254, GB17625.1)							
EMC	EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B							
Green Product	RoHS, cRoHS, WEEE							
Reliability								
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)							

Wallmount Computers

	UC-7101-LX UC-7101-T-LX	UC-7110-LX UC-7110-T-LX	UC-7112-LX	UC-7112-LX Plus	UC-7122-CE	UC-7124-CE	UC-7122-T-CE	UC-7124-T-CE
Computer								
CPU Speed	192 MHz	192 MHz	192 MHz	192 MHz	200 MHz	200 MHz	200 MHz	200 MHz
OS (pre-installed)	µClinux	µClinux	µClinux	Linux	Windows Embedded CE 5.0	Windows Embedded CE 5.0	Windows Embedded CE 5.0	Windows Embedded CE 5.0
DRAM	16 MB	16 MB	16 MB	32 MB	32 MB	32 MB	32 MB	32 MB
Flash	8 MB	8 MB	8 MB	16 MB	16 MB	16 MB	16 Mb	16 MB
USB Ports	–	–	–	–	1 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)
Storage								
SD Slot	✓	–	✓	✓	✓	✓	✓	✓
LAN Interface								
10/100 Mbps Ethernet Ports	1	2	2	2	2 (RJ45)	2 (RJ45)	2 (RJ45)	2 (RJ45)
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface								
RS-232/422/485 Ports	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	4 (RJ45)	2 (DB9-M)	4 (RJ45)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 Kv	15 KV
Console Port	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF, ADDC®							
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)							
LEDs								
System	Ready, SD	Ready	Ready	Ready	Ready, SD	Ready, SD	Ready, SD	Ready, SD
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M/100M	10M/100M	10M/100M	10M/100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics								
Housing	Aluminum (1 mm)							
Weight	130 g	190 g	190 g	190 g	190 g	200 g	190 g	200 g
Dimensions	67 x 22 x 100.4 mm	197 x 44 x 125 mm	197 x 44 x 125 mm	77 x 111 x 26 mm				
Mounting	DIN-Rail, wall			DIN-Rail, wall				
Environmental Limits								
Operating Temperature	-10 to 60°C or -40 to 75°C		-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-40 to 75°C	-40 to 75°C
Storage Temperature	-20 to 80°C or -40 to 85°C		-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-40 to 85°C	-40 to 85°C
Ambient Relative Humidity	5 to 95% (non-condensing)							
Anti Vibration / Shock	–	1 g	1 g	–	1 g / 2 g's			
Regulatory Approvals								
Safety	UL 60950, CSA-C22.2 No. 60950-1, EN 60950-1							
EMC	EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A							
Green Product	RoHS, CRoHS, WEEE							
Reliability								
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)							

Rackmount Computers

	DA-710-XPE	DA-710-LX	DA-681-I-SP-CE	DA-681-I-SP-XPE	DA-681-I-SP-LX	DA-681-I-DP-CE	DA-681-I-DP-XPE	DA-681-I-DP-LX	DA-681-I-DPP-T-CE	DA-681-I-DPP-T-XPE	DA-681-I-DPP-T-LX
Computer											
CPU Speed	2/2.2 GHz	2/2.2 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz
OS (pre-installed)	Win. Embedded Standard 2009	Linux	WinCE 6.0	WinXP Emb.	Linux	WinCE 6.0	WinXP Emb.	Linux	WinCE 6.0	WinXP Emb.	Linux
FSB	533 MHz	533 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz
System Memory	1 GB (2 GB max.)	1 GB (2 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)
Expansion Bus	4 slots	4 slots	PC/104 onboard						–	–	–
USB Ports	4 (USB 2.0)	4 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)
Digital I/O	4 DIs, 4 DOs	4 DIs, 4 DOs	–	–	–	–	–	–	–	–	–
Storage											
Built-in	2 GB	1 GB	1 GB	2 GB	1 GB	1 GB	2 GB	1 GB	256 MB	1 GB	1 GB
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HDD Support	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Other Peripherals											
KB/MS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Display											
Graphics Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LAN Interface											
10/100 Mbps Ethernet Ports	–	–	6	6	6	6	6	6	–	–	–
10/100/1000 Mbps Ethernet Ports	4	4	–	–	–	–	–	–	4	4	4
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface											
RS-232 Ports	2 (DB9-M)	2 (DB9-M)	4 (DB9-M)								
RS-485	–	–	8 (TB)								
ESD Protection	4 KV	4 KV	15 KV								
Digital Isolation	–	–	2 KV								
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF		RTS/CTS, XON/XOFF, ADDC®								
Baudrate	50 bps to 115.2 Kbps		50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)								
LEDs											
System	Power, Storage, Power Failure		Ready, Storage, Power Failure (for dual power models only)								
LAN	100M, 1000M		10M, 100M								
Serial	TX, RX (for 4 modules), Programmable		TX, RX								
Physical Characteristics											
Housing	SECC sheet metal (1 mm)		SECC sheet metal (1 mm)								
Weight	14 kg		4.5 kg								
Dimensions	400 x 480 x 180 mm		440 x 315 x 45 mm								
Mounting	Standard 19-in rachmount		Standard 19-inch rackmount								
Environmental Limits											
Operating Temperature	-10 to 50°C		0 to 60°C						-40 to 75°C		
Storage Temperature	-20 to 80°C		-20 to 75°C						-40 to 85°C		
Ambient Relative Humidity	5 to 95% (non-condensing)		5 to 95% (non-condensing)								
Standards and Certifications											
Safety	UL 60950-1, CSA C22.2 No. 60950-1-07, CCC (GB4943, GB9254, GB17625.1)		UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)								
EMC	EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A		EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A								
Green Product	RoHS, CRoHS, WEEE		RoHS, CRoHS, WEEE								
Reliability											
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)										

Rackmount Computers

	DA-682-CE	DA-682-XPE	DA-682-LX	DA-683-SP-XPE	DA-683-SP-LX	DA-683-DPP-T-LX	DA-683-DPP-T-XPE
Computer							
CPU Speed	1 GHz	1 GHz	1 GHz	1.66 GHz	1.66 GHz	1.66 GHz	1.66 GHz
OS (pre-installed)	WinCE 6.0	WinXP Emb.	Linux	Win. Embedded Standard 2009	Linux	Linux	Win. Embedded Standard 2009
FSB	400 MHz	400 MHz	400 MHz	667	667	667	667
System Memory	256 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	1 GB (2 GB max.)	1 GB (2 GB max.)	1 G (2GB max.)	1 GB (2 GB max.)
Expansion Bus	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots
USB Ports	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)
Digital I/O	–	–	–	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs
Storage							
Built-in	256 MB	1 GB	1 GB	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)	2 GB (DOM)
CompactFlash Socket	✓	✓	✓	✓	✓	✓	✓
HDD Support	✓	✓	✓	✓	✓	✓	✓
Other Peripherals							
KB/MS	✓	✓	✓	✓	✓	✓	✓
Display							
Graphics Controller	✓	✓	✓	✓	✓	✓	✓
LAN Interface							
10/100/1000 Mbps Ethernet Ports	4	4	4	6 (RJ45)	6 (RJ45)	6 (RJ45)	6 (RJ45)
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface							
RS-232 Ports	–	–	–	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
Serial Communication Parameters	–	–	–	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI			
LEDs							
System	Power, Storage						
LAN	100M, 1000M						
Serial	TX, RX (for 2 modules)			Tx, Rx			
Physical Characteristics							
Housing	SECC sheet metal (1 mm)			SECC sheet metal (1 mm)			
Weight	7 kg			4 kg			
Dimensions	440 x 315 x 90 mm	–	–	315 x 440 x 90 mm			
Mounting	Standard 19-inch rackmount						
Environmental Limits							
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C		-40 to 70°C	
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C		-40 to 85°C	
Ambient Relative Humidity	5 to 95% (non-condensing)						
Standards and Certifications							
Safety	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)			UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)			
EMC	EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A			CE (EN55022, EN61000-3-2, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class), CCC (GB9254, GB 17625.1), IEC 61850-3 (DPP-T models only)			
Green Product	RoHS, CRoHS, WEEE						
Reliability							
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓
Warranty	3 years (see www.moxa.com/warranty)						

Rackmount Computers

	DA-660-8-LX	DA-660-8-CE	DA-660-16-LX	DA-660-16-CE	DA-661-16-LX	DA-661-16-CE	DA-662-16-LX	DA-662-16-CE	DA-662-I-16-LX	DA-662-I-16-CE
Computer										
CPU Speed	266 MHz	266 MHz	266 MHz	266 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz
OS (pre-installed)	Emb. Linux	WinCE 5.0	Emb. Linux	Emb. Linux	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0
DRAM	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB
Flash	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
PCMCIA	–	–	–	–	✓	✓	✓	✓	✓	✓
USB Ports	–	–	–	–	2	2	2	2	2	2
Storage										
CompactFlash Socket	–	–	–	–	✓	✓	✓	✓	✓	✓
Display										
Mini Screen with Push Buttons	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LAN Interface										
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	4	4	4	4
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Digital Isolation Protection	–	–	–	–	–	–	–	–	2 KV	2 KV
Serial Interface										
RS-232/422/485 Ports	8 (RJ45)	8 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Console Port	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	–	–	–	–	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	–	–	–	–	RTS/CTS, XON/XOFF, ADDC®					
Baudrate	–	–	–	–	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)					
LEDs										
System	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics										
Housing	SECC sheet metal (1 mm)								SECC sheet metal (1mm)	
Weight	2.6 kg								2.94 kg	
Dimensions	440 x 45 x 198 mm								440 x 45 x 228 mm	
Mounting	Standard 19-inch rackmount								Standard 19-inch rackmount	
Environmental Limits										
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C
Ambient Relative Humidity	5 to 95% (non-condensing)									
Standards and Certifications										
Safety	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1									
EMC	EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A									
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)									

DIN-Rail Computers

	IA260-LX IA260-T-LX	IA260-CE IA260-T-CE	IA261-I-LX IA261-I-T-LX	IA261-I-CE IA261-I-T-CE	IA262-I-LX IA262-I-T-LX	IA262-I-CE IA262-I-T-CE	IA240-LX IA240-T-LX	IA241-LX IA241-T-LX	IA3341
Computer									
CPU Speed	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz	192 MHz	192 MHz	192 MHz
OS (pre-installed)	Linux	WinCE 6.0	Linux	WinCE 6.0	Linux	WinCE 6.0	Embedded Linux		Embedded Linux
DRAM	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	64 MB	64 MB	64 MB
Flash	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	16 MB
PCMCIA	–	–	–	–	–	–	–	✓	–
USB Ports	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)
AI/Thermocouples	–	–	–	–	–	–	–	–	2 AIs, 2 thermocouples
Digital I/O	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 Dos
Storage									
CompactFlash Socket	✓	✓	✓	✓	✓	✓	–	–	–
SD Slot	–	–	–	–	–	–	✓	✓	✓
Display									
Graphics Controller	✓	✓	✓	✓	✓	✓	–	–	–
LAN Interface									
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	2	2	2
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface									
RS-232/422/485 Ports	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	2 (DB9-M)	2 (DB9-M)	4 (RJ45)	4 (RJ45)	2 (DB9-M)
ESD Protection	4 KV	4 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Digital Isolation	–	–	2 KV	2 KV	2 KV	2 KV	–	–	–
Console Port	✓	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF, ADDC®								
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)								
CANbus	–	–	–	–	2 (DB9-M)	2 (DB9-M)	–	–	
LEDs									
System	Power, Ready, Storage								Power, Ready, Storage
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics									
Housing	Aluminum, industrial vertical form factor						SECC sheet metal (1 mm)		SECC sheet metal (1 mm)
Weight	1 kg	1 kg	950 g	950 g	950 g	950 g	430 g	500 g	585 g
Dimensions	52 x 113 x 162 mm	52 x 113 x 162 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 137 x 100 mm	60 x 137 x 100 mm	116 x 35 x 146 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Environmental Limits									
Operating Temperature	-10 to 60°C or -40 to 75°C								-10 to 60°C
Storage Temperature	-20 to 80°C or -40 to 85°C								-20 to 80°C
Ambient Relative Humidity	5 to 95% (non-condensing)								
Regulatory Approvals									
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)						CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)		EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)						UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)		UL 60950-1, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)
Green Product	RoHS, CRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)								5 years

Wireless Computers

	W406-LX	W406-CE	W406-T-LX	W406-T-CE	W315A-LX	W325A-LX	W311-LX	W321-LX	W341-LX
Computer									
CPU Speed	200 MHz	200 MHz	200 MHz	200 MHz	192 MHz	192 MHz	192 MHz		
OS (pre-installed)	Embedded Linux	WinCE 6.0	Embedded Linux	WinCE 6.0	Embedded Linux	Embedded Linux	Embedded Linux with MMU support		
DRAM	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB		64 MB
Flash	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB		16 MB
USB Ports	1 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)	–	–	–	–	2 (USB 2.0)
Relay Outputs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs	–	–	–	–	1
Storage									
SD Slot	✓	✓	✓	✓	✓	✓	✓	✓	✓
LAN Interface									
10/100 Mbps Ethernet Ports	1	1	1	1	1	1	1	1	1
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
WLAN Interface									
Standard Compliance	–	–	–	–	–	–	802.11a/b/g		
Radio Frequency Type	–	–	–	–	–	–	DSSS, CCK, OFDM		
Transmission Rate	–	–	–	–	–	–	54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps) • 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11b: 1, 2, 5.5, 11 Mbps		
Transmission Distance	–	–	–	–	–	–	Up to 100 meters (@ 11 Mbps in open areas)		
Wireless Security	–	–	–	–	–	–	WEP: 64-bit/128-bit, WPA, WPA2 data encryption		
WLAN Modes	–	–	–	–	–	–	Ad-hoc (802.11b/g), Infrastructure		
Cellular Interface									
Cellular Modes	GSM, GPRS, EDGE	GSM/GPRS/EDGE	GSM/GPRS/EDGE	GSM/GPRS/EDGE	GSM, GPRS	GSM, GPRS	–	–	–
Radio Frequency Bands	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	850/900/1800/1900 MHz	–	–	–
GPRS Class	12	12	12	12	10	10	–	–	–
EDGE Class	12	12	12	12	–	–	–	–	–
Coding Schemes	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	CS1 to CS4	–	–	–
Serial Interface									
RS-232/422/485 Ports	2 (DB9-M)	1 (DB9-M)	2 (DB9-M)	1 (DB9-M)	1 (DB9-M)	2 (DB9-M)	1 (DB9-M)	2 (DB9-M)	4 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Console Port	✓	✓	✓	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark								
Flow Control	RTS/CTS, XON/XOFF, ADDC™								
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)								
LEDs									
System	Ready, SD						Ready, SD		
LAN	10M, 100M						10M, 100M		
WLAN	–	–	–	–	–	–	Enable, Signal Strength		
Cellular	Enable, Signal Strength						–	–	–
Serial	TxD, RxD						TxD, RxD		
Physical Characteristics									
Housing	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)	Aluminum (1 mm)
Weight	1 kg	1 kg	195 g	195 g	195 g	195 g	170 g	185 g	390 g
Dimensions	144 x 119 x 40 mm	144 x 119 x 40 mm	144 x 119 x 40 mm	144 x 119 x 40 mm	77 x 111 x 26 mm	77 x 111 x 26 mm	77 x 111 x 26 mm	77 x 111 x 26 mm	150 x 100 x 38 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Antenna Length	85 mm	85 mm	85 mm	85 mm	84 mm	84 mm	–	–	–
Environmental Limits									
Operating Temperature	-10 to 60°C		Wide temperature (by request)		-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C
Storage Temperature	-20 to 80°C		Wide temperature (by request)		-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C
Ambient Relative Humidity	5 to 95% (non-condensing)								
Anti Vibration / Shock	6 g's with DIN-Rail / 20 g's with wall mount		2/6 g's with DIN-Rail / 20 g's with wall mount		5 g's / 50 g's	5 g's / 50 g's	5 g's / 50 g's	5 g's / 50 g's	5 g's / 50 g's
Standards and Certifications									
Safety	EN 60950-1, CSA C22.2 No. 60950-1-03				UL 60950-1, EN 60950-1, CSA C22.2 No. 60950-1-03		UL 60950-1, EN 60950-1		
EMC	EN 55022 Class B, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B				EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A		EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 55024		
Radio	EN 301 489-1, EN 301 489-7, EN 301 511				EN 301 489-1, EN 301 489-7, EN 301 511		EN 301 489-1/17, EN 301 893, EN 300 328, EN 50392, FCC Part 15, Subpart C/E		
Wheeled Vehicles	–	–	–	–	–	–	e-Mark (e13)		–
Green Product	RoHS, CRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)								

Modules and Boards






	EM-2260-CE	EM-2260-LX	EM-1240-LX	EM-1240-T-LX	EM-1220-LX	EM-1220-T-LX
Computer						
CPU Speed	200 MHz	200 MHz	192 MHz	192 MHz	192 MHz	192 MHz
OS (pre-installed)	WinCE 6.0	Linux	Embedded µClinux			
DRAM	128 MB	128 MB	16 MB	16 MB	16 MB	16 MB
Flash	32 MB	32 MB	8 MB	8 MB	8 MB	8 MB
Digital I/O	8 DIs, 8 DOs	8 DIs, 8 DOs	10 GPIOs	10 GPIOs	10 GPIOs	10 GPIOs
Storage						
SD Slot	–	–	✓	✓	✓	✓
EIDE Interface	✓	✓	–	–	–	–
Display						
Graphics Controller	✓	✓	–	–	–	–
LAN Interface						
10/100 Mbps Ethernet Ports	2	2	2	2	2	2
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface						
RS-232/422/485 Ports	4	4	4	4	2	2
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Console Port	✓	✓	✓	✓	✓	✓
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark					
Flow Control	RTS/CTS, XON/XOFF, ADDC®					
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)					
Physical Characteristics						
Weight	70 g	70 g	50 g	50 g	40 g	40 g
Dimensions	106 x 87 mm	106 x 87 mm	90 x 80 mm	90 x 80 mm	80 x 50 mm	80 x 50 mm
Module Interface	–	–	Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)			
Environmental Limits						
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	-40 to 75°C	-10 to 60°C	-40 to 75°C
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C or -40 to 85°C			
Ambient Relative Humidity	5 to 95% (non-condensing)					
Standards and Certifications						
EMC	EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A					
Green Product	RoHS, CRoHS, WEEE					
Reliability						
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)					

Rolling Stock Computers

2

Rolling Stock Computers

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, CompactFlash

- 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

Overview

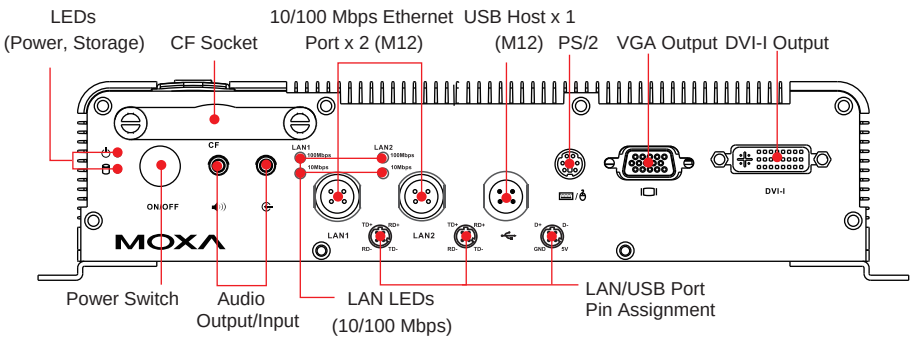
The V2406 Series embedded computers are based on the Intel Atom N270 x86 processor, and feature 4 RS-232/422/485 serial ports, dual LAN ports, and 3 USB 2.0 hosts. In addition, the V2406 computers provide VGA and DVI-I outputs , and are EN 50155 certified, making them particularly well-suited for railway 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.

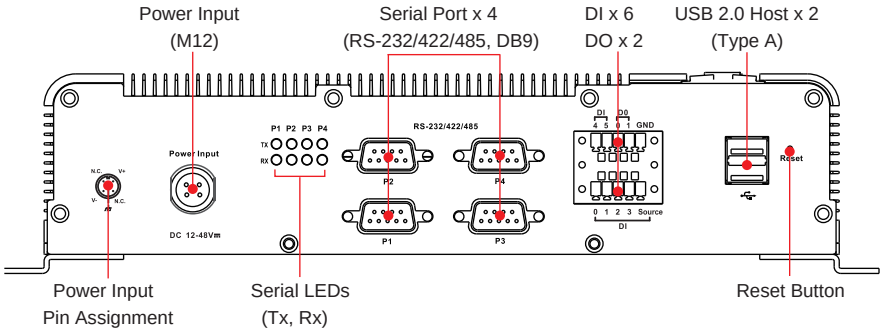
Pre-installed with Linux or Windows Embedded Standard 2009, the V2406 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost. Wide temperature models of the V2406 Series that operate reliably in a -40 to 70°C operating temperature range are also available, offering an optimal solution for applications subjected to harsh environments.

Appearance

Front View

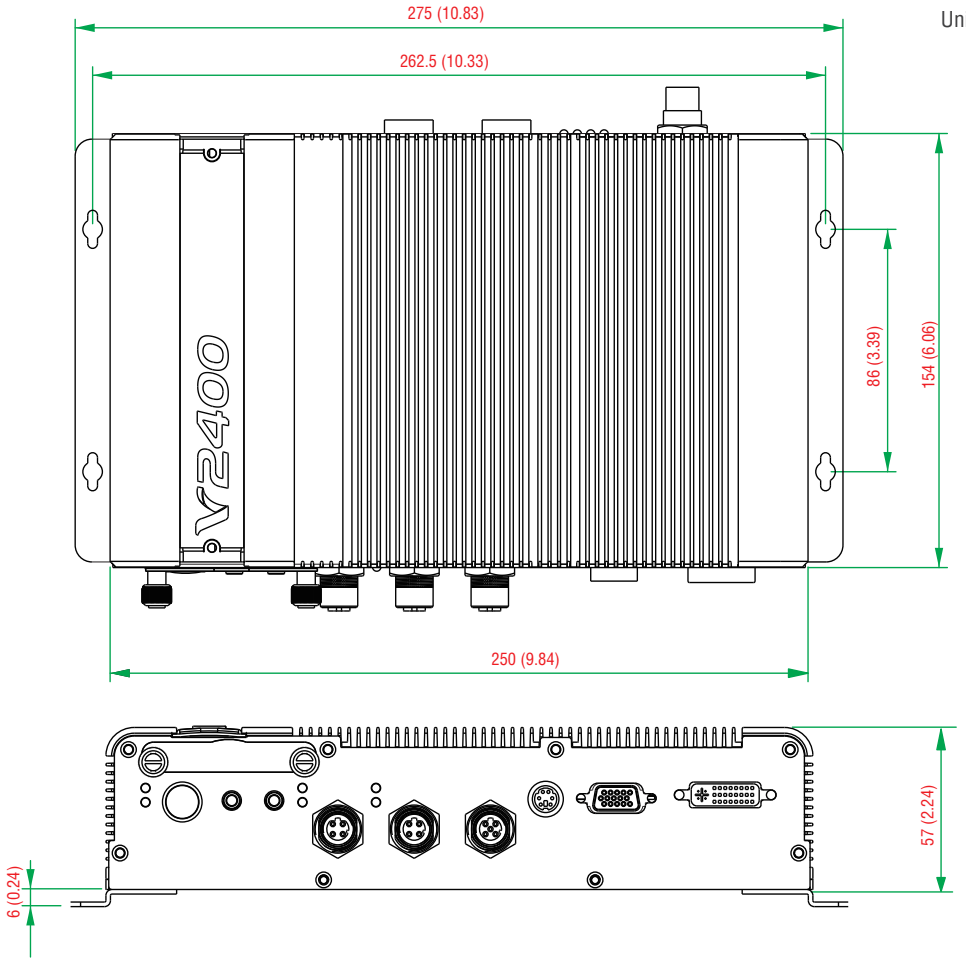


Rear View



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
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. 20 mA per channel
On-state Voltage: 24 VDC nominal
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 SP1
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 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

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-75125-01: Hard disk installation package
DK-DC50131-01: DIN-Rail mounting kit

Package Checklist

- V2406 embedded computer
- Terminal block to power jack converter
- 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

- 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

Introduction

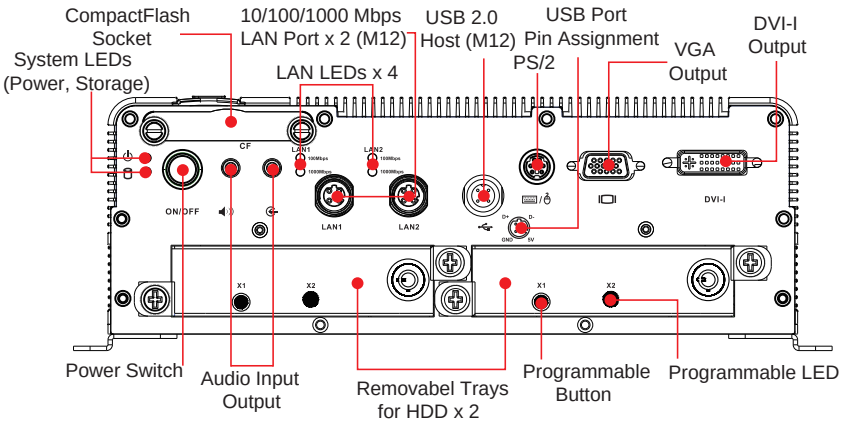
The V2416 Series EN 50155-certified embedded computers are based on the Intel Atom N270 x86 processor and feature 4 RS-232/422/485 serial ports, dual LAN ports, and 3 USB 2.0 hosts. In addition, the V2416 computers provide VGA and DVI-I outputs and are EN 50155 certified to confirm their robustness for 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.

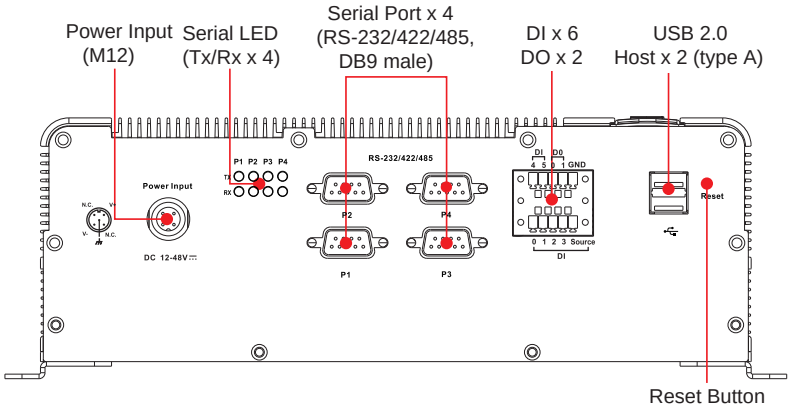
The V2416 series come pre-installed with Linux or Windows Embedded Standard 2009 to provide programmers with a familiar environment in which to develop sophisticated, bug-free application software at a low cost.

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: 4 USB 2.0 compliant hosts; 3 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
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. 20 mA per channel
On-state Voltage: 24 VDC nominal
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

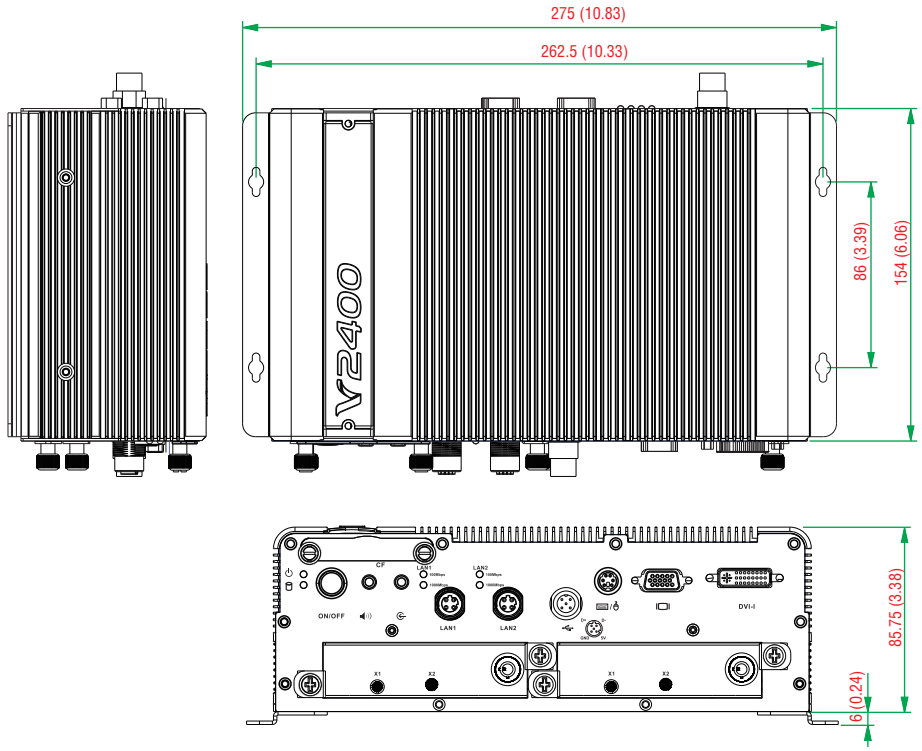
OS: Linux 2.6.32, Debian Lenny 5.0
File System: EXT2/EXT3
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage 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 SP1
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 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

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
FK-75125-01: Hard disk installation package
DK-DC50131-01: DIN-Rail mounting kit

Package Checklist

- V2416 embedded computer
- Wall mounting Kit
- DIN-Rail mounting kit
- Power jack converter with terminal block
- 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

Overview

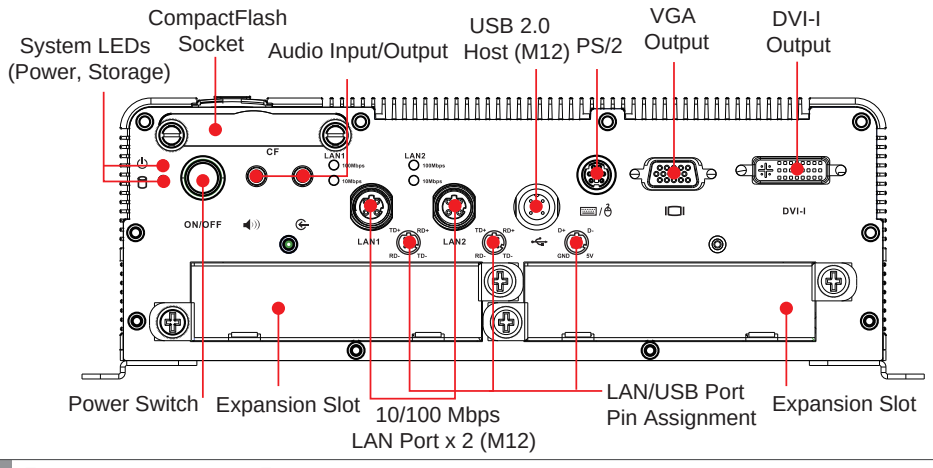
The V2426 Series embedded computers are based on the Intel Atom N270 x86 processor, and feature 4 RS-232/422/485 serial ports, dual LAN ports, and 3 USB 2.0 hosts. In addition, the V2426 computers provide VGA and DVI-I outputs , and are EN 50155 certified, making them particularly well-suited for railway 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.

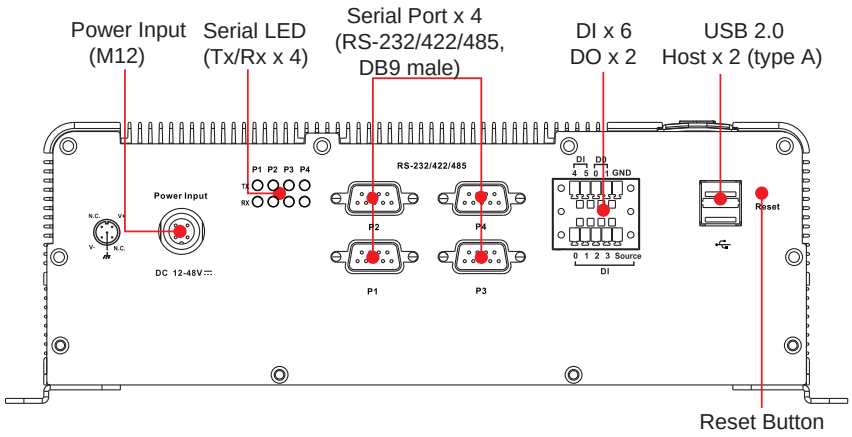
Pre-installed with Linux or Windows Embedded Standard 2009, the V2426 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost. Wide temperature models of the V2426 Series that operate reliably in a -40 to 70°C operating temperature range are also available, offering an optimal solution for applications subjected to harsh environments.

Appearance

Front View

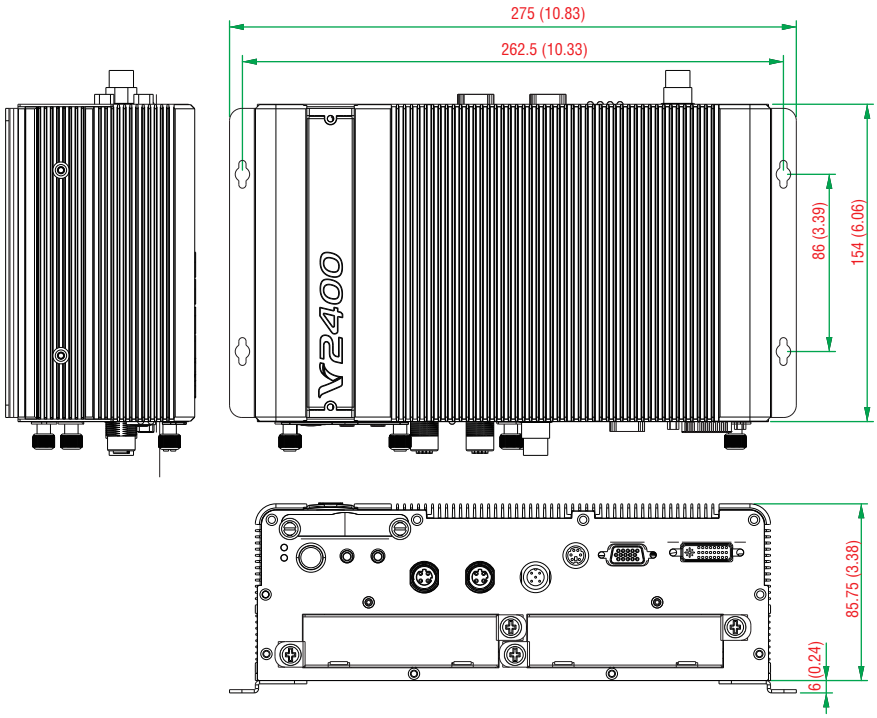


Rear View



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
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. 20 mA per channel
On-state Voltage: 24 VDC nominal
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: EN50155 standard
Anti-shock: EN50155 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 SP1
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 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

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)

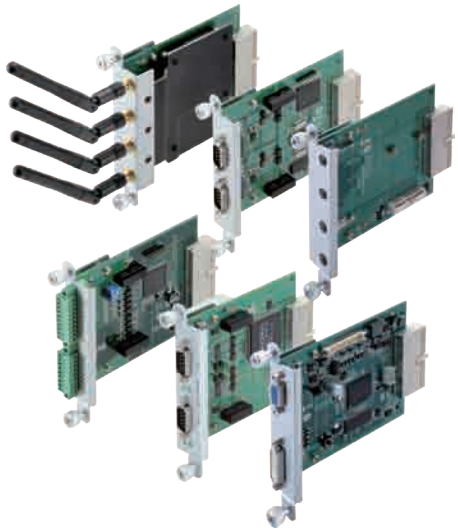
PWR-24250-DT-S1: Power adaptor
PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug
PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug
PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug
PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug
PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug
FK-75125-01: Hard disk installation package
DK-DC50131-01: DIN-Rail mounting kit

Package Checklist

- V2426 embedded computer
- Terminal block to power jack converter
- 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 module

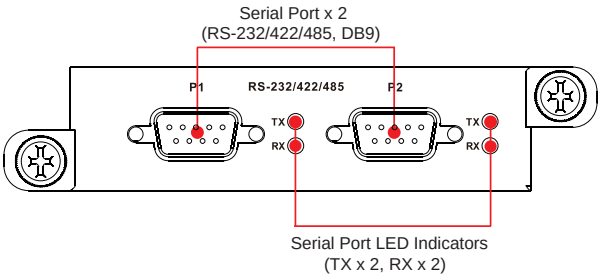
EN50155

Introduction

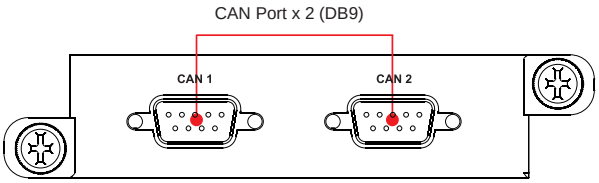
Moxa's V2400 series expansion modules, which come with serial ports, CAN ports, wireless and GPS cards, digital input/output channel card, mini PCI and PCI-e modules, and VGA or DVI-I display connectors, can be used with Moxa's V2422 and V2426 embedded computers, and give end-users the best flexibility for setting up and expanding a variety of industrial applications.

Appearance

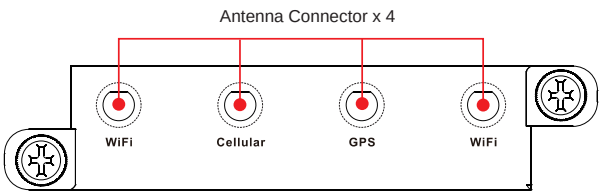
EPM-3032



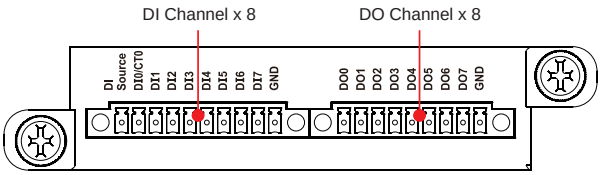
EPM-3112



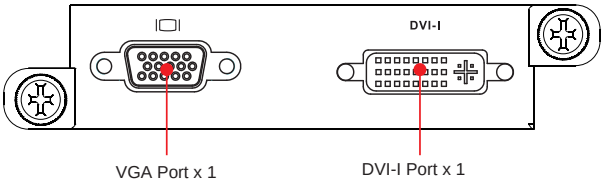
EPM-3337



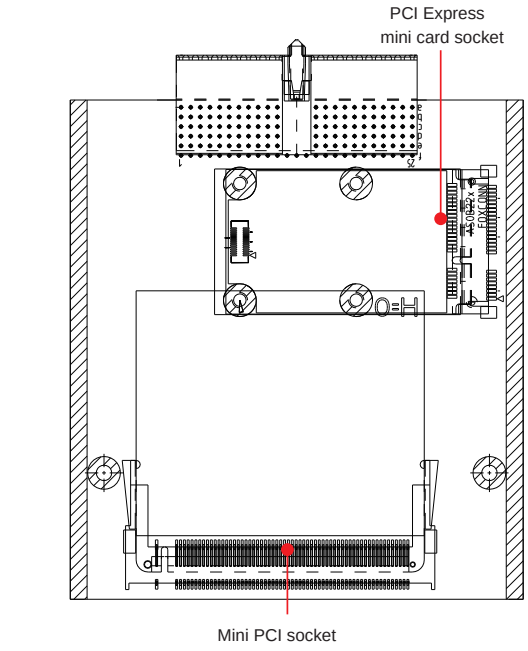
EPM-3438

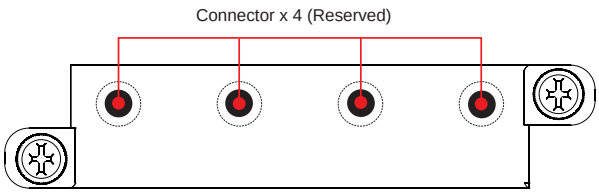


EPM-3552



EPM-DK01





EPM-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 Dass: 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 (DI0 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: DsiplayLink 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

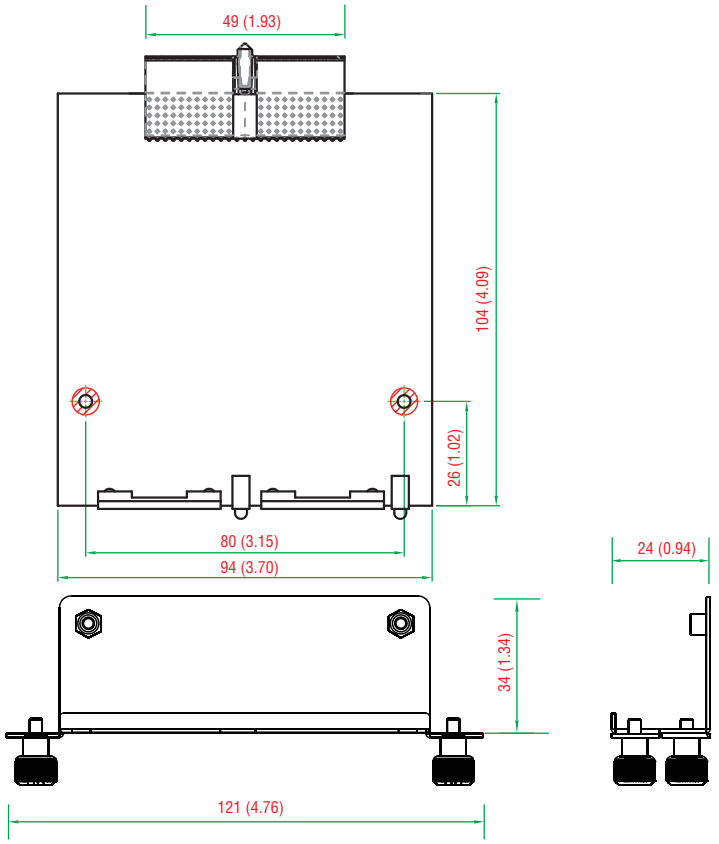
Mini PCI Slot
Interface: PCI
Bus Frequency: 32-bit, 33 MHz PCI

Physical Characteristics
Weight: 117 g

Environmental Limits
Operating Temperature: -40 to 70°C (-40 to 158°F), EN 50155 Class TX

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

Package Checklist
- EPM expansion module

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Marine Computers

3

Marine Computers

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

Introduction

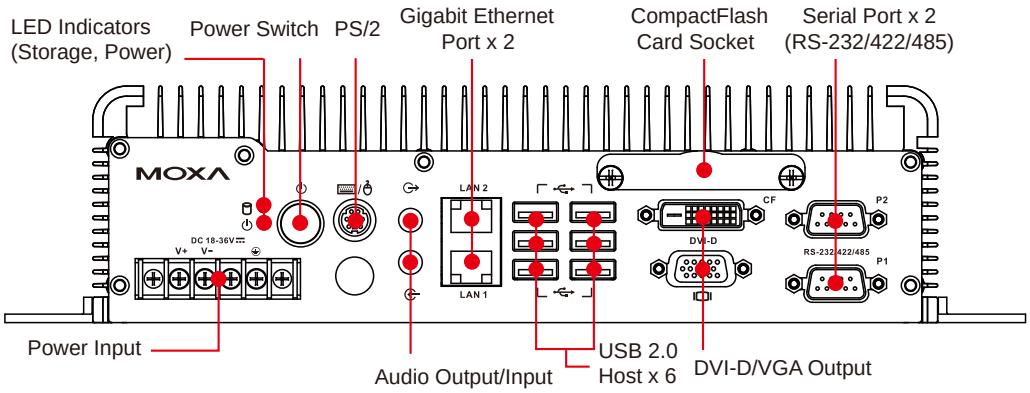
The MPC-122-K marine panel computer features a 2.26 GHz Intel Core 2 Duo processor with up to 4 GB of system memory to deliver a reliable high performance platform for marine system operations. Two RS-232/422/485 optically-isolated serial ports and two Gigabit LAN ports provide reliable serial communications 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.

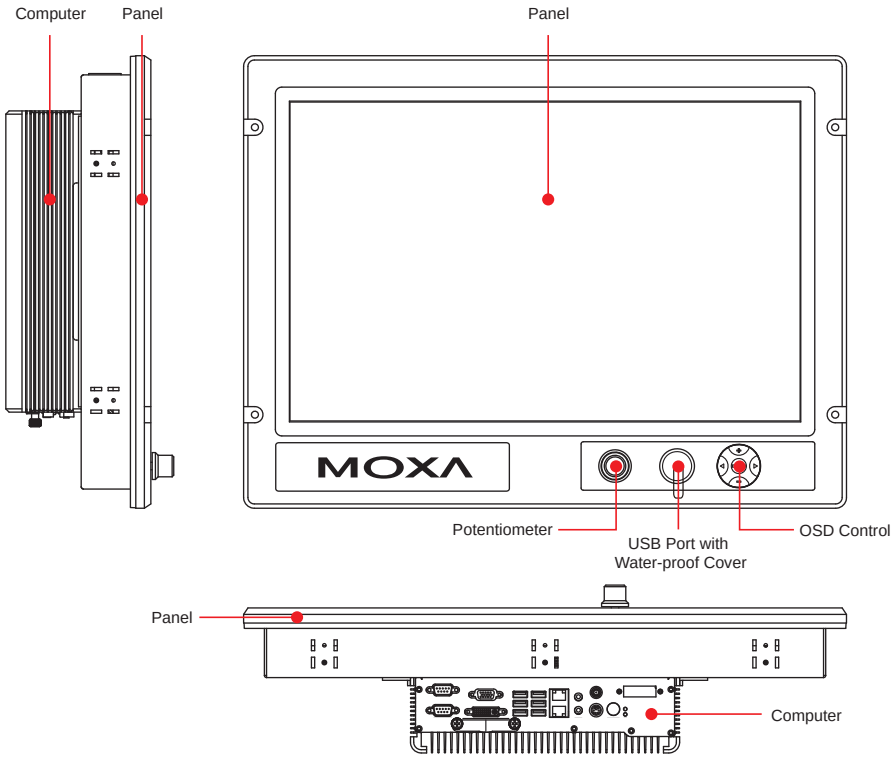
The MPC-122-K marine panel computers are compliant with many different industrial marine standards, such as IEC 60945, DNV, and IACS-E10, to verify their resilience in maritime operations. The IP66 rated enclosure provides additional protection against harsh marine environments.

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/mxm
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: 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
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

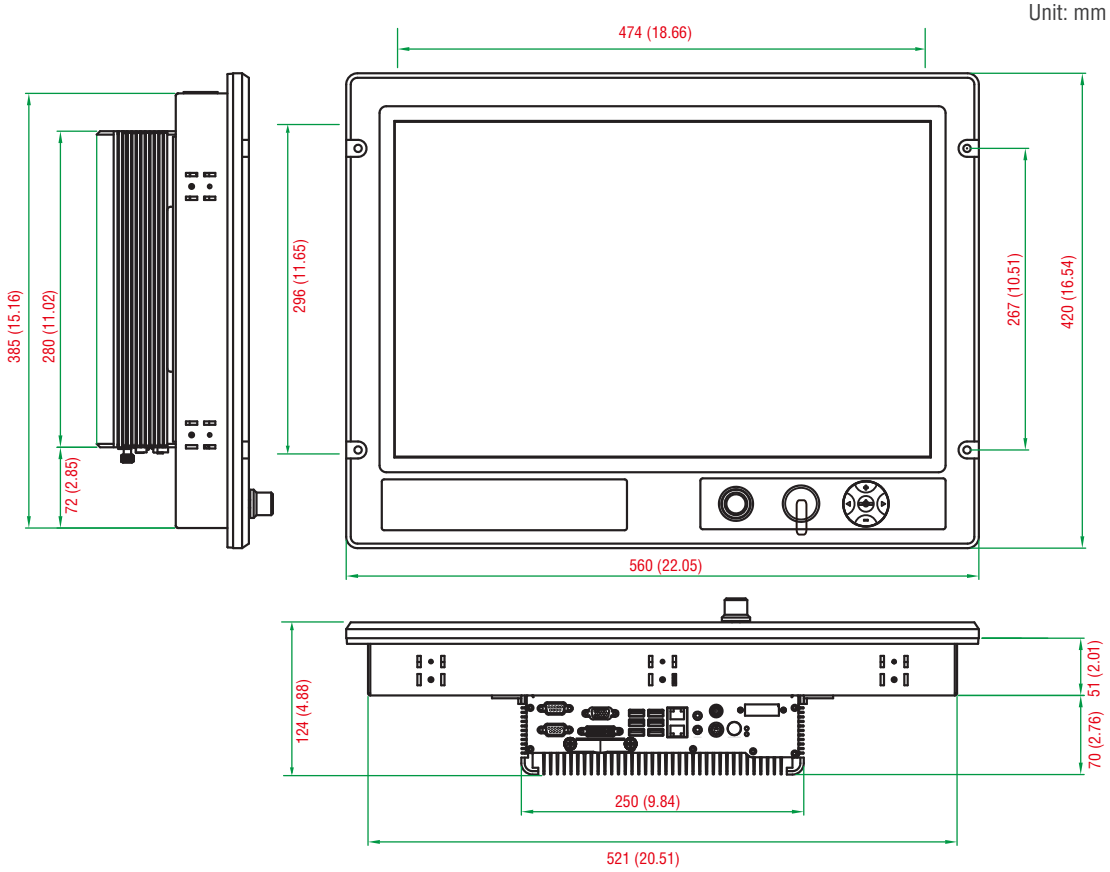
Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 levels for time interval system reset, software programmable
MTBF (mean time between failures): 39,675 hrs

Warranty

Warranty Period: 1 year
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MPC-122X-K (glass with tape bonding): Panel computer with 22" wide viewing angle screen, full-dimming capability, Intel Core 2 Duo 2.26 GHz, DVI-D, VGA, audio, 2 Gigabit LANs, 2 optically-isolated serial ports, 7 USB 2.0 ports, CompactFlash
MPC-122Y-K (glass with optical bonding): Panel computer with 22" wide viewing angle screen, full-dimming capability, Intel Core 2 Duo 2.26 GHz, DVI-D, VGA, audio, 2 Gigabit LANs, 2 optically-isolated serial ports, 7 USB 2.0 ports, CompactFlash

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

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

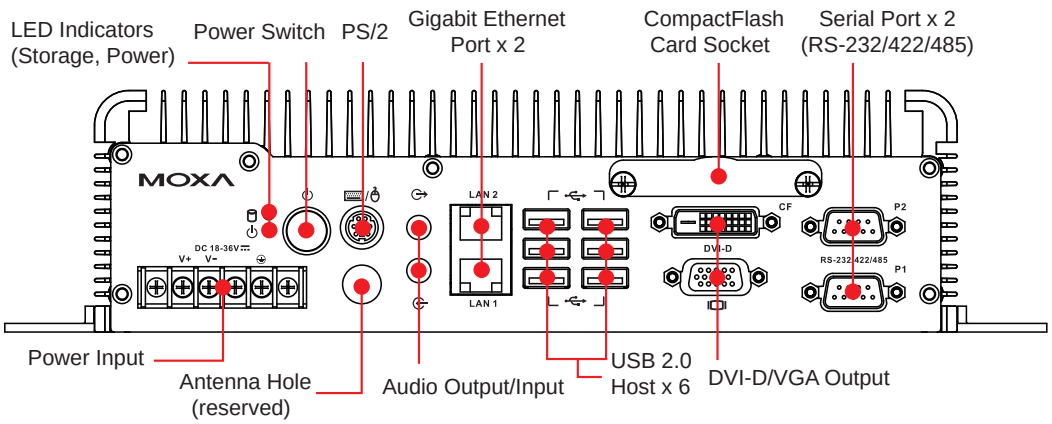
Overview

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.

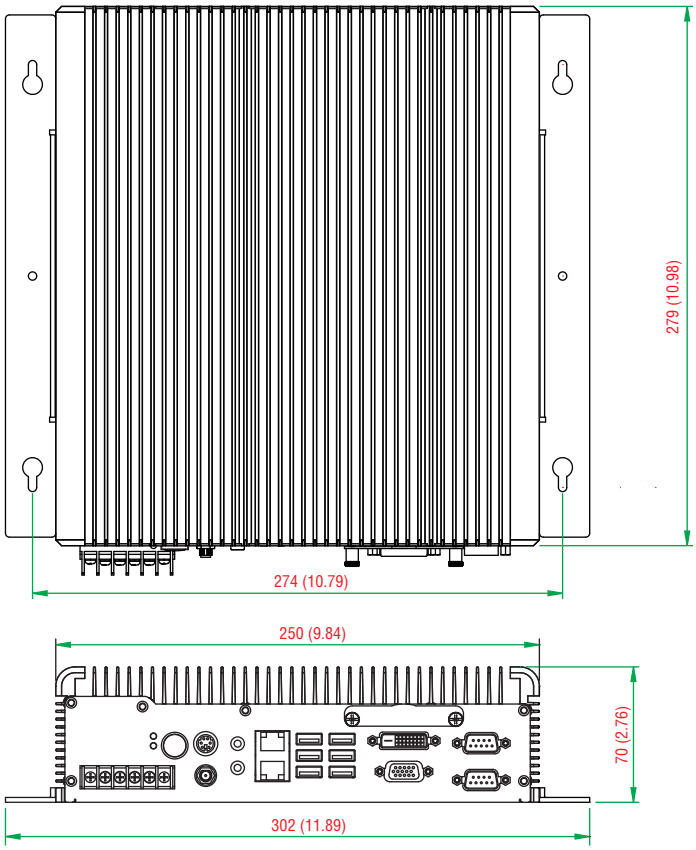
Users can easily install Windows 7, Windows XP SP3, or Windows XP Embedded to provide a flexible and friendly environment for system development and application implementation.

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

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Wallmount Computers

4

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

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.

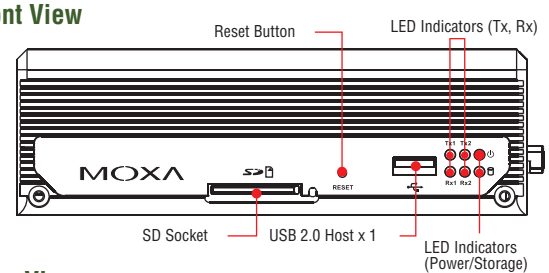
The V2101 computers' 2 serial ports make them ideal for connecting a wide range of serial devices, and the dual 10/100/1000 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2101 computers 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.

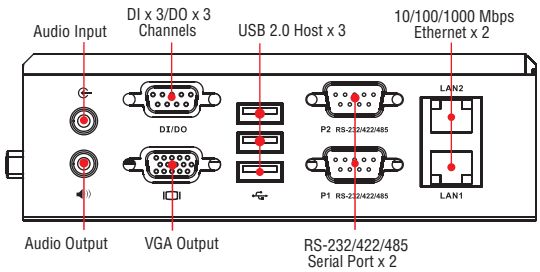
All V2101 models support a wide operating temperature range of -40 to 85°C for harsh industrial environments.

Appearance

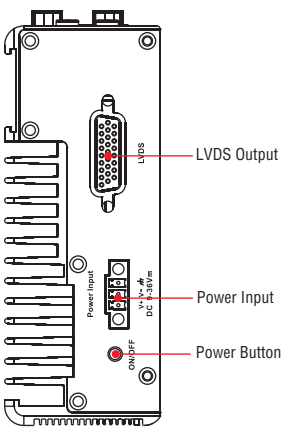
Front View



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 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

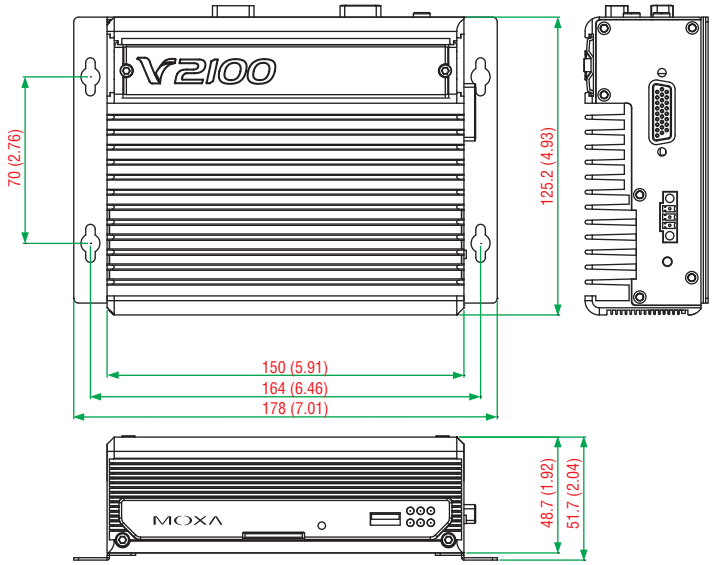
OS: Windows Embedded CE 6.0 R2
File System: FAT (for on-board flash)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP
Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 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 3.5
• XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
• SOAP Toolkit Client
• Winsock 2.2

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 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

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

e Mark

Overview

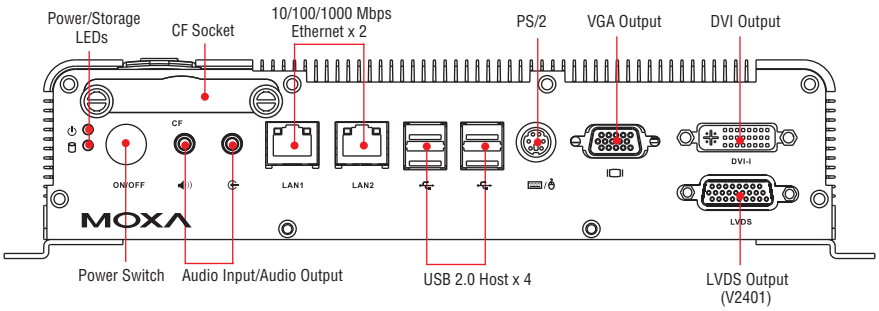
The V2401/2402 Series embedded computers are based on the Intel Atom N270 x86 processor, and feature 4 RS-232/422/485 serial ports, 8 RS-232 serial ports, dual Gigabit LAN ports, 6 USB 2.0 hosts, and a CompactFlash socket. The V2401 computer provides VGA, DVI, and LVDS outputs, and the V2402 computer 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.

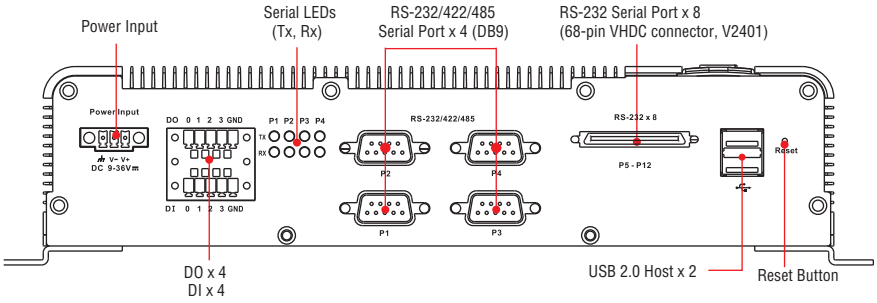
Pre-installed with Linux, Windows CE 6.0, or Windows Embedded Standard 2009, the V2401/2402 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost.

Appearance

Front View

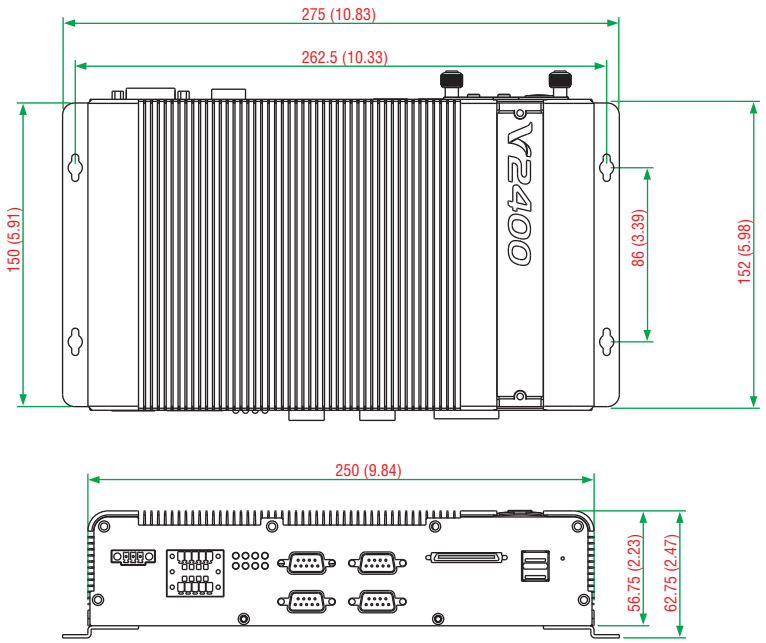


Rear View



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:
• 4 RS-232/422/485 ports*, software selectable (DB9 male)
• 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 5 VDC at 15 Hz
Digital Input Levels:
• Logic level 0: Close to GND
• Logic level 1: Open
Connector Type: Terminal Block

Digital Output
Output Channels: 4, source type, 0 to 5 VDC
Output Current: Max. 20 mA per channel
Output Voltage:
• Logic 0: 0-0.55 V
• Logic 1: 4.2-5.0 V
Connector Type: Terminal Block

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

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
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
- EN 50155 certified
- Ready-to-run Embedded Linux, or Windows Embedded Standard 2009 platform

e Mark

Overview

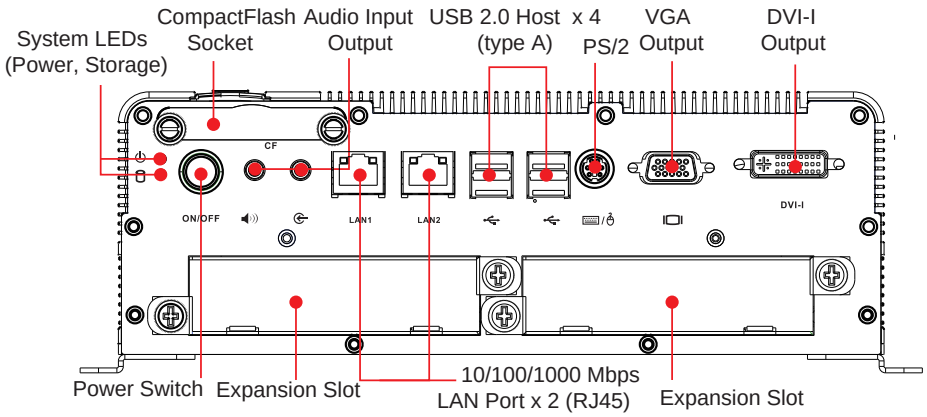
The V2422 Series embedded computers are based on the Intel Atom N270 x86 processor, and feature 4 RS-232/422/485 serial ports, dual Gigabit LAN ports, and 6 USB 2.0 hosts. In addition, the V2422 computers provide VGA and DVI-I outputs, and are EN 50155 certified, making them particularly well-suited 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.

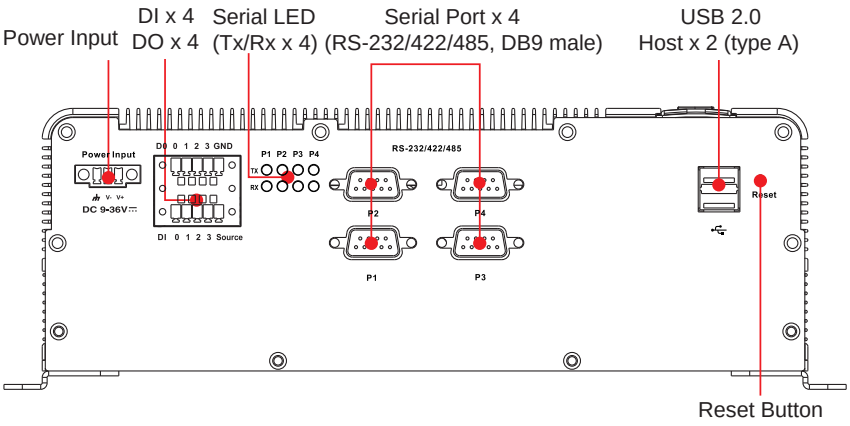
Pre-installed with Linux or Windows Embedded Standard 2009, the V2422 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost.

Appearance

Front View

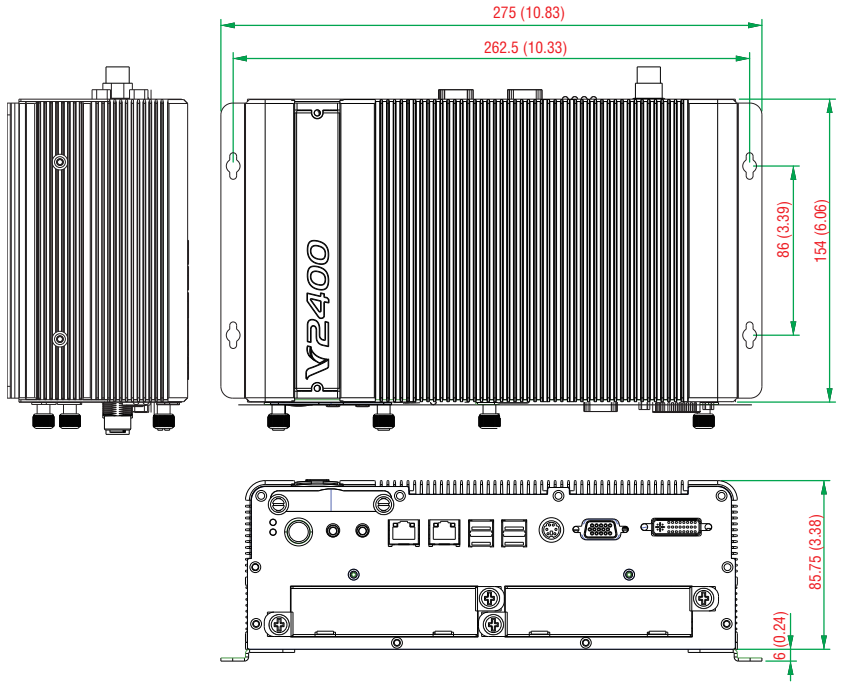


Rear View



Dimensions

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 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 5 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)
Isolation: 3 KV optical isolation

Digital Output
Output Channels: 4, sink type
Output Current: Max. 20 mA per channel
On-state Voltage: 24 VDC nominal
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: EN50155 standard
Anti-shock: EN50155 standard

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 SP1
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 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

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
DK-DC50131-01: DIN-Rail mounting kit

Package Checklist

- V2422 embedded computer
- Terminal block to power jack converter
- 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

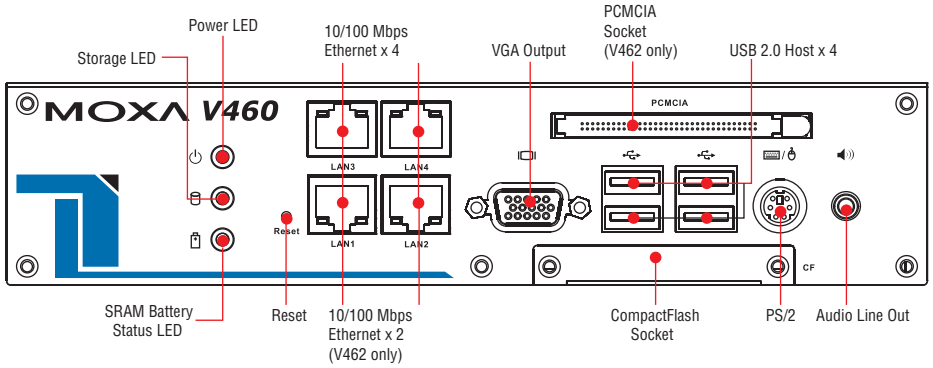
The V460 Series embedded computers are based on the AMD x86 processor, and feature 4 serial ports, dual or quad LAN ports, 4 USB 2.0 hosts, and CompactFlash and PCMCIA sockets. A VGA interface is also included, making the V460 computers particularly well-suited for industrial applications such as SCADA 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.

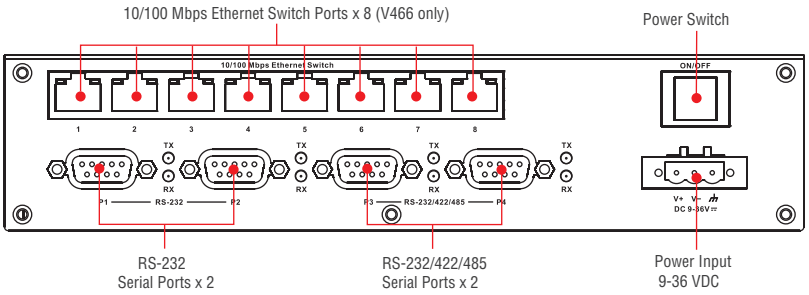
The V460 computers come with the WinCE 6.0 or WinXP Embedded operating system already installed. WinCE 6.0 and WinXP Embedded provide programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

Appearance

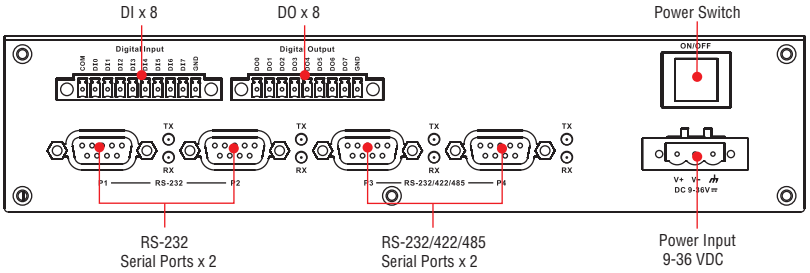
Front View



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

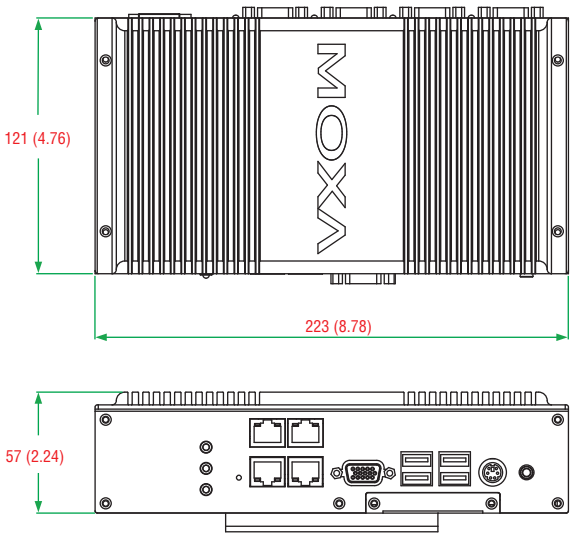
Software Specifications

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, 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 XP Embedded
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 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)

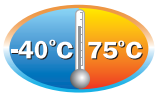
PWR-24250-DT-S1: Power adaptor
PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug
PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug
PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug
PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug
PWC-C7CN-2B-183: Power 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
- Ready-to-run Linux platform
- 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, 4digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts.

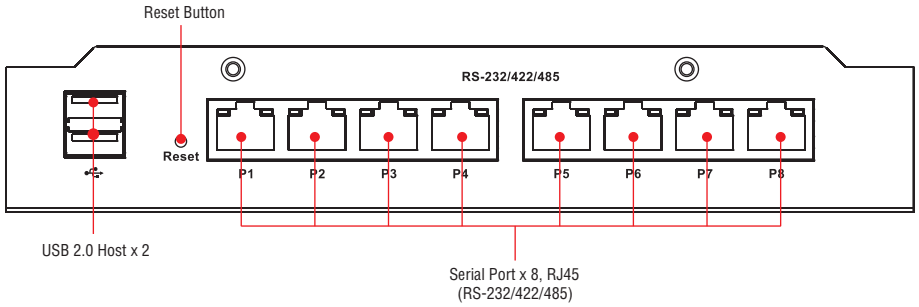
The computers use the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8410, 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 cam 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 applicatios, but with minmal cost and effort.

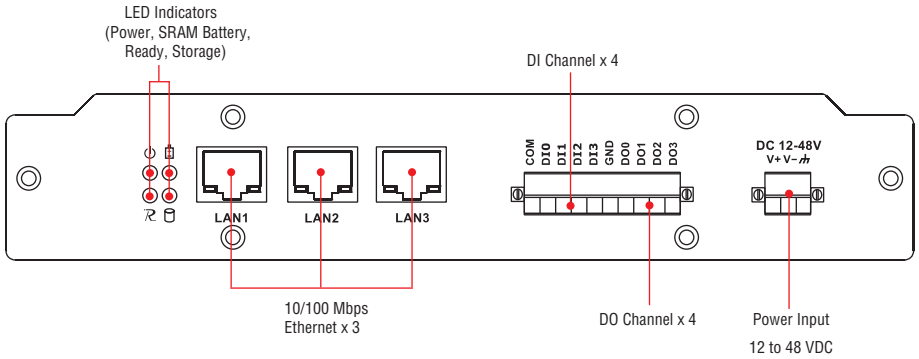
In addition to the standard model, a -40 to 75°C wide temperature model is also available for harsh industrial environments.

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: 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

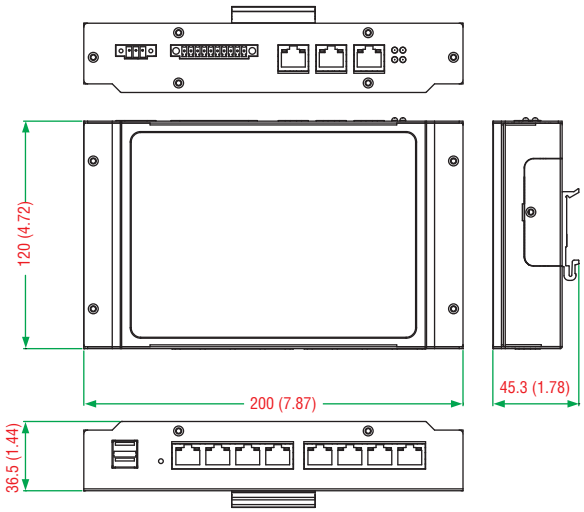
OS: Linux 2.6.23
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage web sites; supports 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, 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
- Ready-to-run Linux platform
- 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.

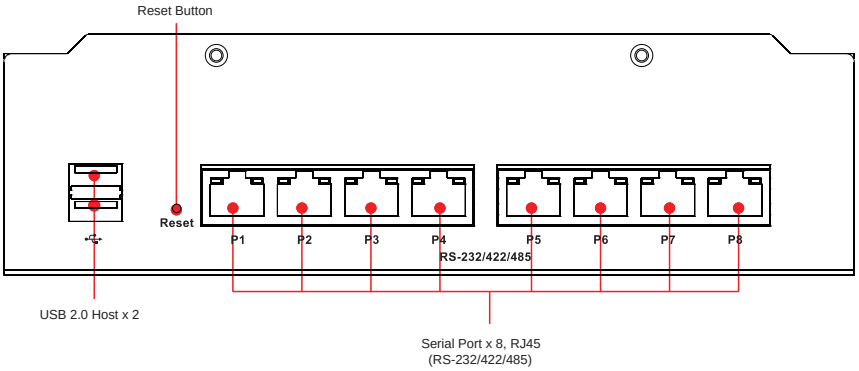
The computers use the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8416, 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.

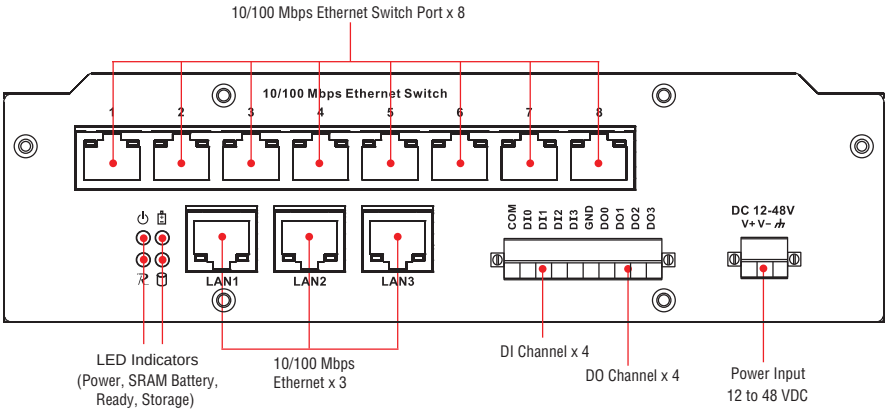
In addition to the standard model, a -40 to 75°C wide temperature model is also available for harsh industrial environments.

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

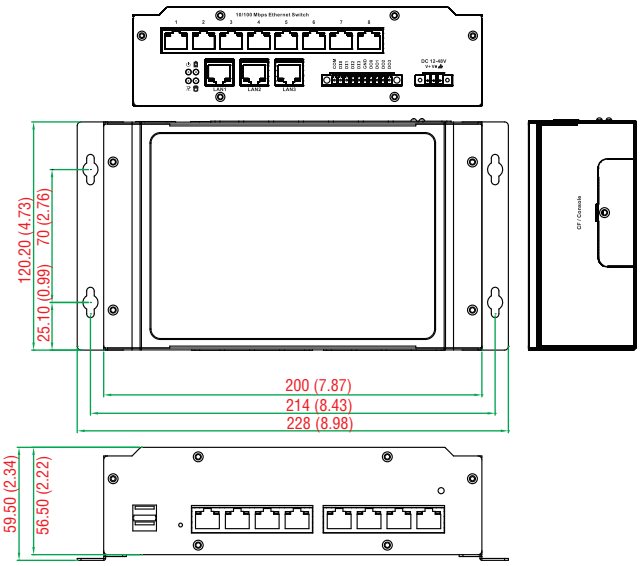
OS: Linux 2.6.23
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage web sites; supports 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, 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
- Ready-to-run Linux platform
- 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.

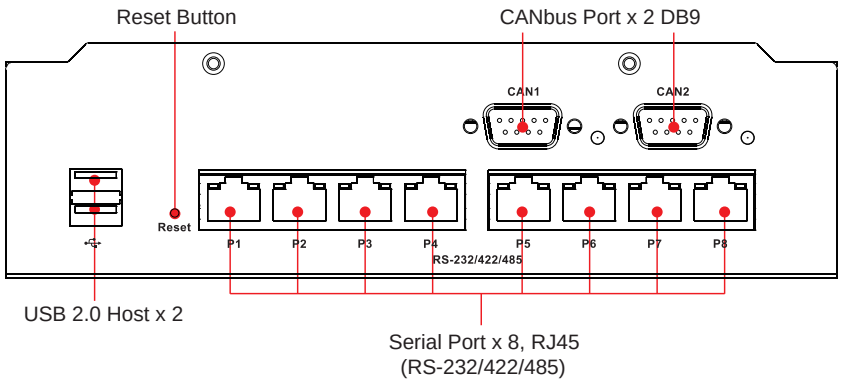
The computers use the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8418, 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.

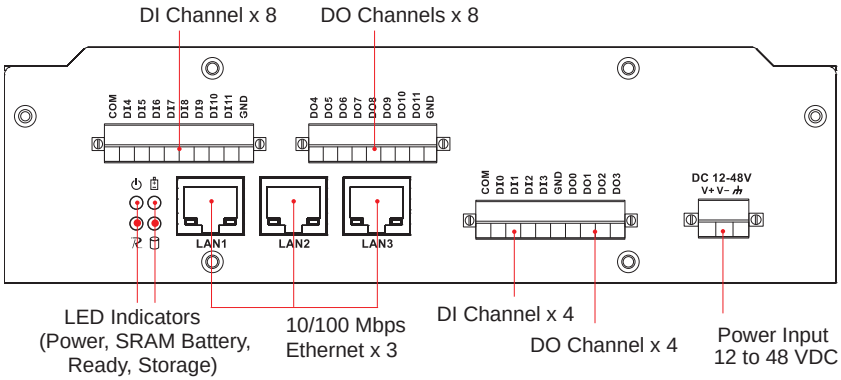
In addition to the standard model, a -40 to 75°C wide temperature model is also available for harsh industrial environments.

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

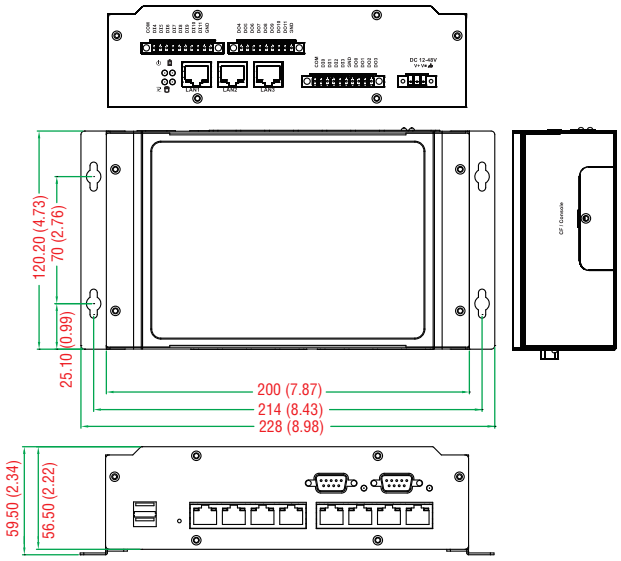
OS: Linux 2.6.23
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage web sites; supports 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, 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
- CompactFlash socket for storage expansion
- Ready-to-run Embedded Linux or Windows CE 6.0

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.

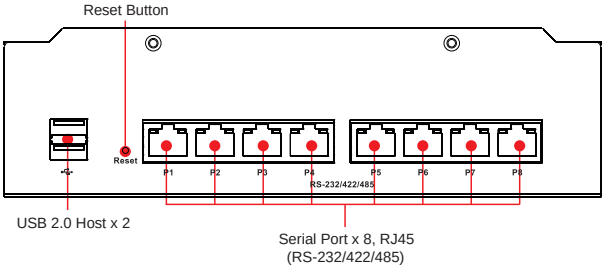
Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss. The UC-8430 computer comes with 8 RS-232/422/485 serial ports, digital I/O, and has 3 LAN ports, making it ideal as a communication platform for industrial applications that require network redundancy. As an added 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.

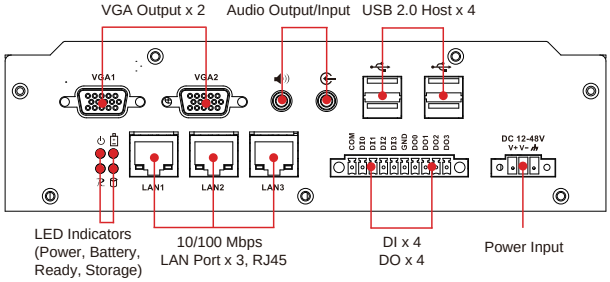
A wide temperature model of the UC-8430, designed to operate reliably in temperatures ranging from -40 to 75°C, is also available.

Appearance

Front View

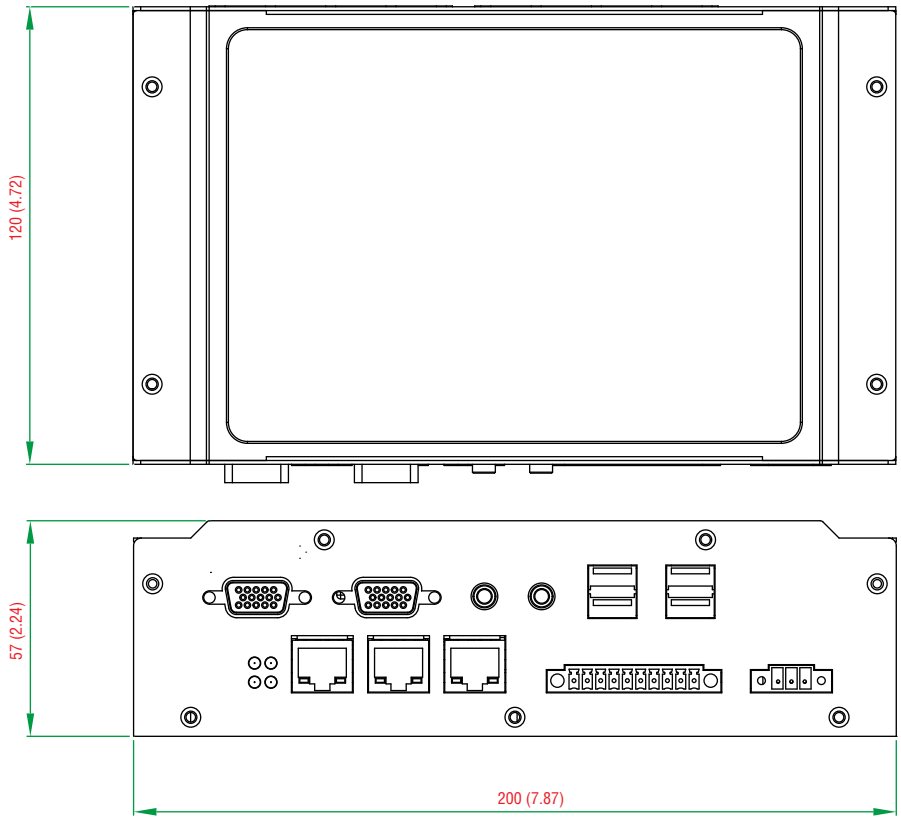


Rear View



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, 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, 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-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 single10/100 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

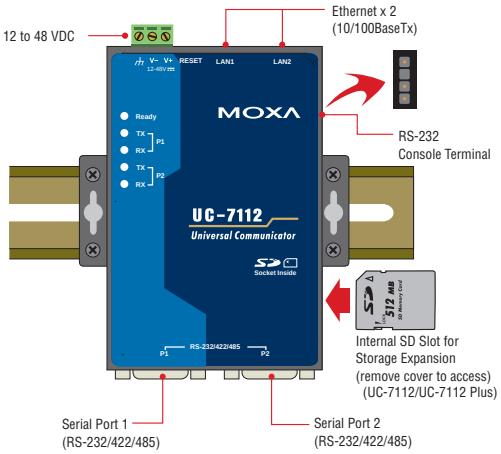
The UC-7101/UC-7110/UC-7112 mini RISC-based communication platforms are ideal for embedded applications. The computers come with 1 or 2 RS-232/422/485 serial ports and single or dual 10/100 Mbps Ethernet LAN ports to provide users with a versatile communication platform.

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.

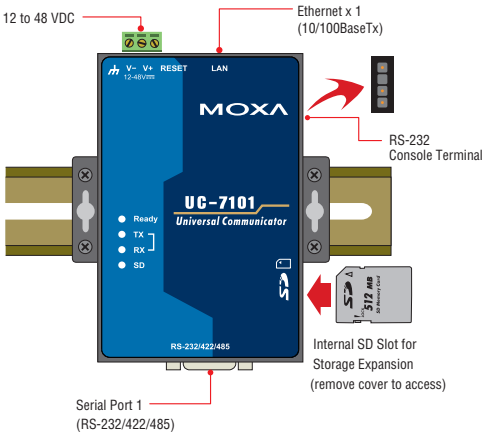
The pre-installed µClinux or Linux operating system provides an open platform for software development. This means that software written for desktop PCs can be easily ported to a UC-7101, UC-7110 or UC-7112 embedded computer with a GNU cross complier, eliminating the need to spend time modifying existing 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: 15 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
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: 148,980 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 2.6.9
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 ; 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

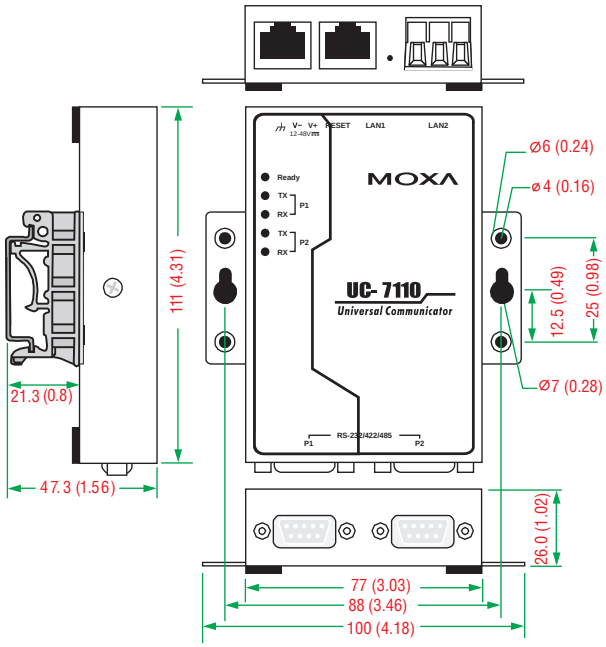
µClinux

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

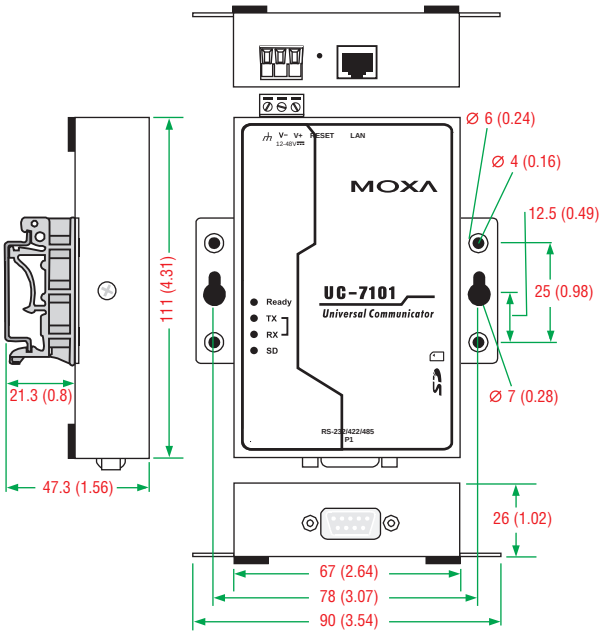
Dimensions

Unit: mm (inch)

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, µClinux OS, -10 to 60°C operating temperature
UC-7110-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, µClinux OS, -10 to 60°C operating temperature
UC-7112-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, SD, µClinux 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, µClinux OS, -40 to 75°C operating temperature
UC-7110-T-LX: Mini RISC-based embedded computer with 2 serial ports, dual LANs, µClinux 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

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

Overview

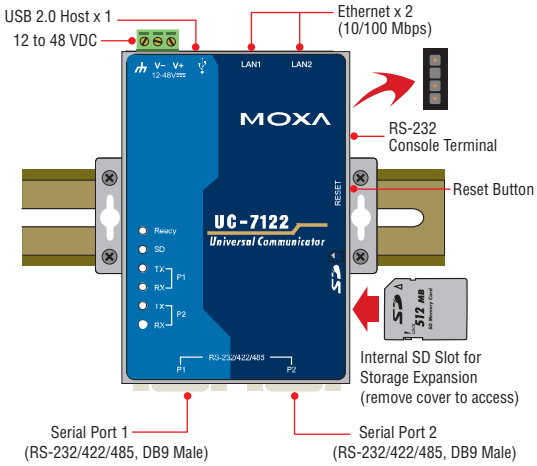
The UC-7122/7124 embedded computers come with 2 or 4 RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports to provide users with a versatile communication platform, making these RISC-based embedded computers ideal for your embedded applications.

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.

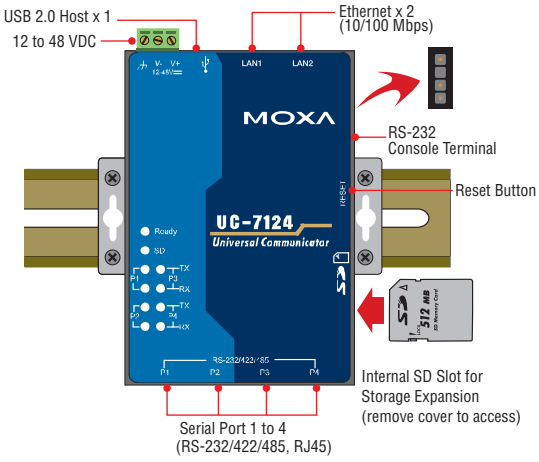
The pre-installed WinCE 5.0 operating system provides a common Windows-based software operating system for software program development. This means that software written in Visual C/C++ for desktop PCs is easily ported to the UC-7122/7124 computers with a general programming tool such as Microsoft Embedded 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: 15 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
Anti-shock: 2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis

Power Requirements
Input Voltage: 12 to 48 VDC
Power Consumption:

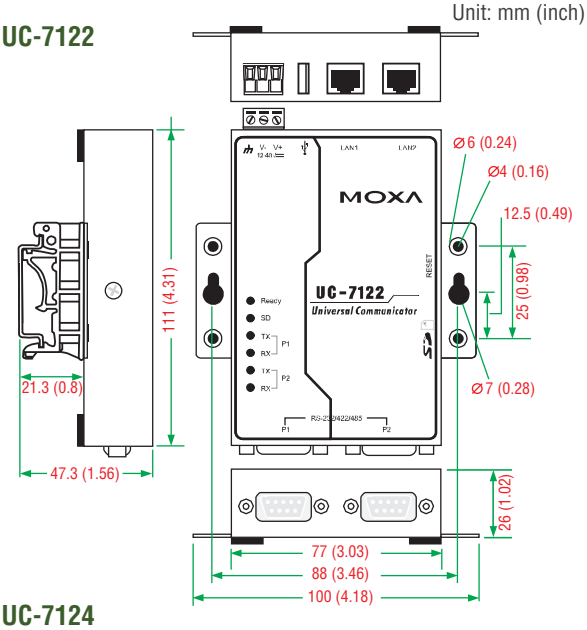
UC-7122: 4.1 W	UC-7124: 4.3 W
• 170 mA @ 24 VDC	• 180 mA @ 24 VDC
• 340 mA @ 12 VDC	• 360 mA @ 12 VDC

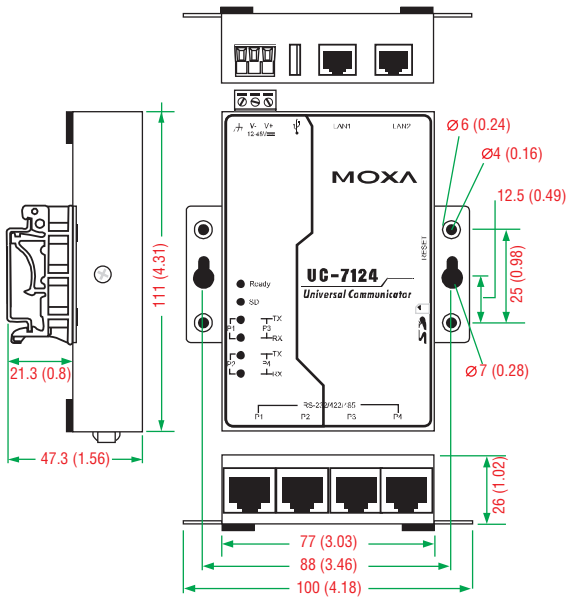
Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC: EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Green Product: RoHS, CRoHS, WEEE

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.

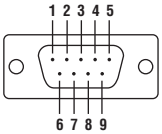
Dimensions
Unit: mm (inch)

UC-7122


UC-7124


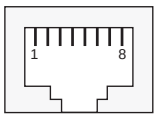
Pin Assignment

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+
6	DCD	RxD-	Data-
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, 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 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	✓	–	✓

Rackmount Computers

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

Overview

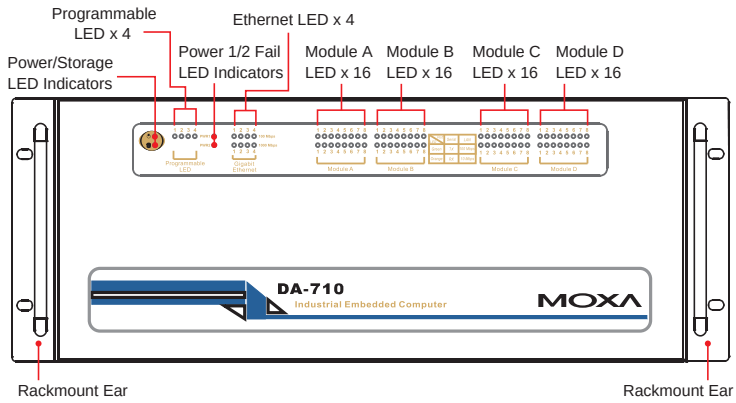
The DA-710 computer is based on the Intel x86 processor, supports VGA, and comes with 4 Ethernet ports, 2 RS-232 serial ports, CompactFlash, and USB. The DA-710 comes in a standard 19-inch, 4U high form factor, making it an ideal platform for industrial applications.

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

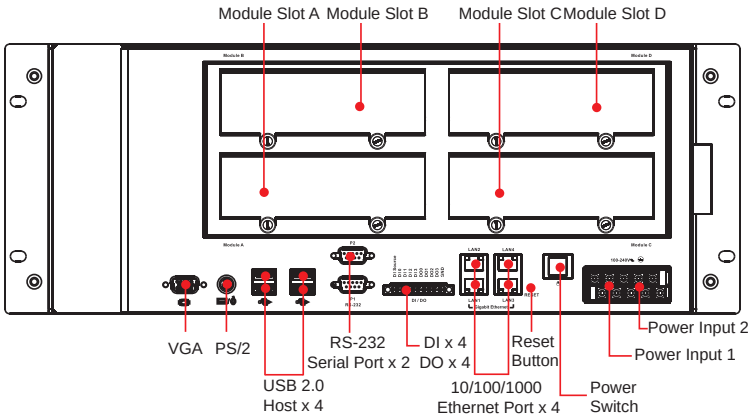
The DA-710 runs Linux, or Windows Embedded Standard 2009 (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower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

Appearance

Front View

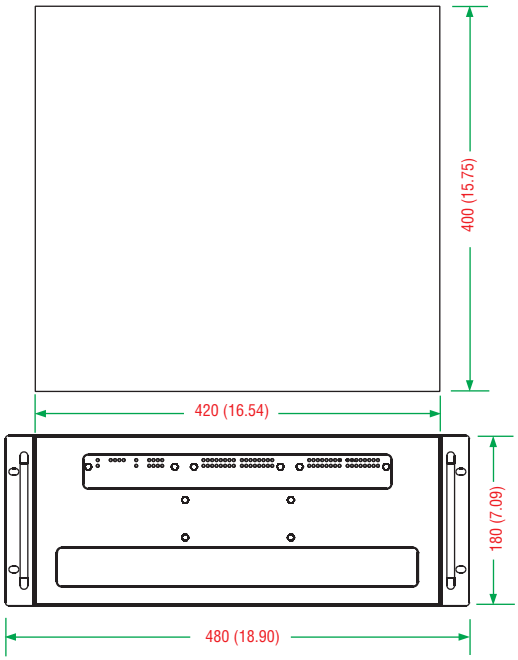


Rear View



Dimensions

Unit: mm (inch)



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

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, WinCE 6.0, 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 optical 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.

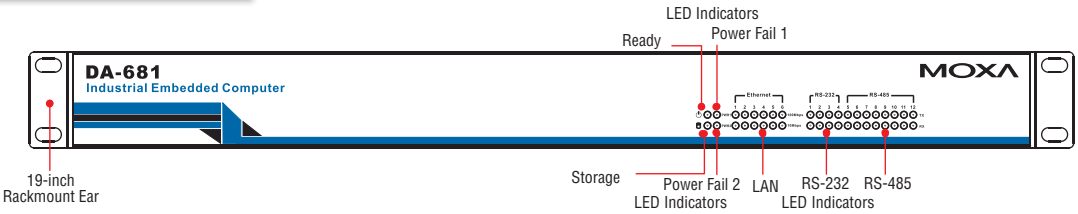
With its robust design, the DA-681 is suitable for industrial automation applications that require standard 19-inch rackmount solutions, such as power automation, transportation, and oil and gas. Another plus is that the serial ports come with 2 KV optical isolation protection to guarantee communication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

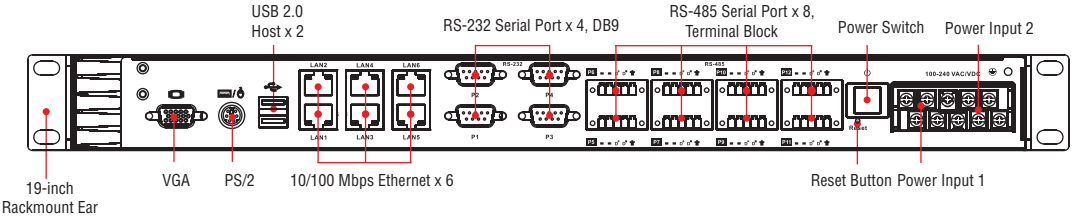
The DA-681 runs Linux, WinCE 6.0, or Windows XP Embedded (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower 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 910GMLE + 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
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 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-232: TxD, RxD, 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

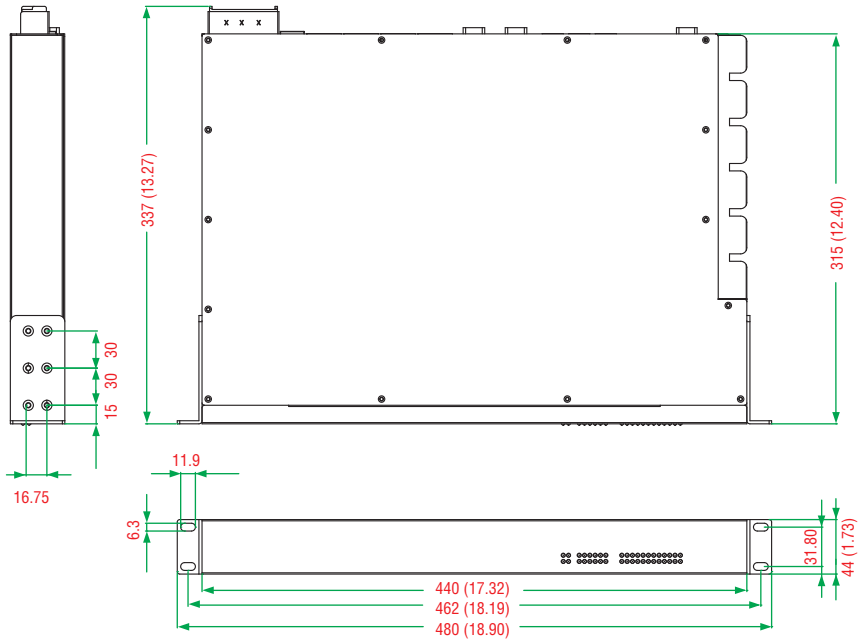
Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)
EMC: EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Power Automation: IEC 61850-3 (DPP-T models only)
Green Product: RoHS, CRoHS, WEEE

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 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

Windows XP Embedded

OS: Windows XP Embedded
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
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-CE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, WinCE 6.0, -10 to 60°C operating temperature
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, WinXPe 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-CE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, WinCE 6.0, -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, WinXPe 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-CE: 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, WinCE 6.0, -40 to 75°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, WinXPe 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-CE	4	8	6	✓	✓	✓	CE 6.0	Single	–
DA-681-I-SP-XPE	4	8	6	✓	✓	✓	XPE	Single	–
DA-681-I-SP-LX	4	8	6	✓	✓	✓	Linux	Single	–
DA-681-I-DP-CE	4	8	6	✓	✓	✓	CE 6.0	Dual	–
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-CE	4	8	6	✓	✓	✓	CE 6.0	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

TAIWAN EXCELLENCE 2009

- 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, WinCE 6.0, or Windows XP Embedded platform
- Fanless design

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.

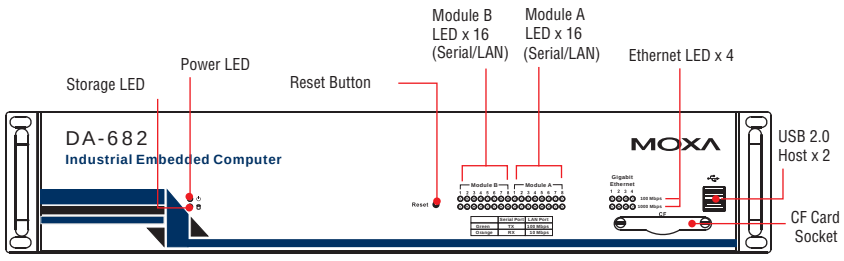
The DA-682 computers run Linux, WinCE 6.0, or Windows XP Embedded (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and 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, and a universal PCI expansion module. The friendly design gives users the advantage of being able to swap out modules quickly and easily.

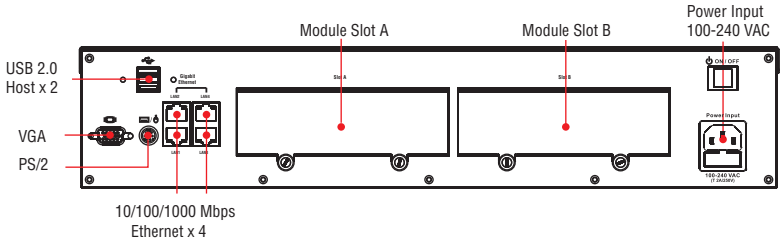
These features make the DA-682 an ideal solution for use with a wide array of industrial automation applications.

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 x16

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

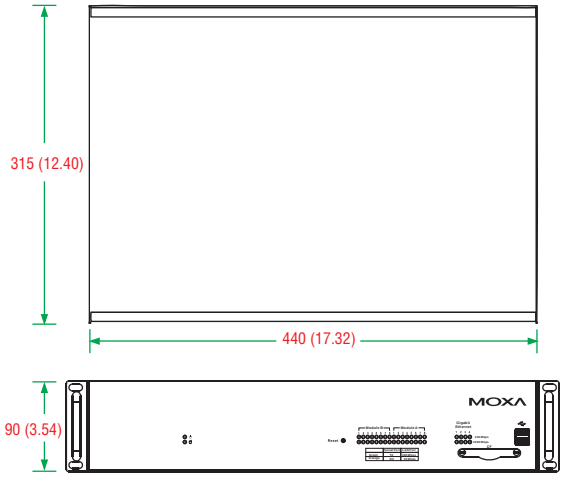
Windows Embedded CE 6.0
OS: Windows Embedded CE 6.0
File System: FAT (for on-board flash)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP
Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport 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

Windows XP Embedded

OS: Windows XP Embedded
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
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-CE: x86 rackmount computer with VGA, 4 Gigabit Ethernet ports, 2 PCI slots, CompactFlash, USB, WinCE 6.0
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

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.

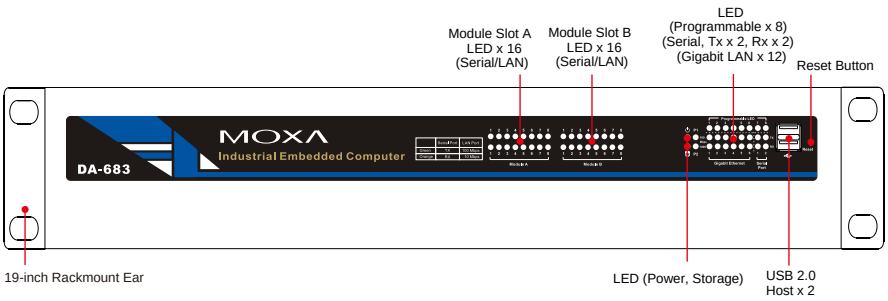
IEC-61850-3 certification confirms that the DA-683 can deliver stable and reliable system operations in power applications. Additional value and convenience is provided through a modular design with two independent slots for flexible system integration and expansion. Users have the option to add a variety 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, 8-port 10/100 Mbps switch 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.

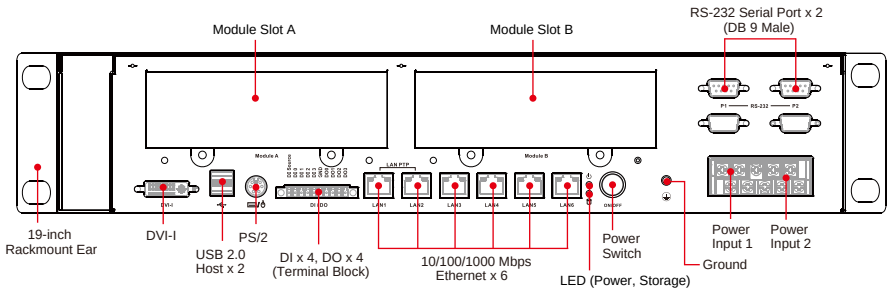
DA-683 computers run Linux or Windows Embedded Standard 2009 (pre-installed), providing a familiar environment for developing sophisticated application software. Moxa provides comprehensive software support to help programmers develop bug-free code quickly and at a lower cost.

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 RBG 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: TxD, RxD, 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 x16
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

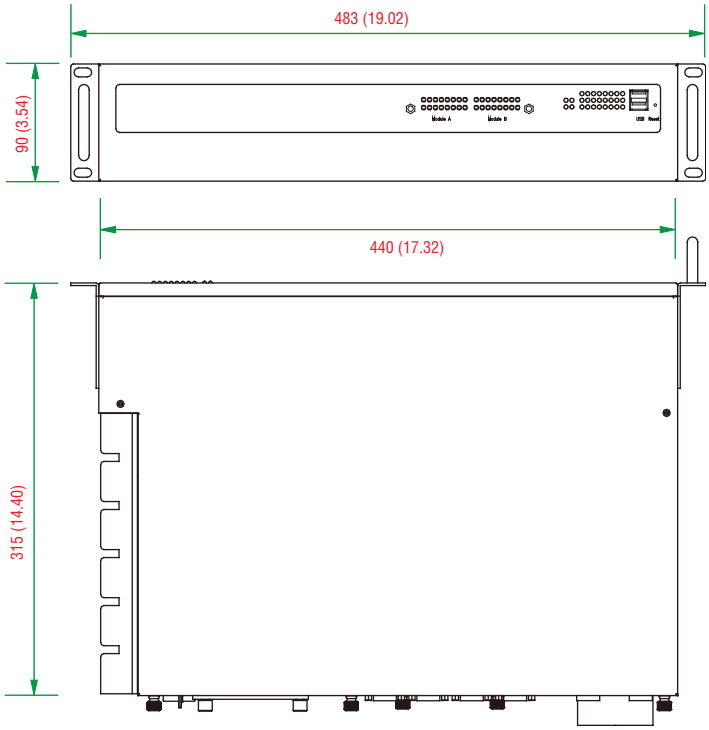
OS: Linux 2.6.32, Debian 5 (Lenny)
File System: EXT2, JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage 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 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
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

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

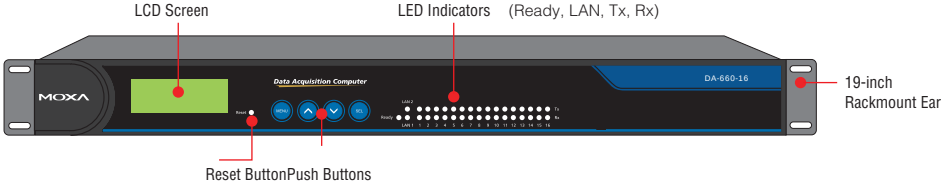
Overview

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.

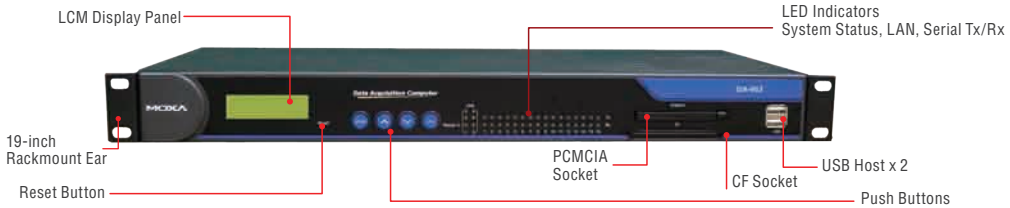
Model Name	RS-232/422/485 Serial Ports		Wired LAN		Wireless LAN	Memory Expansion	
	No. of Ports	Digital Isolation	10/100M	100BaseFX multi-mode	PCMCIA Socket	CompactFlash Socket	USB
DA-660	8 or 16	–	2 ports	–	–	–	–
DA-661	16	–	2 ports	–	✓	✓	2 ports
DA-662	16	–	4 ports	–	✓	✓	2 ports
DA-662-I	16	2 KV per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

Appearance

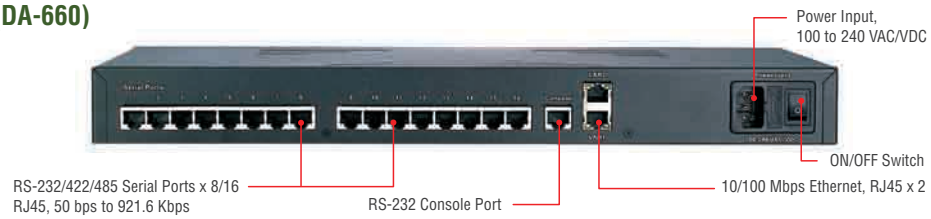
Front View (DA-660)



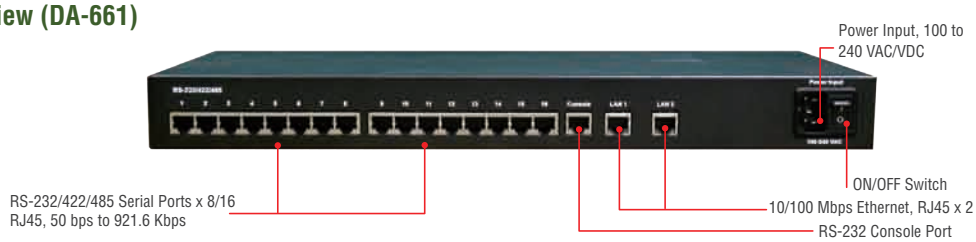
Front View (DA-661/662/662-I)



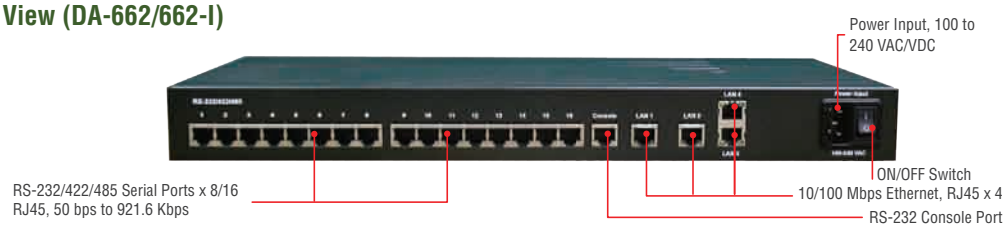
Rear View (DA-660)



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, 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
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 rackkmount

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

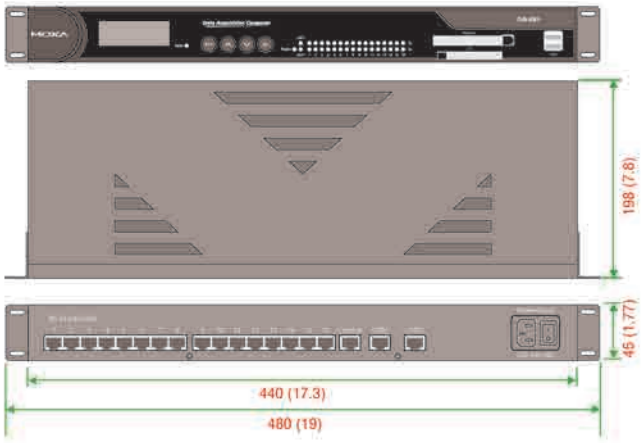
Warranty

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

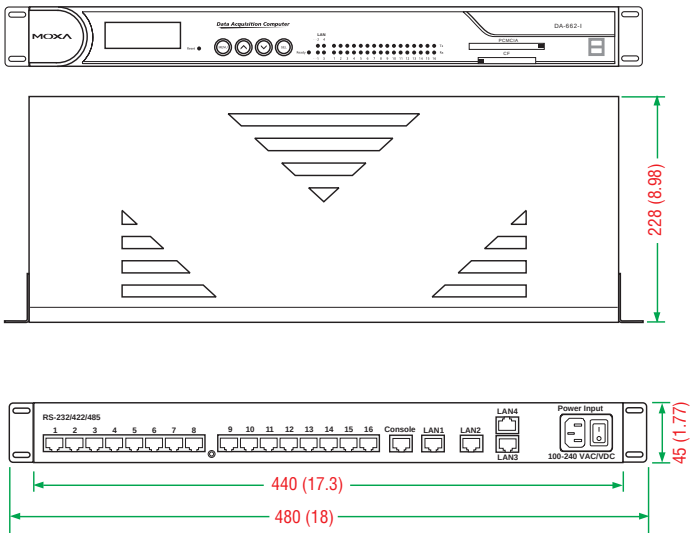
Dimensions

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, 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 (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, 10/100M LAN and unmanaged switch ports, and PCI development kit

- PCI slots for interface expansion
- 8 RS-232/422/485 software-selectable serial modules with isolation protection
- 4 10/100 Mbps LAN modules
- 8 10/100 Mbps unmanaged switch modules
- Universal PCI expansion module
- 8 RS-422/485 serial modules 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 perpheral expansion slots.

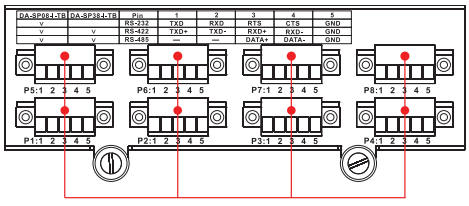
The serial port modules include an 8-port RS-232/422/485 module with either DB9 or terminal block connectors, and an 8-port RS-422/485 module with terminal block connectors. Some modules are even designed with 2 KV digital isolation, making them fully suitable for the great demands of industrial applications that use serial communication.

In addition, a 4-port LAN module and 8-port switch 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.

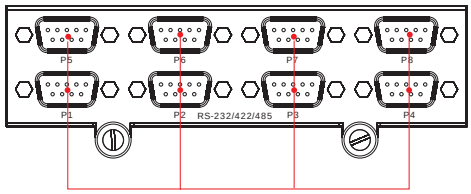
Appearance

DA-SP08-I-TB



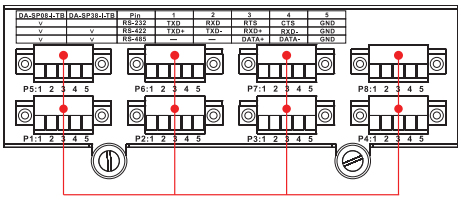
RS-232/422/485 Serial Port x 8

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



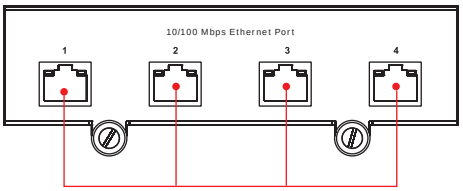
RS-232/422/485
Serial Port x 8

DA-SP38-I-TB



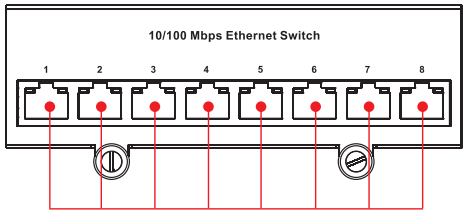
RS-422/485 Serial Port x 8

DA-LN04-RJ



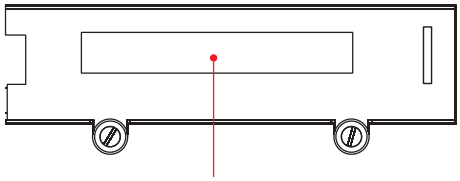
10/100 Mbps
Ethernet x 4

DA-SW08-RJ



10/100 Mbps Switch Port x 8

DA-UPCI-DK



Universal PCI Expansion Slot

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 Adatpor

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

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	✓	✓	✓

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

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	DB9	RJ45	Terminal Block	3.3/5 V
DA-SP08-I-DB	8	–	✓	–	–	✓	–	–	–
DA-SP08-DB	8	–	–	–	–	✓	–	–	–
DA-SP08-I-TB	8	–	✓	–	–	–	–	✓	–
DA-SP38-I-TB	–	8	✓	–	–	–	–	✓	–
DA-SW08-RJ	–	–	–	8	–	–	✓	–	–
DA-LN04-RJ	–	–	–	–	4	–	✓	–	–
DA-UPCI-DK	–	–	–	–	–	–	–	–	✓

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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.

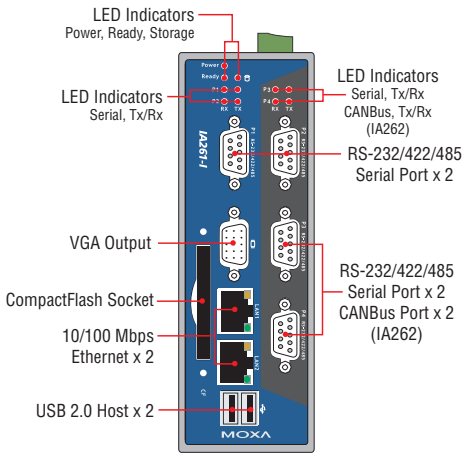
The IA261-I/262-I computers use the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM provide enough memory to run your application 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.

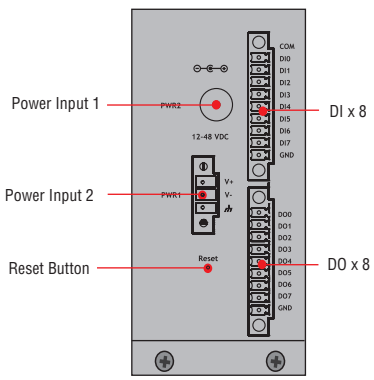
The IA261-I/262-I computers support RS-232/422/485, CANbus, digital I/O, come with 2 KV isolation protection, and have dual LAN ports, making them ideal as communication platforms for industrial applications that require network redundancy. In addition to the standard models, wide temperature (-40 to 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: 15 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)

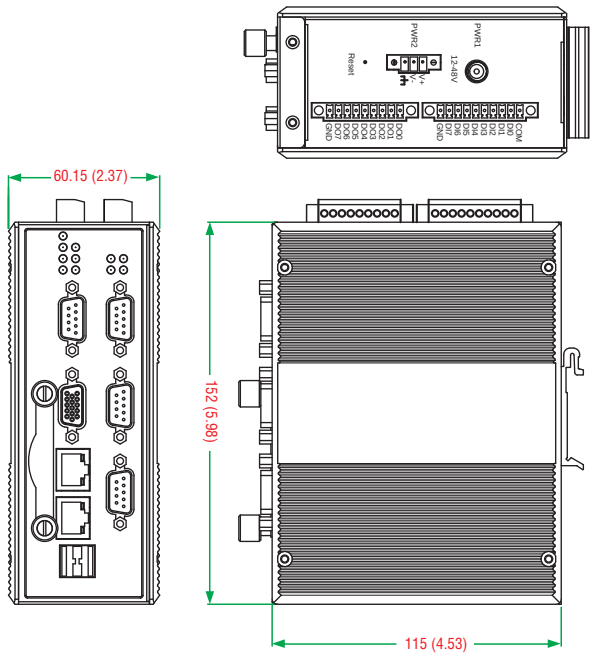
Windows Embedded CE 6.0

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, 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

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 embeddedcomputer
- 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.

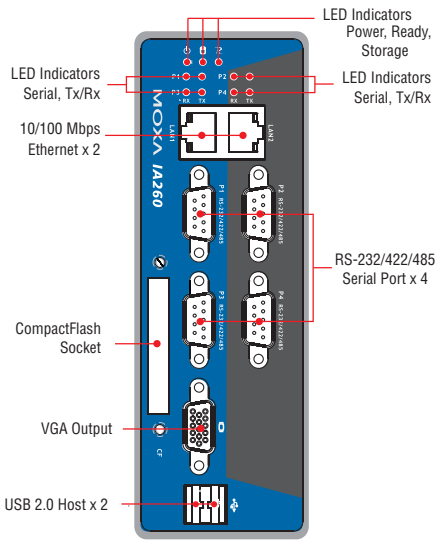
The IA260 computers use the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application software 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.

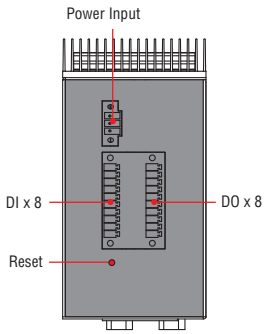
The IA260 computers support RS-232/422/485, digital I/O, and have dual LAN ports, making them ideal as communication platforms for industrial applications that require network redundancy. In addition to the standard model, a wide temperature (-40 to 75°C) model is available for use in harsh industrial 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

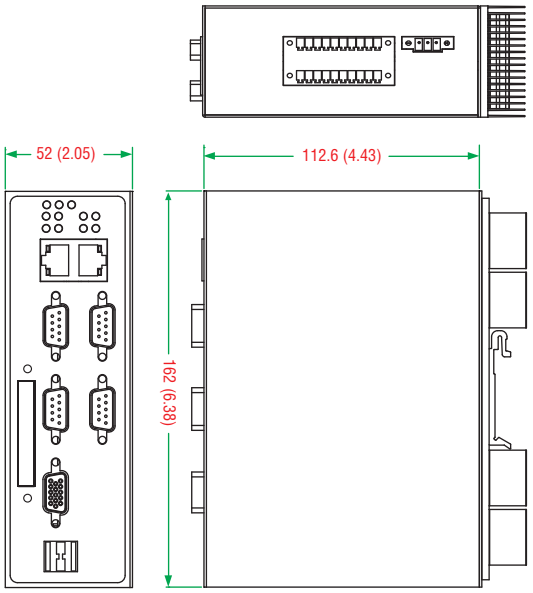
OS: Linux 2.6.23
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage web sites
Terminal Server (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, 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

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.

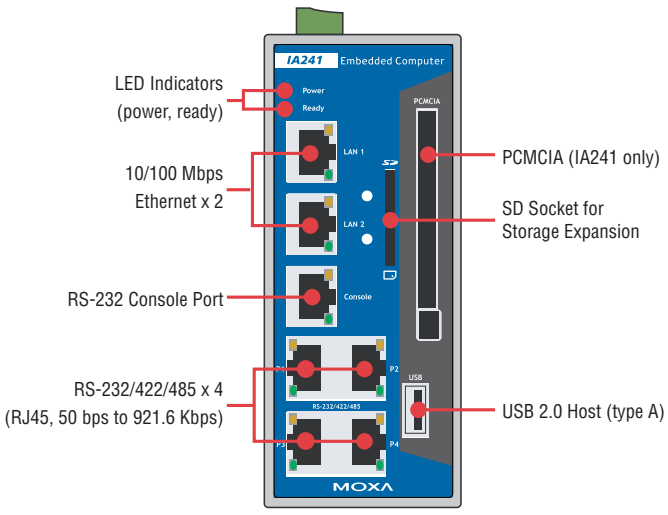
The IA240/241's vertical DIN-rail form factor makes it easy to install the computers in a small cabinet. This space-saving solution also facilitates easy wiring, making the IA240/241 a great choice as front-end embedded controllers for industrial applications.

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.

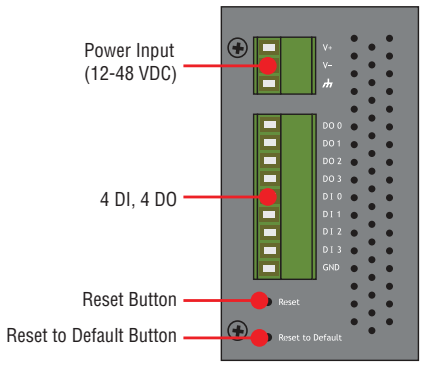
The industrial design of the IA240/IA241 provides a robust, reliable computing platform. Due to their RISC-based architecture, the IA240/IA241 computers will not generate a lot of heat, making them ideal for industrial automation environments.

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: 15 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

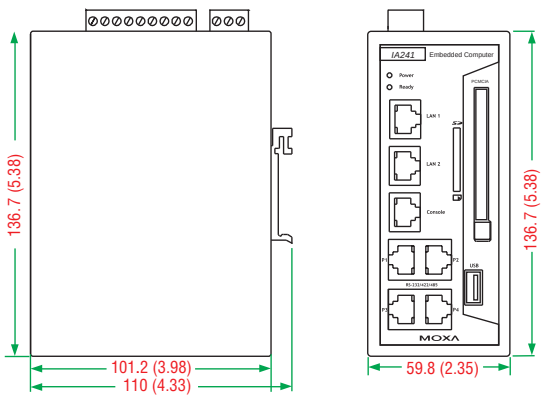
Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC: EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Green Product: RoHS, CRoHS, WEEE

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)



Side View Front View

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 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.

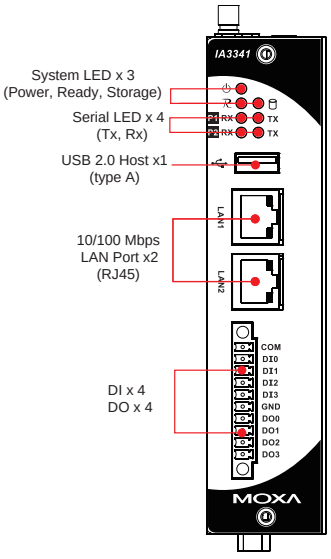
The IA240/241's vertical DIN-rail form factor makes it easy to install the computers in a small cabinet. This space-saving solution also facilitates easy wiring, making the IA240/241 a great choice as front-end embedded controllers for industrial applications.

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.

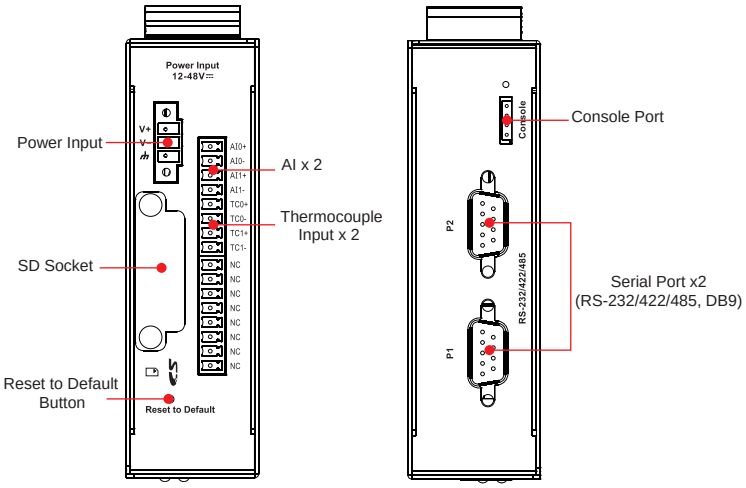
The industrial design of the IA240/IA241 provides a robust, reliable computing platform. Due to their RISC-based architecture, the IA240/IA241 computers will not generate a lot of heat, making them ideal for industrial automation environments.

Appearance

Front View



Top 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: 15 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

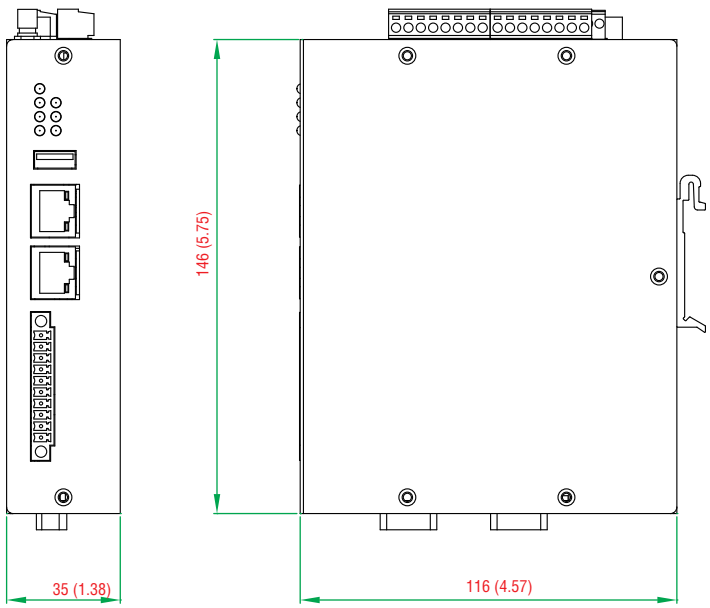
Linux

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

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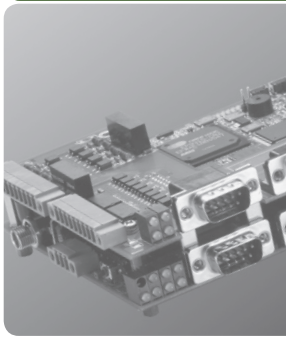
Modules and Boards



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

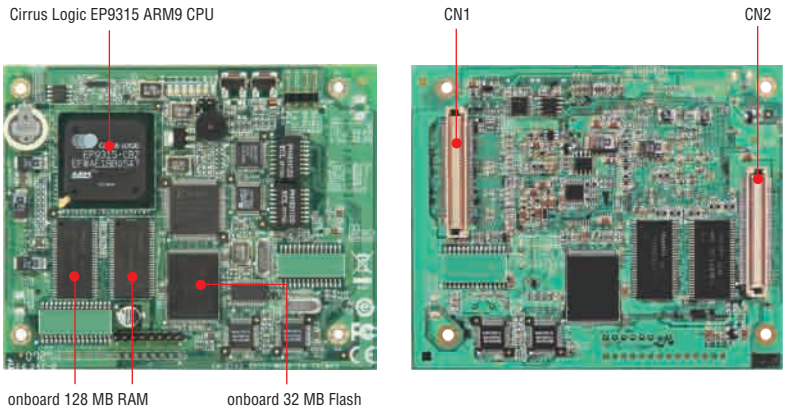
The EM-2260 embedded module features 4 RS-232/422/485 serial ports, dual Ethernet ports, an EIDE interface for designing an external storage connection, such as a CompactFlash socket and USB port signals. The module has a compact design that is easily integrated with a variety of industrial applications, 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.

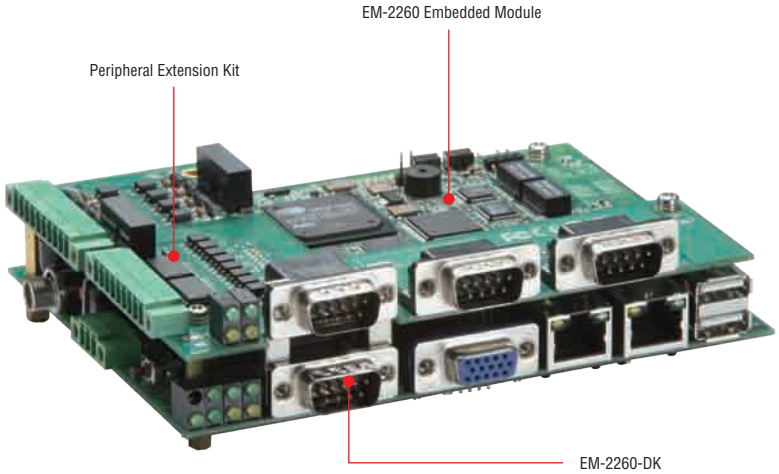
The EM-2260 embedded module uses the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate a lot of heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application 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





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

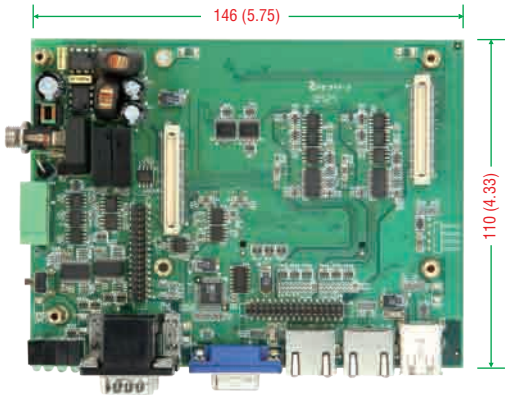
OS: Linux 2.6.23
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage web sites
Terminal 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)

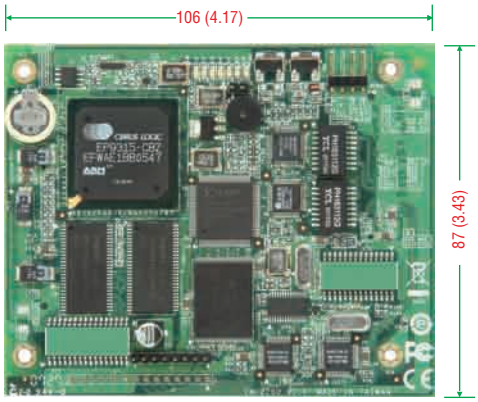
Windows Embedded CE 6.0

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

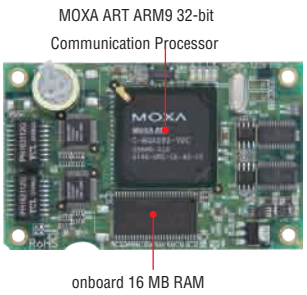
Overview

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.

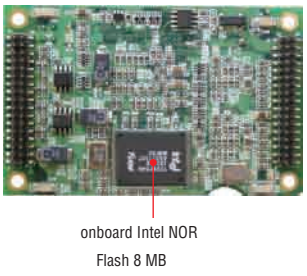
Appearance

EM-1220 Embedded Module

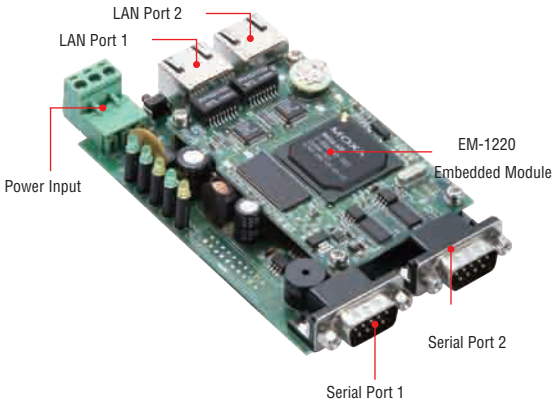
Top View



Bottom View



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: 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
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.

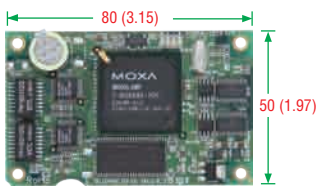
Software Specifications

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

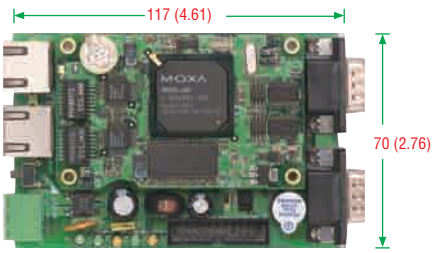
Dimensions

Unit: mm (inch)

EM-1220



EM-1220-DK



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 µClinux Kernel 2.6 platform
- Full-function development kit for quick evaluation and application development
- -40 to 75°C wide temperature models available

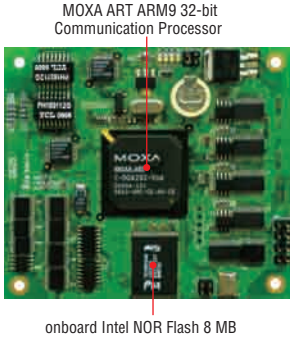
Overview

The EM-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 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

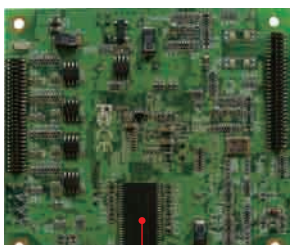
Appearance

EM-1240 Embedded Module

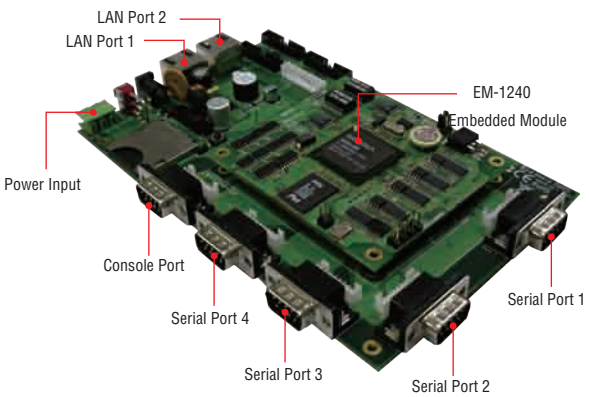
Top View



Bottom View



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, 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.

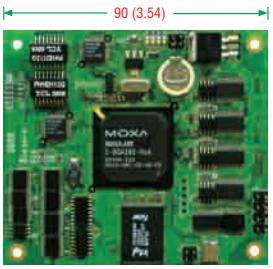
Software Specifications

µClinux
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
ntpdate: Network Time Protocol client utility
Tool Chain:
• Arm-elf-gcc: C/C++ PC Cross Compiler
• µClibc: POSIX standard C library

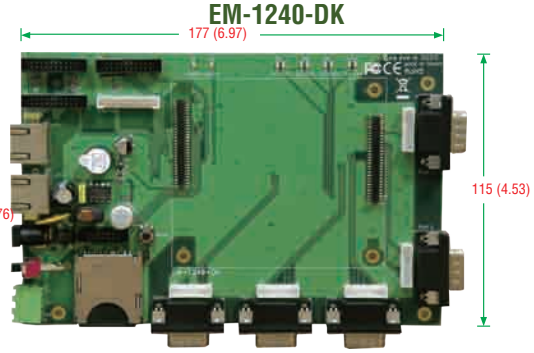
Dimensions

Unit: mm (inch)

EM-1240



EM-1240-DK



Ordering Information

Available Modules

EM-1240-LX: RISC-based embedded core module with 4 serial ports, dual LANs, SD, µClinux OS, -10 to 60°C operating temperature
EM-1240-T-LX: RISC-based embedded core module with 4 serial ports, dual LANs, SD, µClinux, -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

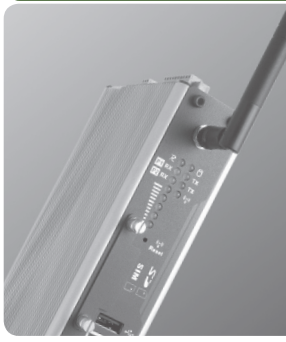
Package Checklist (modules)

- 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-based wireless embedded computer with GSM/GPRS/EDGE, 4 DIs, 4 DOs, 2 serial ports, Ethernet, SD

TAIWAN EXCELLENCE 2010

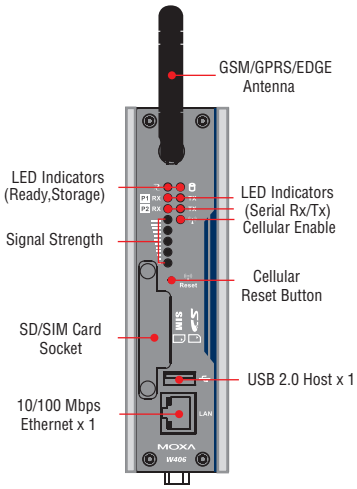
- Cirrus Logic EP9302 32-bit ARM9 processor
- 32 MB RAM on-board (maximum 64 MB)
- 16 MB Flash built in (maximum 32 MB)
- Built-in GSM/GPRS/EDGE cellular communication
- GSM 850/900/1800/1900 MHz supported
- GPRS/EDGE Class 12 supported
- SMS tunnel mode provided
- 4 DIs, 4 DOs
- Two software selectable 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

Overview

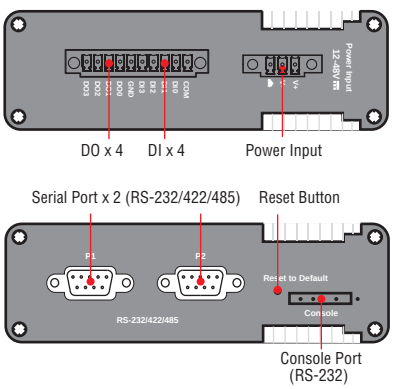
The W406 is an embedded Linux or WinCE computer that features 2 software selectable RS-232/422/485 ports, 1 Ethernet port, and quad-band GSM/GPRS/EDGE 900/1800/850/1900 MHz for cellular communication. It also comes with an SD socket, USB host, and 4 digital input and 4 digital output channels, making 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

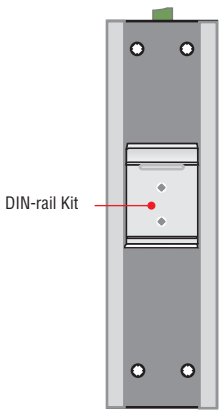
W406 Front View



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

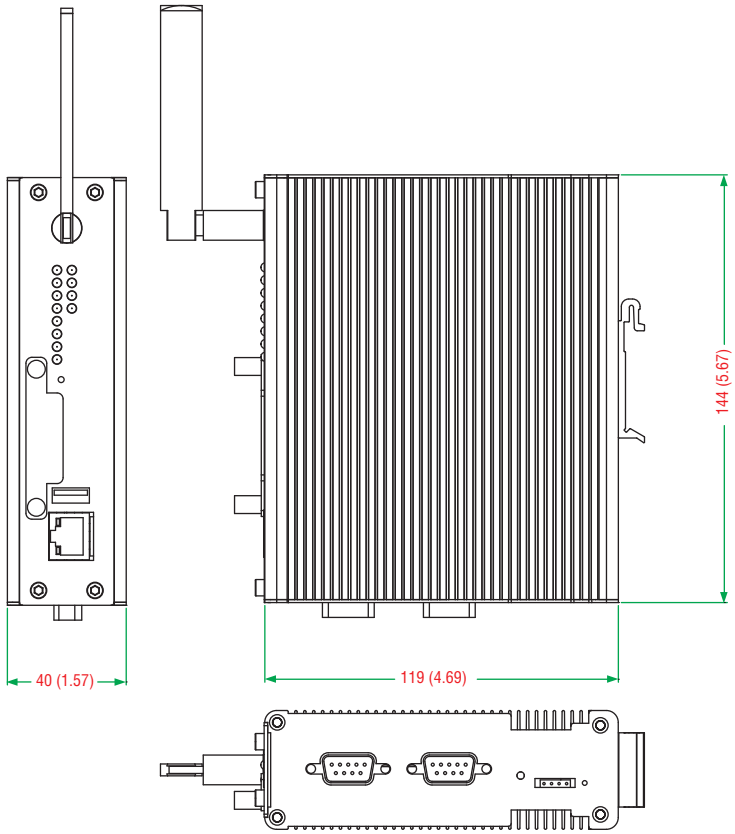
OS: Linux 2.6.23
File System: JFFS2 (for on-board flash)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage Web 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

W315A W325A

- 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 50g 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

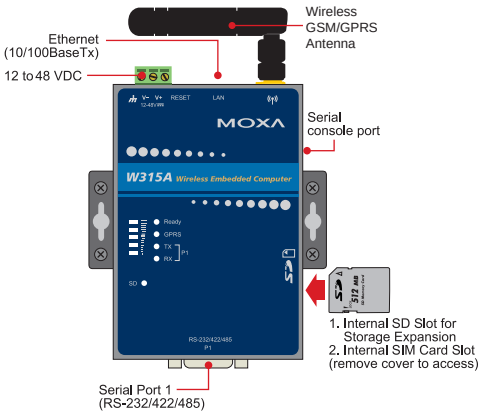
The W315A/325A are embedded Linux computers that feature 1, 2, or 4 software selectable RS-232/422/485 ports, 1 Ethernet port, and quad-band GSM/GPRS 850/900/1800/1900 MHz for cellular communication. Both the W325A and W345A come with an SD socket for external storage expansion. The W315A/325A computers' 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:

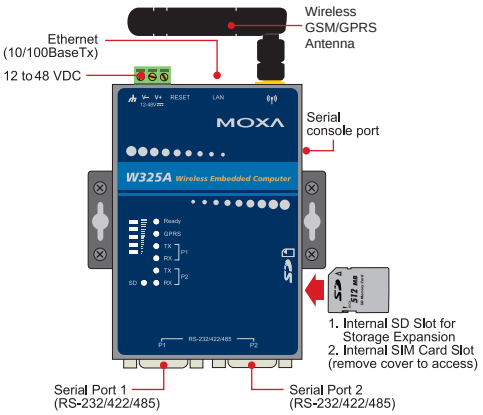
1. Users can execute commands while GPRS is connected
2. Application program development is much easier using the Rcore package

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
• 540 mA @ 24 VDC
• 1000 mA @ 12 VDC
• 200 mA @ 24 VDC
• 400 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

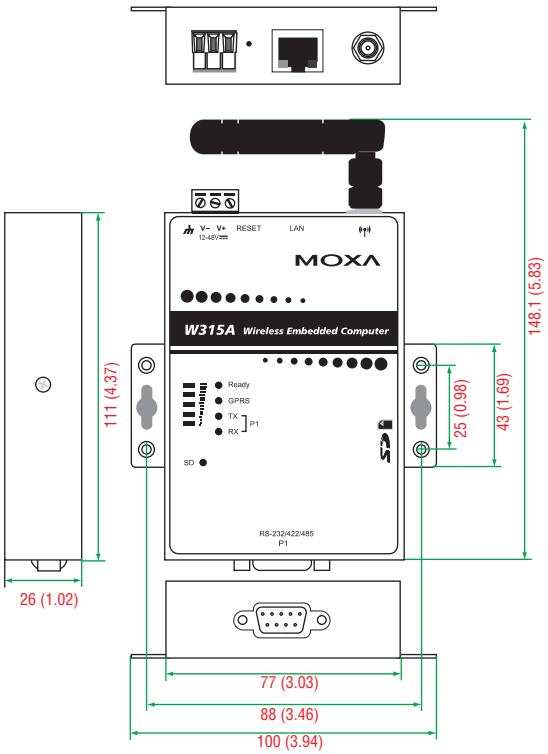
Linux
OS: Linux 2.6.9
File System: JFFS2 (for on-board flash)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage 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)

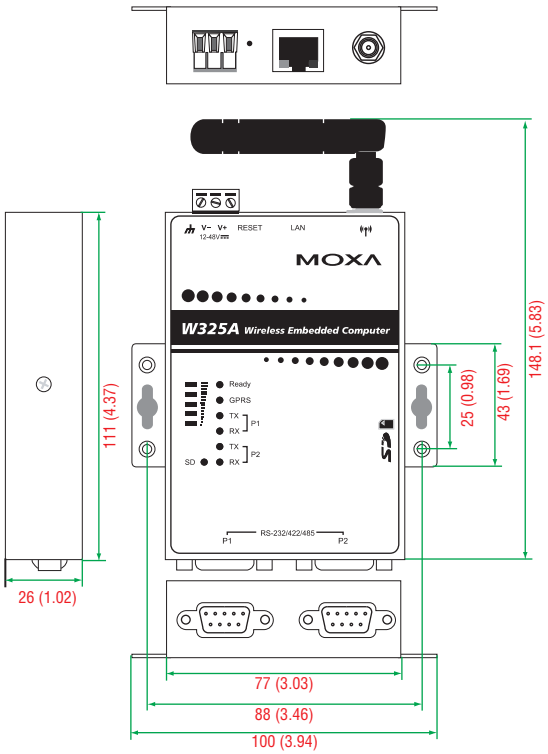
Dimensions

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

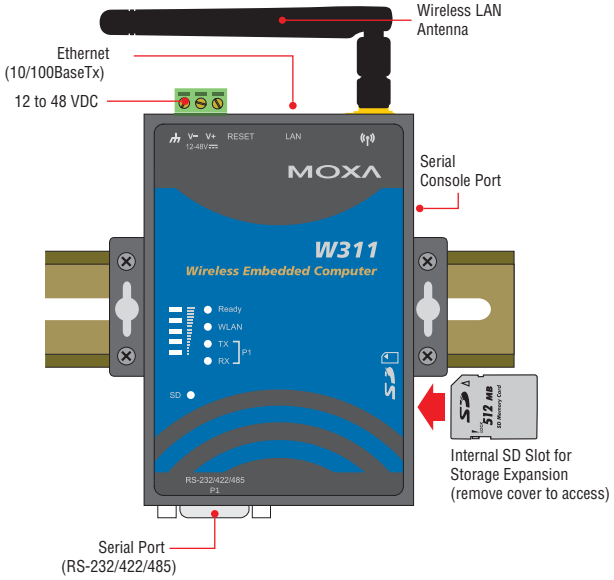
- MOXA ART ARM9 32-bit 192 MHz processor running Linux 2.6
- 32 or 64 MB RAM, and 16 MB flash disk on board
- 802.11a/b/g WLAN with repeater function
- WEP, WPA, and WPA2 encryption
- 10/100 Mbps Ethernet for network redundancy
- Relay output for external alarm connection (W341 only)
- SD socket for storage expansion
- DIN-Rail or wall mount installation
- Designed to withstand continuous 5-g vibration and 50-g shocks
- Robust, fanless design

Overview

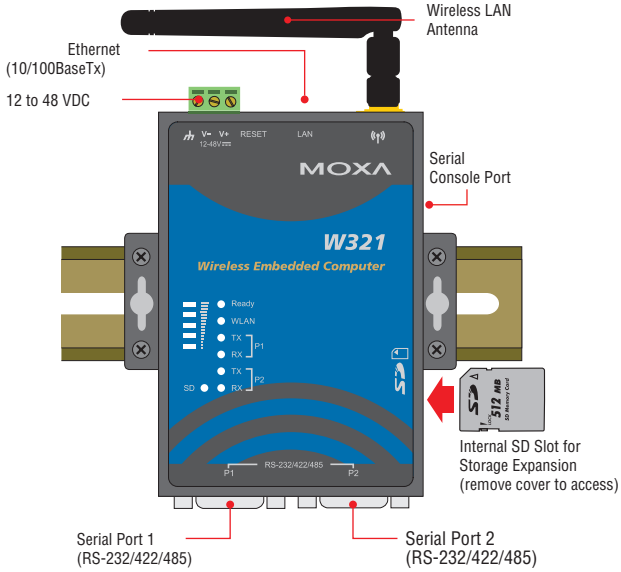
The W311/321/341 embedded Linux computers feature 1, 2, or 4 software selectable RS-232/422/485 ports, and support the IEEE 802.1a/b/g standards for WLAN connections. In addition, the computers have 1 Ethernet port, and some models come with USB 2.0 hosts and an SD socket for storage expansion. The W311/321/341 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

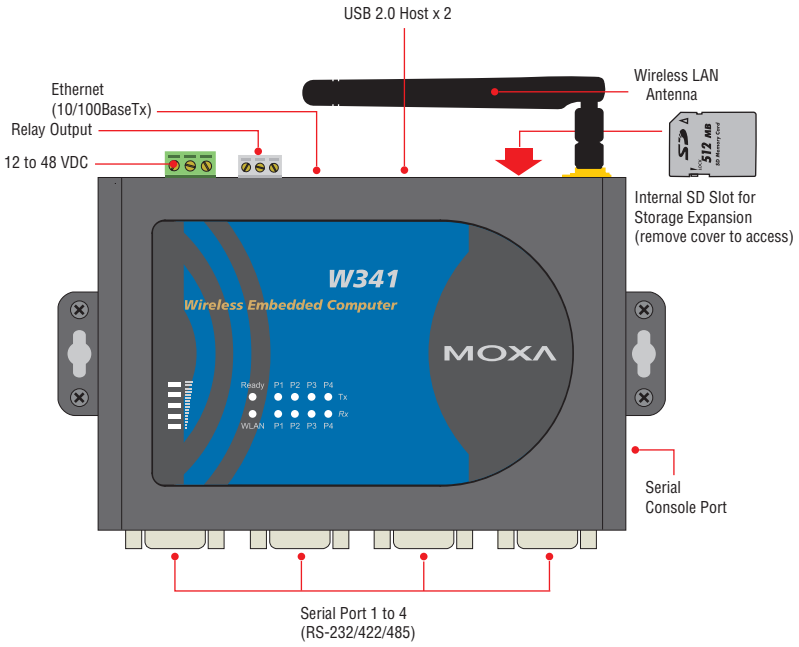
W311



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 24 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

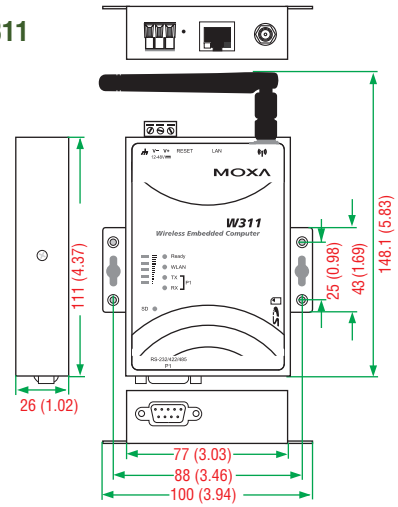
Linux
OS: Linux 2.6.9
File System: JFFS2 (for on-board flash)
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage 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

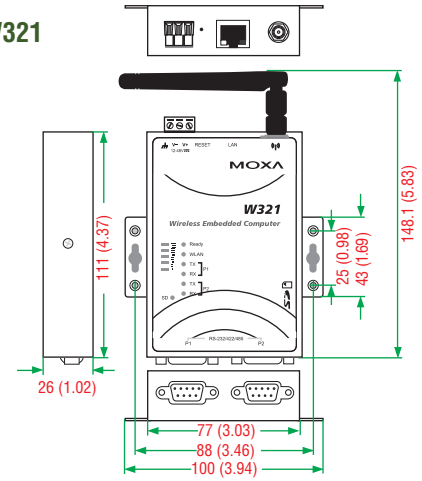
Dimensions

Unit: mm (inch)

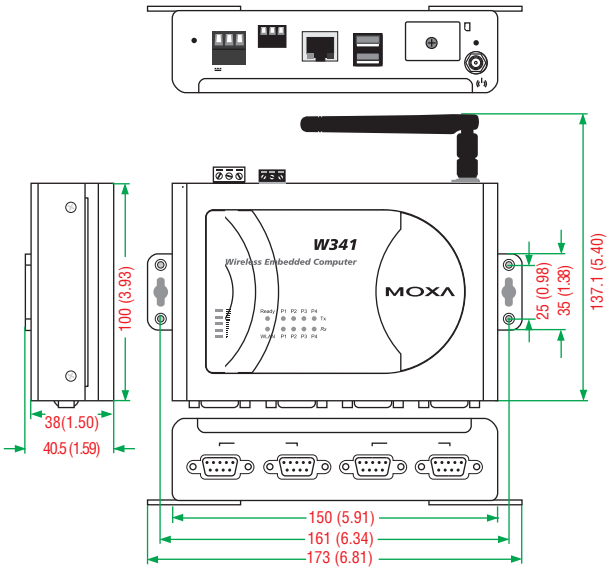
W311



W321

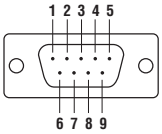


W341



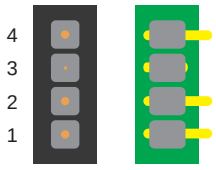
Pin Assignment

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)

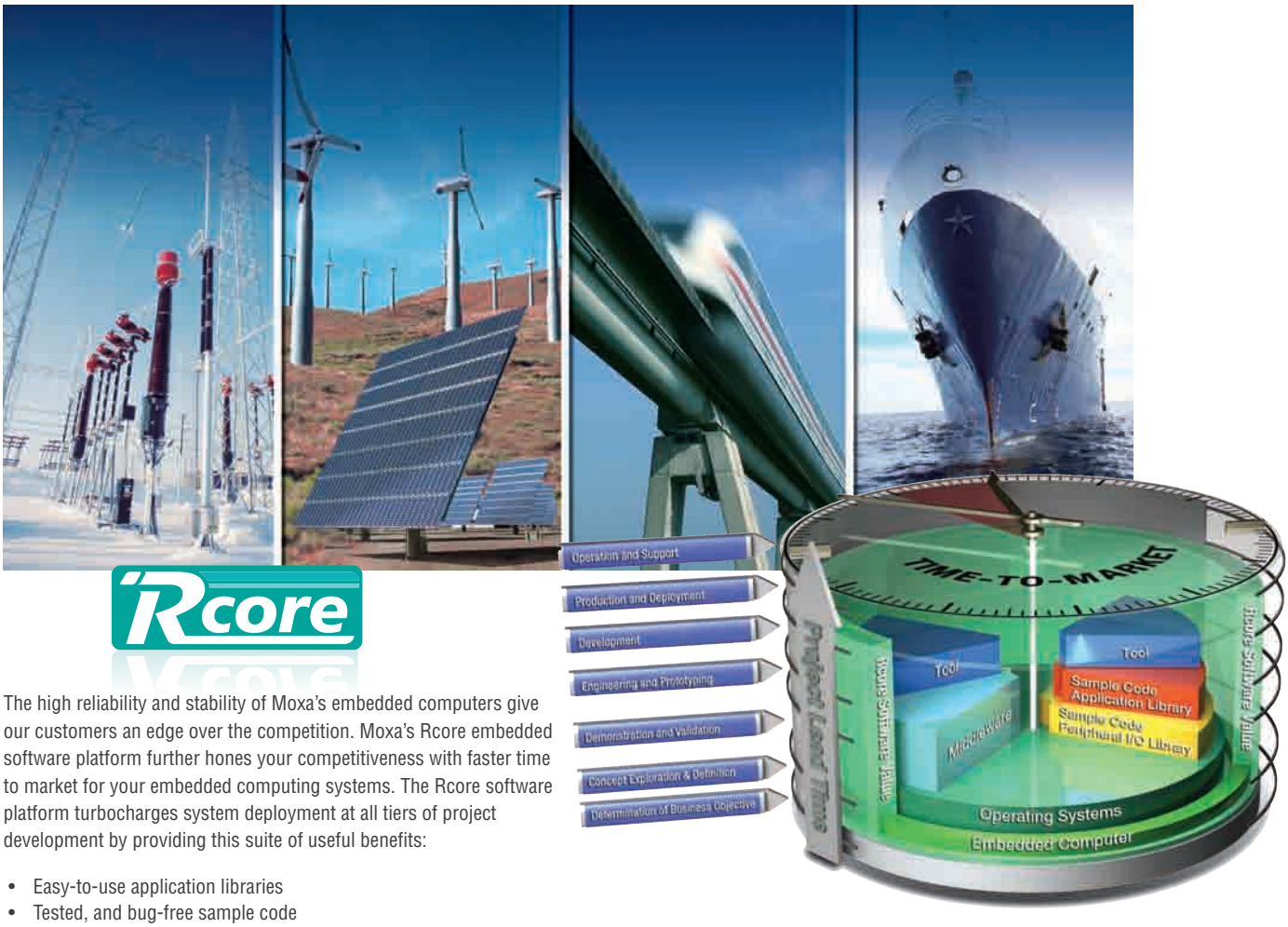
DK-35A: Mounting kit for 35-mm DIN-Rail

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



The high reliability and stability of Moxa's embedded computers give our customers an edge over the competition. Moxa's Rcore embedded software platform further hones your competitiveness with faster time to market for your embedded computing systems. The Rcore software platform turbocharges system deployment at all tiers of project development by providing this suite of useful benefits:

- Easy-to-use application libraries
- Tested, and bug-free sample code
- Consulting-level advice for application development
- Fast concept validation and development cycle

BIOS and Boot Loader

Moxa provides full-featured BIOS and boot loader solutions both for x86-based and RISC-based systems. The wide range of options and extensions provide an answer to any potential need. Key features include:

Boot Loader

- External disk boot option
- MDM remote management tool to remotely update firmware or recover
- Fast boot
- Boot loader customization and consulting

BIOS

- Power failure recovery
- LVDS innovation: various resolutions supported (up to 64 options)
- Dynamic throttling technology
- Remote system wake-up
- Remote LAN boot
- Wide compatibility with peripheral devices
- Secure software protocols
- Fast boot
- BIOS code customization and consulting
- Secured pen drive boot

Operating Systems

Moxa's x86 and ARM industrial computers offer a powerful computing environment and stable system for a variety of industrial applications. These computers use either a Linux or Windows (CE and XPe) operating system to provide programmers with a familiar environment for application development, and help reduce the effort required for system integration. Moxa continues to look for real-time operating systems that are suitable for mission critical applications.

In addition, Moxa supports RISC porting which helps customers save 70% of development time. In addition, RISC and x86 systems both have file protection systems that preserves data during power failures.

Middleware

Moxa offers a variety of middleware to help you easily integrate these application modules into your system. This allows you to take advantage of these modules' rich features without complicating the development process.

VPN

The VPN (OpenVPN, L2TP, and IPSec) middleware makes it easy for user applications to create secure tunnels between communication parties.

Firewall

The firewall (iptables) middleware protects enterprise information from unauthorized access.

Database

The database system (MySQL and MSSQL) middleware can be used to manage field-data acquisition, with web services (Web, PHP, ASP) included to give programmers an integration framework for building Internet accessible field applications, such as WebSCADA.

Sample Code

In addition to being part of the Linux community, the Moxa embedded computer family also includes models running the Microsoft® Windows® Embedded operating system. Adopting a widely used programming environment makes our embedded computers suitable for software development and legacy system migration.

Keypad

The Keypad Programming function helps developers easily program keypad buttons on the UC-7410/7420 and DA-660 series computers. In addition to the primary function, additional API functions are provided, such as a callback function defined by programmers to associate with an event.

LCM

The LCM Programming function helps developers easily program LCM displays on the UC-7410/7420 and DA-660 series computers.

Socket

Moxa embedded computers come with network interfaces that allow client-server applications to communicate with each other across a computer network. A Socket Programming function helps developers implement socket programming with TCP or UDP protocols.

Serial

In addition to the primary Serial Port Programming function, Moxa embedded computers offer higher level APIs for serial connections.

Real Time Clock

Developers can use the RTC Programming function to get the current time, set the hardware clock time to a specified time, set the hardware clock time to the system time, and set the system time from the hardware clock, by use of the function sample codes.

Buzzer

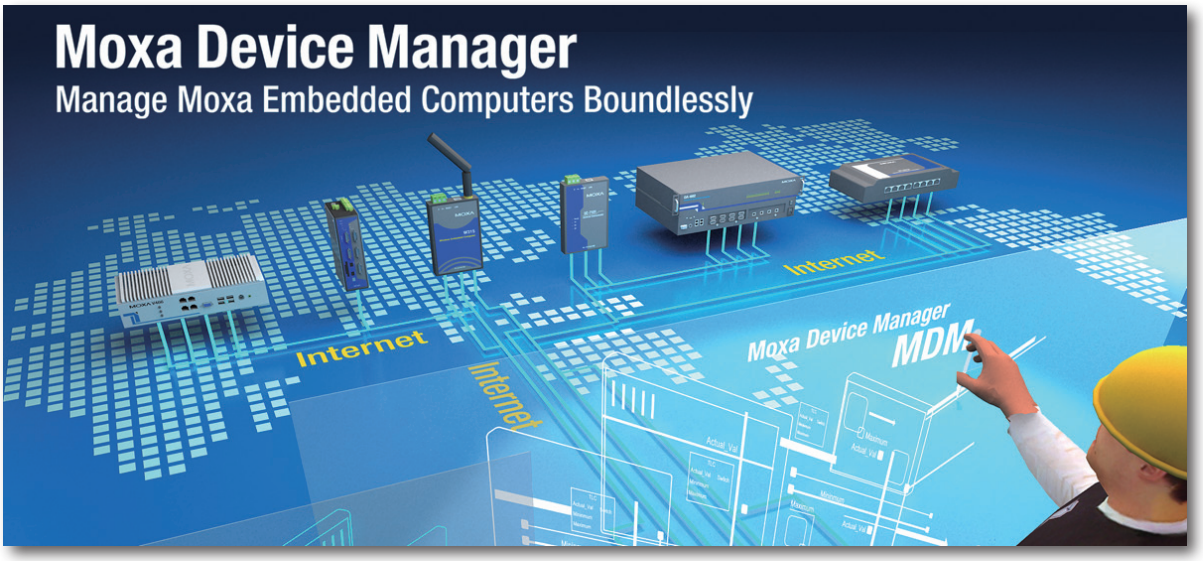
The Buzzer Programming function is used to trigger an audio alarm during unusual events.

Watchdog Timer

Moxa's embedded computers are also equipped with a Watchdog Timer Programming function that sets the system back to normal if applications don't acknowledge.

Moxa Device Manager

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 firmware upgrade (excluding EM-2260-CE, IA26X-CE, UC-712X-CE, DA-68X-LX, and XPe models) and file uploads
- Perform remote file system management
  - Download/upload files
  - Rename a file or directory
  - Run/delete a file
  - Create a directory
  - Get the file list of a directory
  - Change file mode (Linux only)
- Remote program monitoring and process control
- Remote system administration
  - Network configuration settings
  - Launch programs automatically at boot-up
  - System time set up
  - Reboot devices

User-friendly GUI

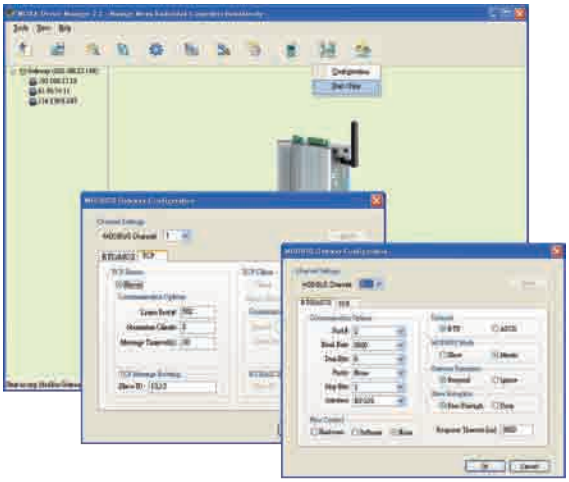
- Easy to use graphical user interface gives users "click and operate" management capability of remote devices
- Friendly window-based utilities make configuration easy

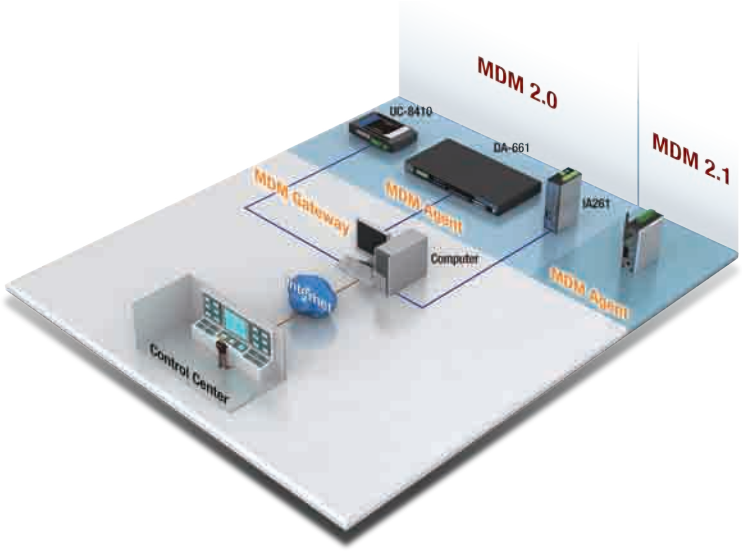
Easy Installation and Setup

- 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

Mobile Configuration (for W406 Series)

- User friendly configuration for mobile setup, including GSM/GPRS/EDGE connection, and reconnection
- nterval setup, and reconnection enable/disable
- Security authentication enabler for PIN and PUK
- Disconnection diagnosis display
- Short Message Service (SMS) management, including Send & Receive SMS, SMS storage
- 10 sets of preinstalled phone books
- AT command console allows users to produce AT commands for operations such as dialing, hanging up, and changing the parameters of the connection





System Requirements

- CPU: Intel Pentium 4 processor or higher
- RAM: 1 GB (Gateway, 512 MB)
- OS: Windows XP

Free Download Information

Moxa device manager comes with MDM Agent, MDM Tool, and MDM Gateway (users can download the package from the Moxa website in the Support/Software section)

- MDM 2.0 Tool Software
- MDM 2.1 Tool Software (W406)
- MDM 2.0 Agent Software
- MDM 2.1 Agent Software (W406)
- MDM 2.0 Gateway Software

MDM API

MDM API Features

- The MDM API provides developers with a framework to write code to manage Moxa embedded computers remotely.
- The MDM API can be integrated with users' applications.
- The MDM API provides a 3-tier system architecture to support Internet access.
- MDM Agent functions created with the MDM API are dynamically linked and loaded to provide the functions dynamically.

MDM API Functions

- 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 product models of Moxa embedded computers for Linux and Windows XPe and CE except UC-71xx-LX series

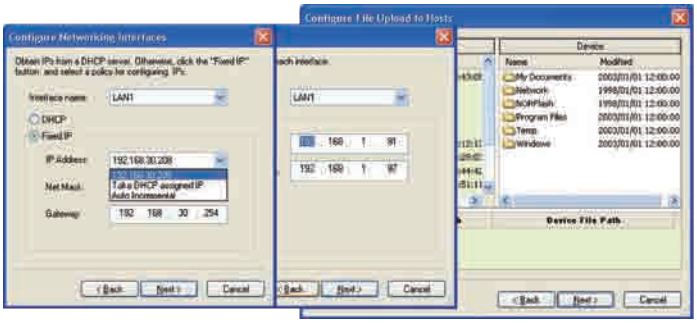
Mass Configuration Tool

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

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Related Products

10

Related 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, and 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 5121-4, 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 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**
  - DIN-Rail managed/unmanaged Ethernet switches
  - Rackmount 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

Turbo Ring Self-Healing Ethernet

Beyond Redundant Rings Turbo Chain

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

*Available in Q3, 2011

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

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 PoE+ managed switches

EDS-P206A-4PoE Series
Space-saving, cost-effective 6-port 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

Rackmount Ethernet Switches

ICS-G7526/G7528 Series
High speed, high capacity 24G+2 10GbE/24G+4 10GbE-port core switches for converged networks

IKS-6524/6526 Series
24 and 24+2G-port industrial rugged rackmount Ethernet switches for control rooms and outdoor cabinets

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-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/industrial_ethernet/index.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
- Wifi Device Servers
- Industrial 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 Converter, Isolators
- Serial to Fiber Converters

Product Spotlight

NPort 5100A Series
Greener 1-port RS-232/422/485 serial device servers with easy deplyment web console

NPort S8000 Series
Combo Ethernt switch and serial device servers

PTC-101 Series
IEC-61850 and EN50155 certified Ethernet-to-fiber converters

NPort IA5000A Series
Industrial device servers with surge protection for serial/Ethernet/Power lines

UPort 400 Series
USB-IF certified industrial-grade USB hubs

CP-118EL-A
One-chip PCI Express serial board with optimized CPU performance

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
Thumb-sized 10/100 Mbps embedded serial device servers

WE-2100T
Wireless LAN embedded serial device servers

Fieldbus Gwteways/Boards

Ethernet Fieldbus Gateway

- DF1 to EtherNet/IP gateways
- Serial-to-Ethernet Modbus gateways

Fieldbus Boards

- CAN Interface Board

Product Spotlight

MGate EIP3000 Series
Easy of use DF1 to EtherNet/IP gateways

CP-602E-I Series
CAN interface PCI Express board with 2 KV isolation

MGate MB3000 Series
Advanced serial-to-Ethernet Modbus gateways

Learn more about serial/USB/Fieldbus on Moxa's website:
http://www.moxa.com/serial_USB_fieldbus/index.htm

Industrial Wireless

Moxa's IEEE 802.11 solutions are designed for industry and include standards-based wireless products with 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.

802.11 Dual RF Wireless Redundancy Turbo Roaming

Industrial IEEE 802.11 Solutions

802.11n Network Solutions

The new AWK-3131 and AWK-4131, which 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-RS 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

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

AWK-6222
IEEE 802.11a/b/g dual-RF outdoor wireless AP/bridge/client

AWK-4131
IEEE 802.11a/b/g/n single-RF outdoor wireless AP/bridge/client

AWK-5222
IEEE 802.11a/b/g dual-RF indoor wireless AP/bridge/client

WAC-1001
Industrial wireless access controller with 50 ms Turbo Roaming

AWK-3121, AWK-4121
IEEE 802.11a/b/g single-RF wireless AP/bridge/client

Learn more about Industrial Wireless on Moxa's website:
http://www.moxa.com/ industrial_wireless /index.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 allow you to establish both primary and backup WAN networks to ensure that your cellular transmission will not be interrupted. 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.

VPN GuaranLink

Industrial Cellular Products

Cellular Router

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 Modem

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 Gateway

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

OnCell 5004/5104-HSDPA Series
5-band GSM/GPRS/EDGE/UMTS/HSDPA high speed cellular router

OnCell 5004/5104
Quad-band GSM/GPRS cellular router

OnCell G3110/G3150-HSDPA Series
5-band GSM/GPRS/EDGE/UMTS/HSDPA high performance IP gateway with VPN

OnCell G3110/G3150
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

OnCell G2110/G2150I
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_solution.htm

IP Surveillance

Create a seamless and stable IP network of on-site video devices and surveillance systems to ensure the safety and security of your industrial facilities using Moxa's IP video solutions, including industrial video encoders/decoders, outdoor IP cameras, industrial multi-service gateway, industrial network video recorders, user-friendly IP surveillance software, and software development kits (SDK). The rugged and industrial VPort series ensures reliable quality video and network transmissions to provide non-stop operations in harsh environments.

Product Portfolio

- **Industrial Video Servers**
  - Industrial Video Encoders
  - Industrial Video Decoders
- **Fixed Dome IP Cameras**
- **Industrial Modular Multi-service Gateway**
- **Industrial Video Recorders**
- **IP Surveillance Software**

Core Competence

Unique Capability of Extreme Ruggedness

As a leading provider of industrial device networking solutions, Moxa has over 24 years of experience in developing rugged products that can withstand the harsh conditions of mission-critical industrial applications. We use this expertise to provide our video networking solutions with the same hardened reliability that is characteristic of all our communications solutions. To guarantee system reliability and safety, many applications require products with special approvals and certifications. Moxa's industrial video networking solutions are all designed to meet these critical requirements:

- Wide operating temperature range (T models)
- Optional fiber-optic Ethernet support for long-haul transmission
- 12/24 VDC or 24 VAC redundant power inputs
- IP30/66-rated housing
- High MTBF (> 200,000 hrs)
- Industrial EMI/ESD protection
- Industrial approvals: UL 508, Class I, Div. 2/ATEX Zone 2, DNV/GL/ABS/LR/NK compliant
- Trusted 5-year warranty

Seamless SCADA-integrated Communications

Moxa provides industrial SCADA surveillance solutions designed in compliance waith industrial I/O devices and SCADA/HMI systems. Choose from a wide variety of VPort video servers with Modbus/TCP protocol support to bridge proprietary automation communications and open IP networks. Through OPC communications, Moxa's SoftNVR-IA IP surveillance software can directly activate video recordings and alarm notifications triggered by automation systems, and the integration of IP surveillance and automation systems could not be easier.

Surveillance System **Automation System**

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

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 461/451 Series
1-channel H.264/MJPEG or MPEG4/ MJPEG industrial video encoders, maximum of 3 video streams

VPort 354 Series
4-channel MJPEG/MPEG4 industrial video encoders, up to 120 FPS at 704 x 480 resolutions

VPort 351 Series
1-channel MJPEG/MPEG4 industrial video encoders, up to 30 FPS at 720 x 480 resolutions

VPort 254 Series
4-channel MJPEG/MPEG4 industrial video encoders, up to 120 FPS at 352 x 240 resolutions

VPort 251 Series
1-channel MJPEG/MPEG4 video encoders, up to 30 FPS at 720 x 480 resolution

VPort D361 Series
1-channel H.264/MJPEG industrial video decoder

VPort D351 Series
1-channel MJPEG/MPEG4 industrial video decoder

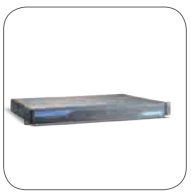
Outdoor IP Cameras

VPort 16-M12 Series
Compact IP cameras for rolling stock applications, EN 50155 compliant, high quality CCD images

Industrial Multi-service Gateway

VPort 704-T
Industrial multi-service gateway built for seamless fieldsite communications for decentralized SCADA systems

Industrial Video Recorders



MxNVR-IA8 Series
8-channel industrial network video recorder for harsh environments

IP Surveillance Software

SoftNVR-IA
32-channel OPC-enabled IP video surveillance software delivers real-time video monitoring

VPort SDK PLUS
User-friendly software development kits for third-party developers to customize video-over-IP management systems

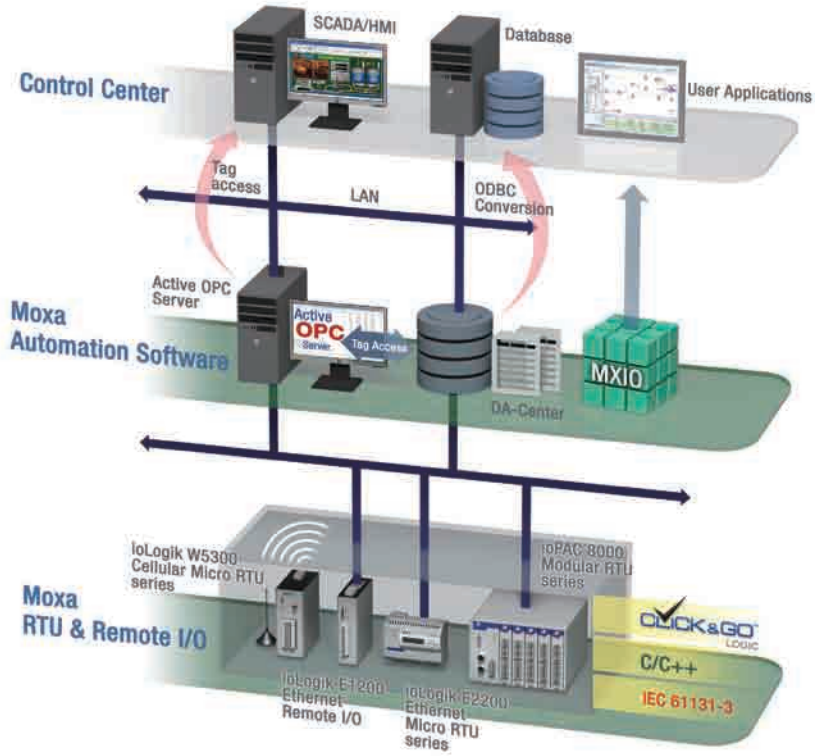
Learn more about IP Surveillance Solutions on Moxa's website:

http://www.moxa.com/ip_surveillance/index.htm

Remote Automation

Moxa's remote automation solutions empower control and monitoring systems in remote locations with the latest technology and industry expertise. Moxa's product portfolio includes programmable RTU controllers, Remote I/O devices, and easy-to-configure automation software. Both network and cellular communication interfaces are available to fit the requirements of different applications and to simplify long-range host-to-device communications around a standard industry protocol. Moxa's integrated solutions give system operators comprehensive situation awareness over their field instruments and enhance your operational and maintenance efficiency.

Product Portfolio



Modular RTU Controllers

ioPAC 8000 series modular RTUs combine powerful computing capability, modular flexibility, unbeatable reliability, and programmable control logic to meet the demands of large scale applications in harsh environments.

Cellular Micro RTU Controllers

An ioLogik W5300 cellular micro RTUs is a 3G HSDPA/GPRS mobile modem, I/O controller, and data logger, all rolled into one, and is perfect for distributed wireless telemetry networks.

Ethernet Micro RTU Controllers

ioLogik E2200 micro RTUs double as intelligent micro I/O controllers by offering easy-to-use local control logic and an Ethernet interface.

Ethernet Remote I/O

ioLogik E1200 Ethernet remote I/O products come with different I/O combinations and two embedded Ethernet switch ports that can be used to form a daisy-chain topology for easy cabling.

Automation Software

Moxa's automation software portfolio includes two software programs: event-driven Active OPC Server and DA-Center, a data logging and conversion tool. Working with ioLogik and ioPAC series products, both solutions leverage the power of the patented "Active" communications technology to maximize data collection efficiency.

Product Spotlight

Modular RTU Controller

ioPAC 8000 Series

- -40 to 75°C operating temperature range
- Anti-vibration EN50155, 50121-3/4 compliant for rail applications
- Programmability of Click&Go, C/C++ or IEC-61131

Cellular Micro RTU Controller

ioLogik W5300 Series

- Flexible, unicode alarm system supporting SMS, email, SNMP Trap, TCP, UDP
- Active and seamless SCADA connection via 3G/GPRS
- Multiple programmability of Click&Go, C/C++ or IEC-61131

Ethernet Micro RTU Controller

ioLogik E2200 Series

- Front-end intelligence that supports IF-THEN-ELSE Click&Go control logic
- Active messaging with real-time stamp, including, SNMP Trap with I/O status, TCP, and email
- Supports SNMPv1/v2c/v3 protocol

Ethernet Remote I/O

ioLogik E1200 Series

- Built-in 2-port Ethernet switch for daisy-chain topologies
- Free support for Moxa's push-based Active OPC Server Lite
- Peer-to-peer I/O singal mapping function

Modular Remote I/O

ioLogik E4200

- Easy expansion; supports up to 16 I/O modules
- Dual Ethernet LANs and one RS-232 port for SMS alarm
- Front-end intelligence that supports IF-THEN-ELSE Click&Go control logic

Automation Software

Active OPC Server

- Patented event-driven tag update
- Firewall-friendly connection from remote ioLogik/ioPAC devices
- Free download from Moxa's website

DA-Center

- Convert field data to ODBC compliant databases
- Convert field data to Excel or Access spreadsheets
- Embedded trend charts for historical analysis

Learn more about Remote Automation on Moxa's website:

http://www.moxa.com/product/remote_io.htm

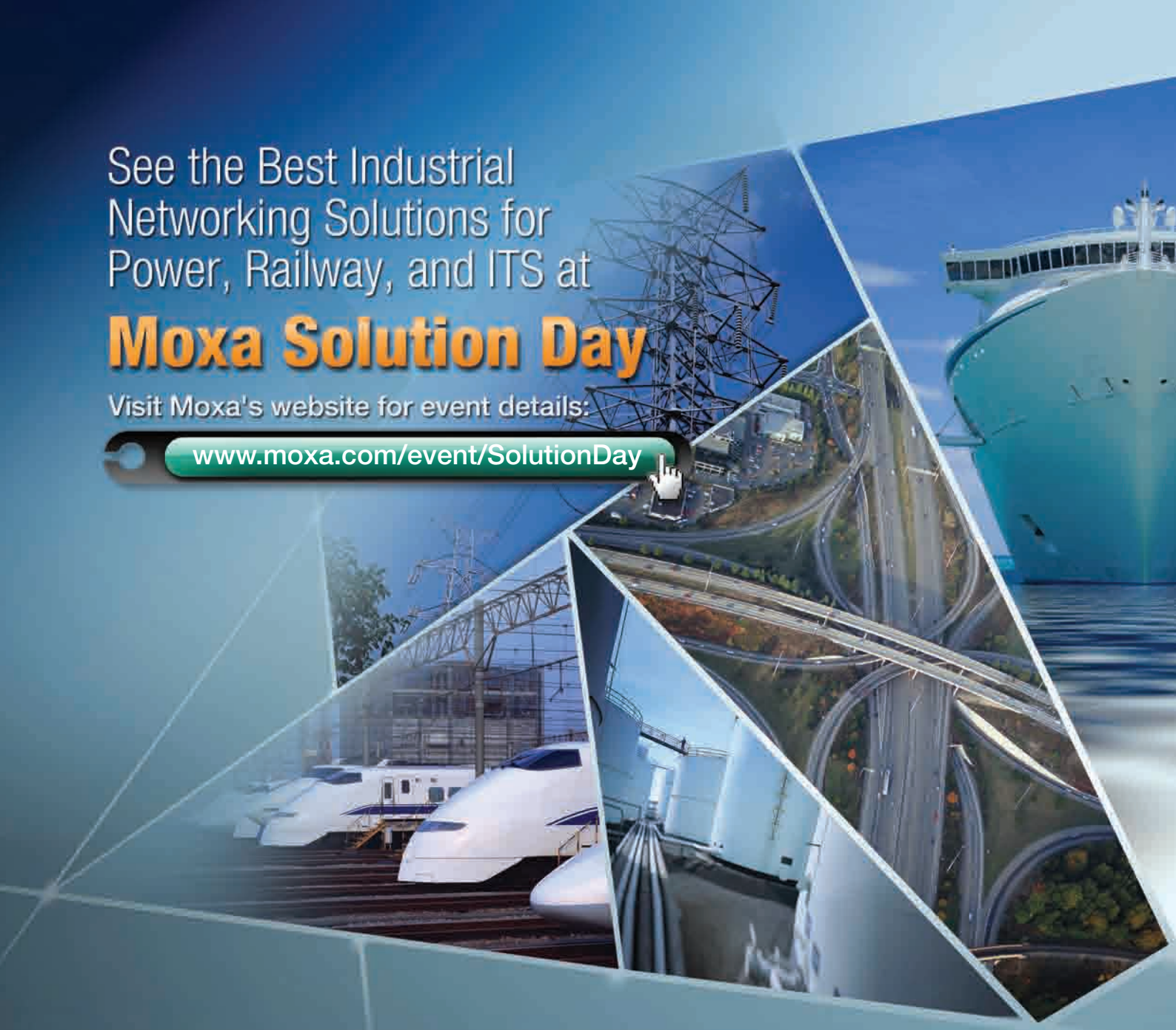
> The latest product information can be found here: www.moxa.com/product

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

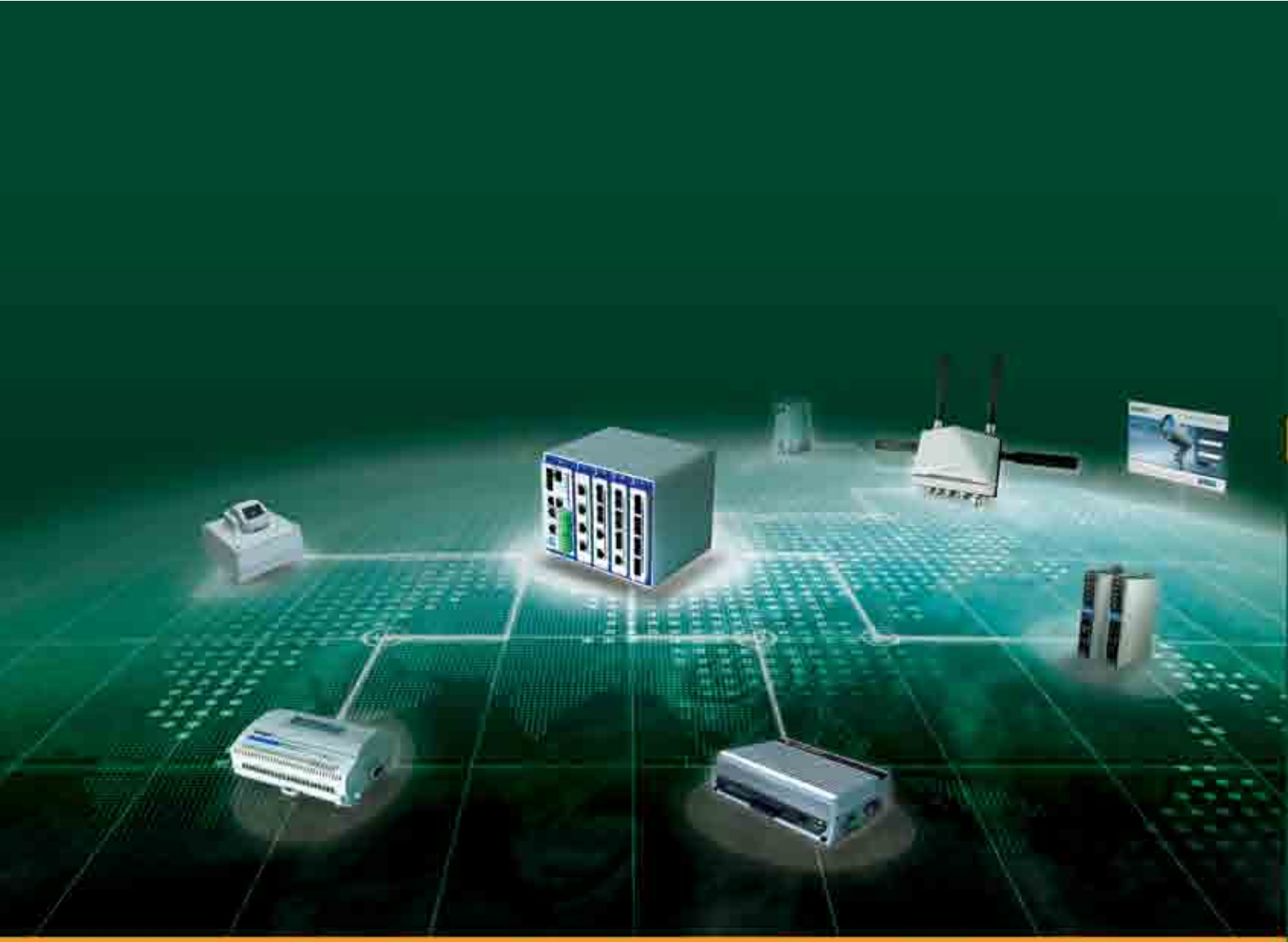


Moxa's Solution Day is a great opportunity to discover the latest trends and advances in industrial networking. Moxa's market experts will concentrate on the latest trends in the power, railway automation, and ITS markets, and examine several real-life applications in detail. You will learn about the 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.

MOXA® SOLUTION DAY



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