Master Catalog

2016-2017

Enabling Connectivity for the Industrial Internet of Things

• Edge Connectivity • Industrial Computing • Network Infrastructure

MOXA®

Reliable Networks ▲ Sincere Service

Moxa: Your Trusted Partner in Automation

As the Industrial Internet of Things (IoT) interconnects our world faster than ever, we rely more than ever on network infrastructures. Since its establishment in 1987, Moxa has had a proven track record of providing customers with the most reliable networks for a variety of industrial applications.

With over 25 years of industry experience, Moxa has connected more than 40 million devices worldwide. These devices have delivered highly reliable communications between people, systems, and processes to achieve all forms of automation and collaboration.

Promise for the Future

Reliable Networks, Sincere Service continues to be Moxa's promise to enable connectivity for the Industrial IoT. Moxa stays ahead of the curve with innovative Ethernet-core technology and solutions to help customers tap into the potential of the Industrial IoT market.

Reliable Networks

Network reliability is the cornerstone of Moxa's commitment to deliver the best value to our customers and partners. Moxa's many solutions share a common set of robust features designed to provide maximum network uptime, especially in harsh environments. Our cutting-edge product portfolio comprises quality and innovative technology to ensure nonstop productivity, operational efficiency, and robust security for complex industrial communications and automation applications.

Sincere Service

At Moxa, we listen carefully to learn more about our customers' expectations and needs before we develop a solution. With extensive experience and innovative technology, we provide premium customization, expert network consulting, and a broad range of technical support services. Through close collaboration with our worldwide partners, we help customers optimize their applications' performance, adapt to fast-changing technologies, and seize opportunities to achieve the best time-to-market results.

Product Offerings

Edge Connectivity

Moxa's edge connectivity products bridge various industrial devices to streamline the acquisition and transmission of data, voice, and video to backbone networks. Customers can enjoy seamless network integration for various cross-system collaborations.

- Serial connectivity
- Industrial Ethernet gateways
- RTU controllers and smart I/O devices
- Industrial IP cameras and video management software

Industrial Computing

Moxa provides RISC- and x86-based industrial computers to work in the most demanding conditions. The world's first wide-temperature-range 4G LTE computer is a perfect example of a device that delivers reliable 4G performance without requiring a fan or a heater.

- Mission-critical computers
- Displays and panel computers
- Compact and wireless computers
- Embedded CPU modules

Network Infrastructure

Moxa's network infrastructure solutions provide comprehensive building blocks to develop robust wired and wireless backbones for mission-critical applications with regard to device reliability, connection availability, cybersecurity, and easy management.

- Industrial Ethernet switches
- Industrial wireless AP/bridge/client and cellular routers
- Industrial secure routers
- Ethernet media converters
- Network management software

Get Connected to Success and Opportunity

Worldwide, Moxa's expert sales team is ready to provide the best quality, support, and services to assist you in all aspects of your projects—from concept to completion—to empower your network operations and applications.

Global Service Coverage

Customer-Oriented Service

Moxa has established a global service network to be closer to our customers to better understand their needs and respond faster to their requirements. Leveraging Moxa's industrial experiences and technological intelligence, our service team provides professional solutions and consulting services, backed by our extensive global resources and solution capabilities.

Extended Teamwork

Through our annual MTSC (Moxa Technical Support Certification) training, Moxa provides the most up-to-date solutions and technologies to our global partners to ensure the best service to customers. Integrating the strengths of our worldwide industry and technology partners, we deliver sincere service and an extended range of innovative solutions to customers.

Total Quality Management

Our commitment to quality is at the heart of Moxa's promise of *Reliable Networks, Sincere Service.* Moxa employs a corporate-wide Total Quality Management System (TQMS) to achieve customer satisfaction and unbeatable results in the following categories:

Robust Technology

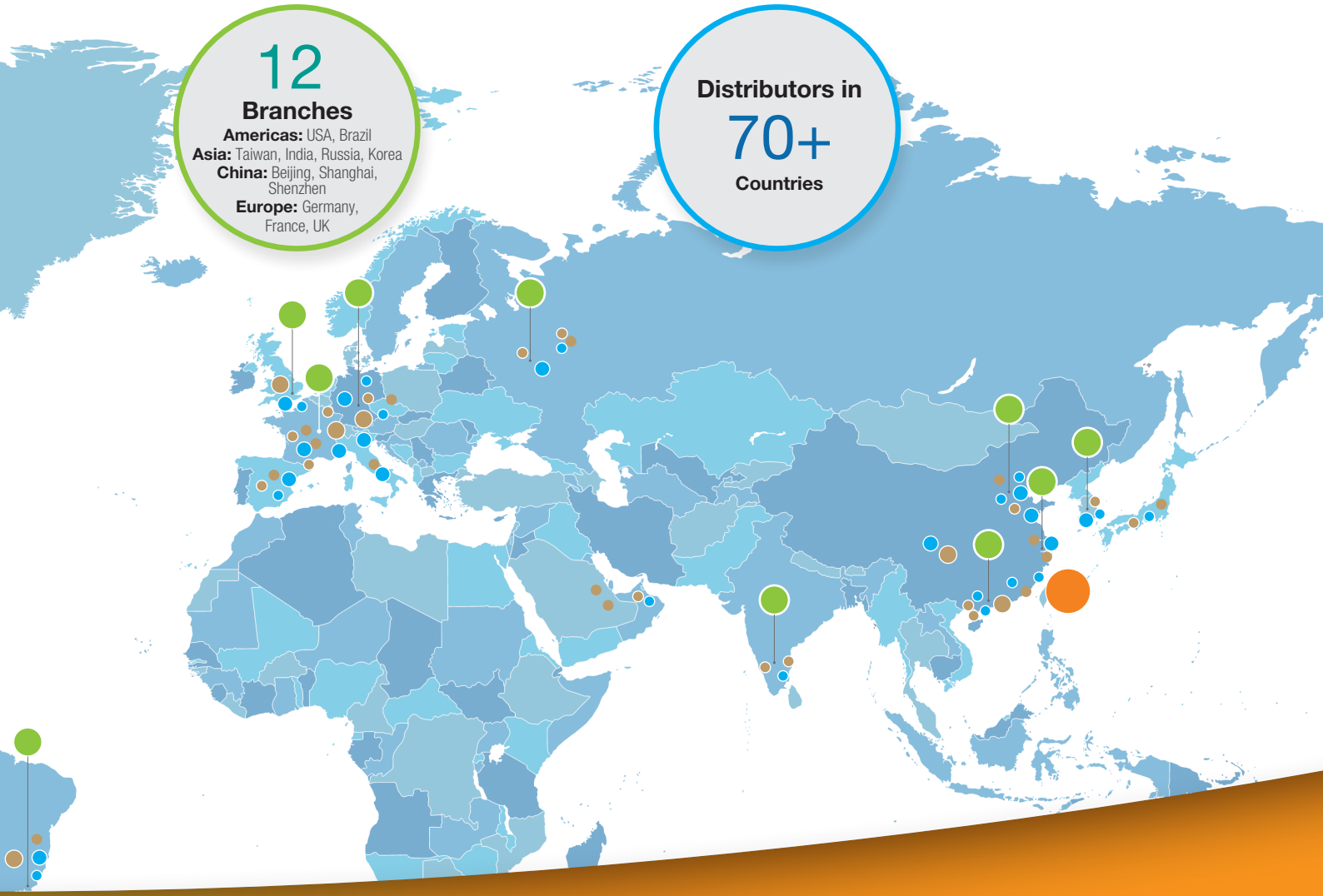
At Moxa, quality starts with concepts that benefit our partners and customers. Moxa attracts a broad spectrum of talent and encourages new ideas to nurture innovation at every level. Following the well-defined New Product Development Process (NPDP), all of Moxa's products must undergo strict tests, verifications, and validations to achieve tangible quality-related benchmarks for various industrial applications.

Project Life-Cycle Management

Moxa is IRIS-certified and implements a rigorous management process to ensure quality and optimal results for long-term projects. Specific RAMS and LCC management guidelines guarantee reliability, longevity, low life-cycle costs, and easy maintenance throughout a project's lifetime.

Continuous Improvement

Moxa motivates each employee to work smarter and find ways for continuous improvement. Our Quality Improvement Team (QIT) and Eight Disciplines Problem-Solving (8D) methodology for solving problems and preventing crises promote continuous progress in the quality of our products, service, and technology, to ensure customer satisfaction.



Technological Innovation

Moxa cultivates continuous technological innovation to meet the constantly changing requirements of industrial environments. To enable the most capable and reliable connectivity required for the Industrial IoT, Moxa strives to achieve application-driven innovations in the following aspects.

■ Performance
High-speed wired/wireless connectivity for future-proof networks

■ Reliability
Proven reliability for continuous productivity

■ Availability
Millisecond-level redundancy for nonstop operations

■ Security
Industrial cybersecurity for critical device protection and secure remote access

■ Manageability
Easy operations in deployment, monitoring, and diagnostics maintenance

■ Interoperability
Leading legacy and versatile fieldbus technologies for seamless automation communication

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Enabling Connectivity for the Industrial Internet of Things

Moxa's industrial network and automation solutions are ready to take connectivity to new frontiers. With a forecast of more than 50 billion devices connected worldwide by 2020, Moxa focuses on connectivity enablement to expand communication and collaboration between various devices, technologies, and people.

Edge Connectivity

Serial/Fieldbus Connectivity

Serial or fieldbus connectivity bridges legacy, fieldbus, and Ethernet devices to reap the benefits of legacy-to-IP communications and operational efficiency.

I/O Connectivity

Industrial I/Os and controllers enable faster data transfer and SCADA response, as well as programming-free logic control.

Video Connectivity

Extreme weather IP cameras activate 360-degree HD surveillance for extreme applications.

Smart Value for Your Applications

Through our fully converged communication solutions, Moxa helps customers build remote control and monitoring networks suited for highly automated industrial operations and demanding public-safety applications.

Powering Productivity

Our cutting-edge product portfolio delivers superior performance thanks to high bandwidth, reliability, availability, and interoperability in mixed-protocol and legacy environments.

- High-speed transmission
- Maximum uptime and availability
- Video always-on networking
- Reliable mobile communications
- Industry-proven reliability
- Legacy compatibility
- Protocol interoperability

Optimizing Operational Efficiency

Moxa's extensive software solutions are the key to operational efficiency, including intuitive management software for operations that are faster and less error-prone, as well as an API platform for faster development and ease-of-use.

- Faster deployment
- Visualized management
- Easier troubleshooting
- Preventive maintenance
- APIs for easy application deployment
- Seamless integration with SCADA systems

Strengthening Security

A convergence of cybersecurity and physical security systems forge a reinforced network to ensure the full protection of control systems and staff safety in industrial applications.

- Device security with authentication, integrity, and firewall protection
- Secure remote access with IPSec, L2TP, or OpenVPN encryption
- IEC 62443 standard compliance *(Available in Q4, 2016)*
- Industrial-grade IP surveillance systems

Factory Automation

Moxa's factory automation solutions are designed to drive productivity and cost reduction through network convergence from the edge to the core. The solutions deliver optimized process integration and automation-friendly management to improve throughput and performance.

Industrial Computing

Industrial Computers

Embedded computers enable seamless data aggregation, analytics, and reporting from the extreme edge to the cloud/core.

Network Infrastructure

Industrial Ethernet

Industrial Wireless

Industrial Ethernet and WLAN solutions offer leading performance, availability, and reliability to achieve maximum uptime and efficiency for wired and wireless connectivity.

Industrial Routers

Industrial secure and cellular routers enable asset protection and secure access across public networks.

Management

IA-friendly device management and network management address easy deployment, supervision, troubleshooting, and seamless collaboration with SCADA and third-party platforms.

Railway Automation

Moxa's IRIS-certified railway solutions come with the top-notch service, quality, and commitment that industrial customers demand. Moxa's railway solutions deliver EN 50155-compliant control and communications between train, ground, and trackside to ensure safety and uninterrupted passenger services.

Power Automation

Moxa has delivered solutions in more than 300 successful substation networking and computing applications. Moxa's solutions ensure GOOSE compliance and zero-packet-loss performance in compliance with IEC 61850-3 and IEEE 1613 standards.

Oil and Gas Automation

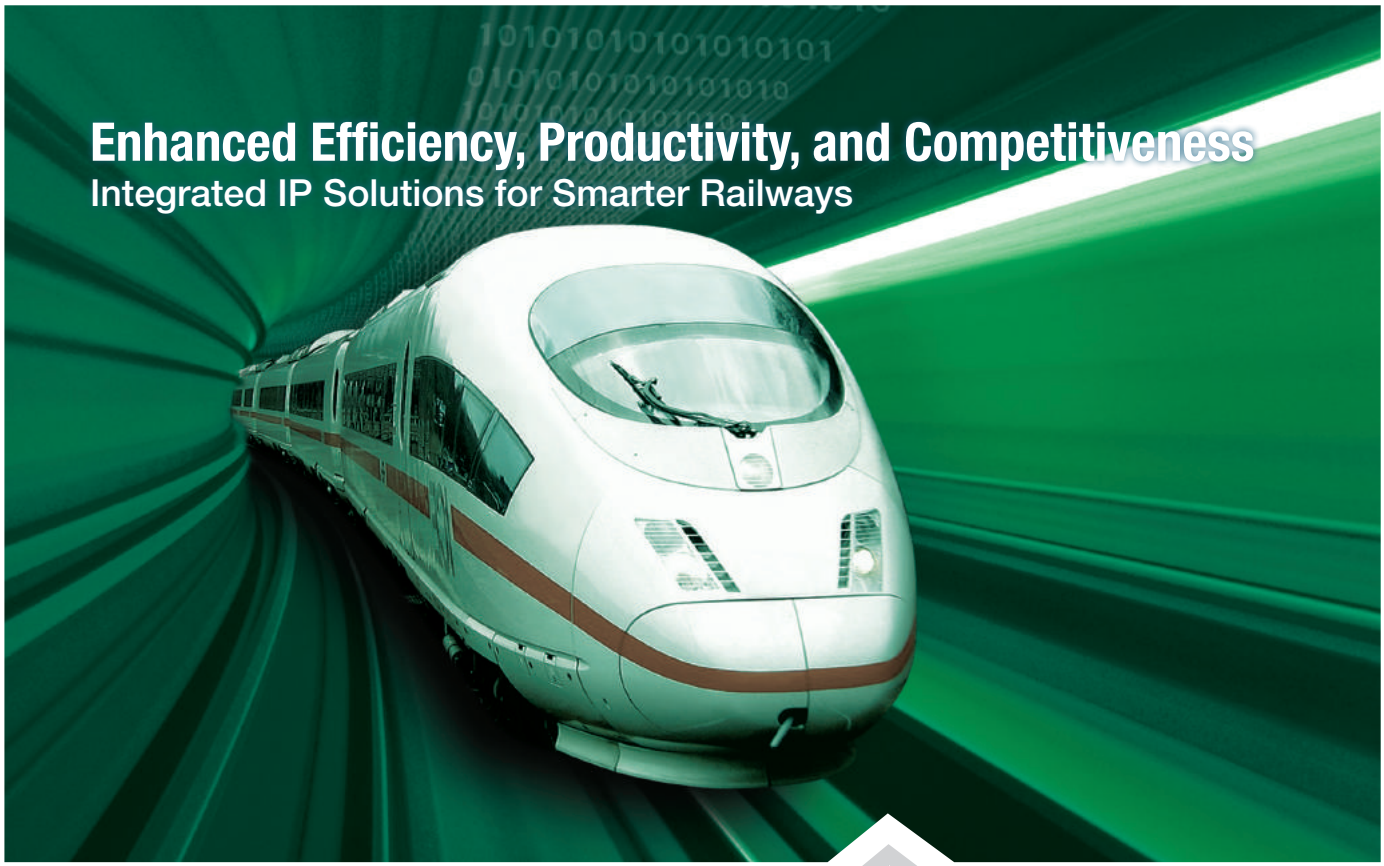
Moxa's oil and gas automation solutions comply with UL Class 1 Division 2, ATEX Zone 2, and IECEx standards, allowing customers to achieve maximum uptime and improved productivity with our oil and gas networking, monitoring, and computing solution portfolio.

Marine Automation

Moxa's marine solutions, compliant with all major maritime certifications, offer a wide range of marine-grade industrial Ethernet and computer products that ensure long-lasting and reliable operations in the challenging environments experienced by ship, offshore oil and gas, and windmill applications.

Intelligent Transportation Systems

Moxa's ITS solutions combine high-bandwidth networks and HD IP video solutions to ensure fast information convergence and nonstop operational continuity, allowing traffic control managers to make decisions quickly in the event of road traffic emergencies.



IRIS-Certified Rail Solutions Verified for Maximum Quality

Moxa is an IRIS-certified global leader in a wide range of IP-based communications solutions. Now, Moxa is contributing its networking expertise to the railway industry through membership in IEC railway committees. Railway operators world-wide have discovered new operational efficiencies by deploying Moxa's unique time and cost-saving railway technologies. By designing for a long MTBF, owning all the core component IPs, and building long-term partnerships, Moxa helps railway integrators create sustainable solutions with low life-cycle costs for passenger comfort and railway operation networks.

Application Focus

- Passenger-oriented service (e.g., onboard Wi-Fi, passenger information systems)
- Railway CCTV
- CBTC (Communication-Based Train Control)
- Wayside data communications systems

Leading Technologies

- Turbo Ring and Turbo Chain: Advanced Ethernet redundancy solutions
- Turbo Roaming: Fast and secure train-to-ground wireless communications
- ACC: Intelligent wireless inter-carriage links
- FLI: Flexible, location-based, intelligent industrial-grade auto-configuration technology

IRIS Certification

Visit www.moxa.com/rail

ACC Auto Carriage Connection FLI Industrial Auto Configuration EN 50155 EN 50121

ToughNet, EDS Series
Industrial Ethernet Switches
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TAP, AWK-RCC/RTG Series
Industrial Wireless AP/Bridge/Client
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NPort 5000AI-M12 Series
RS-232/422/485 Serial Device Servers
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TC-6000, V2000 Series
Industrial Embedded Computers
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VPort Series
Industrial IP Cameras
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ioPAC Series
Industrial RTU Controllers
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ioLogik E1500 Series
Remote I/Os
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Connect to the Smart Grid Today

End-to-End Networking and Computing Solutions for the Power Industry

Many Successful Deployments in Power Projects Worldwide

Create rock-solid and future-proof power networks by partnering with Moxa. Moxa is a Collective Member of CIGRE and has delivered solutions in over 500 successful substation transmission and distribution networking and computing applications around the world. Moxa is now the leading solar energy monitoring supplier in North America with many diverse projects in advanced metering infrastructures worldwide. You can rely on our expertise of more than 25 years in proven solutions in the following industry applications.

Application Focus

- Solar power
- Wind power
- IEC 61850 transmission and distribution substation
- Advanced metering infrastructure

Leading Technologies

- Industry's first IEC 61850 switch with MMS data modeling: SNMP/MMS management with integrated network monitoring solutions for power substation SCADA
- Industry's first integrated PRP/HSR redundancy box for zero recovery time
- Turbo Chain: Different redundant networks can be extended without any ring coupling effort
- Patented computing platform for heat dissipation with wide temperature tolerance
- ThingsPro: Asset management for solar energy monitoring

Visit www.moxa.com/SmartGrid

Turbo Chain | PRP HSR | IEC 61850 IEEE 1613 | ThingsPro

PT-7528 Series
IEC 61850 28-port IEEE 1613 Class 2 Managed Ethernet Switches
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PT-7728-PTP Series
IEC 61850 14-port IEEE 1588v2 Managed PRP/HSR Switches
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PT-G503-PHR-PTP Series
IEC 61850 3-port Full Gigabit Managed PRP/HSR Redundancy Boxes
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DA-820 Series
x86 IEC 61850-3 Certified i7 Rackmount Computers
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NPort S8000 Series
Combo Switches / Serial Device Servers
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UC-8100 Series
RISC Energy Monitoring Computers
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ioLogik E1200 Series
Compact Ethernet Remote I/O
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DCU-8620-T Series
Data Concentration Units
▶Available by request

Proven Solutions for the Harshest Oil & Gas Environments

Integrated Networking, Monitoring, and Computing Systems

Your Trusted Partner in Oil & Gas Automation

Moxa is a leading provider of industrial automation solutions and has proven experience in providing networking equipment and service suitable for the harshest oil & gas environments. Moxa's industrial-grade products and well respected technology enable efficient remote monitoring and easy asset management, delivering business value to customers all over the world. To assure the highest level of safety, the computing, networking, and automation products Moxa develops especially for use in oil & gas facilities meet important global certifications, including ATEX Zone 2, Class 1 Division 2, and IECEx.

Application Focus

- Offshore oil drilling control systems
- Onshore drilling / wellhead monitoring
- Pump stations and pipeline monitoring
- Oil refining and gas station operations

Leading Technologies

- Turbo Ring and Turbo Chain: Unrivaled network redundancy solutions with 20 ms recovery
- Dual-Radio and Turbo Roaming: Zero packet loss and millisecond-level wireless roaming
- ISA99/IEC 62443 compliant for industrial security: Layered cybersecurity solution with innovative PacketGuard™ for Modbus TCP deep packet inspection
- World-leading panel computer design: 1000-nit LCD, glove-friendly multi-touch, system bootup within 3 minutes, -40 to 70°C operating temperature without heater
- MXview, MXview ToGo, QuickLink, MX-AOPC UA Server: Efficient network management by smart visualization, automated configuration, and seamless integration with SCADA systems

Visit www.moxa.com/Solutions/Oil_and_gas

EDS/IKS/ICS Series

Edge-to-Core Ethernet Switches

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EDR Series

VPN/Firewall Secure Routers

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AWK Series

IEEE 802.11a/b/g/n Wireless AP/Bridge/Client

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MGate and NPort Series

Industrial Gateways and Device Servers

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ICF Series

Industrial Serial/PROFIBUS-to Fiber Converters

▶Page 14-32

ioLogik 2500 Series and ioLogik E1200 Series

Smart Remote I/O and Ethernet Remote I/O

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VPort Series

HD IP Cameras

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EXPC-1519 Series

Zone 2 Panel Computers

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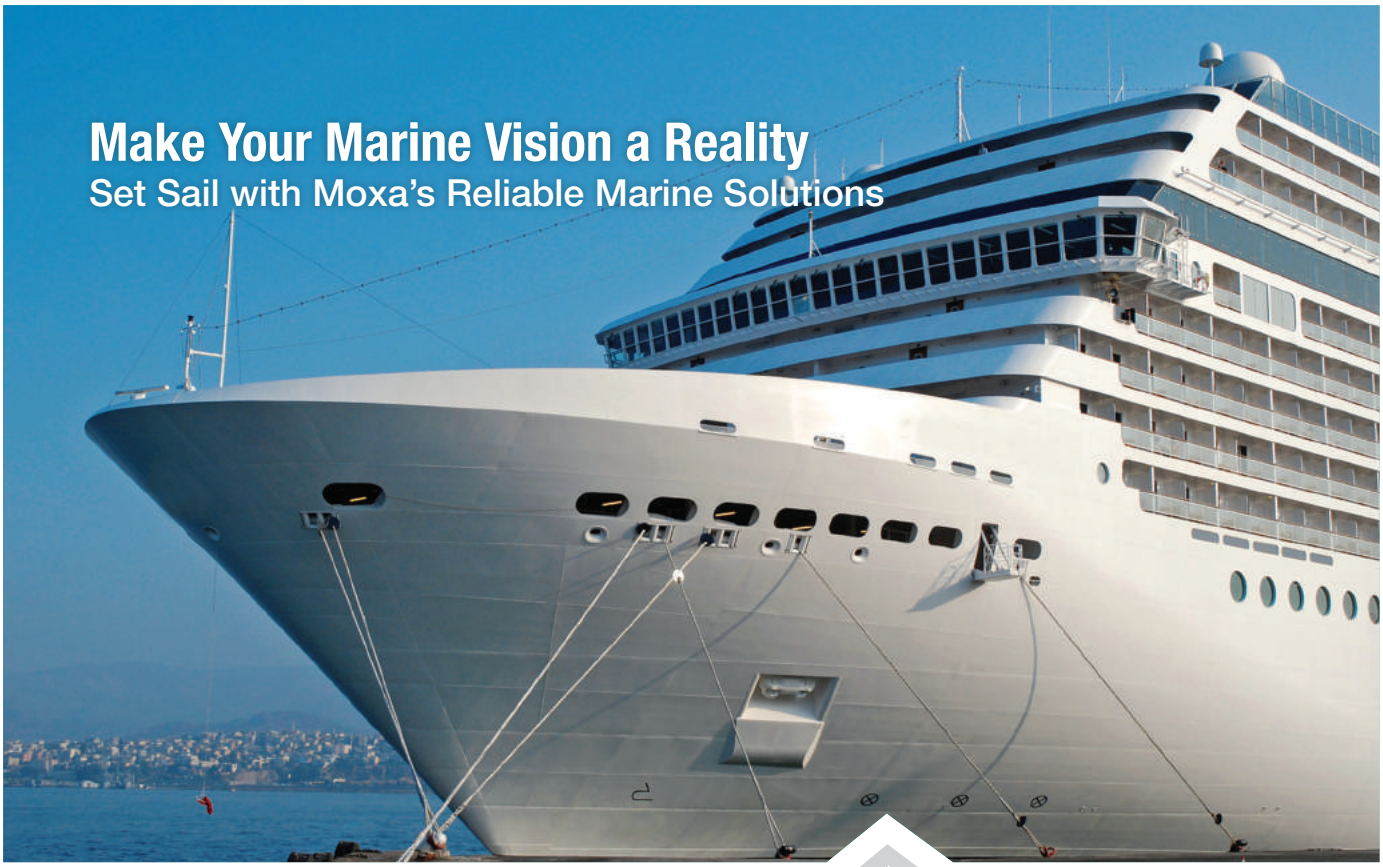

Make Your Marine Vision a Reality

Set Sail with Moxa's Reliable Marine Solutions

Successful Deployment of Integrated Marine Bridge Solutions Worldwide

Moxa provides maritime professionals with industrial-grade marine computers, panel PCs, displays, and Ethernet switches that use leading technologies and reliable designs perfect for applications on docks, marine bridges, open decks, and in control rooms.

Moxa's marine solutions pass strict tests and follow critical industrial standards to ensure compliance with international marine standards, including DNV, ABS, GL, LR, IEC 60945, IEC 61174, IEC 61162, and IACS E10, making Moxa's marine solutions the best option for marine applications.

Application Focus

- Electronic Chart Display and Information System (ECDIS)
- Radar System
- Integrated Navigation System (INS)
- Integrated Platform Management System (IPMS)

Leading Technologies

- Advanced ECDIS color calibration technology: more consistent color rendering for a longer period of use
- Customer initiated smart OSD design: Off-Screen-Display control allows users to easily control the monitor in low light environments
- High performance computing power in a fanless design enhances computers' reliability and reduces customers' maintenance costs

Visit www.moxa.com/marine

GL Lloyd's Register DNV ABS

IACS - E10 IEC 61162 IEC 60945 ClassNK

MPC-2150/2190/2240/2260 Series
Marine Panel Computers
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MD-219/224/226 Series
Marine Displays
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MC-7200 Series
Marine ECDIS Computers
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MGate 5101-PBM-MN Series
PROFIBUS-to-Modbus TCP Gateways
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ioLogik E1200H Series
Ethernet Remote I/O
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EDS-408A Series
Managed Ethernet Switches
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Maximize Your Factory Potential

With Reliability, Ease of Integration, and Global Support

Your Trusted Partner for Factory Automation

To help manufacturers maximize the benefits of integrating network and automation technology, Moxa has focused on the factory automation market for over 26 years. Moxa provides leading solutions for industrial communications, including wired and wireless infrastructures, industrial computing, remote monitoring, and video surveillance.

Application Focus

- SCADA
- Control system networks
- Wireless infrastructures and machine-to-machine communication
- Packaging equipment
- Cybersecurity
- Industrial video surveillance
- Material handling

Main Benefits

Reliability

- Industry leading communication redundancy for < 20 ms recovery time
- Unique thermal design that supports fanless wide temperature operation (-40 to 75°C)
- High level EMI/EMC shielding
- Redundant power supply with isolation protection
- Continual improvement of total quality management
- ISO 9001 quality management standard recognized

Ease of Integration

- User-friendly network and device management software
- Serial, Ethernet, I/O, and wireless solutions integrated into a single network
- Quick mass configuration tool for 90% time savings (with up to 100 switches)
- OPC server for cost-effective SCADA integration

Global Support

- Access to products and support in over 70 countries
- Customization service

VPort Series
Industrial IP Cameras
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EDS Series
Industrial Ethernet Switches
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MGate Series
Industrial Ethernet Gateways
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NPort Series
Serial-to-Ethernet Device Servers
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ioLogik 2500-WL1 Series
Smart Wireless I/O
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EDR-810 Series
Industrial 8+2G Multiport Secure Routers
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AWK-A Series
Industrial Wireless AP/Bridge/Client
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Integrated Network Solutions for Intelligent Transportation

Real-Time Convergence for Non-Stop Safety

Today more than ever before, roadway safety and efficiency depend on real-time information and communication. To increase traffic flow, reduce congestion, and improve incident response times, Moxa's industrial Ethernet solutions facilitate real-time convergence of various sensor data, voice, and video by providing high-speed throughputs and a wide range of network devices. All of these devices emphasize extreme reliability, smart redundancy, easy manageability, and a lower total cost of ownership.

Application Focus

- Advanced Transportation Management Systems
- Tunnels
- Intelligent E-Bus
- Electronic Toll Collection (ETC)

Leading Technologies

High Bandwidth

- 1GbE/10GbE switching and routing
- Up to 500 Mbps router throughput
- Up to 300 Mbps wireless transmission
- Up to 150 Mbps VPN traffic

Extreme Reliability

- Turbo Ring and Turbo Chain self-recovery (< 20 ms @ 250 switches)
- V-ON network redundancy under 50 ms for mission-critical IP surveillance
- Turbo Roaming with millisecond-level handoff times for seamless mobility

Efficient Management

- MXstudio network management suite for installation, operation, maintenance, and diagnostics
- OnCell Central Manager for remote cellular device management
- IP surveillance software solutions for easy SCADA surveillance

Visit www.moxa.com/ITS

ICS Series
Industrial 10GbE Ethernet Switches
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AWK-A Series
Industrial 802.11n AP/Bridge/Client
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EDS-G512E-8PoE
8-port PoE+ Full Gigabit Managed Switch
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VPort Series
Industrial HD IP Cameras
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IEX-408E-2VDSL2 Series
Copper Extender Switches
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NPort IA5000A Series
2-Port Industrial Serial Device Servers
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MXstudio
Industrial Network Management Suite
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Embedded Computers

Rcore Software

Ready-to-Run Rcore Software Platform 20-2

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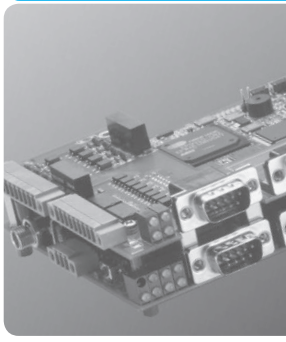
Embedded Computers



Ready-to-Run Rcore Software Platform

Take advantage of Moxa's Rcore platform to increase your competitiveness and ensure a faster time-to-market. The Rcore platform provides the following hard-to-beat benefits:

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

BIOS and Boot Loader

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

BIOS

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

Boot Loader

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

Operating Systems

Moxa's x86 and RISC-based embedded computers offer a powerful computing environment and stable system for a variety of industrial applications. These computers use either a Linux or Windows embedded operating system to provide programmers around the world with a user-friendly environment for application development, and help reduce the effort required for system integration. Moxa is continually on the lookout for real-time operating systems that are suitable for mission-critical applications.

Middleware

Moxa offers a variety of middleware to help you easily integrate these application modules into your system. This is essential for leveraging the key features of these modules and reducing the effort required for application development.

VPN

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

Firewall

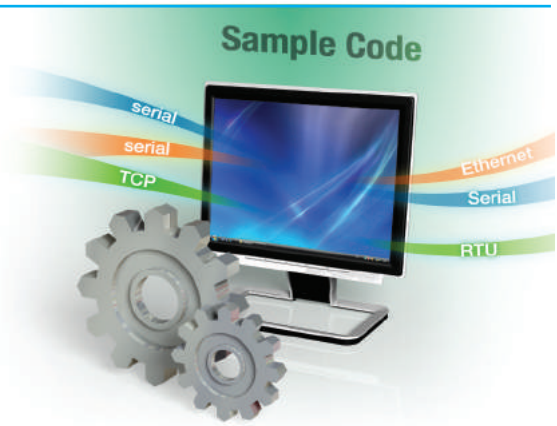
The firewall (iptable) middleware protects enterprise information from unfriendly access.

Database

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

Sample Code

To reduce customers' development cost, Moxa provides sample code for a wide range of embedded applications, including serial-to-Ethernet (S2E), serial-to-serial (S2S), and Modbus TCP and RTU. The high-level sample code and application libraries hide the details of implementing complex data communication by presenting relatively simple function prototypes for user applications. In addition, low-level libraries that manage direct access to peripheral I/O devices, such as LCM, keypad, digital I/O signals, and watchdog functions, are also included. With ready access to such a rich assortment of embedded applications, programmers obtain much greater flexibility than would otherwise be possible. These libraries help programmers quickly grasp the full functionality of their applications, and in this way gain the confidence needed to complete their project, speeding up product development and ensuring that code is efficient and bug-free.



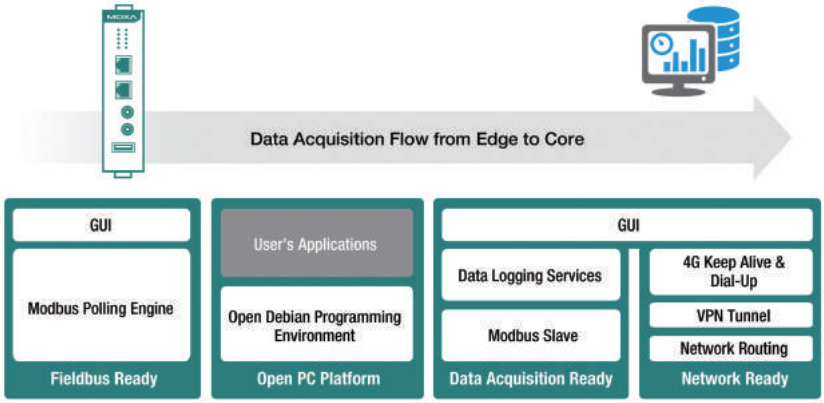
Download

To download Sample Code, visit the following link:

http://rcorecommunity.moxa.com/samplecodedownload

ThingsPro Suite

ThingsPro Suite, which is built on an open Debian Linux platform, enables the integration of fieldbus communications, computing, data acquisition, and wireless networking in a few simple steps. Featuring a Data Logger and Wireless Manager tools, ThingsPro Suite empowers users to focus primarily on their applications instead of the complex integration between things in the field and services in a central computing facility.



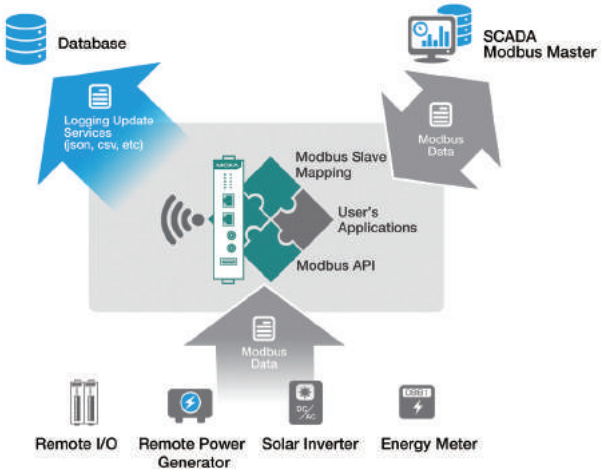
Data Acquisition Flow from Edge-to-Core

ThingsPro Data Logger

A programmable Modbus data logger to enable your industrial IoT applications:

Features and Benefits

- Ready-to-run Modbus RTU and Modbus/TCP polling engine; Modbus knowledge not required.
- Modbus tag API to interface with user applications if data computing is required, providing greater programming flexibility.
- Ready-to-run data-logging software supported to interface with a remote database, making data acquisition easier.

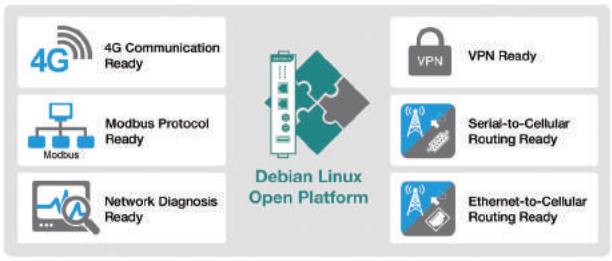


ThingsPro Wireless Manager

A communication-ready programmable platform to enable your industrial IoT applications:

Features and Benefits

- Modbus-protocol-ready for easy interfacing with Modbus devices
- 4G-communication-ready to ensure that your 4G connection is always active
- Network-system-log-ready for easy 4G and network troubleshooting
- VPN-ready for easy setup of remote VPN tunnels from a central server
- Ethernet/serial-to-cellular routing to connect all peripherals to the 4G network



Power Computers

Product Selection Guide

Power Computers 21-2

Substation Computers

DA-820 Series: IEC 61850 native PRP/HSR computer 21-4

DA-682A Series: x86 2U 19-inch rackmount computer with Intel® i7 CPU, 6 gigabit Ethernet ports, 2 PCI expansion slots, fanless design 21-9

DA-681A Series: x86 1U 19-inch rackmount computers with 3rd Gen Intel® Core™ Celeron 1047UE 1.4GHz CPU, 2 isolated RS-232/422/485 and 10 isolated RS-485 ports, 6 LANs, VGA, mSATA, USB 21-12

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 21-17

DA-685 Series: x86 rackmount substation computers with VGA, 2 RS-232/422/485 and 6 RS-485 serial ports, 6 LAN Ports, CompactFlash, USB 21-21

DA-662A Series: RISC 19-inch rackmount data acquisition computers with 8-16 serial ports, Ethernet, USB . . 21-25

DA-710 Series: x86 embedded computers with 2 serial ports, quad LANs, VGA, 4 DIs, 4 DOs, USB, and 4 peripheral expansion slots 21-29

DA Series Expansion Modules: Expansion modules with time-synchronization ports, RS-232/422/485 and RS-232/485 serial ports, 10/100 Mbps LAN and unmanaged switch ports, 100 Mbps fiber LAN ports, and PCI development kit 21-32

AMI & Solar Computers

UC-8100 Series: Communication-centric RISC computing platform 21-36

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Power Computers

Power Computers

	DA-820 Series	DA-682A Series	DA-681A Series	DA-683 Series
Computer				
CPU Speed	2.5 GHz/2.1 GHz	1.4 GHz single core / 1.1 GHz dual core / 1.5 GHz dual core	1.4 GHz	1.66 GHz
OS	–	Linux Debian 7 or Windows Embedded Standard 7 (pre-installed) Note: The OS is pre-installed.	Linux Debian 8 (pre-installed) Note: W7E available by CTOS	Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7 Note: The OS is pre-installed.
OS (Optional)	64-bit Debian 7 64-bit Windows Embedded Standard 7 64-bit Windows 7 Professional for embedded systems	–	–	–
System Memory	Max. 16 GB capacity (204-pin SO-DIMM x 2, each supporting un-buffered ECC DDR3 memory at 1333 and 1600 MT/s, 8 GB Max.)	8 GB capacity, 1 GB (LX) / 2 GB (W7E) pre-installed: 1 slot of 4 GB DDR3-1066/1333 SO-DIMM SDRAM	8 GB capacity, 2 GB for Linux pre-installed; 1 slot of DDR3-1066/1333 SO-DIMM SDRAM	2 GB capacity, 1 GB (LX and XPE)/ 2 GB (W7E) pre-installed: 1 or 2 slots of 2 GB 200-pin DDR2-667 SO-DIMM
Expansion Bus	–	–	PCI/104 onboard (DPP models only)	PCI/104 interface reserved
USB	USB 2.0 hosts x 6, type A connector	USB 2.0 hosts x 2, type A connector	USB 2.0 hosts x 4, type A connector	USB 2.0 hosts x 4, type A connector
Storage				
Built-in	CFast socket: Optional Cfast card to store OS	2 GB (LX) / 8 GB (W7E) industrial DOM for read-only OS volume	8 GB for Linux (pre-installed in mSATA)	2 GB (LX and XPE) / 8 GB (W7E) industrial DOM onboard to store OS
Storage Expansion	4 SATA 2.0 interfaces, supporting RAID 0, 1, 5, 10, hot-swappable	• 1 x CompactFlash socket • 2 x SATA-300 connector	SATA 3.0 interface	CompactFlash socket for CF card expansion, supporting CF Type-I/II
Display				
Graphics Controller	Intel® HD Graphics 4000	Intel 915GME, and Intel Extreme Graphics 2 technology	Intel® HD Graphics (Integrated)	Intel® GMA3150 graphics controller in Intel D510 card
Display Interface	2 VGA outputs (DB15 female connector)	1 VGA output (DB15 female connector)	1 VGA output (DB15 female connector)	Analog RBG display/Digital DVI display
Resolution	CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz	CRT display mode with pixel resolution up to 2548 x 1536 at 75 Hz	CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz	• 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	10/100/1000 Mbps ports x 4	10/100/1000 Mbps ports x 6	10/100/1000 Mbps ports x 6	10/100/1000 Mbps ports x 6
Magnetic Isolation Protection	1.5 kV built-in	1.5 kV built-in	1.5 kV built-in	1.5 KV built-in
Serial Interface				
Serial Standards	2 RS-232/422/485 ports (DB9 male)	–	• 2 RS-232/422/485 ports (DB9 male) • 10 RS-485 ports (terminal block)	2 RS-232 ports (DB9 male)
ESD Protection	–	–	15 kV for all signals	–
Surge Protection	–	–	4 kV (DA-681A-I-DPP Series)	–
Serial Signals				
RS-232	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND	–	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI
RS-422	TxD+, TxD-, RxD+, RxD-, GND	–	TxD+, TxD-, RxD+, RxD-, GND	–
RS-485-4w	TxD+, TxD-, RxD+, RxD-, GND	–	TxD+, TxD-, RxD+, RxD-, GND	–
RS-485-2w	Data+, Data-, GND	–	Data+, Data-, GND	–
Digital Input/Digital Output				
Input/Output Channels	–	–	–	4, sink-type
Input Voltage/Output Current	–	–	–	0 to 30 VDC/200 mA per channel max.
Physical Characteristics				
Housing	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)
Weight	14 kg (31.11 lb)	7 kg (15.56 lb)	4.5 kg (10 lb)	4 kg (8.89 lb)
Dimensions	361 x 440 x 133 mm (14.23 x 17.32 x 5.24 in) (without rackmount ears)	440 x 315 x 90 mm (17.32 x 12.40 x 3.54 in) (without rackmount ears)	440 x 315 x 45 mm (17.32 x 12.40 x 1.77 in), 19-inch 1U height	315 x 440 x 90 mm (12.40 x 17.32 x 3.54 in) (without rackmount ears)
Environmental Limits				
Operating Temperature	• DA-820-C8: -40 to 60°C (-40 to 140°F) • DA-820-C7: -40 to 75 °C (-40 to 167°F)	-10 to 60°C (14 to 140°F)	SP Models: -25 to 55°C (-13 to 131°F) DPP Models: -25 to 55°C (-13 to 131°F) DPP-T Models: -40 to 70°C (-40 to 158°F)	Standard models: -10 to 60°C (14 to 140°F) DPP-T models: -40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)	-20 to 80°C (-4 to 176°F)	-40 to 85°C (-40 to 185°F)	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)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements				
Input Voltage	• High Voltage: 100 to 240 VAC/VDC, 50/60 Hz, 1 A • Low Voltage: 24 to 110 VDC, 4.7 A	100 to 240 VAC auto-ranging (47 to 63 Hz for AC input)	100 to 240 VAC; 100 to 240 VDC	100 to 240 VAC, 50/60 Hz, 0.9-0.4 A
Multiple Power Supplies	Single /Dual power supplies	–	Single / Dual power supplies	Single / Dual power supplies
Power Consumption	60 W	30 W (full loading)	25 W	40 W
Standards and Certifications				
Safety	LVD, UL, cUL	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)	UL 60950-1, IEC 60950-1, EN 60950-1	UL/cUL (UL 60950-1, CSA C22.2 No. 60950-1-03), LVD (EN 60950-1), CCC (GB4943)
Electrical Substation	IEC 61850-3, IEC 60255, IEEE 1613	–	IEC 61850-3, IEEE 1613, IEC 60255	IEC 61850-3, IEEE 1613
Protection Relay	IEC 60255	–	IEC 60255	–
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11			
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Warranty				
Warranty Period	3 years	3 years	3 years	3 years
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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Power Computers

	DA-685 Series	DA-710 Series	DA-662A Series	UC-8100 Series
Computer				
CPU Speed	1.66 GHz	2.2 GHz	500 MHz	300/600/1000 MHz
OS	Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7	Windows Embedded Standard 2009, Linux 2.6	Embedded Linux (pre-installed)	–
System Memory	2 GB capacity, 1 GB (LX and XPE)/ 2 GB (W7E) pre-installed: 1 or 2 slots of 2 GB 200-pin DDR2-667 SO-DIMM	2 GB capacity, 1 GB pre-installled: 1 slot of DDR2-533/667 200-pin SO-DIMM SDRAM	128 MB DRAM onboard, 32 MB Flash onboard	256 or 512 MB DDR3 SDRAM
Expansion Bus	PCI/104 interface reserved		–	–
USB	USB 2.0 hosts x 2, type A connector	USB 2.0 hosts x 4, type A connector	–	USB 2.0 hosts x 1, type A connector
Storage				
Built-in	2 GB (LX and XPE) / 8 GB (W7E) industrial DOM onboard to store OS	2 GB industrial DOM onboard to store OS	–	–
Storage Expansion	CompactFlash socket	CompactFlash socket	–	1 GB SD or 2 GB MicroSD card pre-installed
Other Peripherals				
KB/MS	1 PS/2 interface, supports standard PS/2 keyboard and mouse through Y-type cable	1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse	–	–
Graphics Controller	Intel® GMA3150 graphics controller on Intel D510 card	Integrated Intel graphics media accelerator (GMA X3100)	–	–
Intel Clear Video Technology		MPEG-2 hardware accelerator, Microsoft DirectX 9	–	–
Display Interface	1 VGA output (DB15 female connector)	1 VGA output (DB15 female connector)	–	–
Resolution	CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz	QXGA maximum with resolution up to 2048 x 1536 at 60 Hz	–	–
Ethernet Interface				
LAN	Auto-sensing 10/100/1000 Mbps ports x 6	Auto-sensing 10/100/1000 Mbps ports (RJ45) x 4	Auto-sensing 10/100 Mbps ports (RJ45) x 4	Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection	1.5 kV built-in	1.5 kV built-in	1.5 kV built-in	1.5 kV built-in
Serial Interface				
Serial Standards	• 2 RS-232/422/485 ports (DB9 male) • 6 RS-485-2W ports (terminal block)	2 RS-232 ports (DB9 male)	8 to 16 RS-232/422/485 ports, software selectable (8-pin RJ45)	RS-232/422/485 ports, software-selectable (5-pin terminal block connector) x 1 or 2
ESD Protection	–	4 kV for all signals	8 kV contact, 15 kV Air ESD protection for all signals	
Console Port	–	–	RS-232 (all signals), RJ45 connector	RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)
Serial Signals				
RS-232	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND, RI	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND (DA-662A-I-8/16-LX only: TxD, RxD, RTS, CTS, GND)	TxD, RxD, RTS, CTS, GND
RS-422	TxD+, TxD-, RxD+, RxD-, GND	–	TxD+, TxD-, RxD+, RxD-, GND	TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w	TxD+, TxD-, RxD+, RxD-, GND	–	TxD+, TxD-, RxD+, RxD-, GND	TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w	Data+, Data-, GND	–	Data+, Data-, GND	Data+, Data-, GND
Digital Input/Digital Output				
Input Channel/Output Channel	–	4, sink-type	–	–
Input Voltage/Output Current	–	0 to 30 VDC/max. 200 mA per channel	–	–
Physical Characteristics				
Housing	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)	Polycarbonate plastic
Weight	4 kg (8.89 lb)	14 kg (31.11 lb)	4.3 kg (9.56 lb)	224 g (0.50 lb)
Dimensions	315 x 440 x 90 mm (12.40 x 17.32 x 3.54 in) (without rackmount ears)	• 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)	Without ears: 440 x 45 x 237 mm (17.32 x 1.77 x 9.33 in) With ears: 480 x 45 x 237 mm (18.90 x 1.77 x 9.33 in)	101 x 27 x 128 mm (3.98 x 1.06 x 5.04 in)
Mounting	Standard 19-inch rackmount	Standard 19-inch rackmount	Standard 19-inch rackmount	DIN-rail, wall (with optional kit)
Environmental Limits				
Operating Temperature	-10 to 55°C (14 to 131°F)	-10 to 50°C (14 to 122°F)	-10 to 60°C (14 to 140°F)	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)
Storage Temperature	-20 to 80°C (-4 to 176°F)	-20 to 80°C (4 to 176°F)	-20 to 80°C (-4 to 176°F)	-40 to 80°C (-40 to 176°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements				
Input Voltage	100 to 240 VAC, 50/60 Hz, 0.9-0.4 A	Single or dual inputs, 100 to 240 VAC/ VDC auto-ranging, 47 to 63 Hz, terminal block	100 to 240 VAC auto ranging (47 to 63 Hz for AC input)	12 to 24 VDC (3-pin terminal block, V+, V-, SG)
Power Consumption	40 W	60 W	20 W	5.4 W
Standards and Certifications				
Safety	LVD, UL, cUL, CCC	UL 60950-1, CSA C22.2 No. 60950-1-07, CCC (GB4943, GB9254, GB17625.1)	UL 60950-1	UL 60950-1, EN 60950-1
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11			–
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Warranty				
Warranty Period	3 years	3 years	5 years	5 years
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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DA-820 Series

IEC 61850 native PRP/HSR computer

- Intel Core i7 dual/quad-core processor with Intel QM77 Express chipset
- 2 x 204-pin SO-DIMM ECC DDR3 sockets, supporting un-buffered ECC DDR3 1333/1600 memory at 1333 and 1600 MT/s, 16 GB max.
- 6 USB 2.0 ports for high speed peripherals
- 3 PCIe x1 slots and 2 PCI slots for expansion modules
- 1 PCIe x16 slot for an additional video card
- Highly reliable design, supporting dual power, RAID 0/1/5/10, and PRP/HSR technology (with PRP/HSR expansion module)
- Cybersecurity function
- IEC 61850-3 (general requirements for electrical substation automation, EMC Level 4, C3, Bm)
- IEEE 1613 compliant (environmental and testing requirements for communications networking devices in electric power substations)
- IEC 60255 compliant (measuring relays and protection equipment)

Overview

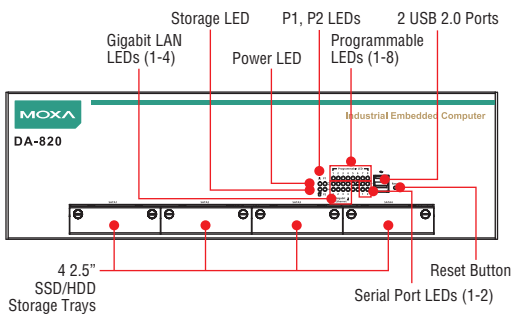
The DA-820's main operating system is based on the Intel quad-core i7-3612QE CPU and QM77 chipset, which supports standard x86, 2 VGA ports, 6 USB port, 4 gigabit LAN ports, and 2 3-in-1 RS-232/422/485 serial ports. The DA-820 is equipped with a 4 SATA disk interface and supports RAID 0/1/5/10 functionality. The DA-820 is specifically designed for substation applications that require precise time synchronization and adherence to the IEC 61850-3 standards. The flexible design makes the DA-820 suitable for local SCADA, environmental monitoring, video surveillance, protocol conversion, and PRP/HSR redundancy applications. In addition, the cybersecurity function makes the DA-820 an ideal solution for secure network communication applications.

The DA-820 complies with the IEC 60255 standards to enable the protection of electrical relays in a smart substation. IEC 60255 is one of the most widely used standards for testing relays and protection equipment, and compliance ensures that the DA-820 will work reliably and seamlessly with IEDs (intelligent electronic devices) as a part of the robust substation automation system.

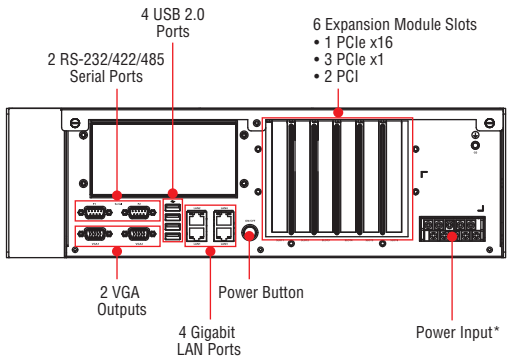
The housing is a standard 3U, 19-inch wide, rack-mounted rugged enclosure. This robust, rack-mountable design provides the hardened protection needed for industrial environment applications.

Appearance

Front View

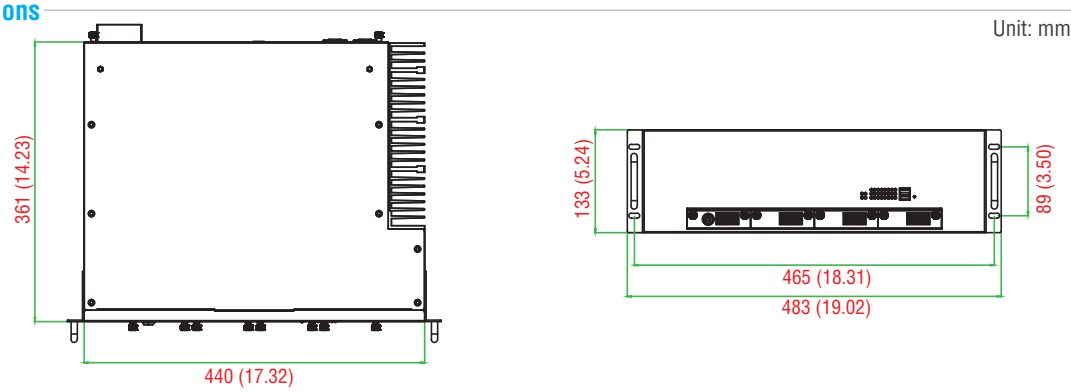


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU:
• DA-820-C7: Intel dual-core i7-3555LE 2.5 GHz processor
• DA-820-C8: Intel quad-core i7-3612QE 2.1 GHz processor
OS (Optional):
64-bit Debian 7
64-bit Windows Embedded Standard 7
64-bit Windows 7 Professional for embedded systems
Note: The OS is optional; you may purchase Windows 7 Embedded Standard 7 or Windows 7 Professional for embedded systems via CTOS, or download Debian 7 from our website.
System Chipset: QM77
BIOS: SPI Flash 64 Mbit BIOS, PCI Plug & Play, ACPI function support
System Memory: Max. 16 GB capacity (204-pin SO-DIMM x 2, each supporting un-buffered ECC DDR3 memory at 1333 and 1600 MT/s, 8 GB Max.)
USB:
• Rear panel: USB 2.0 hosts x 4, Type A connector
• Front panel: USB 2.0 hosts x 2, Type A connector

Storage

Built-in: CFast socket: Optional Cfast card to store OS
Storage Expansion: 4 SATA 2.0 interfaces, supporting RAID 0, 1, 5, 10, hot-swappable

Display

Graphics Controller: Intel® HD Graphics 4000
Display Interface: 2 VGA outputs (DB15 female connector)
Resolution: CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports x 4
• Ethernet 1 to 3: Intel 82574 gigabit Ethernet controller
• Ethernet 4: Intel 82579 gigabit Ethernet controller supporting Intel AMT technology
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

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

Serial Signals

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

LEDs

System: Power, Storage
Gigabit LAN: 100M x 4, 1000M x 4
Serial: TX/RX
Programmable: LED x 8

Switches and Buttons

Power Switch: on/off (on rear panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 14 kg (31.11 lb)
Dimensions: 361 x 440 x 133 mm (14.23 x 17.32 x 5.24 in) (without rackmount ears)
Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature:
• DA-820-C8: -40 to 60°C (-40 to 140°F)
• DA-820-C7: -40 to 75 °C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ 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:
• High Voltage: 100 to 240 VAC/VDC, 50/60 Hz, 1 A
• Low Voltage: 24 to 110 VDC, 4.7 A
Multiple Power Supplies:
• SP: Single power supply
• DP: Dual power supplies
Power Consumption: 60 W

Standards and Certifications

Safety: LVD, UL, cUL
Electrical Substation: IEC 61850-3, IEC 60255, IEEE 1613
Protection Relay: IEC 60255
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power 4 kV; Signal 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
IEC 61000-4-11: (AC 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)

Time:
DA-820-C7-DP-HV-T: 138,503 hrs
DA-820-C7-SP-HV-T: 191,570 hrs
DA-820-C8-DP-HV: 128,077 hrs
DA-820-C8-SP-HV: 172,182 hrs
DA-820-C7-SP-LV-T: 240,015 hrs
DA-820-C7-DP-LV-T: 221,019 hrs
DA-820-C8-SP-LV: 240,015 hrs
DA-820-C8-DP-LV: 221,019 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

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

Software Specifications

Linux

OS: 64-bit Linux Debian 7
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, Netfilter/iptables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected 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: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control)
• GNU C/C++ cross-compiler
• GNU C library
• Perl
Software Package:
• SNMP
• SafeGuard technology

Windows Embedded Standard 7

Core OS:
• 64-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
• Create and Play DVDs
• Photo Viewer
• Remote media streaming
• Windows Media Center
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
• IME Japanese Support
• IME Korean Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
• MS AntiMalware
• Windows Defender
• Bitlocker Secure Startup
• Applocker
Enterprise Features:
• Enterprise Search Scopes
• BranchCache
• DirectAccess
• Windows XP Mode

Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Windows 7 Professional for Embedded Systems

Core OS:
• 64-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
• Create and Play DVDs
• Photo Viewer
• Remote media streaming
• Windows Media Center
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
• MS AntiMalware
• Windows Defender
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Model	Configuration
DA-820-C7-SP-HV	i7-3555LE, dual-core 2.5 GHz, 100 to 240 VAC/VDC, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C7-SP-HV-T	i7-3555LE, dual-core 2.5 GHz, 100 to 240 VAC/VDC, -40 to 75°C, w/o CFast/RAM/OS
DA-820-C7-SP-LV-T	i7-3555LE, dual-core 2.5 GHz, 24 to 110 VDC, -40 to 75°C, w/o CFast/RAM/OS
DA-820-C7-DP-HV	i7-3555LE, dual-core 2.5 GHz, 100 to 240 VAC/VDC x 2, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C7-DP-HV-T	i7-3555LE, dual-core 2.5 GHz, 100 to 240 VAC/VDC x 2, -40 to 75°C, w/o CFast/RAM/OS
DA-820-C7-DP-LV-T	i7-3555LE, dual-core 2.5 GHz, 24 to 110 VDC x 2, -40 to 75°C, w/o CFast/RAM/OS
DA-820-C8-SP-HV	i7-3612QE, quad-core 2.1 GHz, 100 to 240 VAC/VDC, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C8-SP-LV	i7-3612QE, quad-core 2.1 GHz, 24 to 110 VDC, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C8-DP-HV	i7-3612QE, quad-core 2.1 GHz, 100 to 240 VAC/VDC x 2, -40 to 60°C, w/o CFast/RAM/OS
DA-820-C8-DP-LV	i7-3612QE, quad-core 2.1 GHz, 24 to 110 VDC x 2, -40 to 60°C, w/o CFast/RAM/OS

Package Checklist

- DA-820 rackmount computer
- 19-inch rackmount kit
- Documentation CD or DVD
- Quick installation guide (printed)
- Warranty card

To order a DA-820 system with a pre-installed OS, please contact a Moxa sales representative.

Recommended Configuration

Operating System	System Memory	CFast Card
64-bit Linux Debian 7	≥ 2 GB	≥ 2 GB
Windows Embedded Standard 7	≥ 4 GB	≥ 16 GB

Optional DA-820 Expansion Modules	
DA-IRIG-B-S-02-T	IRIG-B expansion module, PCI interface, 1 fiber IRIG-B in, 1 DB9M in/out, 1 DB9M out
DA-IRIG-B-S-04-T	IRIG-B expansion module, PCI interface, 1 fiber IRIG-B in, 1 DB9M in/out, 3 DB9M out
DA-PRP-HSR	PRP, HSR expansion module, PCIe interface
DE-GX02-SFP-T	2-port 1000 Mbps fiber card, SFP slot x 2, PCIe interface (SFP module excluded)
DE-FX02-SFP-T	2-port 100 Mbps fiber card, SFP slot x 2, PCIe interface (SFP module excluded)

Slot	No.	Expansion Card	Application	Moxa Product
PCIe x 16	1	Video Card	Video surveillance	(purchase from another vendor)
		RAID Card	Data storage	(purchase from another vendor)
PCIe x 1	3	PRP/HSR Card	Communication redundancy	DA-PRP-HSR
		LAN Card/Fiber Card	Data transmission	DE-GX02-SFP-T DE-FX02-SFP-T
		RS-232 RS-422 RS-485 CAN	Device control or data acquisition	CP-116E-A CP-118E-A-I CP-138E-A-I CP-134EL-A-I CP-602E-I (CAN Card)
PCI	2	IRIG-B	Time synchronization	DA-IRIG-B-S-02-T DA-IRIG-B-S-04-T
		RS-232 RS-422 RS-485 CAN	Device control or data acquisition	CP-118U/CP-118U-I CP-168U CP-104UL CP-602U-I (CAN Card)

Optional Accessories

Model	Description	Application
Mini DB9F-to-TB	DB9 female to terminal block adapter	For IRIG-B card
DDR3-THERMAL-KIT-82001	DDR3 SDRAM Thermal Kit	For non-DDR3L SDRAM
FAN-KIT-82001	Fan kit without lock	Fan Kit for when using a 3rd party high performance graphics accelerator card in the PCIe x 16 slot.
FAN-KIT-82002	Fan kit with lock	Fan Kit for when using a 3rd party high performance graphics accelerator card in the PCIe x 16 slot.t
HDD-DOOR-LOCK-82001	HDD kit with thermal hole	For heat dissipation

DA-682A Series

x86 2U 19-inch rackmount computer with Intel® i7 CPU, 6 gigabit Ethernet ports, 2 PCI expansion slots, fanless design

- 2nd generation Intel core processors (Sandy Bridge)
- Built-in DDR3 SDRAM and industrial DOM
- 6 Gigabit Ethernet ports for network redundancy
- 2 PCI expansion slots for expansion modules
- 1 CompactFlash socket for storage expansion
- 4 high speed, system-bootable USB 2.0 ports
- 19 inch 2U rack-mountable case
- 100/240 VAC power inputs
- Ready-to-Run Linux or Windows Embedded Standard 7 platform
- Fanless design

Overview

The DA-682A series of computers are x86 platforms with VGA, 6 gigabit Ethernet ports, CompactFlash, USB, and two PCI ports for DA Series expansion modules. The DA-682A comes in a standard 19-inch 2U rack-mountable case.

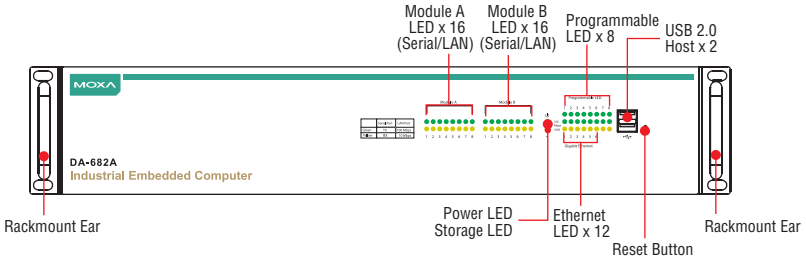
With their robust design, DA-682A computers are specialized for industrial automation applications: power substations, transportation and shipping, and oil and gas production and supply.

The DA-682A runs either Linux or Windows Embedded Standard 7, providing a friendly environment for developing sophisticated application software. Moxa's ready-to-run software and readily available after-service support makes the programmer's job easier, helping programmers develop bug-free code quickly and at a lower cost. In addition, the DA-682A also comes with three different CPU options, and basic models that allow system designers to install the DOM, RAM, and operating system according to their specific requirements. This is particularly flexible for building custom industrial solutions.

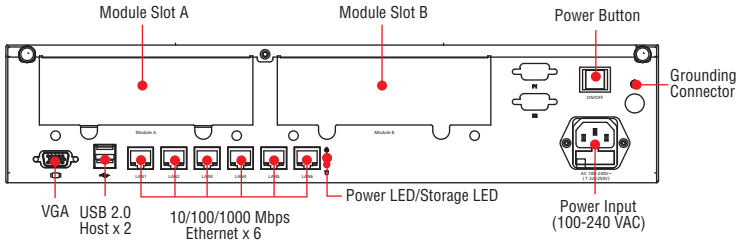
The DA-682A comes with 2 PCI ports that accept DA series expansion modules. Moxa provides a variety of communication modules for the DA series, including an 8-port RS-232/422/485 module, a 4-port 10/100 Mbps LAN module, and a universal PCI expansion module. This friendly design gives users the advantage of being able to swap out modules quickly and easily, making the DA-682A an ideal solution for a wide array of industrial automation applications.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: 2nd generation Intel core processors (Sandy Bridge)
• Intel Celeron 827E, 1.4 GHz single-core processor
• Intel Celeron 847E, 1.1 GHz dual-core processor
• Intel Core i7-2610UE, 1.5 GHz dual-core processor
OS: Linux or Windows Embedded Standard 7 (pre-installed)
Note: The OS is pre-installed.
System Chipset: Intel HM65
BIOS: 64 Mbit Flash BIOS, PCI Plug & Play, ACPI
System Memory: 8 GB capacity, 1 GB (LX) / 2 GB (W7E, 32-bit) pre-installed: 1 slot of 4 GB DDR3-1066/1333 SO-DIMM SDRAM
USB: USB 2.0 hosts x 2, system bootable, Type A connector

Storage

Built-in: 2 GB (LX) / 8 GB (W7E, 32-bit) industrial DOM for read-only OS volume
Storage Expansion:
• 1 x CompactFlash socket
• 2 x SATA-300 connector

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: 1 VGA output (DB15 female connector)
Resolution: CRT display mode with pixel resolution up to 2548 x 1536 at 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports x 6
Magnetic Isolation Protection: 1.5 kV built-in

LEDs

System: Power, Storage
LAN: 100/1000M mode
Programmable: 8 LEDs
Communication: Module A x 16, Module B x 16

Switches and Buttons

Power Button: On/Off (on rear panel)
Reset Button: Soft reboot (on front panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 7 kg (15.56 lb)
Dimensions: 440 x 315 x 90 mm (17.32 x 12.40 x 3.54 in) (without rackmount ears)
Mounting: Standard 19-inch rack

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 Grms @ 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 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 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GH: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
IEC 61000-4-11: (AC 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 watchdog timer, configurable for restarts at 1 to 255 second intervals

MTBF (mean time between failures)

Time: 527,124 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

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

Software Specifications

Linux

OS: Linux Debian 7
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
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
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). 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: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control)
• GNU C/C++ cross-compiler
• GNU C library
• Perl

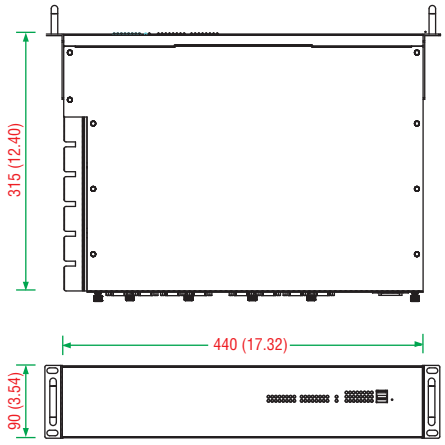
Windows Embedded Standard 7

Core OS:
• Windows 7 Embedded, 32 bit
• Sensor and Location Platform
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts:
• Chinese (Trad. and Simp.), Middle East, South East Asian, and South Asian Fonts
• True Type Fonts

Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter(EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

DA-682A-C0: Rackmount computer with Celeron 827E, 1.4 GHz, single-core CPU, without DOM/RAM/OS, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket
DA-682A-C0-LX: Rackmount computer with Celeron 827E, 1.4 GHz, single-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 1 GB system memory, 2 GB Linux Debian 7 pre-installed DOM
DA-682A-C0-W7E: Rackmount computer with Celeron 827E, 1.4 GHz, single-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 2 GB system memory, 8 GB Windows Embedded Standard 7 pre-installed DOM
DA-682A-C1: Rackmount computer with Celeron 847E, 1.1 GHz, dual-core CPU, without DOM/RAM/OS, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket
DA-682A-C1-LX: Rackmount computer with Celeron 847E, 1.1 GHz, dual-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 1 GB system memory, 2 GB Linux Debian 7 pre-installed DOM
DA-682A-C1-W7E: Rackmount computer with Celeron 847E, 1.1 GHz, dual-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 2 GB system memory, 8 GB Windows Embedded Standard 7 pre-installed DOM
DA-682A-C7: Rackmount computer with Core i7-2610UE 1.5 GHz, dual-core CPU, without DOM/RAM/OS, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket
DA-682A-C7-LX: Rackmount computer with Core i7-2610UE 1.5 GHz, dual-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 1 GB system memory, 2 GB Linux Debian 7 pre-installed DOM
DA-682A-C7-W7E: Rackmount computer with Core i7-2610UE 1.5 GHz, dual-core CPU, VGA, 6 gigabit LANs, USB x 4, CompactFlash socket, 2 GB system memory, 8 GB Windows Embedded Standard 7 pre-installed DOM

Package Checklist

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

Expansion Modules (can be purchased separately)

DA-SP08-I-EMC4-DB: 8-port RS-232/422/485 serial module with DB9 connector and isolation; suitable for EMC Level 4 environments
DA-SP08-I-EMC4-TB: 8-port RS-232/422/485 serial module with terminal block connector and isolation; suitable for EMC Level 4 environments
DA-SP08-I-DB: 8-port RS-232/422/485 serial module with a digitally isolated DB9 connector
DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector
DA-SP08-I-TB: 8-port RS-422/485 serial module with digitally isolated terminal block
DA-SP38-I-TB: 8-port RS-422/485 serial module with digitally isolated terminal block
DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module
DA-LN04-RJ: 4-port 10/100 Mbps LAN module
DA-UPCI-DK: Universal PCI development kit
DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

Optional Accessories (can be purchased separately)

DA-682A HDD Kit: Hard disk installation package

DA-681A Series

x86 1U 19-inch rackmount computers with 3rd Gen Intel® Core™ Celeron 1047UE 1.4GHz CPU, 2 isolated RS-232/422/485 and 10 isolated RS-485 ports, 6 LANs, VGA, mSATA, USB

- IEC 61850-3, IEEE 1613, and IEC 60255 compliant for power substation automation systems (DPP and DPP-T models only)
- 3rd Gen Intel® Core™ Celeron 1047UE 1.4 GHz CPU
- 1 built-in DDR3 memory socket
- 1 mSATA for OS and 1 SATA III for storage expansion
- 6 gigabit Ethernet ports for network redundancy
- 4 USB 2.0 ports for high speed peripherals
- 2 isolated RS-232/422/485 and 10 isolated RS-485 ports
- Embedded Debian 8 Linux (W7E by CTOS)
- Supports both 100 to 240 VAC and VDC power inputs (single power and dual power models available)
- Optional IRIG-B expansion module available on DPP and DPP-T models

Overview

The Moxa DA-681A Series x86-based rackmount embedded computers are designed for control, monitoring, data acquisition, and protocol conversion applications. With its robust design, the DA-681A is suitable for industrial automation applications, such as power automation, transportation, and oil and gas.

The DA-681A's main operating system is based on the 3rd Gen Intel® Core™ Celeron 1047UE 1.4 GHz CPU and HM65 chipset, which supports standard x86, 1 x VGA, 4 x USB, 6 gigabit LAN ports, 2 RS/232/422/485 3-in-1 serial ports, and 10 RS-485 (RS-422 by CV) ports. The DA-681A has a mini PCIe socket for mSATA and comes with Linux pre-installed; Windows 7 Embedded is also supported by the CTOS (Configuration To Order Service) process.

Another plus is that the serial ports come with 2 kV digital galvanic isolation protection to guarantee communication reliability in harsh industrial environments. In addition, the state-of-art IEC 61850-3, IEEE 1613, and IEC 60255 compliance all-in-one design provides rich interfaces especially well suited for of power substation automation applications.

Smart Recovery Function

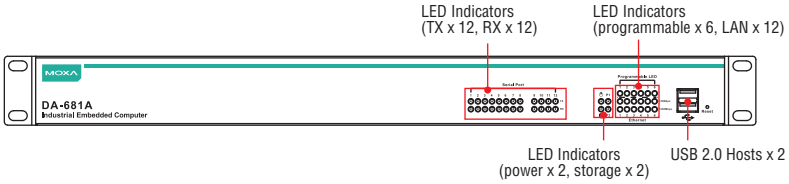
The DA-681A's Smart Recovery function makes it easy to troubleshoot system software errors on computers to minimize downtime. Engineers who are experts in a particular vertical market may not have enough computer domain knowledge to know how to fix the operating system problems. Moxa Smart Recovery™ is an automated BIOS-level software recovery system that allows engineers to automatically trigger OS recovery to minimize downtime.

Proactive Monitoring Function

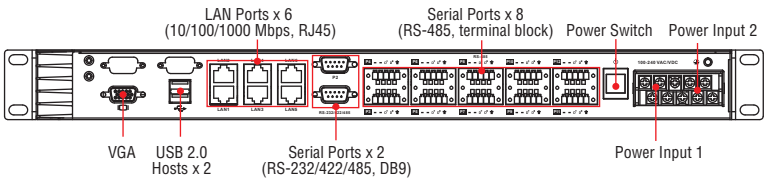
The DA-681A's Proactive Monitoring function monitors the computer's health by keeping an eye on CPU usage, memory usage, storage partition usage, the operating temperature of the CPU and motherboard, and the redundant power monitor, and can trigger a relay to provide either visual or audio alarms.

Appearance

Front View

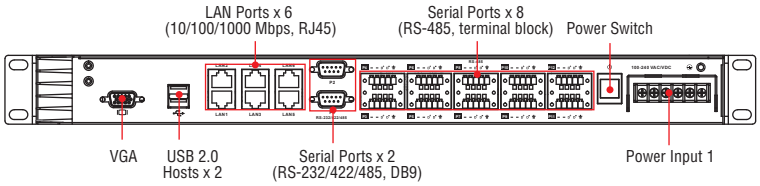


DA-681A-DPP & DA-681A-DPP-T



Rear View

DA-681A-SP



Hardware Specifications

Computer

CPU: 3rd Gen Intel® Core™ Celeron 1047UE 1.4 GHz
OS: Linux Debian 8 (pre-installed)
Note: W7E available by CTOS
System Chipset: Intel HM65
BIOS: 64 Mbit Flash BIOS, PCI Plug & Play, ACPI
System Memory: 8 GB capacity, 2 GB for Linux pre-installed; 1 slot of DDR3-1066/1333 SO-DIMM SDRAM
Expansion Bus: PCI/104 onboard (DPP models only)
USB: USB 2.0 hosts x 4, Type A connector, supports system boot up

Storage

Built-in: 8 GB for Linux (pre-installed in mSATA)
Storage Expansion: SATA 3.0 interface

Display

Graphics Controller: Intel® HD Graphics (Integrated)
Display Memory: Dynamic video memory (shares up to 32 MB of system memory)
Display Interface: 1 VGA output (DB15 female connector)
Resolution: CRT display mode with pixel resolution up to 2048 x 1536 at 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports x 6
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards:
• 2 RS-232/422/485 ports (DB9 male)
• 10 RS-485 ports (terminal block)
ESD Protection: 15 kV for all signals
Surge Protection: 4 kV (DA-681A-I-DPP-T only)
Isolation: 2 kV digital galvanic 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
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

LEDs

System: Power, Storage
LAN: 100M x 6, 1000M x 6
Serial:
RS-232/422/485: 2 x Tx, 2 x Rx
RS-485: 10 x Tx, 10 x Rx
Programmable: 6 LEDs
Power Failure: LED x 2 (dual power models)

Switches and Buttons

Power Button: On/Off (on rear panel)
Reset Button: Hard Reset (on front panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 4.5 kg (10 lb)
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 Models: -25 to 55°C (-13 to 131°F)
DPP Models: -25 to 55°C (-13 to 131°F)
DPP-T 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: 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; 100 to 240 VDC
Input Current: 0.80 A @ 100 VAC; 0.41 A @ 100 VDC
Power Consumption: 25 W

Standards and Certifications

Safety: UL 60950-1, IEC 60950-1, EN 60950-1
Electrical Substation: IEC 61850-3, IEEE 1613, IEC 60255
Protection Relay: IEC 60255
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
For DPP models only:
IEC 61000-4-16: 30 V / 300 V
IEC 61000-4-17: 10% nominal DC voltage
IEC 61000-4-18:
100 kHz: 25K VCM; 1 kv DIM
1 MHz: 2.5 kV CM; 1 kV DM
IEC 61000-4-29: 30% reduction, 0.1 sec.
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools:
• Built-in buzzer and RTC (real-time clock) with battery lithium backup
• Built-in 1 relay for visual/audio alarm.
Automatic Reboot Trigger: Built-in watchdog timer, configurable for restarts at 1 to 255 second intervals

MTBF (mean time between failures)

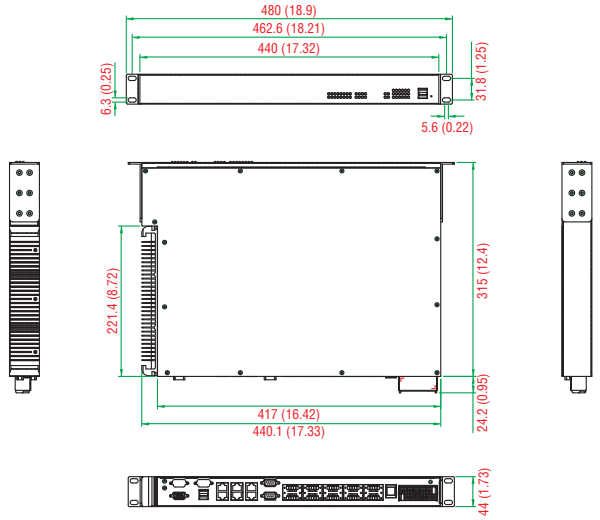
Time:
DA-681A-I-SP: 240,784 hrs
DA-681A-I-DPP: 215,436 hrs
DA-681A-I-DPP-T: 215,436 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

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

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 8, 64-bit
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
Kernel Version: GNU/Linux 3.16
System Shell: DASH (default), BASH
File System: EXT2, EXT3, EXT4
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP,PAP,DHCP, NTP,NFS, SSH, PPP, SFTP, RSYNC, SSL
Programming Language Support: PHP, Perl, Python
Internet Security Suite: OpenVPN, iptables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API)

Windows Embedded Standard 7 (by CTOS)

Core OS:
• Windows 7 Embedded, 32-bit/64-bit
• Sensor and Location Platform
• Remote Procedure Call

Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts:
• Chinese (Trad. and Simp.), Middle East, South East Asian, South Asian Fonts
• True Type Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update

Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Available Models

DA-681A-I-SP: 6 Ethernet ports, VGA, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, single power (RAM, mSATA, OS not included), -25 to 55°C operating temperature
DA-681A-I-SP-LX: 6 Ethernet ports, VGA, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, single power, Linux Debian 8, -25 to 55°C operating temperature
DA-681A-I-DPP: IEC 61850-3 computer with VGA, 6 LAN ports, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, dual power (RAM, mSATA, OS not included), -25 to 55°C operating temperature
DA-681A-I-DPP-LX: IEC 61850-3 computer with VGA, 6 LAN ports, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, dual power, Linux Debian 8, -25 to 55°C operating temperature
DA-681A-I-DPP-T: IEC 61850-3 computer with VGA, 6 LAN ports, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, dual power (RAM, mSATA, OS not included), -40 to 70°C operating temperature
DA-681A-I-DPP-T-LX: IEC 61850-3 computer with VGA, 6 LAN ports, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, dual power, Linux Debian 8, -40 to 70°C operating temperature
Note: To order a DA-681A system with a pre-installed W7E OS, please contact a Moxa sales representative.

Package Checklist

- DA-681A rackmount computer
- 19-inch rackmount kit
- Documentation CD or DVD
- Quick installation guide (printed)
- Warranty card

Recommended Configurations

Operating System	System Memory	mSATA for OS
Windows Embedded Standard 7 32 bit	≥ 4 GB	≥ 8 GB
Windows Embedded Standard 7 64 bit	≥ 4 GB	≥ 16 GB
Linux Debian 8	≥ 2 GB	≥ 4 GB

Comparison of DA-Series Models

Model Name	Serial Ports		Giga LAN Port	Storage			Expansion	System			Power	Relay	IEC 61850-3 IEEE/1613 IEC 60255
	3-in-1	RS-485		SATA	mSATA	USB	PCI-104 (for IRIG-B)	OS	RAM	mSATA			
DA-681A-I-SP	2	10	6	1	1	4	–	–	–	–	1	–	–
DA-681A-I-SP-LX	2	10	6	1	1	4	–	Linux	2G	8G	1	–	–
DA-681A-I-DPP	2	10	6	1	1	4	1	–	–	–	2	1	✓
DA-681A-I-DPP-LX	2	10	6	1	1	4	1	Linux	2G	8G	2	1	✓
DA-681A-I-DPP-T	2	10	6	1	1	4	1	–	–	–	2	1	✓
DA-681A-I-DPP-T-LX	2	10	6	1	1	4	1	Linux	2G	8G	2	1	✓

Optional Accessories

Model Name	Expansion Module	Accessory	
	DA-IRIGB-4DIO-PCI104-EMC4	USB Dongle	DA-681A HDD Kit
DA-681A-I-SP	–	✓	✓
DA-681A-I-SP-LX	–	✓	✓
DA-681A-I-DPP	✓	✓	✓
DA-681A-I-DPP-LX	✓	✓	✓
DA-681A-I-DPP-T	✓	✓	✓
DA-681A-I-DPP-T-LX	✓	✓	✓

Expansion Modules (can be purchased separately)

	Model	Description
	DA-IRIGB-4DIO-PCI104-EMC4	Time-synchronization expansion module, 1 IRIG-B signal input port, 3 digital inputs, 4 digital outputs (DA-681A-I-DPP series only)

Optional Accessories (can be purchased separately)

	Model	Description
	DA-681A HDD Kit	HDD/SSD installation package, supports single HDD/SSD.
	USB Dongle Kit	USB dongle kit installation package. This kit can be installed inside the DA-681A and is suited for security applications. For example, the license activate USB dongle for SCADA or the backup image storage for Smart Recovery.

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 Atom D510 1.66 GHz processor
- 1 DDR2 SO-DIMM 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 interfaces for hard disk drive expansion
- 2 PCI expansion slots for inserting expansion modules
- IEC 61850-3 compliant (DPP-T models only)
- IEEE 1588 compliance for Precision Time Protocol (Linux models only)
- Dual power input models available
- Ready-to-run Embedded Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7 platform
- -40° to 70°C wide temperature models available

IEEE 1588 Nanosecond Accuracy | IEC 61850-3 IEEE 1613 | Microsoft Windows Embedded | RoHS | c UL us LISTED | CE | FC

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 Atom D510 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.

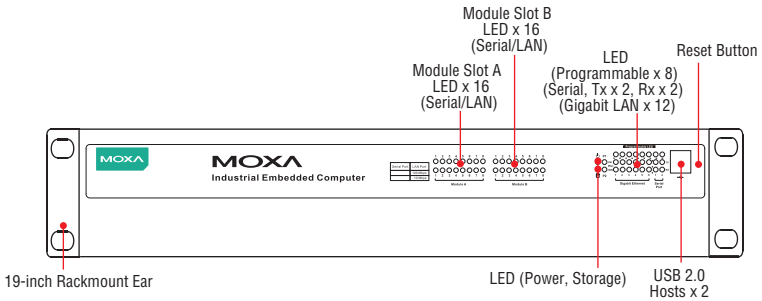
IEC-61850-3 compliance confirms that the DA-683 can deliver stable and reliable system operations in power applications. Additional value and convenience is provided through a modular design with two independent slots for flexible system integration and expansion. Users have the option to add a variety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

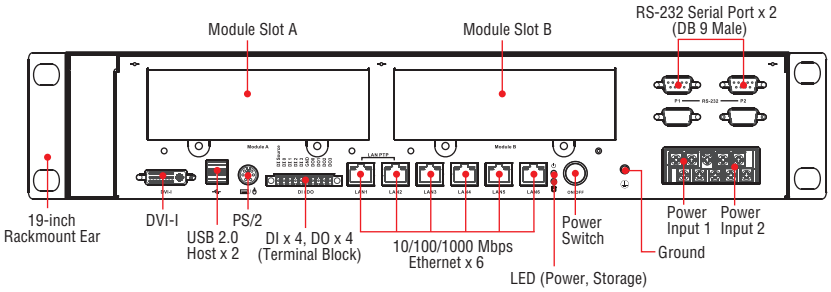
DA-683 computers run Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7 (pre-installed), providing a familiar environment for developing sophisticated application software. Moxa provides comprehensive software support to help programmers develop bug-free code quickly and at a lower cost.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: Intel Atom D510 1.66 GHz processor
OS: Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7
Note: The OS is pre-installed.
System Chipset: Intel Pineview-D + ICH8M
BIOS: 16 Mbit Flash BIOS, PCI Plug & Play, ACPI function support
FSB: 667 MHz
System Memory: 2 GB capacity, 1 GB (LX and XPE)/ 2 GB (W7E) pre-installed: 1 or 2 slots of 2 GB 200-pin DDR2-667 SO-DIMM
Expansion Bus: PCI/104 interface reserved
USB: USB 2.0 hosts x 4, Type A connector, supports system boot up

Storage

Built-in: 2 GB (LX and XPE) / 8 GB (W7E) industrial DOM onboard to store OS
Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II
HDD Support: 2 SATA connectors for drive expansion (with optional HDD kit)

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: Auto-sensing 10/100/1000 Mbps ports x 6
Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 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
Programmable: LED x 8
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: 4 kg (8.89 lb)
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: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
IEC 61000-4-11: (AC models only)
For DPP-T models only:
IEC 61000-4-16: 30 V / 300 V
IEC 61000-4-17: 10% nominal DC voltage
IEC 61000-4-18:
100 kHz: 25k VCM; 1 kV DIM
1 MHz: 2.5 kV CM; 1 kV DM
IEC 61000-4-29: 30% reduction, 0.1 sec.
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)
Time: 135,852 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

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

Software Specifications

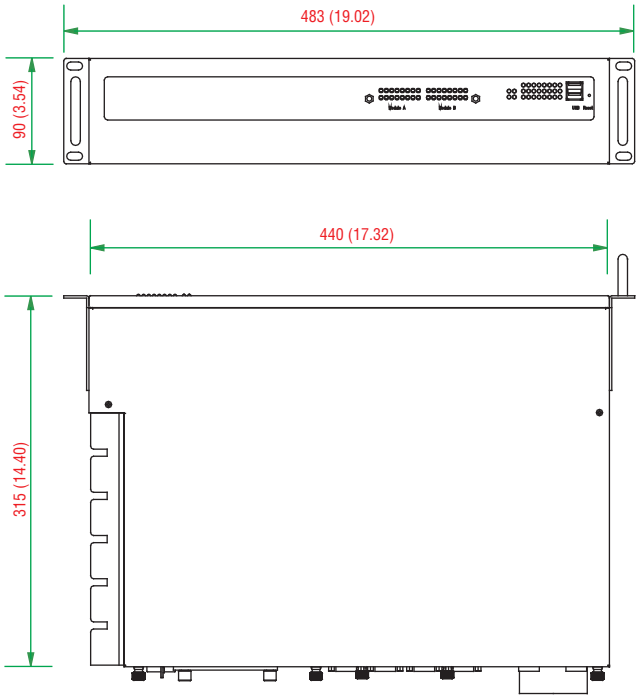
Linux
OS: Linux 2.6.18, Debian Etch 5
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
File System: EXT2, JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE, PTP
Internet Security: OpenVPN, iptables firewall
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 Standard 7
Core OS:
• 32-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
• IME Japanese Support
• IME Korean Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

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, PTP
Web Server (IIS): Allows users to create and manage websites
Remote Registry Service: Enables remote users to modify registry settings on this computer
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Enhanced Write Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage
File-based Write 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-SP-W7E: 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 7, -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 gigabit Ethernet Ports, 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
DA-683-DPP-T-W7E: 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 7, -40 to 70°C operating temperature

Package Checklist

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

Expansion Modules (can be purchased separately)

DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation
DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector
DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation
DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation
DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module
DA-LN04-RJ: 4-port 10/100 Mbps LAN module
DA-UPCI-DK: Universal PCI development kit
DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

Optional Accessories (can be purchased separately)

FK-76127-01: Hard disk installation package

DA-685 Series

x86 rackmount substation computers with VGA, 2 RS-232/422/485 and 6 RS-485 serial ports, 6 LAN Ports, CompactFlash, USB

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

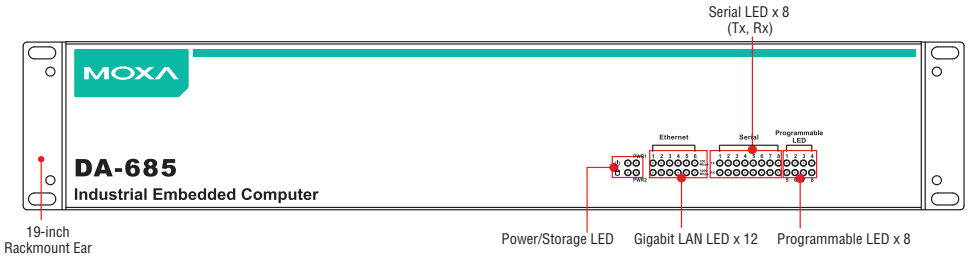
Overview

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

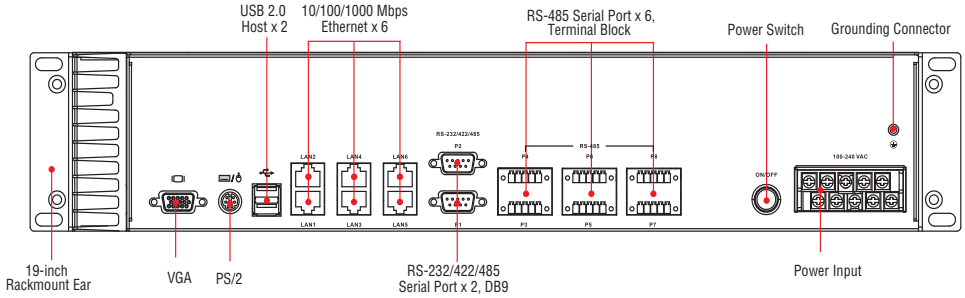
The DA-685 computer are pre-installed with Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7 operating systems, providing a familiar environment for developing sophisticated application software.

Appearance

Front View

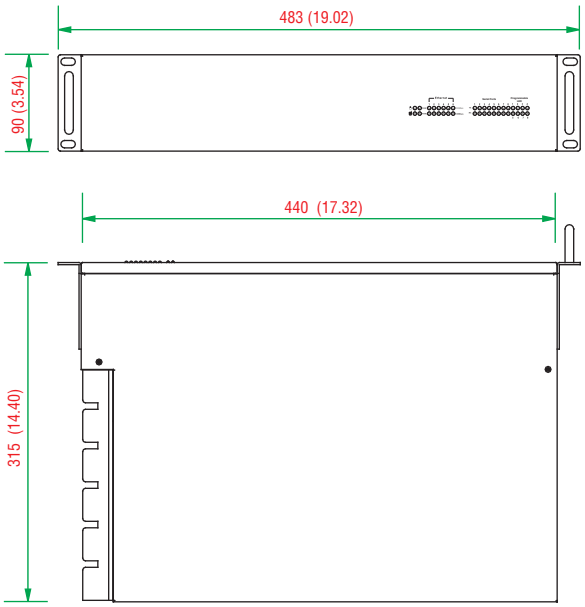


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel Atom D510 1.66 GHz processor
OS: Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7
System Chipset: Intel Pineview-D + ICH8M
BIOS: 16 Mbit Flash BIOS, PCI Plug & Play, ACPI function support
FSB: 667 MHz
System Memory: 2 GB capacity, 1 GB (LX and XPE)/ 2 GB (W7E) pre-installed: 1 or 2 slots of 2 GB 200-pin DDR2-667 SO-DIMM
Expansion Bus: PCI/104 interface reserved
USB: USB 2.0 hosts x 2, Type A connector, supports system boot up

Storage

Built-in: 2 GB (LX and XPE) / 8 GB (W7E) industrial DOM onboard to store OS
Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II
HDD Support: 1 SATA connector for drive expansion

Other Peripherals

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

Display

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

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports x 6
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

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

Serial Signals

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

LEDs

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

Switches and Buttons

Power Switch: on/off (on rear panel)

Physical Characteristics

Housing: SECC sheet metal (1 mm)
Weight: 4 kg (8.89 lb)
Dimensions: 315 x 440 x 90 mm (12.40 x 17.32 x 3.54 in) (without rackmount ears)
Mounting: Standard 19-inch rackmount

Environmental Limits

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

Power Requirements

Input Voltage: 100 to 240 VAC, 50/60 Hz, 0.9-0.4 A
Power Consumption: 40 W

Standards and Certifications

Safety: LVD, UL, cUL, CCC
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GH: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
IEC 61000-4-11: (AC 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)

Time:
DA-685-W7E: 240,825 hrs
DA-685-LX: 168,379 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

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

Software Specifications

Linux

OS: Debian 5 Linux, Lenny; kernel 2.6.26
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
File System: EXT2, JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE, PTP
Internet Security: OpenVPN, iptables firewall
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 Standard 7

Core OS:
• 32-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Storage:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
• IME Japanese Support
• IME Korean Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Windows XP Embedded

OS: Windows Embedded Standard 2009
File System: NTFS
Internet Protocol Suite: HCP, DNS, FTP, HTTP, SNTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS, PTP
Web Server (IIS): Allows users to create and manage websites
Remote Registry Service: Enables remote users to modify registry settings on this computer
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Enhanced Write Filter: Redirect disk write operations to volatile(RAM) or non-volatile (disk) storage
File-based Write 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

Ordering Information

Available Models

DA-685-XPE: x86 rackmount computer with 1.66 GHz CPU, VGA, 6 gigabit Ethernet ports, 2 RS-232/422/485 and 6 2-wire RS-485 ports, CompactFlash, 2 USB ports, single power input, Windows Embedded Standard 2009
DA-685-LX: x86 rackmount computer with 1.66 GHz CPU, VGA, 6 gigabit Ethernet ports, 2 RS-232/422/485 and 6 2-wire RS-485 ports, CompactFlash, 2 USB ports, single power input, Linux
DA-685-W7E: x86 rackmount computer with 1.66 GHz CPU, VGA, 6 gigabit Ethernet ports, 2 RS-232/422/485 and 6 2-wire RS-485 ports, CompactFlash, 2 USB ports, single power input, Windows Embedded Standard 7

Optional Accessories (can be purchased separately)

FK-12072-01: Hard disk installation package (8 screws, 4 brass standoffs, 1 SATA cable, 1 hard disk mounting bracket)

Package Checklist

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

DA-662A Series

RISC 19-inch rackmount data acquisition computers with 8 to 16 serial ports, 4 Ethernet ports, USB

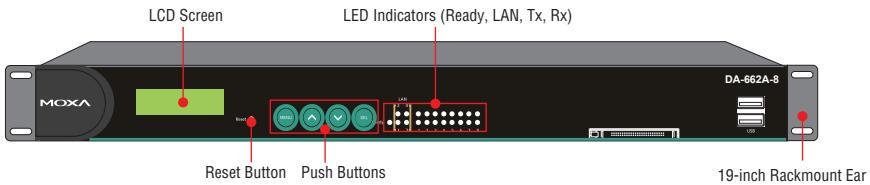
- MoxaMacro 500 MHz processor
- 128 MB RAM onboard, 32 MB flash
- 8 to 16 software-selectable RS-232/422/485 serial ports
- 8 to 16 jumper-configurable 1/150 kΩ pull low/high and 120 ohm termination resistors
- 15 kV ESD protection for all serial signals
- Quad 10/100 Mbps Ethernet ports
- USB and CF slots for storage expansion supported
- Standard 19-inch rackmount installation, 1U height
- Wide range of power input voltages from 100 to 240 VAC
- LCM display and keypad for HMI
- Ready-to-Run Linux OS platform
- Robust, fanless design
- Isolated serial port protection models available

Overview

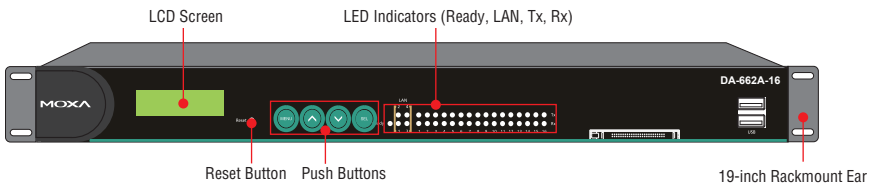
The DA-662A RISC-based, ready-to-run embedded computers are designed for industrial data acquisition applications. The computers have 8 to 16 RS-232/422/485 serial ports, 4 Ethernet ports, and 2 USB 2.0 ports, all based on the MoxaMacro communication processor. In addition, the DA-662A-I-8/16-LX's serial ports come with high level interference protection. The housing is a standard 1U, 19-inch wide rack-mounted rugged enclosure. The robust, rack-mountable mechanism design provides the hardened protection needed for industrial environment applications, and makes it easy for users to install the DA-662A computers on a standard 19-inch rackmount. The DA-662A computers are ideal for applications that require a distributed embedded technology, such as SCADA systems, plant floor automation, and power electricity monitoring applications.

Appearance

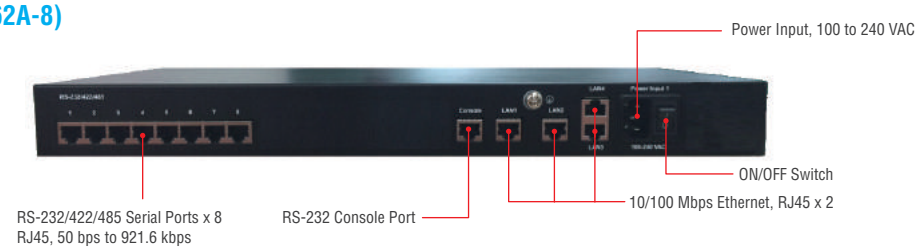
Front View (DA-662A-8)



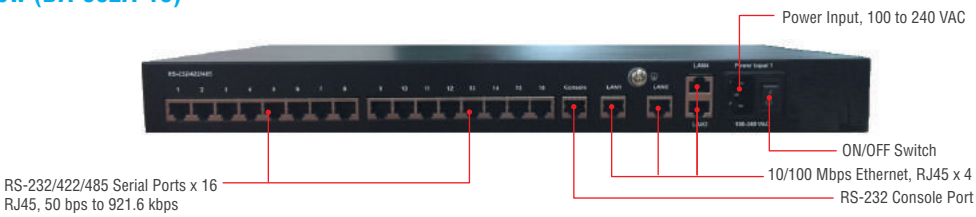
Front View (DA-662A-16)



Rear View (DA-662A-8)



Rear View (DA-662A-16)



Hardware Specifications

Computer
CPU: MoxaMacro 500 MHz
OS: Embedded Linux (pre-installed)
DRAM: 128 MB onboard
Flash: 32 MB onboard

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 4
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Serial Standards: 8 to 16 RS-232/422/485 ports, software selectable (8-pin RJ45)
ESD Protection: 8 kV contact, 15 kV Air ESD protection for all signals
Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 μs waveform (DA-662A-I-8/16-LX only)
Insulation: 500 V (DA-662A-I-8/16-LX only)
Isolation: 2 kV digital isolation (DA-662A-I-8/16-LX only)
Termination Resistor: 120 ohm, jumper selectable
Console Port: RS-232 (all signals), RJ45 connector

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 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
(DA-662A-I-8/16-LX only: TxD, RxD, RTS, CTS, 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: 10/100M x 4
Serial: TxD, RxD (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: 4.3 kg (9.56 lb)
Dimensions:
Without ears: 440 x 45 x 237 mm (17.32 x 1.77 x 9.33 in)
With ears: 480 x 45 x 237 mm (18.90 x 1.77 x 9.33 in)
Mounting: Standard 19-inch rackmount

Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -20 to 80°C (-4 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 Cycle, 13 mins 17 sec per axis

Power Requirements
Input Voltage: 100 to 240 VAC auto ranging
(47 to 63 Hz for AC input)
Power Consumption: 20 W

Standards and Certifications
Safety: UL 60950-1
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 3 V/m
IEC 61000-4-8 1 A/m
IEC 61000-4-11
Green Product: RoHS, CRoHS, WEEE

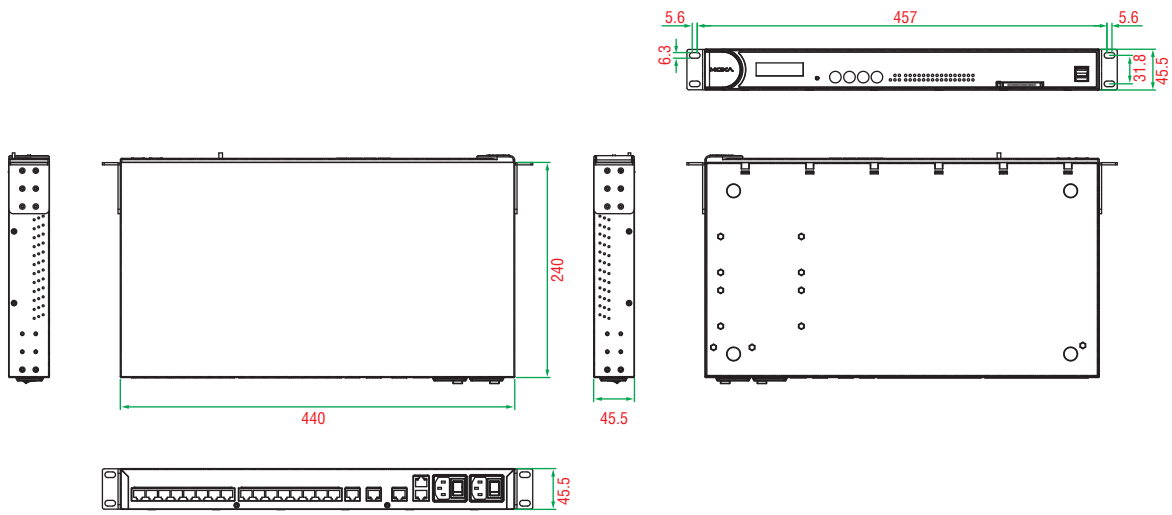
Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time:
DA-662A-8-LX: 272,913 hrs
DA-662A-16-LX: 177,580 hrs
DA-662A-16-DP-LX: 177,260 hrs
DA-662A-I-8-LX: 268,332 hrs
DA-662A-I-16-LX: 189,455 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

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

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux 2.6.38.8
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
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, SNMP v1/v2, SSL, OpenVPN
Internet Security: iptables firewall
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

Ordering Information

Available Models

DA-662A-8-LX: RISC-based 19-inch rackmount data acquisition computer with 8 serial ports, quad LANs, USB, Linux OS
DA-662A-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, quad LANs, USB, Linux OS
DA-662A-16-DP-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports, quad LANs, USB, Linux OS, dual power inputs
DA-662A-I-8-LX: RISC-based 19-inch rackmount data acquisition computer with 8 serial ports (isolation protection), quad LANs, USB, Linux OS
DA-662A-I-16-LX: RISC-based 19-inch rackmount data acquisition computer with 16 serial ports (isolation protection), quad LANs, USB, Linux OS

Package Checklist

- DA-662A 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
- 6 jumper caps
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Model Name	RS-232/422/485 Serial Port	RS-485 2-wire Serial Port only	10/100 Mbps LAN Port	Storage Expansion	Serial port protection
DA-662A-8-LX	8	–	4	2 USB ports, CF slot	15 kV Air ESD protection
DA-662A-16-LX	16	–	4	2 USB ports, CF slot	15 kV Air ESD protection
DA-662A-16-DP-LX	16	–	4	2 USB ports, CF slot	15 kV Air ESD protection
DA-662A-I-8-LX	4	4	4	2 USB ports, CF slot	Isolation: 2 kV digital isolation ESD Protection: 8 kV contact, 15 kV Air ESD protection Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 μs
DA-662A-I-16-LX	4	12	4	2 USB ports, CF slot	Isolation: 2 kV digital isolation ESD Protection: 8 kV contact, 15 kV Air ESD protection Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 μs

Accessories (can be purchased separately)

Model		Description
	PWC-C13US-3B-183 10A/125V	US-type power supply cord
	PWC-C13EU-3B-183 10A/250V	EU-type power supply cord
	PWC-C13CN-3B-183 10A/250V	CN-type power supply cord
	PWC-C13UK-3B-183 10A/250V	UK-type power supply cord
	PWC-C13AU-3B-183 10A/250V	AU-type power supply cord

DA-710 Series

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

- Intel Core 2 Duo T7500 2.2 GHz processor
- 1 socket of 2GB DDR2-533/667 SODIMM SDRAM
- 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

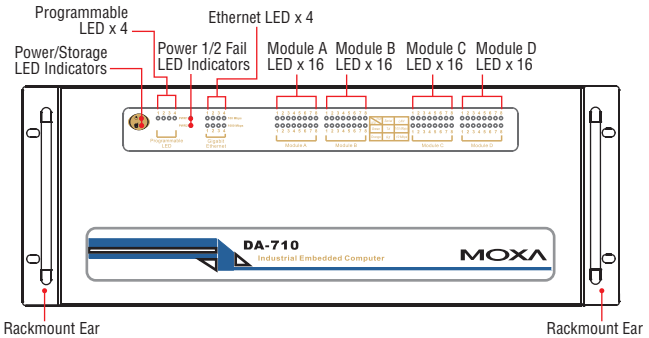
The DA-710 computer is based on the Intel x86 processor, supports VGA, and comes with 4 Ethernet ports, 2 RS-232 serial ports, CompactFlash, and USB. The DA-710 comes in a standard 19-inch, 4U high form factor, making it an ideal platform for industrial applications.

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.

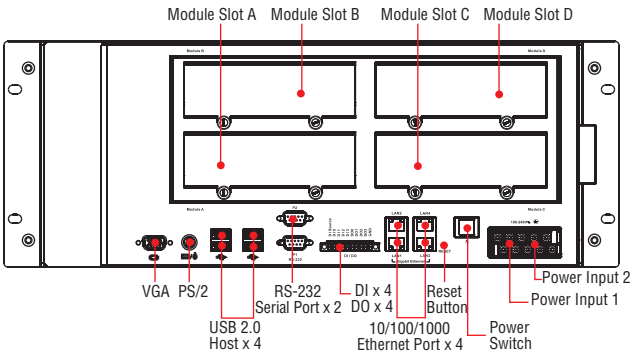
The DA-710 runs Linux, or Windows Embedded Standard 2009 (pre-installed), providing a friendly environment for developing sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and helps programmers develop bug-free code quickly and at a lower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

Appearance

Front View

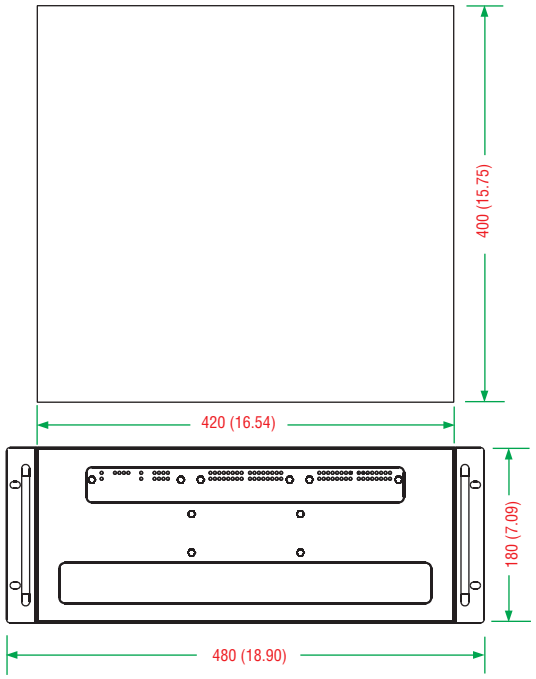


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel Core 2 Duo T7500 2.2 GHz processor
OS: Windows Embedded Standard 2009, Linux 2.6
Note: The OS is pre-installed.
System Chipset: Intel GME965 + ICH8M
BIOS: 8 Mbit SPI Serial Flash, PCI Plug & Play, ACPI function support
FSB: 800 MHz
System Memory: 2 GB capacity, 1 GB pre-installled: 1 slot of DDR2-533/667 200-pin SO-DIMM SDRAM
USB: USB 2.0 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: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 4
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
Programmable: LED x 4
Power Failure: LED x 2
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 (31.11 lb)
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 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
IEC 61000-4-11: (AC models only)
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)
Time: 118,815 hrs
Standard: Telcordia (Bellcore) Standard SR-332

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

Software Specifications

Linux
OS: Linux 2.6.26, Debian 5 (Lenny)
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.
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
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 Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services
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 Write Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage
Application Development Software:
• Moxa API Library
• Microsoft .Net Framework 3.5 with SP1
• Active Directory Service Interface (ADSI) Core
• Common Control Libraries
• Common File Dialogs
• Direct3D, DirectPlay, DirectShow, and Direct show filters
• Mapi32 Libraries
• Message Queuing (MSMQ) Core
• Microsoft Visual C++ Run Time Libraries
• Power Management dynamic-link library
• RPC
• Windows API, Script Engines, and WMI

Ordering Information

Available Models
DA-710-XPE: x86-based rackmount embedded computer with 2 RS-232 ports, 4 LANs, 4 peripheral expansion slots, 4 DIs, 4 DOs, VGA, CompactFlash, USB, Windows Embedded Standard 2009
DA-710-LX: x86-based rackmount embedded computer with 2 RS-232 ports, 4 LANs, 4 peripheral expansion slots, 4 DIs, 4 DOs, VGA, CompactFlash, USB, Linux 2.6

Expansion Modules (can be purchased separately)
DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation
DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector
DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation
DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation
DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module
DA-LN04-RJ: 4-port 10/100 Mbps LAN module
DA-UPCI-DK: Universal PCI development kit
DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming

Optional Accessories (can be purchased separately)
FK-12072-01: Hard disk installation package (8 screws, 4 brass standoffs, 1 SATA cable, 1 hard disk mounting bracket)

Package Checklist
- DA-710 embedded computer
- 19-inch 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 Series Expansion Modules

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

- IRIG-B time-synchronization module
- Universal PCI expansion module
- 4-port 10/100 Mbps LAN module
- 4-port 100 Mbps Fiber LAN module
- 8-port 10/100 Mbps unmanaged switch module
- 8-port RS-422/485 serial module with terminal block connectors
- 8-port RS-232/422/485 software-selectable serial modules with isolation protection
- 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, fiber ports, time-synchronization IRIG-B ports, and PCI slots, give end-users the greatest flexibility for setting up industrial applications and are fully compatible with Moxa's embedded computers that have 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.

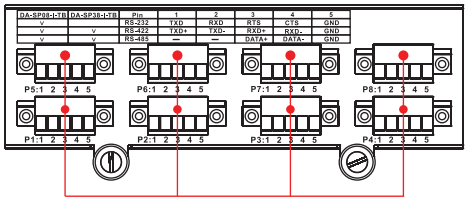
In addition, a 4-port LAN module, 8-port switch module, and 4-port fiber LAN module are available for setting up industrial communication applications with Ethernet-based devices. A universal PCI development kit is also available for PCI-based devices for expanding industrial applications at a reasonable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

The time-synchronization module features 3 digital inputs and 4 digital outputs and provides precision timing information using IRIG-B input signals. The module is designed for embedded computers that support the PCI/104 interface.

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

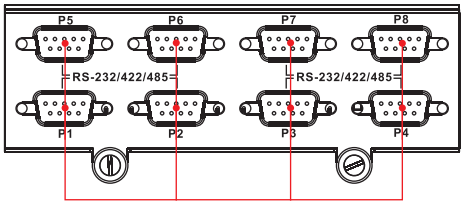
Appearance

DA-SP08-I-TB/DA-SP08-I-EMC4-TB



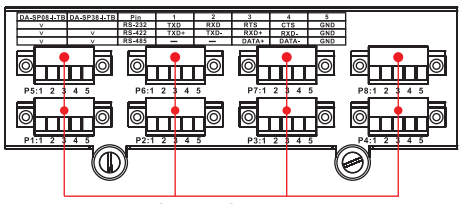
RS-232/422/485 Serial Port x 8

DA-SP08-DB/DA-SP08-I-DB/DA-SP08-I-EMC4-DB



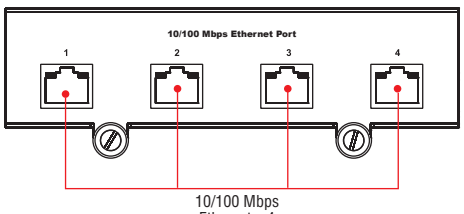
RS-232/422/485
Serial Port x 8

DA-SP38-I-TB



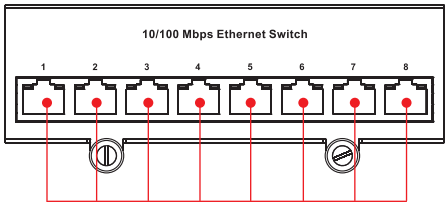
RS-422/485 Serial Port x 8

DA-LN04-RJ



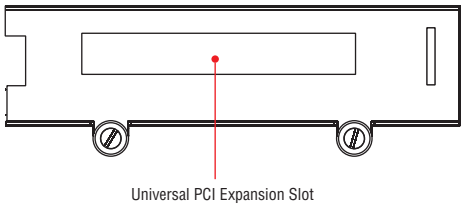
10/100 Mbps
Ethernet x 4

DA-SW08-RJ

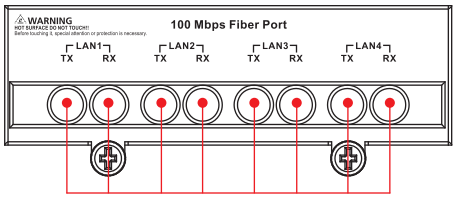


10/100 Mbps Switch Port x 8

DA-UPCI-DK

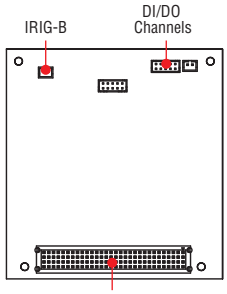

Universal PCI Expansion Slot

DA-FX04-MM-ST-T



Fiber LAN Port x 4

DA-IRIGB-4DIO-PCI104-EMC4



PCI-104 Connector

DA-IRIGB-4DIO-PCI104-EMC4 Hardware Specifications

Hardware
Communication Controller: FPGA Cyclone V
Form Factor: PCI/104

Time Code Input
IRIG-B: Based on the IRIG STANDARD 200-04 and IEEE 1344

Precision and Accuracy
Accuracy (Time Synchronization): ±1 µs
Accuracy (Free Running): ±500 ms @ 24 hr

Input Signals
Single Level:
• Open: High
• Short to GND:> Low
• Level Input: 5 to 12 V
Differential Level:
• D+ - D- > 0.2 V, RXD is High
• D+ - D- < -0.2 V, RXD is Low
• Level Input: 5 V

Interface
IRIG-B: 2-pin wafer to DB9
DI/DO: 10-pin wafter to DB9

Protection
ESD Protection: 8 kV contact, 15 kV Air ESD protection
Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 µs waveform
Insulation: 500 V

Digital Input
Input Channels: 3, 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
Connector Type: DB9 male

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
Isolation: 3 kV optical isolation
Connector Type: Male

Operating Systems
Windows: Windows 7E
Linux: Debian 7

Physical Characteristics
Dimensions: 90 x 96 mm (3.54 x 3.78 in)

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)
Altitude: Up to 2000 m

Standards and Certifications
EMC: CE, FCC
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS:
IEC 61000-4-2 ESD: Contact 8 kV; Air 15 kV
IEC 61000-4-3 RS: 10 V/m (80 MHz to 1 GHz)
IEC 61000-4-4 EFT: Signal 4 kV
IEC 61000-4-5 Surge: Signal 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE

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 (0.64 lb)
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-SP08-I-EMC4-DB/TB Hardware Specifications

Serial Interface
Serial Standards: 8 RS-232/422/485 ports, software selectable (DB9 male or terminal block connector)
ESD Protection: 8 kV contact, 15 kV air
Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 μs waveform
Insulation: 500 V
Isolation: 2 kV digital isolation
Pull low/high: 1k/150k, jumper selectable
Termination Resistor: 120 ohms, jumper selectable

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, RTS, CTS, 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: 500 g (1.11 lb)
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 (0.54 lb)
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 (0.44 lb)
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 (0.44 lb)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

DA-UPCI-DK Hardware Specifications

Universal PCI Expansion Adatper
PCI Slots: 1
Interface Bus: 32-bit Universal PCI (3.3 V and 5 V)

Physical Characteristics
Weight: 195 g (0.43)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)
MTBF (mean time between failures): 11,053,266 hrs

DA-FX04-MM-ST-T Hardware Specifications

Fiber Interface

Number of Ports: 4 (100BaseFX)
Fiber Mode: Multi-mode
Connector Type: ST
Optical Wavelength: 0 to 2 km, 1310 nm (62.5/125 µm, 500 MHz*km)
Min-TX Output: -20 dBm
Max-TX Output: -14 dBm
RX Sensitivity: -34 dBm

Physical Characteristics

Weight: 495 g (1.10 lb)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

Environmental Limits

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

Standards and Certifications

EMC: EMC Level 4, ESD Level 4, criteria A

Software Functions

IEEE 1588 or IP Teaming Selectable (Default =IP Teaming): Supports 4 modes
AFT: Adapter Failover Teaming
SFT: Switch Fault Tolerance
ALB: Adapter Failover and Load Balancing
Link Aggregation: supported

Compatibility Chart for Peripheral Expansion Modules and Embedded Computers

All expansion modules can be used on any of Moxa's embedded computers that come with the peripheral expansion slots. Refer to the following chart.

Module Models	DA-682A	DA-710	DA-683	DA-681A
DA-SP08-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP08-I-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP08-I-TB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP38-I-TB 8-port Serial Module (RS-422/485)	✓	✓	✓	–
DA-LN04-RJ 4-port LAN Module (10/100 Mbps)	✓	✓	✓	–
DA-SW08-RJ 8-port Switch Module (10/100 Mbps)	✓	✓	✓	–
DA-UPCI-DK PCI Module	✓	✓	✓	–
DA-FX04-MM-ST-T 4-port Fiber LAN Module (100 Mbps)	✓	✓	✓	–
DA-SP08-I-EMC4-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP08-I-EMC4-TB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-IRIGB-4DIO-PCI104-EMC4 Time Synchronization Module	✓	✓	✓	✓

Ordering Information

Available Models

DA-IRIGB-4DIO-PCI104-EMC4: 1 IRIG-B signal input port, 3 digital inputs, 4 digital outputs
DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation
DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector
DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation
DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation
DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module
DA-LN04-RJ: 4-port 10/100 Mbps LAN module
DA-UPCI-DK: Universal PCI development kit
DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming
DA-SP08-I-EMC4-DB: 8-port RS-232/422/485 serial module with DB9 connector, digital isolation, and capable of withstanding EMS Level 4 environments
DA-SP08-I-EMC4-TB: 8-port RS-232/422/485 serial module with terminal block connector, digital isolation, and capable of withstanding EMS Level 4 environments

Model Name	Serial Ports		Isolation	Switch	LAN		Connector Type				PCI
	RS-232/422/485	RS-232/485	2 kV Digital	10/100 Mbps	10/100 Mbps (RJ45)	Fiber 100 Mbps (ST)	DB9	RJ45	Terminal Block	ST	3.3/5 V
DA-SP08-I-DB	8	–	✓	–	–	–	✓	–	–	–	–
DA-SP08-DB	8	–	–	–	–	–	✓	–	–	–	–
DA-SP08-I-TB	8	–	✓	–	–	–	–	–	✓	–	–
DA-SP38-I-TB	–	8	✓	–	–	–	–	–	✓	–	–
DA-SW08-RJ	–	–	–	8	–	–	–	✓	–	–	–
DA-LN04-RJ	–	–	–	–	4	–	–	✓	–	–	–
DA-UPCI-DK	–	–	–	–	–	–	–	–	–	–	✓
DA-FX04-MM-ST-T	–	–	–	–	–	✓	–	–	–	✓	–
DA-IRIGB-4DIO-PCI104-EMC4	–	–	–	–	–	–	✓	–	–	–	–
DA-SP08-I-EMC4-DB	8	–	✓	–	–	–	✓	–	–	–	–
DA-SP08-I-EMC4-TB	8	–	✓	–	–	–	–	–	✓	–	–

UC-8100 Series

Communication-centric RISC computing platform

- ARMv7 Cortex-A8 300/600/1000 MHz processor
- Dual auto-sensing 10/100 Mbps Ethernet ports
- SD socket for storage expansion and OS installation
- Rich programmable LEDs and a programmable button for easy installation and maintenance
- Mini PCIe socket for cellular module
- Debian ARM 7 open platform
- Cybersecurity

Overview

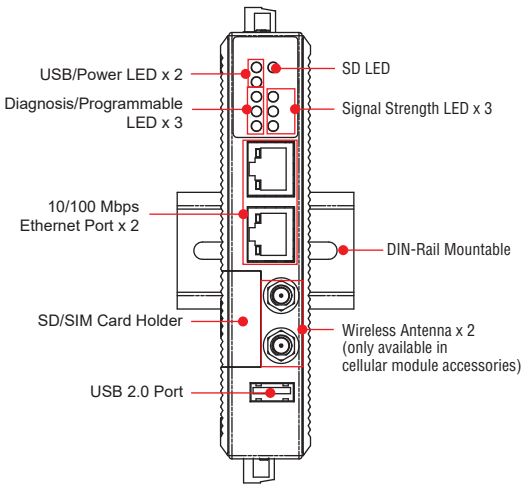
The UC-8100 computing platform is designed for embedded data acquisition applications. The computer comes with one or two RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports, as well as a Mini PCIe socket to support cellular modules. These versatile communication capabilities let users efficiently adapt the UC-8100 to a variety of complex communications solutions.

The UC-8100 is built around a Cortex-A8 RISC processor that has been optimized for use in energy monitoring systems, but is widely applicable to a variety of industrial solutions. With flexible interfacing options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communication platform for many other large-scale deployments.

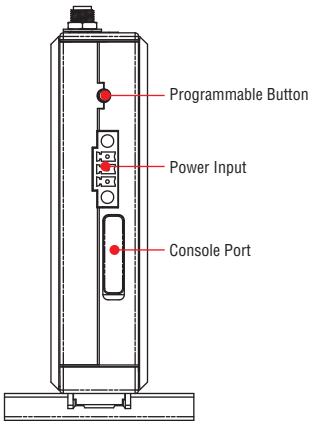
Wide temperature (T) models* are also available for extended temperature applications. All units are thoroughly tested in a testing chamber, guaranteeing that the computing platforms are suitable for wide temperature applications.

Appearance

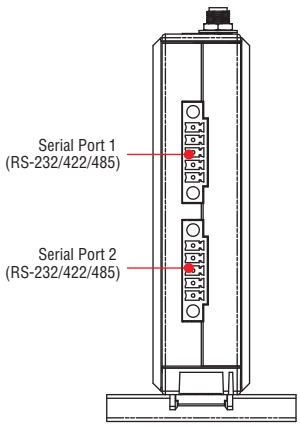
Front View



Top View

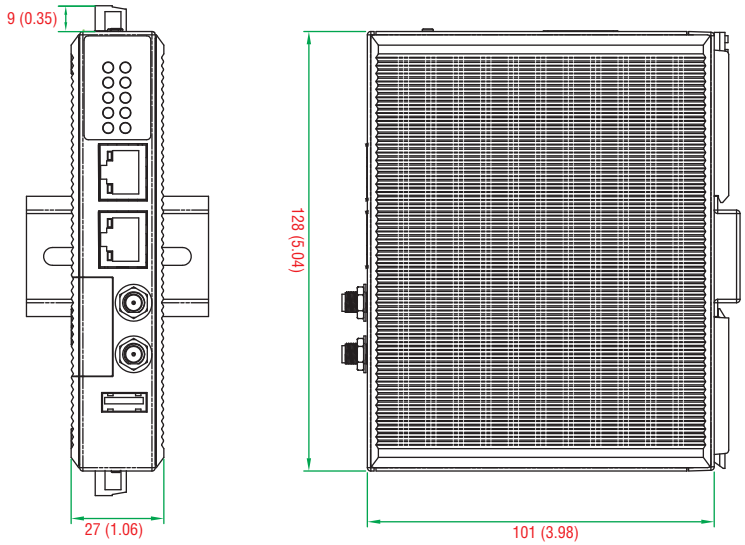


Bottom View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: ARMv7 Cortex-A8 300/600/1000 MHz
USB: USB 2.0 hosts x 1, Type A connector
DRAM: DDR3 SDRAM:
UC-8112-LX: 512 MB
UC-8162-LX: 512 MB
UC-8132-LX: 256 MB
UC-8131-LX: 256 MB
OS (pre-installed): Debian ARM 7 (Kernel 3.2)

Storage

Storage Expansion:
• SDHC/SDXC socket for storing OS and storage expansion
• 1 GB SD card with OS pre-installed
• MicroSD socket for storage expansion (UC-8112-LX only)
• 2 GB MicroSD cards with OS pre-installed (UC-8112-LX only)

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: RS-232/422/485 ports, software-selectable (5-pin terminal block connector) x 1 or 2
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: XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: Max. 921600 bps

Serial Signals

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

LEDs

System: Power x 1, USB x 1, SD x 1, signal strength x 3 (UC-8112/8162/8132 with cellular module)
LAN: 10M/100M on connector
Programmable: Diagnosis x 3

Switches and Buttons

Push Button: Initially configured to return a diagnostic report, and to reset the device to factory defaults

Physical Characteristics

Housing: Polycarbonate plastic
Weight: 224 g (0.50 lb)
Dimensions: 101 x 27 x 128 mm (3.98 x 1.06 x 5.04 in)
Mounting: DIN-rail, wall (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis (without any USB devices attached)
Anti-Shock: 20 g @ IEC 60068-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 24 VDC (3-pin terminal block, V+, V-, SG)
Input Current:
• 450 mA @ 12 VDC
• 225 mA @ 24 VDC
Power Consumption: 5.4 W (without cellular module and external USB device attached)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A

EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8: 20 A/m
IEC 61000-4-9: 300 A/m
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time:
UC-8162-T-LX: 301,648 hrs
UC-8132-T-LX: 302,648 hrs
UC-8131-T-LX: 315,063 hrs
UC-8112-T-LX: 1,181,598 hrs
UC-8162-LX/UC-8132-LX: 1,195,173 hrs
UC-8131-LX: 1,465,546 hrs
UC-8112-LX: 1,149,242 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

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

Software Specifications

Linux

OS: Debian ARM 7
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
Kernel: GNU/Linux 3.2
System Shell: DASH (default), BASH
Text Editor: vim, nano
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP,PAP,DHCP, NTP,NFS, SSH, PPP, SFTP, RSYNC, SSL
Programming Language Support: PHP, Perl, Python
Internet Security Suite: OpenVPN, iptables
Cryptographic Hardware Accelerators: AES, SHA, OpenSSL
Self Diagnosis: Check status of system and hardware component via software method
Linux Board Support Packages (BSP):
• GCC C/C++ cross development tool chain
• Bootloader/ Kernel/ filesystem
Cellular Networking: (UC-8132-LX, UC-8162-LX, UC-8112-LX only)
• WVDIAL: Point-to-Point Protocol dialer that dials a modem and starts pppd to connect to the Internet.
• QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
• MODBUS: Software library to send/receive data according to the Modbus protocol. This library is written in C and supports RTU (serial) and TCP (Ethernet) communications.
• Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API).
Cybersecurity:
• Secure Boot: A novel authentication algorithm proposed to secure platform integration. Only trusted Linux kernel and bootloader should be executed (Patent Pending).
• SUDO Mechanism: Sudo (sometimes considered short for Super-user Do) is a program designed to let system administrators allow some users to execute some commands as root (or another user). The basic philosophy is to give as few privileges as possible but still allow people to get their work done, and the Root account is disabled by default.
• Security Update of existing software packages: All packages in the UC-8100 could be updated for security purposes via Debian or Moxa's Advanced Packaging Tool (APT) server.
• USB Protection: Provides a mechanism for disabling USB function to avoid USB stick malware attacks.
• SD Write Protection: Provides a mechanism for disabling SD write permission both in the filesystem SD and extended storage SD. (Note: Extended storage SD is only supported by the UC-8112-LX).

Ordering Information

Model	CPU	RAM	Serial	Ethernet	Mini PCIe Socket for Wireless Module	Micro SD Socket	SD Socket
UC-8112-LX	1 Ghz	512 MB	2	2	✓	✓ (2 GB MicroSD card with OS pre-installed)	✓ (SD card not attached)
UC-8162-LX	600 Mhz	512 MB	2	2	✓	–	✓ (1 GB SD card with OS pre-installed)
UC-8132-LX	300 Mhz	256 MB	2	2	✓	–	✓ (1 GB SD card with OS pre-installed)
UC-8131-LX	300 Mhz	256 MB	1	2	–	–	✓ (1 GB SD card with OS pre-installed)

Package Checklist (computer)

- UC-8100 embedded computer
- Power jack
- 3-pin terminal block for power
- 5-pin terminal block for UART x 2

Optional Accessories

Power Adapters & Cords, Console Cable		
Adapter	PWR-24250-DT-S1	Power adapter with input: 100-240 VAC, 50-60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W for test and system development in the office under ambient temperature
Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Euro plug
Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
Console Cable	CBL-F9DPF1x4-BK-100	Console cable with 4-pin connector
Wireless Package		
Cellular Package	CELLULAR-LTE-US	LTE module mounting package: • Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 1 • Mini PCI/e mounting screw sets x 2
Cellular Package	CELLULAR-LTE-EU	LTE module mounting package: • Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 1 • Mini PCI/e mounting screw sets x 2
Cellular Package	CELLULAR-3G-EVDO-HSPA+	3G module mounting package: • Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 1 • Mini PCI/e mounting screw sets x 2
WiFi Package	WiFi-BGN	WiFi module mounting package: • WiFi module x 1 • i-PEX MHF to RP-SMA adapter with cable x 1 • Mini PCI/e mounting screw sets x 2
Antennas and Internal Antenna Cables		
GPS Antenna	ANT-GPS-OSM-05-3M	Active GPS antenna, 26 dBi, 1572 MHz, L1 band antenna for GPS
3G Antenna	ANT-3G-SMA	SMA male antenna for cellular, support bands: 850/900/1800/1900/2100 MHz
WiFi Antenna	ANT-WDB-ARM-02	RP-SMA male antenna for WiFi, support bands: 2.4 Ghz
Cellular antenna cable	A-CRF-MHFSF	i-PEX MHF (male, on cellular module) to SMA (female, on top cover) adapter with cable. For when you need to install a GPS antenna or second cellular antenna.
WiFi antenna cable	CRF-MHF/SMA(M)-14.2	i-PEX MHF (male, on cellular module) to RP-SMA (female, on top cover) adapter with cable. For when you need to install a second WiFi antenna.
Mounting Kits		
Wall-mounting Kit	WALLMOUNT-8100-01	Wall-mounting kit with screws

Railway Computers

Product Selection Guide

Railway Computers 22-2

Onboard Computers

TC-6110 Series: EN 50155-compliant x86 train computer with dual LAN ports, dual power inputs, USB, VGA, serial port, CompactFlash, and 4 expansion slots. 22-4

TC-6000 Series Expansion Modules: Peripheral modules for the TC-6000 series 22-8

V2616A Series: x86 embedded computer with Intel Core i5/i7 processor, dual M12 Ethernet ports, serial interfaces, 6 DIs, 2 DOs, VGA and DVI-D, 3 USB ports, 3 SATA interfaces, 2 removable drive trays, CFast card 22-11

V2406A Series: x86 embedded computer with Intel Celeron/Core i7 CPU, VGA, DVI, dual M12 Ethernet ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, dual CFast slots 22-15

V2416A Series: x86 embedded computer with Intel Celeron/Core i7 CPU, VGA, DVI, dual M12 Ethernet ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, dual CFast slots, 2 hot-swappable storage trays 22-20

V2426A Series: x86 embedded computer with Intel Celeron/Core i7 CPU, VGA, DVI, dual M12 Ethernet ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, dual CFast slots, 2 peripheral expansion slots, 12 to 48 VDC power 22-25

V2400 Series Expansion Modules: Expansion peripheral modules (EPM) for the V2400A series 22-31

(Mobile) Multiple WAN Computers

UC-8481 Series: Industrial RISC-based mobile Linux computers with cellular, Wi-Fi, and GPS modules, 2 Ethernet, 2 serial, 2 USB 2.0 ports, and 2 mini PCIe sockets 22-35

Mobile Networking Appliances

RNAS-1200 Series: Network-attached storage with 2 M12 gigabit PoE/PoE+ LAN ports and -40 to 70°C temperature tolerance 22-40

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Railway Computers

Railway Computers

	TC-6110 Series	V2616A Series	V2406A Series	V2416A Series
Computer				
CPU	Intel Atom D525 (dual-core, 1.8 GHz)	Intel Core i5-3610ME (2.7 GHz) Intel Core i7-3517UE (1.7 GHz) Intel Core i7-3612QE (2.1 GHz)	Intel Celeron 1047UE (1.4 GHz) Intel Core i7-3517UE (1.7 GHz)	Intel Celeron 1047UE (1.4 GHz) Intel Core i7-3517UE (1.7 GHz)
OS	Windows Embedded Standard 7 or Linux Debian 7	Windows Embedded Standard 7 or Linux Debian 7	Windows Embedded Standard 7 or Linux Debian 7	Windows Embedded Standard 7 or Linux Debian 7
System Memory	2 GB pre-installed	4 GB pre-installed	4 GB pre-installed	4 GB pre-installed
USB	USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)	USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)	USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)	USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)
Storage				
Built-in	8 GB onboard industrial CompactFlash card for operating system storage	–	–	–
Expansion Slot	–	1 full-size/half-size mini PCIe socket with 1 SIM card socket. Mini PCIe socket supports power on/off control	–	–
HDD/SSD Support	2 removable TC-SATA-T storage trays for 2.5-inch SSD or HDD storage drive (with Intelligent Heating Solution)	2 hot-swappable storage trays for 2.5-inch SATA SSD or HDD, 1 internal SATA-II storage connector for 2.5-inch SSD or HDD	1 internal SATA-II bus for 2.5-inch HDD/SSD*	2 hot-swappable trays for 2.5-inch HDD/SSD storage expansion*
CFast Support	–	1 slot for OS*, 1 slot for backup storage	1 slot for OS*, 1 slot for backup storage	1 slot for OS*, 1 slot for backup storage
Display				
Graphics Controller	Integrated Intel GMA 3150 (Pineview) Graphics Engine	Intel® HD Graphics 4000 (integrated)	Intel® HD Graphics 4000 (integrated)	Intel® HD Graphics 4000 (integrated)
Connector Type	–	1 DVI-I connector, 1 VGA connector	2 DVI-I connectors	2 DVI-I connectors
Display Interface	Up to 2048 x 1536 resolution at 75 Hz, DB9 female connector	• DVI up to 1920 x 1200 resolution @ 60 Hz • VGA up to 1920 x 1200 resolution @ 60 Hz • VGA up to 2048 x 1536 resolution @ 75 Hz	• DVI up to 1920 x 1200 resolution @ 60 Hz • VGA up to 1920 x 1200 resolution @ 60 Hz • VGA up to 2048 x 1536 resolution @ 75 Hz	• DVI up to 1920 x 1200 resolution @ 60 Hz • VGA up to 1920 x 1200 resolution @ 60 Hz • VGA up to 2048 x 1536 resolution @ 75 Hz
Ethernet Interface				
LAN	Auto-sensing 10/100/1000 Mbps ports (M12) x 2	Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2	Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2	Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2
Serial Interface				
Serial Standards	1 RS-232 port (DB9 male)	2 software-selectable RS-232/422/485 ports (DB9 male)	4 RS-232/422/485 ports, software selectable (DB9 male)	4 software-selectable RS-232/422/485 ports (DB9 male)
ESD Protection	–	4 kV for all signals	4 kV for all signals	4 kV for all signals
Data Bits	5, 6, 7, 8	5, 6, 7, 8	5, 6, 7, 8	5, 6, 7, 8
Stop Bits	1, 1.5, 2	1, 1.5, 2	1, 1.5, 2	1, 1.5, 2
Parity	None, Even, Odd, Space, Mark	None, Even, Odd, Space, Mark	None, Even, Odd, Space, Mark	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS	RTS/CTS	RTS/CTS	RTS/CTS
Isolation Protection	–	1.5 kV	1.5 kV	1.5 kV
Digital Input				
Input Channels	–	6	6	6
Input Voltage	–	0 to 30 VDC at 25 Hz	0 to 30 VDC at 25 Hz	0 to 30 VDC at 25 Hz
Digital Output				
Output Channels	–	2, sink type	2, sink type	2, sink type
Output Current	–	Max. 200 mA per channel	Max. 200 mA per channel	Max. 200 mA per channel
On-state Voltage	–	24 VDC nominal, open collector to 30 VDC	24 VDC nominal, open collector to 30 VDC	24 VDC nominal, open collector to 30 VDC
Physical Characteristics				
Housing	Aluminum and SECC sheet metal (1 mm)	Aluminum	Aluminum	Aluminum
Weight	5 kg (11.11 lb)	5 kg (11.11 lb)	2 kg (4.44 lb)	4 kg (8.98 lb)
Dimensions	With ears: 210 x 269 x 133 mm (8.27 x 10.60 x 5.24 in)	287 x 290 x 101 mm (11.29 x 11.41 x 3.97 in)	With ears: 275 x 63 x 154 mm (10.83 x 2.47 x 6.06 in)	With ears: 275 x 92 x 154 mm (10.83 x 3.62 x 6.06 in)
Mounting	Rack	Wall	DIN rail, wall, VESA	DIN rail, wall, VESA
Environmental Limits				
Operating Temperature	-25 to 55°C (-13 to 140°F) or -40 to 70°C (-40 to 158°F)	-25 to 55°C (-13 to 140°F) or -40 to 70°C (-40 to 158°F)	-25 to 55°C (-13 to 131°F) or -40 to 70°C (-40 to 158°F)	-25 to 55°C (-13 to 131°F) or -40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)	(with SSD installed) -40 to 85°C (-40 to 185°F)	-40 to 85°C (-40 to 185°F)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Conformal Coating	Available	Available	Available on request	Available on request
Power Requirements				
Input Voltage	24 to 110 VDC (M12 A-coded)	24 to 110 VDC (M12 A-coded)	12 to 48 VDC (M12 A-coded)	12 to 48 VDC (M12 A-coded)
Power Consumption	32 W (without heater), 62 W (with heater)	• 60 W (no SSD/HDD attached) • 2.5 A @ 24 VDC to 0.55 A @ 110 VDC	• 3.3 A @ 12 VDC, 39.6 W • 0.82 A @ 48 VDC, 39.4 W	• 3.3 A @ 12 VDC, 39.6 W • 0.82 A @ 48 VDC, 39.4 W
Standards and Certifications				
Safety	UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1	UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1
EMC	EN 55022:2010 Class A, EN 55024:2010, FCC CFR Title 47 Part 15 Subpart B: 2011 Class A, CISPR 22:2008, ANSI C63.4:2009, ICES-003 Issue 5:2012 Class A	EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A	EN 55022/24	EN 55022/24
EMI	–	–	CISPR 22, FCC Part 15B Class A	CISPR 22, FCC Part 15B Class A
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11			
Green Product	–	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
RF	EN 62311:Jan 2008, ETSI EN 301 489-1:V1.9.2 (2011-09), ETSI EN 301 489-3:V1.4.1 (2002-08), ETSI EN 301 893:V1.6.1 (2011-11), ETSI EN 300 328:V1.7.1 (2006-10), ETSI EN 300 440-1:V1.6.1 (2010-08), ETSI EN 300 440-2:V1.4.1 (2010-08)	–	–	–
Rail Traffic	EN 50155:2007 (essential compliance*), EN 50121-3-2:2006, EN 50121-4:2006	EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4	EN 50155*, EN 50121-3-2, EN 50121-4	EN 50155*, EN 50121-3-2, EN 50121-4
Environmental Tests	EN 60068-2-1:2007, EN 60068-2-2:2007, EN 61373:1999	EN 60068-2-1:2007, EN 60068-2-2:2007, EN 61373:1999	–	–
Warranty				
Warranty Period	3 years	3 years	3 years	3 years
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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Railway Computers

	V2426A Series	UC-8481 Series	RNAS-1200 Series
Computer			
CPU	Intel Celeron 1047UE (1.4 GHz), Intel Core i7-3517UE (1.7 GHz)	533 MHz	1.0 GHz
OS	Windows Embedded Standard 7 or Linux Debian 7	Linux (pre-installed)	–
System Chipset	Mobile Intel® HM65 Express	–	–
System Memory	1 DDR3-1600 SO-DIMM SDRAM slot, 8 GB max., 4 GB pre-installed	–	–
USB	USB 2.0 hosts x 3 (Type A connectors x 2, M12 D-coded x 1)	USB 2.0 hosts x 2	–
DRAM	–	512 MB DDR2 SDRAM onboard, 32 MB NOR Flash, 512 MB NAND Flash	512 MB DDRII
Flash Memory	–	–	Onboard 2 GB USB DOM to store OS
Storage			
Storage Expansion	–	CompactFlash socket	–
HDD/SSD Support	1 internal SATA-II bus for 2.5-inch HDD/SSD storage expansion*	–	2.5-inch HDD bays x 2, reserved for storage expansion
CFast Support	1 slot for OS*, 1 slot for backup storage	–	–
Display			
Graphics Controller	Intel® HD Graphics 4000 (integrated)	–	–
Connector Type	2 DVI-I connectors	–	–
Display Interface	DVI up to 1920x1200 resolution @ 60 Hz VGA up to 1920x1200 resolution @ 60 Hz VGA up to 2048x1536 resolution @ 75 Hz	–	–
Ethernet Interface			
LAN	Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2	Auto-sensing 10/100 Mbps ports (M12) x 2	Auto-sensing 10/100/1000 Mbps ports (M12) x 2
Magnetic Isolation Protection	–	1.5 kV built in	–
Serial Signals			
RS-232	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND	TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND	–
RS-422	TxD+, TxD-, RxD+, RxD-, GND	TxD+, TxD-, RxD+, RxD-, GND	–
RS-485-4w	TxD+, TxD-, RxD+, RxD-, GND	TxD+, TxD-, RxD+, RxD-, GND	–
RS-485-2w	Data+, Data-, GND	Data+, Data-, GND	–
Digital Input			
Input Channels	6	4	–
Input Voltage	0 to 30 VDC at 25 Hz	0 to 30 VDC	–
Digital Input Levels for Dry Contacts	• Logic level 0: Close to GND • Logic level 1: Open	• 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)	• Logic level 0: +3 V max. • Logic level 1: +10 V to +30 V (COM to DI)	–
Digital Output			
Output Channels	2, sink type	4, sink type	–
Output Current	Max. 200 mA per channel	Max. 200 mA per channel	–
On-state Voltage	24 VDC nominal, open collector to 30 VDC	24 VDC nominal, open collector to 30 ⊗	–
Connector Type	10-pin screw-fastened Euroblock terminal (6 inputs, 2 outputs, DI Source, GND)	10-pin screw terminal block (4 points, GND)	–
Isolation	3 kV optical isolation	–	–
IHS Control			
IHS Function Control	–	–	Temperature reading, power output control for heating function
Physical Characteristics			
Housing	Aluminum	SECC sheet metal (1 mm)	Aluminum
Weight	3 kg (6.67 lb)	1 kg (2.22 lb)	1.98 kg (4.4 lb) (RNAS-1201-T)/2 kg (4.44 lb) (RNAS-1211-T)
Dimensions	With ears: 275 x 92 x 154 mm (10.83 x 3.62 x 6.06 in)	200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)	252 x 130 x 57 mm (9.92 x 5.12 x 2.24 in)
Mounting	DIN rail, wall, VESA	DIN rail, wall	wall
Environmental Limits			
Operating Temperature	-25 to 55°C (-13 to 131°F) or -40 to 70°C (-40 to 158°F)	-25 to 55°C (-13 to 131°F) or -25 to 70°C (-13 to 158°F)	-40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)	-25 to 75°C (-13 to 167°F) or -40 to 80°C (-40 to 176°F)	-40 to 85°C (-40 to 176°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Anti-Vibration	EN 50155 standard	IEC 61373 standard	EN 50155 standard
Anti-Shock	EN 50155 standard	IEC 61373 standard	EN 50155 standard
Conformal Coating	Available on request	–	Available on request
Power Requirements			
Input Voltage	12 to 48 VDC (M12 A-coded)	24 VDC (9 to 48 V), M12 connector	PoE (IEEE 802.3af), or PoE+ (IEEE 802.3at)
Power Consumption	47 W	20 W	25.5 W
Standards and Certifications			
Safety	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1	UL 60950-1
EMC	EN 55022/24	EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B	EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 55024
EMI	CISPR 22, FCC Part 15B Class A	–	FCC Part 15 Subpart B Class A, CISPR 22:2008
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11		
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Rail Traffic	EN 50155*, EN 50121-3-2, EN 50121-4 , IEC 60571	EN 50155*, EN 50121-2-3, EN 50121-4, IEC 61373	EN 50155 (essential compliance*), EN 50121-3-2, IEC 61373
Warranty			
Warranty Period	3 years	5 years (does not apply to cellular module)	5 years (storage drive not included)
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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TC-6110 Series

EN 50155-compliant x86 train computer with dual LAN ports, dual power inputs, USB, VGA, serial port, CompactFlash, and 4 expansion slots

- Durable, fanless design for rolling stock applications
- Modular design for easy storage and peripheral expansion
- Comes with Moxa SafeGuard™, for HDD in wide temperature and high vibration environments
- Compact rackmount 3U housing, wide 24 to 110 VDC isolated power supply
- Supports SNMP-based system configuration, control, and monitoring
- Essential compliance with EN 50155*
- Conformal coating models available

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155

Windows Embedded Standard 7

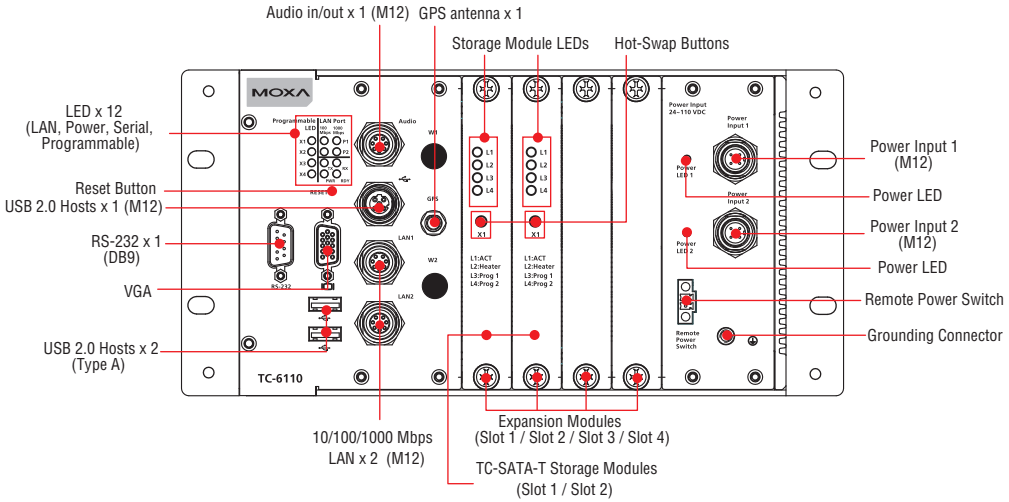
Introduction

TC-6110 train computers are designed specifically for car-borne train automation like network video recorders, passenger information systems, condition monitoring, and train-to-ground communications. The computers come with two gigabit LAN ports, one RS-232 serial port, three USB 2.0 ports, and two TC-SATA-T storage modules, giving customers a versatile solution for on-board train computing.

Designed for high reliability in the demanding conditions experienced in on-board train environments, TC-6110 computers come with M12 connectors on both the gigabit LAN ports and dual power inputs, and an additional M12 USB port. The TC-6000 Series expansion modules further allow for highly flexible, convenient integration into a variety of systems. Users can easily add storage modules for additional capacity, gigabit switch modules to expand network connectivity and/or bandwidth, serial and CAN bus modules for additional serial/CAN device connectivity, or mini PCIe modules for additional peripheral communications.

For the strongest component protection in harsh environments, TC-6110 Series computers are available with conformal coating.

Appearance



Hardware Specifications

Computer
CPU: Intel Atom D525, dual-core 64-bit threaded 1.8 GHz, 1 MB for L2 cache
OS: Windows Embedded Standard 7 or Linux
Note: The OS is pre-installed.
System Chipset: ICH8-M
System Memory: 4 GB capacity, 2 GB pre-installed: 2 slots of 2 GB DDR3-1066 204 pin SO-DIMM SDRAM
USB: USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)

Storage
Built-in: 8 GB onboard industrial CompactFlash card for operating system storage
HDD Support: 2 removable TC-SATA-T storage trays, for 2.5-inch SSD or HDD storage drive (with Intelligent Heating Solution)

Other Peripherals
Audio: 1 line in / line out interface with M12 connector
Independent Sensors: Accelerometer (G-sensor), thermometer (T-sensor)

Display
Graphics Controller: Integrated Intel GMA 3150 (Pineview) Graphics Engine
VGA Interface: Up to 2048 x 1536 resolution at 75 Hz, DB9 female connector

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (M12) x 2

GPS Module
Receiver Types: 50 channels, GPS L1 C/A code, SBAS (WAAS), EGNOS, MSAS, GAGAN
Acquisition:
• Cold start: 29 s
• Warm start: 29 s
• Aided start: 1 s
• Hot start: 1 s
Sensitivity:
• Tracking & Navigation: -160 dBm
• Reacquisition: -160 dBm
• Cold start: -147 dBm
Accuracy:
• Autonomous: 2.5 m
• SBAS: 2.0 m
Protocols: NMEA, UBX binary, max. update rate: 5 Hz (ROM version)
Time Pulse: 0.25 Hz to 1 kHz
Velocity Accuracy: 0.1 m/s
Heading Accuracy: 0.5°
A-GPS: AssistNow Online/Offline, SUPL (Open Mobile Alliance) compliant
Operational Limits:
• Dynamics ≤ 4 g
• Altitude 50,000 m
• Velocity 500 m/s
Connector Type: QMA

WLAN Module (Available on request)
Standards: IEEE 802.11 a/b/g/n for wireless LAN
Security: WEP, TKIP, and AES hardware encryption
Antenna Type: 2 QMA connectors (female type)
Mode: Client (default), Access Point (available on request)

Serial Interface
Serial Standards: 1 RS-232 port (DB9 male)
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS
Baudrate: Up to 115.2 kbps

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

LEDs
System: Independent "Power" and "System Ready" signals
LAN: 100M/Link x 2, 1000M/Link x 2
Serial: TX x 1, RX x 1
Other: Programmable x 4

Physical Characteristics
Housing: Aluminum and SECC sheet metal (1 mm)
Weight: 5 kg (11.11 lb)
Dimensions:
• Without ears: 210 x 222 x 133 mm (8.27 x 8.74 x 5.24 in)
• With ears: 210 x 269 x 133 mm (8.27 x 10.60 x 5.24 in)
Mounting: Rack

Environmental Limits
Operating Temperature:
• Standard models: -25 to 55°C (-13 to 140°F), (EN 50155 Class T1)
• Wide temp. models: -40 to 70°C (-40 to 158°F), (EN 50155 Class Tx)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: Meets EN 50155 standard
Anti-Shock: Meets EN 50155 standard

Power
Reset Button: For warm reboot (front panel)
Input Voltage: 24 to 110 VDC, M12 connector
Power Consumption: 32 W (without heater), 62 W (with heater), no SSD/HDD attached
Note: 24 VDC and 110 VDC compliant with EN 50155

Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1
EMC: EN 55022:2010 Class A, EN 55024:2010, FCC CFR Title 47 Part 15 Subpart B: 2011 Class A, CISPR 22:2008, ANSI C63.4:2009, ICES-003 Issue 5:2012 Class A
RF: EN 62311:Jan 2008, ETSI EN 301 489-1:V1.9.2 (2011-09), ETSI EN 301 489-3:V1.4.1 (2002-08), ETSI EN 301 893:V1.6.1 (2011-11), ETSI EN 300 328:V1.7.1 (2006-10), ETSI EN 300 440-1:V1.6.1 (2010-08), ETSI EN 300 440-2:V1.4.1 (2010-08)
Rail Traffic: EN 50155:2007 (essential compliance*), EN 50121-1:2006 for EMC test, EN 50121-3-2:2006, EN 50121-4:2006, EN 5011:2009+A1:2010, EN 61000-6-4:2007, CISPR 16-1-2:2003/A2:2006, CISPR 16-2-1:2003+A1:2005, CISPR 16-2-3:2006, EN 60068-2-1:2007, EN 60068-2-2:2007, EN 61373:1999
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Environmental Tests: EN 60068-2-1:2007, EN 60068-2-2:2007, EN 61373:1999

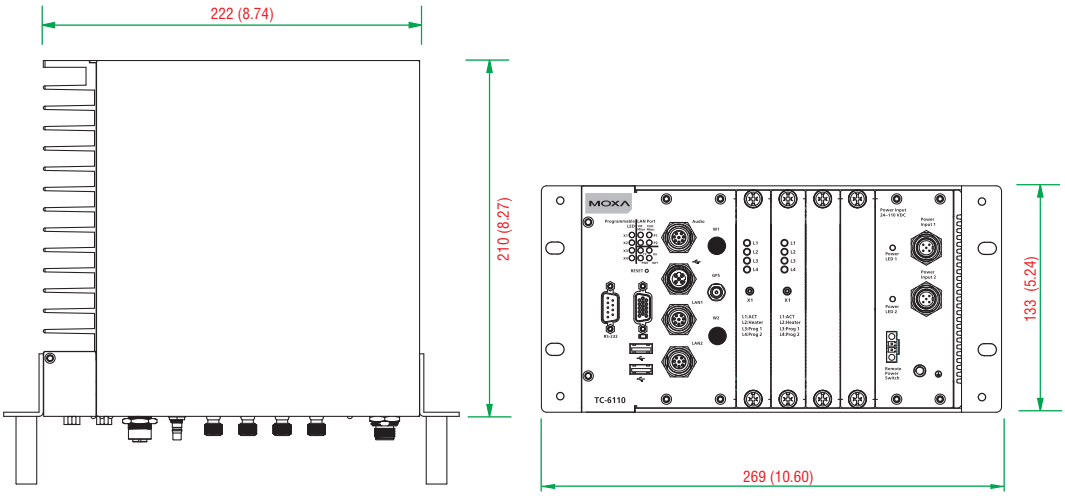
Reliability
Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting system reset with software programmable time intervals of 1-255

MTBF (mean time between failures)
Time: 360,616 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 7
Web Server (Apache): Allows you to create and manage websites; supports PHP and XML
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telent FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). Works with 'chat', 'dip', and 'dialup'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: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Application Development Software:
• Moxa API Library
• GNU C/C++ cross-compiler
• GNU C library
• Perl
Software Package:
• SNMP
• SafeGaurd technology

Windows Embedded Standard 7

Core OS:
• Windows 7 Embedded, 32 bit
• Sensor and Location Platform
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 4.0
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts:
• Chinese (Trad. and Simp.), Middle East, South East Asian, and South Asian Fonts
• True Type Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)

Embedded Features:
- Enhanced Write Filter(EWF)
- File-Based Write Filter (FBWF)
- Message Box Default Reply
- Registry Filter
- WSDAPI for .NET

File Systems and Data Storage:
- Windows Data Access Components
- Windows Backup and Restore

Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Available Models

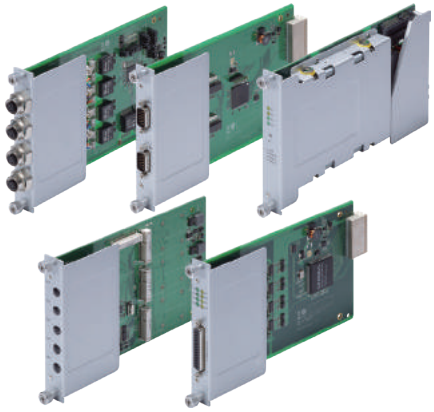
TC-6110-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Win7 Embedded (32-bit), -25 to 55°C operating temperature range, compliant with EN 50155 Class T1
TC-6110-T-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Win7 Embedded (32-bit), -40 to 70°C operating temperature range, compliant with EN 50155 Class TX
TC-6110-CT-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Win7 Embedded (32-bit), -25 to 55°C operating temperature range, compliant with EN 50155 Class T1
TC-6110-CT-T-W7E: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Win7 Embedded (32-bit), -40 to 70°C operating temperature range, compliant with EN 50155 Class TX
TC-6110-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Linux Debian 7, -25 to 55°C operating temperature range, compliant with EN 50155 Class T1
TC-6110-T-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, WLAN module (available on request), Linux Debian 7, -40 to 70°C operating temperature range, compliant with EN 50155 Class TX
TC-6110-CT-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Linux Debian 7, -25 to 55°C operating temperature range, compliant with EN 50155 Class T1
TC-6110-CT-T-LX: Modular 3U/42HP train computer, Intel Atom D525 1.8 GHz CPU, 4 expansion slots, 24 to 110 VDC isolated power, conformal coating, WLAN module (available on request), Linux Debian 7, -40 to 70°C operating temperature range, compliant with EN 50155 Class TX

Package Checklist

- TC-6110 train computer
- Rackmount kit
- Power switch with cable extender
- M12 connector (M12A-5P-IP68)
- Power cable (CBL-Power Jack to M12)
- Quick installation guide (printed)
- Documentation and software CD or DVD
- Warranty card

TC-6000 Series Expansion Modules

Peripheral modules for the TC-6000 series



- TC-SP04-DB44-T: 4-port software-selectable RS- 232/422/485 over DB44-F serial module
- TC-CP02-DB-T: 2-port optically isolated CAN module
- TC-DK10-T/TC-DK20-T: 4-socket mini PCIe card carrier module
- TC-SW04-M12-4P-T: 4-port megabit Ethernet switch port module with M12 connector
- TC-SW04-M12-8P-T: 4-port gigabit Ethernet switch port module with M12 connector

Introduction

TC-6000 series expansion modules provide peripheral interfaces for the TC-6000 series line of railway computers.

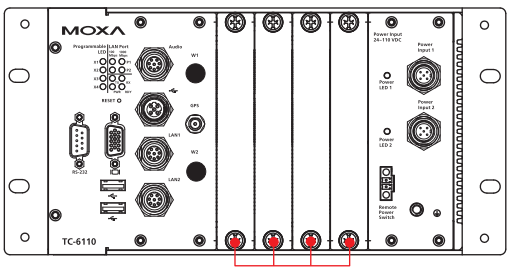
These modules include a 4-port (without PoE) gigabit or megabit Ethernet switch module with M12 connectors, a mini PCIe card carrier module with four sockets, a serial module supporting four software-selectable RS-232/422/485 interfaces over a single DB44-F connector (cable adapter), and an optically isolated CAN module with two ports.

The modules let system integrators and administrators easily add additional Ethernet ports and/or bandwidth, as well as serial, PCIe, and CAN interfaces to the TC-6000 series of train computers.

All of the TC-6000 modules are compliant with the essential sections of the EN 50155 Class TX standard, maintaining the TC-6000 series goal of offering a highly dependable computing platform suitable for a wide variety of on-board railway applications.

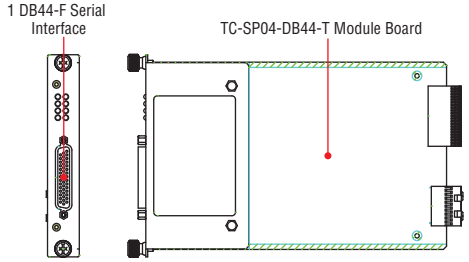
Appearance

TC-6110 Expansion Slot Location

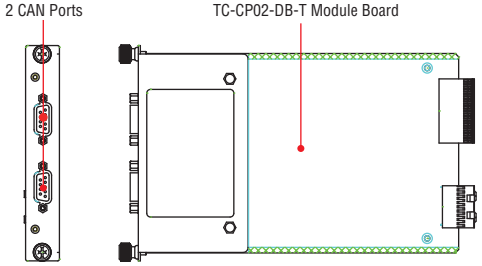


Expansion Modules
(Slot 1 / Slot 2 / Slot 3 / Slot 4)

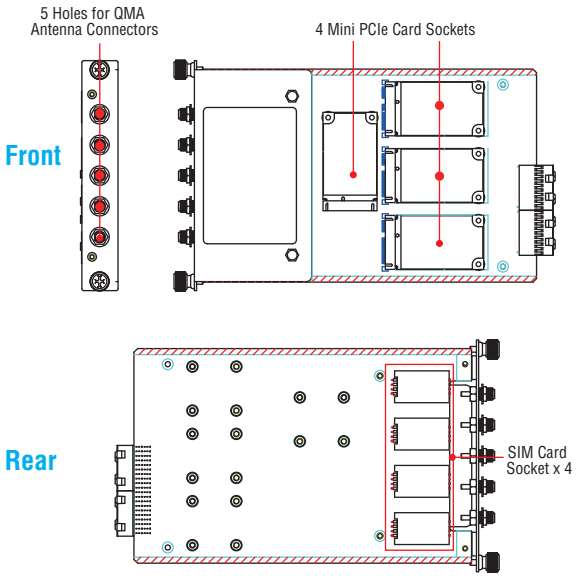
TC-SP04-DB44-T



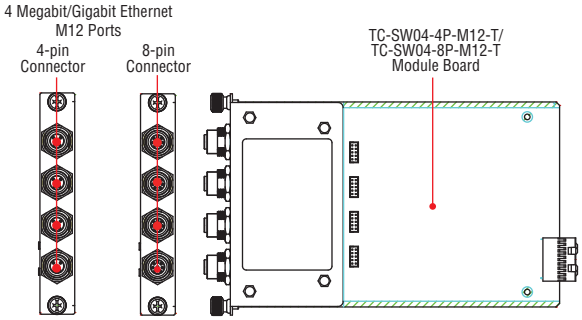
TC-CP02-DB-T



TC-DK10-T/TC-DK20-T



TC-SW04-M12-4P-T/TC-SW04-M12-8P-T



TC-SP04-DB44-T Serial Module

Serial Port Interface

Serial Standards:
RS-232/422/485, software-selectable
Connector Type:
1 DB44 connector serving all 4 interfaces; special cable required

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)

Physical Characteristics

Dimensions: 186 x 118 x 20 mm (7.32 x 4.65 x 0.79 in)
Weight: 234 g (0.52 lb)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F) (EN 50155 Class TX)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

TC-CP02-DB-T CAN Module

CAN Interface

Interface: 2 optically isolated CAN 2.0 A/B ports
Signal: CAN_H, CAN_L
Isolation: 2 kV
Speed: 1 Mbps
Connector Type: DB9 male

Physical Characteristics

Dimensions: 186 x 118 x 20 mm (7.32 x 4.65 x 0.79 in)
Weight: 227 g (0.50 lb)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F) (EN 50155 Class TX)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

TC-DK10-T/TC-DK20-T mini PCIe Carrier Module

Mini PCIe Card

Interface: 4 sockets, total
- Socket 1 on both TC-DK10-T and TC-DK20-T: USB 2.0 / PCIe V1.0
- Sockets 2, 3, and 4 on the TC-DK10-T: USB 2.0
- Sockets 2, 3, and 4 on the TC-DK20-T: USB 2.0 / PCIe V1.0

SIM Card Socket: 4 sockets reserved for cellular applications
Wireless Antenna Hole: 5 reserved for QMA antenna connectors

Physical Characteristics

Dimensions: 186 x 118 x 20 mm (7.32 x 4.65 x 0.79 in)
Weight: 220 g (0.49 lb)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F) (EN 50155 Class TX)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Model	TC-DK10-T				TC-DK20-T			
Interface	Socket 1	Socket 2	Socket 3	Socket 4	Socket 1	Socket 2	Socket 3	Socket 4
PCIe V1.0 (one lane)	✓	–	–	–	✓	✓	✓	✓
USB .20	✓	✓	✓	✓	✓	✓	✓	✓

TC-SW04-M12-4P-T/TC-SW04-M12-8P-T Switch Module

Ethernet Interface

Standard:
4 Ethernet M12 switch ports: auto-sensing 10/100 Mbps (TC-SW04-M12-4P-T) or 10/100/1000 Mbps (TC-SW04-M12-8P-T)
Protection: 1.5 kV magnetic isolation protection
Connector Type: 4-pin M12 D-coded/8-pin M12 A-coded

Physical Characteristics

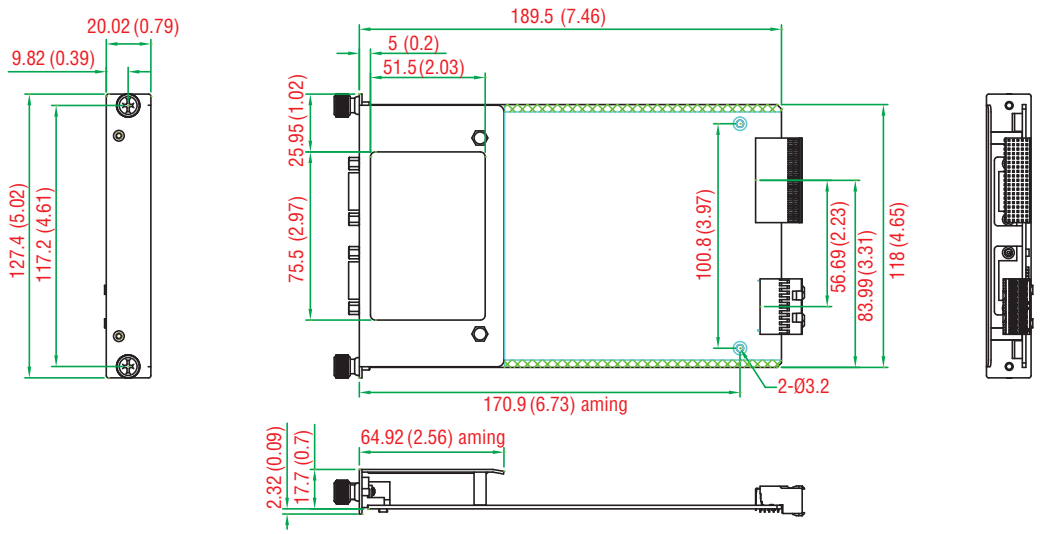
Dimensions: 186 x 118 x 20 mm (7.32 x 4.65 x 0.79 in)
Weight: 278 g (0.62 lb)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F) (EN 50155 Class TX)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TC-SP04-DB44-T: 4 RS-232/422/485 serial interfaces over a single DB44 connector; cable sold separately, -40 to 70°C operating temperature (EN 50155 Class TX)
TC-CP02-DB-T: 2 optically isolated CAN interfaces with DB9 connectors, -40 to 70°C operating temperature (EN 50155 Class TX)
TC-DK10-T: 4 PCIe mini card slots with PCIe and USB interfaces on slot 1 and USB interfaces on Slot 2, 3 and 4, 4 SIM card sockets, -40 to 70°C operating temperature (EN 50155 Class TX)
TC-DK20-T: 4 PCIe mini card slots with PCIe and USB interfaces, 4 SIM card sockets, -40 to 70°C operating temperature (EN 50155 Class TX)
TC-SW04-M12-4P-T: 4-port megabit Ethernet switch with M12 D-coded connectors, -40 to 70°C operating temperature (EN 50155 Class TX)
TC-SW04-M12-8P-T: 4-port gigabit Ethernet switch with M12 A-coded connectors, -40 to 70°C operating temperature (EN 50155 Class TX)

Package Checklist

- TC-6000 series expansion module

V2616A Series

High performance network video recorder computer

- Compliant with EN 50121-4
- Essential compliance with EN 50155*
- IEC 61373 certified for shock and vibration resistance
- Two hot-swappable storage trays for 2.5-inch SSDs or HDDs
- SynMap for system health monitoring
- 24 to 110 VDC wide range isolated power input
- Easy coin battery replacement
- Smart Recovery for manual or automatic system recovery

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155

Windows Embedded Standard 7

Introduction

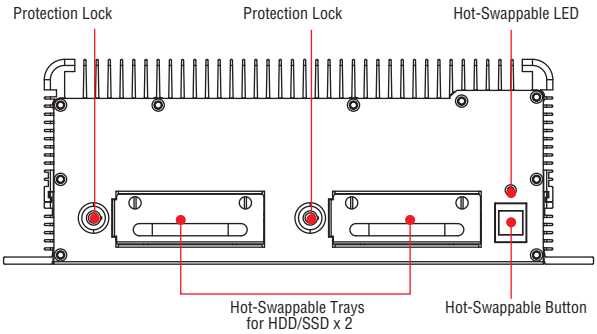
The V2616A series of embedded computers are based on the Intel Core i5/i7 processor, and feature 2 RS-232/422/485 serial ports, dual gigabit LAN ports, 3 USB 2.0 ports, and dual VGA/DVI-D video outputs. The V2616A computers are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making them suitable for a variety of industrial applications.

The V2616A computers come with a CFast socket that provides ample and secure data buffering or additional storage expansion, as well as 2 hot-swappable storage trays that accept 2.5-inch solid state or hard disk storage drives, and may be arranged in RAID 1 arrays to give full data redundancy.

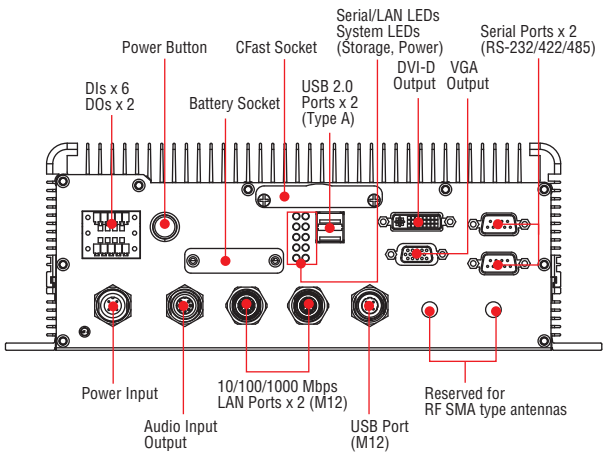
The V2616A series comes with pre-installed Windows Embedded Standard 7 or Debian 7 environments, allowing programmers and system integrators to choose their preferred computing and development platform.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU:
• Intel® Core™ i5-3610ME dual-core processor (3M Cache, 2.7 GHz) for V2616A-C5 series
• Intel® Core™ i7-3517UE dual-core processor (4M Cache, 1.7 GHz) for V2616A-C7-T series
• Intel® Core™ i7-3612QE quad-core processor (6M Cache, 2.1 GHz) for V2616A-C8 series
OS: Linux or Windows Embedded Standard 7
Note: The OS is pre-installed.
System Chipset: Mobile Intel HM65 Express Chipset
System Memory: 16 GB capacity, 4 GB pre-installed: 2 slot of 8 GB DDR3-1600 SO-DIMM SDRAM
USB: USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)

Storage

Built-in: 8 GB CFast to store OS
Storage Expansion: 2 hot-swappable storage trays for 2.5-inch SATA SSD or HDD
HDD Support: 1 internal SATA-II storage connector for 2.5-inch SSD or HDD
Expansion Slot:
1 full-size/half-size mini PCIe socket with 1 SIM card socket. Mini PCIe socket supports power on/off control

Other Peripherals

Audio: Line-in, line-out (M12)

Display

Graphics Controller: Intel® HD Graphics 4000 (integrated)
DVI Interface: DVI-D connector (Chrontel CH7307 SDVO to DVI transmitter), max. resolution 1920 x 1200
VGA Interface: DB15 female connector, max. resolution 2048 x 1536

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2

Serial Interface

Serial Standards: 2 software-selectable RS-232/422/485 ports (DB9 male)
ESD Protection: 4 kV for all signals
Isolation Protection: 1.5 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 (non-standard baudrates supported; see user's manual for details)

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxDA(-), TxDB(+), RxDB(+), RxDA(-), GND
RS-485-4w: TxDA(-), TxDB(+), RxDB(+), RxDA(-), GND
RS-485-2w: DataA(-), DataB(+), GND

Digital Input

Input Channels: 6
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Isolation Protection: 3 kV

Digital Output

Output Channels: 2, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw terminal block (6 DI points, 2 DO points, DI Source, GND)
Isolation: 3 kV optical isolation

LEDs

System: 1 Power, 1 Storage
LAN: 2 100M/Link, 2 1000M/Link
Serial: 2 TX, 2 RX

Physical Characteristics

Housing: Aluminum
Weight: 5 kg (11.11 lb)
Dimensions: 287 x 290 x 101 mm (11.29 x 11.41 x 3.97 in)
Mounting: Wall (mounting kit must be purchased separately)

Environmental Limits

Operating Temperature: (without HDD installed)
Standard models: -25 to 55°C (-13 to 131°F)
Wide temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature: (with SSD 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: 24 to 110 VDC, M12 connector
Note: 24 and 110 VDC are EN 50155 compliant
Input Current: 2.5 A @ 24 VDC to 0.55 A @ 110 VDC (SSD/HDD not attached)
Power Consumption: 60 W (no SSD/HDD attached)
Power Button: On/off (rear panel)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Rail Traffic: EN 50155 (essential compliance*), EN 50121-3-2, EN 50121-4, IEC 61373
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

Reliability

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

MTBF (mean time between failures)

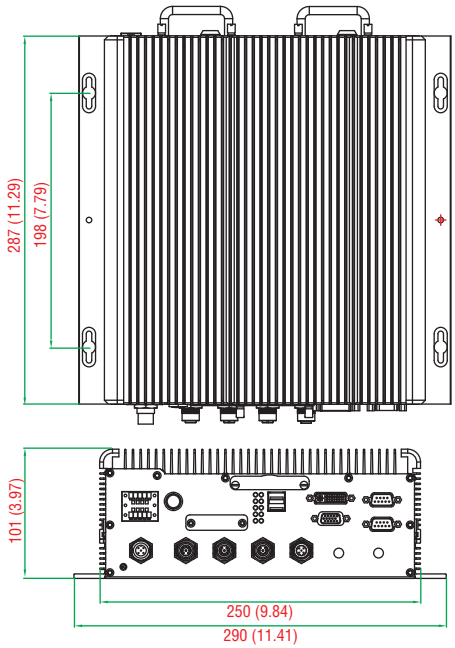
Time:
V2616A-C5 Series: 280,726 hrs
V2616A-C7/C8 Series: 261,297 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 7
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
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, Netfilter/iptables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
ntpdate: Sets the date and time via NTP
Ethernet bonding: The Ethernet bonding for combination of network interfaces on one host for redundancy and/or increased throughput
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). Works with 'chat', 'dip', and 'dialup', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
mdadm: A Linux utility used to manage software RAID devices
Dmraid: Discovers software RAID devices and activates RAID sets
File Server: Enables remote clients to access files and other resources over the network
alsa-utils: Contains various utilities for controlling audio cards
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Moxa mini-PCIe Reset Utility: Resets the mini-PCIE module on the mini-PCIE slot
Moxa Hotplug Daemon: Monitors and manages the hard disk status

Application Development Software:
- Moxa API library
- GNU C/C++ cross compiler
- GNU C library
- Perl

Software Package:
- SNMP
- mx-e1000e
- mx-ptpd2

Windows Embedded Standard 7

Core OS:
- Windows 7 Embedded, 32 bit
- Remote Client
- Remote Procedure Call

Applications and Services Development:
- .Net Framework 3.5
- Remote Desktop Protocol 7.1
- COM OLE Application Support
- COM+ Application Support
- MSMQ

Internet Services:
- Internet Explorer 8.0
- IIS 7.0

File Systems and Data Storage:
- Windows Data Access Components
- Windows Backup and Restore

Diagnostics:
- Common Diagnostic Tools
- Problem Reports and Solutions

Fonts:
- Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle East, South East Asian, and South Asian Fonts

Graphics and Multimedia:
- MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
- MPEG Layer-3 Audio Codecs(MP3)
- MPEG4 Decoders
- Windows Media Video VC-1 (WMV) Codecs
- DirectX and Windows Device Experience
- Windows Media Player 12

International:
- IME Simplified Chinese Support
- IME Traditional Chinese Support
- IME Japanese Support
- IME Korean Support

Management:
- Group Policy Management
- Windows Management Instrument (WMI)
- Windows Update

Networking:
- Extensible Authentication Protocol (EAP)
- Internet Authentication Service
- Telnet Server
- Bluetooth
- Domain Services
- Network Access Protection
- Network and Sharing Center
- Quality of Service
- Remote Access Service (RAS)
- Telephony API Client
- Windows Firewall
- Wireless Networking

Security:
- Credential Roaming Service
- Credentials and Certificate Management
- Windows Authorization Manager (AZMAN)
- Windows Security Center
- Active Directory Rights Management
- Security Base
- Encrypted File System (EFS)

Embedded Features:
- Enhanced Write Filter (EWF)
- File-Based Write Filter (FBWF)
- Message Box Default Reply
- Registry Filter
- WSDAPI for .NET

File Systems and Data Store:
- Windows Data Access
- Windows Backup and Restore

Embedded Self-Health Diagnostics: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Available Models

V2616A-C5: (Barebone) x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C5-W7E: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 Ports, 24 to 110 VDC Power, Win7 Embedded, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C5-CT-W7E: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Windows Embedded Standard 7, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating
V2616A-C5-LX: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C5-CT-LX: x86 embedded computer with Intel Core i5-3610ME, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating
V2616A-C7-T: (Barebone) x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, -40 to 70°C operating temperature (EN 50155 Class TX)
V2616A-C7-T-W7E: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC Power, Windows Embedded Standard 7, -40 to 70°C operating temperature (EN 50155 Class TX)
V2616A-C7-CT-T-W7E: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC Power, Windows Embedded Standard 7, -40 to 70°C operating temperature (EN 50155 Class TX), conformal coating
V2616A-C7-T-LX: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -40 to 70°C operating temperature (EN 50155 Class TX)
V2616A-C7-CT-T-LX: x86 embedded computer with Intel Core i7-3517UE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -40 to 70°C operating temperature (EN 50155 Class TX), conformal coating
V2616A-C8: (Barebone) x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C8-W7E: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Windows Embedded Standard 7, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C8-CT-W7E: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Windows Embedded Standard 7, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating
V2616A-C8-LX: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1)
V2616A-C8-CT-LX: x86 embedded computer with Intel Core i7-3612QE, VGA, DVI, 2 LANs, 2 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 24 to 110 VDC power, Linux, -25 to 55°C operating temperature (EN 50155 Class T1), conformal coating

Package Checklist

- V2616A embedded computer
- 2 storage tray keys
- Power cable (CBL-M12FF5PPJ21-BK-15-IP68)
- 2 5-pin terminal blocks
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V2406A Series

Compact, fanless, anti-vibration railway computers

- Intel Celeron/Core i7 processor suitable for diverse computing demands
- Dual independent DVI-I displays
- 2 gigabit Ethernet ports with M12 X-coded connectors
- 1 SATA connector and 2 CFast sockets for storage expansion
- M12 A-coded power connector
- Compliant with EN 50121-4
- Complies with a portion of EN 50155 specifications
- Ready-to-run Windows Embedded Standard 7 or Linux Debian 7
- -40 to 70°C wide temperature models available
- Supports SNMP-based system configuration, control, and monitoring (Windows Embedded Standard 7 only)

EN 50121

Microsoft® Windows® Embedded

RoHS

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CE FC

Overview

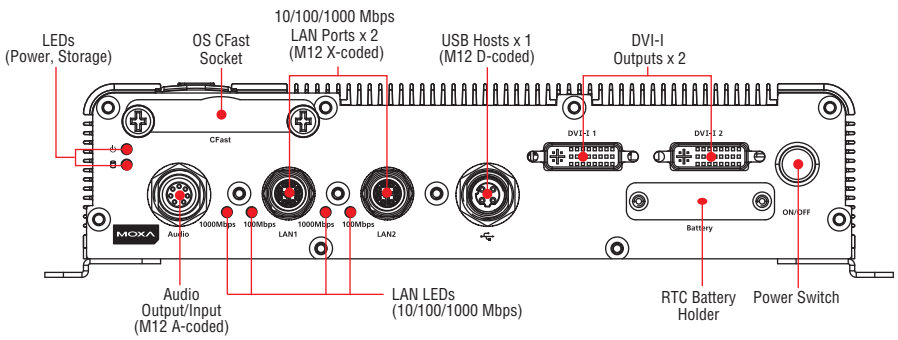
The V2406A Series embedded computers are based on the Intel 3rd generation processor, and feature 4 RS-232/422/485 serial ports, dual LAN ports, audio in/out, 3 USB 2.0 hosts, 2 CFast sockets, and 1 SATA storage socket. The V2406A computers provide dual DVI-I outputs, and in addition are compliant with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making the computers suitable for a variety of industrial applications.

The dual megabit/gigabit Ethernet ports with M12 X-coded connectors offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2406A computers have 6 DIs and 2 DOs for connecting digital input/output devices, and the CFast feature provides the reliability needed for industrial applications that require data buffering and storage expansion.

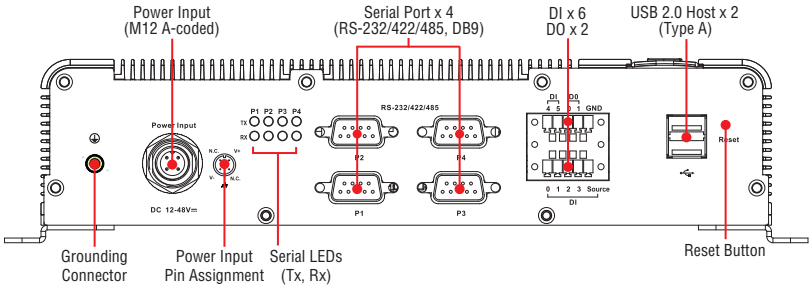
Pre-installed with Linux Debian 7 or Windows Embedded Standard 7, the V2406A Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost. Wide temperature models of the V2406A Series that operate reliably in a -40 to 70°C operating temperature range are also available, offering an optimal solution for applications subjected to harsh environments.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU:
• Intel Celeron 1047UE processor (2M cache, 1.40 GHz) for the V2406A-C2 series
• Intel Core i7-3517UE processor (6M cache, 1.7 GHz) for the V2406A-C7 series
OS: Windows Embedded Standard 7 or Linux Debian 7
System Chipset: Mobile Intel® HM65 Express
System Memory: 1 DDR3-1600 SO-DIMM SDRAM slot, 8 GB max., 4 GB pre-installed
USB: USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)

Storage

HDD/SSD Support: 1 internal SATA-II bus for 2.5-inch HDD/SSD*
*Storage drive not included. To be purchased separately.
CFast Support: 1 slot for OS*, 1 slot for backup storage
*32-bit W7E requires at least an 8 GB CFast card
*64-bit W7E requires at least a 16 GB CFast card (optional)
*Linux Debian 7 requires at least an 8 GB CFast card (to be purchased separately)

Other Peripherals

Audio: Line-in, line-out interface (M12 A-coded)

Display

Graphics Controller: Intel® HD Graphics 4000 (integrated)
Connector Type: 2 DVI-I connectors
Display Interface:
DVI up to 1920x1200 resolution @ 60 Hz
VGA up to 1920x1200 resolution @ 60 Hz
VGA up to 2048x1536 resolution @ 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2
Isolation Protection: 1.5 kV

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software selectable (DB9 male)
ESD Protection: 4 kV for all signals
Isolation Protection: 1.5 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 (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
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Isolation: 3 kV optical isolation

Digital Output

Output Channels: 2, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal (6 inputs, 2 outputs, DI Source, GND)
Isolation: 3 kV optical isolation

LEDs

System: Power, Storage
LAN: 2 per port (10/100/1000 Mbps)
Serial: 2 per port (Tx and Rx)

Switches and Buttons

Power Switch: on/off (front panel)
Reset Button: For warm reboot (front panel)

Physical Characteristics

Housing: Aluminum
Weight: 2 kg (4.44 lb)
Dimensions:
Without ears: 250 x 57 x 154 mm (9.84 x 2.23 x 6.06 in)
With ears: 275 x 63 x 154 mm (10.83 x 2.47 x 6.06 in)
Mounting: Wall, DIN rail (optional), VESA (optional)

Environmental Limits

Operating Temperature*:
Standard models: -25 to 55°C (-13 to 131°F)
Wide temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature*: -40 to 85°C (-40 to 185°F)
*without HDD installed
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: EN 50155 standard
Anti-Shock: EN 50155 standard
Conformal Coating: Available on request

Power Requirements

Input Voltage: 12 to 48 VDC (M12 A-coded)
Note: Compliant with EN 50155 at 24 VDC
Input Current:
• 3.3 A @ 12 VDC
• 0.82 A @ 48 VDC
Power Consumption: 40 W

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4 , IEC 60571
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.

Reliability

Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds

MTBF (mean time between failures)

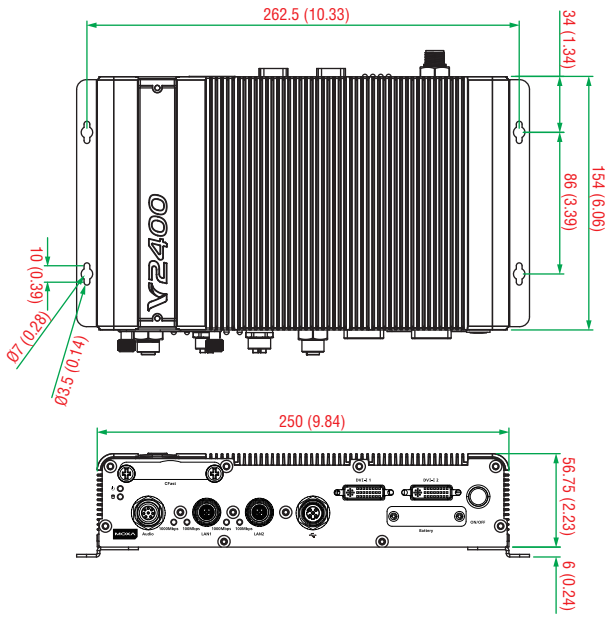
Time:
V2406A-C2 Series: 373,248 hrs
V2406A-C7 Series: 332,173 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 7
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
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). Works with 'chat', 'dip', and 'dialu 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: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.

Application Development Software:
- Moxa API Library
- GNU C library
- Perl

Windows Embedded Standard 7

Core OS:
- 32/64-bit support
- Remote Client
- Remote Procedure Call

Applications and Services Development:
- .Net Framework 4.5
- Remote Desktop Protocol 7.1
- COM OLE Application Support
- COM+ Application Support
- MSMQ

Internet Services:
- Internet Explorer 8.0
- IIS 7.0

Diagnostics:
- Common Diagnostic Tools
- Problem Reports and Solutions

Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts

Graphics and Multimedia:
- MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
- MPEG Layer-3 Audio Codecs (MP3)
- MPEG4 Decoders
- Windows Media Video VC-1 (WMV) Codecs
- DirectX and Windows Device Experience
- Windows Media Player 12

Management:
- Group Policy Management
- Windows Management Instrument (WMI)
- Windows Update

Networking:
- Extensible Authentication Protocol (EAP)
- Internet Authentication Service
- Telnet Server
- Bluetooth
- Domain Services
- Network Access Protection
- Network and Sharing Center
- Quality of Service
- Remote Access Service (RAS)
- Telephony API Client
- Windows Firewall
- Wireless Networking

Security:
- Credential Roaming Service
- Credentials and Certificate Management
- Windows Authorization Manager (AZMAN)
- Windows Security Center
- Active Directory Rights Management
- Security Base
- Encrypted File System (EFS)

Embedded Features:
- Enhanced Write Filter (EWF)
- File-Based Write Filter (FBWF)
- Message Box Default Reply
- Registry Filter
- WSDAPI for .NET

File Systems and Data Store:
- Windows Data Access Components
- Windows Backup and Restore

Embedded Self-Health Diagnostic Software: SNMP-based remote scripting layer for monitoring, reporting, and control

SmartRecovery: BIOS level system recovery tool

Ordering Information

Type	CTO Models						Pre-Configured Models		
Model	V2406A-C2	V2406A-C2-T	V2406A-C2-CT-T	V2406A-C7	V2406A-C7-T	V2406A-C7-CT-T	V2406A-C2-W7E	V2406A-C2-T-W7E	V2406A-C7-T-W7E
Computer									
CPU	Intel Celeron 1047UE 1.4 GHz			Intel Core i7-3517UE 1.7 GHz			Intel Celeron 1047UE 1.4 GHz		Intel Core i7-3517UE 1.7 GHz
Operating System (CTO*)	Optional Note: Windows Embedded Standard 7 (32-bit/64-bit) or Linux Debian 7 (64-bit)						Windows Embedded Standard 7 (32-bit)		
Memory (CTO*)	4 GB pre-installed, can be upgradabled to 8 GB						4 GB pre-installed		
USB	USB 2.0 (Type A) x 2 USB 2.0 (M12 D-coded) x 1								
Power Input Voltage	12 to 48 VDC (M12 A-coded)								
Storage									
OS CFast Storage (CTO*)	Optional Note: 32-bit W7E requires at least an 8 GB CFast card, 64-bit W7E requires at least a 16 GB CFast card, and 64-bit Debian7 requires at least an 8 GB CFast card						8 GB CFast card pre-installed		
Backup CFast Storage (CTO*)	Optional								
SSD / HDD Storage (CTO*)	Optional Note: Anti-vibration storage kit (FK-75125-02) must be purchased separately to install an SSD/HDD								
Interface									
Display Interface	DVI-I x 2								
Audio Interface	Line in/out (M12 A-coded) x 1								
Ethernet Interface	10/100/1000 Mbps (M12 X-coded) x 2								
Serial Ports	RS-232/422/485 (DB9) x 4								
Digital Input Channels	6								
Digital Output Channels	2								
Environmental Limits									
Operating Temperature	T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C	
Conformal Coating	–		Yes	–		Yes	–		

*CTO = Configure To Order

Note:

Please refer to the Component Compatibility Guide (CCG) for the list of components that Moxa has validated to be compatible with this product. You can download the CCG from the Moxa product website.

For components with a Moxa P/N, you can order the components together with your product from Moxa and we will install the selected components in your product. Moxa guarantees the compatibility of the components installed in your CTO product.

Package Checklist

- V2406A embedded computer
- Wall-mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Type		Model Name	Description
Ethernet			
	Cable & Connector	CBL-M12XMM8PRJ45-BK-100-IP67	8-pin male X-coded M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 1 meter, IP67-rated
	Connector	M12X-8PMM-IP67	8-pin male X-coded circular threaded gigabit Ethernet connector, IP67-rated (for field installation)
Mounting Kits			
	Isolated Wall-mounting Kit	V2400 Isolated Wall-mounting Kit	Wall-mounting kit with isolation protection, including two wall-mounting brackets and four screws
	DIN-Rail Mounting Kit	DK-DC50131-01	DIN-rail mounting kit, including two DIN-rail brackets and eight screws
Power			
	Cable	CBL-M12(FF5P)/Open-100 IP67	5-pin female A-coded M12 power cable, 1 meter, IP67-rated
	Connector	M12A-5P-IP68	5-pin male circular threaded A-coded M12 power connector, IP68-rated (for field installation)
	Adapter	PWR-24250-DT-S1	Power adapter for testing and system development in the office under ambient temperature conditions: Input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W
	Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
	Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Euro plug
	Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
	Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
	Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
Audio			
	Connector	M12A-8PMM-IP67	8-pin male circular threaded A-coded M12 connector, IP67-rated (for field-installation)
USB			
	Connector	M12A-5PMM-IP68	5-pin male circular threaded D-coded M12 USB connector, IP68-rated
Storage Kit			
	Internal Storage Kit	FK-75125-02	Hard disk installation package (for HDD, SSD, EN 50155) (only available for the V2406A and V2426A series)
Battery			
	Battery Kit	RTC Battery Kit	Lithium battery with built-in connector for easy replacement

V2416A Series

Compact, fanless, anti-vibration railway computers

- Intel Celeron/Core i7 high performance network video recorder for rolling stock applications
- Two hot-swappable trays for 2.5-inch HDD/SSD storage expansion
- API Library for easy development and storage volume notification
- Dual independent DVI-I displays
- 2 gigabit Ethernet ports with M12 X-coded connectors
- 2 CFast sockets for OS backup
- M12 A-coded power connector
- Compliant with EN 50121-4
- Complies with a portion of EN 50155 specifications
- IEC 61373 certified for shock and vibration resistance
- -40 to 70°C wide temperature models available
- Supports SNMP-based system configuration, control, and monitoring (Windows Embedded Standard 7 only)

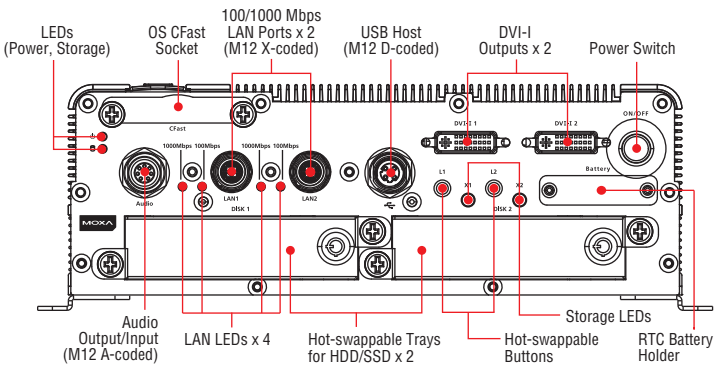
Introduction

The V2416A Series embedded computers are based on the Intel 3rd generation processor and feature 4 RS-232/422/485 serial ports, dual LAN ports, and 3 USB 2.0 hosts. In addition, the V2416A computers provide dual DVI-I outputs and comply with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making them suitable for a variety of industrial applications.

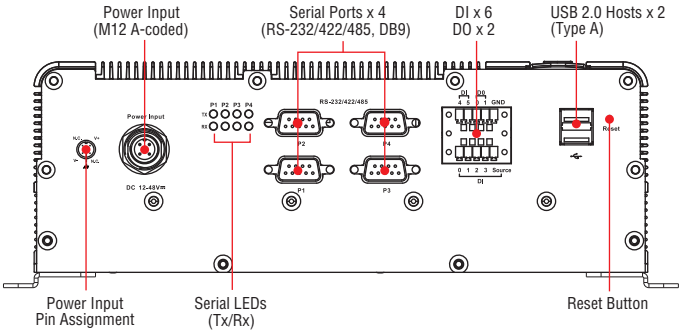
The CFast socket, SATA connectors, and USB sockets provide the V2416A computers with the reliability needed for industrial applications that require data buffering and storage expansion. Most importantly, the V2416A computers come with 2 hot-swappable storage trays for inserting additional storage media, such as hard disk or solid-state drives, and support hot swapping for convenient, fast, and easy storage replacement. Each storage tray has its own LED to indicate whether or not a storage module is plugged in. The V2416Aseries computers come pre-installed with a choice of Linux Debian 7 or Windows Embedded Standard 7 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 Celeron 1047UE processor (2M cache, 1.40 GHz) for the V2416A-C2 series
• Intel Core i7-3517UE processor (6M cache, 1.7 GHz) for the V2416A-C7 series
OS: Windows Embedded Standard 7 or Linux Debian 7
System Chipset: Mobile Intel® HM65 Express
System Memory: 1 DDR3-1600 SO-DIMM SDRAM slot, 8 GB max., 4 GB pre-installed
USB: USB 2.0 hosts x 3 (Type A connectors x 2, supporting system boot up, M12 connectors x 1)

Storage

HDD/SSD Support: 2 hot-swappable trays for 2.5-inch HDD/SSD storage expansion*
*Storage drive not included. Must be purchased separately.
CFast Support: 1 slot for OS*, 1 slot for backup storage
*32-bit W7E requires at least an 8 GB CFast card
*64-bit W7E requires at least a 16 GB CFast card (optional)
*Linux Debian 7 requires at least an 8 GB CFast card (must be purchased separately)

Other Peripherals

Audio: Line-in, line-out interface (M12 A-coded)

Display

Graphics Controller: Intel® HD Graphics 4000 (integrated)
Connector Type: 2 DVI-I connectors
Display Interface:
DVI up to 1920x1200 resolution @ 60 Hz
VGA up to 1920x1200 resolution @ 60 Hz
VGA up to 2048x1536 resolution @ 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2
Isolation Protection: 1.5 kV

Serial Interface

Serial Standards: 4 software-selectable RS-232/422/485 ports (DB9 male)
ESD Protection: 4 kV for all signals
Isolation Protection: 1.5 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 (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
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Isolation: 3 kV optical isolation

Digital Output

Output Channels: 2, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal (6 inputs, 2 outputs, DI Source, GND)
Isolation: 3 kV optical isolation

LEDs

System: Power x 1, Storage x 1, hot-swappable trays x 2
LAN: 2 per port (10/100/1000 Mbps)
Serial: 2 per port (Tx and Rx)

Switches and Buttons

Power Switch: on/off (front panel)
Reset Button: For warm reboot (front panel)
Hot-swappable: trigger (on each removable tray)

Physical Characteristics

Housing: Aluminum
Weight: 4 kg (8.98 lb)
Dimensions:
Without ears: 250 x 86 x 154 mm (9.84 x 3.38 x 6.06 in)
With ears: 275 x 92 x 154 mm (10.83 x 3.62 x 6.06 in)
Mounting: Wall, DIN rail (optional), VESA (optional)

Environmental Limits

Operating Temperature*:
Standard models: -25 to 55°C (-13 to 131°F)
Wide temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature*: -40 to 85°C (-40 to 185°F)
*without HDD installed
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: EN 50155 standard
Anti-Shock: EN 50155 standard
Conformal Coating: Available on request

Power Requirements

Input Voltage: 12 to 48 VDC (M12 A-coded)
Note: Compliant with EN 50155 at 24 VDC
Input Current:
• 3.3 A @ 12 VDC
• 0.82 A @ 48 VDC
Power Consumption: 40 W

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact 6: kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4, IEC 60571
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.

Reliability

Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds

MTBF (mean time between failures)

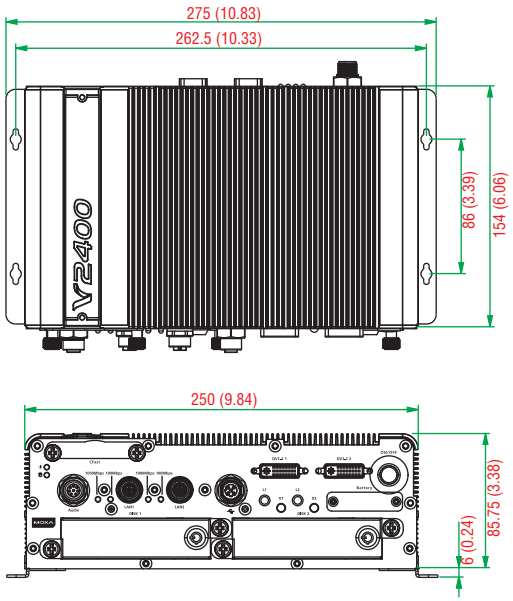
Time: 332,173 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 7
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
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, Netfilter/iptables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network dial-up
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the Point-to-Point Protocol (PPP). Works with 'chat', 'dip', and 'dialup', '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: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.

Application Development Software:
- Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
- GNU C library
- Perl

Windows Embedded Standard 7

Core OS:
- 32-bit or 64-bit supported
- Remote Client
- Remote Procedure Call

Applications and Services Development:
- .Net Framework 4.5
- Remote Desktop Protocol 7.1
- COM OLE Application Support
- COM+ Application Support
- MSMQ

Internet Services:
- Internet Explorer 11
- IIS 7.0

File Systems and Data Storage:
- Windows Data Access Components
- Windows Backup and Restore

Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs (MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostic Software: SNMP-based remote scripting layer for monitoring, reporting, and control
SmartRecovery: BIOS level system recovery tool

Ordering Information

Type	CTO Models						Pre-Configured Models		
Model	V2416A-C2	V2416A-C2-T	V2416A-C2-CT-T	V2416A-C7	V2416A-C7-T	V2416A-C7-CT-T	V2416A-C2-W7E	V2416A-C2-T-W7E	V2416A-C7-T-W7E
Computer									
CPU	Intel Celeron 1047UE 1.4 GHz			Intel Core i7-3517UE 1.7 GHz			Intel Celeron 1047UE 1.4 GHz		Intel Core i7-3517UE 1.7 GHz
Operating System (CTO*)	Optional Note: Windows Embedded Standard 7 (32-bit/64-bit) or Linux Debian 7 (64-bit)						Windows Embedded Standard 7 (32-bit)		
Memory (CTO*)	4 GB pre-installed, can be upgraded to 8 GB						4 GB pre-installed		
USB	USB 2.0 (Type A) x 2 USB 2.0 (M12 D-coded) x 1								
Power Input Voltage	12 to 48 VDC (M12 A-coded)								
Storage									
OS CFast Storage (CTO*)	Optional Note: 32-bit W7E requires at least an 8 GB CFast card, 64-bit W7E requires at least a 16 GB CFast card, and 64-bit Debian7 requires at least an 8 GB CFast card						8 GB CFast card pre-installed		
Backup CFast Storage (CTO*)	Optional								
SSD / HDD Storage (CTO*)	EN 50155 anti-vibration 2.5-inch SSD / HDD hot-swappable storage trays x 2 Note: Storage drive must be purchased separately								
Interface									
Display Interface	DVI-I x 2								
Audio Interface	Line in/out (M12 A-coded) x 1								
Ethernet Interface	10/100/1000 Mbps (M12 X-coded) x 2								
Serial Ports	RS-232/422/485 (DB9) x 4								
Digital Input Channels	6								
Digital Output Channels	2								
Environmental Limits									
Operating Temperature	T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C	
Conformal Coating	–		Yes	–		Yes	–		

*CTO = Configure To Order
Note:
Please refer to the Component Compatibility Guide (CCG) for the list of components that Moxa has validated to be compatible with this product. You can download the CCG from the Moxa product website.
For components with a Moxa P/N, you can order the components together with your product from Moxa and we will install the selected components in your product. Moxa guarantees the compatibility of the components installed in your CTO product.

Package Checklist

- V2416A series embedded computer
- Wall-mounting kit
- 8 screws for hot-swappable HDD trays
- 8 HDD soft washers
- 2 keys for hot-swappable HDD trays
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Type		Model Name	Description
Ethernet			
	Cable & Connector	CBL-M12XMM8PRJ45-BK-100-IP67	8-pin male X-coded M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 1 meter, IP67-rated
	Connector	M12X-8PMM-IP67	8-pin male X-coded circular threaded gigabit Ethernet connector, IP67-rated (for field installation)
Mounting Kits			
	Isolated Wall-mounting Kit	V2400 Isolated Wall-mounting Kit	Wall-mounting kit with isolation protection, including two wall-mounting brackets and four screws
	DIN-Rail Mounting Kit	DK-DC50131-01	DIN-rail mounting kit, including two DIN-rail brackets and eight screws
Power			
	Cable	CBL-M12(FF5P)/Open-100 IP67	5-pin female A-coded M12 power cable, 1 meter, IP67-rated
	Connector	M12A-5P-IP68	5-pin male circular threaded A-coded M12 power connector, IP68-rated (for field installation)
	Adapter	PWR-24250-DT-S1	Power adapter for testing and system development in the office under ambient temperature conditions: Input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W
	Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
	Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Euro plug
	Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
	Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
	Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
Audio			
	Connector	M12A-8PMM-IP67	8-pin male circular threaded A-coded M12 connector, IP67-rated (for field-installation)
USB			
	Connector	M12A-5PMM-IP68	5-pin male circular threaded D-coded M12 USB connector, IP68-rated
Battery			
	Battery Kit	RTC Battery Kit	Lithium battery with built-in connector for easy replacement

V2426A Series

Compact, fanless, anti-vibration railway computer

- Intel Celeron/Intel Core i7 processor suitable for diverse computing demands
- 2 peripheral expansion slots for various I/O, WLAN, mini-PCIe expansion module cards
- Dual independent DVI-I displays
- 2 gigabit Ethernet ports with M12 X-coded connectors
- 1 SATA connector and CFast socket for storage expansion
- M12 A-coded power connector
- Compliant with EN 50121-4
- Complies with a portion of EN 50155 specifications
- Ready-to-run Windows Embedded Standard 7 or Linux Debian 7 platform
- -40 to 70°C wide temperature models available
- Supports SNMP-based system configuration, control, and monitoring (Windows Embedded Standard 7 only)

Microsoft® Windows® Embedded | RoHS | c UL us LISTED | EN 50121 | CE | FC

Overview

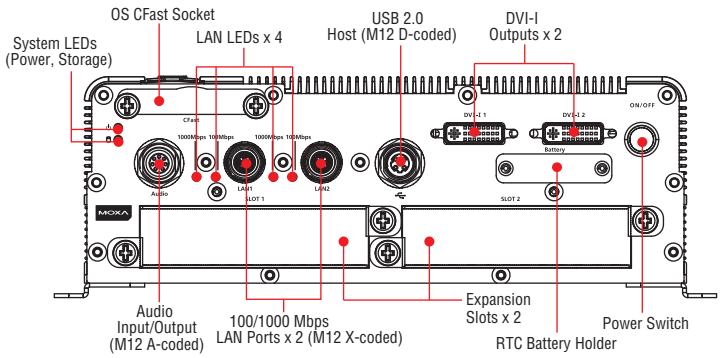
The V2426A Series embedded computers are based on the Intel 3rd generation processor, and feature 4 RS-232/422/485 serial ports, dual LAN ports, 3 USB 2.0 hosts, and dual DVI-I outputs. In addition, the V2426A Series computers comply with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making them suitable for a variety of industrial applications.

The dual megabit/gigabit Ethernet ports with M12 X-coded connectors offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2426A computers have 6 DIs and 2 DOs for connecting digital input/output devices. In addition, the CFast socket, SATA connector, and USB sockets provide the V2426A computers with the reliability needed for industrial applications that require data buffering and storage expansion. Moreover, the V2426A computers come with 2 peripheral expansion slots for inserting different communication modules (2-port CAN module, or HSDPA, GPS, or WLAN module), an 8+8-port digital input/output module, and a 2-port serial module, giving greater flexibility for setting up different industrial applications at field sites.

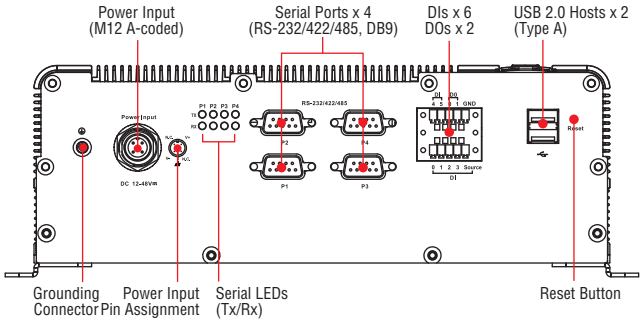
Pre-installed with Linux Debian 7 or Windows Embedded Standard 7, the V2426A Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost. Wide temperature models of the V2426A Series that operate reliably in a -40 to 70°C operating temperature range are also available, offering an optimal solution for applications subjected to harsh environments.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU:
• Intel Celeron 1047UE processor (2M cache, 1.40 GHz) for the V2406A-C2 series
• Intel Core i7-3517UE processor (6M cache, 1.7 GHz) for the V2406A-C7 series
OS: Windows Embedded Standard 7 or Linux Debian 7
System Chipset: Mobile Intel® HM65 Express
System Memory: 1 DDR3-1600 SO-DIMM SDRAM slot, 8 GB max., 4 GB pre-installed
USB: USB 2.0 hosts x 3 (Type A connectors x 2, M12 D-coded x 1)

Storage

HDD/SSD Support: 1 internal SATA-II bus for 2.5-inch HDD/SSD storage expansion*
*Storage drive not included. Must be purchased separately.
CFast Support: 1 slot for OS*, 1 slot for backup storage
*32-bit W7E requires at least an 8 GB CFast card
*64-bit W7E requires at least a 16 GB CFast card (optional)
*Linux Debian 7 requires at least an 8 GB CFast card (to be purchased separately)

Other Peripherals

Audio: Line-in, line-out interface (M12 A-coded)
Expansion Slot: 2 peripheral expansion slots

Display

Graphics Controller: Intel® HD Graphics 4000 (integrated)
Connector Type: 2 DVI-I connectors
Display Interface:
DVI up to 1920x1200 resolution @ 60 Hz
VGA up to 1920x1200 resolution @ 60 Hz
VGA up to 2048x1536 resolution @ 75 Hz

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2
Isolation Protection: 1.5 kV

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software selectable (DB9 male)
ESD Protection: 4 kV for all signals
Isolation Protection: 1.5 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 (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
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Isolation: 3 kV optical isolation

Digital Output

Output Channels: 2, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal (6 inputs, 2 outputs, DI Source, GND)
Isolation: 3 kV optical isolation

LEDs

System: Power, Storage
LAN: 2 per port (10/100/1000 Mbps)
Serial: 2 per port (Tx and Rx)

Switches and Buttons

Power Switch: on/off (front panel)
Reset Button: For warm reboot (rear panel)

Physical Characteristics

Housing: Aluminum
Weight: 3 kg (6.67 lb)
Dimensions:
Without ears: 250 x 86 x 154 mm (9.84 x 3.38 x 6.06 in)
With ears: 275 x 92 x 154 mm (10.83 x 3.62 x 6.06 in)
Mounting: Wall, DIN rail (optional), VESA (optional)

Environmental Limits

Operating Temperature*:
Standard models: -25 to 55°C (-13 to 131°F)
Wide temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature*: -40 to 85°C (-40 to 185°F)
*without HDD installed
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: EN 50155 standard
Anti-Shock: EN 50155 standard
Conformal Coating: Available on request

Power Requirements

Input Voltage: 12 to 48 VDC (M12 A-coded)
Note: Compliant with EN 50155 at 24 VDC
Input Current:
• 3.78 A @ 12 VDC
• 0.96 A @ 48 VDC
Power Consumption: 47 W

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact 6: kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4 , IEC 60571
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.

Reliability

Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds

MTBF (mean time between failures)

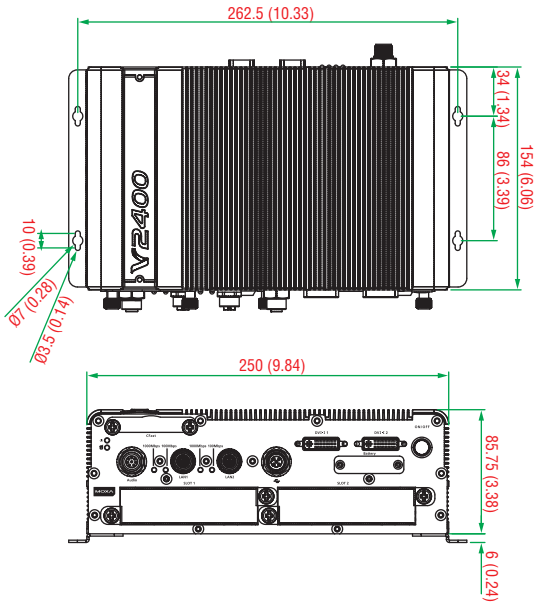
Time: 304,998 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Linux Debian 7
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
File System: EXT 4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, Netfilter/iptables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network dial-up
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: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.

Application Development Software:
- Moxa API Library (Watchdog timer, Moxa serial I/O control)
- GNU C library
- Perl

Windows Embedded Standard 7

Core OS:
- 32-bit or 64-bit supported
- Remote Client
- Remote Procedure Call

Applications and Services Development:
- .Net Framework 4.5
- Remote Desktop Protocol 7.1
- COM OLE Application Support
- COM+ Application Support
- MSMQ

Internet Services:
- Internet Explorer 11
- IIS 7.0

File Systems and Data Storage:
- Windows Data Access Components
- Windows Backup and Restore

Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs (MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
Embedded Self-Health Diagnostic Software: SNMP-based remote scripting layer for monitoring, reporting, and control
SmartRecovery: BIOS level system recovery tool

Ordering Information

Type	CTO Models						Pre-Configured Models		
Model	V2426A-C2	V2426A-C2-T	V2426A-C2-CT-T	V2426A-C7	V2426A-C7-T	V2426A-C7-CT-T	V2426A-C2-W7E	V2426A-C2-T-W7E	V2426A-C7-T-W7E
Computer									
CPU	Intel Celeron 1047UE 1.4 GHz			Intel Core i7-3517UE 1.7 GHz			Intel Celeron 1047UE 1.4 GHz		Intel Core i7-3517UE 1.7 GHz
Operating System (CTO*)	Optional Note: Windows Embedded Standard 7 (32-bit/64-bit) or Linux Debian 7 (64-bit)						Windows Embedded Standard 7 (32-bit)		
Memory (CTO*)	4 GB pre-installed, can be upgraded to 8 GB						4 GB pre-installed		
USB	USB 2.0 (Type A) x 2 USB 2.0 (M12 D-coded) x 1								
Power Input Voltage	12 to 48 VDC (M12 A-coded)								
Storage									
OS CFast Storage (CTO*)	Optional Note: 32-bit W7E requires at least an 8 GB CFast card, 64-bit W7E requires at least a 16 GB CFast card, and 64-bit Debian7 requires at least an 8 GB CFast card						8 GB CFast card pre-installed		
Backup CFast Storage (CTO*)	Optional								
SSD / HDD Storage (CTO*)	SSD / HDD to be purchased separately Note: Anti-vibration storage kit (FK-75125-02) must be purchased separately to install an SSD / HDD								
Interface									
Display Interface	DVI-I x 2								
Audio Interface	Line in/out (M12 A-coded) x 1								
Ethernet Interface	10/100/1000 Mbps (M12 X-coded) x 2								
Serial Ports	RS-232/422/485 (DB9) x 4								
Digital Input Channels	6								
Digital Output Channels	2								
Environmental Limits									
Operating Temperature	T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C		T1: -25 to 55°C	TX: -40 to 70°C	
Conformal Coating	–		Yes	–		Yes	–		
Other Peripherals									
Peripheral Expansion Card	Peripheral expansion slots x 2 Note: Peripheral expansion cards must be purchased separately. Please refer to the "Peripheral Expansion Modules" table below.								

*CTO = Configure To Order
Note:
Please refer to the Component Compatibility Guide (CCG) for the list of components that Moxa has validated to be compatible with this product. You can download the CCG from the Moxa product website.
For components with a Moxa P/N, you can order the components together with your product from Moxa and we will install the selected components in your product. Moxa guarantees the compatibility of the components installed in your product though CTO.

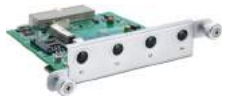
Package Checklist

- V2426A embedded computer
- Wall-mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Type		Model Name	Description
Ethernet			
	Cable & Connector	CBL-M12XMM8PRJ45-BK-100-IP67	8-pin male X-coded M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 1 meter, IP67-rated
	Connector	M12X-8PMM-IP67	8-pin male X-coded circular threaded gigabit Ethernet connector, IP67-rated (for field installation)
Mounting Kits			
	Isolated Wall Wall-mounting	V2400 Isolated Wall-mounting Kit	Wall-mounting kit with isolation protection, including two wall-mounting brackets and four screws
	DIN-Rail Mounting Kit	DK-DC50131-01	DIN-rail mounting kit, including two DIN-rail brackets and eight screws
Power			
	Cable	CBL-M12(FF5P)/Open-100 IP67	5-pin female A-coded M12 power cable, 1 meter, IP67-rated
	Connector	M12A-5P-IP68	5-pin male circular threaded A-coded M12 power connector, IP68-rated (for field installation)
	Adapter	PWR-24250-DT-S1	Power adapter for testing and system development in the office under ambient temperature conditions: Input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W
	Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
	Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Euro plug
	Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
	Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
	Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
Audio			
	Connector	M12A-8PMM-IP67	8-pin male circular threaded A-coded M12 connector, IP67-rated (for field-installation)
USB			
	Connector	M12A-5PMM-IP68	5-pin male circular threaded D-coded M12 USB connector, IP68-rated
Storage Kit			
	Internal Storage Kit	FK-75125-02	Hard disk installation package (for HDD, SSD, EN 50155) (only available for the V2406A and V2426A series)
Battery			
	Battery Kit	RTC Battery Kit	Lithium battery with built-in connector for easy replacement

Peripheral Expansion Modules

	Model name	Description
	EPM-DK02	2 mini PCIe slots, -25 to 55°C operating temperature when used with a Moxa recommended wireless module Note: See the "Wireless Accessory Packages" table below to select a wireless accessory package.
	EPM-DK03	GPS receiver with 2 mini PCIe slots, -25 to 55°C operating temperature when used with a Moxa recommended wireless module (3G x 1 + WiFi x 1) Note: See the "Wireless Accessory Packages" table below to select a wireless accessory package.
	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-3438	8 DIs and 8 DOs, with 3 kV digital isolation protection, 2 kHz counter, -40 to 70°C operating temperature

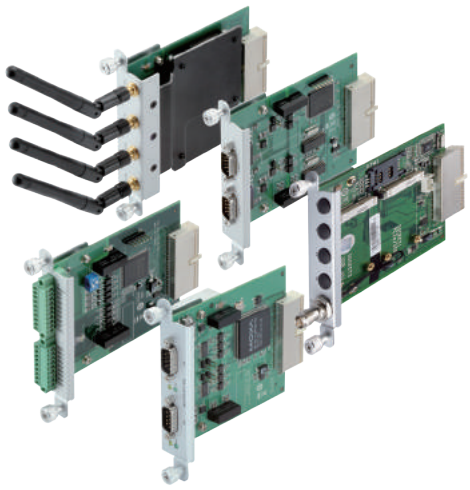
Wireless Accessory Packages

Note: These packages are for the EPM-DK02 and EPM-DK03 only

Type	Model Name	Item	Description
	EPM-DK Wi-Fi Package	Mini-PCIe Card	SprakLAN WPEA-121N Wi-Fi mini card x 1, bracket x 1, silver screws x 2, black screws x 4
		Digital Interface	Mini card internal antenna with QMA connectors x 2, locking washers x 2, O-rings x 2, nuts x 2
	EPM-DK 3G Package	Mini-PCIe Card	Gemalto PHS8-P 3G mini card x 1, black screws x 4
		Thermal Pad	Cellular mini card thermal pad x 1
		Digital Interface	Mini card internal antenna with QMA connector x 1, locking washer x 1, O-ring x 1, nut x 1
	EPM-DK LTE-US Package	Mini-PCIe Card	Gemalto PLS8-US LTE mini card x 1, black screws x 4
		Thermal Pad	Cellular mini card thermal pad x 1
		Digital Interface	Mini card internal antenna with QMA connector x 1, locking washer x 1, O-ring x 1, nut x 1
	EPM-DK LTE-EU Package	Mini-PCIe Card	Gemalto PLS8-E LTE mini card x 1, black screws x 4
		Thermal Pad	Cellular mini card thermal pad x 1
		Digital Interface	Mini card internal antenna with QMA connector x 1, locking washer x 1, O-ring x 1, nut x 1
	A-CRF-CTPSF-R2-50	GPS Extension Cable	TNC to SMA (female) adapter with 50 cm cable x 1
	ANT-GPS-OSM-05-3M	GPS External Antenna	26 dBi, 1572 MHz, L1 band SMA antenna x 1
	A-CRF-MHFQMAF-D1.13-14.2	Digital Interface	Mini card internal antenna with QMA connector x 1, locking washer x 1, O-ring x 1, nut x 1
	ANT-WDB-ARM-02	Wi-Fi External Antenna	Wi-Fi external antenna with SMA connector x 1
	ANT-WCDMA-AHSM-04-2.5m	3G External Antenna	3G external antenna with SMA connector x 1
	ANT-LTEUS-ASM-01	LTE-US External Antenna	LTE-US external antenna with SMA connector x 1
	ANT-LTE-ASM-02	LTE-EU External Antenna	LTE-EU external antenna with SMA connector x 1
	A-CRF-RFQMAM-R2-50	Wi-Fi Extension Cable	QMA (male) to SMA (male) adapter with 50 cm cable x 1
	A-CRF-QMAMSF-R2-50	Cellular Extension Cable	QMA (male) to SMA (female) adapter with 50 cm cable x 1

V2400 Series Expansion Modules

Expansion peripheral modules (EPM) for the V2400 series



- EPM-3032: 2 isolated RS-232/422/485 ports with DB9 connectors
- EPM-3112: 2 isolated CAN ports with DB9 connectors
- EPM-3438: 8+8 DI/DO with 3 kV digital isolation protection, 2 kHz counter
- EPM-DK02*: 2 mini PCIe slots
- EPM-DK03*: GPS receiver, 2 mini PCIe slots

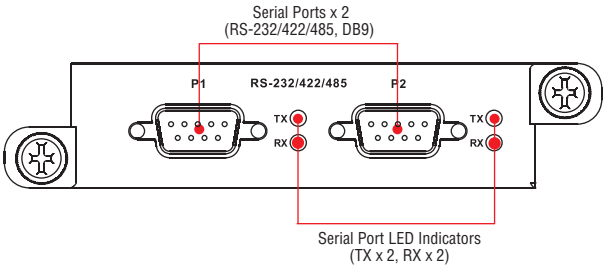
*Operating Temperature:
w/o wireless module: EN 50155 Class TX
w/ wireless module: EN 50155 Class T1

Introduction

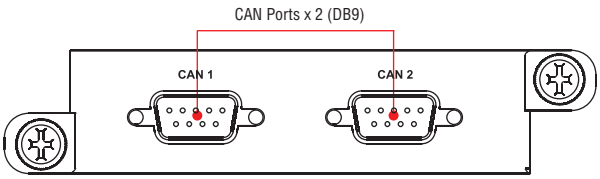
Moxa's V2400 series expansion modules, which come with serial ports, CAN ports, wireless and GPS cards, digital input/output channel cards, mini PCI and PCIe modules, a 2-slot mini-PCIe module, and VGA or DVI-I display connectors, can be used with Moxa's V2426 embedded computers, and give end-users the best flexibility for setting up and expanding a variety of industrial applications.

Appearance

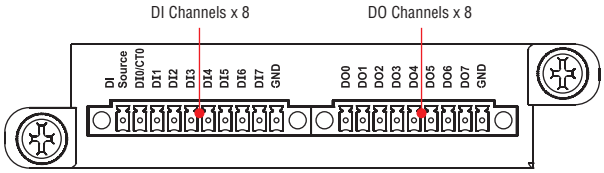
EPM-3032



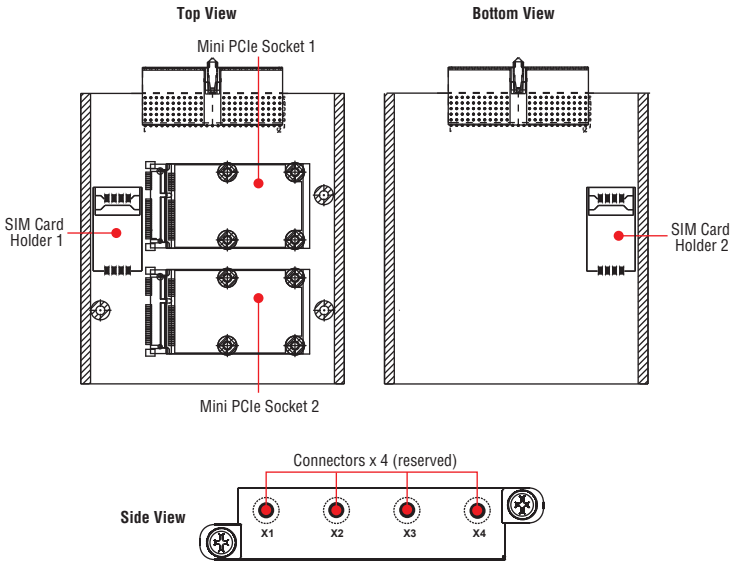
EPM-3112



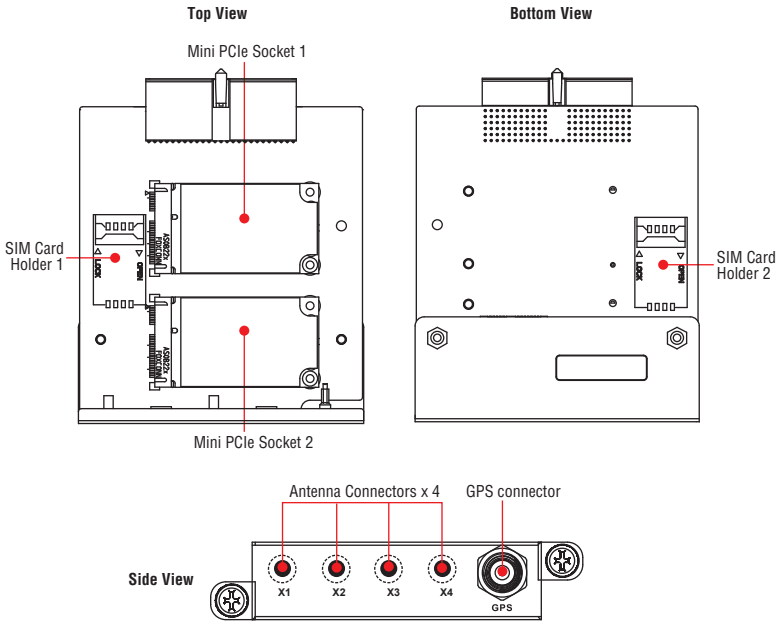
EPM-3438



EPM-DK02



EPM-DK03



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 (0.30 lb)
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 (0.28 lb)
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
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Counter Frequency: 2 kHz (DIO only)
Connector Type: 10-pin screw terminal block (8 DI points, DI Source, GND)
Isolation: 3 kV optical isolation

Digital Output

Output Channels: 8, sink type, 0 to 30 VDC
Output Current: Max. 200 mA per channel
On-state Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 9-pin screw terminal block (8 DO points, GND)
Isolation: 3 kV optical isolation

Physical Characteristics

Weight: 120 g (0.27 lb)
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-DK02 Specifications

PCI Express Mini Slot

Interface:
• Slot 1: PCI-Express V1.0 (one lane) / USB 2.0
• Slot 2: USB 2.0
USB 2.0 Bus SIM Card Holder: Reserved for cellular applications

Physical Characteristics

Weight: 125 g (0.28 g)

Environmental Limits

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

EPM-DK03 Specifications

PCI Express Mini Slot

Interface:
• Slot 1: PCI-Express V1.0 (one lane) / USB 2.0
• Slot 2: USB 2.0
USB 2.0 Bus SIM Card Holder: Reserved for cellular applications

Physical Characteristics

Weight: 220 g (0.49 lb)
Dimensions: 104 x 121 x 34 mm (4.09 x 4.76 x 1.34 in)

Environmental Limits

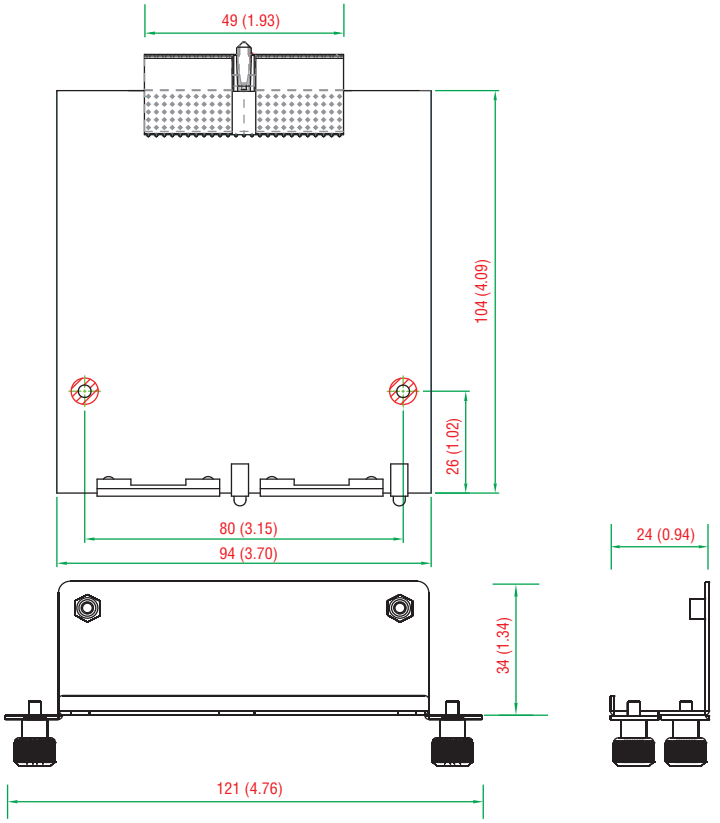
Operating Temperature:
w/o wireless module: -40 to 70°C (-40 to 158°F), EN 50155 Class TX
w/ wireless module: -25 to 55°C (-13 to 131°F), EN 50155 Class T1

GPS Interface

Receiver Types:
• 50-channel u-blox 6 LEA-6 receiver
• GPS L1 C/A code
• GALILEO L1 open service (with upgrade)
• SBAS: WAAS, EGNOS, MSAS, GAGAN
Acquisition:
• Cold starts: 28 s
• Warm starts: 28 s
• Aided starts: 1 s
• Hot starts: 1 s
Sensitivity:
• Tracking: -160 dBm
• Reacquisition: -160 dBm
• Cold starts: -147 dBm
Timing accuracy:
• RMS: 30 ns
• 99%: <60 ns
• Granularity: 21 ns
Accuracy:
• Position: 2.5 m CEP
• SBAS: 2.0 m CEP
Protocols: NMEA, UBX binary, max. update rate: 5 Hz (ROM version)
Time Pulse: 0.25 Hz to 1 kHz
Velocity Accuracy: 0.1 m/s
Heading Accuracy: 0.5 degrees
A-GPS: Supports AssistNow Online and AssistNow Offline, OMA SUPL compliant
Operational Limits: Velocity: 500 m/s (972 knots)

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

EPM-DK02: 2 mini PCIe slots, -25 to 55°C operating temperature
EPM-DK03: GPS receiver, 2 mini PCIe slots, -25 to 55°C operating temperature
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-3438: 8+8 DI/DO with 3 kV digital isolation protection, 2 kHz counter, -40 to 70°C operating temperature

UC-8481 Series

Award-winning Product

TAIWAN EXCELLENCE 2013

Industrial RISC-based mobile Linux computers with cellular, Wi-Fi, and GPS modules, 2 Ethernet, 2 serial, 2 USB 2.0 ports, and 2 mini PCIe sockets

- 512 MB NAND Flash for data storage
- Fanless and rugged design for rolling stock applications
- Complies with a portion of EN 50155 specifications
- Extra Wi-Fi and cellular slots for cross-operator expansions
- Wi-Fi, cellular, and GPS modules for full communications mobility
- Independent, software-based power control of cellular modules
- Ready-to-run embedded Linux operating system
- -25 to 70°C wide temperature models available

Overview

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

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

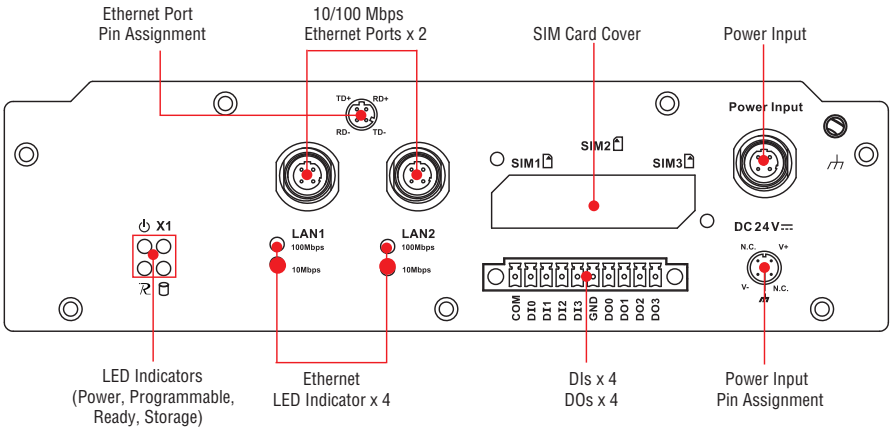
Mostly importantly, the UC-8481 series comes with seven connectors that allow users to connect various wireless and GPS modules, making it particularly well-suited for rolling stock and moving vehicles. The UC-8481 is a convenient cornerstone for customizing intelligent, cost-effective wireless communication platforms.

With an embedded Linux operating system pre-installed, the UC-8481 series provides an open software platform perfect for custom-authored software. Software written on desktop PCs can be easily ported to the UC-8481 via a common compiler, without any modification of code. This makes the UC-8481 an optimal solution for industrial applications, allowing ample customization with minimal cost and effort.

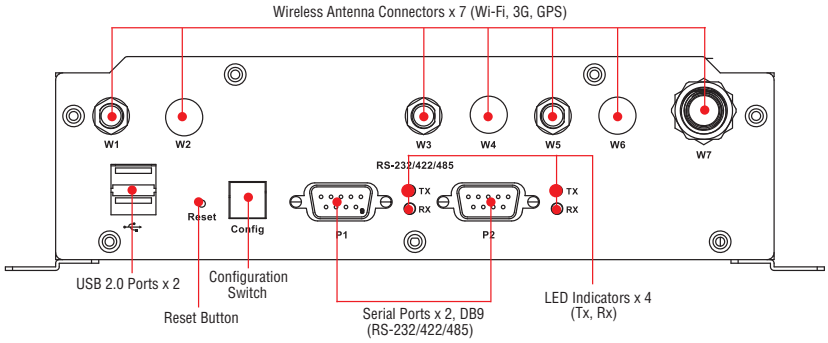
The UC-8481 also comes in a wide-temperature model designed to operate reliably in extreme temperatures ranging from -25 to 70°C.

Appearance

Front View

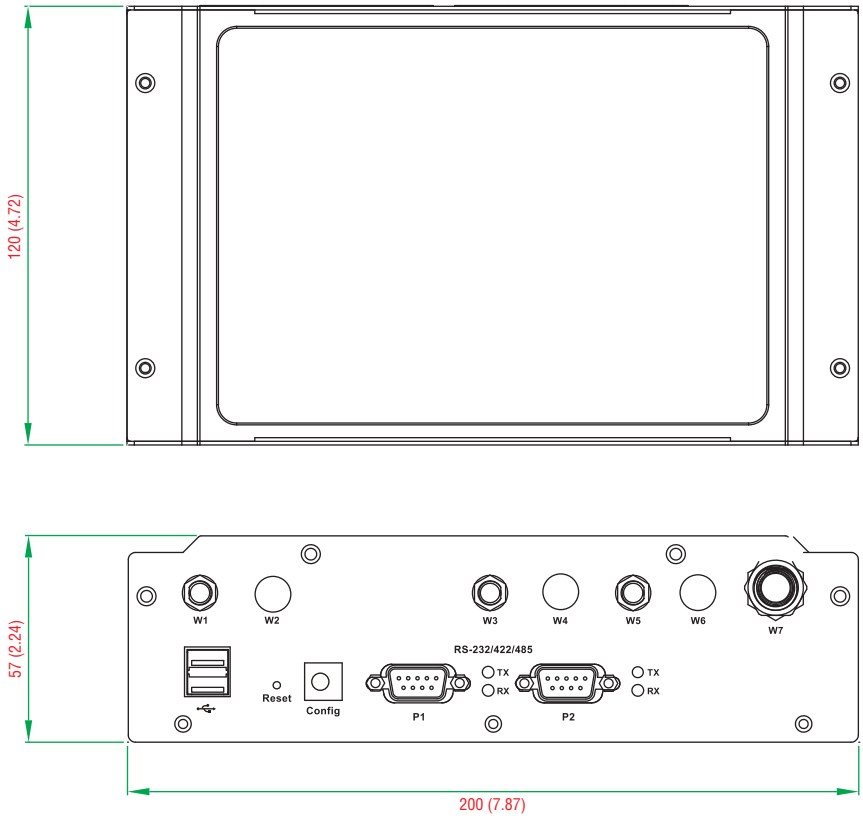


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer
CPU: Intel XScale IXP435, 533 MHz
OS: Linux (pre-installed)
USB: USB 2.0 hosts x 2
DRAM: 512 MB DDR2 SDRAM onboard
Flash:
• NOR Flash, 32 MB (max. 32 MB) onboard to store OS
• NAND Flash, 512 MB (max. 1 GB) for OS file system, caching storage, and data logger

Storage
Storage Expansion: CompactFlash socket

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (M12) x 2
Magnetic Isolation Protection: 1.5 kV built in

GPS Module (U-Blox LEA-6S)
Receiver Types:
• 50-channel U-blox 6 engine
• GPS L1 C/A code
• SBAS: WAAS, EGNOS, MSAS, GAGAN
Acquisition:
• Cold starts: 28 s
• Warm starts: 28 s
• Aided starts: 1 s
• Hot starts: 1 s
Sensitivity:
• Tracking: -160 dBm
• Reacquisition: -160 dBm
• Cold starts: -147 dBm
Timing Accuracy:
• RMS: 30 ns
• 99%: <60 ns
• Granularity: 21 ns
Accuracy:
• Position: 2.5 m CEP
• SBAS: 2.0 m CEP
Protocols: NMEA, UBX binary, max. update rate: 5 Hz (ROM version)
Time Pulse: 0.25 Hz to 1 kHz
Velocity Accuracy: 0.1 m/s
Heading Accuracy: 0.5 degrees
A-GPS: Supports AssistNow Online and AssistNow Offline, OMA SUPL compliant
Operational Limits: Velocity: 500 m/s (972 knots)
Connector Type: TNC

WLAN Module (Atheros AR9220)
WAPN001: IEEE 802.11a/b/g/n wireless LAN module with U.FL antenna connector
Standards: IEEE 802.11a/b/g/n for wireless LAN
Connector Type: QMA connector (female type) x 2
Mode: Client

Cellular Module (Cinterion PH8)
Frequency Bands: GSM/GPRS/EDGE/UMTS/HSPA+
Band Options:
• Five band UMTS(WCDMA/FDD)
• 800/850/1900 AWS and 2100 MHz
• Quad-band GSM: 850/900/1800/1900 MHz
HSDPA/HSUPA Data Rates:
DL: 3.6/7.2/14.4 Mbps; UL: 2.0/5.76 Mbps
UMTS Data Rates:
DL: max 384 kbps; UL: max 384 kbps
EDGE Class 12:
DL: max 237 kbps; UL: max 237 kbps
GPRS Class 12:
DL: max 85.6 kbps; UL: max 85.6 kbps
Connector Type: QMA connector (female type) x 1

Serial Interface
Serial Standards: 2 RS-232/422/485 ports, software-selectable (DB9)
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports non-standard baudrates; see user's manual for details)

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

Digital Input
Input Channels: 4
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (COM to DI)
Connector Type: 10-pin screw terminal block (4 points, COM, GND)
Isolation: 2 kV optical isolation

Digital Output
Output Channels: 4, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 10-pin screw terminal block (4 points, GND)

LEDs
System: Power, Ready, Storage, Programmable
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)
Serial: TxD x 2, RxD x 2
Reset Button: Supports "Reset to Factory Default"

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight: 1 kg (2.22 lb)
Dimensions: 200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)
Mounting: Wall, DIN rail

Environmental Limits
Operating Temperature:
Standard Models: -25 to 55°C (-13 to 131°F)
Wide Temp. Models: -25 to 70°C (-13 to 158°F)
Storage Temperature:
Standard Models: -25 to 75°C (-13 to 167°F)
Wide Temp. Models: -40 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: IEC 61373 standard
Anti-Shock: IEC 61373 standard

Power Requirements
Input Voltage: 24 VDC (9 to 48 V), M12 connector
Input Current: 833 mA @ 24 VDC
Power Consumption: 20 W

Standards and Certifications
Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A

EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50155*, EN 50121-2-3, EN 50121-4, IEC 61373
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time: 195,415 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 5 years (does not apply to cellular module)
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Linux
OS: Linux 2.6.38
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
File System: JFFS2, NFS, Ext2, Ext3, YAFFS2
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall, OpenSSL
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with 'chat', 'dip', and 'diald', among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Wireless: wpa_supplicant is configured using a text file that lists all accepted networks and security policies, including pre-shared keys.
GPS: gpsd is a daemon that receives data from a GPS receiver, and provides the data back to multiple applications such as Kismet or GPS navigation software.
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ cross-compiler, supports EABI
• GNU C library
• GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Ordering Information

Available Models
UC-8481-LX: RISC-based industrial wireless mobile computer with 2 LANs, 2 serial ports, 4 DIs, 4 DOs, 2 USB 2.0 hosts, CF, 1 cellular module, 1 Wi-Fi module, 1 GPS module, 2 mini PCIe sockets (USB interface), Linux OS, -25 to 55°C operating temperature (EN 50155 Class T1)
UC-8481-T-LX: RISC-based industrial wireless mobile computer with 2 LANs, 2 serial ports, 4 DIs, 4 DOs, 2 USB 2.0 hosts, CF, 1 cellular module, 1 Wi-Fi module, 1 GPS module, 2 mini PCIe sockets (USB interface), Linux OS, -25 to 70°C operating temperature (EN 50155 Class T3)

Optional Accessories (can be purchased separately)
PWR-24250-DT-S1: Power adapter
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

M12 Connectors (can be purchased separately)
M12A-5P-IP68: 5-pin female circular threaded A-coded M12 power connector, IP68-rated (for field installation)
M12D-4P-IP68: 4-pin male circular threaded D-coded M12 Ethernet connector, IP68-rated (for field installation)

M12 Cables (can be purchased separately)
CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated
CBL-M12D(MM4P)/RJ45-100 IP67: 1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated

UC-8481 Wi-Fi Accessory Package
WAPN001: Wireless LAN module, supporting IEEE 802.11 a/b/g/n
Wireless Antenna Connector and Cable: QMA (female) antenna connector with 140 mm cable to Wi-Fi module
Installation Kit: Bronze screws x 3, M2.5 screws x 3, thermal pad x 1

UC-8481 PH8 Cellular Accessory Package
EPM-PH8: Cellular Module
Wireless Antenna Connector and Cable: QMA (female) antenna connector with 140 mm cable to cellular module
Installation Kit: Bronze screw x 1, M2.5 screw x 1, thermal pad x 1

WLAN Cable and Antenna
Cable: QMA (male) to SMA (male) adapter with 50 cm cable
Antenna: 2 dual-band omni-directional antenna (2 dBi, RP-SMA, 2.4/5 GHz)

Cellular Cable and Antenna
Cable: QMA (male) to SMA (female) adapter with 50 cm cable
Antenna: Omni 1 dBi rubber SMA antenna

GPS Cable and Antenna
Cable: TNC to SMA (female) adapter with 50 cm cable
Antenna: 26 dBi, 1572 MHz, L1 band antenna

Package Checklist
- UC-8481 embedded computer
- Wall-mounting kit
- DIN-rail mounting kit
- CBL-4PINDB9F-100: 100 cm console port cable; 4 pin header connector to DB9 female connector
- Documentation and software CD or DVD
- Quick installation guide (printed)

Optional Accessories

Ethernet	Item	Type	Model Name	Description
	1	Cable	CBL-M12D(MM4P)/RJ45-100 IP67	1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated
	2	Connector	M12D-4P-IP68	Field-installation D-coded screw-in Ethernet connector, 4-pin male M12 connector, IP68-rated
Power	1	Cable	CBL-M12(FF5P)/OPEN-100 IP67	1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated
	2	Power adapter kit	PWR-24250-DT-S1 adapter w/USA plug	Power adpater, power jack, M12 connector, power cord
	3		PWR-24250-DT-S1 adapter w/Euro plug	Power adpater, power jack, M12 connector, power cord
	4		PWR-24250-DT-S1 adapter w/Australia plug	Power adpater, power jack, M12 connector, power cord
	5		PWR-24250-DT-S1 adapter w/British plug	Power adpater, power jack, M12 connector, power cord
	6		PWR-24250-DT-S1 adapter w/China plug	Power adpater, power jack, M12 connector, power cord
Wi-Fi	1	Cable	A-CRF-RFQMAM-R2-50	QMA (male) to SMA (male) adapter with 50 cm cable
	2	Antenna	ANT-WDB-ARM-02	Omni 1 dBi rubber SMA antenna
	3	Module	UC-8481 Wi-Fi accessory package	WAPN001, wireless module
Cellular	1	Cable	A-CRF-RFQMSF-R2-50	QMA (male) to SMA (female) adapter with 50 cm cable
	2	Antenna	ANT-WDCMA-ASM-1.5	Omni 1 dBi rubber SMA antenna
	3	Module	UC-8481 HSPA cellular accessory package	PH8, cellular module
GPS	1	Cable	A-CRF-CTPSF-R2-50	TNC to SMA (female) adapter with 50 cm cable
	2	Antenna	ANT-GPS-OSM-05-3M	26 dBi, 1572 MHz, L1 band SMA antenna

RNAS-1200 Series

Award-winning Product

TAIWAN EXCELLENCE 2014

Network-attached storage with 2 M12 gigabit PoE+ LAN ports and -40 to 70°C temperature tolerance

- 2 gigabit Ethernet ports for network redundancy
- 2 100 GB disks pre-installed (RNAS-1211-T model only)
- Essential compliance with EN 50155*
- IEC 61373 certified for shock and vibration resistance
- JBOD, BIG, RAID 0, and RAID 1 functions available
- IHS (Intelligent Heating Solution) technology for reliable operation
- Data XPro for data protection in harsh environments
- Fast synchronization in RAID 1

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155

Overview

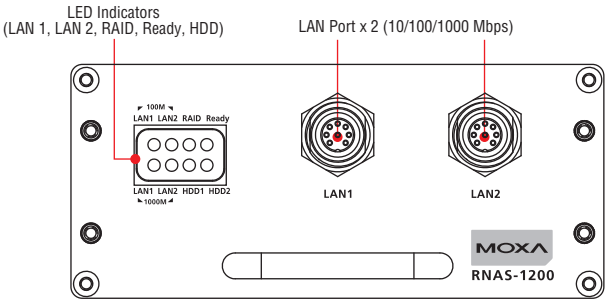
Moxa's RNAS-1200 network-attached storage (NAS) units provide high performance, high reliability, and high capacity data storage in harsh industrial environments. All RNAS-1200 devices are housed in a fanless, thermally efficient, dust and water-protected IP54-rated chassis. This sealed enclosure eliminates internal fans as a point of critical system failure, and protects the internal components from dust and water splashes. RNAS-1200 devices are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making them suitable for a variety of industrial applications.

RNAS-1200 devices also come with Moxa's Intelligent Heating Solution™ (IHS) and Data XPro™ technologies. IHS automatically heats the system to ensure reliable operation even in extremely low temperatures, while the Data XPro™ utility provides intelligent data and drive protections against extreme heat and vibration. In addition, the series' remarkably fast array synchronizations make the full data and hardware redundancies of RAID 1 a feasible alternative for industrial applications, while the two gigabit PoE+ network interfaces provide not only network redundancy, but also a highly efficient, fully redundant power supply over the same set of wires.

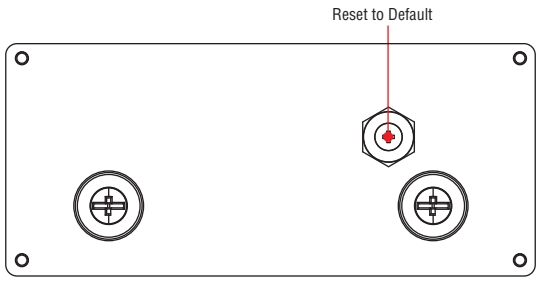
The RNAS-1200 Series combines simple configuration and multiple data and hardware redundancies in a compact, durable, fanless chassis ideal for industrial environments where extreme temperatures and vibration are a concern. The RNAS-1200 NAS devices are your best choice for industrial-strength data storage for rolling stock video surveillance or remote site data storage applications.

Appearance

Front View

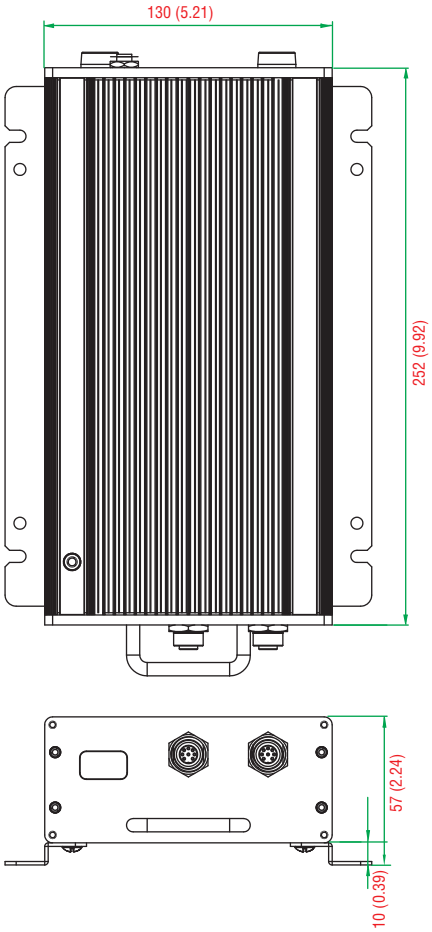


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer
CPU: Onboard Marvell 1.0 GHz 88F6281
DRAM: 512 MB DDRII
Flash Memory: Onboard 2 GB USB DOM to store OS

Storage
RNAS-1201-T: 2.5-inch HDD bay x 2, reserved for storage expansion
RNAS-1211-T: 100 GB HDD x 2 pre-installed

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (M12) x 2

IHS Control
IHS Function Control: Temperature reading, power output control for heating function

LEDs
System: RAID, Ready, HDD1, HDD2
LAN: 100M/Link x 2, 1000M/Link x 2

Physical Characteristics
Housing: Aluminum
Weight:
RNAS-1201-T: 1.98 kg (4.4 lb)
RNAS-1211-T: 2 kg (4.44 lb)
Dimensions: 252 x 130 x 57 mm (9.92 x 5.12 x 2.24 in)
Mounting: Wall
IP Rating: IP 54

Environmental Limits
Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: EN 50155 standard
Anti-Shock: EN 50155 standard
Conformal Coating: Available on request

Power Requirements
Input: PoE (IEEE 802.3af), or PoE+ (IEEE 802.3at)
Note: If the RNAS-1200 is connected to a PoE switch and T1 mode has been configured, the RNAS-1200 should only be booted up when the ambient temperature is above 0°C.

Standards and Certifications
Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: (80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE
Rail Traffic: EN 50155 (essential compliance*), EN 50121-3-2, IEC 61373
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

MTBF (mean time between failures)

Time:
RNAS-1211: 486,185 hrs
RNAS-1201: 503,159 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 5 years (storage drive not included)
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the NAS unit itself, but not its recommended accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Operating System

System Platform: Linux 2.6 pre-installed

Network

IP Settings: Fixed IP, DHCP
Redundancy: Port trunking / NIC teaming

System Management

Firmware Upgrade: Can be run via web interface
System Bootup: Can be observed by LED indicators for system status
HDD Failure Status: Can be observed by LED indicators

Disk Management

JBOD: Two hard disks can work independently
Spanning Big: Two hard disks can be merged as spanning big mode
RAID 0: Two hard disks can be merged and work in RAID 0 mode
RAID 1: Two hard disks can be merged and work in RAID 1 mode
HDD Recovery: Support automatic or manual data recovery when new had disk has been inserted

Data Protection

Vibration Protection: Storage buffer available for strong vibration status
Temperature Protection: Storage buffer available for low/high temperature environment
Fast Sync.: Fast synchronization in RAID 1 mode

SNMP Management

System: Standard MIB-II (RFC 1213), plus additional Moxa features that include: NTP, time zone, and time display management; channel bonding and IP configuration; management of SSH, FTP, and DNS; and configuration of SNMP agents and traps.

Ordering Information

Available Models

RNAS-1201-T: Network-attached storage with 2 M12 PoE+ gigabit LAN ports and -40 to 70°C temperature tolerance (operating)
RNAS-1211-T: Network-attached storage with 2 M12 PoE+ gigabit LAN ports, 2 pre-installed 100 GB hard disks, and -40 to 70°C temperature tolerance (operating)
RNAS-1201-CT-T: Network-attached storage with 2 M12 PoE+ gigabit LAN ports and -40 to 70°C temperature tolerance (operating), conformal coating
RNAS-1211-CT-T: Network-attached storage with 2 M12 PoE+ gigabit LAN ports, 2 pre-installed 100 GB hard disks, and -40 to 70°C temperature tolerance (operating), conformal coating

Package Checklist

- 1 RNAS-1200 storage appliance
- Wall-mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories

Ethernet	Item	Type	Model Name	Description
	1	Cable	CBL-M12MM8PRJ45-BK-100-IP67	1-meter A-coded M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 8-pin male M12 connector, rated IP67
	2	Connectors	M12A-8PMM-IP67	Field-installation A-coded screw-in gigabit Ethernet connector, 8-pin male M12 connector, rated IP67
Mechanical Parts				
	1	Mounting Kit	RNAS Wall-Mounting Assembly with a Lock	Mounting frame with a lock, screws, 2 faceplate brackets, 2 rails
	2	Rail	RNAS Slide Rail	2 extra rails for the RNAS-1200

Mission-Critical Computers

Product Selection Guide

Mission-Critical Computers 23-2

Mission-Critical Computers

MC-7200 Series: x86 fanless, wide temperature industrial computer with 3rd Generation Intel® Core™ processor 23-3

MC-7130-MP: Optimized, highly secure marine platform with diverse interface connectivity 23-6

MC-5000 Series: Fanless ECDIS bridge computers 23-9

MC-1100 Series: Quad-core fanless DIN-rail automation computer 23-13

Mission-Critical Computers

	MC-7200-MP Series	MC-7200-DC-CP Series	MC-7130-MP	MC-5150-DC-CP Series	MC-5150-AC/DC Series	MC-5157-AC/DC Series	MC-1100 Series
Computer							
CPU	Intel® Core™ i7-3555LE 2.5 GHz, Intel® Core™ i3-3120ME 2.4 GHz, Intel® Celeron® 1047UE 1.4 GHz	Intel® Core™ i7-3555LE 2.5 GHz, Intel® Core™ i3-3120ME 2.4 GHz, Intel® Celeron® 1047UE 1.4 GHz	Intel® Core™ i3-3120ME 2.4 GHz	Intel® Core™ i5-520E 2.4 GHz	Intel® Core™ i5-520E 2.4 GHz	Intel® Core™ i5-520E 2.4 GHz	Intel® Atom™ E3845 (Quad Core, 1.91 GHz), Intel® Atom™ E3826 (Dual Core, 1.46 GHz)
Supported OSs	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit
OS Pre-installed	–	–	–	–	–	–	–
System Chipset	Intel® QM77	Intel® QM77	Intel® QM77	Intel® QM57	Intel® QM57	Intel® QM57	–
System Memory Slots	2 SO-DIMM slots, 16 GB capacity	2 SO-DIMM slots, 16 GB capacity	2 SO-DIMM slots, 16 GB capacity	2 SO-DIMM slots, 8 GB capacity	2 SO-DIMM slots, 8 GB capacity	2 SO-DIMM slots, 8 GB capacity	1 SO-DIMM slot, 8 GB capacity
System Memory Pre-installed	4 GB, in 1 slot	4 GB, in 1 slot	4 GB, in 1 slot	2 GB, in 1 slot	2 GB, in 1 slot	2 GB, in 1 slot	2 GB, in 1 slot
Internal Storage Slots	2.5-inch SATA x 2	2.5-inch SATA x 2	2.5-inch SATA x 2	2.5-inch SATA x 1	2.5-inch SATA x 1	2.5-inch SATA x 1	CFast x 1 SD 3.0 (SDHC/SDXC) x 1
External Storage Slots	2.5-inch SATA x 1	2.5-inch SATA x 1	2.5-inch SATA x 1	2.5-inch SATA x 1	2.5-inch SATA x 1	2.5-inch SATA x 1	–
Storage Pre-installed	–	–	–	64 GB MLC SSD	–	–	–
I/O Interface							
USB	USB 2.0 x 6, Type A USB 3.0 x 2, Type A	USB 2.0 x 6, Type A	USB 2.0 x 6, Type A USB 3.0 x 2, Type A	USB 2.0 x 6, Type A	USB 2.0 x 6, Type A	USB 2.0 x 6, Type A	USB 2.0 x 2, Type A
Audio	Line in x 1, Line out x 1, Mic input x 1	Line in x 1, Line out x 1, Mic input x 1	Line in x 1, Line out x 1, Mic input x 1	Line in x 1, Line out x 1	Line in x 1, Line out x 1	Line in x 1, Line out x 1	–
KB/MS	2 PS/2 interfaces	2 PS/2 interfaces	2 PS/2 interfaces	2 PS/2 interfaces	2 PS/2 interfaces	2 PS/2 interfaces	–
PCI Slots	2	–	2	–	–	2	–
PCIe Slots	1, PCIE x16	–	1, PCIE x16	–	–	–	–
Display Interface	1 VGA output, DB15 female 2 DVI-D			1 VGA output, DB15 female 1 DVI-I			1 VGA output, DB15 female 1 display port
LAN Ports	10/100/1000 Mbps (RJ45) x 4			10/100/1000 Mbps (RJ45) x 2			10/100/1000 Mbps (RJ45) x 4
Serial Ports	RS-232/422/485 (DB9) x 2 RS-232 (DB9) x 2						RS-232/422/485 (DB9) x 2
NMEA Ports	NMEA 0183 x 8 (IEC-61162)	–	NMEA 0183 x 8 (IEC-61162)	–	NMEA 0183 x 8 (IEC-61162)	NMEA 0183 x 8 (IEC-61162)	–
Digital Iuput/Output	8DI/8DO	–	8DI/8DO	–	–	–	4DI/4DO
LPT ports	DB25 x 1			–	DB25 x 1		–
Physical Characteristics							
Housing	Aluminum sheet metal						
Weight	8 kg (17.78 lb)	3.75 kg (8.33 lb)	8 kg (17.8 lb)	3.85 kg (8.56 lb)	6.85 kg (15.22 lb)	8 kg (17.78 lb)	1.21 kg (2.69 lb), or 0.97 kg (2.16 lb)
Dimensions	287 x 250 x 70 mm (11.30 x 9.84 x 2.76 in)	150 x 160 x 80 mm (5.91 x 6.30 x 3.15 in)	322 x 300 x 150 mm (12.68 x 11.81 x 5.91 in)	287 x 250 x 70 mm (11.30 x 9.84 x 2.76 in)	287 x 250 x 135 mm (11.30 x 9.84 x 5.31 in)	320 x 300 x 171 mm (12.60 x 11.81 x 6.73 in)	132 x 120 x 92 mm (5.20 x 4.72 x 3.62 in)
Mounting	Wall		Wall	Wall			Wall, DIN rail
Thermal Solution	Fanless		Intelligent fan	Fanless			Fanless
Environmental Limits							
Operating Temperature	-40 to 70°C (-40 to 131°F)		-15 to 55°C (5 to 131°F)				-40 to 70°C (-40 to 131°F)
Storage Temperature	-50 to 80°C (-40 to 176°F)		-20 to 60°C (-4 to 131°F)				-45 to 75°C (-49 to 103°F)
Ambient Relative Humidity	5 to 95% (non-condensing)		5 to 95% (non-condensing)				5 to 95% (non-condensing)
Anti-Vibration	DNV 2.4 standard						
Power Requirements							
Input Voltage	24 VDC (18 to 30 VDC); 100 to 240 VAC						12/24 VDC (9 to 36 VDC)
Power Consumption	Less than 100 W, 2.5 A @ 24 VDC						Less than 30 W
Standards and Certifications							
Marine	DNV 2.4, IEC 60945 4th., IACS-E10						DNV 2.4, IEC 60945 4th
Green Product	RoHS, cRoHS, WEEE						
Warranty							
Warranty Period	3 years						
Details	See www.moxa.com/warranty						
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MC-7200 Series

x86 fanless, wide temperature industrial computer with 3rd Generation Intel® Core™ processor

- High performance platform with 3rd gen. Intel® Core™ i7 3555LE processor
- Rugged, fanless design optimized for harsh environments
- Scalable, modularized interfaces for marine solutions
- Four Ethernet LAN ports + SNMP delivers strong network availability and manageability
- High graphics performance suppported across up to 3 independent displays

Overview

The MC-7200 marine computers are powered by the latest 3rd generation Intel® Core™ i7 3555LE processor and provide high-performance graphics alongside a full range of I/O connectivity that includes eight NMEA 0183 terminals, four serial ports, four gigabit Ethernet ports, six USB 2.0 ports, and two SuperSpeed USB 3.0 ports. The MC-7200 series is designed to deliver unrivalled PC performance for a new generation of automated marine solutions.

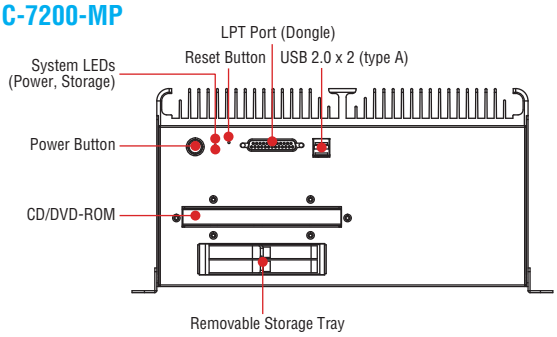
Designed for reliability, durability, and extensive computational and graphics performance, the marine-grade MC-7200 computers feature a rugged shell and vibration tolerance up to 1G. This computer's compact size and low power consumption return a low-heat profile that simplifies bridge and cabinet installations. To facilitate customization and expansion, MC-7200 series computers come with a single PCIe (x16) slot and two universal PCI slots, allowing users to easily install a wide variety of peripherals like radar, graphics, and PROFIBUS cards.

The MC-7200 series is optimized for use with the Windows XP Embedded, XP Professional, or Windows 7 operating systems, allowing users to choose the development environment most suitable for their application.

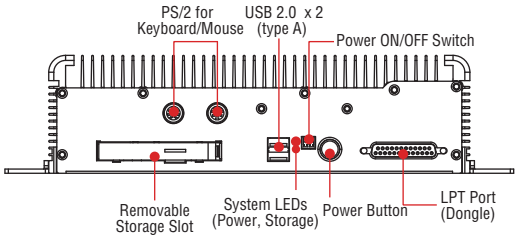
Appearance

Front View

MC-7200-MP

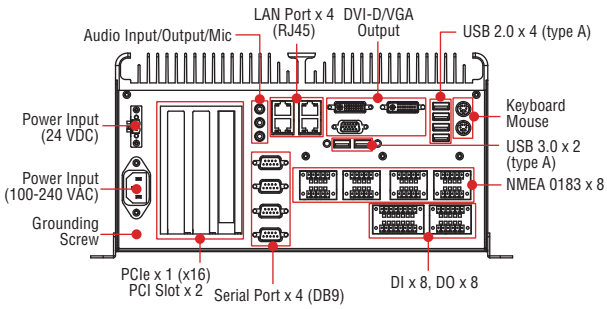


MC-7200-DC-CP

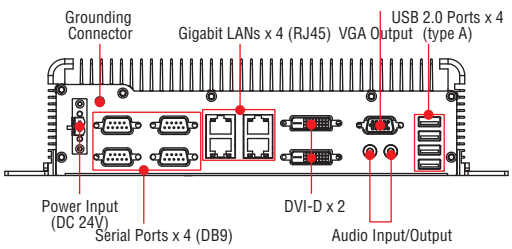


Rear View

MC-7200-MP



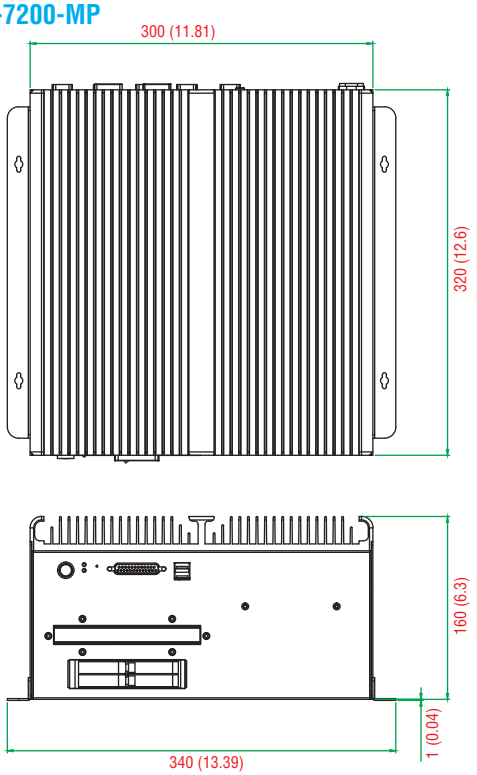
MC-7200-DC-CP



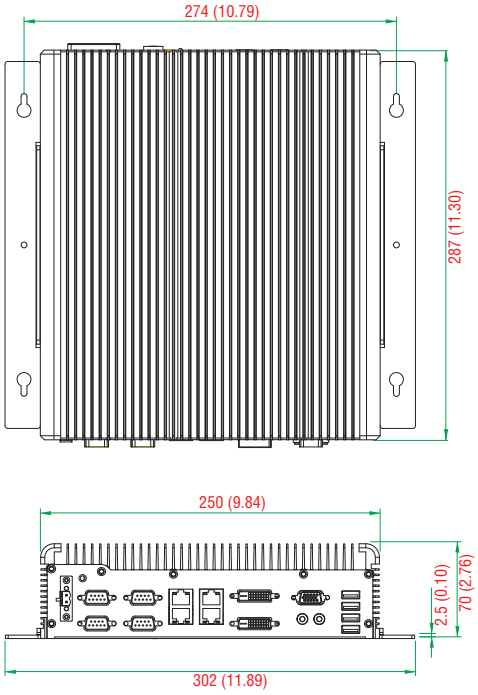
Dimensions

Unit: mm (inch)

MC-7200-MP



MC-7200-DC-CP



Specifications

Computer

CPU: Intel® Core™ i7-3555LE (BGA CPU package), quad-core, 8-threaded, 64-bit 2.1 GHz processor
OS: Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)
System Chipset: Intel® QM77 Express Chipset
System Memory: 16 GB capacity, 4 GB pre-installed: 1 slot for 4 GB DDR3 204-pin SO-DIMM SDRAM
USB:
MP model:
• USB 2.0 hosts x 6, Type A
• USB 3.0 hosts x 2, Type A
DC-CP model: USB 2.0 hosts x 6, Type A
Storage:
• 2 SATA 6 Gbps ports for SSD/HDD
• 2 SATA 3 Gbps ports for SSD/HDD (MC-7270-MP only)

Other Peripherals

Audio: Line in, line out, microphone; 3.5 mm mini-jack
KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse
PCI Slots: 2 (MP model)
LPT Ports: 1
PCIe x16 Slots: 1 (MP model)

Display

Display Interface:
• 1 VGA output: 15-pin D-Sub connector (female), max. resolution 2048 x 1536, 32-bit color at 75 Hz
• 2 DVI-D outputs: 29-pin DVI-D connectors (female), max. resolution 1920 x 1200, 32-bit color at 60 Hz
Graphics Controller: Onboard Intel® HD 4000 graphics

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 4
Magnetic Isolation Protection: 1.5 kV built in

Serial Interface

Serial Standards:
• 2 software-selectable RS-232/422/485 ports (DB9 male)
• 2 RS-232 ports (DB9 male)
• 8 NMEA 0183 v2 terminals (3.81 mm Euroblock connector) (NMEA 2000 available on request)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 230.4 kbps

Serial Signals

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

NMEA Interface

Note: The NMEA interface specs only apply to the MC-7270-MP.
Interfaces:
8 NMEA 0183 v2 terminals (NMEA 2000 available on request)
Base Serial Standard:
• NMEA 0183: RS-422
• NMEA 2000: CAN bus (available on request)
Optical Isolation Protection: 3 kV
Voltage Differential: -15 V to +15 V

Baudrate: 4800 bps
Data Bits: 8
Stop Bits: 1, 1.5, 2
Parity: None
Handshake: None

Digital Input

Input Channels: 8 dry channels, with 4 grounds
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Connector Type: 2 screw-fastened 6-pin 3.81 mm Euroblock terminals
Isolation: ESD protection to DNV specifications

Relay Output

Note: The relay output specs only apply to the MC-7270-MP.
Type: Form A (N.O.) power relay
Output Channels: 8
Contact Rating: 2 A, 30 VDC / 0.5 A, 125 VAC under resistor load
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 100,000 operations @ 2 A, 30 VDC resistive load
Electrical Endurance: 100,000,000 operations
Contact Resistance: 50 milli-ohms (max.) @ 6 V, 0.1 A
Connector Type: 2 screw-fastened 8-pin 3.81 mm Euroblock terminals
Isolation: Relay isolation; ESD protection to DNV specifications

LEDs

System: Storage, Power
LAN: 100M/Link x 4, 1000M/Link x 4 (on connector)

Physical Characteristics

Housing: Aluminum, sheet metal
Weight:
• DC-CP Model: 3.75 kg (8.33 lb)
• MP Model: 8 kg (17.78 lb)
Dimensions:
• DC-CP Model: 150 x 160 x 80 mm (5.91 x 6.30 x 3.15 in)
• MP Model: 287 x 250 x 70 mm (11.30 x 9.84 x 2.76 in)
Mounting: Wall (mounting kit must be purchased separately)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 131°F)
Storage Temperature: -50 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration:
• 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
• 1 Grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
• 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements

Input Voltage:
• DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
• AC: 100 to 240 VAC (MC-7270-MP only)
Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, DNV 2.4, 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 (Pending), IACS-E10 (Pending)
Green Product: RoHS, cRoHS, WEEE

MTBF (mean time between failures)

Time:
• MC-7230-DC-CP-T/MC-7270-DC-CP-T: 619,557 hrs
• MC-7230-MP-T: 219,195 hrs
• MC-7270-MP-T: 219,214 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

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

Ordering Information

Available Models

MC-7270-MP-T: x86-based industrial computer with 3rd gen. Intel® Core™ i7 3555LE processor, 4 serial ports, 8 NMEA 0183 ports, 4 gigabit Ethernet ports, 8 DIs, 8 DOs, 6 USB 2.0 ports, 2 USB 3.0 ports, 2 PCI slots, 1 PCIe x16 slot, VGA/DVI, and AC/DC power inputs
MC-7230-MP-T: x86-based industrial computer with 3rd gen. Intel® Core™ i3 3120ME processor, 4 serial ports, 8 NMEA 0183 ports, 4 gigabit Ethernet ports, 8 DIs, 8 DOs, 6 USB 2.0 ports, 2 USB 3.0 ports, 2 PCI slots, 1 PCIe x16 slot, VGA/DVI, and AC/DC power inputs
MC-7210-MP-T: x86-based industrial computer with 3rd gen. Intel® Celeron 1047 processor, 4 serial ports, 8 NMEA 0183 ports, 4 gigabit Ethernet ports, 8 DIs, 8 DOs, 6 USB 2.0 ports, 2 USB 3.0 ports, 2 PCI slots, 1 PCIe x16 slot, VGA/DVI, and AC/DC power inputs
MC-7270-DC-CP-T: x86-based industrial computer with Intel® Core™ i7 3555LE processor, fanless, wide temperature, 4 serial ports, 4 gigabit Ethernet ports, 6 USB hosts, VGA/DVI, and DC power input
MC-7230-DC-CP-T: x86-based industrial computer with Intel® Core™ i3 3120ME processor, fanless, wide temperature, 4 serial ports, 4 gigabit Ethernet ports, 6 USB hosts, VGA/DVI, and DC power input
MC-7210-DC-CP-T: x86-based industrial computer with Intel® Celeron 1047UE processor, fanless, wide temperature, 4 serial ports, 4 gigabit Ethernet ports, 6 USB hosts, VGA/DVI, and DC power input

Package Checklist (MC-7200-MP-T Series)

- 1 MC-7200-MP-T marine computer
- 2 removable storage protection keys
- Wall mounting kit, with 8 screws
- 1 2-pin terminal block for DC power input
- 1 2-pin terminal block for power ON/OFF switch
- 2 6-pin digital input terminal blocks
- 2 8-pin digital output terminal blocks
- 8 5-pin terminal blocks for NMEA 0183 ports
- Documentation and driver CD
- Quick installation guide
- Warranty card

Package Checklist (MC-7200-DC-CP-T Series)

- 1 MC-7200-DC-CP-T computer
- 1 2-pin terminal block for DC power input
- 1 2-pin terminal block for power ON/OFF switch
- Hard disk installation kit
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

MC-7130-MP

Optimized, highly secure marine platform with diverse interface connectivity

- High-performance computing platform with 3rd gen Intel® Core™ i3 3120ME processor
- Optimized solution with modularized NMEA interfaces
- DNV- and ABS-certified
- Trusted Platform Module provides data and hardware security integrated at the hardware level
- High graphics performance supported across up to 3 independent displays

Overview

The MC-7130-MP marine computer is powered by the latest 3rd generation Intel® Core™ i3 3120ME processor. Optimized for ECDIS, these computers can serve in nearly any bridge role thanks to their comprehensive range of I/O and communications interfaces: eight NMEA 0183 terminals, four serial ports, four gigabit Ethernet ports, six USB 2.0 and three SuperSpeed USB 3.0 ports. The MC-7130-MP is designed to give unrivalled PC performance for a new level of flexibility and control for marine applications.

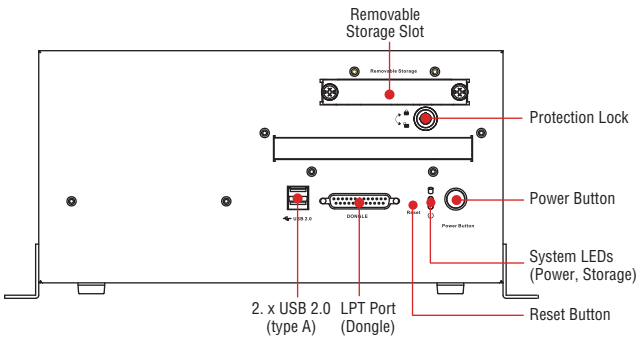
Designed with the highest quality and durability in mind, the marine-grade MC-7130-MP computer features a rugged chassis and vibration tolerance up to 1G, together providing a highly reliable platform that can easily tolerate the harsh environmental challenges of marine environments. Additionally, the MC-7130-MP's compact size and low power consumption return a low heat profile that increases MTBF while simplifying integration into existing bridge systems or newly designed marine solutions.

Finally, the MC-7130-MP also offers convenient connectivity expansions via a single PCIe (x16) slot and two universal PCI slots, allowing users to install a variety of peripheral extensions for radar, PROFIBUS, VGA graphics, and more, allowing for direct consolidation of all input sources at a single hub.

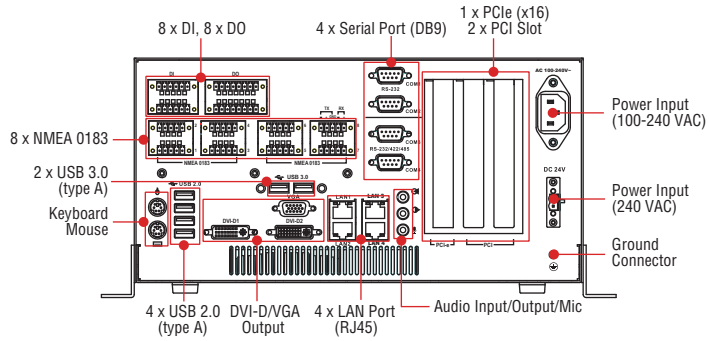
The MC-7130-MP platform is optimized for use with the Windows XP Embedded, XP Professional, or Windows 7 operating systems, allowing users to choose the development environment most suitable for the application's needs.

Appearance

Front View

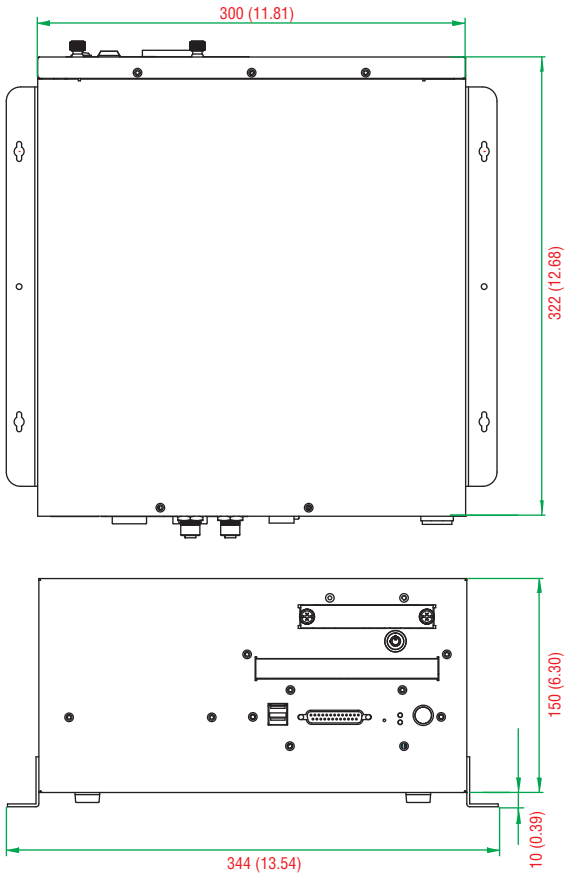


Rear View



Dimensions

Unit: mm (inch)



Specifications

Computer

CPU: Intel® Core™ i3-3120ME (BGA CPU package), dual-core threaded 64-bit 2.4-GHz processor
OS: Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)
System Chipset: Intel® QM77 Express Chipset
System Memory: 16 GB capacity, 4 GB pre-installed: 2 slots of 8 GB DDR3-1066 204 pin SO-DIMM SDRAM
USB:
• USB 2.0 hosts x 6, Type A
• USB 3.0 hosts x 2, Type A
Storage:
• 2 SATA 6 Gbps ports for SSD/HDD
• 2 SATA 3 Gbps ports for SSD/HDD

Other Peripherals

Audio: Line in x 1, Line out x 1, Mic in x 1
KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse
PCI Slots: 2
LPT Ports: 1
PCIe x16 Slots: 1

Display

Display Interface:
• VGA Interface x 1: 15-pin D-Sub connector (female), with resolution up to 1920 x 1080
• DVI-D Interface x 2: 29-pin DVI-D connectors (female), with resolution up to 1920 x 1080, 60 Hz (with reduced blanking)
Graphics Controller: Onboard Intel® HD 4000 graphics

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 4
Magnetic Isolation Protection: 1.5 kV built in

Serial Interface
Serial Standards:
• 2 RS-232/422/485 ports, software-selectable (DB9 male)
• 2 RS-232 ports (DB9)
• 8 NMEA 0183 terminals (NMEA 2000 available on request)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 230.4 kbps

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

NMEA Interface
Serial Standards: NMEA 0183v2 (NMEA 2000 available on request)
Base Serial Standard:
• NMEA 0183: RS-422
• NMEA 2000: CAN bus (available on request)
Optical Isolation Protection: 3 kV
Voltage Differential: -15 V to +15 V
Baudrate: 4800 bps
Data Bits: 8
Stop Bits: 1, 1.5, 2
Parity: None
Handshake: None

Digital Input
Input Channels: 8 dry channels, with 4 grounds
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Connector Type: 6-pin Phoenix-compatible 3.81-mm screw terminal blocks x 2
Isolation: ESD protection to DNV specifications

Relay Output
Type: Form A (N.O.) power relay
Output Channels: 8
Contact Rating: 2 A, 30 VDC / 0.5 A, 125 VAC under resistor load
Initial Insulation Resistance: 1000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance: 100,000 operations @ 2 A, 30 VDC resistive load
Electrical Endurance: 100,000,000 operations
Contact Resistance: Max. 50 mega-ohms @ 6 V, 0.1 A
Connector Type: 2 Euroblock 8-pin 3.81 mm screw terminals
Isolation: Relay isolation; ESD protection to DNV specifications

LEDs
System: Storage, Power
LAN: 2 LEDs on each port: 100 Mbps (left) / 1000 Mbps (right)

Physical Characteristics
Housing: Aluminum, sheet metal
Weight: 8 kg (17.8 lb)
Dimensions: 322 x 300 x 150 mm (12.68 x 11.81 x 5.91 in)
Mounting: Wall
System Cooling: Moxa intelligent fan

Environmental Limits
Operating Temperature: -15 to 55°C (5 to 131°F)
Storage Temperature: -20 to 60°C (-4 to 131°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration:
• 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
• 1 Grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
• 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements
Input Voltage:
• DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
• AC: 100 to 240 VAC
Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications
Safety: UL 60950-1, DNV 2.4, IEC 60945 (4th), IACS E10
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

MTBF (mean time between failures)
Time: 114,305 hrs
Standard: MIL-HDBK-217 FN2

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

Ordering Information

Available Models
MC-7130-MP: x86-based ECDIS computer with 3rd gen. Intel® Core™ i3 CPU processor, 4 serial ports, 8 NMEA 0183 ports, 4 gigabit Ethernet ports, 8 DIs, 8 DOs, 6 USB 2.0 ports, 2 USB 3.0 ports, 2 PCI slots, 1 PCIe x16 slot, VGA/DVI, TPM, and AC/DC power inputs

Optional Accessories (for AC models only, can be purchased separately)
PWC-C13US-3B-183: 10A/125V North American (US) power cord, 183 cm
PWC-C13EU-3B-183: 10A/250V Continental European (EU) power cord, 183 cm
PWC-C13UK-3B-183: 10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C13AU-3B-183: 2.5A/250V Australian (AU) power cord, 183 cm
PWC-C13CN-3B-183: 10A/250V China (CN) power cord, 183 cm

Package Checklist
- MC-7130-MP computer
- 2 removable storage protection keys
- 8 screws for internal and removable drive trays
- Wall-mounting kit
- 6 screws for wall mounting
- 1 terminal block for power input
- 4 terminal blocks for DI/DO channels
- 8 terminal blocks for NMEA 0183 ports
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

MC-5000 Series

Award-winning Product
TAIWAN EXCELLENCE 2013

Fanless ECDIS bridge computers with built-in NMEA interfaces and Intel® dual core i5-520E CPU

- High performance Intel® Core™ i5 520E processor, 3 MB L2 cache
- 2 GB of DDR3 memory built in; supports up to 8 GB
- Dual independent displays (DVI-I + VGA)
- 2 gigabit Ethernet ports for network redundancy
- 2 RS-232/422/485 serial ports
- 2 RS-232 ports
- 8 NMEA terminals
- 2 universal PCI slots
- 6 USB 2.0 ports
- 1 internal SATA storage drive slot
- 1 removable SATA storage drive tray
- 1G anti-vibration design for system reliability
- Compact, fanless design
- 24 VDC or 100 to 240 VAC power input models available
- Supports Windows XP Embedded, XP Professional, Windows 7

Overview

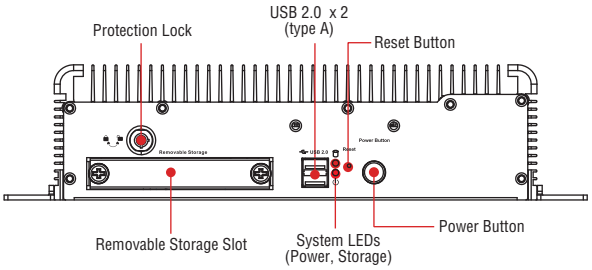
The MC-5000 Series computers feature the Intel® Core™ i5 520E processor and come with four serial ports, two gigabit Ethernet ports, six USB hosts, and eight NMEA terminals. The computers offer high performance and versatile peripherals for marine applications.

Designed with the highest quality and durability in mind, the marine-grade MC-5000 Series computers feature a rugged chassis and are proven against constant vibrations up to 1G, making these computers a most reliable platform even in harsh maritime environments and conditions. In addition, the MC-5150 series' compact size, fanless design, and low power consumption return a low thermal profile that translates into easier installations for any marine solution. 2 universal PCI slots allow users to expand the system using standard peripheral cards for radar, PROFIBUS, or marine-specific interfaces like NMEA.

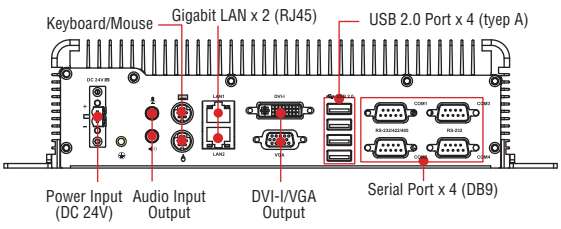
The MC-5000 series is optimized for use with the Windows XP Embedded, XP Professional, or Windows 7 operating systems, allowing users to choose the development environment most suitable for the application's needs.

Appearance

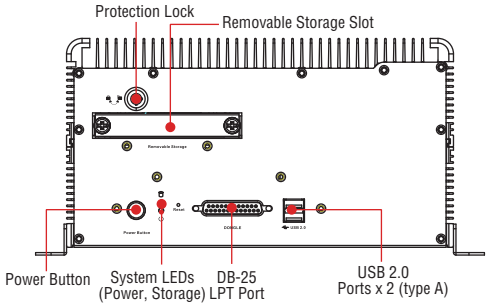
MC-5150-DC-CP Front View



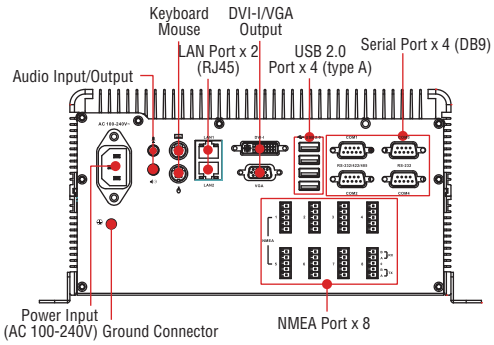
MC-5150-DC-CP Rear View



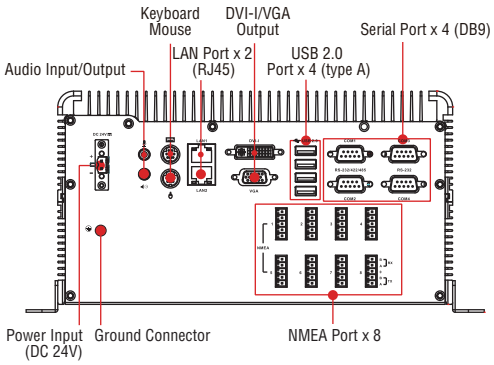
MC-5150-AC/DC Front View



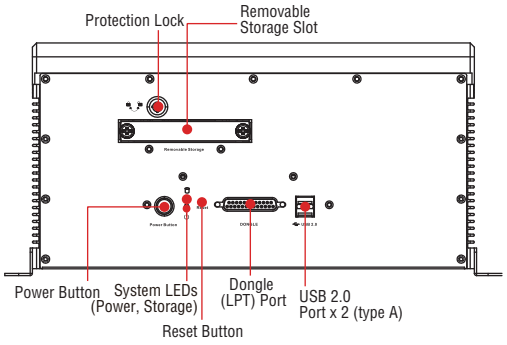
MC-5150-AC Rear View



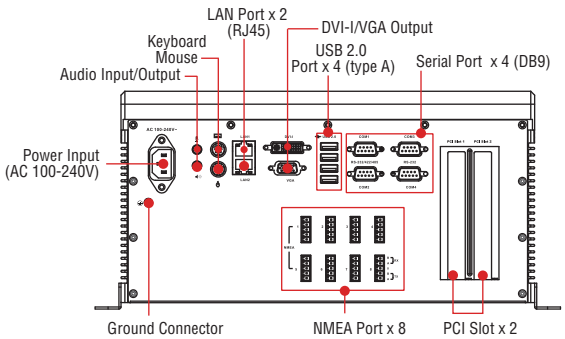
MC-5150-DC Rear View



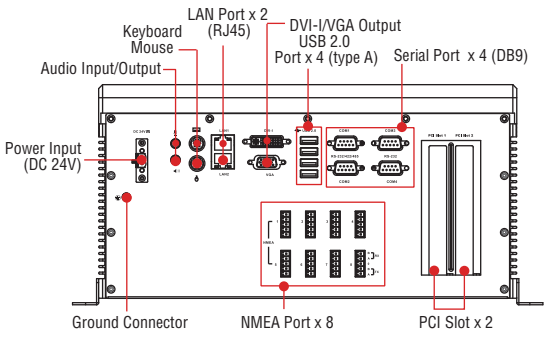
MC-5157-AC/DC Front View



MC-5157-AC Rear View



MC-5157-DC Rear View



Specifications

Computer

CPU: Intel® Core™ i5-520E (BGA CPU package), dual core threaded 64 bit 2.4 GHz processor
OS: Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)
System Chipset: Intel® QM57 Express Chipset
FSB: 1066
System Memory:
- MC-5150-DC-CP: 2 GB capacity, 2 GB pre-installed: 2 slots of 2 GB DDR3 204 pin SO-DIMM SDRAM
- MC-5150-AC/DC: 8 GB capacity, 2 GB pre-installed: 2 slots of 4 GB DDR3 204 pin SO-DIMM SDRAM
- MC-5157-AC/DC: 8 GB capacity, 2 GB pre-installed: 2 slots of 4 GB DDR3 204 pin SO-DIMM SDRAM

USB: USB 2.0 ports x 6, type A
Storage:
- MC-5150-DC-CP: 1 internal SATA storage tray, 1 removable SATA storage tray with 64 GB SSD
- MC-5150-AC/DC: 1 internal SATA storage tray, 1 removable SATA storage drive tray
- MC-5157-AC/DC: 1 internal SATA storage tray, 1 removable SATA storage drive tray

Other Peripherals

Audio: line in / line out, 3.5 mm mini-jack
KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse
PCI Slots: 2 (MC-5157 only)

Display

Display Interface:
- VGA Interface: 15-pin D-Sub connector (female)
- DVI-I Interface: 29-pin DVI-I connector (female)

Graphics Controller: Onboard Intel® HD graphics, 1920 x 1080 max. resolution

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built in

Serial Interface

Serial Standards:
- 2 software-selectable RS-232/422/485 ports, male DB9
- 2 RS-232 ports (DB9)
- 8 NMEA 0183 v2 terminals (3.81 mm Euroblock connector) (MC-5150-AC/DC, MC-5157-AC/DC 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 230.4 kbps

Serial Signals

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

LEDs

System: Storage, Power
LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Physical Characteristics

Housing: Aluminum, sheet metal
Weight:
- MC-5150-DC-CP: 3.85 kg (8.56 lb)
- MC-5150-AC/DC: 6.85 kg (15.22 lb)
- MC-5157-AC/DC: 8 kg (17.78 lb)

Dimensions:
- MC-5150-DC-CP: 287 x 250 x 70 mm (11.30 x 9.84 x 2.76 in) without ears
- MC-5150-AC/DC: 287 x 250 x 135 mm (11.30 x 9.84 x 5.31 in) without ears
- MC-5157-AC/DC: 320 x 300 x 171 mm (12.60 x 11.81 x 6.73 in) without ears

Mounting: Wall

Environmental Limits

Operating Temperature: -15 to 55°C (5 to 131°F)
Storage Temperature: -20 to 60°C (-4 to 131°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration:
- 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
- 1 Grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
- 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements

Input Voltage:
MC-5150-DC-CP: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
MC-5150-AC/DC:
- DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
- AC: 100 to 240 VAC

MC-5157-AC/DC:
- DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
- AC: 100 to 240 VAC

Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, DNV 2.4, 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

MTBF (mean time between failures)

Time:
- MC-5150 Series: 220,490 hrs
- MC-5157 Series: 152,997 hrs

Standard: Telcordia (Bellcore) Standard TR/SR

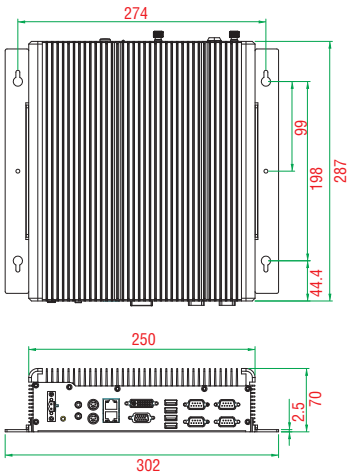
Warranty

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

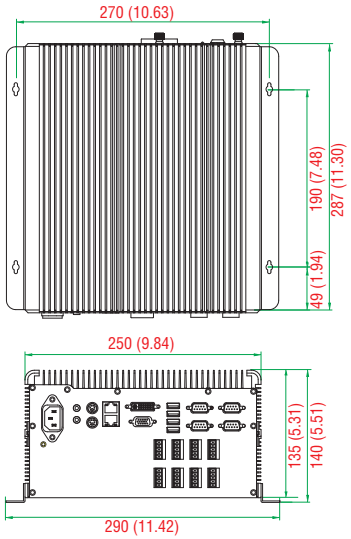
Dimensions

Unit: mm (inch)

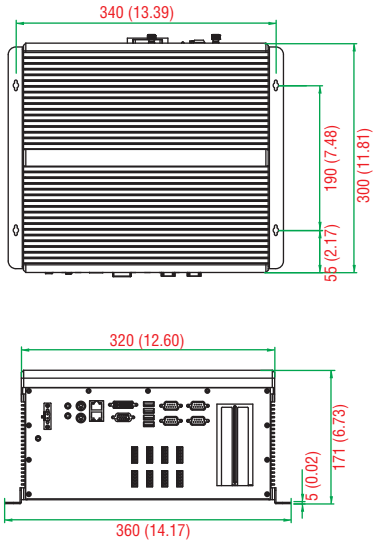
MC-5150-DC-CP



MC-5150-AC/DC



MC-5157-AC/DC



Ordering Information

Available Models

MC-5150-DC-CP: Industrial computer with Intel® Core™ i5 CPU processor, 4 serial ports, 2 gigabit Ethernet ports, 6 USB ports, storage, VGA/DVI, and DC power input
MC-5150-AC: ECDIS computer with Intel® Core™ i5 CPU processor, 4 serial ports, 8 NMEA terminals, 2 gigabit Ethernet ports, 6 USB ports, storage, VGA/DVI, and AC power input
MC-5150-DC: ECDIS computer with Intel® Core™ i5 CPU processor, 4 serial ports, 8 NMEA terminals, 2 gigabit Ethernet ports, 6 USB ports, storage, VGA/DVI, and DC power input
MC-5157-AC: Ship's bridge computer with Intel® Core™ i5 CPU processor, 4 serial ports, 8 NMEA terminals, 2 gigabit Ethernet ports, 6 USB ports, 2 universal PCI slots, storage, VGA/DVI, and AC power input
MC-5157-DC: Ship's bridge computer with Intel® Core™ i5 CPU processor, 4 serial ports, 8 NMEA terminals, 2 gigabit Ethernet ports, 6 USB ports, 2 universal PCI slots, storage, VGA/DVI, and DC power input

Optional Accessories (for AC models only, can be purchased separately)

PWC-C13US-3B-183: 10A/125V North American (US) power cord, 183 cm
PWC-C13EU-3B-183: 10A/250V Continental European (EU) power cord, 183 cm
PWC-C13UK-3B-183: 10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C13AU-3B-183: 2.5A/250V Australian (AU) power cord, 183 cm
PWC-C13CN-3B-183: 10A/250V China (CN) power cord, 183 cm

Package Checklist (MC-5150-DC-CP)

- MC-5150-DC-CP computer
- 2 keys for the locking removable storage trays
- 4 screws for internal drive tray
- Terminal block for power input
- Hard disk installation kit
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

Package Checklist (MC-5150-AC/DC)

- MC-5150-AC/DC computer
- 2 keys for the locking removable storage trays
- 4 screws for internal drive tray
- Terminal block for power input
- Hard disk installation kit
- Documentation and driver CD
- Quick installation guide (printed)
- Warranty card

Package Checklist (MC-5157-AC/DC)

- MC-5157-AC/DC computer
- 2 keys for the locking removable storage trays
- 8 screws for internal and removable drive trays
- Terminal block for power input (DC model only)
- 8 terminal blocks for NMEA interfaces
- Documentation and driver CD
- Quick installation guide (printed)

MC-1100 Series

Preliminary

Quad-core fanless DIN-rail automation computer

- Intel Atom E3800 series processor
- Dual-storage (SD and CFast slots)
- Dual-independent displays (VGA + display port)
- Variety of interfaces: 2 serial ports, 4 Giga LAN, 4 DIs, 4 DOs, 2 USB2.0
- Mini-PCIe sockets for WiFi, 3G, LTE, GPS
- 9 to 36 VDC, wide range isolated power
- -40 to 70°C system operating temperature range
- Moxa SmartRecovery utility to recover system from boot failure (W7E only)
- Marine-grade and Zone 2 compliance

Overview

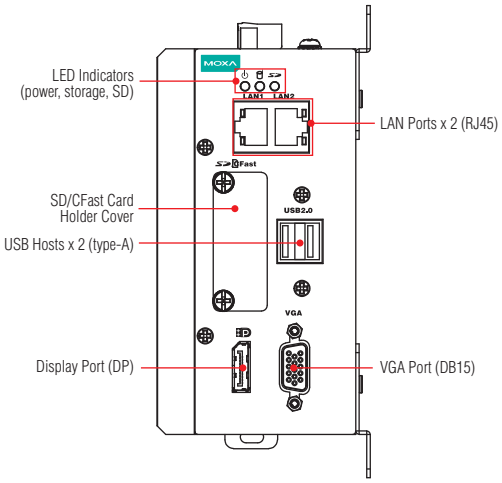
The Moxa MC-1100 series DIN-rail, fanless, x86 embedded computers are based on the Intel® Atom™ E3800 series processor, feature the most reliable I/O design to maximize connectivity, and support wireless modules (WiFi/3G/LTE), making them suitable for a diverse range of communication applications.

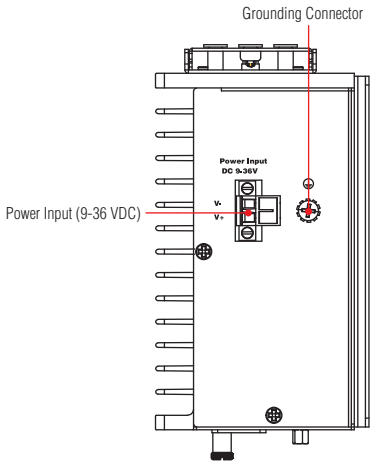
Powered by a wide operating temperature range (-40 to 70°C) and Safety/EMI/EMS compliances, the MC-1100 series is ideal for intelligent computing and communication solutions in critical environments, including marine communication, oil & gas field site monitoring, and transportation.

The MC-1100 series supports “Moxa Hardware Monitoring” for device I/O status monitoring and alerts, system temperature monitoring and alerts, and system power management. Monitoring system status closely makes it easier to recover from errors and provides the most reliable platform for your applications.

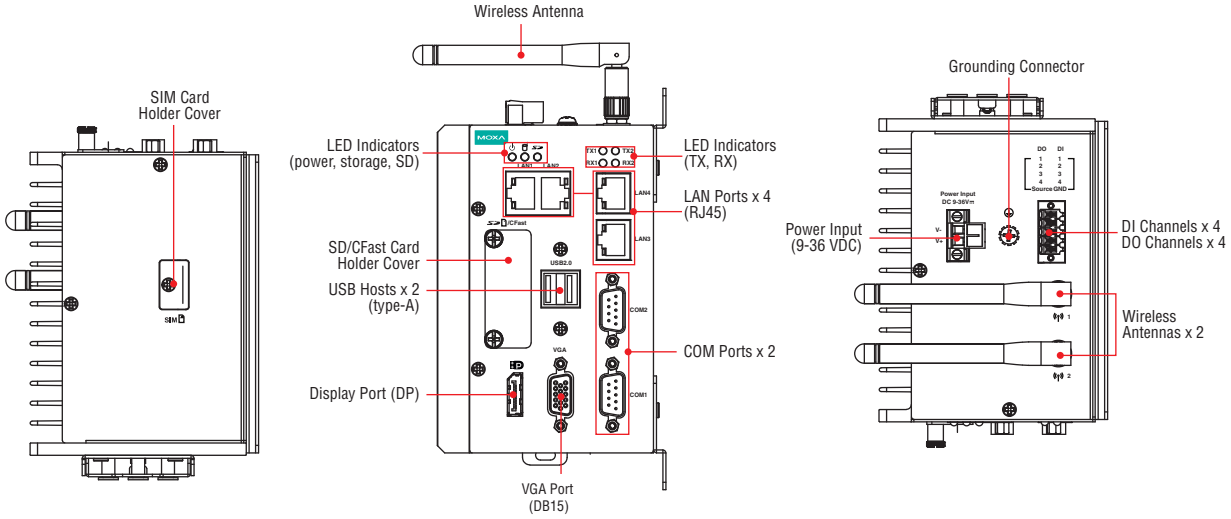
Appearance

MC-1111





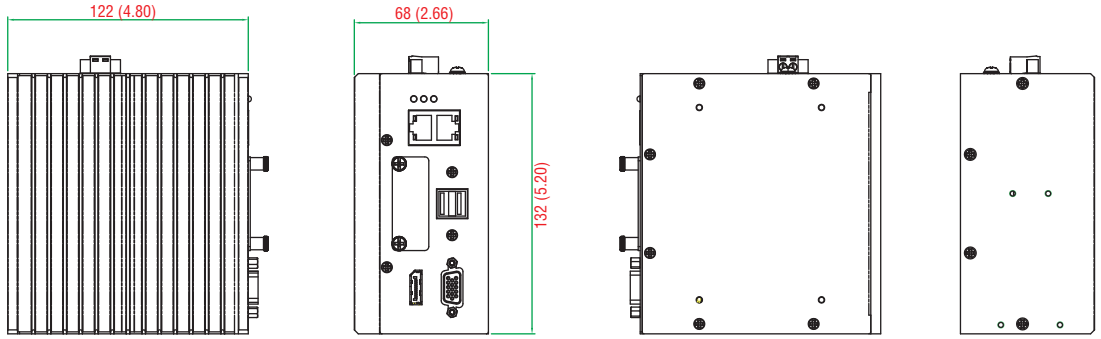
MC-1121



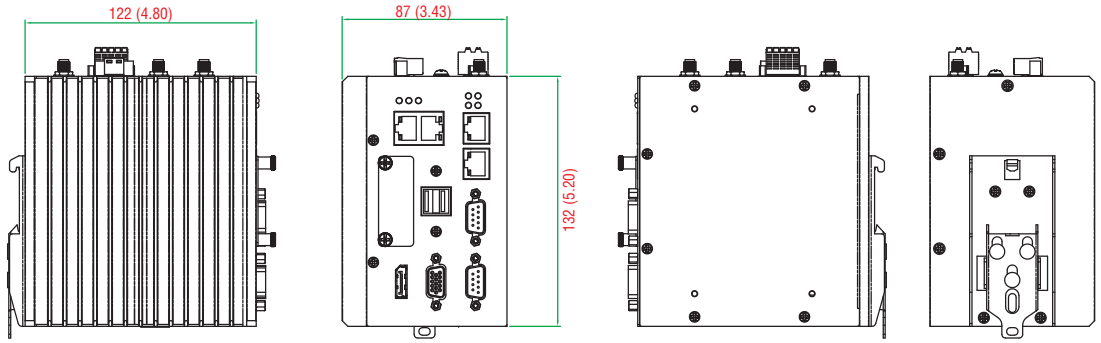
Dimensions

Unit: mm (inch)

MC-1111



MC-1121



Specifications

Computer

CPU:
• Intel® Atom™ processor E3845 (quad-core, 1M cache, 1.91 GHz)
• Intel® Atom™ processor E3826 (dual-core, 1M cache, 1.46 GHz)
System Memory: System Memory: 1 DDR3L SO-DIMM slot, 2 GB pre-installed, 8 GB max.
• E3826: supports DDR3L-1066
• E3845: supports DDR3L-1333
USB: USB 2.0 hosts x 2, Type A connectors
Storage:
• CFast: 1 CFast socket for OS storage
• SD: 1 SD 3.0 (SDHC/SDXC) socket for storage expansion

Other Peripherals

Expansion Slots: 1, Mini-PCIe socket
USIM Slots: 1

Display

Display Interface:
• VGA interface x 1: 15-pin D-Sub connector (female), with resolution up to 1920 x 1200 pixels at 75 Hz
• Display port interface x 1: Display port connector, with resolution up to 2560 x 1600 pixels at 60 Hz
Graphics Controller: Intel® HD Graphics 4000

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-232/422/485 ports, software-selectable (DB9 male)

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 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: DIs x 4, source-type
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 1: +3 V max
• Logic level 0: +10 V to +30 V (Source to DI)
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

Digital Output

Output Channels: DOs x 4, sink-type
Output Current: 200 mA (max.) per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

LEDs

System: Power
Storage: CFast, SD
LAN: 2 LEDs per port (100/1000 Mbps)
Serial: 2 LEDs per port (Tx and Rx)

Physical Characteristics

Housing: Aluminum, sheet metal
Weight:
• MC-1111: 1.21 kg (2.69 lb)
• MC-1121: 09.7 g (2.16 lb)
Dimensions:
• MC-1111: 132 x 122 x 68 mm (5.20 x 4.81 x 2.68 in)
• MC-1121: 132 x 122 x 87 mm (5.20 x 4.81 x 3.43 in)
Mounting: DIN rail, wall (optional)

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 75°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements

Input Voltage: 9 to 36 VDC, isolated
Power Consumption: Less than 30 W

Standards and Certifications

Safety: UL 60950-1, CCC
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A
Marine Standards: IEC 60945 4th
Marine Type Approval: DNV 2.4
Green Product: RoHS, cRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in watchdog timer (WDT), configurable for resets following 1-255 second hang intervals; software programmable

Warranty

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

Ordering Information

Available Models

MC-1111-E2-T: x86 embedded computer with Intel Atom dual-core E3826 processor, 2 GB RAM, VGA, 2 USBs, 2 GigaLANs, 1 CFast socket, 1 SD slot, display port, 9 to 36 VDC power
MC-1111-E4-T: x86 embedded computer with Intel Atom dual-core E3845 processor, 2 GB RAM, VGA, 2 USBs, 2 GigaLANs, 1 CFast socket, 1 SD slot, display port, 9 to 36 VDC power
MC-1121-E2-T: x86 embedded computer with Intel Atom dual-core E3826 processor, 2 GB RAM, VGA, 2 USBs, 4 GigaLANs, 2 serial ports, 4 DIs, 4 DOs, 1 CFast socket, 1 SD slot, display port, 9 to 36 VDC power
MC-1121-E4-T: x86 embedded computer with Intel Atom dual-core E3845 processor, 2 GB RAM, VGA, 2 USBs, 4 GigaLANs, 2 serial ports, 4 DIs, 4 DOs, 1 CFast socket, 1 SD slot, display port, 9 to 36 VDC power

Package Checklist

- MC-1100 embedded computer
- Terminal block to power jack converter
- Din-rail mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

Optional Accessories

Type		Model Name	Description
Power Adapters			
	Adapter	PWR-24250-DT-S1	Power adapter, input voltage 90 to 264 VAC, output voltage 24 V with 2.5 A DC load
	Power Cord	PWC-C7US-2B-183	Power cord with 2-pin connector, USA plug
	Power Cord	PWC-C7EU-2B-183	Power cord with 2-pin connector, Europe plug
	Power Cord	PWC-C7UK-2B-183	Power cord with 2-pin connector, British plug
	Power Cord	PWC-C7AU-2B-183	Power cord with 2-pin connector, Australia plug
	Power Cord	PWC-C7CN-2B-183	Power cord with 2-pin connector, China plug
WI-FI			
	Mini-PCIe Card		SprakLAN WPEA-251NI Wi-Fi mini card, black screws x 4
LTE/3G			
	Mini-PCIe Card		Telit LE910 mini card, LTE for North America and Europe, black screws x 4

Marine Displays and Panel Computers

Product Selection Guide

Marine Displays and Panel Computers 24-2

Marine Displays and Panel Computers

MD-215/219/224/226 Series: 15/19/24/26-inch marine displays 24-3

MD-119/124 Series: 19-inch and 24-inch type-approved ECDIS displays 24-6

MPC-2150/2190/2240/2260 Series: 15/19/24/26-inch fanless panel computers 24-9

Marine Displays and Panel Computers

Preliminary

	MD-119/124 Series	MD-219/224/226 Series	MD-215 Series	MPC-2190/2240/2260 Series	MPC-2150 Series
Computer					
CPU	–	–	–	Intel® Core™ i7-3517UE 1.7 GHz, or Intel® Celeron® 1047UE 1.4 GHz	Intel® Core™ i7-3517UE 1.7 GHz, or Intel® Celeron® 1047UE 1.4 GHz
Supported OS	–	–	–	Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit	Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit
OS Pre-installed	–	–	–	–	–
System Chipset	–	–	–	Intel® HM65 Express Chipset	Intel® HM65 Express Chipset
Memory Slot	–	–	–	1 SO-DIMM slot	1 SO-DIMM slot
System Memory Pre-installed	–	–	–	4 GB pre-installed (SDRAM)	4 GB pre-installed (SDRAM)
Expansion Bus	–	–	–	–	–
USB	–	–	–	USB 2.0 x 4, Type A connectors	USB 2.0 x 4, Type A connectors
Storage slot	–	–	–	MPC-2190: 1 2.5" HDD/SSD slot MPC-2240/2260: 2 2.5" HDD/SSD slot	1 2.5" HDD/SSD slot + 1 CFast slot
Storage Pre-installed	–	–	–	–	–
BIOS	–	–	–	64 Mbit Flash BIOS SPI type, ACPI function supported	64 Mbit Flash BIOS SPI type, ACPI function supported
Other Peripherals					
Audio	–	–	–	Line-in and line-out interface, with 3.5 mm mini jack	Line-in and line-out interface, with 3.5 mm mini jack
KB/MS	–	–	–	2 PS/2 interfaces	2 PS/2 interfaces
Buzzer	75 to 85 db (IEC 60945 compliant)	75 to 85 db (IEC 60945 compliant)	75 to 85 db (IEC 60945 compliant)	75 to 85 db (IEC 60945 compliant)	75 to 85 db (IEC 60945 compliant)
Display					
Panel Size	19/24 inches	19/24/26 inches	15 inches	19/24/26 inches	15 inches
Touch	Resistive touch	Projected capacitive touch	Projected capacitive touch, glove friendly	Projected capacitive touch	Projected capacitive touch, glove friendly
Aspect Ratio	• MD-119: 5:4 • MD-124: 16:9	• MD-219: 5:4 • MD-224: 16:9 • MD-226: 16:10	5:4	• MD-219: 5:4 • MD-224: 16:9 • MD-226: 16:10	5:4
Pixels	• MD-124: 1920 x 1080 • MD-119: 1280 x 1024 (WSXGA+)	• MD-219: 1280 x 1024 (SXGA) • MD-224: 1920 x 1080 (Full HD) • MD-226: 1920 x 1200 (WUXGA)	1024 x 768	• MD-219: 1280 x 1024 (SXGA) • MD-224: 1920 x 1080 (Full HD) • MD-226: 1920 x 1200 (WUXGA)	1024 x 768
Contrast Ratio	• MD-124: 5000:1 • MD-119: 1000:1	• MD-219: 2000: 1 • MD-224: 5000: 1 • MD-226: 1500: 1	700:1	• MD-219: 2000: 1 • MD-224: 5000: 1 • MD-226: 1500: 1	700:1
Light Intensity	• MD-124: 300 cd/m² • MD-119: 350 cd/m²	• MD-219: 300 cd/m² • MD-224: 300 cd/m² • MD-226: 350 cd/m²	1000 cd/m²	• MD-219: 300 cd/m² • MD-224: 300 cd/m² • MD-226: 350 cd/m²	1000 cd/m²
Viewing Angles	• MD-124: 178° x 178° • MD-119: 170° x 160°	• MD-219: 178°/178° • MD-224: 178°/178° • MD-226: 176°/176°	170°/160°	• MD-219: 178°/178° • MD-224: 178°/178° • MD-226: 176°/176°	170°/160°
Max. No. of Colors	16.7M (8-bit)	16.7M (8-bit)	16.7M (8-bit)	16.7M (8-bit)	16.7M (8-bit)
Video inputs	DVI-I x 2, BNC composite x 3	DVI-D x 1, VGA x 1 (DB15 female)	DVI-D x 1, VGA x 1 (DB15 female)	–	DVI-D x 1, VGA x 1 (DB15 female)
Video output	VGA x 1	–	–	DVI-D x 1, VGA x 1 (DB15 female)	–
Ethernet Interface					
LAN	–	–	–	10/100/1000 Mbps ports (RJ45 port) x 2	10/100/1000 Mbps ports (RJ45 port) x 2
Serial Interface					
Serial Standards	2 RS-232 port (DB9)	1 RS-232 port (DB9) 1 RS-422/485 port (terminal block)	1 RS-232 port (DB9) 1 RS-422/485 port (terminal block)	2 RS-232/422/485 ports, software-selectable (DB9 male)	2 RS-232/422/485 ports, software-selectable (DB9 male)
Physical Characteristics					
Housing	Aluminum sheet metal	Aluminum sheet metal	Aluminum sheet metal	Aluminum sheet metal	Aluminum sheet metal
Weight	• MD-124: 12 kg (26.46 lb) • MD-119: 9.7 kg (21.38 lb)	• MD-219: 7.8 kg (17.20 lb) • MD-224: 12 kg (26.46 lb) • MD-226: 15.2 kg (35.51 lb)	6.5 kg (13.44 lb)	• MD-219: 7.8 kg (17.20 lb) • MD-224: 12 kg (26.46 lb) • MD-226: 15.2 kg (35.51 lb)	6.5 kg (14.44 lb)
Dimensions	• MD-124: 85 x 593 x 384 mm (3.35 x 23.45 x 15.12 in) • MD-119: 82 x 483 x 444 mm (3.23 x 19.02 x 17.48 in)	• MD-219: 429 x 387 x 75 mm (16.89 x 15.24 x 2.95 in) • MD-224: 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in) • MD-226: 621 x 440 x 90 mm (24.45 x 17.48 x 3.57 in)	356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)	• MD-219: 429 x 387 x 75 mm (16.89 x 15.24 x 2.95 in) • MD-224: 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in) • MD-226: 621 x 440 x 90 mm (24.45 x 17.48 x 3.57 in)	356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)
Mounting	Console	VESA, desktop, panel	VESA, desktop, panel	VESA, desktop, panel	VESA, desktop, panel
System Cooling	Fan	Fanless	Fanless	Fanless	Fanless
Environmental Limits					
Operating Temperature	-15 to 55°C (5 to 131°F)	-15 to 55°C (5 to 131°F)	-40 to 70°C (-40 to 158°F)	-15 to 55°C (5 to 131°F)	-40 to 70°C (-40 to 158°F)
Storage Temperature	-20 to 60°C (-4 to 140°F)	-20 to 60°C (-4 to 140°F)	-40 to 70°C (-40 to 158°F)	-20 to 60°C (-4 to 140°F)	-40 to 70°C (-40 to 158°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Power Requirements					
Input Voltage	• 24 VDC (18 to 36 VDC) • 110 to 230 VAC, 50/60 Hz	• 24 VDC (18 to 36 VDC) • 110 to 230 VAC, 50/60 Hz	• 12/24 VDC (9 to 36 VDC) • 100 to 240 VAC	• 24 VDC (18 to 36 VDC) • 110 to 230 VAC, 50/60 Hz	• 12/24 VDC (9 to 36 VDC) • 100 to 240 VAC
Standards and Certifications					
Safety	UL 60950-1, CCC	UL 60950-1, CCC	UL 60950-1, CCC	UL 60950-1, CCC	UL 60950-1, IEC 60950-1
EMC	EN 55022/24, CISPR 22, FCC Part 15B Class A	EN 55022/24, CISPR 22, FCC Part 15B Class A	EN 55022/24, CISPR 22, FCC Part 15B Class A	EN 55022/24, CISPR 22, FCC Part 15B Class A	EN 55022/24
Ingress Protection Rating	• Front: IP66 • Rear: IP22	• Front: IP54 • Rear: IP22	• Front: IP66 • Rear: IP22	• Front: IP54 • Rear: IP22	• Front: IP66 • Rear: IP22
Marine	IEC 60945 4th	IEC 60945 4th, DNV, IACS E10, IEC 61174	IEC 60945 4th, DNV, IACS E10	IEC 60945 4th, DNV, IACS E10, IEC 61174	–
Warranty					
Warranty Period	• System: 3 years • LCD panel: 1 year	• System: 3 years • LCD panel: 1 year	• System: 3 years • LCD panel: 1 year	• Computer system: 3 years • LCD panel: 1 year	• Computer system: 3 years • LCD panel: 1 year
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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MD-215/219/224/226 Series

15/19/24/26-inch marine displays

- 15/19/24/26-inch display
- High quality LCD with LED backlight
- Color calibrated for ECDIS compliance
- Full range dimming, 0 to 100%
- SavvyTouch™ display controls
- Built-in RS-232/422/485 interfaces
- Dual power supplies (AC & DC)
- IP54 (front) / IP22 (rear) rated
- Optically bonded and touch panel models available on request

Introduction

The MD-215/219/224/226 series of marine displays comes with full range dimming, wide viewing angles and optional optical bonding. These displays are built with a small-profile modular design that allows easier integration into industrial marine systems, reducing deployment costs and overall time-to-market.

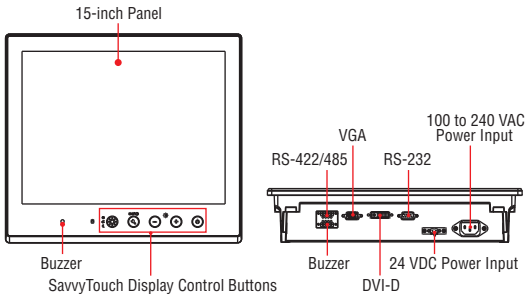
The innovative and user-friendly SavvyTouch display controls offer several unique features not found on any other marine display console: a proximity sensor for convenient adjustments in dark conditions, an info button for immediate updates on power status, and a quick-switch to adjust between day, dusk, and night-time ECDIS modes (for color-calibrated ECDIS models only).

The MD-215/219/224/226 series displays are compliant with IEC 60945, DNV, and IACS-E10, verifying their resilience and durability in maritime conditions. Their IP54 rated enclosure provides additional protection against dust and moisture above and beyond the limits established by these international standards bodies.

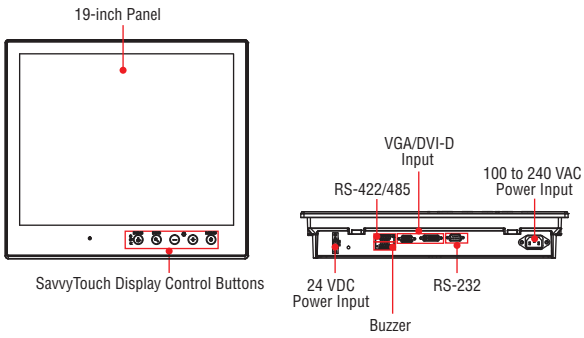
ECDIS-approved models are also available, offering an excellent HMI solution for ECDIS charting and navigation stations.

Appearance

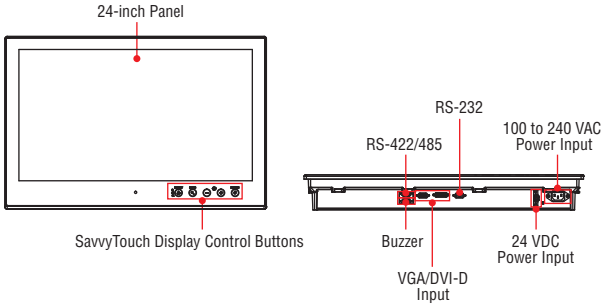
MD-215



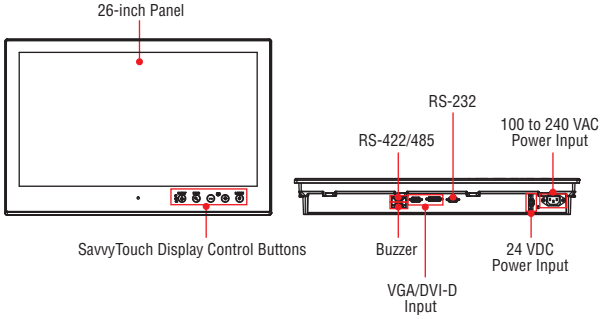
MD-219



MD-224



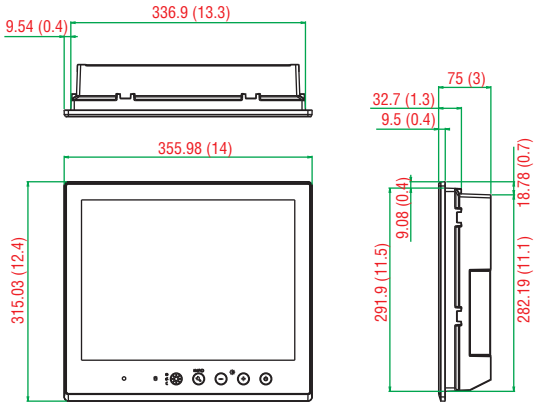
MD-226



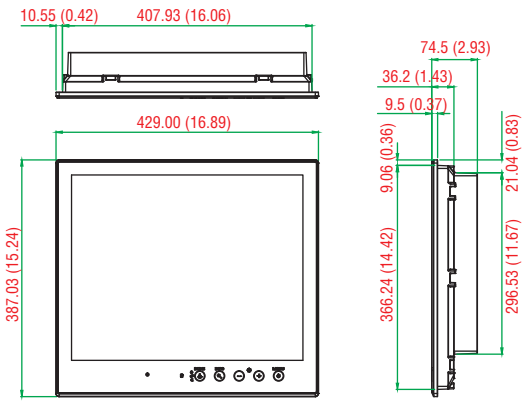
Dimensions

Unit: mm (inch)

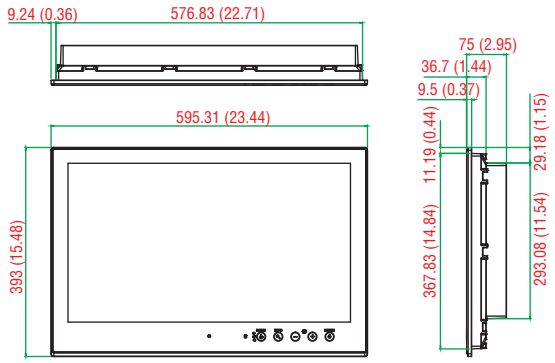
MD-215



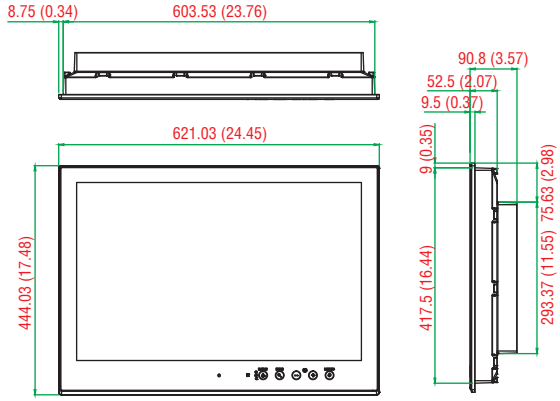
MD-219



MD-224



MD-226



Specifications

Display

Panel Size: 15/19/24/26-inch viewable image size
Panel Type: MVA
Aspect Ratio:
- MD-215: 5:4
- MD-219: 5:4
- MD-224: 16:9
- MD-226: 16:10

Pixels:
- MD-215: 1024 x 768
- MD-219: 1280 x 1024 (SXGA)
- MD-224: 1920 x 1080 (WSXGA+)
- MD-226: 1920 x 1200 (WUXGA)

Pixel Pitch (RGB):
- MD-215: 0.297 (H) x 0.297 (V) mm
- MD-219: 0.294 (H) x 0.294 (V) mm
- MD-224: 0.282 (H) x 0.282 (V) mm
- MD-226: 0.2865 (H) x 0.2865 (V) mm

Response Time:
- MD-215: 20 ms (gray to gray)
- MD-219: 20 ms (gray to gray)
- MD-224: 25 ms (gray to gray)
- MD-226: 15 ms (gray to gray)

Contrast Ratio:
- MD-215: 700: 1
- MD-219: 2000:1
- MD-224: 5000:1
- MD-226: 1500:1

Light Intensity: 300 cd/m/m
Viewing Angles:
- MD-215: 160°/140°
- MD-219/224: 178°/178°
- MD-226: 176°/176°

Active Display Area:
- MD-215: 304.128 (H) x 228.096 (V) mm
- MD-219: 376.32 (H) x 301.06 (V) mm
- MD-224: 531.36 (H) x 298.89 (V) mm
- MD-226: 550.08 (H) x 343.8 (V) mm

Max. No. of Colors: 16.7M / 8-bit color
Display Interface:
- 1 VGA input
- 1 DVI-D input

Resolution:
- VGA: 640 x 480
- SVGA: 800 x 600
- XGA: 1024 x 768
- SXGA: 1280 x 1024 (MD-219/224/226 only)
- WSXGA+: 1920 x 1080 (MD-224/226 only)
- WUXGA: 1920 x 1200 (MD-226 only)

Serial Interface

Serial Standards: 1 RS-232 port (male DB9), 1 RS-422/485 port (Euroblock)
Optical Isolation Protection: 3 kV

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

Front Panel
LEDs: MENU, Brightness, INFO, ECDIS, Day/Dusk/Night
Smart OSD: Yes

Physical Characteristics
Housing: Aluminum sheet metal
Weight:
• MD-215: 6.1 kg (13.56 lb)
• MD-219: 7.8 kg (17.33 lb)
• MD-224: 12 kg (26.67 lb)
• MD-226: 15.2 kg (33.78 lb)
Dimensions:
• MD-215: 356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)
• MD-219: 429 x 387 x 75 mm (16.89 x 15.24 x 2.95 in)
• MD-224: 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in)
• MD-226: 621 x 440 x 90 mm (24.45 x 17.48 x 3.57 in)
Mounting: VESA (optional), panel (optional), desktop (optional)

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)
IP Rating:
• Front: IP54
• Rear: IP22
Anti-vibration: 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements
Input Voltage:
• DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
• AC: 100 to 240 VAC
Power Consumption: 40 W max.

Standards and Certifications
Safety: UL 60950-1, EN 60950-1, IEC 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 1 kV
Marine: IEC 60945 4th, IEC 61174, DNV2.4, IACS E10
Green Product: RoHS, cRoHS, WEEE

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

We recommend taking the following precautions to minimize heat build-up within the display:

- Position the display within ±40° of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within ±40° of the vertical, (b) the ambient temperature exceeds 25°C, or (c) the display is used in a location with minimal ventilation.

Important Safety Precaution:
Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C, it is best to ensure that the ambient temperature does not exceed 25°C. Doing so will increase the life of your display and minimize service costs.

Ordering Information

Available Models
MD-224X: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920 x 1080), LED backlighting, dual-power supply (AC/DC)
MD-224Z: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920 x 1080), projected-capacitive touch panel, LED backlighting, dual-power supply (AC/DC)
MD-215X-T: 15-inch display, DVI-D/VGA video output, AC/DC dual power, tape bonding
MD-215Z-T: 15-inch display, DVI-D/VGA video output, AC/DC dual power, multitouch w/ glove friendly, tape bonding
MD-219X: 19-inch, 5:4 aspect ratio display (1280 x 1024), LED backlight, DVI-D/VGA, RS-232 and RS-422/485 serial ports, AC/DC dual power, tape bonding
MD-219Z: 19-inch, 5:4 aspect ratio display (1280 x 1024), projected capacitive multitouch, LED backlight, DVI-D/VGA, RS-232 and RS-422/485 serial ports, AC/DC dual power, tape bonding
MD-226X: 26-inch, 16:10 aspect ratio display (1920 x 1200), LED backlighting, RS-232/422/485 serial ports, dual-power supply (AC/DC)

Package Checklist
- MD-215/219/224/226 display
- VGA cable
- DVI-D cable
- 2-pin terminal block x 1
- 5-pin terminal block x 2
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately, for AC power input)
PWC-C13US-3B-183: 10A/125V North American (US) power cord, 183 cm
PWC-C13EU-3B-183: 10A/250V Continental European (EU) power cord, 183 cm
PWC-C13UK-3B-183: 10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C13AU-3B-183: 10A/250V Australian (AU) power cord, 183 cm
PWC-C13CN-3B-183: 10A/250V China (CN) power cord, 183 cm

Optional Mounting/Bracket Kits (can be purchased separately)
MPC-MD-2-24-PMTK: Panel-mounting kit
MPC-MD-2-24-VESAMTK: VESA-mounting kit
MPC-MD-2-24-26-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-24-26-DMTK w/ hinge: Desktop-mounting kit with hinge
MPC-MD-2-19-PMTK: Panel-mounting kit
MPC-MD-2-19-VESAMTK: VESA-mounting kit
MPC-MD-2-19-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-19-DMTK w/ hinge: Desktop-mounting kit with angle adjustment hinge
MPC-MD-2-15-PMTK: Panel-mounting kit with 8 screws
MPC-MD-2-15-VESAMTK: VESA-mounting bracket, 100 x 100 mm and 75 x 75 mm

MD-119/124 Series

19 inch and 24 inch type-approved ECDIS displays

- 19/24-inch marine display
- LED backlighting
- Full range dimming
- Dual power supplies (AC and DC)
- Picture-in-Picture (PIP) and Picture-by-Picture (PBP)
- ECDIS color calibration (by request)
- IP66 (front) and IP22 (rear) ratings

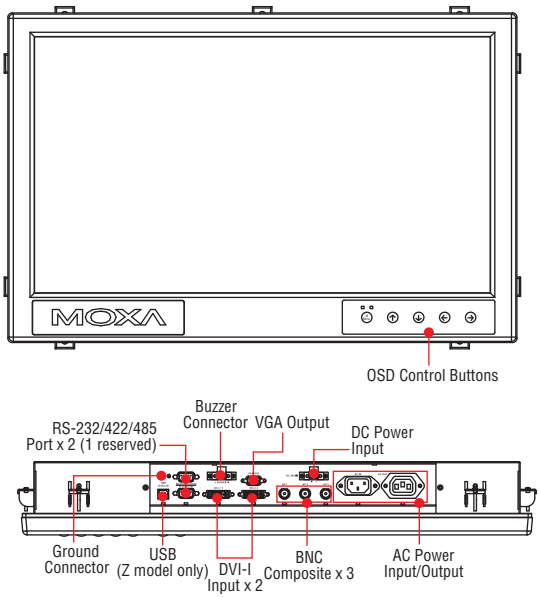
Overview

MD-119 and MD-124 marine displays are designed to meet the demanding performance and durability requirements of industrial-grade maritime service. The MD-119 has a 19 inch screen in a 5:4 aspect ratio, with 1280 x 1024 pixel resolution, PIP (Picture-in-a-Picture) and PBP (Picture-by-a-Picture). The MD-124 has a 24 inch screen in a 16:9 aspect ratio, a maximum resolution of 1920 x 1080, and also supports PIP and PBP. With full range dimming, wide viewing angles, both AC and DC power inputs, and optional touch screens or optical bonding, MD-119 / MD-124 marine displays are ideal not only for use in ECDIS stations, but for a variety of other applications, as well, whether outdoors or on the bridge.

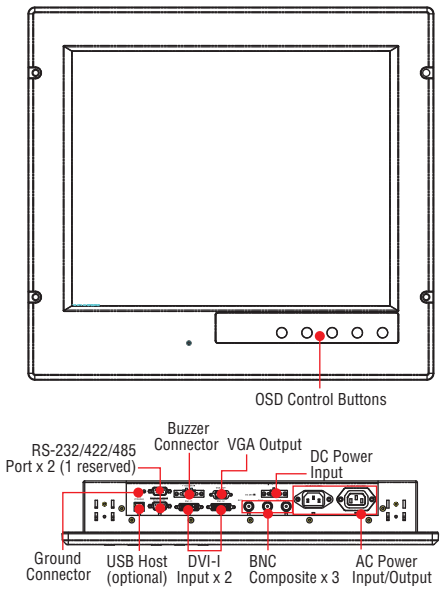
MD-124/MD-119 displays are compliant with a variety of industrial marine standards, including IEC 60945, IEC 61174, DNV, and IACS-E10, amply demonstrating their suitability for on-board marine uses.

Appearance

MD-124



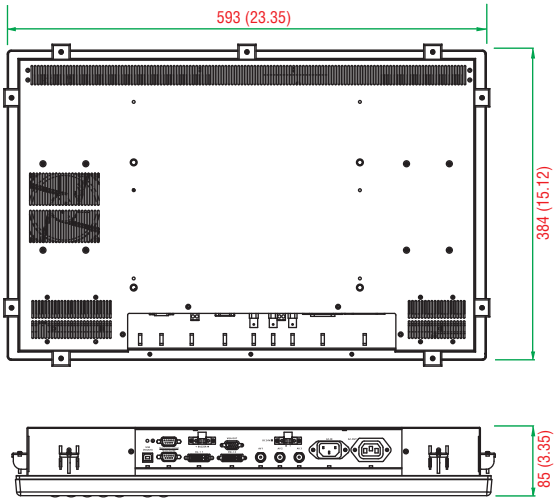
MD-119



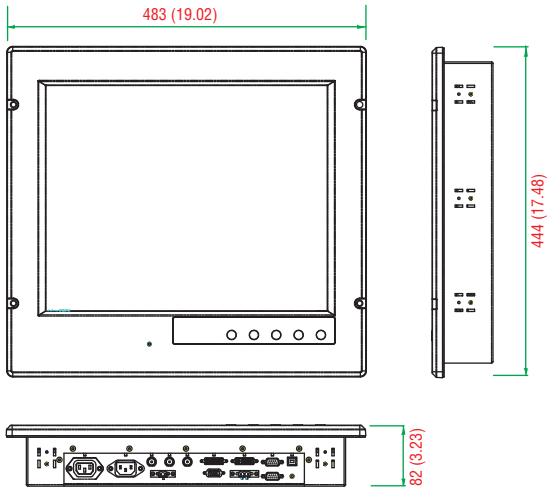
Dimensions

Unit: mm (inch)

MD-124



MD-119



Specifications

Display

Panel Size:
MD-124: 24-inch viewable image size
MD-119: 19-inch viewable image size
Panel Type: MVA
Aspect Ratio:
MD-124: 16:9
MD-119: 5:4
Pixels:
MD-124: 1920 x 1080
MD-119: 1280 x 1024 (WSXGA+)
Pixel Pitch (RGB):
MD-124: 0.282 (H) x 0.282 (V) mm
MD-119: 0.294 (H) x 0.294 (V) mm
Response Time:
MD-124: 8 ms (gray to gray)
MD-119: 5 ms (gray to gray)
Contrast Ratio:
MD-124: 5000:1
MD-119: 1000:1
Light Intensity:
MD-124: 300 cd/m/m
MD-119: 350 cd/m/m
Viewing Angles:
MD-124: 178° x 178° (right-left/up-down)
MD-119: 178° x 178° (right-left/up-down)
Active Display Area:
MD-124: 531.36 (H) x 298.89 (V) mm
MD-119: 376.32 (H) x 301.06 (V) mm / 14.81 (H) x 11.85 (V) in
Max. No. of Colors: 16.7M (8-bit)
Display Interface: VGA x 1, DVI-I x 2, BNC composite x 3
Resolution:
- VGA: 640 x 480
- SVGA: 800 x 600
- XGA: 1024 x 768
- SXGA: 1280 x 1024
- WSXGA+: 1920 x 1080 (optimal setting) (MD-124 only)

Serial Interface

Serial Standards: 1 software-selectable RS-232/422/485 port, male DB9

Serial Signals

RS-232: TxD, RxD, DTR, DSR, CTS, DCD, GND (RTS for MD-124)
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Front Panel

Panel Control Buttons: Power x 1, OSD controls x 4
LEDs: Status, Power

Physical Characteristics

Housing: Aluminum sheet metal
Weight:
MD-124: 12 kg (26.67 lb)
MD-119: 9.7 kg (21.56 lb)
Dimensions:
MD-124: 85 x 593 x 384 mm (3.35 x 23.45 x 15.12 in)
MD-119: 82 x 483 x 444 mm (3.23 x 19.02 x 17.48 in)
Mounting: Console mounting

Environmental Limits

Operating Temperature: -15 to 55°C (5 to 131°F)
Storage Temperature: -20 to 60°C (-4 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration:
- 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
- 1 g @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
- 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr

Power Requirements

Input Voltage:
- 24 VDC (with tolerance from 18 to 36 VDC, 2-pin terminal block)
- 110 to 230 VAC, 50/60 Hz

Power Consumption:
MD-119: 60 W max.
MD-124: 90 W max.

Standards and Certifications

Safety: UL 60950-1, CCC
EMC: EN 55022/24, CISPR 22, FCC Part 15B Class A
Marine: CCS
Green Product: RoHS, cRoHS, WEEE

Warranty

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

We recommend taking the following precautions to minimize heat build-up within the display:

- Position the display within ±40° of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within ±40° of the vertical, (b) the ambient temperature exceeds 25°C, or (c) the display is used in a location with minimal ventilation.

Important Safety Precaution:

Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C, it is best to ensure that the ambient temperature does not exceed 25°C. Doing so will increase the life of your display and minimize service costs.

Ordering Information

Available Models

MD-124X: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920 x 1080), LED backlighting, multipower supply (AC/DC)
MD-124Y: 24-inch optically bonded marine display with 16:9 aspect ratio, full HD (1920 x 1080), LED backlighting, multipower supply (AC/DC)
MD-124Z: 24-inch marine touch-screen display with 16:9 aspect ratio, full HD (1920 x 1080), LED backlighting, multipower supply (AC/DC)
MD-119-X1: 19-inch type approved ECDIS marine display with 5:4 aspect ratio, 1280 x 1024 resolution, LED backlighting, tape bonding, and dual AC/DC power supplies

Package Checklist

- MD-119/MD-124 panel
- Rubber waterproofing gasket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MPC-2150/2190/2240/2260 Series

15/19/24/26-inch Fanless panel computers

- 15/19/24/26-inch panel computer
- Color calibrated for ECDIS compliance
- 3rd Generation Intel® processor (Intel® Core i7 3517UE 1.7 GHz or Celeron® 1047UE, 1.40 GHz)
- SavvyTouch™ display controls
- Fanless system design
- Built-in NMEA 0183 and 3-in-1 software selectable RS-232/422/485 interfaces
- Multipower supplies (AC & DC)

Introduction

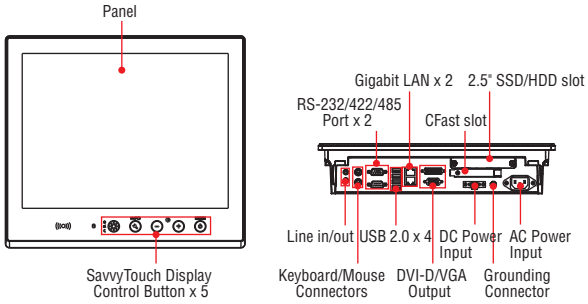
The MPC-2150/2190/2240/2260 series panel computers feature an Intel 3rd generation processor and 4 GB of system memory to deliver a reliable, high performance platform of wide versatility for use in industrial marine environments. With their RS-232/422/485 serial, NMEA 0183, and gigabit Ethernet LAN ports, the MPC-2260 series panel computers support a wide variety of serial and marine-specific interfaces as well as high speed IT communications, all with native network redundancy.

The MPC-2150/2190/2240/2260 series comes with a range of standard display enhancements useful in industrial environments (including 0 to 100% full range dimming, 178°/178° wide viewing angles, and optional optical bonding), as well as Moxa's innovative SavvyTouch display controls.

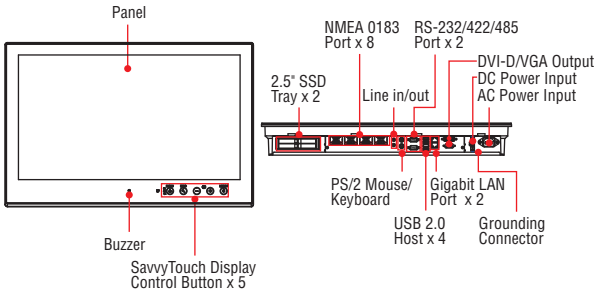
The MPC-2150/2190/2240/2260 panel computers are compliant with several industrial marine standards, including IEC 60945 4th, IEC 61174, DNV2.4, and IACS E10, verifying their resilient durability in marine operations. The MPC-2150/2190/2240/2260 are rugged, type approved, high performance, user-friendly panel computers perfect for ECDIS navigation systems and other marine IBS applications.

Appearance

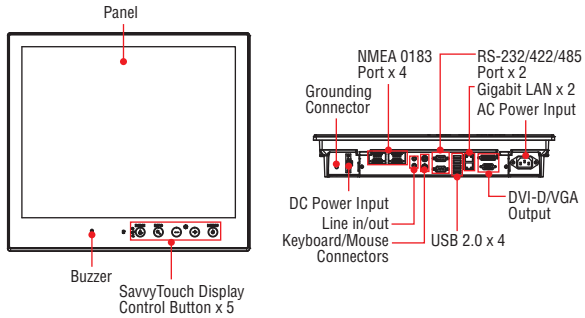
MPC-2150



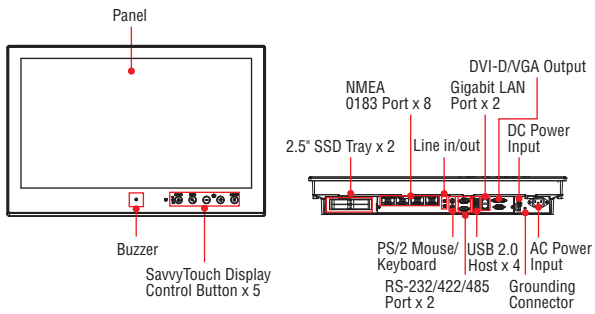
MPC-2240



MPC-2190



MPC-2260



Specifications

Computer

CPU: Intel® Core™ i7-3517UE 1.7 GHz, or Intel® Celeron® 1047UE 1.4 GHz
Supported OS: Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit (the OS is not pre-installed)
System Chipset: Intel HM65
System Memory: 8 GB capacity, 4 GB pre-installed; 1 slot for a 4 GB DDR3-1600 204 pin SO-DIMM SDRAM
USB: USB 2.0 hosts x 4, type A connectors, supporting system boot up
Storage:
• MPC-2150: 1 2.5" HDD/SSD slot + 1 CFast slot (storage is not pre-installed)
• MPC-2190: 1 SATA-III interface: 6 Gbps
• MPC-2240/2260: 2 SATA-III interfaces: 6 Gbps, 2.5" removable storage trays
BIOS: 64 Mbit Flash BIOS with SPI, ACPI
Graphics Controller: Intel HM65 Express chipset built in
Video Outputs: DVI-D x 1, VGA x 1 (female)

Other Peripherals

Audio: line in/out, 3.5 mm mini jack
KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse

Display

Panel Size: 15/19/24/26-inch viewable image size
Panel Type: MVA
Aspect Ratio:
• MPC-2150/2190: 5:4
• MPC-2240: 16:9
• MPC-2260: 16:10
Pixels:
• MPC-2150: 1024 x 768 (XGA)
• MPC-2190: 1280 x 1024 (SXGA)
• MPC-2240: 1920 x 1080 (WSXGA+)
• MPC-2260: 1920 x 1200 (WUXGA)
Pixel Pitch (RGB):
• MPC-2150: 0.297 (H) x 0.297 (V) mm
• MPC-2190: 0.294 (H) x 0.294 (V) mm
• MPC-2240: 0.276 (H) x 0.276 (V) mm
• MPC-2260: 0.2865 (H) x 0.2865 (V) mm
Response Time:
• MPC-2150/2190: 20 ms (gray to gray)
• MPC-2240: 25 ms (gray to gray)
• MPC-2260: 15 ms (gray to gray)
Contrast Ratio:
• MPC-2150: 700:1
• MPC-2190: 2000:1
• MPC-2240: 5000:1
• MPC-2260: 1500:1
Light Intensity: 300 cd/m/m
Viewing Angles:
• MPC-2150: 160°/140°
• MPC-2190/2240: 178°/178°
• MPC-2260: 176°/176°
Active Display Area:
• MPC-2150: 304.128 (H) x 228.096 (V) mm
• MPC-2190: 376.32 (H) x 301.06 (V) mm
• MPC-2240: 531.36 (H) x 298.89 (V) mm
• MPC-2260: 550.08 (H) x 343.8 (V) mm
Max. No. of Colors: 16.7M (8 bit color)
Resolution:
• VGA: 640 x 480
• SVGA: 800 x 600
• XGA: 1024 x 768
• SXGA: 1280 x 1024 (MPC-2190/2240/2260 only)
• WSXGA+: 1920 x 1080 (MPC-2240/2260 only)
• WUXGA: 1920 x 1200 (MPC-2260 only)

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built in

Serial Interface

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

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 115.2 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

NMEA Interface

Serial Standards:
• MPC-2190: 4 NMEA 0183 ports
• MPC-2240/2260: 8 NMEA 0183 ports
Base Serial Standard: RS-422
Optical Isolation Protection: ±6 kV contact discharge, ±8 kV air discharge
Voltage Differential: -15 to +15 V
Baudrate: 4800 bps
Data Bits: 8
Stop Bits: 1, 1.5, 2
Parity: None
Handshake: None

LEDs

System: Storage, Power
LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Front Panel

LEDs:
MENU, Brightness, INFO, ECDIS, Day/Dusk/Night, Storage

Physical Characteristics

Housing: Aluminum sheet metal
Weight:
• MPC-2150: 6.5 kg (14.44 lb)
• MPC-2190: 7.8 kg (17.33 lb)
• MPC-2240: 12.4 kg (27.56 lb)
• MPC-2260: 16.6 kg (36.89 lb)
Dimensions:
• MPC-2150: 356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)
• MPC-2190: 429 x 387 x 74.5 mm (16.89 x 15.24 x 2.93 in)
• MPC-2240: 595 x 393 x 75 mm (23.44 x 15.48 x 2.95 in)
• MPC-2260: 621 x 444 x 90 mm (24.45 x 17.48 x 3.57 in)
Mounting: VESA (optional), panel (optional), desktop (optional)
System Cooling: Fanless thermal design

Environmental Limits

Operating Temperature:
• MPC-2150: -40 to 70°C (-40 to 158°F)
• MPC-2190/2240/2260: -15 to 55°C (5 to 131°F)
Storage Temperature:
• MPC-2150: -40 to 70°C (-40 to 158°F)
• MPC-2190/2240/2260: -20 to 60°C (-4 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Note: For MPC-2260 models, if you expect the storage temperature to exceed 40°C, please ensure that the ambient relative humidity remains below 95%.

IP Rating:
• MPC-2150: Front: IP66, Rear: IP22
• MPC-2190/2240/2260: Front: IP54, Rear: IP22
Anti-vibration: 0.7 g @ DNV2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
Anti-shock:
• MPC-2150: 20 g rms, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage:
• 24 VDC, 6 A or (18 to 34 VDC, 8 A max.), screw-type terminal block
• 100 to 240 VAC, 50 to 60 Hz, 2 A, AC power inlet

Standards and Certifications

Safety: UL 60950-1, EN 60950-1, IEC 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 1 kV
Marine: IEC 60945 4th, IEC 61174, IEC 61162, DNV2.4, IACS E10
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

Warranty

Warranty Period:
• Computer systems: 3 years
• LCD panels: 1 year
Details: See www.moxa.com/warranty

We recommend taking the following precautions to minimize heat build-up within the display:

- Position the display within ±40° of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within ±40° of the vertical, (b) the ambient temperature exceeds 25°C, or (c) the display is used in a location with minimal ventilation.

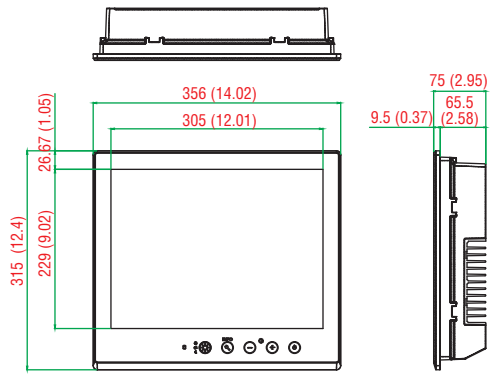
Important Safety Precaution:

Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C for bridge applications, it is best to ensure that the ambient temperature does not exceed 25°C. Doing so will increase the life of your display and minimize service costs.

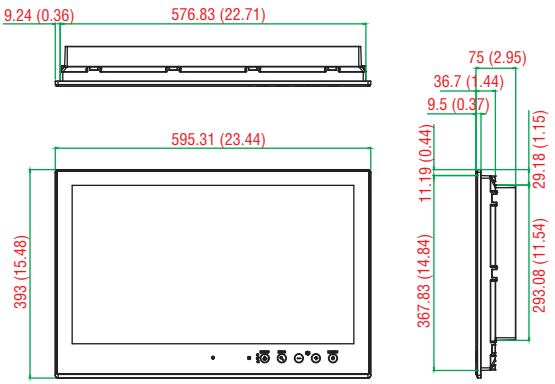
Dimensions

Unit: mm (inch)

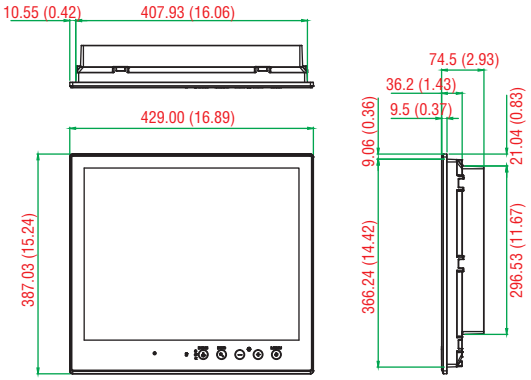
MPC-2150



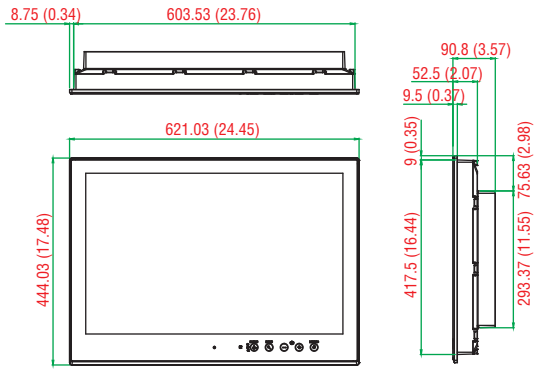
MPC-2240



MPC-2190



MPC-2260



Ordering Information

Available Models

MPC-2240X: 24-inch fanless panel computer with Intel Celeron 1047UE 1.4 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding
MPC-2240Z: 24-inch fanless panel computer with Intel Celeron 1047UE 1.4 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding, projected capacitive touch screen
MPC-2247X: 24-inch fanless panel computer with Intel Core i7 3517UE 1.7 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding
MPC-2247Z: 24-inch fanless panel computer with Intel Core i7 3517UE 1.7 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding, projected capacitive touch screen
MPC-2260X: 26-inch fanless panel computer with Intel Celeron 1047UE 1.4 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding
MPC-2267X: 26-inch fanless panel computer with Intel Core i7 3517UE 1.7 GHz, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, SSD trays, dual AC/DC power inputs, tape bonding
MPC-2190X: 19-inch fanless panel computer with Intel Celeron 1047UE 1.4 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, dual AC/DC power inputs, tape bonding
MPC-2190Z: 19-inch fanless panel computer with Intel Celeron 1047UE 1.4 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, dual AC/DC power inputs, tape bonding, projected capacitive touch screen
MPC-2197X: 19-inch fanless panel computer with Intel Core i7 3517UE 1.7 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, dual AC/DC power inputs, tape bonding
MPC-2197Z: 19-inch fanless panel computer with Intel Core i7 3517UE 1.7 GHz processor, NMEA 0183, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, dual AC/DC power inputs, tape bonding, projected capacitive touch screen
MPC-2150X-T: 15-inch fanless panel computer with Intel® Celeron® 1047UE 1.4 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding
MPC-2150Z-T: 15-inch fanless panel computer with Intel® Celeron® 1047UE 1.4 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding, projected capacitive touch screen
MPC-2157X-T: 15-inch fanless panel computer with Intel® Core™ i7 3517UE 1.7 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding
MPC-2157Z-T: 15-inch fanless panel computer with Intel® Core™ i7 3517UE 1.7 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding, projected capacitive touch screen

Optional Accessories (can be purchased separately, for AC power input)

PWC-C13US-3B-183: 10A/125V North American (US) power cord, 183 cm
PWC-C13EU-3B-183: 10A/250V Continental European (EU) power cord, 183 cm
PWC-C13UK-3B-183: 10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C13AU-3B-183: 10A/250V Australian (AU) power cord, 183 cm
PWC-C13CN-3B-183: 10A/250V China (CN) power cord, 183 cm

Optional Mounting Kits (can be purchased separately)

MPC-MD-2-15-PMTK: 8 screws for panel mount
MPC-MD-2-15-VESAMTK: VESA-mounting bracket, 100 x 100 mm and 75 x 75 mm

Optional Mounting/Bracket Kits (can be purchased separately)

MPC-MD-2-24-PMTK: Panel-mounting kit
MPC-MD-2-24-VESAMTK: VESA-mounting kit
MPC-MD-2-24-26-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-24-26-DMTK w/ hinge: Desktop-mounting kit with hinge
MPC-MD-2-19-PMTK: Panel-mounting kit
MPC-MD-2-19-VESAMTK: VESA-mounting kit
MPC-MD-2-19-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-19-DMTK w/ hinge: Desktop-mounting kit with angle adjustment hinge
MPC-MD-2-15-PMTK: Panel-mounting kit with 8 screws
MPC-MD-2-15-VESAMTK: VESA-mounting bracket, 100 x 100 mm and 75 x 75 mm

Package Checklist (MPC-2150)

- 1 MPC-2150 panel computer
- 1 2-pin terminal block for DC power input
- 2.5-inch SATA SSD/HDD installation kit
- Documentation and driver DVD
- Quick installation guide (printed)
- Warranty card

Package Checklist (MPC-2190)

- 1 MPC-2190 panel computer
- 2 keys for the locking removable storage trays
- 1 2-pin terminal block for DC power input
- 2 5-pin terminal blocks for NMEA 0183 v2 interfaces
- Hard disk installation kit
- Documentation and driver DVD
- Quick installation guide (printed)
- Warranty card

Package Checklist (MPC-2240)

- 1 MPC-2240 panel computer
- 2 keys for locking removable storage trays
- 1 2-pin terminal block for DC power input
- 4 5-pin terminal blocks for NMEA 0183 v2 interfaces
- Documentation and driver DVD
- Quick installation guide (printed)
- Warranty card

Package Checklist (MPC-2260)

- 1 MPC-2260 panel computer
- 2 keys for the locking removable storage trays
- 1 2-pin terminal block for DC power input
- 4 5-pin terminal blocks for NMEA 0183 v2 interfaces
- Documentation and driver DVD
- Quick installation guide (printed)
- Warranty card

Oil & Gas Displays and Panel Computers

Product Selection Guide

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Oil & Gas Displays and Panel Computers

MD-219Z-HB/224Z-HB Series: 19/24-inch sunlight readable displays 25-3
MD-215 Series: 15-inch rugged displays 25-6
MPC-2150 Series: 15-inch industrial fanless panel computers 25-9
EXPC-1519 Series: Zone 2 19-inch panel computers with multiple connectivity options 25-12
EXPC-1319 Series: Fanless rugged Zone 2 19-inch 1000-nit LCD panel computers with touchscreen 25-16

Oil & Gas Displays & Panel Computers

	MD-219Z-HB/224Z-HB Series	MD-215 Series	MPC-2150 Series	EXPC-1519 Series	EXPC-1319 Series
Computer					
CPU	–	–	Intel® Core™ i7-3517UE 1.7 GHz, or Intel® Celeron® 1047UE 1.4 GHz	Intel® Core™ i7-3555LE 2.5 GHz or Intel® Celeron® 1047UE 1.4 GHz Processor	Intel Atom D525 dual core 1.8 GHz processor
Supported OS	–	–	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit	W7E, 32/64-bit W7P, 32/64-bit
OS Pre-installed	–	–	–	–	Windows Embedded Standard 7
System Chipset	–	–	Intel® HM65 Express Chipset	Intel® QM77 Express Chipset	Intel Pineview-D+ ICH8M
Memory Slots	–	–	1 SO-DIMM slot	2 SO-DIMM slots	2 SO-DIMM slots
System Memory Pre-installed	–	–	4 GB pre-installed (SDRAM)	4 GB pre-installed	2 GB pre-installed
Expansion Bus	–	–	–	1 mini PCIe socket (internal)	–
USB	–	–	USB 2.0 x 4	USB 2.0 x 1/3/4 (S1 model)	USB 2.0 x 2
Storage Slots	–	–	2.5-inch HDD/SSD x 1, CFast x 1	2.5-inch HDD/SSD x 1, CFast x 1	2.5-inch HDD/SSD x 1, CompactFlash x 1
Storage Pre-Installed	–	–	–	–	32 GB MLC SSD
Video Output	–	–	DVI-D x 1, VGA x 1 (DB15 female)	VGA x 1 (DB15 female) (S1 model)	VGA output (DB15 female)
Display					
Panel Size	19/24 inches	15 inches	15 inches	19 inches	19 inches
Touch	Projected capacitive touch, glove friendly	Projected capacitive touch, glove friendly	Projected capacitive touch, glove friendly	Projected capacitive touch, glove friendly	Resistive touch
Aspect Ratio	• MD-219Z-HB: 5:4 • MD-224Z-HB: 16:9	5:4	5:4	5:4	5:4
Pixels	• MD-219Z-HB: 1280 x 1024 (SXGA) • MD-224Z-HB: 1920 x 1080 (WSXGA+)	1024 x 768	1024 x 768	1280 x 1024	1280 x 1024
Contrast Ratio	• MD-219Z-HB: 2000:1 • MD-224Z-HB: 5000:1	700:1	700:1	1000:1	1000:1
Light Intensity	1000 cd/m²	1000 cd/m²	1000 cd/m²	1000 cd/m²	1000 cd/m²
Viewing Angles	178°/178°	160°/140°	160°/140°	170°/160°	170°/160°
Video Input	DVI-D x 1, VGA x 1 (DB15 female)	DVI-D x 1, VGA x 1 (DB15 female)	–	–	–
Ethernet Interface					
LAN	–	–	2 10/100/1000 Mbps ports (RJ45 port)	2 10/100/1000 Mbps ports (RJ45 port)	2 10/100/1000 Mbps ports (RJ45 port)
Optical Fiber Interface	–	–	–	2 multimode 100M fiber ports	2 multimode 100M fiber ports
WLAN	–	–	–	1 802.11b/g/n interface (available on request)	–
Serial Interface					
Serial Standards	1 RS-232 port (DB9) 1 RS-422/485 port (terminal block)	1 RS-232 port (DB9) 1 RS-422/485 port (terminal block)	2 RS-232/422/485 ports (DB9 male)	2 RS-232/422/485 ports (DB9 male)	2 RS-232/422/485 ports
Physical Characteristics					
Housing	Aluminum sheet metal	Aluminum sheet metal	Aluminum sheet metal	Aluminum	Aluminum
Weight	• MD-219Z-HB: 7.8 kg (17.33 lb) • MD-224Z-HB: 12 kg (26.67 lb)	6.5 kg (13.44 lb)	6.5 kg (14.44 lb)	15.8 kg (34.83 lb)	10.7 kg (23.78 lb) or 11.9 kg (26.44 lb)
Dimensions	• MD-219Z-HB: 429 x 387 x 75 mm (16.89 x 15.24 x 2.95 in) • MD-224Z-HB: 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in)	356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)	356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)	483 x 408 x 99.5 mm (19.02 x 16.06 x 3.92 in)	483 x 408 x 99 mm (19.02 x 16.06 x 3.90 in)
Mounting	VESA, desktop, panel	VESA, desktop, panel	VESA, desktop, panel	VESA, desktop, yoke, wall, panel	VESA, desktop, yoke, wall, panel
System Cooling	Fanless thermal design	Fanless thermal design	Fanless thermal design	Fanless thermal design	Fanless thermal design
Environmental Limits					
Operating Temperature	-20 to 60°C (-4 to 140°F)	-40 to 70°C (-40 to 158°F)	-40 to 70°C (-40 to 158°F)	-40 to 70°C (-40 to 158°F)	-20 to 60°C (-4 to 140°F) or -40 to 60°C (-40 to 140°F)
Storage Temperature	-20 to 60°C (-4 to 140°F)	-40 to 70°C (-40 to 158°F)	-40 to 70°C (-40 to 158°F)	-40 to 70°C (-40 to 158°F)	-40 to 80°C (-40 to 176°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	–
Power Requirements					
Input Voltage	• DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block) • AC: 100 to 240 VAC	• DC: 12/24 VDC (Range 9 to 36 VDC) • AC: 100 to 240 VAC	• DC: 12/24 VDC (Range 9 to 36 VDC) • AC: 100 to 240 VAC	• DC: 24 VDC (2-pin terminal block) • AC: 100 to 240 VAC (3-pin terminal block)	Typical 24 VDC
Standards and Certifications					
Safety	UL 60950-1, CCC	UL 60950-1, CCC	UL 60950-1, IEC 60950-1	UL 60950-1, IEC 60950-1	UL 60950-1, IEC 60950-1
Ingress Protection Rating	IP66 (front) / IP22 (rear)	IP66 (front) / IP22 (rear)	IP66 (front) / IP22 (rear)	IP66 (front) / IP22 (rear) / NEMA 4X	IP66 (front) / IP22 (rear) / NEMA 4X
Hazardous Environments	Class 1 Division 2	–	Class 1 Division 2, ATEX Zone2, IECEx	Class 1 Division 2, ATEX Zone2, IECEx	Class 1 Division 2, ATEX Zone2, IECEx
Marine	IEC 60945 4th, DNV, IACS E10, IEC 61174	IEC 60945 4th, DNV, IACS E10, IEC 61174	–	–	–
Green Product	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE	RoHS, cRoHS, WEEE
Warranty					
Warranty Period	• System: 3 years • LCD panel: 1 year	• System: 3 years • LCD panel: 1 year	• Computer system: 3 years • LCD panel: 1 year	• Computer system: 3 years • LCD panel: 1 year	• Computer system: 3 years • LCD panel: 1 year
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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MD-219Z-HB/224Z-HB Series

Preliminary

19/24-inch sunlight-readable display

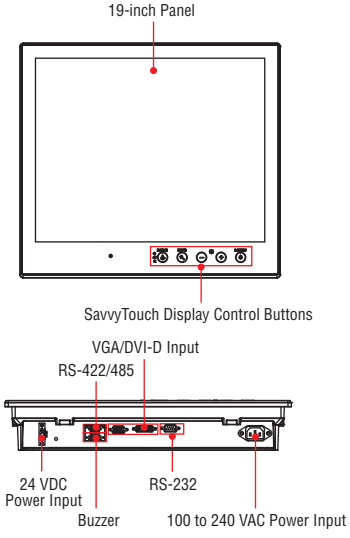
- 19/24-inch display
- 1000-nit LED backlight
- Glove-friendly multi touch
- Full-range dimming, 0 to 100%
- SavvyTouch™ display controls
- Built-in RS-232/422/485 interfaces
- Dual power supplies (AC & DC)
- IP66 (front) / IP22 (rear) rated
- Optically-bonded and touch-panel models available on request
- Marine DNV and oil & gas C1D2 certified

Introduction

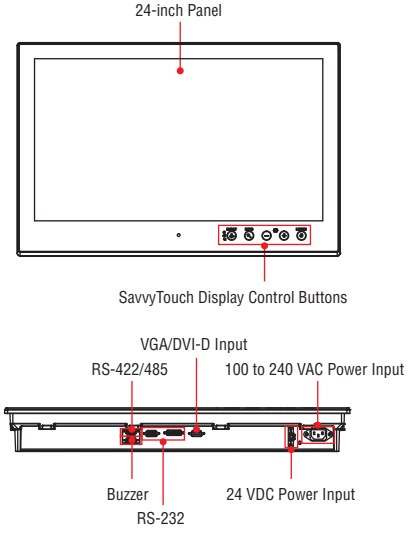
The MD-219Z/224Z-HB displays come with full-range dimming, wide viewing angles, and optional optical bonding features. These displays have a small-profile modular design that allows easier integration into industrial systems, reducing deployment costs and overall time-to-market. The innovative and user-friendly SavvyTouch display controls offer several unique features not found on any other marine display console: a proximity sensor for convenient adjustments in the dark, an info button for immediate updates on power status, and a quick-switch to adjust three different brightness modes. The MD-219Z/224Z-HB series displays are compliant with UL Class 1 Division 2, IEC 60945, DNV, and IACS-E10, verifying their resilience and durability in hazardous conditions. The displays' IP66-rated enclosure provides additional protection against dust and moisture above and beyond the limits established by these international standards.

Appearance

MD-219Z-HB



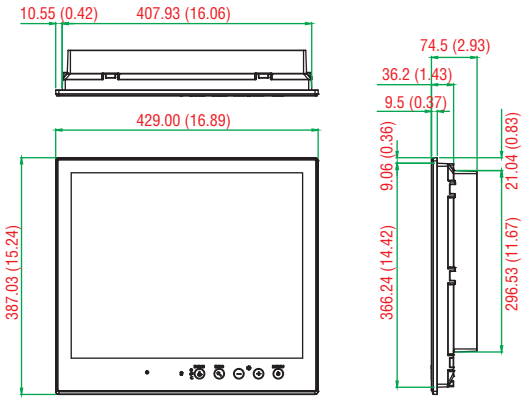
MD-224Z-HB



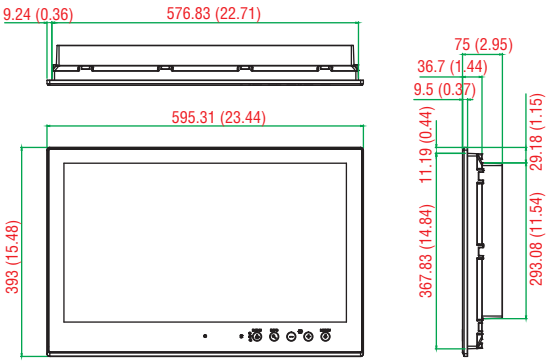
Dimensions

Unit: mm (inch)

MD-219Z-HB



MD-224Z-HB



Specifications

Display

Panel Size: 19/24-inch viewable image size
Panel Type: MVA
Aspect Ratio:
• MD-219Z-HB: 5:4
• MD-224Z-HB: 16:9
Pixels:
• MD-219Z-HB: 1280 x 1024 (SXGA)
• MD-224Z-HB: 1920 x 1080 (WSXGA+)
Pixel Pitch (RGB):
• MD-219Z-HB: 0.294 (H) x 0.294 (V) mm
• MD-224Z-HB: 0.282 (H) x 0.282 (V) mm
Response Time:
• MD-219Z-HB: 20 ms (gray to gray)
• MD-224Z-HB: 25 ms (gray to gray)
Contrast Ratio:
• MD-219Z-HB: 2000:1
• MD-224Z-HB: 5000:1
Light Intensity: 1000 cd/m/m
Viewing Angles: 178°/178°
Active Display Area: 531.36 (H) x 298.89 (V) mm
Max. No. of Colors: 16.7M (8-bit color)
Display Interface:
• 1 VGA input
• 1 DVI-D input
Resolution:
• VGA: 640 x 480
• SVGA: 800 x 600
• XGA: 1024 x 768
• SXGA: 1280 x 1024
• WSXGA+: 1920 x 1080 (optimal setting, MD-224Z-HB only)

Serial Interface

Serial Standards:
RS-232 ports (DB9) x 1, RS-422/485 ports (terminal block) x 1
Optical Isolation Protection: 4 kV

Serial Signals

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

Front Panel

LEDs: MENU, Brightness, INFO, ECDIS, Day/Dusk/Night
Smart OSD: Yes

Physical Characteristics

Housing: Aluminum sheet metal
Weight:
• MD-219Z-HB: 7.8 kg (17.33 lb)
• MD-224Z-HB: 12 kg (26.67 lb)
Dimensions:
• MD-219Z-HB: 429 x 387 x 75 mm (16.89 x 15.24 x 2.95 in)
• MD-224Z-HB: 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in)
Mounting: VESA (optional), panel (optional), desktop (optional)

Environmental Limits

Operating Temperature: -20 to 60°C (-4 to 140°F)
Storage Temperature: -20 to 60°C (-4 to 140°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
IP Rating:
• Front: IP66
• Rear: IP22
Anti-vibration: 0.7 Grms @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements

Input Voltage:
• DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
• AC: 100 to 240 VAC
Power Consumption: 60 W (Max.)

Standards and Certifications

Safety: UL 60950-1, CCC
Hazardous Environments: UL Class 1 Division 2
EMC: EN 55022/24, CISPR 22, FCC Part 15B Class A
Marine: IEC 60945 4th, DNV, IACS E10, IEC 61174
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period: 3 years for system, 1 year for LCD panel
Details: See www.moxa.com/warranty

We recommend taking the following precautions to minimize heat build-up within the display:

- Position the display within ±40° of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within ±40° of the vertical, (b) the ambient temperature exceeds 25°C, or (c) the display is used in a location with minimal ventilation.

Important Safety Precaution:

Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C, it is best to ensure that the ambient temperature does not exceed 25°C. Doing so will increase the life of your display and minimize service costs.

Ordering Information

Available Models

MD-224X: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920x1080), LED backlighting, dual-power supply (AC/DC)
MD-224Z: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920x1080), projected-capacitive touch panel, LED backlighting, dual-power supply (AC/DC)
MD-224Z-HB: 24-inch tape bonded display, 16:9 aspect ratio, full HD (1920x1080), 1000-nit sunlight readable, glove-friendly multi touch, LED backlighting, dual-power supply (AC/DC)
MD-219X: 19-inch, 5:4 aspect ratio display (1280x1024), LED backlight, DVI-D/VGA, RS-232 and RS-422/485 serial ports, AC/DC dual power, tape bonding
MD-219Z: 19-inch, 5:4 aspect ratio display (1280x1024), projected capacitive multi-touch, LED backlight, DVI-D/VGA, RS-232 and RS-422/485 serial ports, AC/DC dual power, tape bonding
MD-219Z-HB: 19-inch sunlight readable display, 5:4 aspect ratio (1280x1024), glove-friendly multi-touch, LED backlight, DVI-D/VGA, RS-232 and RS-422/485 serial ports, AC/DC dual power, tape bonding

Package Checklist

- MD-219/224 display
- VGA cable
- DVI-D cable
- 2-pin terminal block x 1
- 5-pin terminal block x 2
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately, for AC power input)

PWC-C13US-3B-183: 10A/125V North American (US) power cord, 183 cm
PWC-C13EU-3B-183: 10A/250V Continental European (EU) power cord, 183 cm
PWC-C13UK-3B-183: 10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C13AU-3B-183: 10A/250V Australian (AU) power cord, 183 cm
PWC-C13CN-3B-183: 10A/250V China (CN) power cord, 183 cm

Optional Mounting/Bracket Kits (can be purchased separately)

MPC-MD-2-24-PMTK: Panel-mounting kit
MPC-MD-2-24-VESAMTK: VESA-mounting kit
MPC-MD-2-24-26-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-24-26-DMTK w/ hinge: Desktop-mounting kit with hinge
MPC-MD-2-19-PMTK: Panel-mounting kit
MPC-MD-2-19-VESAMTK: VESA-mounting kit
MPC-MD-2-19-DMTK w/o hinge: Desktop-mounting kit without hinge
MPC-MD-2-19-DMTK w/ hinge: Desktop-mounting kit with hinge

MD-215 Series

Preliminary

15-inch rugged industrial display

- 15-inch industrial-grade display
- -40 to 70°C wide-temperature design
- 1000-nit sunlight-readable LCD
- Glove-friendly multi-touch (touch model only)
- Fanless system design
- Multiple power supplies (AC & DC)

Introduction

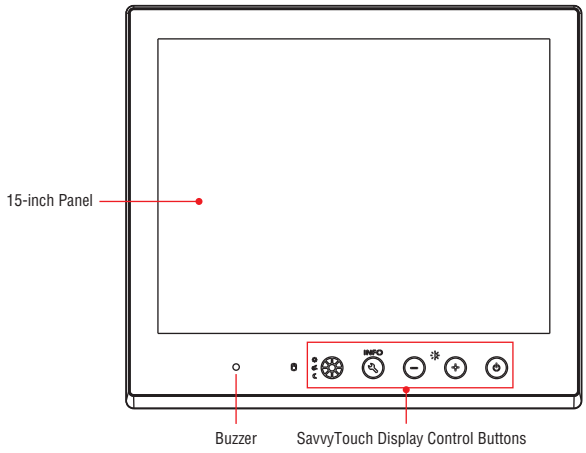
The MD-215 15-inch display has a rugged design for industrial environments. The display uses VGA and DVI-D video signals to support a 1024 x 768 resolution, and comes with RS-232/422/485 ports for connecting serial devices.

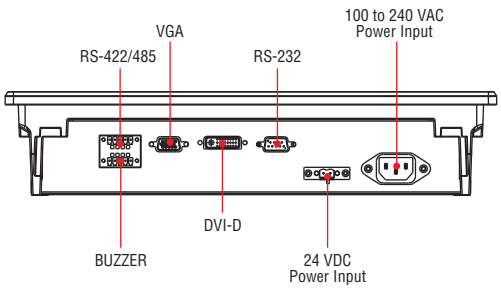
The MD-215 series panel computers are designed with a wide, -40 to 70°C temperature range and come with a patented, fanless, streamlined enclosure designed for highly efficient heat dissipation, making this one of the most reliable industrial platforms available for harsh, hot, outdoor environments, such as oil and gas fields and drilling platforms.

The MD-215 series also features a 1000-nit LCD panel offering a sunlight-readable, projected-capacitive, glove-friendly, multi-touch screen, providing an excellent touch panel for outdoor applications.

The MD-215 series supports both VESA- and panel-mounting, which can be implemented with accessories that can be purchased separately from Moxa.

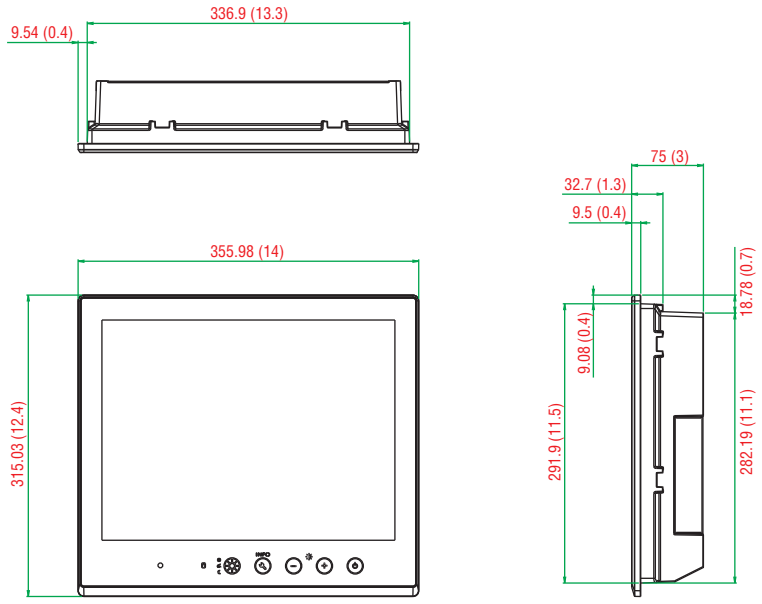
Appearance





Dimensions

Unit: mm (inch)



Specifications

Display

Panel Size: 15-inch readable image size
Panel Type: TN
Touch: Capacitive multi-touch with glove-friendly support (touch models only)
Aspect Ratio: 5:4
Pixels: 1024 x 768
Pixel Pitch (RGB): 0.297 (H) x 0.297 (V) mm
Response Time: 20 ms (gray to gray)
Contrast Ratio: 700:1
Light Intensity: 1000 cd/m/m
Viewing Angles: 160°/140°
Active Display Area: 304.128 (H) x 228.096 (V) mm
Display Interface: VGA input x 1, DVI-D input x 1

Serial Interface

Serial Standards: 1 RS-232 port (DB9), 1 RS-422/485 port (terminal block)
Optical Isolation Protection: 4 kV

Serial Signals

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

Front Panel

LEDs: MENU, brightness, INFO, Brightness mode, Day/Dusk/Night
Smart OSD: Yes

Physical Characteristics

Housing: Aluminum sheet metal
Weight: 6.1 kg (13.56 lb)
Dimensions: 356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)
Mounting: Panel (standard), VESA (mounting kit is optional)
System Cooling: Fanless thermal design

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 70°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 2 Grms, 5-500 Hz frequency, compliant with IEC 60068-2-6 standard
Anti-shock: 20 Grms, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage:
• DC: 12/24 VDC (Range 9 to 36 VDC)
• AC: 100 to 240 VAC
Power Consumption: 60 W (max.)

Standards and Certifications

Safety: UL 60950-1, IEC 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Ingress Protection Rating: IP66 (front) / IP22 (rear)
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period: 3 years for system, 1 year for LCD panel
Details: See www.moxa.com/warranty

Ordering Information

Available Models

MD-215X-T: 15-inch display, DVI-D/VGA video output, AC/DC dual power, tape bonding
MD-215Z-T: 15-inch display, DVI-D/VGA video output, AC/DC dual power, multi-touch w/ glove friendly, tape bonding

Optional Mounting/Bracket Kits (can be purchased separately)

MPC-MD-2-15-PMTK: 8 screws for panel mount
MPC-MD-2-15-VESAMTK: VESA-mounting bracket, 100 x 100 mm and 75 x 75 mm

Package Checklist

- MD-215 display
- VGA cable
- DVI-D cable
- 2-pin terminal block x 1
- 5-pin terminal block x 2
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MPC-2150 Series

15-inch industrial fanless panel computers

- 15-inch panel computer
- 3rd Generation Intel® processor (Intel® Core i7 3517UE 1.7 GHz or Celeron® 1047UE, 1.40 GHz)
- -40 to 70°C wide-temperature design
- 1000-nit sunlight-readable LCD
- Glove-friendly and multi-touch screen
- Fanless system design
- Class 1 Division 2, ATEX Zone 2*, and IECEx* certified
- Multiple power supplies (AC & DC)

*Certification is underway. Please check Moxa's website for the most up-to-date certification status.

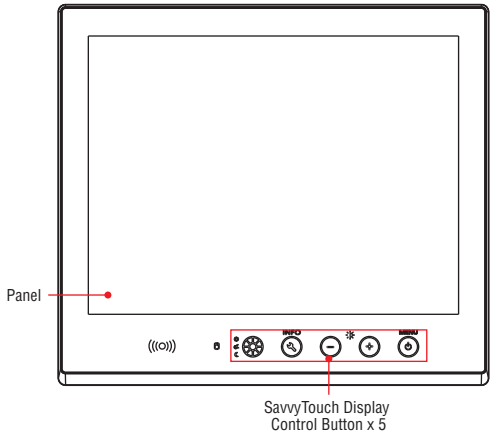
Introduction

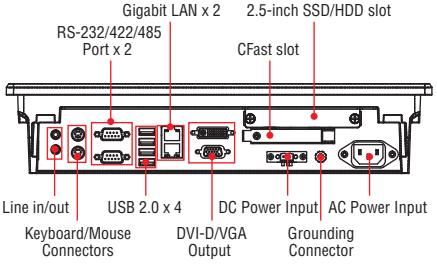
The MPC-2150 15-inch panel computers with 3rd Generation Intel® Core™ processor deliver a reliable, durable, high-performance platform of wide versatility for use in industrial environments. With its two software selectable RS-232/422/485 serial ports and two gigabit Ethernet LAN ports, the MPC-2150 panel computer supports a wide variety of serial interfaces as well as high-speed IT communications, all with native network redundancy. The MPC-2150 also comes with DVI-D and VGA video outputs, allowing you to extend the screen size and reduce the total cost of system development.

The MPC-2150 series panel computers are designed with a wide, -40 to 70°C temperature range, and come with a patented, fanless, streamlined enclosure designed for highly efficient heat dissipation, making this one of the most reliable industrial platforms available for harsh, hot, outdoor environments like oil and gas fields, or drilling platforms.

The MPC-2150 also features a 1000-nit LCD panel offering a sunlight-readable, projected-capacitive, glove-friendly, multi-touch screen, providing for an excellent user experience for applications outdoors.

Appearance





Specifications

Computer

CPU: Intel® Core™ i7-3517UE 1.7 GHz, or Intel® Celeron® 1047UE 1.4 GHz
Supported OS: Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit (the OS is not pre-installed)
System Chipset: Intel® HM65 Express Chipset
System Memory: 4 GB pre-installed (SDRAM)
USB: USB 2.0 hosts x 4, type-A connectors, supporting system boot up
Storage: 1 2.5-inch HDD/SSD slot + 1 CFast slot (storage is not pre-installed)
BIOS: 64 Mbit Flash BIOS SPI type, ACPI function supported
Video Output: DVI-D x 1, VGA x 1 (female)
Buzzer: 75 to 85 db (IEC 60945 compliant)

Other Peripherals

Audio: Line-in and line-out interface, with 3.5 mm mini jack
KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse

Display

Panel Size: 15-inch viewable image size
Panel Type: TN
Touch: Capacitive multi-touch with glove-friendly support (touch models only)
Aspect Ratio: 5:4
Pixels: 1024 x 768
Pixel Pitch (RGB): 0.297 (H) x 0.297 (V) mm
Response Time: 20 ms (gray to gray)
Contrast Ratio: 700:1
Light Intensity: 1000 cd/m/m
Viewing Angles: 178°/178°
Active Display Area: 304.128 (H) x 228.096 (V) mm
Max. No. of Colors: 16.7M (8 bit color)
Resolution:
• VGA: 640 x 480
• SVGA: 800 x 600
• XGA: 1024 x 768

Ethernet Interface

LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45 port) x 2
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface

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

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 (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: MENU, Brightness, INFO, Brightness Mode, Day/Dusk/Night, Storage
Smart OSD: Yes

Physical Characteristics

Housing: Aluminum sheet metal
Weight: 6.5 kg (14.44 lb)
Dimensions: 356 x 315 x 77.2 mm (14.02 x 12.40 x 3.04 in)
Mounting: Panel (standard), VESA (mounting kit is optional)
System Cooling: Fanless thermal design

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 70°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 2 Grms, 5-500 Hz frequency, compliant with IEC 60068-2-6 standard
Anti-shock: 20 Grms, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage:
• DC: 12/24 VDC (Range 9 to 36 VDC)
• AC: 100 to 240 VAC
Power Consumption: Less than 120 W, 2.5 A @ 24 VDC

Standards and Certifications

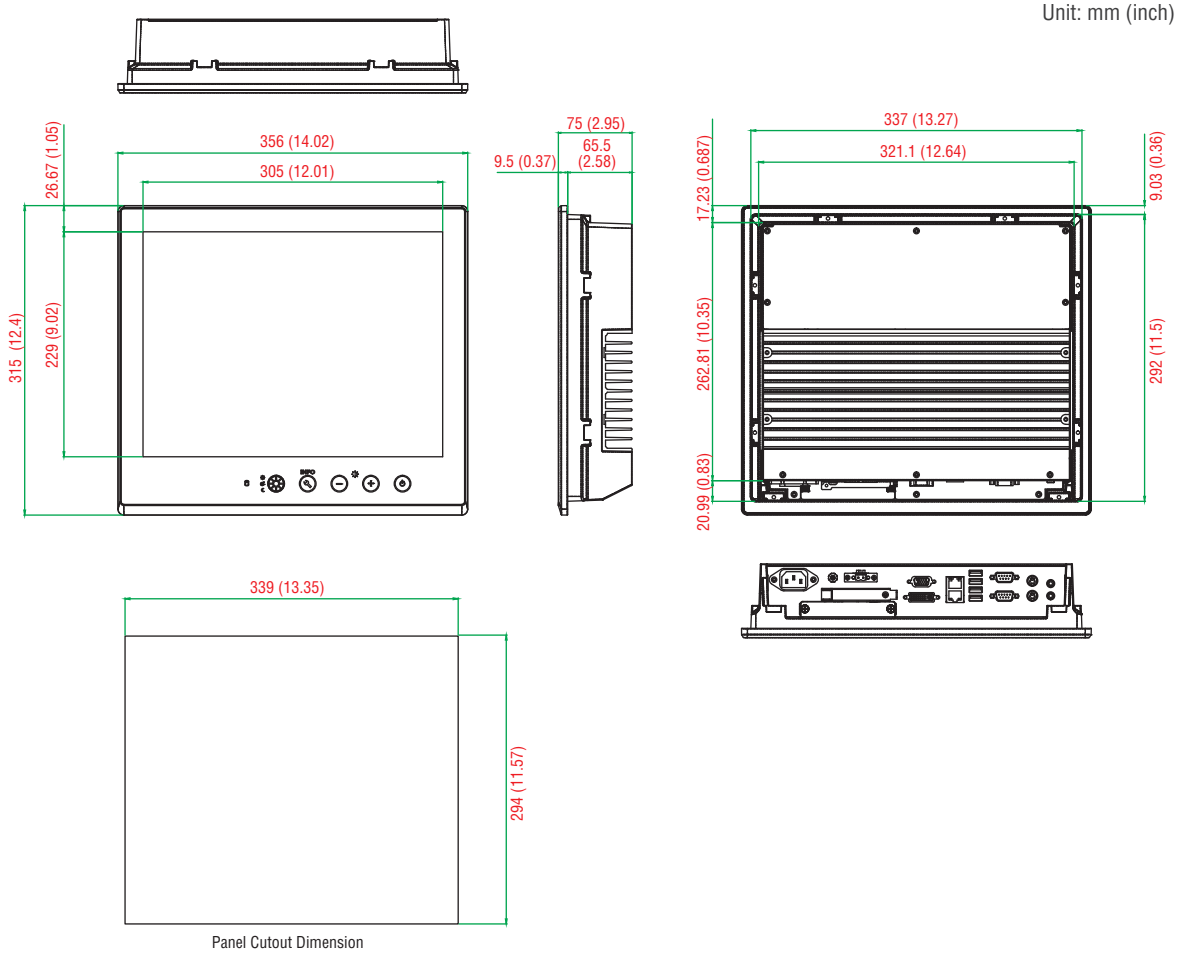
Safety: UL 60950-1, IEC 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8, IEC 61000-4-11
Ingress Protection Rating: IP66 (front) / IP22 (rear) / NEMA 4X
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period:
• Computer system: 3 years
• LCD panel: 1 year
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Panel Cutout Dimension

Ordering Information

Available Models

MPC-2150X-T: 15-inch fanless panel computer with Intel® Celeron® 1047UE 1.4 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding

MPC-2150Z-T: 15-inch fanless panel computer with Intel® Celeron® 1047UE 1.4 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding, projected-capacitive touch screen

MPC-2157X-T: 15-inch fanless panel computer with Intel® Core™ i7 3517UE 1.7 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding

MPC-2157Z-T: 15-inch fanless panel computer with Intel® Core™ i7 3517UE 1.7 GHz processor, RS-232/422/485 serial ports, gigabit LAN ports, USB 2.0 ports, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot, dual AC/DC power inputs, tape bonding, projected-capacitive touch screen

Package Checklist

- 1 MPC-2150 panel computer
- 1 2-pin terminal block for DC power input
- 2.5-inch SATA SSD/HDD installation kit
- Documentation and driver DVD
- Quick installation guide (printed)
- Warranty card

Optional Mounting Kits (can be purchased separately)

MPC-MD-2-15-PMTK: 8 screws for panel mount

MPC-MD-2-15-VESAMTK: VESA-mounting bracket, 100 x 100 mm and 75 x 75 mm

EXPC-1519 Series

Zone 2 19-inch panel computers with multiple connectivity options

- Anti-scratch, 19-inch sunlight viewable, 1000-nit LCD panel
- High performance Intel® 3rd generation Core™ i7-3555LE or Celeron 1047UE CPU
- Fanless design with highly efficient heat dissipation
- -40 to 70°C extended operation temperature
- Multi-touch with glove-friendly touch screen interface
- Options of cable gland and standard USB Type-A/RJ45 connectors
- Totally sealed IP66 / NEMA 4X enclosure
- Class 1 Division 2, ATEX Zone 2*, and IECEx* certified
- Dual AC/DC power supply
- Optional WLAN, 100M Fiber optic connection

*Certification is underway. Please check Moxa's website for the most up-to-date certification status.

Introduction

The EXPC-1519 panel computers are designed for Zone 2 applications in hazardous environments, both indoors and outdoors. The EXPC-1519 series features Intel® 3rd generation Core™ i7-3555LE 2.5 GHz or Celeron 1047UE 1.4 GHz processor, with up to 16 GB of memory to deliver high performance processing.

The EXPC-1519 series offers flexible interface connectivity options to meet your application needs: standard connectors with cable glands, terminal block with cable glands, and standard connectors on the bottom panel.

The EXPC-1519 computers are designed with wide temperature range (-40 to 70°C) and come with a patented, fanless, streamlined enclosure designed for highly efficient heat dissipation, making this one of the most reliable industrial platforms available for harsh, hot outdoor environments like oil and gas fields, or drilling platforms.

In addition, the EXPC-1519 computers feature touchscreen controls with anti-reflection treatment and 1000-nit LED backlight, making them easy to read even during the peak daylight hours.

Specifications

Computer

CPU: Intel® Core™ i7-3555LE 2.5 GHz or Intel® Celeron® 1047UE 1.4 GHz processor
OS: Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit
System Chipset: Intel® QM77 Express Chipset (Intel® BD82QM77 PCH)
System Memory: 2 SO-DIMM slot, DDR3/DDR3L support, 4 GB pre-installed, maximum 16 GB capacity
Expansion Bus: 1 mini PCIe socket
BIOS: 64 Mbit SPI Flash
Graphics Controller: Intel® HD Graphics 4000
Touchscreen: Projected capacitive touch, 7H surface hardness, anti-reflection treatment, glove-friendly

Storage

HDD Support: 2.5-inch SATA, 7 or 9.5 mm in height, access externally
CFast: Push-push type, access externally

Display

Panel Size: 19-inch SXGA, 1000-nit LED backlit LCD
Aspect Ratio: 5:4
Response Time: 5 ms
Contrast Ratio: 1000:1
Viewing Angles:
• Horizontal: 170° (left to right)
• Vertical: 160° (up to down)
Resolution:
• VGA: 640 x 480
• SVGA: 800 x 600
• XGA: 1024 x 768
• SXGA: 1280 x 1024

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

Interface (EXPC-1519-C1-S1/EXPC-1519-C7-S1)

Connector type: On motherboard via cable glands
USB: USB 2.0 hosts x 3, type-A connectors
VGA: 15-pin D-Sub connector (DB15 female), with resolution up to 2048 x 1536 pixels with 32-bit color at 75 Hz
Serial Port: RS-232/422/485 ports (DB9 male) x 2, software-selectable
Ethernet: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Optical Fiber: Multimode 100M fiber optic ports x 2
AC: 100 to 240 VAC (3-pin terminal block)
DC: 24 VDC (2-pin terminal block)

Interface (EXPC-1519-C1-S2/EXPC-1519-C7-S2)

Connector Type: On terminal block via cable glands
USB: USB 2.0 hosts x 4, terminal block
Serial Port: RS-232/422/485 ports (terminal block) x 2, software-selectable
Ethernet: Auto-sensing 10/100/1000 Mbps ports (terminal block) x 2
Optical Fiber : Multimode 100M fiber optic ports x 2
AC: 100 to 240 VAC (3-pin terminal block)
DC: 24 VDC (2-pin terminal block)

Interface (EXPC-1519-C1-S3/EXPC-1519-C7-S3)

Connector Type: On bottom panel
USB: USB 2.0 hosts x 1, type-A connector
Ethernet: Auto-sensing 10/100/1000 Mbps port (RJ45) x 1
AC: 100 to 240 VAC (3-pin terminal block)
DC: 24 VDC (2-pin terminal block)

LEDs and Buttons

System LEDs: Power, Fiber1, Fiber2, LAN1, LAN2, Touch, Info, DAY, Dusk, Night
LAN LEDs: 100M/Link, 1000M/Link (on each RJ45 connector)
Buttons: Power, Brightness +/-, Fn, Touch, Info, Brightness mode

Physical Characteristics

Housing: Aluminum
Weight: 10.7 kg (23.78 lb)
Dimensions: 483 x 408 x 99.5 mm (19.02 x 16.06 x 3.92 in)
Mounting: VESA (100 x 100 mm), desktop, yoke, wall, panel

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 70°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: 2 Grms, 5-500 Hz frequency, compliant with IEC 60068-2-6 standard
Anti-shock: 20 Grms, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage: 100 to 240 VAC or 24 VDC (18 to 32 VDC, 2-pin terminal block)
Power Consumption: 100 to 240 VAC, 47 to 63 Hz, 1 A (less than 100 W) or 24 VDC, 6 A (less than 150 W)

Standards and Certifications

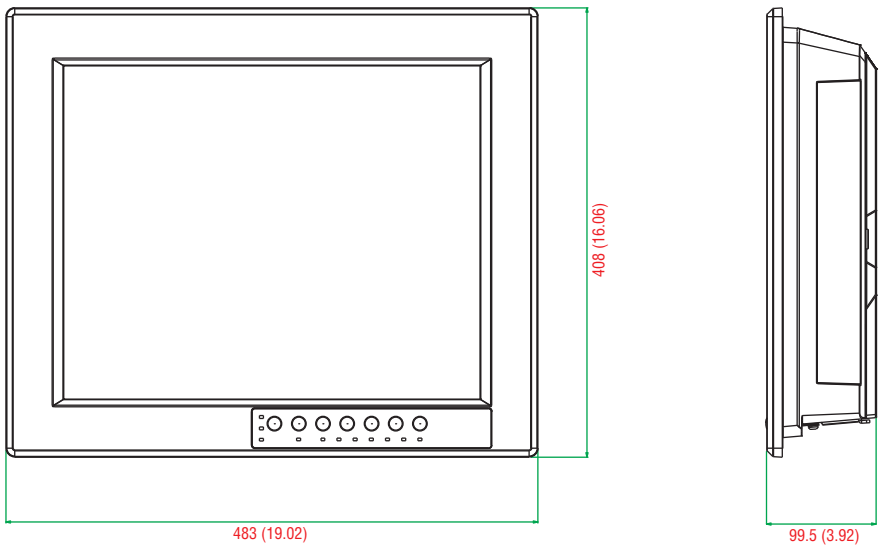
Safety: UL 60950-1, IEC 60950-1
Hazardous Environments: Class 1 Division 2
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge:
AC Power: 2 kV; Signal: 1 kV;
DC Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8, IEC 61000-4-11
Ingress Protection Rating: IP66 / NEMA 4X
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period: 3 years for computer system, 1 year for LCD panel
Details: See www.moxa.com/warranty

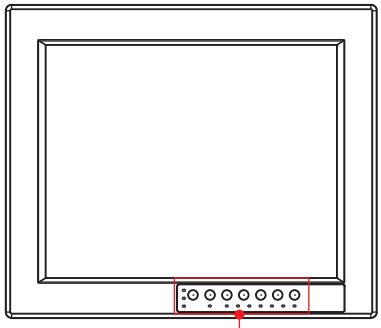
Dimensions

Unit: mm (inch)

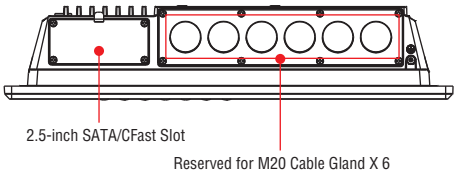


Appearance

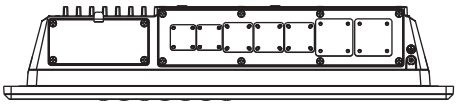
Front View



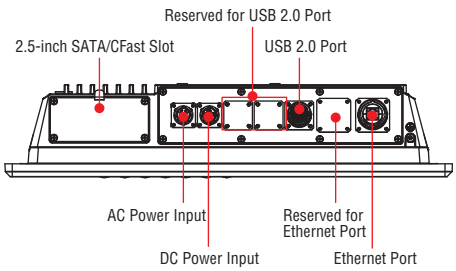
Bottom View (EXPC-1519-C1-S1-T, EXPC-1519-C7-S1-T, EXPC-1519-C1-S2-T, EXPC-1519-C7-S2-T)



Bottom View (EXPC-1519-C1-S3-T, EXPC-1519-C7-S3-T)



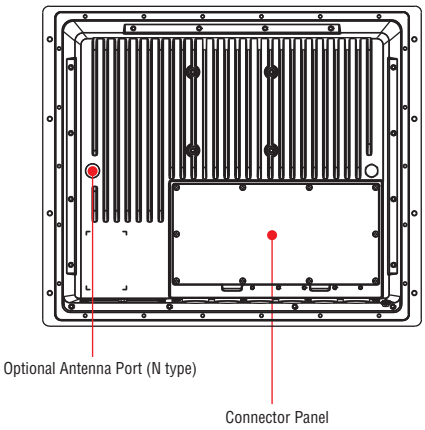
Out-of-the-box view; connectors must be installed by the user

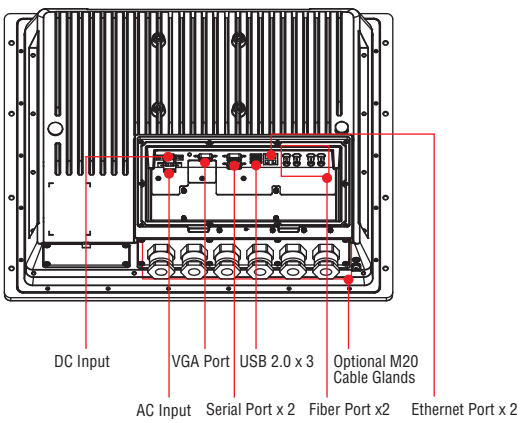


View with connectors installed

Rear View (EXPC-1519-C1-S1-T, EXPC-1519-C7-S1-T)

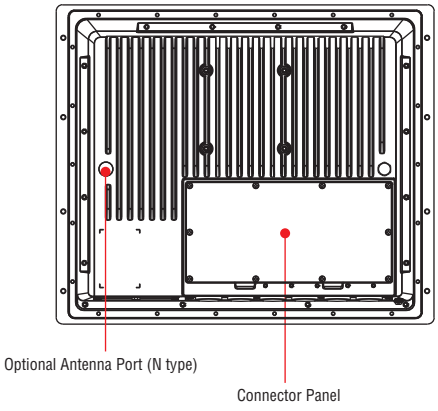
*Viewed at a 5-degree angle

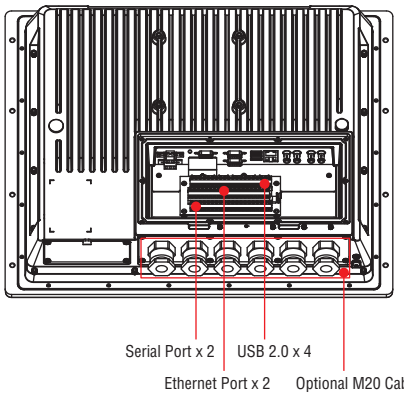




Rear View (EXPC-1519-C1-S2-T, EXPC-1519-C7-S2-T)

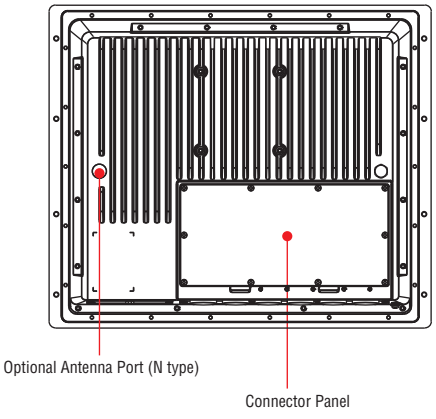
*Viewed at a 5-degree angle

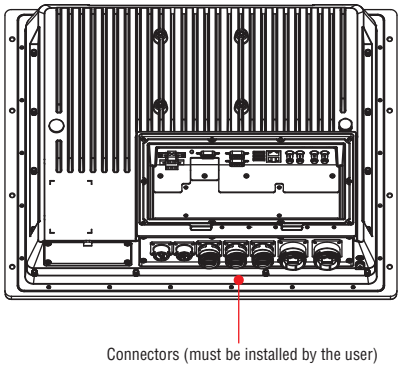




Rear View (EXPC-1519-C1-S3-T, EXPC-1519-C7-S3-T)

*Viewed at a 5-degree angle





Ordering Information

Available Models

EXPC-1519-C1-S1-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Celeron® Processor 1047UE 1.4 GHz, cable gland with standard I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

EXPC-1519-C1-S2-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Celeron® Processor 1047UE 1.4 GHz, cable gland with terminal block I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

EXPC-1519-C1-S3-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Celeron® Processor 1047UE 1.4 GHz, harsh environment I/O connector, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

EXPC-1519-C7-S1-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Core™ i7-3555LE Processor 2.5 GHz, cable gland with standard I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

EXPC-1519-C7-S2-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Core™ i7-3555LE Processor 2.5 GHz, cable gland with terminal block I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

EXPC-1519-C7-S3-T: Fanless, Zone 2 19-inch 1000-nit LCD panel computer, Intel® Core™ i7-3555LE Processor 2.5 GHz, harsh environment I/O connector, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5-inch SSD tray and CFast slot

Package Checklist (EXPC-1519-C1-S3-T, EXPC-1519-C7-S3-T)

- 1 EXPC-1519 panel computer
- HDD/SSD installation kit
- USB female connector installation kit
- RJ45 female connector installation kit
- DC power installation kit
- AC power installation kit
- Quick installation guide
- Documentation and software DVD
- Warranty card

Package Checklist (EXPC-1519-C1-S1-T, EXPC-1519-C7-S1-T, EXPC-1519-C1-S2-T, EXPC-1519-C7-S2-T)

- 1 EXPC-1519 panel computer
- SSD/HDD installation kit
- 1 2-pin terminal block for DC power input
- 1 3-pin terminal block for AC power input
- Quick installation guide
- Documentation and software DVD
- Warranty card

EXPC-1319 Series

Award-winning Product
TAIWAN EXCELLENCE 2014

Fanless rugged Zone 2 19-inch 1000-nit LCD panel computers with touch screen

- Zone 2 certified for hazardous area applications
- High performance / low power Intel dual core Atom D525 1.8 GHz CPU
- Anti-scratch 19-inch sunlight-viewable 1000-nit LCD panel
- Self-health diagnostics software package for remote predictive maintenance
- -40 to 60°C extended operation temperature (with built-in Intelligent Heater)
- Completely sealed IP66 / NEMA 4X panel computer
- Fanless, streamlined enclosure for highly-efficient heat dissipation
- Touch screen control button to enable/disable touch screen interface
- Optional WLAN, 100M Fiber optic connection

Windows Embedded Standard 7

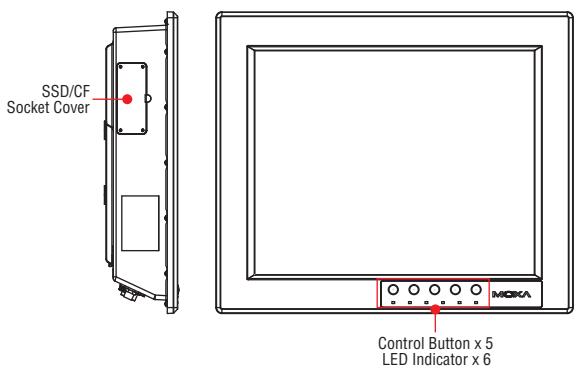
Introduction

The EXPC-1319 panel computers are fanless, durable devices made for both indoor and outdoor hazardous environments. The EXPC-1319 series features the Intel Atom dual core D525 1.8 GHz processor, with up to 4 GB of memory available to deliver high performance processing. The EXPC-1319 is Zone 2 certified, and comes with two electrically isolated, software-selectable RS-232/422/485 serial ports alongside two gigabit LAN ports, providing reliable serial and high speed Ethernet LAN transmissions with full network redundancy.

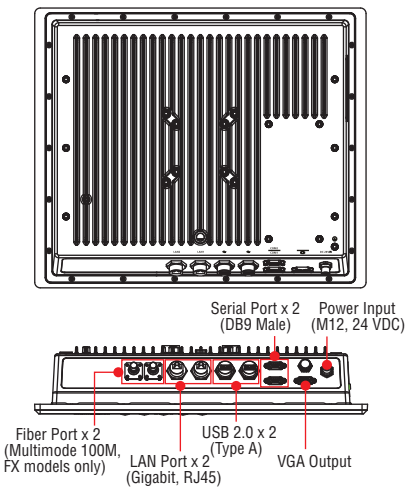
The EXPC-1319 computers come with a patented, fanless, streamlined enclosure designed for highly efficient heat dissipation, making this one of the most reliable industrial platforms available for harsh, hot outdoor environments like oil and gas fields, or drilling platforms. In addition, EXPC-1319 computers come with a self-health diagnostics software that can communicate over SNMP and has an expanded set of features. You can also order this software along with Moxa's Intelligent Heating Solution (IHS), a heating utility for use in extremely low temperature (-40°C) environments. Finally, these computers feature touchscreen controls with glass-film-glass bonding, making them scratch- and glare-resistant and easy to read even during the peak daylight hours.

Appearance

Front and Side Views

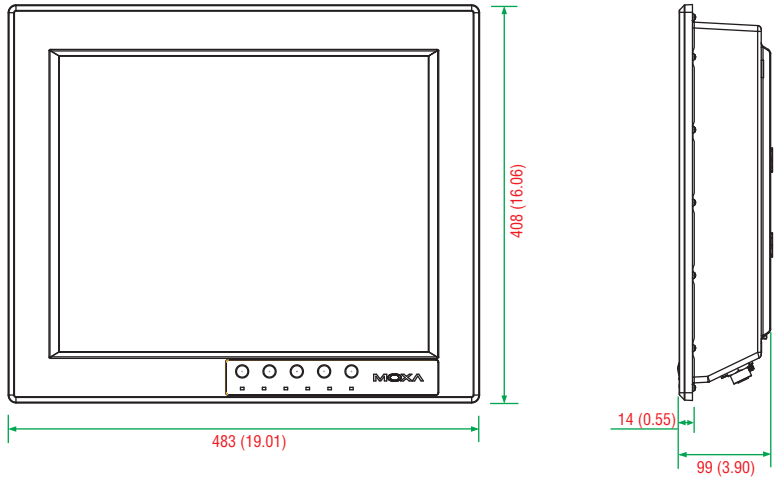


Rear and Bottom Views



Dimensions

Unit: mm (inch)



HardwareSpecifications

Computer
CPU: Intel Atom D525 dual core 1.8 GHz processor
OS: Windows Embedded Standard 7
System Chipset: Intel Pineview-D+ ICH8M
BIOS: 16 Mbit Flash BIOS, SPI type with ACPI
FSB: Intel GMA3150 integrated graphics controller
Video Output: VGA output, waterproof DB-15 (female) connector
System Memory: 4 GB capacity, 2 GB pre-installed: 2 slots of 2 GB DDR3-800 SO-DIMM SDRAM
Automatic Reboot Trigger: Built-in software-programmable watchdog timer for system resets, configurable from 1 to 255 second timeout intervals
Expansion Bus: 1 PCI-104 slot, 1 mini PCIe socket
USB: 2 USB 2.0 hosts, waterproof circular type-A connector
KB/MS: PS/2 interface supports both keyboard and mouse via Y type cable, waterproof connector (optional)

Storage
Storage Expansion:
• Onboard CompactFlash socket x 1
• One extra onboard SATA interface, supporting configurable RAID 0/1
Storage Support: Removable 32 GB industrial grade SSD (operating temperature: -40 to 85°C) to store OS; supports up to 256 GB

Display
Panel Size: 19-inch SXGA, 1000-nit LED backlit LCD
Aspect Ratio: 5:4
Response Time: 5 ms
Contrast Ratio: 1000:1
Viewing Angles:
• Horizontal: 170° (left to right)
• Vertical: 160° (up to down)
Max Colors: 16.7 M colors
Graphics Controller: Integrated Intel GMA3150 graphics controller
Video Output: VGA output, waterproof DB15 (female) connector
Resolution:
• VGA: 640 x 480
• SVGA: 800 x 600
• XGA: 1024 x 768
• SXGA: 1280 x 1024

Touchscreen
EXPC-1319-STS: Resistive single point glass-film-glass
Note: All EXPC-1319 touchscreens are scratch resistant and anti-glare, suitable for use outdoors around heavy equipment.

Ethernet Interface
Hardware Interface: Waterproof RJ45 connector
LAN: 2 auto-sensing 10/100/1000 Mbps ports
Optical Fiber Interface: 2 multimode 100M fiber-optic ports with waterproof Q-ODC connector (FX models only)
WLAN: 1 802.11b/g/n interface (available on request)
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface
Serial Standards: 2 RS-232/422/485 ports, software-selectable
Connector Type: Waterproof DB9 (male)
Baudrate: Up to 38,400 bps
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: Up to 38,400 bps

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 and Buttons
LEDs: Power on/off, heater on/off, storage, LAN port communication x 2, fiber communication
Control Buttons: System on/off, brightness adjustment x 2, touchscreen on/off, programmable “Fn” button

Physical Characteristics
Housing: Aluminum
Weight:
• 10.7 kg (23.78 lb) (without Intelligent Heating Solution)
• 11.9 kg (26.44 lb) (with Intelligent Heating Solution)
Dimensions: 483 x 408 x 99 mm (19.02 x 16.06 x 3.90 in)
Mounting: Yoke, panel, mounting holes for VESA 75/100-mounting

Environmental Limits

Operating Temperature:
• Without Intelligent Heating Solution: -20 to 60°C (-4 to 140°F)
• With Intelligent Heating Solution: -40 to 60°C (-40 to 140°F)
Storage Temperature: -40 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms, 5-500 Hz frequency, compliant with IEC 60068-2-6 standard
Anti-Shock: 20 g, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage:
• Typical 24 VDC
• External 100 to 240 VAC isolated power supply unit (available on request)
Connector: M12, customizable
Power Consumption:
• Without Intelligent Heating Solution: 60 W
• With Intelligent Heating Solution: 120 W

Standards and Certifications

Hazardous Environments: UL Class 1 Division 2, ATEX Zone 2, IECEx
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A
Mechanical: IP66, NEMA 4X
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period: 3 years for computer system, 1 year for LCD panel
Details: See www.moxa.com/warranty

Software Specifications

Windows Embedded Standard 7

Core OS:
• 32-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)
• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12
International:
• IME Simplified Chinese Support
• IME Traditional Chinese Support
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET
File Systems and Data Store:
• Windows Data Access Components
• Windows Backup and Restore
Embedded Self-Health Diagnostic Software: SNMP-based remote scripting layer for monitoring, reporting, and control

Ordering Information

Available Models

EXPC-1319-STS-W7E: Fanless rugged Zone 2 19-inch 1000-nit LCD panel computer, single point touchscreen, IP66, Atom D525 dual core 1.8 GHz CPU, -20 to 60°C operating temperature
EXPC-1319-STS-IHS-W7E: Fanless rugged Zone 2 19-inch 1000-nit LCD panel computer, single point touchscreen, IP66, Atom D525 dual core 1.8 GHz CPU, -40 to 60°C operating temperature, with Intelligent Heating Solution (IHS)
EXPC-1319-STS-FX-W7E: Fanless rugged Zone 2 19-inch 1000-nit LCD panel computer, single point touchscreen, IP66, optical fiber ports, Atom D525 dual core 1.8 GHz CPU, -20 to 60°C operating temperature
EXPC-1319-STS-IHS-FX-W7E: Fanless rugged Zone 2 19-inch 1000-nit LCD panel computer, single point touchscreen, IP66, optical fiber ports, Atom D525 dual core 1.8 GHz CPU, -40 to 60°C operating temperature, with Intelligent Heating Solution (IHS)

Package Checklist

- 1 EXPC-1319 panel computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- Waterproof USB connector pack x 2
- Waterproof DB9 connector pack x 2
- Waterproof LAN connector pack x 2
- Waterproof power connector pack x 1
- Wall-mounting kit
- Quick installation guide
- Documentation and software DVD
- Warranty card

Compact/Fanless Computers

Product Selection Guide

x86 Computers 26-2
RISC Computers 26-3

x86 Computers

V2403 Series: x86 embedded computer with Intel 3rd Gen Core-i CPU, HDMI, DVI, 2 LANs, 4 serial ports, 4 DIs, 4 DOs, 4 USB 2.0 ports, dual CFast slots, wireless enabled 26-4
V2201 Series: x86 embedded computer with Intel Atom E3800 CPU, HDMI, 2 LANs, 2 serial ports, 4 DIs, 4 DOs, 2 USB 2.0 and 1 USB 3.0 ports, mSATA, SD, wireless enabled 26-8

RISC Computers

UC-8416/8418 Series: RISC ready-to-run embedded computers with 8 serial ports, 3 LANs, DIOs, 8 switch ports, 2 CAN ports, USB, CompactFlash 26-12
UC-7101/7110/7112 Series: RISC ready-to-run embedded computers with 1 or 2 serial ports, dual LANs, SD. . . 26-16
UC-7122/7124 Series: RISC ready-to-run embedded computers with dual LANs, 2 or 4 serial ports, SD, USB . . . 26-20
IA260 Series: RISC-embedded computers with 4 serial ports, dual LANs, VGA, DIOs, CompactFlash, USB 26-23
IA240 Series: RISC-embedded computers with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD . 26-26

x86 Computers

	V2403 Series	V2201 Series
Computer		
CPU	V2403-C2 Series: Intel® Celeron 1047UE (Dual Core, 2M Cache, 1.40 GHz) V2403-C3 Series: Intel® Core i3-3217UE (Dual Core, 2M Cache, 1.60 GHz) V2403-C7 Series: Intel® Core i7-3517UE (Dual Core, 4M Cache, 1.70 GHz)	V2201-E1 Series: Intel® Atom™ Processor E3815 (Single Core, 512K Cache, 1.46 GHz) V2201-E2 Series: Intel® Atom™ Processor E3826 (Dual Core, 1M Cache, 1.46 GHz) V2201-E4 Series: Intel® Atom™ Processor E3845 (Quad Core, 1M Cache, 1.91 GHz)
OS	Windows Embedded Standard 7 64-bit or Linux Debian 8 64-bit	Windows Embedded Standard 7 64-bit or Linux Debian 8 64-bit
System Memory	1 DDR3-1600 SDRAM slot, 4 GB pre-installed, 8 GB max.	1 DDR3 SO-DIMM slot (2 GB pre-installed for Linux models, 4 GB pre-installed for Windows models, 8 GB max.) • E3815 and E3826 support DDR3L-1066 • E3845 supports DDR3L-1333
USB	USB 2.0 hosts x 4, type A connectors	USB 3.0 hosts x 1, USB 2.0 hosts x 2, type A connectors
Storage		
CFast	1 removable CFast socket for OS storage, 1 internal CFast socket for OS backup	–
mSATA	1 internal mini-PCIe socket for storage expansion	1 internal mini-PCIe socket for OS storage
SD	–	1 SD 3.0 (SDHC/SDXC) socket for storage expansion
SSD/HDD	1 internal SATA-II connector for 2.5" SSD/HDD	–
Audio		
Input	Line-in interface (audio jack)	–
Output	Line-out interface (audio jack)	Line-out interface (together with HDMI)
Other Peripherals		
Expansion Slot	2 Mini-PCIe sockets • 1 USB signal, for Sierra Wireless 3G/LTE module • 1 USB + PCIe signal	2 Mini-PCIe sockets • 1 USB signal, for Sierra Wireless 3G/LTE module • 1 USB + PCIe signal
USIM	2 USIM slot	1 USIM slot
Display		
Graphics Controller	Intel® HD (integrated)	Intel® HD (integrated)
Connector Type	1 HDMI connector (type A), 1 DVI-I connector, 1 VGA connector (CV required)	1 HDMI connector (type A)
Display Interface	HDMI supports HDMI 1.4b, 1920 x 1200 resolution @ 60 Hz • DVI up to 1920x1200 resolution @ 60 Hz • VGA up to 1920x1200 resolution @ 60 Hz • VGA up to 2048x1536 resolution @ 75 Hz	Supports HDMI 1.4a, 1920 x 1080 pixels @ 60/24 Hz
Ethernet Interface		
LAN	Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2	Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Isolation Protection	1.5 kV	1.5 kV
Wireless SMA Interface		
Wi-Fi	2 SMA connectors	2 SMA connectors
3G/LTE	2 SMA connectors	2 SMA connectors
GPS	1 SMA connector	1 SMA connector
Serial Interface		
Serial Standards	RS-232/422/485 x 4 (DB9 male)	RS-232/422/485 x 2 (DB9 male)
Digital Input/Digital Output		
Input/Output Channels	DI x 4, DO x 4, sink type	DI x 4, DO x 4, sink type
Connector Type	10-pin screw-fastened Euroblock terminal	10-pin screw-fastened Euroblock terminal
Physical Characteristics		
Weight	2.247 kg (4.99 lb) or 2.168 kg (4.82 lb)	940 g (2.09 lb)
Dimensions	275 x 63 x 154 mm (10.83 x 2.47 x 6.06 in)	178 x 52.5 x 120.2 mm (7.01 x 2.07 x 4.73 in)
Mounting	DIN-rail, wall	DIN-rail, wall
Environmental Limits		
Operating Temperature	-40 to 70°C (-40 to 158°F)	-40 to 85°C (-40 to 185°F) or -40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Anti-Vibration	IEC 60068-2-64: 5 Grms, 5 Hz to 500 Hz, 1 hr/axis w/ mSATA, CFast, SSD	IEC 60068-2-64: 5 Grms, 5 Hz to 500 Hz, 1 hr/axis w/ mSATA, SD
Anti-Shock	IEC 60068-2-27: 50 g/11ms ±X, ±Y, ±Z, 3 shocks each axis w/ mSATA, CFast, SSD	IEC 60068-2-27: 100 g/11ms ±X, ±Y, ±Z, 3 shocks each axis w/ mSATA, SD
Power Requirements		
Input Voltage	9 to 36 VDC (3-pin terminal block for V+, V-, SG)	9 to 36 VDC (3-pin terminal block for V+, V-, SG)
Input Current	1.39 A @ 24 VDC	2 A @ 9 VDC
Power Consumption	31.59 W	18 W
Standards and Certifications		
Safety	UL 60950-1, CSA C22.2 No. 60950-1-03 (60950-1-07), EN 60950-1, UL 508	UL 60950-1, CSA C22.2 No. 60950-1-03 (60950-1-07), EN 60950-1, UL 508
EMC	EN 55022/24, EN 61000-6-2/6-4	EN 55022/24, EN 61000-6-2/6-4*
EMI	CISPR 22, FCC Part 15B Class A	CISPR 22, FCC Part 15B Class A
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6 , IEC 61000-4-8	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Warranty		
Warranty Period	3 years	3 years
Details	See www.moxa.com/warranty	See www.moxa.com/warranty
Page	26-4	26-8

RISC Computers

	UC-8416/8418 Series	UC-7101/7110/7112 Series	UC-7122/7124 Series	IA260 Series	IA240 Series
Computer					
CPU Speed	533 MHz	192 MHz	200 MHz	200 MHz	192 MHz
OS	Linux or Windows CE 6.0	µClinux or Linux	Windows CE 5.0	Linux or Windows CE 6.0	Linux
Expansion Bus	PCI/104 onboard	–	–	–	–
USB	USB 2.0 hosts x 2	–	USB 2.0 hosts x 1	USB 2.0 hosts x 2	USB 2.0 hosts x 1
DRAM	DDR2 SDRAM, 256 MB (512 MB max.)	UC-7101/7110/7112: 16 MB UC-7112 Plus: 32 MB	DDR2 SDRAM, 32 MB	DDR2 SDRAM, 128 MB	DDR2 SDRAM, 64 MB
Flash	• NOR Flash, 16 MB • NAND Flash, 32 MB	UC-7101/7110/7112: 8 MB UC-7112 Plus: 16 MB	NOR Flash, 16 MB	NOR Flash, 32 MB	NOR Flash, 16 MB
SRAM	256 KB, battery backup	–	–	–	–
Storage					
Storage Expansion	CompactFlash socket	SD slot (UC-7101, UC-7112, and UC-7112 Plus only)	SD slot	CompactFlash socket	SD slot
Display					
Display Interface	–	–	–	CRT interface for VGA output, DB15 female connector	–
Resolution	–	–	–	1024 x 768, 8 bits	–
Ethernet Interface					
LAN	10/100 Mbps ports x 2 (RJ45)	10/100 Mbps ports x 1 or 2 (RJ45)	10/100 Mbps ports x 2 (RJ45)	10/100 Mbps ports x 2 (RJ45)	10/100 Mbps ports x 2 (RJ45)
Switch Port	10/100 Mbps unmanaged ports (RJ45) x 8 (UC-8416)	–	–	–	–
Serial Interface					
Serial Standards	RS-232/422/485 x 8 (RJ45)	RS-232/422/485 x 1 or 2 (DB9 male)	RS-232/422/485 ports x 2 (DB9) or 4 (RJ45)	RS-232/422/485 ports x 4 (DB9 male)	RS-232/422/485 ports x 4 (RJ45)
Console Port	RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)	RS-232 (TxD, RxD, GND) • UC-7101: 4-pin pin header output • UC-7110/7112: 3-wire pin-header	RS-232 (TxD, RxD, GND), 4-pin pin header output	RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)	RS-232, RJ45 connector, supports PPP
Digital Input					
Input Channels	UC-8416: DI x 4 UC-8418: DI x 12	–		DI x 8	DI x 4
Connector Type	10-pin screw-fastened terminal block (4 points, COM, GND)			10-pin screw-fastened terminal block (8 points, COM, GND)	–
Digital Output					
Output Channels	UC-8416: DO x 4, sink type UC-8418: DO x 12, sink type	–	–	DO x 8, sink type	DO x 4
Connector Type	10-pin screw-fastened terminal block (4 points, GND)	–	–	9-pin screw-fastened terminal block	–
Physical Characteristics					
Weight	1 kg (2.22 lb)	• UC-7101: 130 g (0.29 lb) • UC-7110/7112: 190 g (0.42 lb)	UC-7122: 190 g (0.42 lb) UC-7124: 200 g (0.44 lb)	1 kg (2.22 lb)	430 g (0.96 lb)
Dimensions	200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)	• 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)	77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)	52 x 112.6 x 162 mm (2.05 x 4.43 x 6.38 in)	60 x 137 x 100 mm (2.36 x 5.39 x 3.94 in)
Environmental Limits					
Operating Temperature	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)	-10 to 60°C (14 to 140°F) or -40 to 75°C (-40 to 167°F)
Storage Temperature	-20 to 75°C (-4 to 167°F) or -40 to 85°C (-40 to 185°F)	-20 to 75°C (-4 to 167°F) or -40 to 85°C (-40 to 185°F)	-20 to 75°C (-4 to 167°F) or -40 to 85°C (-40 to 185°F)	-20 to 75°C (-4 to 167°F) or -40 to 85°C (-40 to 185°F)	-20 to 75°C (-4 to 167°F) or -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Anti-Vibration	2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis	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)	1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis	2 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr per axis	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	20 g @ IEC-68-2-27, half sine wave, 11 ms	–	–	20 g @ IEC-68-2-27, half sine wave, 11 ms	–
Power Requirements					
Input Voltage	12 to 48 VDC (3-pin terminal block)	12 to 48 VDC	12 to 48 VDC	12 to 48 VDC (3-pin terminal block)	12 to 48 VDC
Input Current	• 310 mA @ 48 VDC • 625 mA @ 24 VDC • 1350 mA @ 12 VDC	• 170 mA @ 24 VDC • 340 mA @ 12 VDC	• 170 mA @ 24 VDC • 340 mA @ 12 VDC	• 450 mA @ 24 VDC • 900 mA @ 12 VDC	• 300 mA @ 24 VDC • 600 mA @ 12 VDC
Power Consumption	15 W	4.5 W	UC-7122: 4.1 W UC-7124: 4.3 W	5.8 W/11 W	7 W
Standards and Certifications					
Safety	UL 60950-1, EN 60950-1, CCC (GB9254, GB17625.1)	• 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	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1, CCC (GB4943, GB9254, GB17625.1)	UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC	FCC Part 15 Subpart B Class A	FCC Part 15 Subpart B Class A	FCC Part 15 Subpart B Class A	FCC Part 15 Subpart B Class A	FCC Part 15 Subpart B Class A
EMI	–	–	–	–	–
EMS	IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11				
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Warranty					
Warranty Period	5 years	5 years	5 years	5 years	5 years
Details	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty	See www.moxa.com/warranty
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V2403 Series

Fanless, rugged, ready-to-go x86 Industrial IoT embedded computer

- Intel Core-i series processor with three performance options
- -40 to 70°C (system+LTE) operating temperature
- Dual CFast sockets for storing OS and OS backup
- Triple mini-PCIe sockets for storage and wireless modules; supports mSATA, Wi-Fi, 3G, LTE, GPS, and Bluetooth
- Variety of interfaces: 4 serial ports, 2 Ethernet LAN ports, 4 DIs, 4 DOs, USB, HDMI, wireless
- EN 61000-6-2 and EN 61000-6-4 certification; meets EMC standard for heavy industry
- Up to 5 Grms anti-vibration and 100-g anti-shock
- Ready-to-run Debian 8 and Windows Embedded Standard 7 platforms
- Moxa Proactive Monitoring utility for system hardware health monitoring
- Moxa Smart Recovery utility to recover system from boot failure (W7E only)

Overview

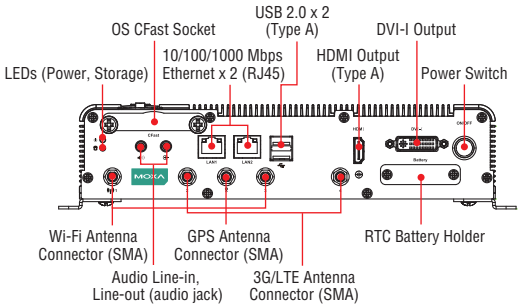
The Moxa V2403 series fanless x86 embedded computer is based on the Intel® 3rd gen Core-i™ series processor, features the most reliable I/O design to maximize connectivity, and supports dual wireless modules, making it suitable for a diverse range of communication applications. The computer's thermal design ensures reliable system operation in temperatures ranging from -40 to 70°C (with a special purpose Moxa wireless module installed). The V2403 series supports "Moxa Proactive Monitoring" for device I/O status monitoring and alerts, system temperature monitoring and alerts, and system power management. Monitoring system status closely makes it easier to recover from errors and provides the most reliable platform for your applications.

Applications:

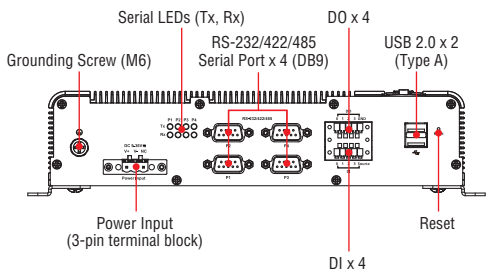
- Remote Terminal Unit (RTU)
- Data acquisition
- M2M communication (smart gateway)
- Digital signage
- Factory automation
- In-vehicle monitor/data logger (transportation)
- Programmable router
- Energy usage optimization
- Predictive maintenance
- Asset management

Appearance

Front View



Rear View



Hardware Specifications

Computer
CPU:
V2403-C2 Series: Intel® Celeron 1047UE (Dual Core, 2M Cache, 1.40 GHz)
V2403-C3 Series: Intel® Core i3-3217UE (Dual Core, 3M Cache, 1.60 GHz)
V2403-C7 Series: Intel® Core i7-3517UE (Dual Core, 4M Cache, 1.70 GHz)
OS: Windows Embedded Standard 7 64-bit or Linux Debian 8 64-bit
System Memory: 1 DDR3-1600 SDRAM slot, 8 GB max.
USB: USB 2.0 hosts x 4, type A connectors, supporting system boot up

Storage
CFast : 1 removable CFast socket for OS storage, 1 internal CFast socket for OS backup
mSATA: 1 internal mini-PCIe socket for storage expansion
SSD/HDD: 1 internal SATA-II connector for 2.5" SSD/HDD

Audio
Input: Line-in interface (audio jack)
Output: Line-out interface (audio jack)

Wireless Peripherals
Expansion Slot: 2 Mini-PCIe sockets
• 1 USB signal, for Sierra Wireless 3G/LTE module
• 1 USB + PCIe signal
USIM: 2 USIM slots

Display
Graphics Controller: Intel® HD (integrated)
Connector Type: 1 HDMI connector (type A), 1 DVI-I connector, 1 VGA connector (CV required)
Display Interface: HDMI supports HDMI 1.4b, 1920 x 1200 resolution @ 60 Hz
• DVI up to 1920x1200 resolution @ 60 Hz
• VGA up to 1920x1200 resolution @ 60 Hz
• VGA up to 2048x1536 resolution @ 75 Hz

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Isolation Protection: 1.5 kV

Wireless SMA Interface
Wi-Fi: 2 SMA connectors
3G/LTE: 2 SMA connectors
GPS: 1 SMA connector

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

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

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: DI x 4
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
Logic level 0: Close to GND
Logic level 1: Open
Digital Input Levels for Wet Contacts:
Logic level 1: +3 V max
Logic level 0: +10 V to +30 V (Source to DI)
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

Digital Output
Output Channels: DO x 4, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

LEDs
System: Power
Storage: CFast/SSD/HDD/mSATA
LAN: 2 LEDs per port (10/100/1000 Mbps)
Serial: 2 LEDs per port (Tx and Rx)

Switches and Buttons
Power Switch: on/off
Reset Button: System reset

Physical Characteristics
Housing: Aluminum
Weight:
"-W" Models: 2.247 kg (4.99 lb)
non "-W" Models: 2.168 kg (4.82 lb)
Dimensions:
Without ears: 250 x 57 x 154 mm (9.84 x 2.23 x 6.06 in)
With ears: 275 x 63 x 154 mm (10.83 x 2.47 x 6.06 in)
Mounting: DIN rail, wall

Environmental Limits
Operating Temperature:
Standard models: -40 to 70°C (-40 to 158°F), with Moxa recommended wireless modules (3G/LTE + Wi-Fi) installed
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: IEC 60068-2-64: 5 Grms, 5 Hz to 500 Hz, 1 hr/axis w/ mSATA, CFast, SSD
Anti-Shock: IEC 60068-2-27: 50 g/11ms ±X, ±Y, ±Z, 3 shocks each axis w/ mSATA, CFast, SSD

Power Requirements
Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)
Input Current:
• 3.51 A @ 9 VDC
• 1.39 A @ 24 VDC
• 0.93 A @ 36 VDC
Power Consumption: 34 W

Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-03 (60950-1-07), EN 60950-1, UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 1 kV
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE

Reliability
Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds

MTBF (mean time between failures)

Time:
V2403-C2-W-T/V2403-C3-W-T /V2403-C7-W-T: 335,810 hrs
V2403-C2-T/V2403-C3-T/V2403-C7-T: 358,958 hrs
V2403-C2-T-W7E/V2403-C2-T-LX: 329,398 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Linux

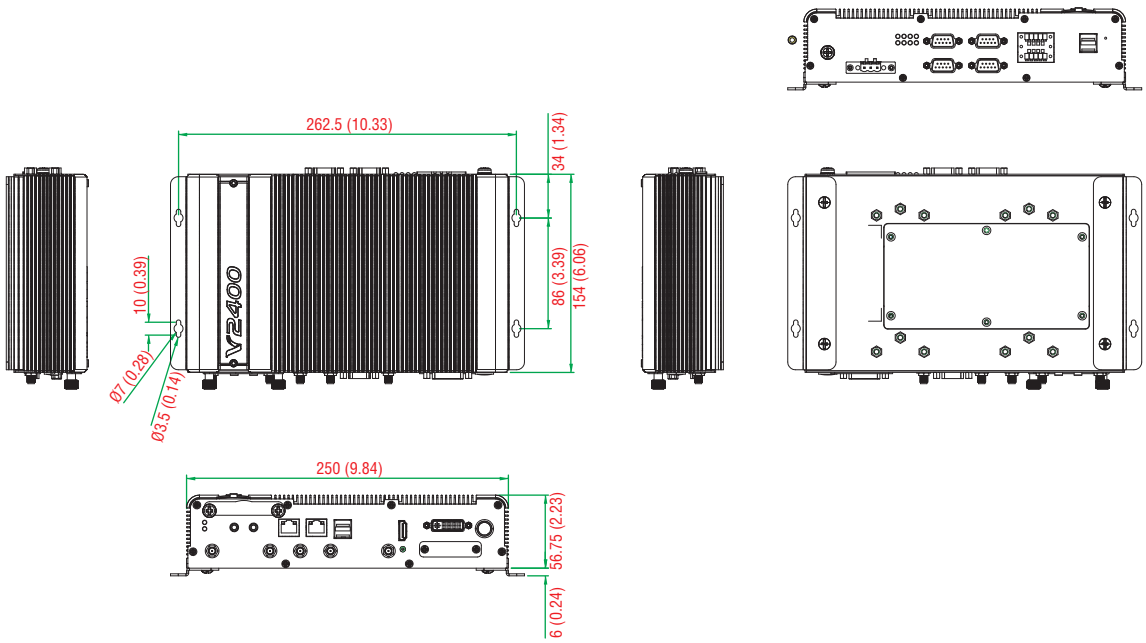
OS: Linux Debian 8 64-bit
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two unsecure hosts over an unsecure network
Kernel Version: GNU/Linux 3.16
System Shell: DASH (default), BASH
Text Editor: vim
File System: ext4
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, ARP, HTTP, ICMP, ARP, DHCP, NTP, NFS, SSH, SFTP, RSYNC, SSL
Internet Security Suite: OpenVPN, IPTables Firewall
Cellular Networking: QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
Watchdog: A watchdog timer that triggers a system reset upon software freezes, for both specific applications and system-wide failures.
Application Development Software:
• Moxa API Library
• GNU C library
• Perl
Embedded Self-Health Maintenance Software: Moxa Proactive Monitoring
Security Update of Existing Software Packages: All software packages installed on the V2403 can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server.

Windows Embedded Standard 7

Core OS:
• 64-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM + Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Western, Middle Eastern, South East Asian, and South Asian
Graphics and Multimedia:
• MPEG Layer-3 Audio Codecs (MP3)
• MPEG4 Decoders
• DirectX and Windows Device Experience
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Registry Filter
• WSDAPI for .NET
File Systems and Data Store:
• Windows Data Access Components
• Windows Backup and Restore
Maintenance: Moxa Proactive Monitoring and Moxa Smart Recovery

Dimensions

Unit: mm (inch)



Ordering Information

Pre-Configured Models																			
Model Name	CPU	RAM	OS CFast	OS	Backup Cfast	Internal SSD/HDD		mSATA	HDMI	DVI-I	LAN	Serial	DI/O	USB 2.0	Expansion Socket	Wireless Connector	LTE Heat Sink	Operating Temp.	LTE Operating Temp.
						Bracket	Storage												
V2403-C2-T-LX	1047UE	4 GB	8 GB	Debian 8	–	–	–	–	1	1	2	4	4/4	4	–	–	–	-40 to 70°C	–
V2403-C2-T-W7E	1047UE	4 GB	8 GB	W7E	–	–	–	–	1	1	2	4	4/4	4	–	–	–	-40 to 70°C	–

CTO Models, Default (optional)																			
	Must select for system to work																		
Model Name	CPU	RAM*	OS CFast*	OS*	Backup CFast*	Internal SSD/HDD		mSATA*	HDMI	DVI-I	LAN	Serial	DI/O	USB 2.0	Expansion Socket	Wireless Connector	LTE Heat Sink	Operating Temp.	LTE Operating Temp.
						Bracket*	Storage*												
V2403-C2-T	1047UE	4 GB (2, 8 GB)	N/A (8, 16, 32 GB)	N/A (Debian 8 & W7E)	N/A (8, 16, 32 GB)	N/A (Enable)	N/A (0.5, 1, 2 TB)	–	1	1	2	4	4/4	4	–	–	–	-40 to 70°C	–
V2403-C3-T	3217UE							–	1	1	2	4	4/4	4	–	–	–	-40 to 70°C	–
V2403-C7-T	3517UE							–	1	1	2	4	4/4	4	–	–	–	-40 to 70°C	–
V2403-C2-W-T	1047UE					–	–	N/A (8, 16, 32, 64 GB)	1	1	2	4	4/4	4	2	5	1	-40 to 70°C	-40 to 70°C
V2403-C3-W-T	3217UE					–	–		1	1	2	4	4/4	4	2	5	1	-40 to 70°C	-40 to 70°C
V2403-C7-W-T	3517UE					–	–		1	1	2	4	4/4	4	2	5	1	-40 to 70°C	-40 to 70°C

*CTO = Configured To Order

Note:

Refer to the Component Compatibility Guide (CCG) for the list of components that Moxa has validated to be compatible with this product. You can download the CCG from the Moxa product website. For components with a Moxa P/N, you can order the components together with your product from Moxa and we will install the selected components in your product. Moxa guarantees the compatibility of the components installed in CTO products.

Package Checklist

- V2403 embedded computer
- Terminal block to power jack converter
- Wall-mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

V2201 Series

Fanless, ultra-compact, rugged x86 IIoT embedded computer

- Intel Atom E3800 series processor with three performance options
- -40 to 85°C system operating temperature (-40 to 70°C with LTE module installed)
- Dual mini-PCIe sockets for wireless modules, supports W-iFi, 3G, LTE, GPS, and Bluetooth
- Variety of interfaces: 2 serial ports, 2 Ethernet LAN port, 4 DIs, 4 DOs, SD, USB, HDMI, wireless
- EN 61000-6-2 and EN 61000-6-4 certification*; meets EMC standard for heavy industry
- Up to 5 Grms anti-vibration and 100-g anti-shock
- Ready-to-run Debian 8 and Windows Embedded Standard 7 platforms
- Moxa Proactive Monitoring utility for system hardware health monitoring
- Moxa Smart Recovery utility to recover system from boot failure (W7E only)

*Passed with AC/DC adapter.

Overview

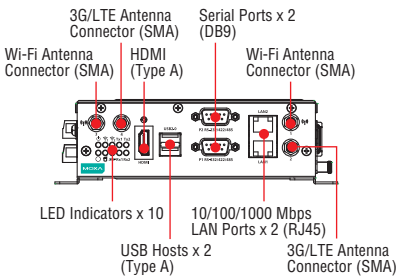
The Moxa V2201 series ultra-compact x86 embedded computer is based on the Intel® Atom™ E3800 series processor, features the most reliable I/O design to maximize connectivity, and supports dual wireless modules, making it suitable for a diverse range of communication applications. The computer's thermal design ensures reliable system operation in temperatures ranging from -40 to 85°C (-40 to 70°C with a special purpose Moxa wireless module installed). The V2201 series supports "Moxa Hardware Monitoring" for device I/O status monitoring and alerts, system temperature monitoring and alerts, and system power management. Monitoring system status closely makes it easier to recover from errors and provides the most reliable platform for your applications.

Applications:

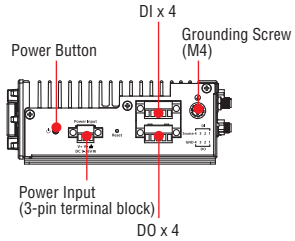
- Remote Terminal Unit (RTU)
- Data acquisition
- M2M communication (smart gateway)
- Digital signage
- Factory automation
- In-vehicle monitor/data logger (transportation)
- Programmable router
- Energy usage optimization
- Predictive maintenance
- Asset management

Appearance

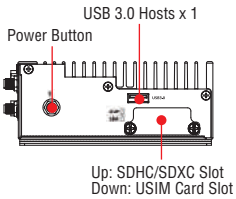
Front View



Left Side View



Right Side View



Hardware Specifications

Computer
CPU:
V2201-E1 Series: Intel® Atom™ Processor E3815 (Single Core, 512K Cache, 1.46 GHz)
V2201-E2 Series: Intel® Atom™ Processor E3826 (Dual Core, 1M Cache, 1.46 GHz)
V2201-E4 Series: Intel® Atom™ Processor E3845 (Quad Core, 1M Cache, 1.91 GHz)
OS: Windows Embedded Standard 7 64-bit or Linux Debian 8 64-bit
System Memory: 1 DDR3 SO-DIMM slot, 8 GB max.
• E3815 and E3826 support DDR3L-1066
• E3845 supports DDR3L-1333
USB: 1 bootable USB 3.0 port, 2 bootable USB 2.0 ports (type A)

Storage
mSATA: 1 internal mini-PCIe socket for OS storage
SD: 1 SD 3.0 (SDHC/SDXC) socket for storage expansion*
*W7E only supports SD 2.0

Audio
Output: Line-out interface (together with HDMI)

Other Peripherals
Expansion Slot: 2 Mini-PCIe sockets
• 1 USB signal, for Sierra Wireless 3G/LTE module
• 1 USB + PCIe signal
USIM: 1 USIM slot

Display
Graphics Controller: Intel® HD (integrated)
Connector Type: 1 HDMI connector (type A)
Display Interface: Supports HDMI 1.4a, 1920 x 1080 pixels @ 60/24 Hz

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 2
Isolation Protection: 1.5 kV

Wireless SMA Interface
Wi-Fi: 2 SMA connectors
3G/LTE: 2 SMA connectors
GPS: 1 SMA connector

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

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: DI x 4
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
Logic level 0: Close to GND
Logic level 1: Open
Digital Input Levels for Wet Contacts:
Logic level 1: +3 V max.
Logic level 0: +10 V to +30 V (Source to DI)
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

Digital Output
Output Channels: DO x 4, sink type
Output Current: Max. 200 mA per channel
On-State Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10-pin screw-fastened Euroblock terminal
Isolation: 3 kV optical isolation

LEDs
System: Power, user-defined
Storage: mSATA, SD
LAN: 2 LEDs per port (100/1000 Mbps)
Serial: 2 LEDs per port (Tx and Rx)
Wireless: Mini-PCIe 1, Mini-PCIe 2

Switches and Buttons
Power Switch: on/off (left-side panel)
Reset Button: For warm reboot (left-side panel)

Physical Characteristics
Housing: Aluminum
Weight: 940 g (2.09 lb)
Dimensions:
Without ears: 150 x 48.8 x 120.2 mm (5.91 x 1.92 x 4.73 in)
With ears: 178 x 52.5 x 120.2 mm (7.01 x 2.07 x 4.73 in)
Mounting: DIN rail, wall

Environmental Limits
Operating Temperature:
• E1/E2 models: -40 to 85°C (-40 to 185°F)
• E4 models: -40 to 70°C (-40 to 158°F)
• E1-W/E2-W/E4-W models with Moxa recommended wireless modules (3G/LTE + Wi-Fi) installed: -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: IEC 60068-2-64: 5 Grms, 5 Hz to 500 Hz, 1 hr/axis w/ mSATA, SD
Anti-Shock: IEC 60068-2-27: 100 g/11 ms ±X, ±Y, ±Z, 3 shocks each axis w/ mSATA, SD

Power Requirements
Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)
Input Current: 2 A @ 9 VDC
Power Consumption: 18 W

Standards and Certifications
Safety: UL 60950-1, CSA C22.2 No. 60950-1-03 (60950-1-07), EN 60950-1, UL 508
EMC: EN 55022/24, EN 61000-6-2/6-4*
*Passed with AC/DC adapter.
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE

Reliability
Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds

MTBF (mean time between failures)
Time: 408,275 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Linux

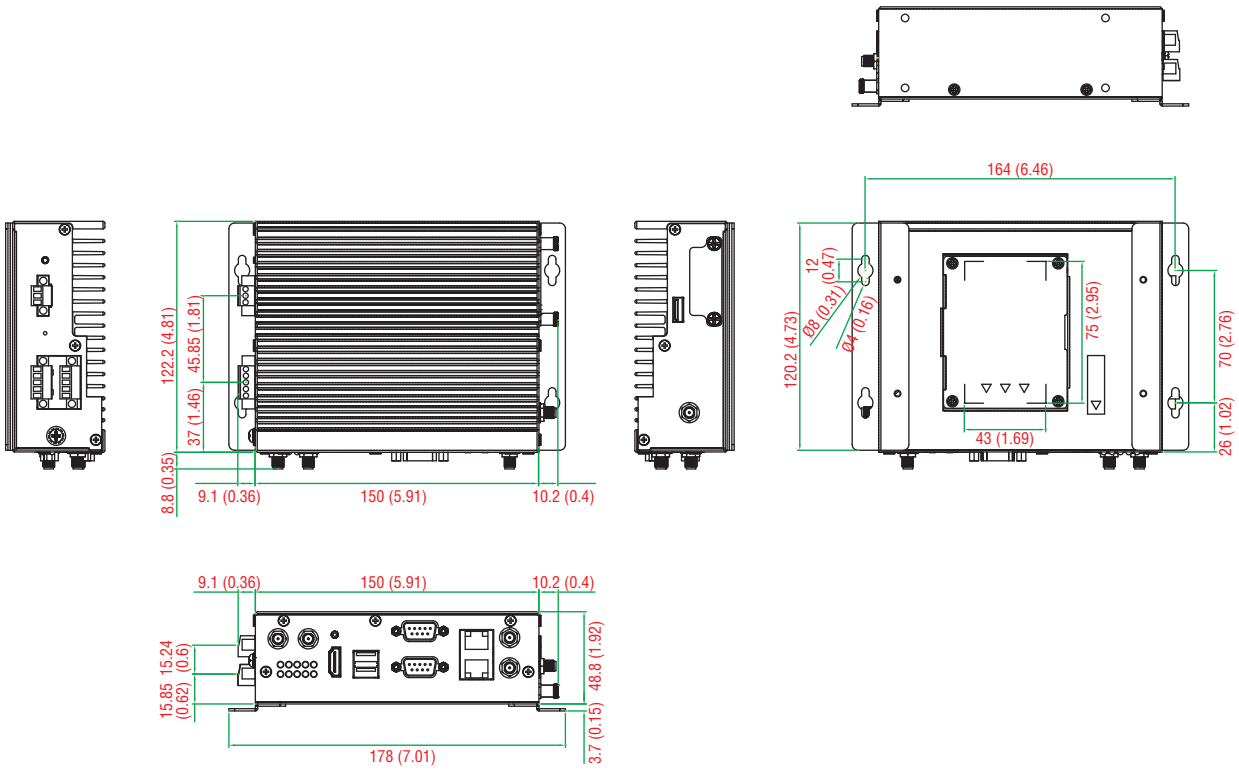
OS: Linux Debian 8 64-bit
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: EXT2, EXT3, EXT4
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP,PAP,DHCP, NTP,NFS, SSH, PPP, SFTP, RSYNC, SSL
Internet Security: OpenVPN, IPTables
Secure Shell for Remote Access: SSH allows remote logins to a secure encrypted console from any connected network
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API)
Embedded Self-Health Maintenance Software: Moxa Proactive Monitoring

Windows Embedded Standard 7

Core OS:
• 64-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Western, Middle Eastern, South East Asian, and South Asian
Graphics and Multimedia:
• MPEG Layer-3 Audio Codecs (MP3)
• MPEG4 Decoders
• DirectX and Windows Device Experience
Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update
Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking
Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)
Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Registry Filter
• WSDAPI for .NET
File Systems and Data Store:
• Windows Data Access Components
• Windows Backup and Restore
Maintenance: Moxa Proactive Monitoring and Moxa Smart Recovery

Dimensions

Unit: mm (inch)



Ordering Information

Pre-Configured Models

	Must select for system to work														
Model Name	CPU	RAM	mSATA	OS	SD	HDMI	LAN	Serial	DI/O	USB 3.0/2.0	USIM slot	Expansion Socket	Wireless Connector	LTE Heat Sink	Operating Temp.	LTE Operating Temp.
V2201-E1-T-LX	E3815	2 GB	8 GB	Debian 8	–	1	2	2	4/4	1/2	1	2	–	–	-40 to 85°C	–
V2201-E1-T-W7E	E3815	4 GB	8 GB	W7E	–	1	2	2	4/4	1/2	1	2	–	–	-40 to 85°C	–

CTO Models

	Must select for system to work														
Model Name	CPU	RAM (CTO*)	mSATA (CTO*)	OS (CTO*)	SD (CTO*)	HDMI	LAN	Serial	DI/O	USB 3.0/2.0	USIM slot	Expansion Socket	Wireless Connector	LTE Heat Sink	Operating Temp.	LTE Operating Temp.
V2201-E1-T	E3815	Default 4 GB (2 or 8 GB optional)	Default 8 GB (16 or 32 GB optional)	Default N/A (Debian 8 or W7E optional)	Default N/A (8, 16, 32, or 64 GB optional)	1	2	2	4/4	1/2	1	2	–	–	-40 to 85°C	–
V2201-E2-T	E3826					1	2	2	4/4	1/2	1	2	–	–	-40 to 85°C	–
V2201-E4-T	E3845					1	2	2	4/4	1/2	1	2	–	–	-40 to 70°C	–
V2201-E1-W-T	E3815					1	2	2	4/4	1/2	1	2	5	1	-40 to 85°C	-40 to 70°C
V2201-E2-W-T	E3826					1	2	2	4/4	1/2	1	2	5	1	-40 to 85°C	-40 to 70°C
V2201-E4-W-T	E3845					1	2	2	4/4	1/2	1	2	5	1	-40 to 70°C	-40 to 70°C

*CTO = Configured To Order

Note:

Refer to the Component Compatibility Guide (CCG) for the list of components that Moxa has validated to be compatible with this product. You can download the CCG from the Moxa product website. For components with a Moxa P/N, you can order the components together with your product from Moxa and we will install the selected components in your product. Moxa guarantees the compatibility of the components installed in CTO products.

Package Checklist

- V2201 embedded computer
- Terminal block to power jack converter
- Wall-mounting kit
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

UC-8416/8418 Series

RISC ready-to-run embedded computers with 8 serial ports, 3 LANs, DIOs, 8 switch ports, 2 CAN ports, USB, CompactFlash

- Intel XScale IXP435 533 MHz processor
- 8 RS-232/422/485 serial ports
- 2 CAN-bus ports (UC-8418)
- 8 unmanaged-switch ports (UC-8416)
- 12 digital input and 12 digital output channels (UC-8418)
- 3 10/100 Mbps Ethernet ports
- 2 USB 2.0 hosts for mass storage devices
- Supports IPv6 function (Linux model only)
- DIN-rail or wall-mounting 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-8416/8418 series embedded computers come with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 2 CAN ports, 8 Ethernet 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. These computers come with various communication interfaces, such as serial ports, Ethernet ports, CAN ports, and digital input/output channels, making them ideal as a communication platform for industrial applications that require network and device communications.

The UC-8416/8418 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-8416/8418 Series platform by using a common compiler, without needing to modify the code. making these computers an optimal solution for use with industrial applications, but with minimal cost and effort.

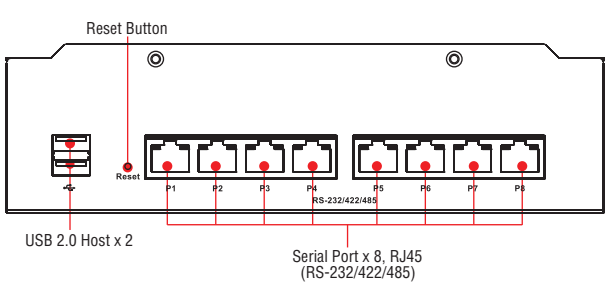
In addition to the standard model, a -40 to 75°C wide temperature model is also available for harsh industrial environments.

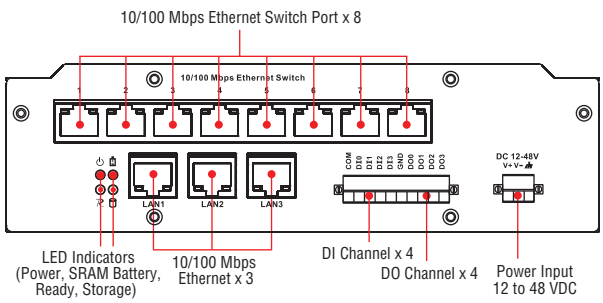
Appearance

Front View

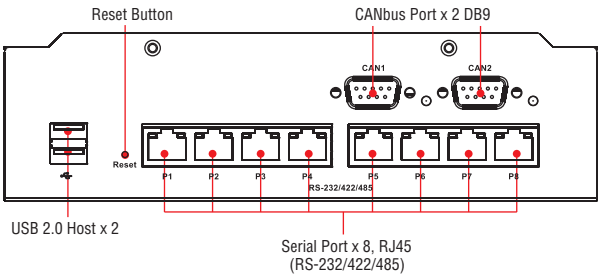
Rear View

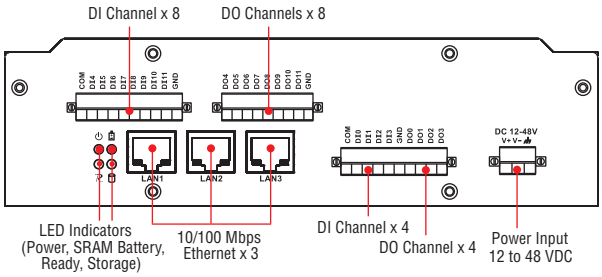
UC-8416





UC-8418





Hardware Specifications

Computer
CPU: Intel XScale IXP435, 533 MHz
Expansion Bus: PCI/104 onboard
USB: USB 2.0 hosts x 2, type A connectors
DRAM: DDR2 SDRAM, 256 MB (512 MB max.)
Flash:
• NOR Flash, 16 MB to sore OS (32 MB max. on CV request)
• NAND Flash, 32 MB to store data
OS (pre-installed): Linux
SRAM: 256 KB, battery backup

Storage
Storage Expansion: CompactFlash socket

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 3
Switch Port: 10/100 Mbps unmanaged-switch ports (RJ45) x 8 (UC-8416)
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface
Serial Standards: RS-232/422/485 software-selectable ports (8-pin RJ45) x 8
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 nonstandard 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:
UC-8416: DI x 4
UC-8418: DI x 12
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-fastened terminal block (4 points, COM, GND)
Isolation: 3 kV optical isolation

Digital Output
Output Channels: UC-8416: DO x 4, sink type
UC-8418: DO x 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-fastened terminal block (4 points, GND)
Isolation: 3 kV optical isolation

CANbus Communication (UC-8418 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, 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 (2.22 lb)
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 Grms @ 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)
Input Current:
• 310 mA @ 48 VDC
• 625 mA @ 24 VDC
• 1350 mA @ 12 VDC
Power Consumption: 15 W

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)

Time:
• UC-8416: 156,942 hrs
• UC-8418: 149,140 hrs
Standard: Telcordia (Bellcore) Standard

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 adapter and cables.

Software Specifications

Linux

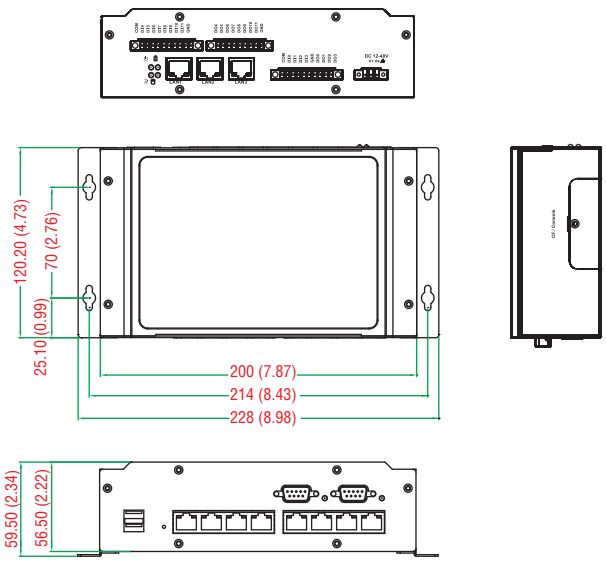
OS: Linux 3.8.13
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, IPTables Firewall
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon Works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ cross-compiler
• GNU C library
• GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0
File System: FAT
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP
Web Server (WinCE IIS): Supports ASP, ISAPI Secure Socket Layer (SSL 2/3) and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions
Dial-up Networking: Supports RAS client API and PPP, Extensible Authentication Protocol (EAP), and RAS scripting
Watchdog: Features a hardware function to trigger system reset in a user-specified time interval. (Moxa API provided)
Application Development Software:
• Moxa WinCE 6.0 SDK
• Moxa API Library
• C runtime libraries
• 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
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-8416/8418 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 adapter (including power jack converter)
- Documentation and software CD
- 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 single 10/100 Mbps Ethernet for network redundancy
- 1 or 2 software-selectable RS-232/422/485 ports
- 50 bps to 921.6 kbps baudrate (nonstandard 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.

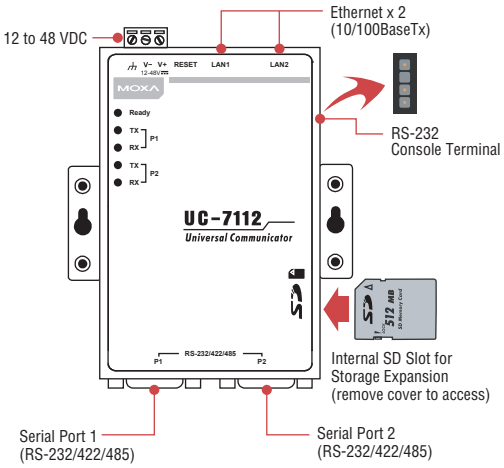
The UC-7101/UC-7110/UC-7112 platforms use the ARM9 RISC CPU. The architecture and modern semiconductor technology used in the ARM9 RISC CPU are designed to provide the CPU with a powerful computing engine and many useful communication functions, but without generating too much heat. The built-in 8 or 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.

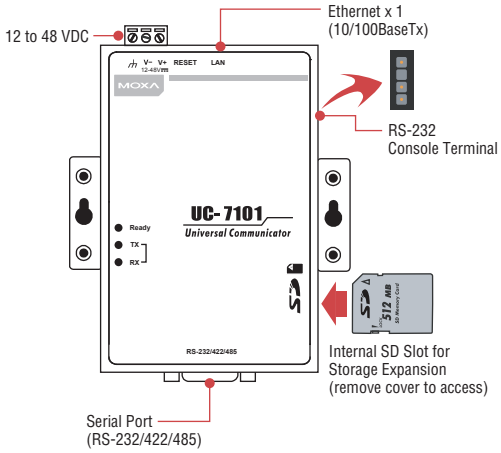
The pre-installed µClinux or Linux operating system provides an open platform for software development. This means that software written for desktop PCs can be easily ported to a UC-7101, UC-7110, or UC-7112 embedded computer with a GNU cross complier, eliminating the need to spend time modifying existing 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
DRAM:
UC-7101/7110/7112: 16 MB
UC-7112 Plus: 32 MB
Flash:
UC-7101/7110/7112: 8 MB
UC-7112 Plus: 16 MB
OS (pre-installed): µClinux or Linux

Storage

Storage Expansion: SD slot (UC-7101, UC-7112, and UC-7112 Plus only)

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps (RJ45)
• UC-7101: 1 port
• UC-7110/7112/7112 Plus: 2 ports
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: RS-232/422/485 software-selectable (DB9 male)
• UC-7101: 1 port
• UC-7110/7112: 2 ports
ESD Protection: 4 kV ESD for all signals
Console Port: RS-232 (TxD, RxD, GND)
• UC-7101: 4-pin pin header output
• UC-7110/7112: 3-wire pin-header

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard 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 (0.29 lb)
• UC-7110/7112: 190 g (0.42 lb)
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 Grms @ 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
Input Current:
• 170 mA @ 24 VDC
• 340 mA @ 12 VDC
Power Consumption: 4.5 W

Standards and Certifications

Safety:
• UC-7101: UL 60950, CSA-C22.2 No. 60950-1, EN 60950-1
• UC-7110/7112: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC: EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A, DNV
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

Time:
UC-7101: 514,973 hrs
UC-7110: 149,414 hrs
UC-7112 Plus: 148,980 hrs
UC-7112: 148,980 hrs
Standard:
UC-7101: Telcordia (Bellcore) Standard
UC-7110: MIL-HDBK-217F
UC-7112 Plus: Bellcore-SR332
UC-7112: MIL-HDBK-217F

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Linux (UC-7112-LX Plus only)

OS: Linux 2.6.38
File System: JFFS2, NFS, Ext2, Ext3, Ext4, VFAT/FAT
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMP v1/v2c, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE, SSH 1.0/2.0, SSL
Internet Security: OpenVPN, IPTables Firewall, OpenSSL
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon Works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Watchdog: Features a hardware function to trigger system reset in a user-specified time interval(Moxa API provided)
Moxa Package Management System (MPKG): Provides package management system which you can install/uninstall software utilities or libraries.
IP Bonding: Linux standard bonding driver provides a method for aggregating multiple network interfaces into a single logical “bonded” interface.
Net-SNMP: Support v1 and v2c.
Cryptographic Hardware Accelerator: Supports DES-ECB, DES-CBC, DES-EDE3, AES-ECB, and AES-CBC algorithms
Debian: Debian 5 lenny port provided
Application Development Software:
• Moxa API Library (Moxa serial I/O control, Moxa DI/DO API, Moxa buzzer API)
• GNU C/C++ cross-compiler
• GNU C library

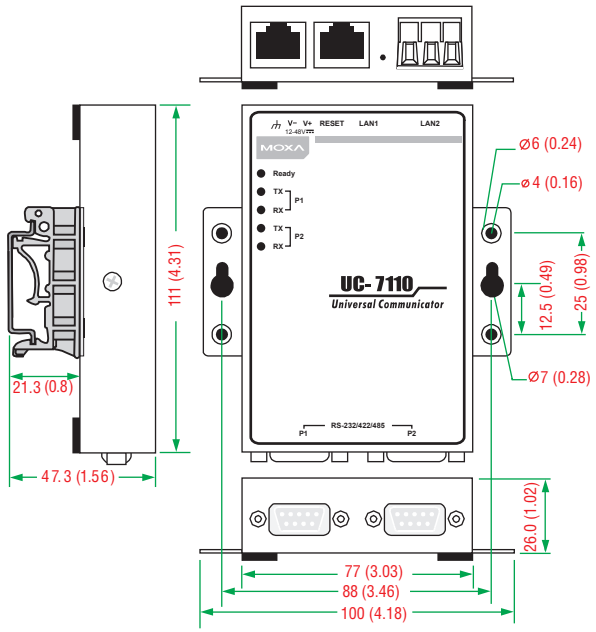
µClinux

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 (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon Works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
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

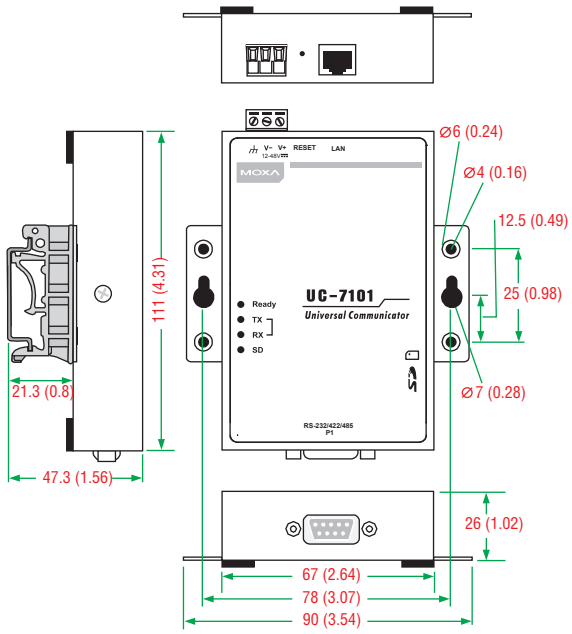
Dimensions

UC-7110/UC-7112

Unit: mm (inch)



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 adapter (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 (nonstandard 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

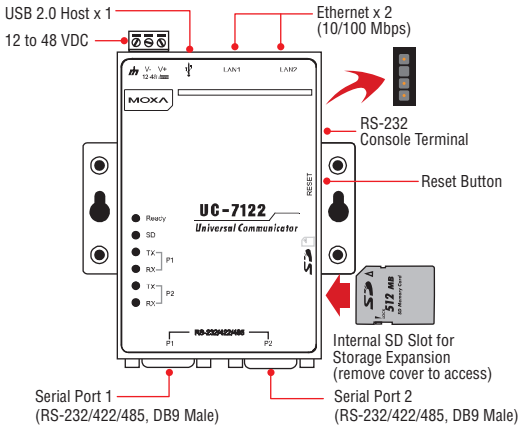
The UC-7122/7124 embedded computers come with 2 or 4 RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports to provide users with a versatile communication platform, making these RISC-based embedded computers ideal for your embedded applications.

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. The RS-232/422/485 serial ports on these computers allow you to connect a variety of serial devices. 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.

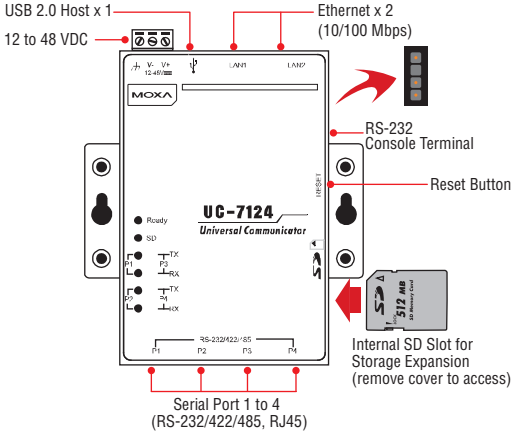
The pre-installed WinCE 5.0 operating system provides a common Windows-based software operating system for software program development. This means that software written in Visual C/C++ for desktop PCs can easily be ported to the UC-7122/7124 computers with a general programming tool such as Microsoft Embedded Visual C++ or Microsoft Visual Studio 2005. You will not need to spend time modifying existing software code, the operating system, device or the drivers. You can store the software that you created on the computer's flash memory without any modification.

Appearance

UC-7122



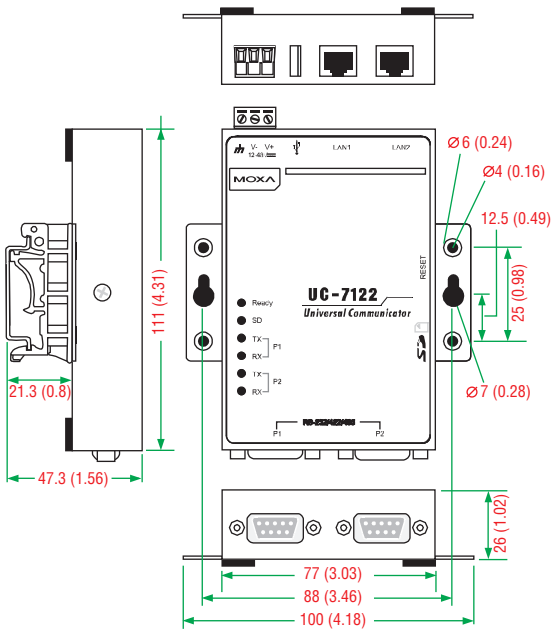
UC-7124



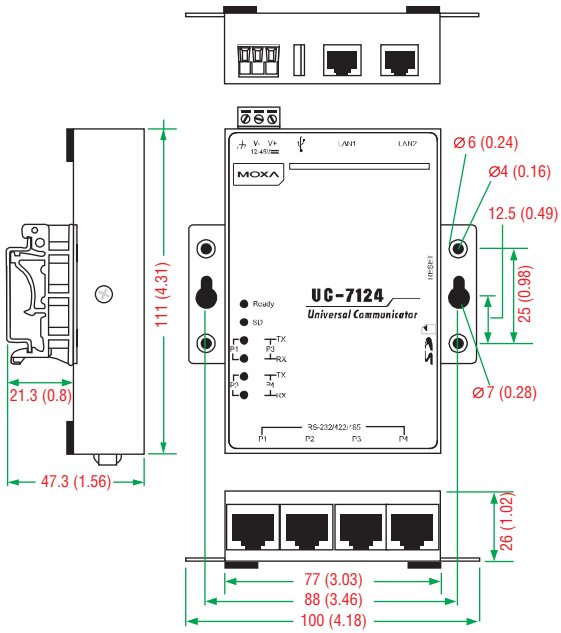
Dimensions

UC-7122

Unit: mm (inch)



UC-7124



Hardware Specifications

Computer

CPU: Cirrus EP9302 ARM9 CPU, 200 MHz
USB: USB 2.0 hosts x 1, type A connector
DRAM: DDR2 SDRAM, 32 MB
Flash: NOR Flash, 16 MB
OS (pre-installed): Windows CE 5.0

Storage

Storage Expansion: SD slot

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface

Serial Standards:
UC-7122: RS-232/422/485 ports, software-selectable (DB9 male) x 2
UC-7124: RS-232/422/485 ports, software-selectable (RJ45) x 4
ESD Protection: 4 kV for all signals
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard 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 (0.42 lb)
UC-7124: 200 g (0.44 lb)
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 Grms @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
UC-7122:
• 170 mA @ 24 VDC
• 340 mA @ 12 VDC
UC-7124:
• 180 mA @ 24 VDC
• 360 mA @ 12 VDC
Power Consumption:
• UC-7122: 4.1 W
• UC-7124: 4.3 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)

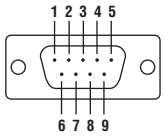
Time:
• UC-7122: 234,746 hrs
• UC-7124: 210,233 hrs
Standard: Telcordia (Bellcore) Standard

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 adapter and cables.

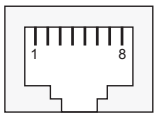
Pin Assignment

UC-7122 (DB9 male connector)



PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

UC-7124 (8-pin RJ45 connector)



PIN	RS-232	RS-422/485-4w	RS-485
1	DSR	–	–
2	RTS	TxD+	–
3	GND	GND	GND
4	TxD	TxD-	–
5	RxD	RxD+	Data+(B)
6	DCD	RxD-	Data-(A)
7	CTS	–	–
8	DTR	–	–

Software Specifications

Windows Embedded CE 5.0

OS: Windows Embedded CE 5.0
File System: FAT (for onboard flash memory)
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 based on a user-specified time interval. (Moxa API provided)

Application Development Software:
• Moxa WinCE 5.0 SDK
• Moxa API Library
• C runtime libraries
• 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)

DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws

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 adapter (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	✓	–	✓

IA260 Series

Award-winning Product
TAIWAN EXCELLENCE 2009

RISC-embedded computers with 4 serial ports, dual LANs, VGA, DIOs, 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.

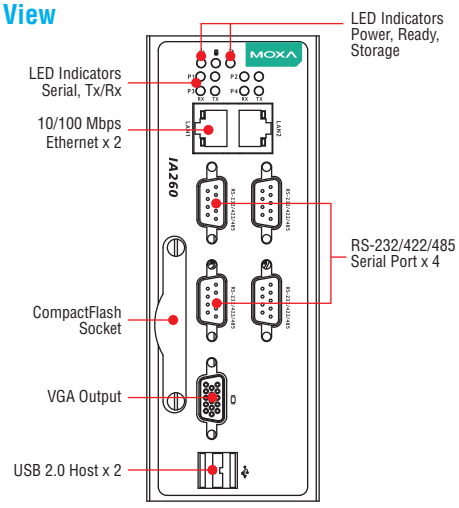
The IA260 computers use the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application software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

The patented "H-Type" heat dissipation design can directly transmit heat from inside the housing to the outside, which makes the IA260 an ideal computing unit for applications that involve extremely high temperatures. 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.

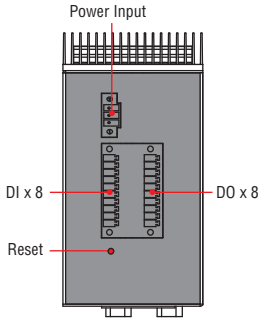
The IA260 computers support RS-232/422/485, digital I/O, and have dual LAN ports, making them ideal for communication platforms in industrial applications that require network redundancy. In addition to the standard model, a wide-temperature (-40 to 75°C) model is available for use in harsh industrial-automation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

Appearance

Front View



Top View



Hardware Specifications

Computer
CPU: Cirrus EP9315 ARM9 CPU, 200 MHz
USB: USB 2.0 hosts x 2, type A connector
DRAM: DDR2 SDRAM, 128 MB
Flash: NOR Flash, 32 MB
OS (pre-installed): Linux or Windows CE 6.0

Storage
Storage Expansion: CF card type I/II

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: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Serial Standards: RS-232/422/485 ports, software-selectable (DB9 male) x 4
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 nonstandard 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: DI x 8
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-fastened terminal block (8 points, COM, GND)
Isolation: 3 kV optical isolation

Digital Output
Output Channels: DO x 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-fastened 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 (2.22 lb)
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 Grms @ 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)
Input Current:
With no load on USB ports:
• 240 mA @ 24 VDC
• 480 mA @ 12 VDC
With full load on USB ports:
• 450 mA @ 24 VDC
• 900 mA @ 12 VDC
Power Consumption:
With no load on USB ports: 5.8 W
With full load on USB ports: 11 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 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 3 V/m
IEC 61000-4-8 1 A/m
IEC 61000-4-11
Green Product: RoHS, CRoHS, WEEE

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

MTBF (mean time between failures)
Time: 145,328 hrs
Standard: Telcordia (Bellcore) Standard

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 adapter and cables.

Software Specifications

Linux

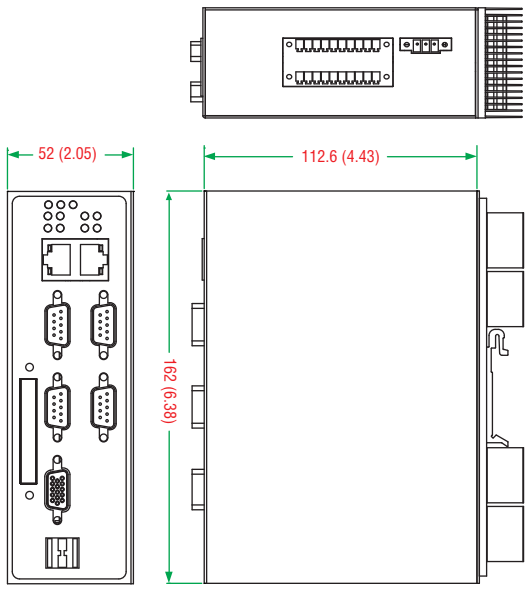
OS: Linux 2.6.23
Web Server (Apache): Allows you to create and manage web sites
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, IPTables Firewall
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon Works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
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 onboard flash memory)
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 adapter
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

IA240 Series

Award-winning Product
TAIWAN EXCELLENCE 2006

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
- 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 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.

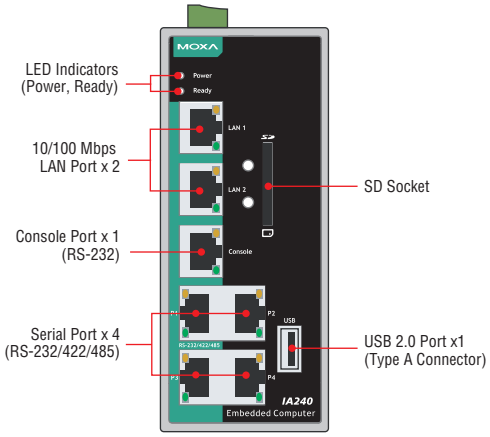
The IA240's vertical DIN-rail form factor makes it easy to install the computers in a small cabinet. This space-saving solution also facilitates easy wiring, making the IA240 a great choice as front-end embedded controllers for industrial applications.

Wide-temperature models of the IA240 are also available. The IA240-T can operate reliably in a temperature range from -40 to 75°C, making them appropriate for harsh industrial automation environments.

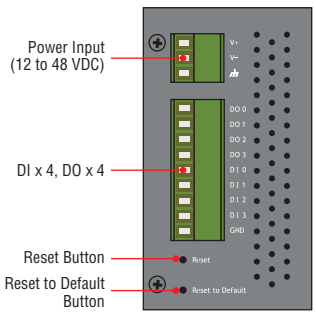
The industrial design of the IA240 provides a robust, reliable computing platform. Due to their RISC-based architecture, the IA240 computers will not generate a lot of heat, making them ideal for industrial automation environments.

Appearance

Front View



Top View



Hardware Specifications

Computer
CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz
USB: USB 2.0 hosts x 1, type A connector
DRAM: DDR2 SDRAM, 64 MB
Flash: NOR Flash, 16 MB
OS (pre-installed): Embedded Linux

Storage
Storage Expansion: SD slot

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface
Serial Standards: RS-232/422/485 ports, software-selectable (8-pin RJ45) x 4
ESD Protection: 4 kV for all signals
Console Port: RS-232, RJ45 connector, supports PPP

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard 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: DI x 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: DO x 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:
430 g (0.96 lb)
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 Grms @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 min 17 sec per axis

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current:
• 300 mA @ 24 VDC
• 600 mA @ 12 VDC
Power Consumption: 7 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
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV
IEC 61000-4-6 CS: Signal: 10 V/m
IEC 61000-4-8 1 A/m
IEC 61000-4-11
Green Product: RoHS, CRoHS, WEEE

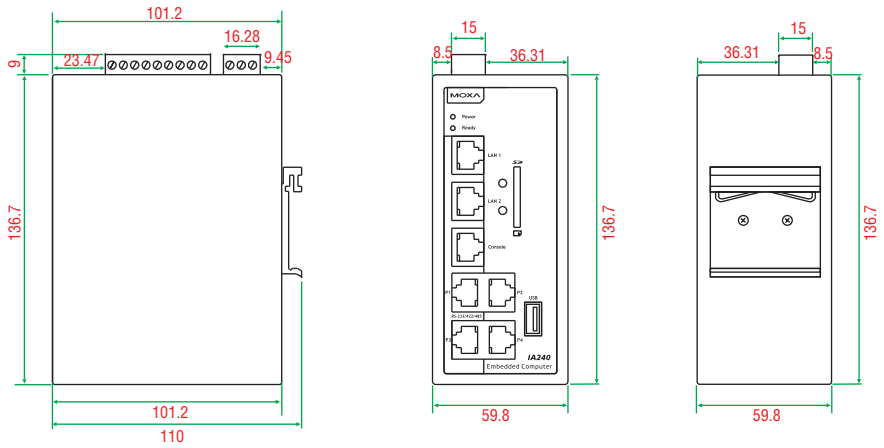
Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time: 425,321 hrs
Standard: Telcordia (Bellcore) Standard

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 adapter and cables.

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View

Software Specifications

Linux

OS: Linux 2.6.9
Web Server (Apache): Allows you to create and manage web sites
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
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
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
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
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

Package Checklist

- IA240 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 adapter (including terminal block to power jack converter)
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Wireless Computers

Product Selection Guide

Wireless Embedded Computers 27-2

Multiple WAN Programmable Routers

MAR-2000 Series: Industrial multi-radio mobile access and applications router. 27-3

Cellular Computers

W6000 Series: Compact, rugged, wireless computer with 3G/LTE, LAN, and 2 serial ports 27-7

WLAN Computers

UC-8100-ME-T Series: Communication-centric RISC computing platform 27-10

UC-8410A Series: Highly efficient, security-enabled, wireless platform that supports a rich set of interfaces . . . 27-14

Wireless Embedded Computers

Preliminary

Preliminary

Preliminary

	MAR-2000	W6000	UC-8100-ME-T	UC-8410A
Computer				
CPU Speed	533 Mhz	300 MHz	1 GHz	1 GHz x 2
OS (pre-installed)	Linux	Linux	Linux	Linux Debian 8
DRAM	512 MB	512 MB	512 MB	512 MB
Flash	32 MB	4 GB	4 GB	–
USB Ports	2 (USB 2.0)	–	1 (USB 2.0)	2 (USB 2.0 Type A)
Relay Outputs	4 DIs, 4 DOs	–	–	4 DIs, 4 DOs
Storage				
SD Slots	–	mSD Slot x 1	SD Slot x 1	SD Slot x 1, with 1 GB pre-installed
CompactFlash	✓	–	–	–
mSATA Slots	–	–	–	1
LAN Interface				
10/100 Mbps Ethernet Ports	2	1	2	–
10/100/1000 Mbps Ethernet Ports	–	–	–	3
Magnetic Isolation Protection	1.5 kV	1.5 kV	1.5 kV	1.5 kV
WLAN Interface				
Standard Compliance	802.11a/b/g/n	802.11a/b/g/n	–	802.11a/b/g/n
Radio Frequency Type	DSSS, CCK, OFDM	DSSS, CCK, OFDM	–	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	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	–	802.11a: 6 to 54 Mbps 802.11b: 1 to 11 Mbps 802.11g: 6 to 54 Mbps
Wireless Security	WEP: 64/128-bit WPA, WPA2 data encryption	WEP: 64/128-bit WPA, WPA2 data encryption	–	64/128-bit WEP, WPA, WPA2, 802.1x
Cellular Interface				
Cellular Modes	GSM/GPRS/EDGE/UMTS/HSPA+	GSM/GPRS/EDGE/UMTS/HSPA+/LTE	GSM/GPRS/EDGE/UMTS/HSPA+/LTE	GSM/GPRS/EDGE/UMTS/HSPA+/LTE
Radio Frequency Bands	• Five band UMTS(WCDMA/FDD) • 800/850/1900 AWS and 2100 MHz • Quad-band GSM: 850/900/1800/1900 MHz • 4G: LTE-FDD / HSPA+ (B1, B2, B3, B5, B7, B8, B20) • 4G: LTE-FDD, HSPA+, GSM/GPRS/EDGE, GSM/GPRS/EDGE, CDMA (B1, B2, B4, B5, B8, B13, B17, B25, BC0, BC1, BC10)	• Five band UMTS(WCDMA/FDD) • 800/850/1900 AWS and 2100 MHz • Quad-band GSM: 850/900/1800/1900 MHz • 4G: LTE-FDD / HSPA+ (B1, B2, B3, B5, B7, B8, B20) • 4G: LTE-FDD, HSPA+, GSM/GPRS/EDGE, GSM/GPRS/EDGE, CDMA (B1, B2, B4, B5, B8, B13, B17, B25, BC0, BC1, BC10)	• Five band UMTS(WCDMA/FDD) • 800/850/1900 AWS and 2100 MHz • Quad-band GSM: 850/900/1800/1900 MHz • 4G: LTE-FDD / HSPA+ (B1, B2, B3, B5, B7, B8, B20) • 4G: LTE-FDD, HSPA+, GSM/GPRS/EDGE, GSM/GPRS/EDGE, CDMA (B1, B2, B4, B5, B8, B13, B17, B25, BC0, BC1, BC10)	• Five band UMTS(WCDMA/FDD) • 800/850/1900 AWS and 2100 MHz • Quad-band GSM: 850/900/1800/1900 MHz • 4G: LTE-FDD / HSPA+ (B1, B2, B3, B5, B7, B8, B20) • 4G: LTE-FDD, HSPA+, GSM/GPRS/EDGE, GSM/GPRS/EDGE, CDMA (B1, B2, B4, B5, B8, B13, B17, B25, BC0, BC1, BC10)
Serial Interface				
RS-232/422/485 Ports	2 (DB9 male)	2 (terminal block)	2 (terminal block)	8
ESD Protection	4 kV	15 kV	15 kV	15 kV
Console Port	–	✓	✓	✓
Serial Communication Parameters	Even, Odd, Space, Mark	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	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark
Flow Control	Flow Control RTS/CTS, XON/XOFF	RTS/CTS, XON/XOFF, ADDC™	RTS/CTS, XON/XOFF, ADDC™	RTS/CTS, XON/XOFF, ADDC™
Baudrate	50 bps to 115.2 kbps	50 bps to 921.6 kbps (nonstandard baudrates supported)	50 bps to 921.6 kbps (nonstandard baudrates supported)	50 bps to 115.2 kbps (nonstandard baudrates supported)
LEDs				
System	Power, Ready, Storage, Programmable	Ready, PWR	Ready, PWR	Ready, PWR
Diagnostics	–	–	✓	✓
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M, 1000M
WAN	–	–	–	–
Cellular	–	Cellular Enabled, Signal Strength	Cellular Enabled, Signal Strength	Signal Strength
Serial	–	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics				
Housing	SECC sheet metal (1 mm)	SECC sheet metal (1 mm)	SECC sheet metal	SECC sheet metal (1 mm)
Weight	1 kg (2.22 lb)	875 g (1.94 lb)	1.02 kg (2.27 lb)	1 kg (2.22 lb)
Dimensions	200 x 57 x 120 mm	111 x 25 x 77 mm	141 x 54.8 x 125.6 mm	200 x 120 x 48.6 mm
Mounting	DIN rail, wall	DIN rail, wall	DIN rail, wall	DIN rail, wall
Environmental Limits				
Operating Temperature	-25 to 70°C (-13 to 158°F)	-40 to 70°C (-40 to 158°F)	-40 to 85°C (-40 to 185°F)	-10 to 60°C / -40 to 75°C (-14 to 140°F / -40 to 167°F)
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-40 to 80°C (-40 to 176°F)	-40 to 85°C (-40 to 185°F)	-40 to 85°C (-40 to 185°F)	-20 to 75°C / -40 to 85°C (-4 to 167°F / -40 to 185°F)
Anti Vibration/Shock	IEC 61373 standard	IEC 61373 standard	IEC 61373 standard	IEC 61373 standard
Regulatory Approvals				
Safety	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1	UL 60950-1, EN 60950-1	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 B, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B	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 B, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B
Wheeled Vehicles	EN 50155, EN 50121-2-3, EN -4, IEC 61373	–	–	–
Green Product	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE	RoHS, CRoHS, WEEE
Reliability				
Buzzer, RTC, WDT	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)			
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MAR-2000 Series

Industrial multi-radio mobile access and applications router

- Dynamic routing across multiple WANs
- Policy-based routing management
- Simple Web management user interface
- IEEE 802.11a/b/g/n wireless AP/bridge/client
- Five-band UMTS/HSPA+ and quad-band GSM/GPRS/EDGE industrial IP-modems
- Complies with a portion of EN 50155 specifications
- Built-in 50-channel GPS for location-based applications
- -25 to 70°C wide temperature range (EN 50155 Class T3)

Overview

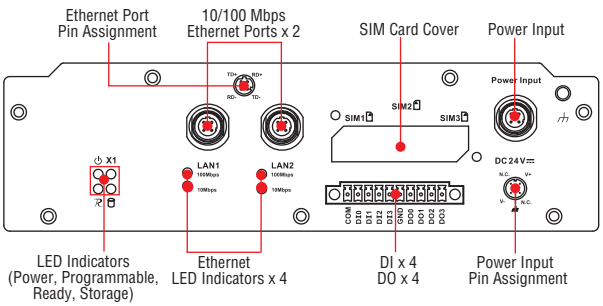
The MAR-2000 is a compact, simple, and programmable RISC-based wireless mobile router with strong wireless routing capabilities. With a built-in GPS module, HSPA+ cellular and 802.11a/b/g/n wireless capabilities, independent power switches on its cellular module connectors, and high thermal tolerance, the MAR-2000 is compliant with a portion of EN 50155 specifications. The built-in 32 MB NOR Flash ROM and 512 MB SDRAM give you enough memory for installing your own application software, the 512 MB NAND Flash can be used to provide additional data storage, and the CompactFlash socket is available for adding more memory when needed. The built-in GPS module supports geo-fencing functionality, making it ideal for managing wireless connections in cross-WAN environments often associated with rolling stock and other vehicular applications.

When a train travels to a different region, it often encounters switches that support different wireless interfaces, such as Wi-Fi, UMTS, and HSPA+. The MAR-2000 uses multiple-WAN support and backup functionality to ensure that your wireless connections are always available, stable, and reliable.

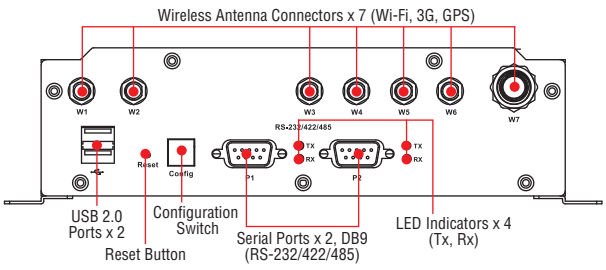
As an added bonus, the MAR-2000 series includes wide temperature models designed to operate reliably in extreme environments with temperatures ranging from -25 to 70°C.

Appearance

Front View

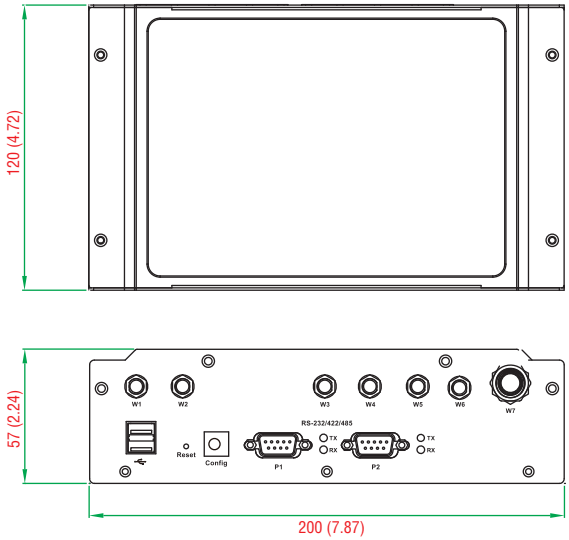


Rear View



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz
USB: USB 2.0 hosts x 2, type A connector
DRAM: DDR2 SDRAM, 512 MB
Flash:
• NOR Flash, 32 MB onboard to store OS
• NAND Flash, 512 MB (1 GB max.) for OS file system, caching storage, and data logger
OS (pre-installed): Linux 3.8.13

Storage

Storage Expansion: CompactFlash (Type I/II) sockets x 1, up to 8 GB

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps ports (M12) x 2
Magnetic Isolation Protection: 1.5 kV, built in

GPS Module (U-Blox LEA-6S)

Receiver Types:
• 50-channel U-blox 6 engine
• GPS L1 C/A code
• SBAS: WAAS, EGNOS, MSAS, GAGAN
Acquisition:
• Cold starts: 28 s
• Warm starts: 28 s
• Aided starts: 1 s
• Hot starts: 1 s
Sensitivity:
• Tracking: -160 dBm
• Reacquisition: -160 dBm
• Cold starts: -147 dBm
Timing Accuracy:
• RMS: 30 ns
• 99%: < 60 ns
• Granularity: 21 ns
Accuracy:
• Position: 2.5 m CEP
• SBAS: 2.0 m CEP
Protocols: NMEA, UBX binary, 5 Hz max. update rate (ROM version)
Time Pulse: 0.25 Hz to 1 kHz
Velocity Accuracy: 0.1 m/s
Heading Accuracy: 0.5 degrees
A-GPS: Supports AssistNow Online and AssistNow Offline, OMA SUPL compliant
Operational Limits: Velocity: 500 m/s (972 knots)
Connector Type: TNC

WLAN Module (Atheros AR9220)

WAPN001: IEEE 802.11a/b/g/n wireless LAN module with TNC antenna connector
Standards: IEEE 802.11a/b/g/n for wireless LAN
Connector Type: QMA connectors (female type) x 2
Mode: Client/AP

Cellular Module (Cinterion PH8)

Frequency Bands: GSM/GPRS/EDGE/UMTS/HSPA+
Band Options:
• Five-band UMTS (WCDMA/FDD)
• 800/850/1900 AWS and 2100 MHz
• Quad-band GSM: 850/900/1800/1900 MHz
HSDPA/HSUPA Data Rates:
DL: 3.6/7.2/14.4 Mbps; UL: 2.0/5.76 Mbps
UMTS Data Rates:
DL: 384 kbps (max.); UL:384 kbps (max.)
EDGE Class 12:
DL: 237 kbps (max.); UL: 237 kbps (max.)
GPRS Class 12:
DL: 85.6 kbps (max.); UL: 85.6 kbps (max.)
Connector Type: QMA connector (female type)

Serial Interface

Serial Standards: RS-232/422/485 software-selectable ports (DB9) x 2
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 nonstandard 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: DI x 4
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-fastened terminal block (4 points, COM, GND)
Isolation: 2 kV optical isolation

Digital Output
Output Channels: DO x 4, sink type
Output Current: 200 mA (max.) per channel
On-State Voltage: 24 VDC nominal, open collector to 30 V
Connector Type: 10-pin screw-fastened terminal block (4 points, GND)

LEDs
System: Power, Ready, Storage, Programmable
LAN: 10M x 2, 100M x 2 (on connector)
Serial: TxD x 2, RxD x 2
Reset Button: Supports "Reset to Factory Default"

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight: 1.2 kg (2.67 lb)
Dimensions: 200 x 57 x 120 mm (7.87 x 2.24 x 4.72 in)
Mounting: DIN rail, wall

Environmental Limits
Operating Temperature: -25 to 70°C (-13 to 158°F)
Storage Temperature: -40 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: IEC 61373 standard
Anti-Shock: IEC 61373 standard

Power Requirements
Input Voltage: 24 VDC (9 to 48 V), M12 connector
Input Current: 833 mA @ 24 VDC
Power Consumption: 20 W

Standards and Certifications
Safety: UL 60950-1
EMC: EN 55022 Class A, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, FCC Part 15 Subpart B Class A
Rail Traffic: EN 50155*, EN 50121-3-2, EN 50121-4, IEC 61373
*Complies with a portion of EN 50155 specifications.

Reliability
Alert Tools: Built-in buzzer and RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)
Time:
MAR-2002-T: 280,129 hrs
MAR-2001-T: 350,609 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

Warranty
Warranty Period: 5 years (does not apply to cellular module)
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adapters and cables.

Software Specifications

Linux
OS: Linux 3.8.13
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: JFFS2, NFS, Ext2, Ext3, Ext4, UBIFS
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv2, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, PPP
Internet Security: OpenVPN, IPTables Firewall, OpenSSL
Network Service: Moxa's Dynamic Routing and network management Web UI
GPS: Uses gpsd, which is a daemon that receives data from a GPS receiver, and provides the data back to multiple applications such as Kismet or GPS navigation software
Application Development Software:
• Moxa API Library (Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ cross-compiler, supports EABI
• GNU C library
• GDB source-level debugging server
Software Protection: Encryption tool for user executable files (based on patented Moxa technology)

Ordering Information

Type	Models	
Model Name	MAR-2001-T	MAR-2002-T
Management Service		
MAR-2000 Web Management Utility	Available	
MAR-2000 Dynamic Routing	Available	
Storage		
CF Sockets	1	
Wireless		
Cellular 3G (WCDMA)	2 quad-band GSM/GPRS, EDGE, five-band UMTS/HSPA+ industrial IP-modems	3 quad-band GSM/GPRS, EDGE, five-band UMTS/ HSPA+ industrial IP-modems
Wi-Fi	2 IEEE 802.11a/b/g/n dual-RF wireless AP/bridge/client	1 IEEE 802.11a/b/g/n dual-RF wireless AP/bridge/client
GPS	50-channel GPS module	
Interface		
Ethernet Ports	2	
Serial Ports	2	
DI/DO	4 DIs, 4 DOs	
USB	2.0 host	
Environmental Limits		
Operating Temperature	-25 to 70°C (-13 to 158°F), (EN 50155 Class T3)	
Conformal Coating	Available by Request	

M12 Connectors (can be purchased separately)

M12A-5P-IP68: Field-installaable A-coded screw-fastened power connector, 5-pin female M12 connector, IP68-rated
M12D-4P-IP68: Field-installable D-coded screw-fastened Ethernet connector, 4-pin male M12 connector, IP68-rated

M12 Cables (can be purchased separately)

CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated
CBL-M12D(MM4P)/RJ45-100 IP67: 1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated

WLAN Cable and Antenna

Cable: QMA (male) to SMA (male) adapter with 50 cm cable
Antenna: 2 dual-band omnidirectional antennas (2 dBi, RP-SMA, 2.4/5 GHz)

Cellular Cable and Antenna

Cable: QMA (male) to SMA (female) adapter with 50 cm cable
Antenna: Omni 1 dBi rubber SMA antenna

GPS Cable and Antenna

Cable: TNC to SMA (female) adapter with 50 cm cable
Antenna: 26 dBi, 1572 MHz, L1 band antenna

Package Checklist

- MAR-2000 programmable router
- Wall-mounting kit
- DIN-rail mounting kit
- CBL-4PINDB9F-100: 100 cm console port cable; 4 pin header connector to female DB9 connector
- Documentation and software CD or DVD
- Quick installation guide (printed)

W6000 Series

Preliminary

Compact, rugged, wireless computer with 3G/LTE, LAN, and 2 serial ports

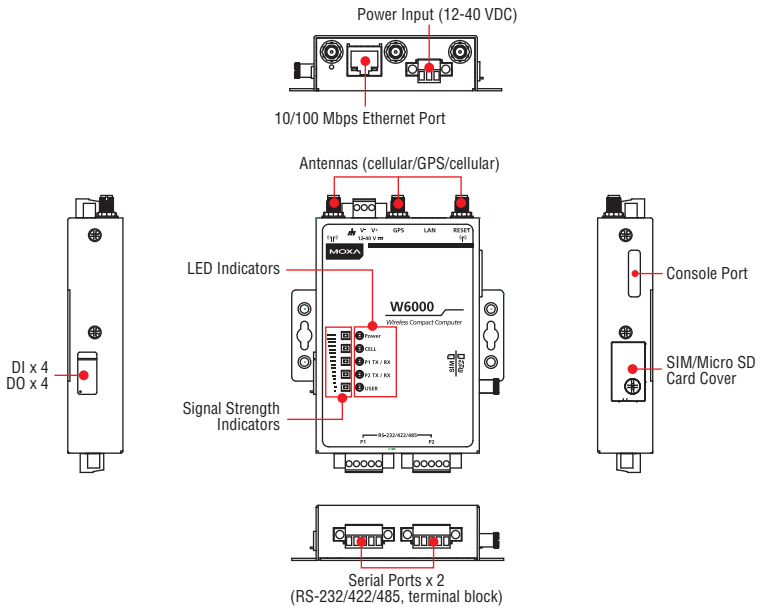
- ARMv7 Cortex-A8 processor with 512 MB RAM
- Built-in high speed HSPA+, LTE, and GPS support
- -40 to 70°C LTE operating temperature for harsh environments
- Compact size: 100 x 60 x 22 mm
- Auto-sensing 10/100 Mbps Ethernet port
- Dual software-selectable RS-232/422/485 serial ports
- MicroSD socket for storage expansion
- Debian ARM 8 open platform
- Keep alive session persistence
- Wireless, secure-router computer

Overview

The W6000 series computers are embedded Linux computers featuring 2 software selectable RS-232/422/485 ports, 1 Ethernet port, and LTE/US, HSPA, GPRS/GSM, and GPS for complex communication solutions. All W6000 computers come with a microSD socket for external storage expansion. The W6000 computers' Linux OS runs on the 32-bit ARM Cortex-A8 processor, which provides a powerful and reliable platform for harsh, industrial environments.

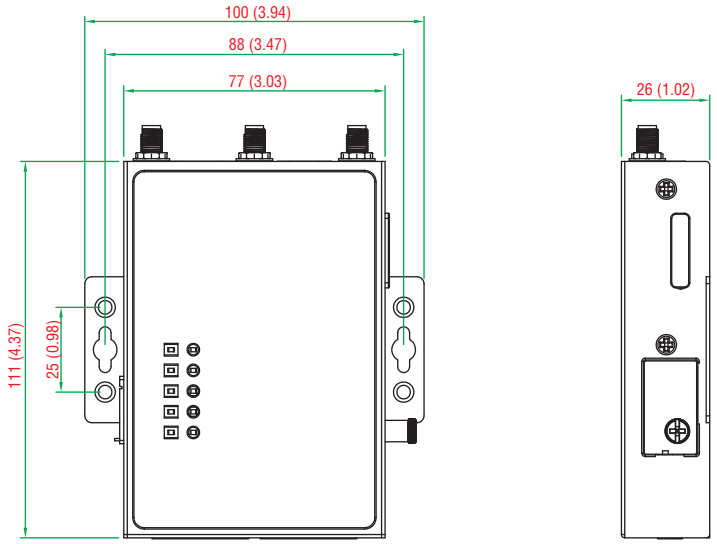
The W6000 is built around a low-power Cortex-A8 RISC processor and Debain ARM Linux OS that has been optimized for use in energy monitoring systems, but is widely applicable to a variety of industrial solutions. With powerful computing and multiple communication options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communication platform to replace individual computers and routers for many other large-scale deployments.

Appearance



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: ARMv7 Cortex-A8 300 MHz (600 MHz, 1 GHz by project)
USB: USB 2.0 hosts x 1, type A connector
DRAM: DDR3 SDRAM: 512 MB
OS (pre-installed): Debian ARM 8 (Kernel 4.0)

Storage

Storage Expansion: MicroSD socket for storage expansion

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 1
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface

Serial Standards: RS-232/422/485 ports, software-selectable (5-pin terminal block connector) x 1 or 2
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: XON/XOFF, ADDC® (Automatic Data Direction Control) for RS-485
Baudrate: 921600 bps (max.)

Serial Signals

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

Digital I/O

Digital Input: 3.3V/TTL digital inputs x 4
Digital Output: 3.3V/TTL digital outputs x 4

LEDs

System: Power x 1, cellular x 1, serial TX/RX x 2, signal strength x 5, user-defined x 1
LAN: 10M/100M on connector

Physical Characteristics

Housing: Aluminum (1 mm)
Weight: 875 g (1.94 lb)
Dimensions: 111 x 25 x 77 mm (4.37 x 0.98 x 3.03 in)
Mounting: Wall, DIN rail (with optional kit)

Environmental Limits

Operating Temperature: -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: 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis
Anti-Shock: 20 g @ IEC 60068-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 9 to 40 VDC (3-pin terminal block, V+, V-, SG)
Input Current:
• 450 mA @ 12 VDC
• 225 mA @ 24 VDC
Power Consumption: 5.4 W

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

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

Software Specifications

Linux

OS: Debian ARM 8 (Kernel 4.0)
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
Kernel: GNU/Linux 4.0
System Shell: DASH (default), BASH
Text Editor: vim, nano
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SSH, PPP, SFTP, RSYNC, SSL
Programming Language Support: PHP, Perl, Python
Internet Security Suite: OpenVPN, IPTables
Cryptographic Hardware Accelerators: AES, SHA, OpenSSL
Linux Board Support Packages (BSP):
• GCC C/C++ cross development tool chain
• Bootloader/ Kernel
Cellular Networking:
• WVDIAL: Point-to-Point Protocol dialer that dials a modem and uses the PPP protocol to connect to the Internet.
• QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
• MODBUS: Software library to send/receive data according to the Modbus protocol. This library is written in C and supports RTU (serial) and TCP (Ethernet) communications.
• Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API).
Cybersecurity:
• Secure Boot: A novel authentication algorithm proposed to secure platform integration. Only trusted Linux kernel and bootloader should be executed (Patent Pending).
• Sudo Mechanism: Sudo (sometimes considered short for super user do is a program designed to let system administrators allow some users to execute certain commands as the root user (or another user). The root user account is disabled by default. The basic philosophy is to give as few privileges as possible but still allow people to get their work.
• Security Update of Existing Software Packages: All software packages installed on the W6000 can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server.
• microSD write protection: Provides a mechanism for disabling SD write permission to the microSD memory card plugged in directly into the card slot, or which is part of an extended storage system.

Ordering Information

Model	Antennas	Primary Network	Auxiliary Network	Serial Ports	LAN
W6393-T-LX-US	3	LTE-US	GPS	2	1
W6393-T-LX-EU	3	LTE-EU	GPS	2	1
W6273-T-LX	2	HSPA+	GPS	2	1

Optional Accessories

Antennas and Internal Antenna Cables		
GPS Antenna	ANT-GPS-OSM-05-3M	Active GPS antenna, 26 dBi, 1572 MHz, L1 band antenna for GPS
LTE Antenna	ANT-LTE-OSM-03-3m BK	Multi-band antenna that covers 700-2700 MHz frequencies. Specially designed for 2G, 3G, and 4G applications. Magnetic mounting is available.
LTE Antenna	ANT-LTE-ASM-04 BK	LTE Stick antenna that covers 704-960/1710-2620 MHz, providing omnidirectional radiation with a gain of 4.5 dBi.
LTE Antenna	ANT-LTE-ASM-05 BK	LTE stick antenna that covers 704-960/1710-2620 MHz with a gain of 5 dBi.
LTE Antenna	ANT-LTE-OSM-06-3m BK MIMO	Multi-band antenna that covers 700-2700/2400-2500/5150-5850 MHz frequencies. Screw-fastened mounting and full IP67 waterproofing are available.

Package Checklist

- W6000 embedded computer

UC-8100-ME-T Series

Preliminary

Communication-centric RISC computing platform

- ARMv7 Cortex-A8 1000 MHz processor
- Dual auto-sensing 10/100 Mbps Ethernet ports
- SD socket for storage expansion
- Programmable LEDs and a programmable button for easy installation and maintenance
- Mini PCIe socket for cellular module
- Debian ARM 7 open platform
- Cybersecurity
- -40°C to 70°C wide temperature range with LTE enabled

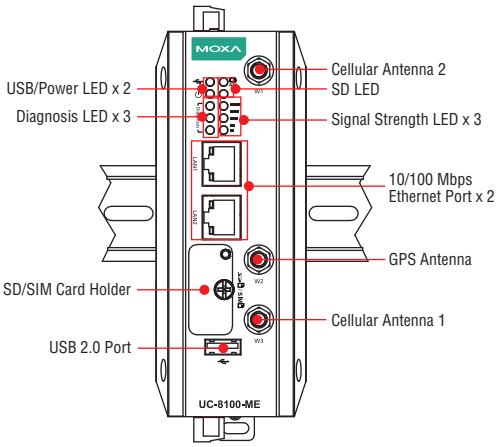
Overview

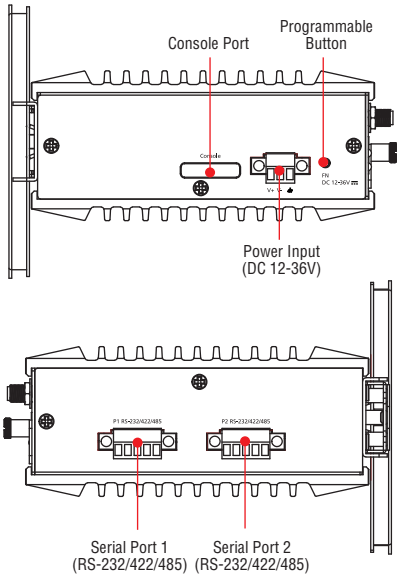
The UC-8100-ME-T computing platform is designed for embedded data acquisition applications. The computer comes with one or two RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports, as well as a Mini PCIe socket to support cellular modules. These versatile communication capabilities let users efficiently adapt the UC-8100-ME-T to a variety of complex communications solutions.

The UC-8100-ME-T is built around a Cortex-A8 RISC processor that has been optimized for use in energy monitoring systems, but is widely applicable to a variety of industrial solutions. With flexible interfacing options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communication platform for many other large-scale deployments.

Wide temperature LTE-enabled models are available for extended temperature applications. All units are thoroughly tested in a testing chamber, guaranteeing that the LTE-enabled computing platforms are suitable for wide temperature applications.

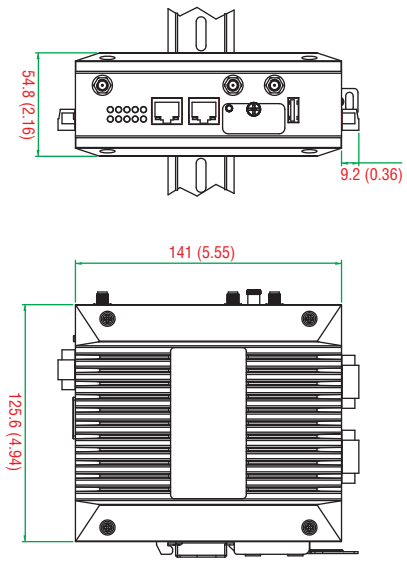
Appearance





Dimensions

Unit: mm (inch)



Hardware Specifications

Computer

CPU: ARMv7 Cortex-A8 1000 MHz
USB: USB 2.0 host x 1 (type A connector)
DRAM:
UC-8112-ME-T-LX: 512 MB DDR3 SDRAM
UC-8112-ME-T-LX-US: 512 MB DDR3 SDRAM
OS (pre-installed): Debian ARM 7 (Kernel 3.2)

Storage

Storage Expansion:
• SDHC/SDXC socket for storage expansion
• 4 GB eMMC flash with OS pre-installed

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: 1 or 2 RS-232/422/485 ports, software-selectable (5-pin terminal block connector)
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: XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 921600 bps (max.)

Serial Signals

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

LEDs

System: Power x 1, USB x 1, SD x 1, signal strength x 3
LAN: 10M/100M on connector
Programmable: Diagnosis x 3

Switches and Buttons

Push Button: Initially configured to return a diagnostic report, and to reset the device to factory defaults

Physical Characteristics

Housing: SECC + Al 5052
Weight: 550 g (1.22 lb)
Dimensions: 141 x 119.9 x 36 mm (5.56 x 4.72 x 1.42 x in)
Mounting: DIN rail, wall (with optional kit)

Environmental Limits

Operating Temperature:
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Wide Temp. models (with LTE accessory): -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: 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis (without any USB devices attached)
Anti-Shock: 20 g @ IEC 60068-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 24 VDC (3-pin terminal block, V+, V-, SG)
Input Current:
• 260 mA @ 12 VDC
• 135 mA @ 24 VDC
Power Consumption: 3.24 W (without cellular module and external USB device attached)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: External RTC (real-time clock)
Automatic Reboot Trigger: External WDT (watchdog timer)

Warranty

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

Software Specifications

Linux

OS: Debian ARM 8
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
Kernel: GNU/Linux 4.0
System Shell: DASH (default), BASH
Text Editor: vim, nano
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SSH, PPP, SFTP, RSYNC, SSL
Programming Language Support: PHP, Perl, Python
Internet Security Suite: OpenVPN, IPTables
Cryptographic Hardware Accelerators: AES, SHA, OpenSSL
Self Diagnosis: Check status of system and hardware component via software method
Linux Board Support Packages (BSP):
• GCC C/C++ cross development tool chain
• Bootloader/ Kernel/ filesystem
Cellular Networking:
• WVDIAL: Point-to-Point Protocol dialer that dials a modem and starts pppd to connect to the Internet.
• QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
• MODBUS: Software library to send/receive data according to the Modbus protocol. This library is written in C and supports RTU (serial) and TCP (Ethernet) communications.
• Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API).
Cybersecurity:
• Secure Boot: A novel authentication algorithm proposed to secure platform integration. Only trusted Linux kernel and bootloader should be executed (Patent Pending).
• SUDO Mechanism: Sudo (short for super-user do) is a program designed to let system administrators allow some users to execute certain commands as the root user (or another user). The root user account is disabled by default. The basic philosophy is to give as few privileges as possible but still allow people to get their work.
• Security Update of Existing Software Packages: All software packages installed on the UC-8100-ME-T can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server.
• USB Protection: Provides a mechanism for disabling USB function to avoid USB stick malware attacks.
• SD Write Protection: Provides a mechanism for disabling write permission to the microSD memory card plugged in directly into the card slot, or which is part of an extended storage system.

Ordering Information

Model	CPU	RAM	Serial	Ethernet	SD Card Slot	USB	Operating Temperature
UC-8112-ME-T-LX	1 Ghz	512 MB	2	2	1	1	-40 to 85°C
UC-8112-ME-T-LX-LTE-US (LTE module pre-installed)	1 Ghz	512 MB	2	2	1	1	-40 to 70°C

Package Checklist

- UC-8100-ME-T embedded computer
- Power jack
- 3-pin terminal block for power
- 5-pin terminal block for UART x 2
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Power Adapters, Power Cords, Console Cables

Model Name	Package Contents	Description
PWR-24250-DT-S1	• Power Adapter x 1	Power adapter for testing and system development indoors under ambient temperature conditions (input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A; output: 24 VDC, 2.5 A, 60 W)
PWC-C7US-2B-183	• Power Cord x 1	10A/125V North American (US) power cord, 183 cm
PWC-C7EU-2B-183	• Power Cord x 1	10A/250V Continental European (EU) power cord, 183 cm
PWC-C7UK-2B-183	• Power Cord x 1	10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C7AU-2B-183	• Power Cord x 1	2.5A/250V Australian (AU) power cord, 183 cm
PWC-C7CN-2B-183	• Power Cord x 1	10A/250V China (CN) power cord, 183 cm
CBL-F9DPF1x4-BK-100	• Console Cable x 1	Console cable with 4-pin connector

Wireless Packages

Model Name	Package Contents	Description
ME-CELLULAR-LTE-EU	• Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 3 • Mini PCI/e mount screw sets x 2 • Heat sink x 1	LTE regions: Asia, Europe, Australia, New Zealand (compatible with LTE/EU, HSPA+, GPRS/GSM, and GPS) LTE: B1, B3, B7, B8, B20 UMTS/HSPA+: B1, B2, B5, B6, B8 GNSS (GPS+Glonass)
ME-CELLULAR-LTE-US	• Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 3 • Mini PCI/e mount screw sets x 2 • Heat sink x 1	LTE regions: North America (compatible with LTE/US, HSPA, GPRS/GSM, and GPS) LTE: B2, B4, B5, B13, B17, B25 UMTS/HSPA+: B1, B2, B4, B5, B8 GNSS (GPS+Glonass)
ME-WiFi-BGN	• Wi-Fi module x 1 • i-PEX MHF to RP-SMA adapter with cable x 2 • Mini PCI/e mount screw sets x 2	(compatible with IEEE 802.11b/g/n) 2.4 Ghz only

Antennas and Internal Antenna Cables

Model Name	Package Contents	Description
ANT-GPS-OSM-05-3M	• GPS Antenna x 1	Active GPS antenna, 26 dBi, 1572 MHz, L1 band antenna for GPS
ANT-LTE-OSM-03-3m BK	• LTE Antenna x 1	Multi-band antenna that covers 700-2700 MHz. Specially designed for 2G, 3G, and 4G applications. Magnetic mounting is available.
ANT-LTE-ASM-04 BK	• LTE Antenna x 1	LTE Stick antenna that covers 704-960/1710-2620 MHz providing omnidirectional radiation with a gain of 4.5 dBi.
ANT-LTE-ASM-05 BK	• LTE Antenna x 1	LTE stick antenna that covers 704-960/1710-2620 MHz with a gain of 5 dBi.
ANT-LTE-OSM-06-3m BK MIMO	• LTE Antenna x 1	Multi-band antenna that covers 700-2700/2400-2500/5150-5850 MHz frequencies. Screw-fastened mounting and full IP67 waterproofing are available.
CRF-MHF/SMA(M)-14.2	• Wi-Fi Antenna x 1	RP-SMA male antenna for Wi-Fi; supports 2.4 Ghz band.
A-CRF-MHFSF	• Cellular antenna cable x 1	i-PEX MHF (male, on cellular module) to SMA (female, on top cover) adapter with cable. Used to install a GPS antenna or second cellular antenna.
CRF-MHF/SMA(M)-14.2	• Wi-Fi antenna cable x 1	i-PEX MHF (male, on cellular module) to RP-SMA (female, on top cover) adapter with cable. Used to install a second Wi-Fi antenna.

Mounting Kits

Model Name	Package Contents	Description
N/A	• Wall-mounting kit x 1	Wall-mounting kit with screws

UC-8410A Series

Preliminary

Highly efficient, security-enabled, wireless platform that supports a rich set of interfaces

- Freescale LS1021A Coretex-A7 1 GHz dual-core processor
- 512 MB DDR3 SDRAM
- 8 RS-232/422/485 serial ports
- 3 10/100/1000 Mbps Ethernet ports
- Wireless-enabled with PCIe mini slot
- 2 USB 2.0 hosts for mass storage devices
- DIN-rail or wall-mounting installation
- Robust, fanless design
- -40 to 75°C wide temperature model available
- Ready-to-run Debian ARM 8

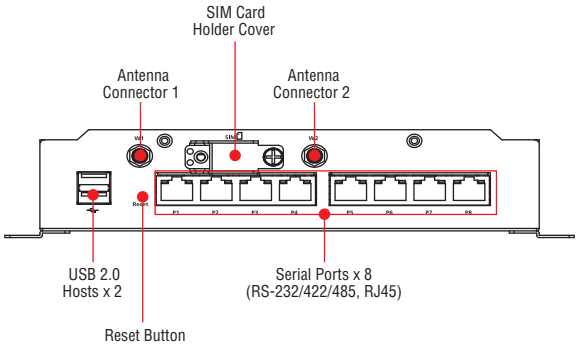
Overview

The UC-8410A Series embedded computers support a rich collection of communication interfaces, including 8 RS-232/422/485 serial ports, 3 Ethernet ports, 1 PCIe mini slot for a wireless module, 4 digital input channels, 4 digital output channels, 1 mSATA slot, and 2 USB 2.0 hosts.

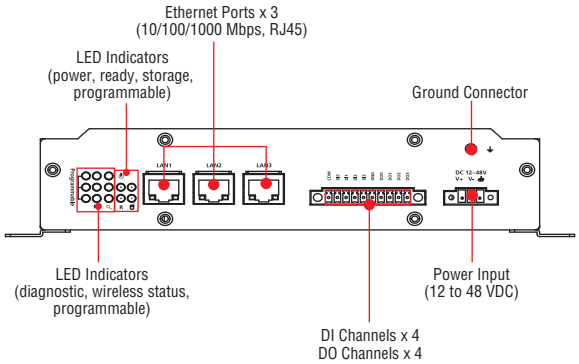
The UC-8410A computer uses the Freescale Cortex-A7 dual-core 1 GHz RISC CPU. This powerful computing engine supports several useful communications functions, without generating too much heat. The built-in 1 GB SD card and 512 MB DDR3 SDRAM give you enough memory to run your application software, and the mSATA slot provides the flexibility of adding additional data storage. The UC-8410A comes with a variety of communication interaces, including serial ports, Ethernet ports, wireless communication slot, and digital input/output channels, making them ideal as communication platforms for industrial applications that require network and device communications.

The UC-8410A Series comes with Linux Debian 8 pre-installed to provide an open software operating system for software program development. This makes the UC-8410A computer an optimal solution for use with industrial applications, but at 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: ARMv7 Cortex-A7 dual-core 1 GHz
USB: USB 2.0 hosts x 2, Type A connector
DRAM: 512 MB DDR3 SDRAM onboard (up to 1 GB, by CV request)
OS (pre-installed): Debian ARM 8

Storage
Main Storage: 1 GB SD card for OS
Storage Expansion: mSATA slot

Ethernet Interface
LAN: Auto-sensing 10/100/1000 Mbps ports (RJ45) x 3
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Serial Standards: RS-232/422/485 software-selectable ports (8-pin RJ45) x 8
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 115.2 kbps (supports nonstandard 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: DI x 4
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: +10 to +30 V (COM to DI)
• Logic level 1: +3 V max.
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-drain to 30 V
Connector Type: 10-pin screw terminal block (4 points, GND)
Isolation: 3 kV optical isolation

LEDs
System: Power, Ready, Storage, Diagnostic, Wireless signal strength
LAN: 100M/Link/Act x 3, 1000M/Link/Act x 3 (on connector)
Serial: TxD x 8, RxD x 8 (on connector)
Reset Button: Supports "Reset to Factory Default and System diagnostics"

Physical Characteristics
Housing: SECC sheet metal (1 mm)
Weight: 1 kg (2.21 lb)
Dimensions: 200 x 120 x 48.6 mm (7.87 x 4.72 x 1.91 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 Grms @ 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)
Input Current:
• 1570 mA @ 12 VDC
• 420 mA @ 24 VDC
Power Consumption: 18 W

Standards and Certifications
Safety: UL 60950-1, CCC (GB9254, GB17625.1)
EMC: EN 55022 Class A, 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)

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 adapter and cables.

Software Specifications

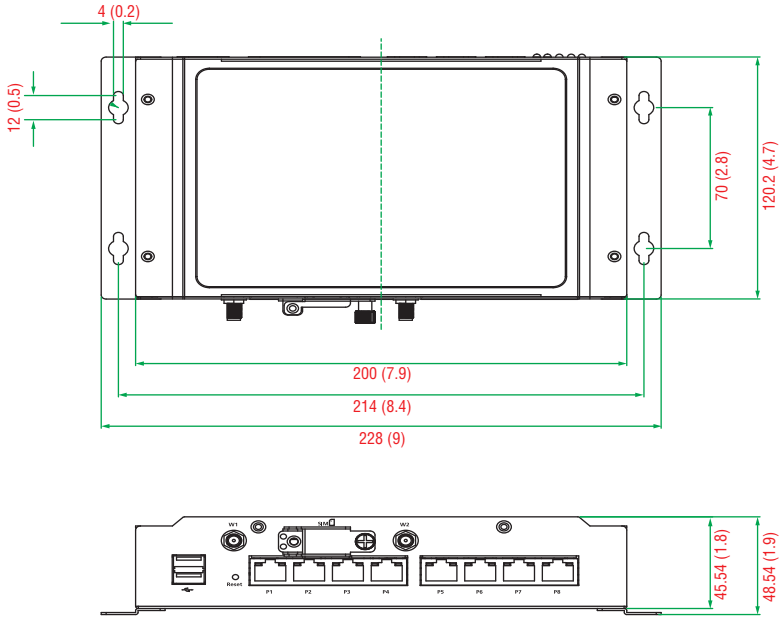
Linux

OS: Debian ARM 8
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): SSH allows remote logins to a secure encrypted console from any connected network
Kernel:
GNU/Linux 3.12
System Shell: DASH, BASH
Text Editor: vim, nano
File System: Ext2, Ext3, Ext4
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SSH, PPP, SFTP, RSYNC, SSL
Programming Language Support: PHP, Perl, Python
Internet Security: OpenVPN, iptables
Cryptographic Hardware Accelerators: AES, SHA, OpenSSL
Self Diagnosis: Check status of system and hardware component via software method

Linux Board Support Packages (BSP): GCC C/C++ cross development tool chain
Bootloader/ Kernel/ filesystem
Cellular Networking: Allows Unix machines to connect to the Internpppd to connect to the Internet.
Connect talcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard 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

UC-8410A-LX: Cortext-A7 1 GHz dual-core RISC-based computer, 1 GB SD card, 512 MB DDR3L, serial ports x 8, DIs x 4, DOs x 4, LANs x 3, wireless enabled, mSATA slots x 1, USB, Debian ARM8, -10 to 60°C operating temperature
UC-8410A-T-LX: Cortex-A7 1 GHz dual-core RISC-based computer, 1 GB SD card, 512 MB DDR3L, serial ports x 8, DIs x 4, DOs x 4, LANs x 3, wireless enabled, mSATA slots x 1, USB, Debian ARM8, -40 to 75°C operating temperature

Package Checklist

- UC-8410A embedded computer
- Wall-mounting kit
- DIN-rail mounting kit
- Power jack
- 3-pin terminal block for power
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

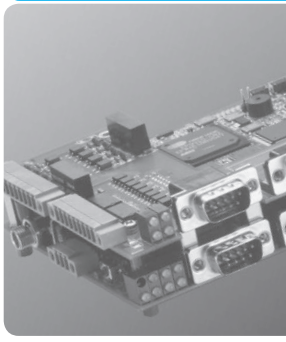
Embedded CPU Modules

Product Selection Guide

Embedded CPU Modules. 28-2

Embedded CPU Modules

EM-2260 Series: RISC embedded core modules with 4 serial port DI/DO, dual LANs, VGA, CompactFlash, USB 28-3
EM-1220 Series: RISC ready-to-run embedded core modules with 2 serial ports, dual LANs, SD. 28-6
EM-1240 Series: RISC ready-to-run embedded core modules with 4 serial ports, dual LANs, SD. 28-9



Embedded CPU Modules

	EM-2260-CE	EM-2260-LX	EM-1220-LX	EM-1220-T-LX	EM-1240-LX	EM-1240-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	Embedded µClinux	Embedded µClinux	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	2	2	4	4
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 (nonstandard baudrates supported; see user's manual for details)					
Physical Characteristics						
Weight	70 g (0.16 lb)		40 g (0.09 lb)		50 g (0.11 lb)	
Dimensions	106 x 87 mm (4.17 x 3.43 in)		80 x 50 mm (3.15 x 1.97 in)		90 x 80 mm (3.54 x 3.15 in)	
Module Interface	–	–	Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)			
Environmental Limits						
Operating Temperature	-10 to 60°C (14 to 140°F)	-10 to 60°C (14 to 140°F)	-10 to 60°C (14 to 140°F)	-40 to 75°C (-40 to 167°F)	-10 to 60°C (14 to 140°F)	-40 to 75°C (-40 to 167°F)
Storage Temperature	-20 to 80°C (-4 to 176°F)	-20 to 80°C (-4 to 176°F)	-20 to 80°C (-4 to 176°F)	-40 to 85°C (-40 to 185°F)	-20 to 80°C (-4 to 176°F)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Regulatory Approvals						
EMC	EN 55022 Class A, EN 61000-3-2 Class A, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A		CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)			
Green Product	RoHS, CRoHS, WEEE					
Reliability						
Buzzer, RTC, WDT	✓	✓	✓	✓	✓	✓
Warranty	5 years (see www.moxa.com/warranty)					
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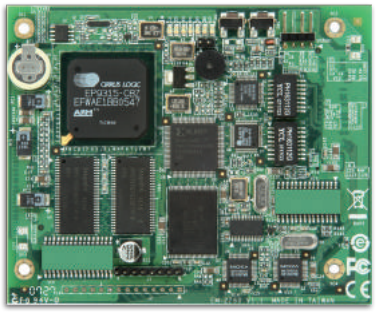
EM-2260 Series

RISC embedded core modules with 4 serial ports, 8 DIs, 8 DOs, dual LANs, VGA, CompactFlash, USB



- Cirrus Logic EP9315 ARM9 CPU, 200 MHz
- 128 MB RAM onboard, 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 ports 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

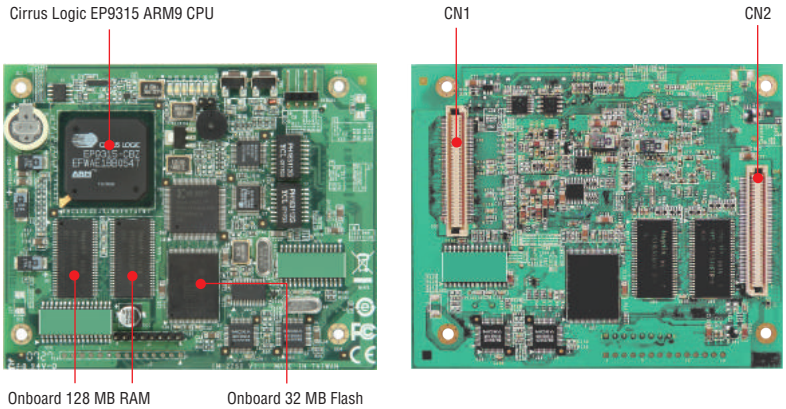
The EM-2260 embedded module features 4 RS-232/422/485 serial ports, dual Ethernet ports, and an EIDE interface for designing an external storage connection, such as a CompactFlash socket or USB port signals. The module has a compact design that is easily integrated with a variety of industrial applications,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

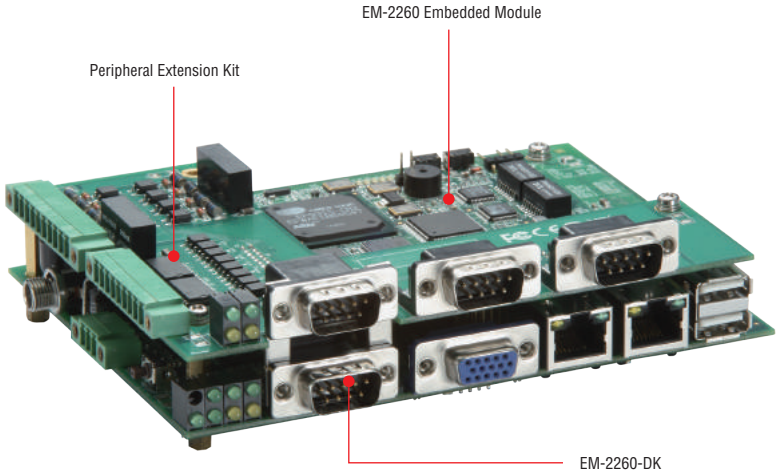
The EM-2260 Development Kit provides users with a handy tool for first time evaluation to test the functionality of the embedded core module. It has several peripherals built-in, including RS-232/422/485 ports and digital input and output, making it suitable for developing a variety of industrial applications.

Appearance

EM-2260 Embedded Module



Development Kit



Hardware Specifications

Computer
CPU: Cirrus Logic EP9315 ARM9 CPU, 200 MHz
DRAM: SDRAM, 128 MB
Flash: NOR Flash, 32 MB
OS (pre-installed): Linux or Windows CE 6.0

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: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Serial Standards: RS-232/422/485 ports x 4, software-selectable
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 nonstandard 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: DI x 8
Input Voltage: 3.3 V, CMOS level

Digital Output
Output Channels: DO x 8
Digital Output Levels: 3.3 V, CMOS level

Switches and Buttons
Reset Button: Supports "Reset to Factory Default"

Physical Characteristics
Weight: 70 g (0.16 lb)
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
Input Current: 480 mA @ 12 VDC
Power Consumption: 5.8 W

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)
Time: 131,832 hrs
Standard: Telcordia (Bellcore) Standard

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

Software Specifications

Linux

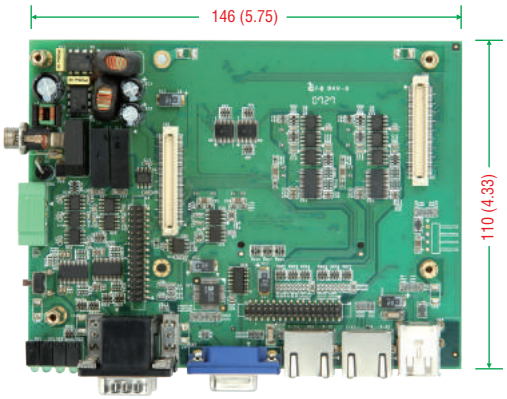
OS: Linux 2.6.23
Web Server (Apache): Allows you to create and manage web sites
Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an unsecure network
File System: JFFS2, NFS, Ext2, Ext3
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, IPTables Firewall
Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
Watchdog: Features a hardware function to trigger system reset based on 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)

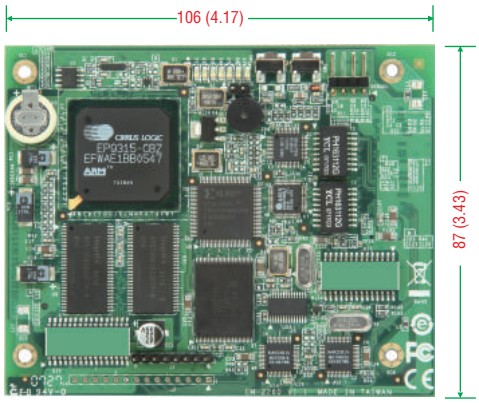
Windows Embedded CE 6.0

OS: Windows Embedded CE 6.0
File System: FAT (for onboard 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 based on 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 adapter 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 onboard
- 2 software-selectable RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet ports 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

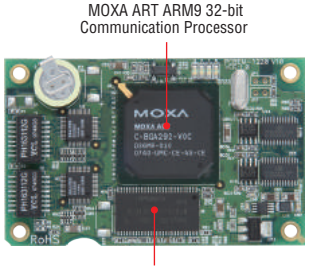
Overview

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 offers 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 harsh environments.

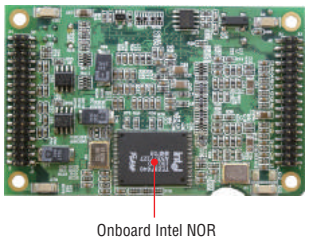
Appearance

EM-1220 Embedded Module

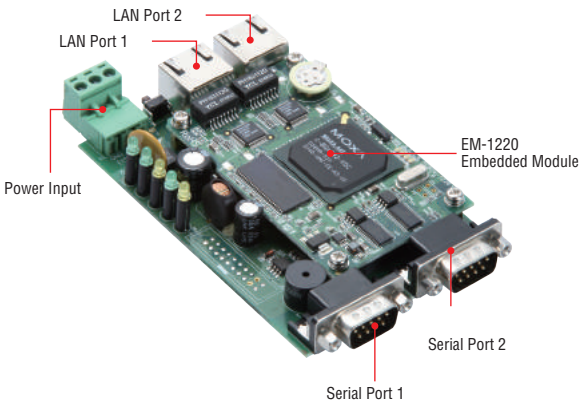
Top View



Bottom View



Development Kit



Hardware Specifications

Computer
CPU: MOXA ART ARM9 32-bit, 192 MHz
DRAM: SDRAM, 16 MB
Flash: NOR Flash, 8 MB
OS (pre-installed): Linux

Storage
Storage Expansion: SD sockets x 1

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface
Serial Standards: RS-232/422/485 x 2, software-selectable
ESD Protection: 15 kV for all signals
Console Port: TTL signal, 4-pin pin header output

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard 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 (0.09 lb)
• EM-1220 Development Kit: 120 g (0.27 lb)
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-by-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
Input Current: 625 mA @ 3.3 VDC
Power Consumption: 2.1 W

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)
Time: 405,735 hrs
Standard: Telcordia (Bellcore) Standard

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 adapter and cables.

Software Specifications

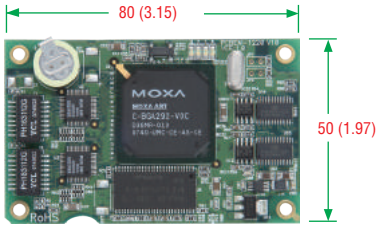
µClinux
OS: µClinux 2.6.19
File System: JFFS2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, TFTP, PPP, PPPoE
Web Server (Boa): Allows you to create and manage web sites
Terminal Server (Telnet): Provides telnet communications between two hosts over the network

Dial-up Networking: PPP Daemon (pppd) for Linux that uses the PPP protocol and allows Unix machines to connect to the Internet as PPP servers or clients, through dialup. The PPP Daemon works with chat, dip, and diald programs among others, and supports the IP, TCP, UDP, and IPX for Linux (Novell) protocols.
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

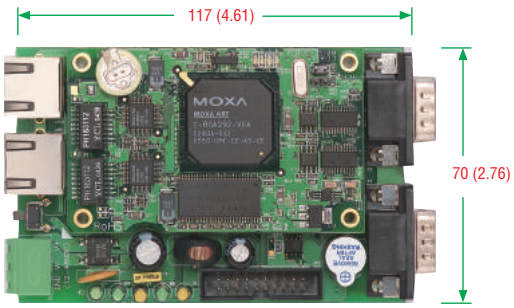
Dimensions

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)

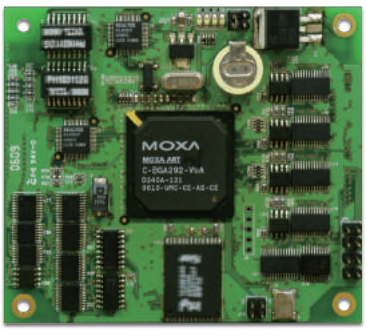
- EM-1220 module

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 adapter (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



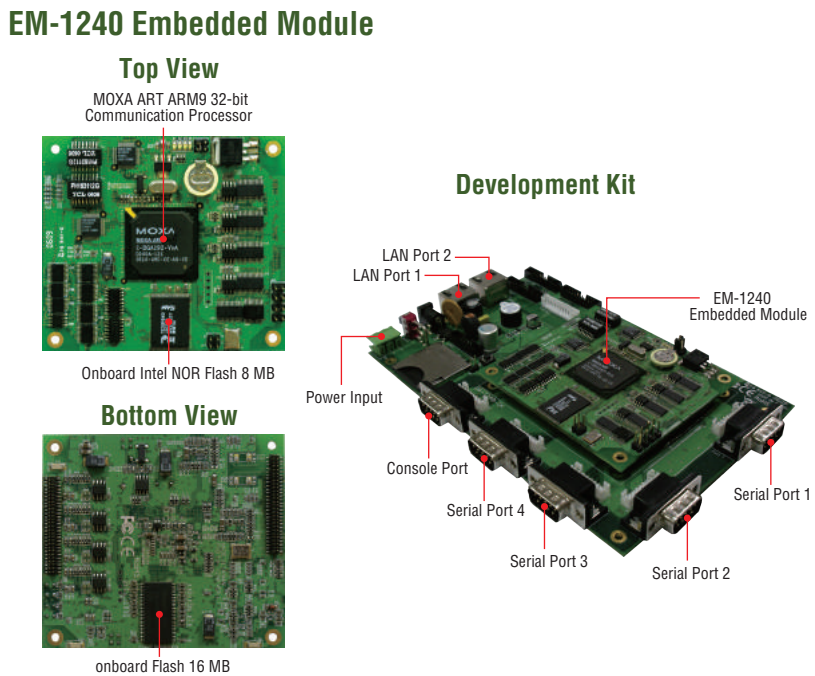
- MOXA ART ARM9 32-bit 192 MHz processor
- 16 MB RAM, 8 MB flash disk onboard
- 4 software-selectable RS-232/422/485 serial ports
- Dual 10/100 Mbps Ethernet ports for network redundancy
- SD signals supported for external SD socket connection
- Built-in RTC, buzzer
- 10 GPIOs reserved for system integration
- 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 harsh environments.

Appearance

EM-1240 Embedded Module



Hardware Specifications

Computer
CPU: MOXA ART ARM9 32-bit, 192 MHz
DRAM: SDRAM, 16 MB
Flash: NOR Flash, 8 MB
OS (pre-installed): Linux

Storage
Storage Expansion: SD sockets x 1

Ethernet Interface
LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV, built-in

Serial Interface
Serial Standards: RS-232/422/485 x 4, software-selectable
ESD Protection: 15 kV for all signals
Console Port: RS-232 (all signals), RJ45 connector

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports nonstandard 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 (0.11 lb)
• EM-1240 Development Kit: 200 g (0.44 lb)
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
Input Current: 500 mA @ 5 VDC
Power Consumption: 2.5 W

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)
Time: 385,419 hrs
Standard: Telcordia (Bellcore) Standard

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 adapter and cables.

Software Specifications

µClinux
OS: µClinux 2.6.19
File System: JFFS2
Internet Protocol Suite: ARP, ICMP, IPV4, TCP, UDP, FTP, Telnet, SNMP V1, HTTP, CHAP, PAP, DHCP, NTP, NFS V2, SMTP, Telnet, PPP, PPPoE
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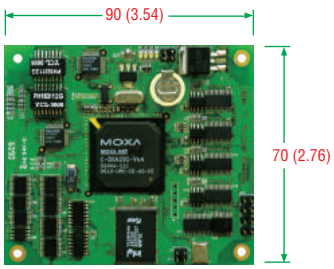
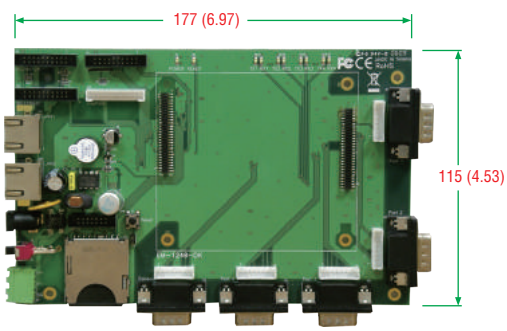


EM-1240-DK



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Development Kits (can be purchased separately)

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- Quick installation guide (printed)
- Warranty card

Your Trusted Partner in Automation

Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things. With over 25 years of industry experience, Moxa has connected more than 40 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for industrial communications infrastructures.

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