An Overview
of Embedded Computing

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**An Overview
of Embedded
Computing**

Introduction to Embedded Computers

Moxa's embedded computers are all-in-one devices that handle special purpose computing tasks for industrial applications. The computers use either the RISC-based ARM9, Intel XScale, Cirrus Logic, or X86 processor to provide powerful communication and computing functions. In addition, an ample number of serial ports that support different interfaces are available for connecting a variety of industrial devices to a network for demanding numerical computing, protocol conversion, and data processing tasks. Some of Moxa's embedded computers even come with a USB 2.0 port, CompactFlash, SD interfaces for storage expansion, and a PCMCIA socket for adding wireless communication capability, and the pre-built, ready-to-run Linux, Windows CE, or Windows XP Embedded platforms are easy to access, so that software programmers can concentrate on developing their own application programs.

: Ready-to-Run Platform

It takes the right hardware and software to optimize any embedded computing application. While each series in our embedded computing family may have unique properties of its own, all Moxa embedded computers share the following features to maximize reliability and efficiency.

Rcore Embedded Software Platform

Moxa's Rcore provides users with an integrated ready-to-run embedded platform that speeds up and reduces the effort required for system development for faster time-to-market.

Real Industrial-grade Hardware Design

Moxa's real industrial design supports features that provide users with a reliable platform for building the most optimal embedded solutions at the lowest cost. The robust hardware design and easy-to-use software tools make Moxa's embedded computers ideal for establishing embedded systems quickly and effortlessly.
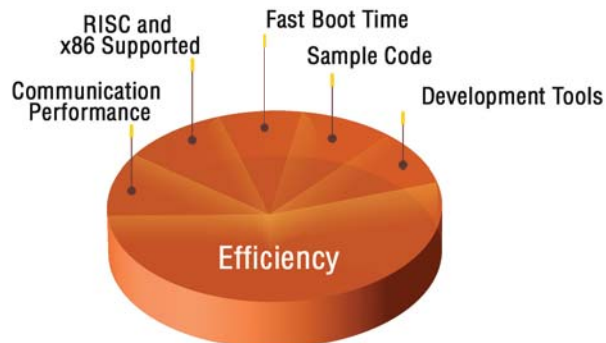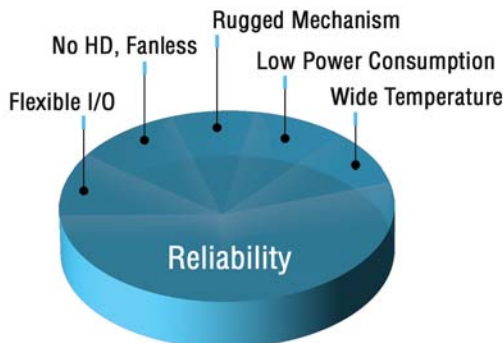
: Embedded Computing with Open Source Linux

Open source Linux architecture for easy development

The pre-installed Linux OS provides an open source software operating system for your software development. This means that software written for the desktop PC is easily ported to Moxa's embedded computers by performing a GNU cross compile without needing to modify the code.
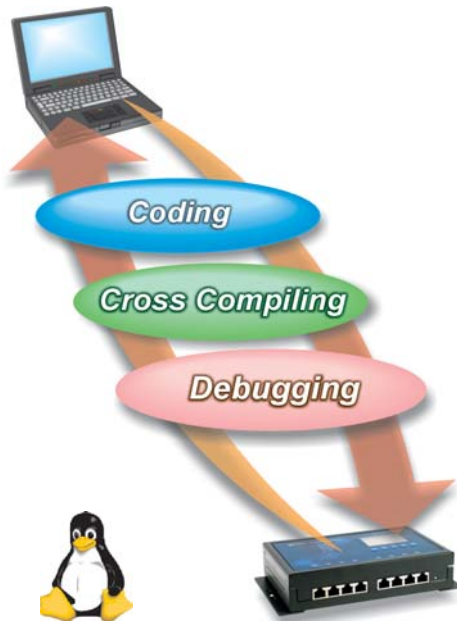
How to develop your application with tool chains

Step 1: Set up the development environment
• Install Linux on your PC (Redhat 7.2 or above is recommended)
• Install the tool chain (Cross compiler, GlibC, GDB), included on the CD-ROM, to your Linux PC
• Configure the IP, Netmask, etc.

Step 2: Set up the development environment
• Develop a C or C++ user application on your PC
• Compile C programs and link to the library with the Moxa tool chain.

Step 3: Deployment
• Download the program to your Moxa embedded computer via FTP
• Your Moxa embedded computer, with customized application, is ready to go!

**DDD Tool
GDB Debug Client**

Ethernet

GDB DebugServer
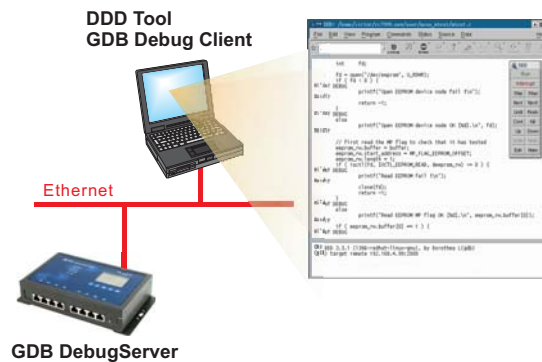
Source level debugging

Moxa's embedded computers (UC-7400 Series, UC-7400 Plus Series, DA-660 Series, IA240 Series, IA260 Series, and UC-8410 Series) have a built-in GDB server that enables software developers to use freeware, such as DDD in Linux environments, for source level debugging.
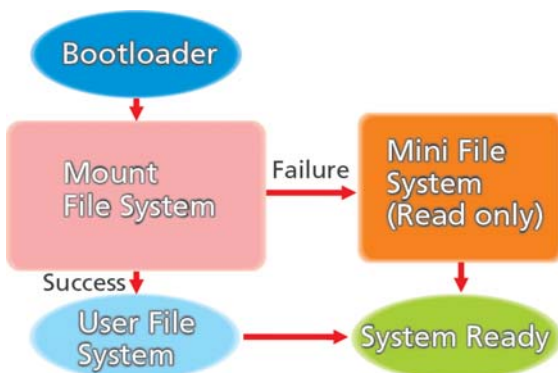
Embedded web server for web applications

Moxa's embedded computers have a pre-installed web server daemon that lets you set up your web application easily. Edit your web application with any familiar web tool, and then download the site to the Moxa embedded computer. Enjoy the benefits of web applications that are viewable with any popular web browser.

Robust self-recovery file system

Moxa's embedded computers provide a self-recovery file system to ensure reliable operation. There are two file systems inside. One is the User File System, and the other is a Mini File System. If mounting the user file system fails, Moxa's embedded computers will auto-boot from the Mini File System to ensure a successful boot-up.

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: Embedded Computing with Windows Embedded

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

Easier Application Development with IDE Tools

Software written for the desktop PC can be easily ported to a Moxa embedded computer with very little or even no modifications. Both porting and new development can be done using any number of friendly Integrated Development Environment (IDE) tools. Choose the tools based on the application language you plan to use and install them on your development PC. For detailed installation steps, please refer to the user's manual.

C/C++ Applications:
Using Embedded Visual C++ (eVC) 4.0

The eVC 4.0 tools can be downloaded for free from MSDN's download page. Install the eVC 4.0 tools and import service pack 4. Note that eVC is used for CE versions under 5.0.

Using Visual Studio 2005 or Visual Studio 2008

Microsoft Visual Studio 2005/2008 is a complete set of development tools for building C/C++ applications. You can develop WinCE applications with the Moxa SDK using Visual Studio 2005/2008 for WinCE 5.0/6.0/XPe.

VB.NET/C# Applications:
Using Visual Studio 2005 or Visual Studio 2008

Microsoft Visual Studio 2005/2008 is a complete set of development tools for building ASP.NET Web applications, XML Web services, and mobile applications. Visual Basic, Visual C++, Visual C#, and Visual J# (XPe only) all use the same IDE, which allows them to share tools and facilities when creating mixed-language solutions.

If you are building applications under WinCE, after installing the IDE tool you will also need to install a Windows Embedded SDK (provided by Moxa) on your development PC. After doing so, the SDK will be integrated with your IDE tool.

The Win CE SDK includes C libraries and run-time libraries, Microsoft Foundation Classes (MFC), SOAP Toolkit, .NET Compact Framework, XML, and Winsock for you to develop your applications.

Web-based Management System

Moxa's embedded computers are network-centric programmable platforms designed to be used as front-end computers for data acquisition and industrial control. The embedded computer is often located away from the system administrator in the same harsh environment as the controlled devices. This makes the task of managing the computer remotely an important aspect of the embedded computer's operation.

To resolve this remote management issue and reduce the work load of the system administrator, the Moxa embedded computer is installed with a Web-based management system. The system incorporates often-used features into an internal site and categorizes the features on a menu bar, as shown in the accompanying figures.

- System Information
- Networking/Server Configuration
- Process (Thread) Monitoring/Control
- Services Monitoring/Control
- Binary/Text File Management and Upload

This web-based management system allows you to manage web sites, the registry database for system and application programs, and many other aspects of the computer's operation.

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Rcore—Moxa's Embedded 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

⋮ Operating Systems

Moxa's x86 and ARM embedded computers offer a powerful computing environment and stable system for a variety of industrial applications. These computers use either a Linux or Windows (CE and XPe) embedded operating system to provide programmers around the world with a user-friendly environment for application development, and help reduce the effort required for system integration. Moxa continues to look 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 profound features of these modules and reducing the effort required for application development. The VPN (OpenVPN, L2TP, and IPSec) middleware makes it easy for user applications to create secure tunnels between communication parties. The firewall (iptable) middleware protects enterprise information from un-friendly access. The database system (MySQL and MSSQL) middleware can be used to manage field-data acquisition, with web services (Web, PHP, ASP) included to give programmers an integration framework for building Internet accessible field applications, such as WebSCADA.

⋮ Sample Code

To lower customers' development cost, Moxa provides sample code for a wide range of embedded applications, such as serial-to-Ethernet (S2E), serial-to-serial (S2S), and Modbus TCP and RTU. This high-level sample code or application libraries hide the details of implementing complex data communication by presenting relatively simple function prototypes for user applications. In addition, low-level libraries that manage direct access to peripheral I/O devices, such as LCM, key pad, digital IO signals, and watchdog functions, are also included. With ready access to such a rich assortment of embedded applications, programmers obtain a 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, essentially speeding up product development and ensuring that code is efficient and bug-free.

⋮ Tools

Moxa provides a Windows PC-based tool (MDM) that auto-detects, configures, and manages Moxa's embedded computers over an Internet   environment. This tool provides features for setting IP addresses, managing files, monitoring memory usage of computers, and helping application developers deploy their programs en masse to an entire army of computers.

Moxa Device Manager
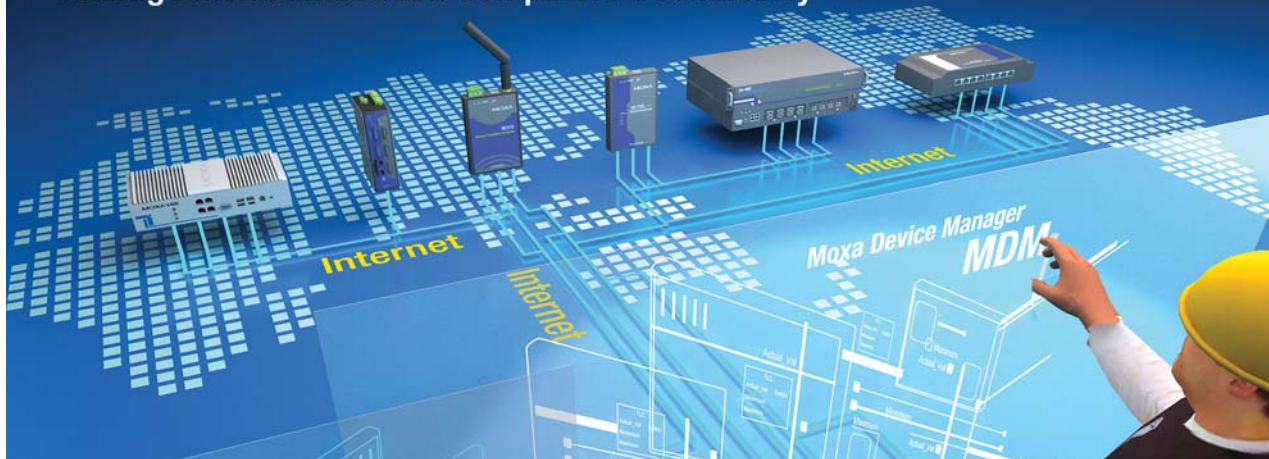
Systems that incorporate several devices located at remote sites present a big challenge to solution providers. This is particularly true for industrial applications that use several headless embedded computers distributed over a wide area. Although this type of

computer is generally accessible from over the network, the existing remote management options present a rather clumsy solution for managing large numbers of embedded computers.

The Telnet/SSH Solution

Perhaps the most common method of managing embedded computers remotely over the network is to use Telnet/SSH. However, one of the main drawbacks to this type of management is that you can only connect to one embedded computer at a time. In addition, the

administrator must actively type in the IP address of the embedded computer to establish the Telnet/SSH connection. It can be a real nightmare to keep track of which IP address is associated with which embedded computer.

The Command Line Solution

Another method of managing an embedded computer includes working from the command line. Although this can be done from over the network, most administrators find it difficult to remember all of the commands that are required to manage files and run programs. Script

files that combine several commands in one text file can be used to automate the command line method, but this option can also be quite time-consuming for administrators that manage tens if not hundreds of machines.

Using MDM (Moxa Device Manager) to Manage Embedded Computers

Moxa Device Manager (MDM for short) is an easy-to-use remote management tool for managing Moxa's ready-to-run embedded computers over the Internet. Moxa's embedded computers make excellent front-end computers at remote sites for on-site data collection and industrial control applications. MDM is designed to make it easy for system administrators to manage their remote embedded computers. One of the key benefits of MDM is that management tasks, such as configuring the network, managing and/ or transmitting text and binary files, and monitoring and controlling processes, can be handled easily using a Windows-based user interface. In addition, MDM can be used to manage different models

of embedded computer, and embedded computers that use different operating systems, all from one centrally located computer. As long as the individual embedded computers are pre-installed with an MDM agent, they can be recognized and managed by the unified MDM tool from your PC. These features help ensure that MDM gives system integrators an efficient tool for handling all remote devices from one computer.

In addition to controlling heterogeneous computer systems, the traffic between the MDM tool and any of the MDM agents is encrypted. This feature protects data transmitted from the system. Users can comfortably manage the remote devices without worrying about the usual risks associated with transmitting data over a network.

: The Benefits of MDM

Remote Control and Management

- Supports all models of Moxa embedded computer and Linux, WinCE, WinXPe operating systems
- Control and monitor remote embedded units over the Internet
- Broadcast search for Moxa embedded computers on the same LAN
- Get instant device status
- List basic information (IP, Model, Firmware version, OS, Hostname CPU, product image, memory information, and storage information) of all devices on the main page

Command-line Free Configuration and Maintenance

- Launch programs automatically when booting up
- One-to-multiple file transfers
- Perform remote file system management
- Configure network interfaces
- Monitor and kill processes
- View detailed system information
- Reboot devices
- Upgrade firmware for multiple devices at one time
- Update system time

Easy-to-use User Interface

- Friendlier "click and operate" interface for remote device management
- Friendly windows-based utilities for easy configuration

Easy Installation and Setup

- An MDM Agent program running on an embedded computer can be started automatically at boot-up
- MDM Tool and Gateway can be installed on any PC running Windows XP

: How to Get MDM

Moxa Device Manager comes with MDM Agent, MDM Tool, and MDM Gateway. Users can download the Moxa Device Manager package from the "Support → Software" page on Moxa's website.

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An Overview of Embedded Computing > Moxa Device Manager

Real Industrial-grade Hardware Design

Besides Rcore, Moxa's "real industrial design" supports features that provide users with a reliable platform for building the most optimal embedded solutions at the lowest cost. The robust hardware design

and easy-to-use software tools make Moxa's embedded computers ideal for establishing embedded systems quickly and effortlessly.

: Communication Cores

Serial Ports

Serial communication is one of Moxa's core technologies, and has helped millions of serial devices connect to the network for industrial

applications. Our RS-232/422/485 serial ports provide powerful communication performance for all industrial device connectivity.

Ethernet Ports (switch ports & LAN ports)

Both switch ports and LAN ports are available on some models to offer a diverse range of network communication options, helping users

easily create an integrated industrial application that requires Ethernet protocols.

DI/DO Channels

Moxa's DI/DO channels are designed with 3 KV of optical isolation protection to ensure that your system operates safely and reliably.

These DI/DO channels are quite useful for activating remote motion triggers.

CAN Ports

Moxa also provides embedded computers with CAN ports for connecting remote devices. The CAN port models are suitable for

industrial automation applications that require the CANOpen protocol.

: Fit for Harsh Enviroments

Wide Temperature

Moxa's embedded computers are designed to withstand temperatures ranging from -40 to 75°C for use in extremely hot or cold environments.

One popular use is with applications that require installing the computers in roadside cabinets.

Low Power Consumption

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

Anti-vibration and Anti-shock Design

Moxa's embedded computers have an industrial-grade, rugged design that can endure continuous 5G vibration, and also provide a 50G anti-shock guarantee, making them the best embedded computer solution for industrial environments that experience strong vibrations. These computers can also be used as the core computer for applications that require installing the embedded computer on moving objects.

Isolation

Isolation protection is a key part of creating a secure communication platform. All of Moxa's communication interfaces are well-protected with different isolation standards. All serial ports come with 15 KV ESD protection for all signals, Ethernet ports come with 1.5 KV magnetic protection, and DI/DO channels have 3 KV optical isolation protection. These features make Moxa's embedded computers the ideal solution for providing stable and reliable industrial communication.

: Robust Design

EMI

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

Cable-less

The cable-less concept offers a strong hardware design and promises a reliable combination of embedded components. This design helps ensure stable system operation and robust hardware design, since all of the components are firmly attached. This is especially beneficial for applications that require installing the computer on moving objects.

Fanless

A fanless design is a major requirement for industrial solutions. Moxa focuses on choosing the finest components that generate less heat but can still maintain high system performance. The fanless design makes Moxa's embedded computers ideal solutions for applications that experience extremely hot or cold environments.

Compact Design

Moxa's industrial embedded computers have a compact form factor, making them ideal for both indoor and outdoor industrial environments, especially at field sites that do not have a lot of extra space. Moxa has made its mark in the embedded market by providing computers that are compact yet powerful, and can be used in any industrial environment.

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An Overview of Embedded Computing > Real Industrial-grade Hardware Design

Customized Service for Embedded Computers

Moxa's professional technical support has made us one of the world leaders in the industrial networking and communication industry. With more than 20 years of R&D experience, we are able to offer a greater variety of off-the-shelf solutions to meet the requirements of your industrial applications.

In recent years, we have received many requests for customized products and solutions that involve our embedded computing products. This is an indication to us that people in the industrial automation industry recognize the true value provided by our products and services.

If you are looking for new ways to grow your business and increase your value, then Moxa's new DTO (designed to order) service may be for you. This new service, as it applies to our embedded computers, has been established to provide more customer-oriented embedded products and services by giving our customers the flexibility they require for their industrial embedded computing applications.

As a world-class leader in industrial communication and networking technology, Moxa's expertise includes the development of modular technology for a variety of CPU platforms, which allows us to provide high quality products, individual technology, and high quality service.

What does Moxa's Customized Service Offer?

High Quality Products

-Over 20 years of experience
-Solid 5-year warranties
-Low RMA

Specialized Technology

-Expertise in computing, communication and control
-Value added software platform
-Designed for harsh environments

High Quality Service

-Quick response
-Customer centric

Embedded Computers for Communication

Wallmount Computers

	V462-CE V462-T-CE	V462-XPE V462-T-XPE	V464-CE V464-T-CE	V464-XPE V464-T-XPE	V466-CE V466-T-CE	V466-XPE V466-T-XPE	V468-CE V468-T-CE	V468-XPE V468-T-XPE	V481-CE V481-T-CE	V481-XPE V481-T-XPE
Computer										
CPU Speed	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	500 MHz	1 GHz	1 GHz
OS (pre-installed)	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 6.0	WinXP Emb.	WinCE 5.0	WinXP Emb.
DRAM	---	---	---	---	---	---	---	---	---	---
SRAM	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	256 KB	---	---
FSB	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz
Flash	---	---	---	---	---	---	---	---	---	---
System Memory	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)
PCMCIA	√	√	---	---	---	---	---	---	---	---
Expansion Bus	PC/104-Plus onboard									
USB Ports	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)
Digital I/O	---	---	---	---	---	---	8 DIs, 8 DOs	8 DIs, 8 DOs	---	---
Storage										
Built-in	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB	256 MB	1 GB
CompactFlash Socket	√	√	√	√	√	√	√	√	√	√
SD Slot	---	---	---	---	---	---	---	---	---	---
Other Peripherals										
KB/MS	1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable									
Audio	AC97 audio, with speaker-out interface									
Display										
Graphics Controller	√	√	√	√	√	√	√	√	√	√
Mini Screen with Push Buttons	---	---	---	---	---	---	---	---	---	---
LAN Interface										
10/100 Mbps Ethernet Ports	2	2	4	4	4	4	4	4	1	1
10/100/1000 Mbps Ethernet Ports	---	---	---	---	---	---	---	---	1	1
Switch Ports	---	---	---	---	8	8	---	---	---	---
Controller	Realtek RTL8100CL								---	---
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface										
RS-232 Ports	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	2 (DB9 male)	---	---
RS-485	---	---	---	---	---	---	---	---	---	---
RS-232/422/485 Ports	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	8 (DB9-M)	8 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Digital Isolation	---	---	---	---	---	---	---	---	---	---
Console Port	---	---	---	---	---	---	---	---	---	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF, ADDC®									
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)									
CANbus	---	---	---	---	---	---	---	---	---	---
LEDs										
System	Power, Battery, Storage								Power, Storage	
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M, Switch	10M, 100M, Switch	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	---	---	---	---	---	---	---	---	---	---
Physical Characteristics										
Housing	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Weight	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	1.32 kg	2.2 kg	2.2 kg
Dimensions	223 x 120.5 x 57 mm								225 x 140 x 70 mm	
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Environmental Limits										
Operating Temperature	-10 to 60°C or -40 to 75°C								-10 to 60°C or -35 to 75°C	
Operating Humidity	5 to 95% RH									
Storage Temperature	-20 to 80°C or -40 to 85°C									
Anti Vibration/Shock	---	---	---	---	---	---	---	---	---	---
Regulatory Approvals										
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)									
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)								UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)	
Green Product	---	---	RoHS, WEEE							
Reliability										
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)									

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Embedded Computers for Communication > Product Selection Guides

Wallmount Computers

	UC-8410-LX UC-8410-T-LX	UC-8416-LX UC-8416-T-LX	UC-8418-LX UC-8418-T-LX	UC-7402-LX	UC-7402-LX Plus	UC-7408-LX UC-7408-T-LX	UC-7408-LX Plus UC-7408-T-LX Plus	UC-7408-CE UC-7408-T-CE	UC-7410-LX	UC-7410-LX Plus
Computer										
CPU Speed	533 MHz	533 MHz	533 MHz	266 MHz	533 MHz	266 MHz	533 MHz	266 MHz	266 MHz	533 MHz
OS (pre-installed)	Linux			Embedded Linux				WinCE 5.0	Embedded Linux	
DRAM	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB
SRAM	---	---	---	---	---	---	---	---	---	---
FSB	---	---	---	---	---	---	---	---	---	---
Flash	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	16 MB (OS); 32 MB (data)	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
System Memory	---	---	---	---	---	---	---	---	---	---
PCMCIA	---	---	---	√	√	√	√	√	---	---
Expansion Bus	---	---	---	---	---	---	---	---	---	---
USB Ports	---	---	---	---	---	---	---	---	---	---
Digital I/O	4 DIs, 4 DOs	4 DIs, 4 DOs	12 DIs, 12 DOs	---	---	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	---	---
Storage										
Built-in	---	---	---	---	---	---	---	---	---	---
CompactFlash Socket	√	√	√	√	√	√	√	√	---	---
SD Slot	---	---	---	---	---	---	---	---	---	---
Other Peripherals										
KB/MS	---	---	---	---	---	---	---	---	---	---
Audio	---	---	---	---	---	---	---	---	---	---
Display										
Graphics Controller	---	---	---	---	---	---	---	---	---	---
Mini Screen with Push Buttons	---	---	---	---	---	---	---	---	√	√
LAN Interface										
10/100 Mbps Ethernet Ports	3	3	3	2	2	2	2	2	2	2
10/100/1000 Mbps Ethernet Ports	---	---	---	---	---	---	---	---	---	---
Switch Ports	---	8	---	---	---	---	---	---	---	---
Controller	---	---	---	---	---	---	---	---	---	---
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface										
RS-232 Ports	---	---	---	---	---	---	---	---	---	---
RS-485	---	---	---	---	---	---	---	---	---	---
RS-232/422/485 Ports	8 (RJ45)	8 (RJ45)	8 (RJ45)	---	---	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Digital Isolation	---	---	---	---	---	---	---	---	---	---
Console Port	√	√	√	√	√	√	√	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			---	---	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark				
Flow Control	RTS/CTS, XON/XOFF, ADDC®			---	---	RTS/CTS, XON/XOFF, ADDC®				
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)			---	---	50 bps to 921.6 Kbps (non-standard baudrates supported)				
CANbus	---	---	2 (DB9-M)	---	---	---	---	---	---	---
LEDs										
System	Power, Ready, Storage, Battery			OS Ready						
LAN	10M, 100M			10M, 100M						
Serial	TxD, RxD			TxD, RxD						
Physical Characteristics										
Housing	SECC sheet metal (1 mm)									
Weight	850 g	930 g	1 kg	830 g	830 g	870 g	870 g	870 g	810 g	810 g
Dimensions	200 x 36.5 x 120 mm	200 x 56 x 120 mm		197 x 44 x 125 mm						
Mounting	DIN-Rail, wall			DIN-Rail, wall						
Environmental Limits										
Operating Temperature	-10 to 60°C or -40 to 75°C			-10 to 60°C		-10 to 60°C or -40 to 75°C			-10 to 60°C	
Operating Humidity	5 to 95% RH			5 to 95% RH		5 to 95% RH			5 to 95% RH	
Storage Temperature	-20 to 80°C or -40 to 85°C			-20 to 80°C		-20 to 80°C			-20 to 80°C	
Anti Vibration/Shock	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g	1g/5g
Regulatory Approvals										
EMC	CE (EN55022 Class B, EN55024-4-2, EN55024-4-3, EN55024-4-4), FCC (Part 15 Subpart B, Class B)			CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)						
Safety	UL/cUL (UL60950-1), CCC, LVD			UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)						
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)									

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Wallmount Computers

	UC-7420-LX	UC-7420-LX Plus	UC-7410-CE	UC-7420-CE	UC-7122-CE UC-7122-T-CE	UC-7124-CE UC-7124-T-CE	UC-7110-LX UC-7110-T-LX	UC-7112-LX	UC-7112-LX Plus	UC-7101-LX UC-7101-T-LX
Computer										
CPU Speed	266 MHz	533 MHz	266 MHz	533 MHz	200 MHz	200 MHz	192 MHz	192 MHz	192 MHz	192 MHz
OS (pre-installed)	Embedded Linux		WinCE 5.0				µClinux		Linux	µClinux
DRAM	128 MB	128 MB	128 MB	128 MB	32 MB	32 MB	16 MB	16 MB	32 MB	16 MB
SRAM	---	---	---	---	---	---	---	---	---	---
FSB	---	---	---	---	---	---	---	---	---	---
Flash	32 MB	32 MB	32 MB	32 MB	16 MB	16 MB	8 MB	8 MB	16 MB	8 MB
System Memory	---	---	---	---	---	---	---	---	---	---
PCMCIA	√	√	---	√	---	---	---	---	---	---
Expansion Bus	---	---	---	---	---	---	---	---	---	---
USB Ports	---	---	---	---	---	---	---	---	---	---
Digital I/O	---	---	---	---	---	---	---	---	---	---
Storage										
Built-in	---	---	---	---	---	---	---	---	---	---
CompactFlash Socket	√	√	---	√	---	---	---	---	---	---
SD Slot	---	---	---	---	√	√	---	√	√	√
Other Peripherals										
KB/MS	---	---	---	---	---	---	---	---	---	---
Audio	---	---	---	---	---	---	---	---	---	---
Display										
Graphics Controller	---	---	---	---	---	---	---	---	---	---
Mini Screen with Push Buttons	√	√	√	√	---	---	---	---	---	---
LAN Interface										
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	2	2	2	1
10/100/1000 Mbps Ethernet Ports	---	---	---	---	---	---	---	---	---	---
Switch Ports	---	---	---	---	---	---	---	---	---	---
Controller	---	---	---	---	---	---	---	---	---	---
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface										
RS-232 Ports	---	---	---	---	---	---	---	---	---	---
RS-485	---	---	---	---	---	---	---	---	---	---
RS-232/422/485 Ports	8 (RJ45)	8 (RJ45)	8 (RJ45)	8 (RJ45)	2 (RJ45)	4 (RJ45)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)	2 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Optical Isolation	---	---	---	---	---	---	---	---	---	---
Console Port	√	√	√	√	√	√	√	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF, ADDC®									
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)									
CANbus	---	---	---	---	---	---	---	---	---	---
LEDs										
System	OS Ready				Ready, SD		OS Ready			Ready
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics										
Housing	SECC sheet metal (1 mm)				Aluminum (1 mm)					
Weight	875 g	875 g	875 g	875 g	190 g	200 g	190 g	190 g	190 g	130 g
Dimensions	197 x 44 x 125 mm				77 x 111 x 26 mm					67 x 22 x 100.4 mm
Mounting	DIN-Rail, wall				DIN-Rail, wall					DIN-Rail, wall
Environmental Limits										
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C or -40 to 75°C					
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C		-20 to 80°C or -40 to 85°C			
Anti Vibration/Shock	1g/5g	1g/5g	1g/5g	1g/5g	---	---	---	---	---	---
Regulatory Approvals										
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)									
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)				LVD (EN60950-1), UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03)		UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)			LVD (EN60950-1), UL/cUL (UL60950, CAN/CSA-C22.2 No. 60950-00)
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)									

Rackmount Computers

	DA-681-I-SP-CE	DA-681-I-SP-XPE	DA-681-I-SP-LX	DA-681-I-DP-CE	DA-681-I-DP-XPE	DA-681-I-DP-LX	DA-682-CE	DA-682-XPE	DA-682-LX
Computer									
CPU Speed	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz
OS (pre-installed)	WinCE 6.0	WinXP Emb. SP2	Linux	WinCE 6.0	WinXP Emb. SP2	Linux	WinCE 6.0	WinXP Emb. SP2	Linux
DRAM	---	---	---	---	---	---	---	---	---
FSB	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz	400 MHz
Flash	---	---	---	---	---	---	---	---	---
System Memory	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)	256 MB (1 GB max.)	512 MB (1 GB max.)	512 MB (1 GB max.)
PCMCIA	---	---	---	---	---	---	---	---	---
Expansion Bus	PC/104-Plus onboard								
USB Ports	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)	4 (USB 2.0)
Storage									
Built-in	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB	256 MB	1 GB	1 GB
CompactFlash Socket	√	√	√	√	√	√	√	√	√
HDD Support	√	√	√	√	√	√	√	√	√
Other Peripherals									
KB/MS	1 PS/2 interface, supports standard PS/2 keyboard and PS/2 mouse via Y-type cable (Optional)								
Display									
Graphics Controller	√	√	√	√	√	√	√	√	√
Mini Screen with Push Buttons	---	---	---	---	---	---	---	---	---
LAN Interface									
10/100 Mbps Ethernet Ports	6	6	6	6	6	6			
10/100/1000 Mbps Ethernet Ports	---	---	---	---	---	---	4	4	4
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
100BaseFX Fiber Ports (multi-mode)	---	---	---	---	---	---	---	---	---
Serial Interface									
RS-232 Ports	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	---	---	---
RS-485	8 (TB)	8 (TB)	8 (TB)	8 (TB)	8 (TB)	8 (TB)	---	---	---
RS-232/422/485 Ports	---	---	---	---	---	---	---	---	---
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	---	---	---
Digital Isolation	2 KV	2 KV	2 KV	2 KV	2 KV	2 KV	---	---	---
Console Port	---	---	---	---	---	---	---	---	---
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark						---	---	---
Flow Control	RTS/CTS, XON/XOFF, ADDC®						---	---	---
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)						---	---	---
LEDs									
System	Ready, Storage, Power Failure (for dual power models only)						Ready, Power, Storage		
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	100M, 1000M	100M, 1000M	100M, 1000M
Serial	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX	TX, RX
Physical Characteristics									
Housing	SECC sheet metal (1 mm)								
Weight	4.5 kg	4.5 kg	4.5 kg	4.5 kg	4.5 kg	4.5 kg	7 kg	7 kg	7 kg
Dimensions	440 x 253 x 45 mm						440 x 253 x 90 mm		
Mounting	Standard 19-inch rackmount								
Environmental Limits									
Operating Temperature	0 to 60°C	0 to 60°C	0 to 60°C	0 to 60°C	0 to 60°C	0 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 75°C	-20 to 80°C	-20 to 80°C	-20 to 80°C
Regulatory Approvals									
EMC	CE (EN61000-3-2, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1) CE (EN55022)						CE (EN61000-6-4)		
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)								
Green Product	RoHS, CRoHS, WEEE								
Reliability									
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)								

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Rackmount Computers

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	DA-660-8-LX	DA-660-8-CE	DA-660-16-LX	DA-660-16-CE	DA-661-16-LX	DA-661-16-CE	DA-662-16-LX	DA-662-16-CE	DA-662-I-16-LX	DA-662-I-16-CE
Computer										
CPU Speed	266 MHz	266 MHz	266 MHz	266 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz	533 MHz
OS (pre-installed)	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0	Emb. Linux	WinCE 5.0
DRAM	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB
FSB	---	---	---	---	---	---	---	---	---	---
Flash	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
System Memory	---	---	---	---	---	---	---	---	---	---
PCMCIA	---	---	---	---	√	√	√	√	√	√
Expansion Bus	---	---	---	---	---	---	---	---	---	---
USB Ports	---	---	---	---	2	2	2	2	2	2
Storage										
Built-in	---	---	---	---	---	---	---	---	---	---
CompactFlash Socket	---	---	---	---	√	√	√	√	√	√
HDD Support	---	---	---	---	---	---	---	---	---	---
Other Peripherals										
KB/MS	---	---	---	---	---	---	---	---	---	---
Display										
Graphics Controller	---	---	---	---	---	---	---	---	---	---
Mini Screen with Push Buttons	√	√	√	√	√	√	√	√	√	√
LAN Interface										
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	4	4	4	4
10/100/1000 Mbps Ethernet Ports	---	---	---	---	---	---	---	---	---	---
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
100BaseFX Fiber Ports (multi-mode)	---	---	---	---	---	---	---	---	---	---
Serial Interface										
RS-232 Ports	---	---	---	---	---	---	---	---	---	---
RS-485	---	---	---	---	---	---	---	---	---	---
RS-232/422/485 Ports	8 (RJ45)	8 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)	16 (RJ45)
ESD Protection	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Digital Isolation	---	---	---	---	---	---	---	---	2 KV	2 KV
Console Port	√	√	√	√	√	√	√	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark									
Flow Control	RTS/CTS, XON/XOFF, ADDC®									
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)									
LEDs										
System	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready	OS Ready
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics										
Housing	SECC sheet metal (1 mm)									
Weight	2600 g	2600 g	2600 g	2600 g	2600 g	2600 g	2600 g	2600 g	2940 g	2940 g
Dimensions	440 x 45 x 198 mm								440 x 45 x 228 mm	
Mounting	Standard 19-inch rackmount									
Environmental Limits										
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C	-10 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C	-20 to 80°C
Regulatory Approvals										
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)									
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)									
Green Product	RoHS, CRoHS, WEEE									
Reliability										
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)									

Module/Board Computers

	EM-2260-CE	EM-2260-LX	EM-1240-LX EM-1240-T-LX	EM-1220-LX EM-1220-T-LX
Computer				
CPU Speed	200 MHz	200 MHz	192 MHz	192 MHz
OS (pre-installed)	WinCE 6.0	Linux	Embedded µClinux	
DRAM	128 MB	128 MB	16 MB	16 MB
Flash	32 MB	32 MB	8 MB	8 MB
Digital I/O	8 DIs, 8 DOs	8 DIs, 8 DOs	---	---
Storage				
SD Slot	---	---	√	√
EIDE Interface	√	√	---	---
Display				
Graphics Controller	√	√	---	---
LAN Interface				
10/100 Mbps Ethernet Ports	2	2	2	2
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface				
RS-232/422/485 Ports	4	4	4	2
ESD Protection	15 KV	15 KV	15 KV	15 KV
Console Port	√	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark			
Flow Control	RTS/CTS, XON/XOFF, ADDC®			
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)			
Physical Characteristics				
Weight	70 g	70 g	50 g	40 g
Dimensions	106 x 87 mm	106 x 87 mm	90 x 80 mm	80 x 50 mm
Module Interface	---	---	Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)	
Environmental Limits				
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C or -40 to 75°C	
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C or -40 to 85°C	
Regulatory Approvals				
EMC	CE (Class A), FCC		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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Embedded Computers for Communication ❯ Product Selection Guides

V462 Series

x86-based computers with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB

-40°C 75°C

> AMD Geode LX 800@0.9W CPU, 500 MHz
> Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
> Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
> 256 KB of SRAM with battery backup
> 2 RS-232 and 2 RS-232/422/485 serial ports, supporting non-standard baudrates
> Dual 10/100 Mbps Ethernet ports for network redundancy
> CompactFlash socket for storage expansion
> 4 USB 2.0 hosts supporting system boot up
> LED indicators for power, battery, storage
> Ready-to-run WinCE 6.0 or Windows XP Embedded platform
> DIN-rail and wall-mount installation
> -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Microsoft® Windows® Embedded   CCC   e   RoHS   CE   FC   c UL us LISTED

⋮ Overview

The V462 embedded computers are based on the AMD x86 processor, and feature 4 serial ports, dual LAN ports, 4 USB 2.0 hosts, and CompactFlash and PCMCIA sockets. A VGA interface is also included, making the V462 computers particularly well-suited for industrial applications such as SCADA and factory automation.

The V464 computers' 4 serial ports can be used to connect a wide range of serial devices, and the dual 10/100 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous

operation for data communication and management. In addition, the CompactFlash, PCMCIA, and USB sockets provide the V462 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

The V462 computers come with the WinCE 6.0 or WinXP Embedded operating system already installed. WinCE 6.0 and WinXP Embedded provide programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

⋮ Appearance

Front View

Power LED   10/100 Mbps Ethernet x 2   VGA   PCMCIA Socket   USB 2.0 Host x 4

Storage LED

MOXA V462

Reset   LAN1   LAN2

PCMCIA

CF

SRAM Battery Status LED   Reset   CompactFlash Socket   PS/2   Audio Line Out

Rear View

Power Switch

RS-232
Serial Ports x 2

RS-232/422/485
Serial Ports x 2

Power Input
9-36 VDC

: Hardware Specifications

Computer

CPU: AMD Geode LX 800@0.9W processor, 128K L2 Cache, 500 MHz

OS (pre-installed): Windows CE 6.0 or Windows XP Embedded

System Chipset: AMD CS5536

BIOS: 4 mega-bit Flash BIOS, supporting Plug & Play, APM 1.2, ACPI 1.0

SRAM: 256 KB, battery backup

FSB: 400 MHz
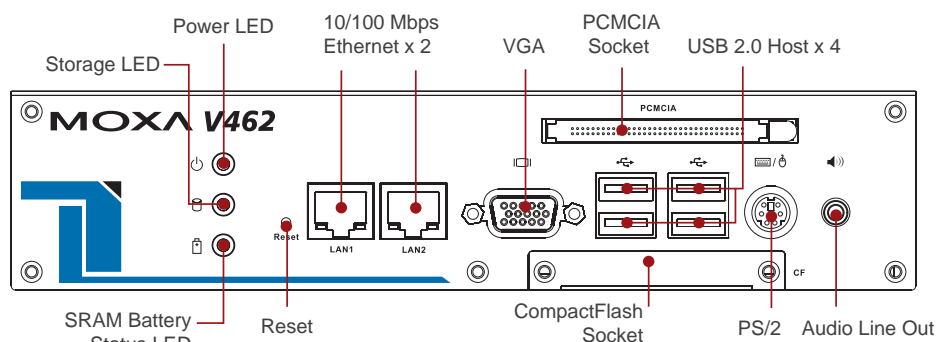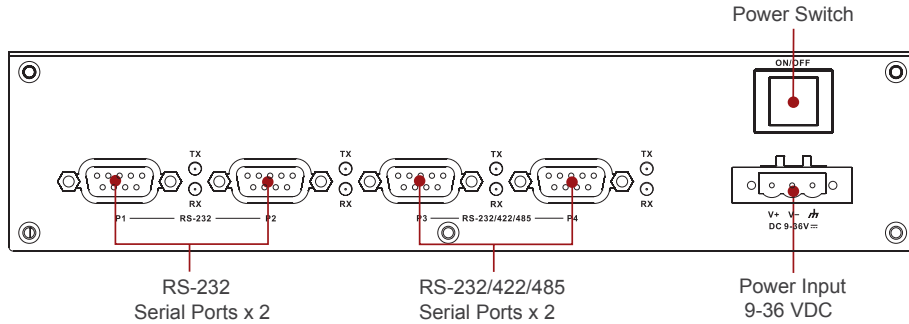
System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR400 up to 1 GB

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1/JEIDA 4.2 card

Expansion Bus: PC/104-Plus onboard

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

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial DOM for OS

Storage Expansion: CompactFlash socket

Other Peripherals

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

Audio: AC97 audio, with speaker-out interface

Display

Graphics Controller: CPU integrated 2D graphics

Display Interface: CRT interface for VGA output

Ethernet Interface

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

Controller: Realtek RTL8100CL

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: Power, Battery, Storage

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

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum, EPIC form factor

Weight: 1.32 kg

Dimensions: 223 x 120.5 x 57 mm (8.78 x 4.74 x 2.24 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)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 26 W
• 730 mA @ 36 VDC
• 1080 mA @ 24 VDC
• 2820 mA @ 9 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)

Reliability

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

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

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

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

: Software Specifications

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE).

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

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

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).

Application Development Software:
- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions

120.5 mm
(4.74 in)

223 mm (8.78 in)

57 mm
(2.24 in)

Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, SNTP, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

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

Application Development Software:
- Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with The USB .95 or 1.0
- Windows API, Media Player 10, Script Engines, and WMI

: Ordering Information

Available Models

V462-CE: x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature

V462-XPE: x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature

V462-T-CE: x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and WinCE 6.0 OS, -40 to 75°C operating temperature

V462-T-XPE: x86 embedded computer with 4 serial ports, dual LANs, VGA, CompactFlash, PCMCIA, USB, and Windows XP Embedded OS, -40 to 75°C operating temperature

Package Checklist

- V462 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- DIN-rail Mounting Kit
- PS2 to KB/MS Y-type Cable
- Document and Software CD or DVD
- Quick Installation Guide (printed)
- Warranty Card

V464 Series

x86-based computers with 4 serial ports, quad LANs, VGA, CompactFlash, USB

-40°C 75°C

> AMD Geode LX 800@0.9W CPU, 500 MHz
> Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
> Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
> 256 KB of SRAM with battery backup
> 2 RS-232 and 2 RS-232/422/485 serial ports, supporting non-standard baudrates
> Quad 10/100 Mbps Ethernet ports for network redundancy
> CompactFlash socket for storage expansion
> 4 USB 2.0 hosts supporting system boot up
> LED indicators for power, battery, storage
> Ready-to-run WinCE 6.0 or Windows XP Embedded platform
> DIN-rail and wall-mount installation
> Robust, fan-less design
> -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Microsoft® **Windows® Embedded**   CCC   e   RoHS   C€   FC   c UL us LISTED

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Embedded Computers for Communication ˅ V464 Series

⠿ Overview

The V464 embedded computers are based on the AMD x86 processor, and feature 4 serial ports, quad LAN ports, 4 USB 2.0 hosts, and CompactFlash. A VGA interface is included, making the V464 computers particularly well-suited for industrial applications such as SCADA and factory automation.

The V464 computers' 4 serial ports make them ideal for connecting a wide range of serial devices, and the quad 10/100 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. In addition, the CompactFlash and USB sockets provide the V464 computers with the reliability needed for industrial applications that require data buffering and storage expansion.

The V464 computers come with either the WinCE 6.0 or WinXP Embedded operating system already installed. WinCE 6.0 and WinXP Embedded provide programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

⠿ Appearance

Front View

Rear view

Power Switch

ON/OFF

V+ V- ⏚
DC 9-36V ⎓

RS-232
Serial Ports x 2

RS-232/422/485
Serial Ports x 2

Power Input
9-36 VDC

: Hardware Specifications

Computer

CPU: AMD Geode LX 800@0.9W processor, 128K L2 Cache, 500 MHz

OS (pre-installed): Windows CE 6.0 or Windows XP Embedded

System Chipset: AMD CS5536

BIOS: 4 mega-bit Flash BIOS, supporting Plug & Play, APM 1.2, ACPI 1.0

SRAM: 256 KB, battery backup

FSB: 400 MHz

System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR400 up to 1 GB

Expansion Bus: PC/104-Plus onboard

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

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial DOM for OS

Storage Expansion: CompactFlash socket

Other Peripherals

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

Audio: AC97 audio, with speaker-out interface

Display

Graphics Controller: CPU integrated 2D graphics

Display Interface: CRT interface for VGA output

Ethernet Interface

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

Controller: Realtek RTL8100CL

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: Power, Battery, Storage

LAN: 10M/Link x 4, 100M/Link x 4 (on connector)

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum, EPIC form factor

Weight: 1.32 kg

Dimensions: 223 x 120.5 x 57 mm (8.78 x 4.74 x 2.24 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)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 26 W
• 730 mA @ 36 VDC
• 1080 mA @ 24 VDC
• 2820 mA @ 9 VDC)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)

Green Product: RoHS, WEEE

Reliability

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

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

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

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

:: Software Specifications

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE)

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

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

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function)

Application Development Software:
• Moxa WinCE 6.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 2.0 SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
• SOAP Toolkit Client
• Winsock 2.2

Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, SNTP, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. It allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

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

Application Development Software:
• Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
• Active Directory Service Interface (ADSI) Core
• Active Template Library (ATL),ASP.NET 2.0
• Certificate Request Client & Certificate Autoenrollment (CLR and the .NET Framework class library)
• COM APIs
• Common Control Libraries
• Common File Dialogs
• Direct3D, DirectPlay, DirectShow and Direct show filters
• Distributed Transaction Coordinator (MSDTC)
• Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
• Event Log, Internet Explorer
• Mapi32 Libraries
• Message Queuing (MSMQ) Core
• Microsoft Visual C++ Run Time Libraries
• Power Management dynamic-link library
• Registry Editor
• RPC
• Smart Card Cryptographic Service Providers
• USB 2.0 core drivers compliant with The USB .95 or 1.0
• Windows API, Media Player 10, Script Engines, and WMI

Dimensions

120.5 mm (4.74 in)

223 mm (8.78 in)

57 mm (2.24 in)

:: Ordering Information

Available Models

V464-CE: x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature

V464-XPE: x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature

V464-T-CE: x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and WinCE 6.0 OS, -40 to 75°C operating temperature

V464-T-XPE: x86 embedded computer with 4 serial ports, quad LANs, VGA, CompactFlash, USB, and Windows XP Embedded OS, -40 to 75°C operating temperature

Package Checklist

• V464 embedded computer
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• DIN-rail Mounting Kit
• PS2 to KB/MS Y-type Cable
• Document and Software CD or DVD
• Quick Installation Guide (printed)
• Warranty Card

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Embedded Computers for Communication › V464 Series

V466 Series

x86-based computers with 4 serial ports, quad LANs, VGA, CompactFlash, built-in 8-port Ethernet switch, USB

-40°C 75°C

> AMD Geode LX 800@0.9W CPU, 500 MHz
> Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
> Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
> 256 KB battery backup SRAM
> 2 RS-232 and 2 RS-232/422/485 serial ports, supporting non-standard baudrates
> Quad 10/100 Mbps Ethernet ports for network redundancy
> Built-in 8-port Ethernet switch for connecting network devices
> CompactFlash socket for storage expansion
> 4 USB 2.0 hosts supporting system boot up
> LED indicators for power, battery, storage
> Ready-to-run WinCE 6.0 or Windows XP Embedded platform
> DIN-rail and wall-mount installation
> Robust, fan-less design
> -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Microsoft® Windows® Embedded   CCC   e   RoHS   CE   FC   c UL us LISTED

: Overview

The V466 embedded computers are based on the AMD x86 processor, and feature 4 serial ports, quad LAN ports, 4 USB 2.0 hosts, and CompactFlash. A VGA interface is included to make the V466 computers particularly well-suited for industrial applications, such as SCADA and factory automation.

The V466 computers' 4 serial ports make them ideal for connecting a wide range of serial devices, and the quad 10/100 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an

added convenience, the V466 computers have 8 built-in 10/100 Mbps Ethernet switch ports for connecting network devices. In addition, the CompactFlash and USB sockets provide the V466 computers with the reliability needed for industrial applications that require data buffering and storage expansion.
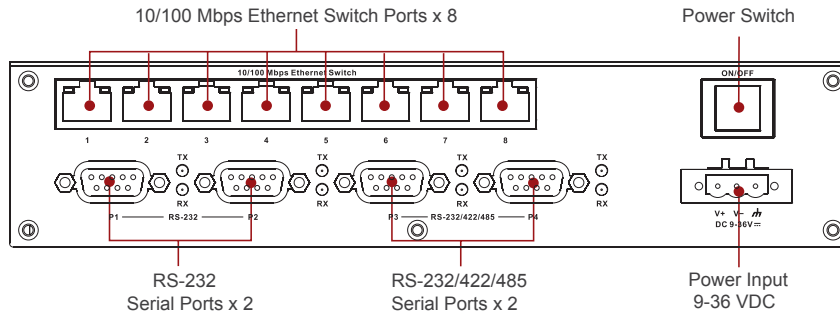
The V466 computers comes with the WinCE 6.0 or WinXP Embedded operating system already installed. WinCE 6.0 or WinXP Embedded provides programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

: Appearance

Front View

Power LED
Storage LED
10/100 Mbps Ethernet x 4
VGA
USB 2.0 Host x 4

SRAM Battery Status LED
Reset
CompactFlash Socket
PS/2
Audio Line Out

Rear view

10/100 Mbps Ethernet Switch Ports x 8   Power Switch

RS-232
Serial Ports x 2

RS-232/422/485
Serial Ports x 2

Power Input
9-36 VDC

: Hardware Specifications

Computer

CPU: AMD Geode LX 800@0.9W processor with 128K L2 Cache, 500 MHz

OS (pre-installed): Windows CE 6.0 or Windows XP Embedded

System Chipset: AMD CS5536

BIOS: 4 mega-bit Flash BIOS, supporting Plug & Play, APM 1.2, ACPI 1.0

SRAM: 256 KB, battery backup

FSB: 400 MHz

System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR400 up to 1 GB

Expansion Bus: PC/104-Plus onboard

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

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial DOM for OS

Storage Expansion: CompactFlash socket

Other Peripherals

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

Audio: AC97 audio, with speaker-out interface

Display

Graphics Controller: CPU integrated 2D graphics

Display Interface: CRT interface for VGA output

Ethernet Interface

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

Switch Ports: Built-in 8-port Ethernet switch (10/100 Mbps, unmanaged)

Controller: Realtek RTL8100CL

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manuals 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: Power, Battery, Storage

LAN: 10M/Link x 4, 100M/Link x 4 (on connector), Switch x 8

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum, EPIC form factor

Weight: 1.32 kg

Dimensions:
Without ears: 223 x 120.5 x 57 mm (8.78 x 4.74 x 2.24 in)
With ears: 253 x 120.5 x 57 (9.96 x 4.74 x 2.24 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)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 26 W
• 730 mA @ 36 VDC
• 1080 mA @ 24 VDC
• 2820 mA @ 9 VDC)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)

Green Product: RoHS, WEEE

Reliability

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

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

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

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

Software Specifications

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE)

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

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

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function)

Application Development Software:
• Moxa WinCE 6.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 2.0 SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
• SOAP Toolkit Client
• Winsock 2.2

Dimensions

120.5 mm (4.74 in)
223 mm (8.78 in)
57 mm (2.24 in)

Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, SNTP, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. It allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

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

Application Development Software:
• Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
• Active Directory Service Interface (ADSI) Core
• Active Template Library (ATL),ASP.NET 2.0
• Certificate Request Client & Certificate Autoenrollment (CLR and the .NET Framework class library)
• COM APIs
• Common Control Libraries
• Common File Dialogs
• Direct3D, DirectPlay, DirectShow and Direct show filters
• Distributed Transaction Coordinator (MSDTC)
• Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
• Event Log, Internet Explorer
• Mapi32 Libraries
• Message Queuing (MSMQ) Core
• Microsoft Visual C++ Run Time Libraries
• Power Management dynamic-link library
• Registry Editor
• RPC
• Smart Card Cryptographic Service Providers
• USB 2.0 core drivers compliant with USB .95 or 1.0
• Windows API, Media Player 10, Script Engines, and WMI

Ordering Information

Available Models

V466-CE: x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature

V466-XPE: x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature

V466-T-CE: x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and WinCE 6.0 OS, -40 to 75°C operating temperature

V466-T-XPE: x86 embedded computer with 4 serial ports, quad LANs, 8-port Ethernet switch, VGA, CompactFlash, USB, and Windows XP Embedded OS, -40 to 75°C operating temperature

Package Checklist
• V466 embedded computer
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• DIN-rail Mounting Kit
• PS2 to KB/MS Y-type Cable
• Document and Software CD or DVD
• Quick Installation Guide (printed)
• Warranty Card

V468 Series

x86-based computers with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB

-40°C 75°C

> AMD Geode LX 800@0.9W CPU, 500 MHz
> Built-in 256 MB (CE) or 512 MB (XPe) DDR SDRAM
> Built-in 256 MB (CE) or 1 GB (XPe) industrial DOM to store the operating system
> 256 KB battery backup SRAM
> 2 RS-232 and 2 RS-232/422/485 serial ports, supporting non-standard baudrates
> Quad 10/100 Mbps Ethernet ports for network redundancy
> 8 DI and 8 DO interfaces for digital input/output connections, with 3 KV isolation protection
> CompactFlash socket for storage expansion
> 4 USB 2.0 hosts supporting system boot up
> LED indicators for power, battery, storage
> Ready-to-run WinCE 6.0 or Windows XP Embedded platform
> DIN-rail and wall-mount installation
> Robust, fan-less design
> -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Microsoft® Windows® Embedded   CCC   e   RoHS   CE   FC   c(UL)us LISTED

: Overview

The V468 embedded computers are based on the AMD x86 processor, and feature 4 serial ports, quad LAN ports, 4 USB 2.0 hosts, and CompactFlash. A VGA interface is included to make the V468 computers particularly well-suited for industrial applications, such as SCADA and factory automation.

The V468 computers' 4 serial ports make them ideal for connecting a wide range of serial devices, and the quad 10/100 Mbps Ethernet ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As

an added convenience, the V468 computers have 8 DIs and 8 DOs for connecting digital input/output devices. In addition, the CompactFlash and USB sockets provide the V468 computers with the reliability needed for industrial applications that require data buffering and storage expansion.
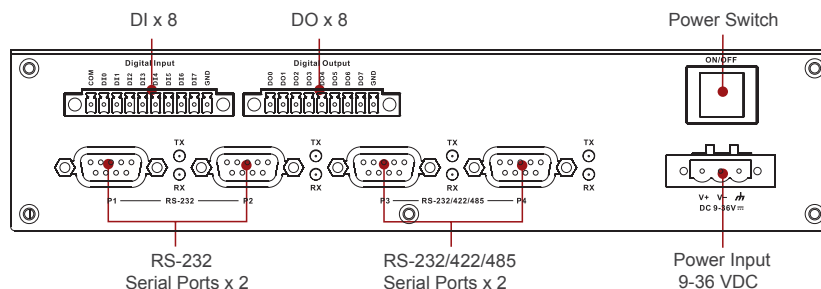
The V468 computers come with the WinCE 6.0 or WinXP Embedded operating system already installed. WinCE 6.0 or WinXP Embedded provides programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

: Appearance

Front View

Power LED · Storage LED · 10/100 Mbps Ethernet x 4 · VGA · USB 2.0 Host x 4

SRAM Battery Status LED · Reset · CompactFlash Socket · PS/2 · Audio Output

Rear view

DI x 8 · DO x 8 · Power Switch

RS-232 Serial Ports x 2 · RS-232/422/485 Serial Ports x 2 · Power Input 9-36 VDC

⠿ Hardware Specifications

Computer

CPU: AMD Geode LX 800@0.9W processor with 128K L2 Cache, 500 MHz

OS (pre-installed): Windows CE 6.0 or Windows XP Embedded

System Chipset: AMD CS5536

BIOS: 4 mega-bit Flash BIOS, supporting Plug & Play, APM 1.2, ACPI 1.0

SRAM: 256 KB, battery backup

FSB: 400 MHz

System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR400 up to 1 GB

Expansion Bus: PC/104-Plus onboard

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

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial DOM for OS

Storage Expansion: CompactFlash socket

Other Peripherals

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

Audio: AC97 audio, with speaker-out interface

Display

Graphics Controller: CPU integrated 2D graphics

Display Interface: CRT interface for VGA output

Ethernet Interface

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

Controller: Realtek RTL8100CL

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

Digital Input

Input Channels: 8, source type

Input Voltage: 0 to 30 VDC at 5 KHz

Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open

Digital Input Levels for Wet Contacts:
• Logic level 0: +3V max.
• Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (8 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 8, sink type

Output Current: Max. 200 mA per channel

Output Voltage:
• Logic 0: 0-0.55 V
• Logic 1: 2.5-3.3 V

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

Connector Type: 9-pin screw terminal block

Isolation: 3 KV optical isolation

LEDs

System: Power, Battery, Storage

LAN: 10M/Link x 4, 100M/Link x 4 (on connector)

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum, EPIC form factor

Weight: 1.32 kg

Dimensions:
Without ears: 223 x 120.5 x 57 mm (8.78 x 4.74 x 2.24 in)
With ears: 248 x 140 x 70 mm (9.76 x 5.51 x 2.76 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block for V+, V-, SG)

Power Consumption: 26 W
• 730 mA @ 36 VDC
• 1080 mA @ 24 VDC
• 2820 mA @ 9 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD, CCC (GB4943)

Green Product: RoHS, WEEE

Reliability

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

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

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

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

: Software Specifications

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE)

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

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

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function)

Application Development Software:
- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Dimensions

120.5 mm (4.74 in)

223 mm (8.78 in)

57 mm (2.24 in)

Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, SNTP, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. It allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

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

Application Development Software:
- Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with USB .95 or 1.0
- Windows API, Media Player 10, Script Engines, and WMI

: Ordering Information

Available Models

V468-CE: x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and WinCE 6.0 OS, -10 to 60°C operating temperature

V468-XPE: x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and Windows XP Embedded OS, -10 to 60°C operating temperature

V468-T-CE: x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and WinCE 6.0 OS, -40 to 75°C operating temperature

V468-T-XPE: x86 embedded computer with 4 serial ports, quad LANs, VGA, 8 DI, 8 DO, CompactFlash, USB, and Windows XP Embedded OS, -40 to 75°C operating temperature

Package Checklist

- V468 embedded computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- DIN-rail Mounting Kit
- PS2 to KB/MS Y-type Cable
- Document and Software CD or DVD
- Quick Installation Guide (printed)
- Warranty Card

15

Embedded Computers for Communication > V468 Series

V481 Series

x86-based computer with 8 serial ports, dual LANs, VGA, CompactFlash, USB, audio

-35°C 75°C

> Intel Celeron M 1 GHz CPU, 400 MHz FSB
> 256 MB (CE) or 512 MB (XPe) DDR SDRAM, 256 MB (CE) or 1 GB (XPe) industrial CompactFlash built in
> 8 software-selectable RS-232/422/485 serial ports
> Serial port speed from 50 bps to 921.6 Kbps, supporting non-standard baudrates
> 10/100 Mbps and 10/100/1000 Mbps LANs for network redundancy
> Supports 2nd CompactFlash socket for storage expansion
> 2 USB 2.0 hosts that support system bootup
> LED indicators for system power and storage
> Designed to withstand 5g's of continuous vibration and 50g shocks
> Ready-to-run WinCE 5.0 or Windows XP Embedded platform
> DIN-rail or wall-mount installation
> Robust, fanless design
> Wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Microsoft® Windows® Embedded | CCC | e | RoHS | DNV | CE | FC | c UL us LISTED

: Overview

The V481 ready-to-run embedded computers are based on the Intel x86 processor, and come with VGA interface, dual LANs, 8 serial ports, CompactFlash, USB, and audio. The VGA interface was included to make this computer particularly well-suited for industrial applications, such as SCADA and factory automation.
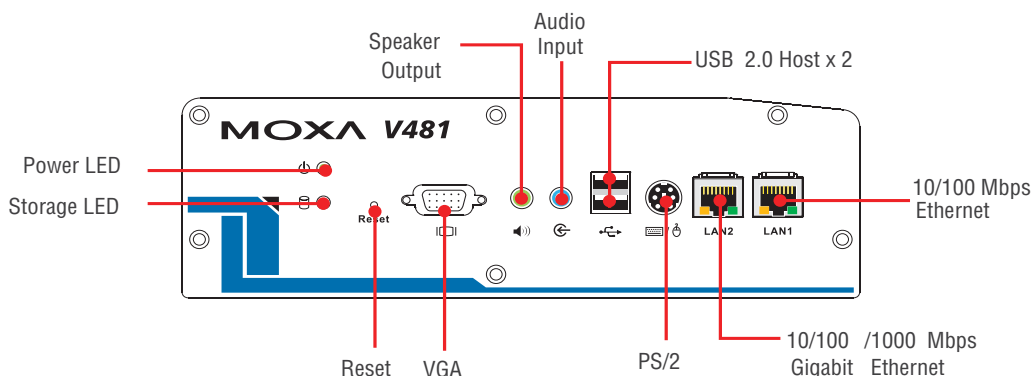
The V481 computers come with 8 software-selectable RS-232/422/485 serial ports built in, making them ideal for connecting a wide range of serial devices. The 10/100 Mbps and 10/100/1000 Mbps LAN ports offer a reliable solution for network redundancy, promising continuous operation for data communication and management. In addition, the second CompactFlash socket makes storage expansion easier, and the

USB slots can be used to connect different types of devices, making the V481 a reliable embedded computer for industrial applications that require VGA and HMI features.

The V481 comes with the Windows CE 5.0 or Windows XP Embedded operating system pre-installed, providing a friendly environment for programmers to develop sophisticated application software. The great software support that Moxa provides makes the programmer's job easier, and makes it possible to develop bug-free code quickly and at a lower cost. In addition, the wide operating temperature model, which works in temperatures ranging from -35 to 75°C, provides users with a great solution for any harsh environment.
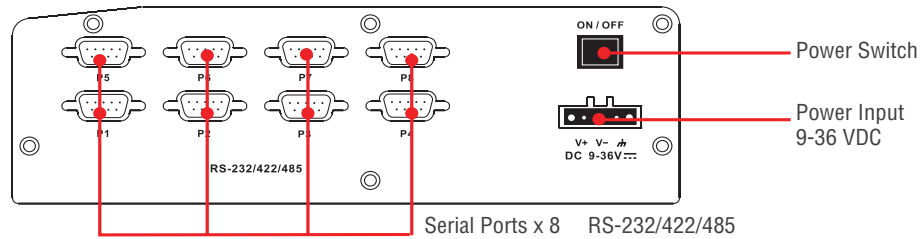
: Appearance

Front View

Speaker Output
Audio Input
USB 2.0 Host x 2
Power LED
Storage LED
10/100 Mbps Ethernet
Reset
VGA
PS/2
10/100 /1000 Mbps Gigabit Ethernet

Rear view

ON / OFF .... Power Switch

V+ V- ⏚
DC 9-36V ⎓ .... Power Input 9-36 VDC

Serial Ports x 8   RS-232/422/485

⦂ Hardware Specifications

Computer

CPU: Intel ULV Celeron M 1 GHz processor

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

System Chipset: Intel 852GM GMCH +ICH4

BIOS: 4 mega-bit Flash BIOS, supporting Plug & Play

FSB: 400 MHz

System Memory: 200-pin SO-DIMM socket with built-in 256 MB (CE) or 512 MB (XPe) DDR, supporting DDR200/266 up to 1 GB

Expansion Bus: PC/104-Plus onboard

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

Storage

Built-in: 256 MB (CE) or 1 GB (XPe) industrial CompactFlash card onboard to store OS

Storage Expansion: CompactFlash socket

Other Peripherals

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

Audio: AC97 audio, with speaker-out interface

Display

Graphics Controller: Integrated graphics with built-in Intel 852GM GMCH and Intel extreme Graphics 2 technology

Display Memory: Dynamic video memory for up to 32 MB of system memory

Display Interface: CRT

Ethernet Interface

LAN: 2 independent LAN ports (RJ45)
• LAN1: Auto-sensing 10/100 Mbps Ethernet, using integrated MAC and Intel 82562GZ transceiver
• LAN2: Auto-sensing 10/100/1000 Mbps Gigabit Ethernet, using Realtek RTL8110SC controller

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: Power, Storage

LAN1: Act/Link and 10/100 Mbps mode (on connector)

LAN2: Act/Link and 10/100/1000 Mbps mode (on connector)

Switches and Buttons

Power Switch: on/off

Reset Button: For warm reboot

Physical Characteristics

Housing: Aluminum

Weight: 2.2 kg

Dimensions:
Without ears: 225 x 140 x 70 mm (8.86 x 5.51 x 2.76 in)
With ears: 248 X 140 X 70 mm (9.76 X 5.51 X 2.76 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -35 to 75°C (-31 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 9 to 36 VDC

Power Consumption: 24 W
• 650 mA @ 36 VDC
• 1000 mA @ 24 VDC
• 2750 mA @ 9 VDC)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)

Green Product: RoHS, WEEE

Reliability

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

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

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

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

: Software Specifications

Windows Embedded CE 5.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

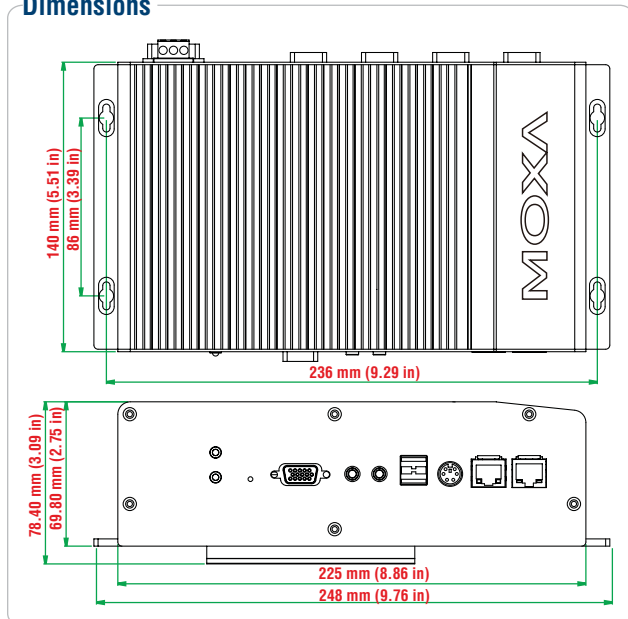**FTP Server:** Used for transferring files to and from remote computer systems over a network.

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

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

Application Development Environment:
• Moxa WinCE 5.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 2.0 SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
• SOAP Toolkit, Winsock 2.2, SQL Mobile

Dimensions

Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS,IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, SNTP, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers, exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

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

Application Development Software:
• Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
• Active Directory Service Interface (ADSI) Core
• Active Template Library (ATL),ASP.NET 2.0
• Certificate Request Client & Certificate Autoenrollment (CLR and the .NET Framework class library)
• COM APIs
• Common Control Libraries
• Common File Dialogs
• Direct3D, DirectPlay, DirectShow and Direct show filters
• Distributed Transaction Coordinator (MSDTC)
• Enhanced Write Filter (redirects disk write operations to volatile (RAM) or non-volatile (disk) storage)
• Event Log,Internet Explorer
• Mapi32 Libraries
• Message Queuing (MSMQ) Core
• Microsoft Visual C++ Run Time Libraries
• Power Management dynamic-link library
• Registry Editor
• RPC
• Smart Card Cryptographic Service Providers
• USB 2.0 core drivers compliant with USB .95 or 1.0
• Windows API, Media Player 10, Script Engines, and WMI

: Ordering Information

Available Models

V481-CE: x86 embedded computer with VGA, dual LANs, 8 serial ports, CompactFlash, USB, audio, WinCE 5.0, -10 to 60°C operating temperature

V481-XPE: x86 embedded computer with VGA, dual LANs, 8 serial ports, CompactFlash, USB, audio, Win XPE, -10 to 60°C operating temperature

V481-T-CE: x86 embedded computer with VGA, dual LANs, 8 serial ports, Compact Flash, USB, audio, WinCE 5.0, -35 to 75°C operating temperature

V481-T-XPE: x86 embedded computer with VGA, dual LANs, 8 serial ports, CompactFlash, USB, audio, Win XPE, -35 to 75°C operating temperature

Package Checklist

• V481 embedded computer
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• DIN-rail Mounting Kit
• PS2 to KB/MS Y-type Cable
• Document and Software CD or DVD
• Quick Installation Guide (printed)
• Warranty Card

UC-8410 Series

RISC-based industrial embedded computer with 8 serial ports, 3 LANs, DIO, CompactFlash, USB

-40°C ~ 75°C

> Intel XScale IXP435 533 MHz processor
> 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
> 16 MB NOR Flash onboard to store OS, 32 MB NAND Flash onboard for data storage
> 256 KB battery backup SRAM
> 8 RS-232/422/485 serial ports
> 4 digital input and 4 digital output channels
> 3 10/100 Mbps Ethernet ports
> 2 USB 2.0 hosts for mass storage devices
> CompactFlash socket for storage expansion
> Ready-to-run Linux platform
> DIN-Rail or wall mounting installation
> Robust, fanless design
> Wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

15

Embedded Computers for Communication > UC-8410 Series

⋮ Overview

The UC-8410 embedded computers come with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 4 digital input channels, 4 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts. The UC-8410 computers use the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but does not generate a lot of heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8410, and the 32 MB NAND Flash can be used for data storage. Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss.
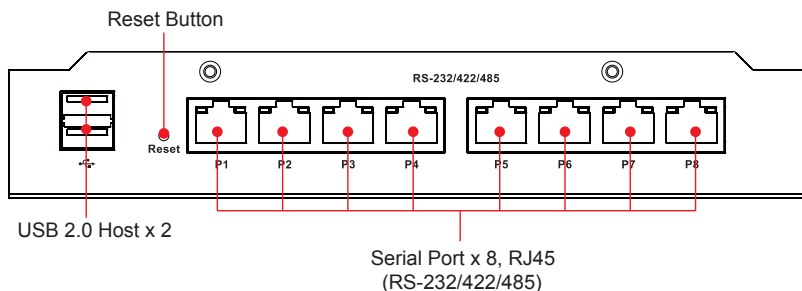
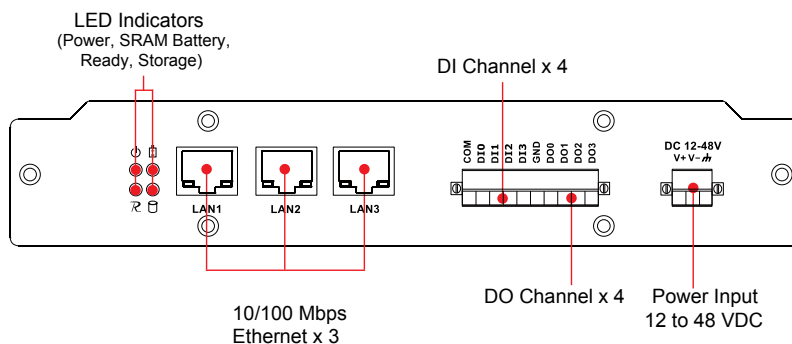The UC-8410 computers support RS-232/422/485 serial ports, digital I/O channels, and has 3 LAN ports, making them ideal as communication platforms for industrial applications that require network redundancy.

The UC-8410 computers come with the Linux 2.6 platform pre-installed to provide an open standard operating system for software program development. Software written for a desktop PC can be easity ported to the UC-8410 without modifying the code—all that's needed is a common compiler. This makes the UC-8410 an optimal solution for minimizing the cost and effort required for industrial applications.

In addition to the standard model, a wide temperature (-40 to 75°C) model of the UC-8410 is also available for use in harsh industrial environments.

⋮ Appearance

Reset Button

RS-232/422/485

Reset

P1 P2 P3 P4 P5 P6 P7 P8

USB 2.0 Host x 2

Serial Port x 8, RJ45
(RS-232/422/485)

LED Indicators
(Power, SRAM Battery, Ready, Storage)

DI Channel x 4

DO Channel x 4   Power Input 12 to 48 VDC

10/100 Mbps Ethernet x 3

: Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux

DRAM: 256 MB DDR2 SDRAM onboard (512 MB max.)

SRAM: 256 KB, battery backup

Flash:
16 MB NOR Flash onboard to store OS (supports up to 32 MB)
32 MB NAND Flash onboard to store data

USB: USB 2.0 full speed x 2 (OHCI)

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 3 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD Protection: 15 KV for all signals

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open

Digital Input Levels for Wet Contacts:
• Logic level 0: +3V max.
• Logic level 1: +10V to +30V (COM to DI)

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

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

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

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

Isolation: 3 KV optical isolation

LEDs

System: Power, Ready, Storage, Battery for SRAM

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

Serial: TxD x 8, RxD x 8

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 850 g

Dimensions: 200 x 36.5 x 120 mm (7.87 x 1.44 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)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 1g @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis

Anti-shock: 5g @ IEC-68-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption: 15 W
• 300 mA @ 48 V
• 625 mA @ 24 VDC
• 1280 mA @ 12 V)

Regulatory Approvals

EMC: CE (EN55022 Class B, EN55024-4-2, EN55024-4-3, EN55024-4-4), FCC (Part 15 Subpart B, Class B)

Safety: UL/cUL (UL60950-1), CCC (GB9254, GB 17625.1), LVD (EN60950)

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 adaptor and cables.

: Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, busybox, tinylogin, telnet, ftp, ssh, scp

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

openvpn: virtual private network service manager

pppd: dial in/out over serial port daemon

snmpd: snmpd agent daemon

openssl: open SSL

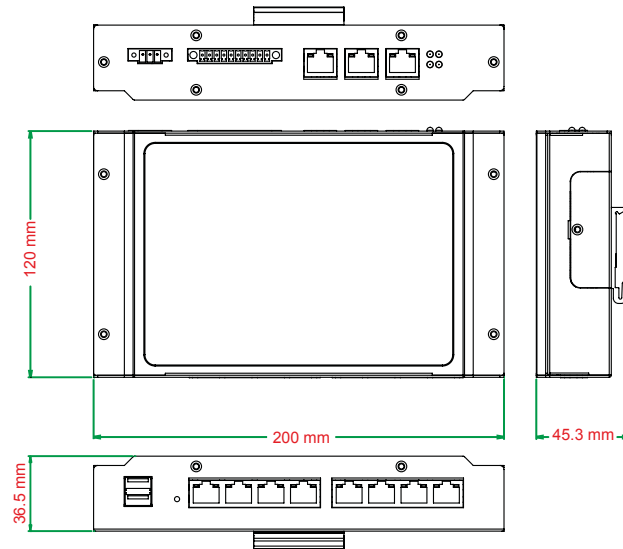**Application Development Software:** Moxa Linux API device control

Linux Tool Chain:
- GCC (V4.2.1): C/C++ PC Cross Compiler
- Glibc (V2.2.5): POSIX standard C Library
- GDB (V6.3): source level debug server

H/W Block Diagram
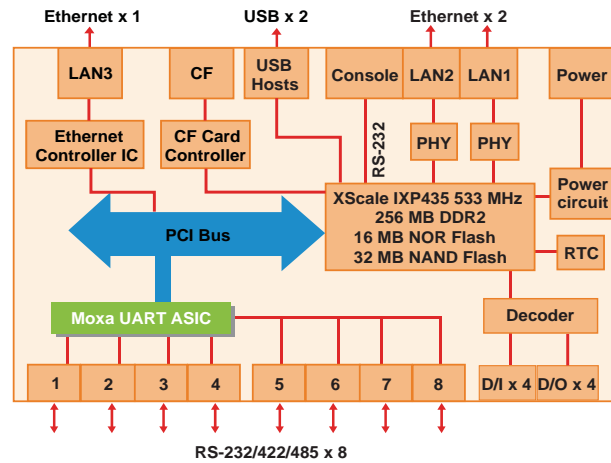
Dimensions (unit = mm)

: Ordering Information

Available Models

UC-8410-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

UC-8410-T-LX: RISC-based industrial embedded computer with 8 serial ports, 4 DIs, 4 DOs, 3 LANs, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

Package Checklist

- UC-8410 computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (includes power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

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Embedded Computers for Communication > UC-8410 Series

UC-8416 Series

RISC-based industrial embedded computers with 8 serial ports, 3 LANs, DIO, 8 built-in Ethernet switch ports, CompactFlash, USB

-40°C 75°C

> Intel XScale IXP435 533 MHz processor
> 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
> 32 MB NAND Flash for data storage
> 256 KB battery backup SRAM
> 8 RS-232/422/485 serial ports
> 8 Ethernet switch ports
> 4 digital input and 4 digital output channels
> 3 10/100 Mbps Ethernet ports
> 2 USB 2.0 hosts for mass storage devices
> CompactFlash socket for storage expansion
> Ready-to-run Linux platform
> DIN-Rail or wall mounting installation
> Robust, fanless design
> -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

: Overview

The UC-8416 embedded computer comes with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 8 Ethernet switch ports, 4 digital input channels, 4 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts.
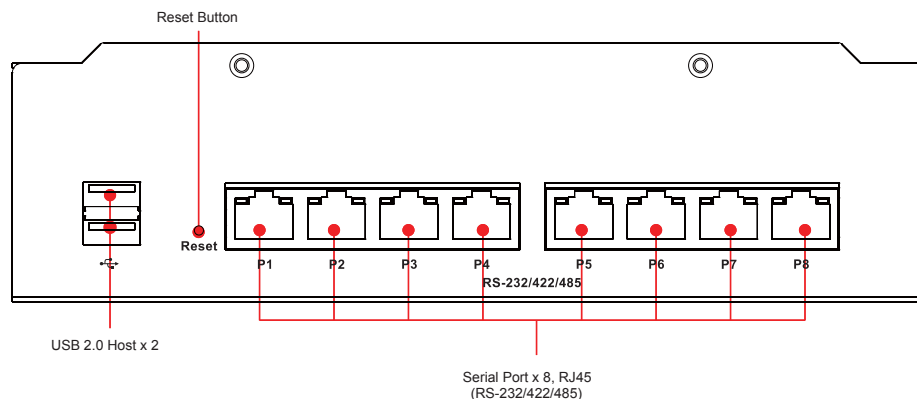
The computer uses the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8410, and the 32 MB NAND Flash can be used to provide additional data storage. Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding data loss.
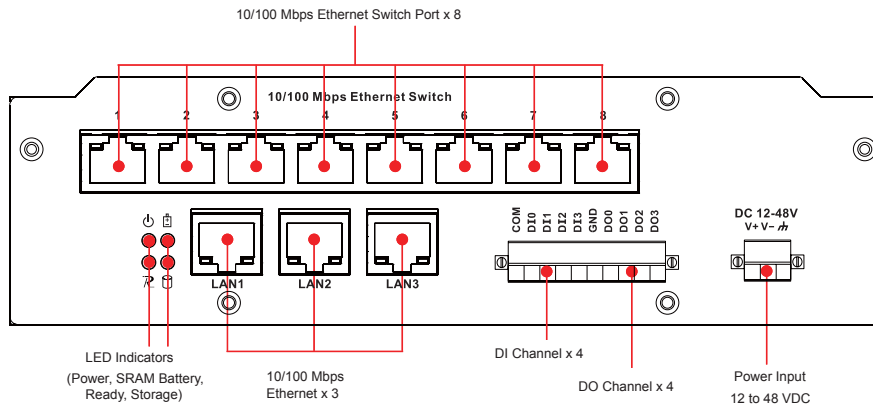
The UC-8416 computer comes with 8 RS-232/422/485 serial ports, digital I/O, and has 3 LAN ports and 8 Ethernet switch ports, making it ideal as a communication platform for industrial applications that require network redundancy.

The UC-8416 comes with the Linux 2.6 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 platform by using a common compiler, without needing to modify the code. This makes the UC-8416 an optimal solution for use with industrial applications, but with minimal cost and effort.

In addition to the standard model, the UC-8416 also comes in a -40 to 75°C wide temperature model for harsh industrial environments.

: Appearance

Reset Button

Reset

USB 2.0 Host x 2

P1 P2 P3 P4 P5 P6 P7 P8

RS-232/422/485

Serial Port x 8, RJ45
(RS-232/422/485)

10/100 Mbps Ethernet Switch Port x 8

10/100 Mbps Ethernet Switch

LAN1 LAN2 LAN3

COM DI0 DI1 DI2 DI3 GND DO0 DO1 DO2 DO3

DC 12-48V V+ V–

LED Indicators
(Power, SRAM Battery,
Ready, Storage)

10/100 Mbps
Ethernet x 3

DI Channel x 4

DO Channel x 4

Power Input
12 to 48 VDC

: Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux

DRAM: 256 MB DDR2 SDRAM onboard (supports DDR2 up to 512 MB)

SRAM: 256 KB, battery backup

Flash:
16 MB NOR Flash onboard to store OS (supports up to 32 MB)
32 MB NAND Flash onboard to store data

USB: USB 2.0 full speed x 2 (OHCI)

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 3 auto-sensing 10/100 Mbps ports (RJ45)

Switch Ports: 8 10/100 Mbps unmanaged ports

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

Digital Input

Input Channels: 4, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open

Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (COM to DI)

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

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 4, sink type

Output Current: Max. 200 mA per channel

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

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

Isolation: 3 KV optical isolation

LEDs

System: Power, Ready, Storage, Battery for SRAM

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

Serial: TxD x 8, RxD x 8

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 930 g

Dimensions: 200 x 56 x 120 mm (7.87 x 2.20 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)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 1g @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis

Anti-shock: 5g @ IEC-68-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption: 15 W
• 300 mA @ 48 V
• 625 mA @ 24 VDC
• 1280 mA @ 12 V

Regulatory Approvals

EMC: CE (EN55022 Class B, EN55024-4-2, EN55024-4-3, EN55024-4-4), FCC (Part 15 Subpart B, Class B)

Safety: UL/cUL (UL60950-1), CCC (GB9254, GB 17625.1), LVD (EN60950)

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 adaptor and cables.

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Embedded Computers for Communication > UC-8416 Series

: Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, busybox, tinylogin, telnet, ftp, ssh, scp

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

openvpn: virtual private network service manager

pppd: dial in/out over serial port daemon
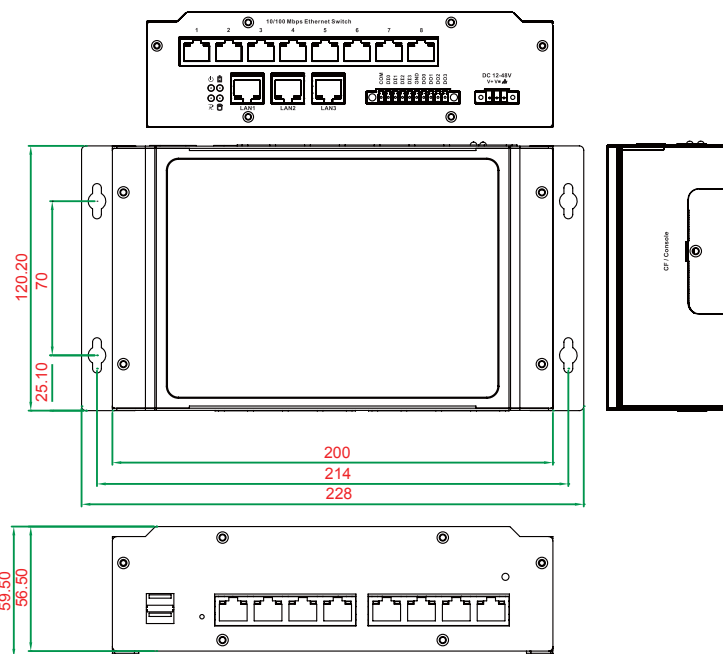
snmpd: snmpd agent daemon

openssl: open SSL

Application Development Software: Moxa Linux API device control

Linux Tool Chain:
• GCC (V4.2.1): C/C++ PC Cross Compiler
• Glibc (V2.2.5): POSIX standard C Library
• GDB (V6.3): source level debug server

Dimensions (unit = mm)

: 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-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

Package Checklist

• UC-8416 computer
• Wall mounting kit
• DIN-Rail mounting kit
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
• Universal Power Adaptor (including power jack converter)
• Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

UC-8418 Series

RISC-based industrial embedded computers with 8 serial ports, 3 LANs, DIO, 2 CAN Ports ,CompactFlash, USB

-40°C 75°C

> Intel XScale IXP435 533 MHz processor
> 256 MB DDR2 SDRAM and 16 MB Flash ROM onboard
> 32 MB NAND Flash for data storage
> 256 KB battery backup SRAM
> 8 RS-232/422/485 serial ports
> 2 CANbus ports
> 12 digital input and 12 digital output channels
> 3 10/100 Mbps Ethernet ports
> 2 USB 2.0 hosts for mass storage devices
> CompactFlash socket for storage expansion
> Ready-to-run Linux platform
> DIN-Rail or wall mounting installation
> Robust, fanless design
> -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

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Embedded Computers for Communication > UC-8418 Series
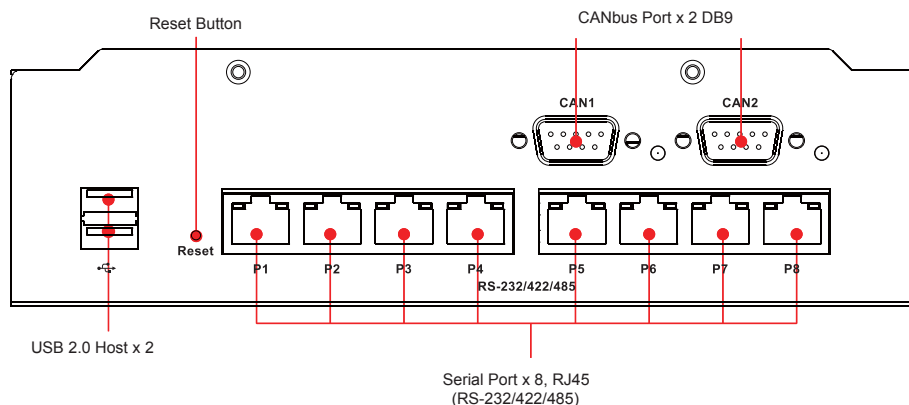
: Overview

The UC-8418 embedded computer comes with 8 RS-232/422/485 serial ports, 3 Ethernet ports, 2 CAN ports, 12 digital input channels, 12 digital output channels, a CompactFlash socket, and 2 USB 2.0 hosts.
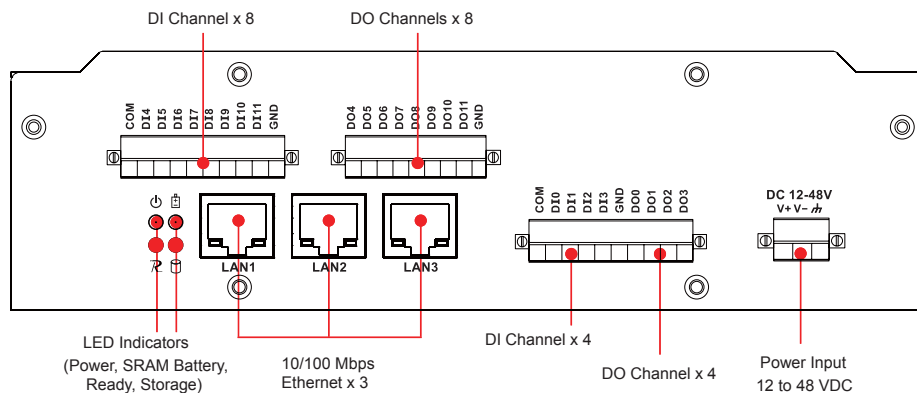
The computer uses the Intel XScale IXP435 533 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 16 MB NOR Flash ROM and 256 MB SDRAM give you enough memory to run your application software directly on the UC-8410, and the 32 MB NAND Flash can be used to provide additional data storage. Moreover, the 256 KB SRAM offers a better data retention mechanism for avoiding

data loss. The UC-8418 computer comes with 8 RS-232/422/485 serial ports, digital I/O, and has 3 LAN ports and 2 CANbus ports, making it ideal as a communication platform for industrial applications that require network redundancy.

The UC-8418 comes with the Linux 2.6 platform pre-installed to provide an open software operating system for software program development. Software written for a desktop PC can be easily ported to the UC-8418 platform by using a common compiler, without needing to modify the code. This makes the UC-8418 an optimal solution for use with industrial applications, but with minimal cost and effort.

In addition to the standard model, UC-8418 also comes in a -40 to 75°C wide temperature model for harsh industrial environments.

: Appearance

Reset Button

CANbus Port x 2 DB9

CAN1   CAN2

Reset

P1   P2   P3   P4   P5   P6   P7   P8

RS-232/422/485

USB 2.0 Host x 2

Serial Port x 8, RJ45
(RS-232/422/485)

DI Channel x 8   DO Channels x 8

LED Indicators
(Power, SRAM Battery,
Ready, Storage)

10/100 Mbps
Ethernet x 3

DI Channel x 4

DO Channel x 4

Power Input
12 to 48 VDC

Hardware Specifications

Computer

CPU: Intel XScale IXP435, 533 MHz

OS (pre-installed): Linux

DRAM: 256 MB DDR2 SDRAM onboard (supports DDR2 up to 512 MB)

SRAM: 256 KB, battery backup

Flash:
16 MB NOR Flash onboard to store OS (supports up to 32 MB)
32 MB NAND Flash onboard to store data

USB: USB 2.0 full speed x 2 (OHCI)

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

LAN: 3 auto-sensing 10/100 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

Digital Input

Input Channels: 12, source type

Input Voltage: 0 to 30 VDC

Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open

Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (COM to DI)

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

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 12, sink type

Output Current: Max. 200 mA per channel

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

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

Isolation: 3 KV optical isolation

CANbus Communication

Interface: Dual optically isolated CAN2.0A/2.0B compliant ports

CAN Controller: Phillips SJA1000T

Signals: CAN-H, CAN-L

Protocols: Supports CANOpen library

Isolation: 2 KV optical isolation

Speed: 10 Kbps to 1 Mbps

Connector Type: DB9 male

LEDs

System: Power, Ready, Storage, Battery for SRAM

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

Serial: TxD x 8, RxD x 8

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 1 kg

Dimensions: 200 x 56 x 120 mm (7.87 x 2.20 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)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 75°C (-4 to 167°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Anti-vibration: 1g @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis

Anti-shock: 5g @ IEC-68-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption: 15 W
• 300 mA @ 48 V
• 625 mA @ 24 VDC
• 1280 mA @ 12 V)

Regulatory Approvals

EMC: CE (EN55022 Class B, EN55024-4-2, EN55024-4-3, EN55024-4-4), FCC (Part 15 Subpart B, Class B)

Safety: UL/cUL (UL60950-1), CCC (GB9254, GB 17625.1), LVD (EN60950)

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 adaptor and cables.

Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, busybox, tinylogin, telnet, ftp, ssh, scp

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

openvpn: virtual private network service manager

pppd: dial in/out over serial port daemon
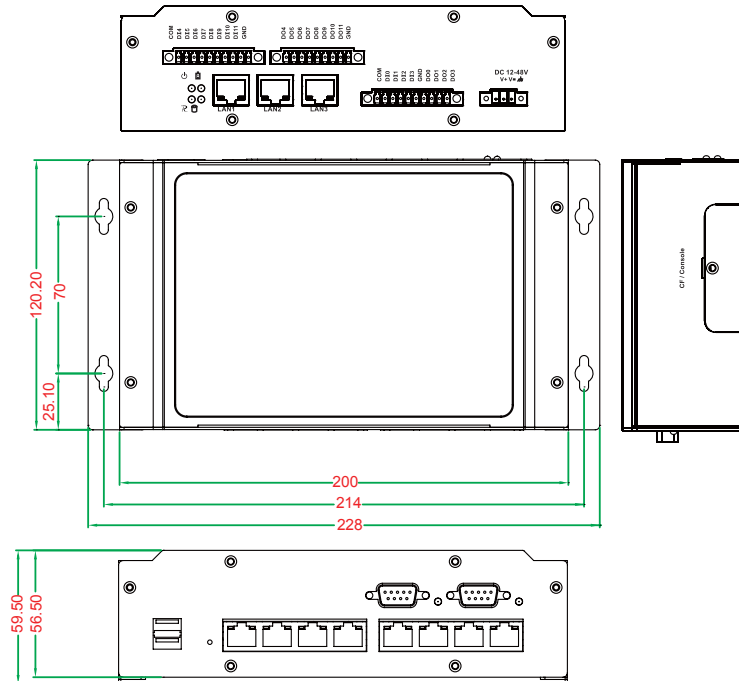
snmpd: snmpd agent daemon

openssl: open SSL

Application Development Software: Moxa Linux API device control

Linux Tool Chain:
- GCC (V4.2.1): C/C++ PC Cross Compiler
- Glibc (V2.2.5): POSIX standard C Library
- GDB (V6.3): source level debug server

Dimensions (unit = mm)

Ordering Information

Available Models

UC-8418-LX: RISC-based industrial embedded computer with 8 serial ports, 12 DIs, 12 DOs, 3 LANs, 2 CAN ports, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

UC-8418-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

Package Checklist

- UC-8418 computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal Power Adaptor (including power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

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Embedded Computers for Communication › UC-8418 Series

UC-7402 Series

RISC-based ready-to-run network computers with built-in web server, dual LANs, PCMCIA, CompactFlash

> Intel XScale IXP422/425, 266/533 MHz processor
> On-board 128 MB RAM, 32 MB flash
> Dual 10/100 Mbps Ethernet for network redundancy
> CompactFlash socket for storage expansion
> PCMCIA supporting WLAN, GPRS, UMTS, HSDPA
> Ready-to-run Linux platform
> Hardware level data encryption engine supports AES, DES, and 3DES
> SSL, SSH, TLS security function
> Built-in firewall and VPN function
> Apache web server supports PHP and XML
> DIN-rail or wall-mount installation

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

: Overview

The UC-7402 embedded computers are web server network computers that feature dual 10/100 Mbps Ethernet ports, a PCMCIA interface for wireless LAN communication, and CompactFlash for mass storage disk expansion. The UC-7402 computers are an excellent choice for embedded network applications and a variety of machine-to-machine solutions.

The UC-7402 computers are rugged, compact embedded computers designed for industrial applications. Two key design features are low power consumption and fanless operation, which together ensure greater reliability and longer system life. The communication oriented functionality includes both hardware and software. In fact,

the software design is ideal for network communication applications, such as connecting to machines and other devices over a network. The UC-7402 computers provide real-time data access, a secure network gateway, and a VPN router. The built-in web server allows the UC-7402 computers to be used as a web-enabled gateway for accessing monitoring and control functions from anywhere on the network.

Since the UC-7402 series provides WLAN 802.11b/g connectivity, both wired and wireless networks can be integrated into one communication system. Users can capture real-time data from the network, and then use the UC-7402 to convert data into various standard formats. Data can be buffered and then distributed to the proper web browser.

: Typical Application
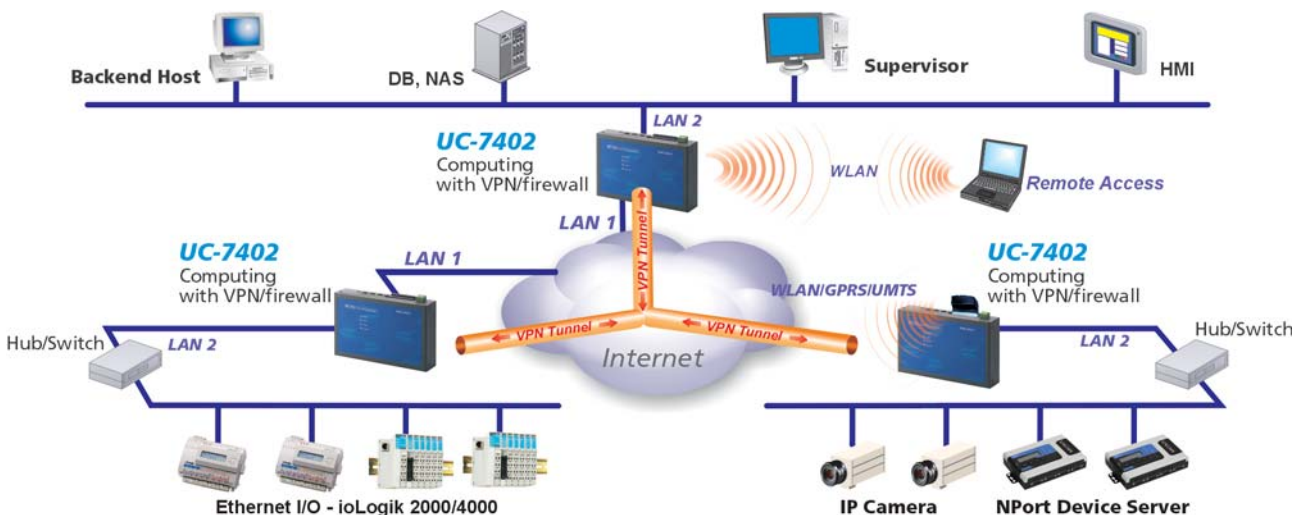
: Hardware Specifications

Computer

CPU:
UC-7402: Intel XScale IXP422 266 MHz
UC-7402 Plus: Intel XScale IXP425 533 MHz

OS (pre-installed): Embedded Linux

DRAM: 128 MB onboard (256 MB for ODM)

Flash: 32 MB onboard

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1/JEIDA 4.2 card

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

Serial Signals

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

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

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

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

LEDs

System: OS Ready, Console (TxD/RxD)

LAN: 10M/100M x 2

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 830 g

Dimensions: 197 x 44 x 125 mm (7.76 x 1.73 x 4.92 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

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

Anti-vibration: 1g @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis

Anti-shock: 5g @ IEC-68-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 4.3 W
• 180 mA @ 24 VDC
• 360 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

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

: Software Specifications

Linux

Kernel Version: 2.4.18 or 2.6.10 (Plus version)

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
• Moxa Linux API Library for device control
• Linux Tool Chain: Gcc, Glibc, GDB

: Ordering Information

Available Models

UC-7402-LX: RISC-based IXP422 embedded computer with dual LANs, PCMCIA, CompactFlash, Linux 2.4

UC-7402-LX Plus: RISC-based IXP425 embedded computer with dual LANs, PCMCIA, CompactFlash, Linux 2.6

Package Checklist

• UC-7402 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
• Universal power adaptor (including terminal block to power jack converter)
• Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

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Embedded Computers for Communication ➤ UC-7402 Series

UC-7408 Series

RISC-based data acquisition computers with 8 serial ports, 8 DI/DO channels, dual LANs, PCMCIA, CompactFlash

-40°C 75°C

> Intel XScale IXP422/425, 266/533 MHz processor
> 128 MB RAM on-board, 32 MB flash disk
> 8 RS-232/422/485 serial ports
> 8-ch digital input and 8-ch digital output (TTL Signal)
> Dual 10/100 Mbps Ethernet for network redundancy
> CompactFlash socket for storage expansion
> PCMCIA supporting WLAN, GPRS, UMTS, HSDPA
> Ready-to-run Linux or WinCE 5.0 platform
> DIN-rail or wallmount installation
> Robust, fanless design
> -40 to 75°C wide temperature models available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Microsoft® Windows® Embedded · RoHS · DNV · CE · FC · c UL us LISTED · TÜV Rheinland Product Safety · BAUART GEPRÜFT TYPE APPROVED

Overview

The UC-7408 data acquisition embedded computers feature 8 RS-232/422/485 serial ports, an 8-ch digital input and 8-ch digital output, dual 10/100 Mbps ports, a PCMCIA interface for wireless LAN communication, and CompactFlash slot for mass storage disk expansion.
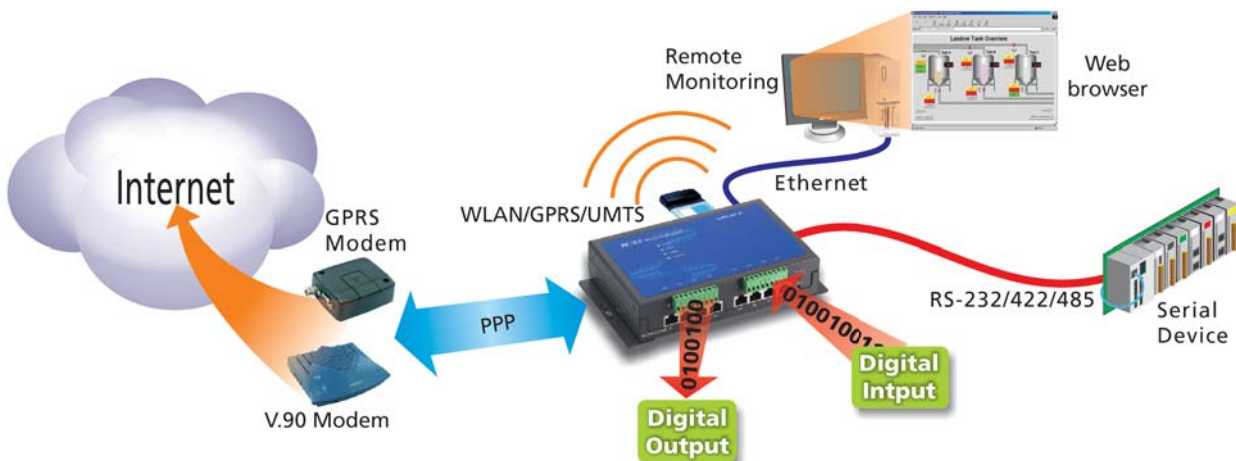
The digital I/O feature of the UC-7408 series provides users with the convenience of connecting digital devices to a front-end embedded computer. The UC-7408 can be used for on/off event handling by reading the state change of the digital input signal. In addition, output signals from external digital devices can be imported through the UC-7408's digital input channels, and the UC-7408 can be programmed to take immediate action when it detects a change in the state of the signal.

The digital output channels on the UC-7408 can connect to devices and trigger digital output signals to control external digital devices. With the digital I/O feature, Moxa's embedded computers support both data acquisition and protocol conversion through the RS-232/422/485 serial ports, and simple I/O control with the digital I/O signals.

UC-7408 embedded computers come pre-installed with either the open standard Linux OS, or the more common WinCE OS. Software written for a desktop PC can be easily ported to the UC-7408 platform by using a common compiler, without needing to modify the code, and the software you develop for your own applications can be stored in the UC-7408's flash memory.
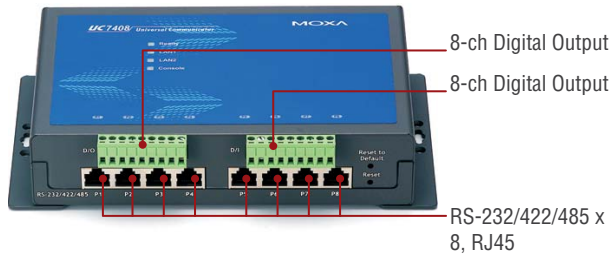
In addition to the standard model, a wide temperature (-40 to 75°C) model of the UC-7408 is available for use in harsh industrial environments.
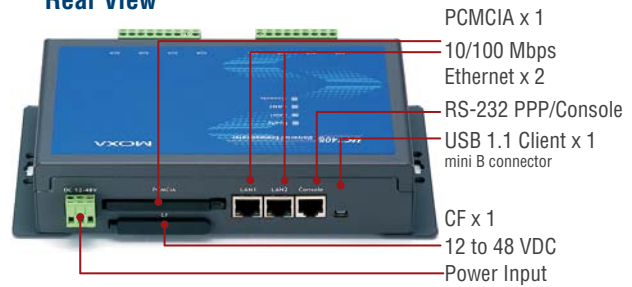
Typical Application

: Appearance

Front View

- 8-ch Digital Output
- 8-ch Digital Output
- RS-232/422/485 x 8, RJ45

Rear View

- PCMCIA x 1
- 10/100 Mbps Ethernet x 2
- RS-232 PPP/Console
- USB 1.1 Client x 1 mini B connector
- CF x 1
- 12 to 48 VDC Power Input

: Hardware Specifications

Computer

CPU:
UC-7408: Intel XScale IXP422 266 MHz
UC-7408 Plus: Intel XScale IXP425 533 MHz

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

DRAM: 128 MB onboard (256 MB for ODM)

Flash: 32 MB onboard

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1 or JEIDA 4.2 card

Storage

Storage Expansion: CompactFlash socket

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD Protection: 15 KV for all signals

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

Digital Input

Input Channels: 8

Input Voltage:
• Logic 0: 0-0.8 V
• Logic 1: 2.0-5.5 V
-24 mA

Digital Output

Output Channels: 8

Output Current: 24 mA

Output Voltage:
• Logic 0: 0-0.55 V
• Logic 1: 2.5-3.3 V

LEDs

System: OS Ready, Console (TxD/RxD)

LAN: 10M/100M x 2

Serial: TxD x 8, RxD x 8

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 870 g

Dimensions: 197 x 44 x 125 mm (7.76 x 1.73 x 4.92 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

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

Anti-vibration: 1g @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis

Anti-shock: 5g @ IEC-68-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 7.6 W
• 315 mA @ 24 VDC
• 628 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

Reliability

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

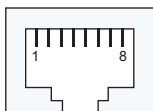**Automatic Reboot Trigger:** Built-in WDT (watchdog timer)

Warranty

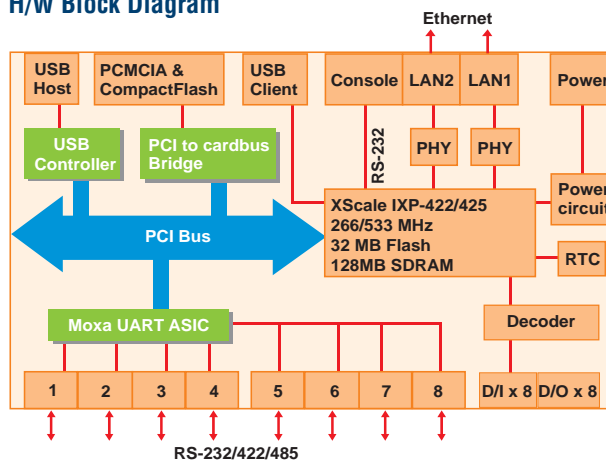**Warranty Period:** 5 years

Details: See www.moxa.com/warranty

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Pin Assignment

8-pin RJ45

PIN	RS-232	RS-422/RS-485-4w	RS-485
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TxD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

H/W Block Diagram

: Software Specifications

Linux

Kernel Version: 2.4.18 or 2.6.10 (Plus version)

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
• Moxa Linux API Library for device control
• Linux Tool Chain: Gcc, Glibc, GDB

Windows Embedded CE 5.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

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

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

Application Development Environment:
• Moxa WinCE 5.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft Foundation Classes (MFC)
• Microsoft® .NET Compact Framework 2.0 SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX2
• SOAP Toolkit
• Winsock 2.2

: Ordering Information

Available Models

UC-7408-LX: RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, Linux 2.4, -10 to 60°C operating temperature

UC-7408-LX Plus: RISC-based IXP425 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, USB, Linux 2.6, -10 to 60°C operating temperature

UC-7408-CE: RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, WinCE 5.0, -10 to 60°C operating temperature

UC-7408-T-LX: RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, Linux 2.4, -40 to 75°C operating temperature

UC-7408-T-LX Plus: RISC-based IXP425 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, USB, Linux 2.6, -40 to 75°C operating temperature

UC-7408-T-CE: RISC-based IXP422 embedded computer with 8 serial ports, 8 DI channels, 8 DO channels, dual LANs, PCMCIA, CompactFlash, WinCE 5.0, -40 to 75°C operating temperature

Package Checklist

• UC-7408 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
• Universal power adaptor (including terminal block to power jack converter)
• Document and Software CD
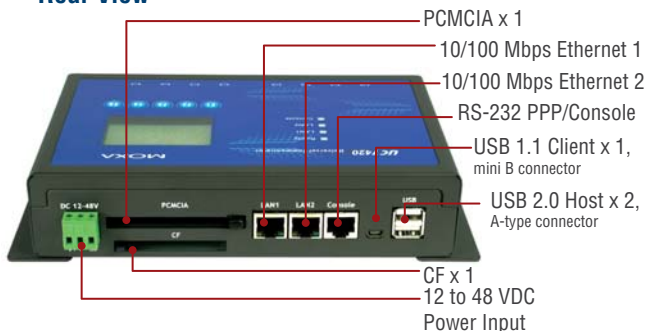• Quick Installation Guide (printed)
• Warranty Card

UC-7410/7420 Series

RISC-based ready-to-run computers with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash

> Intel XScale IXP422/425, 266/533 MHz processor
> 128 MB RAM on-board, 32 MB flash
> 8 RS-232/422/485 serial ports
> Dual 10/100 Mbps Ethernet for network redundancy
> USB 2.0 host
> CompactFlash socket for storage expansion
> PCMCIA supports WLAN, GPRS, UMTS, HSDPA
> LCM display and keypad for HMI ready-to-run Linux or WinCE 5.0 platform
> DIN-rail or wallmount installation
> Robust, fanless design

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Microsoft® Windows® Embedded

Overview

The UC-7410/UC-7420 RISC-based ready-to-run Linux and WinCE computers are designed for embedded applications. The computers feature 8 RS-232/422/485 serial ports, a PCMCIA interface for wireless LAN communication, CompactFlash, and USB ports for adding external memory. The pre-installed open-standard Linux or WinCE operating system makes a convenient platform for software development. Software written for a desktop PC can be ported "as is" to the UC-7410/UC-7420 platform using readily available development tools, and the code can be stored in the UC-7410/UC-7420's Flash memory. System integrators use UC-7410/UC-7420 computers as part of distributed control systems based on embedded technology.

Typical Applications

Protocol Conversion

Modbus/TCP

Ethernet

RS-232/422/485

RTU

Modbus Serial

PLC

Proprietary Protocol

Data Buffering

HMI

3239473747
0325678679

Polling

0001123145

Frame 1: 0001123145
Frame 2: 0001123145
Frame N: 0001123145

Buffering

Device

Data Security

#@ $s $4 3 ^
8%#* $@(
$@ +(2 ^%#
F*&E % 9 y #

Encryption   Decryption

2005-02-01
$23,435

Card reader

: Appearance

Front View

Graphics LCM
128 x 64 dots

Keypad Buttons

RS-232/422/485
x 8, RJ45

Rear View

PCMCIA x 1
10/100 Mbps Ethernet 1
10/100 Mbps Ethernet 2
RS-232 PPP/Console
USB 1.1 Client x 1,
mini B connector
USB 2.0 Host x 2,
A-type connector
CF x 1
12 to 48 VDC
Power Input

: Hardware Specifications

Computer

CPU:
UC-7410/7420: Intel XScale IXP422 266 MHz
UC-7410/7420 Plus: Intel XScale IXP425 533 MHz

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

DRAM: 128 MB onboard (256 MB for ODM)

Flash: 32 MB onboard

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1/JEIDA 4.2 card
(UC-7420 only)

Storage

Storage Expansion: CompactFlash socket (UC-7420 only)

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD Protection: 15 KV for all signals

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data
direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: OS Ready, Console (TxD/RxD)

LAN: 10M/100M x 2

Serial: TxD x 8, RxD x 8

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case, 128 x 64 dot graphics
mode

Push Buttons: Five membrane buttons for convenient on-site
configuration

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight:
UC-7410: 810 g
UC-7420: 875 g

Dimensions: 197 x 44 x 125 mm (7.76 x 1.73 x 4.92 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

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

Anti-vibration: 1g @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1
hr/axis

Anti-shock: 5g @ IEC-68-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
UC-7410: 10 W
• 415 mA @ 24 VDC
• 830 mA @ 12 VDC
UC-7420: 11 W
• 450 mA @ 24 VDC
• 890 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3,
EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV
(EN60950-1)

Reliability

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

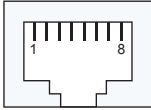**Automatic Reboot Trigger:** Built-in WDT (watchdog timer)

Warranty

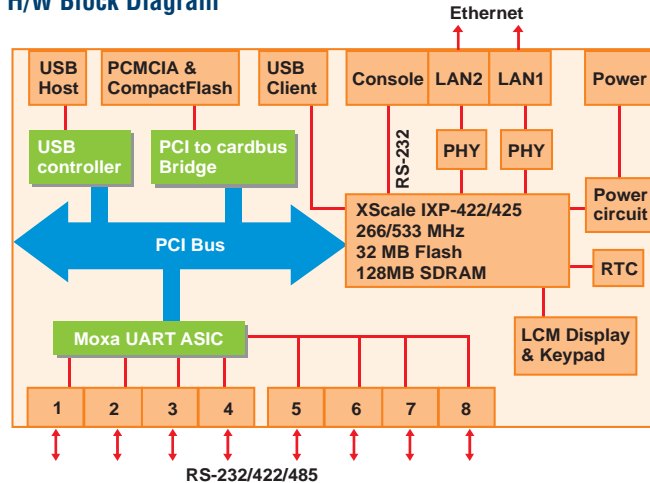**Warranty Period:** 5 years

Details: See www.moxa.com/warranty

Pin Assignment

8-pin RJ45

PIN	RS-232	RS-422/RS-485-4w	RS-485
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TxD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

H/W Block Diagram

: Software Specifications

Linux

Kernel Version: 2.4.18 or 2.6.10 (Plus version)

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
• Moxa Linux API Library for device control
• Linux Tool Chain: Gcc, Glibc, GDB

Windows Embedded CE 5.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

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

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

Application Development Environment:
• Moxa WinCE 5.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft Foundation Classes (MFC)
• Microsoft® .NET Compact Framework 2.0 SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX2
• SOAP Toolkit
• Winsock 2.2

: Ordering Information

Available Models

UC-7410-LX: RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, Linux 2.4

UC-7410-LX Plus: RISC-based IXP425 embedded computer with 8 serial ports, dual LANs, Linux 2.6

UC-7420-LX: RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash, Linux 2.4

UC-7420-LX Plus: RISC-based IXP425 embedded computer with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash, Linux 2.6

UC-7410-CE: RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, WinCE 5.0

UC-7420-CE: RISC-based IXP422 embedded computer with 8 serial ports, dual LANs, USB, PCMCIA, CompactFlash, WinCE 5.0

Package Checklist

• UC-7410 or UC-7420 computer
• Wall mounting kit
• DIN-Rail mounting kit
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
• CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
• Universal power adaptor
• Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

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Embedded Computers for Communication > UC-7410/7420 Series

UC-7122/7124 Series

Mini RISC-based ready-to-run computer with dual LANs, 2 or 4 serial ports, SD, USB

-40°C 75°C

> Cirrus Logic EP9302 ARM9 32-bit 200 MHz processor
> On-board 32 MB RAM, 16 MB flash disk
> 2 or 4 software-selectable RS-232/422/485 serial ports
> 50 bps to 921.6 Kbps baudrate (non-standard baudrates supported)
> Dual 10/100 Mbps Ethernet for network redundancy
> SD socket for storage expansion supported
> Built-in real-time clock (RTC), buzzer, watchdog timer (WDT)
> Ready-to-run WinCE 5.0 platform
> -40 to 75°C wide temperature models available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Windows® Embedded | e | RoHS | DNV | CE | FC | c(UL)us LISTED

: 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.
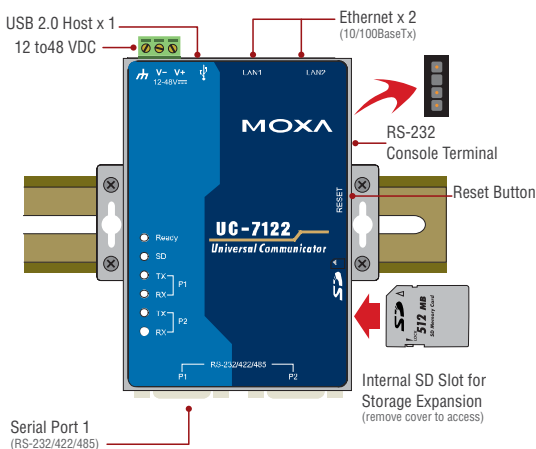
The UC-7122/7124 embedded computers use the Cirrus Logic EP9302 ARM9 200 MHz RISC CPU. Unlike the X86 CPU, which uses a CISC design, the ARM9's RISC design architecture and modern semiconductor technology provide the UC-7122/7124 with a powerful computing engine and communication functions, but without generating too much heat. Moreover, the built-in 16 MB NOR Flash ROM and 16 MB SDRAM give you enough storage capacity to run applications on the UC-7122/7124 computers. The additional SD socket provides the flexibility of adding storage expansion disks, and the dual LAN ports built into the ARM9 make the UC-7122/7124 ideal communication platforms for simple data acquisition and protocol

conversion applications. In addition, the RS-232/422/485 serial ports allow you to connect a variety of serial devices. Taken together, these features ensure that the UC-7122/7124 embedded computers are convenient and powerful central control units for industrial applications, such as data acquisition, remote device control and monitoring, and protocol conversion.
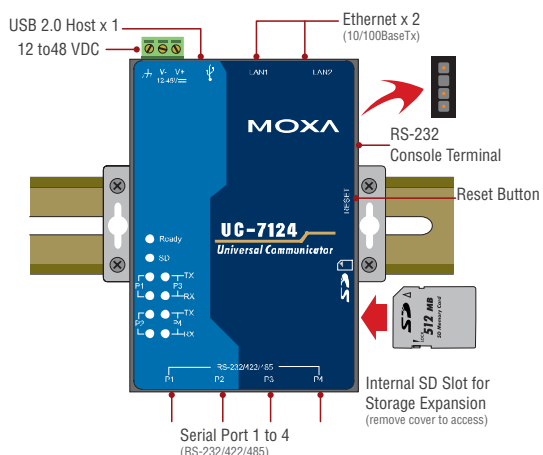
The pre-installed WinCE 5.0 operating system provides a common Windows-based software operating system for software program development. This means that software written in Visual C/C++ for desktop PCs is easily ported to the UC-7122/7124 computers with a general programming tool such as Microsoft Embedded Visual C++ or Microsoft Visual Studio 2005. You will not need to spend time modifying existing software code, and the operating system, device drivers, and your own software can all be stored in the UC-7122/7124's flash memory.

: Appearance

UC-7122

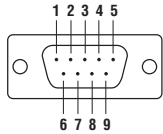USB 2.0 Host x 1
12 to48 VDC
Ethernet x 2 (10/100BaseTx)
RS-232 Console Terminal
Reset Button
Internal SD Slot for Storage Expansion (remove cover to access)
Serial Port 1 (RS-232/422/485)

UC-7124

USB 2.0 Host x 1
12 to48 VDC
Ethernet x 2 (10/100BaseTx)
RS-232 Console Terminal
Reset Button
Internal SD Slot for Storage Expansion (remove cover to access)
Serial Port 1 to 4 (RS-232/422/485)

: Hardware Specifications

Computer

CPU: Cirrus EP9302 ARM9 CPU, 200 MHz

OS (pre-installed): Windows CE 5.0

DRAM: 32 MB onboard (64 MB for ODM)

Flash: 16 MB onboard (32 MB for ODM)

Storage

Storage Expansion: SD slot

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 or 4 RS-232/422/485 ports, software-selectable (8-pin RJ45)

ESD Protection: 15 KV for all signals

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: Ready, SD

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

Serial: TxD, RxD (2 or 4 of each)

Physical Characteristics

Housing: Aluminum (1 mm)

Weight:
UC-7122: 190 g
UC-7124: 200 g

Dimensions: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

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

Power Requirements

Input Voltage: 12 to 48 VDC

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

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety:
LVD: EN60950-1
UL/cUL: UL60950-1, CSA C22.2 No. 60950-1-03

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 adaptor and cables.

Dimensions

UC-7122

unit = mm (inch)

UC-7124

unit = mm (inch)

Pin Assignment

UC-7122 (DB9 male connector)

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

UC-7124 (8-pin RJ45 connector)
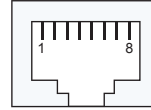
PIN	RS-232	RS-422/485-4w	RS-485
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TxD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

: Software Specifications

Windows Embedded CE 5.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: TFAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

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

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

Application Development Environment:
• Moxa WinCE 5.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft Foundation Classes (MFC)
• Microsoft .NET Compact Framework 2.0 SP2
• 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

Accessories (can be purchased separately)

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

Package Checklist

- UC-7122 or UC-7124 computer
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-150: 4-pin pin header to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8 pin RJ45 to DB9 male serial port cable, 150 cm
- Universal power adaptor (including terminal block to power jack converter)
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

UC-7110/7112 Series

Mini RISC-based ready-to-run computer with 2 serial ports, dual LANs, SD

-40°C 75°C

> MOXA ART ARM9 32-bit 192 MHz processor
> 16 or 32 MB RAM
> 8 or 16 MB Flash ROM
> Dual 10/100 Mbps Ethernet for network redundancy
> 2 software-selectable RS-232/422/485 ports
> 50 bps to 921.6 Kbps baudrate (non-standard baudrates supported)
> SD socket for storage expansion
> Built-in real-time clock (RTC) and buzzer
> Pre-installed Linux Kernel 2.6 platform
> -40 to 75°C wide temperature models available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

: Overview

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

The UC-7110/UC-7112 use the ARM9 RISC CPU. Unlike the X86 CPU, which uses a CISC design, the ARM9's RISC design architecture and modern semiconductor technology provide the CPU with a powerful computing engine and communication functions, but without generating too much heat. The built-in 8 or 16 MB NOR Flash ROM and 16 or 32 MB SDRAM provide plenty of storage, and the SD socket on the UC-7112 provides the user with flexible storage expansion to run applications that generate a lot of data. The dual LAN ports built

into the ARM9 make the UC-7110/UC-7112 ideal communication platforms for some data acquisition and protocol conversion applications, and the 2 RS-232/422/485 serial ports allow you to connect a variety of serial devices.

The pre-installed µClinux operating system provides an open software operating system for software program development. This means that software written for desktop PCs can be easily ported to a UC-7110 or UC-7112 embedded computer with a GNU cross complier, so that you will not need to spend time modifying existing software code. The operating system, device drivers, and your own software can all be stored in the UC-7110/7112's flash memory.

: Appearance
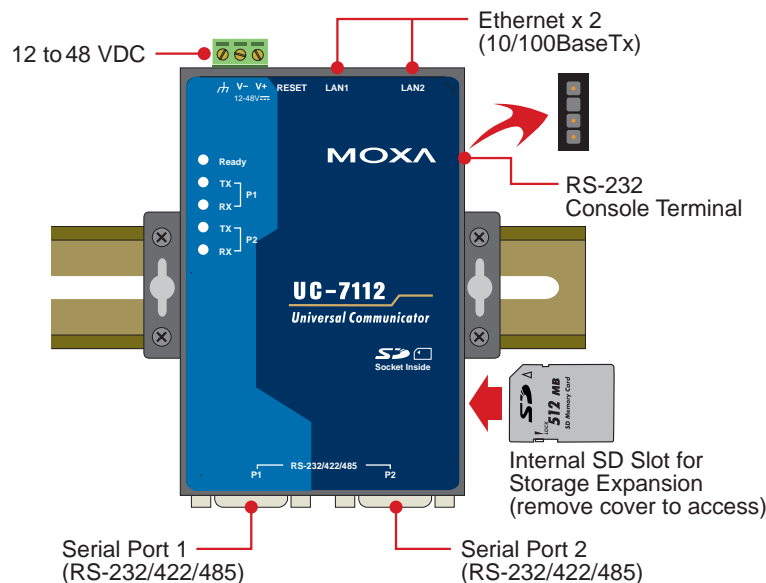
12 to 48 VDC

Ethernet x 2 (10/100BaseTx)

RS-232 Console Terminal

Internal SD Slot for Storage Expansion (remove cover to access)

Serial Port 1 (RS-232/422/485)

Serial Port 2 (RS-232/422/485)

: Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz

OS (pre-installed): µClinux or Linux

DRAM:
UC-7110/UC-7112: 16 MB (32 MB for ODM)
UC-7112 Plus: 32 MB onboard (64 MB for ODM)

Flash:
UC-7110/UC-7112: 8 MB onboard (16 MB for ODM)
UC-7112 Plus: 16 MB onboard

Storage

Storage Expansion: SD slot (UC-7112 and UC-7112 Plus only)

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD Protection: 15 KV for all signals

Console Port: RS-232, 3-wire (TxD, RxD, GND), pin-header

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: OS Ready

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

Serial: TxD x 2, RxD x 2

Physical Characteristics

Housing: Aluminum (1 mm)

Weight: 190 g

Dimensions: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 4.5 W
• 170 mA @ 24 VDC
• 340 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

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 adaptor and cables.

Dimensions

unit = mm(inch)

Pin Assignment

DB9 male connector

1 2 3 4 5
6 7 8 9

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Serial consol port

4-GND
3-NC
2-RxD
1-TxD

H/W Block Diagram

Ethernet

LAN 1 | LAN 2
PHY | PHY
Power Circuit
MAC | MAC
32/16 MB SDRAM
RTC
MOXA ART CPU 32-bit ARM9 192 MHz
16/8 MB Flash
Watchdog
SD
UART | UART | UART
Serial Port 1 | Serial Port 2 | Console Port

RS-232/422/485   RS-232

: Software Specifications

Linux

Kernel Version: 2.6.9

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/ 2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
• Moxa Linux API Library for device control
• Linux Tool Chain: Gcc, Glibc, GDB

µClinux

Kernel Version: 2.6.19

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: msh, busybox, tinylogin, telnet, ftp

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

telnetd: Telnet Server daemon

inetd: TCP server manager program

ftpd: FTP server daemon

boa: Web server daemon

Application Development Software:
• Moxa Linux API Library for device control
• Linux Tool Chain:
• Arm-elf-gcc: C/C++ PC Cross Compiler
• µClibc: POSIX Standard Library

: Ordering Information

Available Models

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-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-7110 or UC-7112 computer
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• CBL-4PINDB9F-150: 4-pin pin header to DB9 female console port cable, 150 cm
• Universal power adaptor (includes terminal block to power jack converter)
• Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

UC-7101 Series

Mini RISC-based ready-to-run computer with 1 serial port, LAN, SD, µClinux

-40°C 75°C

> MOXA ART ARM9 32-bit 192 MHz processor
> 16 MB RAM and 8 MB Flash ROM
> One 10/100 Mbps Ethernet port for network redundancy
> One software-selectable RS-232/422/485 port
> Select any baudrate from 50 bps to 921.6 Kbps
> SD socket for storage expansion
> Built-in real-time clock (RTC), buzzer, watchdog timer (WDT)
> Pre-installed µClinux Kernel 2.6 platform
> -40 to 75°C wide temperature model available
> DIN-Rail or wall mountable
> Robust fanless design

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

: Overview

The UC-7101 may be Moxa's smallest RISC-based communication platform for embedded applications, but it is also one of the most powerful. The computer comes with one RS-232/422/485 serial port and a 10/100 Mbps Ethernet LAN port to provide users with a versatile platform for industrial communication and embedded computing.

The UC-7101 embedded computer uses the MOXA ART ARM9 192 MHz RISC CPU, which provides a powerful computing engine and communication functions, but without generating too much heat. The built-in 8 MB NOR Flash ROM and 16 MB SDRAM give users plenty of storage capacity, and the SD socket provides greater flexibility for running a variety of applications. The LAN port built into the ARM9 CPU allows the UC-7101 computer to be used as a communication

platform for basic data acquisition and protocol conversion applications, and the computer's RS-232/422/485 serial port allows you to connect one serial device for data acquisition applications.

The UC-7101 comes with the µClinux operating system pre-installed. Software written for desktop PCs is easily ported to the UC-7101 computer with a GNU cross complier, so that you will not need to spend time modifying existing software code.

The wide temperature model of the UC-7101 supports an operating temperature from -40 to 75°C, making it suitable for any harsh environment. The combination of excellent features makes the UC-7101 embedded computer an ideal solution for a variety of industrial automation applications.

: Typical Application
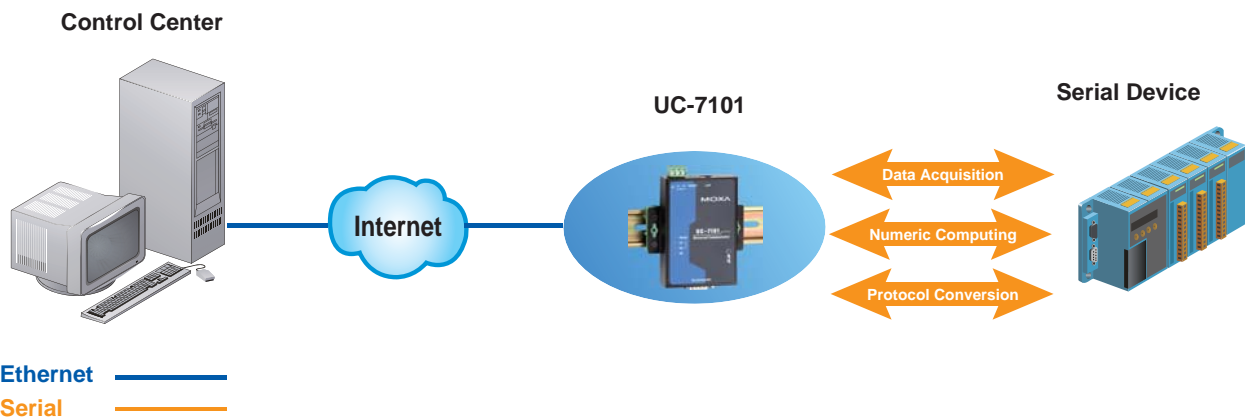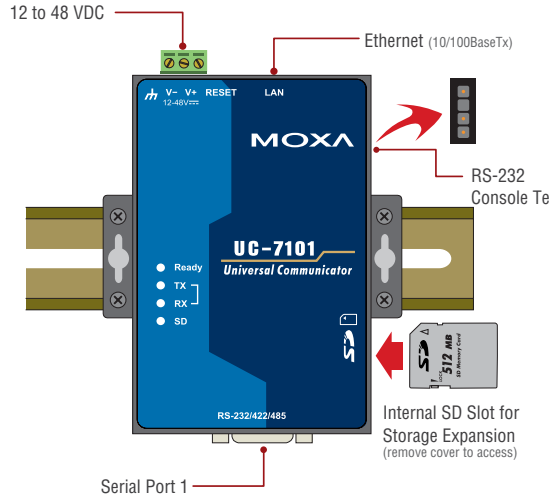
Control Center

UC-7101

Serial Device

Internet

Data Acquisition

Numeric Computing

Protocol Conversion

Ethernet ————

Serial ————

MOXA® ▶ www.moxa.com ▶ info@moxa.com

: Appearance

12 to 48 VDC

Ethernet (10/100BaseTx)

RS-232
Console Te

Internal SD Slot for
Storage Expansion
(remove cover to access)

Serial Port 1

: Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz processor

OS (pre-installed): µClinux (based on Linux Kernel 2.6)

DRAM: 16 MB

Flash: 8 MB

Storage

Storage Expansion: SD slot

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD Protection: 15 KV ESD for all signals

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: Ready

LAN: 10M/Link x 1, 100M/Link x 1 (located on RJ45 connector)

Serial: TxD x 1, RxD x 1

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum (1 mm)

Weight: 130 g

Dimensions: 67 x 22 x 100.4 mm (2.64 x 0.87 x 3.95 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)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 4.5 W
• 170 mA @ 24 VDC
• 340 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety:
LVD: EN60950-1
UL/cUL: UL60950, CAN/CSA-C22.2 No. 60950-00

Green Product: RoHS, CRoHS, WEEE

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 adaptor and cables.

Dimensions

unit = mm (inch)

Software Specifications

µCLinux

Kernel Version: 2.6.19

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash) for kernel, root file system (read only), and user directory (read/write)

System Utilities: msh, busybox, tinylogin, telnet, ftp

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

telnetd: Telnet server daemon

inetd: TCP server manager program

ftpd: FTP server daemon

boa: Web server daemon

Application Development Software:
• Moxa Linux API Library
• Linux Tool Chain:
• Arm-elf-gcc: C/C++ PC cross compiler
• µClibc: POSIX standard library

Device Drivers: UART, RTC, buzzer, SD card

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-7101-T-LX: Mini RISC-based embedded computer with 1 serial port, LAN, µClinux OS, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

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

Package Checklist

• UC-7101 computer
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• CBL-4PINDB9F-150: 4-pin pin header to DB9 female console port cable, 150 cm
• Universal power adaptor (including terminal block to power jack converter)
• Universal power adaptor
• Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

DA-681 Series

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

> Intel Celeron M 1 GHz processor with 400 MHz FSB
> 1 x 200-pin DDR2 SODIMM socket, supporting DDR2 400 up to 1 GB (512 MB built-in)
> Six 10/100 Mbps Ethernet ports
> 1 CompactFlash socket, 1 IDE ATA-150 connector for storage expansion
> USB 2.0 ports for high speed peripherals
> 4 isolated RS-232 and 8 isolated RS-485 ports
> Serial port speed from 50 to 921.6 Kbps, supporting nonstandard baudrates
> Embedded Linux, WinCE 6.0, or WinXPe platform
> 19-inch rackmount model, 1U height
> Dual 100/240 VAC/VDC power input (single power and dual power models available)
> Fanless Design

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

15

Embedded Computers for Communication ❯ DA-681 Series

: Overview

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

With its robust design, the DA-681 is suitable for industrial automation applications that require standard 19-inch rackmount solutions, such as power automation, transportation, and oil and gas. Another plus

is that the serial ports come with 2 KV optical isolation protection to guarantee communication reliability in harsh industrial environments.

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

: Appearance
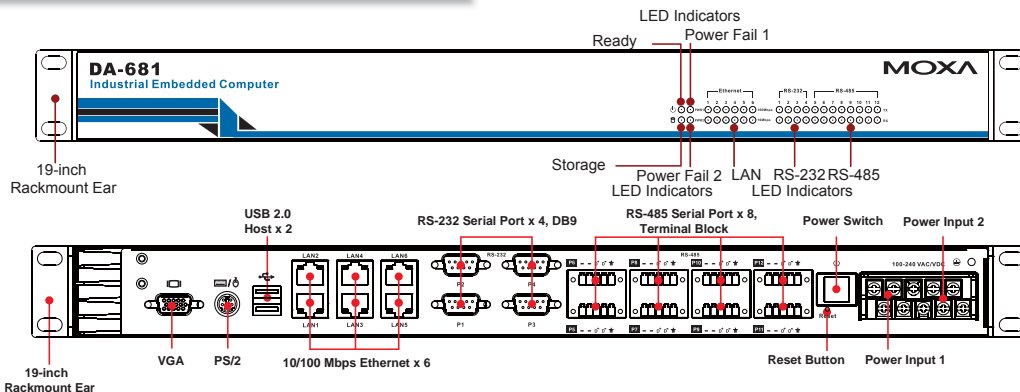
LED Indicators
Power Fail 1
Ready

19-inch Rackmount Ear

Storage
Power Fail 2 LED Indicators
LAN LED Indicators
RS-232 LED Indicators
RS-485

USB 2.0 Host x 2
RS-232 Serial Port x 4, DB9
RS-485 Serial Port x 8, Terminal Block
Power Switch
Power Input 2

19-inch Rackmount Ear
VGA
PS/2
10/100 Mbps Ethernet x 6
Reset Button
Power Input 1

: Hardware Specifications

Computer

CPU: Intel Celeron M 1 GHz processor

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

System Chipset: Intel 910GMLE + ICH6M chipset

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

FSB: 400/533 MHz

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

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

Storage

Built-in: 1 GB SSD (DOM) onboard to store OS via IDE interface

Storage Expansion: CompactFlash socket

HDD Support: SATA connector for HDD expansion

Other Peripherals

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

Display

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

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

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

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

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards:
• 4 RS-232 ports (DB9 male)
• 8 RS-485 ports (terminal block)

ESD Protection: 15 KV for all signals

Isolation: 2 KV digital isolation

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

LEDs

Sytem: Power x 1, Storage x 1

LAN: 10M x 6, 100M x 6

Serial:
RS-232: 4 x Tx, 4 x Rx
RS-485: 8 x Tx, 8 x Rx

Power Failure: LED x 2 (dual power models)

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 4.5 kg

Dimensions: 440 x 253 x 45 mm (19-inch 1U height)

Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

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

Power Requirements

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

Power Consumption: 26 W

Regulatory Approvals

EMC: CE (EN55022, EN61000-3-2, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)

Green Product: RoHS, CRoHS, WEEE

Reliability

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

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

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)
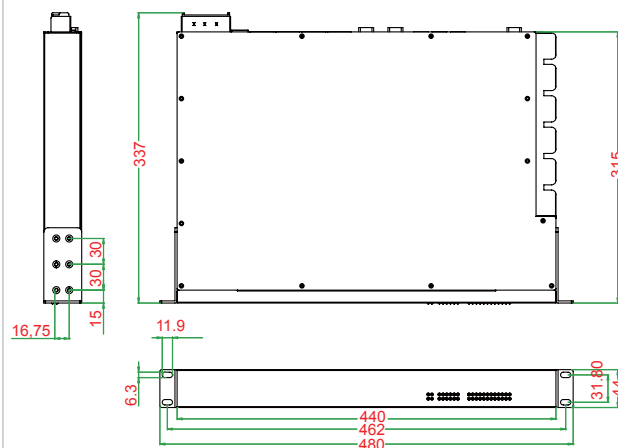
: Software Specifications

Linux

Distribution: Debian Etch 4.0

Kernel Version: 2.6.18

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE

File System: EXT2 (1G DOM)

System Utilities: bash, busybox, login, telnet, ftp, ssh, openbsd-inetd, apt, apt-utils, dpkg, grub, udev

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

OpenVPN: virtual private network service manager

iptables: Firewall service manager

NAT: Network Address Translation

pppd: dial in/out over serial port daemon & PPPoE

pppoe: PPP over ethernet

tftp/tftpd: Trivial file transfer protocol client/server

snmpd: snmpd agent daemon

usbmount: supports USB PnP

DHCP Client: dhcp3-client

cron: to manage regular background processing

grep: NU grep, egrep, and fgrep

minicom: friendly serial communication program

watchdog: software watchdog

inetd: TCP server manager program

Application Development Environment: GNU Make 3.8.1 (GNU make utility to maintain groups of programs)

Automatic configuration script builder: autoconf 2.13

gcc: GNU C compiler

g++: GNU C++ compiler

libc6-dev: GNU C library (development libraries and headers)

Perl: Pratical Extraction and Report Language

Vim: Vi IMproved (enhanced vi editor)

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE).

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

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

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).

Application Development Software:
- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
- SOAP Toolkit Client
- Winsock 2.2

Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

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

Application Development Software:
- Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate
- Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with USB .95 or 1.0
- Windows API, Media Player 10, Script Engines, and WMI

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Embedded Computers for Communication > DA-681 Series

: Ordering Information

Available Models

DA-681-I-SP-CE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, WinCE 6.0

DA-681-I-SP-XPE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Single Power, WinXPe SP2

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

DA-681-I-DP-CE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, WinCE 6.0

DA-681-I-DP-XPE: x86 rackmount computer with VGA, 6 Ethernet ports, 4 RS-232 ports, 8 RS-485 ports, CompactFlash, SATA, USB, Dual Power, WinXPe SP2

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

Package Checklist

- DA-681 computer
- Ethernet Cable: RJ45 to RJ45 cross-over cable, 100 cm
- Quick Installation Guide (printed)
- Document and Software CD or DVD
- Product Warranty Statement

DA-682 Series

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

TAIWAN EXCELLENCE 2009

> Intel Celeron M 1 GHz processor with 400 MHz FSB
> Built-in DDR2 SDRAM and industrial flash disk module
> Quad Gigabit Ethernet ports for network redundancy
> Software selectable RS-232/422/485 with 2 KV isolation protection
> PCI expansion slots for inserting expansion modules
> 1 CompactFlash socket for storage expansion
> USB 2.0 ports for high speed peripherals, supporting system bootup
> 19-inch rackmount, 2U high form factor
> 100/240 VAC/VDC power inputs
> Ready-to-Run Linux, WinCE 6.0, or Windows XP Embedded platform
> Fanless design

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Microsoft® Windows® Embedded   CCC   e   RoHS   CE   FC   c UL us LISTED

: Overview

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

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

The DA-682 computers run Linux, WinCE 6.0, or Windows XP

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

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

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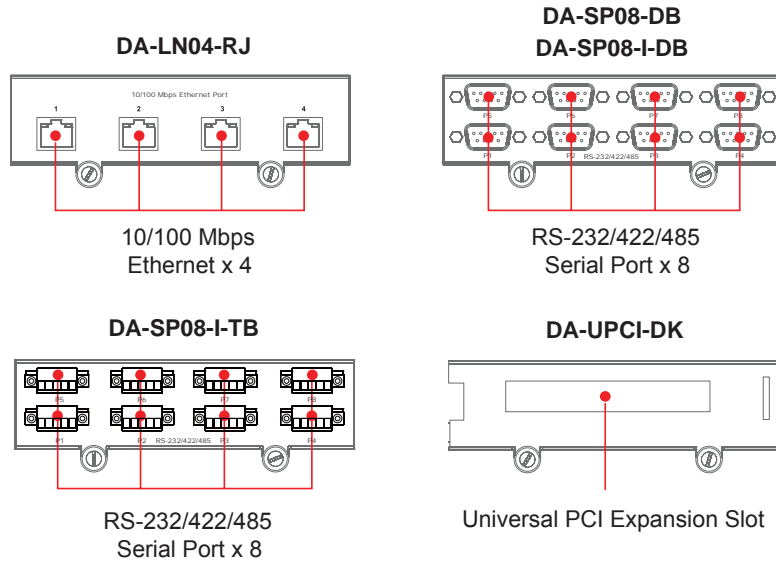
: Appearance

Front View
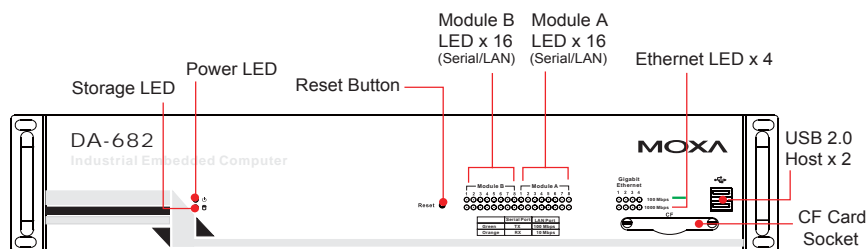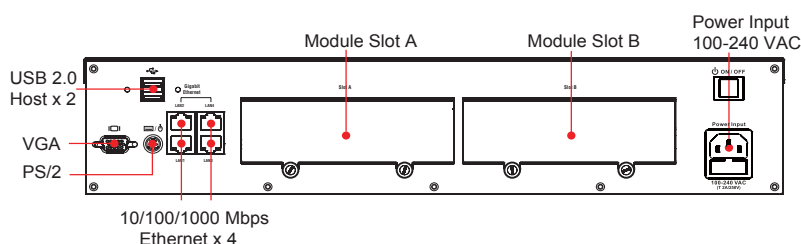
Storage LED · Power LED · Reset Button · Module B LED x 16 (Serial/LAN) · Module A LED x 16 (Serial/LAN) · Ethernet LED x 4 · USB 2.0 Host x 2 · CF Card Socket

Rear View

USB 2.0 Host x 2 · VGA · PS/2 · 10/100/1000 Mbps Ethernet x 4 · Module Slot A · Module Slot B · Power Input 100-240 VAC

Expansion Modules

DA-LN04-RJ

10/100 Mbps
Ethernet x 4

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

RS-232/422/485
Serial Port x 8

DA-SP08-I-TB

RS-232/422/485
Serial Port x 8

DA-UPCI-DK

Universal PCI Expansion Slot

: Hardware Specifications

Computer

CPU: Intel Celeron M 1 GHz processor

OS (pre-installed): Linux, WinCE 6.0, or Windows XP Embedded SP2

System Chipset: Intel 915GME + ICH6M chipset

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

FSB: 400/533 MHz

System Memory: 1 x 200-pin DDR2 SODIMM socket supporting DDR2 400/533; up to 1 GB max. (512 MB for WinXPe/Linux, 256 MB for WinCE 6.0)

Expansion Bus: PC/104-Plus onboard

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

Storage

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

Storage Expansion: CompactFlash socket

Other Peripherals

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

Display

Graphics Controller: Integrated graphics with built-in Intel 915GME, and built-in Intel extreme Graphics 2 technology

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

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

Resolution: CRT display mode with pixel resolution up to 2548 x 1536 at 75 Hz

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

LEDs

Sytem: Power, Storage

Gigabit LAN: 100M x 4, 1000M x 4

LAN: 10/100M mode

Serial: TX/RX

Communication: Module A x 16, Module B x16

Switches and Buttons

Power Switch: on/off (on rear panel)

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

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight: 7 kg

Dimensions: 440 x 253 x 90 mm (17.32 x 9.96 x 3.54 in) (without rackmount ears)

Mounting: Standard 19-inch rackmount

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

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

Power Requirements

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

Power Consumption: 30 W (full loading)

Regulatory Approvals

EMC: CE (EN61000-6-4, EN61000-3-2, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)

Reliability

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

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

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

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Embedded Computers for Communication > DA-682 Series

⋮ DA-SP08-DB/DA-SP08-I-DB/TB (module with 8 serial ports)

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

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

⋮ DA-LN04-RJ (module with 4 LAN ports)

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps Ethernet x 4, RJ45 connectors

Magnetic Isolation Protection: 1.5 KV built-in

⋮ DA-UPCI-DK (module with 1 Universal PCI expansion slot)

Universal PCI Expansion Adatpor

PCI Slots: 1

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

⋮ Software Specifications

Linux

Distribution: Debian Etch 4.0 r2

Kernel Version: 2.6.18

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE

File System: EXT2, JFFS2 (1G DOM)

System Utilities: bash, busybox, login, telnet, ftp, ssh, openbsd-inetd, apt, apt-utils, dpkg, grub, udev

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

Openvpn: virtual private network service manager

iptables: Firewall service manager

NAT: Network Address Translation

pppd: dial in/out over serial port daemon & PPPoE

pppoe: PPP over ethernet

tftp/tftpd: Trivial file transfer protocol client/server

snmpd: snmpd agent daemon

usbmount: support USB PnP

DHCP Client: dhcp3-client

cron: management of regular background processing

grep: NU grep, egrep and fgrep

minicom: friendly serial communication program

watchdog: software watchdog

inetd: TCP server manager program

Application Development Environment: GNU Make 3.8.1 (GNU make utility to maintain groups of programs)

Automatic configuration script builder: autoconf 2.13

gcc: GNU C compiler

g++: GNU C++ compiler

libc6-dev: GNU C Library (development libraries and headers)

Perl: Pratical Extraction and Report Language

Vim: Vi IMproved - enhanced vi editor

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Enables clients to access files and other resources over the network (Microsoft® Wincows® CE).

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.

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

Watchdog Service: CPU Hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).

Application Development Environment:
• Moxa WinCE 6.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 2.0 SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX, SAX2
• SOAP Toolkit Client
• Winsock 2.2

Windows XP Embedded

System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, FTP, SMTP, PPPoE, PPTP, NetBIOS

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.
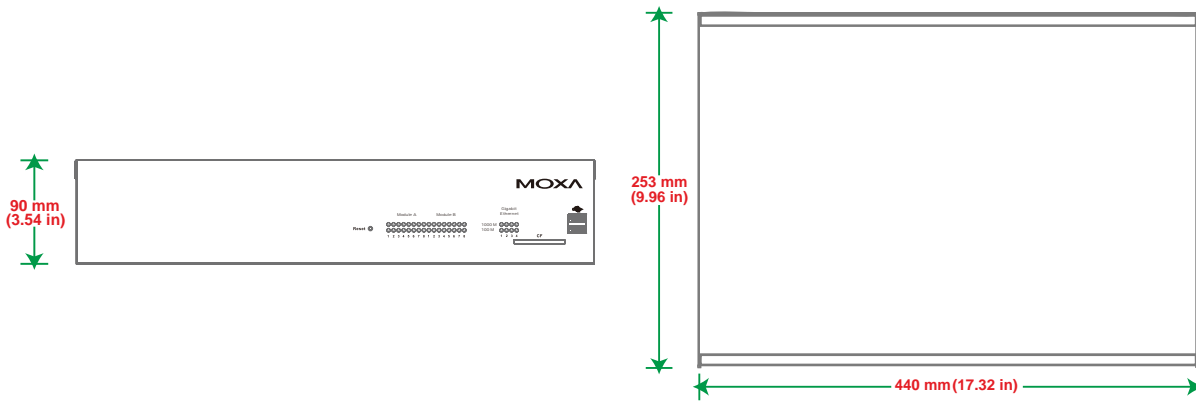
Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

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

Application Development Environment:
• Microsoft .Net Framework 2.0 with service pack 2 (CLR and the .NET Framework class library)
• Active Directory Service Interface (ADSI) Core
• Active Template Library (ATL),ASP.NET 2.0
• Certificate Request Client & Certificate
• Autoenrollment (CLR and the .NET Framework class library)
• COM APIs
• Common Control Libraries
• Common File Dialogs
• Direct3D, DirectPlay, DirectShow and Direct show filters
• Distributed Transaction Coordinator (MSDTC)
• Enhanced Write Filter (Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage)
• Event Log, Internet Explorer
• Mapi32 Libraries
• Message Queuing (MSMQ) Core
• Microsoft Visual C++ Run Time Libraries
• Power Management dynamic-link library
• Registry Editor
• RPC
• Smart Card Cryptographic Service Providers
• USB 2.0 core drivers compliant with USB .95 or 1.0
• Windows API, Media Player 10, Script Engines, and WMI

Dimensions

90 mm (3.54 in)

253 mm (9.96 in)

440 mm (17.32 in)

: Ordering Information

Available Models

DA-682-CE: x86 rackmount computer with VGA, 4 Gigabit Ethernet ports, 2 PCI slots, CompactFlash, USB, WinCE 6.0

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

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

Expansion Modules (can be purchased separately)

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

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

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

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

DA-UPCI-DK: Universal PCI development kit

Package Checklist
• DA-682 embedded computer
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• AC power cable
• Document and Software CD or DVD
• Quick Installation Guide (printed)
• Warranty Card

DA-660/661/662/662-I

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

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

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Microsoft® Windows® Embedded   RoHS   CE   FC   c(UL)us LISTED   TÜV Rheinland Product Safety BAUART GEPRÜFT TYPE APPROVED

: Overview

The DA-660/661/662/662-I embedded computers come with 8 or 16 software-selectable RS-232/422/485 serial ports, making them suitable for a variety of industrial applications. Models are available with either 2 or 4 10/100 Mbps Ethernet ports. Most models come with a PCMCIA socket to provide 802.11 b/g wireless LAN card expansion, and a CompactFlash socket and USB ports to make it easy to add additional memory. The computers are designed with a standard 19-inch, rugged 1U rackmount case, and are embedded with a 100-240V AC/DC power input. This combination of features gives users a robust and reliable ready-to-run solution for applications such as data acquisition and power substations.

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

: Appearance

Front View (DA-660)

LCD Screen   LED Indicators (Ready, LAN, Tx, Rx)

Data Acquisition Computer   DA-660-16   19-inch Rackmount Ear

Reset Button   Push Buttons
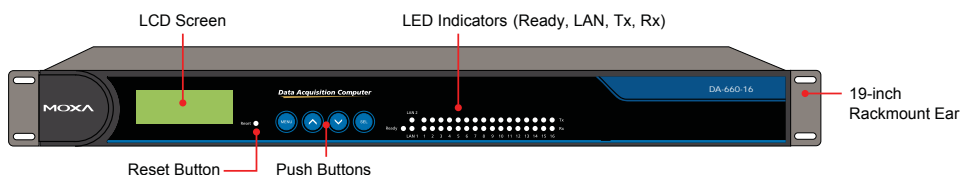
Front View (DA-661/662/662-I)

- LCM Display Panel
- 19-inch Rackmount Ear
- Reset Button
- LED Indicators — System Status, LAN, Serial Tx/Rx
- PCMCIA Socket
- CF Socket
- USB Host x 2
- Push Buttons

Rear View (DA-660)

- Power Input, 100 to 240 VAC/VDC
- RS-232/422/485 Serial Ports x 8/16 RJ45, 50 bps to 921.6 Kbps
- RS-232 Console Port
- ON/OFF Switch
- 10/100 Mbps Ethernet, RJ45 x 2

Rear View (DA-661)

- Power Input, 100 to 240 VAC/VDC
- RS-232/422/485 Serial Ports x 8/16 RJ45, 50 bps to 921.6 Kbps
- ON/OFF Switch
- 10/100 Mbps Ethernet, RJ45 x 2
- RS-232 Console Port

Rear View (DA-662/662-I)

- Power Input, 100 to 240 VAC/VDC
- RS-232/422/485 Serial Ports x 8/16 RJ45, 50 bps to 921.6 Kbps
- ON/OFF Switch
- 10/100 Mbps Ethernet, RJ45 x 4
- RS-232 Console Port

: Hardware Specifications

Computer

CPU:
DA-660: Intel XScale IXP422 266 MHz
DA-661/662/662-I: IXP425 533 MHz

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

DRAM: 128 MB onboard (256 MB for ODM)

Flash: 32 MB onboard

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

Storage

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

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD Protection: 15 KV for all signals

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

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: OS Ready

LAN:
DA-660/661: 10/100M x 2
DA-662/662-I: 10/100M x 4

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

Mini Screen with Push Buttons

LCD Panel: Liquid Crystal Display on the case, 2 x 16 text mode

Push Buttons: Four membrane buttons for convenient on-site configuration

Physical Characteristics

Housing: SECC sheet metal (1 mm)

Weight:
DA-660/661/662: 2600 g
DA-662-I: 2940 g

Dimensions:
DA-660/661/662:
Without ears: 440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
With ears: 480 x 45 x 198 mm (18.90 x 1.77 x 7.80 in)
DA-662-I:
Without ears: 440 x 45 x 228 mm (17.32 x 1.77 x 8.98 in)
With ears: 480 x 45 x 224 mm (18.90 x 1.77 x 8.82 in)

Mounting: Standard 19-inch rackkmount

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

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

Power Requirements

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

Power Consumption:
DA-660: 12 W
DA-661/662/662-I: 20 W

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

Reliability

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

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

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions

DA-660/661/662
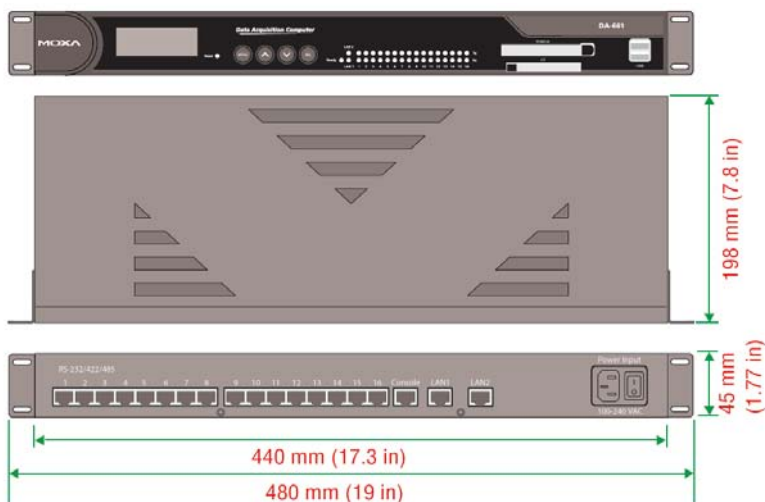
DA-662-I
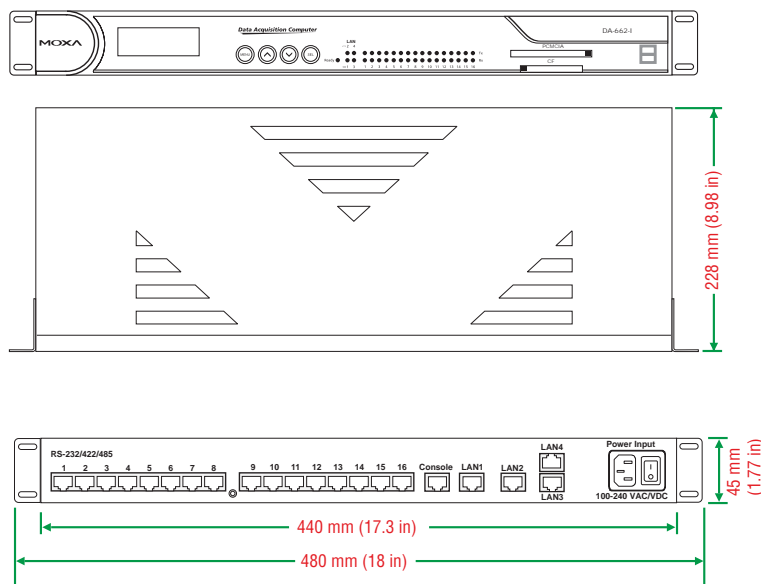
: Software Specifications

Linux

Kernel Version:
DA-660: 2.4.18
DA-661/662/662-I: 2.6.10

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/ 2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
• Moxa Linux API Library for device control
• Linux Tool Chain: Gcc, Glibc, GDB

Windows Embedded CE 5.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, SMTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client (DA-662-I only).

FTP Server: Used for transferring files to and from remote computer systems over a network.

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

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

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

Application Development Software:
• Moxa WinCE 5.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft Foundation Classes (MFC)
• Microsoft® .NET Compact Framework 2.0 SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX2
• SOAP Toolkit
• Winsock 2.2

: Ordering Information

Available Models

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

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

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

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

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

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

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

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

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

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

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Embedded Computers for Communication > DA-660/661/662/662-I

Package Checklist

• DA-660 series computer
• 19-inch rackmount kit
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
• CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
• Power Cord
• Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

EM-2260 Series

RISC-based embedded core modules with 4 serial ports, 8 DI/DO, dual LANs, VGA, CompactFlash, USB

> Cirrus Logic EP9315 ARM9 CPU, 200 MHz
> 128 MB RAM on-board, 32 MB flash disk
> Graphical interface for external VGA output connection
> 2 KV optically isolated RS-232/422/485 serial ports
> Dual 10/100 Mbps Ethernet for network redundancy
> 8 DI and 8 DO channels
> Supports CompactFlash and USB 2.0 hosts
> Ready-to-run WinCE 6.0 or Linux platform
> Full-function development kit for quick evaluation and application development

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Windows® Embedded

RoHS CE FC

: Overview

The EM-2260 embedded module features 4 RS-232/422/485 serial ports, dual Ethernet ports, an EIDE interface for designing an external storage connection, such as a CompactFlash socket and USB port signals. The module has a compact design that is easily integrated with a variety of industrial applications, including gas stations, vending machines, and ticketing machines, and offers a powerful serial communication capability for better system integration. Programmers will find the pre-installed, ready-to-run Windows CE 6.0 platform and full-function development kit a great benefit to developing software and building reliable communication bases for industrial automation applications.

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

give you enough memory to run your application software directly on the EM-2260. With its built-in VGA output interface, the EM-2260 is suitable for use with SCADA systems in industrial applications, such as manufacturing automation, production line process monitoring, and mining automation, that require VGA and HMI features.

The EM-2260 comes pre-installed with either the open standard Linux OS, or the more common WinCE OS. Software written for a desktop PC can be easily ported to the EM-2260 platform by using a common compiler, without needing to modify the code, and the software you develop for your own applications can be stored in the EM-2260's flash memory.
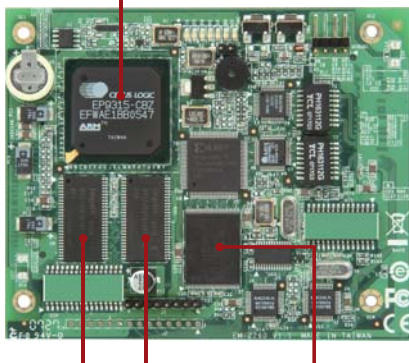
The EM-2260 Development Kit provides users with a handy tool for first time evaluation to test the functionality of the embedded core module. It has several peripherals built-in, including RS-232/422/485 ports and digital input and output, making it suitable for developing a variety of industrial applications.
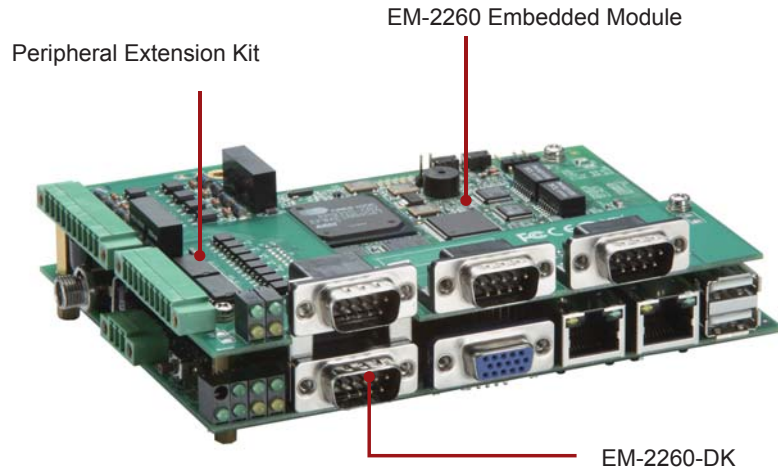
: Appearance

Cirrus Logic EP9315 ARM9 CPU   CN1   CN2
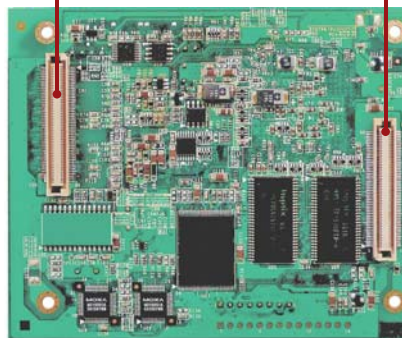
onboard 128 MB RAM   onboard 32 MB Flash

EM-2260 Embedded Module

Peripheral Extension Kit

EM-2260 Embedded Module

EM-2260-DK

: Hardware Specifications

Computer
CPU: Cirrus Logik EP9315 ARM9 CPU, 200 MHz
OS (pre-installed): Windows CE 6.0 or Linux
DRAM: 128 MB onboard (optional 256 MB)
Flash: 32 MB

Storage
Storage Expansion: EIDE interface for connecting up to 2 external devices

Display
Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support
Display Memory: Dynamic video memory (shares system memory)
Resolution: 1024 x 768, 8 bits

Ethernet Interface
LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 KV built-in

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

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

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

Digital Input
Input Channels: 8
Input Voltage: 3.3 V, CMOS level

Digital Output
Output Channels: 8
Digital Output Levels: 3.3 V, CMOS level
Reset Button: Supports "Reset to Factory Default"

Physical Characteristics
Weight: 70 g
Dimensions: 106 x 87 mm (4.17 x 3.43 in)

Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Operating Humidity: 5 to 95% RH
Storage Temperature: -20 to 80°C (-4 to 176°F)

Power Requirements
Input Voltage: 12 VDC
Power Consumption: 5.8 W (480 mA @ 12 VDC)

Regulatory Approvals
EMC: CE (Class A), FCC
Green Product: RoHS, WEEE

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

: Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: ARP, PPP, CHAP, PAP, IPv4, ICMP, TCP, UDP, DHCP, FTP, SNMP V1, HTTP, NTP, NFS, SMTP, SSH 1.0/2.0, SSL, Telnet, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, tinylogin, telnet, ftp, smtpclient, scp, busybox

telnetd: telnet server daemon

sshd: secure shell server

Apache: web server daemon

openvpn: virtual private network

pppd: dial in/out over serial port daemon

snmpd: snmpd agent daemon

inetd: TCP server manager program

openssl: open SSL

Linux Tool Chain:
• GCC (V3.3.2): C/C++ PC Cross Compiler
• GDB (V5.3): Source level debug server
• Blibc (V2.2.5): POSIX standard C library

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard Telnet client

FTP Server: Used for transferring files to and from remote computer systems over a network.

File Server: Microsoft® Windows® CE functionality enables clients to access files and other resources over the network.

Web Server (HTTPD): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, and Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI extensions.

Dial-up Networking Service: RAS client API and PPP, with support for Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Service: CPU hardware function for resetting CPU in a user specified time interval. Activated by Moxa library function.

Application Development Software:
• Moxa WinCE 6.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 2.0 with SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX
• SOAP Toolkit
• Winsock 2.2

Dimensions
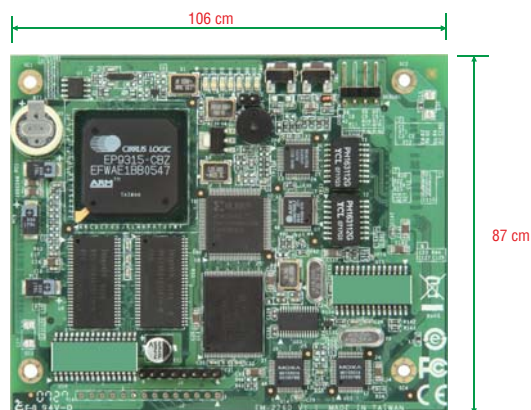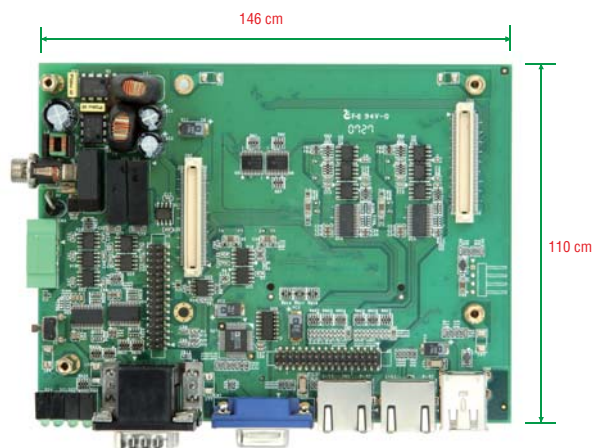
: Ordering Information

Available Modules

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 (must 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 embedded module

Package Checklist (development kits)
• EM-2260 embedded module
• EM-2260-DK, the carrier board for the EM-2260 module
• Universal power adaptor set
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

EM-1240 Series

RISC-based ready-to-run embedded core module with 4 serial ports, dual LANs, SD, µClinux

-40°C 75°C

> MOXA ART ARM9 32-bit 192 MHz processor
> 16 MB RAM, 8 MB flash on-board
> 4 software-selectable RS-232/422/485 serial ports
> Dual 10/100 Mbps Ethernet for network redundancy
> RS-232 serial console port supporting PPP
> Ready-to-run µClinux Kernel 2.6 platform
> SD signals supported for external SD socket connection
> Built-in RTC, buzzer
> 10 GPIOs reserved for system integration
> Full-function development kit for quick evaluation and application development
> -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

⋮ 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 module has a compact design that can be easily integrated with related 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.
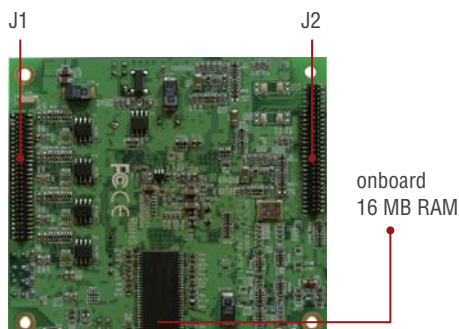
In addition, the wide temperature EM-1240-T model is also available to provide a reliable solution for any harsh environment.
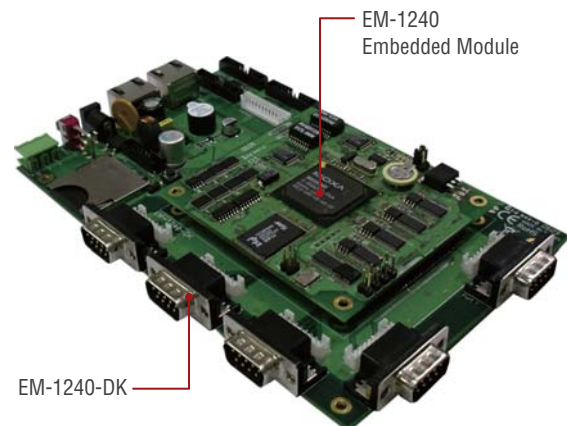
⋮ Appearance

Embedded Module—Top View

MOXA ART ARM9 32-bit Communication Processor

onboard Intel NOR Flash 8 MB

Embedded Module—Bottom View

J1   J2
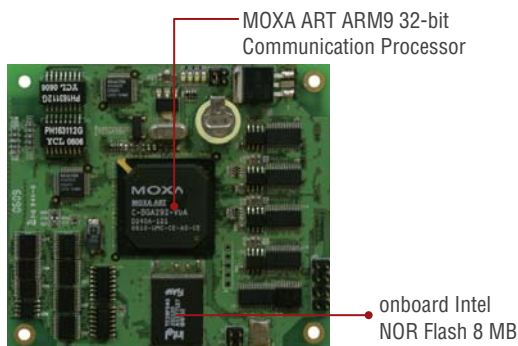
onboard 16 MB RAM

Development Kit Appearance

EM-1240 Embedded Module

EM-1240-DK

: Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz processor

OS (pre-installed): Embedded µClinux (kernel 2.6.19)

DRAM: 16 MB onboard (32 MB for ODM)

Flash: 8 MB onboard (16 MB for ODM)

Storage

Storage Expansion: SD signals for external Secure Digital (SD) socket connection

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software-selectable

ESD Protection: 15 KV for all signals

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: Ready

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

Serial: TxD x 4, RxD x 4

Physical Characteristics

Weight:
EM-1240 Module: 50 g
EM-1240 Development Kit: 200 g

Dimensions:
EM-1240 Module: 90 x 80 mm (3.54 x 3.15 in)
EM-1240 Development Kit: 177 x 115 mm (6.97 x 4.53 in)

Module Interface: Two 2 x 28 pin-headers (1.27 x 1.27 mm pitch)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 3.3 VDC

Power Consumption: 2.5 W (740 mA @ 3.3 VDC)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Reliability

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

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

Warranty

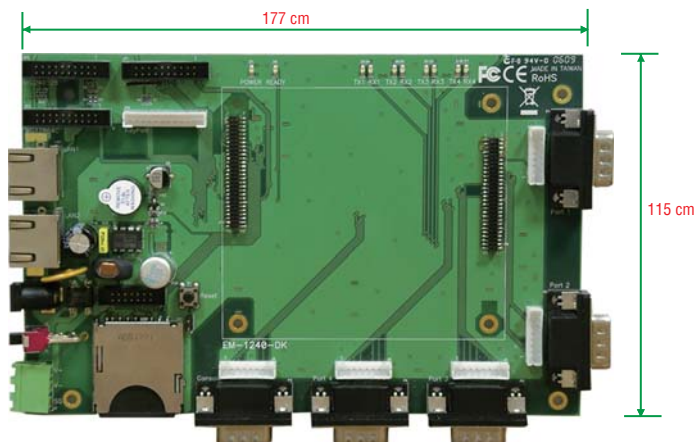**Warranty Period:** 5 years

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 adaptor and cables.

Dimensions
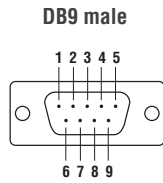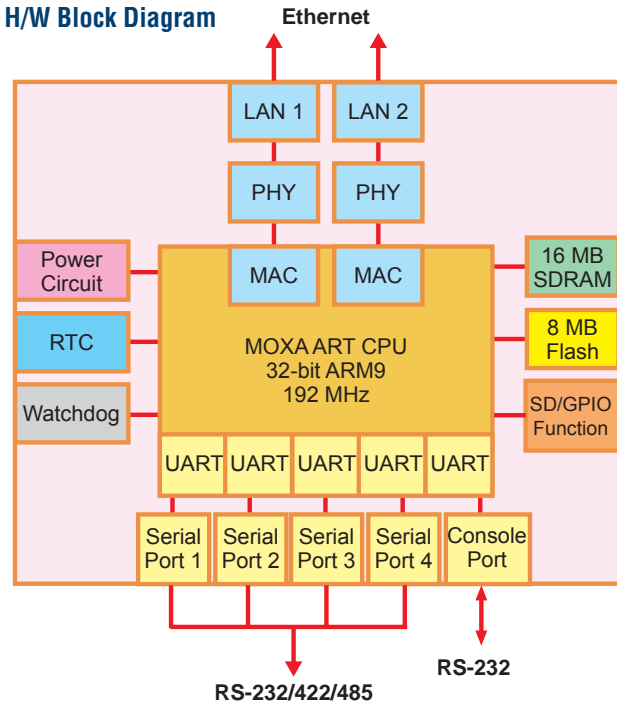
EM-1240 Embedded Module
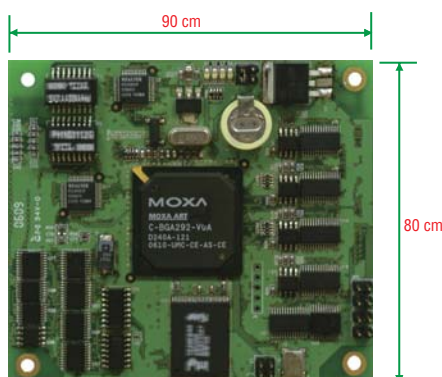
90 cm

80 cm

EM-1240-DK

177 cm

115 cm

Pin Assignment

DB9 male

1 2 3 4 5

6 7 8 9

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	–	–

H/W Block Diagram

Ethernet

LAN 1 | LAN 2

PHY | PHY

Power Circuit

RTC

Watchdog

MAC | MAC

MOXA ART CPU
32-bit ARM9
192 MHz

16 MB SDRAM

8 MB Flash

SD/GPIO Function

UART UART UART UART UART

Serial Port 1 | Serial Port 2 | Serial Port 3 | Serial Port 4 | Console Port

RS-232

RS-232/422/485

: Software Specifications

µClinux

Kernel Version: 2.6.19

Protocol Stack: ARP, ICMP, IPV4, TCP, UDP, FTP, Telnet, SNMP V1, HTTP, CHAP, PAP, DHCP, NTP, NFS V2, SMTP, Telnet, PPP, PPPoE

File System: JFFS2, root file system (read only), and user directory (read/write)

System Utilities: msh, busybox, tinylogin, telnet, ftp

pppd: Dial in/out over serial port daemon, including PPPoE (Point-to-Point over Ethernet)

snmpd: SNMP V1 Agent daemon

telnetd: Telnet server daemon

inetd: TCP server manager program

ftpd: FTP server program

boa: Web server daemon

ntpdate: Network Time Protocol client utility

Tool Chain:
• Arm-elf-gcc: C/C++ PC Cross Compiler
• µClibc: POSIX standard C library

: Ordering Information

Available Modules

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

EM-1240-T-LX: RISC-based embedded core module with 4 serial ports, dual LANs, SD, µClinux, -40 to 75°C operating temperature

Development Kits (must be purchased separately)

EM-1240 Development Kit: Includes the EM-1240-DK snap-on testing board with built-in RJ45 LAN ports and DB9 male serial ports

Package Checklist (module)

• EM-1240-LX or EM-1240-T-LX embedded module

Package Checklist (Development Kit)

• EM-1240 embedded module
• EM-1240-DK, the carrier board for the EM-1240 module
• Universal power adaptor set
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• DB9 female to terminal block adaptor
• Terminal block (300V, 15A)
• Universal power adaptor set
• Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

EM-1220 Series

RISC-based ready-to-run embedded core module with 2 serial ports, dual LANs, SD, µClinux

-40°C 75°C

> MOXA ART ARM9 32-bit 192 MHz processor
> 16 MB RAM, 8 MB flash disk on-board
> 2 software-selectable RS-232/422/485 serial ports
> Dual 10/100 Mbps Ethernet for network redundancy
> Ready-to-run µClinux Kernel 2.6 platform
> SD signals supported for external SD socket connection
> Built-in RTC, buzzer
> 8 GPIOs reserved for system integration
> Credit card size design for easy integration at any field site
> Full-function development kit for quick evaluation and application development
> -40 to 75°C wide temperature model available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

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, the "wide temperature" EM-1220-T model is also available to provide a reliable solution for any harsh environment.
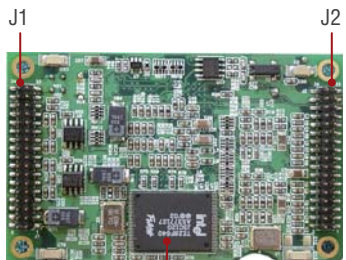
Appearance

Embedded Module—Top View
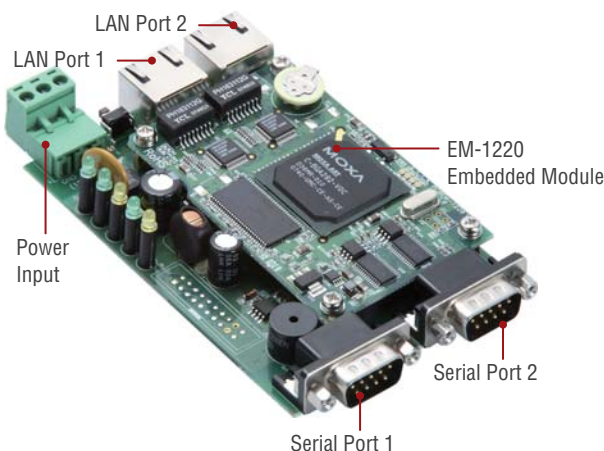
MOXA ART ARM9 32-bit Communication Processor

onboard 16 MB RAM

Embedded Module—Bottom View

J1   J2

onboard Intel NOR Flash 8 MB

Development Kit

LAN Port 2
LAN Port 1
Power Input
EM-1220 Embedded Module
Serial Port 2
Serial Port 1

: Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz processor

OS (pre-installed): Embedded µClinux (kernel 2.6.19)

DRAM: 16 MB onboard (32 MB for ODM)

Flash: 8 MB onboard (16 MB for ODM)

Storage

Storage Expansion: SD signals for external Secure Digital (SD) socket connection

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

ESD Protection: 15 KV for all signals

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: Ready

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

Serial: TxD x 2, RxD x 2

Physical Characteristics

Weight:
EM-1220 Module: 40 g
EM-1220 Development Kit: 120 g

Dimensions:
EM-1220 Module: 80 x 50 mm (3.15 x 1.97 in)
EM-1220 Development Kit: 117 x 70 mm (4.61 x 2.76 in)

Module Interface: Two 2 x 17 pin-headers (2.5 x 2.5 mm pitch)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 3.3 VDC

Power Consumption: 2.1 W (625 mA @ 3.3 VDC)

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Reliability

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

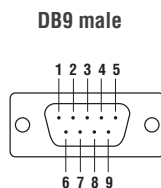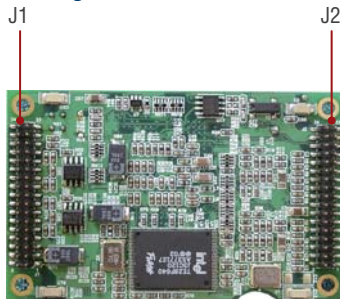**Automatic Reboot Trigger:** Built-in WDT (watchdog timer)

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 adaptor and cables.

Pin Assignment

J1   J2

Jumper 1 (J1)

Pin No.	Signals	Pin No.	Signals
1	VCC (3.3V)	2	VCC (3.3V)
3	VCC (3.3V)	4	VCC (3.3V)
5	GND	6	GND
7	GND	8	GND
9	TxD0 (RS-232)	10	RxD0(RS-232)
11	RTS0	12	CTS0
13	DTR0	14	DSR0
15	RxD1 (RS-232)	16	DCD0
17	CTS1	18	TxD1 (RS-232)
19	DSR1	20	RTS1
21	DCD1	22	DTR1
23	Data-(A)0/ RxD-(A)0	24	Data-(A)1/ RxD-(A)1
25	Data+(B)0/ RxD+(B)0	26	Data+(B)1/ RxD+(A)1
27	Serial LED_Tx0	28	Serial LED_Rx0
29	Serial LED_Tx1	30	Serial LED_Rx1
31	TxDA(-)0	32	TxDA(-)1
33	TxDB(+)0	34	TxDB(+)1

Jumper 2 (J2)

Pin No.	Signals	Pin No.	Signals
1	Console_RxD	2	Console_TxD
3	Eth1_TxD_out+	4	GND
5	Eth1_TxD_out-	6	Eth1_RxD_in+
7	Eth1_LED_100M	8	Eth1_RxD_in-
9	Eth0_TxD_out+	10	Eth1_LED_10M
11	Eth0_RxD_out-	12	Eth0_RxD_in+
13	Eth0_LED_100M	14	Eth0_RxD_in-
15	GPIO0	16	Eth0_LED_10M
17	GPIO2	18	GPIO1
19	GPIO4	20	GPIO3
21	GPIO6	22	GPIO5
23	GPIO8	24	GPIO7
25	Buzzer	26	GPIO9
27	LED_Ready	28	SW Reset
29	SDA	30	SCL
31	GND	32	GND
33	GND	34	GND

DB9 male

1 2 3 4 5

6 7 8 9

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	–	–

: Software Specifications

µClinux

Kernel Version: 2.6.19

Protocol Stack: ARP, ICMP, IPV4, TCP, UDP, FTP, Telnet, SNMP V1, HTTP, CHAP, PAP, DHCP, NTP, NFS V2, SMTP, Telnet, PPP, PPPoE

File System: JFFS2, root file system (read only), and user directory (read/write)

System Utilities: msh, busybox, tinylogin, telnet, ftp

pppd: Dial in/out over serial port daemon, including PPPoE (Point-to-Point over Ethernet)

snmpd: SNMP V1 Agent daemon

telnetd: Telnet server daemon

inetd: TCP server manager program
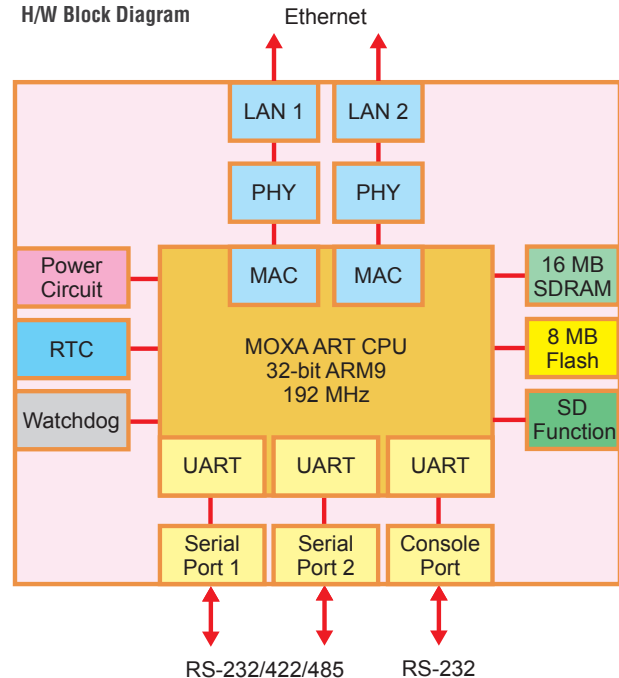
ftpd: FTP server program

boa: Web server daemon

ntpdate: Network Time Protocol client utility

Tool Chain:
• Arm-elf-gcc: C/C++ PC Cross Compiler
• µClibc: POSIX standard C library

H/W Block Diagram

: 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 (must 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 (module)
• EM-1220-LX or EM-1220-T-LX embedded module

Package Checklist (Development Kit)
• EM-1220 embedded module
• EM-1220-DK, the carrier board for the EM-1220 module
• CBL-4PINDB9F-150: 4-pin pin header to DB9 female console port cable, 150 cm
• Universal power adaptor (including terminal block to power jack converter)
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

Embedded Computers for Automation

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Embedded Computers for Automation

DIN-Rail Computers

	IA260-CE IA260-T-CE	IA260-LX IA260-T-LX	IA261-I-LX IA261-I-T-LX	IA261-I-CE IA261-I-T-CE	IA262-I-LX IA262-I-T-LX	IA262-I-CE IA262-I-T-CE	IA240-LX IA240-T-LX	IA241-LX IA241-T-LX
Computer								
CPU Speed	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz	192 MHz	192 MHz
OS (pre-installed)	WinCE 6.0	Linux	Linux	WinCE 6.0	Linux	WinCE 6.0	Embedded Linux	
DRAM	128 MB (256 MB max.)						64 MB	64 MB
Flash	32 MB (64 MB max.)		32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
PCMCIA	---	---	---	---	---	---	---	√
USB Ports	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	2 (USB 2.0)	1 (USB 2.0)	1 (USB 2.0)
Digital I/O	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	8 DIs, 8 DOs	4 DIs, 4 DOs	4 DIs, 4 DOs
Storage								
CompactFlash Socket	√	√	√	√	√	√	---	---
SD Slot	---	---	---	---	---	---	√	√
Display								
Graphics Controller	√	√	√	√	√	√	---	---
LAN Interface								
10/100 Mbps Ethernet Ports	2	2	2	2	2	2	2	2
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV	1.5 KV
Serial Interface								
RS-232/422/485 Ports	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	4 (DB9-M)	2 (DB9-M)	2 (DB9-M)	4 (RJ45)	4 (RJ45)
ESD Protection	---	---	15 KV	15 KV	15 KV	15 KV	15 KV	15 KV
Digital Isolation	---	---	2 KV	2 KV	2 KV	2 KV	---	---
Console Port	√	√	√	√	√	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark							
Flow Control	RTS/CTS, XON/XOFF, ADDC®							
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)							
CANbus	---	---	---	---	2 (DB9-M)	2 (DB9-M)	---	---
LEDs								
System	Power, Ready, Storage							
LAN	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M	10M, 100M
Serial	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics								
Housing	Aluminum, industrial vertical form factor						Aluminum (1 mm)	
Weight	1 kg	1 kg	950 g	950 g	950 g	950 g	430 g	500 g
Dimensions	52 x 112.6 x 162 mm	52 x 112.6 x 162 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 115 x 152 mm	60 x 137 x 100 mm	60 x 137 x 100 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Environmental Limits								
Operating Temperature	-10 to 60°C or -40 to 75°C							
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C or -40 to 85°C							
Regulatory Approvals								
EMC	CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)						CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)	
Safety	UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)						UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)	
Green Product	RoHS, CRoHS, WEEE							
Reliability								
Buzzer, RTC, WDT	√	√	√	√	√	√	√	√
Warranty	5 years (see www.moxa.com/warranty)							

IA260 Series

RISC-based computers with 4 serial ports, dual LANs, VGA, DIO, CompactFlash, USB

-40°C 75°C

TAIWAN EXCELLENCE 2009

> **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/WinCE 6.0 platform**
> **H-type heat dissipation design for system reliability**
> **-40 to 75°C wide operating temperature model available**

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Windows® Embedded   RoHS   C€   FC   c(UL)us LISTED

⦂ Overview

The IA260 embedded computers come with 4 RS-232/422/485 serial ports, dual Ethernet ports, 8 digital input channels, 8 digital output channels, a VGA output, 2 USB hosts, and a CompactFlash socket. The computers are housed in a compact, IP40 protected, industrial-strength aluminum case.

The IA260 computers use the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM give you enough memory to run your application software directly on the IA260.
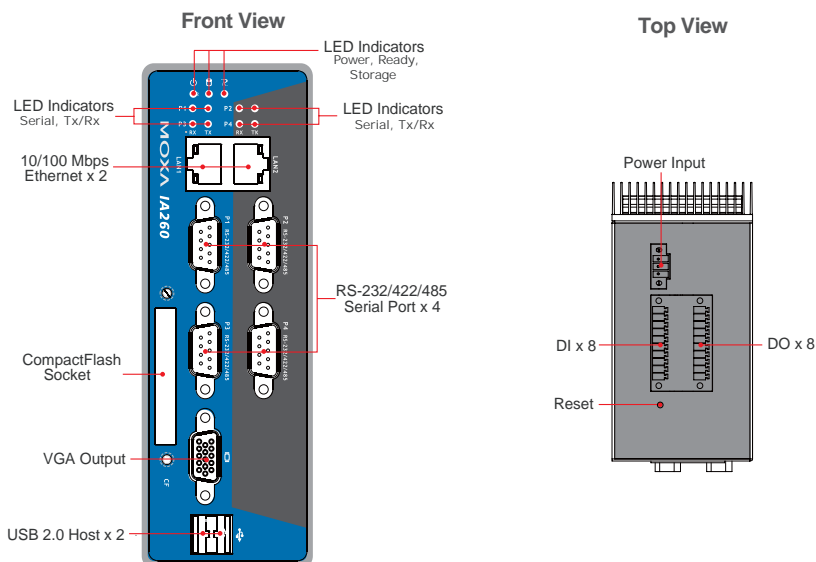
The patented "H-Type" heat dissipation design makes the IA260 an ideal computing unit for applications in extremely hot field sites, since it can directly transmit heat from inside the housing to the

air. With its built-in VGA output interface, the IA260 computers are suitable for use with SCADA systems in industrial applications, such as factory automation, production line process monitoring, and mining automation, that require VGA and HMI features.

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

The IA260 embedded computers come pre-installed with either the open standard Linux OS, or the more common WinCE OS. Software written for a desktop PC can be easily ported to the IA260 platform by using a common compiler, without needing to modify the code, and the software you develop for your own applications can be stored in the IA260's flash memory.

⦂ Appearance

Front View

LED Indicators
Power, Ready, Storage

LED Indicators
Serial, Tx/Rx

LED Indicators
Serial, Tx/Rx

10/100 Mbps
Ethernet x 2

RS-232/422/485
Serial Port x 4

CompactFlash
Socket

VGA Output

USB 2.0 Host x 2

Top View

Power Input

DI x 8

DO x 8

Reset

: Hardware Specifications

Computer

CPU: Cirrus EP9315 ARM9 CPU, 200 MHz

OS (pre-installed): Windows CE 6.0 or Linux

DRAM: 128 MB onboard (optional 256 MB)

Flash: 32 MB onboard (optional 64 MB)

USB: USB hosts x 2, compliant with USB 2.0 (OHCI) type A connectors

Storage

Storage Expansion: CompactFlash slot

Display

Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support

Display Memory: Dynamic video memory (shares system memory)

Display Interface: CRT interface for VGA output, DB15 female connector

Resolution: 1024 x 768, 8 bits

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

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

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

Digital Input

Input Channels: 8, source type

Input Voltage: 0 to 30 VDC at 5 KHz

Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open

Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (8 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 8, sink type

Output Current: Max. 200 mA per channel

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

Connector Type: 9-pin screw terminal block

Isolation: 3 KV optical isolation

LEDs

System: Power, Ready, Storage

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

Serial: TxD x 4, RxD x 4

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum, industrial vertical form factor

Weight: 1 kg

Dimensions: 52 x 112.6 x 162 mm (2.05 x 4.43 x 6.38 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC (3-pin terminal block)

Power Consumption:
With no load on USB ports: 5.8 W
• 240 mA @ 24 VDC
• 480 mA @ 12 VDC
With full load on USB ports: 11 W
• 450 mA @ 24 VDC
• 900 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A), CCC (GB9254, GB 17625.1)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), LVD (EN60950-1), CCC (GB4943)

Reliability

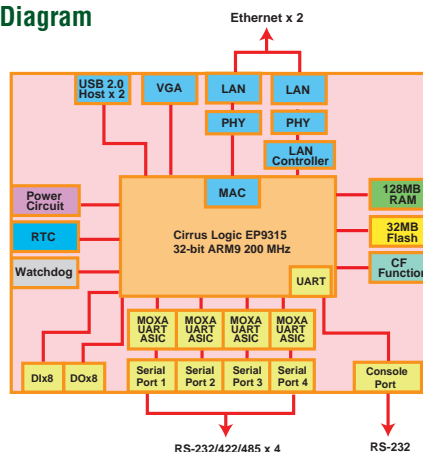**Automatic Reboot Trigger:** Built-in WDT (watchdog timer)

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 adaptor and cables.

H/W Block Diagram

⁞ Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: ARP, PPP, CHAP, PAP, IPv4, ICMP, TCP, UDP, DHCP, FTP, SNMP V1, HTTP, NTP, NFS, SMTP, SSH 1.0/2.0, SSL, Telnet, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, tinylogin, telnet, ftp, smtpclient, scp

telnetd: telnet server daemon

sshd: secure shell server

Apache: web server daemon

openvpn: virtual private network

pppd: dial in/out over serial port daeon

snmpd: snmpd agent daeon

inetd: TCP server manager program

openssl: open SSL

Linux Tool Chain:
• GCC (V4.2.1): C/C++ PC Cross Compiler
• GDB (V5.3): Source level debug server
• Glibc (V2.2.5): POSIX standard C library

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.
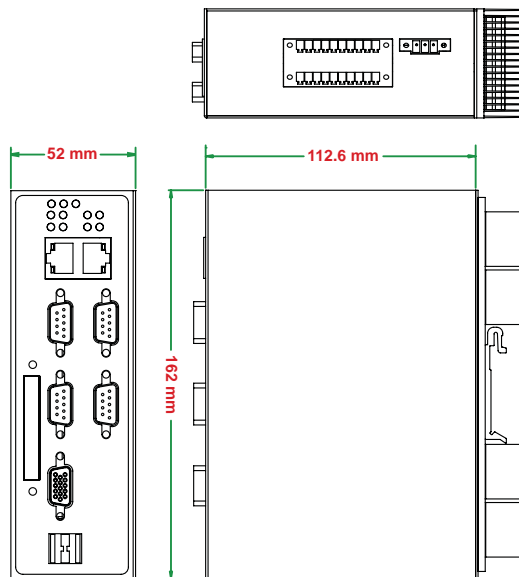
Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Server: CPU hardware function for resetting the CPU in a user-specified time interval; activated by a Moxa library function

Application Development Software:
• Moxa WinCE 6.0 SDK
• C Libraries and Run-times
• Component Services (COM and DCOM)
• Microsoft® .NET Compact Framework 2.0 with SP2
• XML, including DOM, XQL, XPATH, XSLT, SAX
• SOAP Toolkit
• Winsock 2.2

Dimensions

- 52 mm
- 112.6 mm
- 162 mm

⁞ 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 computer
• Wall mounting kit
• DIN-Rail mounting kit
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
• CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
• Universal Power Adaptor
• Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

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Embedded Computers for Automation ˃ IA260 Series

IA261-I/262-I Series

RISC-based computers with 2 or 4 digitally isolated serial ports, dual LANs, VGA, CAN, DIO, CompactFlash, USB

-40°C 75°C

> Cirrus Logic EP9315 ARM9 CPU, 200 MHz
> 128 MB RAM on-board, 32 MB flash disk
> VGA interface for field site monitoring
> 2 KV digitally isolated RS-232/422/485 serial ports
> Dual 10/100 Mbps Ethernet for network redundancy
> Dual 2 KV digitally isolated CAN ports with CANopen protocol support
> 8+8 DI/DO with 3 KV optical isolation protection
> 12 to 48 VDC redundant power input design
> Supports CompactFlash and USB 2.0 hosts
> Ready-to-run Linux or WinCE 6.0 platform
> -40 to 75°C wide temperature models available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Microsoft® Windows® Embedded · RoHS · CE · FC · c(UL)us LISTED

: Overview

The IA261-I/262-I embedded computers come with 2 (IA262-I) or 4 (IA261) RS-232/422/485 serial ports, dual CANbus ports (IA262-I only), dual Ethernet ports, 8 digital input channels, 8 digital output channels, VGA output, 2 USB hosts, and a CompactFlash socket. The computers are housed in a compact, IP40 protected, industrial-strength aluminum case.

The IA261-I/262-I computers use the Cirrus Logic EP9315 ARM9, 32-bit, 200 MHz RISC CPU. This powerful computing engine supports several useful communication functions, but will not generate too much heat. The built-in 32 MB NOR Flash ROM and 128 MB SDRAM provide enough memory to run your application software directly on the IA261-I/262-I.
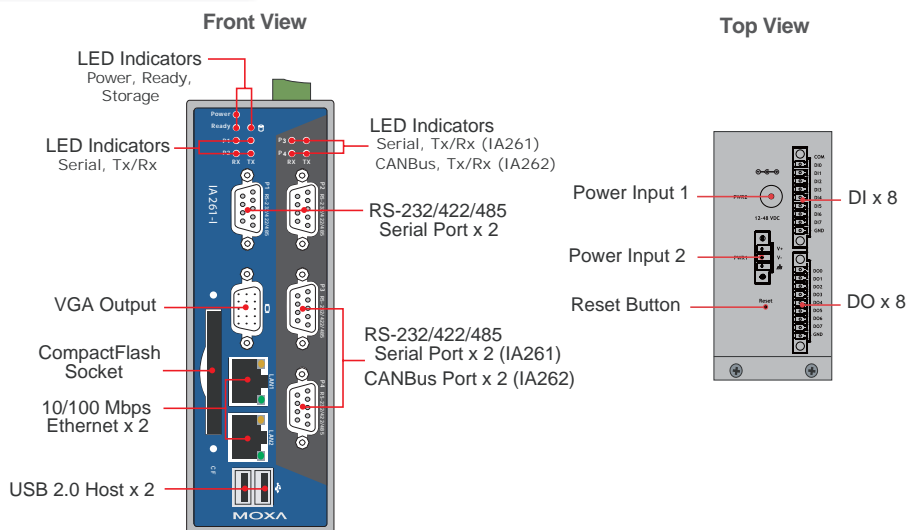
With its built-in VGA output interface, the IA261-I/262-I are suitable for use with SCADA systems in industrial applications, such as

manufacturing automation, production line process monitoring, and mining automation, that require VGA and HMI features.

The IA261-I/262-I computers support RS-232/422/485, CANbus, digital I/O, come with 2 KV isolation protection, and have dual LAN ports, making them ideal as communication platforms for industrial applications that require network redundancy. In addition to the standard models, wide temperature (-40 to 75°C) models are available for use in harsh industrial automation environments.

The IA261-I/262-I embedded computers come pre-installed with either the open standard Linux OS, or the more common WinCE OS. Software written for a desktop PC can be easily ported to the IA261-I/262-I platform by using a common compiler, without needing to modify the code, and the software you develop for your own applications can be stored in the IA261-I/266-I's flash memory.

: Appearance

Front View

LED Indicators
Power, Ready, Storage

LED Indicators
Serial, Tx/Rx

LED Indicators
Serial, Tx/Rx (IA261)
CANBus, Tx/Rx (IA262)

RS-232/422/485
Serial Port x 2

VGA Output

CompactFlash
Socket

10/100 Mbps
Ethernet x 2

USB 2.0 Host x 2

RS-232/422/485
Serial Port x 2 (IA261)
CANBus Port x 2 (IA262)

Top View

Power Input 1

Power Input 2

Reset Button

DI x 8

DO x 8

⁝ Hardware Specifications

Computer

CPU: Cirrus EP9315 ARM9 CPU, 200 MHz

OS (pre-installed): Windows CE 6.0 or Linux

DRAM: 128 MB onboard (optional 256 MB)

Flash: 32 MB onboard

USB: USB hosts x 2, compliant with USB 2.0 (OHCI) type A connectors

Storage

Storage Expansion: CompactFlash slot

Display

Graphics Controller: EP9315 internal graphics accelerator engine with TTL graphical signal support

Display Memory: Dynamic video memory (shares system memory)

Display Interface: CRT interface for VGA output, DB15 female connector

Resolution: 1024 x 768, 8 bits

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 2 or 4 RS-232/422/485 ports, software-selectable (DB9 male)

ESD Protection: 15 KV for all signals

Isolation: 2 KV digital isolation

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

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC™ (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

Digital Input

Input Channels: 8, source type

Input Voltage: 0 to 30 VDC at 5 KHz

Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open

Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (COM to DI)

Connector Type: 10-pin screw terminal block (8 points, COM, GND)

Isolation: 3 KV optical isolation

Digital Output

Output Channels: 8, sink type

Output Current: Max. 200 mA per channel

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

Connector Type: 9-pin screw terminal block

Isolation: 3 KV optical isolation

CANbus Communication (IA262-I only)

Interface: Dual optically isolated CAN2.0A/2.0B compliant ports

CAN Controller: Phillips SJA1000T

Signals: CAN-H, CAN-L

Protocols: Supports CANOpen library

Isolation: 2 KV digital isolation

Speed: 10 Kbps to 1 Mbps

Connector Type: DB9 male

LEDs

System: Power, Ready, Storage

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

Serial: TxD x 4, RxD x 4
IA261-I: P1 to P4 for serial ports
IA262-I: P1 to P2 for serial ports, P3 to P4 for CAN ports

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum, industrial vertical form factor

Weight: 950 g

Dimensions: 60 x 115 x 152 mm (2.36 x 4.53 x 5.98 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: Redundant power input design
PWR1: 12 to 48 VDC (3-pin terminal block)
PWR2: 12 to 48 VDC (power jack with thread)

Power Consumption:
With no load on USB ports: 5.8 W
• 240 mA @ 24 VDC
• 480 mA @ 12 VDC
With full load on USB ports: 11 W
• 450 mA @ 24 VDC
• 900 mA @ 12 VDC

Regulatory Approvals

EMC: CE (Class A), FCC

Safety: UL/cUL

Green Product: RoHS, WEEE

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 adaptor and cables.

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Embedded Computers for Automation > IA261-I/262-I Series

: Software Specifications

Linux

Kernel Version: 2.6.23

Protocol Stack: ARP, PPP, CHAP, PAP, IPv4, ICMP, TCP, UDP, DHCP, FTP, SNMP V1, HTTP, NTP, NFS, SMTP, SSH 1.0/2.0, SSL, Telnet, PPPoE, OpenVPN

File System: JFFS2, NFS, Ext2, Ext3, VFAT/FAT

System Utilities: bash, tinylogin, telnet, ftp, smtpclient, scp

telnetd: telnet server daemon

sshd: secure shell server

Apache: web server daemon

openvpn: virtual private network

pppd: dial in/out over serial port daeon

snmpd: snmpd agent daeon

inetd: TCP server manager program

openssl: open SSL

Linux Tool Chain:
- GCC (V4.2.1): C/C++ PC Cross Compiler
- GDB (V5.3): Source level debug server
- Glibc (V2.2.5): POSIX standard C library

Windows Embedded CE 6.0

System Utilities: Windows command shell, telnet, ftp, web-based administration manager

File System: FAT (on-board flash)

Protocol Stack: TCP, UDP, IPv4, SNMP V2, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSL, DHCP, SNTP, Telnet, FTP, PPP

Telnet Server: Allows remote administration through a standard telnet client.

FTP Server: Used for transferring files to and from remote computer systems over a network.

Web Server (httpd): Includes ASP, ISAPI Secure Socket Layer support, SSL 2, SSL 3, Transport Layer Security (TLS/SSL 3.1) public key-based protocols, and Web Administration ISAPI Extensions.
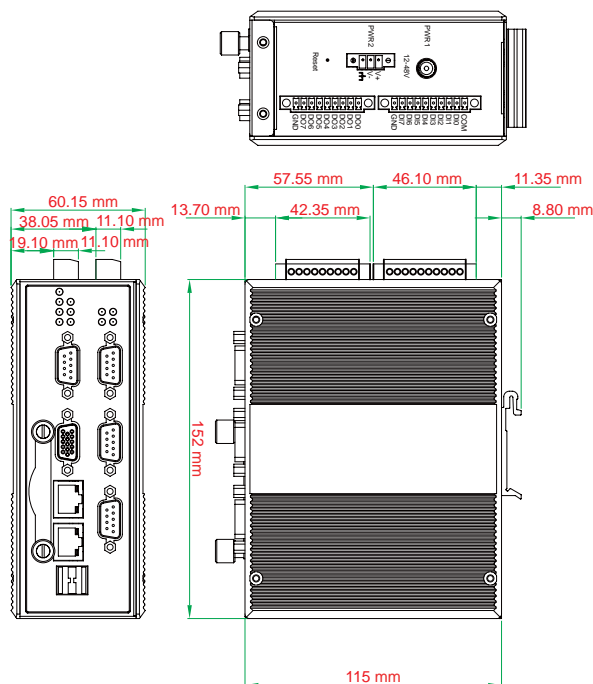
Dial-up Networking Service: RAS client API and PPP, supporting Extensible Authentication Protocol (EAP) and RAS scripting.

Watchdog Server: CPU hardware function for resetting the CPU in a user-specified time interval; activated by a Moxa library function

Application Development Software:
- Moxa WinCE 6.0 SDK
- C Libraries and Run-times
- Component Services (COM and DCOM)
- Microsoft® .NET Compact Framework 2.0 with SP2
- XML, including DOM, XQL, XPATH, XSLT, SAX
- SOAP Toolkit
- Winsock 2.2

Dimensions

: Ordering Information

Available Models

IA261-I-LX: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, Compact-Flash, USB, Linux OS, -10 to 60°C operating temperature

IA261-I-CE: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, Compact-Flash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature

IA262-I-LX: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Linux OS, -10 to 60°C operating temperature

IA262-I-CE: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Win CE 6.0 OS, -10 to 60°C operating temperature

IA261-I-T-LX: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

IA261-I-T-CE: RISC-based embedded computer with 4 serial ports, DIO, dual LANs, VGA, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature

IA262-I-T-LX: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Linux OS, -40 to 75°C operating temperature

IA262-I-T-CE: RISC-based embedded computer with 2 serial ports, DIO, dual LANs, VGA, CANbus, CompactFlash, USB, Win CE 6.0 OS, -40 to 75°C operating temperature

Package Checklist

- IA261-I or IA262-I computer
- Wall mounting kit
- DIN-Rail mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
- CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
- Universal Power Adaptor
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

IA240/241 Series

RISC-based industrial computers with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD

-40°C 75°C

TAIWAN
EXCELLENCE
2006

> MOXA ART 32-bit ARM9 industrial processor
> 64 MB RAM, 16 MB flash onboard
> 4 RS-232/422/485 serial ports
> 4 digital input and 4 digital output channels (TTL signal)
> Dual 10/100 Mbps Ethernet for network redundancy
> PCMCIA slot for wireless expansion (802.11b/g, GPRS/UMTS/HSDPA)
> SD socket for storage expansion
> Ready-to-run Linux Kernel 2.6 platform
> Unique patented Software Encryption Lock
> Installation options: DIN-rail, wallmount (with accessory)
> Robust, fanless design, IP30 protection mechanism
> -40 to 75°C wide temperature models available

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

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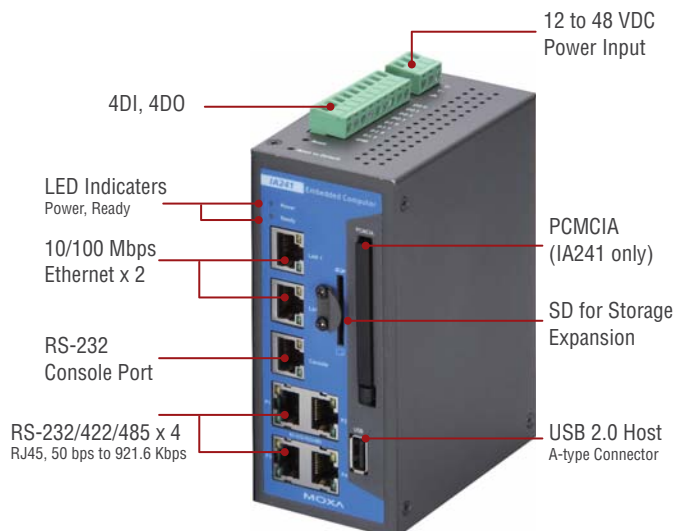Embedded Computers for Automation ▶ IA240/241 Series

⋮ Overview

The IA240/241 embedded computers are designed for industrial automation applications. The computers feature 4 RS-232/422/485 serial ports, dual LANs, 4 digital input channels, 4 digital output channels, and a PCMCIA cardbus and SD socket in a compact, IP30 protected, industrial-strength rugged housing.

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

Wide temperature models of the IA240/241 are also available. The IA240-T and IA241-T can operate reliably in a temperature range from -40 to 75°C, making them appropriate for harsh industrial automation environments.

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

⋮ Appearance

12 to 48 VDC
Power Input

4DI, 4DO

LED Indicaters
Power, Ready

10/100 Mbps
Ethernet x 2

RS-232
Console Port

RS-232/422/485 x 4
RJ45, 50 bps to 921.6 Kbps

PCMCIA
(IA241 only)

SD for Storage
Expansion

USB 2.0 Host
A-type Connector

: Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz

OS (pre-installed): Embedded Linux

DRAM: 64 MB onboard (128 MB for IA241 ODM)

Flash: 16 MB onboard (32 MB for IA241 ODM)

PCMCIA: Cardbus card and 16-bit PCMCIA 2.1, JEIDA 4.2 card (IA241 only)

USB: USB 2.0 host

Storage

Storage Expansion: SD slot

Ethernet Interface

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

Magnetic Isolation Protection: 1.5 KV built-in

Serial Interface

Serial Standards: 4 RS-232/422/485 ports, software-selectable (8-pin RJ45)

ESD Protection: 15 KV for all signals

Console Port: RS-232, RJ45 connector, supports PPP

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

Digital Input

Input Channels: 4

Input Voltage:
Logic 0: 0-0.8 V
Logic 1: 2.0-5.5 V

Over-current Limit: -24 mA

Digital Output

Output Channels: 4

Output Current: 24 mA

Output Voltage:
Logic 0: 0-0.55 V
Logic 1: 2.5-3.3 V

LEDs

System: Power, Ready, Storage

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

Serial: TxD x 4, RxD x 4 (on connector)

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum (1 mm)

Weight:
IA240: 430 g
IA241: 500 g

Dimensions: 60 x 137 x 100 mm (2.36 x 5.39 x 3.94 in)

Mounting: DIN-Rail, wall

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Operating Humidity: 5 to 95% RH

Storage Temperature:
Standard Models: -20 to 80°C (-4 to 176°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption: 7 W
• 300 mA @ 24 VDC
• 600 mA @ 12 VDC

Regulatory Approvals

EMC: CE (EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024), FCC (Part 15 Subpart B, CISPR 22 Class A)

Safety: UL/cUL (UL60950-1, CSA C22.2 No. 60950-1-03), TÜV (EN60950-1)

Reliability

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

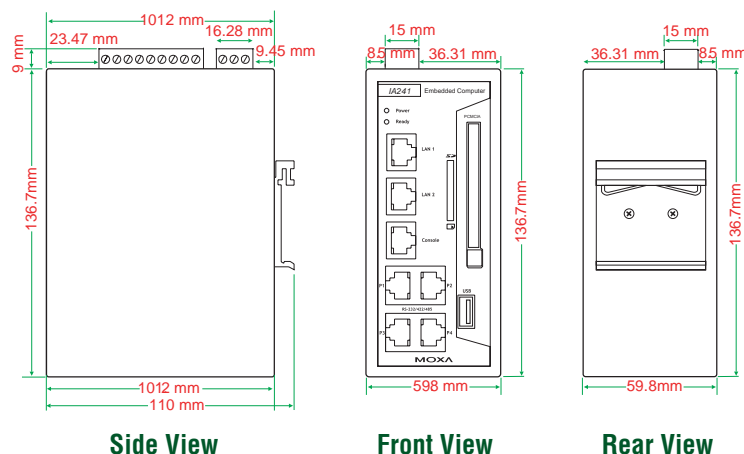**Automatic Reboot Trigger:** Built-in WDT (watchdog timer)

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 adaptor and cables.
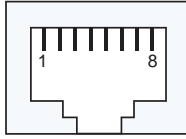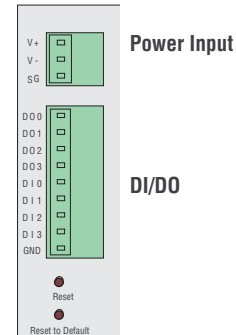
Dimensions

Side View   **Front View**   **Rear View**

Pin Assignment

**Serial Port,
RJ45 Connector**

PIN	RS-232	RS-422	RS-485
1	DSR	---	---
2	RTS	TxD+	---
3	GND	GND	GND
4	TxD	TxD-	---
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	---	---
8	DTR	---	---

Terminal Block on Top

Power Input

DI/DO

Software Specifications

Linux

Kernel Version: 2.6.9

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/ 2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Software:
• Moxa Linux API Library for device control
• Linux Tool Chain: Gcc, Glibc, GDB

Software Encryption Lock:
BINEncryptor: Encryption tool for binary files (based on patented Moxa technology)

Ordering Information

Available Models

IA240-LX: RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, SD, Linux OS, -10 to 60°C operating temperature

IA241-LX: RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD, Linux OS, -10 to 60°C operating temperature

IA240-T-LX: RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, SD, Linux OS, -40 to 75°C operating temperature

IA241-T-LX: RISC-based industrial computer with 4 serial ports, 4 DI and 4 DO channels, dual LANs, PCMCIA, SD, Linux OS, -40 to 75°C operating temperature

Package Checklist

• IA240 or IA241 computer
• Wall mounting kit
• Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
• CBL-RJ45F9-150: 8-pin RJ45 to DB9 female console port cable, 150 cm
• CBL-RJ45M9-150: 8-pin RJ45 to DB9 male serial port cable, 150 cm
• Universal power adaptor (including terminal block to power jack converter) Document and Software CD
• Quick Installation Guide (printed)
• Warranty Card

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Embedded Computers for Automation › IA240/241 Series

Wireless Embedded Computers

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Wireless Embedded Computers

RISC-based WLAN Computers

	W311-LX	W321-LX	W341-LX
Computer			
CPU Speed	192 MHz	192 MHz	192 MHz
OS (pre-installed)	Embedded Linux with MMU support		
DRAM	32 MB	32 MB	64 MB
Flash	16 MB	16 MB	16 MB
USB Ports	---	---	2 (USB 2.0)
Relay Output	---	---	√
Storage			
SD Slot	√	√	√
LAN Interface			
10/100 Mbps Ethernet Ports	1	1	1
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV
100BaseFX Fiber Ports (multi-mode)	---	---	---
WLAN Interface			
Standard Compliance	802.11a/b/g		
Radio Frequency Type	DSSS, CCK, OFDM		
Transmission Rate	54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps) • 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11b: 1, 2, 5.5, 11 Mbps		
Transmission Distance	Up to 100 meters (@ 11 Mbps in open areas)		
Wireless Security	WEP: 64-bit/128-bit, WPA, WPA2 data encryption		
WLAN Modes	Ad-hoc (802.11b/g), Infrastructure		
Serial Interface			
RS-232/422/485 Ports	1 (DB9-M)	2 (DB9-M)	4 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV
Console Port	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		
Flow Control	RTS/CTS, XON/XOFF, ADDC™		
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)		
LEDs			
System	Ready, SD	Ready, SD	Ready, SD
LAN	10M, 100M	10M, 100M	10M, 100M
WLAN	Enable, Signal Strength		
Serial	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics			
Housing	Aluminum (1 mm)		
Weight	170 g	185 g	390 g
Dimensions	77 x 111 x 26 mm	77 x 111 x 26 mm	150 x 100 x 38 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Environmental Limits			
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C
Anti Vibration/Shock	5g/50g	5g/50g	5g/50g
Regulatory Approvals			
EMC	CE (ETSI EN 301 489-1/-17, ETSI EN 301 893, ETSI EN 300 328, EN50392), FCC Part 15C & Part 15E		
Safety	UL/cUL (UL60950-1), TÜV (EN60950-1)		
Green Product	RoHS, CRoHS, WEEE		
Reliability			
Buzzer, RTC, WDT	√	√	√
Warranty	5 years (see www.moxa.com/warranty)		

Cellular Computers

	W315-LX	W325-LX	W345-LX
Computer			
CPU Speed	192 MHz	192 MHz	192 MHz
OS (pre-installed)	Embedded Linux with MMU support		
DRAM	32 MB	32 MB	64 MB
Flash	16 MB	16 MB	16 MB
USB Ports	---	---	2 (USB 2.0)
Relay Output	---	---	√
Storage			
SD Slot	√	√	√
LAN Interface			
10/100 Mbps Ethernet Ports	1	1	1
Magnetic Isolation Protection	1.5 KV	1.5 KV	1.5 KV
100BaseFX Fiber Ports (multi-mode)	---	---	---
Cellular Interface			
Cellular Modes	GSM, GPRS		
Radio Frequency Bands	850/900/1800/1900 MHz		
GPRS Class	10		
Coding Schemes	CS1 to CS4		
Serial Interface			
RS-232/422/485 Ports	1 (DB9-M)	2 (DB9-M)	4 (DB9-M)
ESD Protection	15 KV	15 KV	15 KV
Console Port	√	√	√
Serial Communication Parameters	Data Bits: 5, 6, 7, 8; Stop Bits: 1, 1.5, 2; Parity: None, Even, Odd, Space, Mark		
Flow Control	RTS/CTS, XON/XOFF, ADDC™		
Baudrate	50 bps to 921.6 Kbps (non-standard baudrates supported)		
LEDs			
System	Ready, SD	Ready, SD	Ready, SD
LAN	10M, 100M	10M, 100M	10M, 100M
Cellular	GPRS Enabled, GSM Signal Strength		
Serial	TxD, RxD	TxD, RxD	TxD, RxD
Physical Characteristics			
Housing	Aluminum (1 mm)		
Weight	195 g	195 g	400 g
Dimensions	77 x 111 x 26 mm	77 x 111 x 26 mm	150 x 100 x 38 mm
Mounting	DIN-Rail, wall	DIN-Rail, wall	DIN-Rail, wall
Antenna Length	110 mm	110 mm	110 mm
Environmental Limits			
Operating Temperature	-10 to 60°C	-10 to 60°C	-10 to 60°C
Operating Humidity	5 to 95% RH	5 to 95% RH	5 to 95% RH
Storage Temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C
Anti Vibration/Shock	5g/50g	5g/50g	5g/50g
Regulatory Approvals			
EMC	FCC: Part 15, Part 24/24		
CE	EN55022, EN61000		
R&TTE	EN301 489-1, EN301 489-7, EN301 511		
Safety	LVD: EN60950-1 UL/cUL: UL60950-1, CSA C22.2 No. 60950-1-03		
Green Product	GCF-CC, RoHS, CRoHS, WEEE		
Reliability			
Buzzer, RTC, WDT	√	√	√
Warranty	5 years (see www.moxa.com/warranty)		

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Wireless Embedded Computers › Product Selection Guide

W311/321/341

RISC-based embedded Linux computers with WLAN, LAN, and 1, 2, or 4 serial ports

W341

W321

W311

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

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

: Overview

The W311/321/341 embedded Linux computers feature 1, 2, or 4 software selectable RS-232/422/485 ports, and support the IEEE 802.1a/b/g standards for WLAN connections. In addition, the computers have 1 Ethernet port, and some models come with USB 2.0 hosts and an SD socket for storage expansion. The W311/321/341
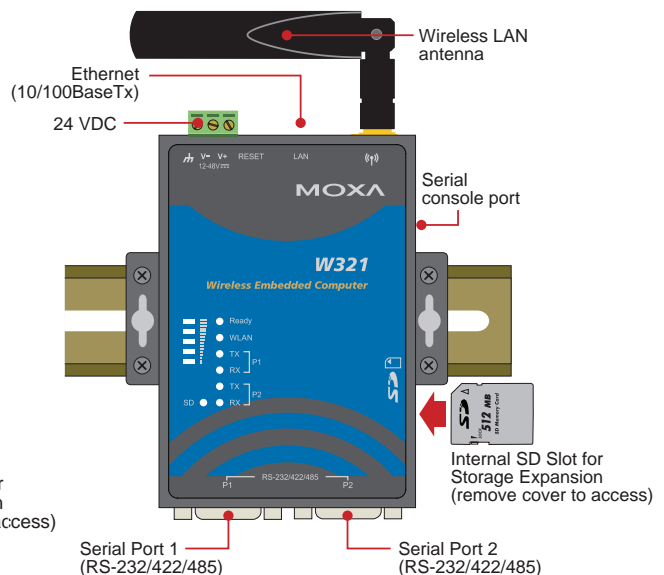
computers' Linux OS runs on the MOXA ART 32-bit ARM9 processor that provides a powerful and reliable platform for harsh, industrial environments. You will find these computers ideal for a variety of machine-to-machine applications, including data acquisition, protocol conversion, and remote device control and monitoring.
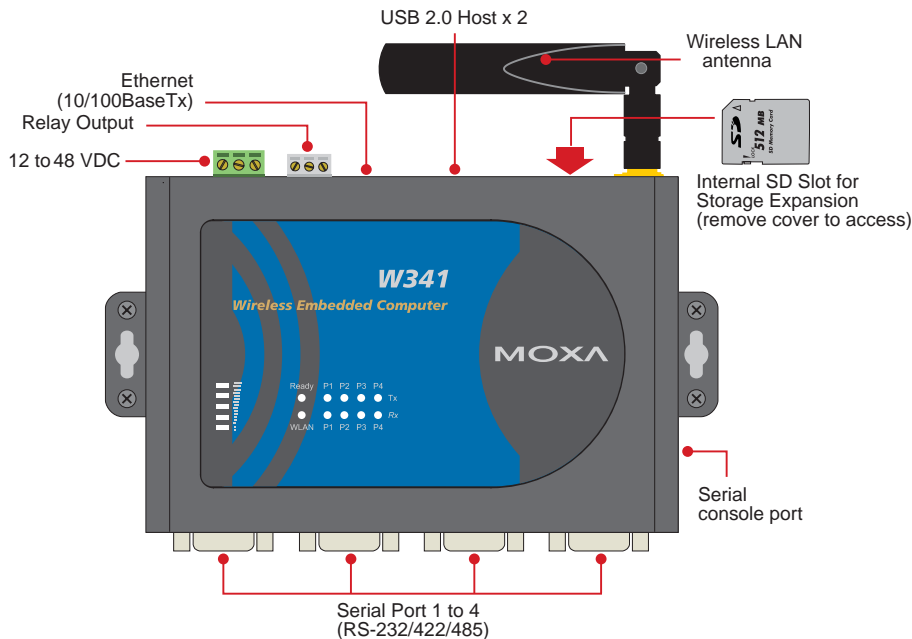
: Appearance

W311

Wireless LAN antenna
Ethernet (10/100BaseTx)
24 VDC
Serial console port
Internal SD Slot for Storage Expansion (remove cover to access)
Serial Port (RS-232/422/485)

W321

Wireless LAN antenna
Ethernet (10/100BaseTx)
24 VDC
Serial console port
Internal SD Slot for Storage Expansion (remove cover to access)
Serial Port 1 (RS-232/422/485)
Serial Port 2 (RS-232/422/485)

W341

USB 2.0 Host x 2

Wireless LAN antenna

Ethernet (10/100BaseTx)

Relay Output

12 to 48 VDC

W341
Wireless Embedded Computer

MOXA

Ready P1 P2 P3 P4
Tx
WLAN P1 P2 P3 P4
Rx

Internal SD Slot for Storage Expansion (remove cover to access)

Serial console port

Serial Port 1 to 4 (RS-232/422/485)

: Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit 192 MHz

OS (pre-installed): Embedded Linux with MMU support

DRAM:
W311/321: 32 MB
W341: 64 MB

Flash: 16 MB

USB: (W341 only) USB 2.0 compliant hosts x 2, type A connector, supports system boot up

Relay Output: (W341 only)
• Form C, SPDT x 1
• Normal Switching Capacity: 2 A @ 30 VDC
• Switching Power: 60 W max.
• Switching Voltage: 220 VDC max.
• Switching Current: 2 A max.
• Operating Time: 4 ms @ 20°C
• Initial Contact Resistance: 100 milli-ohm max.

Storage Expansion: SD slot

Ethernet Interface

LAN: 1 auto-sensing 10/100 Mbps port (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

WLAN Interface

Standard Compliance: 802.11a/b/g

Radio Frequency Type: DSSS, CCK, OFDM

Media Access Protocol: CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance)

Tx Power (typical):
• 5.15-5.35 GHz: 14 dBm @ 6 Mbps, 14 dBm @ 54 Mbps
• 5.725-5.825 GHz: 14 dBm @ 6 Mbps, 13 dBm @ 54 Mbps
• 2.412-2.483 GHz (802.11g): 17 dBm @ 6 Mbps, 15 dBm @ 54 Mbps
• 2.412-2.472 GHz (802.11b): 18 dBm @ 1-11 Mbps

Rx Sensitivity (typical):
• 5.15-5.35 GHz: 6 Mbps @ -82 dBm, 54 Mbps @ -67 dBm
• 5.47-5.725 GHz: 6 Mbps @ -82 dBm, 54 Mbps @ -67 dBm
• 5.725-5.825 GHz: 6 Mbps @ -80 dBm, 54 Mbps @ -69 dBm
• 2.412-2.472 GHz (802.11g): 6 Mbps @ -84 dBm, 54 Mbps @ -69 dBm
• 2.412-2.472 GHz (802.11b): 11 Mbps @ -82 dBm, 1 Mbps @-90 dBm

Transmission Rate: 54 Mbps (max.) with auto fallback (54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps)
• 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
• 802.11b: 1, 2, 5.5, 11 Mbps

Transmission Distance: Up to 100 meters (@ 11 Mbps in open areas)

Antenna Connector: Reverse SMA

Antenna: External 2 dbi dipole antenna

Wireless Security: WEP: 64-bit/128-bit, WPA, WPA2 data encryption

WLAN Modes: Ad-hoc (802.11b/g), Infrastructure

Serial Interface

Serial Standards: 1, 2, or 4 RS-232/422/485 ports, software-selectable (DB9 male)

EDS Protection: 15 KV ESD protection for all signals

Console Port: RS-232 interface (TxD, RxD, GND), with 4-pin pin header output

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC™ (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System: Ready, SD

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

WLAN: Enable, Signal Strength

Serial: TxD, RxD

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum (1 mm)

Weight:
W311: 170 g
W321: 185 g
W341: 390 g

Dimensions: (without ears or antenna)
W311/W321: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
W341: 150 x 100 x 38 mm (5.91 x 3.94 x 1.50 in)

Mounting: DIN-rail (requires optional DK-35A DIN-rail kit), wall

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

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

Anti-Vibration: 5g @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis

Anti-Shock: 50g @ IEC-68-2-6, half-sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
W311/321: 4.8 W
• 400 mA @ 24 VDC
• 400 mA @ 12 VDC
W341:
With no load on USB ports: 7.2 W
• 300 mA @ 24 VDC
• 600 mA @ 12 VDC
With full load on USB ports: 14.4 W
• 600 mA @ 24 VDC
• 1200 mA @ 12 VDC

Regulatory Approvals

EMC: CE (ETSI EN 301 489-1/-17, ETSI EN 301 893, ETSI EN 300 328, EN50392), FCC Part 15C & Part 15E

Safety: UL/cUL (UL60950-1), T V (EN60950-1)

Green Product: RoHS, CRoHS, WEEE

Reliability

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

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

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

: Software Specifications

Linux

Kernel Version: 2.6.9

Boot Loader: Redboot

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/ 2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Environment:
• MOXA Linux API Library
• Linux Tool Chain: Gcc, Glibc, GDB
• BINEncryptor: Encryption tool for binary files, based on "Moxa Intellectual Protection Technology" (Patented)
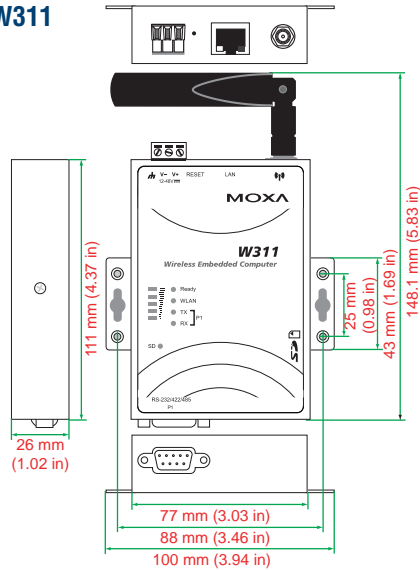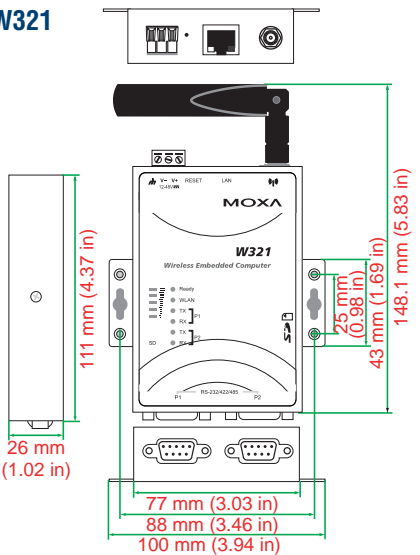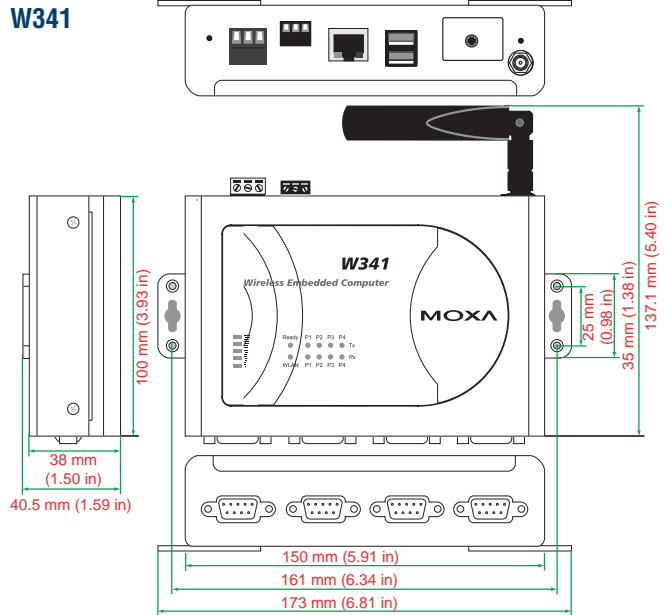
Device Drivers:
• W311/W321: UART, RTC, Buzzer, SD Card
• W341: UART, RTC, Buzzer, SD Card, USB (supports USB flash disk), Watchdog Timer, DO
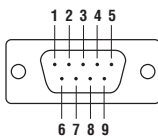
Software Encryption Lock:
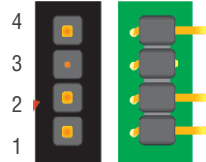BINEncryptor: Encryption tool for binary files (based on patented Moxa technology)

Dimensions

W311

W341

W321

Pin Assignment Male DB9

PIN	RS-232	RS-422/485-4w	RS-485-2w
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Serial Console port

PIN	
1	TxD
2	RxD
3	NC
4	GND

: Ordering Information

Available Models

W311-LX: Mini RISC-based wireless Linux computer with WLAN, 1 serial port, LAN, and SD

W321-LX: Mini RISC-based wireless Linux computer with WLAN, 2 serial ports, LAN, and SD

W341-LX: RISC-based wireless Linux computer with WLAN, 4 serial ports, LAN, SD, USB, and relay output

Package Checklist

- W311 or W321 or W341 computer
- Wall mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including terminal block to power jack converter)
- WLAN Antenna
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

W315/325/345

RISC-based embedded computers with GSM/GPRS, LAN, and 1, 2, or 4 serial ports

> **MOXA ART ARM9 32-bit 192 MHz processor**
> **32 or 64 MB RAM, and 16 MB flash disk onboard**
> **Built-in quad band GSM/GPRS 850/900/1800/1900 MHz**
> **GPRS Class 10, coding scheme from CS1 to CS4 supported**
> **1, 2, or 4 software-selectable RS-232/422/485 serial ports**
> **10/100 Mbps Ethernet for network redundancy**
> **Designed to withstand 5 g's of continuous vibration and 50-g shocks**
> **Relay Output for external alarm connection (W345 only)**
> **SD slot for storage expansion**
> **Ready-to-run Linux Kernel 2.6 platform**
> **DIN-rail or wall-mount installation**
> **Robust, fanless design**

W345

W325

W315

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.
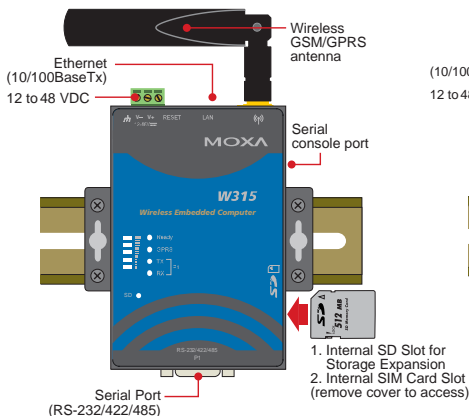
Overview

The W315/325/345 are embedded Linux computers that feature 1, 2, or 4 software selectable RS-232/422/485 ports, 1 Ethernet port, and quad-band GSM/GPRS 900/1800/850/1900 MHz for cellular communication. In addition, the W345 has 2 USB 2.0 hosts and 1 relay output, and the W325 and W345 come with an SD socket for external storage expansion. The W315/325/345 computers' Linux OS runs on
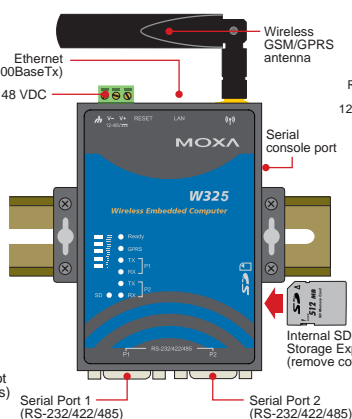
the MOXA ART 32-bit ARM9 processor, which provides a powerful and reliable platform for harsh, industrial environments. You will find these computers ideal for a variety of machine-to-machine applications, including data acquisition, protocol conversion, and remote device control and monitoring.
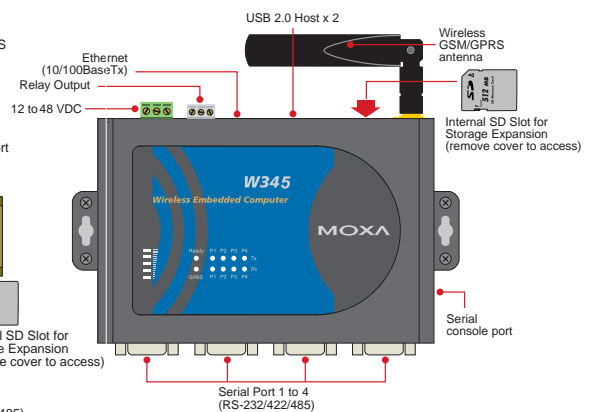
Appearance

W315

Wireless GSM/GPRS antenna
Ethernet (10/100BaseTx)
12 to 48 VDC
Serial console port
W315
Wireless Embedded Computer
1. Internal SD Slot for Storage Expansion
2. Internal SIM Card Slot (remove cover to access)
Serial Port (RS-232/422/485)

W325

Wireless GSM/GPRS antenna
Ethernet (10/100BaseTx)
12 to 48 VDC
Serial console port
W325
Wireless Embedded Computer
Internal SD Slot for Storage Expansion (remove cover to access)
Serial Port 1 (RS-232/422/485)
Serial Port 2 (RS-232/422/485)

W345

USB 2.0 Host x 2
Wireless GSM/GPRS antenna
Ethernet (10/100BaseTx)
Relay Output
12 to 48 VDC
Internal SD Slot for Storage Expansion (remove cover to access)
W345
Wireless Embedded Computer
Serial console port
Serial Port 1 to 4 (RS-232/422/485)

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Wireless Embedded Computers > W315/325/345

: Hardware Specifications

Computer

CPU: MOXA ART ARM9 32-bit RISC CPU, 192 MHz

OS (pre-installed): Embedded Linux with MMU support

DRAM:
W315/325: 32 MB
W345: 64 MB

Flash: 16 MB

USB: (W345 only) USB 2.0 compliant hosts x 2, type A connector, supports system boot up

Relay Output: (W345 only)
• Form C, SPDT x 1
• Normal Switching Capacity: 2A @30 VDC
• Switching Power: 60 W max.
• Switching Voltage: 220 VDC max.
• Switching Current: 2 A max.
• Operating Time: 4 ms @ 20°C
• Initial Contact Resistance: 100 milli-ohm max.

Storage Expansion: SD slot

Ethernet Interface

LAN: 1 auto-sensing 10/100 Mbps port (RJ45)

Magnetic Isolation Protection: 1.5 KV built-in

Cellular Interface

Cellular Modes: GSM, GPRS

Radio Frequency Bands: 850/900/1800/1900 MHz

GPRS Class: 10

Coding Schemes: CS1 to CS4

Serial Interface

Serial Standards: 1, 2, or 4 RS-232/422/485 ports, software-selectable (DB9 male)

EDS Protection: 15 KV ESD protection for all signals

Console Port: RS-232 interface (TxD, RxD, GND), with 4-pin pin header output

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC™ (automatic data direction control) for RS-485

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

Serial Signals

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

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

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

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

LEDs

System:
W315: Ready
W325: Ready, SD
W345: Ready, SD

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

Cellular: GPRS Enabled, GSM Signal Strength

Serial: TxD, RxD

Switches and Buttons

Reset Button: Supports "Reset to Factory Default"

Physical Characteristics

Housing: Aluminum (1 mm)

Weight:
W315/325: 195 g
W345: 400 g

Dimensions: (without ears or antenna)
W315: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
W325: 77 x 111 x 26 mm (3.03 x 4.37 x 1.02 in)
W345: 150 x 100 x 38 mm (5.91 x 3.94 x 1.50 in)

Mounting: DIN-rail (requires optional DK-35A DIN-rail kit), wall

Antenna Length: 110 mm

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Operating Humidity: 5 to 95% RH

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

Anti-Vibration: 5g @ IEC-68-2-6, sine wave, 5-500 Hz, 1 Oct./min, 1 hr/axis

Anti-Shock: 50g @ IEC-68-2-6, half-sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 48 VDC

Power Consumption:
W315/325: 4.8 W
• 400 mA @ 24 VDC
• 400 mA @ 12 VDC
W345:
With no load on USB ports: 7.2 W
• 300 mA @ 24 VDC
• 600 mA @ 12 VDC
With full load on USB ports: 14.4 W
• 600 mA @ 24 VDC
• 1200 mA @ 12 VDC

Regulatory Approvals

EMC: FCC: Part 15, Part 24/24

CE: EN55022, EN61000

R&TTE: EN301 489-1, EN301 489-7, EN301 511

Safety: LVD: EN60950-1

UL/cUL: UL60950-1, CSA C22.2 No. 60950-1-03

Green Product: RoHS, CRoHS, WEEE

Reliability

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

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

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

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Wireless Embedded Computers > *W315/325/345*

: Software Specifications

Linux

Kernel Version: 2.6.9

Boot Loader: Redboot

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, IGMP, ARP, HTTP, CHAP, PAP, SSH 1.0/ 2.0, SSL, DHCP, NTP, NFS, SMTP, Telnet, FTP, PPP, PPPoE

File System: JFFS2 (on-board flash)

System Utilities: bash, busybox, tinylogin, telnet, ftp, scp

telnetd: Telnet Server daemon

ftpd: FTP server daemon

sshd: Secure shell server

Apache: Web server daemon, supporting PHP and XML

openvpn: Virtual private network service manager

iptables: Firewall service manager

pppd: dial in/out over serial port daemon & PPPoE

snmpd: snmpd agent daemon

inetd: TCP server manager program

Application Development Environment:
• MOXA Linux API Library
• Linux Tool Chain: Gcc, Glibc, GDB
• BINEncryptor: Encryption tool for binary files, based on "Moxa Intellectual Protection Technology" (Patented)

Device Drivers:
W311: UART, RTC, Buzzer, SD Card
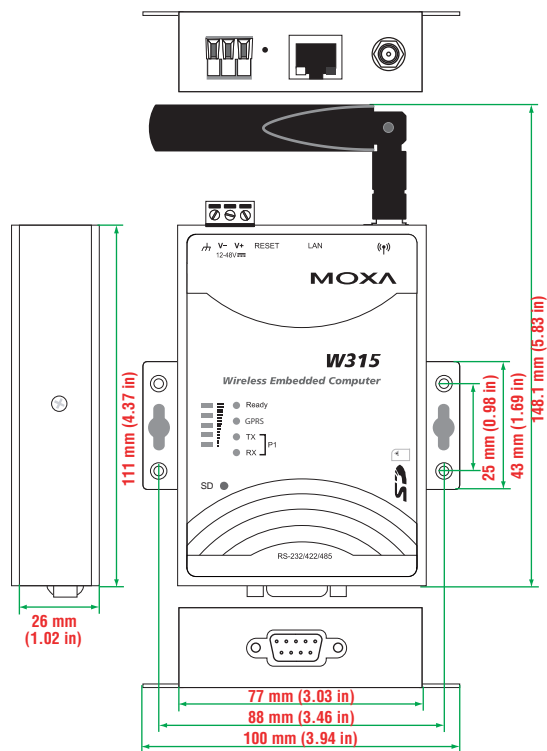W321: UART, RTC, Buzzer, SD Card
W341: UART, RTC, Buzzer, SD Card, USB (supports USB flash disk), DO
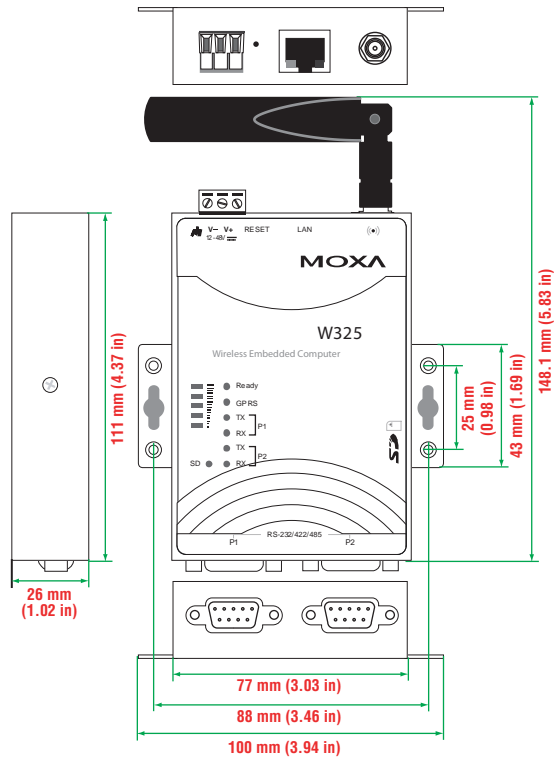
Software Encryption Lock:
BINEncryptor: Encryption tool for binary files (based on patented Moxa technology)
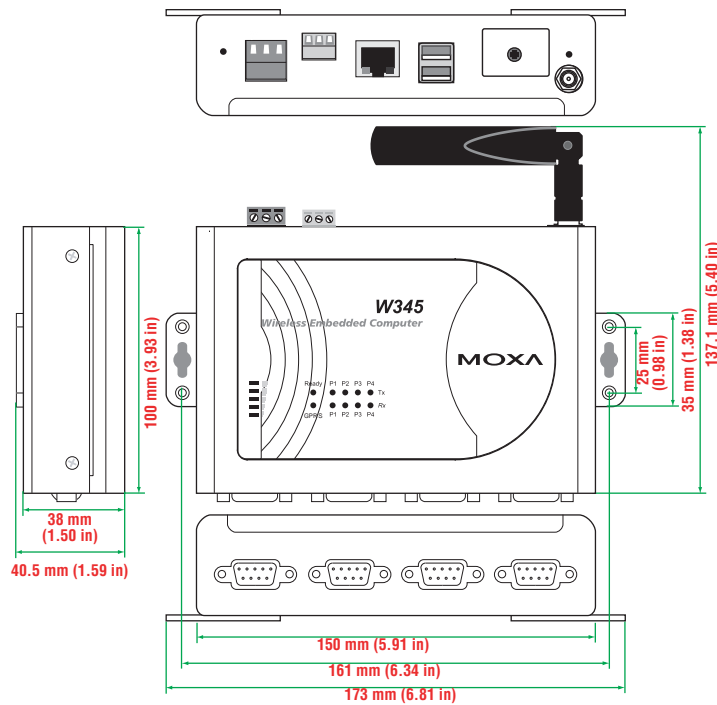
Dimensions

W315

W325

W345

100 mm (3.93 in)

137.1 mm (5.40 in)

35 mm (1.38 in)

25 mm (0.98 in)

38 mm (1.50 in)

40.5 mm (1.59 in)

150 mm (5.91 in)

161 mm (6.34 in)

173 mm (6.81 in)

: Ordering Information

Available Models

W315-LX: Mini RISC-based wireless Linux computer with GSM/GPRS, 1 serial port, and LAN, and SD

W325-LX: Mini RISC-based wireless Linux computer with GSM/GPRS, 2 serial ports, LAN, and SD

W345-LX: RISC-based wireless Linux computer with GSM/GPRS, 4 serial ports, LAN, SD, USB, and relay output

Package Checklist

- W315 or W325 or W345 computer
- Wall mounting kit
- Ethernet cable: RJ45 to RJ45 cross-over cable, 100 cm
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Universal power adaptor (including terminal block to power jack converter)
- GSM/GPRS Antenna
- Document and Software CD
- Quick Installation Guide (printed)
- Warranty Card

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Wireless Embedded Computers > W315/325/345