Moxa enters every facet of your life

7:00 a.m.
Drive to work.

8:00 a.m.
Stop for gas.

8:30 a.m.
Wait for the traffic light to change.

9:00 a.m.
Arrive at the office. Use ID card to sign in.

12:00 p.m.
Buy lunch at a fast food restaurant.

3:00 p.m.
Pick up customers at the airport.

5:00 p.m.
Withdraw money from the ATM.

7:00 p.m.
Park in an automated parking lot while shopping.

Why Use Multiport Serial Boards?

Multiport serial boards are installed in the slots inside a PC. Slots are available for ISA, PCI, PCI-X, and PC/104 busses, with each board providing one or more serial ports. Today, multiport serial boards are commonly used for controlling external devices for different applications, including industrial automation, building automation, CNC machines, and more. They can also connect to computer servers for the purpose of monitoring and controlling the server from a remote location. The boards were once used mainly to connect many terminals and/or modems to serial ports.

Multiport boards use different types of external connectors, including DB9, DB25, and RJ45, to connect devices (modems, terminals, etc.) to a computer. Each physical device is connected to its own serial port, and since the space on the external part of the board is limited, there is often not enough room to fit all of the serial port connectors on the board. To solve this problem, the connectors are often on the ends of "octopus" cables that connect to the board. Another option is to use an external box (which could be rack mountable) that is connected by a cable to the multiport serial board.

What Benefits Should Multiport Boards Provide?

Flexibility. Most multiport serial board vendors allow users to begin with a small-range system with 8 ports, and then expand up to 128 ports, depending on business growth. In addition, users have different options for control boards (PCI or ISA), connection modules (rackmount or desktop), and COM port interface (RS-232 or RS-422). Any combination of these options can be used in one system.

Speed. Many board vendors develop their own proprietary chip that is integrated with a dedicated processor, enabling the board to transmit-and-receive data at up to 921 Kbps full duplex across all ports simultaneously. This is two to four times faster than the speed available using standard UART technology.

Reliability. Along with providing a fast throughput speed and reduced load on the host system CPU, the multiport serial board vendor should also produce boards that are reliable. By designing boards with a long MTBF (Mean Time Before Failure), users can be assured that the multiport serial board will provide many years of uninterrupted service.

Efficiency. Many multiport serial boards use 128-byte FIFOs, which is larger than the standard 16550 UART. Experience has shown that 128 bytes is enough to keep data from getting backed up at the serial controller level, while still conserving CPU resources.

Moxa's MSB Benefits

- You get true flexibility, with the best choice of bus platform, connector type, COM port interface, and connection module.
- Choose from various bus interfaces: ISA, PC/104, PCI, PCI-X, and PCI Express.
- Highest performance that meets all speed-demanding and data intensive communication applications.
- Choose from a variety of connection cables and boxes for RS-232/422/485.
- Drivers for many different operating systems: DOS, Windows, Linux, UNIX
- 128-byte FIFO and on-chip H/W, S/W flow control

Extreme Serial Performance Technology

The new Moxa Turbo Serial Engine™ is a specially designed semiconductor chip that makes Moxa's second generation of Smart Multiport Serial Boards the top performing boards in their class.

The stamp-sized MU860 Turbo Serial Engine™, which draws on Moxa's 18-plus years of experience in serial board design, combines a high-performance UART with Burst Data Mode, on-chip hardware/software flow control and PCI bridge, and on-chip ADDC™ for RS-485 communication. These special features push serial communication throughput to over 700 Kbps per port, making MU860 the most powerful UART chip in the world.

The MU860 Turbo Serial Engine™ makes Moxa's second generation of Smart Multiport Serial Boards into top performing, cost-effective products. Turbo Serial Engine™ will play an important role in providing customers around the world with high-performance, high-value serial communications solutions.

Features

- 8-port UART with 128-byte FIFO and Burst Data Mode
- On-chip hardware, software flow control and ADDC™ (Automatic Data Direction Control)
- 3.3V/5V PCI Ver. 2.2 controller
- On-chip RS-422, 2-wire RS-485, 4-wire RS-485 control circuit

RS-485 ADDC™ (Automatic Data Direction Control) Design

What Is Direction Control?

RS-485 is often used to create a simple network that includes two or more nodes. If more than 2 nodes transmit at the same time, data from different transmissions could collide. For this reason, RS-485 devices need to control the direction that data is transmitted.

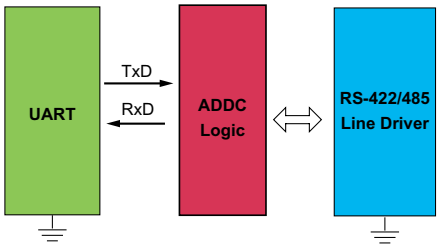
Data Direction Control Methods

	By RTS	Moxa's ADDC	Other Companies' Auto Solutions
Technology	Software (Control the RTS to switch direction)	Hardware (Auto)	Hardware (Auto)
System Complexity*	Low	Low	High
Reaction time**	Slow	Fast	Fast
Board application	Yes	Yes	Yes
Works with Converter	Yes	Yes	No

* System complexity refers to the components that make up the product board.
** The time interval that the RS-485 device needs to switch on or off to transmit data. A longer time markes data collisions more likely. A shorter time markes data collisions less likely.

Limitations:
*The system must determine when to switch the transmitter on and off.
*Only one node can switch on/off at any given time.

Traditional Solution:
Use the RTS signal to control the transmitter by software.



Advanced Method:
ADDC™ (Automatic Data Direction Control).

Benefit:
ADDC™ switches the transmitter on and off very precisely by hardware, effectively simplifying the complexity of timing control by software.

Result:
The Industrial Multiport Communication Board uses embedded ADDC™ technology to sense and control data direction automatically instead of using RTS/CTS control, making the handshaking signal method obsolete.

PComm Utility

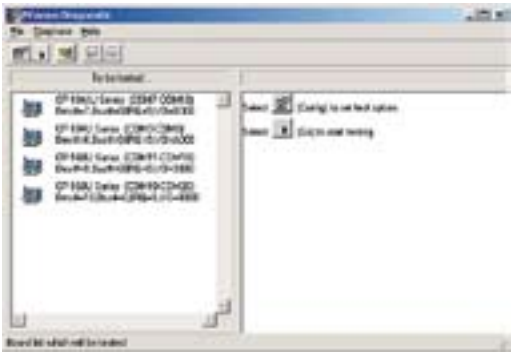
Moxa PComm Utility, a professional serial comm developing tool for PCs, is a software package that runs under Windows 2000/XP/2003, Windows NT, and Windows 95/98/ME. It includes a powerful serial communication library for easy programming in most popular languages, useful utilities (such as Diagnostic, Monitor, Terminal Emulator, Data Scope, and Performance Analyzer), and illustrative example programs and comprehensive online documentation.

Use the serial communication library to develop a system for data communication, remote access, data acquisition, or industrial control in Windows 2000/XP/2003, Windows NT, and Windows 95/98/ME environments. PComm offers an easier solution compared to the more complex Windows Win32 COMM API.

Utilities

Five useful utilities are available to help you debug and troubleshoot serial communication problems quickly: PComm Diagnostic, PComm Monitor, and Terminal Emulator are available on the Multiport Serial Board CD-ROM, and Data Scope and Performance Analyzer can be downloaded from Moxa's website. Each utility is introduced below.

PComm Diagnostic
Diagnostic is a utility that provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, DTR/DCD, etc. This utility only works with MOXA boards.



PComm Monitor
PComm Monitor provides a port monitoring function for MOXA boards and ports.

Terminal Emulator

Terminal Emulator features multi-windows and supports VT100/ANSI and Dumb terminal types. Transfer data interactively, send patterns periodically, and transfer files using ZModem, YModem, XModem, Kermit, or ASCII protocols.

File transfer

Multi-windows

Data Scope

The Data Scope utility provides transparent monitoring of serial communication lines and allows data to be streamed to disk storage for later analysis in either ASCII or HEX mode. Use Data Scope with a portable PC that has two COM ports to create an economical yet powerful data scope instrument.

Performance Analyzer

Performance Analyzer is a utility that can help you analyze a system's serial communication performance on any COM port that you select in advance.

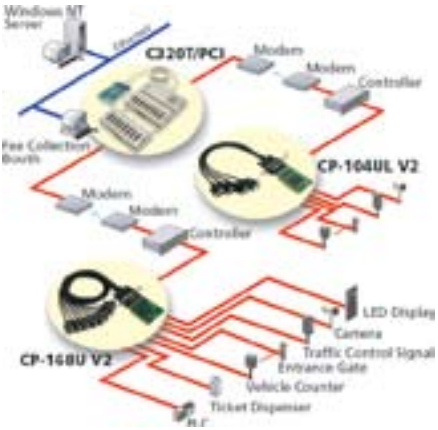
Success Stories

Transportation

The current trend of ITS (Intelligent Transportation System) applications is to use e-Automation control and data processing platforms. Many principalities are installing platforms in highway, freeway, and city transportation systems. These systems handle speed auditing, dynamically displayed LED signboards, and traffic signal control systems.

In recent years, the ITS market has experienced a major upswing worldwide. Freeway tollgates make use of many types of serial equipment, such as speed detectors, searchlights, and cameras. By using Moxa CP-168U V2, CP-104UL V2, and other Moxa multiport serial boards, we can connect all types of serial equipment to an IPC, allowing the host computer at the tollgate to collect information sent from IPCs via modems through Moxa C320T/PCI (max 128 ports). The information can be sent back to the tollgate center for processing and further analysis, resulting in a more powerful, efficient, safer, and automatic freeway transportation system.

Products: CP-104UL V2, CP-168U V2, C320Turbo/PCI
Country: Taiwan
Overall benefits: Reduces installation and operational costs

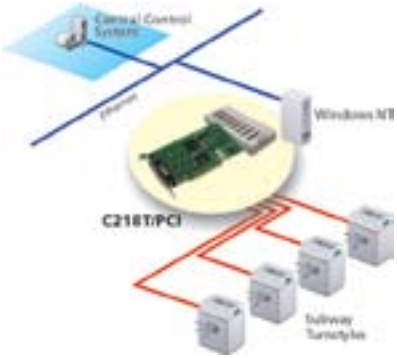


Automatic Subway Ticket Collection

Subways have been one of the main transportation arteries of major cities for many years, and creating automated subways is a key part of keeping this type of mass transportation system running smoothly. In order to cope with the huge volume of passengers, it is essential to automate the traditionally manual operations of ticket vending, collecting, and validation.

The company highlighted in this story uses a UnixWare PC that is installed with MOXA C218Turbo and connection option Opt8K to connect each entrance and exit gate with an RS-485 communication interface. Ticket validation is done automatically when the passenger inserts a ticket into the slot at the gate. The computer, located in the central control room, uses the information stored on the ticket to calculate the distance traveled and corresponding fare in real time, and then instructs the gate to open and let the passenger pass, or remain closed and sound an alarm for assistance.

Products: C218Turbo/PCI
Country: Korea
Overall benefits: Reduces installation and operational costs

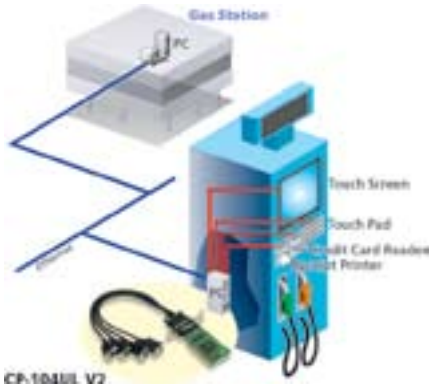


Gas Stations

The 1990's saw a big increase in the number of motorbikes and automobiles in China, leading to the need for more gas stations to provide service and fuel. However, most gas stations in China still use yesterday's management methods, and consequently fall far short of the more stringent demands of today's fast-paced customers.

The key to modernizing gas stations in China is the installation of smart gas pumps. In addition to the usual hose and nozel, modern pumps feature an LED display screen, a touch pad for entering data, a creadit card reader, and a built-in computer. Moxa's multiport serial boards are used to connect the touch pad, LED screen, card reader, and flow-rate sensors to the computer. Customers are happy since they spend less time waiting in line and get better service from the gas station attendants. Petroleum companies are also happy, since using credit cards gives them a straightforward way to keep track of and analyze their customers' buying behavior.

Products: CP-104UL V2, CP-168U V2, C320Turbo/PCI
Country: China
Overall benefits: Improve customer satisfaction



CNC Machine Control System

Conventional Numerical Controllers (NC) use a process defined by instructions typed on cards that are read sequentially by an external card reader. However, the process is not very flexible—when the manufacturing process changes, an entirely new set of cards must be created. The control process can be input from tapes, but since the tape reader is slow, some manual operations are required. This kind of setup is not suitable when multiple NCs operate concurrently.

To create a fully automated system, the modern NC is equipped with a computer communication interface (normally a serial port) that makes Computerized Numerical Controllers (CNCs) easy to use. A PC running Windows 2000, and with a MOXA C320Turbo/PCI installed can be used. Not only can the C320Turbo/PCI control up to 32 CNC machines at the same time via a high-speed communication interface (460.8 Kbps max.), it can also transmit large amounts of CAD/CAM data to 32 CNC machines simultaneously. C320Turbo/PCI is expandable, allowing external serial modules to be located as far as 100 m from the host.

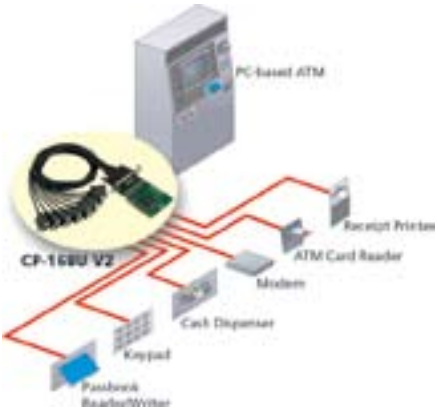
Products: C320Turbo/PCI
Country: United States
Overall benefits: Streamlined process, Increased efficiency

ATM/KIOSK Application

The company mentioned here took notice of the fact that self-service is a key part of the banking automation industry, and in response developed a new generation of innovative and competitive ATMs (Automated Teller Machines). The ATMs assist banks and financial institutions with providing more services to more customers, 24 hours a day, 7 days a week.

After evaluating different possible solutions, the company decided to use a PC-based architecture. Since PC technology is very mature and open-end suppliers are numerous, the availability of vast software resources and environments greatly reduced development time. To connect the peripherals needed inside the ATM, the company chose MOXA CP-168U V2. This 8-port serial card was all that was needed to link the ATM's magnetic card reader, cash dispenser, cash insertion unit, balance sheet printer, keypad, and modem.

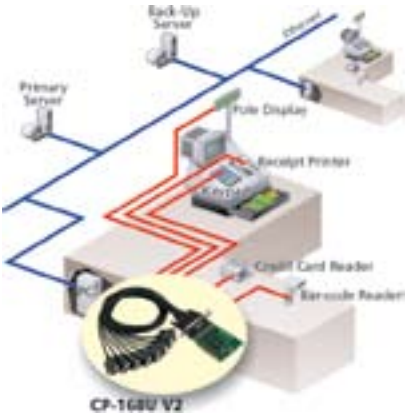
Products: CP-168U V2, CP-104UL V2
Country: Japan
Overall benefits: Centralize control, cost effective



Convenience Store Application

Typical POS system applications are PC-based POS cash registers, including bar-code scanners, credit card readers, receipt printers, pole displays, cash registers, as well as any other self-service machine connection. Since POS machines are placed at many different locations, POS system providers demand a highly reliable solution to avoid maintenance problems. In addition, since a large number of multiport boards are usually needed for POS projects, POS system providers are very concerned about price. This means that reliability and a competitive price are the two key factors that POS customers consider. The reason Moxa's serial boards are so good at meeting customer's needs and concerns is because we took great care to design these serial boards especially for POS applications.

Products: CP-104UL V2, CP-168U V2
Country: Taiwan
Overall benefits: Saves time and cost

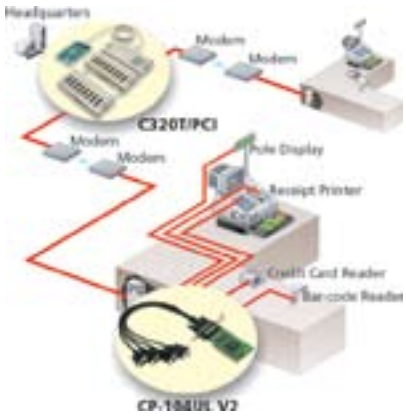


Retail Chain Store POS System

A major retail group in Taiwan that owns hundreds of communication retail chain stores has recently installed several MOXA CP-104UL V2 boards in twenty-some stores throughout Taipei. The boards are used as part of the company's POS (Point of Sale) system, connecting barcode scanners, cash registers, pole displays, and modems, to a central computer.

At the other end of the line, the PC server in the head office has a MOXA C320Turbo/PCI board installed, with each of its serial ports connected to a modem. This enables the company's headquarters to keep close tabs on each store's sales activities, including easy analysis of customer buying habits and updating merchandise inventories. This type of integrated POS system speeds up the sales process, making it possible to serve more customers and increase profit. Moxa's compact boards fit virtually any PC, driver installation and software configuration is easy, and the operational cost is low. The boards are also highly reliable and provide support for all popular operating systems.

Products: CP-104UL V2, CP-168U V2, C320Turbo/PCI
Country: United States
Overall benefits: Speeds up the sales process, Saves time and cost



Building Automation System

A Building Automation (BA) management system gives building managers better control over resources, improving operational efficiency and reducing costs in the control room. With today's data communication technology and sophisticated computer software, an intelligent building can be managed and monitored from a central location with a computerized building management system.

The company mentioned here uses a PC and MOXA CP-134U-I V2 or CP-132UL-I V2 to develop automatic air conditioning control systems, elevator controllers, entrance controls, and fire alarm systems. Both boards provide an RS-422/485 interface. A common problem with many applications is ground loop currents that flow through the ground line when ground voltage levels differ between connected devices. To eliminate this problem, both boards are available with 2000V of Optical Isolation Protection. The building manager can easily monitor and control each air conditioner via communication links between the air conditioners and MOXA CP-134U-I V2 or CP-132UL-I V2.

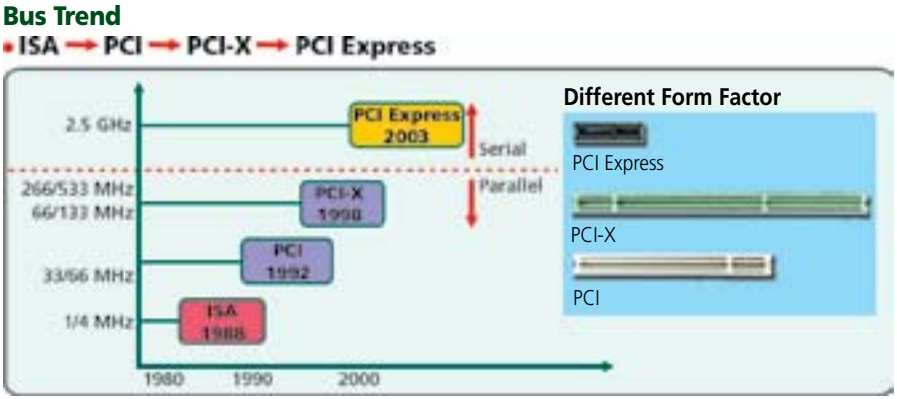
Products: CP-134U-I V2, CP-132UL-I V2
Country: China
Overall benefits: Centralize control, cost effective

PCI Express Introduction

A single PCI Express serial link is a dual-simplex connection using two pairs of wires (one pair for transmit and one pair for receive) to transmit only one bit per cycle. Although this sounds limiting, it can transmit at the extremely high speed of 2.5 Gbps, which equates to a burst mode of 320 Mbps (Mega-bytes/sec) on a single connection. These two pairs of wires is called a lane.

What's the difference between PCI and PCI Express

PCI Express uses a serial interface and allows for point-to-point interconnections between devices using directly wired interfaces between these connection points. This differs from previous PCI bus architectures that used a shared, parallel bus architecture.



Moxa Multiport Serial Board Slot Type Selection Guide

Interface	2P RS-232	4P RS-232	8P RS-232	2P RS-485	4P RS-485	8P RS-485
ISA	√	√	√	√	√	
PC/104		√		√		
PCI	√	√	√	√	√	
PCI-X	√	√	√	√	√	√
PCI Express*		√	√			√

* For detailed information about all products, please visit Moxa's website or contact our distributors.

PCI Replacement

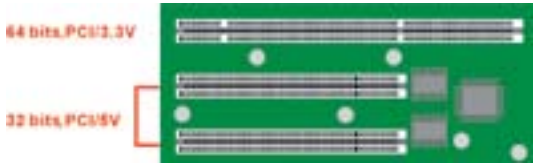
PCI Express is the industry's attempt to unify all of the current different types of I/O bus into a single "future proof" standard. Over the past ten years, PCI has handled the large and varying uses it has been given, most of which were never foreseen when the specification was created. Current PCI specifications are based on a multi-drop, parallel bus implementation that is coming very close to its performance limits, which cannot be stretched without spending a large amount of money for very little gain.

Universal PCI Board Tutorial

Moxa's Universal PCI Series meets the new slot standard for expansion boards that is being rapidly adopted by PC server manufacturers. In addition, Moxa's universal PCI boards work with both 3.3-volt and 5-volt PCI slots, allowing the boards to be used in virtually any PC available. We provide 2/4/8 independent RS-232/422/485 serial ports for connecting data acquisition equipment and many other serial devices to PCs.

Universal PCI

The somewhat old fashioned PCI bus standard only supports a 32-bit bus and 5V connector key. However, the trend of sharing maximum bandwith, reducing power consumption, and speeding up transmission speed has motivated moving the PCI bus standard from 32-bit PCI/5V to 64-bit PCI/3.3V. Moxa's universal PCI series provides the following features, making it easy to use MOXA boards in any signaling environment.



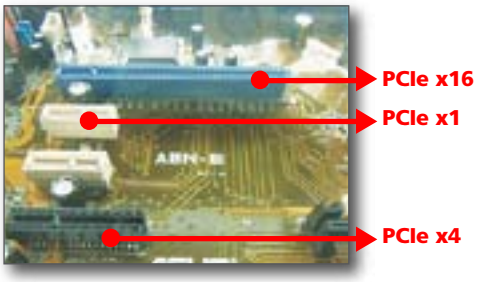
- **Supports both 64-bit & 32-bit PCI bus**
- **Supports both 3.3V & 5V connector keys**

Universal PCI Multiport Serial Board Selection Guide

Items / Interface	Ports	Product	Universal PCI	15 KV Surge Protection	2 KV Isolation	Low Profile
RS-232	2	CP-102U	√	√		
		CP-102UL	√	√		√
	4	CP-104UL V2	√	√		√
		CP-104JU V2	√	√		
	8	CP-168U V2	√	√		
RS-422/485	2	CP-132UL-I V2	√	√	√	√
		CP-132UL V2	√	√		√
	4	CP-134U V2	√	√		
		CP-134U-I V2	√	√	√	
RS-232/422/485	8	CP-118U	√	√		

PCI Express Specifications

Multiple lanes are combined to create a PCI Express link. In this case, the number of lanes is used to label the connection. E.g., x1, x2, x4, x12, x16, or x32. Based on the meaning of "lane," PCI Express x1 uses 4 wires to create the connection, but a x16 configuration requires 64 wires. It makes sense then, that different sized connections use different sized slots. In the figure below, you can see slots for PCI Express x1, PCI Express x4, and PCI Express x16. A PCI Express connector can be installed in a larger slot, but not a smaller one. This means that you can install Moxa's PCI Express x1 Board into any PCI Express slot.



Interface / MSB	x 1 slot	x 4 slot	x 8 slot	x 16 slot
x 1 card	√	√	√	√
x 4 card		√	√	√
x 8 card			√	√
x 16 card				√

8-Port RS-232/422/485 PCI Express Smart Board

CP-118EL

- PCI Express x 1 compliant
- Serial communication speed of up to 921.6 Kbps
- 128-byte FIFO and on-chip H/W, S/W flow control
- Various connection cables/boxes for RS-232/422/485
- Windows 2003/XP/2000/98/ME, Linux, Unix driver support
- Easy maintenance with on-board LED display and management software
- 3.3 V power requirement
- On-board 15 KV ESD Surge Protection
- Low profile board for compact-sized PCs

Linux 2.4 | Linux 2.6 | Linux 64 bit
Win2K | WinXP | Win2003 | Win 64 bit
SCO Open Server 5 | SCO Unixwave 2.1 | SCO Unixwave 7 | SCO Open Server 6

Ordering Information

CP-118EL	8-port RS-232/422/485 PCI Express BUS, 921.6 Kbps, 15 KV Surge Protection

* All items include: MOXA Software CD, QIG, Low profile bracket

8-Port RS-232/422/485 PCI Express Smart Board

CP-168EL

Coming Soon

Linux 2.4 Linux 2.6 Linux 64 bit
Win2K WinXP Win2003 Win 64 bit
SCO Open Server 5 SCO Unixwave 2.1 SCO Unixwave 7 SCO Open Server 6

- PCI Express x 1 compliant
- 50 bps to 921.6 Kbps
- Data flow LED display on-board
- High performance 128-byte FIFO driver
- On-board 15 KV ESD Surge Protection
- Flexible RS-232/422/485 interface options
- Low profile board for compact-sized PCs

Moxa's CP-168EL PCI Express board meets the new slot standard for expansion boards that is being rapidly adopted by PC server manufacturers. In addition, CP-168EL PCI Express boards work with PCI Express x 1, allowing the boards to be used in virtually any available PC server. The CP-168EL offers 8 independent RS-232 serial ports for connecting data acquisition equipment and many other serial devices to the PC.

Ordering Information

CP-168EL	8-port RS-232, PCI Express BUS, 921.6 Kbps, 15 KV Surge Protection

* All items include: MOXA Software CD, QIG, Low profile bracket

4-Port RS-232 PCI Express Smart Board

CP-104EL

Coming Soon

Linux 2.4 Linux 2.6 Linux 64 bit
Win2K WinXP Win2003 Win 64 bit
SCO Open Server 5 SCO Unixwave 2.1 SCO Unixwave 7 SCO Open Server 6

- PCI Express x 1 compliant
- Serial communication speed of up to 921.6 Kbps
- 128-byte FIFO and on-chip H/W, S/W flow control
- Easy maintenance with on-board LED display and management software
- 3.3 V power requirement
- On-board 15 KV ESD Surge Protection
- Windows, Linux, Unix driver support.
- Low profile board for compact-sized PCs

Ordering Information

CP-104EL	4-port RS-232, PCI Express BUS, 921.6 Kbps, 15 KV Surge Protection (cable included—choose CBL-M44M25x4-50 or CBL-M44M9x4-50)

* All items include: MOXA Software CD, QIG, Low profile bracket

32-Port Intelligent RS-232/422 Board

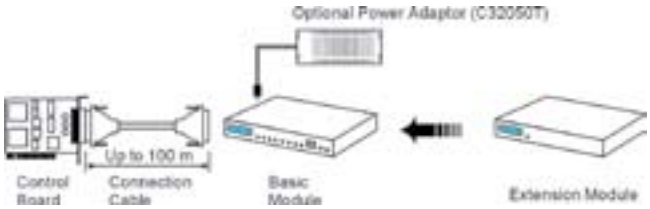
C320Turbo Series

High port-density Intelligent Board

- 8 to 32 ports per board (max. 4 boards, 128 ports per system)
- Dramatically decrease host CPU loading
- High performance at high port-density
- 3.3V and 5V Universal PCI support

The Intelligent C320Turbo series multiport serial board provides an expandable and flexible COM/TTY solution for 8- to 128-port RS-232/422 applications. C320Turbo's on-board CPU and dual port large memory take the load off host systems whose performance and scalability are critical for large-scale systems.

Rackmount



16-port RS-232

Ordering Example
- Control Board—C32010T/PCI
- Connection Cable—C32020T
- Basic Module—C32081T

C32081T

32-port RS-232

Ordering Example
- Control Board—C32010T/PCI
- Connection Cable—C32020T
- Basic Module—C32081T
- Extension Module—C32083T

C32083T

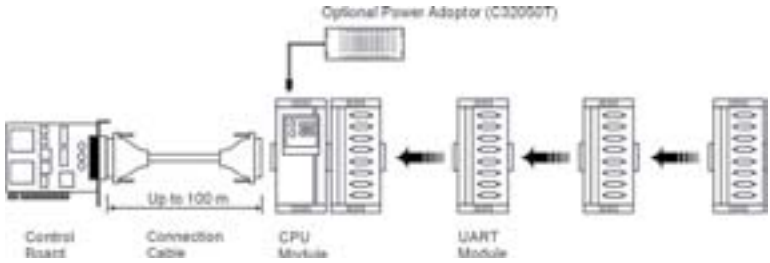
C32081T

Ordering Information

Control Board C32010T/PCI	
Connection Cable C32020T: 2 m DB25-to-DB25, 25-wire cable	
Rackmount Connection Modules Basic Modules (must choose one) C32080T: 8 ports, RS-232, RJ45 (10-pin) C32081T: 16 ports, RS-232, RJ45 (10-pin)	Extension Modules (optional) C32082T: 8 ports, RS-232, RJ45 (10-pin) C32083T: 16 ports, RS-232, RJ45 (10-pin)

Expansion on demand up to 128 ports with 4 boards per PC!

Desktop



8-port RS-232

Ordering Example
Control Board—C32010T/PCI
Connection Cable—C32020T
CPU Module—C32030T
UART Module—C32045T x 1

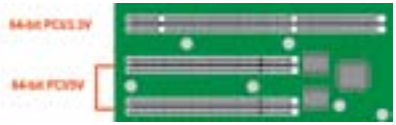
16-port RS-232 & 16-port RS-422

Ordering Example
Control Board—C32010T/PCI
Connection Cable—C32020T
CPU Module—C32030T
UART Module—C32045T x 2
+ C32061T x 2

C320T/PCI Supports Universal PCI

The somewhat old fashioned PCI bus standard only supports a 32-bit bus and 5V connector key. However, the trend of sharing maximum bandwith, reducing power consumption, and speeding up transmission speed has motivated moving the PCI bus standard from 32-bit PCI/5V to 64-bit PCI/3.3V. C320 Turbo/PCI provides the following features, making it easy to use in any signaling environment.

- Supports both 64-bit and 32-bit PCI bus
- Supports both 3.3V and 5V connector keys

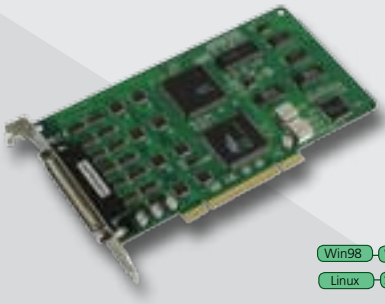


Ordering Information

Control Board C32010T/PCI	
Connection Cable C32020T: 2 m DB25-to-DB25, 25-wire cable	
Desktop Connection Modules	
CPU Modules	UART Modules (choose at least one)
C32030T: CPU Module	C32045T: RS-232, Female DB25 C32047T: RS-232, Male DB25 C32071T: RS-232, Female DB25, with Surge Protection (25 KV ESD) C32061T: RS-422, Female DB25 C32065T: RS-422, Female DB25, with Isolation (2 KV)

8-Port Intelligent RS-232/422/485 Board

C218Turbo Series



- 8-port RS-232 intelligent communication board
- Effectively reduces CPU loading
- Versatile OS driver support
- Various connection options
- Data transmission speed of up to 921.6 Kbps
- High throughput for great performance
- 3.3V and 5V Universal PCI support

Win98 WinME WinNT Win2K WinXP
Linux SCO Unix SVR 4.2 Unix Ware

FC CE PComm Lite

Low CPU loading and High Performance

C218Turbo's on-board CPU and large dual-port memory can maintain a sustained 230.4 Kbps throughput on all eight ports simultaneously, while occupying just 5% of the host's processor time, freeing up more host resources for other tasks.

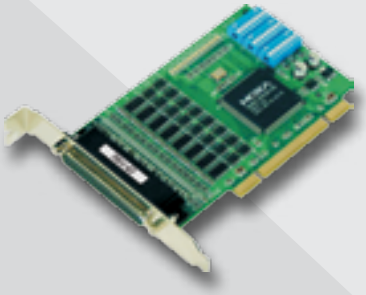
Ordering Information

C218Turbo/PCI	Intelligent, 8-port RS-232 board, Universal PCI bus, 921.6 Kbps

* All items include: MOXA Software CD, QIG

8-Port RS-232/422/485 Universal PCI Smart Board

CP-118U



- Over 700 Kbps data throughput, for top performance
- Serial communication speed of up to 921.6 Kbps
- 128-byte FIFO and on-chip H/W, S/W flow control
- Universal PCI compatible with 3.3/5V PCI and PCI-X
- Various connection cables/boxes for RS-232/422/485
- Windows 2003/XP/2000/98/ME, Linux, Unix driver support
- Easy maintenance with on-board LED display and management software
- Single 5 VDC power requirement
- On-board 15 KV ESD protection

Win98 WinNT Win2K
WinXP Win2003 Linux 2.6
SCO Open Server 5 SCO Unixwave 2.1 SCO Unixwave 7

FC CE PComm Lite

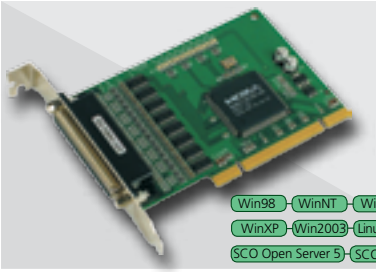
Ordering Information

CP-118U	8-port RS-232/422/485 Universal PCI bus, 921.6 Kbps, 15 KV Surge Protection

* All items include: MOXA Software CD, QIG

8-Port RS-232/422/485 Universal PCI Smart Board

CP-168U V2



- 50 bps to 921.6 Kbps
- Data flow LED display on-board
- 3.3V and 5V Universal PCI support
- High performance 128-byte FIFO driver
- Embedded 15 KV ESD Surge Protection
- Flexible RS-232/422/485 interface options

Moxa's CP-168 Universal PCI board meets the new slot standard for expansion boards that is being rapidly adopted by PC server manufacturers. In addition, CP-168 Universal PCI boards work with both 3.3V and 5V server slots, allowing the boards to be used in virtually any available PC server. CP-168U offers 8 independent RS-232 serial ports for connecting data acquisition equipment and many other serial devices to the PC and compatible systems.

Ordering Information

CP-168U V2	8-port RS-232 board, Universal PCI bus, 921.6 Kbps, 15 KV Surge Protection

* All items include: MOXA Software CD, QIG

Versatile interface options for C218Turbo/CP-118U/CP-168U V2

Opt8 Series

Select one of the following connection options for connecting to C218Turbo/CP-118U/CP-168U V2 multiport serial boards.

Connection Cables

CBL-M62M25x8-100 (Opt8C): DB25(M)

CBL-M62M9x8-100 (Opt8D): DB9(M)

Connection Boxes

OPT8A: DB25(F)
OPT8B: DB25(M)
OPT8S: DB25(F)
(Surge: 25 KV ESD)

OPT8Z: DB25(F)
OPT8F: DB25(F)
(Isolation: 500V)

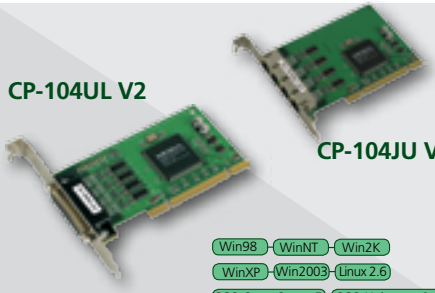
OPT8K: DB25(F)
(Surge: 16 KV ESD)

OPT8-M9:
DB9(M)

OPT8-RJ45:
8-pin RJ45

4-Port RS-232 Universal PCI Smart Board

CP-104UL V2, CP-104JU V2



- Over 800 Kbps data throughput, for top performance
- Serial communication speed of up to 921.6 Kbps
- 128-byte FIFO and on-chip H/W, S/W flow control
- Universal PCI compatible, with 3.3/5V PCI and PCI-X
- Easy maintenance with on-board LED display and management software
- Single 5 VDC power requirement

Win98 WinNT Win2K
WinXP Win2003 Linux 2.6
SCO Open Server 5 SCO Unixwave 2.1 SCO Unixwave 7

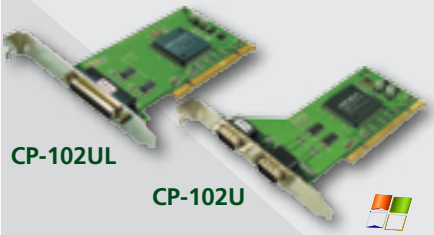
Ordering Information

CP-104UL V2	4-port RS-232 Low Profile board, Universal PCI BUS, 921.6 Kbps, 15 KV Surge Protection (cable included—choose CBL-M44M25x4-50 or CBL-M44M9x4-50)
CP-104JU V2	4-port RS-232 board, 8-pin RJ45 connectors, Universal PCI BUS, 921.6 Kbps, 15 KV Surge Protection

* All items include: MOXA Software CD, QIG, Standard & Low profile brackets

2-port RS-232 Universal PCI Smart Board

CP-102U, CP-102UL



Win98 WinNT Win2K
WinXP Win2003 Linux 2.6
SCO Open Server 5 SCO Unixwave 2.1 SCO Unixwave 7

- Over 800 Kbps data throughput, for top performance
- Serial communication speed of up to 921.6 Kbps
- 128-byte FIFO and on-chip H/W, S/W flow control
- Universal PCI compatible with 3.3/5V PCI and PCI-X
- MD1 low profile board (CP-102UL) for compact-sized PCs
- Windows 2003/XP/2000/98/ME, Linux, Unix driver support
- Easy maintenance with on-board LED display and management software
- Single 5 VDC power requirement
- On-board 15 KV ESD protection

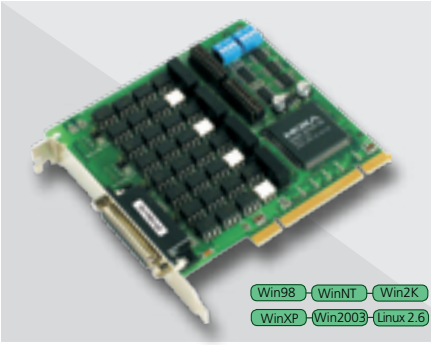
Ordering Information

CP-102U	2-port RS-232 Universal PCI Smart Serial Board, 921.6 Kbps, 15 KV Surge Protection
CP-102UL	2-port RS-232 Universal PCI Smart Serial Board, Low Profile, 921.6 Kbps, 15 KV Surge Protection

* All items include: MOXA Software CD, QIG, Standard & Low profile brackets

Industrial 4-Port RS-422/485 Universal PCI Smart Board

CP-134U V2 Series



Win98 WinNT Win2K WinXP Win2003 Linux 2.6

- Ports 1 and 2 support RS-232 and RS-422/485
- Supports 4 independent RS-422/485 serial ports
- Universal PCI bus
- Data flow LED display onboard
- Supports 128-byte FIFO Driver
- RS-485 with ADDC™
- Embedded 15 KV ESD protection
- 2 KV Optical Isolation (CP-134U-I V2)
- 50 bps to 921.6 Kbps

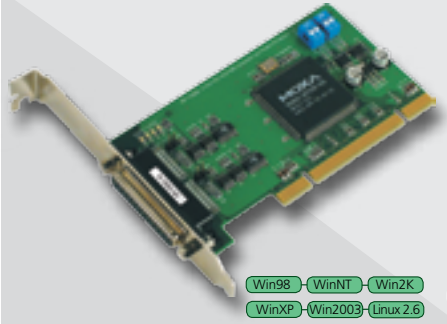
Ordering Information

CP-134U-I V2	4-port RS-422/485 board, Universal PCI BUS, Female DB44, 921.6 Kbps, 2 KV Isolation Protection (cable included—choose CBL-M44M25x4-50 or CBL-M44M9x4-50)
CP-134U V2	4-port RS-422/485 board, Universal PCI BUS, Female DB44, 921.6 Kbps (cable included—choose CBL-M44M25x4-50 or CBL-M44M9x4-50)

* All items include: MOXA Software CD, QIG

Industrial 2-Port RS-422/485 Universal PCI Smart Board

CP-132UL V2 Series



Win98 WinNT Win2K WinXP Win2003 Linux 2.6

- Supports 2 independent RS-422/485 serial ports
- Universal PCI bus
- Data flow LED display onboard
- Supports 128-byte FIFO Driver
- RS-485 with ADDC™
- Embedded 15 KV ESD protection
- 2 KV Optical Isolation (CP-132UL-I V2)
- 50 bps to 921.6 Kbps
- MDI low Profile board for compact-sized PCs

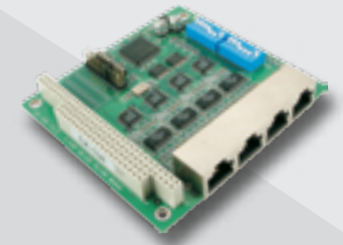
Ordering Information

CP-132UL-I V2	2-port RS-422/485 Low Profile board, Universal PCI BUS, 921.6 Kbps, 2 KV Isolation Protection, 15 KV Surge Protection (cable included—CBL-M25M9x2-50)
CP-132UL V2	2-port RS-422/485 Low Profile board, Universal PCI BUS, 921.6 Kbps, 15 KV Surge Protection (cable included—CBL-M25M9x2-50)

* All items include: MOXA Software CD, QIG, Standard & Low profile brackets

PC/104, 4-port RS-232 Multiport Serial Board

CA-104



DOS Win98 WinNT Win2K
WinXP Win2003 Linux 2.4 Linux 2.6

- 4 RS-232 serial interface ports
- On-chip hardware flow control
- Built-in 15 KV ESD Surge Protection
- Jumper and DIP Switch selectable IRQ, I/O settings
- Onboard Tx, Rx LED indicators for each port
- Works perfectly with all major Operating Systems

FC CE PComm Lite

Ordering Information

CA-104	4-port RS-232 board, PC/104 BUS, 8-pin RJ45, 230.4 Kbps, 15 KV ESD Protection

* All items include: MOXA Software CD, QIG

PC/104, 2-port RS-422/485 Multiport Serial Board

CA-132/132I

DOS Win98 WinNT Win2K
WinXP Win2003 Linux 2.4 Linux 2.6

- On-chip hardware flow control
- Built-in 15 KV ESD Surge Protection
- Jumper and DIP Switch selectable IRQ, I/O settings
- Onboard Tx, Rx LED indicators for each port
- Supports RS-485 ADDC™ (Automatic Data Direction Control) intelligence
- Built-in termination resistors enabled by DIP switch

FC CE PComm Lite

Ordering Information

CA-132	2-port RS-422/485 board, PC/104 BUS, 8-pin RJ45, 230.4 Kbps, 15 KV ESD Protection
CA-132I	2-port RS-422/485 board, PC/104 BUS, 8-pin RJ45, 230.4 Kbps, 15 KV ESD Protection, 2 KV Isolation Protection

* All items include: MOXA Software CD, QIG

Optional Accessories (for CA-104, CA-132/132I)

CBL-RJ45M9-150	8-pin RJ45 to male DB9, 150 cm cable
CBL-RJ45M25-150	8-pin RJ45 to male DB25, 150 cm cable

PCI Express Boards Selection Guide



Model Name	CP-118EL	CP-168EL	CP-104EL
No. of Ports	8	8	4
Bus Interface	PCI Express x 1	PCI Express x 1	PCI Express x 1
Serial Interface	RS-232/422/485	RS-232	RS-232
Board Connectors	SCSI VHDCI 68	SCSI VHDCI 68	Female DB44
Cable/Box Connectors	Male DB9/Male DB25 Female DB25/8-Pin RJ45	Male DB9/Male DB25 Female DB25/8-Pin RJ45	Male DB9/Male DB25
Power Requirement	860 mA (3.3V)	630 mA (3.3V)	430 mA (3.3V)
Dimensions (W x D)	132 x 67.2 mm	102 x 67.2 mm	100 x 67.2 mm
Optical Isolation	---	Optional	---
FIFO	128 bytes		
Low Profile	Yes		
Controller	MU860		
ESD Surge Protection	15 KV ESD		
Baudrate	50 bps to 921.6 Kbps		
Flow Control	RTS/CTS, XON/XOFF		
Operating Temperature	0 to 55°C (32 to 131°F)		
Operating Humidity	5 to 95% RH		
Storage Temperature	-20 to 85°C (-4 to 185°F)		
Regulatory Approvals	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B		
Warranty	5 years		

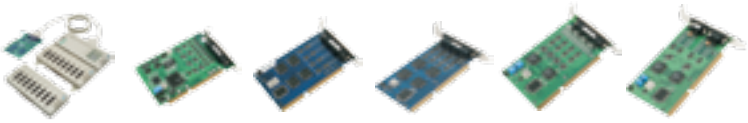
Universal PCI Boards Selection Guide

Model Name	C320Turbo/ PCI	C218Turbo/ PCI	CP-118U	CP-168U V2	CP-104UL V2	CP-104JU V2
No. of Ports	32	8	8	4	4	4
Bus Interface	Universal PCI	Universal PCI	Universal PCI	Universal PCI	Universal PCI	Universal PCI
Serial Interface	RS-232/422	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232	RS-232
Board Connectors	Female DB25	Female DB62	Female DB62	Female DB62	Female DB44	8-pin RJ45
Cable/Box Connectors	Male DB25, Female DB25, 10-pin RJ45	Male DB9, Male DB25, Female DB25, 8-pin RJ45	Male DB9, Male DB25, Female DB25, 8-pin RJ45	Male DB9, Male DB25, Female DB25, 8-pin RJ45	Male DB9, Male DB25	Male DB9, Male DB25, Female DB9, Female DB25
Power Requirement	500 mA (+5V)	530 mA (+5V), 110 mA (+12V), 35 mA (-12V)	240 mA (+5V, RS-232) 300 mA (+5V, RS-422)	180 mA (+5V)	120 mA (+5V)	135 mA (+5V)
Dimensions (W x D)	129 x 90 mm	180 x 105 mm	135 x 82 mm	120 x 82 mm	120 x 64.5 mm	120 x 64.5 mm
Optical Isolation	Optional	Optional	---	Optional	---	---
Low Profile	---	---	---	---	Yes	---
Processor	TMS320BC52-40 RISC CPU	TMS320BC52-40 RISC CPU	---	---	---	---
Memory	512 KB	512 KB	---	---	---	---
Controller	16C550C	16C550C	MU860	MU860	MU860	MU860
ESD Surge Protection	Optional	Optional	15 KV ESD	15 KV ESD	15 KV ESD	15 KV ESD
Baudrate	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps
FIFO	16 bytes	16 bytes	128 bytes	128 bytes	128 bytes	128 bytes
Flow Control	RTS/CTS, XON/XOFF					
Operating Temperature	0 to 55°C (32 to 131°F)					
Operating Humidity	5 to 95% RH					
Storage Temperature	-20 to 85°C (-4 to 185°F)					
Regulatory Approvals	EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class A	EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class A	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EEN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EEN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B
Warranty	5 years					

Universal PCI Boards Selection Guide

Model Name	CP-102U	CP-102UL	CP-134U V2	CP-134U-I V2	CP-132UL V2	CP-132UL-I V2
No. of Ports	2	2	4	4	2	2
Bus Interface	Universal PCI	Universal PCI	Universal PCI	Universal PCI	Universal PCI	Universal PCI
Serial Interface	RS-232	RS-232	RS-232/422/485	RS-232/422/485	RS-422/485	RS-422/485
Board Connectors	Male DB9	Female DB25	Female DB44	Female DB44	Female DB25	Female DB25
Cable/Box Connectors	Male DB9	Male DB9	Male DB9, Male DB25	Male DB9, Male DB25	Male DB9	Male DB9
Power Requirement	93 mA (+5V)	93 mA (+5V)	180 mA (+5V)	850 mA (+5V)	120 mA (+5V)	490 mA (+5V)
Dimensions (W x D)	120 x 80 mm	120 x 64.5 mm	120 x 82.5 mm	120 x 115 mm	120 x 64.5 mm	120 x 64.5 mm
Optical Isolation	---	---	---	2 KV	---	2 KV
Low Profile	---	Yes	---	---	Yes	Yes
Processor	---	---	---	---	---	---
Memory	---	---	---	---	---	---
Controller	MU860	MU860	MU860	MU860	MU860	MU860
ESD Surge Protection	15 KV ESD	15 KV ESD	15 KV ESD	15 KV ESD	15 KV ESD	15 KV ESD
Baudrate	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps
FIFO	128 bytes					
Flow Control	RTS/CTS, XON/XOFF					
Operating Temperature	0 to 55°C (32 to 131°F)					
Operating Humidity	5 to 95% RH					
Storage Temperature	-20 to 85°C (-4 to 185°F)					
Regulatory Approvals	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B
Warranty	5 years					

ISA Boards Selection Guide



Model Name	CP-102U	CP-102UL	CP-134U V2	CP-134U-I V2	CP-132UL V2	CP-132UL-I V2
No. of Ports	2	2	4	4	2	2
Bus Interface	ISA	ISA	ISA	ISA	ISA	ISA
Serial Interface	RS-232/422	RS-232/422/485	RS-232/422/485	RS-232	RS-422/485	RS-422/485
Board Connectors	Female DB25	Female DB62	Female DB62	Female DB37	Female DB37	Female DB37
Cable/Box Connectors	Male DB25, Female DB25, 8-pin RJ45	Male DB9, Male DB25, Female DB25, 8-pin RJ45	Male DB9, Male DB25, Female DB25, 8-pin RJ45	Male DB9, Male DB25	Male DB9, Male DB25	Male DB9, Male DB25
Power Requirement	83 mA (+5V)	530 mA (+5V) 110 mA (+12V) 35 mA (-12V)	170 mA (+5V) 100 mA (+12V) 60 mA (-12V)	100 mA (+5V) 100 mA (+12V) 60 mA (-12V)	620 mA (+5V)	620 mA (+5V)
Dimensions (W x D)	158 x 107 mm	180 x 105 mm	157 x 93 mm	157 x 93 mm	168 x 85 mm (CI-134) 180 x 110 mm (CI-134I) 180 x 110 mm (CI-134IS)	157 x 75 mm (CI-132) 157 x 105 mm (CI-132I) 157 x 105 mm (CI-132IS)
Optical Isolation	Optional	Optional	---	---	---	---
Processor	TMS320BC52-40 RISC CPU	TMS320BC52-40 RISC CPU	---	---	---	---
Memory	512 KB	512 KB	---	---	---	---
Controller	16C550C	16C550C	16C550C	16C550C	16C550C	16C550C
ESD Surge Protection	Optinoal	Optinoal	25 KV ESD (C168HS)	25 KV ESD (C104HS)	25 KV ESD (CI-134IS)	25 KV ESD (CI-132IS)
Baudrate	50 bps to 460.8 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps	50 bps to 921.6 Kbps
FIFO	16 bytes					
Flow Control	RTS/CTS, XON/XOFF					
Operating Temperature	0 to 55°C (32 to 131°F)					
Operating Humidity	5 to 95% RH					
Storage Temperature	-20 to 85°C (-4 to 185°F)					
Regulatory Approvals	EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class A	EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class A	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B
Warranty	5 years					

PC/104 Boards Selection Guide



Model Name	CA-104	CA-132	CA-132I
No. of Ports	4	2	2
Bus Interface	PC/104	PC/104	PC/104
Serial Interface	RS-232	RS-422/485	RS-422/485
Board Connectors	8-pin RJ45	8-pin RJ45	8-pin RJ45
Cable/Box Connectors	Male DB9/Male DB25 Female DB9/Female DB25	Male DB9/Male DB25 Female DB9/Female DB25	Male DB9/Male DB25 Female DB9/Female DB25
Power Requirement	245 mA (+5V)	210 mA (+5V)	455 mA (+5V)
Dimensions (W x D)	96 x 90 mm	96 x 90 mm	96 x 90 mm
Optical Isolation	---	---	2 KV
FIFO	64 bytes		
Controller	MU150		
ESD Surge Protection	15 KV ESD		
Baudrate	50 bps to 230.4 Kbps		
Flow Control	RTS/CTS, XON/XOFF		
Operating Temperature	0 to 55°C (32 to 131°F)		
Operating Humidity	5 to 95% RH		
Storage Temperature	-20 to 85°C (-4 to 185°F)		
Regulatory Approvals	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B		
Warranty	5 years		