# **Universal PCI Board User's Manual**

Multiport Serial Board for PCI and PCI-X Bus

Eighth Edition, July 2012

www.moxa.com/product



# **Universal PCI Board User's Manual**

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The following topics are covered in this chapter:

- Overview
  - > Applications
- Package Checklist
- Product Features
- Product Specifications
- Installation Guide

# **Overview**

Moxa Universal PCI (UPCI) multiport serial boards can be installed in PCI or PCI-X slots, and support both 3.3V and 5V PCI/PCI-X. With a UPCI board, you can connect data acquisition equipment and other serial devices to your PC over RS-232, RS-422, or RS-485. Each board has on-chip hardware and software flow control, a built-in 128-byte Tx/Rx FIFO, and well-designed device drivers that have been fine-tuned. This allows Moxa UPCI boards to support data transmission speeds of up to 921.6 Kbps.

The following UPCI multiport serial boards are available from Moxa:

8 Ports	
CP-118U:	8 ports, RS-232/422/485
CP-118U-T:	8 ports, RS-232/422/485, wide temperature
CP-118U-I:	8 ports, RS-232/422/485, 2KV optical isolation
CP-118-U-I-T:	8 ports, RS-232/422/485, 2KV optical isolation, wide temperature
CP-138U:	8 ports, RS-422/485
CP-138-T:	8 ports, RS-422/485, wide temperature
CP-138-I:	8 ports, RS-422/485, 2KV optical isolation, wide temperature
CP-138-U-T-I:	8 ports, RS-422/485, 2KV optical isolation
CP-168U:	8 ports, RS-232
CP-168U-T:	8 ports, RS-232, wide temperature
4 Ports	
CP-114UL:	4 ports, RS-232/422/485, low profile
CP-114UL-T:	4 ports, RS-232/422/485, low profile, wide temperature
CP-114UL-I:	4 ports, RS-232/422/485, low profile, 2KV optical isolation
CP-114UL-I-T:	4 ports, RS-232/422/485, low profile, , 2KV optical isolation, wide temperature
CP-134U:	4 ports, RS-422/485
CP-134U-T:	4 ports, RS-422/485, wide temperature
CP-134U-I:	4 ports, RS-422/485, 2KV optical isolation
CP-134U-I-T:	4 ports, RS-422/485, 2KV optical isolation, wide temperature
CP-104UL:	4 ports, RS-232, low profile
CP-104UL-T:	4 ports, RS-232, low profile, wide temperature
CP-104JU:	4 ports, RS-232, 8-pin RJ45 connector on-board
CP-104JU-T:	4 ports, RS-232, 8-pin RJ45 connector on-board, wide temperature
POS-104UL:	4 ports, RS-232, low profile, serial port powered
POS-104UL-T:	4 ports, RS-232, low profile, serial port powered, wide temperature
2 Ports	
CP-112UL:	2 ports, RS-232/422/485, low profile
CP-112UL-T:	2 ports, RS-232/422/485, low profile, wide temperature
CP-112UL-I:	2 ports, RS-232/422/485, low profile, 2KV optical isolation
CP-112UL-I-T:	2 ports, RS-232/422/485, low profile, 2KV optical isolation
CP-132UL:	2 ports, RS-422/485, low profile
CP-132UL-T:	2 ports, RS-422/485, low profile, wide temperature
CP-132UL-I:	2 ports, RS-422/485, low profile, 2KV optical isolation
CP-132UL-I-T:	2 ports, RS-422/485, low profile, 2KV optical isolation, wide temperature
CP-102UL:	2 ports, RS-232, low profile
CP-102UL-T:	2 ports, RS-232, low profile, wide temperature
CP-102U:	2 ports, RS-232
CP-102U-T:	2 ports, RS-232, wide temperature
CP-102UF:	2 ports, Serial-over-fiber board

### Smartio—The Smart Multiport Async Solution

The Smartio Series of multiport serial boards includes the CP-168U, CP-104UL, CP-104JU, POS-104UL, CP-102UL, and CP-102U. These boards provide RS-232 serial ports for connecting terminals, modems, printers, scanners, cash registers, bar code readers, keypads, numeric displays, electrical scales, data acquisition equipment, and many other serial devices to a PC. These boards are a reliable, high-performance solution for multiport serial communication.

### Industio—The Industrial Multiport Async Solution

The Industio Series of multiport serial boards includes the CP-118U-I, CP-118U, CP-138U-I, CP-138U, CP-114UL, CP134U, CP-134U-I, CP-132UL, and CP-132UL-I. These boards are designed for industrial use, with serial ports that can be configured independently for RS-232, RS-422, or RS-485 operation. Industio boards provide a reliable communication link over distances of up to 4000 ft and support point-to-point full-duplex or multi-drop half-duplex. With RS-485 operation, a single port can connect to 32 devices in a multi-drop environment.

### ADDC<sup>™</sup> (Automatic Data Direction Control) for RS-485

ADDC<sup>™</sup> (Automatic Data Direction Control) makes it easier to manage 2-wire RS-485 half-duplex connections, eliminating the need for software interference. This means that it is not necessary to write extra code for Windows applications to control the half-duplex protocol. ADDC intelligence is built into Industio boards.

### Serial-over-fiber Board

The CP-102UF is a serial-over-fiber board designed for industrial automation applications that require a long distance, multi-point, PC-based data acquisition solution. The single-mode model (CP-102UF-S) can transmit up to 40 km, and the multi-mode model (CP-102UF-M) can transmit up to 5 km. For many industrial applications, an even bigger benefit is that optical fiber isolates the data from dangerous increases in ground potential, ground loops, and electrical EMI/RFI electromagnetic radiation.

### Built-in Termination Resistors for RS-422 and RS-485

Industio boards have termination resistors built-in, eliminating the headaches involved in determining the proper impedance for the resistors. For additional information, please refer to Chapter 2.

### **ESD and Isolation Protection**

Certain models include TVSS (Transient Voltage Surge Suppressor) technology to help prevent damage due to lightning or high potential voltage. Optical isolation (2000V) and embedded protection (max. ESD of 16 KV, max. EFT of 2 KV) are also available with certain models. These features help provide protection in critical or harsh factory-type environments.

### **PCI Solution**

UPCI boards comply with PCI Spec. 2.1 and do not require switches or jumpers. IRQ and I/O address is automatically assigned by the PCI BIOS. This means that the board must be physically installed in the computer first before the driver software is installed.

### **Universal PCI**

For maximum compatibility with the PCI local bus specification, UPCI boards support both 3.3V and 5V PCI connector types. The 32/64-bit PCI local bus specification specifies both a 3.3V/5V and 32/64-bit slot.

### **Operating System Support**

Moxa UPCI boards are compatible with most major industrial platforms, including Windows, DOS, and Linux. Drivers are provided for smoother installation, configuration, and performance. This manual provides separate sections for the different operating systems that are supported.

### **Moxa Serial Communication Tools**

For application development, Moxa provides a serial communication library for Windows called PComm. This library can help you develop your own applications in Visual Basic, Visual C++, Borland Delphi, and more. Utilities are included for debugging, monitoring communication status, terminal emulation, and file transfer.

## **Applications**

UPCI boards are suitable for many industrial applications, including the following:

- Multipoint data acquisition
- Factory automation
- Critical industrial control
- Remote serial device control
- Internet/intranet connections
- Remote access applications
- Multi-user applications
- Industrial automation
- Office automation
- Telecommunications
- PC-based vending machines or kiosk systems
- POS (Point-of-Sale) systems

# Package Checklist

UPCI boards are shipped with the following items:

- 1 Moxa UPCI multiport serial board
- Low profile bracket (low profile models only)
- Document & Software CD
- Quick Installation Guide
- 5-year Product Warranty statement

NOTE: Notify your sales representative if any of the above items is missing or damaged. For information on optional accessories for each model, please refer to Chapter 5.

# **Product Features**

Moxa UPCI boards enjoy the following features:

- Over 700 Kbps data throughput for top performance
- Serial communication speed up to 921.6 Kbps
- 128-byte FIFO and on-chip hardware and software flow control
- Universal PCI supporting 3.3V PCI, 5V PCI and PCI-X
- Driver support for Windows, Windows CE, Windows XP Embedded, DOS, Linux, FreeBSD, QNX SCO OpenServer, UnixWare7
- On-board 15 KV ESD protection
- Low profile for compact-sized PCs (on "L" models only)
- 2 KV optical isolation protection (on "I" models only)
- -40 to 85°C wide temperature (on "T" models only)

# **Product Specifications**

### Hardware

I/O Controller: Connector Type:

MU860 (compatible with 16	6C550C)
CP-118U-I:	Female DB78
CP-118U:	Female DB62
CP-138U-I:	Female DB78
CP-138U:	Female DB62
CP-168U :	Female DB62
CP-114UL/ CP-114UL-I:	Female DB44
CP-134U/CP-134U-I:	Female DB44
CP-104UL :	Female DB44
CP-104JU :	8-pin RJ45
POS-104UL:	Female DB44
CP-112UL/CP-112UL-I:	Female DB25
CP-132UL/CP-112UL-I:	Female DB25
CP-102UL:	Female DB25
CP-102U:	Male DB9
CP-114UL:	Female DB44
CP-134U :	Female DB44
CP-134U-I :	Female DB44
CP-132UL :	Female DB25
CP-132UL-I :	Female DB25
CP-102UF:	ST type

Interface

Bus:	32-bit Universal PCI
No. of Ports:	8 Ports:
	CP-118U/CP-118U-I
	CP-138U/CP-138U-I
	CP-1168U
	4 Ports:
	CP-114UL/CP-114UL-I
	CP-134U/CP-134U-I
	CP-104UL/CP-104JU
	POS-104UL:
	2 Ports:
	CP-112UL/CP-112UL-I
	CP-132UL/CP-132UL-I
	CP-102UL
	CP-102U/CP-102UF
Max. No. of Boards:	4
Signals	
RS-232:	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422:	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
4-wire RS-485:	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
2-wire RS-485:	Data+(B), Data-(A), GND
Performance	
Baudrate:	50 bps to 921.6 Kbps
Configuration	
Parity:	None, Even, Odd, Space, Mark
Data Bits:	5, 6, 7, 8
Stop Bits:	1, 1.5, 2
I/O Address, IRQ:	Assigned by BIOS
FIFO:	128 bytes
Flow Control:	RTS/CTS, XON/XOFF
Driver Support:	Windows 2000
	Windows XP/2003/Vista/2008 (x86 & x64)
	Linux 2.4
	Linux 2.6 (x86 & x64)
	Complete driver support information is available at www.moxa.com in the
	Download center.
Power Output:	5V/12V (POS-104UL only)
Power and Environment	
Operating Temperature:	0 to 55°C (32 to 131°F)
Operating Humidity:	5 to 95% RH
Storage Temperature:	-40 to 85°C (-40 to 185°F)
Protection:	Embedded 15 KV ESD protection
Certifications	
Approved:	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, IEC61000-4-2,
	IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8,
	IEC61000-4-11, FCC Part 15 Class B
Warranty	5 years

# Installation Guide

UPCI board installation can be divided into six steps as follows:

- **Step 1:** Select serial transmission mode.
  - For certain models, you will need to set onboard DIP switches to select the serial transmission mode for each port. This applies to the CP-118U-I, CP-138U-I, CP-118U, CP-138U, CP-114UL, CP 114UL + CP 124UL + C
    - CP-114UL-I, CP-134U, CP-134U-I, CP-112UL, CP-112UL-I, CP-132UL, CP-132UL-I, POS-104UL, and CP-102UF. For details, please refer to Chapter 2.
- Step 2: Install board. UPCI boards are installed in an open PCI or PCI-X expansion slot on the PC. For details, please refer to Chapter 2.
- Step 3:Install drivers and configure boardFor details, please refer to Chapters 3 through 8.
- **Step 4:** Connect your serial devices to the board's serial ports For details, please refer to Chapter 10.
- Step 5: Restart system and verify driver initializationFor details, please refer to Chapters 3 through 8.
- **Step 6:** Develop and run your serial communication application For details, please refer to Chapter 9.

2

# Hardware Installation

The following topics are covered in this chapter:

- Overview
- **Configuring the Board and Dimension** 
  - > CP-118U/CP-118U-I
  - > CP-138U/CP-138U-I
  - ➢ CP-168U
  - ➢ CP-114UL/CP-114UL-I
  - CP-134U/CP-134U-I
  - ➢ CP-104UL
  - ➢ CP-104JU
  - > POS-104UL
  - CP-112UL/CP-112UL-I
  - CP-132UL/CP-132UL-I
  - ➢ CP-102UL
  - ➢ CP-102U
  - ➢ CP-102UF
- Plugging the Board into an Expansion Slot

# **Overview**

This chapter explains the hardware installation procedure in detail. Since the BIOS automatically assigns the IRQ number and I/O addresses, you will need to install the board before you install the drivers. You can install up to 4 UPCI boards in one system, as long as sufficient I/O address and IRQ number resources are available.

# **Configuring the Board and Dimension**

<u>8 Ports</u>

## CP-118U/CP-118U-I



Onboard termination resistors can be activated individually for each serial port using jumpers JP1 through JP8. For CP-118U-I, JP1/2/3/4/5/6/7/8 corresponds to serial port 1/2/3/4/5/6/7/8, respectively. For CP-118U, JP1/2/3/4/5/6/7/8 corresponds to serial port 8/7/6/5/4/3/2/1, respectively. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

The onboard DIP switches, S1, S2, and S3, are used to select RS-232, RS-422, or RS-485 mode for each serial port. There are 8 switches on each bank corresponding to the 8 serial ports. S3 selects between RS-232 and RS-422/485, S2 selects between RS-422 and RS-485, and S1 selects between 2-wire and 4-wire RS-485, as follows:

Mode	S1	S2	<b>S</b> 3
RS-232			ON
RS-422		ON	OFF
4-wire RS-485	ON	OFF	OFF
2-wire RS-485	OFF	OFF	OFF

# CP-138U/CP-138U-I





Onboard termination resistors can be activated individually for each serial port using jumpers JP1 through JP8. For CP-138U-I, JP1/2/3/4/5/6/7/8 corresponds to serial port 1/2/3/4/5/6/7/8, respectively. For CP-138U, JP1/2/3/4/5/6/7/8 corresponds to serial port 8/7/6/5/4/3/2/1, respectively. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

The onboard DIP switches, S1 and S2, are used to select RS-422 or RS-485 mode for each serial port. There are 8 switches on each bank corresponding to the 8 serial ports. S2 selects between RS-422 and RS-485; S1 selects between 2-wire and 4-wire RS-485, as follows:

Mode	S1	S2
RS-422		ON
4-wire RS-485	ON	OFF
2-wire RS-485	OFF	OFF

## CP-168U



This board does not require configuration.

### 4 Ports

# CP-114UL/CP-114UL-I





Onboard termination resistors can be activated individually for each serial port using jumpers JP1 through JP4. For CP-114UL, JP1/2/3/4 corresponds to serial port 1/2/3/4, respectively. For CP-114UL-I, JP1/2/3/4 corresponds to serial port 4/3/2/1, respectively. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

The onboard DIP switches, S1, S2, and S3, are used to select RS-232, RS-422, or RS-485 mode for each serial port. Switches 1 through 4 on each bank correspond to the 4 serial ports. S3 selects between RS-232 and RS-422/485, S2 selects between RS-422 and RS-485, and S1 selects between 2-wire and 4-wire RS-485, as follows:

Mode	S1	S2	<b>S</b> 3
RS-232			ON
RS-422		ON	OFF
4-wire RS-485	ON	OFF	OFF
2-wire RS-485	OFF	OFF	OFF

## CP-134U/CP-134U-I



Onboard termination resistors can be activated individually for each serial port using jumpers JP1 through JP4. For CP-134U, JP1/2/3/4 corresponds to serial port 1/2/3/4, respectively. For CP-134U-I, JP1/2/3/4 corresponds to serial port 4/3/2/1, respectively. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

The onboard DIP switches, S1 and S2, are used to select RS-422 or RS-485 mode for each serial port. Switches 1 through 4 on each bank correspond to the 4 serial ports. S2 selects between RS-422 and RS-485; S1 selects between 2-wire and 4-wire RS-485. In addition, ports 1 and 2 can be set individually to RS-232 mode using the on-board 30-pin jumpers, as follows:

RS422 RS485

RS232

Port1

Port2





Use the jumper to cover the left two columns of jumper pins.

RS-232 mode: Use the jumper to cover the right

two columns of jumper pins.





This board does not require configuration.

### CP-104JU



This board does not require configuration.

## POS-104UL



The onboard jumpers are used to specify the pin 9 power signal for each serial port.

### Step a

The top row of jumper pins selects the source of 12V power; the bottom row of jumper pins selects the source of 5V power:

Bus power	External power
•	• • •

If 5V or 12V external power is enabled, you will need to connect the cable from the back of POS-104UL to the PC's power supply. Remove both jumpers to disable all power signals to all ports.

### Step b

For each serial port, a set of 5 jumper pins is used select the power signal that is sent to pin 9.

5V	12V	RI signal (input)
•••	••	•••

To disable pin 9 power signals for a specific port, remove the jumper.

F

F

CP-112UL-I

O JP1

O JP2

16 mm(0.63 in ) 41.7 mm (1.64 in)

## CP-112UL/CP-112UL-I





2-WIRE ON

S2

RS48

R\$422

1 2 3

0

MOXA

MU860

0

64.4 mm (2.53 in)

> 80.35 mm (3.16 in)

> > 121 mm (4.76 in)

Mode	S1	S2	<b>S</b> 3
RS-232	ON		
RS-422	OFF	ON	
4-Wire RS-485	OFF	OFF	ON
2-Wire RS-485	OFF	OFF	OFF

## CP-132UL/CP-132UL-I



Onboard termination resistors can be activated individually for each serial port using jumpers JP1 and JP2. JP1 corresponds to serial port 1. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

The onboard DIP switches, S1 and S2, are used to select RS-422 or RS-485 mode for each serial port. On each bank, switch 1 corresponds to port 1 and switch 2 corresponds to port 2. S2 selects between RS-422 and RS-485; S1 selects between 2-wire and 4-wire RS-485.

## **CP-102UL**



This board does not require configuration.

## CP-102U



This board does not require configuration.

# **CP-102UF**



The onboard DIP switches are used to configure the CP-102UF for "Ring mode" or "Normal". When using the CP-102UF board, your PC can be included as one node of a fiber ring formed using Moxa's own TCF-142 serial-to-fiber converter. Since each TCF-142 has two fiber ports and one serial port, PCs that are part of the ring will be able to communicate with serial devices connected to the ring. Note that the Tx port of the CP-102UF connects to a neighboring converter's Rx port to form the ring. When one node transmits a signal, the signal travels around the ring until it returns back to the transmitting unit, which then blocks the signals.



**NOTE** When configuring two or more CP-102UF boards installed in the same computer, please pay attention to the model names of the boards. The two models can be recognized by the type of connector on the board. Model CP-102UF-M uses plastic ST connectors, whereas model CP-102UF-S uses metal ST connectors.

# Plugging the Board into an Expansion Slot



### ATTENTION Safety First!

To avoid damaging your system and board, make sure your PC's power is turned off before installing your Universal PCI Board.

- Step 1: Power off the PC.
- Step 2: Shut off the power to any peripheral devices and remove the PC's cover.
- **Step 3:** Configure the UPCI board's DIP switches and jumpers as necessary. This only applies to certain models. For additional information, please refer to your model in this chapter.
- Step 4: Insert the board firmly into a free PCI or PCI-X slot on the PC.
- Step 6: Use a screw to secure the board in place.
- Step 7: Replace the PC's cover.
- Step 8: Power on the PC. The BIOS will automatically set the IRQ and I/O address.
- Step 9: Install the software. For details, please refer to the appropriate chapter for your operating system.

# Driver Installation: Windows Vista/2008

The following topics are covered in this chapter:

- Overview
- Installing the Driver
- Installing the Ports
- Verifying the Installation
- Configuring the Ports
- Disabling the Board
- Uninstalling the Board

# **Overview**

This chapter explains how to install, configure, update, and remove the board drivers for Windows Vista. The following models are supported:

2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Windows Vista supports up to 256 serial ports, from COM1 to COM256. Moxa developed pure 32 and 64-bit Windows device drivers in order to fully utilize the advanced multi-process and multi-thread features of Windows Vista. The drivers conform to the Win32 COMM API standard.

You can download the drivers from the Moxa website. For information on developing your own serial programming applications, please refer to Chapter 9.

Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

The overall procedure for installing the drivers is shown on the right. A newly installed board will be automatically detected by the operating system.



# Installing the Driver

The following instructions show how to install the driver for the first time under Windows Vista. You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver. The installation procedure for Windows 2008 is similar.



### ATTENTION

The following steps will not be necessary if a Moxa UPCI board was already installed on your computer. Windows will automatically detect and install any additional board(s) at bootup. In this case, you may proceed directly to configuring the ports.

Note that these instructions use the CP-118U as an example. The procedure for installing all models is the same.

 After the board is physically installed and the PC boots up, Windows will automatically detect the new board. The Found New Hardware Wizard window will open automatically. Select Locate and install driver software (recommended).



2. Select I don't have the disc. Show me other options.



3. Select Browse my computer for driver software (advanced).

VVIn	dows couldn't find driver software for your device	
*	Check for a solution Windows will check to see if there are steps you can take to get your device working.	
*	Browse my computer for driver software (advanced) Locate and install driver software manually.	

4. Click **Browse** and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software).

For 32-bit (x86) platforms, select the **\Windows 2008\_Vista\x86** folder.

For 64-bit (x64) platforms, select the \Windows 2008\_Vista\x64 folder.

After selecting the folder, click **Next** to continue.

G I Found New Hardware - PCI Serial Port	
Browse for driver software on your computer	
Search for driver software in this location: F:\CP-118U\Software\Windows Vista\x86 Include subfolders	Browse
	Next Cancel

5. If you receive a warning message stating that the Windows can't verify the publisher of the software, select **Install** this driver software anyway.



6. After the drivers have been installed, click Close to exit the wizard.



# **Installing the Ports**

After the board and drivers have been installed, an installation wizard will guide you through installation of the newly added serial ports, starting with port 0.

1. When prompted to insert a disc, select I don't have the disc. Show me other options.



2. Select Browse my computer for driver software (advanced).

•	Check for a solution
	Windows will check to see if there are steps you can take to get your device working.
4	Province into computer for driver cofficience (advanced)
1	Locate and install driver software manually.

Click Browse and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software). For 32-bit (x86) platforms, select the \Windows 2008\_Vista\x86 folder. For 64-bit (x64) platforms, select the \Windows 2008\_Vista\x86 folder. After selecting the folder, click Next to continue.

G	Found New Hardware - PCI Serial Port	
	Browse for driver software on your computer	
	Search for driver software in this location:	Pressee
	Include subfolders	Browse
		Next Cancel

4. If you receive a warning message stating that the Windows can't verify the publisher of the software, select **Install** this driver software anyway.



5. After the drivers have been installed, click **Close to exit the wizard**. The other serial ports will automatically install in the background.

	×
🕞 🧕 Found New Hardware - MOXA Communication Port 1 (COM3)	
Found New Hardware - MOXA Communication Port I (COM3) The software for this device has been successfully installed Windows has finished installing the driver software for this device: MOXA Port 0	
	lose

# Verifying the Installation

You can use Windows Device Manager to verify proper installation.

1. Under My Computer, click System Properties.



2. In the System window, click Device Manager.

				<u>_</u> 2
Control Panel	System	▼   <b>*</b> •     Sear	ch	2
Device Manager     Device Manager     Summary exitings     System protection     Advanced system settings	View basic informatic Windows edition Windows Vista™ Enterpr Copyright © 2006 Micro	on about your computer ise soft Corporation. All rights reserved.		
	System Rating:	1,0 Windows Experience Index		0
	Processor:	Intel(R) Celeron(R) M processor	600MHz 599 MHz	
	System type:	32-bit Operating System		
	Computer name, domain, a	nd workgroup settings	Change settings	
See also	Full computer name:	ha-PC	Unange settings	
Windows Undate	Computer description:			
Security Center	Workgroup:	WORKGROUP		
Performance	Windows activation			

3. In the **Device Manager** window, you should see the UPCI board under Multi-port serial adapters (CP-118U in this example). You should also see Moxa communication ports under **Ports (COM & LPT)**.

File       Action       Yiew       Help         Image: Stress Str	3
Image: Second	
<ul> <li>Disk drives</li> <li>Display adapters</li> <li>DVD/CD-ROM drives</li> <li>Floppy disk drives</li> <li>Floppy disk drives</li> <li>Floppy drive controllers</li> <li>Human Interface Devices</li> <li>IDE ATA/ATAPI controllers</li> <li>Keyboards</li> <li>Moitors</li> <li>Monitors</li> <li>Mottr port serial adapters</li> <li>MotxA CP-118U Series (PCI Bus)</li> <li>Network adapters</li> <li>Other devices</li> <li>Other devices</li> <li>Communications Port (COM2)</li> <li>MOXA Communication Port 2 (COM4)</li> <li>MOXA Communication Port 4 (COM6)</li> <li>MOXA Communication Port 5 (COM7)</li> <li>MOXA Communication Port 6 (COM2)</li> </ul>	
<ul> <li>DVD/CD-ROM drives</li> <li>Floppy disk drives</li> <li>Floppy drive controllers</li> <li>Mice and other pointing devices</li> <li>Monitors</li> <li>Monitors</li> <li>Monti-port serial adapters</li> <li>MOXA CP-118U Series (PCI Bus)</li> <li>Network adapters</li> <li>Other devices</li> <li>Ports (COM &amp; LPT)</li> <li>Communications Port (COM1)</li> <li>Communications Port (COM2)</li> <li>MOXA Communication Port 2 (COM4)</li> <li>MOXA Communication Port 3 (COM5)</li> <li>MOXA Communication Port 4 (COM6)</li> <li>MOXA Communication Port 5 (COM7)</li> <li>MOXA Communication Port 6 (COM6)</li> </ul>	*
<ul> <li>Floppy drive controllers</li> <li>Human Interface Devices</li> <li>IDE ATA/ATAPI controllers</li> <li>Keyboards</li> <li>Mice and other pointing devices</li> <li>Monitors</li> <li>MOXA CP-118U Series (PCI Bus)</li> <li>Network adapters</li> <li>Other devices</li> <li>Ports (COM &amp; LPT)</li> <li>Communications Port (COM1)</li> <li>Communications Port (COM2)</li> <li>MOXA Communication Port 2 (COM4)</li> <li>MOXA Communication Port 3 (COM5)</li> <li>MOXA Communication Port 4 (COM6)</li> <li>MOXA Communication Port 5 (COM7)</li> <li>MOXA Communication Port 6 (COM2)</li> </ul>	
<ul> <li>IDE ATA/ATAPI controllers</li> <li>Keyboards</li> <li>Mice and other pointing devices</li> <li>Monitors</li> <li>Monitors</li> <li>MOXA CP-118U Series (PCI Bus)</li> <li>Network adapters</li> <li>Other devices</li> <li>Ports (COM &amp; LPT)</li> <li>Communications Port (COM1)</li> <li>Communications Port (COM2)</li> <li>MOXA Communication Port 1 (COM3)</li> <li>MOXA Communication Port 3 (COM5)</li> <li>MOXA Communication Port 4 (COM6)</li> <li>MOXA Communication Port 5 (COM7)</li> <li>MOXA Communication Port 6 (COM6)</li> </ul>	
<ul> <li>Mice and other pointing devices</li> <li>Monitors</li> <li>Multi-port serial adapters</li> <li>MOXA CP-118U Series (PCI Bus)</li> <li>Metwork adapters</li> <li>Other devices</li> <li>Ports (COM &amp; LPT)</li> <li>Communications Port (COM1)</li> <li>Communications Port (COM2)</li> <li>MOXA Communication Port 1 (COM3)</li> <li>MOXA Communication Port 2 (COM4)</li> <li>MOXA Communication Port 3 (COM5)</li> <li>MOXA Communication Port 4 (COM6)</li> <li>MOXA Communication Port 5 (COM7)</li> <li>MOXA Communication Port 6 (COM6)</li> </ul>	
<ul> <li>Multi-port serial adapters</li> <li>MOXA CP-118U Series (PCI Bus)</li> <li>Metwork adapters</li> <li>Other devices</li> <li>Ports (COM &amp; LPT)</li> <li>Communications Port (COM1)</li> <li>Communications Port (COM2)</li> <li>MOXA Communication Port 1 (COM3)</li> <li>MOXA Communication Port 2 (COM4)</li> <li>MOXA Communication Port 3 (COM5)</li> <li>MOXA Communication Port 4 (COM6)</li> <li>MOXA Communication Port 5 (COM7)</li> <li>MOXA Communication Port 6 (COM6)</li> </ul>	
Active of the event of the	_
Other devices     Other devices     Ports (COM & LPT)     Communications Port (COM)     MOXA Communication Port 1 (COM)     MOXA Communication Port 2 (COM4     MOXA Communication Port 3 (COM5)     MOXA Communication Port 4 (COM6)     MOXA Communication Port 5 (COM7)     MOXA Communication Port 6 (COM6)	=
Communications Port (COM1) Communications Port (COM2) MOXA Communication Port 1 (COM3) MOXA Communication Port 2 (COM4) MOXA Communication Port 3 (COM5) MOXA Communication Port 4 (COM6) MOXA Communication Port 5 (COM7) MOXA Communication Port 6 (COM6)	
MOXA Communication Port 4 (COM2) MOXA Communication Port 2 (COM4) MOXA Communication Port 3 (COM5) MOXA Communication Port 4 (COM6) MOXA Communication Port 5 (COM7) MOXA Communication Port 6 (COM6)	
MOXA Communication Port 1 (COM3) MOXA Communication Port 2 (COM4) MOXA Communication Port 3 (COM5) MOXA Communication Port 4 (COM6) MOXA Communication Port 5 (COM7) MOXA Communication Port 6 (COM6)	
MOXA Communication Port 2 (COM4) MOXA Communication Port 3 (COM5) MOXA Communication Port 4 (COM6) MOXA Communication Port 5 (COM7)	
MOXA Communication Port 3 (COM5) MOXA Communication Port 4 (COM6) MOXA Communication Port 5 (COM7)	
MOXA Communication Port 4 (COM6) MOXA Communication Port 5 (COM7) MOXA Communication Port 6 (COM6)	
MOXA Communication Port 5 (COM7)	
MOXA Communication Port 6 (COMs)	
MOXA Communication Port 8 (COM10)	
🕀 🔲 Processors	7

4. If you see any special marks, such as a question mark or an exclamation mark, next to the Moxa items, the installation of your module or serial ports was not successful. Examine the Windows event log for details.
# **Configuring the Ports**

After the board and serial port drivers are installed, the board's **Properties** window will appear. The system will map the ports automatically. You may be prompted to take care of port configuration if other Moxa boards have been installed.

1. On the Ports Configuration tab, select a port to configure and click Port Setting.

neral	Ports Conf	iguration Driver	Details Resource	es
Port	COM No.	Rx FIFO Level	Tx FIFO Level	
1	COM 3	High	High	
2	COM 4	High	High	
3	COM 5	High	High	
4	COM 6	High	High	
5	COM 7	High	High	
6	COM 8	High	High	<u>H</u> elp
7	COM 9	High	High	
8	COM 10	High	High	Port Info
				Port Setting

 Under Port Number, select a COM number to assign to the serial port. Select Auto Enumerating COM Number to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.

Port Number	COM3 (current)	-
🔽 Auto	Enumerating <u>C</u> O	M Numbe
<u>R</u> x FIFO Level	High	•
🔽 Set th	ie change to <u>a</u> ll p	ports
<u>I</u> x FIFO Level	High	•
l <b>v</b> <u>S</u> et th	ie change to all p	ports

Select an **Rx FIFO Trigger** and **Tx FIFO Size**. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select **Set the change to all ports** to use this setting for all serial ports on the board.

	Tx FIFO	Rx FIFO
High	128	120
Middle	64	60
Low	1	1

 Click OK to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click OK to close the Properties window and apply the new port settings.

# **Disabling the Board**

1. Right-click My Computer and select Properties in the context menu.



2. In the System window, click Device Manager.

~			
🔾 🗢 🕎 🕨 Control Panel	<ul> <li>System</li> </ul>	✓ 4 Sear	ch
Device Manager Periode setting System protection Advanced system settings	View basic informatio Windows edition Windows Vista™ Enterpri Copyright © 2006 Micro	in about your computer ise soft Corporation. All rights reserved.	
	System Rating:	1,0 Windows Experience Index	-
	Processor:	Intel(R) Celeron(R) M processor	600MHz 599 MHz
	Memory (RAM):	479 MB	
	System type:	32-bit Operating System	
	Computer name, domain, ar	nd workgroup settings	
	Computer name:	ha-PC	@Change settings
See also	Full computer name:	ha-PC	
Windows <u>U</u> pdate	Computer description:		
Security Center	Workgroup:	WORKGROUP	
	AND A CONTRACTOR		

3. In **Device Manager**, right-click the UPCI board under **Multi-port serial adapters** and select **Disable** in the context menu. This will disable the board.

# **Uninstalling the Board**

1. Right-click My Computer and select Properties in the context menu.



2. In the System window, click Device Manager.

🗿 🔵 🗢 👰 🕨 Control Panel	<ul> <li>System</li> </ul>	✓ 43 Sec	arch	
Device Manager         Device Manager         Device settings         System protection         Advanced system settings	View basic informatic Windows edition Windows Vista <sup>™</sup> Enterpr Copyright © 2006 Micro	on about your computer ise soft Corporation. All rights reserved.		0
	System Rating:	1.0 Windows Experience Index		
	Processon	Intel(R) Celeron(R) M processor	600MHz 599 MHz	
	Memory (RAM):	479 MB		
	System type:	32-bit Operating System		
	Computer name, domain, a	nd workgroup settings		
	Computer name:	ha-PC	Change settings	
See also	Full computer name:	ha-PC		
Windows <u>U</u> pdate	Computer description:			
Security Center	Workgroup:	WORKGROUP		
Performance	Windows activation			

- 3. Right-click the UPCI board under **Multi-port serial adapters** (CP-118U in this example) and select **Uninstall** in the context menu.
- 4. A confirmation dialog will appear. Click **OK** to uninstall the device.

# Driver Installation: Windows XP/2003

The following topics are covered in this chapter:

- Overview
- Installing the Driver
- Installing the Ports
- Verifying the Installation
- **Configuring the Ports**
- Using PComm
- Using Event Log
- Disabling the Board
- Uninstalling the Board

#### **Overview**

This chapter explains how to install, configure, update, and remove the board drivers for Windows XP/2003. The following models are supported:

2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Windows XP/2003 supports up to 256 serial ports, from COM1 to COM256. Moxa developed pure 32 and 64-bit Windows device drivers in order to fully utilize the advanced multi-process and multi-thread features of Windows XP/2003. The drivers conform to the Win32 COMM API standard.

You can download the drivers from the Moxa website. For information on developing your own serial programming applications, please refer to Chapter 9.

Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

The overall procedure for installing the drivers is shown on the right. A newly installed board will be automatically detected by the operating system.



# Installing the Driver

The following instructions show how to install the driver for the first time under Windows XP. The same procedure is used for Windows 2003. You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver.



#### ATTENTION

The following steps will not be necessary if a Moxa UPCI board was already installed on your computer. Windows will automatically detect and install any additional board(s) at bootup. In this case, you may proceed directly to configuring the ports.

Note that these instructions use the CP-118U as an example. The procedure for installing all models is the same.

 After the board is physically installed and the PC boots up, Windows will automatically detect the new board. The Found New Hardware Wizard window will open automatically. When prompted to connect to Windows Update, select. No, not this time and click Next to continue.

Found New Hardware Wizard		
	Welcome to the Found New Hardware Wizard	
	Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission). <u>Read our privacy policy</u>	
	Can Windows connect to Windows Update to search for software?	
	$\bigcirc$ Yes, this time only	
	Yes, now and every time I connect a device	
	No, not this time     Interview     Interview	
	Click Next to continue.	
	< <u>B</u> ack <u>N</u> ext > Cancel	

2. Select Install from a list or specific location (Advanced) and click Next to continue.



3. Select Search for the best driver in these locations and Include this location in the search. Click **Browse** and select the appropriate directory on the Document & Software CD for the driver.

Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software). For 32-bit (x86) platforms, select the **\Windows XP\_2003\x86** folder. For 64-bit (x64) platforms, select the **\Windows XP\_2003\x64** folder. After selecting the folder, click **Next** to continue.

Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check beyou below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (lloppy, CD-ROM)
Include this location in the search:
F:\CP-118U\Software\Windows XP_2003\x86
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< <u>B</u> ack <u>N</u> ext > Cancel

4. If you see a warning that the software has not passed Windows Logo testing, click Continue Anyway.

Har dwa	Hardware Installation		
<u>.</u>	The software you are installing for this hardware: MOXA CP-118U Series (PCI Bus) has not passed Windows Logo testing to verify its compatibility with Windows XP. ( <u>Tell me why this testing is important</u> .) <b>Continuing your installation of this software may impair</b> or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.		
	Continue Anyway		

5. Windows will install the drivers. When the installation is complete, click Finish.

Found New Hardware Wizard				
Please wa	it while the wizard installs the	e software		Ð
M	MOXA CP-118U Series (PCI Bus)	)		
	<b>6</b>		Þ	
		< <u>B</u> ack	<u>N</u> ext >	Cancel

Found New Hardware Wizard		
	Completing the Found New Hardware Wizard	
	The wizard has finished installing the software for:	
	MOXA CP-118U Series (PCI Bus)	
	Click Finish to close the wizard.	
	< Back Finish Cancel	

# **Installing the Ports**

After the board and drivers have been installed, an installation wizard will guide you through installation of the newly added serial ports, starting with port 0.

1. When prompted to connect to Windows Update, select No, not this time and click Next to continue.

Found New Hardware Wizard		
	Welcome to the Found New Hardware Wizard	
	Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission). <u>Read our privacy policy</u>	
	Can Windows connect to Windows Update to search for software?	
	○ Yes, this time only	
	Yes, now and every time I connect a device	
	No, not this time	
	Click Next to continue.	
	< <u>B</u> ack <u>N</u> ext > Cancel	

2. Select Install from a list or specific location (Advanced) and click Next to continue.



 Select Search for the best driver in these locations and Include this location in the search. Click Browse and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software).

For 32-bit (x86) platforms, select the **\Windows XP\_2003\x86** folder.

For 64-bit (x64) platforms, select the **\Windows XP\_2003\x64** folder.

After selecting the folder, click **Next** to continue.

Found New Hardware Wizard			
Please choose your search and installation options.			
⊙ Search for the best driver in these locations.			
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.			
Search removable media (floppy, CD-ROM)			
✓ Include this location in the search:			
F:\CP-118U\Software\Windows XP_2003\x86 V Browse			
Don't search. I will choose the driver to install.			
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.			
< <u>B</u> ack <u>N</u> ext > Cancel			

4. If you see a warning that the software has not passed Windows Logo testing, click Continue Anyway.

Har dwa	re Installation
1	The software you are installing for this hardware: MOXA Port 0 has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.) Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
	Continue Anyway

5. After the drivers for the serial port have been installed, click **Finish** to close the wizard. Repeat this process for the remaining serial ports.



# Verifying the Installation

You can use Windows Device Manager to verify proper installation of the board.

1. Right-click My Computer and select Properties in the context menu.

Ļ	
Му Со	<b>Open</b> Explore
	Search Manage
	Map Network Drive Disconnect Network Drive
	Create Shortcut Rename
	Properties

2. In the Hardware tab, click Device Manager.

System Properties
System Restore Automatic opuaces Remote
General Computer Name Hardware Advanced
Device Manager The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
<u>D</u> evice Manager
Drivers Driver Signing lets you make sure that installed drivers are compatible with Windows. Windows Update lets you set up how Windows connects to Windows Update for drivers.
Driver <u>S</u> igning <u>W</u> indows Update
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles
OK Cancel Apply

3. In the **Device Manager** window, you should see your UPCI board under Multi-port serial adapters (CP-118U in this example). You should also see Moxa communication ports under **Ports (COM & LPT)**.



4. If you see any special marks, such as a question mark or an exclamation mark, next to the Moxa items, the installation of the board was not successful. Examine the Windows event log for details.

# **Configuring the Ports**

After the board and serial port drivers are installed, the board's **Properties** window will appear. The system will map the ports automatically. You may be prompted to take care of port configuration if other Moxa boards have been installed.

1. On the Ports Configuration tab, select a port to configure and click Port Setting.

IOXA CP-1	118U Ser	ries (PCI Bus)	Properties	? 🛛
General P	<sup>p</sup> orts Config	guration Driver	Details Resour	ces
Port C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9	COM No. OM 3 OM 4 OM 5 OM 6 OM 7 OM 8 OM 9 OM 9 OM 10	Rx FIFO Level High High High High High High High High	Tx FIFO Level High High High High High High High High	Help Port Info Port Setting

 Under Port Number, select a COM number to assign to the serial port. Select Auto Enumerating COM Number to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.

Port 1	×
Port Number	COM3 (current)
<u>R</u> x FIFO Level ☑ Set the	High 💽 e change to <u>a</u> ll ports
<u>I</u> x FIFO Level ☑ <u>S</u> et the	High 💽 e change to all ports
	<u>O</u> K Cancel

 Select an Rx FIFO Trigger and Tx FIFO Size. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select Set the change to all ports to use this setting for all serial ports on the board.

	Tx FIFO	Rx FIFO
High	128	120
Middle	64	60
Low	1	1

 Click OK to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click OK to close the Properties window and apply the new port settings.

# **Using PComm**

PComm Diagnostic is a useful program for checking the board's status. It provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, and other items. You can use PComm Diagnostic to verify that the module and serial ports are working properly.

You may download PComm from the Moxa website.

🐯 PComm Diagnostic	_ 🗆 🗙
File Diagnose Help	
To be tested	
CP-118U Series (COM3-COM10) IRQ=19,I/D=C880 PCI bus 4, device 15, function 0 CP-118U Series (COM3-COM10) IRQ=19,I/D=C880 PCI bus 4, device 15, function 0 Driver : 1.14 Total Configuration Boards = 1 COM Port Available Boards = 1 COM Port Available Boards = 1	
Ready	11

# **Using Event Log**

You may refer to the Windows event log to verify operation of the board. To view the event log, open Event Viewer, which is located under Administrative Tools in the Control Panel. Information about the board will be located under the System category.

# **Disabling the Board**

1. Right-click My Computer and select Properties in the context menu.



2. In the Hardware tab, click Device Manager.

System Properties			
System Restore Automatic Updates Remote			
General Computer Name Hardware Advanced			
Device Manager			
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.			
Device Manager			
Drivers         Driver Signing lets you make sure that installed drivers are compatible with Windows. Windows Update lets you set up how Windows connects to Windows Update for drivers.         Driver Signing       Windows Update         Driver Signing       Windows Update         Hardware Profiles       Hardware profiles provide a way for you to set up and store different hardware configurations.			
Hardware <u>P</u> rofiles			
OK Cancel Apply			

3. In **Device Manager**, right-click the UPCI board under **Multi-port serial adapters** and select **Disable** in the context menu. This will disable the board.

# **Uninstalling the Board**

1. Right-click My Computer and select Properties in the context menu.



2. In the Hardware tab, click Device Manager.

System Properties			
System Restore Automatic Updates Remote			
General Computer Name Hardware Advanced			
Device Manager			
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.			
Device Manager			
Drivers			
Driver Signing lets you make sure that installed drivers are compatible with Windows. Windows Update lets you set up how Windows connects to Windows Update for drivers.			
Driver Signing <u>W</u> indows Update			
Hardware Profiles			
Hardware profiles provide a way for you to set up and store different hardware configurations.			
Hardware Profiles			

3. Right-click the UPCI board under **Multi-port serial adapters** (CP-118U in this example) and select **Uninstall** in the context menu.



4. A confirmation dialog will appear. Click **OK** to uninstall the device.

# **Driver Installation: Windows 2000**

The following topics are covered in this chapter:

- Overview
- Installing the Driver
- Installing the Ports
- Verifying the Installation
- Configuring the Ports
- Using PComm
- Using Event Log
- Disabling the Board
- Uninstalling the Board

### **Overview**

This chapter explains how to install, configure, update, and remove the board drivers for Windows 2000. The following models are supported:

2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Windows 2000 supports up to 256 serial ports, from COM1 to COM256. Moxa developed pure 32-bit Windows device drivers in order to fully utilize the advanced multi-process and multi-thread features of Windows 2000. The drivers conform to the Win32 COMM API standard.

You can download the drivers from the Moxa website. For information on developing your own serial programming applications, please refer to Chapter 9.

Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

The overall procedure for installing the drivers is shown on the right. A newly installed board will be automatically detected by the operating system.



### Installing the Driver

The following instructions show how to install the driver for the first time under Windows 2000. You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver.



#### ATTENTION

The following steps will not be necessary if a Moxa UPCI board was already installed on your computer. Windows will automatically detect and install any additional board(s) at bootup. In this case, you may proceed directly to configuring the ports.

Note that these instructions use the CP-118U as an example. The procedure for installing all models is the same.

1. After the board is physically installed and the PC boots up, Windows will automatically detect the new board and the Found New Hardware Wizard window will open automatically. Click **Next** to continue.

Found New Hardware		
PCI Serial Port Installing		
Found New Hardware Wizard	Welcome to the Found New Hardware Wizard This wizard helps you install a device driver for a hardware device.	
	To continue, click Next.	
	< <u>B</u> ack	Cancel

2. Select Search for a suitable driver for my device (recommended) and click Next to continue.

Found New Hardware Wizard
Install Hardware Device Drivers A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:         PCI         Serial Port         A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.         What do you want the wizard to do?         Search for a suitable driver for my device (recommended)         Display a list of the known drivers for this device so that I can choose a specific driver
< <u>B</u> ack <u>N</u> ext > Cancel

3. Select Specify a location and click Next to continue.

Found New Hardware Wizard
Locate Driver Files Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify. To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations: Floppy disk drives CD-ROM drives
✓ Specify a location ✓ Microsoft Windows Update
< <u>B</u> ack <u>N</u> ext > Cancel

4. Click Browse and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software). Select the \Windows 2K folder and click Next to continue.

Hardware Wizard	×
Insert the manufacturer's installation disk into the drive selected, and then click OK.	OK Cancel
Copy manufacturer's files from:	Browse
	<u>Copy manufacturer's files from:</u> <u>Copy The Unit of Source Sourc</u>

5. After the wizard has located the driver files, click **Next** to proceed.

Found New Hardware Wizard
Driver Files Search Results The wizard has finished searching for driver files for your hardware device.
The wizard found a driver for the following device:
PCI Serial Port
Windows found a driver for this device. To install the driver Windows found, click Next.
d:\cp-118u\software\windows 2k\mxser.inf
< <u>B</u> ack <u>Next&gt;</u> Cancel

6. If you see a warning that the digital signature has not been found, click **Yes** to proceed.

Digital Signature Not Found	
	The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested. The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows. MDXA CP-118U Series (PCI Bus) If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available. Do you want to continue the installation?
	Yes <u>N</u> o <u>M</u> ore Info

7. Windows will install the drivers. When the installation is complete, click Finish.



# **Installing the Ports**

After the board and drivers have been installed, an installation wizard will guide you through installation of the newly added serial ports, starting with port 0.

1. When the installation wizard opens, click **Next** to proceed.

Found New Hardware Wizard	
	Welcome to the Found New Hardware Wizard This wizard helps you install a device driver for a hardware device.
	< Back Cancel

2. Select Search for a suitable driver for my device (recommended) and click Next to continue.

Found New Hardware Wizard
Install Hardware Device Drivers A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device: MDXA communication port
A device driver is a sortware program that makes a hardware device work, windows needs driver files for your new device. To locate driver files and complete the installation click Next.
what do you want the wizard to do?     Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< <u>B</u> ack <u>N</u> ext > Cancel

3. Select Specify a location and click Next to continue.

Found New Hardware Wizard	
Locate Driver Files Where do you want Windows to search for driver files?	
Search for driver files for the following hardware device:	
MOXA communication port	
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.	
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.	
Optional search locations: Floppy disk drives CD-ROM drives	
Specify a location	
Microsoft Windows Update	
< <u>B</u> ack <u>N</u> ext > Cancel	

4. Click Browse and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software). Select the \Windows 2K folder and click Next to continue.

Found Nev	w Hardware Wizard	×
	Insert the manufacturer's installation disk into the drive selected, and then click OK.	OK Cancel
	Copy manufacturer's files from:	<u>B</u> rowse

5. After the wizard has located the driver files, click **Next** to proceed.

Found New Hardware Wizard
Driver Files Search Results The wizard has finished searching for driver files for your hardware device.
The wizard found a driver for the following device:
Vindeus feund a driver fer Nie device. To install the driver Vindeus feund aliak Maut
windows round a driver for this device. To install the driver windows round, click next.
d:\cp-118u\software\windows 2k\mxsport.inf
The wizard also found other drivers that are suitable for this device. To view a list of these drivers or install one of these drivers, select the following check box, and then click Next. —
Install one of the other drivers
< <u>B</u> ack <u>Next</u> > Cancel

6. After the drivers have been installed, click **Finish** to exit the wizard. The other serial ports will automatically install in the background.

Found New Hardware Wizard	
	Completing the Found New Hardware Wizard MDXA Port 0 Windows has finished installing the software for this device.
	< <u>B</u> ack <b>[Finish</b> ] Cancel

# Verifying the Installation

You can use Windows Device Manager to verify proper installation of the board.

1. Right-click My Computer and select Properties in the context menu.



2. In the Hardware tab, click Device Manager.

System Properties 🥂 🗙
General Network Identification Hardware Use Profiles Advanced
Hardware Wizard The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware. Hardware Wizard
Device Manager The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the
Driver Signing
Hardware Profiles Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles
OK Cancel Apply

3. In the **Device Manager** window, you should see your UPCI board under Multi-port serial adapters (CP-118U in this example). You should also see Moxa communication ports under **Ports (COM & LPT)**.



4. If you see any special marks, such as a question mark or an exclamation mark, next to the Moxa items, the installation of the board was not successful. Examine the Windows event log for details.

# **Configuring the Ports**

After the board and serial port drivers are installed, the board's **Properties** window will appear. The system will map the ports automatically. You may be prompted to take care of port configuration if other Moxa boards have been installed.

1. On the Ports Configuration tab, select a port to configure and click Port Setting.

	Link	111-1-	
COM 3	High	High	
COM 5 COM 6	High High	High High	
COM 7	High	High	
COM 8 COM 9	High High	High High	Help
COM 10	High	High	
			Port Info
			Dest Catting
	COM 4 COM 5 COM 6 COM 7 COM 8 COM 9 COM 10	COM 4 High COM 5 High COM 6 High COM 7 High COM 8 High COM 9 High COM 10 High	COM 4 High High COM 5 High High COM 6 High High COM 7 High High COM 7 High High COM 8 High High COM 9 High High COM 10 High High

 Under Port Number, select a COM number to assign to the serial port. Select Auto Enumerating COM Number to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.

Port 1	]
Port Number	COM3 (current)
🗹 Aut	to Enumerating <u>C</u> OM Number
<u>R</u> x FIFO Level	High
💌 Set	the change to <u>a</u> ll ports
<u>I</u> x FIFO Level	High 💌
<mark>⊠</mark> <u>S</u> et	the change to all ports
٢	OK Cancel
L	

 Select an Rx FIFO Trigger and Tx FIFO Size. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select Set the change to all ports to use this setting for all serial ports on the board.

	Tx FIFO	Rx FIFO
High	128	120
Middle	64	60
Low	1	1

 Click OK to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click OK to close the Properties window and apply the new port settings.

# **Using PComm**

PComm Diagnostic is a useful program for checking the board's status. It provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, and other items. You can use PComm Diagnostic to verify that the module and serial ports are working properly.

You may download PComm from the Moxa website.

👯 PComm Diagnostic	<u>_ </u>	×
File Diagnose Help		
🖻 🖌 🔣 🔙 🎒		
To be tested		
CP-118U Series (COM3-COM10) IRQ=19.//0=C880 PCI bus 4, device 15, function 0	Board Status       CP-118U Series (CDM3-COM10)       IRQ=19.//0=C880       PCI bus 4, device 15, function 0       Driver: 1.14   Total Configuration Boards = 1 COM Port Available Boards = 1 OK	
Ready		11.

# **Using Event Log**

You may refer to the Windows event log to verify operation of the board. To view the event log, open Event Viewer, which is located under Administrative Tools in the Control Panel. Information about the board will be located under the System category.

# **Disabling the Board**

1. Right-click My Computer and select Properties in the context menu.



2. In the Hardware tab, click Device Manager.

System Prop	erties			? ×
General Ne	etwork Identification	Hardware	ser Profiles Ad	vanced
Hardware	: Wizard The Hardware wiza unplug, eject, and c	rd helps you ii onfigure your	nstall, uninstall, rep hardware. <u>H</u> ardware Wiz	air, ard
Device M	anager			
	The Device Manage on your computer. L properties of any de	er lists all the Ise the Devic vice.	hardware devices e Manager to char	installed nge the
	Driver <u>S</u> igning	J	<u>D</u> evice Mana	ger
Hardware	Profiles Hardware profiles pr different hardware c	ovide a way I onfigurations.	for you to set up ar	nd store
			Hardware <u>P</u> rol	iles
		OK	Cancel	Apply

3. In **Device Manager**, right-click the UPCI board under **Multi-port serial adapters** and select **Disable** in the context menu. This will disable the board.

# **Uninstalling the Board**

1. Right-click My Computer and select Properties in the context menu.



2. In the Hardware tab, click Device Manager.

System Properties	<u>?</u> ×					
General Network Identification Hardware User Profiles Advanced						
Hardware Wizard The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.						
_ Device Manager						
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.						
Driver Signing Device Manager	$\mathbb{P}$					
Hardware Profiles Hardware profiles provide a way for you to set up and store different hardware configurations.						
Hardware Profiles						
OK Cancel <u>Ap</u>	yly					

3. Right-click the UPCI board under **Multi-port serial adapters** (CP-118U in this example) and select **Uninstall** in the context menu.



4. At the warning prompt, click **OK** to uninstall the device.

# **Driver Installation: Windows NT**

The following topics are covered in this chapter:

- Overview
- Installing the Driver
- Configuring the Ports
- Removing the Board
- Updating the Driver
- Removing the Driver

### **Overview**

This chapter explains how to install, configure, update, and remove the board drivers for Windows NT. The following models are supported:

2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Windows NT supports up to 256 serial ports, from COM1 to COM256. Moxa developed pure 32-bit Windows device drivers in order to fully utilize the advanced multi-process and multi-thread features of Windows NT. The drivers conform to the Win32 COMM API standard.

You can download the drivers from the Moxa website. For information on developing your own serial programming applications, please refer to Chapter 9.

Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

The overall procedure for installing the drivers is shown on the right. Windows NT will not automatically detect a newly installed board. You will need to manually add the board in the operating system.



# Installing the Driver

You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver. Note that these instructions use the CP-168U as an example. The procedure for installing all models is the same.

1. Log into Windows NT as Administrator.

Locate the appropriate folder for your board's drivers on the Document & Software CD. The NT drivers will be located under the product folder in the **\Software\WinNT** directory (e.g., under \CP-118U Series\Software). Copy this folder to the PC's hard disk and remember its location.

In the **Control Panel**, open **Network** applet. On the **Adapters** tab, click **Add**. When prompted to select a product, click **Have Disk**...

You will be prompted to enter the path to the driver. Enter the location of the drivers that you copied from the Document & Software CD (C:\Windows.nt in this example) and then click OK.

Network ?X
Identification Services Protocols Adapters Bindings
Network Adapters:
Select Network Adapter
Click the Network Adapter that matches your hardware, and then
Insert Disk
Insert disk with software provided by the software or hardware manufacturer. If the files can be found at a different location, for example on another drive type a new path to the files below.
Iter Int C:\Windows.nt
OK Cancel
OK Cancel

2. When prompted, select your board model (Smartio/Industio Family multiport board in this example) and click OK.

Select OEM Option	ς.
Choose a software supported by this hardware manufacturer's disk.	
MOXA Smartio/Industio Family multiport board	
OK Cancel <u>H</u> elp	

 After the files have been installed, a configuration panel will open. This is where boards are installed, configured, and removed. If another board has already been installed on the system, it will already be listed. Windows NT does not automatically detect Moxa UPCI boards, so you will need to click Add for a newly installed board.

Moxa Smartio/Indu	stio Configur	ation Pane					×
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number	
$\frown$							
Add		<u>R</u> emove				Property	
			_				
			1				
		<u>O</u> K				Cancei	

4. Under Board Type, select the UPCI board that is being installed. The window will show the COM settings for the serial ports on the board. You can modify the COM settings for any port at this time by selecting a port and clicking Port Setting. If you are satisfied with the COM settings, click OK to return to the configuration panel.

Pro	opert	y				
	Board Type			8U Series(Bi	us/Dev=2/12)	
	🔽 INT Vector			AC00		
	Interrupt No.			48 👻		
	B	ase I/O Port	Address	A800	_	
				1		
	Port	COM No.	RX FIFO Lev	el   Tx FIFO	Level	
I.	1	COM3	High	High		
2	2	COM4	High	High		
13	3	COM5	High	High		
4	4	COM6	High	High		
15	5	COM7	High	High		
E	5	COM8	High	High		
17	<u> </u>	COM9	High	High		
18	5	COM10	High	High		
				Rost Info	Port Setting	
				Courinto	For setting	
				ок	Cancel	
5. The board will now appear in the configuration panel (**CP-168U Series in this example**). Click **OK** to return to the Network applet. After that, click **OK** again to exit the Network applet

Moxa Smartio/Indu	stio Configur	ation Pane	1			
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number
CP-1660 Series	A800	ACUL	40	.2	12	COMS - COMITO
Add		Remove				Property
		<u>o</u> k				Cancel

6. Restart the PC. After you have logged back into Windows NT, you may check the event log issued by the Moxa driver to see if the board's ports have been initialized successfully. In the Administrative group, open Event Viewer and select Log and System. For each newly installed or configured Moxa UPCI board, check for a message stating that the board has been enabled (e.g., "Moxa CP-168U board, with first serial port COM3, has been enabled").



#### ATTENTION

The driver configuration will NOT take effect until you restart the PC. Double check that all CP-168U board components are connected and fastened tightly to ensure that the system and the driver can start up successfully.

# **Configuring the Ports**

1. In Windows **Control Panel**, open the **Network** applet. In the **Adapters** tab, UPCI boards will appear as a type of Moxa adapter (**Moxa Smartio/Industio Family Adapter** in this example). Select the Moxa adapter and click **Properties...** 

Network ?X
Identification Services Protocols Adapters Bindings
Network Adapters:
■ [1] Intel[R] PRO/100 VE Network Connection ■ [2] MOXA Smartio/Industio Family Adapter
Add <u>B</u> emove <u>Properties</u> <u>Update</u> <u>Item Notes:</u> MOXA Smartio/Industo Family Adapter
OK Cancel

2. The configuration panel will open with a list of installed boards. Select your board and click **Property**. Up to 4 Moxa UPCI boards can be installed at a time.

🔒 Moxa Smartio/Indu	stio Configu	ation Pane	l				
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number	Ĩ
CP-168U Series	A800	ACOC	48	2	12	COM3 - COM10	1
1							
Add		Remove				Property	
		<u>0</u> K				Cancel	

3. Select a port to configure and click Port Setting.

Ρ	ropert	y						×
	B	oard Type		P-168U	Series(E	)us/De	ev=2/12)	-
	INT Vector			A	.C00			
	Interrupt No.			48	3	-		
	B	ase I/O Port	<u>A</u> ddress	Ā	800			
	Deut	0000			T., 550	1		
	Port	COM NO.	RX FIFO	Levei	TXFFO	Leve	: <b>I</b>	
	1	COM3	High		High			
	2	COM4	High		High			
	3	COM5	High		High			
	4	COME	High		High			
	5	COM7	High		High			
	5	COM8	High		High			
	lá –	COM9	High		High			
	Ľ	COWITO	nign		nign			
						1		
				Eo	rt Info		Port Setting	
				0	ĸ		Cancel	

 Under Port Number, select a COM number to assign to the serial port. Select Auto Enumerating COM Number to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.

Poi	d 1
	Port Number COM3 ▼ Auto Enumerating COM Number
	Rx FIFO Level High ▼ ▼ Set the change to <u>all ports</u>
	Ix FIFO Level High ▼ ▼ Set the change to all ports
	<u>O</u> K Cancel

Select an **Rx FIFO Trigger** and **Tx FIFO Size**. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select **Set the change to all ports** to use this setting for all serial ports on the board.

	Tx FIFO	Rx FIFO
High	128	120
Middle	64	60
Low	1	1

 Click OK to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click OK to close the Properties window and apply the new port settings. Click OK again to exit the Network applet.

Moxa Smartio/Indu	stio Configur	ation Pane						
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM N	lumber	
CP-168U Series	A800	ACOC	48	2	12	COM3	- COM10	
Add		Remove	1			Prope	artu	
		<u>I.(</u> emove				Tobe	sity	
		ок				Car		

## **Removing the Board**

To remove a board, shut of your PC and physically remove the board from the PCI slot. The next time you start up the PC, Windows NT will automatically remove the configuration. You do not need to go through the Windows control panel.

## **Updating the Driver**

1. In Windows **Control Panel**, open the **Network** applet. In the **Adapters** tab, UPCI boards will appear as a type of Moxa adapter (**Moxa Smartio/Industio Family Adapter** in this example). Select the Moxa adapter and click **Remove**.

Network ?X
Identification Services Protocols Adapters Bindings
Network Adapters:
[1] Intel(R) PR0/100 VE Network Connection      [2] MDXA Smartio/Industic Family Adapter
Add Bemove Properties Update
MOXA Smartio/Industo Family Adapter
OK Cancel

2. Restart the system. Go through the process of installing the drivers using the new drivers.

# **Removing the Driver**

1. In Windows **Control Panel**, open the **Network** applet. In the **Adapters** tab, UPCI boards will appear as a type of Moxa adapter (**Moxa Smartio/Industio Family Adapter** in this example). Select the Moxa adapter and click **Remove**.

Network	? ×
Identification Services Protocols Adapters Bindings	
Network Adapters:	
1] Intel(R) PRO/100 VE Network Connection	
[2] MOXA Smartio/Industic Family Adapter	
	- 11
Add Bemove Properties Update	
Item Notes:	
MOXA Smartio/Industo Family Adapter	
OK Canc	εl

2. Click **OK** to exit the Network applet and restart the system.

7

# Driver Installation: Windows 95/98/ME

The following topics are covered in this chapter:

- Overview
- Installing the Driver
  - > Windows 95
  - ➢ Windows 98 and ME
- Configuring the Ports
- Updating the Driver
- Removing the Driver

### **Overview**

This chapter explains how to install, configure, update, and remove the board drivers for Windows 95/98/ME. The following models are supported:

2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Windows 95/98/ME supports up to 128 serial ports, from COM1 to COM128. In order to fully utilize the advanced multi-process and multi-thread features of Windows 95/98/ME, Moxa developed pure 32-bit virtual device port drivers (VxD) that are compliant with communication drivers (VCOMM). The drivers conform to the Win32 COMM API standard.

You can download the drivers from the Moxa website. For information on developing your own serial programming applications, please refer to Chapter 9.

Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

The overall procedure for installing the drivers is shown on the right. A newly installed board will be automatically detected by the operating system.



## Installing the Driver

The following instructions show how to install the driver for the first time under Windows 95/98/ME. You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver.



#### ATTENTION

The following steps will not be necessary if a Moxa UPCI board was already installed on your computer. Windows will automatically detect and install any additional board(s) at bootup. In this case, you may proceed directly to configuring the ports.

### Windows 95

1. After the board is physically installed and the PC boots up, Windows will automatically detect the new board and the Found New Hardware Wizard window will open. Click **Next** to continue.

Jpdate Device Driver Wizard					
Update Device Driver V	Vizard This wizard will complete the installation of: PCI Serial Controller by searching your local drives, network, and Internet locations for the most current driver. If you have a disk or CD-ROM tha: came with this device, insert it now. It is recommended that you let Windows search for an updated driver. To do this, click Next to continue.				
	< <u>B</u> ack Next> Cancel				

2. Select Other Locations...

Update Device Driver	Wizard
	Windows was unable to locate a driver for this device. f you do not want to install a driver now, click Finish. To search for a driver manually, click Other Locations. Or, to begin the automatic search again, click Back.
<b>~</b>	Other Locations
	< Back Frish Cancel

3. Click **Browse** and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the **\Software** directory (e.g., under \CP-168U \Software). Select the **\Win9x** folder and click **OK** to continue.

Select Other Location	×
Type the name of the folder that contains the drive Browse.	r you want. To search for a folder, click
Location	Browse)
	OK Cancel

4. After Windows finds the drivers, click Finish.

Add New Hardware Wi	zard				
	Windows driver file search for the device:				
	CP-168U Series				
	If you want to use this driver, click Finish. If this is not the correct driver and you want to search for a different driver manually, click Other Locations.				
📕 🥗 🍣 🗌	Location of Driver				
<u></u>	Windows.95				
	Other Locations				
	·				
	< <u>B</u> ack Finish Cancel				

5. You may begin configuring and using the new COM ports right away without restarting Windows.

### Windows 98 and ME

 After the board is physically installed and the PC boots up, Windows will automatically detect the new board and the Found New Hardware Wizard window will open. Click Next to continue.



2. Select **Display a list...** and click **Next**.

Add New Hardware Wiz	ard
	What do you want Windows to do?
	<ul> <li>Search for the best driver for your device. (Recommerded).</li> </ul>
	<ul> <li>Display a lis: of all the drivers in a specific location, so you can select the driver you want.</li> </ul>
<b>B</b>	
<b>~</b>	
	< <u>B</u> ack Next > Cancel

3. Select Other Devices and click Next.

Add New Hardware Wizard					
	Select the type of device from the list below, then click Next. Mouse Multi-function adapters MultiIDController Network adapters				
	Other detected devices Other devices PCMCIA socket Ports (COM & LPT) Printer SBP2 SCSI controllers				
	< <u>B</u> ack Next> Cancel				

4. Select Have Disk ...

Add New	Hardware Wizard			
<b>}</b>	Select the manufacturer and model of your hardware device. If you have a disk that contains the updated driver, click Have Disk. To install the updated driver, click Finish.			
Mo <u>d</u> els: Unsupr	vorted Device			
	<u>H</u> ave Disk < <u>B</u> ack Next > Cancel			

 Click Browse and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-168U \Software). Select the \Win9x folder and click OK to continue.



6. After Windows installs the drivers, click Finish.

Add New Hardware Wizard						
	CP-168U Series Windows has finished installing the software you selected that your new hardware device requires.					
	< Back Frish Cancel					

# **Configuring the Ports**

You may configure the COM ports after the board and drivers have been installed.

1. In the Windows **Control Panel**, open the **System** applet.

🗟 Control P	anel				_	. <u> </u>
<u> </u>	<u>V</u> iew <u>G</u> o	F <u>a</u> vorites <u>H</u>	<u>H</u> elp			-
Baok.	↓ → . Forward	Up	Kap Drive	<b>X</b> Disconnect	X Cut	»
Address 🐼	Control Panel					•
Add New	Add/Remove	Bate/Time	Display	Fonts	Game	
Hardware	Programs		Ś	50		
Internet Options	Keyboard -	Modems	Mouse	Multime	dia Network	
2		ų,				
Sources (32bit	Passwords	Power Managemen	Printers it	Setting	na Sounds gs	
System	Telephony	<b>E</b> Users				
21 object(s)				My Compute	r	

2. In the **Device Manager** tab, expand the **Moxa Smartio/Industio multiport board** category by clicking the "+" sign next to it. Select the desired board (CP-168U in this example) and click **Properties**.

System Properties	? ×
General Device Manager Hardware Profiles Performance	
• View devices by type • • • • • • • • • • • • • • • • • • •	
Computer Co	
Properties Refresh Remove Print	]
OK Carro	el

3. On the Ports Configuration tab, select a port to configure and click Port Setting.

CP-1	68U	Series Prop	oerties				?	×
Ge	eneral	Ports Config	juration Di	iver	Resour	ces		
		_		_				I
		M IN	l <u>V</u> ector	A	C00			Н
		įni	terrupt No	10	)	$\overline{\mathbf{v}}$		
		Base I/O Port	<u>A</u> ddress	A	800			Н
		PCI Bus Nur	nberis 0 an	, d Devi	ice Numi	beris O		Н
ſ								
	Por	t COM No.	Rx FIFO L	.evel	Tx FIF(	D Level		
	2	COM 3	High High		High High			Н
	3	COM 5	High		High			Н
	4	COM 6	High		High			
	5	COM 7	High		High			
	6	COM 8	High		High			Ш
	8	COM 3 COM 10	High		High			
	L		-		-			
					Por	tinfo	Port Setting	Н
						OK	Cancel	

4. Under Port Number, select a COM number to assign to the serial port. Select Auto Enumerating COM Number to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.

Po	rt 1
	Port Number COM3
	Rx FIFO Level     High       Image: Set the change to all ports
	Ix FIFO Level     High       Set the change to all ports
	<u>O</u> K Cance <u>I</u>

Select an **Rx FIFO Trigger** and **Tx FIFO Size**. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select **Set the change to all ports** to use this setting for all serial ports on the board.

	Tx FIFO	Rx FIFO
High	128	120
Middle	64	60
Low	1	1

 Click OK to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click OK to close the Properties window and apply the new port settings. Click OK again to close the Device Manager and restart the system.

## **Updating the Driver**

You may configure the COM ports after the board and drivers have been installed.

1. In the Windows **Control Panel**, open the **System** applet.



2. In the **Device Manager** tab, expand the **Moxa Smartio/Industio multiport board** category by clicking the "+" sign next to it. Select the desired board (CP-168U in this example) and click **Properties**.

System Properties	? ×
Genera Device Manager Hardware Profiles Performance	
• View devices by type • • • • • • • • • • • • • • • • • • •	
Computer CDROM Disk drives Display adapters Floppy disk controllers Hard disk controllers Hard disk controllers Mouse Mouse Moxa Smartio/Industio multiport board Moxa Smartio/Industio multiport board Ports (COM & LPT) Ports (COM & LPT) System devices	
Properties Refresh Remove Print	
OKCd	incel

3. In the Driver tab, click Update Driver....



4. Select the appropriate model (CP-168U in this example) and click Have Disk...

Update D	evice Driver Wizard
$\diamond$	Select the manufacturer and nodel of your hardware device. If you have a disk that contains the updated driver, click Have Disk. To install the updated driver, click Finish.
Mo <u>d</u> els: CP-104U CP-114 9 CP-132U CP-132U CP-132U CP-134U CP-168U CT-114 9	Series Geries Series Series Series Series Series Series Teries Have Disk
	< <u>B</u> ack Next > Cancel

- 5. When prompted, select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software). Select the \Win9x folder and click OK to continue.
- 6. You will be prompted to restart the system. The new drivers will be in effect the next time you restart.

# **Removing the Driver**

1. In the Windows Control Panel, open the Add/Remove Programs applet. On the Install/Uninstall tab, select Moxa Smartio/Industio Driver and click Add/Remove.

Add/Remove Programs Properties 🔹 👔 🗙				
Install/Uninstall Windows Setup Startup Disk				
Ð	To install a drive, clict	a new program fr k Install.	om a floppy di	isk or CD-ROM
				<u>I</u> nstall
3	Lhe following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.			
Avance AC'97 Audio Intel[R] PRO Ethernet Adapter and Software MOXA Smartio/Industio Driver SiS 315_315E				
			4	Add/ <u>R</u> emove
		ОК	Cancel	Apply

2. When prompted, click **Yes** to confirm that you want to remove the driver.

MOXA Smartio/Industio Driver 🛛 🛛 🕅		
Do you really want to remove NOXA Smartio/Industio Driver $?$		
Yes <u>N</u> o		

3. After the driver has been removed, click **OK** to return to the **Add/Remove Programs** applet.

MOXA Smartio/Industio Driver 🛛 🕅		
Remove MOXA Smartio/Industio Driver complete !		
OK ]		

# **Driver Installation: Windows CE**

The following topics are covered in this chapter:

- Windows CE 5.0
  - Installing the Driver
- □ Windows CE 6.0 Installation

### Windows CE 5.0

In this section, we explain how to install Moxa Universal PCI boards under WinCE 5.0. These instructions are intended for users who are familiar with the Windows CE Platform Builder 5.0 Toolkit, and would like to install one or more Moxa Tech products. Here, we only give the step-by-step installation instructions for the development environment. You will need to download the image file to the target host yourself.

The CP-104UL board is used to illustrate the installation procedure.

#### Installing the Driver

The following procedure explains how to install the CP-104UL multiport serial module driver under WinCE.

Obtain a copy of Moxa Tech WinCE 5.0 driver package and extract it to your computer. Double click the Install package to copy the **Mxser** folder to %WINCEROOT%\PLATFORM\ automatically, and import the supported Moxa Tech products into the **Folder**.

1. Start WinCE Platform Builder, select File, and open New Platform.



2. Enter a Name for Workspace and press Next.

New Platform \	Wizard - Step 2		
Workspace Choose	Workspace Name And Location Choose a friendly name for your workspace.		
	Name:		
	Path:		
	E:\WINCE500\PBWorkspaces\Test1\		
1 1			
2	< Back Next > Finish	Cancel	

3. When you see **Board Support Packages**, **Design Template**, **Applications & Media**, **Networking & Communications**, **OBEX Server**, select what you need to build your own environment. The **Completing the New Platform Wizard** window will open to indicate that it has finished creating a new platform. Click **Finish** to complete the setup.

lew Platform Wizard - Step 4				
Design Template A design template is a pre-defined selection of Catalog items.				
Available design templates: Custom Device Digital Media Receiver Enterprise Terminal Enterprise Web Pad Gateway Industrial Controller Internet Appliance IP Phone Mobile Handheld Set-Top Box Tiny Kernel Windows Thin Client		Choose the design template that is most closely aligned with the purpose of your target device. Provides the starting point for a range of Web Pad-based devices with touch display and wireless networking.		
Platform Wizard - Step 5  Applications & Media  Soluti items (or explication)	< Back	Next >	Finish	Cancel
Select items for application Items:    Items:	s and media to inc k cess Protocol (LD) ws CE IP3 IPEG-4 Video rting	Support for designed fo	S design. applications and or the .NET Comp size of these item	services act Framework. hs: 10063 KB
3	< Back	Next >	Finish	Cancel

New Platform Wizard - Step 6				
Networking & Communications Select items for networking design.	and communic	ations to include	in your OS	•
Items: V OBEX Server V TCP/IPv6 Support Uccal Area Network (LAN) Personal Area Network (F V Remote Desktop Connect Vide Area Network (WAN)	PAN] tion []	The founda Framework standard a	tion of the OBES that provides s nd user-defined size of these ite	X Application upport for both services. ms: 10924 KB
2	< Back	Next >	Finish	Cancel
OBEX Server Security Warning Under certain circumstances, the Object security of your platform. This catalog if • If proper security and authentication can be installed. • If proper encryption techniques are in to third parties. To learn more about potential OBEX sec more securely, see the following topics: <u>OBEX Security</u> <u>Enhancing the Security of a Device</u>	t Exchange Protoc tem poses the foll techniques are n not used, OBEX ru surity risks, as we	ol (OBEX) catalog its owing potential secu ot used, a service th inning over Bluetoot II as the best practic	em can compromise rity risks: at interferes with se h could expose data es for using this cat	e the ervices.exe a packets alog item
	< Back	Next >	Finish	Cancel
New Platform Wizard - Step 8				
Completing the New P	latform Wiz	ard		
You have successfully complete	d the New Platfo	orm Wizard.		
You have created an OS design platform. By default, Platform B configuration and a Release con Options: • Modify build options for the Debug design without closing this wizard To close this wizard, click Finish.	for a Windows ( uilder provides a nfiguration of thi g and Release configu त्र	CE-based a Debug s OS design. <i>urations of your OS</i>		
2	< Back	Next >	Finish	Cancel

4. Open Manage Catalog Items (File → Manage Catalog Items). In the Catalog (View → Catalog), browse to \Third Party\Device Drivers\ MOXA Smartio/Industio-PCI, PC/104-Plus. Right-click on the driver Prefix COM or Prefix MXU you would like to include and choose Add to OS Design.

NOTE You can only select either Prefix COM or Prefix MXU, but not both.

5. Prefix COM supports up to 10 ports, from COM0 to COM9. Prefix MXU supports more than 10 ports, so it is better for you to select Prefix MXU if you are not sure how many ports the device has. Otherwise, you will only be allowed to use one multiport serial board on the target host.



After adding Moxa Tech drivers into your OS Design, a new project is automatically added to your workspace. The project name is mxserce5. The project can be accessed from File View (View → File View). The mxserce5 project contains a number of files used to configure the drivers included in your OS Design.



NOTE If you would like to use "Terminal Emulator" tool, please modify mxserce5.reg and keyboard like below (This is only just for "one" "COM" port). You have to notice number of ports, COM, MXU and enter the correct information. [HKEY\_LOCAL\_MACHINE\ExtModems\HayesCompat1]

"Port" = "COM2:" "DeviceType" = dword: 1 "FriendlyName" = "Hayes Compatible on COM2:"

7. Finally, open Build OS, select Build and Sysgen, and be sure to click Copy Files to Release Directory After Build and Make Run-Time Image After Build.

🍤 a_test - Platform Builder - [Welcome	e to Platform Builder]	_ @ 🗙		
Eile Edit View Project Platform Target	Build Project Build OS Tools Window Help	_ & ×		
Image: Second	· · · · · · · · · · · · · · · · · · ·			
CE Device	Image: State Sta	AX		
Added the Common Control feature (SYSGEN_COMMCTRL) to the platform. Completed the feature and driver list update successfully.				
Builds files in the tree for this OS des	sign and then runs the Sysgen tool, and builds proje Size: ~17412 KB 🛓			

- 8. Finally, copy your image file to the target Host.
- **NOTE** If you have created a Windows CE Platform Builder in the development environment, you can skip steps 2, 3, and 4.

# Windows CE 6.0 Installation

The following procedure explains how to install the CP-102U multiport serial board driver under WinCE 6.0.

- 1. Obtain a copy of Moxa's WinCE 6.0 driver and extract it to your computer. Double click the install package to automatically install **Mxser**.
- 2. Create a new project in Visual Studio 2005.

In Visual Studio 2005, click File  $\rightarrow$  New  $\rightarrow$  Project and select "Platform Builder for CE 6.0." Choose "OS Design" template and then click OK.



New Project			? 🗙
Project types: Visual C++ CLR CLR General MFC Smart Devi Win32 Other Languag Other Project T Platform Builde	ce es vnes er for CE 6.0	Templates: Visual Studio installed templates OS Design My Templates Search Online Templates	
A project for creatin <u>N</u> ame: Location: Solution Na <u>m</u> e:	g a Windows Embedd OSDesign1 C:\WINCE600VOSD OSDesign1	led CE 6.0 operating system esigns Create <u>d</u> irectory for solution	▼ Erowse DK Cancel

 The CE 6.0 OS Design Wizard will start. Click "Next" to get the Board Support Packages page and select CEPC: x86. Click "Next" to continue.

Windows Embedded CE 6.	Windows Embedded CE 6.0 OS Design Wizard ? 🔀			
Windows <sup>-</sup> Embedded CE 6.0	Welcome to the Windows Embedded CE 6.0 OS Design Wizard			
	This wizard guides you through the process of creating an OS design for a CE 6.0 based platform. An OS design defines the characteristics of a CE 6.0 OS.			
	You can create an OS design by choosing a design template and one or more board support packages (BSPs). A BSP includes an OEM adaptation layer (OAL) and device drivers.			
	This wizard helps you:			
	Choose a BSP. Choose a design template. Add items to your OS design or remove items from it.			
	To continue, click Next.			
(	< Previous Next > Pinish Cancel			
Windows Embedded CE 6.	) OS Design Wizard			
Board Support Packa A BSP contains a set of c	ages (BSPs) levice drivers that are added to your OS design			
<u>A</u> vailable BSPs:				
CEPC: x86	Select one or more BSPs for your OS design.			
	A BSP for a Windows Embedded CE PC-based hardware reference platform. The platform uses the OS based on the x86 architecture.			
	Note: Only BSPs supported by installed CPUs are displayed in the list.			
(	< <u>Previous</u> <u>N</u> ext > <u>B</u> nish Cancel			

4. On the **Design Templates** page select your environment, PDA Device for example. Click "**Next**" to continue.

Windows Embedded CE 6.0 OS Design Wizard	? 🛛
Design Templates A design template is a set of predefined catalog	items.
<u>Available design templates:</u> Consumer Media Device Custom Device <u>PDA Device</u> Phone Device Small Footprint Device Thin Client	Choose the design template that is most closely aligned with the purpose of your target device. Provides the starting point for a range of personal digital assistants (PDAs) or mobile devices with a clamshell-and-keyboard design.
< Previous	ext > <u>Fi</u> nish Cancel

5. On the Design Template Variants page select your environment, Mobile Handheld for example. Click "**Next**" to continue.

Windows Embedded CE 6.0 OS Design Wizard			
Design Template Variants Select a design template variant that provides the functionality that your target device requires.			
<u>V</u> ariants: Mobile Handheld Enterprise Web Pad	Mobile Handheld		
< <u>P</u> revious	ext > Einish Cancel		

6. On the **Application & Media** page select your environment, .NET Compact Framework 2.0, ActiveSync, and Quarter VGA Resources-Portrait Mode for example. Click "**Next**" to continue.

Windows Embedded CE 6.0 OS Design Wizard	? 🛛
Applications & Media Select items for applications and media to include	de in your OS design.
.NET Compact Framework 2.0         □       File Systems and Data Store         □       Windows Embedded CE Error Reporting         □       Active Sync         □       Internet Browser         □       Quarter VGA Resources - Portrait Mode         Windows Media Audio/MP3       Windows Messenger         WordPad       WordPad	Support for applications and services designed for the .NET V2.0 Compact Framework.
< <u>P</u> revious	ext >Einish Cancel

7. On the Networking & Communication page select your environment, TCP/IPv6 Support for example. Click "Next" to continue.

Windows Embedded CE 6.0 OS Design Wizard	? 🛛
Networking & Communications Select items for networking and communication	s to include in your OS design.
	The Internet standard protocol, version 6.
< <u>P</u> revious	ext >Einish Cancel

 When the OS Design Project Wizard Complete screen appears, click "Finish." The catalog notification will pop up. Click "Acknowledge" to finish the project.



 Open the project you created. Click Project on top of the screen, and select Add Existing Subproject. Specify the PCI MSB Mxser driver location with the subproject file "mxserce6.pbpxml."



10. After the subproject is added, you may configure the "**mxserce6.reg**" registry file with the location [HKEY\_LOCAL\_MACHINE\Drivers\BuiltIn\PCI\Template\MOXAPCICOM].



11. Configuring FIFO and index: Setting the FIFO registry value to **1** enables the FIFO function and **0** disables it. The index allows you to define the initial COM port number in WinCE, but before using this function; make sure that the COM port numbers do not conflict.

Name	Туре	Data			
📄 (Default)	REG_SZ	(value not set)	P	roperties	<b>→</b> ₽ ×
📖 CHIP	REG_DWORD	0x00000001 (1)	F	IFO Registry Value	-
🗒 Class	REG_DWORD	0x0000007 (7)	-	no negaty rata	
🗒 DeviceArrayIndex	REG_DWORD	0x0000000 (0)		∰ <b>2</b> ↓ 🖻	
📄 DeviceID	REG_MULTI_SZ	1022 1021 1321		Misc	
💐 DeviceType	REG_DWORD	0x0000000 (0)		Data	1
📄 DI	REG_SZ	mxser_com.Dll		Harry Value	1
FIFO	REG_DWORD	0x00000001 (1)		Hex value	1
鼢 index	REG DWORD	0x00000002 (2)		Key	HKEY_LOCAL_MACHINE\Drivers
lsrDll	REG SZ	mxisr.dll		Name	FIFO
IsrHandler	REG_SZ	ISRHandler		Туре	REG_DWORD
関 Order	REG_DWORD	0x0000000 (0)	Ξ	Misc	
📄 Prefix	REG_SZ	COM		Data	2
関 SubClass	REG_DWORD	0x0000000 (0)		Hex Value	2
📄 Tsp	REG_SZ	Unimodem.dll		Key	HKEY_LOCAL_MACHINE\Drivers
📄 VendorID	REG_MULTI_SZ	1393 1393 1393		Name	index
				Туре	REG DWORD

12. Open **Build** and select **Advanced Build Commands** and choose **Build Sysgen**. This operation will take you a few minutes.

File Edit View Project	Bu	ild Debug Target Tool	s Window	Co	mmuni	ty Help
🔚 🕶 🖉 🚰 🛃 🎒 🗌	₩	Build Solution	Fi	7	x86 Re	ık 🔹 Platform Builder-Specific (_T( 💌 🏄
		Rebuild Solution	Ctrl+Alt+F7	7		
Device: CE Device -		Clean Solution				
Solution Explorer - Solution 'OSE		Build OSDesign3				
- 		Rebuild OSDesign3				
		Clean OSDesign3				
		Advanced Build Commands		►		Sysgen
Favorites		Build All Subprojects				Clean Sysgen
🕀 🦳 Parameter Files		Rebuild All Subprojects			]	Build and Sysgen 🛛 🔓
Solution 🍓 Catalog 🙋		Build All SDKs			]	Rebuild and Clean Sysgen
Output		Copy Files to Release Directo	iry		]	Build Current BSP and Subprojects
Show output from: Windows C		Make Run-Time Image			]	Rebuild Current BSP and Subprojects

13. After building sysgen, select **Build** and choose **Make Run-Time Image** to create the WinCE OS image. Finally, copy your image file to the target Host.



# **Driver Installation: Non Windows**

The following topics are covered in this chapter:

- Overview
- 🗖 DOS
  - Installing the Driver
  - > Setting up the Driver
  - Loading the Driver
  - Unloading the Driver
- Linux (32-bit/64-bit)
- sco

## **Overview**

This chapter explains how to install, configure, update, and remove the board drivers for non Windows operating systems. Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

You can download DOS, Linux, and SCO drivers from the Moxa website. For information on developing your own serial programming applications, please refer to the next chapter.

# DOS

Moxa DOS API-232 is a software package that can help you develop or debug serial communications programs. This section will show you how to install the package, how to set up the driver, and how to load or unload the driver. The following models are supported:

2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

### Installing the Driver

 Run the installation program, DOSINST.EXE under \Software\DOS on the Document & Software CD. Specify the target directory for the API-232 files (e.g., C:\MOXA). Press F2 to start the installation.

<u>74</u>	INSTALLATION AP-222	
	Installation	
	Target directory	
	M: Help M2: Start installation	
_		-

2. After installation is complete, you will be prompted to set up the board and driver initial values. It is strongly recommended that you set up the board and driver at this time by pressing **Y**.

	INSTALLATION APPEZZ
	Installation complete, 57 files copied. After leaving this program, you have to run C:\MOXA\BIN\SETUP.EXE program to setup board & driver initial values.
J	bo you want to run selor. Ene now ((1/H)
J	bo you want to Pull SETOR. EXE how PCPAD

## Setting up the Driver

The following instructions are not intended to illustrate every function of the setup program. For more detailed information, please refer to the help files by pressing **F1** in the setup program.

1. Run the setup program, BIN\SETUP.EXE.

Select your board model (CP-134U in this example) and press Enter.

Board Setu	
C168 PCI Series C164 PCI Series CT-114 Series CP-132 Series CP-132 Series CP-1680 Series CP-1680 Series CP-1320 Series CP-1320 Series CP-1340 Series CP-1340 Series CP-194JU Series NONE	Imit setuy

2. Press **PgDn** to view and modify the setup options for the selected board.

ļ	Be	oard S	etup		
Board no. 2 3 4	CP-134U Series RONE NOME NOME NOME	Port on.	1/0 Addenses Deang	7 <b>89 8</b>	ns:fQer.m., 8 ≷ 11.
<b>3</b>	10: Save & Exi	t Daoi Di	eit PyDn: I	ort set	up

3. The settings for each port will be displayed. Verify the settings and make any necessary changes.

		Po	et S	letu	p			
Edited Normanie	. 194	112	#3	- 84				
Tall Antifer size	1.R	1K	18	1.K				_
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To NOR-OFF onto	Mo No	No	No	No	=	-	=	-
Ha SORFOFT onto	No No	No	No	No	-	-	-	-
91	Helly	95: Geo	up edit	M181: 5	Save B	set Alto	et.	

- Port number: This is the port ID of each port. Application software will refer to a port by its port number (ID). Port numbers must be unique; duplicate port numbers are not allowed. The port number can range from 0 to 255 as long as it does not overlap with another port. Generally, you should consider the convenience of programming when specifying the port number.
- TxD buffer size: This is the transmission (output) buffer allocated in the system for each port.
- RxD buffer size: This is the receiving (input) buffer allocated in the system for each port.
- F5: Group Edit: This allows you to configure several ports simultaneously as a group.

				- 318			8888
	Port	Se	etay	þ	***		E
Port Sumher Tall huffer wi	🖬 Group	Etd i	it				
Hall Judfme al	PORT PROFILE		POF	ans.	-		-
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4. Press F10 to save the latest configuration and exit the setup program.

### Loading the Driver

After setting up the driver, you must load the driver in order to gain access to the serial ports on the serial board. Run **BIN\DP-DRV.EXE** at the DOS prompt. The driver will detect your multiport serial board automatically. You should see messages indicating successful detection of your module, such as the following:

```
Smartio/Industio Family DOS driver Version 1.9
Setup driver .
CP-134U series (Bus= x ,Dev=y) : OK!
Device driver setup O.K.
```

At this point, you can execute applications that support API-232 functions, or start developing applications using the API-232 library.

### **Unloading the Driver**

To unload or release the driver from memory, enter **DP-DRV /Q** at the DOS prompt.

### Linux (32-bit/64-bit)

The Linux drivers support the following models:

CP-102U	CP-114UL	CP-132UL-I	CP-138U-I
CP-102UL	CP-118U	CP-134U	CP-168U
CP-104JU	CP-118U-I	CP-134U-I	POS-104UL
CP-104UL	CP-132UL	CP-138U	CP-102UF

To install and load the Linux drivers, enter the following commands from the Linux prompt:

```
# mkdir moxa
# cd moxa
# tar -xzvf driv_linux_smart_vx.x_build_yymmddhh.tgz
# cd mxser
# make clean; make install
# cd /moxa/mxser/driver
# ./msmknod
```

\_

# modprobe mxser

If the driver has loaded successfully, you should see a message such as the following:

```
MOXA Smartio/Industio family driver version 1.11
Found MOXA CP-168U series board(BusNo=2,DevNo=13)
ttyM0 - ttyM7 max. baudrate = 921600 bps
```

You can verify that the driver has loaded by entering the following:

# lsmode |grep mxser

You should see a message such as the following:

mxser 59484 0

The installation will include **msdiag**, a diagnostic utility, **msterm**, a terminal emulation program, and **msmon**, a monitoring utility. For additional information, please refer to **readme.txt** in the **/home/moxa/mxser** directory.

### SCO

- SCO OpenServer 5
- SCO OpenServer 6
- SCO UnixWare 7

Follow the steps given in this section to install the SCO OpenServer 5/6 & SCO UnixWare 7 driver. The installation procedures for SCO UnixWare 7 and SCO OpenServer 5/6 are similar.

- 1. Copy the driver file .tar to your host.
- #tar xvf <driver tar file>
   #/tmp/moxa/mxinstall
- 3. The window shown below will open next. Press RETURN to continue.

Copyright© 2008 Moxa Inc. All Rights Reserved. Moxa Smartio/Industio Family Device Driver Installation (Ver. 1.11)

\_\_\_\_\_

For SCO UnixWare 7

Tar files, please wait....O.K. Press RETURN to continue

4. <Note: If your environment is SCO OpenServer 5/6, you can skip step 4 & 5>

When you see the screen below, select "Esc" to exit and reboot your computer.

MOXA Smartio/Industio	Family	Installation	Utility	(Ver	1.11)
	i airiiry	mation	o thirty	( • • •	

Smartio/Industio Family Basic Configuration							
Board No.	Board Type	I/O Address	Interrupt	Bus/Dev No.			
1	None						
2	None						
3	None						
4	None						
PgDn: getty Setting Esc: Exit							
Enter: Confirm Input Value		Value Tab: (	Change Item				

5. After rebooting computer, key in "moxaadm", you will see MAIN MENU, select Basic Configuration.

MAIN MENU
Basic Configuration
Advanced Configuration
Interface Configuration
Port Monitoring
Terminal Emulation
Driver Removal
Exit

 When you see the following screen, press Enter to select the MOXA Multiport Serial Board you installed by port and by model. For example, if you installed the CP-104UL, you should select 4 ports and then CP-104UL.

Smartio/Industio Family Basic Configuration								
Board No.	Board Type	I/O Address	Interrupt	Bus/Dev No.				
1	None							
2	None							
3	None							
4	None							
PgDn: getty Setting Esc: Exit								
Enter: Confirm Input Value T		Value Tab: (	Change Item					

- 7. The board's basic information, such as I/O address, Bus No., and Device No., will be shown. The SCO system will assign the resources automatically to the Universal PCI board you selected.
- 8. Next, press "Esc" to exit and reboot your computer.
- 9. Note, whenever you change a MAIN MENU item, you have to reboot your computer.
10

# **Serial Programming Tools**

The following topics are covered in this chapter:

- Overview
- Serial Programming Library
- PComm Utilities
  - Installation
  - PComm Diagnostic
  - PComm Monitor
  - PComm Terminal Emulator

#### **Overview**

Moxa provides Windows serial programming libraries and troubleshooting utilities that are easy to use and powerful. You can use these tools to reduce software development time.

The serial communication library is useful for developing applications for data communications, remote access, data acquisition, and industrial control. It provides a simpler solution compared to the more complex Windows Win32 COMM API.

PComm is a professional serial communication tool for Windows PCs. PComm includes the following features:

- Useful utilities for diagnostics, port monitoring, and terminal emulation
- Sample programs
- Comprehensive help files

# Serial Programming Library

The serial programming library assists you in developing serial communications programs for any COM port that complies with the Microsoft Win32 API. It facilitates the implementation of multi-process and multi-thread serial communication programs and can remarkably reduce development time.

The library provides a complete set of functions as well as various sample programs for Visual C++, Visual Basic, and Delphi. To view detailed descriptions of the available functions and sample programs, go to **Start**  $\rightarrow$  **Program**  $\rightarrow$  **PComm Lite** and select **PComm Lib Help**, **PComm Porting Notes**, or **PComm Programming Guide**. You may also refer to the sample programs in the PComm directory.

### **PComm Utilities**

This section provides brief descriptions of the PComm utilities. For more information about these utilities, please refer to the Windows help files or to the API-232.txt file for DOS.

#### Installation

To install PComm, run **Setup.exe** from the Document and Software CD. Please note that the PComm diagnostic and monitor utilities are for Moxa boards only. These two utilities will not work with other serial boards.

#### **PComm Diagnostic**

PComm Diagnostic is designed for Moxa boards only. It provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, DTR/DCD, and other items. You can use PComm Diagnostic to check the operation of both software and hardware.



To run the Diagnostic program, go to Start  $\rightarrow$  Program  $\rightarrow$  PComm Lite  $\rightarrow$  Diagnostic.

#### **PComm Monitor**

PComm Monitor is designed for Moxa boards in Windows NT only. It allows you to monitor data transmission of selected Moxa COM ports. It monitors data transmission, throughput, and line status at regular intervals. Click on a specific port to view that port's communication parameters and status.



To run PComm Monitor, go to Start → Program → PComm Lite → Monitor.

#### **PComm Terminal Emulator**

PComm Terminal Emulator can be used to connect to a serial port to verify that data transmission is functioning correctly. It supports multiple windows and both VT100 and ANSI terminal types. You can interactively transfer data, periodically send patterns, and transfer files using ASCII, XMODEM, YMODEM, ZMODEM, and KERMIT protocols.

To run PComm Terminal Emulator, go to Start  $\rightarrow$  Program  $\rightarrow$  PComm Lite  $\rightarrow$  Terminal Emulator.



# **Pin Assignments**

The following topics are covered in this chapter:

- Overview
- CP-102U
  - > DB9 (Male): RS-232
- CP-102UL
  - DB25 (Female): RS-232
- CP-104JU
  - ➢ 8-pin RJ45: RS-232
- CP-104UL
  - ➢ DB44 (Female): RS-232
- CP-112UL
  - DB25 (Female): RS-232
  - DB25 (Female): RS-422
  - DB25 (Female): RS-485 (4-wire)
  - DB25 (Female): RS-485 (2-wire)
- CP-114UL
  - ➢ DB44 (Female): RS-232
  - DB44 (Female): RS-422, RS-485 (4-wire)
  - > DB44 (Female): RS-485 (2-wire)
- CP-118U
  - ▶ DB62 (Female): RS-232
  - DB62 (Female): RS-422, RS-485 (4-wire)
  - DB62 (Female): RS-485 (2-wire)
- CP-118U-I
  - DB78 (Female): RS-232
  - > DB78 (Female): RS-422, RS-485 (4-wire)
  - DB78 (Female): RS-485 (2-wire)

#### CP-132UL, CP-132UL-I

- DB25 (Female): RS-422
- DB25 (Female): RS-485 (4-wire)
- DB25 (Female): RS-485 (2-wire)
- CP-134U, CP-134U-I
  - DB44 (Female): RS-232 (Ports 1 and 2 only)
  - DB44 (Female): RS-422
  - DB44 (Female): RS-485 (4-wire)
  - DB44 (Female): RS-485 (2-wire)

#### CP-138U

- > DB62 (Female): RS-422, RS-485 (4-wire)
- DB62 (Female): RS-485 (2-wire)

#### CP-138U-I

- > DB78 (Female): RS-422, RS-485 (4-wire)
- DB78 (Female): RS-485 (2-wire)
- CP-168U
  - DB62 (Female): RS-232
- D POS-104UL
  - DB44 (Female): RS-232
- CP-102UF

#### Serial Connectors

- DB9 (Male)
- DB25 (Male)
- > DB25 (Female)
- ≻ RJ45

#### **Overview**

This chapter provides the pin assignments for each Moxa UPCI multiport serial board, as well as the pin assignments for the optional accessories. Except for the CP-102U and CP-102UF, which have two built-in DB9 (male) serial connectors and an ST type fiber connector, respectively, Moxa's UPCI boards do not have built-in serial port connectors. For all other models, you will need a cable or other accessory with standard serial connectors in order to connect serial devices to the board. The following chart shows the available cables and accessories for each model.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-102U	2×DB9 (male)		
CP-102UL			
CP-112UL			
CP-112UL-I	DB25 (female)	CBL-M25M9x2-50	2×DB9 (male)
CP-132UL			
CP-132UL-I			
CP-104UL		CBL-M44M9x4-50	4×DB9 (male)
CP-114UL			
CP-114UL-I	DB44 (female)		$4 \times DR25$ (male)
CP-134U		CDL-1014410123X4-30	4×DD25 (IIIdle)
CP-134U-I			
	D 145	CBL-RJ45M9-150	4×DB9 (male)
CF-104J0	KJ45	CBL-RJ45M25-150	4×DB25 (male)
		OPT8-M9	$P_{\rm X} D R (male)$
		CBL-M62M9x8-100 (OPT8D)	
CP-118U		OPT8B	$P_{\rm V}$ DP25 (male)
CP-138U	DB62 (female)	CBL-M62M25x8-100 (OPT8C)	oxnezo (male)
CP-168U		OPT8A, OPT8S, OPT8F, OPT8Z, OPT8K,	
		OPT8I	oxDB25 (Terriale)
		OPT8-RJ45*	8×RJ45
CP-118U-I		CBL-M78M9x8-100	8×DB9 (male)
CP-138U-I		CBL-M78M25x8-100	8×DB25 (male)
POS-104UL	DB44 (female)	CBL-M44M9x4-50(POS)	4×DB9 (male)
CP-102UF	STx2		

\* The OPT8-RJ45 is designed for RS-232 only. It should only be used with the CP-118U in RS-232 mode or with the CP-168U.

The serial connectors on each accessory use standard serial port pin assignments. Please refer to the Serial Connectors section for details.

## **CP-102U**



This board supports RS-232 only.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-102U	2×DB9 (male)		

#### DB9 (Male): RS-232

Pin	Signal
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

# **CP-102UL**

This board supports RS-232 only.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-102UL	DB25 (female)	CBL-M25M9x2-50	2×DB9 (male)

## DB25 (Female): RS-232

Pin	Signal	Pin	Signal
1		14	
2	DCD1	15	DTR1
3	GND	16	DSR1
4	CTS1	17	RTS1
5	RxD1	18	TxD1
6		19	
7		20	
8		21	DCD0
9	DTRO	22	GND
10	DSR0	23	CTS0
11	RTS0	24	RxD0
12	TxD0	25	
13			

# CP-104JU



This board supports RS-232 only.

Model	Board Connector	Supported Accessories	Serial Connectors		
CP-104JU	DIAE	CBL-RJ45M9-150 4×DB9 (male)			
	KJ40	CBL-RJ45M25-150	4×DB25 (male)		

## 8-pin RJ45: RS-232

Pin	Signal
1	DSR
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	DTR

## **CP-104UL**

This board supports RS-232 only.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-104UL	DD44 (famala)	BL-M44M9x4-50 4×DB9 (male)	
	DB44 (Ternale)	CBL-M44M25x4-50	4×DB25 (male)

#### DB44 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	TxD3	16	CTS3	31	DCD3
2	RxD3	17	DTR3	32	
3	RTS3	18	DSR3	33	GND
4		19		34	
5	TxD2	20	CTS2	35	DCD2
6	RxD2	21	DTR2	36	
7	RTS2	22	DSR2	37	GND
8		23		38	
9	TxD1	24	CTS1	39	DCD1
10	RxD1	25	DTR1	40	
11	RTS1	26	DSR1	41	GND
12		27		42	DCD0
13	TxD0	28	CTS0	43	
14	RxD0	29	DTRO	44	GND
15	RTS0	30	DSR0		

## **CP-112UL**

This board supports RS-232, RS-422, and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-112UL	DB25 (female)	CBL-M25M9x2-50	2×DB9 (male)

#### DB25 (Female): RS-232

Pin	Signal	Pin	Signal
1		14	
2	DCD1	15	DTR1
3	GND	16	DSR1
4	CTS1	17	RTS1
5	RxD1	18	TxD1
6		19	
7		20	
8		21	DCD0
9	DTRO	22	GND
10	DSR0	23	CTS0
11	RTS0	24	RxD0
12	TxD0	25	
13			

#### DB25 (Female): RS-422

Pin	Signal	Pin	Signal
1		14	
2	TxD1-(A)	15	RxD1-(A)
3	GND1	16	
4		17	
5	TxD1+(B)	18	RxD1+(B)
6		19	
7		20	
8		21	TxD0-(A)
9	RxD0-(A)	22	GND0
10		23	
11		24	TxD0+(B)
12	RxD0+(B)	25	
13			

## DB25 (Female): RS-485 (4-wire)

Pin	Signal	Pin	Signal
1		14	
2	TxD1-(A)	15	RxD1-(A)
3	GND1	16	
4		17	
5	TxD1+(B)	18	RxD1+(B)
6		19	
7		20	
8		21	TxD0-(A)
9	RxD0-(A)	22	GND0
10		23	
11		24	TxD0+(B)
12	RxD0+(B)	25	
13			

#### DB25 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal
1		14	
2		15	Data1-(A)
3	GND1	16	
4		17	
5		18	Data1+(B)
6		19	
7		20	
8		21	
9	Data0-(A)	22	GND0
10		23	
11		24	
12	Data0+(B)	25	
13			

## **CP-114UL**

This board supports RS-232, RS-422, and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CD 11411	CP-114UL DB44 (female)	CBL-M44M9x4-50	4×DB9 (male)
CP-TT4UL		CBL-M44M25x4-50	4×DB25 (male)

#### DB44 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	TxD3	16	CTS3	31	DCD3
2	RxD3	17	DTR3	32	
3	RTS3	18	DSR3	33	GND
4		19		34	
5	TxD2	20	CTS2	35	DCD2
6	RxD2	21	DTR2	36	
7	RTS2	22	DSR2	37	GND
8		23		38	
9	TxD1	24	CTS1	39	DCD1
10	RxD1	25	DTR1	40	
11	RTS1	26	DSR1	41	GND
12		27		42	DCD0
13	TxD0	28	CTS0	43	
14	RxD0	29	DTRO	44	GND
15	RTSO	30	DSRO		

#### DB44 (Female): RS-422, RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	RxD3+(B)	16		31	TxD3-(A)
2	TxD3+(B)	17	RxD3-(A)	32	
3		18		33	GND
4		19		34	
5	RxD2+(B)	20		35	TxD2-(A)
6	TxD2+(B)	21	RxD2-(A)	36	
7		22		37	GND
8		23		38	
9	RxD1+(B)	24		39	TxD1-(A)
10	TxD1+(B)	25	RxD1-(A)	40	
11		26		41	GND
12		27		42	TxD0-(A)
13	RxD0+(B)	28		43	
14	RxD0-(A)	29	RxD0-(A)	44	GND
15		30			

#### DB44 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	Data3+(B)	16		31	
2		17	Data3-(A)	32	
3		18		33	GND
4		19		34	
5	Data2+(B)	20		35	
6		21	Data2-(A)	36	
7		22		37	GND
8		23		38	
9	Data1+(B)	24		39	
10		25	Data1-(A)	40	
11		26		41	GND
12		27		42	
13	Data0+(B)	28		43	
14		29	Data0-(A)	44	GND
15		30			

# CP-118U



This board supports RS-232, RS-422, and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
		OPT8-M9	QuDDQ (mala)
CP-118U	DB62 (female)	CBL-M62M9x8-100 (OPT8D)	8×DB9 (male)
		OPT8B	
		CBL-M62M25x8-100 (OPT8C)	8×DB25 (male)
		OPT8A, OPT8S	8×DB25 (female)
		OPT8-RJ45*	8×RJ45

 $^{\star}$  The OPT8-RJ45 is designed for RS-232 only. It should only be used with the CP-118U in RS-232 mode.

DB62	(Female):	RS-232
------	-----------	--------

Pin	Signal	Pin	Signal	Pin	Signal
1	TxD0	22	RxD0	43	CTS0
2	DTRO	23	DSR0	44	RTS0
3	RxD1	24	DCD0	45	GND
4	DSR1	25	TxD1	46	CTS1
5	DCD1	26	DTR1	47	RTS1
6	TxD2	27	RxD2	48	CTS2
7	DTR2	28	DSR2	49	RTS2
8	RxD3	29	DCD2	50	GND
9	DSR3	30	TxD3	51	CTS3
10	DCD3	31	DTR3	52	RTS3
11	RxD4	32	GND	53	CTS4
12	DSR4	33	TxD4	54	RTS4
13	DCD4	34	DTR4	55	GND
14	TxD5	35	RxD5	56	CTS5
15	DTR5	36	DSR5	57	RTS5
16	RxD6	37	DCD5	58	GND
17	DSR6	38	TxD6	59	CTS6
18	DCD6	39	DTR6	60	RTS6
19	RxD7	40	GND	61	CTS7
20	DSR7	41	TxD7	62	RTS7
21	DCD7	42	DTR7		

## DB62 (Female): RS-422, RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	RxD0+(B)	22	TxD0+(B)	43	
2	RxD0-(A)	23		44	
3	TxD1+(B)	24	TxD0-(A)	45	GND
4		25	RxD1+(B)	46	
5	TxD1-(A)	26	RxD1-(A)	47	
6	RxD2+(B)	27	TxD2+(B)	48	
7	RxD2-(A)	28		49	
8	TxD3+(B)	29	TxD2-(A)	50	GND
9		30	RxD3+(B)	51	
10	TxD3-(A)	31	RxD3-(A)	52	
11	TxD4+(B)	32	GND	53	
12		33	RxD4+(B)	54	
13	TxD4-(A)	34	RxD4-(A)	55	GND
14	RxD5+(B)	35	TxD5+(B)	56	
15	RxD5-(A)	36		57	
16	TxD6+(B)	37	TxD5-(A)	58	GND
17		38	RxD6+(B)	59	
18	TxD6-(A)	39	RxD6-(A)	60	
19	TxD7+(B)	40	GND	61	
20		41	RxD7+(B)	62	
21	TxD7-(A)	42	RxD7-(A)		

## DB62 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	Data0+(B)	22		43	
2	Data0-(A)	23		44	
3		24		45	GND
4		25	Data1+(B)	46	
5		26	Data1-(A)	47	
6	Data2+(B)	27		48	
7	Data2-(A)	28		49	
8		29		50	GND
9		30	Data3+(B)	51	
10		31	Data3-(A)	52	
11		32	GND	53	
12		33	Data4+(B)	54	
13		34	Data4-(A)	55	GND
14	Data5+(B)	35		56	
15	Data5-(A)	36		57	
16		37		58	GND
17		38	Data6+(B)	59	
18		39	Data6-(A)	60	
19		40	GND	61	
20		41	Data7+(B)	62	
21		42	Data7-(A)		

## CP-118U-I

This board supports RS-232, RS-422, and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-118U-I DB78 (female)	DD70 (famala)	CBL-M78M9x8-100	8×DB9 (male)
	CBL-M78M25x8-100	8×DB25 (male)	

#### DB78 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	27	DTR5	53	CTS2
2	TxD7	28	RTS4	54	DSR2
3		29	DTR4	55	CTS1
4	GND6	30		56	DSR1
5	TxD6	31	RTS3	57	
6	GND5	32	DTR3	58	CTS0
7	TxD5	33	RTS2	59	DSR0
8		34	DTR2	60	DCD7
9	GND4	35		61	RxD7
10	TxD4	36	RTS1	62	DCD6
11	GND3	37	DTR1	63	RxD6
12	TxD3	38	RTS0	64	
13		39	DTRO	65	DCD5
14	GND2	40	CTS7	66	RxD5
15	TxD2	41	DSR7	67	DCD4
16	GND1	42		68	RxD4
17	TxD1	43	CTS6	69	
18		44	DSR6	70	DCD3
19	GND0	45	CTS5	71	RxD3
20	TxD0	46	DSR5	72	DCD2
21	RTS7	47		73	RxD2
22	DTR7	48	CTS4	74	
23	RTS6	49	DSR4	75	DCD1
24	DTR6	50	CTS3	76	RxD1
25		51	DSR3	77	DCD0
26	RTS5	52		78	RxD0

#### DB78 (Female): RS-422, RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	27	RxD5-(A)	53	
2	RxD7+(B)	28		54	
3		29	RxD4-(A)	55	
4	GND6	30		56	
5	RxD6+(B)	31		57	
6	GND5	32	RxD3-(A)	58	
7	RxD5+(B)	33		59	
8		34	RxD2-(A)	60	TxD7-(A)
9	GND4	35		61	TxD7+(B)
10	RxD4+(B)	36		62	TxD6-(A)
11	GND3	37	RxD1-(A)	63	TxD6+(B)
12	RxD3+(B)	38		64	
13		39	RxD0-(A)	65	TxD5-(A)
14	GND2	40		66	TxD5+(B)
15	RxD2+(B)	41		67	TxD4-(A)
16	GND1	42		68	TxD4+(B)
17	RxD1+(B)	43		69	
18		44		70	TxD3-(A)
19	GND0	45		71	TxD3+(B)
20	RxD0+(B)	46		72	TxD2-(A)
21		47		73	TxD2+(B)
22	RxD7-(A)	48		74	
23		49		75	TxD1-(A)
24	RxD6-(A)	50		76	TxD1+(B)
25		51		77	TxD0-(A)
26		52		78	TxD0+(B)

#### DB78 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	15	Data2+(B)	29	Data4-(A)
2	Data7+(B)	16	GND1	30	
3		17	Data1+(B)	31	
4	GND6	18		32	Data3-(A)
5	Data6+(B)	19	GND0	33	
6	GND5	20	Data0+(B)	34	Data2-(A)
7	Data5+(B)	21		35	
8		22	Data7-(A)	36	
9	GND4	23		37	Data1-(A)
10	Data4+(B)	24	Data6-(A)	38	
11	GND3	25		39	Data0-(A)
12	Data3+(B)	26		40	
13		27	Data5-(A)	41	
14	GND2	28		42	

# CP-132UL, CP-132UL-I

These boards support RS-422 and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-132UL			2×DB9 (male)
CP-132UL-I	DB25 (Temale)	CBE-10125101982-50	

#### DB25 (Female): RS-422

Pin	Signal	Pin	Signal
1		14	CTS1-(A)
2	TxD1-(A)	15	RxD1-(A)
3	GND1	16	RTS1-(A)
4	CTS1+(B)	17	RTS1+(B)
5	TxD1+(B)	18	RxD1+(B)
6		19	
7		20	
8	CTSO-(A)	21	TxD0-(A)
9	RxD0-(A)	22	GND0
10	RTSO-(A)	23	CTSO+(B)
11	RTS0+(B)	24	TxD0+(B)
12	RxD0+(B)	25	
13			

## DB25 (Female): RS-485 (4-wire)

Pin	Signal	Pin	Signal
1		14	
2	TxD1-(A)	15	RxD1-(A)
3	GND1	16	
4		17	
5	TxD1+(B)	18	RxD1+(B)
6		19	
7		20	
8		21	TxD0-(A)
9	RxD0-(A)	22	GND0
10		23	
11		24	TxD0+(B)
12	RxD0+(B)	25	
13			

#### DB25 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal
1		14	
2		15	Data1-(A)
3	GND1	16	
4		17	
5		18	Data1+(B)
6		19	
7		20	
8		21	
9	Data0-(A)	22	GND0
10		23	
11		24	
12	Data0+(B)	25	
13			

# CP-134U, CP-134U-I

These boards support RS-422 and RS-485 (both 2 and 4-wire). Ports 1 and 2 also support RS-232.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-134U	DB44 (female)	CBL-M44M9x4-50	4×DB9 (male)
CP-134U-I		CBL-M44M25x4-50	4×DB25 (male)

## DB44 (Female): RS-232 (Ports 1 and 2 only)

Pin	Signal	Pin	Signal	Pin	Signal
1		16		31	
2		17		32	
3		18		33	
4		19		34	
5		20		35	
6		21		36	
7		22		37	
8		23		38	
9	TXD1	24	CTS1	39	DCD1
10	RXD1	25	DTR1	40	RI1
11	RTS1	26	DSR1	41	GND
12		27		42	DCD0
13	TXD0	28	CTS0	43	RIO
14	RXD0	29	DTRO	44	GND
15	RTS0	30	DSR0		

#### DB44 (Female): RS-422

Pin	Signal	Pin	Signal	Pin	Signal
1	RXD3+(B)	16	CTS3+(B)	31	TXD3-(A)
2	TXD3+(B)	17	RXD3-(A)	32	CTS3-(A)
3	RTS3+(B)	18	RTS3-(A)	33	GND3
4		19		34	
5	RXD2+(B)	20	CTS2+(B)	35	TXD2-(A)
6	TXD2+(B)	21	RXD2-(A)	36	CTS2-(A)
7	RTS2+(B)	22	RTS2-(A)	37	GND2
8		23		38	
9	RXD1+(B)	24	CTS1+(B)	39	TXD1-(A)
10	TXD1+(B)	25	RXD1-(A)	40	CTS1-(A)
11	RTS1+(B)	26	RTS1-(A)	41	GND1
12		27		42	TXD0-(A)
13	RXD0+(B)	28	CTSO+(B)	43	CTSO-(A)
14	TXD0+(B)	29	RXD0-(A)	44	GND0
15	RTSO+(B)	30	RTSO-(A)		

## DB44 (Female): RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	RXD3+(B)	16		31	TXD3-(A)
2	TXD3+(B)	17	RXD3-(A)	32	
3		18		33	GND3
4		19		34	
5	RXD2+(B)	20		35	TXD2-(A)
6	TXD2+(B)	21	RXD2-(A)	36	
7		22		37	GND2
8		23		38	
9	RXD1+(B)	24		39	TXD1-(A)
10	TXD1+(B)	25	RXD1-(A)	40	
11		26		41	GND1
12		27		42	TXD0-(A)
13	RXD0+(B)	28		43	
14	TXD0+(B)	29	RXD0-(A)	44	GND0
15		30			

#### DB44 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	Data3+(B)	16		31	
2		17	Data3-(A)	32	
3		18		33	GND3
4		19		34	
5	Data2+(B)	20		35	
6		21	Data2-(A)	36	
7		22		37	GND2
8		23		38	
9	Data1+(B)	24		39	
10		25	Data1-(A)	40	
11		26		41	GND1
12		27		42	
13	Data0+(B)	28		43	
14		29	Data0-(A)	44	GND0
15		30			

# CP-138U

This board supports RS-422 and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
		OPT8-M9	8×DB9 (male)
CP-138U		CBL-M62M9x8-100 (OPT8D) OPT8B CBL-M62M25x8-100 (OPT8C)	
	DB62 (fomale)		8×DB25 (male)
	DBoz (Ternale)		
		OPT8A, OPT8S, OPT8F, OPT8Z, OPT8K,	8×DB25 (female)
		OPT8I	

#### DB62 (Female): RS-422, RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	RxD0+(B)	22	TxD0+(B)	43	
2	RxD0-(A)	23		44	
3	TxD1+(B)	24	TxD0-(A)	45	GND
4		25	RxD1+(B)	46	
5	TxD1-(A)	26	RxD1-(A)	47	
6	RxD2+(B)	27	TxD2+(B)	48	
7	RxD2-(A)	28		49	
8	TxD3+(B)	29	TxD2-(A)	50	GND
9		30	RxD3+(B)	51	
10	TxD3-(A)	31	RxD3-(A)	52	
11	TxD4+(B)	32	GND	53	
12		33	RxD4+(B)	54	
13	TxD4-(A)	34	RxD4-(A)	55	GND
14	RxD5+(B)	35	TxD5+(B)	56	
15	RxD5-(A)	36		57	
16	TxD6+(B)	37	TxD5-(A)	58	GND
17		38	RxD6+(B)	59	
18	TxD6-(A)	39	RxD6-(A)	60	
19	TxD7+(B)	40	GND	61	
20		41	RxD7+(B)	62	
21	TxD7-(A)	42	RxD7-(A)		

## DB62 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	Data0+(B)	22		43	
2	Data0-(A)	23		44	
3		24		45	GND
4		25	Data1+(B)	46	
5		26	Data1-(A)	47	
6	Data2+(B)	27		48	
7	Data2-(A)	28		49	
8		29		50	GND
9		30	Data3+(B)	51	
10		31	Data3-(A)	52	
11		32	GND	53	
12		33	Data4+(B)	54	
13		34	Data4-(A)	55	GND
14	Data5+(B)	35		56	
15	Data5-(A)	36		57	
16		37		58	GND
17		38	Data6+(B)	59	
18		39	Data6-(A)	60	
19		40	GND	61	
20		41	Data7+(B)	62	
21		42	Data7-(A)		

## CP-138U-I

This board supports RS-422 and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors	
CP-138U-I	DD70 (famala)	CBL-M78M9x8-100	8×DB9 (male)	
	DB78 (Ternale)	CBL-M78M25x8-100	8×DB25 (male)	

# DB78 (Female): RS-422, RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	27	RxD5-(A)	53	
2	RxD7+(B)	28		54	
3		29	RxD4-(A)	55	
4	GND6	30		56	
5	RxD6+(B)	31		57	
6	GND5	32	RxD3-(A)	58	
7	RxD5+(B)	33		59	
8		34	RxD2-(A)	60	TxD7-(A)
9	GND4	35		61	TxD7+(B)
10	RxD4+(B)	36		62	TxD6-(A)
11	GND3	37	RxD1-(A)	63	TxD6+(B)
12	RxD3+(B)	38		64	
13		39	RxD0-(A)	65	TxD5-(A)
14	GND2	40		66	TxD5+(B)
15	RxD2+(B)	41		67	TxD4-(A)
16	GND1	42		68	TxD4+(B)
17	RxD1+(B)	43		69	
18		44		70	TxD3-(A)
19	GND0	45		71	TxD3+(B)
20	RxD0+(B)	46		72	TxD2-(A)
21		47		73	TxD2+(B)
22	RxD7-(A)	48		74	
23		49		75	TxD1-(A)
24	RxD6-(A)	50		76	TxD1+(B)
25		51		77	TxD0-(A)
26		52		78	TxD0+(B)

#### DB78 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	15	Data2+(B)	29	Data4-(A)
2	Data7+(B)	16	GND1	30	
3		17	Data1+(B)	31	
4	GND6	18		32	Data3-(A)
5	Data6+(B)	19	GND0	33	
6	GND5	20	Data0+(B)	34	Data2-(A)
7	Data5+(B)	21		35	
8		22	Data7-(A)	36	
9	GND4	23		37	Data1-(A)
10	Data4+(B)	24	Data6-(A)	38	
11	GND3	25		39	Data0-(A)
12	Data3+(B)	26		40	
13		27	Data5-(A)	41	
14	GND2	28		42	

# CP-168U

This board supports RS-232. With the OPT8F or OPT8Z accessory, it can support RS-422. With the OPT8K or OPT8I accessory, it can support RS-422 and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-168U		OPT8-M9	
		CBL-M62M9x8-100 (OPT8D)	8×DB9 (Male)
		OPT8B	8×DB25 (Male)
	DB62 (Female)	CBL-M62M25x8-100 (OPT8C)	8×DB25 (Male)
		OPT8A, OPT8S, OPT8F, OPT8Z, OPT8K,	expect (Formale)
		OPT8I	oxDbz5 (remale)
		OPT8-RJ45	8×RJ45

#### DB62 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	TxD0	22	RxD0	43	CTS0
2	DTRO	23	DSR0	44	RTS0
3	RxD1	24	DCD0	45	GND
4	DSR1	25	TxD1	46	CTS1
5	DCD1	26	DTR1	47	RTS1
6	TxD2	27	RxD2	48	CTS2
7	DTR2	28	DSR2	49	RTS2
8	RxD3	29	DCD2	50	GND
9	DSR3	30	TxD3	51	CTS3
10	DCD3	31	DTR3	52	RTS3
11	RxD4	32	GND	53	CTS4
12	DSR4	33	TxD4	54	RTS4
13	DCD4	34	DTR4	55	GND
14	TxD5	35	RxD5	56	CTS5
15	DTR5	36	DSR5	57	RTS5
16	RxD6	37	DCD5	58	GND
17	DSR6	38	TxD6	59	CTS6
18	DCD6	39	DTR6	60	RTS6
19	RxD7	40	GND	61	CTS7
20	DSR7	41	TxD7	62	RTS7
21	DCD7	42	DTR7		

# POS-104UL

This board supports RS-232 only.

Model	Board Connector	Supported Accessories	Serial Connectors
POS-104UL	DB44 (female)	CBL-M44M9x4-50(POS)	4×DB9 (male)

## DB44 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	TxD3	16	CTS3	31	DCD3
2	RxD3	17	DTR3	32	
3	RTS3	18	DSR3	33	GND
4	5V/12V/RI3	19		34	
5	TxD2	20	CTS2	35	DCD2
6	RxD2	21	DTR2	36	
7	RTS2	22	DSR2	37	GND
8	5V/12V/RI2	23		38	
9	TxD1	24	CTS1	39	DCD1
10	RxD1	25	DTR1	40	
11	RTS1	26	DSR1	41	GND
12	5V/12V/RI1	27		42	DCD0
13	TxD0	28	CTS0	43	5V/12V/RI0
14	RxD0	29	DTRO	44	GND
15	RTS0	30	DSR0		

## **CP-102UF**



# **Serial Connectors**

#### DB9 (Male)

The following accessories provide DB9 (male) serial connectors for your UPCI board:

Accessory	Board Connector	Serial Connectors
CBL-M25M9x2-50	DB25 (female)	2×DB9 (male)
CBL-M44M9x4-50	DB44 (female)	4×DB9 (male)
CBL-M44M9x4-50(POS)	DB44 (female)	4×DB9 (male)
CBL-RJ45M9-150	RJ45	4×DB9 (male)
OPT8-M9	DP(2) (female)	(mala)
CBL-M62M9x8-100 (OPT8D)	DB62 (Ternale)	8×DB9 (male)
CBL-M78M9x8-100	DB78 (female)	8×DB9 (male)



The pin assignments for the DB9 (male) serial connector are shown below. There are different pin assignments depending on the serial interface that your board is configured for.

Pin	RS-232	RS-422/RS-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		
9	*5V/12V/RI		

\* The 5V/12V/RI signal only applies to the POS-104UL

#### DB25 (Male)

The following accessories provide DB25 (male) serial connectors for your UPCI board:

Accessory	Board Connector	Serial Connectors
CBL-M44M25x4-50	DB44 (female)	4×DB25 (male)
CBL-RJ45M25-150	RJ45	4×DB25 (male)
OPT8B	DB62 (female)	8×DB25 (male)
CBL-M62M25x8-100 (OPT8C)		
CBL-M78M25x8-100	DB78 (female)	8×DB25 (male)



The pin assignments for the DB25 (male) serial connector are shown below. There are different pin assignments depending on the serial interface that your board is configured for.

Pin	RS-232	RS-422/RS-485 (4W)	RS-485 (2W)
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	
4	RTS		
5	CTS		
6	DSR		
7	GND	GND	GND
8	DCD	TxD-(A)	
20	DTR	RxD-(A)	Data-(A)

#### DB25 (Female)

The following accessories provide DB25 (female) serial connectors for your UPCI board:

Accessory	Board Connector	Serial Connectors
OPT8A, OPT8S, *OPT8F, *OPT8Z, *OPT8K,	DR62 (fomalo)	$9 \times DP2E$ (formula)
*OPT8I		oxDB25 (leitiale)

\* The OPT8F, OPT8Z, OPT8K, and OPT8I are designed for use with the CP-168U only.



The pin assignments for the DB25 (female) serial connector are shown below. There are different pin assignments depending on the serial interface that your board is configured for.

#### OPT8A, OPT8S

Pin	RS-232	RS-422/RS-485 (4W)	RS-485 (2W)
2	RxD	TxD+(B)	
3	TxD	RxD+(B)	Data+(B)
4	CTS		
5	RTS		
6	DTR	RxD-(A)	Data-(A)
7	GND	GND	GND
8	DCD	TxD-(A)	
20	DSR		

#### OPT8F, OPT8Z, OPT8K, OPT8I

Pin	RS-422/RS-485 (4W)	RS-485 (2W)
2	RxD+(B)	Data+(B)
3	TxD+(B)	
7	GND	GND
14	RxD-(A)	Data-(A)
16	TxD-(A)	

#### **RJ45**

The following accessories provide RJ45 serial connectors for your UPCI board:

Accessory	Board Connector	Serial Connectors
OPT8-RJ45	DB62 (female)	8×RJ45



The pin assignments for the RJ45 serial connector are shown below. Only RS-232 is supported. The OPT8-RJ45 accessory should only be used with the CP-118U in RS-232 mode or with the CP-168U.

Pin	RS-232
1	DSR
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	DTR