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

**Multiport Serial Board for PCI Express Bus** 

Fourth Edition, December 2008

www.moxa.com/product



© 2008 Moxa Inc. All rights reserved. Reproduction without permission is prohibited.

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

The software described in this manual is furnished under a license agreement and may be used only in accordance with the terms of that agreement.

### **Copyright Notice**

Copyright © 2008 Moxa Inc. All rights reserved. Reproduction without permission is prohibited.

### Trademarks

MOXA is a registered trademark of Moxa Inc. All other trademarks or registered marks in this manual belong to their respective manufacturers.

### Disclaimer

Information in this document is subject to change without notice and does not represent a commitment on the part of Moxa.

Moxa provides this document "as is," without warranty of any kind, either expressed or implied, including, but not limited to, its particular purpose. Moxa reserves the right to make improvements and/or changes to this manual, or to the products and/or the programs described in this manual, at any time.

Information provided in this manual is intended to be accurate and reliable. However, Moxa assumes no responsibility for its use, or for any infringements on the rights of third parties that may result from its use.

This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

### Technical Support Contact Information www.moxa.com/support

Moxa Americas:	Moxa China (Shanghai office):
Toll-free: 1-888-669-2872	Toll-free: 800-820-5036
Tel: +1-714-528-6777	Tel: +86-21-5258-9955
Fax: +1-714-528-6778	Fax: +86-10-6872-3958
Moxa Europe:	Moxa Asia-Pacific:
Tel: +49-89-3 70 03 99-0	Tel: +886-2-8919-1230

Fax: +49-89-3 70 03 99-99 Fax: +886-2-8919-1231

## **Table of Contents**

Chapter 1	Introduction	1-1
•	Overview	
	Applications	
	Features	
	Package Checklist	
	Installation Flowchart	
Chapter 2	Hardware Installation	2-1
	CP-118EL Dimensions	
	DIP Switch Settings (CP-118EL only)	
	CP-168EL Dimensions (Unit= mm)	
	CP-104EL Dimensions (Unit= mm)	
	CP-102E Dimensions (Unit: mm)	
	CP-102EL Dimensions (Unit: mm)	
	CP-132EL Dimensions (Unit: mm)	
	CP-132EL-I Dimensions (Unit: mm)	
	CP-114EL Dimensions (Unit: mm)	
	CP-114EL-I Dimensions (Unit: mm)	
	Plugging the Board into an Expansion Slot	
Chapter 3	Software Installation	3-1
	Windows Drivers	
	Windows 2008/Vista (32-bit/64-bit)	
	Windows 2003/XP (32-bit/64-bit)	
	Windows 2000	
	Non-Windows Drivers	
	DOS	
	Linux (32-bit/64-bit)	
	SCO	
	Windows CE 5.0	
	Installing the driver	
Chapter 4	Serial Programming Tools	
	Moxa PComm	
	Installing PComm	
	PComm Programming Library	
	Utilities	
	Diagnostics (for Moxa boards only)	
	Monitor (for Moxa boards under Windows 2000/XP/2003)	
	Terminal Emulator	
	RS-485 Programming	
	ADDC <sup>TM</sup>	
Chapter 5	Pin Assignments	
	CP-118EL	
	Board Side Pin Assignments—Female SCSI VHDCI68	
	Device Side Pin Assignments	
	CP-168EL	
	Board Side Pin Assignments—Female SCSI VHDCI68	

	Device Side Pin Assignments	
	CP-104EL	
	Board Side Pin Assignments—Female DB44	
	Device Side Pin Assignments	5-10
	CP-102E	5-11
	Board Side Pin Assignments—Male DB9	5-11
	CP-102EL	5-11
	Board Side Pin Assignments—Female DB25	5-11
	Device Side Pin Assignments	5-12
	CP-132EL/CP-132EL-I	
	Board Side Pin Assignments—Female DB25	5-12
	Device Side Pin Assignments	5-13
	CP-114EL/CP-114EL-I	5-13
	Board Side Pin Assignments—Female DB44	5-13
	Device Side Pin Assignments	5-15
Chapter 6	Troubleshooting	6-1
•	General Troubleshooting	
Appendix A	Technical Reference	A-1
••	Product Specifications	
	CP-118EL Specifications	
	CP-168EL Specifications	
	CP-104EL Specifications	A-2
	CP-102E Specifications	A-3
	CP-102EL Specifications	
	CP-132EL Series Specifications	
	CP-114EL Series Specifications	A-6

# 1 Introduction

Moxa's PCI Express serial boards meet the new slot standard for expansion boards, and work with any PCI Express slots. The boards have multiple RS-232/422/485 serial ports for connecting data acquisition equipment and other serial devices to a PC.

This chapter covers the following topics:

- **Overview**
- □ Applications
- Features
- Package Checklist
- □ Installation Flowchart

### Overview

Moxa's new PCI Express Multiport Serial Boards, named CP-118EL, CP-168EL, and CP-104EL, are designed for POS and ATM applications and for use by industrial automation system manufacturers and system integrators. The boards are compatible with all popular operating systems, and each of them supports data rates of up to 921.6 Kbps, and provides full modem control signals, ensuring compatibility with a wide range of serial peripherals. In addition, CP-118EL, CP-168EL, and CP-104EL work with PCI Express ×1, allowing the boards to be installed in any available PCI Express slot (including ×1, ×2, ×4, ×8, ×16, ×32).

### **PCI Express Solution**

The boards comply with PCI Express Spec. 1.1. The serial transmission mode (RS-232, RS-422, 2-wire RS-485, or 4-wire RS-485) for each port is set with onboard switches (CP-118EL has DIP Switches, CP-168EL and CP-104EL are RS-232 only), but the ports' transmission parameters are configured after the boards are installed. The PCI BIOS automatically assigns the IRQ and I/O addresses. For this reason, you must plug the boards into the computer before installing the drivers. For more PCI Express information, refer to the "Technical Reference" appendix.

### **ESD** Protection

The PCI Express boards come with built-in 15 KV ESD protection to prevent damage to the boards from lightning or high potential voltage. The surge protection feature makes the PCI Express boards suitable for industrial, factory-type applications, and for use with applications that are subject to severe weather conditions.

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

To make 2-wire RS-485 half-duplex connections easier to manage, ADDC<sup>TM</sup> (Automatic Data Direction Control) intelligence is built into the CP-118EL board, eliminating the need for software interference. Windows applications can be set up to manage RS-485 ports without writing additional code to control the half-duplex protocol.

### **Operating System Support**

The PCI Express boards are compatible with all major industrial platforms, including Windows 2000/XP/2003, DOS, and Linux. Moxa device drivers are provided for smoother installation, configuration, and performance. In this manual, we provide installation details for Windows 2003/XP, Windows 2000, DOS, Linux, and SCO.

Visit Moxa's website at <u>www.moxa.com</u> to download the latest drivers and user's manuals for all of Moxa's products.

#### Moxa Serial Comm Tool

For application development, Moxa provides an easy-to-use serial communication library called PComm that runs under Windows NT/95/98/2000/XP/2003. Use this library to develop your own applications with Visual Basic, Visual C++, Borland Delphi, etc. Utilities, such as Data Scope, Monitor, Terminal Emulator, and Diagnostics are included to make it easier to debug, monitor communication status, provide terminal emulation, and transfer files.

### Applications

The PCI Express boards are suitable for many different applications, including:

- Internet/Intranet Connections
- Remote Access
- Multi-user Applications
- Industrial Automation
- Office Automation
- Telecommunications
- PC-based Vending Machines and Kiosks
- POS (Point-of-Sale) Systems

### Features

The PCI Express boards have the following outstanding features:

- PCI Express ×1 compliant
- Low profile board for compact-sized PCs
- Data flow LED display onboard
- Moxa UART with 128-byte FIFO driver
- 50 bps to 921.6 Kbps transmission speed
- Supports both 4-wire and 2-wire RS-485 (CP-118EL,CP-132EL Series,CP-114EL Series)
- 2-wire RS-485 data control with ADDC<sup>TM</sup> (CP-118EL,CP-132EL Series,CP-114EL Series)
- Embedded 15 KV ESD surge protection
- Drivers for all major industrial platforms—Windows 2000, Windows XP/2003/Vista/2008 (32-bit/64-bit), DOS, Linux (32-bit/64-bit), SCO, FreeBSD 4.x/5.x

### Package Checklist

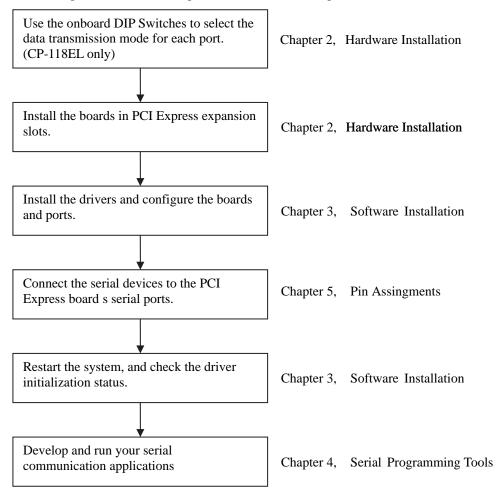
The following items are included in the PCI Express board package:

- PCI Express serial board
- Document and Software CD-ROM
- Quick Installation Guide
- · Low profile bracket

NOTE: Notify your sales representative if any of the above items are missing or damaged.

### **Installation Flowchart**

The following flowchart provides a brief summary of the procedure you should follow to install the PCI Express boards and also provides references to chapters with more detailed information:



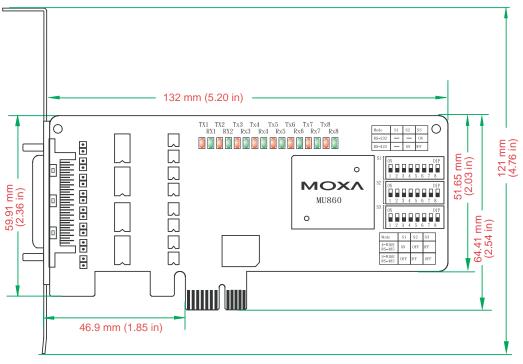
## Hardware Installation

This chapter describes the PCI Express Series hardware installation procedure. Since the BIOS automatically assigns the PCI Express board's IRQ number and I/O addresses, you must plug in the board before installing the driver.

This chapter covers the following topics:

- **CP-118EL Dimensions**
- DIP Switch Settings (CP-118EL only)
- **CP-168EL Dimensions (Unit= mm)**
- **CP-104EL Dimensions (Unit= mm)**
- **CP-102E** Dimensions (Unit: mm)
- **CP-102EL Dimensions (Unit: mm)**
- **CP-132EL Dimensions (Unit: mm)**
- CP-132EL-I Dimensions (Unit: mm)
- **CP-114EL Dimensions (Unit: mm)**
- **CP-114EL-I Dimensions (Unit: mm)**
- **D** Plugging the Board into an Expansion Slot

### **CP-118EL Dimensions**



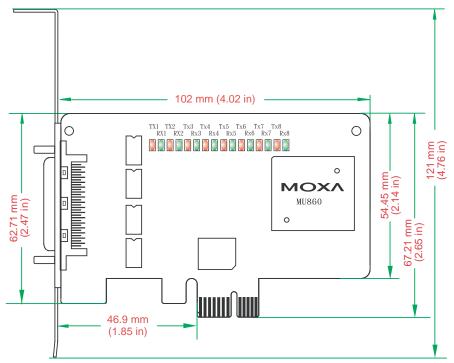
NOTE: Use JP1/2/3/4/5/6/7/8 to activate the Termination Resistors for ports 1/2/3/4/5/6/7/8. **Open** Termination Resistor is NOT active **Short** Termination Resistor is ACTIVE

### **DIP Switch Settings (CP-118EL only)**

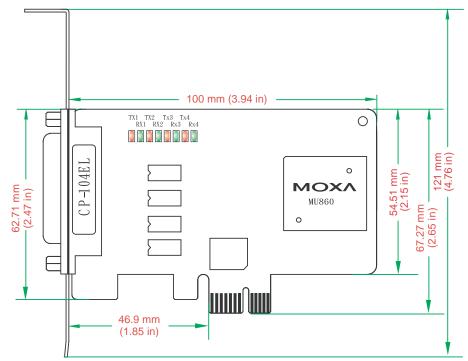
CP-118EL has three onboard DIP Switch arrays, each with 8 switches, shown in the table below and on the listed board (see the above block diagram) as S1, S2, and S3. The switches are used to select one of four serial interfaces—RS-232, RS-422, 4-wire RS-485, 2-wire RS-485—for each of the eight ports. Note that 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.

Mode	S1	S2	S3
RS-232			ON
RS-422		ON	OFF
4-Wire RS-485	ON	OFF	OFF
2-Wire RS-485	OFF	OFF	OFF

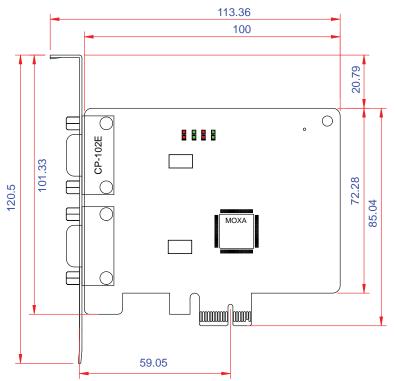
## **CP-168EL Dimensions (Unit= mm)**



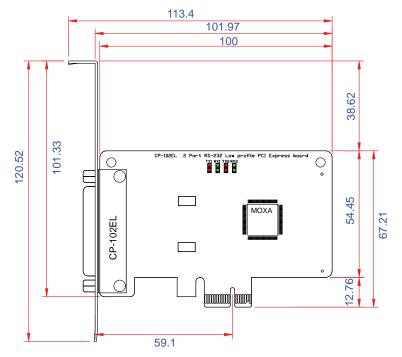
## **CP-104EL Dimensions (Unit= mm)**



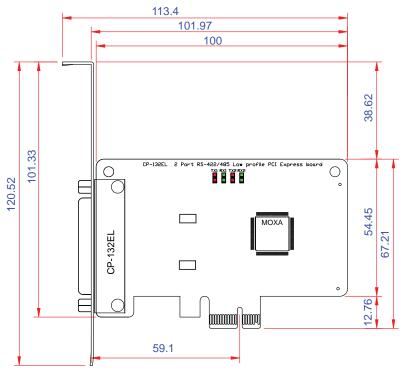
## **CP-102E Dimensions (Unit: mm)**



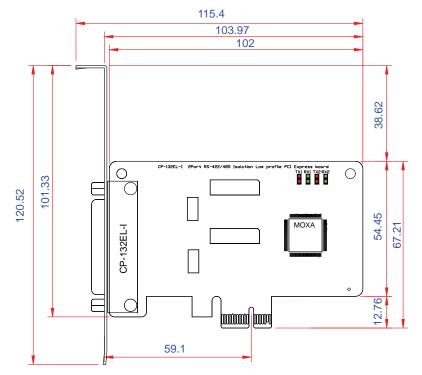
## **CP-102EL Dimensions (Unit: mm)**



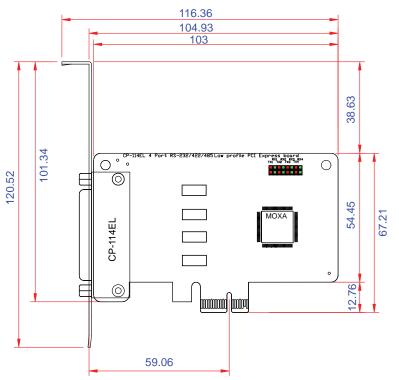
## **CP-132EL Dimensions (Unit: mm)**



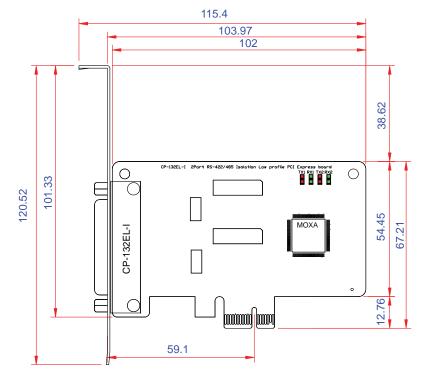
## **CP-132EL-I Dimensions (Unit: mm)**



## **CP-114EL Dimensions (Unit: mm)**



## **CP-114EL-I Dimensions (Unit: mm)**



### Plugging the Board into an Expansion Slot

Since the BIOS automatically assigns the PCI Express board's IRQ number and I/O addresses, you must plug the board into one of the computer's expansion slots before installing the driver.

Step 1: Power off the PC.



#### WARNING

To avoid damaging your system and board, make sure you turn off your computer before installing the board.

	<ul><li>Step 2: Remove the PC's cover.</li><li>Step 3: Remove the slot cover bracket if there is one.</li></ul>
	Step 4: Use the onboard DIP Switches to set the transmission mode for each port (see the previous section for details); (CP-118EL only)
	Step 5: Plug the PCI Express board firmly into a free PCI Express slot.
	Step 6: Fasten the holding screw to fix the control 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.
NOTE	Each Moxa PCI Express board uses one unique IRQ and I/O address, both of which are assigned automatically by the PCI BIOS.

**Step 9:** Proceed with the software installation discussed in the next chapter, "Software Installation."

## **Software Installation**

This chapter gives installation, configuration, and update/removal procedures for the driver for Windows 2000, Windows 2003/XP/Vista/2008 (32-bit/64-bit), DOS, Linux (32-bit/64-bit), and SCO, and WinCE 5.0. Before proceeding with the software installation, complete the hardware installation discussed in the previous chapter, "Hardware Installation."

Refer to the next chapter, "Serial Programming Tools," for information about developing your own serial programming applications. Note that you can install up to 4 PCI Express boards in one system, provided sufficient I/O address and IRQ number resources are available.

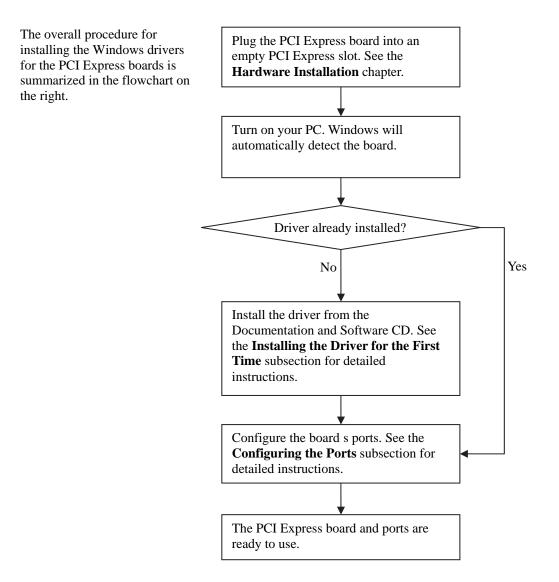
You can download the Windows 2000/XP/2003/Vista/2008, DOS, Linux, and SCO, and WinCE 5.0 drivers from the Moxa website.

This chapter covers the following topics:

- Windows Drivers
  - Windows 2008/Vista (32-bit/64-bit)
  - ▶ Windows 2003/XP (32-bit/64-bit)
  - ➢ Windows 2000
- **Non-Windows Drivers** 
  - > DOS
  - Linux (32-bit/64-bit)
  - > SCO
- □ Windows CE 5.0
  - Installing the driver

### Windows Drivers

Moxa provides drivers that allow you to use the following serial board products under Windows 2008/Vista/2003/XP/2000, Windows 98/95, and Windows NT. Windows 95/98/NT do not support PCI Express drivers.





### WARNING

If you are installing a PCI Express board on an ASUS A8N Series (AMD CPU) motherboard and the installation process hangs the first time, then restart the PC to reinstall it.

**NOTE** The following steps use CP-114EL as an example.

### Windows 2008/Vista (32-bit/64-bit)

In this section, we describe the installation procedure for Windows Vista. The installation procedure for Windows 2008 is similar.

Windows 2008 and Windows Vista support up to 256 serial ports from COM1 to COM256. In order to make the best use of Windows 2008/Vista's multi-process/multi-thread advanced features, 32-bit and 64-bit Windows 2008/Vista device drivers were developed for Moxa multiport boards. The drivers conform to the Win32 COMM API standard.

### **Installing the Driver**

The following procedure describes how to install the CP-114EL driver for the first time with Windows Vista. First, make sure that you have already plugged the board or boards into the system's PCI Express slot(s).

**NOTE** If you have already installed a CP-114EL or other Moxa PCI Express board in your computer, and you are installing additional boards, Windows 2008/Vista will automatically detect and install the new board(s) the next time you boot up the computer. In this case, proceed directly to the next section, "Configuring the Ports," to configure the ports' serial transmission parameters.

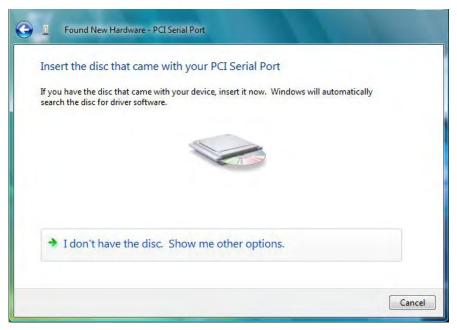
1. After plugging the board into an expansion slot and powering on your PC, Windows Vista will automatically detect the new board, and the **Found New Hardware** window will open.



2. The Found New Hardware – PCI Serial Port window will open automatically. This window will offer to connect to the Windows update site to search for a driver. Select Don't search online.



3. Select I don't have the disc. Show me other options, and then click Browse my computer for device software (advanced) to continue.





4. Select Search for driver software in this location, select Include subfolders, and then click Browse. If the system is a 32-bit (x86) platform, navigate to the \CP-114EL Series\Software\Windows 2008\_Vista\x86 folder on the CD. If the system is a 64-bit (x64) platform, navigate to the \CP-114EL Series\Software\Windows 2008\_Vista\x64 folder on the CD, and then click Next to continue.

The following figure shows the path for x86.

$\bigcirc$	Found New Hardware - PCI Serial Port
	Browse for driver software on your computer
	Search for driver software in this location:
	C:\Users\moxa\Desktop\driv_win_smart_v1.16_build_08061313\x86
	Next Cancel

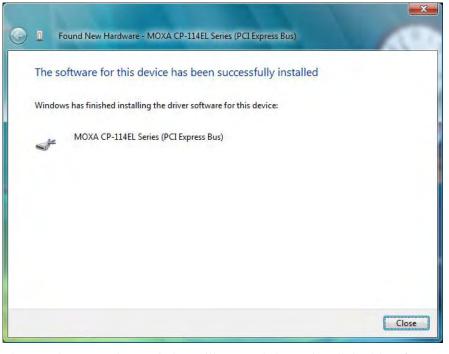
The following figure shows the path for x64.

G	Found New Hardware - MOXA communication port	~ 7
	Browse for driver software on your computer	
	Search for driver software in this location:	
	C:\Users\moxa\Desktop\driv_win_smart_v1.16_build_08061313\x64 👻	Browse
	☑ Include subfolders	
		Next Cancel

5. Wait while the installation wizard searches for the correct drivers. The next window that opens cautions you that although this software has not passed Windows Logo testing, the driver has been tested and shown that it can support the Windows OS. Click **Install this driver software anyway** to proceed.



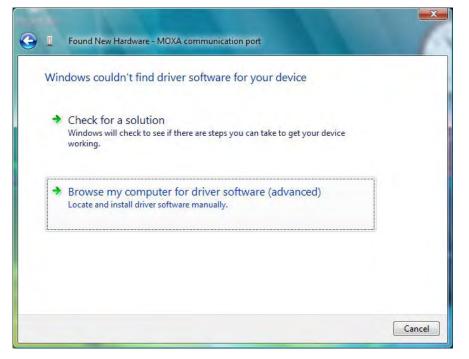
6. Wait while the driver software is installed. The next window shows the model name of the board, and indicates that Windows has completed the driver installation. Click **Close** to proceed with the rest of the installation procedure.



7. The Found New Hardware window will open to help you install the driver for MOXA Port 0. Select **Don't search online**.

Allow Windows communication	to search online fo port?	or driver sof	tware for you	ur MOXA	
➔ Yes, alway:	s search online (red	commended	)		
	automatically search for m to your computer.	the latest drive	rs and application	ns for your hardwa	are and
Yes, search	online this time o	nly			
Windows will your compute	search for the latest drive r.	ers and applicat	ions for this devi	ce and download	them t
Don't sear	ch online				
Your device m	ay not function properly	y until you get t	he latest software	2.	

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



9. Select Search for driver software in this location, select Include subfolders, and then click Browse. If the system is a 32-bit (x86) platform, navigate to the \CP-114EL Series\Software\Windows 2008\_Vista\x86 folder on the CD. If the system is a 64-bit (x64) platform, navigate to the \CP-114EL Series\Software\Windows 2008\_Vista\x64 folder on the CD, and then click Next to continue.

The following figure shows the path for x86.

🕞 🗕 Found New Hardware - PCI Serial Port	
Browse for driver software on your computer	
Search for driver software in this location:	
C:\Users\moxa\Desktop\driv_win_smart_v1:16_build_08061313\x86 ▼	Browse
☑ Include subfolders	
	Next Cancel

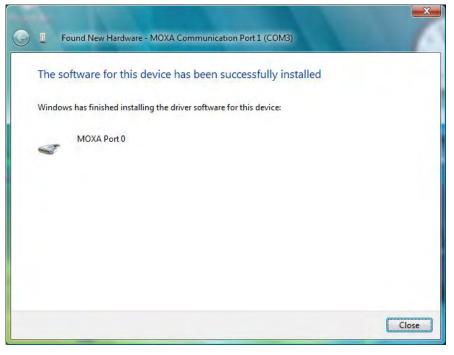
The following figure shows the path for x64.

Found New Hardware - MOXA communication port	7
Browse for driver software on your computer	
Search for driver software in this location:	
C:\Users\moxa\Desktop\driv_win_smart_v1.16_build_08061313\x64	Browse
	Next Cancel

10. Wait while the installation wizard searches. The next window that opens cautions you that although this software has not passed Windows Logo testing, the driver has been tested and shown that it can support the Windows OS. Click **Install this driver software anyway** to proceed.



11. After all files have been copied to the system, the **software for this device has been successfully installed** window will open to indicate that it has finished installing **Port 0**. Port installation procedure is complete when Port 0 has been set up.



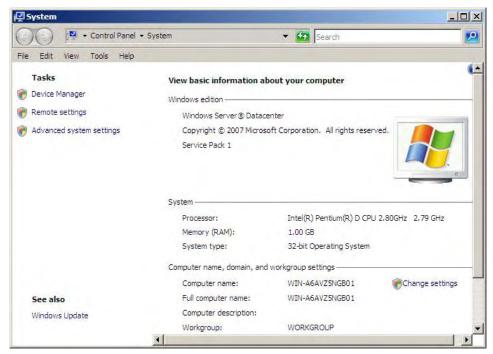
12. The "Your devices are ready to use" will reappear to inform you that the hardware was installed successfully.



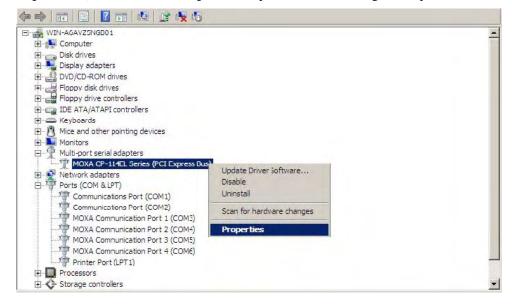
### **Configuring the Ports**

After the driver has been installed, use Device Manager to configure the CP-114EL serial ports.

1. Click Start  $\rightarrow$  Settings  $\rightarrow$  Control Panel  $\rightarrow$  System, select the Hardware tab, and then click Device Manager.



2. Expand the **Multi-port serial adapters** tab, right click **MOXA CP-114EL Series (PCI Express Bus)**, and then click **Properties** to open the board's configuration panel.



3. Click the port you would like to configure to highlight it, and then click Port Setting.

COM No. COM 3 COM 4 COM 5 COM 6	Rx FIFO Level High High High	Tx FIFO Level High High	Interface RS-232	Termination Resistor Disable
COM 4 COM 5	High	the second se	RS-232	Dieshle
COM 5		High		Disclore
	Lich		RS-232	Disable
COM 6	nign	High	RS-232	Disable
	High	High	RS-232	Disable
Help			Port Inf	o Port Setting
	Help	Help	Help	Help Port Inf

- 4. Select a COM number for the port from the Port Number pull-down list.
- 5. Select the **Auto Enumerating COM Number** option to map subsequent ports automatically. The port numbers will be assigned in sequence. For example, if COM 3 is assigned to Port 1, then COM 4 (if not already occupied) will be assigned to Port 2, etc.
- 6. Select an **Rx FIFO** Trigger from the **Rx FIFO** Level pull-down list. Rx FIFO trigger levels of **High**, **Middle**, and **Low** are available, with the default set to High (120 bytes). Select **Set the change to all ports** option to apply this Rx FIFO Trigger to all ports.
- 7. Select a **Tx FIFO Level** from the **Tx FIFO Level** pull-down list. Tx FIFO Levels of **High**, **Middle**, and **Low** are available, with the default set to High (128 bytes). Select **Set the change to all ports** option to apply the just defined Tx FIFO Size to all ports.

Port Number	COM3 (current)	•
Auto	Enumerating COM	Numbe
Rx FIFO Level	High	-
✓ Set th	e change to all po	rts
Tx FIFO Level	High	•
Set th	e change to all po	rts
Interface	RS-422	-
I Set th	e change to all po	rts
Termination Resisto	r Enable	•
🔽 Set th	e change to all po	rts

	Tx FIFO	Rx FIFO
High	128	120
Middle	64	60
Low	1	1
Unit: By	tes	

#### PCI Express Board User's Manual

 If you use the CP-114EL, CP-114EL-I, CP-132EL, CP-132EL-I, select Interface (RS-232, RS-422, 2-wire RS-485, 4-wire RS-485) and Termination Resistor (120Ω, Enable or Disable) to configure. Take CP-114EL for example. If you would like to configure as RS-422 and no Termination Resistor, please see figures below. However, if you use the CP-118EL, please refer to Chapter 2 to configure Interface by DIP switch and Termination Resistor by jumper.

Port Number COM3 (current)	Port Number COM3 (current)
Rx FIFO Level High	Rx FIFO Level High I ✓ Set the change to all ports
Tx FIFO Level High  For Set the change to all ports	Tx FIFO Level     High       I✓     Set the change to all ports
Interface RS-422	Interface RS-422 Set the change to all ports
Termination Resistor I Set the change to all ports	Termination Resistor Disable

9. Click **OK** to save the port settings, and then click **OK** in the **Property** window to finish the port settings procedure.

### Using Event Log

To use the **Event Log** to check the installation of your MOXA boards, click **Start**  $\rightarrow$  **Settings**  $\rightarrow$  **Control Panel**  $\rightarrow$  **Administrative Tools**  $\rightarrow$  **Event Viewer** to enter the Event Viewer utility. Look under the System category to find the latest information relevant to Moxa's drivers.

### **Removing the Driver**

To uninstall the driver, click Start → Settings → Control Panel → System, select the Hardware tab, and then click Device Manager. Use the mouse to place the cursor over the CP-114EL Series board under Multi-port serial adapters, and then click the right mouse button. Select the Uninstall option.

• 🔿 🖬 🗐 📓 🖬 👰 🖏 🐻	
HA-07 Computer Disk drives Display acapters DVD/CD-ROM drives Floppy disk drives Floppy drive controllers Floppy drive controllers Floppy drive controllers Floppy drive controllers Keyboards Mcce and other pointing devices Monitors Multi-port serial edapters	
Image: Second	Update Driver Software Disable Uninstall Scan for hardware changes

2. Select **Delete the driver software for this device** and click **OK** to proceed with uninstalling the board.



3. The **Device Manager** window refreshes automatically, showing that the driver and ports for the CP-114EL Series board have been removed.

📲 Device Manager	
File Action View Help	
WIN-A6AVZ5NGB01         Disk drives         Disk drives         Display adapters         DVD/CD-ROM drives         Flopp drive controllers         TDE ATA/ATAPI controllers         Computer         Mice and other pointing devices         Monitors         Ports (COM & LPT)         Processors         Storage controllers         Display adapters         Universal Serial Bus controllers	

### Windows 2003/XP (32-bit/64-bit)

In this section, we describe the installation procedure for Windows XP. The installation procedure for Windows 2003 is similar.

Windows 2003/XP support up to 256 serial ports, from COM1 to COM256. In order to make the best use of Windows 2003/XP's multi-process/multi-thread advanced features, 32-bit and 64-bit Windows 2003/XP device drivers were developed for Moxa multiport boards. The drivers conform to the Win32 COMM API standard.

### Installing the Driver

The following procedure shows how to install the CP-118EL driver for the first time under Windows XP. First, make sure that you have already plugged the board or boards into the system's PCI Express slot(s).

**NOTE** If you have already installed a CP-118EL or other Moxa PCI Express board in your computer, and you are installing additional boards, Windows 2003/XP will automatically detect and install the new board(s) the next time you boot up the computer. In this case, proceed directly to the next section, "Configuring the Ports," to configure the ports' serial transmission parameters.

#### PCI Express Board User's Manual

1. After plugging the board into an expansion slot and powering on your PC, Windows XP will automatically detect the new board, and the **Found New Hardware** balloon will open in the bottom right corner of the Windows desktop.



2. The **Welcome to the Found New Hardware Wizard** window will open automatically. This window will offer to connect to the Windows update site to search for a driver. Select **No, not at this time** and click **Next** to continue.

Found New Hardware Wiza	ard
	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). Online privacy information Can Windows connect to Windows Update to search for software? Yes, this time only Yes, now and givery time I connect a device No, not this time Click Next to continue.
	< Back Next > Cancel

Found New Hardware Wizard	
This wizard helps you install software for: PCI Serial Port If your hardware came with an instal or floppy disk, insert it now.	illation CD
What do you want the wizard to do? Install the software automatically (Recomment Install from a list or specific location (Advance)	
Click Next to continue.	
K Back Next >	Cancel

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

4. Select Search for the best driver in these locations, select Include this location in the search, and then click Browse. If the system is a 32-bit (x86) platform, navigate to the \CP-118EL\Software\Windows XP\_2003\x86 folder on the CD. If the system is a 64-bit (x64) platform, navigate to the \CP-118EL\Software\Windows XP\_2003\x64 folder on the CD, and then click Next to continue.

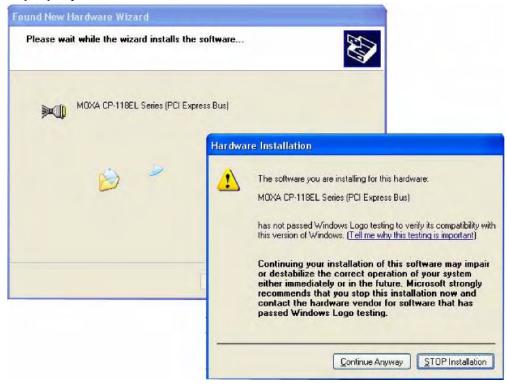
The following figure shows the path for x86.

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)	
H:\CP-118EL\Software\Windows XP 2003\x86 V Rrowse	
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.	
< Back Next > Cancel	

The following figure shows the path for x64.

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:
H:\CP-118EL\Software\Windows XP_2003\x64 🔽 Browse
O 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.
< Back Next > Cancel

5. Wait while the installation wizard searches for the correct drivers. The next window that opens cautions you that although this software has not passed Windows Logo testing, the driver has been tested and shown that it can support the Windows OS. Click **Continue Anyway** to proceed.



#### PCI Express Board User's Manual

6. Wait while the driver software is installed.

Found New Hardware Wizard	
Please wait while the wizard installs the software	
MOXA CP-118EL Series (PCI Express Bus)	
mxser.sys To C:\WINDOWS\system32\DRIVERS	
< Back Next > Cancel	

7. The next window shows the model name of the board, and indicates that Windows has completed the driver installation. Click **Finish** to proceed with the rest of the installation procedure.



#### PCI Express Board User's Manual

8. The **Found New Hardware Wizard** window will open to help you install the driver for Moxa Port 0. This window will offer to connect to the Windows update site to search for a driver. Select **No, not at this time** and then click **Next** to continue.



9. Select Install from a list or specific location (Advanced), and then click Next to proceed.

Found New Hardware Wiza	ard
	This wizard helps you install software for: MDXA communication port If your hardware came with an installation CD or floppy disk, insert it now.
	What do you want the wizard to do? <ul> <li>Install the software automatically (Recommended)</li> <li>Install from a list or specific location (Advanced)</li> </ul> Click Next to continue.
	< Back Next > Cancel

Select Search for the best driver in these locations, select Include this location in the search, and then click Browse. If necessary, use the Browse button to navigate to the \CP-118EL\Software\Windows XP\_2003\x86 folder (32 bit platform) or \CP-118EL\Software\Windows XP\_2003\x64 folder (64 bit platform), and then click Next to proceed.

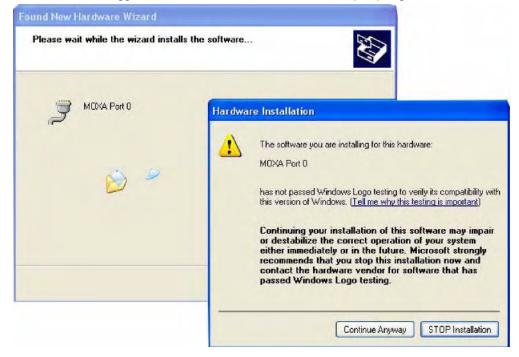
The following figure shows the path for x86.

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:  H:\CP-118EL\Software\Windows XP_2003\x86	
O 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.	
< Back Next > Cancel	

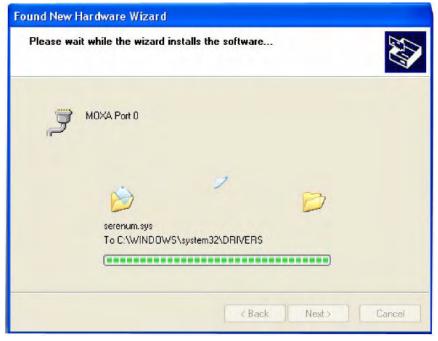
The following figure shows the path for x64.

Please ch	oose your search and installation options.
💽 Sea	rch for the best driver in these locations.
	the check boxes below to limit or expand the default search, which includes local s and removable media. The best driver found will be installed.
E	Search removable media (floppy, CD-ROM)
Б	Include this location in the search:
	H:\CP-118EL\Software\Windows XP_2003\x64 🖌 Browse
ODon	't search. I will choose the driver to install.
	ose this option to select the device driver from a list. Windows does not guarantee t driver you choose will be the best match for your hardware.
	<pre>&lt; Back Next &gt; Cancel</pre>

11. Wait while the installation wizard searches. The next window that opens cautions you that although this software has not passed Windows Logo testing, the driver has been tested and shown that it can support the Windows OS. Click **Continue Anyway** to proceed.



12. Wait while the wizard installs the software.



13. After all files have been copied to the system, the **Completing the Found New Hardware Wizard** window will open to indicate that it has finished installing **Port 0**. Click **Finish** to proceed with the rest of the installation.



14. Repeat Step 7 through Step 11 for each of the remaining seven ports. The last port to be installed will be Moxa Port 7, as shown in the following figure.

Found New Hardware Wiz	ard
	Completing the Found New Hardware Wizard The wizard has finished installing the software for:
	Click Finish to close the wizard.
	K Back Finish Cancel

15. The **Found New Hardware** balloon will reappear to inform you that the hardware was installed successfully.

🔅 Found New Hardware	×
Your new hardware is installed and ready to	use.
<b></b>	$\mathbf{N}$

# **Configuring the Ports**

After the driver has been installed, use Device Manager to configure the CP-118EL serial ports.

1. Click Start → Settings → Control Panel → System, select the Hardware tab, and then click Device Manager.

	Restore	Automa	itic Updates	Remote
General	Compu	uter Name	Hardware	Advanced
Device M	anager			
3			the hardware device	
×	on your compu- properties of an		evice Manager to ch	hange the
			Device Ma	inager
				andger
Drivers	_			
Party			sure that installed o indows Update lets :	
			/indows Update lets	
		Signing		
1	Linuar 9			Indata
[	Driver 9	-igrang		Ipdate
( Hardware		- grang		Ipdate
( Hardware	Profiles Hardware profi	iles provide a v	vay for you to set up	
( Hardware	Profiles	iles provide a v	vay for you to set up	
( Hardware	Profiles Hardware profi	iles provide a v	vay for you to set up	and store
( Hardware	Profiles Hardware profi	iles provide a v	vay for you to set up ons.	and store

2. Expand the **Multi-port serial adapters** tab, right click **Moxa CP-118EL Series (PCI Express Bus)**, and then click **Properties** to open the board's configuration panel.

🗒 Device Manager						
File Action View Help						
← → 🗉 🗳 🗳 💐 🗮 🗮 🦉						
MOXA-0YNV8PQEQ2     Gomputer     Disk drives     Display adapters     Floppy disk controllers     Floppy disk drives     Dis ATA/ATAPI controllers     Keyboards     Moitce and other pointing devices     Monitors     Multi-port serial adapters						
MOXA CP-118EL Series (PCI Express P     MoxA capters	Update Driver					
🖃 🚽 Ports (COM & LPT)	Disable					
- Z Communications Port (COM1)	Uninstall					
Scan for hardware changes						
— 🍠 MOXA Communication Port 2 (COM3)	Properties					
MOXA Communication Port 3 (COM4) MOXA Communication Port 4 (COM5)						
MOXA Communication Port 4 (COM5)						
MOXA Communication Port 5 (COMB)						
MOXA Communication Port 7 (COM8)						
MOXA Communication Port 8 (COM9)						

3. Click the port you would like to configure to highlight it, and then click **Port Setting**.

Port	COM No.	Rx FIFO Level		
1 2	COM 2 COM 3	High High	High High	
3	COM 4	High	High	
4 5	COM 5 COM 6	High High	High High	
6 7 8	COM 8 COM 7 COM 8 COM 9	High High High	High High High	Help
0	COM 5	nigri	nıyrı	Port Info
				Port Setting
				ronseang

- 4. Select a COM number for the port from the **Port Number** pull-down list.
- 5. Select the **Auto Enumerating COM Number** option to map subsequent ports automatically. The port numbers will be assigned in sequence. For example, if COM 3 is assigned to Port 1, then COM 4 (if not already occupied) will be assigned to Port 2, etc.
- 6. Select an **Rx FIFO** Trigger from the **Rx FIFO** Level pull-down list. Rx FIFO trigger levels of **High**, **Middle**, and **Low** are available, with the default set to High (120 bytes). Select **Set the change to all ports** option to apply this Rx FIFO Trigger to all ports.
- 7. Select a **Tx FIFO Level** from the **Tx FIFO Level** pull-down list. Tx FIFO Levels of **High**, **Middle**, and **Low** are available, with the default set to High (128 bytes). Select **Set the change to all ports** option to apply the just defined Tx FIFO Size to all ports.

rt 1		×		Tx FIFO	Rx FIFO
		-	High	128	120
	COM3 (current)		Middle	64	60
Auto	Enumerating <u>C</u> OM Num	ber	Low	1	1
D. 51501		-	Unit: Byte	es	
<u>Rx</u> FIFO Level	High	1			
Set th	e change to <u>a</u> ll ports				
<u>T</u> x FIFO Level	High				
<mark>⊡</mark> <u>S</u> et th	e change to all ports				
	OK Cano				
_	<u>O</u> K Cano	:ei			

8. If you use the CP-114EL, CP-114EL-I, CP-132EL, CP-132EL-I, select Interface (RS-232, RS-422, 2-wire RS-485, 4-wire RS-485) and Termination Resistor (120Ω, Enable or Disable) to configure. Take the CP-114EL for example. If you would like to configure as RS-422 and no Termination Resistor, please see figures below. However, if you use the CP-118EL, please refer to Chapter 2 to configure interface by DIP switch and Termination Resistor by jumper.

#### **Software Installation**

Port Number COM3 (current)	Port Number COM3 (current)
B×FIFO Level High ✓ ✓ Set the change to all ports	Bx FIFD Level High ▼ ▼ Set the change to all ports
Ix FIFO Level High ▼ ✓ Set the change to all ports	Ix FIFD Level High ▼ ✓ Set the change to all ports
Interface RS-422 ▼ Interface RS-232 INF Set the ch RS-422 INF Set Charles Control	Interface RS-422 Set the change to all ports
Termination Resistor ▼ Set the change to all ports	Termination Resistor Disable ▼ ▼ Set the ch Disable Enable

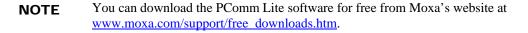
9. Click **OK** to save the port settings, and then click **OK** in the **Property** window to finish the port settings procedure.

# **Using Moxa PComm Utility**

The PComm Diagnostic program is a useful tool for checking the status of Moxa's multiport boards. The program can be used to test internal and external IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, etc. Use this program to ensure that your Moxa boards and ports are working properly.

To start the program, click Start  $\rightarrow$  Programs  $\rightarrow$  PComm Lite 2000  $\rightarrow$  PComm Diagnostic.

R PComm Diagnostic		- O X
File Diegnose Help		
<b>B</b> , <b>A</b>		
To be lested		
DP-118EL Series (ICDM2-COM9) IRQ-16//0-DCC0 PCI bus 5, device 0, function 0	Select Configuration Boards = 1	
<u>S</u>		
Ready		34



# **Using Event Log**

To use the **Event Log** to check the installation of your Moxa boards, click **Start**  $\rightarrow$  **Settings**  $\rightarrow$  **Control Panel**  $\rightarrow$  **Administrative Tools**  $\rightarrow$  **Event Viewer** to enter the Event Viewer utility. Look under the **System** category to find the latest information relevant to Moxa's drivers.

## **Removing the Driver**

 To uninstall the driver, click Start → Settings → Control Panel → System, select the Hardware tab, and then click Device Manager. Use the mouse to place the cursor over the CP-118EL Series board under Multi-port serial adapters, and then click the right mouse button. Select the Uninstall... option.

e Action View Help	
-> 🗉 🗗 🖨 😫 🕿 🏅	8 8
A MOXA-0YNV8PQEQ2	
표 😼 Computer	
🕀 🥯 Disk drives	
🖅 😼 Display adapters	
🗉 📹 Floppy disk controllers	
🗉 😃 Floppy disk drives	
E Controllers	
🕀 🥌 Keyboards	
⊕	
Keyboards     Keyboards     Mice and other pointing devices     Micros	
<ul> <li>➡ ➡ Keyboards</li> <li>➡ ➡ Mice and other pointing devices</li> <li>➡ ➡ ➡ Monitors</li> <li>➡ ➡ ➡ Multi-port serial adapters</li> </ul>	
Keyboards     Mice and other pointing devices     Mice and other pointing devices     Monitors     Multi-port serial adapters     MOXA CP-118EL Series (PCI Exp	
E Source Keyboards     Mice and other pointing devices     Monitors     Multi-port serial adapters     MOXA CP-118EL Series (PCI Exp     Metwork adapters	Update Driver
<ul> <li>Keyboards</li> <li>Mice and other pointing devices</li> <li>Monitors</li> <li>Multi-port serial adapters</li> <li>MOXA CP-118EL Series (PCI Exp Network adapters</li> <li>Person Network adapters</li> <li>Person CCOM &amp; LPT)</li> </ul>	Update Driver Disable
<ul> <li>Keyboards</li> <li>Mice and other pointing devices</li> <li>Monitors</li> <li>Multi-port serial adapters</li> <li>MOXA CP-118EL Series (PCI Exp Network adapters</li> <li>Ports (COM &amp; LPT)</li> <li>Processors</li> </ul>	Update Driver
<ul> <li>Keyboards</li> <li>Mice and other pointing devices</li> <li>Monitors</li> <li>Multi-port serial adapters</li> <li>MOXA CP-118EL Series (PCI Exp Network adapters</li> <li>Ports (COM &amp; LPT)</li> <li>Processors</li> <li>SCSI and RAID controllers</li> </ul>	Update Driver Disable
<ul> <li>Keyboards</li> <li>Mice and other pointing devices</li> <li>Monitors</li> <li>Multi-port serial adapters</li> <li>MOXA CP-118EL Series (PCI Exp Network adapters</li> <li>Ports (COM &amp; LPT)</li> <li>Processors</li> <li>SCSI and RAID controllers</li> <li>Sound, video and game controllers</li> </ul>	Update Driver Disable Uninstall Scan for hardware changes
<ul> <li>Keyboards</li> <li>Mice and other pointing devices</li> <li>Monitors</li> <li>Multi-port serial adapters</li> <li>MOXA CP-118EL Series (PCI Exp Network adapters</li> <li>Ports (COM &amp; LPT)</li> <li>Processors</li> <li>SCSI and RAID controllers</li> </ul>	Update Driver Disable Uninstall

2. Click **OK** to proceed with uninstalling the board.

Confirm	n Device Removal 🛛 💽 🔀
»()	MOXA CP-118EL Series (PCI Express Bus)
Warning	; You are about to uninstall this device from your system.
	OK Cancel

3. The **Device Manager** window refreshes automatically, showing that the driver and ports for the CP-118EL Series board have been removed.

📙 Devi	ice Ma	inage	ŕ		
File A	Action	View	Help		
$\leftrightarrow$ $\Rightarrow$	:4	9	ß	2	
	10XA-0	YNV8P	QEQ2		
<b>±</b>	Com				
+	🥟 Disk				
÷		lay ada			
	🗿 Flop				
	📕 Flop				
	_		TAPI co	ontrollers	
<b>.</b>	Keyl				
<b>+</b>	) Mice	and ot	her po	inting devices	
<b>.</b>					
	🚇 Netv		10000		
	9 Port		& LPT	)	
	R Proc				
-	¥			ontrollers	
1.	2	1		game controllers	
-	Stor				
	🚽 Syst				
+ 6	👌 Univ	ersal S	erial Bu	us controllers	

# Windows 2000

In this section, we describe the installation procedure for Windows 2000.

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

## Installing the Driver for the First Time

The following procedure shows how to install the CP-118EL driver for the first time under Windows 2000. First, make sure you have already plugged the board or boards into the system's PCI Express slot(s).

**NOTE** If you have already installed a CP-118EL or other Moxa PCI Express board in your computer, and you are installing additional boards, Windows 2000 will automatically detect and install the new board(s) the next time you boot up the computer. In this case, proceed directly to the next section, "Configuring the Ports," to configure the ports' serial transmission parameters.

1. After plugging the board into an expansion slot and powering on your PC, Windows 2000 will automatically detect the new board, and the **Found New Hardware** window will be displayed for a moment or two.

Found New Hardware				
3	PCI Serial Port			
Installing	ĥ.,			

2. When the **Welcome to the Found New Hardware Wizard** window opens, click **Next** to continue.

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

3. Select Search for a suitable driver for my device (recommended), and then 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:
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

4. Select **Specify a location** and then 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:	
PCI Serial 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 > Ca	ncel

5. Navigate to the \CP-118EL\Software\Windows 2K folder on the software CD, and then click OK to continue.

ert the manufacturer's installation disk into the drive	1
ected, and then click OK.	OK
	Cancel
oy manufacturer's files from:	
\CP-118EL\Software\Windows 2K	Browse
	py manufacturer's files from: NCP-118ELNSoftware WVindows 2K

6. Click **Next** to copy the driver files to your system.

Found New Hardware Wizard	
Driver Files Search Results The wizard has finished searching for driv	ver files for your hardware device.
The wizard found a driver for the followin	g device:
PCI Serial Port	
Windows found a driver for this device. T	o install the driver Windows found, click Next.
e:\cp-118el\software\wind	lows 2K\mxser.inf
	< Back Next > Cancel

7. The next window that opens cautions you that although this software has not passed Windows Logo testing, the driver has been tested and shown that it can support the Windows OS. Click **Yes** to proceed.



8. Wait while the files are copied to your hard drive.

×
Cancel

9. The next window shows the model number of the board, and indicates that Windows has completed the driver installation. Click **Finish** to continue with the rest of the installation procedure.



10. The **Found New Hardware** Wizard window will open to help you install the driver for Moxa Port 0. Click **Next** to continue.



11. Select Search for a suitable driver for my device (recommended), and then 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

12. Select **Specify a location** and then 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:
PCI Serial 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

13. Navigate to the \CP-118EL\Software\Windows 2K folder on the software CD, and then click OK to continue.

Found Ne	w Hardware Wizard	×
	Insert the manufacturer's installation disk into the drive selected, and then click OK.	OK
		Cancel
	Copy manufacturer's files from:	
	E:\CP-118EL\Software\Windows 2K	Browse

14. Wait while the installation wizard searches.

Found New Hardware Wizard	
Driver Files Search Results The wizard has finished searching for driv	er files for your hardware device.
The wizard found a driver for the following	) device:
MOXA communication port	
Windows found a driver for this device. To	o install the driver Windows found, click Next.
e:\cp-118el\software\winde	ows 2k\mxsport.inf
	re suitable for this device. To view a list of s, select the following check box, and then click
Install one of the other drivers	
	<back next=""> Cancel</back>

15. The next window that opens cautions you that although this software has not passed Windows Logo testing, the driver has been tested and shown that it can support the Windows OS. Click **Yes** to proceed.



16. Wait while the files are copied to your hard drive.

×		Copying Files
		$\sim$
		mxsicfg.dll
		To D:\WINNT\system32
	Cancel	
:	Cancel	

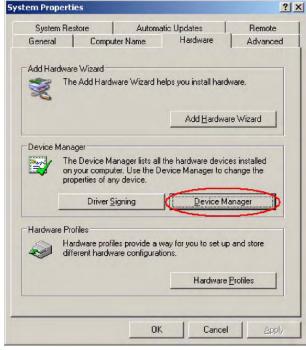
17. After all files have been copied to the system, the **Completing the Found New Hardware Wizard** window will open to indicate that it has finished installing **Port 0**. Click **Finish** to proceed with the rest of the installation.



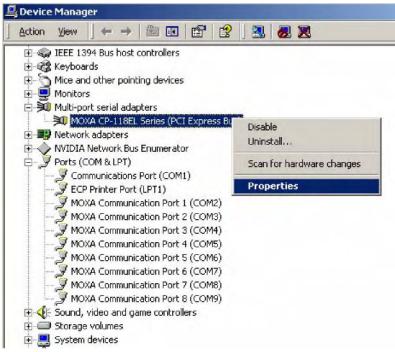
# **Configuring the Ports**

After the driver has been installed, use Device Manager to configure the CP-118EL serial ports.

1. Click **Start → Settings → Control Panel → System**, select the **Hardware** tab, and then click **Device Manager**.



2. Expand the **Multi-port serial adapters** tab, right click **Moxa CP-118EL Series (PCI Express Bus)**, and then click **Properties** to open the board's configuration panel.



3. Basic information about the board is displayed on the **General** page. Click the **Ports Configuration** tab to configure the board's serial ports.

DXA CP-	118EL Series (PC	I Express Bu	s) Prope	ties	? >
General	Ports Configuration	n Driver Re	esources		
	MOXA CP-118EL	. Series (PCI Ex	press Bus)		
	Device type:	Multi-port se	rial adapter	s	
	Manufacturer:	Moxa Techr	nologies Ind	<b>5</b> .	
	Location:	PCI Slot 9 (PCI bus 5, device 0, function 0)			tion 0)
Devic	e status				
	are having probler the troubleshooter.	ns with this dev	vice, click 1	[roubleshoote	r to
			Т	oubleshooter.	
Device	usage:				
Use thi	is device (enable)				•

4. Click the port you would like to configure to highlight it, and then click **Port Setting**.

-
1
•
ng

- 5. Select a COM number for the port from the Port Number pull-down list.
- 6. Select the **Auto Enumerating COM Number** option to map subsequent ports automatically. The port numbers will be assigned in sequence. For example, if COM 3 is assigned to Port 1, then COM 4 (if not already occupied) will be assigned to Port 2, etc.
- 7. Select an **Rx FIFO Trigger** from the **Rx FIFO Level** pull-down list. Rx FIFO trigger levels of **High**, **Middle**, and **Low** are available, with the default set to High (120 bytes). Select Set **the change to all ports** option to apply this Rx FIFO Trigger to all ports.
- 8. Select a **Tx FIFO Level** from the **Tx FIFO Level** pull-down list. Tx FIFO Levels of **High**, **Middle**, and **Low** are available, with the default set to High (128 bytes). Select **Set the change to all ports** option to apply the just defined Tx FIFO Size to all ports.

	Tx FIFO	Rx FIFO	
High	128	120	
Middle	64	60	
Low	1	1	
Unit: Byte	S		
	Middle Low	High 128 Middle 64	High128120Middle6460Low11

9. If you use the CP-114EL, CP-114EL-I, CP-132EL, CP-132EL-I, select Interface (RS-232, RS-422, 2-wire RS-485, 4-wire RS-485) and Termination Resistor (120Ω, Enable or Disable) to configure. Take the CP-114EL for example. If you would like to configure as RS-422 and no Termination Resistor, please see figures below. However, if you use the CP-118EL, please refer to Chapter 2 to configure interface by DIP switch and Termination Resistor by jumper.

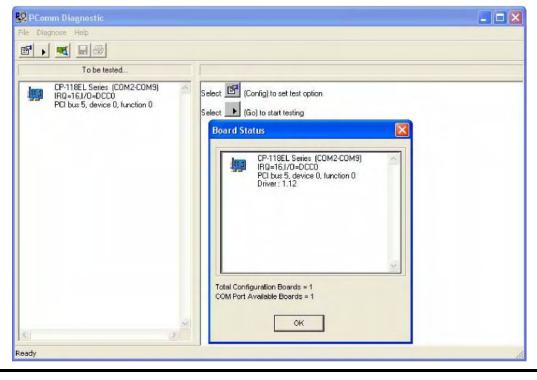
Port Number COM3 (current)	Port Number COM3 (current)
Bx FIFO Level High ▼ ✓ Set the change to all ports	Bx FIFO Level High ✓ Set the change to all ports
<u>I</u> x FIFD Level High ▼ ▼ Set the change to all ports	Ix FIFD Level     High       I     Set the change to all ports
Interface RS-422 Set the ch RS-232	Interface RS-422
Termination Resistor ▼ Set the change to all ports	T <u>e</u> rmination Resistor Disable ▼ ✓ <u>S</u> et the ch Disable Enable

10. Click **OK** to save the port settings, and then click **OK** in the **Property** window to finish the port settings procedure.

### Using Moxa PComm Utility

The PComm Diagnostic program is a useful tool for checking the status of Moxa's multiport boards. The program can be used to test internal and external IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, etc. Use this program to ensure that your Moxa boards and ports are working properly.

To start the program, click Start  $\rightarrow$  Programs  $\rightarrow$  PComm Lite 2000  $\rightarrow$  PComm Diagnostic.



**NOTE** You can download the PComm Lite software for free from Moxa's website at <u>www.moxa.com/support/free\_downloads.htm</u>.

# Using Event Log

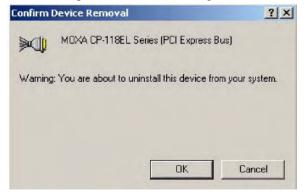
To use the **Event Log** to check the installation of your Moxa boards, click **Start**  $\rightarrow$  **Settings**  $\rightarrow$  **Control Panel**  $\rightarrow$  **Administrative Tools**  $\rightarrow$  **Event Viewer** to enter the Event Viewer utility. Look under the **System** category to find the latest information relevant to Moxa's drivers.

# **Removing the Driver**

 To uninstall the driver, click Start → Settings → Control Panel → System, select the Hardware tab, and then click Device Manager. Use the mouse to place the cursor over the CP-118EL Series board under Multi-port serial adapters, and then click the right mouse button. Select the Uninstall... option.

ction View 🛛 🖛 🔿 💼 🖬 🖆	* 😫 🛃 🛃 🗶
E 🥪 IEEE 1394 Bus host controllers	
🗄 🍓 Keyboards	
🗄 🕤 Mice and other pointing devices	
🗄 📃 Monitors	
Multi-port serial adapters	
MOXA CP-118EL Series (PCI Exer	ress Bus)
Retwork adapters	Disable
🕀 🔷 NVIDIA Network Bus Enumerator	Uninstall
E J Ports (COM & LPT)	Scan for hardware changes
Communications Port (COMI)	
ECP Printer Port (LPT1)	Properties
MOXA Communication Port 2 (CC	
MOXA Communication Port 3 (CC	
MOXA Communication Port 4 (CC	
MOXA Communication Port 6 (CC	
MOXA Communication Port 6 (CC	
MOXA Communication Port 8 (CC	
	5(4)
E Grage volumes	

2. Click **OK** to proceed with uninstalling the board.



3. The **Device Manager** window refreshes automatically, showing that the driver and ports for the CP-118EL Series board have been removed.



# **Non-Windows Drivers**

Drivers are provided for DOS, Linux, and SCO.

# DOS

Moxa DOS API-232 is a software package that assists users in developing new programs, or debugging existing programs for serial communications. This section explains how to install the package, how to set up the driver, and how to load or unload the driver.

Moxa provides drivers that allow you to use the following serial board products under DOS:

- PCI Express Boards: CP-118EL, CP-168EL, CP-104EL.
- Universal PCI Boards: CP-118U, CP-168U, CP-104UL, CP-104JU, CP-102U, CP-102UL, CP-134U, CP-134U-I, CP-132UL, CP-132UL-I V2(CP-132U-I V1)
- **PCI Boards:** C168H/PCI, C104H/PCI, C104HS/PCI, CP-114, CP-114I, CP-114S, CP-114IS, CP-132, CP-132I, CP-132IS, CP-132IS
- **ISA Boards:** C168H, C168HS, C168P, C104H, C104HS, C104P, CI-104J, CI-104JS, CI-134, CI-134I, CI-134IS, CI-132, CI-132I, CI-132IS
- cPCI Boards: CT-114I



#### WARNING

If you are using a Serial ATA HDD under DOS, the installation process will also hang. In this case, change your HDD to IDE drive.

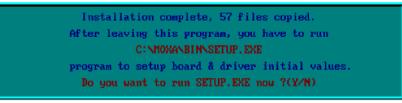
**NOTE** The following procedure shows how to install the CP-168EL driver under DOS.

### Installing the Driver

1. Run the installation program, **DOSINST.EXE** from the **\Software\DOS** folder on the Documentation and Software CD. Specify the target API-232 directory (e.g. C:\Moxa) to which the driver will be copied. Press F2 to start the installation.

Installation					
Target directory	C: NMOXA				
MI: Help	92: Start installation				

2. After the installation is complete, a window will open to ask if you want to run **SETUP.EXE**. Press **Y** to run the program.



# Setting up the Driver

This section covers some of the setup program's most frequently used functions. For complete details, press F1 to open the on-line help file.

- 1. Run **BIN\SETUP.EXE**.
- 2. Press Enter to select the model name of the Moxa board you are installing.



3. A window will open displaying basic configuration information for all boards of this type currently installed in the system. Press **PgDn** to configure the port settings.

	Туре	Port no.	1/0 Address	1 RG	
1	CP-168EL Series	1-8	8988		3/8
	NONE				
	NONE				
4	NONE				

4. You may enter or modify the settings of each port at this stage. The values displayed first are the port's initial values that were set up when the driver was installed.

Port Setup								
Port Number	01	02	03	04	05	06	07	08
TxD buffer size	1K	1K	1K	1K	1K	1K	1K	1K
RxD buffer size	1K	1K	1K	1K	1K	1K	1K	1K
Baud rate	9600	9600	9600	9600	9600	9600	9600	9600
Character length	8	8	8	8	8	8	8	8
Stop bits	1	1	1	1	1	1	1	1
Parity	None	None	None	None	None	None	None	None
DTR output state	0n	0n	<b>0</b> n	0n	On	On	On	0n
RTS output state	0n	On	0n	0n	0n	On	On	0n
CTS flow control	No	No	No	No	No	No	No	No
RTS flow control	No	No	No	No	No	No	No	No
Tx XON/OFF cntrl	No	No	No	No	No	No	No	No
Rx XON/OFF cntrl	No	No	No	No	No	No	No	No
¥1: ;	ielę –	P5: Geu	up edit	P10: 3	Save B	se: Abo	et	

5. Press F10 to save the changes and exit the SETUP program.

## Legends

In this section, we explain the meaning of some of the fields and functions.

#### Port number

This is the ID of the port. Application software uses port number (ID) when referring to a port. You can set the port numbers to any number between 0 and 255 (inclusive). However, you must ensure that you assign each port a unique port number. If you are developing your own application software, then you may want to select port numbers that take into consideration the structure of the program.

#### TxD buffer size

The TxD buffer is the transmission (output) buffer allocated by the system for each port.

#### **RxD** buffer size

The RxD buffer is the receiving (input) buffer allocated by the system for each port.

#### F5 Group Edit

This convenient function allows you to edit the configuration of several ports at one time as a group.

Port Setup							
Port Number	C Charama	12.33.4	•	П	06	07	08
TxD buffer si	🖬 Group	- ROT (		<u> </u>	1K	1K	1K
RxD buffer si	PORT PROFILE	2	PORTS		1K	1K	1K
Baud rate	TxD buffer size	1K	01	1	9600	9600	9600
Character len	RxD buffer size	<b>1</b> K	02		8	8	8
Stop bits	Baud rate	9600	03		1	1	1
Parity	Character length	8	04		None	None	None
DTR output st	Stop bits	1	05		<b>0</b> n	0n	<b>0</b> n
RTS output st	Parity	None	06		<b>0</b> n	0n	0n
CTS flow cont	DTR output state	On	07		No	No	No
RTS flow cont	RTS output state	On	08		No	No	No
Tx XON/OFF cn	CTS flow control	No			No	No	No
Rx XON/OFF cm	RTS flow control	No			No	No	No
	Tx XON/OFF cutr1	No				_	
<u> </u>	Rx XON/OFF cutrl	No		ų.	e: Abo	et	
					THE REAL		
	Inter: Mit/sele	et Tab:	Swite	i i			
ennennennen en er	P18: Update	Discont	Abort		1111111		

## Loading the Driver

After completing the setup procedure, run **BIN\DP-DRV.EXE** from the DOS prompt to load the driver. The driver will automatically detect the boards that have already been installed. If one or more boards are detected, you will see a message similar to the following:

Smartio/Industio Family DOS driver Version 1.7 Setup driver ... CP-168EL series (Bus= x,Dev=y) : OK! Device driver setup O.K.

This indicates that the CP-168EL Series driver has been installed properly. At this point, you may execute applications that support API-232 functions, or start developing applications using the API-232 library.

## Unloading the Driver

To unload (release) the driver from memory, type **DP-DRV/Q** at the DOS prompt and then press **Enter**.

# Linux (32-bit/64-bit)

Moxa provides drivers that allow you to use the following serial board products under Linux.

```
• PCI Express Boards:
CP-118EL,CP-168EL,CP-104EL,CP-102E,CP-102EL,CP-132EL,CP-132EL-I,CP-114EL,CP-1
14EL-I
```

**NOTE** The following procedure shows how to install the CP-114EL driver under Linux.

Execute the following commands from the Linux prompt:

```
    #mount /dev/cdrom /mnt/cdrom
#cd /
#mkdir moxa
#cd moxa
#cp /mnt/cdrom/<driver directory>/driv_linux_smart_vx.x_build_yymmddhh.tgz.
    #tar -xzvf driv_linux_smart_vx.x_build_yymmddhh.tgz.
    #cd mxser
#make clean; make install
```

- 3. #cd /moxa/mxser/driver
   #./msmknod
- 4. #modprobe mxupcie
- For CP-132EL, CP-132EL-I, CP-114EL, CP-114EL-I, use the Moxa Port Configuration Tool to set Interface and Termination Resistor for the MUE series. The MUE series includes CP-102E, CP-102EL, CP-132EL, CP-132EL-I, CP-114EL and CP-114EL-I.

Usage: muestty <operation> device

Device: The MUE series device node

Operation:	-h	Help
	-g	Get interface and terminator type
	-i intf	Set interface type with options below
	-t value	Set termination resistor with options below
intf	RS232	RS-232 mode
	RS422	RS-422 mode
	RS4852W	RS-485 2-wire mode
	RS4854W	RS-485 4-wire mode
value	NONTERM	Non termination resistor
	120TERM	120ohm termination resistor

For example:

To set the MUE interface # muestty –i RS422 /dev/ttyMUE2 To set the MUE termination resistor # muestty –t 120TERM /dev/ttyMUE2

- 6. Use the Moxa diagnostics utility to verify the driver status: #cd /moxa/mxser/utility/diag #./msdiag
- 7. Use the Moxa terminal utility to test the tty ports: #cd /moxa/mxser/utility/term #./msterm

# 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.
- 2. #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

Press RETURN to continue

4. <Note: If your environment is SCO OpenServer 5/6, you could skip step 4 & 5> When you see the screen below, select "Esc" to exit and reboot your computer.

WOXA Smarto/ industro Family instantation Ounty (Ver 1.11)							
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 Tab: Change Item						

MOXA Smartio/Industio Family Installation Utility (Ver 1 11)

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

6. You will 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-104EL, select 4 ports and then CP-104EL.

1	MOXA Smartio/Industio Family Installation Utility (Ver 1.11)							
	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 SettingEsc: ExitEnter: Confirm Input ValueTab: Change Item							

- 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 PCI Express board you selected.
- 8. Next, press "Esc" to exit and reboot your computer.
- <Note: The step 9 & 10 are only for CP-132EL Series and CP-114EL Series> After rebooting, key in "moxaadm". When you see MAIN MENU, select Interface Configuration to set your Resister and Interface. For example, if you want to set one of the

CP-114EL ports as RS-422 and  $120\Omega$ , you have to select RS-422 and  $120\Omega$ .

- 10. Save your Interface Configuration and then reboot computer again.
- 11. Note that whenever you change a MAIN MENU item, you have to reboot your computer.

# Windows CE 5.0

In this section, we explain how to install Moxa PCI Express 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 WinCE 5.0 driver for the Moxa PCI Express Multiport Serial Module supports the following products:

• PCI Express: CP-118EL, CP-168EL and CP-104EL

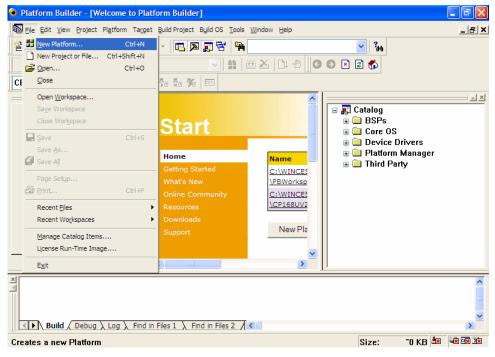
The CP-104EL board is used to illustrate the installation procedure.

# Installing the driver

The following procedure explains how to install the CP-104EL 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.

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



3. Enter a Name for Workspace and press Next.

New Platform	Wizard - Step 2				
	e Name And Location a friendly name for		e.		1
	Name: Test1			_	
	Path:	\PBWorkspace	estTest11		
	1				
2		< Back	Next >	Finish	Cancel

4. 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.

A design template is a pre-defined s Available design templates:	election of Catalog items.	
Custom Device Digital Media Receiver Enterprise Terminal	closely aligned with the purpose of your	
Enterprise Web Pad Gateway Industrial Controller Internet Appliance IP Phone Mobile Handheld Set-Top Box Tiny Kernel Windows Thin Client	Web Pad-based devices with touch display and wireless networking.	
2) < Ba	nck Next > Finish Cancel	

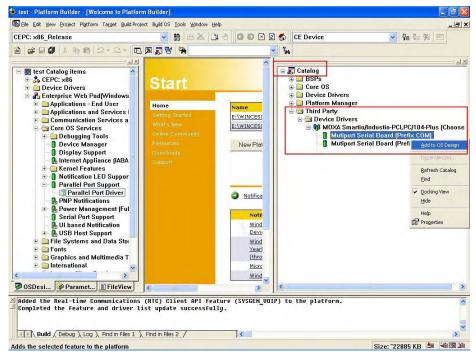
Calant Brans for the state		
Select items for applications	and media to include in your OS design.	-
ms:		
.NET Compact Framework	Support for applications	
ActiveSync	designed for the .NET Co	mpact Framework.
Lightweight Directory Acc           Standard SDK for Window		
VBScript support	5 62	
☑ Windows Media Audio/MI	93	
✓ Windows Media Video/MI	PEG-4 Video	
✓ Windows Messenger ✓ WordPad		
✓ Internet Browser		
Microsoft File Viewers		
Windows CE Error Report		
	Estimated size of these	items: 10063 KB
2	< Back Next > Finish	Cancel
Distant Blood Day 6		•
v Platform Wizard - Step 6		
	is g and communications to include in your	os
design.		
ems:		
- OBEX Server		the OBEX Application
TCP/IPv6 Support	ataphasta brackasta	ovides support for bot
🖬 🔟 Local Area Network (L4		-defined services.
Personal Area Network Remote Desktop Conn		
	AN)	these items: 10924 KB
	AN)	these items: 10924 KE
Wide Area Network (W	Estimated size of	these items: 10924 KE inish Cance
Wide Area Network (W	Estimated size of	
Wide Area Network (W	Estimated size of	
이 교 Wide Area Network (W 고) Platform Wizard - Step 7	Estimated size of	
이 교 Wide Area Network (W 고) Platform Wizard - Step 7	Estimated size of	
Wide Area Network (W Witard - Step 7 BEX Server curity Warning	AN] Estimated size of < Back Next > F	inish Cance
Wide Area Network (W Wizard - Step 7 BEX Server curity Warning der certain circumstances, the Ob.	Estimated size of	inish Cance
Wide Area Network (W Platform Wizard - Step 7 BEX Server curity Warning der certain circumstances, the Ob surity of your platform. This catalc f proper security and authenticat	Estimated size of CBack Next > F	inish Cance
Wide Area Network (W Wizard - Step 7 BEX Server curity Warning der certain circumstances, the Ob unity of your platform. This catalc fr proper security and authenticat can be installed.	ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks: on techniques are not used, a service that interfer	inish Cance
Wide Area Network (W  Platform Wizard - Step 7  BEX Server  curity Warning der certain circumstances, the Ob purity of your platform. This catalc for poer security and authenticat can be installed. If proper encryption techniques a	AN) Estimated size of < Back Next > F ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks:	inish Cance
Wide Area Network (W  Platform Wizard - Step 7  BEX Server  curity Warning  der certain circumstances, the Ob unity of your platform. This catalc if proper encryption techniques a to third parties. learn more about potential OBEX	Estimated size of CBack Next> F ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks: on techniques are not used, a service that interfer re not used, OBEX running over Bluetooth could ex- security risks, as well as the best practices for using	mpromise the es with services.exe pose data packets
Wide Area Network (W  Platform Wizard - Step 7  BEX Server  curity Warning  der certain circumstances, the Ob, unity of your platform. This catala If proper security and authenticat can be installed. If proper encryption techniques a to third parties. If proper encryption techniteceeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee	Estimated size of CBack Next> F ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks: on techniques are not used, a service that interfer re not used, OBEX running over Bluetooth could ex- security risks, as well as the best practices for using	mpromise the es with services.exe pose data packets
Wide Area Network (W  Platform Wizard - Step 7  BEX Server  curity Warning  der certain circumstances, the Ob urity of your platform. This catalc  If proper security and authenticat can be installed.  If proper encryption techniques a to third parties.  learn more about potential OBEX re security.  Security	Estimated size of CBack Next> F ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks: on techniques are not used, a service that interfer re not used, OBEX running over Bluetooth could ex- security risks, as well as the best practices for using	mpromise the es with services.exe pose data packets
Wide Area Network (W  Platform Wizard - Step 7  BEX Server  curity Warning der certain circumstances, the Ob surity of your platform. This catalc If proper security and authenticat can be installed. If proper encryption techniques a to third parties.	Estimated size of CBack Next> F ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks: on techniques are not used, a service that interfer re not used, OBEX running over Bluetooth could ex- security risks, as well as the best practices for using	mpromise the es with services.exe pose data packets
Wide Area Network (W     Vide Area Network (W     Platform Wizard - Step 7     BEX Server     curity Warning     der certain circumstances, the Ob     surity of your platform. This catalc     for poper security and authenticat     can be installed.     If proper encryption techniques a     to third parties.     learn more about potential OBEX     re security.     see the following top     EX Security	Estimated size of CBack Next> F ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks: on techniques are not used, a service that interfer re not used, OBEX running over Bluetooth could ex- security risks, as well as the best practices for using	mpromise the es with services.exe pose data packets
Wide Area Network (W     Vide Area Network (W     Platform Wizard - Step 7     BEX Server     curity Warning     der certain circumstances, the Ob     surity of your platform. This catalc     for poper security and authenticat     can be installed.     If proper encryption techniques a     to third parties.     learn more about potential OBEX     re security.     see the following top     EX Security	Estimated size of CBack Next> F ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks: on techniques are not used, a service that interfer re not used, OBEX running over Bluetooth could ex- security risks, as well as the best practices for using	mpromise the es with services.exe pose data packets
Wide Area Network (W  Platform Wizard - Step 7  BEX Server  curity Warning  der certain circumstances, the Ob urity of your platform. This catalc  If proper security and authenticat can be installed.  If proper encryption techniques a to third parties.  learn more about potential OBEX re security.  Security	Estimated size of CBack Next> F ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks: on techniques are not used, a service that interfer re not used, OBEX running over Bluetooth could ex- security risks, as well as the best practices for using	mpromise the es with services.exe pose data packets
Wide Area Network (W  Platform Wizard - Step 7  BEX Server  curity Warning  der certain circumstances, the Ob urity of your platform. This catalc  If proper security and authenticat can be installed.  If proper encryption techniques a to third parties.  learn more about potential OBEX re security.  Security	Estimated size of CBack Next> F ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks: on techniques are not used, a service that interfer re not used, OBEX running over Bluetooth could ex- security risks, as well as the best practices for using	mpromise the es with services.exe pose data packets
Wide Area Network (W Wizard - Step 7 Platform Wizard - Step 7 BEX Server curity Warning for certain circumstances, the Ob urity of your platform. This catale ff proper security and authenticat can be installed. If proper encryption techniques a to third parties. learn more about potential OBEX re securely, see the following top EX Security	Estimated size of CBack Next> F ect Exchange Protocol (OBEX) catalog item can co g item poses the following potential security risks: on techniques are not used, a service that interfer re not used, OBEX running over Bluetooth could ex- security risks, as well as the best practices for using	mpromise the es with services.exe pose data packets



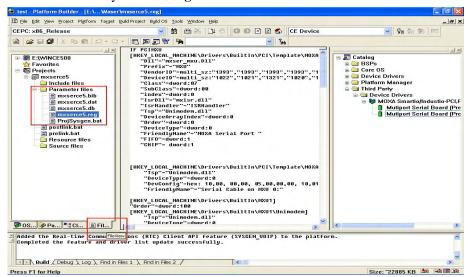
5. Open Manage Catalog Items (File → Manage Catalog Items). In the Catalog (View → Catalog), browse to \Third Party\Device Drivers\ Moxa Smartio/Industio-PCI, PC/104-Plus. Right-click on the driver Prefix COM or Prefix MXU you would like to include and choose Add to OS Design.

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

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.

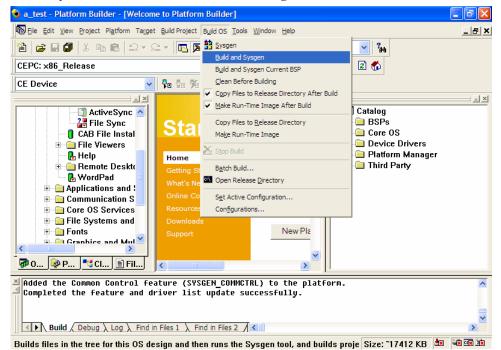
[HKEY\_LOCAL\_MACHINE\ExtModems\HayesCompat1]

"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**.



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.

# **Serial Programming Tools**

Moxa provides an easy to use yet powerful serial programming library, and communication troubleshooting utilities under Windows 2000/XP/2003, Windows 95/98, and Windows NT. The following sections provide details about the installation, the library, and the utilities for various platforms.

This chapter covers the following topics:

#### Moxa PComm

- Installing PComm
- PComm Programming Library

#### **Utilities**

- Diagnostics (for Moxa boards only)
- Monitor (for Moxa boards under Windows 2000/XP/2003)
- > Terminal Emulator

#### □ RS-485 Programming

➢ ADDC™

#### Moxa PComm

PComm, a professional serial communication tool for PCs, is a software package that runs under Windows NT95/98/2000/XP/2003. PComm provides:

- A powerful serial communication library that simplifies serial programming tasks for most popular programming languages. The serial communication library is useful for developing applications for data communications, remote access, data acquisition, and industrial control under Windows NT95/98/2000/XP/2003, and is a simpler programming solution compared to the more complex Windows Win32 COMM API.
- Useful utilities such as diagnostics, monitor, and terminal emulator.
- Illustrative sample programs.
- Comprehensive on-line documentation.

#### Installing PComm

To install PComm, run **\Setup.exe** from the Documentation and Software CD. Note that the PComm diagnostics and monitor utilities are for Moxa boards only. To use these utilities, you must have a Moxa board and the appropriate Windows (NT/95/98/2000/XP/2003) device driver installed in your system. See the "Software Installation" chapter for instructions on how to install the drivers.

After installing PComm, click **Start**, select **Program Files**, and then the **PComm Lite group** to select from the list of utilities and documents.

#### PComm Programming Library

The serial communication library helps you develop serial communications programs for any COM port that complies with the Microsoft Win32 API. This library facilitates the implementation of multi-process, multi-thread serial communication programs, and greatly reduces the time required to develop applications.

For a complete description of the library functions and sample programs for Visual C++, Visual Basic, and Delphi, check the help file and the sample programs in the PComm directory.

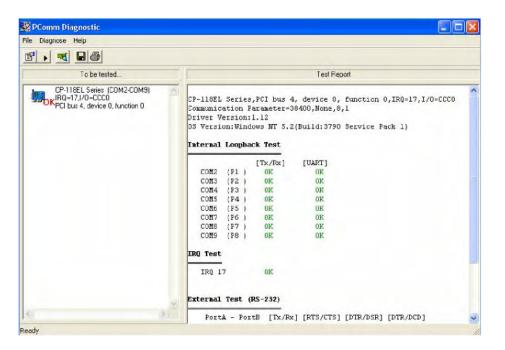
#### Utilities

In this section, we provide brief descriptions of each utility. For more information about these utilities, read the on-line help from the Documentation and Software CD.

#### Diagnostics (for Moxa boards only)

This convenient diagnostics program, which only works with Moxa boards and ports, provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, DTR/DCD, etc. The diagnostics program allows the user to check both the hardware and software functions.

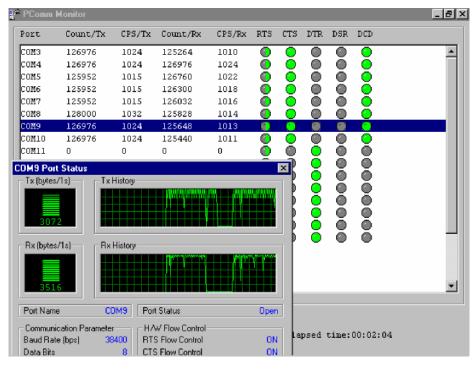
To run the diagnostics program, click Start  $\rightarrow$  Program  $\rightarrow$  PComm Lite  $\rightarrow$  Diagnostic. A typical test report for a Moxa board is as follows:



#### Monitor (for Moxa boards under Windows 2000/XP/2003)

This useful port status monitoring program allows you to monitor data transmission of selected Moxa COM ports. The program monitors data transmission/receiving throughput, and communication line status, with data updated and displayed on the screen at regular time intervals. Click a specific port to see a graph of the current communication parameters and status of that port.

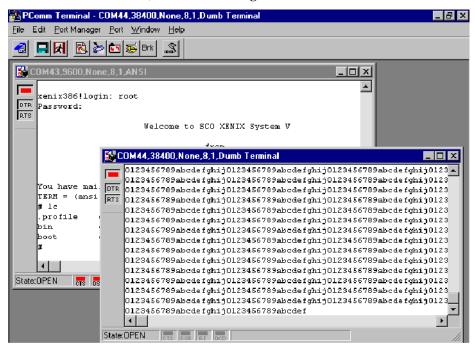
To run the Monitor program, click **Start**  $\rightarrow$  **Program**  $\rightarrow$  **PComm Lite**  $\rightarrow$  **Monitor**.



#### **Terminal Emulator**

Use Terminal Emulator to connect to your PC's serial ports to check if data is being transmitted correctly. Terminal Emulator features multi-windows, and supports VT100 and ANSI terminal types. You can transfer data interactively, send patterns periodically, and transfer files using ASCII, XMODEM, YMODEM, ZMODEM, and KERMIT protocols.

To run Terminal Emulator, click Start  $\rightarrow$  **Program**  $\rightarrow$  **PComm Lite**  $\rightarrow$  **Terminal Emulator**.



#### **RS-485 Programming**

If you are using your CP-118EL Series board for RS-485 applications, in addition to reading this section, you should also refer to the "Connection Cables and Cable Wiring" chapter for more details about using RS-485.

The CP-118EL Series supports 2-wire half-duplex RS-485 and 4-wire full duplex RS-485 communication. Ports configured for 2-wire RS-485 use the Data+ and Data- pins for both transmitting and receiving data. Moxa's own ADDC<sup>TM</sup> (Automatic Data Direction Control) technology is used to switch between transmission and reception.

#### ADDC™

ADDC<sup>™</sup> is the best method for switching between transmission and reception when using 2-wire RS-485.

When using ADDC<sup>TM</sup>, additional code is not required to switch between data transmission and reception, since the board's built-in intelligent hardware mechanism automatically manages the switching mechanism. RS-485 programming using ADDC<sup>TM</sup> mode is just as simple and straightforward as RS-232 or RS-422 programming.

# **Pin Assignments**

This chapter covers the following topics:

#### **CP-118EL**

- > Board Side Pin Assignments—Female SCSI VHDCI68
- Device Side Pin Assignments

#### **CP-168EL**

- > Board Side Pin Assignments—Female SCSI VHDCI68
- Device Side Pin Assignments

#### CP-104EL

- Board Side Pin Assignments—Female DB44
- Device Side Pin Assignments

#### **CP-102E**

Board Side Pin Assignments—Male DB9

#### **CP-102EL**

- Board Side Pin Assignments—Female DB25
- Device Side Pin Assignments

#### □ CP-132EL/CP-132EL-I

- Board Side Pin Assignments—Female DB25
- Device Side Pin Assignments

#### CP-114EL/CP-114EL-I

- > Board Side Pin Assignments—Female DB44
- Device Side Pin Assignments

PCIe Board	Model	Connector Type	Interface
	OPT8D+/OPT8-M9+	Male DB9	RS-232
CP-118EL	OPT8B+/OPT8C+	Male DB25	RS-422/4-wire RS-485
	OPT8A+/OPT8S+	Female DB25	2-wire RS-485
	OPT8D+/OPT8-M9+	Male DB9	
	OPT8B+/OPT8C+	Male DB25	RS-232
CP-168EL	OPT8A+/OPT8S+	Female DB25	
	OPT8F+/OPT8Z+	Female DB25	RS-422
	OPT8K+/OPT8I+	Female DB25	RS-422/RS-485
CP-104EL	CBL-M44M9x4-50	Male DB9	RS-232
CF-104LL	CBL-M44M25x4-50	Male DB25	K3-232
CP-102EL	CBL-M25M9x2-50	Male DB9	RS-232
CP-132EL/ CP-132EL-I	CBL-M25M9x2-50	Male DB9	RS-422/4-wire RS-485/2-wire RS-485
CP-114EL/	CBL-M44M9x4-50	Male DB9	RS-232
CP-114EL/	CBL-M44M25x4-50	Male DB25	RS-422/4-wire RS-485 2-wire RS-485

To select a PCIe board accessories please refer to the following table:

### **CP-118EL**

The CP-118EL board has a female SCSI VHDCI68 connector on the board, with various connection options available for connecting from the board to your serial devices. In this chapter, we provide pin assignments for the board side connector, as well as pin assignments for device side connectors for the different connection options.

The CP-118EL board supports RS-232, RS-422, 4-wire RS-485, and 2-wire RS-485. Note that the RS-422 standard uses a balanced voltage digital interface to allow 9600 bps communication over cables of up to 4000 feet in length. You can connect ten receivers to one driver for broadcasting systems. The RS-485 standard is an enhanced version of the RS-422 balanced line standard. It allows multiple drivers and receivers to work on a multidrop network. A maximum of 32 drivers and 32 receivers can be set up on a multidrop network. The CP-118EL board supports both 2-wire half-duplex and 4-wire full-duplex RS-485 communications. In 2-wire RS-485, Data+/- pins are used for both data transmitting and receiving.

### Board Side Pin Assignments—Female SCSI VHDCI68



#### **RS-232**

Pin	Signal										
1	RxD6	13	DCD4	25	TxD2	37	RI7	49	RI5	61	TxD1
2	CTS6	14	RTS4	26	GND	38	RTS7	50	CTS5	62	DSR1
3	RI6	15	RI4	27	TxD0	39	DCD7	51	RxD5	63	DTR1
4	RTS6	16	CTS4	28	DSR0	40	DTR7	52	RxD3	64	DCD1
5	DCD6	17	RxD4	29	DTR0	41	DSR7	53	CTS3	65	RTS1
6	DTR6	18	RxD2	30	DCD0	42	TxD7	54	RI3	66	RI1
7	DSR6	19	CTS2	31	RTS0	43	GND	55	RTS3	67	CTS1
8	TxD6	20	RI2	32	RI0	44	TxD5	56	DCD3	68	RxD1
9	GND	21	RTS2	33	CTS0	45	DSR5	57	DTR3		
10	TxD4	22	DCD2	34	RxD0	46	DTR5	58	DSR3		
11	DSR4	23	DTR2	35	RxD7	47	DCD5	59	TxD3		
12	DTR4	24	DSR2	36	CTS7	48	RTS5	60	GND		

#### **RS-422 and 4-wire RS-485**

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	TxD6+(B)	18	TxD2+(B)	35	TxD7+(B)	52	TxD3+(B)
5	TxD6-(A)	22	TxD2-(A)	39	TxD7-(A)	56	TxD3-(A)
6	RxD6-(A)	23	RxD2-(A)	40	RxD7-(A)	57	RxD3-(A)
8	RxD6+(B)	25	RxD2+(B)	42	RxD7+(B)	59	RxD3+(B)
9	GND	26	GND	43	GND	60	GND
10	RxD4+(B)	27	RxD0+(B)	44	RxD5+(B)	61	RxD1+(B)
12	RxD4-(A)	29	RxD0-(A)	46	RxD5-(A)	63	RxD1-(A)
13	TxD4-(A)	30	TxD0-(A)	47	TxD5-(A)	64	TxD1-(A)
17	TxD4+(B)	34	TxD0+(B)	51	TxD5+(B)	68	TxD1+(B)

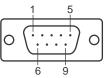
#### 2-wire RS-485

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
6	D6-(A)	23	D2-(A)	40	D7-(A)	57	D3-(A)
8	D6+(B)	25	D2+(B)	42	D7+(B)	59	D3+(B)
9	GND	26	GND	43	GND	60	GND
10	D4+(B)	27	D0+(B)	44	D5+(B)	61	D1+(B)
12	D4-(A)	29	D0-(A)	46	D5-(A)	63	D1-(A)

### Device Side Pin Assignments

### Male DB9 (OPT8D+/OPT8-M9+)

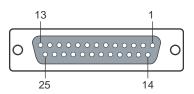
Pin	RS-232	RS-422 / 4-wire RS-485	2-wire RS-485			
1	DCD	TxD-(A)				
2	RxD	TxD+(B)				
3	TxD	RxD+(B)	Data+(B)			
4	DTR	RxD-(A)	Data-(A)			
5	GND	GND	GND			
6	DSR					
7	RTS					
8	CTS					
9						



### Male DB25 (OPT8B+/C+)

	$ \begin{array}{c} 1 \\ 1 \\ 13 \\ \hline 14 \\ 25 \\ \end{array} $						
Pin	RS-232	RS-422 / 4-wire RS-485	2-wire RS-485				
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)				

#### Female DB25 (OPT8A+/S+)



Pin	RS-232	RS-422 / 4-wire RS-485	2-wire RS-485
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		

### **CP-168EL**

The CP-168EL board has a female SCSI VHDCI68 connector on the board, with various connection options available for connecting from the board to your serial devices. In this chapter, we give pin assignments for the board side connector, as well as pin assignments for device side connectors for the different connection options. The CP-168EL board supports RS-232 interface on board.

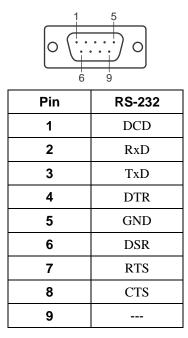
### Board Side Pin Assignments—Female SCSI VHDCI68



#### RS-232

Pin	Signal										
1	RxD6	13	DCD4	25	TxD2	37	RI7	49	RI5	61	TxD1
2	CTS6	14	RTS4	26	GND	38	RTS7	50	CTS5	62	DSR1
3	RI6	15	RI4	27	TxD0	39	DCD7	51	RxD5	63	DTR1
4	RTS6	16	CTS4	28	DSR0	40	DTR7	52	RxD3	64	DCD1
5	DCD6	17	RxD4	29	DTR0	41	DSR7	53	CTS3	65	RTS1
6	DTR6	18	RxD2	30	DCD0	42	TxD7	54	RI3	66	RI1
7	DSR6	19	CTS2	31	RTS0	43	GND	55	RTS3	67	CTS1
8	TxD6	20	RI2	32	RI0	44	TxD5	56	DCD3	68	RxD1
9	GND	21	RTS2	33	CTS0	45	DSR5	57	DTR3		
10	TxD4	22	DCD2	34	RxD0	46	DTR5	58	DSR3		
11	DSR4	23	DTR2	35	RxD7	47	DCD5	59	TxD3		
12	DTR4	24	DSR2	36	CTS7	48	RTS5	60	GND		

### Male DB9 (OPT8D+/OPT8-M9+)



### Male DB25 (OPT8B+/C+)

1 1 1 1 1 1 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0		
Pin	RS-232	
2	TxD	
3	RxD	
4	RTS	
5	CTS	
6	DSR	
7	GND	
8	DCD	
20	DTR	

#### Female DB25 (OPT8A+/S+)

13 0 25 14				
Pin	RS-232			
2	RxD			
3	TxD			
4	CTS			
5	RTS			
6	DTR			
7	GND			
8	DCD			
20	DSR			

### Female DB25 (OPT8F+/Z+)

Pin	RS-422
2	RxD+(B)
3	TxD+(B)
7	GND
14	RxD-(A)
16	TxD-(A)

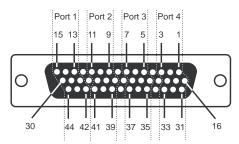
### Female DB25 (OPT8K+/I+)

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

### CP-104EL

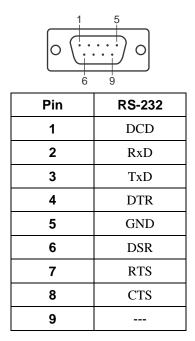
Board Side Pin Assignments—Female DB44

**RS-232** 

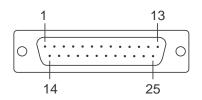


F	Port 1		Port 2		Port 3		Port 4
13	TxD	9	TxD	5	TxD	1	TxD
14	RxD	10	RxD	6	RxD	2	RxD
15	RTS	11	RTS	7	RTS	3	RTS
28	CTS	24	CTS	20	CTS	16	CTS
29	DSR	25	DSR	21	DSR	17	DSR
30	GND	26	GND	22	GND	18	GND
42	DCD	39	DCD	35	DCD	31	DCD
44	DTR	41	DTR	37	DTR	33	DTR

### Male DB9 (CBL-M44M9x4-50)



### Male DB25 (CBL-M44M25x4-50)



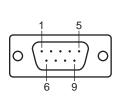
Pin	RS-232	
2	TxD	
3	RxD	
4	RTS	
5	CTS	
6	DSR	
7	GND	
8	DCD	
20	DTR	

### CP-102E

### Board Side Pin Assignments—Male DB9

CP-102E has two Male DB9 connectors on board.

#### Male DB9

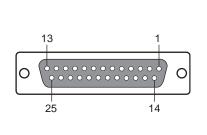


Pin	RS-232 Signals	
1	DCD	
2	RxD	
3	TxD	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	

### **CP-102EL**

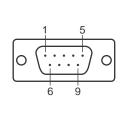
Board Side Pin Assignments—Female DB25

#### **RS-232**



Pin	RS-232	Pin	<b>RS-232</b>
1		13	
2	DCD1	14	
3	GND	15	DTR1
4	CTS1	16	DSR1
5	RxD1	17	RTS1
6		18	TxD1
7		19	
8		20	
9	DTR0	21	DCD0
10	DSR0	22	GND
11	RTS0	23	CTS0
12	TxD0	24	RxD0

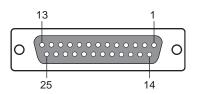
#### Male DB9 (CBL-M25M9x2-50)



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

### CP-132EL/CP-132EL-I

Board Side Pin Assignments—Female DB25

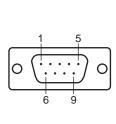


Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1		14		1		14	
2	TxD1-(A)	15	RxD1-(A)	2		15	Data1-(A)
3	GND1	16		3	GND1	16	
4		17		4		17	
5	<b>TxD1+(B)</b>	18	<b>RxD1</b> +( <b>B</b> )	5		18	Data1+(B)
6		19		6		19	
7		20		7		20	
8		21	TxD0-(A)	8		21	
9	RxD0-(A)	22	GND0	9	Data0-(A)	22	GND0
10		23		10		23	
11		24	<b>TxD0+(B)</b>	11		24	
12	<b>RxD0+(B)</b>	25		12	Data0+(B)	25	
13				13			

RS-422 & 4-wire RS-485

2-wire RS-485

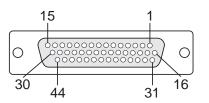
#### Male DB9 (CBL-M25M9x2-50)



Pin	RS-422 / 4-wire RS-485	2-wire RS-485
1	TxD-(A)	
2	TxD+(B)	
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND
6		
7		
8		
9		

### CP-114EL/CP-114EL-I

Board Side Pin Assignments—Female DB44



#### **RS-232**

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	TxD1	13	TxD0	25	DTR1	37	GND
2	RxD2	14	RxD0	26	DSR1	38	
3	RTS3	15	RTS0	27		39	DCD1
4		16	CTS3	28	CTS0	40	
5	TxD2	17	DTR3	29	DTR0	41	GND
6	RxD2	18	DSR3	30	DSR0	42	DCD0
7	RTS2	19		31	DCD3	43	
8		20	CTS2	32		44	GND
9	TxD1	21	DTR2	33	GND		
10	RxD1	22	DSR2	34			
11	RTS1	23		35	DCD2		
12		24	CTS1	36			

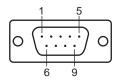
#### RS-422 & 4-wire RS-485

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

#### 2-wire RS-485

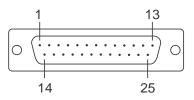
Pin	Signal	Pin	Signal	Pin	Signal
1	Data3+(B)	16		31	
2		17	Data3-(A)	32	
3		18		33	GND3
4		19		34	
5	Data2+(B)	20		35	
6		21	Data2-(A)	36	
7		22		37	GND2
8		23		38	
9	Data1+(B)	24		39	
10		25	Data1-(A)	40	
11		26		41	GND1
12		27		42	
13	Data0+(B)	28		43	
14		29	Data0-(A)	44	GND0
15		30			

### Male DB9 (CBL-M44M9x4-50)



Pin	RS-232	RS-422 & 4-wire RS-485	2-wire RS-485
ГШ			2-wire 1\3-403
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		

### Male DB25 (CBL-M44M25x4-50)



		RS-422 &	
Pin	RS-232	4-wire RS-485	2-wire RS-485
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)

# **6** Troubleshooting

Common PCI Express Series problems and possible solutions are as follows. If you still have problems after reading this chapter, contact your dealer or Moxa for help, or use the Problem Report Form at the end of this manual to report problems to your dealer.

### **General Troubleshooting**

**1.** The Moxa PCI Express board cannot be detected by the Moxa driver while installing the driver.

#### Hardware causes and solutions:

- a. The board is not installed in the computer. Please install it.
- b. The board is not properly plugged into the system. If this is the case, re-plug the board into a PCI Express slot. It is also possible that a slot has malfunctioned. In this case, try other slots until you find one that works.
- c. The motherboard does not have an available IRQ for the PCI Express board. In this case, enter the BIOS and make sure there is an available IRQ under PCI/PnP settings.
- 2. The Moxa PCI Express board and driver are activated but cannot transfer (transmit/receive) data.

#### Hardware Causes and Solutions:

- a. Make sure the cable wiring is connected correctly. Refer to the "Pin Assignments" chapter for correct cable connections.
- b. The cable or the board could be defective. Try other ports, cables, or boards to verify this, or use the PComm Diagnostic utility to test the Moxa board and port conditions. If the Diagnostic program reports an error, replace the faulty components.

#### **Software Causes and Solutions:**

- a. PCI Express Series boards will check the line status (CTS) before transmitting data if the RTS/CTS flow control feature is set to Enable in the configuration or application program. Refer to the "Connection Cables and Cable Wiring" chapter for proper wiring diagrams, and check the line status of the suspected port using the diagnostics LED indicators on the mini tester.
- b. The board control application may not be written correctly according to the corresponding API of the operating system. To check this problem, run another application that you know is correct, or use the utilities provided by Moxa (such as PComm Terminal emulator or HyperTerminal under Windows platform).

# **Technical Reference**

## **Product Specifications**

### **CP-118EL Specifications**

Connectors	SCSI VHDCI68
Comm. Controller	MU860 (16C550C compatible)
Interface	
Bus Interface	PCI Express × 1
Number of Ports	8
Max No. of Boards	4 (only one IRQ required)
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	
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
I/O address/IRQ	BIOS assigned
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS, XON/XOFF
Power and Environment	t i i i i i i i i i i i i i i i i i i i
Power Requirement	860 mA (3.3V)
Operating Temperature	0 to 55°C (32 to 132°F)
Operating Humidity	5 to 95% RH
Storage Temperature	-20 to 85°C (-4 to 185°F)
ESD Protection	Embedded 15 KV ESD Protection
<b>Regulatory Approvals</b>	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B
Warranty	5 years

### **CP-168EL Specifications**

SCSI VHDCI68
MU860 (16C550C compatible)
PCI Express × 1
8
4 (only one IRQ required)
TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
50 bps to 921.6 Kbps
5, 6, 7, 8
1, 1.5, 2
BIOS assigned
None, Even, Odd, Space, Mark
RTS/CTS, XON/XOFF
t
630 mA (3.3V)
0 to 55°C (32 to 132°F)
5 to 95% RH
-20 to 85°C (-4 to 185°F)
Embedded 15 KV ESD Protection
EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B
5 years

### **CP-104EL Specifications**

Hardware	
Connectors	Female DB44
Comm. Controller	MU860 (16C550C compatible)
Interface	
Bus Interface	PCI Express × 1
Number of Ports	4
Max No. of Boards	4 (only one IRQ required)
Signals	
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
Performance	
Baudrate	50 bps to 921.6 Kbps

#### PCI Express Board User's Manual

Configuration		
Data Bits	5, 6, 7, 8	
Stop Bits	1, 1.5, 2	
I/O address/IRQ	BIOS assigned	
Parity	None, Even, Odd, Space, Mark	
Flow Control	RTS/CTS, XON/XOFF	
Power and Environment		
Power Requirement	430 mA (3.3V)	
Operating Temperature	0 to 55°C (32 to 132°F)	
Operating Humidity	5 to 95% RH	
Storage Temperature	-20 to 85°C (-4 to 185°F)	
ESD Protection	Embedded 15 KV ESD Protection	
<b>Regulatory Approvals</b>	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B	
Warranty	5 years	

### **CP-102E** Specifications

Hardware	
Connectors	Male DB9 x 2
Comm. Controller	16C550C compatible
Interface	
Bus Interface	PCI Express × 1
Number of Ports	2
Max No. of Boards	4
Signal	
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
Performance	
Baudrate	50 bps to 921.6 Kbps
Configuration	
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
I/O address/IRQ	BIOS assigned
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS, XON/XOFF
Environment	
Operating Temperature	0 to 55°C (32 to 132°F)
Operating Humidity	5 to 95% RH
Storage Temperature	-20 to 85°C (-4 to 185°F)

ESD Protection	Embedded 15 KV ESD Protection
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN61000-6-2, IEC-61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, FCC Part 15 Class B
Warranty	5 years

### **CP-102EL Specifications**

Hardware	
Connectors	Female DB25
Comm. Controller	16C550C compatible
Interface	
Bus Interface	PCI Express $\times$ 1
Number of Ports	2
Max No. of Boards	4
Signal	
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
Performance	
Baudrate	50 bps to 921.6 Kbps
Configuration	
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
I/O address/IRQ	BIOS assigned
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS, XON/XOFF
Environment	
Operating Temperature	0 to 55°C (32 to 132°F)
Operating Humidity	5 to 95% RH
Storage Temperature	-20 to 85°C (-4 to 185°F)
ESD Protection	Embedded 15 KV ESD Protection
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN61000-6-2, IEC-61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, FCC Part 15 Class B
Warranty	5 years

### **CP-132EL Series Specifications**

Hardware	
Connectors	Female DB25
Comm. Controller	16C550C compatible
Interface	
Bus Interface	PCI Express × 1
Number of Ports	2
Max No. of Boards	4
Signal	
RS-422	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485 4-Wire	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485 2-Wire	Data+(B), Data-(A), GND
Performance	
Baudrate	50 bps to 921.6 Kbps
Configuration	
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
I/O address/IRQ	BIOS assigned
Parity	None, Even, Odd, Space, Mark
Flow Control	XON/XOFF
Environment	
Operating Temperature	0 to 55°C (32 to 132°F)
Operating Humidity	5 to 95% RH
Storage Temperature	-20 to 85°C (-4 to 185°F)
ESD Protection	Embedded 15 KV ESD Protection
Optical Isolation	2 KV (only for CP-132EL-I)
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN61000-6-2, IEC-61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, FCC Part 15 Class B
Warranty	5 years

### **CP-114EL Series Specifications**

•	
Hardware	
Connectors	Female DB44
Comm. Controller	16C550C compatible
Interface	
Bus Interface	PCI Express × 1
Number of Ports	4
Max No. of Boards	4
Signal	
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485 4-Wire	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
RS-485 2-Wire	Data+(B), Data-(A), GND
Performance	
Baudrate	50 bps to 921.6 Kbps
Configuration	
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
I/O address/IRQ	BIOS assigned
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS, XON/XOFF
Environment	
Operating Temperature	0 to 55°C (32 to 132°F)
Operating Humidity	5 to 95% RH
Storage Temperature	-20 to 85°C (-4 to 185°F)
ESD Protection	Embedded 15 KV ESD Protection
Optical Isolation	2 KV (only for CP-114EL-I)
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN61000-6-2, IEC-61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, FCC Part 15 Class B
Warranty	5 years