# PCI Express Board User's Manual

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www.moxa.com/product



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

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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.

The following topics are covered in this chapter:

#### Overview

- PCI Express Solution
- ESD Protection
- > ADDC<sup>™</sup> (Automatic Data Direction Control) for RS-485
- > Operating System Support
- Moxa Serial Comm Tool
- Intelligent RS-485
- Applications
- Features
- Package Checklist
- Installation Flowchart

### **Overview**

Moxa's new PCI Express Multiport Serial Boards 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, all models work with PCI Express x1, allowing the boards to be installed in any available PCI Express slot (including x1, x2, x4, x8, x16, x32).

### **PCI Express Solution**

The boards comply with PCI Express Spec. 1.1. 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 with15 kV ESD protection built in 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

RS-485 uses differential data transmission over two wires to transmit data from one station to another, and allows multiple transmitters and receivers to be used on the same data line. RS-485 uses half-duplex transmission, which means that transmission and reception share the same data channels. For this reason, only one transmitter can be active at any given time.

Moxa's serial boards have a built-in circuitry to switch transmitters on and off automatically. We call this form of switching ADDC® (automatic data direction control). ADDC® is much easier to implement than the traditional "handshaking" method that uses the RTS signal.



### **Operating System Support**

The PCI Express boards are compatible with all major industrial platforms, including Windows 2000/XP/2003/Vista/2008, Windows 7/8/2012, Windows CE, DOS, Linux, and SCO. Moxa device drivers are provided for smoother installation, configuration, and performance.

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.

### Intelligent RS-485

With Intelligent RS-485, you only need one click to automatically tune the Pull High/Low and Termination resistors and get your system ready to go!

## **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
- 128-byte FIFO and on-chip H/W, S/W flow control
- 50 bps to 921.6 kbps transmission speed
- Embedded 15 kV ESD surge protection
- Drivers are provided for all major industrial platforms: Windows 2000, Windows XP/2003/Vista/2008 (32-bit/64-bit), Windows 7 (32-bit/64-bit), Windows 8 (32-bit/64-bit), Windows 2012 (64-bit), Windows CE, Windows XP Embedded, DOS, Linux (32-bit/64-bit), SCO

## Package Checklist

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

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

## **Installation Flowchart**

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



# Hardware Installation

In this chapter, we show the dimensions diagrams of all of the boards in the PCI Express Series, and describe the 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 (driver installation is discussed in Chapter 3).

The following topics are covered in this chapter:

- CP-118EL-A Dimensions
- CP-168EL-A Dimensions
- CP-104EL-A Dimensions
- CP-102E Dimensions
- CP-102EL Dimensions
- CP-132EL Dimensions
- CP-132EL-I Dimensions
- CP-114EL Dimensions
- CP-114EL-I Dimensions
- CP-116E-A Dimensions
- CP-134EL-A-I Dimensions
- CP-118E-A-I/138E-A-I Dimensions
- Plugging the Board into an Expansion Slot

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



# **CP-168EL-A Dimensions**



# **CP-104EL-A Dimensions**



# **CP-102E Dimensions**



# **CP-102EL Dimensions**



# **CP-132EL Dimensions**



## **CP-132EL-I** Dimensions



# **CP-114EL Dimensions**



# **CP-114EL-I** Dimensions



# **CP-116E-A Dimensions**



## **CP-134EL-A-I** Dimensions



## CP-118E-A-I/138E-A-I Dimensions



## **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.

Step 2: Remove the PC's cover.

Step 3: Remove the slot cover bracket if there is one.

Step 4: Plug the PCI Express board firmly into a free PCI Express slot.

Step 5: Fasten the holding screw to fix the control board in place.

Step 6: Replace the PC's cover.

Step 7: 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 8: Proceed with the software installation discussed in the next chapter, "Software Installation."

# **Software Installation**

In this chapter, we give installation, configuration, and update/removal procedures for the driver for Windows 2000, Windows 2003/XP/Vista/2008 (32-bit/64-bit), Windows 7/8/8.1 (32-bit/64-bit), Windows 2012 (64-bit), DOS, Linux (32-bit/64-bit), 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 drivers from the Moxa website.

The following topics are covered in this chapter:

#### Windows Drivers

- Windows 7/8/8.1 (32-bit/64-bit)
- 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 Drivers**

Moxa provides drivers that allow you to use the PCI Express Series serial boards under Windows 7/8 and Windows 2008/Vista/2003/XP/2000.

The overall procedure for installing the Windows drivers for the PCI Express boards is summarized in the flowchart on the right.



### Windows 7/8/8.1 (32-bit/64-bit)

Since the Windows 8 installation procedures and popup windows are almost the same as Windows 7, in this section we describe the installation procedure for Windows 7 to illustrate.

### Installing the Driver

The following procedure describes how to install the CP-104EL-A driver for the first time with Windows 7. 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-104EL-A or other Moxa PCI Express board in your computer, and you are installing additional boards, Windows 7 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 7 will automatically detect the new board, and a popup window\* that states Device driver software was not successfully installed will appear in the lower right corner of your computer screen.

X X

\*The popup message will not appear in Windows 8.

	J	Installing device driver software 🔌 🗙 Click here for status.
ſ		Device driver software was not successfully installed <sup>S</sup> Click here for details.

Go to Device Manager/Other devices to install the PCI Serial Port driver. Right click on the PCI Serial port. Windows will offer to connect to the Windows update site to search for a driver. Select Update Driver Software....

File Action View Help
<ul> <li>ha-06</li> <li>Disk drives</li> <li>Display adapters</li> <li>DVD/CD-ROM drives</li> <li>Floppy disk drives</li> <li>Floppy drive controllers</li> <li>IDE ATA/ATAPI controllers</li> <li>Keyboards</li> <li>Monitors</li> <li>Network adapters</li> <li>Other devices</li> <li>PCI Serial Port</li> <li>Processors</li> <li>System device</li> <li>Universal Seria</li> <li>Scan for hardware changes</li> <li>Properties</li> </ul>
Launches the Update Driver Software Wizard fc

3. Select Browse my computer for device software 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-104EL-A Series\Software\Windows 7\x86 folder on the CD. If the system is a 64-bit (x64) platform, navigate to the \CP-104EL-A Series\Software\Windows 7\x64 folder on the CD, and then click Next to continue.

The following figure shows the path for x86.

General Update Driver Software - PCI Serial Port		×
Browse for driver software on your computer		
Search for driver software in this location:		
C:\Users\moxa\Desktop\PCIe Driver\disk.x86	Browse	
☑ Include subfolders		
➔ Let me pick from a list of device drivers on my This list will show installed driver software compatible with t software in the same category as the device.	Computer     he device, and all driver	
	Next	Cancel

5. 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.



 After installing the multiport serial adapter driver, install the Moxa Port driver next. Right click on MOXA communication port. A popup window will open to help you install the driver for MOXA Port 0. Select Update Driver Software...



7. Select Browse my computer for device software to continue.



 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-104EL-A Series\Software\Windows 7\x86 folder on the CD. If the system is a 64-bit (x64) platform, navigate to the \CP-104EL-A Series\Software\Windows 7\x64 folder on the CD, and then click Next to continue.

The following figure shows the path for x86.

Browse for driver software on your comp	puter
Search for driver software in this location:	
C:\Users\moxa\Desktop\PCIe Driver\x86	▼ Browse
Let me pick from a list of device driv This list will show installed driver software com software in the same category as the device.	vers on my computer apatible with the device, and all driver

9. After all files have been copied to the system, a window showing **Windows has successfully updated your driver software** will open to indicate that it has finished installing **MOXA Port 0**. The Port installation procedure is complete when Port 0 has been set up.



10. Repeat Step 7 through Step 11 for each of the remaining three ports. The last port to be installed will be Moxa Port 3, as shown in the following figure.





11. In Windows 7, a message stating **Your device is ready to use** will pop up\* to inform you that the hardware was installed successfully.

\*The popup message will not appear in Windows 8.



### **Configuring the Ports**

After the driver has been installed, use Device Manager to configure the CP-104EL-A serial ports.

1. Expand the **Multi-port serial adapters** tab, right click **MOXA CP-104EL Series (PCI Express Bus)**, and then click **Properties** to open the board's configuration panel.



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

MOXA CP-104EL Series (PCI Express Bus) Properties										
	Ge	neral	Ports Confi	iguration	Driver	Details Reso	urces			
										_
		Port	COM No.	Rx FIFO	Level	Tx FIFO Level	Interface	Terminati	on Resistor	
		1	COM 3	High		High	RS-232	Disable		
		2	COM 4	High		High	RS-232	Disable		
		3	COM 5	High		High	RS-232	Disable		
		4	COM 6	High		High	RS-232	Disable		
	1									
			Help	1			Port Info	P	ort Setting	1
				]						
Ľ		_			_					
								ОК	Cano	cel

3. Select a COM number for the port from the **Port Number** pull-down list. 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.

Port	1		×
F	Port Number	COM3 (current)	▼ OM Number
F	& FIFO Level ☑ Set	High the change to all	▼ ports
Г	Tx FIFO Level ▼ Set	High the change to all	▼ ports
Ir	n <b>terface</b> ⊠ Set	RS-232 the change to al	<b>▼</b> ports
Г	Fermination Resi ☑ Set	stor Disable	<b>▼</b> ports
	[	ОК	Cancel

- 4. 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.
- 5. 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: Bytes

 If you are using CP-118EL-A, CP-114EL, CP-114EL-I, CP-132EL, or CP-132EL-I, select Interface (RS-232, RS-422, RS-485-2W, or RS-485-4W) and Termination Resistor (120Ω, Enable, or Disable) to configure. We use the CP-118EL-A to illustrate. The following figure shows the settings for configuring the port for RS-422 and no Termination Resistor (select Disable).

Po	rt 1
	Port Number COM7 (current)
	Auto Enumerating COM Number
	Rx FIFO Level High 💌
	Set the change to all ports
	Tx FIFO Level High 💌
	Set the change to all ports
	Interface RS-422 -
	Set the change to all ports
	Termination Resistor Disable
	Set the change to all ports
	OK Cancel

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

### **Removing the Driver**

 Open Device Manager and use the mouse to place the cursor over the CP-104EL-A Series board under Multi-port serial adapters, click the right mouse button, and then select the Uninstall option.



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

Conf	firm Device Uninstall
1	MOXA CP-104EL Series (PCI Express Bus)
Wa	aming: You are about to uninstall this device from your system.
<b>V</b>	Delete the driver software for this device.
	OK Cancel

 The Device Manager window refreshes automatically, showing that the driver and ports for the CP-104EL-A Series board have been removed.



### 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.

Allo	w Windows to search online for driver software for your PCI Serial Port?
+	Yes, always search online (recommended) Windows will automatically search for the latest drivers and applications for your hardware and download them to your computer.
+	Yes, search online this time only Windows will search for the latest drivers and applications for this device and download them to your computer.
+	Don't search online Your device may not function properly until you get the latest software.
leas	e read Microsoft's privacy statement

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

G	1	Found New Hardware - PCI Serial Port	
	Inse	ert the disc that came with your PCI Serial Port	
	If you searc	J have the disc that came with your device, insert it now. Windows will automatically In the disc for driver software.	
	•	I don't have the disc. Show me other options.	
			Cancel
	_		
C	0	Found New Hardware - PCI Serial Port	
<b>@</b>	<u>I</u> Win	Found New Hardware - PCI Serial Port dows couldn't find driver software for your device	
	∎ Win	Found New Hardware - PCI Serial Port adows couldn't find driver software for your device Check for a solution Windows will check to see if there are steps you can take to get your device working.	
•	₪ Win ♦	Found New Hardware - PCI Serial Port adows couldn't find driver software for your device Check for a solution Windows will check to see if there are steps you can take to get your device working. Browse my computer for driver software (advanced) Locate and install driver software manually.	
	₽ Win →	Found New Hardware - PCI Serial Port adows couldn't find driver software for your device Check for a solution Windows will check to see if there are steps you can take to get your device working. Browse my computer for driver software (advanced) Locate and install driver software manually.	

4. 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.

E 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.

G	Found New Hardware - MOXA communication 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\x64	
	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.

9	Windows can't verify the publisher of this driver software
	Don't install this driver software
	You should check your manufacturer's website for updated driver software for your device.
	Install this driver software anyway
	Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or stea information.

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.



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

•	1	Found New Hardware - MOXA communication port	1
	Win	dows couldn't find driver software for your device	
	+	Check for a solution Windows will check to see if there are steps you can take to get your device working.	
	•	Browse my computer for driver software (advanced) Locate and install driver software manually.	
	1		5
			Cancel

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.

G	Found New Hardware - MOXA communication 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\x64	
	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.

9	Win	dows can't verify the publisher of this driver software
	+	Don't install this driver software
		You should check your manufacturer's website for updated driver software for your device.
	>	Install this driver software anyway
		Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or stee information.

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**. The port installation procedure is complete when Port 0 has been set up.

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

12. The **Your devices are ready to use** popup 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.

 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-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.

Port 1	COM No.	D FIFO I			
1		HX FIFU Level	Tx FIFO Level	Interface	Termination Resistor
	COM 3	High	High	RS-232	Disable
2	COM 4	High	High	RS-232	Disable
3	COM 5	High	High	RS-232	Disable
4	COM 6	High	High	RS-232	Disable
	Help	]		Port Inf	o Port Setting

- 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** drop-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.

🔽 Auto Er		
	numerating COI	4 Numbe
Rx FIFO Level	High	•
✓ Set the	change to all p	orts
Tx FIFO Level	High	•
🔽 Set the	change to all p	orts
Interface	RS-422	•
🔽 Set the	change to all p	orts
Termination Resistor	Enable	•
✓ Set the	change to all p	orts

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

3-22

 If you use the CP-114EL, CP-114EL-I, CP-132EL, CP-132EL-I, CP-118EL-A, select Interface (RS-232, RS-422, RS-485-2W, or RS-485-4W) and Termination Resistor (120Ω, Enable, or Disable) to configure. We use CP-114EL to illustrate. The following figure shows the settings for configuring the port for RS-422 and no Termination Resistor (select Disable).

Port Number CO	M3 (current)	Port Number COM3 (current)
Rx FIFO Level I▼ Set the c	High 💽	Rx FIFO Level High  For Set the change to all ports
Tx FIFO Level I▼ Set the c	High 💽	Tx FIFO Level High  For Set the change to all ports
Interface	RS-422 RS-232 RS-422	Interface RS-422 Set the change to all ports
Termination Resistor	R5-485 2W R5-485 4W Disable	Termination Resistor Disable ▼ ▼ Set the che Enable

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

#### **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, click the right mouse button, and then select the Uninstall option.



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 WIN-A6AVZ5NGB01 Disk drives Display adapters Display adapters DVD/CD-ROM drives DVD/CD-ROM drives DVD/CD	

# 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-A 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-A 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.
  - 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.

٩	Found New Hardware	×
PCI	Serial Port	
		5

 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 Wizard	
	Welcome to the Found New Hardware Wizard Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission). Online privacy information
	Can Windows connect to Windows Update to search for software? Yes, this time only Yes, now and gvery time I connect a device No, not this time
	Click Next to continue.
	< 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 Series\Software\Windows XP\_2003\x86 folder on the CD. If the system is a 64-bit (x64) platform, navigate to the \CP-118EL Series\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.		
<ul> <li>Search for the best driver in these locations.</li> </ul>		
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 🗸 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		

The following figure shows the path for x64.

Found New Hardware Wizard		
Please choose your search and installation options.		
<ul> <li>Search for the best driver in these locations.</li> </ul>		
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		
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.

Found New Hardware Wizard	
Please wait while the wizard installs the software	
MOXA CP-118EL Series (PCI Express Bus)	
Hard	ware Installation
	The software you are installing for this hardware: MOXA CP-118EL Series (PCI Express Bus) has not passed Windows Logo testing to verify its compatibility with this version of Windows. ( <u>Tell me why this testing is important</u> ) <b>Continuing your installation of this software may impair</b>
	or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
	Continue Anyway STOP Installation

6. Wait while the driver software is installed.

Found New Hardware Wizard			
Please wait while the wiz	zard installs the softwar	e	Ð
MOXA CP-1188	EL Series (PCI Express Bus)		
mxser.sys To C:WIN	DOWS\system32\DRIVER	5	
	< Ba	ack 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.

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

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 Wizard		
Image: Note of the i		
< 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 Series\Software\Windows XP\_2003\x86 folder (32 bit platform) or \CP-118EL Series\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 🖌 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				

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				

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.

Found New Hardware Wizard				
Please wait while the wizard installs the software				
MOXA Port 0	Hardware Installation         Image: A software you are installing for this hardware:         MOXA Port 0         has not passed Windows Logo testing to verify its compatibility with this version of Windows. (Tell me why this testing is important)         Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware verdor for software that has passed Windows Logo testing.			
	Continue Anyway STOP Installation			

12. Wait while the wizard installs the software.

Found New Hardware Wizard	d	
Please wait while the wizard	l installs the software	Ø.
Disk Port 0		
serenum.sys To C:\WINDO\	✓ WS\system32\DRIVERS	
(*******		
	< Back Next >	Cancel

 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.

Found New Hardware Wiz	ard
	Completing the Found New Hardware Wizard The wizard has finished installing the software for:
	< Back Finish Cancel

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 Wizard		
	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.



#### **Configuring the Ports**

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

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

мо	XA CI	2-118EL S	eries (PCI Ex	press Bus) Pr	operties	? 🗙
G	ieneral	Ports Conf	iguration Driver	Details Reso	ources	
ſ						
	Port	COM No.	Rx FIFO Level	Tx FIFO Level	I	
	1	COM 2	High	High		
	3	COM 4	High	High		
	4	COM 5	High	High		
	5 6 7 8	COM 8 COM 8 COM 9	High High High	High High High	Help	
		COM 5	ngn	rigit	Port Info	
					Port Setting	
1						
				(	OK Ca	incel

- 4. Select a COM number for the port from the Port Number drop-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 drop-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.
- Select a Tx FIFO Level from the Tx FIFO Level drop-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 1	1
Port Number COM3 (current)	
Auto Enumerating COM Number	
<u>B</u> x FIFO Level High ▼	
Set the change to all ports	
<u>I</u> x FIFO Level High ▼	
Set the change to all ports	
OK Cancel	

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

Unit: Bytes

 If you use the CP-118EL-A, CP-114EL, CP-114EL-I, CP-132EL, CP-132EL-I, select Interface (RS-232, RS-422, RS-485-2W, or RS-485-4W) and Termination Resistor (120Ω, Enable, or Disable) to configure. The CP-114EL is used to illustrate. The following figure shows the settings for configuring the port for RS-422 and no Termination Resistor (select Disable).

ort 1 🔀	Port 1
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
Ix FIFO Level High ▼ ▼ Set the change to all ports	Ix FIFO Level     High       ✓     Set the change to all ports
Interface RS-422 ▼ ▼ Set the ch RS-232	Interface RS-422 Set the change to all ports
Termination Resistor RS-485 4₩ Termination Resistor SS-485 4₩ UTisable Set the change to all ports	T <u>e</u> rmination Resistor Disable
<u> </u>	<u> </u>

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.

To be tested	
PP-118EL Series (COM2-COM9) IRQ-16J/0-DCC0 PCI bus 5, device 0, function 0	Select Config) to set test option Select (Go) to stalt testing Board Status (P-118EL Series (COM2-COM9) IRQ-161/70-DCC0 PCI bus 5, device 0, function 0 Driver : 1.12
2 (8)	Total Configuration Boards = 1 COM Port Available Boards = 1 OK



#### **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, click the right mouse button, and then select the Uninstall... option.



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

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

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

🚇 Device Manager
File Action View Help
MOXA-OYNV8PQEQ2     Omputer     Disk drives     Display adapters     Display adapters     Floppy disk controllers     Floppy disk drives     IDE ATA/ATAPI controllers     Keyboards     Monitors     Monitors     Network adapters     Ports (COM & LPT)     Processors
<ul> <li>SCSI and RAID controllers</li> <li>Sound, video and game controllers</li> <li>Storage volumes</li> <li>System devices</li> <li>Het Controllers</li> </ul>

### 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-A 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-A 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.



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. To continue, click Next.
	< <u>B</u> ack Next> 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 gisk drives CD-ROM drives Specify a location Microsoft Windows Update
< <u>B</u> ack <u>N</u> ext > Cancel

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

w Hardware Wizard	
Insert the manufacturer's installation disk into the drive selected, and then click DK.	OK
	Cancel
Copy manufacturer's files from:	
	w Hardware Wizard Insert the manufacturer's installation disk into the drive selected, and then click DK. Copy manufacturer's files from:

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

ind 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	i device:
PCI Serial Port	
Windows found a driver for this device. To	o install the driver Windows found, click Next.
e: \cp-118el\software \windo	ows 2K\mxser.inf

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.

Digital Signature Not Fo	ound	×
3	The Microsoft digital signature affirms that software has been tested with Windows and that the software has no been altered since it was tested.	it.
	The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.	
	MOXA CP-118EL Series (PCI Express Bus)	
	If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.	
	Do you want to continue the installation?	

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

opying Files		×
mxsicfg.dll		
To D:\WINNT\system32		
	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.

Found New Hardware Wizar	d
	Completing the Found New Hardware WizardImage: MCXA CP-118EL Series (PCI Express Bus)Windows has finished installing the software for this device.
	To close this wizard, click Finish.

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

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.

ound New Hardware Wizard
Locate Driver Files Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify. To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations: ☐ Floppy gisk 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 Series\Software\Windows 2K** folder on the software CD, and then click **OK** to continue.

Found Net	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.

D <b>river File</b> The wit	s Search Results ard has finished searching for c	driver files for your ha	irdware device.	ENT.
The wia	ard found a driver for the follow	ing device:		
P	M0XA communication port			
Windov	is found a driver for this device.	. To install the driver	Windows found, clic	k Next
	e:\cp-118el\software\wir	ndows 2k\mxspo	rt.inf	
The wia these d Next.	ard also found other drivers tha ivers or install one of these driv	at are suitable for this rers, select the follow	device. To view a li ing check box, and	st of then click
🔲 Inst	all one of the other drivers			

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.

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

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

Cancel
<u> </u>

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.

 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.

Device Manager	
$\underline{Action}  \underline{\forall iew}  \boxed{ \leftarrow \rightarrow \ }  \underline{\textcircled{m}}  \boxed{\underline{m}}  \underline{\underline{m}}  \boxed{\underline{m}}  \underline{\underline{m}}  \underline{m}}  \underline{\underline{m}}  \underline{\underline{m}} \end{matrix} \underline{m}}  \underline{\underline{m}} \underbrace{\underline{m}} \underline{\underline{m}} \end{matrix} \underline{m}}  \underline{\underline{m}} \underbrace{\underline{m}} \underbrace{\underline{m}} \underline{\underline{m}} \underline{m}} \underbrace{\underline{m}} \underbrace{\underline{m}} \underline{\underline{m}} \underline{m}} \underbrace{\underline{m}} \underbrace{\underline{m}} \underline{m}} \underbrace{\underline{m}} \underbrace{\underline{m}} \underline{m}} \underline{m}} \underbrace{\underline{m}} \underline{m} \underline{m}} \underbrace{\underline{m}} \underline{m} \underline{m}} \underline{m} \underline{m}} \underbrace{\underline{m}} \underline{m} \underline{m}} \underline{m} \underline{m}} \underline{m} \underline{m}} \underline{m} m$	3 😹 🗶
🔃 🥪 IEEE 1394 Bus host controllers	
🗄 🥸 Keyboards	
Mice and other pointing devices	
🗄 💭 Monitors	
🖻 🔊 Multi-port serial adapters	
MOXA CP-118EL Series (PCI Express Bu	Dicable
🔁 🌉 Network adapters	Upinctal
🗈 🔷 NVIDIA Network Bus Enumerator 💦 🔤	Ohinstailt
🖻 🚽 Ports (COM & LPT)	Scan for hardware changes
🥩 Communications Port (COM1)	
- Z ECP Printer Port (LPT1)	Properties
— 🚽 MOXA Communication Port 1 (COM2)	
— 🍠 MOXA Communication Port 2 (COM3)	
- 🦪 MOXA Communication Port 3 (COM4)	
— 🚽 MOXA Communication Port 4 (COM5)	
- Z MOXA Communication Port 5 (COM6)	
— 🚽 MOXA Communication Port 7 (COM8)	
🔁 🍕 Sound, video and game controllers	
🗄 🛲 Storage volumes	
连 🌉 System devices	

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



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

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

- 5. Select a COM number for the port from the Port Number drop-down list.
- 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.

- Select an Rx FIFO Trigger from the Rx FIFO Level drop-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** drop-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 1		×
Port Number	COM3 (current)	
<u>R</u> x FIFO Level I▼ Set	High 💌	
<u>I</u> x FIFO Level ☑ <u>S</u> et	High 💌	
[	<u>O</u> K Cancel	

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

Unit: Bytes

 If you use the CP-118EL-A, CP-114EL, CP-114EL-I, CP-132EL, CP-132EL-I, select Interface (RS-232, RS-422, RS-485-2W, or RS-485-4W) and Termination Resistor (120Ω, Enable, or Disable) to configure. We use the CP-114EL to illustrate. The following figure shows the settings for configuring the port for RS-422 and no Termination Resistor (select Disable).

rt 1 🔀	Port 1
Port Number COM3 (current)	Port Number COM3 (current)
Bx FIFO Level     High       I     Set the change to all ports	Bx FIFO Level High ▼ ▼ Set the change to <u>all</u> ports
Ix FIFO Level High ▼ ▼ Set the change to all ports	Ix FIFO Level High ▼ ✓ Set the change to all ports
Interface RS-422 ▼ ▼ Set the ch RS-232	Interface RS-422  Set the change to all ports
Termination Resistor BS-485 4W Disable Units and Units Set the change to all ports	Termination Resistor Disable ▼ ▼ Set the ch Disable Enable
<u>Q</u> K Cancel	<u> </u>

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 serial 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, click the right mouse button, and then select the Uninstall... option.



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

Device Removal	?×
MOXA CP-118EL Series (PCI Express Bus)	
g: You are about to uninstall this device from your sy	istem.
OK Can	cel
	Device Removal MOXA CP-118EL Series (PCI Express Bus) r: You are about to uninstall this device from your sy OK Can

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-102E, CP-102EL, CP-132EL, CP-132EL-I CP-104EL-A, CP-114EL, CP-114EL-I, CP-118EL-A, CP-168EL-A, CP-118E-A-I, CP-138E-A-I, CP-134EL-A-I, CP-116E-A



#### WARNING

If you are using a Serial ATA HDD under DOS, the installation process will hang. To prevent the installation process from hanging, change your HDD to an IDE drive.

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

#### **Installing the Driver**

 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., <u>C:\Moxa</u>) to which the driver will be copied. Press F2 to start the installation.

🗆 🛛 🗖	stallation	
Target directory	C: NMORA	
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	IRQ	
1	CP-168EL Series	1-8	B880	5	3 / 0
	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 Number	01	02	03	04	05	06	- 07.	08
TxD buffer size	1K	1K	1K	1K	1K	1К	1K	1K
RxD buffer size	1К	1K	1K	-1K	1K	1K	1K	1.K
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	On	On	On	On	On	On	On
RTS output state	On	On	On	On	On	-On	- On	On
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 C	No	No

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.

ort Number	Geoup	Edit	b.	Л	06	07	08
d) buffer si	DONT BRODULD		-		18	18	18
aud rate	PORT PROFILE	414	PURIS		9688	-9688	9688
haracter len	TXP surrer size	TK	01		8	8	8
ton hits	NXD buffer Size	LK	02		1	1	1
aritu	Baud rate	9668	03		None	None	None
TR output st	Stan hite		09		On	On	On
TS output st	Dawitu	Nove	05		0n	On	On
IS flow cont	ITR output state	Om	82		No	No	No
rs flow cont	RTS output state	- On	88		No	No	No
NON/OFF on	CTS flow control	No			No	No	No
KON/OFF cn	RTS flow control	No			No	No	No
	Tx 80N/OFF control	No				And Construction	
2	Bx XON/OFF cutr1	No		L.	e: Abo	et	
	IN HOIP OFF CHEFT		1		तललस्त्रस्		egene

#### 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 boards under Linux.

• PCI Express Boards: CP-118EL, CP-168EL, CP-104EL, CP-102E, CP-102EL, CP-132EL, CP-132EL-I, CP-114EL, CP-114EL-I, CP-118E-A-I/ CP-138E-A-I/ CP-134EL-A-I/CP-116E-A

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
 #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 the 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	1200hm 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.
- #tar xvf <driver tar file>
   #/tmp/moxa/mxinstall
- 3. The window shown below will open next. Press RETURN to continue.

```
_____
```

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Moxa Smartio/Industio Family Device Driver Installation (Ver. 1.11)

For SCO UnixWare 7

Tar files, please wait.....O.K.

Press RETURN to continue

**NOTE** If your environment is SCO OpenServer 5/6, you can skip steps 4 and 5.

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

```
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							
En	PgDn: getty Setting Esc: Exit Enter: Confirm Input Value Tab: Change Item							

5. After rebooting the computer, type "moxaadm"; when you 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.

	Smartio/Indu	ustio Family Basic (	Configuration			
Board No.	Board Type	I/O Address	Interrupt	Bus/Dev N		
1	None					
2	None					
3	None					
4	None					
4 None						

7. The board's basic information, such as I/O address, Bus No., and Device No., will be shown. The SCO system will assign the resources automatically to the PCI Express board you selected.

8. Next, press "Esc" to exit and reboot your computer.

NOTE Steps 9 and 10 are only for the CP-132EL Series and CP-114EL Series

- 9. After rebooting, type "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 the computer again.

11. Note that whenever you change a MAIN MENU item, you need to reboot your computer.

# **Configuring Intelligent RS-485**

In this chapter, we describe how to use the "Auto-Tuning" and "Diagnosis" tools supported by Moxa's Intelligent RS-485 boards to tune your RS-485 network. The Auto-Tuning tool tests your RS-485 network and then configures certain Moxa boards (CP-118E-A-I, CP-138E-A-I, CP-134EL-A-I, and CP-116E-A) automatically. The Diagnosis tool can tell you how to manually configure other Moxa boards, as well as non-Moxa boards. We use the CP-134EL-A board to demonstrate how to use the Intelligent RS-485 tools under Windows 7/8/8.1.

The basic procedure you should follow is illustrated in the following workflow diagram:



The following topics are covered in this chapter:

- Windows Users
- Linux Users

# Windows Users

Take the following steps to use the Intelligent RS-485 function.

1. Expand the **Multi-port serial adapters** tab, right click **MOXA CP-134EL-A Series** (PCI Express Bus), and then click **Properties** to open the configuration panel.



2. Double-click the COM number you wish to configure.

мо	ХА СР	-134EL-A S	eries (PCI Expr	ess Bus) Propert	ies	
Ge	eneral	Ports Confi	iguration Drive	r Details Reso	ources	
	Port	COM No.	Rx FIFO Leve	I Tx FIFO Level	Interface	Termination Resistor
	1	COM 2	High	High	RS-485 2W	Disable
	2	COM 83	High	High	RS-485 2W	Disable ]
	3	COM 84	High	High	RS-485 ZW	Disable
	4	CO MOD	High	High	H3-489 ZW	Disable
	•					Þ
			1			- 1
		Help			Port Info	Port Setting
						Shart Diagnosia
						Stait Diagnosis
						OK Cancel
Check the Auto Enumerating COM Number option to map subsequent ports automatically. The port numbers will be assigned in sequence. Select Interface (RS-232, RS-422, RS-485-2W, or RS-485-4W) from the drop-down box. An Auto Tuning function is provided with RS-485-2W. Click OK to save the settings.

Port 2	×
Port Number	COM83 (current)
<b>N</b> A	uto Enumerating COM Number
Rx FIFO Level	High
s 🔊	et the change to all ports
Tx FIFO Level	High
s 🔊	et the change to all ports
Interface	RS-485 2W
Bias Resistor	150 K 💌
Termination Resistor	Disable 💌
	Auto Tuning
<b>⊽</b> S	et the change to all ports
	OK Cancel

- 4. Click **OK** on the **Ports Configuration** page to save the settings.
- 5. Test if the communication is **OK**. If it's not OK, proceed to Step 6.
- 6. Click on the COM Number, and then click Auto Tuning and click OK. The PCIe board will automatically detect the RS-485 environment and suggest the correct Bias Resistor and Termination Resistor. Click OK to save the setting. To apply the setting, you need to click OK on the Ports Configuration page.

		Ger	neral	Ports Cor	figuration	Driver	Details	Events	Resources	
Port Number	COM83 (current)									
F	Auto Enumerating COM Number		Tx FIF	0 Level	Interface	Term	ination F	esistor	<b>Bias Resistor</b>	Status
Rx FIFO Level	High  V Set the change to all ports		High High High High		RS-485 2W RS-485 2W RS-485 2W RS-485 2W	Disab Disab Disab Disab	le le le		150 K 150 K 150 K 150 K	Data Error OK OK OK
Tx FIFO Level	High ▼ Set the change to all ports									
Interface	RS-485 2W		<							>
Bias Resistor	150 K 💌			Help					Port Info	Port Setting
Termination Resis	stor Disable 💌									Stop Diagnosis
	Auto Tuning									
Ģ	<ul> <li>Set the change to all ports</li> </ul>									

7. Test if the communication is **OK**. If it's not OK, proceed to Step 8.

8. Go to the properties screen and select **COM Port needs to be diagnosed**. Click **Start Diagnosis** and then when the **CAUTION** message appears, click **OK**.

MOXA Smartio/Industio Family Board Warning Message	×
CAUTION	
Remember to connect devices for diagnosis.	
Always show warning during this session.	

9. Adjust "non-MOXA" devices according to the Status.

Tx FIFO	Level	Interface	Termin	ation Re	esistor	<b>Bias Resistor</b>	Stat	us
High		RS-485 2W	Disable			150 K	Data	Error
High		RS-485 2W	Disable			150 K	OK	
High		RS-485 ZW	Disable			150 K	OK	
High		RS-485 ZW	Disable			150 K	UK	
	ale	1				Dark Infr	1	Dart Catting
	alb				24	FOILINIO		Foil Setting
							5	Stop Diagnosis
							_	

Status	Cause	Adjust Pull-High	Adjust Terminator
		/Low Resistor	Resistor
Waveform Distortion	Too many devices	$\checkmark$	-
Receive Reflect Signal	Long distance	-	$\checkmark$
Data Error	Too many devices & long distance	$\checkmark$	$\checkmark$

**NOTE** The Diagnosis tool is extremely sensitive, and consequently could indicate errors even if the communication status okay. In this case, you can decide whether or not to make the suggested configuration changes.

10. Repeat from Step 6 until the communication is okay.

### **Linux Users**

Take the following steps to configure the Intelligent RS-485 function.

1. Use the following command to do the configuration.

```
#./muestty -g /dev/ttyMUE1
```

root@linux:/moxa/mxser# muestty -g /dev/ttyMUE1 muestty: /dev/ttyMUE1 is set to RS-485 2W mode. muestty: /dev/ttyMUE1 none terminal resistor. muestty: /dev/ttyMUE1 disable pull high/low resistor (150K ohm)

- 2. Test if the communication is OK. If it's OK, nothing further needs to be done. If it's not OK, proceed with Step 3.
- 3. Use the following command for the **Auto-Tuning** process. Enter "Y" to make the value effective immediately.

```
#./muestty -a (baud rate value) /dev/ttyMUE1
root@linux:~# muestty -a 115200 /dev/ttyMUE1
Start tuning resistor...
[Status]
Pull High/Low Resistor : 1K
                         : 120 ohm
Terminator Resistor
Tuning Status
                         : OK
Note 1. To execute this command again if the serial device
        has been changed on the bus
     2. If the communication is correctly, record the related
        resistor value and init the setting on the rc.mxser file.
        Otherwise, execute the diagnose to get the error status.
Done.
Make these values effective immediately? [Y/n] (Enter for default=Y):
The values have been set now.
```

- 4. Test if the communication is OK. If it's OK, nothing further needs to be done. If it's not OK, proceed with Step 5.
- 5. Use the following command to run diagnosis.



6. Adjust non-MOXA devices according to the Status

Status	Cause	Adjust Pull-High	Adjust Terminator
		/Low Resistor	Resistor
Waveform Distortion	Too many devices	$\checkmark$	-
Receive Reflect Signal	Long distance	-	$\checkmark$
Data Error	Too many devices & long distance	$\checkmark$	$\checkmark$

**NOTE** The Diagnosis tool is extremely sensitive, and consequently could indicate errors even if the communication status okay. In this case, you can decide whether or not to make the suggested configuration changes.

7. Repeat from Step 3 until the communication is OK.

# **Serial Programming Tools**

Moxa provides an easy to use yet powerful serial programming library and communication troubleshooting utilities under Windows 2000/XP/2003/Vista/2008/7(x86 and x64), Windows 95/98, and Windows NT. The following sections provide details about the installation, the library, and the utilities for various platforms.

The following topics are covered in this chapter:

#### Moxa PComm

- Installing PComm
- PComm Programming Library

#### Utilities

- Diagnostics (for Moxa boards only)
- > Monitor (for Moxa boards under Windows 2000/XP/2003/Vista/2008/7(x86 and x64)
- > Terminal Emulator

#### RS-485 Programming

➤ ADDC<sup>TM</sup>

## Moxa PComm

PComm, a professional serial communication tool for PCs, is a software package that runs under Windows NT95/98/2000/XP/2003/Vista/2008/7(x86 and x64). 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/Vista/2008/7(x86 and x64), 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/Vista/2008/7(x86 and x64) 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/Vista/2008/7(x86 and x64)

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 → Program → PComm Lite → Terminal Emulator.

🐴 PComm Terminal - (	COM44,38400,None,8,1,Dumb Terminal	- 8 ×
File Edit Port Manager	r <u>P</u> ort <u>W</u> indow <u>H</u> elp	
CDM43.9600.Nor	nc.8.1_ANSI	
You have nai. TERM = (ansi # lc .profile bin boot # State:OPEN TE BE	COM44.38400.None.8.1.Dumb Terminal	23 × 23
	State:DPEN	•

## **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>™</sup> (Automatic Data Direction Control) technology is used to switch between transmission and reception.

#### **ADDC**<sup>™</sup>

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

When using ADDC<sup>™</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>™</sup> mode is just as simple and straightforward as RS-232 or RS-422 programming.

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# **Pin Assignments**

The following topics are covered in this chapter:

#### PCI e Board Accessories Table

#### CP-118EL-A

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

#### CP-168EL-A

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

#### CP-104EL-A

- 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

#### CP-118E-A-I/CP-138E-A-I

- Board Side Pin Assignments—Female DB78
- Device Side Pin Assignments—Male DB9
- Male DB25 (CBL-M78M25x8-100)

#### CP134EL-A-I

- Board Side Pin Assignments—Female DB44
- Device Side Pin Assignments—Male DB9
- Male DB25 (CBL-M44M25x4-50)

#### CP-116E-A

- Board Side Pin Assignments—Female SCSI VHDCI68
- Device Side Pin Assignments—Male DB9
- Male DB25 ( OPT8B+ / CBL-M68M25x8-100)
- ➢ Female DB25 (OPT8A+/S+)

## **PCIe Board Accessories Table**

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

PCI e Board	Model	Connector Type	Interface
CP-118EL-A	CBL-M68M9x8-100/	DB9 male	RS-232
	OPT8-M9+		RS-422/4-wireRS-485
	OPT8B+/	DB25 male	2-wireRS-485
	CBL-M68M25x8-100		
	OPT8A+/OPT8S+	DB25 female	
CP-168EL-A	CBL-M68M9x8-100/	DB9 male	RS-232
	OPT8-M9+		
	OPT8B+/OPT8C+	DB25 male	
	OPT8A+/OPT8S+	DB25 female	
CP-104EL-A	CBL-M44M9x4-50	DB9 male	RS-232
	CBL-M44M25x4-50	DB25 male	
CP-102EL	CBL-M25M9x2-50	DB9 male	RS-232
CP-132EL/	CBL-M25M9x2-50	DB9 male	RS-422/4-wire RS-485/
CP-132EL-I			2-wire RS-485
CP-114EL/	CBL-M44M9x4-50	DB9 male	RS-232
CP-114EL-I	CBL-M44M25x4-50	DB25 male	RS-422/4-wire RS-485
			2-wire RS-485
CP-118E-A-I/	CBL-M78M9x8-100	DB9 male	RS-232
CP-138E-A-I	CBL-M78M25x8-100	DB25 male	RS-422/4-wireRS-485
			2-wire RS-485
CP-134EL-A-I	CBL-M44M9x4-50	DB9 male	RS-422/4-wire RS-485/
	CBL-M44M25x4-50	DB25 male	2-wire RS-485
CP-116E-A	OPT8-M9+/	DB9 male	RS-232
	CBL-M68M9x8-100		RS-422/4-wire RS-485
	OPT8B+/	DB25 male	2-wire RS-485
	CBL-M68M25x8-100		
	OPT8A+/OPT8S+	DB25 female	

## CP-118EL-A

The CP-118EL-A 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-A 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-A 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	RIO	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 (CBL-M68M9x8-100/OPT8-M9+)

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



#### Male DB25 (OPT8B+/ CBL-M68M25x8-100)

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



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

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



## CP-168EL-A

The CP-168EL-A 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-A board supports the RS-232 interface onboard.

### 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	RIO	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		

### **Device Side Pin Assignments**

Male DB9 (CBL-M68M9x8-100/OPT8-M9+)

Pin	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	-



#### Male DB25 (OPT8B+/ CBL-M68M25x8-100)

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



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

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



## CP-104EL-A

### **Board Side Pin Assignments-Female DB44**

#### **RS-232**



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	DTR	25	DTR	21	DTR	17	DTR
30	DSR	26	DSR	22	DSR	18	DSR
42	DCD	39	DCD	35	DCD	31	DCD
44	GND	41	GND	37	GND	33	GND

### **Device Side Pin Assignments**

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

Pin	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	-



#### 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**

The CP-102E has two male DB9 connectors onboard.

#### Male DB9

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

# **CP-102EL**

## **Board Side Pin Assignments—Female DB25**

#### RS-232

Pin	RS-232	Pin	RS-232
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

## **Device Side Pin Assignments**

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

Pin	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	-





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

## **Board Side Pin Assignments—Female DB25**



	RS-422 & 4-wire RS-485			2-wire RS-485			
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	TxD1+(B)	18	RxD1+(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	TxD0+(B)	11	_	24	_
12	RxD0+(B)	25	-	12	Data0+(B)	25	-
13	_			13	_		

## **Device Side Pin Assignments**

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

Pin	RS-422/RS-485-4W	RS-485-2W
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	TxD3	13	TxD0	25	DTR1	37	GND
2	RxD3	14	RxD0	26	DSR1	38	-
3	RTS3	15	RTS0	27	-	39	DCD1
4	-	16	CTS3	28	CTS0	40	-
5	TxD2	17	DTR3	29	DTRO	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	-		

## **Device Side Pin Assignments**

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

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



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

Pin	RS-232	RS-422/RS-485-4W	RS-485-2W
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	-
4	RTS	-	-
5	CTS	-	-
6	DSR	-	-
7	GND	GND	GND
8	DCD	TxD-(A)	-
20	DTR	RxD-(A)	Data-(A)
22	-	-	-



# CP-118E-A-I/CP-138E-A-I

## Board Side Pin Assignments—Female DB78



#### RS-232

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	21	RTS7	40	CTS7	60	DCD7
2	TXD7	22	DTR7	41	DSR7	61	RXD7
3	-	23	RTS6	42	-	62	DCD6
4	GND6	24	DTR6	43	CTS6	63	RXD6
5	TXD6	25	-	44	DSR6	64	-
6	GND5	26	RTS5	45	CTS5	65	DCD5
7	TXD5	27	DTR5	46	DSR5	66	RXD5
8	-	28	RTS4	47	-	67	DCD4
9	GND4	29	DTR4	48	CTS4	68	RXD4
10	TXD4	30	-	49	DSR4	69	-
11	GND3	31	RTS3	50	CTS3	70	DCD3
12	TXD3	32	DTR3	51	DSR3	71	RXD3
13	-	33	RTS2	52	-	72	DCD2
14	GND2	34	DTR2	53	CTS2	73	RXD2
15	TXD2	35	-	54	DSR2	74	-
16	GND1	36	RTS1	55	CTS1	75	DCD1
17	TXD1	37	DTR1	56	DSR1	76	RXD1
18	-	38	RTS0	57	-	77	DCD0
19	GND0	39	DTRO	58	CTS0	78	RXD0
20	TXD0			59	DSR0		

#### RS-485-4W/RS-422

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	21	_	40	_	60	TXD7-
2	RXD7+	22	RXD7-	41	-	61	TXD7+
3	-	23	-	42	-	62	TXD6-
4	GND6	24	RXD6-	43	-	63	TXD6+
5	RXD6+	25	_	44	-	64	-
6	GND5	26	-	45	-	65	TXD5-
7	RXD5+	27	RXD5-	46	-	66	TXD5+
8		28		47	-	67	TXD4-
9	GND4	29	RXD4-	48	-	68	TXD4+
10	RXD4+	30	-	49	-	69	-
11	GND3	31	_	50	-	70	TXD3-
12	RXD3+	32	RXD3-	51	-	71	TXD3+
13	_	33	-	52	_	72	TXD2-
14	GND2	34	RXD2-	53	-	73	TXD2+
15	RXD2+	35		54	-	74	
16	GND1	36	_	55	-	75	TXD1-
17	RXD1+	37	RXD1-	56	-	76	TXD1+
18	-	38	_	57	-	77	TXD0-
19	GND0	39	RXD0-	58	-	78	TXD0+
20	RXD0+			59	_		

#### RS-485-2W

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	21	-	40	_	60	-
2	DATA7+	22	DATA7-	41	_	61	_
3	-	23	-	42	_	62	-
4	GND6	24	DATA6-	43	-	63	-
5	DATA6+	25	-	44	-	64	-
6	GND5	26	-	45	_	65	-
7	DATA5+	27	DATA5-	46	-	66	-
8	-	28	-	47	_	67	-
9	GND4	29	DATA4-	48	-	68	-
10	DATA4+	30	-	49	-	69	-
11	GND3	31	-	50	-	70	-
12	DATA3+	32	DATA3-	51	-	71	-
13	-	33	-	52	-	72	-
14	GND2	34	DATA2-	53	-	73	-
15	DATA2+	35	-	54	_	74	-
16	GND1	36	-	55	_	75	-
17	DATA1+	37	DATA1-	56	-	76	-
18	-	38	-	57	-	77	-
19	GND0	39	DATA0-	58	_	78	-
20	DATA0+			59	-		

## Device Side Pin Assignments—Male DB9

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



## Male DB25 (CBL-M78M25x8-100)

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



# CP134EL-A-I

## **Board Side Pin Assignments—Female DB44**



#### RS-422

Pin	Signal	Pin	Signal	Pin	Signal
1	RXD4+	16	CTS4+	31	TXD4-
2	TXD4+	17	RXD4-	32	CTS4-
3	RTS4+	18	RTS4-	33	GND4
4	-	19	-	34	-
5	RXD3+	20	CTS3+	35	TXD3-
6	TXD3+	21	RXD3-	36	CTS3-
7	RTS3+	22	RTS3-	37	GND3
8	-	23	-	38	-
9	RXD2+	24	CTS2+	39	TXD2-
10	TXD2+	25	RXD2-	40	CTS2-
11	RTS2+	26	RTS2-	41	GND2
12	-	27	-	42	TXD1-
13	RXD1+	28	CTS1+	43	CTS1-
14	TXD1+	29	RXD1-	44	GND1
15	RTS1+	30	RTS1-		

#### RS-485-4W

Pin	Signal	Pin	Signal	Pin	Signal
1	RXD4+	16	-	31	TXD4-
2	TXD4+	17	RXD4-	32	-
3	-	18	-	33	GND4
4	-	19	-	34	-
5	RXD3+	20	-	35	TXD3-
6	TXD3+	21	RXD3-	36	_
7	-	22	-	37	GND3
8	-	23	-	38	_
9	RXD2+	24	-	39	TXD2-
10	TXD2+	25	RXD2-	40	_
11	-	26	-	41	GND2
12	-	27	-	42	TXD1-
13	RXD1+	28	-	43	_
14	TXD1+	29	RXD1-	44	GND1
15	-	30	-		

#### RS-485-2W

Pin	Signal	Pin	Signal	Pin	Signal
1	DATA4+	16	-	31	-
2	-	17	DATA4-	32	-
3	-	18	-	33	-
4	-	19	-	34	-
5	DATA3+	20	-	35	-
6	-	21	DATA3-	36	-
7	-	22	-	37	-
8	-	23	-	38	-
9	DATA2+	24	-	39	-
10	-	25	DATA2-	40	-
11	-	26	-	41	-
12	-	27	-	42	-
13	DATA1+	28	-	43	-
14	-	29	DATA1-	44	-
15	-	30	-		

## Device Side Pin Assignments—Male DB9

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



## Male DB25 (CBL-M44M25x4-50)

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



## CP-116E-A

## Board Side Pin Assignments—Female SCSI VHDCI68



Pin	Signal										
1	RxD6	13	DCD4	25	TxD2	37	-	49	-	61	TxD1
2	CTS6	14	RTS4	26	GND	38	RTS7	50	CTS5	62	DSR1
3	-	15	-	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	_	66	_
7	DSR6	19	CTS2	31	RTS0	43	GND	55	RTS3	67	CTS1
8	TxD6	20	_	32	_	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	-	-

### Device Side Pin Assignments—Male DB9

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



### Male DB25 ( OPT8B+ / CBL-M68M25x8-100)

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



## Female DB25 (OPT8A+/S+)

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



# 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.

#### 1. The Moxa PCI Express board cannot be detected by the Moxa driver while installing the driver. Hardware causes and solutions:

- a. Express slot. It is also possible that a slot has malfunctioned. In this case, try other slots until you find one that works.
- b. 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).

A

# **Product Specifications**

The following topics are covered in this appendix:

- CP-118EL-A Specifications
- CP-168EL-A Specifications
- CP-104EL-A Specifications
- CP-102E Specifications
- CP-102EL Specifications
- CP-132EL Series Specifications
- CP-114EL Series Specifications
- CP-118E-A-I Specifications
- CP-138E-A-I Specifications
- CP-134EL-A-I Specifications
- CP-116E-A Specifications

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

Hardware	
Connectors	SCSI VHDCI68
Comm. Controller	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	
Power Requirement	1285 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
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, 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-168EL-A Specifications**

Hardware	
Connectors	SCSI VHDCI68
Comm. Controller	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
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	
Power Requirement	1225 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
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, 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-104EL-A Specifications**

Hardware	
Connectors	Female DB44
Comm. Controller	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
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	805 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
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, 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-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 × 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

# **CP-118E-A-I Specifications**

Hardware		
Connectors	Female DB 78	
Comm. Controller	16C550C Compatible	
Interface		
Bus Interface	PCI-Express x 1	
Number of Ports	8	
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	
4-wire RS-485	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND	
2-wire RS-422	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		
Power Requirement	2356 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	
Surge Protection	4 kV	
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, 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-138E-A-I** Specifications

Hardware	
Connectors	Female DB 78
Comm. Controller	16C550C Compatible
Interface	
Bus Interface	PCI-Express x 1
Number of Ports	8
Max No. of Boards	4
Signal	
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-422	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	
Power Requirement	2356 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
Surge Protection	4 kV
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, 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-134EL-A-I** Specifications

Hardware	
Connectors	Female DB 44
Comm. Controller	16C550C Compatible
Interface	
Bus Interface	PCI-Express x 1
Number of Ports	4
Max No. of Boards	4
Signal	
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-422	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	
Power Requirement	3414 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
Surge Protection	4 kV
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, 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-116E-A Specifications**

Hardware	
Connectors	Female SCSI VHDCI68
Comm. Controller	16C550C Compatible
Interface	
Bus Interface	PCI-Express x 1
Number of Ports	16
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
4-wire RS-485	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
2-wire RS-422	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	
Power Requirement	2733 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)
Surge Protection	4 KV
ESD Protection	Embedded 15 kV ESD Protection
Regulatory Approvals	EN55022, EN55024, EN61000-3-2, EN61000-3-3, 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