PCI Express Board User's Manual

Multiport Serial Board for PCI Express Bus

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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
- 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 ×1, allowing the boards to be installed in any available PCI Express slot (including ×1, ×2, ×4, ×8, ×16, ×32).

PCI Express Solution

The boards comply with PCI Express Spec. 1.1. The ports' transmission parameters are configured after the boards are installed. The PCI BIOS automatically assigns the IRQ and I/O addresses. For this reason, you must plug the boards into the computer before installing the drivers. For more PCI Express information, refer to the "Technical Reference" appendix.

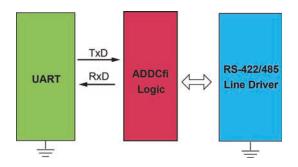
ESD Protection

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

ADDC[™] (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, FreeBSD, QNX, 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.

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 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, FreeBSD 4.x/5.x

Package Checklist

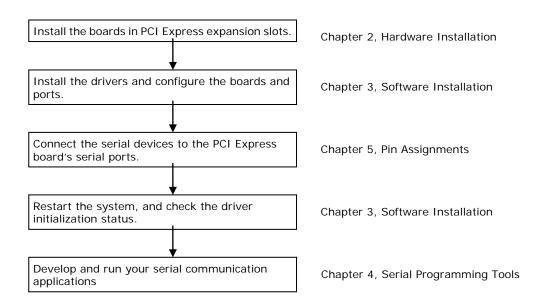
The following items are included in the PCI Express board package:

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

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

Installation Flowchart

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



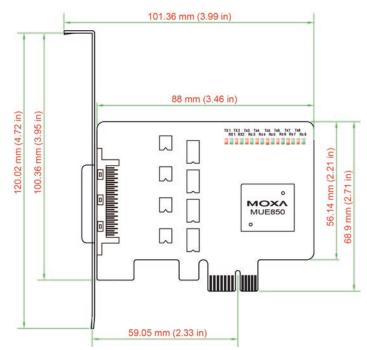
Hardware Installation

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

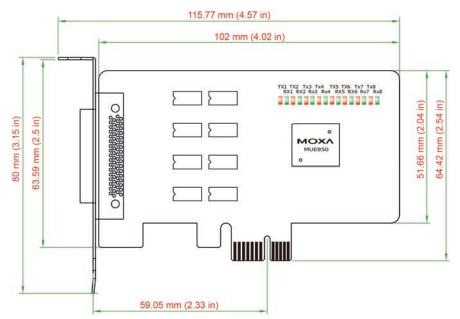
The following topics are covered in this chapter:

- 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
- Plugging the Board into an Expansion Slot

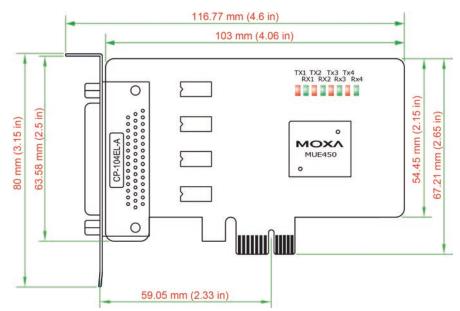
CP-118EL-A Dimensions



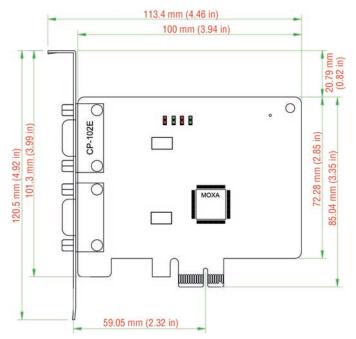
CP-168EL-A Dimensions



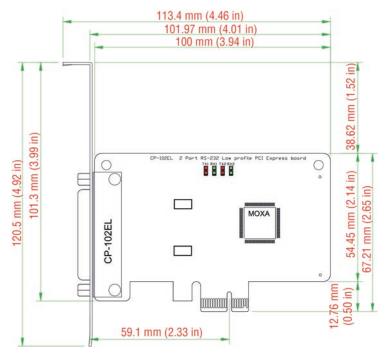
CP-104EL-A Dimensions



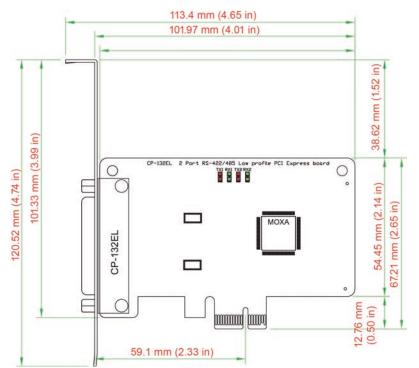
CP-102E Dimensions



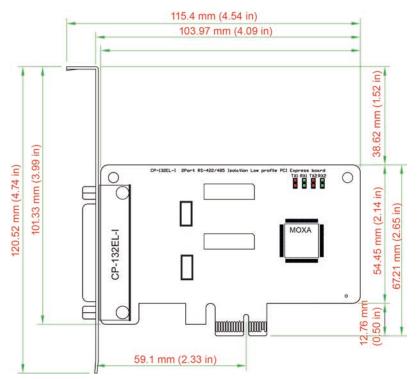
CP-102EL Dimensions



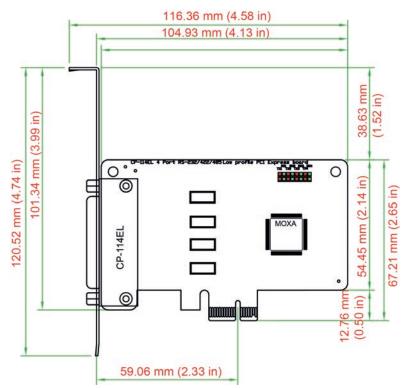
CP-132EL Dimensions



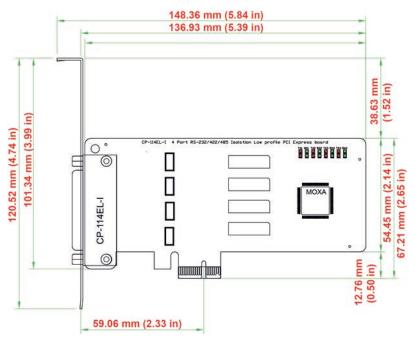
CP-132EL-I Dimensions



CP-114EL Dimensions



CP-114EL-I Dimensions



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

This chapter gives installation, configuration, and update/removal procedures for the driver for Windows 2000, Windows 2003/XP/Vista/2008 (32-bit/64-bit), Windows 7/8 (32-bit/64-bit), Windows 2012 (64-bit), DOS, Linux (32-bit/64-bit), and SCO, and WinCE 5.0. Before proceeding with the software installation, complete the hardware installation discussed in the previous chapter, "Hardware Installation."

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

You can download the drivers from the Moxa website.

The following topics are covered in this chapter:

Windows Drivers

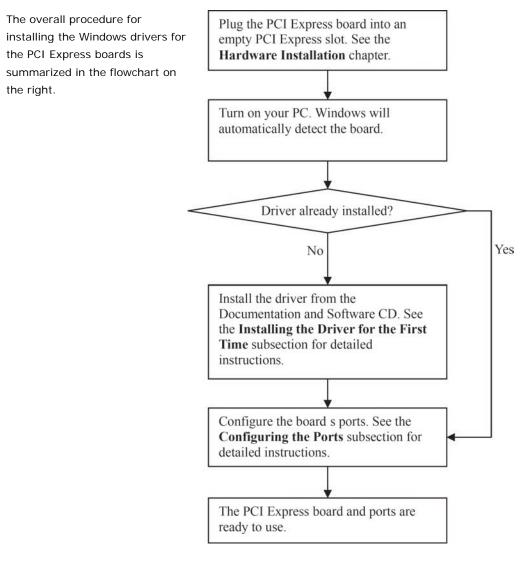
- Windows 7/8 (32-bit/64-bit)
- Windows 2008/Vista (32-bit/64-bit)
- Windows 2003/XP (32-bit/64-bit)
- ➢ Windows 2000

Non-Windows Drivers

- > DOS
- Linux (32-bit/64-bit)
- > SCO

Windows Drivers

Moxa provides drivers that allow you to use the following serial board products under Windows 7/8, Windows 2008/Vista/2003/XP/2000.



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

The Windows 8 installation procedures and popup windows are almost the same as Windows 7. Thus, in this section, we describe the installation procedure for Windows 7 as an example.

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.

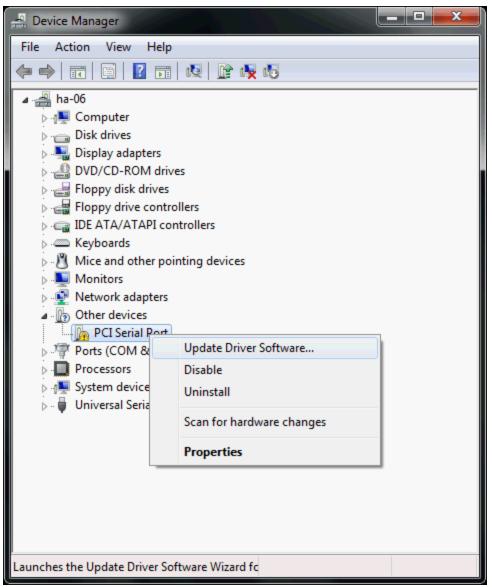
1. After plugging the board into an expansion slot and powering on your PC, Windows 7 will automatically detect the new board, and a popup window that states Device driver software was not successfully installed will appear in the lower right corner of your computer screen.

* (The popup message will not show in Windows 8.)

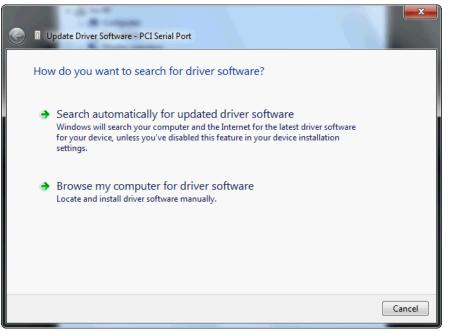


Device driver software was not successfully installed 🔌 🗙 Click here for details.

 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....



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

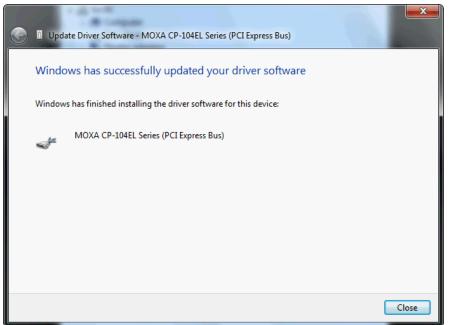


 Select Search for driver software in this location, select Include subfolders, and then click Browse. If the system is a 32-bit (x86) platform, navigate to the \CP-104EL-A Series\Software\Windows 7\x86 folder on the CD. If the system is a 64-bit (x64) platform, navigate to the \CP-104EL-A Series\Software\Windows 7\x64 folder on the CD, and then click Next to continue.

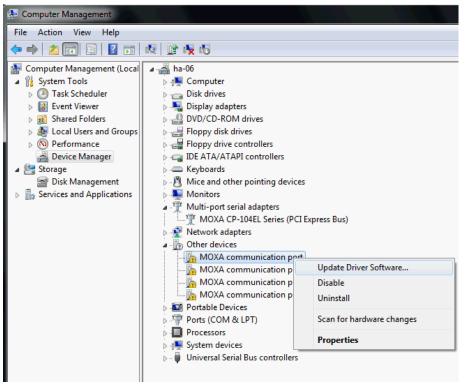
The following figure shows the path for x86.

G I Update Driver Software - PCI Serial Port	
Browse for driver software on your compute	er
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 This list will show installed driver software compatil software in the same category as the device.	
	Next Cancel

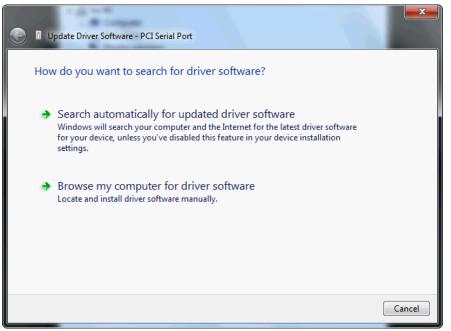
 Wait while the driver software is installed. The next window shows the model name of the board, and indicates that Windows has completed the driver installation. Click **Close** to proceed with the rest of the installation procedure.



 After installing the multiport serial adaptors driver, install the Moxa Port diver 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.

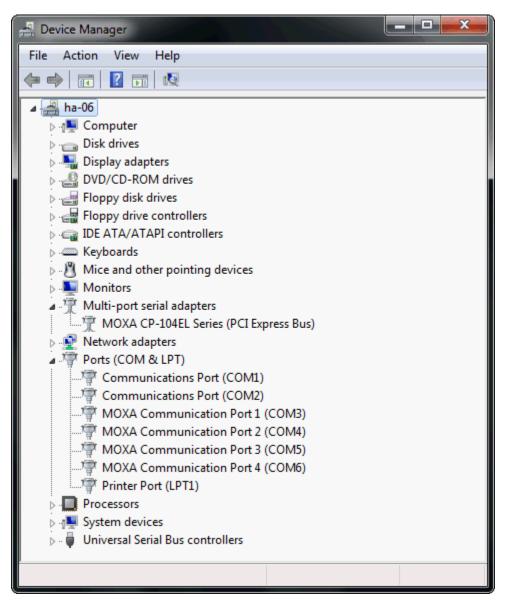
General Update Driver Software - PCI Serial Port	
Browse for driver software on your computer	
Search for driver software in this location:	
C:\Users\moxa\Desktop\PCIe Driver\disk.x86 Browse	
☑ Include subfolders	
Let me pick from a list of device drivers on my computer This list will show installed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

 After all files have been copied to the system, 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.

Update Driver Software - MOXA Communication Port 1 (COM3)	
Windows has successfully updated your driver software	
Windows has finished installing the driver software for this device:	
MOXA Port 0	
	Close

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.

G	Update Driver Software - MOXA Communication Port 4 (COM6)	
	Windows has successfully updated your driver software	
	Windows has finished installing the driver software for this device:	
	MOXA Port 3	
		Close



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

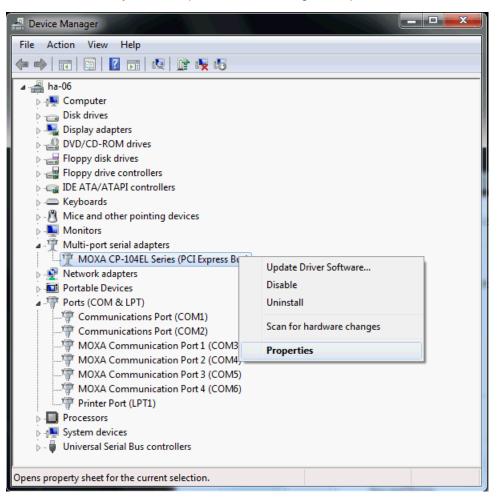
* (The popup message will not show in Windows 8.) Your device is ready to use Device driver software installed successfully.

3-8

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					
General	General Ports Configuration Driver Details Resources				
Port	COM No. COM 3	Rx FIFO Level High	Tx FIFO Level High	Interface RS-232	Termination Resistor
2 3	COM 4 COM 5 COM 6	High High High	High High High	RS-232 RS-232 RS-232	Disable Disable Disable
	Help			Port Info	Port Setting
OK Cancel					

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.

Po	rt 1
	Port Number COM3 (current)
	Rx FIFO Level High
	Tx FIFO Level High
	Interface RS-232 Set the change to all ports
	Termination Resistor Disable ▼ ▼ Set the change to all ports
	OK 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					

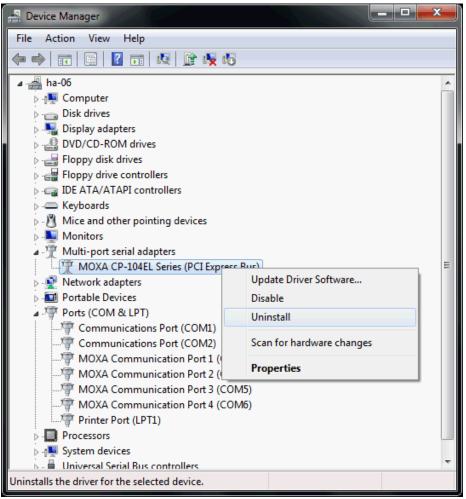
 If you are using CP-118EL-A, CP-114EL, CP-114EL-I, CP-132EL, or CP-132EL-I, select Interface (RS-232, RS-422, 2-wire RS-485, 4-wire RS-485) and Termination Resistor (120Ω, Enable or Disable) to configure. We use the CP-118EL-A to illustrate. The following figures show the settings for configuring the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

Port 1
Port Number COM7 (current)
Rx FIFO Level High Image: Set the change to all ports
Tx FIFO Level High
Interface RS-422 Set the change to all ports
Temination Resistor Disable
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

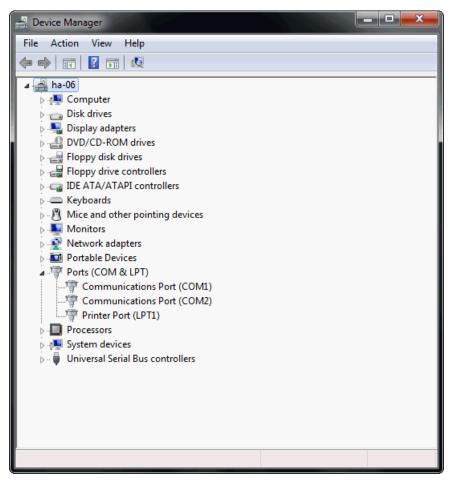
 Go to Device Manager. Use the mouse to place the cursor over the CP-104EL-A Series board under Multi-port serial adapters, and then click the right mouse button. Select the Uninstall option.



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

1	Confirm Device Uninstall
	MOXA CP-104EL Series (PCI Express Bus)
	Warning: You are about to uninstall this device from your system.
	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.

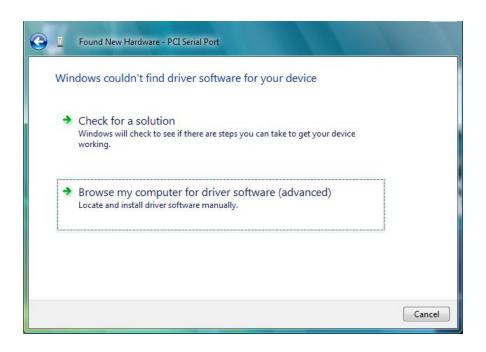


2. The Found New Hardware – PCI Serial Port window will open automatically. This window will offer to connect to the Windows update site to search for a driver. Select Don't search online.

llo	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
eas	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	Found New Hardware - PCI Serial Port	
	Insert the disc that came with your PCI Serial Port	
	If you have the disc that came with your device, insert it now. Windows will automatically search the disc for driver software.	
	A	
	✤ I don't have the disc. Show me other options.	
		Cancel



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 co	omputer
Search for driver software in this location:	
C:\Users\moxa\Desktop\driv_win_smart_v1.16_b	build_08061313\x86 Browse
Include subfolders	
	Next Cancel
	Next Cancel

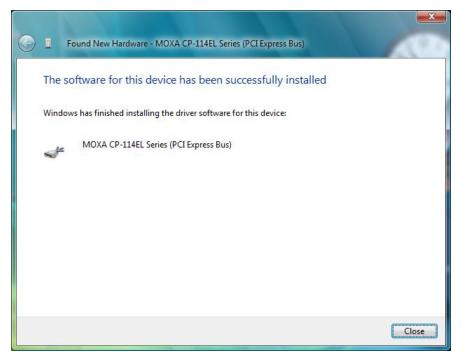
The following figure shows the path for x64.

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	▼ Browse
	Next Cancel

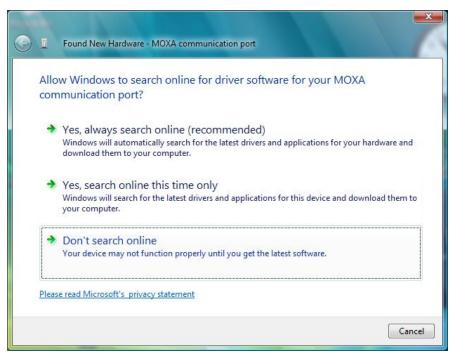
5. Wait while the installation wizard searches for the correct drivers. The next window that opens cautions you that although this software has not passed Windows Logo testing, the driver has been tested and shown that it can support the Windows OS. Click **Install this driver software anyway** to proceed.

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).

9	1	Found New Hardware - MOXA communication port	
	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.	
			Cancel

 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.

G 🛽 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	Event New Hardware - MOXA communication port				×
	Browse for driver software on your computer				
	Search for driver software in this location:	_			
	C:\Users\mova\Desktop\driv_win_smart_v1.16_build_08061313\x64	- [Browse		
			Next	Ca	ncel

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.

Š)	Windows can't verify the publisher of this driver softw						
	+	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.					

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

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

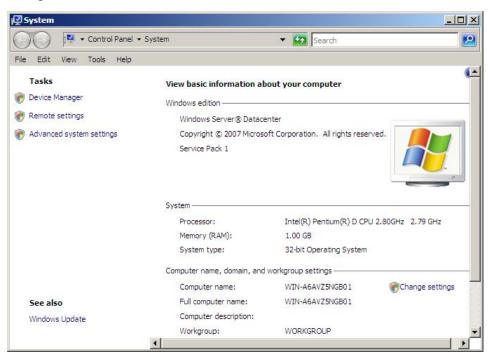
12. The "Your devices are ready to use" will reappear to inform you that the hardware was installed successfully.



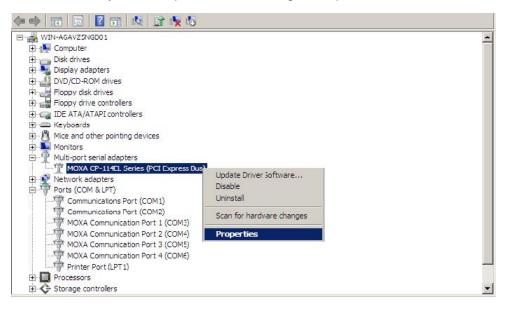
Configuring the Ports

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.

ieneral	Ports Conf	figuration Drive	r Details Reso	ources	
Port	COM No.	Rx FIFO Leve	Tx FIFO Level	Interface	Termination 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
	Help			Port Int	o Port Setting
	Help]		Port In	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.
- Select a Tx FIFO Level from the Tx FIFO Level pull-down list. Tx FIFO Levels of High, Middle, and Low are available, with the default set to High (128 bytes). Select Set the change to all ports option to apply the just defined Tx FIFO Size to all ports.

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

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

Unit: Bytes

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

1	DM3 (current)	Port Number COM3 (curre Auto Enumerating	herere 2.5
α FIFO Level I▼ Set the	High	Rx FIFO Level High	▼ all ports
fx FIFO Level ▼ Set the	High	Tx FIFO Level High I⊄ Set the change to	▼ all ports
nterface IV Set the	110-444	Interface RS-42	
Fermination Resistor	RS-485 2W RS-485 4W Disable	Termination Resistor Disab	

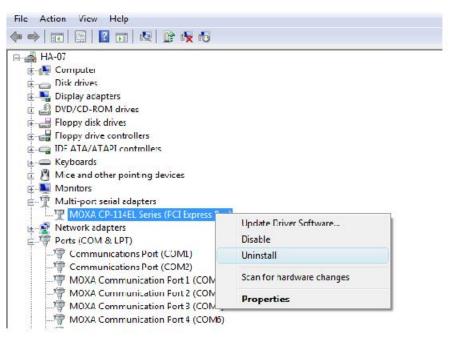
9. Click OK to save the port settings, and then click OK in the Property window to finish the

Using Event Log

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

Removing the Driver

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



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 DVD/CD-ROM drives Floppy disk drives DVD/CD-ROM drives Floppy drive controllers DE ATA/ATAPI controllers CM Keyboards DMonitors Network adapters Ports (COM & LPT) Porcessors CM Storage controllers CM System devices CM Universal Serial Bus controllers	
·	

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

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

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

Installing the Driver

The following procedure shows how to install the CP-118EL-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).

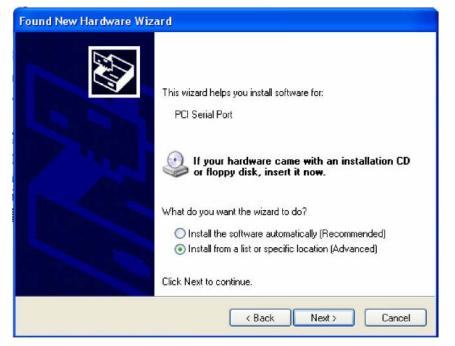
- **NOTE** If you have already installed a CP-118EL-A or other Moxa PCI Express board in your computer, and you are installing additional boards, Windows 2003/XP will automatically detect and install the new board(s) the next time you boot up the computer. In this case, proceed directly to the next section,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



 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.



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.
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				

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.

lease wai	t while the wiza	rd installs the	e software	
»	MOXA CP-118EL	Series (PCI Exp	press Bus)	
			Har dwa	re Installation
	Ď	2	1	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>
			C	Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.

6. Wait while the driver software is installed.

Found New Hardware Wizard				
Please wa	it while the wizard installs th	ne software		
×	MOXA CP-118EL Series (PCI E	xpress Bus)		
	mxser.sys To C:\WINDOWS\system(32\DRIVERS		
		< Back	Next >	Cancel

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

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

 Select Search for the best driver in these locations, select Include this location in the search, and then click Browse. If necessary, use the Browse button to navigate to the \CP-118EL 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-RDM)
✓ Include this location in the search:
H:\CP-118EL\Software\Windows XP_2003\x84 ✔ 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.
<pre></pre>

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

Found New Hardware Wizard	
Please wait while the wizard installs the	software
MOXA Port 0	Hardware Installation It is 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 vendor for software that has passed Windows Logo testing.
	Continue Anyway STOP Installation

12. Wait while the wizard installs the software.

Found New Hardware Wizard			
Please wait while the wizard installs	s the software		E.
MOXA Port 0			
serenum.sys To C:\WINDOWS\syste	₽ m32\DBIVEBS	D	
	< 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 O. Click Finish to proceed with the rest of the installation.

Found New Hardware Wizard		
	Completing the Found New Hardware Wizard The wizard has finished installing the software for: MOXA Port 0	
	< 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: MDXA Port 7		
	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.



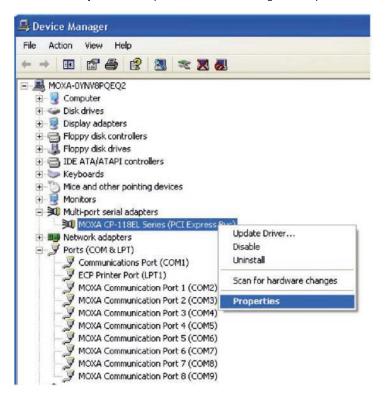
Configuring the Ports

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.

М	DXA CI	P-118EL S	ieries (PCI I	Express Bus) Pro	perties	? 🗙
[ieneral	Ports Conf	iguration Driv	ver Details Resou	rces	
		* 				
	Port	COM No.	Rx FIFO Les			
	1 2	COM 3	High High	High High		
	3	COM 4 COM 5	High High	High High		
	5	COM 6	High	High		
	6 7	COM 7 COM 8	High High	High High	Help	
	8	COM 9	High	High	Port Info	1
					Port Setting	
				[ок с	ancel

- 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.
- 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.
- Select a Tx FIFO Level from the Tx FIFO Level pull-down list. Tx FIFO Levels of High, Middle, and Low are available, with the default set to High (128 bytes). Select Set the change to all ports option to apply the just defined Tx FIFO Size to all ports.

Port 1	×
Port Number	COM3 (current)
🔽 Aut	o Enumerating <u>C</u> OM Number
<u>R</u> x FIFO Level	High
🔽 Set	the change to <u>a</u> ll ports
<u>T</u> x FIFO Level	High
⊠ <u>S</u> et	the change to all ports
	OK Const
L	<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, 2-wire RS-485, 4-wire RS-485) and Termination Resistor (120Ω, Enable or Disable) to configure. Take the CP-114EL for example. If you would like to configure as RS-422 and no Termination Resistor, please see figures below.

Port Number COM3 (current)	Port Number COM3 (current)
Auto Enumerating <u>C</u> OM Number	Auto Enumerating COM Number
<u>R</u> x FIFO Level High	Rx FIFO Level High
Set the change to all ports	Set the change to all ports
Tx FIFO Level High	Ix FIFO Level High
Set the change to all ports	Set the change to all ports
Interface RS-422	Interface RS-422
✓ <u>S</u> et the ch RS-232 RS-422	Set the change to all ports
Termination Resistor	Termination Resistor Disable
☑ Set the change to all ports	✓ Set the ch Enable
QK Cancel	OK Cance

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.

PComm Diagnostic	
e Diagnose Help	
5 🕨 🚾 🖻 🕾	
To be tested	f), established a second se
P-110EL Senies (CDM2-CDM9) IRQ-16J/0-DCC0 PCI bus 5, device 0, function 0	Select Config) to set test option Select Go to start testing Board Status CP-118EL Series (COM2-COM9) IR0-16//0-PCC0 PCI bus 5, device 0, function 0 Driver: 1.12 Total Configuration Boards = 1 COM Port Available Boards = 1 OK

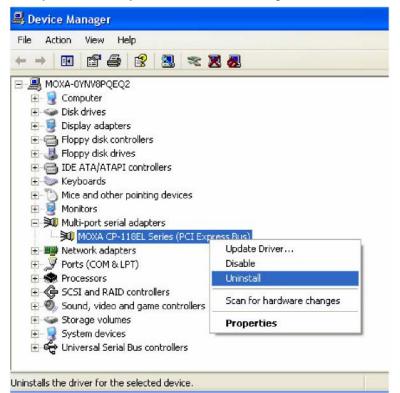
NOTE You can download the PComm Lite software for free from Moxa's website at <u>www.moxa.com/support/free_downloads.htm</u>.

Using Event Log

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

Removing the Driver

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



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

Confirm Device Removal		
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.

🔒 De	vice Manager
File	Action View Help
÷ -	
- 9	MOXA-0YNV8PQEQ2
+	🖳 🛃 Computer
+	🥪 Disk drives
+	📲 Display adapters
÷.	Floppy disk controllers
+	退 Floppy disk drives
+	IDE ATA/ATAPI controllers
+	🦢 Keyboards
÷.	Mice and other pointing devices
÷	🧕 Monitors
÷	III Network adapters
+	🔊 Ports (COM & LPT)
+	Recessors
+	CSI and RAID controllers
÷.	🕘 Sound, video and game controllers
+	🐲 Storage volumes
+	- 🛃 System devices
+	🕰 Universal Serial Bus controllers

Windows 2000

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

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

Installing the Driver for the First Time

The following procedure shows how to install the CP-118EL-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.
	< <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:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify. To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations: ☐ Floppy disk drives ☐ CD-ROM drives ☑ Specify a location ☐ Microsoft Windows Update
< <u>B</u> ack <u>N</u> ext > Cancel

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.	ОК
	Cancel
Copy manufacturer's files from:	
E:\CP-118EL\Software\Windows 2K	Browse
	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.

The wizard I	found a driver for the following device:
D PC	CI Serial Port
Windows to	und a driver for this device. To install the driver Windows found, click Next.
WINDOWS 10	
	cp-118el\software\windows 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	pund	×
<u>)</u>	The Microsoft digital signature affirms that software has been tested with Windows and that the software has no been altered since it was tested.	ł
	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 Wizard	
	Completing the Found New Hardware Wizard MOXA 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.

Found New Hardware Wizard
Locate Driver Files Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify. To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations: ☐ Floppy 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 Nev	w Hardware Wizard	×
	Insert the manufacturer's installation disk into the drive selected, and then click OK.	OK
		Cancel
	Copy manufacturer's files from:	
	E:\CP-118EL\Software\Windows 2K	Browse

14. Wait while the installation wizard searches.

Driver Files Search Results The wizard has finished searching for	driver files for your har	dware device.	Chill
The wizard found a driver for the follow	ving device:		
MOXA communication port			
Windows found a driver for this device	. To install the driver \	Windows found, c	lick Next.
e:\cp-118el\software\wi	ndows 2k\mxspor	t.inf	
The wizard also found other drivers that these drivers or install one of these driv Next.			
Install one of the other drivers			
	< Back		Cancel

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
3	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.

×
ancel

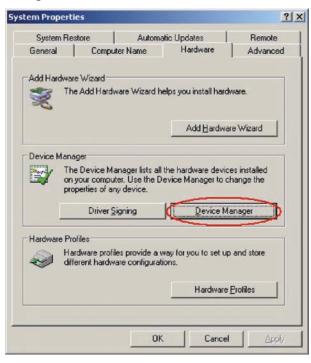
17. After all files have been copied to the system, the **Completing the Found New Hardware Wizard** window will open to indicate that it has finished installing **Port 0**. Click **Finish** to proceed with the rest of the installation.

Found New Hardware Wizard	
	Completing the Found New Hardware Wizard MOXA Port 0 Windows has finished installing the software for this device.
	To close this wizard, click Finish.
	< Back. Finish Cancel

Configuring the Ports

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

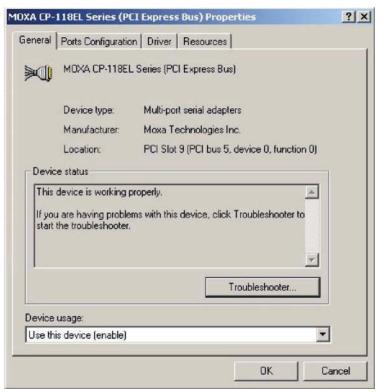
 Click Start → Settings → Control Panel → System, select the Hardware tab, and then click Device Manager.



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	
Action View ← → 🛍 📧 😭 😭	3 😹 🗶
😟 🥪 IEEE 1394 Bus host controllers	
🗄 🍪 Keyboards	
😟 🕤 Mice and other pointing devices	
🗄 💭 Monitors	
🖻 🔊 Multi-port serial adapters	
MOXA CP-118EL Series (PCI Express Bu	Disable
🔁 🌉 Network adapters	Uninstall
😟 🔷 NVIDIA Network Bus Enumerator	Of Itrisedian.
🖻 🚽 Ports (COM & LPT)	Scan for hardware changes
- 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)	
- 🦪 MOXA Communication Port 5 (COM6)	
— 🍠 MOXA Communication Port 6 (COM7)	
— 🍠 MOXA Communication Port 7 (COM8)	
E- Storage volumes	
🔄 🌉 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	COM 2	High	High	
2 3	COM 3 COM 4	High High	High High	
4	COM 5	High	High	
5	COM 6	High	High	
4 5 6 7	COM 7 COM 8	High	High	Help
8	COM 9	High High	High High	
				Port Info
				Port Setting

- 5. 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.
 - 3-45

- Select an Rx FIFO Trigger from the Rx FIFO Level pull-down list. Rx FIFO trigger levels of High, Middle, and Low are available, with the default set to High (120 bytes). Select Set the change to all ports option to apply this Rx FIFO Trigger to all ports.
- 8. Select a **Tx FIFO Level** from the **Tx FIFO Level** pull-down list. Tx FIFO Levels of **High**, **Middle**, and **Low** are available, with the default set to High (128 bytes). Select **Set the change to all ports** option to apply the just defined Tx FIFO Size to all ports.

Port 1	×
Port Number	COM3 (current)
<u>R</u> x FIFO Level ▼ Se	High I the change to <u>all ports</u>
<u>I</u> x FIFO Level ▼ <u>S</u> e	High 💌 t the change to all ports
	<u>D</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, 2-wire RS-485, 4-wire RS-485) and Termination Resistor (120Ω, Enable or Disable) to configure. Take the CP-114EL for example. If you would like to configure as RS-422 and no Termination Resistor, please see figures below.

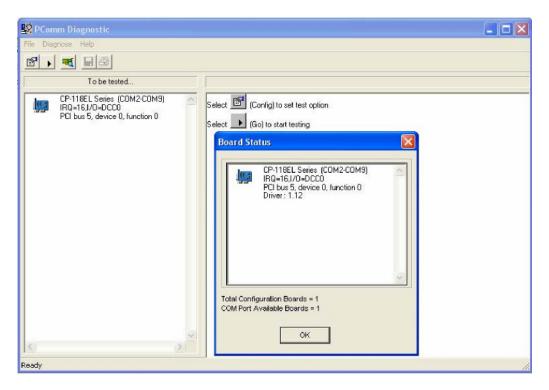
rt 1 🔀	Port 1
Port Number COM3 (current)	Port Number COM3 (current)
Bx FIFO Level High ▼ ▼ Set the change to all ports	Bx FIFO Level High ▼ ✓ Set the change to all ports
Ix FIFO Level High ▼ ▼ Set the change to all ports	Ix FIFO Level High I Set the change to all ports
Interface RS-422 ▼ Set the ch RS-232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

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

Using Moxa PComm Utility

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

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



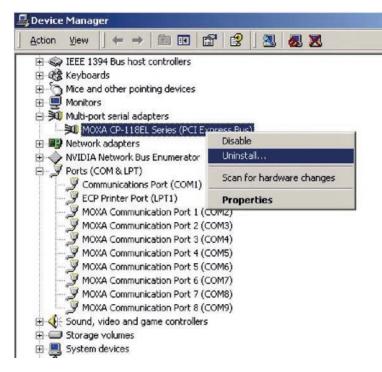
NOTE You can download the PComm Lite software for free from Moxa's website at <u>www.moxa.com/support/free_downloads.htm</u>.

Using Event Log

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

Removing the Driver

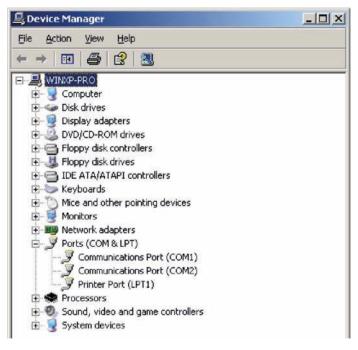
 To uninstall the driver, click Start → Settings → Control Panel → System, select the Hardware tab, and then click Device Manager. Use the mouse to place the cursor over the CP-118EL Series board under Multi-port serial adapters, and then click the right mouse button. Select the Uninstall... option.



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

Confirm	Device Removal	<u>? ×</u>
	MOXA CP-118EL Series (PCI Express Bus	5]
Warning	g: You are about to uninstall this device from	your system.
		1
	OK	Cancel

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



WARNING

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

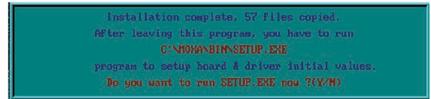
NOTE The following procedure shows how to install the CP-168EL driver under DOS.

Installing the Driver

 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.

🗆 🗌 Ins	stallation	Γ
Target directory	C: NMORA	
M: Kelp	12: 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		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	1K	1K	1K
RxD buffer size	1К	1K	1К	-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	0n	On	On
RTS output state	— O n	0n	On	0n	On	-0n	0n	0n
CTS flow control	No	No No	No	No	No	No	No	No
RTS flow control	No	No	No	No	No	No	No	No
Tx XON/OFF entrl	No	No	No	No	No	No	No	No
Rx XON/OFF cntrl	No.	No	No	No	No	No	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.

Port Number	🛛 Group	The last	4-	FI	06	07	08
TxD buffer si				4	1К	1.K	1K
RxD buffer si	PORT PROFILE	1	PORTS		1K	1K	1K
Baud rate	TxD huffer size	1K	01		9600	-9600	9600
Character len	RxD buffer size	1K	02		8	8	8
Stop bits	Baud rate	9600	03		1	1	1
Parity	Character length	8	04		None	None	None
DTR output st	Stop bits	11-	05		- On	On	On
RTS output st	Parity	None	06		0n	On	0n
CTS flow cont	DTR output state	On	07		No	No	No
RTS flow cont	RTS output state	On	08		No	No	No
Tx XON/OFF on	CTS flow control	No			No	No	No
Rx XON/OFF cn	RTS flow control	No			No	No	No
	Tx XON/OFF cutr1	No				in a subsection of the section of th	
<u>></u>	Bx XON/OFF cutr1	No			ast Aba	et	
			l		1000000		Harakata

Loading the Driver

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

Smartio/Industio Family DOS driver Version 1.7

Setup driver ...

CP-168EL series (Bus= x , Dev=y) : OK!

Device driver setup O.K.

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

Unloading the Driver

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

Linux (32-bit/64-bit)

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

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

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

Execute the following commands from the Linux prompt:

1.	#mount /dev/cdrom /mnt/cdrom
	#cd /
	#mkdir moxa
	#cd moxa
	#cp /mnt/cdrom/ <driver directory="">/driv_linux_smart_vx.x_build_yymmddhh.tgz.</driver>
	<pre>#tar -xzvf driv_linux_smart_vx.x_build_yymmddhh.tgz.</pre>

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

Usage: muestty <operation> device

Device: The MUE series device node

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

For example:

To set the MUE interface

- # muestty -i RS422 /dev/ttyMUE2
- To set the MUE termination resistor
 - # muestty -t 120TERM /dev/ttyMUE2
- 6. Use the Moxa diagnostics utility to verify the driver status:
 - #cd /moxa/mxser/utility/diag

#./msdiag

- 7. Use the Moxa terminal utility to test the tty ports:
 - #cd /moxa/mxser/utility/term
 - #./msterm

SCO

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

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

- 1. Copy the driver file .tar to your host.
- #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 could skip step 4 & 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						
PgDn: getty Setting Esc: Exit Enter: Confirm Input Value Tab: Change Item							

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

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

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 No.	
1	None				
2	None				
3	None				
4	None				
Er	PgDn: getty S nter: Confirm Input	0	Exit Change Item		

e 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 & 10 are only for CP-132EL Series and CP-114EL Series

- 9. After rebooting, key in "moxaadm". When you see MAIN MENU, select Interface Configuration to set your Resister and Interface. For example, if you want to set one of the CP-114EL ports as RS-422 and 120Ω, you have to select RS-422 and 120 $\Omega.$
- 10. Save your Interface Configuration and then reboot computer again.

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

Serial Programming Tools

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

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)
- > Terminal Emulator

RS-485 Programming

➤ ADDCTM

Moxa PComm

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

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

Installing PComm

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

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

PComm Programming Library

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

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

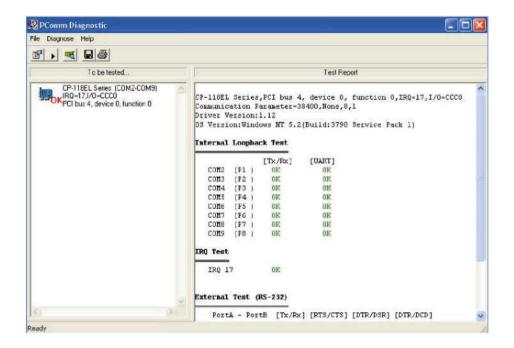
Utilities

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

Diagnostics (for Moxa boards only)

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

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



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

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

PComm	Monitor									_ 6
Port	Count/Tx	CPS/Tx	Count/Rx	CPS/Rx	RTS	CTS	DTR	DSR	DCD	
сомз	126976	1024	125264	1010	0	0	0	0	0	1
COM4	126976	1024	126976	1024	۲	Ō	0	0	0	
COM5	125952	1015	126760	1022	0	0	0	Ō		
COM6	125952	1015	126300	1018	0		0	0	0	
COM7	125952	1015	126032	1016	0		0	0	0	
COM8	128000	1032	125828	1014	0		0			
COM9	126976	1024	125648	1013	۲	0	۲	۲	0	
COM10	126976	1024	125440	1011		0	0		0	
COM11	0	0	0	0	0	0	0	0	0	
307 Rx (bytes		History					0000000	00000	0000000	-
351										
Port Nam	ne CC	OM9 Por	t Status		Oper	1				
Communi	ication Parameter	HA	W Flow Control							
Baud Rate (bps) 38400		400 BT	S Flow Control		ON	La	psed	time:	00:02:04	

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	X
File Edit Port Manager Port Window Help	
COM43.9500.None.8.1ANSI	
COM44,38400,None,8,1,Dumb Terminal	ज्ञ।
Vou have mai 0123456789abcde fghij0123456789abcde fghij0123456789abc	

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[™] (Automatic Data Direction Control) technology is used to switch between transmission and reception.

ADDC[™]

ADDC[™] is the best method for switching between transmission and reception when using 2-wire RS-485.

When using ADDC[™], 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[™] mode is just as simple and straightforward as RS-232 or RS-422 programming.

Pin Assignments

The following topics are covered in this chapter:

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

PCIe Board	Model	Connector Type	Interface
CP-118EL-A	CBL-M68M9x8-100/	Male DB9	RS-232
	OPT8-M9+		RS-422/4-wire RS-485
	OPT8B+/	Male DB25	2-wire RS-485
	CBL-M68M25x8-100		
	OPT8A+/OPT8S+	Female DB25	
CP-168EL-A	CBL-M68M9x8-100/	Male DB9	RS-232
	OPT8-M9+		
	OPT8B+/OPT8C+	Male DB25	
	OPT8A+/OPT8S+	Female DB25	
	OPT8F+/OPT8Z+	Female DB25	RS-422
	OPT8K+	Female DB25	RS-422/RS-485
CP-104EL-A	CBL-M44M9x4-50	Male DB9	RS-232
	CBL-M44M25x4-50	Male DB25	
CP-102EL	CBL-M25M9x2-50	Male DB9	RS-232
CP-132EL/	CBL-M25M9x2-50	Male DB9	RS-422/4-wire RS-485/2-wire
CP-132EL-I			RS-485
CP-114EL/	CBL-M44M9x4-50	Male DB9	RS-232
CP-114EL-I	CBL-M44M25x4-50	Male DB25	RS-422/4-wire RS-485
			2-wire RS-485

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

CP-118EL-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



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	DTRO	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-232

RS-422 and 4-wire RS-485

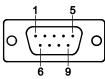
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	TxD6+(B)	18	TxD2+(B)	35	TxD7+(B)	52	TxD3+(B)
5	TxD6-(A)	22	TxD2-(A)	39	TxD7-(A)	56	TxD3-(A)
6	RxD6-(A)	23	RxD2-(A)	40	RxD7-(A)	57	RxD3-(A)
8	RxD6+(B)	25	RxD2+(B)	42	RxD7+(B)	59	RxD3+(B)
9	GND	26	GND	43	GND	60	GND
10	RxD4+(B)	27	RxD0+(B)	44	RxD5+(B)	61	RxD1+(B)
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)

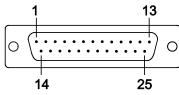
Device Side Pin Assignments

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



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

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



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

Female DB25 (OPT8A+/S+)

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

CP-168EL-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 RS-232 interface on board.

Board Side Pin Assignments—Female SCSI VHDCI68

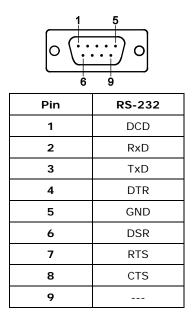


Pin	Signal										
1	RxD6	13	DCD4	25	TxD2	37	RI7	49	RI5	61	TxD1
2	CTS6	14	RTS4	26	GND	38	RTS7	50	CTS5	62	DSR1
3	RI6	15	RI4	27	TxD0	39	DCD7	51	RxD5	63	DTR1
4	RTS6	16	CTS4	28	DSR0	40	DTR7	52	RxD3	64	DCD1
5	DCD6	17	RxD4	29	DTRO	41	DSR7	53	CTS3	65	RTS1
6	DTR6	18	RxD2	30	DCD0	42	TxD7	54	RI3	66	RI1
7	DSR6	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		

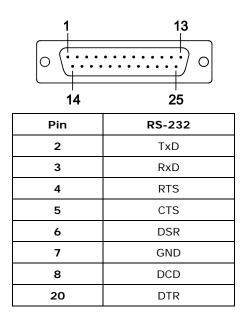
RS-232

Device Side Pin Assignments

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



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



Female DB25 (OPT8A+/S+)

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

Female DB25 (OPT8F+/Z+)

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

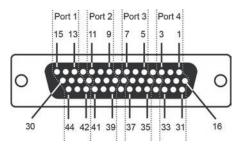
Female DB25 (OPT8K+)

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

CP-104EL-A

Board Side Pin Assignments—Female DB44

RS-232



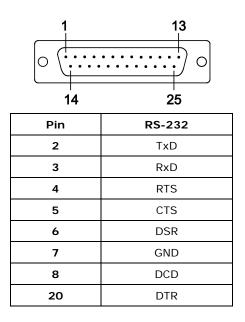
F	Port 1		Port 2		ort 3	Port 4		
13	TxD	9	TxD	5	TxD	1	TxD	
14	RxD	10	RxD	6	RxD	2	RxD	
15	RTS	11	RTS	7	RTS	3	RTS	
28	CTS	24	CTS	20	CTS	16	CTS	
29	DTR	25	DTR	21	DTR	17	DTR	
30	DSR	26	DSR	22	DSR	18	DSR	
42	DCD	39	DCD	35	DCD	31	DCD	
44	GND	41	GND	37	GND	33	GND	

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			

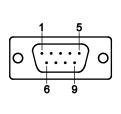
Male DB25 (CBL-M44M25x4-50)



Board Side Pin Assignments—Male DB9

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

Male DB9



Pin	RS-232 Signals	
1	DCD	
2	RxD	
3	TxD	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	
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
13 1	4	CTS1	16	DSR1
	5	RxD1	17	RTS1
O (,,,,,,,,) O	6		18	TxD1
	7		19	
25 14	8		20	
	9	DTR0	21	DCD0
	10	DSR0	22	GND
	11	RTS0	23	CTS0
	12	TxD0	24	RxD0

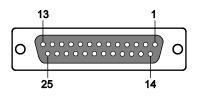
Device Side Pin Assignments

Male DB9 (CBL-M25M9x2-50)

	Pin	RS-232
	1	DCD
1 5	2	RxD
	3	TxD
	4	DTR
	5	GND
6 9	6	DSR
0 9	7	RTS
	8	CTS
	9	

CP-132EL/CP-132EL-I

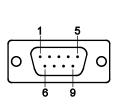
Board Side Pin Assignments—Female DB25



	RS-422 & 4-wire RS-485				2-wire	RS-48	5
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	GNDO	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

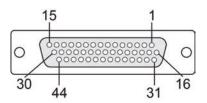
Male DB9 (CBL-M25M9x2-50)



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

CP-114EL/CP-114EL-I

Board Side Pin Assignments—Female DB44



RS-232

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	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

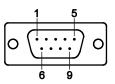
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	RxD3(+)	13	RxD0(+)	25	RxD1(-)	37	GND
2	TxD3(+)	14	TxD0(+)	26		38	
3		15		27		39	TxD1(-)
4		16		28		40	
5	RxD2(+)	17	RxD3(-)	29	RxD0(-)	41	GND
6	TxD2(+)	18		30		42	TxD0(-)
7		19		31	TxD3(-)	43	
8		20		32		44	GND
9	RxD1(+)	21	RxD2(-)	33	GND		
10	TxD1(+)	22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

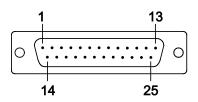
Device Side Pin Assignments

Male DB9 (CBL-M44M9x4-50)



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

Male DB25 (CBL-M44M25x4-50)



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

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.

The following topics are covered in this chapter:

General Troubleshooting

General Troubleshooting

- 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

Technical Reference

The following topics are covered in this appendix:

Product Specifications

- 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

Product 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