# Mini PCI Express Multiport Serial Board Series User Manual

Version 1.0, December 2022

www.moxa.com/products



#### Mini PCI Express Multiport Serial Board Series User Manual

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

### **Copyright Notice**

© 2022 Moxa Inc. All rights reserved.

#### Trademarks

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

### Disclaimer

- Information in this document is subject to change without notice and does not represent a commitment on the part of Moxa.
- Moxa provides this document as is, without warranty of any kind, either expressed or implied, including, but not limited to, its particular purpose. Moxa reserves the right to make improvements and/or changes to this manual, or to the products and/or the programs described in this manual, at any time.
- Information provided in this manual is intended to be accurate and reliable. However, Moxa assumes no
  responsibility for its use, or for any infringements on the rights of third parties that may result from its
  use.
- This product might include unintentional technical or typographical errors. Changes are periodically
  made to the information herein to correct such errors, and these changes are incorporated into new
  editions of the publication.

### **Technical Support Contact Information**

www.moxa.com/support

### **Table of Contents**

1.	Introduction Overview	
	Mini PCI Express Solution	
	ADDC <sup>™</sup> (Automatic Data Direction Control) for RS-485	
	Operating System Support	
	Moxa Serial Comm Tool	
	Applications	
	Features	
	Package Checklist	
	Installation Flowchart	
2.	Hardware Installation	
	Hardware Installation Procedure	
	Mini PCIe Boards Dimension	
	CP-102N-T Dimensions	
	CP-102N-I-T Dimensions	
	CP-132N-T Dimensions	11
	CP-132N-I-T Dimensions	12
	CP-104N-T Dimensions	12
	CP-104N-I-T Dimensions	13
	CP-134N-I-T Dimensions	14
	CP-114N-T Dimensions	
3.	Software Installation	
	Windows Driver	
	Windows 7/8 /8.1/10/11, Server 2008 R2/2012/2012 R2/ 2016 (x64)/2019/2022	
	Linux Driver(32-bit/64-bit)	
4.	Serial Programming Tools	
	Moxa PComm	
	Installing PComm	
	PComm Programming Library	
	Utilities	
	Diagnostics (for Moxa boards only)	
	Monitor	
	Terminal Emulator	
-	ViewCom	
5.	Programming Guide	
	Relative Product List	
	PCI Configuration for Moxa Board	
	UART Register Structure for MUE250, MUE450, and MUE850 Chips	
	For Baudrate Settings	
	Moxa Board PCI Device ID List	
	UART Datasheet	
6.	Pin Assignments	
	Mini PCIe Board Accessories Table	
	CP-102N-T	
	Female Wafer to DB9 Connector Pin Assignments	43
	CP-102N-I-T	44
	Female Wafer to DB9 Connector Pin Assignments	
	CP-132N-T	44
	Female Wafer to DB9 Connector Pin Assignments	
	CP-132N-I-T	
	Female Wafer to DB9 Connector Pin Assignments	
	CP-104N-T	
	Female Wafer to DB9 Connector Pin Assignments	
	CP-104N-I-T	
	Board Side Pin Assignment	
	Device Side Pin Assignment	
	CP-134N-I-T	
	Board Side Pin Assignment	

7.	Troubleshooting	50
	Device Side Pin Assignment	
	Board Side Pin Assignment	
	CP-114N-T	
	Device Side Pin Assignment	

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

## **Overview**

Moxa's new Mini PCI Express Multiport Serial Boards family fulfills a customized expansion need and provides a faster response to market. It includes isolated and non-isolated RS-232/422/485 communication cards for a variety of applications and users, such as industrial automation system manufacturers, system integrators, and industrial PC makers.

## **Mini PCI Express Solution**

All mini PCIe Serial Boards feature high performance 16C950 compatible UARTs. Available in 4-port and 2port versions, they are compatible with all popular operating systems, supports data rates of up to 921.6 kbps, and have 128-byte transmit and receive FIFOs. All mini PCIe serial cards operate in wide temperatures, ranging from -40 to 85°C. In addition, the packaging of all mini PCIe serial cards include door brackets, allowing the board to be installed in Moxa IPC Expansion slots.

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

RS-485 uses differential data transmission over two wires to transmit data from one station to another and allows multiple transmitters and receivers to be used on the same data line. RS-485 uses half-duplex transmission, meaning transmission and reception share the same data channels. Hence, 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 Automatic Data Direction Control (ADDC®). ADDC® is much easier to implement than the traditional handshaking method that uses the RTS signal.



## **Operating System Support**

The Mini PCI Express boards are compatible with all major industrial platforms, including Windows and Linux. 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 operation system. Use this library to develop your own applications with Visual Basic, Visual C++, Borland Delphi, to name a few. Utilities such as View Com, 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 Mini 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 Mini PCI Express boards have the following outstanding features:

- Supports Mini PCI Express interface
- Small size for compact-sized or Din-rail PCs
- 128-byte FIFO and on-chip H/W, S/W flow control
- 50 bps to 921.6 kbps transmission speed
- Drivers are provided for Windows and Linux

## Package Checklist

- 1 Moxa Mini PCI Express multi serial board (CP-104N-I-T, CP-134N-I-T, CP-114N-T models have the main board and I/O boards)
- 1 Moxa DB bracket
- Internal connection cable (25 cm)
- Documentation
- Quick installation guide (printed)
- Warranty card

NOTE

The cable type and number of DB brackets might differ different product models. Notify your sales representative if any of the above items are missing or damaged

## **Installation Flowchart**

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



In this chapter, we show the dimensions diagrams for all the boards in the Mini PCI Express Series and describe the hardware installation procedure. Since the BIOS automatically assigns the PCI Express board's IRQ number and I/O addresses, you must plug in the board before installing the driver (driver installation is discussed in Chapter 3).

## **Hardware Installation Procedure**

The Mini PCI Express board must be plugged into the PC before installing the driver. The following steps show how to install the Moxa Mini PCI express cards.

- 1. Find the Mini PCIe slot in your computer.
- 2. Insert the Mini PCIe multiport serial board and lock the screws.
- 3. Unscrew to remove the blank expansion plate. (We use Moxa V2406C as an example.)



# For the models (CP-102N-T, CP-102N-I-T, CP-132N-T, CP-132N-I-T, CP-104N-T) without I/O boards.

4. Unscrew the hexagonal copper pillars on the cable (DB9 Connector) and use them to connect the provided cables with the bracket.



5. Insert the plate through the blank expansion slot and lock the screws.



6. Connect the Mini PCIe multiport serial board with the cables.



#### For the models (CP-104N-I-T, CP-134N-I-T, CP-114N-T) with I/O boards.

4. Unscrew the hexagonal copper pillars on the I/O board and lock the I/O board with the bracket.



5. Insert the I/O board with the bracket through the blank plate hole and lock the screws.



6. Connect the I/O board to the Mini PCIe multiport serial board with the serial cables.



## **Mini PCIe Boards Dimension**

Mini PCI express serial boards series is included in the following models.

Model	Ports	Bus	Chip
CP-102N-T	2	PCIe	MUE850
CP-102N-I-T	2	PCIe	MUE850
CP-132N-T	2	PCIe	MUE850
CP-132N-I-T	2	PCIe	MUE850
CP-104N-T	4	PCIe	MUE850
CP-104N-I-T	4	PCIe	MUE850
CP-134N-I-T	4	PCIe	MUE850
CP-114N-T	4	PCIe	MUE850

The following content is showing the models' dimension.

## **CP-102N-T** Dimensions



## **CP-102N-I-T** Dimensions

Unit: mm



## **CP-132N-T** Dimensions



## **CP-132N-I-T** Dimensions

Unit: mm



## **CP-104N-T** Dimensions

Unit: mm





1.4

## **CP-104N-I-T** Dimensions

### Mainboard Dimensions (Mini PCIe)

Unit: mm



### **I/O Board Dimensions**



## **CP-134N-I-T** Dimensions

### Mainboard Dimensions (Mini PCIe)

Unit: mm



### **I/O Board Dimensions**



## **CP-114N-T** Dimensions

### Mainboard Dimensions (Mini PCIe)

Unit: mm



### **I/O Board Dimensions**



In this chapter, we give installation, configuration, and update/removal procedures for the driver for Windows and Linux, 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

You can download the drivers from the Moxa website.

## **Windows Driver**

Moxa provides drivers that allow you to use the Mini PCI Express Series serial boards for various Windows platforms, such as Windows 7/8/8.1/10/11.

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



## Windows 7/8 /8.1/10/11, Server 2008 R2/2012/2012 R2/ 2016 (x64)/2019/2022

This section includes the following topics:

- Installing the Driver
- Configuring the Ports
- Checking the Status
- Removing the Driver
- Uninstalling the Driver

We will take Window 10 as an example. Its procedure is similar to the other Windows platforms regarding installing, configuring, checking the port status, removing, or uninstalling the Mini PCI Express cards.

#### **Installing the Driver**

In this section, we describe how to install the Mini PCI Express cards for the first time with Windows 10. First, make sure that you have already plugged the board or boards into the system's Mini PCI Express slot(s).

Second, you may download the drivers at <u>www.moxa.com</u>. Based on the OS type, choose the corresponding driver.

Follow the following procedures to install the driver.

- 1. Double-click the installation file that you download from the Moxa website.
- 2. The Setup Wizard will open. Click **Next** to install the driver.

🕵 Setup - MOXA Smartio/Ir	🕼 Setup - MOXA Smartio/Industio Windows Driver — 🗌 🗙		
MOXA	Welcome to the MOXA Smartio/Industio Windows Driver Setup Wizard		
	This will install MOXA Smartio/Industio Windows Driver Ver3.1 on your computer.		
	It is recommended that you close all other applications before continuing.		
	Click Next to continue, or Cancel to exit Setup.		
	Next > Cancel		

3. Please read the license agreement. If you agree, please click **Next** to move on.

🕵 Setup - MOXA Smartio/Industio Windows Driver — 🗌	×
License Agreement Please read the following important information before continuing.	
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.	
MOXA END-USER LICENSE AGREEMENT	^
FOR MOXA SMARTIO/INDUSTIO WINDOWS DRIVER	
IMPORTANT: Please Read This Agreement Before Using The Software Indicated Above.	
This End-User License Agreement ("EULA") is a legal agreement between you, the Customer (either as an individual or a single entity), and the Owner concerning this special purpose ("System") computer device that includes certain Owner software products ("Software") installed on the System. Installing, copying, or	<b>~</b>
• I accept the agreement	
$\bigcirc I  \underline{d} o$ not accept the agreement	
< <u>B</u> ack <u>N</u> ext > Ca	ncel

4. Click **Next** to install the driver in the indicated folder or click the **Browse...** button to locate a different folder.

📸 Setup - MOXA Smartio/Industio Windows Driver	-		$\times$
Select Destination Location Where should MOXA Smartio/Industio Windows Driver be installed?			
Setup will install MOXA Smartio/Industio Windows Driver into folder.	the foll	owing	
To continue, click Next. If you would like to select a different folder, o	lick Bro	wse.	
C:\Program Files\Moxa\SmartioIndustioDriver	B	Browse	
At least 3.0 MB of free disk space is required.			
< Back Next	t >	Can	cel

5. Select the component (tools) you want to install. These tools are useful for configuration, monitoring, and troubleshooting. We would recommend you install it (choose the full installation). However, if you would like to install it later, please untick the box in front of the tools. Click **Next** when you are ready to continue.

Select the components you want to instal install. Click Next when you are ready to		lo not want to
Custom installation		~
✓ ViewCom - Moxa COM ports status vi	iewer (Recommended)	4.2 MB
PComm Terminal Emulator - Serial d	lata verification	1.6 MB
PComm Monitor - Serial communicat	ion monitoring	0.4 MB
PComm Diagnostic - Troubleshooting	-	0.8 MB
Performance Analyzer - Throughput	testing	0.6 MB
Current selection requires at least 8.6 MB		

#### NOTE

The following process is based on all tools that have been selected.

6. This page shows the tools that will be installed on your computer. Click **Install** and continue the installation process.

🕵 Setup - MOXA Smartio/Industio Windows Driver —		$\times$
Ready to Install Setup is now ready to begin installing MOXA Smartio/Industio Windows Driver on your computer.		
Click Install to continue with the installation, or click Back if you want to review or change any settings.		
Destination location: C:\Program Files\Moxa\SmartioIndustioDriver	^	
Setup type: Custom installation		
Selected components: ViewCom - Moxa COM ports status viewer (Recommended) PComm Terminal Emulator - Serial data verification PComm Monitor - Serial communication monitoring PComm Diagnostic - Troubleshooting tool Performance Analyzer - Throughput testing	~	
< >		
< Back Install	Cance	ł

7. Please wait until the installation is completed.

🕼 Setup - MOXA Smartio/Industio Windows Driver	_		$\times$
Installing Please wait while Setup installs MOXA Smartio/Industio Windows D computer.	river on y	our	
Installing driver (28%)			
		_	
		Can	cel

8. This page will show all the applications that you have installed. Click **Next** to continue the installation process.

🕼 Setup - MOXA Smartio/Industio Windows Driver	_	×
Installed Items Installation is complete. The following list shows the ite computer.	ms installed on your	
Core Component		
Device Driver	Installed	
Utility Component		
ViewCom	Installed	
PComm Terminal Emulator	Installed	
PComm Monitor	Installed	
PComm Diagnostic	Installed	
PComm Performance Analyzer	Installed	
	Next >	

9. On this page, you can check the serial card default port basic configuration here. You can also click the **Scan** button to refresh this page. Click **Next** to continue the install process.

J Setup - MOXA Smartio/Industio Windows Driver	_		×
Review installed COM ports			
Review installation or change settings in Windows Device Manager			
You may press Scan button to rescan the incomplete installation. Following list the COM ports which are installed on computer.			
[1] PCI bus 5, device 0, function 0		^	
MOXA CP-114N Series (Mini PCI Express Bus) - RS-232/422/485 Port 1 : COM2 @ RS-232 (Default)			
Port 2 : COM3 @ RS-232 (Default)			
Port 3 : COM4 @ RS-232 (Default) Port 4 : COM5 @ RS-232 (Default)			
		~	
Scan			
Scarr			
	_		
< Back Next >	>		

10. This is the final page for the installation process. It shows two ways to do further device configuration. One directs to the multiport serial adapters on the device manager page; the other use the ViewCom tool that you have installed. Click **Finish** to complete the installation process.

🥵 Setup - MOXA Smartio/Industio Windows Driver — 🗌 🗙		
MOXA	Completing the MOXA Smartio/Industio Windows Driver Setup Wizard	
	Click Finish to exit Setup.	
	* If you want to change the device settings, go to "Multi-port serial adapters" in the Device Manager.	
A	✓ ₩ Multi-port serial adapters ₩ MOXA CP-118EL-A Series (PCI Express Bus)	
	* If you have installed ViewCom, go to the system tray and use ViewCom to change the device settings easily.	
0	▲ 💭 ENG 11:08 AM 02/16/2022	
	└ Launch Windows Device Manager after finish	
	< Back Finish	

#### **Configuring the Ports**

After the driver has been installed, use the Device Manager to configure the serial port of your Mini PCI Express cards (the CP-114N-T will be used as an example). In this section, we describe how to access MOXA Smartio/Industio Window Driver and guide through the configuration of serial ports.

#### Accessing MOXA Smartio/Industio Window Driver

Expand the **Multi-port serial adapters tab**, right click **Moxa CP-114N Series**, and then click **Properties** to open the board's configuration panel. Please see the following section for more detailed information for the configuration of the Mini PCIe port.



### **Configuring Serial Port**

You can set all parameters in the driver properties page's configuration sheet. Here is an introduction to this page.

Port	1	Rx FIFO Level	Tx FIFO Level	Interface	Termination Resistor
1	COM 2	High	High	RS-232	Disable
2	COM 3	High	High	RS-232	Disable
3	COM 4	High	High	RS-232	Disable
4	COM 5	High	High	RS-232	Disable
3	rt Setting	4 Port Info	1		
Po	it setting				

### 1. FAQ:

Click the FAQ button, which will open the FAQ document. If you encounter problems, please check this document before you reached out technical support.

😭 Moxa Smartio/Industio FAQ						-	×
File Edit View Go Help							
Hide Back Forward Print Option	3						
Other Settings     FAQ	Verview	Geries (PCI Expre	ss Bus) Propert	ies		×	^
	General Configurat	ion Driver De	tails Events F	Resources			
	Overview					FAQ	
	Port COM No.		Tx FIFO Level		Termination	Resistor	
	1 COM 3 2 COM 4	High High	High High	RS-232 RS-232	Disable Disable		
	3 COM 5	High	High	RS-232	Disable		
	4 COM 6	High	High	RS-232	Disable		
	5 COM 7	High	High	RS-232	Disable		
	6 COM 8 7 COM 9	High High	High High	RS-232 RS-232	Disable Disable		
	8 COM 10	High High	High High	RS-232 RS-232	Disable Disable		
	<					>	
	Port Setting	Port Info			Start Dia	gnosis	
	Other Settings						
	I VM-Compati	ble					
					ОК	Cancel	
							~

#### 2. Overview:

In this section, it shows the port parameters such as COM Number, TX and RX FIFO level, and Termination Resistor. The following are the description of this parameters.

Uver	Uverview				
Port	COM No.	Rx FIFO Level	Tx FIFO Level	Interface	Termination Resistor
1	COM 2	High	High	RS-232	Disable
2	COM 3	High	High	RS-232	Disable
3	COM 4	High	High	RS-232	Disable
4	COM 5	High	High	RS-232	Disable

#### • Port Number and COM No.

You will need to set up all the ports of the board with the desired "COM number", which should not conflict with other COM numbers in use.

#### RX and TX FIFO

- > Rx FIFO Level
  - □ Low Disables FIFO, resulting in decreased latency, and low throughput.
  - □ High Results in high throughput, but with increased latency. (Default)
- > Tx FIFO Level
  - □ Low Disables FIFO (recommended when the attached serial device has a small buffer, or slow transmission speed).
  - High Results in high throughput. (Default)

#### Interface

 This column shows the interface of serial ports. You can change the interface by clicking the Port Setting button and making the changes in "Port Setting" dialog box. For the RS-232/422/485 serial boards, the interface default setting is RS-232. For the RS-422/485 serial boards, the interface default setting is RS-485 2W

#### Termination Resistor

You may need to enable the termination resistor in the long communication distance.

- Enable (120 ohm)
- > Disable (Default)

#### 3. Port Setting:

Click this button, which will open the port setting window for you to configure the serial ports.

Port 1	×esources
COM Number 2(current)	FAQ
Auto Enumerating COM Number	Interface Termination Resistor
Basic Settings Rx FIFO Level High 💌	RS-232 Disable RS-232 Disable RS-232 Disable RS-232 Disable RS-232 Disable
Tx FIFO Level High   Interface RS-232	
Termination Resistor RS-422 RS-485 2W I Set the consingent our points	5
Save Cancel	
VM-Compatible	

#### Port Number/Auto Enumerating COM Number

Select a COM number for the port from the Port Number drop-down list. You could also type the port number in the text column to quickly get the target port.

Port 1	<
COM Number 1	
Auto Enumerating COM Number	

Select the **Auto Enumerating COM Number** option to map subsequent ports automatically. The port numbers will be assigned in sequence. For example, if COM 1 is assigned to Port 1, then COM 2 (if not already occupied) will be assigned to Port 2, etc.

#### Basic Settings (Rx, TX FIFO, Interface)

#### RX and TX FIFO

Basic Settings				
<u>R</u> x FIFO Level	High 💌			
<u>I</u> x FIFO Level	Low (Disable) Middle High			
Interface	RS-232 💌			
T <u>e</u> rmination Resistor	Disable 💌			
Set the change to all ports				
Save Cancel				

- 1. Select an Rx FIFO Trigger from the Rx FIFO Level drop-down list. Rx FIFO trigger levels of High, Middle, and Low are available, with the default set at High (120 bytes).
  - > Low Disables FIFO, resulting in decreased latency and low throughput.
  - > High Results in high throughput but with increased latency. (Default)
- 2. Select a Tx FIFO Level from the Tx FIFO Level drop-down list. Tx FIFO Levels of High, Middle, and Low are available, with the default set at High (128 bytes).
  - Low Disables FIFO (recommended when the attached serial device has a small buffer, or slow transmission speed).
  - > High Results in high throughput. (Default)

#### TX/RX FIFO Size

	TX FIFO (Byte)	RX FIFO (Byte)
High (Default)	128	120
Middle	64	60
Low	1	1

#### Serial Interface

Basic Settings Rx FIFO Level	High
Tx FIFO Level	High
Interface	RS-232
Termination Resistor	RS-232 RS-422 RS-485 2W RS-485 4W

If you are using CP-132N-T, CP-132N-I-T, CP-134N-I-T, or CP-114N-T, **select Interface from the drop-down list** (RS-232, RS-422, RS-485-2W, or RS-485-4W).

Basic Settings			
Rx FIFO Level	High 💌		
Tx FIFO Level	High 💌		
Interface	RS-232 💌		
Termination Resistor	Disable		
Set the change to all ports			

Check the **Set the change to all ports** option to apply the just define configuration (Interface and Bias Settings).

Click **Save** to apply the port settings and click **OK** in the Property window to finish the port settings procedure.

#### 4. VM-compatible:

Click this button to get the information summary of this port. Click  $\ensuremath{\textbf{OK}}$  to close this window.

Port 1	X Resources	
Port Info Rx FIFO size : 120 Tx FIFO size : 128 UART Type : MUE-850 CPLD Ver : N/A	FAG evel Interface Termination Resistor RS-232 Disable RS-232 Disable RS-232 Disable RS-232 Disable RS-232 Disable	_
OK Port Setting Port Info Other Settings VM-Compatible		

#### 5. Port info:

Tick this setting to ignore PCI capability if this board has an transmission issue on the virtual machine.

VM-Compatible	

#### **Bias Resistor Setting**

The termination resistor ( $120\Omega$ , Enable, or Disable) and pull high/low resistor will be set by the DIP switch on the main board (CP-132N-T, CP-132-I-T). For the models CP-114N-T and CP-134N-I-T, you can find the DIP switch on the I/O boards. The default setting of the resistors is disable termination resistor and use 150 kohm. If you connect serial cables with a long range, we recommend you enable the 120-ohm termination resistor and set the pull high/low at 1 kohm. Otherwise, please keep it in the default setting so that the serial device continues to work as normal.



	On	OFF (Default)	
SW1	Enable 120-ohm termination resistor	Disable termination resistor	
SW2	1K-ohm pull-high/low resistors	150K-ohm Pull-high/low resistors	
SW3	Reserved for future feature		
SW4	Reserved for future feature		

#### **Checking the Status**

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

Go to start the program, click **The Windows icon** and find **the PComm Diagnostic Program**. If you just install it, the program will be shown on the recently added group. The program Default installation location will be C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Moxa. You could also go to the location and launch the program directly.

=	Recently added	
	PComm Diagnostic	
	PComm Monitor	
	Performance Analyzer	
	Expand $\checkmark$	
	м	
	MOXA New	
	S	
	Search	
	🔅 Settings	
	w	
8	Windows Accessories	
D	Windows Administrative Tools	
	Windows Ease of Access	
2	Windows PowerShell	
٢	Windows Security	
Ф	Windows System	
-	오 # 🥥 🥥 🥥	

Or, you can click the search icon and search the **PComm Diagnostic** program, and then launch this program.



If the serial board is installed successfully, you will see the installed serial device shown on the Board Status window.

File       Disprose       Help         Image: Image: Disprose       Image: Disprose       Image: Disprose         Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose         Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose         Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose         Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose         Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose         Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose       Image: Disprose       Image:	- 🗆 🗙	😡 PComm Diagnostic
To be tested  P-1144 Series (CDA3CDM6) PG0-15J/O-D000 Select C (Corlig) to set test option Select (COA3CDM6) Total Corliguration Beards = 1 COM Port Available Beards = 1 COM Port Available Beards = 1 COM Port Available Beards = 1		File Diagnose Help
CP-114N Serie: (CDN3-CDM6) RQ-15J:OD-0000 Select  Gold to start testing Found Status CP-114N Series: (CDN3-CDM6) CP-114N Series: (CDN3-CDM6) CP-114N Series: (CDN3-CDM6) CP-114N Series: (CDN3-CDM6) Dever: 31 build 220 Dever: 31 buil		r • • •
Select		To be tested
Ready	PP-1149 Senier (CCM32C0M6) PR0=13128-0000 Wree: 31 build 220	Select  (Go) to start testing

#### **Removing the Driver**

1. Open the Device Manager and put the cursor over MOXA CP-114N Series (Mini PCI Express Bus) under Multi-port serial adapters. Right-click and select the **Uninstall** option.



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



#### **Uninstalling the Driver**

The MSB driver may be removed through Add/Remove Programs in the Windows Control Panel. Open the Control Panel and click **Uninstall a program**.



#### Click **Uninstall** next to MOXA Smartio/Industio Windows Driver Verx.xx

Programs and Features							- 0	$\times$
← → × ↑ 👩 > Control P	Panel > Programs > Programs and Features				v ē	Search Progran	ns and Features	Q
						-		
Control Panel Home	Uninstall or change a program							
View installed updates	To uninstall a program, select it from the list and then	click Uninstall, Change, or Repair.						
Turn Windows features on or off								
OTT	Organize 👻 Uninstall						== -	?
	Name	Publisher	Installed On	Size	Version			
	Microsoft Visual C++ 2008 Redistributable - x86 9.0.2	Microsoft Corporation	6/9/2022	6.67 MB	9.0.210	22		
	MOXA Smartio/Industio Windows Driver Ver3.1	Moxa Inc.	6/10/2022	2.18 MB	3.1			
	MOXA UPort 1110/1130/1150 Windows Driver Ver3.1	Moxa Inc.	6/9/2022	2.14 MB	3.1			
	💩 opsi-client-agent		6/9/2022		4.1.0.0-	19		
	📧 PComm Lite Ver1.6	Moxa Inc.	6/10/2022	4.55 MB				
				C: 0.40	140			
	Moxa Inc. Product version: 3.1	Support link: http oxa.com Update information: http			MB			
	Help link: http://www.m	oxa.com opuate information: http	://www.moxa.c	om				

0	Programs and Features								- (		$\times$
	> - 🛧 🖬 > Control Pa	anel > Programs > Programs and Features					√ Ō	Search Program	is and Fea	tures	٩
•	Control Panel Home View installed updates Turn Windows features on or off	Uninstall or change a program To uninstall a program, select it from the list and then	click Uninstall, Change, or R	epair.							
	011	Organize - Uninstall								•	?
		Name	Publisher		Installed On	Size	Versio				
		Microsoft Visual C++ 2008 Redistributable - x86 9.0.2     MOXA Smartio/Industio Windows Driver Ver3.1	Microsoft Corporation Moxa Inc.	MOXA		io Windows Dri				×	
		MOXA UPort 1110/1130/1150 Windows Driver Ver3.1     opsi-client-agent     PComm Lite Ver1.6	Moxa Inc.		Smartio/Inc	Justio Windows	Driver	ely remove MOXA and all of its comp Yes	No	]	
		Moxa Inc. Product version: 3.1 Help link: http://www.me	Support lin oxa.com Update information			om Size: 2.18 om	MB				

Wait until the driver has been uninstalled.



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

Moxa provides drivers that allow you to use the following serial boards for Linux.

**Mini PCI Express Boards:** CP-102N-T, CP-102N-I-T, CP-132N-T, CP-132N-I-T, CP-104N-T, CP-104N-I-T, CP-134N-I-T, CP-114N-T

#### NOTE

The following procedure shows how to install the CP-114N-T driver for Linux.

Execute the following commands from the Linux prompt:

1. #cd /

```
#mkdir moxa
```

#cd moxa

```
#cp /<driver directory>/driv_linux_smart_<version>_build_<build_date>.tgz .
#tar -zxvf driv_linux_smart <version> build <build_date>.tgz
```

2. #cd mxser

#make clean; make install

3. #cd /moxa/mxser/driver

```
#./msmknod
```

- 4. #modprobe mxupcie
- Use the Moxa Port Configuration Tool to set CP-100N Series Interface for the MUE series. Usage: muestty <operation> device

Device: The MUE series device node

-h	Help
-g	Get interface and terminator type
-i intf	Set interface type with options below
RS232	RS-232 mode
RS422	RS-422 mode
RS4852W	RS-485 2-wire mode
RS4854W	RS-485 4-wire mode
	-g -i intf RS232 RS422 RS4852W

For example To set the CP-100N Series interface # muestty –i RS422 /dev/ttyMUE2

- 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

Moxa provides an easy-to-use yet powerful serial programming library as well as utilities for communication troubleshooting for Windows platforms. The following sections provide details about the installation, the library, and the utilities for various platforms.

## Moxa PComm

PComm, a professional serial communication tool for PCs, is a software package that runs under Windows NT95/98/2000/XP/2003/Vista/2008/7(x86 and x64)/8/8.1/10/11. 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 for Windows NT95/98/2000/XP/2003/Vista/2008/7(x86 and x64), and is a simpler programming solution compared to the more complex Windows Win32 COMM API.
- Useful utilities such as diagnostics, monitor, and terminal emulator.
- Illustrative sample programs.
- Comprehensive online documentation.

## **Installing PComm**

To install PComm, you could download the installation file on the Moxa website or review Chapter 3, "Software Installation", to install it while you are installing the mini PCIe Serial Card driver. Note that the PComm diagnostics and monitor utilities are for Moxa boards only. To use these utilities, you must have a Moxa board and the appropriate Windows (NT/95/98/2000/XP/2003/Vista/2008/7(x86 and x64)/8/8.1/10/11 device driver installed in your system. See Chapter 3, "Software Installation", for instructions on how to install the drivers.

After installing PComm, click the search icon and search the PComm program 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 communication programs for any COM port that complies with the Microsoft Win32 API. This library facilitates the implementation of multiprocesses, multithread 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 he online help from the Documentation.

## 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 the search icon and search the **PComm Diagnostic** program and then launch this program.



A typical test report for a Moxa board is as follows:

👷 PComm Diagnostic		- 0 ×	🕺 PComm Diagnostic	- 🗆 X
File Diagnose Help			File Diagnose Help	
er , 🔫 日母			61, 51	
To be tested			To be tested	Test Report
₩ 0°-11415em; (200420046) Ing-13U-0-600	Test Stature         0           Costs         0           Costs         0           Costs         0           Costs         0           Costs         0	.189-19,1/6-0000 (DTR/sct) 00 00 00 00 00	<sup>(0-1)415eee</sup> (COA)COM9 <sup>(0)</sup> COK <sup>(10-1)</sup> A0-6000	CP-1181 Sectes, FCI Dus 4, device 0, function 0, IBQ-15, 1/0-2000 Commitantic Neuroscient/8400, Bios, 6, 1           CP-1181 Sectes, FCI Dus 4, device 0, function 0, IBQ-15, 1/0-2000 Commitantic Neuroscient/8400, Bios, 6, 1           CD Version Sectors 100, Bios, 6, 1           COM (62, 10, 0)           COM (64, 0)

### Monitor

This useful port status monitoring program allows you to monitor data transmission of selected Moxa COM ports.

To run the Monitor program, click the search icon and search the **PComm Monitor** program and then launch this program.



The program monitors data transmission/reception 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.


### **Terminal Emulator**

Use Terminal Emulator to connect to your PC's serial ports to check if the data is transmitted correctly.

To run Terminal Emulator, click the search icon and search the **PComm Terminal Emulator** program and then launch this program.

=	All	Apps	Documents	Settings	Photos	More $\checkmark$	Feedback	
ඛ	Best n	natch						
	4	PComm Desktop a	app	ulator	$\rightarrow$	-		
						PComm Terminal Emula Desktop app	tor	
						다 Open		
						Run as administrator		
						Open file location		
						-⇔ Pin to Start		
						- Pin to taskbar		
						🔟 Uninstall		
ŝ					_			
	Рp	comm ter	rminal Emulate	or				
	ρ	Ĭ	1					

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.

File Edit Port Manager Port Window Help   Image: State of the st	PComm Terminal - (	COM44,38400,None,8,1,Dumb Terminal	<u>_ 8 ×</u>
COM43.9600.None.8.1.ANS1   Password:   Password:   Velcome to SCO XENIX System V   Value   Vou have mai.   TERM = (ansi   # 1c   D123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123   D123456789abcdefghij0123456789abcdefghij012345	<u>File</u> Edit <u>P</u> ort Manager	r <u>P</u> ort <u>W</u> indow <u>H</u> elp	
Image: State Open Notes Image: State Open Notes   Image: Open Notes Image: State Open	a 🖪 🕅 🖻 🖉		
DTR RTS Pas sword:   Velcome to SCO XENIX System V   You have mai TERM = (ansi profile bin boot 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789	🔂 COM43,9600,Nor	ne,8,1,ANSI	
You have mai 0123456789abcde fghij0123456789abcde fghij0123456789abc	DTR Password:	in: root	
You have mai 0123456789abcdefghij0123456		Welcome to SCO XENIX System V	
You have mai 0123456789abcdefghij0123456		SUCOMAA 38400 None 8.1 Dumb Terminal	
State: OPEN CIS DSR RI DCD	TERM = (ansi # lc .profile bin boot #	0123456789abcde f ghij0123456789abcde f ghij0123456789abcde f ghi 0123456789abcde f ghij0123456789abcde f ghij0123456789abcde f ghi	H10123 H10123 H10123 H10123 H10123 H10123 H10123 H10123 H10123 H10123 H10123 H10123 H10123

### ViewCom

ViewCom is a useful tool to easily see your Moxa serial board status. ViewCom is also a shortcut to the serial boards parameter configuration page. You don't need to go to "device manager" and find the serial boards name, which is a complicated process.

ViewCom has many useful features.

1. Clicking the ViewCom icon will lead you to the device manager page for monitoring and configuring your devices, including Moxa Serial Boards.



2. Hold your cursor on the ViewCom icon, and it will show the Moxa serial boards you have installed.



3. Right-click on the ViewCom icon.



You can choose a Moxa multi-port serial board and go to the serial boards parameter configuration page directly.

	General Configuration Driver Details Ever	ts Resources
		FAQ
	Overview	
	Port COM No. Rx FIFO Level Tx FIFO	evel Interface Termination Resistor
	1 COM 41 High High	RS-485 2W Disable
	2 COM 42 High High	RS-485 2W Disable
	3 COM 43 High High	RS-485 2W Disable
	4 COM 44 High High	RS-485 2W Disable
	5 COM 45 High High 6 COM 46 High High	RS-485 2W Disable RS-485 2W Disable
	7 COM 47 High High	RS-485 2W Disable
	8 COM 48 High High	RS-485 2W Disable
us) (B) - PCI bus 7,0,0		
s Bus) (A) - PCI bus 6,0,0	<	
1655 B05) (A) - PCI B05 0,0,0		
	Port Setting Port Info	Stop Diagnosis
		Landiana
	> Other Settings	
50		

If you want to develop your own driver, no matter whether on a Windows or Linux platform, the Moxa Smartio/Industio Programming Guide is a useful instruction. The following topics are covered in this chapter:

# **Relative Product List**

IRQ \* 1

I/O :

UART register:	64 bytes ( 8 bytes / port * 8port ) for MU860 4096 bytes ( 512 bytes / port * 8port ) for MUE250/450/850
IRQ Vector register:	16 bytes ( only 1 byte used )

### **PCI** Configuration for Moxa Board

- A. MOXA Vendor ID = 0x1393
- B. Device ID = (Please see Moxa Board PCI Device ID List section)
- C. Hardware resource on Device Configuration Register of PCI configuration space

Resource Name	Chip	Address	Offset	Size	
IRQ	All	0x3C			
IRQ Vector Address	MU860	0x1C	BAR3	16 bytes	
UART register	MU860	0x18	BAR2	64 bytes	
(I/O Base Address)	110800	DATS DAKZ		04 Dytes	
UART register	MUE250, MUE450, MUE850	0x14	BAR1	4096 bytes	
(Memory Base Address)	102230, 1102430, 1102830	0,14	DARI	4090 Dytes	
Vector Base Address	MUE250, MUE450, MUE850	0x18	BAR2	16 bytes	

Byte Offset	0-7	8-15	16-23	24-31	
00h	Vender ID		C	Device ID	
04h	Command			Status	
08h					
0Ch					
10h		BA	R0		
14h		BA	R1		
18h	BAR2				
1Ch	BAR3				
3Ch	Interrupt Line	Interru	upt Pin	Reserved	

### NOTE

Mini PCIe multi-ports serial board use MUE850.



#### NOTE

For MUE250, MUE450, and MUE850 Chips Only: Memory mode is recommended for these chips to access UART. To use memory mode, the driver must access the memory base address, which is located at BAR1.

# UART Register Structure for MUE250, MUE450, and MUE850 Chips

There are 512 bytes for each UART register and 0x200 offset between each port. However, there is one exception: for the models that are 4-port boards, such as **CP-104EL-A**, **CP-114EL**, **CP-114EL-I**, and **CP-134EL-A**, the offset of the fourth UART register is 0xE00.



**Registers for 8 ports** 

**Registers for 4 ports** 

### ΝΟΤΕ

For a detailed description of the UART register, please see the UART Datasheet section.

#### UART register address = I/O base address + (port-1) \* 0x200

For example, if the base address is 0x200:

The first port's UART register's I/O address is 0x200 + (1-1) \* 0x200 = 0x200The first register's I/O address is 0x200, The second register's I/O address is 0x201, ....

The second port's UART register's I/O address is 0x200 + (2-1) \* 0x200 = 0x400 The first register's I/O register is 0x400, The second register's I/O register is 0x401, .....

#### **Control Serial Interface and Termination Resistor for MUE Chips**

For Moxa boards that use MUE250, MUE450, and MUE850 chips, BAR2, which allocates 16 bytes, is the vector base address that can be used to control serial interfaces and termination resistors, according to the following table.

Offset	Bit	Port #	Parameters	
0x4	[30]	1		
0,4	[74]	2		
0x5	[30]	3	0x0 : RS-232	
023	[74]	4	0x1 : RS-422	
0x6	[30]	5	0xF:RS-485 2W	
0.00	[74]	6	0xB : RS-485 4W	
0x7	[30]	7		
0.27	[74]	8		
0x8	[70]	[81]	GPIO – Input	
		[81]	GPIO direction configuration	
0x9	[70]		0 : Set GPIO direction to input	
			1 : Set GPIO direction to output	
			GPIO – Output (Termination Resistor)	
0xA	[70]	[81]	0 : Low (0 Ohm)	
			1 : High (120 Ohm)	

Especially, the interfaces of 4-port models, such as CP-114EL and CP-114EL-I, use the following offset

to set the interface of port 4.

Offset	Bit	Port #	Parameters				
0x4	[30]	1					
0.004	[74]	2	0.0 . 0.0				
0x5	[30]	3	−0x0:RS-232 −0x1:RS-422				
023	[74]	-	-0xF : RS-485 2W				
0x6	[30]	-	-0xB : RS-485 4W				
0.00	[74]	-					
0x7	[30]	4					

# **For Baudrate Settings**

For General PC Com Port: CLK=1.8432MHz Div = CLK/(Baud x 16)

But for Moxa Board: CLK=**14.7456**MHz Div = **CLK**/(Baud x 16)

# **Moxa Board PCI Device ID List**

Model	Ports	Bus	Chip	Max Baud	Vendor ID	Device ID
CP-102N-T	2	PCIe	MUE850	921.6k	0x1393	0x1027
CP-102N-I-T	2	PCIe	MUE850	921.6k	0x1393	0x1027
CP-132N-T	2	PCIe	MUE850	921.6k	0x1393	0x1323
CP-132N-I-T	2	PCIe	MUE850	921.6k	0x1393	0x1323
CP-104N-T	4	PCIe	MUE850	921.6k	0x1393	0x1046
CP-104N-I-T	4	PCIe	MUE850	921.6k	0x1393	0x1046
CP-134N-I-T	4	PCIe	MUE850	921.6k	0x1393	0x1343
CP-114N-T	4	PCIe	MUE850	921.6k	0x1393	0x1145
CP-102U	2	UPCI	MU860	921.6k	0x1393	0x1022
CP-102UL	2	UPCI	MU860	921.6k	0x1393	0x1021
CP-132UL	2	UPCI	MU860	921.6k	0x1393	0x1321
CP-132UL-I	2	UPCI	MU860	921.6k	0x1393	0x1321
CP-102E	2	PCIe	MUE250	921.6k	0x1393	0x1024
CP-102EL	2	PCIe	MUE250	921.6k	0x1393	0x1025
CP-132EL	2	PCIe	MUE250	921.6k	0x1393	0x1322
CP-132EL-I	2	PCIe	MUE250	921.6k	0x1393	0x1322
CP-104UL	4	UPCI	MU860	921.6k	0x1393	0x1041
CP-104JU	4	UPCI	MU860	921.6k	0x1393	0x1042
CP-114UL	4	UPCI	MU860	921.6k	0x1393	0x1143
CP-114UL-I	4	UPCI	MU860	921.6k	0x1393	0x1143
CP-134U	4	UPCI	MU860	921.6k	0x1393	0x1340
CP-134U-I	4	UPCI	MU860	921.6k	0x1393	0x1340
CP-104EL-A	4	PCIe	MUE450	921.6k	0x1393	0x1045
CP-114EL	4	PCIe	MUE450	921.6k	0x1393	0x1144
CP-114EL-I	4	PCIe	MUE450	921.6k	0x1393	0x1144
CP-134EL-A	4	PCIe	MUE450	921.6k	0x1393	0x1342
CB-114	4	PC/104-Plus	MU860	921.6k	0x1393	0x1142
CB-134I	4	PC/104-Plus	MU860	921.6k	0x1393	0x1341
CP-118U	8	UPCI	MU860	921.6k	0x1393	0x1180
CP-118U-I	8	UPCI	MU860	921.6k	0x1393	0x1180
CP-138U	8	UPCI	MU860	921.6k	0x1393	0x1380
CP-138U-I	8	UPCI	MU860	921.6k	0x1393	0x1380
CP-168U	8	UPCI	MU860	921.6k	0x1393	0x1681
CP-116E-A(A)	8	PCIe	MUE850	921.6k	0x1393	0x1160
CP-116E-A(B)	8	PCIe	MUE850	921.6k	0x1393	0x1161
CP-118EL-A	8	PCIe	MUE850	921.6k	0x1393	0x1182
CP-118E-A-I	8	PCIe	MUE850	921.6k	0x1393	0x1183
CP-138E-A-I	8	PCIe	MUE850	921.6k	0x1393	0x1381
CP-168EL-A	8	PCIe	MUE850	921.6k	0x1393	0x1683
CB-108	8	PC/104-Plus	MU860	921.6k	0x1393	0x1080

# **UART Datasheet**

Moxa's chips are compatible with the following chips. For more details about UART register description, please refer to the links below.

UART	Port	Datasheet
MU-860	2-8	TL16C550C
MUE-250	2	PI7C9X7952
MUE-450	4	PI7C9X7954
MUE-850	8	PI7C9X7958

# **Mini PCIe Board Accessories Table**

Internal Connection Accessories							
Model	Description	Suitable models					
CBL-M9HSF1x10H-15-01	10-pin female wafer to 1 DB9 male	CP-102N-I-T					
CBC-M9H3F1X10H-13-01	serial cable, 15 cm	CP-132N-I-T					
CBL-M9HSF1x10H-15-02	10-pin female wafer to 1 DB9 male	CP-102N-T					
CBE-M913F1X101-13-02	serial cable, 15 cm	CP-132N-T					
CBL-M9x2HSF2x10H-15	20-pin female wafer to 2 DB9 male	CP-104N-T					
CDE-M9X2113F2X1011-13	serial cables, 15 cm	CF-104IN-1					
	20-pin female wafer to 20-pin female	CP-104N-I-T					
CBL-HSF2x10-15	serial cable, 15 cm	CP-134N-I-T					
		CP-114N-T					

# **CP-102N-T**

The CP-102N-T 2-port RS-232 Mini PCI Express serial board has two male wafer connectors on the board, with a 10-pin female wafer connector connected to the DB9 male connector via cables.

### **Female Wafer to DB9 Connector Pin Assignments**

#### Female Wafer Connector

1

# 

Female wafer Pin	DB9 Male Pin	RS-232
9	1	DCD
8	2	RxD
7	3	TxD
6	4	DTR
10	5	GND
3	6	DSR
2	7	RTS
1	8	CTS
-	9	-

#### **DB9 Male Connector**



# CP-102N-I-T

The CP-102N-T 2-port RS-232 Mini PCI Express serial board has two male wafer connectors on the board, with 10-pin female wafer connector connected to the DB9 male connector via cables.

### Female Wafer to DB9 Connector Pin Assignments



Female wafer Pin	DB9 Male Pin	RS-232
2	1	DCD
4	2	RxD
6	3	TxD
8	4	DTR
9	5	GND
3	6	DSR
5	7	RTS
7	8	CTS
-	9	-

# CP-132N-T

The CP-132N-T 2-port RS-422/485 Mini PCI Express serial board supports RS-422, 4-wire RS-485, and 2-wire RS-485. It has two male wafer connectors on the board, with a 10-pin female wafer connector connected to the DB9 male connector via cables.

# Female Wafer to DB9 Connector Pin Assignments

#### 

Female wafer Pin	DB9 Male Pin	RS-422/RS-485-4W	RS-485-2W
9	1	TxD-(A)	-
8	2	TxD+(B)	-
7	3	RxD+(B)	Data+(B)
6	4	RxD-(A)	Data-(A)
10	5	GND	GND
3	6	-	-
2	7	-	-
1	8	-	-
-	9	-	-

#### **Female Wafer Connector**

#### **DB9 Male Connector**

# CP-132N-I-T

The CP-132N-I-T 2-port RS-422/485 Mini PCI Express serial board supports RS-422, 4-wire RS-485, and 2-wire RS-485. It has two male wafer connectors on the board, with a 10-pin female wafer connector connected to the DB9 male connector via cables.

### Female Wafer to DB9 Connector Pin Assignments



Female wafer Pin	DB9 Male Pin	RS-422/RS-485-4W	RS-485-2W
2	1	TxD-(A)	-
4	2	TxD+(B)	-
6	3	RxD+(B)	Data+(B)
8	4	RxD-(A)	Data-(A)
9	5	GND	GND
3	6	-	-
5	7	-	-
7	8	-	-
-	9	-	-

# **CP-104N-T**

The CP-104N-T 4-port RS-232 Mini PCI Express serial board supports RS-232 interface. It has two male wafer connectors on the board, with a 20-pin female wafer connector connected to the DB9 male connector via cables.

# Female Wafer to DB9 Connector Pin Assignments



Female Wafer Pin	Port 1 DB9 Male Pin	RS-232	Female Wafer Pin	Port 2 DB9 Male Pin	RS-232
17	1	DCD1	18	1	DCD2
13	2	RxD1	14	2	RxD2
9	3	TxD1	10	3	TxD2
5	4	DTR1	6	4	DTR2
3	5	GND1	4	5	GND2
16	6	DSR1	16	6	DSR2
11	7	RTS1	12	7	RTS2
7	8	CTS1	8	8	CTS2
-	9	_	-	9	-

# CP-104N-I-T

The CP-104N-I-T 4-port RS-232 Mini PCI Express serial board supports RS-232 interface. It has two male wafer connectors on the board, with a 20-pin female wafer connector connected to the I/O board via cables.

### **Board Side Pin Assignment**



Main Board Side Female Wafer Pin	I/O Board Side Female Wafer Pin	Main Board Side Female Wafer Pin	I/O Board Side Female Wafer Pin
1	2	11	12
2	1	12	11
3	4	13	14
4	3	14	13
5	6	15	16
6	5	16	15
7	8	17	18
8	7	18	17
9	10	19	20
10	9	20	10

# **Device Side Pin Assignment**



DB9 Male Pin	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	_

# CP-134N-I-T

The CP-134N-I-T 4-port RS-422/485 Mini PCI Express serial board supports RS-422/485 interface. It has two male wafer connectors on the board, with a 20-pin female wafer connector connected to the I/O board via cables.

# **Board Side Pin Assignment**



Main Board Side Female Wafer Pin	I/O Board Side Female Wafer Pin	Main Board Side Female Wafer Pin	I/O Board Side Female Wafer Pin
1	2	11	12
2	1	12	11
3	4	13	14
4	3	14	13
5	6	15	16
6	5	16	15
7	8	17	18
8	7	18	17
9	10	19	20
10	9	20	10

# **Device Side Pin Assignment**



DB9 Male Pin	RS-422/RS-485-4W	RS-485-2W
1	TxD-(A)	-
2	TxD+(B)	-
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(A)
5	GND	GND
6	-	-
7	-	-
8	-	-
9	-	-

# CP-114N-T

### **Board Side Pin Assignment**



Main Board Side Female Wafer Pin	I/O Board Side female Wafer Pin	Main Board Side Female Wafer Pin	I/O Board Side Female Wafer Pin
1	2	11	12
2	1	12	11
3	4	13	14
4	3	14	13
5	6	15	16
6	5	16	15
7	8	17	18
8	7	18	17
9	10	19	20
10	9	20	10

## **Device Side Pin Assignment**



DB9 Male Pin	RS-232	RS-422/RS-485-4W	RS-485-2W
1	DCD	TxD-(A)	-
2	RxD	TxD-(B)	-
3	TxD	RxD-(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	-	-
7	RTS	-	-
8	CTS	_	-
9	-	-	-

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

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

#### Hardware causes and solutions:

- a. Express slot. It is 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 Chapter 6, "Pin Assignments", 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; then, 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! that runs under the Windows platform).