Mini PCI Express Multiport Serial Board Series User Manual

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www.moxa.com/products



Mini PCI Express Multiport Serial Board Series User Manual

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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[™] (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 summarizes 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-112N-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-112N-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-112N-T Dimensions

Unit: mm





ц

2

CP-104N-T Dimensions

Unit: mm



CP-104N-I-T Dimensions

Mainboard Dimensions (Mini PCIe)



I/O Board Dimensions

Unit: mm



CP-134N-I-T Dimensions

Mainboard Dimensions (Mini PCIe)



I/O Board Dimensions

Unit: mm



CP-114N-T Dimensions

Mainboard Dimensions (Mini PCIe)



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 agreement before continuing with the installation. | of thi | s | |
| MOXA END-USER LICENSE AGREEMENT | | ^ | |
| FOR MOXA SMARTIO/INDUSTIO WINDOWS DRIV | /ER | | |
| IMPORTANT: Please Read This Agreement Before Usin Software Indicated Above. | ıg Th | e | |
| This End-User License Agreement ("EULA") is a legal agreement be the Customer (either as an individual or a single entity), and the Owner this special purpose ("System") computer device that includes cer software products ("Software") installed on the System. Installing, | tween conce tain C copyii | i you, erning Dwner ng, or ¥ | |
| • I accept the agreement | | | |
| $\bigcirc I \underline{d} o$ not accept the agreement | | | |
| < <u>B</u> ack <u>N</u> ext > | | Can | cel |

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 follo | owing | |
| To continue, click Next. If you would like to select a different folder, o | lick Bro | wse. | |
| C:\Program Files\Moxa\SmartioIndustioDriver | В | rowse | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| At least 3.0 MB of free disk space is required. | | | |
| < Back Nex | 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 in install. Click Next when you are read | nstall; clear the components you y to continue. | do not want to |
|---|--|----------------|
| Custom installation | | ~ |
| ViewCom - Moxa COM ports state | us viewer (Recommended) | 4.2 MI |
| PComm Terminal Emulator - Ser | ial data verification | 1.6 MI |
| PComm Monitor - Serial commur | nication monitoring | 0.4 MI |
| PComm Diagnostic - Troublesho | oting tool | 0.8 MI |
| Performance Analyzer - Through | put testing | 0.6 MI |
| | | |

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 — | | × |
|---|-------|---|
| 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 | | |
| < | > | |
| < <u>B</u> ack Install | Cance | I |

7. Please wait until the installation is completed.

| 🕼 Setup - MOXA Smartio/Industio Windows Driver 🦳 | × |
|--|---|
| Installing Please wait while Setup installs MOXA Smartio/Industio Windows Driver on your computer. | |
| Installing driver (28%) | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| Cance | 2 |

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

| Betup - MOXA Smartio/Industio Windows Driver | _ | \times |
|---|-----------------------|----------|
| Installed Items Installation is complete. The following list shows the it computer. | ems 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 | | ^ | |
| 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 | |
| C m C m | └ 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.

| Over | | By EIEO Lovel | Tu FIFO Louis | Interface | Termination Resister |
|-----------|------------|----------------|---------------|-----------|----------------------|
| 1 | COM NO. | High | High | BS-232 | Disable |
| 2 | COM 3 | High | High | BS-232 | Disable |
| 3 | COM 4 | High | High | RS-232 | Disable |
| 4 | COM 5 | High | High | BS-232 | Disable |
| | | • | | | |
| 3 Po | rt Setting | 4 Port Info | 1 | | |
| 3 Po | rt Setting | 4 Port Info | | | |

1. FAQ:

1

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 Optio | 15 | | |
| Contents Index Search Fa · · · · · · · · · · · · · · · · · · | Verview | × | ^ |
| | General Configuration Driver Datalle Evente Resources | ~ | |
| | FAQ | | |
| | Overview | | |
| | Port COM No. Rx FIFO Level Tx FIFO Level Interface Termination Resistor | | |
| | 1 COM 3 High High RS-232 Disable | | |
| | 2 COM 4 High High RS-232 Disable | | |
| | 3 CUM 5 High High HS-232 Disable | | |
| | 4 CUM 6 High High High R5-232 Disable | | |
| | 6 CDM 8 High High BS-232 Disable | | |
| | 7 CDM 9 High High BS-232 Disable | | |
| | 8 COM 10 High High RS-232 Disable | | |
| | | | |
| | Port Setting Port Info Start Diagnosis | | |
| | Other Settings | | |
| | ☐ VM-Compatible | | |
| | | | |
| | OK Canc | el | |
| | | | ~ |

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.

| - 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 Besistor |
| Basic Settings Rx FIFO Level High 💌 | 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 RS-485 4W Set the change to un ports | 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 | |
| S | ave C | ancel |

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 | × Resources | |
|------------------------|----------------------------------|---------|
| Port Info | | FAQ |
| Rx FIFO size : 120 | evel Interface Termination R | esistor |
| Tx FIFO size : 128 | RS-232 Disable RS-232 Disable | |
| UART Type : MUE-850 | RS-232 Disable RS-232 Disable | |
| CPLD Ver : N/A | | |
| ОК | | |
| 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.

| Other Settings | |
|----------------|--|
| VM-Compatible | |

Bias Resistor Setting

The termination resistor (120Ω , 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 V | |
| | м | |
| | MOXA New | |
| | s | |
| | Search | |
| | 🔅 Settings | |
| | w | |
| 8 | Windows Accessories | |
| D | Windows Administrative Tools | |
| | Windows Ease of Access | |
| 3 | Windows PowerShell | |
| ٢ | Windows Security | |
| Φ | Windows System | |
| | උ 🖽 🥥 🥥 🧔 | - |

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.

| The Depose Help | 😰 PComm Diagnostic | | × |
|--|--|--|---|
| To be tested. C1 be tested. C2 be tested. Select ID (Config) to set test option. | ile Disgnose Help | | |
| To be texted Image: Construction State of the construction | | | |
| Child Select (COM SCOM6) Select ID (Corlig) to set test option Select ID (Corlig) test option Test (Corlig) test option Select ID (Corlig) test option </td <td>To be tested</td> <td></td> <td></td> | To be tested | | |
| Ready | CP:114/Stele: [CDM3:CDM6] Select ID Coordig to set test option. Select ID (Go) to start testing ID (Go) to start testing ID (F):144/Selec: [CDM3:CDM6] ID (Go) to start testing ID (F):144/Selec: [CDM3:CDM6] ID (Go) to start testing ID (F):144/Selec: [CDM3:CDM6] ID </td <td></td> <td></td> | | |

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 | | | | | | | - 🗆 | \times |
|-----------------------------|--|-------------------------------------|--------------|---------------|---------|----------------|-----------------|----------|
| ← → × ↑ 👩 > Control P | anel > Programs > Programs and Features | | | | v ē | Search Program | 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 | Organize 👻 Uninstall | | | | | | 8 2 2 | ? |
| | Name | Publisher | Installed On | Size | Version | n | | |
| | 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 | | | | |
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| | Moxa Inc. Product version: 3.1 | Support link: http | //www.moxa.c | om Size: 2.18 | МВ | | | |
| | Help link: http://www.m | oxa.com Update information: http | //www.moxa.c | om | | | | |
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| 0 | Programs and Features | | | | | | | | - 🗆 | × |
|---|---|---|--|----------------------|--------------------------------|-----------------------------------|----------------------|--------------------------------------|----------------|------|
| ÷ | → 👻 🛧 🚺 > Control Pa | anel > Programs > Programs and Features | | | | | ڻ <i>ب</i> | Search Program | ns and Feature | s ,P |
| • | Control Panel Home View installed updates Turn Windows features on or | Uninstall or change a program To uninstall a program, select it from the list and then | click Uninstall, Change, or R | epair. | | | | | | |
| | off | Organize 👻 Uninstall | | | | | | | | ? |
| | | Name | Publisher | | Installed On | Size | Version | ı | | |
| | | Microsoft Visual C++ 2008 Redistributable - x86 9.0.2 MOXA Smartio/Industio Windows Driver Ver3.1 | Microsoft Corporation Moxa Inc. | MOXA | 6/0/2022 Smartio/Indust | io Windows Dri | ver Unin | nstall | × |] |
| | | MOXA UPort 1110/1130/1150 Windows Driver Ver3.1 | Moxa Inc. | | Are you suu Smartio/Ind | e you want to c Justio Windows | ompletel Driver a | ly remove MOXA nd all of its comp | No | |
| | | Moxa Inc. Product version: 3.1 Help link: http://www.me | Support lin oxa.com Update informatio | k: http: n: http: | //www.moxa.co //www.moxa.co | om Size: 2.18 om | MB | | | |

Wait until the driver has been uninstalled.

| MOXA Smartio/Industio Windows Driver Uninstall | × |
|--|-------|
| Uninstall Status | |
| Please wait while MOXA Smartio/Industio Windows Driver is removed from your computer. | 18 |
| Uninstalling driver and utility (35%) | |
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| MOXA Smartio/Industio Windows Driver Uninstall X | |
| | |
| removed from your computer. | |
| ОК | |
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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

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

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 and 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 the 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, refer to the Documentation online.

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 | |
| | | | 61, 4 94 | |
| To be tested | | | To be tested | Test Report |
| (CP1105564) R0-15J-0-000 | PetStatus 0, 28 Text Board (24.114) Series Text Board (24.114) Series Text Status (24.114) Series Control (24.114) Series Control (24.114) Series Control (24.114) Series | 9-15, 1/0-0000 | (\$11815em) (5043C0H3) | Child Seise, PCI has 4, decice 0, function 0, IR0-15, 1/0-2000 Doministics Primerosisheo, None, 9, 1 Driver Version: Number BI - 2 (Buildisbo) Internal Logical (BL - 2 (Buildisbo)) Internal Logical (BL - 2 (Buildisbo)) Internal Logical (BL - 2 (Buildisbo)) Internal Logical (BL - 2 (|
| 3 | <pre>(Test Time : 06/10/22 19:39:47)</pre> | | < >> | (Test Time : 06/10/22 19:39:47) |

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 V Feed | iback | |
|---|--------|--------------------|----------------|----------|---------------|--|-------|--|
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| | 42 | PComm Desktop a | Terminal Emu | ılator | \rightarrow | | | |
| | | | | | | PComm Terminal Emulator Desktop app | | |
| | | | | | | C Open | | |
| | | | | | | C Run as administrator | | |
| | | | | | | D Open file location | | |
| | | | | | | - Pin to Start | | |
| | | | | | | - Pin to taskbar | | |
| | | | | | | 🛍 Uninstall | | |
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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.

| 🏜 PComm Terminal - I | COM44,38400,None,8,1,Dumb Terminal _ 8 3 |
|---|--|
| <u>File</u> Edit <u>P</u> ort Manager | r <u>P</u> ort <u>W</u> indow <u>H</u> elp |
| | |
| COM43.9600.Nor | ne,8,1,ANSI |
| You have mai. TERM = (ansi # 1c .profile bin boot # State:OPEN OTS 05 | COM44.38400.None.8.1.Dumb Terminal |
| | State:OPEN CTS DSR RI DCD |

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.

| Bit PCI bus 7,0,0 A M 2 A M 2 A M 2 A M 2 | | MOXA CP-116E-A Series (PCI Express Bus) (A) Properties General Configuration Driver Details Events Resources |
|---|--------------------------------|---|
| (B) - PCI bus 7,0,0 (A) - PCI bus 6,0,0 | | - Duerview |
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| (B) - PCI bus 7,0,0 (A) - PCI bus 6,0,0 | | 1 COM 41 High High DS 495 201 Disable |
| (B) - PCI bus 7,0,0 (A) - PCI bus 6,0,0 (B) - PCI bus 6,0,0 (A) - PCI bus 6,0,0 (A) - PCI bus 6,0,0 (A) - PCI bus 6,0,0 (B) - PCI bus 6,0,0 (A) - PCI bus 6,0,0 (A) - PCI bus 6,0,0 (A) - PCI bus 6,0,0 (B) - PCI bus 6,0,0 (C) - PCI bus 6, | | 2 COM 41 High High BS 485 2W Disable |
| (8) - PCI bus 5,0,0 (A) - PCI bus 6,0,0 | | 3 COM 43 High High BS-485 2W Disable |
| (B) - PCI bus 7,0,0 (A) - PCI bus 6,0,0 (B) - PCI bus 6,0,0 (C) - PCI bus 6, | | 4 COM 44 High High High RS-485 2W Disable |
| (B) - PCI bus 7,0.0 6 COM 46 High High RS-485 2w Disable (B) - PCI bus 7,0.0 RS-485 2w Disable RS-485 2w Disable (A) - PCI bus 6,0.0 Port Setting Port Info Stop Diagnosis (A) - PCI bus 6,0.0 Other Settings VM-Competible | | 5 CDM 45 High High BS-485 2W Disable |
| (B) - PCI bus 7,0,0 7 COM 47 High High RS-485 2w Disable (A) - PCI bus 6,0,0 RS-485 2w Disable Comparison Comparison (A) - PCI bus 6,0,0 RS-485 2w Disable Comparison Comparison (A) - PCI bus 6,0,0 Comparison Comparison Comparison Comparison (A) - PCI bus 6,0,0 Comparison Comparison Comparison Comparison (A) - PCI bus 6,0,0 Comparison Comparison Comparison Comparison (A) - PCI bus 6,0,0 Comparison Comparison Comparison Comparison (A) - PCI bus 6,0,0 Comparison Comparison Comparison Comparison | | 6 COM 46 High High RS-485 2W Disable |
| (8) - PCI bus 7,0,0 8 COM 48 High High RIS-485 2w/ Disable (A) - PCI bus 6,0,0 Port Setting Port Info Stop Diagnosis (A) - PCI bus 6,0,0 Other Setting Port Info Stop Diagnosis (A) - PCI bus 6,0,0 Other Setting Port Info Stop Diagnosis (A) - PCI bus 6,0,0 TvM-Compatible | | 7 COM 47 High High RS-485 2W Disable |
| (8) - PCI bus 7,0,0 (A) - PCI bus 6,0,0 Port Setting Port Settings Cher Settings Cher Settings Cher Settings Cher Settings Cher Settings | | 8 CDM 48 High High RS-485 2W Disable |
| (A) - PCI bus 6,0,0 Port Setting Port Info Stop Diagnosis Other Settings C VM-Compatible | ss Bus) (B) - PCI bus 7,0,0 | |
| Pot Setting Pot Info Stop Diagnosit ه ۲ ۲ ۲ ه ۲ ۲ ۲ ه ۲ ۲ ۲ | ess Bus) (A) - PCI bus 6,0,0 | < |
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| 6/10/2022 (9) | g ^Q ∧ ⊑ (۵) 2:55 PM | |
| | 6/10/2022 | |
| | | |

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 |
|----------------------|---|
| IRQ Vector register: | 16 bytes (only 1 byte used) |
| C 5 | |

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 O | ffset | Size | |
|-----------------------|------------------------|-----------|-------|------------|--|
| IRQ | All | 0x3C | | | |
| IRQ Vector Address | MU860 | 0x1C | BAR3 | 16 bytes | |
| UART register | MUREO | 0,19 | | 64 bytes | |
| (I/O Base Address) | 110800 | 0X10 | DAKZ | 04 Dytes | |
| UART register | | 0×14 | BAD1 | 1096 bytos | |
| (Memory Base Address) | 102230, 102430, 102630 | 0,14 | DARI | 4050 Dyles | |
| Vector Base Address | MUE250, MUE450, MUE850 | 0x18 | BAR2 | 16 bytes | |

| Byte Offset | 0-7 | 8-15 | 16-23 | 24-31 | | |
|-------------|----------------|-----------|---------|----------|--|--|
| 00h | Vende | er ID | Devi | ce ID | | |
| 04h | Comr | nand | Status | | | |
| 08h | | | | | | |
| 0Ch | | | | | | |
| 10h | BARO | | | | | |
| 14h | BAR1 | | | | | |
| 18h | BAR2 | | | | | |
| 1Ch | BAR3 | | | | | |
| | | | | | | |
| 3Ch | Interrupt Line | e 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 |
|--------|------|--------|--------------------------------------|
| 0×4 | [30] | 1 | |
| 0.004 | [74] | 2 | |
| 0.45 | [30] | 3 | 0x0 : RS-232 |
| 023 | [74] | 4 | 0x1 : RS-422 |
| 0.46 | [30] | 5 | 0xF:RS-485 2W |
| 0x0 | [74] | 6 | 0xB:RS-485 4W |
| 0.7 | [30] | 7 | |
| 0.0.7 | [74] | 8 | |
| 0x8 | [70] | [81] | GPIO – Input |
| | | | GPIO direction configuration |
| 0x9 | [70] | [81] | 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 |
|--------|------|--------|---|
| 0×4 | [30] | 1 | |
| 084 | [74] | 2 | |
| 0x5 - | [30] | 3 | 0x0 : RS-232 0x1 : RS-422 0xF : RS-485 2W |
| | [74] | - | |
| 0×6 | [30] | - | 0xB : RS-485 4W |
| 0x0 | [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-112N-T | 2 | PCIe | MUE850 | 921.6k | 0x1393 | 0x1121 |
| 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

| Model | Description | Suitable models | |
|----------------------|--------------------------------------|-----------------|--|
| | 10-pin female wafer to 1 DB9 male | CP-102N-I-T | |
| CBE-M913F1X101-13-01 | serial cable, 15 cm | CP-132N-I-T | |
| | 10 pip fomale water to 1 DB0 male | CP-102N-T | |
| CBL-M9HSF1x10H-15-02 | sorial cable 15 cm | CP-132N-T | |
| | | CP-112N-T | |
| | 20-pin female wafer to 2 DB9 male | CP-104N-T | |
| | serial cables, 15 cm | | |
| | 20 pip fomale water to 20 pip fomale | CP-104N-I-T | |
| CBL-HSF2x10-15 | corial cable 15 cm | CP-134N-I-T | |
| | | CP-114N-T | |

Internal Connection Accessories

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

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| 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-112N-T

The CP-112N-T 2-port RS-232/422/485 Mini PCI Express serial board supports RS232, 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 Connector

DB9 Male Connector



| Female wafer Pin | DB9 Male Pin | RS-232 | RS-422/RS-485-4W | RS-485-2W |
|------------------|--------------|--------|------------------|-----------|
| 9 | 1 | DCD | TxD-(A) | - |
| 8 | 2 | RxD | TxD+(B) | - |
| 7 | 3 | TxD | RxD+(B) | Data+(B) |
| 6 | 4 | DTR | RxD-(A) | Data-(A) |
| 10 | 5 | GND | GND | GND |
| 3 | 6 | DSR | _ | - |
| 2 | 7 | RTS | _ | - |
| 1 | 8 | CTS | - | - |
| - | 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 emulatori that runs under the Windows platform).