



# PCI Express-A Intelligent RS-485 Quick Installation Guide

First Edition, February 2014

## Overview

Moxa's CP-118E-A-I, CP-138E-A-I, CP-134EL-A-I, and CP-116E-A multiport serial boards are designed for use by industrial automation system manufacturers and system integrators. The boards are compatible with all popular operating systems, and each board supports data rates up to 921.6 kbps and provides full modem control signals, ensuring compatibility with a wide range of serial peripherals. In addition, since the boards work with PCI Express x1, they can be installed in any available PCI Express slot (including x1, x2, x4, x8, x16, x32).

## Package Checklist

Before installing the PCI Express board, verify that the package contains the following items:

- 1 PCI Express serial board
- 1 low profile bracket (CP-134EL-A-I only)
- Documentation and software CD
- Quick installation guide

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

## Hardware Installation Procedure

The PCI Express board MUST be plugged into the PC before the driver is installed. Follow these steps to install the board in the PC.

1. Power off the PC and then plug the board firmly into any open PCI Express slot.
2. Fasten the holding screw to fix the board in place.
3. Plug the connection cable into the board's connector.
4. Power on the PC. The BIOS will automatically set the IRQ and I/O address.

## Software Installation Information

The board MUST be plugged in before installing the driver. See the previous section for instructions on how to install the board in your PC. Refer to the PCI Express board's user's manual for detailed instructions on installing the drivers for this board.

**NOTE** The following procedure describes how to install the driver for the CP-118E-A-I. The procedure for installing drivers for the other boards is similar

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

1. After powering on your PC, Windows 7/8/8.1 will automatically detect the PCIe board.
2. Insert the PCIe software CD in your CD-ROM drive.
3. Windows 7/8/8.1 will automatically detect the new board, and a popup window that states "Device driver software was not successfully installed" will appear in the lower right corner of your computer screen.
4. Go to **Device Manager** → **Other devices** to install the PCI serial port driver. Right click on the PCI serial port. Windows will offer to connect to the Windows update site to search for a driver. Select **Update Driver Software...**
5. Select **Browse my computer** to search for device software.
6. Select **Search for driver software in this location**, select **Include subfolders**, and then click **Browse**. If the system is a 32-bit (x86) platform, navigate to the \CP-118E-A-I\Software\Windows 7\x86 folder on the CD. If the system is a 64-bit (x64) platform, navigate to the \CP-118E-A-I\Software\Windows 7\x64 folder on the CD, and then click **Next** to continue.
7. Wait while the driver software is installed. The next window shows the model name of the board, and indicates that Windows has completed the driver installation. Click **Close** to proceed with the rest of the installation procedure.
8. After installing the multiport serial adapter driver, install the Moxa Port driver next. Right click on **MOXA communication port**. A popup window will open to help you install the driver for MOXA Port 0. Select **Update Driver Software...**
9. Select **Browse my computer for device software** to continue.
10. Select **Search for driver software in this location**, select **Include subfolders**, and then click **Browse**. If the system is a 32-bit (x86) platform, navigate to \CP-118E-A-I\Software\Windows 7\x86 folder on the CD. If the system is a 64-bit (x64) platform, navigate to \CP-118E-A-I\Software\Windows 7\x64 folder on the CD, and then click **Next** to continue.
11. After all files have been copied to the system, a window showing that Windows has successfully updated your driver software will open to indicate that it has finished installing MOXA Port 0. The Port installation procedure is complete when Port 0 has been set up.
12. Repeat Step 8 through Step 11 for each of the remaining three ports. The last port to be installed will be Moxa Port 7.
13. In Windows 7, a message stating Your device is ready to use will appear to inform you that the hardware was installed successfully. (The popup message will not appear in Windows 8.)

### Intelligent RS-485 Settings

After the driver is installed and the RS-485 topology is set, use Device Manager to configure the CP-118E-A-I's serial ports. We provide Diagnosis and Auto Tuning functions for 2-wire RS-485.

1. Expand the **Multi-port serial adapters** tab, right click **MOXA CP-118E-A-I Series (PCI Express Bus)**, and then click **Properties** to open the board's configuration panel.
2. Select a COM number for the port from the **Port Number** drop-down list. Select the **Auto Enumerating COM Number** option to map subsequent ports automatically. The port numbers will be assigned in sequence. Select **Interface (RS-232, RS-422, RS-485-2W, or RS-485-4W)** to configure. An Auto Tuning function is provided with 2-wire RS-485. Click **OK** to apply the setting.
3. Test if the communication is OK. If not, proceed with Step 4.
4. Click on the COM number, and then click Auto Tuning and click **OK**. The PCIe board will automatically detect the RS-485 environment and suggest the correct Bias Resistor and Termination Resistor. Click **OK** to save the setting. To apply the setting, you also need to click **OK** on the Ports Configuration page.
5. Test if the communication is OK. If not, proceed with Step 6.
6. Go to the properties screen. Choose the COM Port that needs to be diagnosed and then click **Start Diagnosis**. When the CAUTION message appears, click **OK**. Adjust "non-MOXA" devices according to the Status.

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

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

7. Repeat from Step 4 until communication is OK.

### Windows 2008/Vista/2003/XP/2000 Driver Installation

Please refer to the PCI Express user's manual.

### Linux Driver Installation

1. Execute the following commands from the Linux prompt:

```
#mount /dev/cdrom /mnt/cdrom
#cd /
#mkdir moxa
#cd moxa
#cp/mnt/cdrom/<driver directory>/mxser.tgz .
#tar xvfz mxser.tgz
#cd mxser
#./mxinstall
```

- Use the Moxa diagnostic utility to verify the driver status:  

```
#cd /moxa/mxser/utility/diag
#./msdiag
```
- Use the Moxa terminal utility to test the tty ports:  

```
#cd /moxa/mxser/utility/term
#./msterm
```

### Intelligent RS-485 Settings under Linux

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

- Use the following command to do the configuration:  

```
#./muestty -g /dev/ttyMUE1
```
- Test if the communication works. If it's OK, nothing further needs to be done. If it's not OK, proceed to Step 3.
- Use the following command to do the **Auto-Tuning** process. Enter "Y" to make the value effective immediately.  

```
#./muestty -a (baud rate value) /dev/ttyMUE1
```
- Test if the communication works. If it's OK, nothing further needs to be done. If it's not OK, proceed to Step 5.
- Use the following command to run diagnosis  

```
#./muestty -d (baud rate value) /dev/ttyMUE1
```
- Adjust non-MOXA devices according to the Status

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

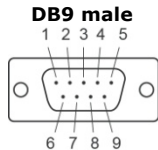
Note: The Diagnosis tool is extremely sensitive, and consequently could indicate errors even if the communication status okay. In this case, you can decide whether or not to make the suggested configuration changes.

### Pin Assignments

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

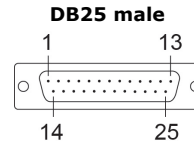
##### Male DB9 (CBL-M78M9x8-100)

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



##### Male DB25 (CBL-M78M25x8-100)

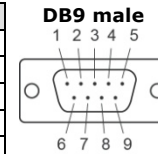
Pin	RS-232	RS-422/ RS-485-4W	RS-485-2W
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	-
4	RTS	-	-
5	CTS	-	-
6	DSR	-	-
7	GND	GND	GND
8	DCD	TxD-(A)	-
20	DTR	RxD-(A)	Data-(A)



#### CP-134EL-A-I

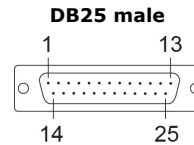
##### Male DB9 (CBL-M44M9x4-50)

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



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

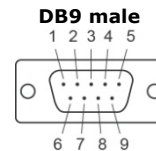
Pin	RS-232	RS-422/ RS-485-4W	RS-485-2W
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	-
4	RTS	-	-
5	CTS	-	-
6	DSR	-	-
7	GND	GND	GND
8	DCD	TxD-(A)	-
20	DTR	RxD-(A)	Data-(A)



#### CP-116E-A

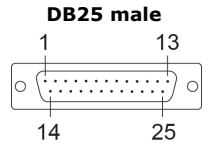
##### Male DB9 (OPT8-M9+ / CBL-M68M9x8-100)

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



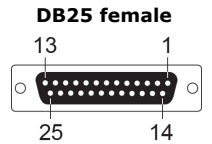
##### Male DB25 (OPT8B+ / CBL-M68M25x8-100)

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



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

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



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