CA and CB Series Multiport Serial Module User's Manual

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www.moxa.com/product



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Welcome to the CA and CB Series of PC/104 communication modules, a multiport serial module for industrial applications. It is designed for the PC/104 CPU and PC/104-Plus boards that respectively accept the PC/104 and PC/104-Plus expansion interface. Optional DB9 and DB25 cables are available to connect different devices.

The CA Series includes the following models:

CA-108:	8 ports, RS-232
CA-108-T:	8 ports, RS-232, wide temperature
CA-114:	4 ports, RS-232/422/485
CA-114-T:	4 ports, RS-232/422/485, wide temperature
CA-134I:	4 ports, RS-422/485, optical isolation protection
CA-134I-T:	4 ports, RS-422/485, optical isolation protection, wide temperature
CA-104:	4 ports, RS-232
CA-104-T :	4 ports, RS-232, wide temperature
CA-132:	2 ports, RS-422/485
CA-132-T:	2 ports, RS-422/485, wide temperature
CA-132I:	2 ports, RS-422/485, optical isolation protection
CA-132I-T:	2 ports, RS-422/485, optical isolation protection, wide temperature

The CB Series includes the following models:

CB-108:	8 ports, RS-232
CB-108-T:	8 ports, RS-232, wide temperature
CB-114:	4 ports, RS-232/422/485
CB-114-T:	4 ports, RS-232/422/485, wide temperature
CB-134I:	4 ports, RS-422/485, optical isolation protection
Cb-134I-T:	4 ports, RS-422/485, optical isolation protection, wide temperature

2 kV optical isolation is provided on optical isolation models. Wide-temperature models are rated for operation between -40 to 85°C.

The following topics are covered in this chapter:

Overview

- Package Checklist
- Product Specifications

Overview

The PC/104 standard serial boards are very popular for embedded applications. Moxa offers a wide selection of PC/104 and PC/104-Plus serial boards to provide industrial-grade connections to multiple serial devices.

Use Moxa's serial boards so that your PC/104-based systems can establish serial device connections with high data throughput over multiple serial interfaces. The CA serial board series is for PC/104 modules, while the CB serial board series is for PC/104-Plus modules.

Package Checklist

MOXA performs a careful mechanical and electrical inspection of each module prior to shipping. Your module should arrive in perfect electrical order, free of any marks or scratches. Please handle the module by the edges only, since your body's static charge can damage the integrated circuits. When the module is not in use, please keep it in the anti-static package provided. You may also use this package to return the module if it requires repair.

The CA/CB Series module is shipped with the following items:

- Multiport serial module (PC/104 is for CA Series; PC/104-Plus is for CB Series)
- Documentation and software CD
- Quick installation guide
- 5-year product warranty statement

NOTE Please notify your sales representative if any of the above items are missing or damaged.

The CA Series module features the following:

- Two, four, or eight serial ports (depending on the model)
- RS-232, RS-422, or RS-485 operation (depending on the model)
- 64-byte FIFOs and on-chip flow control
- Up to 921.6Kbps data transmission speed
- Built-in 15 KV ESD protection
- Configurable IRQ and I/O settings
- Onboard Tx, Rx LED indicators for each port
- Optional wide temperature support (-40 to 85°C)

The CB Series module features the following:

- Four or eight serial ports (depending on the model)
- RS-232, RS-422, or RS-485 operation (depending on the model)
- 128-byte FIFOs and on-chip flow control
- Up to 921.6Kbps data transmission speed
- Built-in 15 KV ESD protection
- Onboard Tx, Rx LED indicators for each port
- Optional wide temperature support (-40 to 85°C)

Product Specifications

NOTE The latest specifications for Moxa's products can be found at <u>https://www.moxa.com</u>.

Hardware Installation

This chapter explains how to install the CA/CB Series multiport serial module.

The following topics are covered in this chapter:

- Hardware Installation
- Block Diagrams
 - > I/O Base Address (For CA Series)
 - Rotary Switch (For CB Series)
 - > Termination Resistor
 - > Interrupt Vector for CA Series

Serial Interface

Hardware Installation

Installing the CA/CB Series module is easy. For the CA Series, before inserting the module into the PC/104 slot, you must first configure the I/O base address, interrupt vector, IRQ, and serial interface (for select models).



ATTENTION

Safety First!

To prevent damage to your system or board, make sure your embedded PC's power is turned off before installing your CA/CB Series module.

CA Serie	es	CB Serie	es
Step 1:	Shut off power to your embedded PC and	Step 1:	Shut off power to your embedded PC and to
	to any peripheral devices. After shutting		any peripheral devices. After shutting off
	off power, remove the cover of your		power, remove the cover of your embedded
	embedded PC.		PC.
Step 2:	Use the DIP switches on the module to	Step 2:	Use the DIP switches on the module to select
	select the I/O base address, interrupt		the serial interface. Details for each model
	vector, IRQ, and serial interface (for		are provided later in this chapter.
	select models). Details for each model are	Step 3:	Insert the module firmly into the embedded
	provided later in this chapter.		PC's PC/104-Plus slot.
Step 3:	Insert the module firmly into the	Step 4:	Screw the control board in place.
	embedded PC's PC/104 slot.	Step 5:	Connect the cables.
Step 4:	Screw the control board in place	Step 6:	Power on the embedded PC. The BIOS will
Step 5:	Connect the cables.		automatically set the IRQ and I/O address.
Step 6:	Power on the embedded PC.	Step 7:	Proceed with the software installation. Please
			refer to Chapter 3.

Block Diagrams

<u>CA-108</u>





<u>CB-114</u>



<u>CB-134I</u>



I/O Base Address (For CA Series)

Use DIP switch SW1 to set port 1's I/O base address. The other ports will be configured automatically. The default I/O base address is 0×180 and allows settings from 0×000 to 0×3 FF. Some popular settings are provided below:

A3	A4	A5	A6	A7	A8	A9	
8	1	2	4	8	1	2	Hex
ON	0×000						
ON	ON	ON	ON	ON	ON	off	0×200
ON	ON	ON	ON	ON	off	off	0×300
ON	ON	ON	ON	off	off	off	0×380
ON	ON	ON	off	off	off	off	0×3C0
ON	ON	off	off	off	off	off	0×3E0
ON	off	off	off	off	off	off	0×3F0
off	0×3F8						
off	ON	ON	ON	ON	ON	ON	0×008
off	off	ON	ON	ON	ON	ON	0×018
off	off	off	ON	ON	ON	ON	0×038
off	off	off	off	ON	ON	ON	0×078
off	off	off	off	off	ON	ON	0×0F8
off	off	off	off	off	ON	off	0×2F8

For example, an I/O base address of 0×180 should be set as follows:

A3	A4	A5	A6	A7	A8	A9	Hex
ON	ON	ON	ON	off	off	ON	0×180



The other serial ports will be set automatically to 0×188 , 0×190 , 0×198 , etc.

Rotary Switch (For CB Series)

A rotary switch on the board makes it easy to set the appropriate signals, particularly when installing multiple PC/104-Plus modules in the same unit. The rotary switch, which looks like a clock, provides a bidirectional path with no signal propagation delay. The first module on the stack should be set to CLK0, the second to CLK1, etc., to eliminate clock skew between modules.

Termination Resistor

Onboard termination resistors can be activated individually for each serial port using jumpers. With regard to the CA Series: for CA-114 and CA-134I, use JP1 through JP4; for CA-132 and CA-132I, use JP1 and JP2. JP1 corresponds to serial port 1. For the CB Series, use jumpers JP1 through JP4. JP1 corresponds to serial port 1. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

Interrupt Vector for CA Series

Use DIP switch SW2 to set port 1's interrupt vector. The default interrupt vector is $0 \times 1C0$, with SW2 set as follows:

A3	A4	A5	A6	A7	A8	A9	Hex
ON	ON	ON	off	off	off	ON	0×1C0



Serial Interface

CA Series

For the CA-114, use SW3, SW4, and SW5 to select the serial interface as follows:

Interface	RS-232	RS-422	4w RS-485	2w RS-485
SW3	-	-	ON	OFF
SW4	-	ON	OFF	OFF
SW5	ON	OFF	OFF	OFF



For the CA-134I, CA-132 , and CA-132I , use the 2-WIRE/4-WIRE and RS-422/RS-485 DIP switches to select the serial interface as follows:

Interface	2-WIRE/4-WIRE	RS-422/RS-485
RS-422	-	OFF
4-wire RS-485	OFF	ON
2-wire RS-485	ON	ON

CB Series

For the CB-114 and CB-134I, use the DIP switch to select serial interface.

<u>CB-114</u>

Mode	S1	S2	S3
RS-232	-	-	ON
RS-422	-	ON	OFF
4-wire RS-485	ON	OFF	OFF
2-wire RS-485	OFF	OFF	OFF

<u>CB-134I</u>

Mode	S1	S2
RS-422	-	OFF
4-wire RS-485	OFF	ON
2-wire RS-485	ON	ON

IRQ for CA Series

Before selecting an IRQ, please enter the PC's BIOS and reserve a dedicated IRQ for the module. On the module, the IRQ is set by a jumper. Before inserting the module into the PC/104 slot, use the jumper to select an IRQ (3, 4, 5, 6, 7, 9, 10, 11, 12, or 15).

Software Installation

After installing the CA/CB Series module in your embedded computer, the next step is installing the software. Drivers for various operating systems are provided, including DOS, Windows, and Linux. This chapter explains how to install and remove the CA/CB Series driver.

The following topics are covered in this chapter:

Windows OS

- Older OS for CA Series
- Older OS for CB Series
- > Newer OS for Both CA/CB Series
- Non-Windows OS

Windows OS

Older OS for CA Series

DOS

Moxa DOS API-232 is a software package that can help you develop or debug serial communications programs. This section will explain how to install the package, set up the driver, and load or unload the driver. For additional information about the API-232 library and utilities, please refer to Chapter 4. The DOS drivers support the CA-104, CA-104-T, CA-132, CA-132-T, CA-132I, and CA-132I-T. The CA-108, CA-114, and CA-134I models are not supported under DOS. In the following instructions, the CA-104 is used as an example.

Installing the Driver

Run the installation program, **DOSINST.EXE**, in the DOS folder. Specify the target directory for the API-232 files (e.g., **C:\MOXA**). Press **F2** to start the installation.

INSTALLATION 08-28	
Installation	
Target directory C: VIOSA F15 Holy 725 Start Installation	
12 Mary 12 Service Interaction	J

When the installation is completed, you will be prompted to set up the board and driver initial values. We strongly recommendthat you do so.

<u>74</u>	INSTALLATION APP-202
	Installation complete. 57 files copied. After leaving this program, you have to run C:NEGANABINASTUP.EXE program to setup board & driver initial values. Do you want to run SETUP.EME now Y(Y/R)

Driver Setup

The following instructions are not intended to illustrate every function of the setup program. For more detailed information, please refer to the help files by pressing F1 in the setup program.

- 1. Run the setup program **BIN\SETUP.EXE**.
- 2. Select your CA Series model and press Enter.

PC/104 Bound Stebup Dated no. Type CA-104 Sector Select Select Select Sector Sector
Board no. Type Select ss 180 INT Vector 1 CA-184 Select 5 1c8 2 CA-132 CA-184 Series 9 2c8
1 CA-104 2 CA-132 CA-184 Series 9 2c8
D CA-132 CA-132. Series 7 3c8 4 N CA-1321 Series -

3. You must set the Port No., I/O Address, IRQ, and INT Vector properly. These settings must match your module's hardware configuration.

ies 1-4		Trins 189	INT though
ies 1-4	180		
		5	5
			6 1
		-	7 T
		-	9
Nath Basi	Ball Pgl	nd Root s	10
	Kell Bast	Kalt Reet Rait Pyt	Kait Kas: Kait IgDni Ports

4. Press **PgDn** to view advanced the port setup options. Your module's configuration will be displayed along with other settings, such as port number, buffer size, etc.

5. Verify the settings and make any necessary changes.

j .		Po	rt S	ietu	p			I
Port Number	81	82	83	819				
Tab haffer size	iK	1K	1K	18	-	-		-
Roll buffen size	1K	1K	1K	1K	-	-	-	-
Baud rate	9600	9600	9600	9600	-	-	-	-
Charactes length	8	8	8	8	-	-	-	-
Stop bits	1	1	1	1	-	-	-	-
Parity	None	None	None	None		-		
ITH output state	On	On	On	On				
WIS comput whate	0n	On.	0n	0n				-
CTS Flow control	No	No	No	No.	-	-	-	-
HTS flow control	No	No	No	No	-	-	-	-
Is HOM/OFF cuts !	No	No	No	No				
Rs HON/OFF cate1	No	No	No	No				
Ph: 1	leip	NG: Give	up edit	Pilse 3	thure its	sect Alter	at	

Port number:

This is the port ID of each port. Application software will refer to a port by its port number (ID). Port numbers must be unique; duplicated port numbers are not allowed. The port ID can range from 0 to 127 as long as it does not overlap with another port. Generally, you should consider the convenience of programming when specifying the port number.

TxD buffer size:This is the transmission (output) buffer allocated in the system for each port.**RxD buffer size:**This is the receiving (input) buffer allocated in the system for each port.**F5: Group Edit:**This allows you to configure several ports simultaneously as a group.



6. Press F10 to save the latest configuration and exit the setup program.

Loading the Driver

After setting up the driver, you must load the driver in order to gain access to the serial ports on the module. Run **BIN\DPC-DRV.EXE** at the DOS prompt. The driver will detect your CA Series module automatically. You should see messages indicating successful detection of your module, such as the following:

PC/104 Communication Module DOS driver Version 1.0 Setup driver ... CA-104 series OK! Device driver setup O.K.

At this point, you can execute applications that support API-232 functions, or start developing applications using the API-232 library.

Unloading the Driver

To unload or release the CA Series driver from memory, enter **DPC-DRV/Q** at the DOS prompt.

Windows NT

The Windows NT drivers conform to the Win32 COMM API standard and support the CA-104, CA-104-T, CA-132, CA-132-T, CA-132I, CA-132I-T. CA-108, CA-114, and CA-134I.

In the following instructions, the CA-104 is used as an example.

Installing the Driver

1. Right-click Network Neighborhood and select Properties in the context menu.



2. Under the Adapters tab, click Add....

Network				? ×		
Identification Ser	vices Protocols	Adapters	Bindings			
Network Adapter	s:					
IIID-Link D	FE-530TX PCI Fas	st Ethernet Ad	apter (Rev B)			
<u>A</u> dd	<u>R</u> emove	Properties	Update			
Item Notes:						
Item Notes: D-Link DFE-530TX PCI Fast Ethernet Adapter (Rev B)						
		OK	Car	ncel		

3. When prompted to select a network adapter, click **Have Disk**.

Select Ne	twork Adapter 🔋 🔀
	Click the Network Adapter that matches your hardware, and then click OK. If you have an installation disk for this component, click Have Disk.
<u>N</u> etwork	Adapter:
■9 3Co ■9 3Co ■9 3Co ■9 3Co	m 3C508 ISA 16-bit Ethernet Adapter m Etherlink II Adapter (also II/16 and II/16 TP) m Etherlink III ISA/PCMCIA Adapter m EtherLink III PCI Bus-Master Adapter (3C590) m Etherlink16/EtherLink16 TP Adapter m Etherlink16/EtherLink16 TP Adapter
	<u>H</u> ave Disk
	OK Cancel

4. At the prompt, insert the installation disk provided with your module.



For the location, enter A:\windows.nt. Click OK to continue.

5. Windows will install the drivers.



6. After the files have been installed, a configuration panel will open. Click **Add** to continue.

Moxa PC104 Comm	unication Mo	odule Confi	gurati	ion Pa	anel		2
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number	Ι
			1			Deserved	
<u>A</u> dd		Remove				Property	
		<u>o</u> k				Cancel	
			_				

7. Under **Board Type**, select your CA Series model. The window will show the COM port numbers that will be assigned to the CA Series serial ports, as well as other settings. Click **OK** to continue.

F	ropert	у						X
	Ð	oard Type		CA104			•	1
	v	INT ⊻ecto	or	CA104 CA132 CA132	Series			
	Įn	terrupt No.			10	•		
	B	ase I/O Port	. <u>A</u> ddre	ss [180			
	Port	COM No.		FO Trig.	Tx FIFO :	Size		
	1 2 3 4	COM3 COM4 COM5 COM6	56 56 56 56		64 64 64 64			
							Port Setting	
					<u>o</u> k		Cancel	

8. The CA Series module will appear as a network adapter. Click **OK** to complete installation of the module.

etwork			?
Identification Ser	vices Protocols	Adapters Bin	dings
Network Adapter	s:		
		ast Ethernet Adapt Ition Module Adap	
Add	<u>R</u> emove	Properties	<u>U</u> pdate
	ommunication Mo	Jule Adapter	
		ОК	Cancel

Uninstalling the Module

1. Right-click **Network Neighborhood** and select **Properties** in the context menu.



2. Under the **Adapters** tab, select your CA Series module and click **Remove**.

Network ? 🗙
Identification Services Protocols Adapters Bindings
Network Adapters:
I] D-Link DFE-530TX PCI Fast Ethernet Adapter (Rev B) [3] M0XA PC104 Communication Module Adapter
Add <u>Bernove</u> <u>Properties</u> <u>Update</u> <u>Item Notes:</u> MDXA PC104 Communication Module Adapter
OKCancel

3. A confirmation dialog will appear. Click ${\bf OK}$ to uninstall the device.

Warning	×
⚠	This action will permanently remove the component from the system. If you wish to reinstall it, you will have to restart the system before doing so.
	Do you still wish to continue?
	<u>Yes</u> <u>N</u> o

Windows 95, 98, ME

The Windows 95/98/ME drivers conform to the Win32 COMM API standard and support the CA-104, CA-104-T, CA-132, CA-132-T, CA-132I, CA-132I-T, CA-108, CA-114, and CA-134I.

×

In the following instructions, the CA-104 is used as an example.

Installing the Driver

1. Insert the CA Series installation disk and run **Setup95.exe** through **Start menu** \rightarrow **Run**.

Run		? ×
5	Type the name of a program, folder, docur resource, and Windows will open it for you	
<u>O</u> pen:	A:\Setup95.exe	•
	OK Cancel	<u>B</u> rowse
🛃 Start		

2. Click **Next** to proceed through the Welcome screens.

Moxer Crov Command		
	Welcome! This installation program is about to install Moxa Smartio/Industio driver to your system. Press the Next button to start the installation. You can press the Cancel button now if you don't want to proceed further installation procedure.	
	Next > Cancel	
Moxa PC104 Communic	ation Module Drivers Installation	<
	Ready to Install! You are now ready to install Moxa PC104 Communication Module driver. Press the Next button to begin the installation or the Back button to reenter the Update Driver information.	
	< Back Next> Cancel	

3. Windows will install the drivers. When the installation has been completed, click **Finish**.

Installing	×
Copying Moxa PC C:\WIN98\SYST	104 Communication Module Driver: EM\mxiser.vxd
	39%
	Cancel
Moxa PC104 Communic	ation Module Drivers Installation
	Installation Completed! The Moxa PC104 Communication Module driver has been successfully installed. Press the Finish button to complete installation and enter the Moxa PC104 Communication Module driver configuration panel.
	[

4. After the files have been installed, a configuration panel will open. Click **Add** to continue.

Ioxa PC104 Communication Module Configuration Panel						
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number
<u>A</u> dd		<u>R</u> emove				Property
			-			
		<u>0</u> K				Cancel

5. Under **Board Type**, select your CA Series model. The window will show the COM port numbers that will be assigned to the CA Series serial ports, as well as other settings. Click **OK** to continue.

Proper	ty .						>
₿	oard Type		CA104	Series		•	-
F	✓ INT Vector	or	CA104 CA132 CA132I	Series			
ļr	iterrupt No.			10	•		-11
в	ase I/O Por	: <u>A</u> ddre	ss [180		_	
Port	COM No.		FO Trig.	Tx FIFC) Size		
1 2 3 4	COM3 COM4	56 56		64 64			
3	COM5	56		64			
4	COM6	56		64			
						Port Setting	
				<u>o</u> k		Cancel	

6. The CA Series module will now appear in the configuration panel. Click **OK** to complete installation of the module.

doxa PC104 Comm	unication Mo	odule Confi	gurat	ion Pa	anel		
							_
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number	1
CA104 Series	180	1C0	10			COM40 COM4	
Add		Remove				Property	
·······							
		<u>o</u> k				Cancel	

Open the configuration panel again through **Start** \rightarrow **Programs** \rightarrow **Moxa Utilities** \rightarrow **MOXA PC104 Communication Module Configuration Panel**.

Uninstalling the Module

Open the configuration panel through Start>Programs>Moxa Utilities>Moxa PC104
 Communication Module Configuration Panel. Select your CA Series module and click Remove

loxa PC104 Comm	unication Mo	odule Confi	gurati	ion Pa	anel	
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number
CA104 Series	180	1C0	10			COM40 COM4
		Barraus	1			Duousutu
<u>A</u> dd		Remove				Property
		OK	1			Cancel
		<u> </u>				Cancel

2. A confirmation dialog will appear. Click ${\bf Yes}$ to uninstall the device.

Configuration Panel 🛛 🕅								
?	Do you really want to remove this board ?							
	Yes <u>N</u> o							

3. To remove the driver from the system, open Add/Remove Programs in the Control Panel.

Control Page 2018	anel			_ [×
<u> </u>	<u>V</u> iew <u>G</u> o	F <u>a</u> vorites <u>H</u>	elp		
Back -	Forward	t. Up	Cut Copy	Paste	»
Address 🗟	Control Panel				•
			122	3	-
Add New Hardware	Add/Remove Programs	BDE Administrator	Date/Time	Display	
Aa	ø.	i			
Fonts	Game Controllers	Internet Options	Keyboard	Modems	
Logitech	50	₽Ŷ		%	
Mouse	Multimedia	Network	ODBC Data Sources (32bit)	Passwords	-
1 object(s) selec	cted		🛄 My Comp	outer	_//,

4. Under the Install/Uninstall tab, select MOXA PC104 Communication Module Driver and click Add/Remove.

Add/Remo	ve Programs Properties 🛛 🔋 🗙
Install/Uni	install Windows Setup Startup Disk
Ð	To install a new program from a floppy disk or CD-ROM drive, click Install.
	Install
3	The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.
MOXAT	ft Jet 4.0 Service Pack 4 🗾 🔺
MOXA 9 Nero - B Partition PComm PComm	PC104 Communication Module Driver Smartio/Industio Driver Burning Rom (Web installer) Magic 5.0 Lite 2.5 Pro Ver 2.0 I System Driver
	Add/ <u>R</u> emove
	OK Cancel Apply

5. A confirmation dialog will appear. Click **Yes** to remove the driver.

MOXA PC104 Communication Module Driver
Do you really want to remove MOXA PC104 Communication Module Driver ?
<u>Y</u> es <u>N</u> o

6. After the driver has been removed, click **OK** to close the window.

MOXA PC104 Communication Module Driver 🛛 🛛							
Remove MOXA PC104 Communication Module Driver complete !							
(OK]							

Windows CE 5.0

In this section, we explain how to install Moxa CA series boards under WinCE 5.0. These instructions are intended for users who are familiar with the Windows CE Platform Builder 5.0 ToolKit, and who would like to install one or more Moxa Tech products. Here, we only give the step-by-step installation instructions for the development environment. You will need to download the image file to the target host yourself.

The WinCE 5.0 driver for the Moxa CA Series PC/104 Multiport Serial Module supports the following products:

CA Series: CA-108, CA-114, CA-134I, CA-104, CA-132, and CA-132I.

In the the following steps, we are using CA-104 as an example.

Installing the driver

The following procedure explains how to install the CA-104 multiport serial module driver under WinCE.

- Obtain a copy of the Moxa Tech WinCE 5.0 driver package and extract it to your computer. Double-click the **Installation** icon to copy the Mxpcdrv folder to %WINCEROOT%\PLATFORM\ automatically, and import the supported Moxa Tech products into the **Folder**.
- 2. Start WinCE Platform Builder, and then select **File** →**New Platform**.



3. Enter a workspace name and then press **Next**.

New Platform	Wizard - Step 2	
	e Name And Location a friendly name for your workspace.	٩
	Name: [cest] Path: E:\WINCE500\PBWorkspaces\Test1\ 	
2	< Back Next > Finish	Cancel

4. When you see Board Support Packages, Design Template, Applications & Media, Networking & Communications, OBEX Server, select what you need to build your own environment. The Completing the New Platform Wizard window will open to indicate that it has created a new platform. Click Finish to complete the setup.

Available design templates: Custom Device Digital Media Receiver Enterprise Terminal Enterprise Web Pad Gateway Industrial Controller Internet Appliance IP Phone Mobile Handheld Set-Top Box Tiny Kernel Windows Thin Client	Choose the design template that is most closely aligned with the purpose of your target device. Provides the starting point for a range of Web Pad-based devices with touch display and wireless networking.
---	---

w Platform Wizard - Step 5	
Applications & Media Select items for applications and media to inc	lude in your OS design.
ems:	
NET Compact Framework ActiveSync DCOM Lightweight Directory Access Protocol (LD/ Standard SDK for Windows CE VBScript support VBScript support Windows Media Audio/MP3 Windows Media Video/MPEG-4 Video Vindows Messenger WordPad Internet Browser Microsoft File Viewers Windows CE Error Reporting	Support for applications and services designed for the .NET Compact Framework. Estimated size of these items: 10063 KB
2 Kack	Next > Finish Cancel
w Platform Wizard - Step 6 Networking & Communications Select items for networking and communicatio design.	ns to include in your OS
ems: V OBEX Server V TCP/IPv6 Support Local Area Network (LAN) Personal Area Network (PAN) V Remote Desktop Connection V Wide Area Network (WAN)	The foundation of the OBEX Application Framework that provides support for both standard and user-defined services.
	Estimated size of these items: 10924 KB

New Platform Wizard - Step 7				X		
OBEX Server Security Warning Under certain circumstances, the Object Exchange Protocol (OBEX) catalog item can compromise the security of your platform. This catalog item poses the following potential security risks: • If proper security and authentication techniques are not used, a service that interferes with services.exe can be installed. • If proper encryption techniques are not used, OBEX running over Bluetooth could expose data packets to third parties. To learn more about potential OBEX security risks, as well as the best practices for using this catalog item more securely, see the following topics: OBEX Security Enhancing the Security of a Device						
0	< Back	Next >	Finish	Cancel		
New Platform Wizard - Step 8						
Completing the New You have successfully comp You have created an OS de platform. By default, Platfor configuration and a Release Options: • Modify build options for the f design without closing this w To close this wizard, click Fin	pleted the New P sign for a Windo rm Builder provid e configuration o <u>Debug and Release co</u> <u>wizard.</u>	latform Wizard. ws CE-based les a Debug f this OS design.	<u>S</u>			
2	< Back	Next >	Finish	Cancel		

 Select File →Manage Catalog Items In View →Catalog, and browse \Third Party\Device Drivers\ MOXA Smartio/Industio-PC/104. Right-click on the driver Prefix COM or Prefix MXU you would like to include and choose Add to OS Design.

NOTE You can only select either Prefix COM or Prefix MXU, but not both.

Prefix COM supports up to 10 ports, from COM0 to COM9. Prefix MXU supports more than 10 ports, so it is better for you to select Prefix MXU if you are not sure how many ports the device has. Otherwise, you will only be allowed to use one multiport serial board on the target host.



6. After adding Moxa Tech drivers into your OS Design, a new project is automatically added to your workspace. The project name is mxpcdrvce5.reg. The project can be accessed from View →File View. The mxpcdrvce5.reg project contains a number of files used to configure the drivers included in your OS Design. For ISA boards, remember to set the IRQ and I/O address in mxpcdrvce5.reg. For example, if your IRQ is 10, IOBASE is 0180, Interrupt and Vector is 01c0, then you should configure "1A" for SysIntr, "0180" and "01c0" for IOBASE, "A" for IRQ ,and "1" for FIFO. When applying the formula "IRQ+10", remember that IRQ is in base 10, and 10 is in Hex format. If we first convert the IRQ value to Hex format, then SysIntr will equal 1A. Otherwise, set FIFO to 1 to enable the FIFO.

NOTE To use the "Terminal Emulator" tool, modify mxpcdrvce5.reg and keyboard as shown below (this is just for "one" "COM" port). Take note of the number of ports, COM, and MXU, and then enter the correct information. [HKEY_LOCAL_MACHINE\ExtModems\HayesCompat1] "Port"="COM2:" "DeviceType"=dword:1 "FriendlyName"="Hayes Compatible on COM2:"



 Finally, open Build OS, select Build and Sysgen, and be sure to click Copy Files to Release Directory After Build and Make Run-Time Image After Build.

🕹 X86CE - Platform Builder - [C.\\UPORT\mxucom\	MXUCOM.cpp]			- 2 🛛
E File Edit View Project Platform Target Build Project	Build OS Tools Window Help			_ & ×
CEPC: ×86_Release	Syngen Build and Syngen			
1	Byild and Sysgen Current BSP		CE Device 💽 🖓 🖗 🖗	
C:WINCESDO PLATFORM PLATFORM PARVATE public Favorites Pojects Parameter files Parameter files		<pre>/ HXUCOM.cpp : Defines include "Stdafx.h" include "KXUCOM.h" include "KXUCOM.h" include "Gon.h" include "Hoxa.h" DNG DbgLevel =DBG_D define HXU 1 if HXU 1 if HXU 1 if HXU 1 if incom Point define COM Point therine COM Point therine COM Point therine COM Incontrol therine COM Incontrol therine COM Incontrol therine COM Incontrol therine COM Incont</pre>	Catalog Catalog Core OS Core OS Device Drivers MOXA Smartightdustio-PC/104 (Choose 1) Mutiport Serial Board (Prefix COM) Mutiport Serial Board (Prefix MXU)	
Added the Real-time Communications (R		VOIP) to the platform.		^
Build (Debug) Log) Find in Files 1	Find in Files 2 /			>

- 8. Finally, copy your image file to the target host.
- **NOTE** If you created a Windows CE Platform Builder in the development environment, skip steps 2, 3, and 4.

Older OS for CB Series

DOS

Moxa DOS API-232 is a software package that can help you develop or debug serial communications programs. This section will explain how to install the package, set up the driver, and load or unload the driver. For additional information about the API-232 library and utilities, please refer to Chapter 4.

The DOS drivers support all models in the CB Series.

In the following instructions, the CB-104 is used as an example.

Installing the Driver

Run the installation program, **DOSINST.EXE**, in the DOS folder. Specify the target directory for the API-232 files (e.g., **C:\MOXA**). Press **F2** to start the installation.

<u> </u>	INSTALLATION 08-88	
		-
	linstallation 🗌	WILLIAM
	Target directory C: NHOSA	
	M: Help 72: Start Installation	
	anan yanan yanan yanan kataka kat Bana kataka k Bana kataka k	

After the installation has been completed, you will be prompted to set up the board and driver initial values. We strongly recommend that you do so.

<u>4</u> 10	INSTALLATION NEESS	j
	Installation complete. 57 files copied. After leaving this program, you have to run COMMANDIANSETHP.EME program to setup board & driver initial values. Do you want to run SETUP.EME now 7(Y/M)	

Driver Setup

The following instructions are not intended to illustrate every function of the setup program. For more detailed information, please refer to the help files by pressing F1 in the setup program.

- 1. Run the setup program **BIN\SETUP.EXE**.
- 2. Select your CB Series model and press Enter.
- 3. A window will open, displaying all configuration information for all installed modules. Press **PgDn** to view advanced port setup options and to make configuration changes. Your module's configuration will be displayed along with other settings such as port number, buffer size, etc.
- 4. Verify the settings and make any necessary changes.

1		Po	rt S	ietuj	2			
Port Number	81	82	83	814				
Tab hoffer size	iK	1K	1K	18	-	-		-
Roll buffer size	1K	1K	1K	1K	-	-	-	-
Baud rate	9600	9600	9600	9600	-	-	-	-
Character length	8	8	8	8	-	-	-	-
Stop bits	1	1	1	1	-	-		-
Parity	None	None	None	None		-		
ITH output state	0n	0n	On	On		-		-
HIS cutput state	0n	0n.	On	0n				-
CTS flow control	No	No	No	No	-	-	-	-
HTS flow control	No	No	No	No	-	-	-	-
IN HOM/OFF CAMP!	Mo	No	No	No				
Iz HON/OFF catel	No	No	No	No				
P1: 1	ielp.	Billi Giana	up edit	Pin: a	hwe B	et Abo	#2	

Port number:This is the port ID of each port. Application software will refer to a port by its port
number (ID). Port numbers must be unique; duplicate port numbers are not
allowed. The port ID can range from 0 to 127 as long as it does not overlap with
another port. Generally, you should consider the convenience of programming
when specifying the port number.TxD buffer size:This is the transmission (output) buffer allocated in the system for each port.RxD buffer size:This is the receiving (input) buffer allocated in the system for each port.F5: Group Edit:This allows you to configure several ports simultaneously as a group.

1	Por	t Si	stuj	9	1		J.
Cont. Basher Tob Bailfer at	Liroup	Edi	16		-	-	
Bob buffer of	PORT PROFILE	ú.	POR	-	-	-	
Saud sate	Lal Author size	18	64		-	-	
Chevecter hea	Roll Julier stor	IR	129	î 🗐	-	-	
Stop hits	Toud este	9688	256		-	-	-
Excite	Chaparter (dort)	B	512		-		-
FIS output st	Stop Mile	1	1X		-	-	
MIS output st	Paneta	None	28				
CIS Flaw comb	WR output state	On	4K		-	-	
MS Fiou cont	358 output state	On	8K		-		1
Tx NOMPORT en	CTS Flow contreol	No	16.K		-		
Rx 2000/00FF em	HIS flow control	No	323	*	-		
	To NON-OFT cuty1	No		_	of Allen		
	By MOMCHET suchs I	No			en anon		
)	THE REPORT OF A DECK OF A DECK OF			Ē	et Alton	at .	

5. Press **F10** to save the latest configuration and exit the setup program.

Loading the Driver

After setting up the driver, you must load the driver in order to gain access to the serial ports on the module. Run **BIN\DPC-DRV.EXE** at the DOS prompt. The driver will detect your CB Series module automatically. You should see messages indicating successful detection of your module, such as the following:

Smartio/Industio Family DOS driver Version 1.8 Setup driver ... CB-114 series (Bus=x, Dev=y): OK! Device driver setup O.K.

At this point, you can execute applications that support API-232 functions, or start developing applications using the API-232 library.

Unloading the Driver

To unload or release the CB Series driver from memory, enter **DPC-DRV/Q** at the DOS prompt.

Windows NT

Installing the Driver

You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver.

Note that these instructions use the CB-114 as an example. The procedure for installing all models is the same.

- 1. Log into Windows NT as Administrator.
- Locate the appropriate folder for your board's drivers on the Document & Software CD. The NT drivers will be located under the product folder in the \Software\WinNT directory (e.g., under \CB-114 Series\Software). Copy this folder to the PC's hard disk and remember its location.
- 3. In the **Control Panel**, open **Network** applet. On the **Adapters** tab, click **Add**. When prompted to select a product, click **Have Disk....**

You will be prompted to enter the path to the driver. Enter the location of the drivers that you copied from the Document & Software CD (**C:\Windows.nt** in this example) and then click **OK**.

Network ? × Identification Services Protocols Adoptots Bindings
Network Adepters:
Select Network Adapter
Elick the Network Adapter that matches your hardware, and then IIIIIIII I click OK III unu have an installation disk for this component click
Insert Disk
Insert dak with software provided by the software or hardware manufacturer. If the files can be found at a different location, for example on another drive type a new path to the files below.
OK Cancel
DK. Cancel

4. When prompted, select your board model (**Smartio/Industio Family multiport board** in this example) and click **OK**.

Select OEM	Option			X
Choose a so	ftware support	ed by this hardwa	re manufacturer's disk	. .
MDXA Sme	ntio/Industio Fa	amly mutipert boa	rd	
	ŨK	Cancel	<u>Н</u> ер	
5. After the files have been installed, a configuration panel will open. This is where boards are installed, configured, and removed. If another board has already been installed on the system, it will already be listed. Windows NT does not automatically detect Moxa UPCI boards, so you will need to click Add for a newly installed board.

Board Type	1/0 address	INT vector	RQ	Bus	Dev	COM Number
<u>A</u> d#)	Remove				Property
		QK				Cancaj

6. Under Board Type, select the UPCI board that is being installed. The window will show the COM settings for the serial ports on the board. You can modify the COM settings for any port at this time by selecting a port and clicking Port Setting. If you are satisfied with the COM settings, click OK to return to the configuration panel.

Propert	у			×
Ð	oard Type	M	OXA CB-114 S	eries
F	INT <u>v</u> ect	or	AC00	
In	terrupt No.		48	<u>.</u>
B	ase I/O Por	t <u>A</u> ddress	A800	
Port	COM No.			O Level
2 3 4	COM3 COM4 COM5 COM6	High High High High	High High High High	
		[<u>P</u> ort Info <u>Q</u> K	Port Setting Cancel

7. The board will now appear in the configuration panel (**CB-114 Series in this example**). Click **OK** to return to the Network applet. After that, click **OK** again to exit the Network applet

Board Type	I/O address	and the rest of the second sec	IRQ	Bus	Dev	COM Number
IOXA CB-114 Series	A800	ACOC	48	2	12	COM3 - COM6
			-1			
Add		Remove	1			Property

8. Restart the PC. After you have logged back into Windows NT, you may check the event log issued by the Moxa driver to see if the board's ports have been initialized successfully. In the **Administrative** group, open **Event Viewer** and select **Log and System**. For each newly installed or configured Moxa UPCI board, check for a message stating that the board has been enabled (e.g., "MoxaCB-114 board, with first serial port COM3, has been enabled").

Configuring the Ports

 In Windows Control Panel, open the Network applet. In the Adapters tab, UPCI boards will appear as a type of Moxa adapter (MOXA Smartio/Industio Family Adapter in this example). Select the Moxa adapter and click Properties....

Network			? ×
Identification Ser	vices Protocols	Adapters Bin	dings
Network Adapter	8:		
	R0/100 VE Netw nariio1 ndusiio Fa		
<u>A</u> dd	Bemove	<u>Properties</u>	Update
Jem Notes			
MOXA Smartio/I	ndusto Family Ac	laplei	
		OK	Cancel

 The configuration panel will open with a list of installed boards. Select your board and click **Property**. Up to four Moxa UPCI boards can be installed at a time.

Board Type	I/O address	and the second sec	IRQ	Bus	Dev	COM Number
IOXA CB-114 Series	s A800	ACOC	48	2	12	COM3 - COM6
1						
Add		Remove	1			Property

3. Select a port to configure and click **Port Setting**.

Propert	y			×
Ð	oard Type	M	OXA CB-114 Seri	es 🔽
F	7 INT <u>v</u> ecti	or	AC00	
ļr	iterrupt No.		48	7
в	ase I/O Port	t <u>A</u> ddress	A800	
Port	COM No.	Rx FIFO		Level
2 3 4	COM3 COM4 COM5 COM6	High High High High	High High High High	
			Eort Info	Port Setting
			<u>o</u> k	Cancel

Under **Port Number**, select a COM number to assign to the serial port. Select **Auto Enumerating COM Number** to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.

Poo	d 1	
	Port Number CCM3	
	Bx FFO Level High ▼ ▼ Set the change to <u>all ports</u>	
	Ix FFO Level High	
	QK Cancel	

4. Select an **Rx FIFO Trigger** and **Tx FIFO Size**. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select **Set the change to all ports** to use this setting for all serial ports on the board.

	TxFIFO	RxFIFO
High	128	120
Middle	64	60
Low	1	1

5. Click **OK** to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click **OK** to close the **Properties** window and apply the new port settings. Click **OK** again to exit the Network applet.

Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number
IOXA CB-114 Series	A800	ACOC	48	2	12	COM3 - COM6
		Barraya	1			Proventy 1
Add		Remove	1			Property

Removing the Board

To remove a board, shut of your PC and physically remove the board from the PCI slot. The next time you start up the PC, Windows NT will automatically remove the configuration. You do not need to go through the Windows control panel.

Updating the Driver

 In Windows Control Panel, open the Network applet. Under the Adapters tab, UPCI boards will appear as a type of Moxa adapter (MOXA Smartio/Industio Family Adapter in this example). Select the Moxa adapter and click Remove.

Network 🔋 🗙
Identification Services Protocols Adapters Bindings
Betwork Adapters:
■ [1] Intel(R) PRO/100 VE Network Connection ■ 2[2] M0XA Smartio4 notustic Family Adapter
Add Eemove roperties Update Jem Noles MOXA Smartio/Industo Family Adapter
OK Carcel

- 2. Restart the system.
- 3. Go through the process of installing the drivers, using the new drivers.

Removing the Driver

 In the Windows Control Panel, open the Network applet. Under the Adapters tab, UPCI boards will appear as a type of Moxa adapter (MOXA Smartio/Industio Family Adapter in this example). Select the Moxa adapter and click Remove.



2. Click **OK** to exit the Network applet and restart the system.

Windows 95/98/ME

Installing the Driver

Windows 95

1. After the board is physically installed and the PC boots up, Windows will automatically detect the new board and the Found New Hardware Wizard window will open. Click **Next** to continue.

Update Device Driver V	√izard
	This wizard will complete the installation of. PDI Serial Controller
	by searching your local drives, network, and Internet locations for the most current driver. If you have a disk or CD-ROM they came with this device, insert it now. It is recommended that you let Windows search for an updated driver. To do this, click Next to continue.
	K Back Next > Cancel

2. Select Other Locations...

Update Device Driver V	Wizard
	Windows was unable to locate a driver for this device. If you do not want to install a driver now, click Finish. To search for a driver manually, click Dither Locations. Dr, to begin the automatic search again, click Back.
~	Other Locations
	< Beck Enish Cancel

 Click Browse and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory. Select the \Win9x folder and click OK to continue.

Select Other Location	X
Type the name of the folder that contains the drift Browse.	veryou want. To zearch for a folder, click
Location p	Bjovee
	OK Cancel

4. After Windows finds the drivers, click **Finish**.

Add New Hardware Wi	zard
	Windows driver file search for the device:
	MOXA CB-114 Series (PC/104-Plus)
	If you want to use this driver, click Finish. If this is not the correct driver and you want to search for a different driver manually, click Other Locations.
🏽 🥸 🌧	Location of Driver
	Windows.95
	Other Locations
<u>.</u>	
	< <u>B</u> ack Finish Cancel

You can configure and use the new COM ports right away without restarting Windows.

Windows 98 and ME

1. After the board is physically installed and the PC boots up, Windows will automatically detect the new board and the **Found New Hardware Wizard** window will open. Click **Next** to continue.

Add New Hardware Wiz	ard
	This wizard searches for new drivers for:
	PCI Serial Controller
	A device driver is a software program that makes a hardware device work.
8.3	
	< Bank Next > Cancel

2. Select **Display a list...** and click **Next**.

Add New Hardware Wiz	ard a state of the st
	 What do you want Windows to do? Search for the best driver for your device. (Recommended). Display blist of all the drivers in a specific posation, so you can select the driver you want.
	Kack Next> Cancel

3. Select **Other Devices** and click **Next**.

Add New Hardware Wizard				
	Select the type of device from the fist below, then click Next. Mouse Multifunction adapters Multifunction adapters Multifunction adapters Differ detected devices Differ detected devices Differ detected devices Differ detected			
\$	Ports (COM & LPT) Printer SBP2 SCSI controllers			
	K Back Next> Cancel			

4. Select Have Disk...

Add Nev	v Hardware Wizard
₽	Select the manufacturer and model of your hardware device. If you have a disk that contains the updated driver, click Have Disk. To install the updated driver, click Finish.
Models:	
Unsup	oried Device
	Have Disk
	< Back Next> Cancel

 Click Browse and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory. Select the \Win9x folder and click OK to continue.



6. After Windows has installed the drivers, click **Finish**.

Add New Hardware Wiz	ard
	Windows has finished installing the software you selected that your new hardware device requires.
-	< Back Finish Cancel

Configuring the Ports

Configure the COM ports after the board and drivers have been installed.
 In the Windows **Control Panel**, open the **System** applet.

🗟 Control P	anel					
∐Ele ⊑dit	<u>View</u> <u>G</u> o	F <u>a</u> vorites <u>H</u>	elp			1
Dards.	. + . Ferward	. 🖬 Up	と Map Drive Di		Y.	30
Address 🐼	Control Panel					•
*		8	2	A	e.	
Add New Hardware	Add/Remove Programs	Date/Time	Display	Fonts	Game Controllere	
\$			<i>S</i>	<u>84</u>	<u>=</u> 2	
Internet Options	Keyboard	Modems	Mouse	Multimedia	Network	
B	%	ų	1	S	4	
ODBC Data Sources (32bit	Parsmordo	Power Management	Printers	Regiona Settings	Sounds	
	62	<u>_</u>				
System	Tel hory	Harra				
21 object(s)				ly Computer		li

 In the Device Manager tab, expand the Moxa Smartio/Industio multiport board category by clicking the "+" sign next to it. Select the desired board and click Properties.

	v devices by <u>ty</u> mputer	pe C Vie	w devices by <u>c</u> on	necton
	CDROM Disk drives			
T	Display adapte	ers		
÷-ē	Floppy disk co	ontrollers		
	Hard disk con	trollers		
	Keyboard Monitors			
₽.8	Mauro			
		/Industio multipo	ort board	
+	Notwork adap	-114 Series		
	Ports (COM &			
÷	System device	25		
	1	1	. 1	
Pro	perties	Refresh	R <u>e</u> move	Print

3. Under the **Ports Configuration** tab, select a port to configure and click **Port Setting**.

oper	ty			
₿	loard Type	M	XA CB-114 Series	F
F	Z INT <u>v</u> ect	:01	AC00	
ļr	nterrupt No	2	48	3
B	lase I/O Poi	rt <u>A</u> ddress	A800	-
19155				_]
Port	COM No.	Rx FIFO L	evel Tx FFO Lev	/el
1	COM3	High	High	
2	COM4	High	High	
2 3 4	COM5	High	High	
4	COM6	High	High	
			Port Info	Port Setting
		Г	<u>o</u> k	Cancel

Under **Port Number**, select a COM number to assign to the serial port. Select **Auto Enumerating COM Number** to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.

Port 1			
<u>P</u> ort Nu		COM3 umerating <u>C</u> ON	• Number
B×FF¢		High change to <u>a</u> ll p	D rts
<u>T</u> x FIFO		High change to all p	▼ 2tro
	<u></u>	<	Cance]

4. Select an **Rx FIFO Trigger** and **Tx FIFO Size**. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select **Set the change to all ports** to use this setting for all serial ports on the board.

	TxFIFO	RxFIFO
High	128	120
Middle	64	60
Low	1	1

5. Click **OK** to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click **OK** to close the **Properties** window and apply the new port settings. Click **OK** again to close the **Device Manager** and restart the system.

Updating the Driver

You may configure the COM ports after the board and drivers have been installed.

1. In the Windows **Control Panel**, open the **System** applet.



 Under the Device Manager tab, expand the Moxa Smartio/Industio multiport board category by clicking the "+" sign next to it. Select the desired board and click Properties.

General Device Mar	ager Dardware	Profiles Performa	nce
 View devices by Computer CDROM 		iew devices by <u>c</u> on	
Disk drives Disk drives Display ad Display ad Display ad Display ad Display ad Disk drives Disk drives Disk drives Disk drives Disk drives Disk drives	apters controllers		
	& LPT)	bort board	
Properties	Re <u>f</u> resh	Remove	Pri <u>n</u> t
		OK	Cancel

3. In the **Driver** tab, click **Update Driver**....

MOXA CB-114	Series (PC/104-Plus)	Properties	?×
General Port	s Configuration Driver	Resources	
<> ма	DXA CB-114 Series (F	2C/104-Plus)	
Provider:	Not available		
Date:	Not available		
	ils about the driver files l stails To update the driv x.		
	Driver File Details	Update D	river
		OK	Cancel

4. Select the appropriate model (CP-168U in this example) and click **Have Disk...**

Update	Device Driver Wizard
\diamond	Select the manufacturer and nodel of your hardware device. If you have a disk that contains the updated driver, click Have Disk. To install the updated driver, click Finish.
Models:	
CP-114 CP-132 CP-132 CP-134	4U Series 4 Series 2 Series 2U Series 4U Series 4 Series 4 Series Have Disk
	< <u>B</u> ack Next> Cancel

- When prompted, select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the **\Software** directory. Select the **\Win9x** folder and click **OK** to continue.
- 6. You will be prompted to restart the system. The new drivers will be in effect the next time you restart.

Removing the Driver

1. In the Windows Control Panel, open the Add/Remove Programs applet. On the Install/Uninstall tab, select MOXA Smartio/Industio Driver and click Add/Remove.

Add/Remo	Add/Remove Program: Propertie:			? ×
InstalVUn	install) Win	dowsSetup 5	taitup Disk	
2	To instal - drive, dicl		ram a flappy disk i	or CD-ROM
				install
3	Windows.	. To remove a pr nts, select it from	n be outomatically ogram or to modify the list and click	
Inte(B)	SmarticyInd	iet Adapter and	Soltware	
			Add	/ <u>∃</u> ernove
		۵K	Cancel	Apply

2. When prompted, click **Yes** to confirm that you want to remove the driver.

MOXA Smartio/Industic Driver	×
Do you really want to remove NOXA Smartic/Inductio Driver	?
<u>Yes</u> No	

3. After the driver has been removed, click **OK** to return to the **Add/Remove Programs** applet.

MOXA Smartio/Industic Driver
Remove MEXA Smartic/Industic Driver complete !
<u> 0K </u>

Windows CE 5.0

In this section, we explain how to install Moxa CB series boards under WinCE 5.0. These instructions are intended for users who are familiar with the Windows CE Platform Builder 5.0 Toolkit, and would like to install one or more Moxa Tech products. Here, we only give the step-by-step installation instructions for the development environment. You will need to download the image file to the target host yourself.

The WinCE 5.0 driver for the Moxa CB Series PC/104-*Plus* Multiport Serial Module supports the following products:

CB Series: CB-108, CB-114, CB-134I

The CB-114 board is used to illustrate the installation procedure.

Installing the driver

The following procedure explains how to install the CB-114 multiport serial module driver under WinCE.

 Obtain a copy of Moxa Tech WinCE 5.0 driver package and extract it to your computer. Double-click the Install package to copy the Mxser folder to %WINCEROOT%\PLATFORM\ automatically, and import the supported MOXA Tech products into the Folder. 2. Start WinCE Platform Builder, select File, and open New Platform.



3. Enter a name for Workspace and press Next.

New Platform V	Wizard - Step 2	
	Name And Location a friendly name for your workspace.	1
	Name: [[est] Path: E:\WINCE500\PBWorkspaces\Test1\ 	
0	< Back Next > Finish	Cancel

4. When you see Board Support Packages, Design Template, Applications & Media, Networking & Communications, OBEX Server, select what you need to build your own environment. The Completing the New Platform Wizard window will open to indicate that it has finished creating a new platform. Click Finish to complete the setup.

Available design templates:	Choose the design template that is most
Custom Device Digital Media Receiver	closely aligned with the purpose of your target device.
Enterprise Terminal Enterprise Web Pad Gateway Industrial Controller Internet Appliance IP Phone Mobile Handheld Set-Top Box Tiny Kernel Windows Thin Client	Provides the starting point for a range of Web Pad-based devices with touch display and wireless networking.

New Platform Wizard - Step 5	
Applications & Media Select items for applications and media to incl	ude in your OS design.
Items:	
 NET Compact Framework ActiveSync DCOM Lightweight Directory Access Protocol (LD/ Standard SDK for Windows CE VBScript support Windows Media Audio/MP3 Windows Media Video/MPEG-4 Video Windows Messenger WordPad Internet Browser Microsoft File Viewers Windows CE Error Reporting 	Support for applications and services designed for the .NET Compact Framework.
× ×	Estimated size of these items: 10063 KB
2 < Back	Next > Finish Cancel

ew Platform Wizard - Step 6		
Networking & Communications Select items for networking and communic design.	cations to include in your OS	1
Items: OBEX Server TCP/IPv6 Support Local Area Network (LAN) Personal Area Network (PAN) Remote Desktop Connection Wide Area Network (WAN)	The foundation of the OBEX. Framework that provides su standard and user-defined s	pport for both
2 C Back	Estimated size of these item	cancel

ew Platform Wizard - Step 7					D
OBEX Server					100
Security Warning					
Under certain circumstances, the security of your platform. This ca	Object Exchange Prot talog item poses the fi	ocol (OBEX) catal ollowing potential	og item can compron security risks:	nise the	
 If proper security and authent can be installed. 	ication techniques are	not used, a servi	ce that interferes with	h services.exe	
 If proper encryption technique to third parties. 	s are not used, OBEX	running over Blue	tooth could expose a	data packets	
To learn more about potential OB more securely, see the following		vell as the best pr	actices for using this	catalog item	
OBEX Security					
Enhancing the Security of a Devic	28				
0	< Back	Next >	Finish	Cancel	



5. Open Manage Catalog Items (File →Manage Catalog Items). Under Catalog (View →Catalog), browse t\Third Party\Device Drivers\ MOXA Smartio/Industio-PCI, PC/104-Plus. Right-click on the driver Prefix COM or Prefix MXU you would like to include and choose Add to OS Design.

NOTE You can only select either Prefix COM or Prefix MXU, but not both.

Prefix COM supports up to 10 ports, from COM0 to COM9. Prefix MXU supports more than 10 ports, so it is better to select Prefix MXU if you are not sure how many ports the device has. Otherwise, you will only be allowed to use one multiport serial board on the target host.



After adding Moxa Tech drivers into your OS Design, a new project is automatically added to your workspace. The project name is mxserce5. The project can be accessed from File View (View →File View). The mxserce5 project contains a number of files used to configure the drivers included in your OS Design.



NOTE If you would like to use the "Terminal Emulator" tool, please modify mxserce5.reg and keyboard like below (This is only just for "one" "COM" port). You have to take note of the number of ports, COM, MXU, and enter the correct information.

[HKEY_LOCAL_MACHINE\ExtModems\HayesCompat1] "Port"="COM2:" "DeviceType"=dword:1 "FriendlyName"="Hayes Compatible on COM2:"

7. Finally, open Build OS, select Build and Sysgen, and be sure to click Copy Files to Release Directory After Build and Make Run-Time Image After Build.



8. Finally, copy your image file to the target host.

NOTE If you have created a Windows CE Platform Builder in the development environment, skip steps 2, 3, and 4...

Newer OS for Both CA/CB Series

The content below will describe the software installation for newer Windows OS, including Windows 2000/XP/2003/Vista/2008/7/8/8.1/10 (x86/x64), Windows Server 2008 R2/2012/2012 R2/2016 (x64)

The following topics include

- □ Installing the Driver
- Configuring the Ports
- Checking the Status
- Removing the Driver
- Uninstallation the Driver

We will take Window 7 (x64) for example, to let you know how to install your CA or CB boards. The installation procedure of Windows7 is similar to the other Windows platforms. The content describes how to install, configure, check the port status, remove, or uninstall the CA or CB boards.

NOTE In the installation section, the CA Series has more installation procedures as it follows the ISA standard. The content will be added, followed by the installation part of CB Series.

Installing the Driver

In this section, we will describe how to install the CA or CB boards for the first time with Windows 7.

First, make sure that you have already plugged the board or boards into the system's PC/104 or PC/104-Plus slot(s).

NOTE If you have already installed Moxa CA or CB board(s) in your computer, and you are installing additional boards, Windows 7 will automatically detect and install the new board(s) the next time you boot up the computer. In this case, proceed directly to the next section, "Configuring the Ports," to configure the ports' serial transmission parameters.

Second, download the drivers at <u>www.moxa.com</u>. Based on the OS type, choose the corresponding driver. Then, follow the following procedures to install the driver.

1. The Setup Wizard will open. Click $\ensuremath{\textbf{Next}}$ to install the driver.

🔂 Setup - MOXA Smartio/Industio Windows Driver 📃 📼 💌		
	Welcome to the MOXA Smartio/Industio Windows Driver Setup Wizard	
	This will install MOXA Smartio/Industio Windows Driver Ver1.24 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	

2. Please read the license agreement. If you agree, 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 A GREEMENT 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 entities wednets ("Software") installed on the System Untilling
I go not accept the agreement ○ I go not accept the agreement
<u> </u>

3. Click **Next** to install the driver in the indicated folder, or use the drop-down folder list to locate a different folder.

🔂 Setup - MOXA Smartio/Industio Windows Driver	- • •
Select Destination Location Where should MOXA Smartio/Industio Windows Driver be installed?	
Setup will install MOXA Smartio/Industio Windows Driver into folder.	the following
To continue, click Next. If you would like to select a different folder, cli	ck Browse.
C:\Program Files\Moxa\SmartioIndustioDriver	Browse
At least 0.8 MB of free disk space is required.	
< Back Next	> Cancel

4. Click **Install** to proceed with the installation.

😼 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	*
4	
< Back Install C	Cancel

5. Click **Finish** to complete the installation of the driver.



If your model is from the CB Series, then the installation is done. Otherwise, you need to do the following steps to complete the installation for the CA Series (CA-114 Series is taken as example).

Add Hardware Wizard	
	Welcome to the Add Hardware Wizard
	This wizard helps you:
601	 Install software to support the hardware you add to your computer.
	 Troubleshoot problems you may be having with your hardware.
	If your hardware came with an installation CD, it is recommended that you click Cancel to close this wizard and use the manufacturer's CD to install this hardware. To continue, click Next.
	< <u>B</u> ack <u>N</u> ext > Cancel

1. Select Add Hardware Wizard from the Control Panel. When the wizard opens, click Next to continue.

2. Select Yes, I have already connected the hardware and click Next to continue.



3. Select Add a new hardware device and click Next to continue.

Add Hardware Wizard	
The following hardware is already installed on your computer	
From the list below, select an installed hardware device, then click Next to check properties or troubleshoot a problem you might be having.	
To add hardware not shown in the list, click "Add a new hardware device."	
Intel(R) 82801DB/DBM USB2 Enhanced Host Controller - 24CD USB Root Hub USB Root Hub USB Root Hub USB Root Hub Add a new hardware device	
< <u>B</u> ack <u>N</u> ext >	Cancel

4. Select **Install the hardware that I manually select from a list (Advanced)** and click **Next** to continue.

Add Hardware Wizard
The wizard can help you install other hardware
The wizard can search for other hardware and automatically install it for you. Or, if you know exactly which hardware model you want to install, you can select it from a list.
What do you want the wizard to do? Search for and install the hardware automatically (Recommended) install the hardware that I manually select from a list (Advanced)
< <u>B</u> ack <u>N</u> ext > Cancel

5. Select **Multi-port serial adapters** and click **Next** to continue.

Add Hardware Wizard	
From the list below, select the type of hardware you are installing	E
If you do not see the hardware category you want, click Show All Devices. Common <u>h</u> ardware types:	
Show All Devices Display adapters Display adapters IDE ATA/ATAPI controllers IDE ATA/ATAPI control	
< <u>B</u> ack <u>N</u> ext >	Cancel

6. Select your CA Series model and click **Next** to continue.

Add Hardware Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Model
MOXA CA104 Series
MOXA CA108 Series
MOXA CA132 Series
This driver is not digitally signed! <u>Have Disk <u>I ell me why driver signing is important</u> </u>
< <u>B</u> ack <u>N</u> ext > Cancel

7. To begin installing the module, click **Next**.

Add Hardware Wizard	
The wizard is ready to install your hardware	>
Hardware to install:	
MOXA CA114 Series	
To start installing your new hardware, click Next.	
< <u>B</u> ack Next> Cancel	<u>ר</u>

8. If you see a warning that the software has not passed Windows Logo testing, click Continue Anyway.



9. Windows will install the drivers. When the installation has been completed, click **Finish**.

Copying Files	
<i>></i>	
mxisport.sys To C:\WINDOWS\system32\DRIVERS	
(Cancel



After the module has been installed, you will be prompted to install the new serial ports. A Found New Hardware Wizard window will open for the first serial port, port 0. Select No, not this time and click Next.



11. Select Install from a list or specific location (Advanced) and click Next.

Found New Hardware Wizar	d
	his wizard helps you install software for: MOXA communication port If your hardware came with an installation CD or floppy disk, insert it now. /hat do you want the wizard to do? Install the software automatically (Recommended) Install from a list or specific location (Advanced) lick Next to continue.
	< <u>B</u> ack <u>N</u> ext > Cancel

12. Select Search for the best driver in these locations and Include this location in the search. Select the **\Program Files\MOXA\SmartioIndustioDriver** folder on the C drive disk, and click **Next**.

Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM)
Include this location in the search:
C:\Program Files\Moxa\SmartioIndustioDriver V Browse
O Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
<pre>< Back Next > Cancel</pre>

13. If you see a warning that the software has not passed Windows Logo testing, click **Continue Anyway**.

Hardwa	re Installation
1	The software you are installing for this hardware: MOXA Port 0 has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.) Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
	Continue Anyway STOP Installation

14. Windows will install the necessary drivers.



15. After the installation is complete, click **Finish**.

Found New Hardware Wiz	ard
	Completing the Found New Hardware Wizard The wizard has finished installing the software for: MOXA Port 0
	< <u>B</u> ack Finish Cancel

16. Repeat the installation process for the remaining serial ports.

Configuring the Ports

After the driver has been installed, use Device Manager to configure the serial port of your CA or CB boards (CB-134I Series will be used as example).

In this section, we describe how to access MOXA Smartio/Industio Window Driver and lead you to do the serial port configuration.

- □ Accessing MOXA Smartio/Industio Window Driver
- Configuring Serial Port
 - Port Number
 - > Rx, TX FIFO

Accessing MOXA Smartio/Industio Window Driver

Expand the **Multi-port serial adapters** tab, right-click **CB-134I Series (PC/104-Plus)**, and then click **Properties** to open the board's configuration panel.

🚔 Device Manager		
File Action View Help		
	5	
⊿ 🛁 3p5gd2		 Actions
⊳ n Sinter		Device Manager on local co 🔺
 Disk drives Uisplay adapters 		More Actions 🔹 🕨
Floppy disk drives		
Floppy drive controllers		
Um Human Interface Devices		
De ATA/ATAPI controllers		
▶ 📥 Keyboards		
Mice and other pointing devices		
Monitors		
Multi-port serial adapters		
MOXA CB-134I Series (PC/10	Update Driver Software	
Network adapters	Disable	
▲ - 1/2 Other devices	-	
Inknown device 	<u>U</u> ninstall	
Processors	Sc <u>a</u> n for hardware changes	
Sound, video and game controlle	Properties	
System devices		
- Universal Serial Bus controllers		
· · ·		
		<u> </u>
Opens property sheet for the current selection.		

Configuring the Serial Ports

Port Number

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

MO:	ХА СВ	-134I Serie:	5 (PC/104-	·Plus) l	Propertie	s	—
Ge	eneral	Ports Confi	iguration	Driver	Details	Resou	rces
Г							
	Port	COM No.	Rx FIFO	Level	Tx FIFO	Level	
	1	COM 1	High		High		
	2	COM 2 COM 3	High High		High High		
	4	COM 3	High		High		
	·						
							<u>H</u> elp
							Port Info
							Port Setting
						OK	Cancel

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

Port 1
Port Number COM1 (current)
Auto Enumerating COM Number
Rx FIFO Level High 💌
Set the change to all ports
Tx FIFO Level High 💌
✓ Set the change to all ports
OK Cancel

Rx, TX FIFO

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

	Tx FIFO		Rx FIFO	
	(Byte)		(Byte)	
	CA Series	CB Series	CA Series	CB Series
High	64	128	56	120
Middle	32	64	28	60
Low	1	1	1	1

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

Checking the Status

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

To start the program, click **Start→ Programs→ MOXA→ PComm Ver 1.X→ PComm Diagnostic**



File Diagnoss Help Image: Second Status Image: CB-134 Series (CDM1+CDM4) Image: CB-134 Series (CDM1+CDM4	🐯 PComm Diagnostic		- • ×
To be tested CB-134 Series (COM1-COM4) IRQ-21 J/O-8400 PCI bus 1, device 10, function 0 Select Image: CB-134 Series (COM1-COM4) IRQ-21 J/O-8400 PCI bus 1, device 10, function 0 Driver : 1.24 build 1 Total Configuration Boards = 1 COM Port Available Boards = 1 QK	File Diagnose Help		
CB-134 Series (CDM1-C0M4) IRQ-21 J/0-B400 PCI bus 1, device 10, function 0 Select Image: CB-134 Series (CDM1-C0M4) IRQ-21 J/0-B400 PCI bus 1, device 10, function 0 Driver : 1.24 build 1			
COM Port Available Boards = 1	CB-134 Series (COM1-COM4) IRQ-21/JO-B400	Select 10 (C Select (C	
Paadu		COM Port Available Boards = 1	

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

Removing the Driver

 Open the Device Manager and use the mouse to place the cursor over the MOXA CB-134I Series (PC/104-Plus boards) under Multi-port serial adapters, right-click, and then select the Uninstall option.

🚔 Device Manager		
File Action View Help		
⊿ 🛁 3p5gd2		
▶ 1 ∰ Computer		
Disk drives		
Display adapters		
👂 🛁 Floppy disk drives		
Floppy drive controllers		
👂 🥼 Human Interface Devices		
IDE ATA/ATAPI controllers		
Keyboards		
Mice and other pointing devices		
Monitors		
Multi-port serial adapters		
MOXA CB-134I Series (PC/104-Plus)		
Network adapters	Update Driver Software	
Other devices	<u>D</u> isable	
🛄 Unknown device	Uninstall	
Ports (COM & LPT)		
	Sc <u>a</u> n for hardware changes	
Sound, video and game controllers	Properties	
▶ 📲 System devices		
🍺 – 🏺 Universal Serial Bus controllers		
Uninstalls the driver for the selected device.		

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

Uninstallating the Driver

The MSB driver may be removed through Add/Remove Programs in the Windows Control Panel. Click **Uninstall** next to **MOXA Smartio/Industio Windows Driver Verx.xx**

Control Panel Home	and the second sec				
	Uninstall or change a program				
View installed updates Turn Windows features on or	To uninstall a program, select it from the list and t	hen click Uninstall, Change, or	Repair.		
off	Organize 🔻 Uninstall			-	= • 🔳
	Name Uninstall this program.	Publisher	✓ Installed On	Size	Version
	DSU Ver2.1	Moxa Inc.	1/18/2017	1.65 MB	
	MOXA Smartio/Industio Windows Driver Ver1.24	Moxa Inc.	1/31/2017		1.24
	★ NPort Windows Driver Manager ■ PComm Lite Ver1.6	Moxa Inc. Moxa Inc.	1/18/2017 1/9/2017	4.52 MB	1.19
	4	11			
	Moxa Inc. Product version: 1.24 Help link: http://www.		ink: <u>http://www.moxa.c</u> ion: http://www.moxa.c		
	Help link: http://www.	moxa.com Update informati	ion: http://www.moxa.c	om	
🖉 💌 💽 V Control Panel 🕽		moxa.com Update informati	ion: http://www.moxa.c		
	Help link: http://www. All Control Panel Items Programs and Features I	moxa.com Update informati	ion: http://www.moxa.c	om	
Control Panel Home	Help link: http://www.	moxa.com Update informati	ion: http://www.moxa.c	om	
Control Panel Home View installed updates	Help link: http://www. All Control Panel Items Programs and Features I	moxa.com Update informati Moxa Inc.	• • • • • • • • • • • • • • • • • • •	om	
Control Panel Home	Help link: http://www. All Control Panel Items Programs and Features I Uninstall or change a program To uninstall a program, select it from the list and t	moxa.com Update informati Moxa Inc.	• • • • • • • • • • • • • • • • • • •	om Programs and Fo	eatures
Control Panel Home View installed updates Turn Windows features on or	Help link: http://www. All Control Panel Items Programs and Features I Uninstall or change a program To uninstall a program, select it from the list and t Organize Uninstall	Moxa.com Update informati Moxa Inc. hen click Uninstall, Change, or	• • • • • • • • • • • • • • • • • • •	om	eatures
Control Panel Home View installed updates Turn Windows features on or	Help link: http://www. All Control Panel Items Programs and Features I Uninstall or change a program To uninstall a program, select it from the list and t Organize Uninstall Name	Moxa.com Update informati Moxa Inc. hen click Uninstall, Change, or Publisher	 • http://www.moxa.c • • • • • • • • • • • • • • • • • • •	om Programs and Fo B Size	eatures
Control Panel Home View installed updates Turn Windows features on or	Help link: http://www.i All Control Panel Items Programs and Features I Uninstall or change a program To uninstall a program, select it from the list and t Organize Uninstall Name DSU Ver2.1	Moxa Inc. Moxa Inc. Publisher Moxa Inc.	 http://www.moxa.c fy Search Repair. Installed On 1/18/2017 	om Programs and Fa	eatures
Control Panel Home View installed updates Turn Windows features on or	Help link: http://www.i All Control Panel Items Programs and Features I Uninstall or change a program To uninstall a program, select it from the list and t Organize Uninstall Name DSU Ver2.1 MOXA Smartio/Industio Windows Driver Ver1.24	Moxa Inc. Moxa Inc. Publisher Moxa Inc. Moxa Inc.	 ✓ ✓ ✓ Search Repair. ✓ Installed On 1/18/2017 1/31/2017	om Programs and Fo B Size	eatures
Control Panel Home View installed updates Turn Windows features on or off	Help link: http://www.i All Control Panel Items Programs and Features I Uninstall or change a program To uninstall a program, select it from the list and t Organize Uninstall Name DSU Ver2.1 MOXA Smartio/Industio Windows Driver Ver1.24 Nort Windows Driver Manager	Moxa Inc. Moxa Inc. Publisher Moxa Inc. Moxa Inc. Moxa Inc. Moxa Inc.	 ✓ 4y Search Repair. ✓ Installed On 1/18/2017 1/31/2017 1/18/2017 	Programs and Fa	eatures
Control Panel Home View installed updates Turn Windows features on or off	Help link: http://www.i All Control Panel Items Programs and Features I Uninstall or change a program To uninstall a program, select it from the list and t Organize Uninstall Name DSU Ver2.1 MOXA Smartio/Industio Windows Driver Ver1.24	Moxa Inc. Moxa Inc. Publisher Moxa Inc. Moxa Inc.	 ✓ ✓ ✓ Search Repair. ✓ Installed On 1/18/2017 1/31/2017 	om Programs and Fo B Size	eatures
Control Panel Home View installed updates Turn Windows features on or off	Help link: http://www.i All Control Panel Items Programs and Features I Uninstall or change a program To uninstall a program, select it from the list and t Organize Uninstall Name DSU Ver2.1 MOXA Smartio/Industio Windows Driver Ver1.24 Nort Windows Driver Manager	Moxa Inc. Moxa Inc. Publisher Moxa Inc. Moxa Inc. Moxa Inc. Moxa Inc. Moxa Inc.	 ✓ 4y Search Repair. ✓ Installed On 1/18/2017 1/31/2017 1/18/2017 	Programs and Fa	eatures
Control Panel Home View installed updates Turn Windows features on or off	Help link: http://www.i All Control Panel Items Programs and Features I Uninstall or change a program To uninstall a program, select it from the list and t Organize Uninstall Name DSU Ver2.1 MOXA Smartio/Industio Windows Driver Ver1.24 MoXA Smartio/Industio Windows Driver Ver1.24 Whort Windows Driver Manager DXA Smartio/Industio Windows Driver Uninstall Organize Are you sure you want to completely remove MC Windows Driver and all of its components?	Moxa Inc. Moxa Inc. Publisher Moxa Inc. Moxa Inc. Moxa Inc. Moxa Inc. Moxa Inc.	 ✓ 4y Search Repair. ✓ Installed On 1/18/2017 1/31/2017 1/18/2017 	Programs and Fa	eatures
Control Panel Home View installed updates Turn Windows features on or off	Help link: http://www.i All Control Panel Items Programs and Features I Uninstall or change a program To uninstall a program, select it from the list and t Organize Uninstall Name DSU Ver2.1 MOXA Smartio/Industio Windows Driver Ver1.24 MoXA Smartio/Industio Windows Driver Ver1.24 Whort Windows Driver Manager DXA Smartio/Industio Windows Driver Uninstall Organize Are you sure you want to completely remove MC Windows Driver and all of its components?	Moxa.com Update informatio	 ✓ 4y Search Repair. ✓ Installed On 1/18/2017 1/31/2017 1/18/2017 	Programs and Fa	eatures
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	Name	Publisher	/ Installed On	Size	Version
	DSU Ver2.1	Moxa Inc.	1/18/2017	1.65 MB	version.
	MOXA Smartio/Industio Windows Driver Ver1.24	Moxa Inc.	1/31/2017		1.24
	🎪 NPort Windows Driver Manager	Moxa Inc.	1/18/2017		1.19
	MOXA Smartio/Industio Windows Driver was suc from your computer.	ccessfully removed			
	Moxa Inc. Product version: 1.24 Help link: http://www.m	III Support link: <u>http</u> 10xa.com Update information: http			

Non-Windows OS

Linux

1. Execute the following commands from the Linux prompt:

```
#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# #cd mxser

2. #cd /moxa/mxser/driver

#./mpmknod

- Install the module driver using the hardware settings that you selected. For example, for an I/O address of 0x180, an INT vector of 0x1CO, and an IRQ of 10, execute the following command:
 #modprobe mxser ioaddr=0x180 iovect=0x1C0 irq=10
 (This step is only for CA Series)
- You can use the Moxa diagnostic utility to verify the driver's status:
 #cd /moxa/mxser/utility/diag
 #./msdiag
- You can use the Moxa terminal utility to test the TTY ports: #cd /moxa/mxser/utility/term #./msterm

Serial Programming Tools

Moxa provides Windows serial programming libraries and troubleshooting utilities that are easy to use and powerful. You can use these tools to reduce software development time.

The serial communication library is useful for developing applications for data communications, remote access, data acquisition, and industrial control. It provides a simpler solution compared to the more complex Windows Win32 COMM API.

PComm is a professional serial communication tool for Windows PCs. PComm includes the following features:

- Useful utilities for diagnostics, port monitoring, and terminal emulation
- Sample programs
- Comprehensive help files

The following topics are covered in this chapter:

Serial Programming Library

PComm Utilities

- > Installation
- PComm Diagnostic
- PComm Monitor
- > PComm Terminal Emulator

Serial Programming Library

The serial programming library assists you in developing serial communications programs for any COM port that complies with the Microsoft Win32 API. It facilitates the implementation of multi-process and multi-thread serial communication programs and can remarkably reduce development time.

The library provides a complete set of functions as well as various sample programs for Visual C++, Visual Basic, and Delphi. To view detailed descriptions of the available functions and sample programs, go to **Start** → **Program** → **PComm Lite** and select **PComm Lib Help**, **PComm Porting Notes**, or **PComm Programming Guide**. You may also refer to the sample programs in the PComm directory.

PComm Utilities

This sections provides brief descriptions of the PComm utilities. For more information about these utilities, please refer to the help files or to the API-232.txt file for DOS.

Installation

To install PComm, run **Setup.exe** from the installation diskette. Please note that the PComm diagnostic and monitor utilities are for Moxa boards only. These two utilities will not work with other serial boards.

PComm Diagnostic

PComm Diagnostic is designed for Moxa boards only. It provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, DTR/DCD, and other items. You can use PComm Diagnostic to check the operation of both software and hardware.

To run the Diagnostic program, go to **Start → Program → PComm Lite → Diagnostic**.

🕸 PComm Diagnostic				
File Diagnose Help				
🖻 🗖 🔳 🖨				
To be tested				
CA114 Series(4 ports) (C IRQ=10,I/O=1C0	ОМЗ-СОМ6) 🔼	Select 💼 (Config) to se	t test option	
_		Select 💽 (Go) to start to	esting	
Boa	rd Status			
Ready	CA114 Ser IRQ=10,// Driver:	ries(4 ports) (COM3-COM6) 0=1C0	<	
	al Configuration Boai M Port Available Boa			
Strategy and the state of the s		ок	(e).	-

PComm Monitor

PComm Monitor is designed for Moxa board in Windows NT only. It allows you to monitor data transmission of selected Moxa COM ports. It monitors data transmission, throughput, and line status at regular intervals. Click on a specific port to view that port's communication parameters and status.



To run PComm Monitor, go to Start -> Program -> PComm Lite -> Monitor.

PComm Terminal Emulator

PComm Terminal Emulator can be used to connect to a serial port to verify that data transmission is functioning correctly. It supports multiple windows and both VT100 and ANSI terminal types. You can interactively transfer data, periodically send patterns, and transfer files using ASCII, XMODEM, YMODEM, ZMODEM, and KERMIT protocols.

To run PComm Terminal Emulator, go to **Start** \rightarrow **Program** \rightarrow **PComm Lite** \rightarrow **Terminal Emulator**.



Smartio/Industio Programming Guide

If you want to develop your own driver, no matter whether it is on a Windows or Linux platform, Moxa Smartio/Industio Programming Guide is very useful.

The following topics are covered in this chapter:

- Relative Product List
- **D** Resource Requirement for Moxa Board
- **PCI** Configuration for Moxa Board
- UART Register Structure for MU860 chip
- □ UART Register Structure for MUE250, MUE450, and MUE850 chips
- For Baud Rate Setting
- Moxa Board PCI Device ID List
- UART Datasheet

Relative Product List

Please see the "Moxa Board PCI Device ID List" at the end of this document.

Resource Requirement for Moxa Board

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 is used)

PCI Configuration for Moxa Board

A. MOXA Vendor ID: 0x1393

B. Device ID: Please see the "Moxa Board PCI Device ID List" section

C. Hardware resources on the Device Configuration Register of the 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)				
UART register	MUE250, MUE450, MUE850	0x14	BAR1	4096 bytes
(Memory Base Address)				
Vector Base Address	MUE250, MUE450, MUE850	0x18	BAR2	16 bytes

Byte Offset	0-7	8-15	16-23	24-31
00h	Vendor ID		Device ID	
04h	Command		Status	
08h				
0Ch				
10h	BAR0			
14h	BAR1			
18h	BAR2			
1Ch	BAR3			
3Ch	Interrupt Line	Interrupt Pin	Reserved	

NOTE For MUE250, MUE450, and MUE850 chips only:

Memory mode is recommended for these chips to access UART. To use memory mode, the driver has to access the memory base address, which is located at BAR1.

UART Register Structure for MU860 chip



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

• UART register address = I/O base address + (port-1) *8

For example, if the base address is 0x180:

The first port's UART registered I/O address is 0x180+(1-1)*8 = 0x180

The first registered I/O address is 0x180,

The second registered I/O address is 0x181,

The second port's UART registered I/O address is 0x180+(2-1)*8 = 0x188The first registered I/O address is 0x188,

The second registered I/O address is 0x189, ...

• IRQ Vector Register Structure



Bit Value	Status
0	Interrupt pending. Please read the UART register to get the detail interrupt
	information *.
1	No interrupt pending.

All serial ports on the same Moxa board use the same IRQ. Check the vector to determine which port issues the interruption. You can also get the information by querying the IIR of each port.

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 which 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.



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

	 UART register address = I/O base address + (port-1) * 0x200 For example, if base address is 0x200:
	The first port's UART registered I/O address is 0x200 + (1-1) * 0x200 = 0x200 The first registered I/O address is 0x200, The second registered I/O address is 0x201,
	The second port's UART registered I/O address is 0x200 + (2-1) * 0x200 = 0x400 The first registered I/O register is 0x400, The second registered I/O register is 0x401,
NOTE	For CP-104EL-A, CP-114EL, CP-114EL-I, and CP-134EL-A only: The first port's UART registered address: I/O base address The second port's UART registered address: I/O base address + 1 * 0x200 The third port's UART registered address: I/O base address + 2 * 0x200 The fourth port's UART registered address:I/O base address + 7 * 0x200Type note content here.

Control Serial Interface and Termination Resistor for MUE chips

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

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

Especially, the interface of 4-port models, such as CP-114EL and CP-114EL-I, is using the following offset to set the interface of port 4.

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

For Baud Rate Setting

For General PC Com Port: CLK=1.8432MHz

 $Div = CLK/(Baud \times 16)$

But for Moxa Board: CLK=14.7456MHz

 $Div = CLK/(Baud \times 16)$

Moxa Board PCI Device ID List

Model	Ports	Bus	Chip	Max Baud	Vendor ID	Device ID
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 the UART register description, please refer to the downloaded links below.

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

Pin Assignments

The box header connector(s) on the module is used to connect to serial devices. Optional cables are available that provide DB9 or DB25 connectors. The pin assignments of the box header connectors and available cables are provided below.

Box Header Pin Assignments

RS-232

These pin assignments apply to the CA-108/CB-108, CA-114/CB114, and CA-104. Note that there are two 40-pin box header connectors on the CA-108/CB108, each of which connects to 4 serial ports.

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	DCD0	11	DCD1	21	DCD2	31	DCD3
2	DSR0	12	DSR1	22	DSR2	32	DSR3
3	RxD0	13	RxD1	23	RxD2	33	RxD3
4	RTS0	14	RTS1	24	RTS2	34	RTS3
5	TxD0	15	TxD1	25	TxD2	35	TxD3
6	CTS0	16	CTS1	26	CTS2	36	CTS3
7	DTR0	17	DTR1	27	DTR2	37	DTR3
8	-	18	-	28	-	38	-
9	GND0	19	GND1	29	GND2	39	GND3
10	-	20	-	30	-	40	-

RS-422, 4-wire RS-485

These pin assignments apply to the CA-132, CA-132I, CA-114/CB-114, and CA-134I/CB1341. With regard to the CA Series, pins 21 to 40 apply to the CA-114 and CA-134I only.

Pin	Signal	Pin	Signal	Pin*	Signal*	Pin*	Signal*
1	TxD0-(A)	11	TxD1-(A)	21	TxD2-(A)	31	TxD3-(A)
3	TxD0+(B)	13	TxD1+(B)	23	TxD2+(B)	33	TxD3+(B)
5	RxD0+(B)	15	RxD1+(B)	25	RxD2+(B)	35	RxD3+(B)
7	RxD0-(A)	17	RxD1-(A)	27	RxD2-(A)	37	RxD3-(A)
9	GND0	19	GND1	29	GND2	39	GND3

2-wire RS-485

These pin assignments apply to the CA-132 , CA-132I , CA-114/CB-114, and CA-134I/CB-1341. With regard to the CA series, pins 21 to 40 apply to the CA-114 and CA-134I only.

Pin	Signal	Pin	Signal	Pin*	Signal*	Pin*	Signal*
5	Data0+(B)	15	Data1+(B)	25	Data2+(B)	35	Data3+(B)
7	Data0-(A)	17	Data1-(A)	27	Data2-(A)	37	Data3-(A)
9	GND0	19	GND1	29	GND2	39	GND3