CA-132/132I User's Manual

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www.moxa.com/product



Moxa Technologies Co., Ltd.

Tel: +886-2-8919-1230 Fax: +886-2-8919-1231 Web: www.moxa.com

MOXA Technical Support

The Americas

Worldwide: <u>support@moxa.com.tw</u> support@moxa.com

CA-132/132I User's Manual

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1 Introduction

Welcome to MOXA CA-132/132I Series of advanced 2-port RS-422/485 PC/104 communication modules, a new industrial multiport serial board solution. Both ports of CA-132/132I can be configured by DIP Switch for either the RS-422 or RS-485 interface, and with its PC/104 standard, the CA-132/132I Series is compatible with any PC/104 CPU module or CPU card that accepts PC/104 expansion modules.

The following topics are covered in this chapter:

- □ Overview
- Package Checklist
- **D** Product Features
- **D** Product Specifications

Overview

CA-132/132I is a PC/104 module that supports the RS-422/485 serial interfaces, and can be used with PC/104 CPU modules or CPU cards that accept PC/104 expansion modules. CA-132/132I has two independent serial interfaces, which are accessed through RJ45 connectors. You can configure both ports for the RS-422 or RS-485 interfaces by DIP switch. The module's industry-standard MOXA UART (16C550 compatible) is fully programmable. Moxa has implemented its patented ADDCTM technology for RS-485 automatic direction control, so there is no need to change jumpers to switch the module between driver and receiver. The built-in 16 KV ESD surge protection protects other devices connected to the RS-485 network.

Package Checklist

MOXA CA-132/132I products are shipped with the following items:

- 1 MOXA CA-132/132I 2-port serial board
- CA-132/132I Document & Software CD
- CA-132/132I Quick Installation Guide

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

Product Features

CA-132/132I Series products enjoy the following features:

- 2 RS-422/485 ports
- RS-422/485 communication distance up to 4000 feet (1.2 km)
- High speed data transmission rate up to 230.4 Kbps
- Switch selectable for I/O and INT Vector addresses (from Hex 000 to 3FF)
- 64-byte FIFOs
- IRQ settings are selectable by jumper
- Built-in 16 KV ESD surge protection for TX and RX lines
- 4 LED indicators onboard (red for TX, and green for RX)
- Support 4-wire RS-422 and 2/4-wire RS-485
- ADDCTM for RS-485 transmission
- CA-132I has 2 KV isolation protection

Product Specifications

CA-132/132I Series boards have the following specifications:

- Dimensions: 9.6 cm × 9.0 cm
- Bus: PC/104
- Baud rate: 50 to 230.4 Kbps
- Character length: 5, 6, 7, or 8 bits
- Parity: even, odd, none, mark, and space
- Stop bit: 1, 1.5 or 2
- I/O connectors: dual 8-pin RJ-45 connectors
- Interrupt levels: IRQ 3, 4, 5, 6, 7, 9, 10, 11, 12 or 15
- Clock input: 14.745 MHz
- Power consumption (+5 V): CA-132/210 mA, CA-132I/455 mA
- MTBF: 100,000 hrs @ 25°C environment
- Operating temperature: 0 to 55°C

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- Storage temperature: -20 to 85°C
- Relative humidity: 5 to 95%, non-condensing
- Regulatory Approvals: FCC Class A, CE

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Hardware Installation

This chapter includes information about hardware installation of CA-132/132I Series boards. The following topics are covered:

- **D** Hardware Installation
- **Block Diagram of CA-132/132I**
- □ RS-422/485 Interface Settings
- **I/O Address & Interrupt Vector Settings**
- □ IRQ Setting
- Initial Inspection
- □ RS-422/485 pin assignments

Hardware Installation

The hardware installation of CA-132/132I serial boards is easy to carry out. Before you insert CA-132/132I into the PC/104 interface, you must first configure the RS-422/485 setting, I/O Base Address & Interrupt Vector, and IRQ Settings. Follow the detailed steps given below to install the CA-132/132I serial board in your computer.

Step 1: Configure the RS-422/485 setting, I/O Base Address & Interrupt Vector, and IRQ Settings (see details below).

ATTENTION

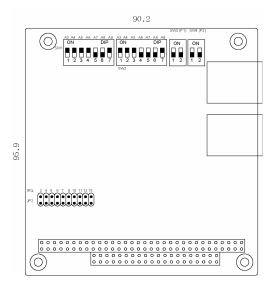
Safety First!

To avoid damaging your system and boards, make sure your PC's power is turned off before installing your CA-132/132I board.

- **Step 2:** Turn your PC's power off, and also shut off the power to any peripheral devices, and remove the PC's cover.
- Step 3: Insert the CA-132/132I serial board into the PC/104 interface slot.
- Step 4: Fasten the holding screw to fix the serial board in place.
- Step 5: Replace the PC's cover.

Step 6: Power on the PC.

Block Diagram of CA-132/132I



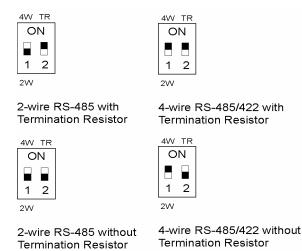
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RS-422/485 Interface Settings

You can use DIP switches SW3 and SW4 to configure each port individually for either RS-422 (4-wire) or RS-485 (2/4-wire) interface with termination resistor (TR) on/off (120 ohm). SW3 configures Port 1, and SW4 configures Port 2, as shown in the switch setting diagrams below.



The following diagram shows how to use the DIP switches to configure each port for either RS-422 (4-wire) or RS-485 (2/4-wire) interface with or without termination resistor.



I/O Base Address & Interrupt Vector Settings

CA-132/132I Series have two 7-switch DIP switch panels, named SW1 and SW2. Panel SW1 is for I/O Base Address setting, and SW2 is for Interrupt Vector setting. Once you configure Port 1's I/O Base Address and Interrupt Vector, the settings for the other ports will be configured automatically as well. You can choose base addresses from hex 000 to 3FF. The default settings are CH#1 (Hex 180) for I/O Base Address and 1C0 for Interrupt Vector settings.

Example:

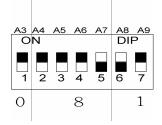
When you wish to configure your Port 1's I/O base address to 180, the DIP switch settings of panel SW1 should be as follows:

A3	A4	A5	A6	A7	A8	A9	Hex
On	On	On	On	Off	Off	On	0 × 180

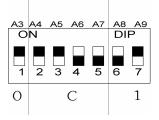
When you wish to configure your Port 1's INT Vector to 1C0, the DIP switch settings of panel SW2 should be as follows:

A3	A4	A5	A6	A7	A8	A9	Hex
On	On	On	Off	Off	Off	On	0 × 1C0

The following diagrams show the DIP switch settings of panel SW1 and panel SW2 when the I/O base address is configured to be 180, and the INT Vector is configured to be 1C0.



The diagram shown above is SW1 for setting I/O Base Address.



The diagram shown above is SW2 for setting INT Vector.

A9

A3		A4	A5	A6	A7	A 8
8		1	2	4	8	1
On		On	On	On	On	On
On		On	On	On	On	On
On		On	On	On	On	Off
On		On	On	On	Off	Off
On		On	On	Off	Off	Off
On		On	Off	Off	Off	Off
On		Off	Off	Off	Off	Off
Off		Off	Off	Off	Off	Off
Off		On	On	On	On	On
Off		Off	On	On	On	On
Off		Off	Off	On	On	On
Off		Off	Off	Off	On	On
Off		Off	Off	Off	Off	On
Off		Off	Off	Off	Off	Off
	-					

At this point, the start of I/O addresses of Port 2 will be automatically configured at 188.

1 2 Hex On On 0×000 On Off 0×200 Off Off 0×300 Off Off 0x380 Off Off 0x3C0 Off Off 0×3E0 Off 0×3F0 On Off Off 0×3F8 On On 0×008 On 0×018 On On 0x038 On On On 0×078 On On 0×0F8 Off On 0×2F8

IRQ Setting

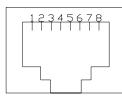
CA-132/132I Series has a jumper selectable function for you to configure IRQ settings. Before you insert a CA-132/132I board into the PC/104 interface, you need to choose an available jumper from 3, 4, 5, 6, 7, 9, 10, 11, 12, or 15 to configure the IRQ setting.

Initial Inspection

Before we ship CA-132/132I products, we first perform a careful mechanical and electrical inspection of these serial boards. Products should be free of any marks or scratches and in perfect electrical order when customers receive them. Handle these boards only by their edges, since the static charge from your body may damage the integrated circuits. Always keep the boards in their anti-static package whenever they are not installed. You can also use this package to return the board should it need to be repaired.

RS-422/485 Pin Assignments

Async Port 4-wire RS-422/4-wire 485 Pin Assignment (RJ45)



SIGNAL
Х
Х
TXD+
TXD-
RXD-
RXD+
GND
Х

Async Port 2-wire RS-485 Pin Assignment (RJ45)

5678

PIN	SIGNAL
1	Х
2	Х
3	Х
4	Х
5	DATA-
6	DATA+
7	GND
8	Х

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After installing the CA-132/132I serial boards in your computer, the next step is to install the software. The drivers for CA-132/132I support various operating systems, including Window NT, Windows 2000/XP/2003, and Windows 95/98/Me. This chapter includes information about how to install and remove the CA-132/132I board.

The following topics are covered in this chapter:

- Windows NT
- **Windows 2000/XP/2003**
- □ Windows 95/98/Me
- DOS

Windows NT

Installing the driver

The following procedure is for installing the CA-132/132I serial board driver under Windows NT 4.0.

1. Use the mouse to position the cursor over your desktop's **Network** icon, and then click the right mouse button. Select **Properties** and then click the left mouse button.

Netv	vork
leight	<u>O</u> pen
	<u>E</u> xplore
	Eind Computer
	Map <u>N</u> etwork Drive
	Disconnect Network Drive
	Create <u>S</u> hortcut
	Rena <u>m</u> e
	P <u>r</u> operties

2. When the **Network** window opens, click on the **Adapters** tab and then click on **Add**.

Tetwork					
Identification	Services	Protocols	Adapters	Binding	s
<u>N</u> etwork Ada	apters:				
3 (1) D-L#	nk DFE-530	ITX PCI Fas	t Ethernet A	dapter (F	lev B)
Add	<u><u> </u></u>	emove	Properties.		<u>U</u> pdate
D-Link DFE	-530TX PC	Fast Ethen	net Adapter	(Rev B)	
			01	<	Cancel

3. When the **Select Network Adapter** window opens, click on **Have Disk** to install the driver from the floppy disk enclosed with the CA-132/132I serial board.

Select Ne	twork Adapter 🔹 😵
Ш <mark>Ш</mark>	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:
III 3Cor III 3Cor III 3Cor III 3Cor	n 3C508 ISA 16-bit Ethernet Adapter n Etherlink II Adapter (also II/16 and II/16 TP) n Etherlink III ISA/PCMCIA Adapter n EtherLink III PCI Bus-Master Adapter (3C590) n Etherlink16/EtherLink16 TP Adapter Stat Etherlink PCI 10/100PASE T Adapter (3C595)
	Have Disk
	OK Cancel

4. The **Insert Disk** window will open asking you to insert the disk into your computer. Type **A:\windows.nt** to locate the setup file on the disk and then click **OK**.

Insert disk 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.	Insert Disi	V	~
A:\windows.nt	F	hardware manufacturer. If the files can be found at a different location, for example on another drive type a	
		A:\windows.nt	

5. The **Setup** window will open, showing that the computer is copying the setup file to your computer.

Setup X
Copying: mxicfg.exe
To: C:\WINNT\System32
45%
Cance

6. After the setup file has been copied, the Moxa PC104 Communication Module Configuration Panel window will open. Click Add to continue.

Board Type	I/O address	INT vector	IRQ B	us Dev	COM Number

7. When the **Property** window opens, select **CA132 Series** or **CA132I Series** under **Board Type**. The window will show the COM port number to which the serial ports of CA-132/CA-132I are assigned, and the default settings for the ports. Click **OK** to continue.

Propert	у			
B	oard Type	CA13	2 Series	Ţ
F	✓ INT <u>V</u> ector	or	1C0	
Įn	terrupt No.		10	•
B	ase I/O Port	: <u>A</u> ddress	180	-
			1	
Port	COM No.	Rx FIFO Trig	. Tx FIFO S	Size
1	COM3	56	64	5,20
2	COM4	56	64	
L				
L				
L				
L				
				Port Setting
				Lon county
			<u>0</u> K	Cancel

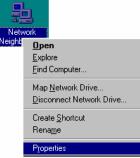
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8. The **Network** window will open, showing the serial board you just added to your computer. Click **OK** to finish the installation.

Network
Identification Services Protocols Adapters Bindings
Network Adapters:
[1] D-Link DFE-530TX PCI Fast Ethernet Adapter (Rev B) [3] MDXA PC104 Communication Module Adapter
Add <u>R</u> emove <u>Properties</u> <u>Update</u>
MDXA PC104 Communication Module Adapter
OK Cancel

Removing a CA-132/132I serial board

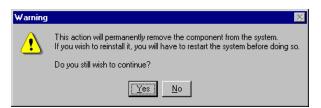
1. If you wish to remove a CA-132/132I serial board, move your mouse to your desktop's **Network** icon, click the right mouse button, and then select **Properties**.



2. When the Network window opens, choose Adapters, select MOXA PC104 Communication Module Adapter, and then click on Remove.

Network			? ×
Identification Set	vices Protocols	s Adapters Bin	idings]
Network Adapter			
		ast Ethernet Adap ation Module Adap	
<u>A</u> dd	<u>R</u> emove	Properties	<u>U</u> pdate
Item Notes:			
M0XA PC104 C	ommunication Mo	odule Adapter	
		OK	Cancel

3. A Warning window will open. Click Yes if you wish to remove the CA-132/132I serial board.



Windows 2000/XP/2003

Installing the driver

The following procedure explains how to install the CA-132/132I serial board driver under Windows 2000/XP/2003.

1. Use your mouse to position the cursor over your desktop's **My Computer** icon, click the right mouse button, and then select **Properties**.

, je	
My Co	Open Explore Search Manage
	Map Network Drive Disconnect Network Drive
	Create Shortcut Rename
	Properties

2. When the **System Properties** window opens, click on the **Hardware** tab, and then click on **Hardware Wizard...** to start the installation.

System Properties	ŶŇ			
General Network Identification Hardware User Profiles Advanced				
Hardware Wizard				
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.				
Hardware Wizard				
Device Manager				
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.				
Driver <u>S</u> igning <u>D</u> evice Manager				
Hardware Profiles				
Hardware profiles provide a way for you to set up and store different hardware configurations.				
Hardware Profiles				
OK Cancel	ply			

3. The Add/Remove Hardware Wizard window will open next. Click on Next to continue.

Add/Remove Hardware wizard	
	Velcome to the Add/Remove Hardware Wizard his wizard helps you add, remove, unplug, and oubleshoot your hardware.
	< Back Next > Cancel

4. When the **Choose a Hardware Task** window opens, select **Add/Troubleshoot a device**, and then click on **Next** to continue.

Add/Remove Hardware Wizard				
Choose a Hardware Task Which hardware task do you want to perform?				
Select the hardware task you want to perform, and then click Next.				
 Add/Troubleshoot a device Choose this option if you are adding a new device to your computer or are having problems getting a device working. 				
Uninstall/Unplug a device Choose this option to uninstall a device or to prepare the computer to unplug a device.				
<u> < B</u> ack <u>N</u> ext > Cancel				

5. The **New Hardware Detection** window will open showing that the Wizard is searching for the CA-132/CA-132I serial board on your computer.

Add/Remove Hardware Wizard New Hardware Detection The wizard automatically locates new Plug	and Play hardware.	
Windows is searching for new Plug and Pla Searching	ay hardware to install.	
	< <u>B</u> ack <u>N</u> er	xt > Cancel

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6. When the **Choose a Hardware Device** window opens, select **Add** a new device and then click **Next** to continue.

Add/Remove Hardware Wizard
Choose a Hardware Device Which hardware device do you want to troubleshoot?
The following hardware is already installed on your computer. If you are having problems with one of these devices, select the device, and then click Next. If you are attempting to add a device and it is not shown below, select Add a new device, and then click Next.
Devices
Plug and Play Monitor Floppy disk drive E-DE CD-ROM 50X L Maxtor 33073H3 ISAPNP Read Data Port
< <u>B</u> ack <u>N</u> ext> Cancel

7. The **Find New Hardware** window will open next. Select **No, I want to select the hardware from a list**, since CA-132/132I is a brand new type of ISA serial board, and then click on **Next** to continue.

Add/Remove Hardware Wizard
Find New Hardware Windows can also detect hardware that is not Plug and Play compatible.
When Windows detects new hardware, it checks the current settings for the device and installs the correct driver.
Do you want Windows to search for your new hardware? Ýes, search for new hardware No, I want to select the hardware from a list
< <u>B</u> ack <u>N</u> ext > Cancel

8. When the Hardware Type window opens, select Multi-port serial adapters under Hardware types, and then click on Next to continue.

Add/Remove Hardware Wizard	
Hardware Type What type of hardware do you want to install?	
Select the type of hardware you want to install.	
Hardware types:	
 Imaging devices Infrared devices Memory technology driver Modems Multi-port serial adapters Network adapters Other devices PCMCIA adapters Reds (COM & L PT) 	
< <u>B</u> ack <u>N</u> ext >	Cancel

9. When the **Select a Device Driver** window opens, click on **Have Disk** to install the CA-132/132I driver from the floppy disk that came with the CA-132/132I serial board.

Add/Remove Hardware Wizard	
Select a Device Driver Which driver do you want to in	nstall for this device?
	d model of your hardware device and then click Next. If you he driver you want to install, click Have Disk. Models:
Control Corporation Digi International Equinox Systems Inc. Moxa Technologies Inc. Specialix International Ltd. Stallion Technologies	RocketHUB 4 Port Device RocketHUB 8 Port Device RocketPort 16 Port, ISA-BUS RocketPort 32 Port, ISA-BUS RocketPort 4 Port, ISA-BUS RocketPort 8 Port, ISA-BUS VS1000 16 to 64 Port Device
	< <u>B</u> ack <u>N</u> ext> Cancel

10. The **Install from Disk** window that opens will prompt you to insert the installation disk into your computer's floppy disk drive.

Install Fro	om Disk	X
_	Insert the manufacturer's installation disk into the drive selected, and then click DK.	OK Cancel
	Copy manufacturer's files from:	<u>B</u> rowse

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11. After inserting the installation disk, click on **Browse** to locate the setup file from the disk. Click **OK** to continue.



12. When the Select a Device Driver window opens, select MOXA CA132 Series or MOXA CA132I Series and then click Next to continue.

Add/Remove Hardware Wizard
Select a Device Driver Which driver do you want to install for this device?
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.
Mo <u>d</u> els: MOXA CA104 Series MOXA CA132 Series MOXA CA132I Series
<u>H</u> ave Disk
< <u>B</u> ack <u>N</u> ext> Cancel

13. The Start Hardware Installation window will open next. Click on Next to continue.

Add/Remove Hardware Wizard
Start Hardware Installation Windows is ready to install drivers for your new hardware.
MOXA CA132 Series
Windows will use default settings to install the software for this hardware device. To install the software for your new hardware, click Next.
< <u>B</u> ack <u>Mext></u> Cancel

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14. A **Digital Signature Not Found** window will open. Although this message states that MOXA CA132 Series (or CA132I Series if you choose it) driver does not contain a Microsoft digital signature, the CA132 Series driver has already been tested and been shown that it can support Windows OS. Click **Yes** to continue the installation.

Digital Signature Not Fou	nd 🔀
	The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested. The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows. MDXA CA132 Series If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available. Do you want to continue the installation?
	Yes No More Info

15. The next window to open states that the installation is completed. Click **Finish** to end the installation.

Add/Remove Hardware Wiza	rd
	Completing the Add/Remove Hardware Wizard
	The following hardware was installed: MDXA CA132 Series
	Windows has finished installing the software for this device.
	To close this wizard, click Finish.
	< Back Finish Cancel

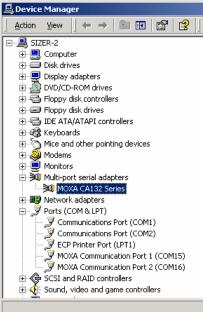
16. After the installation is completed, use your mouse to position the cursor over your desktop's **My Computer** icon, click the right mouse button, and then select **Properties**.

Ļ	
My Co	Open Explore Search Manage
	Map Network Drive Disconnect Network Drive
	Create Shortcut Rename
	Properties

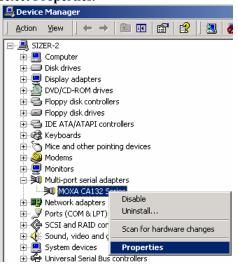
17. When the **System Properties** window opens, click on the **Hardware** tab, and then click on **Device Manager**.

System Properties ?	×
General Network Identification Hardware User Profiles Advanced	
Hardware Wizard	
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.	
Hardware Wizard	
Device Manager	
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.	
Driver Signing Device Manager	
- Hardware Profiles	
Hardware profiles provide a way for you to set up and store different hardware configurations.	
Hardware Profiles	
OK Cancel Apply	

 The Device Manager window will open next. At this point, you should be able to find MOXA CA132 Series/MOXA CA132I Series under Multi-port serial adapters, and MOXA communication Port 1 and Port 2 (assigned to COM 15 and COM 16, respectively, for the example shown here) under Ports (COM & LPT).



19. Select MOXA CA132 Series/MOXA CA132I Series, click the right mouse button, and then select Properties.



20. The **MOXA CA132 Series/MOXA CA132I Series Properties** window will open, allowing you to view general information, Ports Configuration, Driver version, and Resource Settings.

MOXA CA1	32 Series Prope	rties 🤶 🔀
General	Ports Configuration	n Driver Resources
×1)	MOXA CA132 Se	ries
	Device type:	Multi-port serial adapters
	Manufacturer:	Moxa Technologies Inc.
	Location:	Unknown
This (e status device is working p are having probler he troubleshooter.	roperly. Ins with this device, click Troubleshooter to Image: state
<u>D</u> evice	-	
Use thi	s device (enable)	<u> </u>
		OK Cancel

Disabling the device

1. Use your mouse to position the cursor over you desktop's **My Computer** icon, click the right mouse button, and then select **Properties**.



2. The System Properties window will open. Choose Hardware and select Device Manager.

System Prope	ittes			<u></u> .
General Ne	twork Identification	Hardware	User Profiles	Advanced
Hardware	Wizard The Hardware wiza unplug, eject, and c			
Device M	anager The Device Manag on your computer. L properties of any de	Jse the Devi	hardware devi	ces installed
	Driver <u>S</u> igning		<u>D</u> evice M	anager
Hardware	Profiles Hardware profiles pi different hardware c			p and store
			Hardware	Profiles
			Cancel	Apply
				200

3. The Device Manager window will open. Select MOXA CA132 Series/MOXA CA132I Series under Multi-port serial adapters, and click on the right mouse button. Select Disable and click on the left mouse button to disable the device.



Uninstalling the device

- 1. Follow steps 1 and 2 of **Disabling the device**.
- 2. Select MOXA CA132 Series/MOXA CA132I Series under Multi-port serial adapters, click the right mouse button, and then select Uninstall.
- 3. A Warning window will open. Click OK to uninstall the device.

Confirm I	Device Removal
×1)	MOXA CA132 Series
Warning	; You are about to uninstall this device from your system.
	OK Cancel

Windows 95/98/ME

Installing the driver

- The following is for installing the driver of CA-132/132I serial boards under Windows 95/98/ME. 1. Insert the installation disk into your computer. Click on **Run** under the **Start Menu**, and then
 - click on Browse to locate the setup file in the disk, or directly type in the path.

Run	? ×
<u> </u>	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
<u>O</u> pen:	A:\win9xDisk\Disk\Setup95.exe
	OK Cancel Browse
🋃 Star	t 🛛 🧭 🗍

2. A Welcome message will appear. Click Next to continue.



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3. A window will open stating the computer is ready to install the driver. Click on **Next** to continue.

	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.					
	< <u>B</u> ack <u>N</u> ext> <u>C</u> ancel					

4. A message will appear showing that the setup file is being installed.



5. A window will appear showing that the installation is completed. Click on **Finish** to end the installation.



6. The Moxa PC104 Communication Module Configuration Panel window will appear. Click on Add to add the CA-132/132I serial board to your computer.

Ioxa PC104 Communication Module Configuration Panel						
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number
Add		<u>R</u> emove				Property
		<u>о</u> к				Cancel

7. The Property window will open. Select CA132 Series/CA132I Series under Board Type.

oper	. <u>,</u>						
₿	oard Type		CA104	Series			•
R	✓ INT <u>V</u> ec	tor	CA104 CA132	Series			
ļr	iterrupt No		CA132	Series 10		•	
В	ase I/O Po	rt <u>A</u> ddr	ess [180		_	
	COM No	Bx F	IFO Triq.	TX FIF) Size	;	
Port	CONTRO						
1	COM3	56		64			
1	COM3 COM4	56 56		64			
1	COM3 COM4 COM18	56 56 56		64 64			
1	COM3 COM4	56 56		64			
	COM3 COM4 COM18	56 56 56		64 64			
1	COM3 COM4 COM18	56 56 56		64 64			
1	COM3 COM4 COM18	56 56 56		64 64			
1	COM3 COM4 COM18	56 56 56		64 64			
1	COM3 COM4 COM18	56 56 56		64 64		Port Setting	1

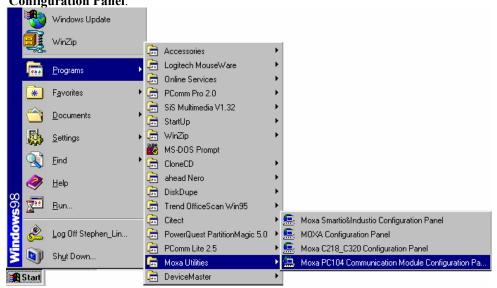
8. The **Property** window will show the COM port number to which the serial ports of CA-132/132I are assigned, and the default settings of the ports. Click **OK** to continue.

Proper	ty					×
E	oard Type		CA132	Series		•
F	✓ INT ⊻ecto	or	ſ	1C0	_	
ļ	nterrupt No.		F	10		-
E	ase I/O Por	: <u>A</u> ddres	ss [180		
Port			O Trig.		O Size	
1	COM3	56		64		
2	COM4	56		64		
						Port Setting
				<u>o</u> k		Cancel

9. The Moxa PC104 Communication Module Configuration Panel window will show the CA132/CA132I serial board you just added. Click OK to close the window.

oxa PCTU4 Comm	iunication Mo	baule Conri	gurac	ion Pa	anei		
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM	Number
				Dus	Dev		
CA132 Series	180	1C0	10			COM3	COM4
Add		Remove				Pror	perty
							,
		01/					
		<u>o</u> k				US US	ancel

10. To open the Moxa PC104 Communication Module Configuration Panel window, click on Start → Programs → Moxa Untilities → MOXA PC104 Communication Module Configuration Panel.



11. The Moxa PC104 Communication Module Configuration Panel window will open allowing you to see the CA132 Series/CA132I Series serial board you just added. You can click on **Property** to see and configure the information and settings of the board's COM ports.

Ioxa PC104 Communication Module Configuration Panel						
Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number
CA132 Series	180	1C0	10			COM3 COM4
		_	_		_	
			1			
<u>A</u> dd		Remove				Property
			_			
		<u>o</u> k				Cancel
		<u>∽</u>				

Removing the device

 If you wish to remove the device, follow steps 11 and 12 of Installing the driver. Click on Remove when the Moxa PC104 Communication Module Configuration Panel opens.
 Moxa PC104 Communication Module Configuration Panel

Board Type	I/O address	INT vector	IRQ	Bus	Dev	COM Number
CA132 Series	180	1C0	10			COM3 COM4
Add		Remove				Property
		<u>o</u> k				Cancel

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2. A warning message will appear asking you if you really want to remove this board. Click on **Yes** to remove the CA-132/132I serial board.



Uninstalling the driver

- 1. Click on Start \rightarrow Settings \rightarrow Control Panel.
- 2. Select Add/Remove Programs.

🗟 Control Pa	anel			_ [IX
<u> </u>	<u>V</u> iew <u>G</u> o	F <u>a</u> vorites <u>F</u>	<u>l</u> elp		
Back -	Forward	t_ Up	X Di Cut Copy	Paste	»
Address 🐼	Control Panel				•
			189	3	-
Add New Hardware	Add/Remove Programs	BDE Administrato	Date/Time	Display	
Aa	ø.	S			
Fonts	Game Controllers	Internet Options	Keyboard	Modems	
Logitech	52	₽Ŷ	-	%	
Mouse	Multimedia	Network	ODBC Data Sources (32bit)	Passwords	•
1 object(s) sele	cted		🛄 My Comp	outer	_//

Choose Install/Uninstall, select MOXA PC104 Communication Module Driver, and then click Add/Remove to uninstall the driver.

Add/Hemov	ve Programs Properties	1 4
Install/Unir	nstall Windows Setup Startup Disk	
Ð	To install a new program from a floppy disk od drive, click Install.	or CD-ROM
		nstall
3	The following software can be automatically Windows. To remove a program or to modify components, select it from the list and click Add/Remove.	
MOXA In MOXA P MOXA S Nero - B Partition PComm I PComm I	it Jet 4.0 Service Pack 4 ntellio Driver 'C104 Communication Module Driver 'martio/Industio Driver urning Rom (Web installer) Magic 5.0 Lite 2.5 Pro Ver 2.0 System Driver	
	Add	/ <u>R</u> emove
	OK Cancel	Apply

3. A message will appear asking you if you really want to remove the driver. Click **Yes** to uninstall the driver.

MOXA PC104	Communication Module Driver 🛛 🛛 🔀
Do you really w	ant to remove MOXA PC104 Communication Module Driver ?
	<u>Yes</u> <u>N</u> o

4. A message will prompt up confirming that the uninstallation of the driver is completed. Click **OK** to close the window.

MOXA PC104 Communication Module Driver 🛛 🛛 🕅
Remove M0XA PC104 Communication Module Driver complete !
[OK]

DOS

MOXA DOS API-232 is a software package that assists users to develop and/or debug programs for serial communications. This section will show you how to install the package, how to setup up the driver, and how to load or unload driver.

For details of the serial programming (API-232 Library) and utilities, please refer to the next chapter, "Serial Programming Tools".

Installing Driver

Run the installation program, DOSINST.EXE, in the DOS folder. Specify the target API-232 directory (e.g. C:\MOXA) where software driver will be copied. Press F2 to start the installation.

INSTALLATION RE-222	
Installation	
Target directory C: NHOXA ¥1: Help ¥2: Start installation	

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After installation is complete, you will be prompted to proceed running setup program. It is strongly recommended to do so.

Driver Setup

The following are steps for setting up the CA-132 Series(CA-132/CA-132I) driver. Note that it is not intended to illustrate all the convenient functions of the setup programs when configuring the boards. Please refer to the F1 on-line help instructions as running setup program.

- 1. Run the setup program, BIN\SETUP.EXE.
- 2. Please press **Enter** to select the proper model name, CA-132 Series. If you install CA-132I model, select CA-132I Series.



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3. You have to configure the Port No., I/O Address, IRQ and INT Vector properly. These settings **MUST** match up the hardware configuration of CA-132 or CA-132I.



4. You may press **PgDn** key to have advanced "Port setup". Now the configuration of the desired CA-132 Series board will be shown along with other default settings, such as port number, buffer size, etc.



Up to now you have completed the setup for **CA-132** Series board. You may skip this step and go directly to the next **step 4** if you need not change any setting or configure any board. You may now enter/modify each port's configuration. These displayed values are the port initial values as driver is loaded.

1		Po	rt S	letu	p			1
Port Number	81	02	03	04				
TxD buffer size	1K	1K	1K	1K	-		-	
RxD buffer size	1K	1K	1K	1 K		2 -		2=
Baud rate	9600	9600	9600	9600	-		-	
Character length	8	8	8	8	-			
Stop bits	1	1	1	1	-	-	-	-
Parity	None	None	None	None	-	-	-	-
OTR output state	On	On	On	0n	-			-
RTS output state	On	0n	On	On	-		-	
CTS flow control	No	No	No	No	-	-	—	-
RTS flow control	No	No	No	No	-	-	-	-
Tx XON/OFF entri	No	No	No	No	-	-	-	-
Rx XON/OFF entrl	No	No	No	No		-		-
¥1:	Help	NS: Gro	up edit	P10:	Save B	se: Abo	et	

Legend:

Some noticeable fields and functions are explained below.

Port number:This is actually the port ID of each port. The application software will refer to
the port by its port number (ID). Duplicated port number is not allowed. That
is, each MOXA serial port is referred to as port number in terms of serial
programming.You may map the port number range to the one you prefer between 0 and 127
as long as no port number overlapping condition or port number undefined
condition occurs. Generally, you should take the convenience of programming
into consideration when specifying the port numbers for the board.TxD buffer size:The transmission (output) buffer allocated in the system for each port.F5: Group Edit:This is a convenient function that helps you edit the configuration of several



Tab: Switch

Esc: Abort

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

Enter: Mit/select

F10: Update

Loading Driver

Having completed the setup, you can load the driver, "BIN\DPC-DRV.EXE", at the DOS prompt. The driver will detect the CA-132 Series board automatically. If the board(s) is(are) detected, a message similar to below will show:

(CA-132) PC/104 Communication Module DOS driver Version 1.0 Setup driver ... CA-132 series OK! Device driver setup O.K.

(CA-132I) PC/104 Communication Module DOS driver Version 1.0 Setup driver ... CA-132I series OK! Device driver setup O.K.

It means the CA-132 Series driver is installed properly. At this point, you are ready to execute application that supports API-232 functions, or start developing applications using API-232 library.

Unloading Driver

To unload (release) the CA-132 Series driver from memory, type "DPC-DRV/Q" at the DOS prompt.

Serial Programming Tool

Moxa supports a class of easy to use, yet powerful serial programming libraries and communication troubleshooting utilities under Windows NT/2000/XP/2003 and Windows 95/98/Me. Use these MOXA Serial Programming Tools to decrease your software development time. In the following sections, we describe the installation of the library, and the utilities supported for various programming platforms. *PComm*, a professional serial comm tool for PCs, is a software package that runs under Windows NT/2000/XP/2003 and Windows 95/98/Me. *PComm* provides:

- A powerful serial communication library for easy programming in the most popular programming languages. The serial communication library is useful for developing applications for data communications, remote access, data acquisition, and industrial control under Windows NT/2000/XP/2003 or Windows 95/98/Me. It is a simpler solution compared to the more complex Windows Win32 COMM API.
- Useful utilities such as diagnostic, monitor, and terminal emulator.
- Illustrative sample programs,
- Comprehensive on-line documentation.

The following topics are covered in this chapter:

- **D** PComm Installation
- **D** PComm Programming Library
- □ Utilities

PComm Installation

To install *PComm*, run \Setup.exe from the diskette enclosed in the package. Please note that the *PComm* diagnostic and monitor utilities are for MOXA boards only; these two utilities will not work with other manufacturer's serial boards.

PComm Programming Library

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

This serial communication library provides a complete function library and sample programs for Visual C++, Visual Basic, and Delphi. To view detailed function descriptions and sample programs, click on [Start] \rightarrow [Program] \rightarrow [PComm Lite] \rightarrow [PComm Lib Help], [PComm Porting Notes] or [PComm Programming Guide], or refer to the sample programs in the PComm directory.

Utilities

In this section, we give brief descriptions of each utility. For more information about these utilities, see the on-line help from the software diskette.

Diagnostic (for MOXA boards only)

A convenient diagnostic program, ONLY for MOXA boards and ports, provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, DTR/DCD, etc. It allows the user to check the function of both software and hardware.

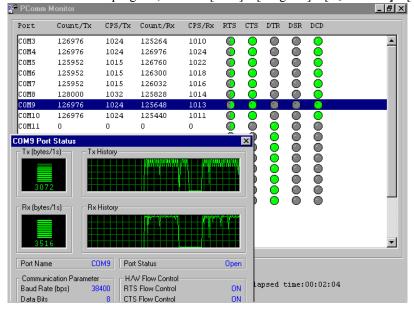
To run the Diagnostic program, click on [Start] \rightarrow [Program] \rightarrow [*PComm* Lite] \rightarrow [Diagnostic].

🙀 PComm Diagnostic		_ 8 ×
<u>File D</u> iagnose <u>H</u> elp		
e , 💌 💵 🎒		
To be tested	Test Report	
CP-104U Series (CDM9-CDM6)	CP-104U Series Dev#=11,Eus#=0,IR0=9,I/0=A800 Communication Parameter=38400,None,8,1 Driver Version:1.5.0 05 Version:Windows NT 5.0(Build:2195 Service Pack 3) Internal Loopback Test	
	(Tx/Px) [UART] COM3 (P1.) 0K 0K COM4 (P2.) 0K 0K COM5 (P3.) 0K 0K COM5 (P4.) 0K 0K IR0 Test IR0.9 0K	
X P	External Test (RS-232) PortA - PortB [Tx/Rx] [RTS/CTS] [DTR/DSR] [DTR/DCD] COM3 - COM4 OK OK OK OK OK COM5 - COM6 OK OK OK OK OK (Test Time : 01/24/03 17:15:30)	
Ready	-3	

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Monitor (for MOXA boards under Windows NT Only)

A useful port status monitoring program allows you to monitor data transmission of selected MOXA COM ports. It monitors data transmission/receiving throughput, and communication line status, with data updated and displayed on the screen at regular time intervals. Click on a specific port to see a graph of the current communication parameters and status of that port. To run the Monitor program, click on [Start] \rightarrow [Program] \rightarrow [*Pcomm* Lite] \rightarrow [Monitor].



Terminal Emulator

Terminal Emulator can be used to connect to various ports to see if data transmission is functioning correctly. Terminal Emulator features multi-windows, and supports VT100 and ANSI terminal types. You can transfer data interactively, send patterns periodically, and transfer files using ASCII, XMODEM, YMODEM, ZMODEM, and KERMIT protocols.

🙀 PComm Terminal - COM44,38400,None,8,1,Dumb Terminal _ 8 × File Edit Port Manager Port Window Help 🛃 🗔 🛃 🕺 🎥 🖼 🕾 Brk 🔜 8 - 🗆 🗵 ٠ mix386!login: root DTR Password: Welcome to SCO XENIX System V 🔀 COM44,38400,None,8,1,Dumb Terminal _ 🗆 × 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 🔺 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 You have mai DTR TERM = (ansi RTS 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 # 1c 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 .profile 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 bin boot 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcde fghij0123456789abcde fghij0123456789abcde fghij0123 0123456789abcde fghij0123456789abcde fghij0123456789abcde fghij0123 • State:0PEN CTS DS 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdefghij0123456789abcdefghij0123 0123456789abcdefghij0123456789abcdef • State:OPEN CTS DSR RT DCD

To run Terminal Emulator, click on [Start] \rightarrow [Program] \rightarrow [*PComm* Lite] \rightarrow [Terminal Emulator].

RS-485 Programming

If you intend to do RS-485 communication with CA-132/132I Series boards, please follow the RS-485 programming guide below and also refer to the chapter, "**Connection Cable and Cable Wiring**", for more RS-485 operation details.

The CA-132/132I Series supports **only 2-wire half-duplex RS-485 communication**. Data+/- pins are used for both data transmitting and receiving, depending on the mode selected: either **Automatic Data Direction Control** or **By RTS**.

By RTS Mode (For back-compatibility)

If the mode switch for the port is set to the **OFF** position, By RTS Mode is used. The port is ready for transmitting data if **RTS signal is asserted** and ready for receiving data if **RTS signal is not asserted**. **RTS** scheme is the traditional method, and is suitable for most systems, including Windows NT, Windows 95/98 and DOS, or even UNIX, that permits RTS control from application programs. This mode should be compatible with most existing RS-485 applications.

How to transmit and receive data for Windows NT, 95/98

We recommend you to configure CA-132/132I Series ports as follows in order to acquire precise timing control in RS-485 2-wire transmission. There are 2 solutions to control RS-485 2-wire transmission.

Solution 1

The following model is common in KS-485 2-wire transmission.		
<pre>sio_SetWriteTimeouts(port, 0)</pre>	/* Set sio_write() into block mode if for Windows	
	NT and Windows 95/98 */	
sio_RTS(port, 1)	/* Turn on RTS signal. The RS-485 port is ready for	
	transmitting data. */	
sio_write(port, buff, 10)	/* Write 10 byte characters in "buff". The function	
	blocks until last character transmitted */	
sio_RTS(port, 0)	/* Turn off RTS signal. The RS-485 port is ready for	
	receiving data. */	
sio_read(port, buff, 10)	/* Read 10 bytes */	

The following model is common in RS-485 2-wire transmission.

Solution 2

There is a dedicated RS-485 function in *PComm* library. It integrates the above functions of solution 1 regarding sending data as one.

<pre>sio_putb_x(port, buff, tick); /*</pre>	1. Turn on RTS and ready for transmitting data.
	2. Send data.
	3. Wait for tick time.
	4. Turn off RTS and ready for receiving data. */

For more information on these functions, please refer to *PComm* library on-line Help file for Windows NT and Windows 95/98 respectively.

A

Service Information

This appendix shows you how to contact Moxa for information about this and other products, and how to report problems.

In this appendix, we cover the following topics.

- **D** MOXA Internet Services
- Problem Report Form
- **D** Product Return Procedure

MOXA Internet Services

Customer satisfaction is our number one concern, and to ensure that customers receive the full benefit of our products, Moxa Internet Services has been set up to provide technical support, driver updates, product information, and user's manual updates.

The following services are provided

E-mail for technical support.....support@moxa.com.tw

World Wide Web (WWW) Site for product information:

.....<u>http://www.moxa.com</u>

Problem Report Form

MOXA CA-132/132I Series

Customer name:			
Company:			
Tel:	Fax:		
Email:	Date:		

1. Moxa Product: □ CA-132 □ CA-132I

2. Serial Number: _____

Problem Description: Please describe the symptoms of the problem as clearly as possible, including any error messages you see. A clearly written description of the problem will allow us to reproduce the symptoms, and expedite the repair of your product.

Product Return Procedure

For product repair, exchange, or refund, the customer must:

- Provide evidence of original purchase.
- Obtain a Product Return Agreement (PRA) from the sales representative or dealer.
- Fill out the Problem Report Form (PRF). Include as much detail as possible for a shorter product repair time.
- Carefully pack the product in an anti-static package, and send it, pre-paid, to the dealer. The PRA should be visible on the outside of the package, and include a description of the problem, along with the return address and telephone number of a technical contact.

Document Edition	Revision Date	Revision Details
2^{nd}	June 23, 2004	1. Updated the edition of this manual on the title page.
		2. Changed Moxa's new logo on the title page.
		 p.1-2 Changed power consumption. Added Regulatory Approvals.
		4. p.2-2 Changed block diagram.
		 p.2-6 Changed "Async Port 4-wire RS-422 Pin Assignment (RJ45)" to "Async Port 4-wire RS/422/485 Pin Assignment (RJ45)."

Revision History

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