MIC-3611/3611R

4-port RS-422/485 Communication Card w/ Surge & Isolation Protection/ Rear I/O Support

User Manual

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Part No. 2003361100 1st Edition

Printed in Taiwan May 2006

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Technical Support and Assistance

Step 1. Visit the Advantech web site at **www.advantech.com/support** where you can find the latest information about the product.

Step 2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- MIC-3611 series card
- Rear I/O module(for MIC-3611R only)
- DB44 cable(PN:1700440300)
- Industrial Communication Driver, Utility and CompactPCI communication card, user's manual in ICOM CD-ROM

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User's Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one of the following situations arises, get the equipment checked by service personnel:

a. The power cord or plug is damaged.

b. Liquid has penetrated into the equipment.

c. The equipment has been exposed to moisture.

d. The equipment does not work well, or you cannot get it to work according to the user's manual.

e. The equipment has been dropped and damaged.

f. The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

1. To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.

2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Contents

CHAPTER 1

General Information

Sections include:

- Introduction
- Features
- Specifications

Chapter 1 General Information

1.1 Introduction

The MIC-3611/3611R is a 3U,6U/3U sized 4-port RS-422/485 CompactPCI Comm. Card, serial communication cards which complies with PICMG 2.0 R2.1 CompactPCI specifications. All channels are addressed in a continuous 32 byte I/O block for simplified software access. All channels may also share one PCI interrupt. An interrupt status register is available for determining the interrupt source.

The MIC-3611/3611R comes standard with 16C954 UARTs containing 128 byte FIFOs which are available as an option. These upgraded FIFOs greatly reduce CPU overhead and are an ideal choice for heavy multitasking environments.

1.2 Features

- PCI Specification 2.1x compliant
- Speeds up to 921.6 Kbps
- 16C954 UARTs with 128-byte standard
- Standard Industrial 3U/6U sized CPCI Board size
- I/O address automatically assigned by PCI Plug-and-Play
- OS supported: Windows 98/ NT/ 2000/ XP
- Surge protection ($2500V_{DC}$).
- Interrupt status register for increased performance
- Space reserved for termination resistors (for RS-422/485)
- Automatic RS-485 data flow control
- Isolation protection 2500Vdc
- Rear I/O (MIC-3611R only)

1.3 Specifications

- **Bus Interface:** CPCI bus specification 2.1x compliant
- **Bus Controller:** PLX9030
- **Communication Controller:** 16C954

• **IRQ:** All ports use the same IRQ assigned by PCI Plug-and-Play

• **Data Bits:** 5, 6, 7, 8

• **Stop Bits:** 1, 1.5, 2

• **Parity:** None, Even, Odd

• **Speed (bps):** 50 ~ 921.6 K

• **Data Signals:**

TX+, TX-, RX+, RX-, RTS+, RTS-, CTS+, CTS-, GND (for RS-422)

DATA+, DATA-, GND (for RS-485)

• **Power Consumption:** +5V @ 716mA

• **Dimensions:** 160 x 100 mm

• **Operating temperature:** 0 ~ 70 (referring to IEC68-2-1, 2)

• **Operating Humidity:** 5 ~ 95% Relative Humidity,
non-condensing (referring to IEC 68-2-1, 2)

• **Operating Humidity:** 5 ~ 95% Relative Humidity,
non-condensing (referring to IEC 68-2-3)

• **Storage Temperature:** -20 ~ 80° C

CHAPTER 2

Software Installation

This chapter shows how to install the driver and Advantech Device Manager.

Sections include:

- Device Manager Installation
- Driver Installation

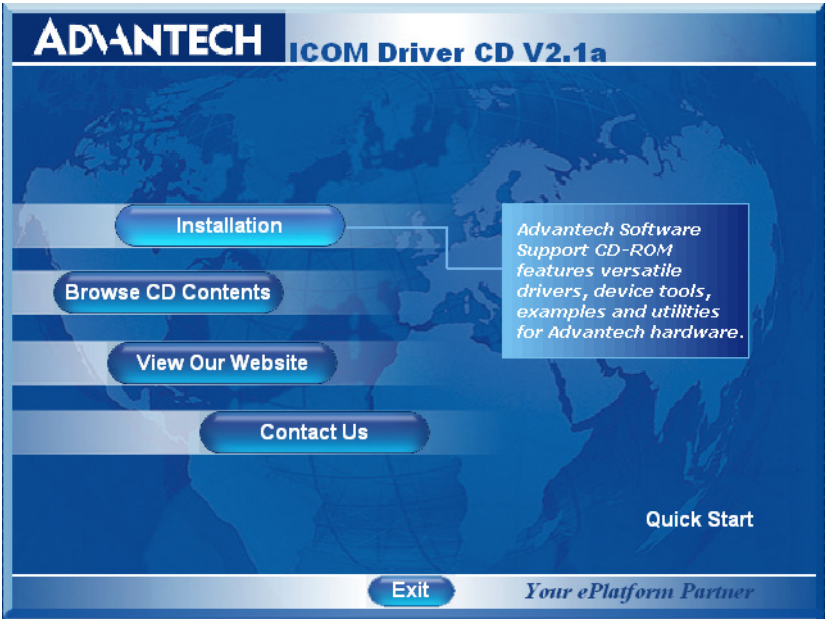
Chapter 2 Software Installation

2.1 Device Manager Installation

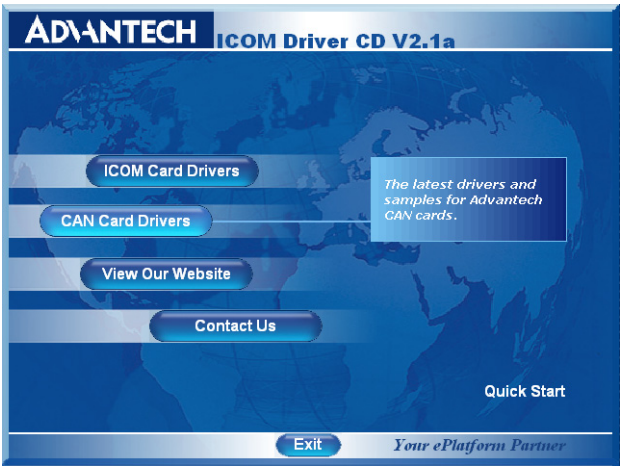
Advantech Device Manager is a software program that allows you to configure your hardware and store the settings in your Windows registry. You must install the Advantech Device Manager if you want to add and manage Advantech cards.

Please follow the steps below to install Advantech Device Manager.

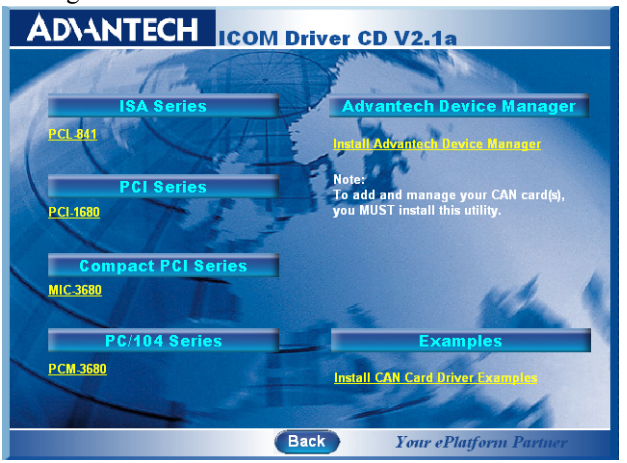
1. Click **Installation** to start installation.



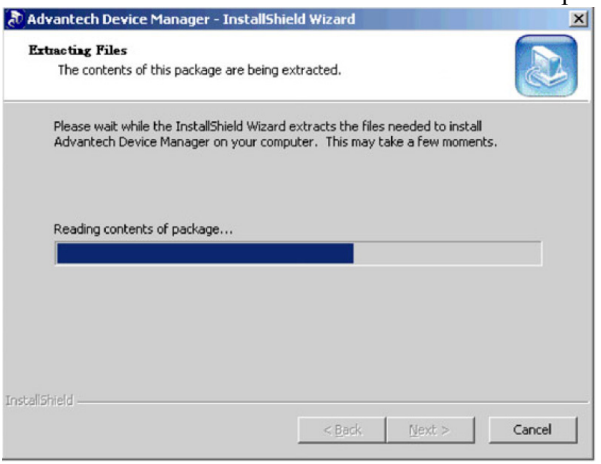
2. Click **ICOM Card Drivers** to enter ICOM card selection

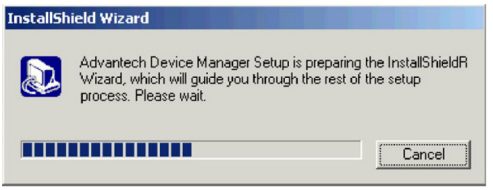


3. Click **Advantech Device Manager** to install Advantech Device Manager.

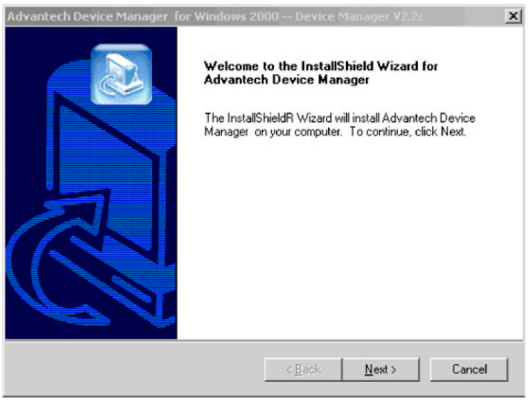


4. The InstallShield Wizard will initiate the installation process.

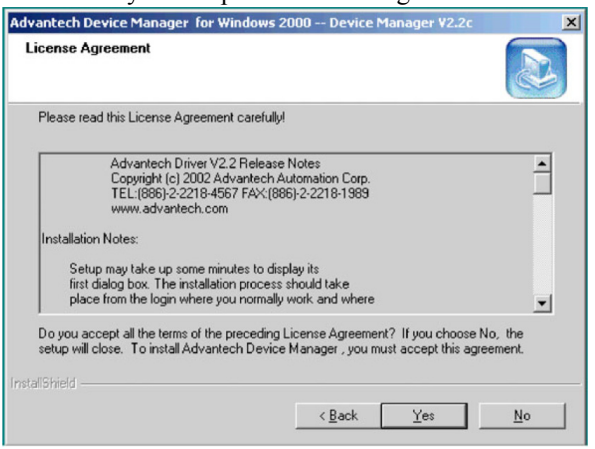




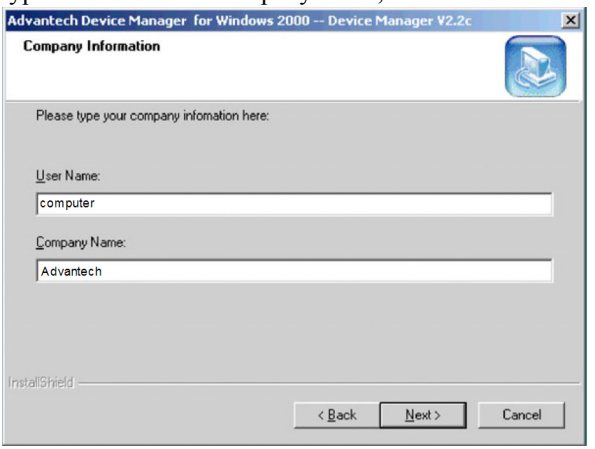
5. Click **Next** to start the installation process.



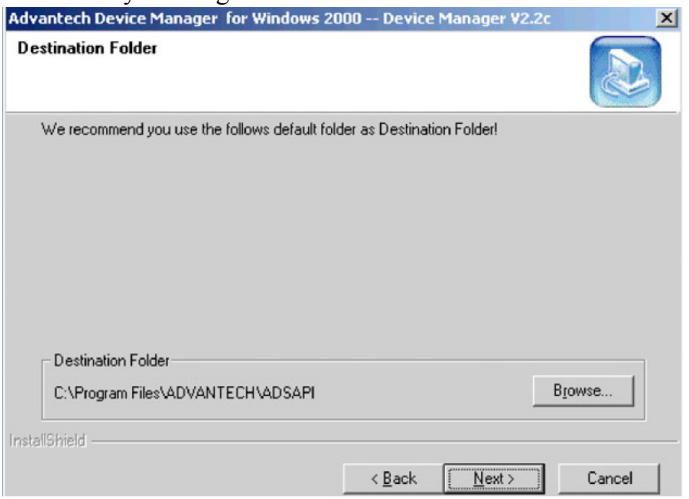
6. Click **Yes** if you accept the License Agreement.



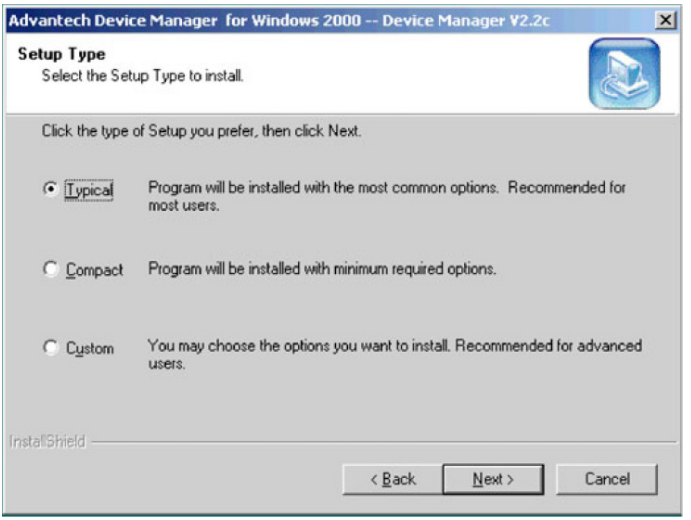
7. Type user name and company name, and then click **Next**.



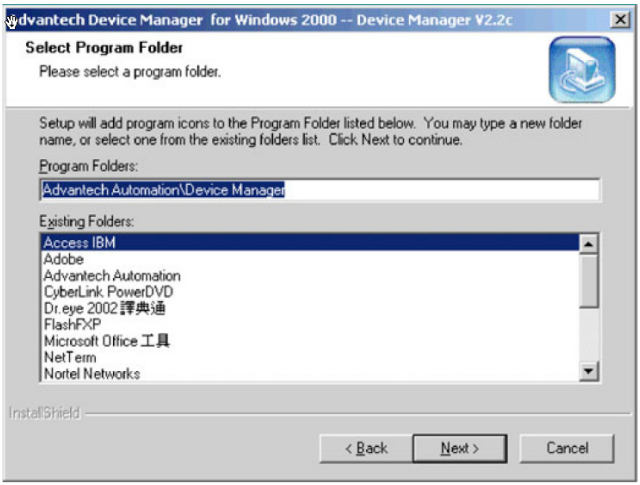
8. Click **Next** to accept the default installation folder, or specify a folder by clicking **Browse**.



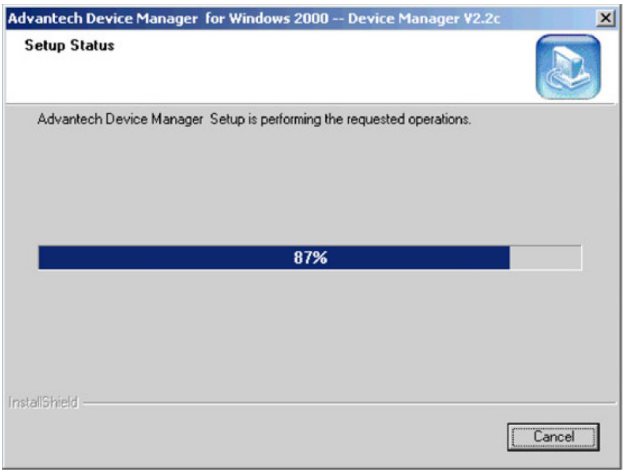
9. Choose the type of setup you prefer, and then click **Next**.



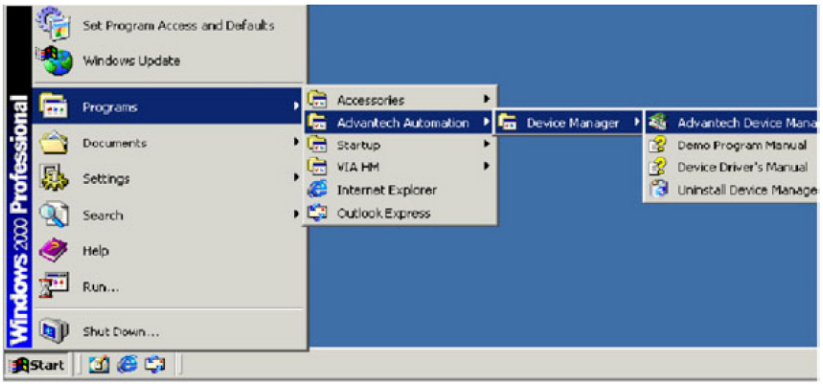
10. Setup will add program icons to the default program folder. You may type a new folder name, or select one from the existing folder list. Click **Next** to continue.



11. Click **Back** to review or change your settings. Click **Next**, and the installation program will copy the files to your computer to finish the installation process.



12. You can see that shortcuts were added to your Windows Start Menu.

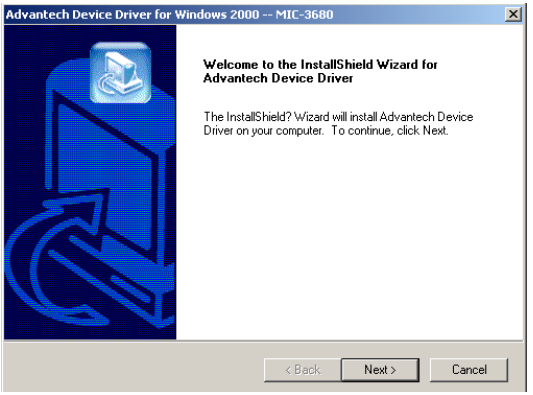


13. After the physical hardware has been installed, execute Advantech Device Manager to see MIC-3611/3611R in both Installed Devices & Supported Devices windows. Click **Setup** for each port setting.

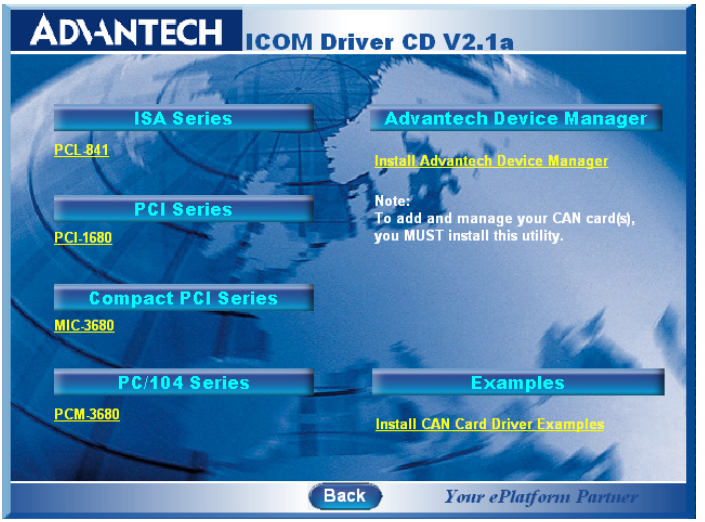
2.2 Driver Installation

Please follow the steps below for the MIC-3611/3611R driver installation.

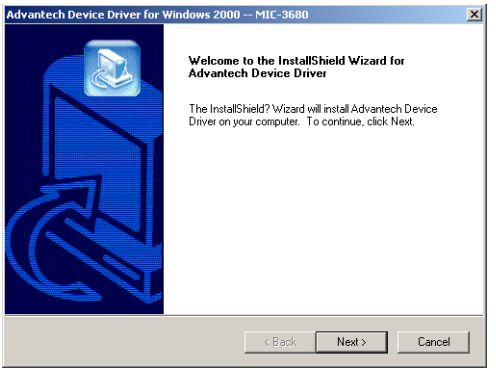
1. Insert your companion CD-ROM disc into your CD-ROM drive.
2. The driver setup program will be launched automatically. If the auto-play function is not enabled on your system, use Windows Explorer or the Windows Run command to execute **autorun.exe** on the companion CD-ROM.
3. Click **Installation** to start installation.



4. Click **ICOM Card Drivers** to enter the ICOM selection screen.
5. Choose the card you want to install (MIC-3611/3611R), and then click the hyperlink.



6. Click **Next**, and the Advantech Device Driver will be automatically installed on your computer.



7. After the physical hardware has been installed, the card will be automatically detected.

CHAPTER 3

Hardware Configuration

Sections include:

- Initial Inspection
- Hardware Installation
- I/O Address and Interrupt Setup
- Board Layout: Dimensions
- Jumper Settings

Chapter 3 Hardware Configuration

This chapter gives users a package item checklist, proper instructions about unpacking and step-by-step procedures for card installation.

3.1 Initial Inspection

In addition to this manual, you should find the following items inside the shipping package of the MIC-3611/3611R:

- CPCI Communication Interface Card
- Advantech Automation Software CD-ROM
- CPCI Communication Card User's Manual
- Wiring Cable

We have carefully inspected the CPCI communication card series before shipping. It should be free of marks & scratches, and in perfect working order on receipt. As you unpack the unit, check it for signs of shipping damage (damaged box, scratches, dents, etc.). If it is damaged, or it fails to meet specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection we will make arrangements to repair or replace the unit.

When you handle the CPCI communication card series, remove it from its protective packaging by grasping the rear metal panel. Keep the anti-vibration packaging. Whenever you remove the card from the PC, store it in this package for protection.

Note: *Discharge your static electric charge by touching the back of the grounded chassis of the system unit (metal) before handling the board. Avoid contact with materials that hold a static charge, such as plastic, vinyl and styrofoam. Handle the board only by its edges to avoid static damage to its integrated circuits. Avoid touching the exposed circuit connectors. We also recommend that you use a grounded wrist strap and place the card on a static dissipative mat whenever you work with it.*

3.2 Hardware Installation

Note: *Make sure you have installed the driver first before installing the card (please refer to the software installation in Chapter 3.*

When you install the MIC-3611/3611R Card, be sure the DLL driver of the MIC-3611/3611R installation is complete, you can now go on to install the MIC-3611/3611R card in your CPCI computer. But it is suggested that you should refer to the computer user manual or related documentation if you have any doubt. Please follow the steps below to install the card on your system.

To install a card:

Step 1: Remove one cover on the unused slot of your CPCI computer.

Step 2: Hold the Card Vertically. Be sure that the card is pointing in the correct direction. The components of the card should be pointing to the right-hand side and the black handle of the card should be pointing to lower edge of the chassis.

Step 3: Holding the lower handle, pull the handle down to unlock it.

Step 4: Insert the MIC-3611/3611R card into the CPCI chassis carefully by sliding the lower edges of the card into the card guides.

Step 5: Please push the card into slot gently by sliding the card along the card guide until J1 meets the long needle on the backplane.

Note*:* *If your card is correctly positioned and has been slid all the way into the chassis, the handle should match the rectangular holes. If not, remove the card from the card guide and repeat step 3 again. Do not try to install a card by forcing it into the chassis.*

Step 6: Push the card into the right place, secure the card by pushing the handle on to lock it into place.

Note: *The Blue LED on the front panel details the installation status of the card while the system is on.*

In **Step 5,** when J1 meets the long needle on the backplane, **Blue LED** will light; after **Step 6**, the system can configure the card automatically, and the **Blue LED** is turned off when the system finished the device configuration.

If the system power is off, you can install the card step by step without attending **Blue LED's** state.

To remove a card:

Step 1: Push the handle down to unlock the card, then the CPCI system will automatically uninstall the card configuration.

Step 2: Once the system finished the device configuration, the **Blue LED** on the front panel will turn on. Now you can slide the card out.

Note: *Because of the "Hot-Swap", the above steps detail the card removal process while the system is on.*

If the system power is off, please follow **step1** and **step2** and disregard the status of the **Blue LED**.

3.3 I/O Address and Interrupt Setup

Base Address Setting

When the MIC-3611/3611R is installed in the system or if the machine is first turned on, the configuration software must scan the various buses in the system. If the software locates the MIC-3611/3611R, the system will configure the device based on the parameters of the PCI device configuration registers, including the I/O base address, I/O range, memory base address, memory range, and so forth. The I/O base address is the base address on the four ports of the MIC-3611/3611R card. The four ports address and interrupt register setting are as shown:

Base Address Setting	
CH 1	Base Add. + 00H
CH 2	Base Add. + 08H
CH 3	Base Add. + 10H
CH 4	Base Add. + 18H

3.4 Board Layout: Dimensions

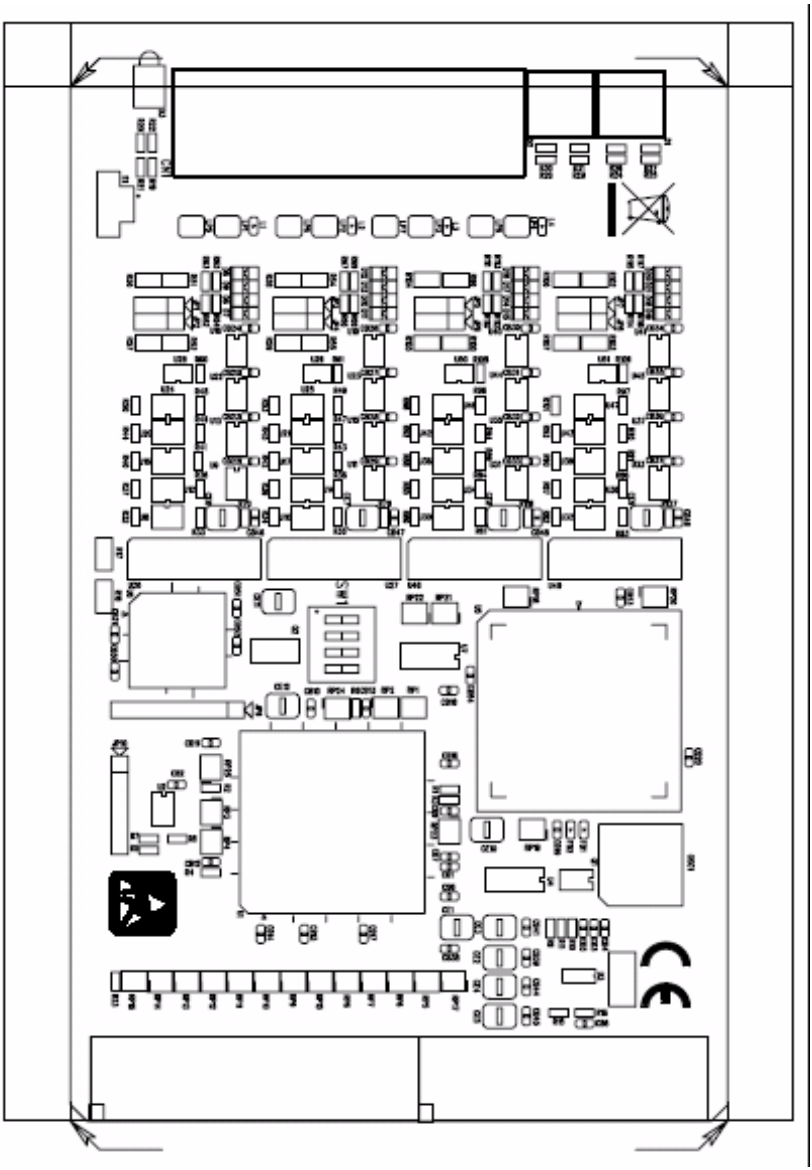


Figure 3.1: MIC-3611 Board Layout

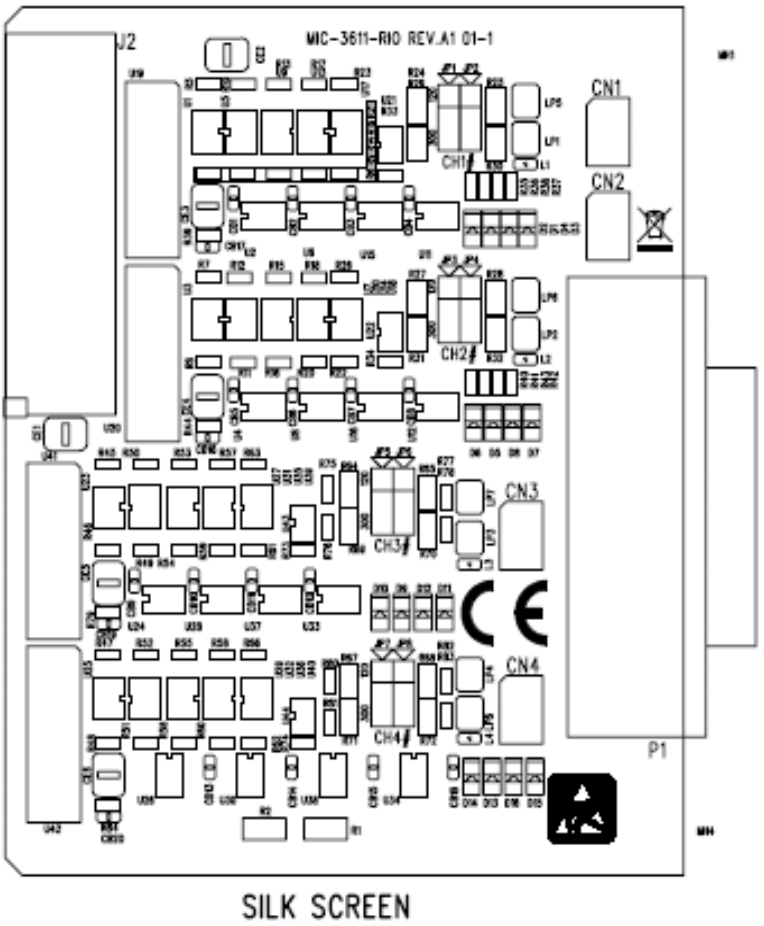


Figure 3.2: Rear I/O Module Board Layout

3.5 Jumper Settings

How To Set Jumpers

You configure your card to match the needs of your application by setting the jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3. You may find a pair of needle-nose pliers for setting the jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

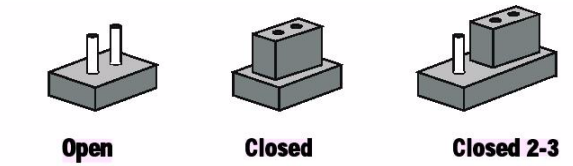


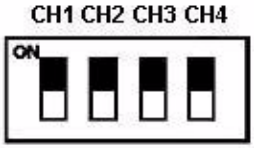
Figure 3.3: Jumper setting example

DIP switch S1 have to switch to “AUTO” for RS-485 mode

	CH1	CH2	CH3	CH4
ON	ON	ON	ON	ON
OFF	AUTO	AUTO	AUTO	AUTO

RS-422 Master mode

For RS-422 Master mode, DIP switch S1 will have to be “ON”

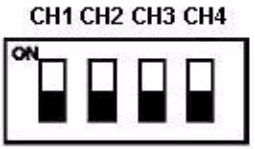


	CH1	CH2	CH3	CH4
ON	ON	ON	ON	ON
AUTO	AUTO	AUTO	AUTO	AUTO

RS-422 Slave mode

For RS-422 Slave mode, DIP switch S1 will have to be switched to "AUTO"

	CH1	CH2	CH3	CH4
ON	ON	ON	ON	ON
AUTO	AUTO	AUTO	AUTO	AUTO



Terminator Resistor Setup (Both MIC-3611 & MIC-3611RIO)

- JP1,JP3,JP5,JP7 (RS485)
- JP2,JP4,JP6,JP8 (For RS422)

In the RS485/422 mode, you can install terminator resistors to match line impedance. For each signal line Tx (Data), Rx will have to be a separate resistor 120 or 300. For more details about jumper locations please refer to Figure 2-1.

The terminator resistors is 120 when the top pin and middle pin are connected.

The terminator resistors is 300 when the bottom pin and middle pin are connected.

CHAPTER 4

Pin Assignments & Wiring

Sections include:

- Overview

Chapter 4 Pin Assignments & Wiring

4.1 Overview

RS-485 Mode

The MIC-3611/3611R has 4 RS-485 ports. The following lists the pin assignments for the DB44 connectors on the bracket. You may copy the octopus cable for DB44 to 4 x DB9 with these output pin.

Refer to Figure 4-1

DATA#+ = TX#+

DATA#- = TX#-

Table 4.1: DB44 Connector Pin Assignment: RS-485

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
2	DATA0+	31	DATA0-	33	GND
6	DATA1+	35	DATA1-	37	GND
10	DATA2+	39	DATA2-	41	GND
14	DATA3+	42	DATA3-	44	GND

Table 4.2: RS-485 Mode DB9P Male Connector

Signal	Name	Pin#
GND	Ground	5
DATA-	Transmit Data	1
DATA+	Data Terminal Ready	2

RS-422

MIC-3611/3611R has 4 RS-422 ports. The following lists the pin assignments of the DB44 connector on the bracket. You may fabricate octopus cable for DB44 to 4 x DB9 with these output pin.

Table 4.3: DB44 Connector Pin Assignment: RS-422

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
2	TX0+	3	RTS0+	33	GND
31	TX0-	18	RTS0-		
1	RX0+	16	CTS0+		
17	RX0-	32	CTS0-		
6	TX1+	7	RTS1+	37	GND
35	TX1-	22	RTS1-		
5	RX1+	20	CTS1+		
21	RX1-	36	CTS1-		
10	TX2+	11	RTS2+	41	GND
39	TX2-	26	RTS2-		
9	RX2+	24	CTS2+		
25	RX2-	40	CTS2-		
14	TX3+	15	RTS3+	44	GND
42	TX3-	30	RTS3-		
13	RX3+	28	CTS3+		
29	RX3-	43	CTS3-		

Table 4.4: RS-422 Mode DB9 Male Connectors		
Signal	**Name**	**Pin#**
GND	Ground	5
TX+	Transmit Data+	2
TX-	Transmit Data-	1
RX+	Receive Data+	3
RX-	Receive Data-	4
RTS+	Request To Send+	7
RTS-	Request To Send-	6
CTS+	Clear To Send+	8
CTS-	Clear To Send-	9

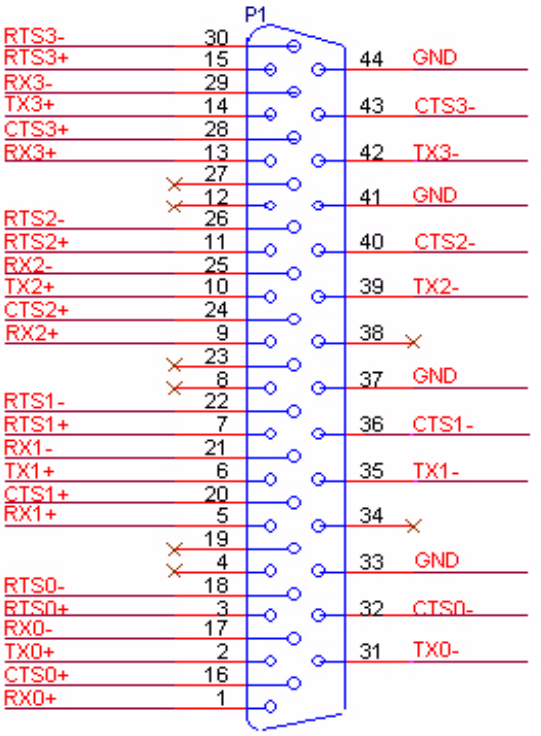


Figure 4.1: DB44 Connector RS-422 Mode

CHAPTER 5

Register Structure

Sections include:

- Overview

Chapter 5 Register Structure

5.1 Overview

This chapter gives short descriptions of each of the module's registers. For more information please refer to the data book for the OX16C954 UART chip.

All registers are one byte. Bit 0 is the least significant bit, and bit 7 is the most significant bit. The address of each register is specified as an offset from the port base address (BASE).

DLAB is the "Divisor Latch Access Bit, bit 7 of BASE+3.

BASE+0 Receiver buffer register when DLAB=0 (read operation).

BASE+0 Transmitter holding register when DLAB=0 (write operation)

BASE+0 Divisor latch bits 0 - 7 when DLAB=1.

BASE+1 Divisor latch bits 8 - 15 when DLAB=1

The two bytes BASE+0 and BASE+1 together form a 16-bit number, the divisor, which determines the baud rate together with the values of TCR and CPR and Bit7 of MCR (Modem Control Register) (refer to 16C954 datasheet). The formula to set BaudRate as follows:

$$BaudRate = \frac{InputClock}{SC * Divisor * prescaler}$$

SC is sample clock value defined by TCR, when TCR=0x00, ***SC*** =16.

Prescaler is defined by MCR[7] and CPR.

Prescaler = 1 when MCR[7] = '0';

Prescaler = M+(N / 8), when MCR[7] ='1',

where: M = CPR[7:3] (Integer part – 1 to 31)

N = CPR[2:0] (Fractional part – 0.000 to 0.875)

While Bit7 of MCR is Logic"1", TCR=0x00 and CPR=0x40, set the divisor as follows:

Baudrate	Divisor	Baudrate	Divisor
50	2304	3600	32
75	1536	4800	24
150	768	7200	16
300	384	9600	12
600	192	19200	6
1200	96	38400	3
1800	64	57600	2
2400	48	115200	1

While Bit7 of MCR is Logic"0", TCR=0x00, set the divisor as follows:

Baudrate	Divisor
230400	4
307200	3
460800	2
921600	1

BASE+1 Interrupt Enable Register (IER) when DLAB=0

Bit0 Enables received-data-available interrupt

Bit1 Enables transmitter-holding-register-empty interrupt

Bit2 Enables receiver-line-status interrupt

Bit3 Enables modem-status interrupt

Register Mode	650/950 Mode	550/750 Mode
Bit4	Sleep mode	
Bit5	Special Char detect	Alternate sleep mode
Bit6	CTS Interrupt mask	Unused
Bit7	RTS Interrupt Mask	

BASE+2 (read) Interrupt status register (ISR)

Register	ISR
Bit0	Interrupt pending
Bit1	Interrupt priority (All modes)
Bit2	
Bit3	
Bit4	Interrupt priority (Enhanced mode)
Bit5	
Bit6	FIFOs enabled
Bit7	

Level	Interrupt source	ISR[5:0] see note 3
-	No interrupt pending [1]	000001
1	Receiver status error **or** Address-bit detected in 9-bit mode	000110
2a	Receiver data available	000100
2b	Receiver time-out	001100
3	Transmitter THR empty	000010
4	Modem status change	000000
5 [2]	In-band flow control XOFF **or** Special character (XOFF2) **or** Special character 1, 2, 3 or 4 **or** bit 9 set in 9-bit mode	010000
6 [2]	CTS or RTS change of state	100000

Note1: *ISR[0] indicates whether any interrupts are pending.*

Note2: *Interrupts of priority levels 5 and 6 cannot occur unless the UART is in Enhanced mode.*

Note3: *ISR[5] is only used in 650 & 950 modes. In 750 mode, it is '0' when FIFO size is 16 and '1' when FIFO size is 128. In all other modes it is permanently set to 0*

BASE+2 (write) FIFO Control Register (FCR)

Bit0 Enables transmit and receive FIFO

Bit1 Clears contents of receive FIFO

Bit2 Clears contents of transmit FIFO

Bits6-7 Sets trigger level for receiver FIFO interrupt.

Bit 7	Bit 6	FIFO Trigger Level
0	0	16
0	1	32
1	0	112
1	1	120

BASE+3 Line Control Register (LCR)

Bit 0 Word length select bit 0

Bit 1 Word length select bit 1

Bit 2 Number of stop bits

Bit 3 Parity enable

Bit 4 odd/even parity select

Bit 5 Force parity

Bit 6 Tx break

Bit 7 Divisor Latch Access Bit (DLAB)

Bit 1	Bit 0	Word Length(bits)
0	0	5
0	1	6
1	0	7
1	1	8

BASE+4 Modem Control Register (MCR)

Bit 0 DTR

Bit 1 RTS

Bit 3 Interrupt enable by software

Bit 7 Baud prescale select

BASE+5 Line Status Register (LSR)

Bit 0 Receiver data ready

Bit 1 Overrun error

Bit 2 Parity error

Bit 3 Framing error

Bit 4 Breaks interrupt

Bit 5 Transmitter holding register empty

Bit 6 Transmitter shift register empty

Bit 7 At least one parity, framing, or break error on FIFO

BASE+6 Modem Status Register (MSR)

Bit 0 Delta CTS

Bit 1 Delta DSR

Bit 2 Trailing edge ring indicator

Bit 3 Delta received line signal detect

Bit 4 CTS

Bit 5 DSR

Bit 6 RI

Bit 7 DCD

BASE+7 Temporary data register and indexed control

Register offset value bits

Register To Select Auto 485 Mode

Each UART in OX16c954 has one ACR register (Additional control register), **Bits [4:3]** in which it is used to set auto 485 mode with hardware circuit of MIC-3611/3611R. The ACR register is one register located at offset 0x00 of the 16c954's Indexed Control Register. Set "11" to **Bits[4:3]** of this register to select auto 485 mode and "00" to select compatible with 16C450, 16C550,16C650 and 16C750. For more information on configuring the ACR, please refer to the data sheet of OX16C954 UART chip.