

User Manual

USB-4600 Series

**2/4-port RS-232/422/485 to USB
Converters with ESD Surge
Protection**

ADVANTECH

eAutomation

Copyright

The documentation and the software included with this product are copyrighted 2006 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties, which may result from its use.

Acknowledgements

Intel and Pentium are trademarks of Intel Corporation.

Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

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 merchandise 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.

Part No. XXXXXXXXXXXX

Printed in Taiwan

Edition 1

May 2009

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.

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.

Technical Support and Assistance

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

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User 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:
 15. The power cord or plug is damaged.
 16. Liquid has penetrated into the equipment.
 17. The equipment has been exposed to moisture.
 18. The equipment does not work well, or you cannot get it to work according to the user's manual.
 19. The equipment has been dropped and damaged.
 20. The equipment has obvious signs of breakage.
21. **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.**
22. **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.**
23. 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.

| | | |
|------------------|--|-----------|
| Chapter 1 | Introduction..... | 1 |
| 1.1 | Overview | 2 |
| 1.2 | Features | 2 |
| 1.3 | Specifications | 2 |
| 1.3.1 | General | 2 |
| 1.3.2 | Insert..... | 2 |
| 1.3.3 | Communications | 2 |
| 1.3.4 | Mechanism..... | 3 |
| 1.3.5 | Protection..... | 3 |
| 1.3.6 | Software..... | 3 |
| 1.3.7 | Environment..... | 3 |
| 1.4 | Dimensions | 3 |
| Chapter 2 | Installation..... | 5 |
| 2.1 | Driver Installation | 6 |
| 2.1.1 | Steps for Driver Setup..... | 6 |
| 2.2 | Hardware Installation | 8 |
| 2.3 | Verifying Driver Setup | 9 |
| 2.4 | Limitations | 10 |
| 2.5 | Unplugging the Converters | 10 |
| 2.6 | Updating the Drivers | 10 |
| 2.7 | Uninstalling the Drivers | 11 |
| Chapter 3 | Settings | 13 |
| 3.1 | Serial Configuration..... | 14 |
| 3.2 | Changing the Port Number | 15 |
| Chapter 4 | Signal Connection | 17 |
| 4.1 | Pin Assignment | 18 |
| 4.2 | LED Status | 18 |
| | Table 4.1: LED Indicator Status Description..... | 18 |

Chapter 1

Introduction

1.1 Overview

Advantech's USB-4600 Series of serial to USB converters are the easiest, the most reliable way to add serial ports to a PC. To attach the USB-4602B/4602BM/4604B/4604BM to a PC, you don't need to open the chassis or power down your PC. After installing the driver, connect the USB converters to your computer, will instantly get extra high-speed RS-232/422/485 ports. By simply plugging in a USB-hub, USB-4600 series eliminate the configuration issues associated with high-priced, elder card solutions. You only have to install the driver, no need to set cards slot, IRQ addresses, or device addresses. This reduces programming effort.

USB-4600 series products are compliant with USB 2.0 and 1.1 specifications, and up to 480M bps high-speed requirement. USB-4600 series supports for transmission speeds up to 921.6k bps, which meets the demand for high speed data exchange.

1.2 Features

USB-4600 Series products have the following features:

- Full compliance with USB V1.1 and V2.0 specifications.
- RS-232/422/485 port supported
- Serial Transmission speed up to 921.6 kbps
- Automatic RS-485 data flow control
- No external power supply necessary; the hub derives its power from USB port
- Plug & Play installation
- No additional IRQs or I/O ports required
- Hot swap function supported

1.3 Specifications

1.3.1 General

- Certifications CE, FCC
- Connectors 1 x USB Type B (Type A to Type B cable provided)
2 x DB9
- Enclosure ABS+PS
- USB Cable Max. 15ft (4.6 m)
- Mounting DIN 35 rail, stack, wall

1.3.2 Insert

- Power Input 10 to 48 VDC (external) or 5 VDC (Bus Power)
- Power Consumption 100 mA @ 5 V (Typical)
150 mA @ 5 V (Max.)

1.3.3 Communications

- Data Bits 5, 6, 7, 8
- Parity Bits Odd, even, none, space, mark
- Stop Bits 1, 1.5, 2
- Transmission Speed Up to 921.6 kbps

1.3.4 Mechanism

- Dimensions 132 x 80 x 32 mm
- Enclosure ABS+PC
- Mounting DIN-rail, panel

1.3.5 Protection

- EFT Protection 2,500 VDC
- ESD Surge Protection IC Embedded 16KV

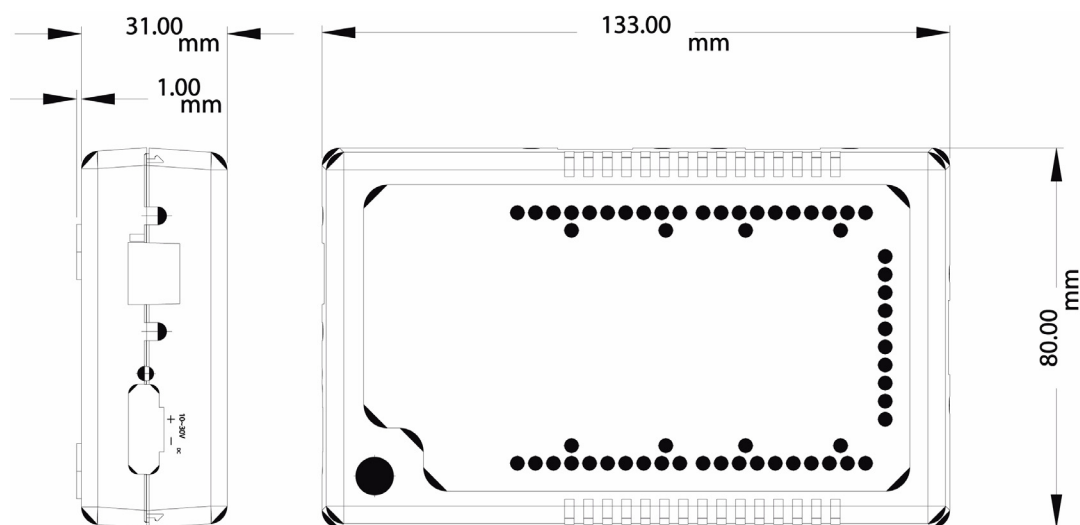
1.3.6 Software

- Driver Support Windows 2000/XP/2003

1.3.7 Environment

- Operating Temperature 0 ~ 55° C (32 ~ 131° F)
- Storage Temperature -25 ~ 80° C (-13 ~ 176° F)
- Operating Humidity 20 ~ 95% (non-condensing)
- Storage Humidity 5 ~ 95% (non-condensing)

1.4 Dimensions



Chapter 2

Installation

2.1 Driver Installation

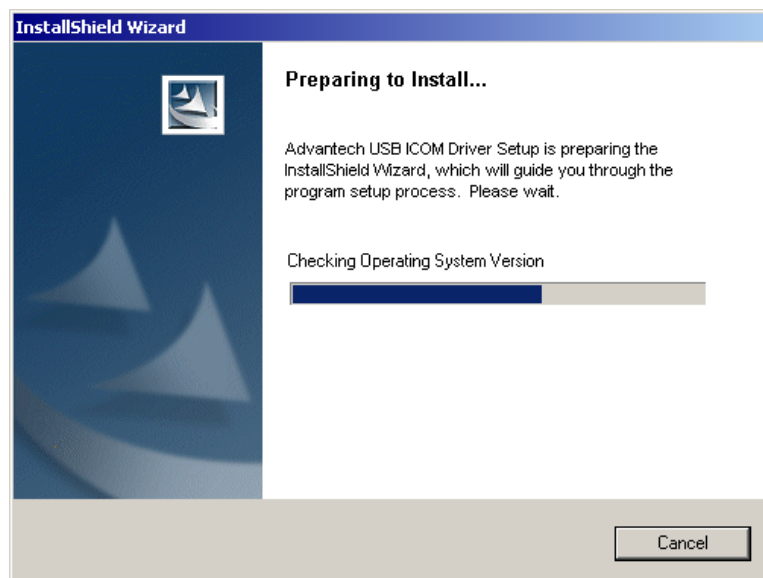
We strongly recommend you install the driver before you insert the USB-4600 Series into USB port of your PC, since this will guarantee a smooth installation process.

2.1.1 Steps for Driver Setup

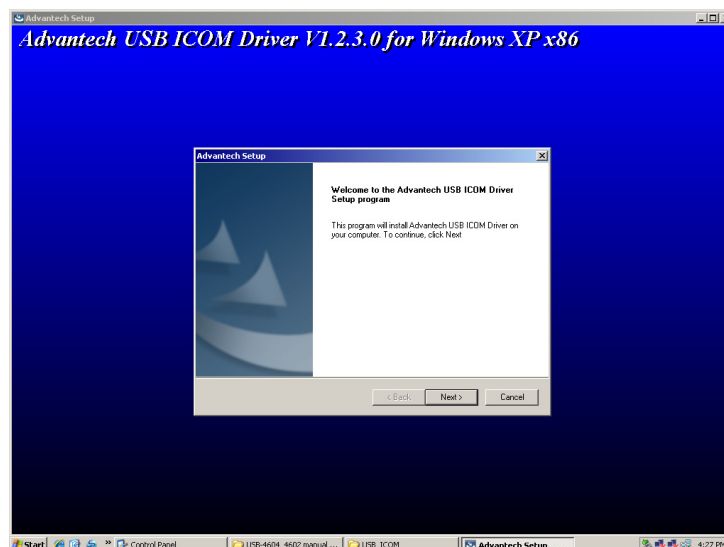
1. Insert your companion CD-ROM disc into your CD-ROM drive and double clicking the small icon on the companion CD



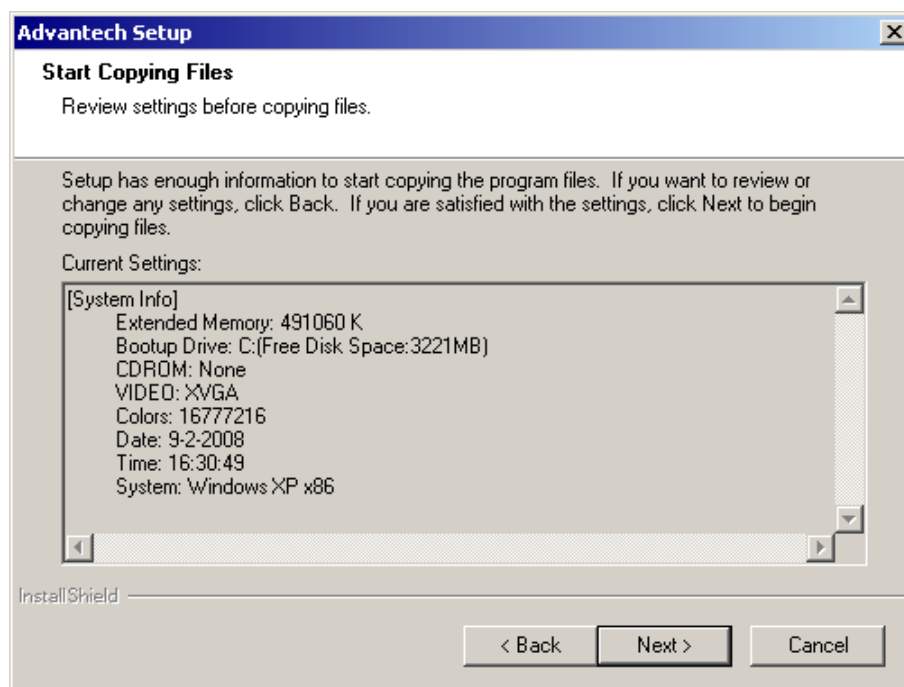
2. After executing the USB_ICOM.exe, the InstallShield Wizard starts to install the driver.



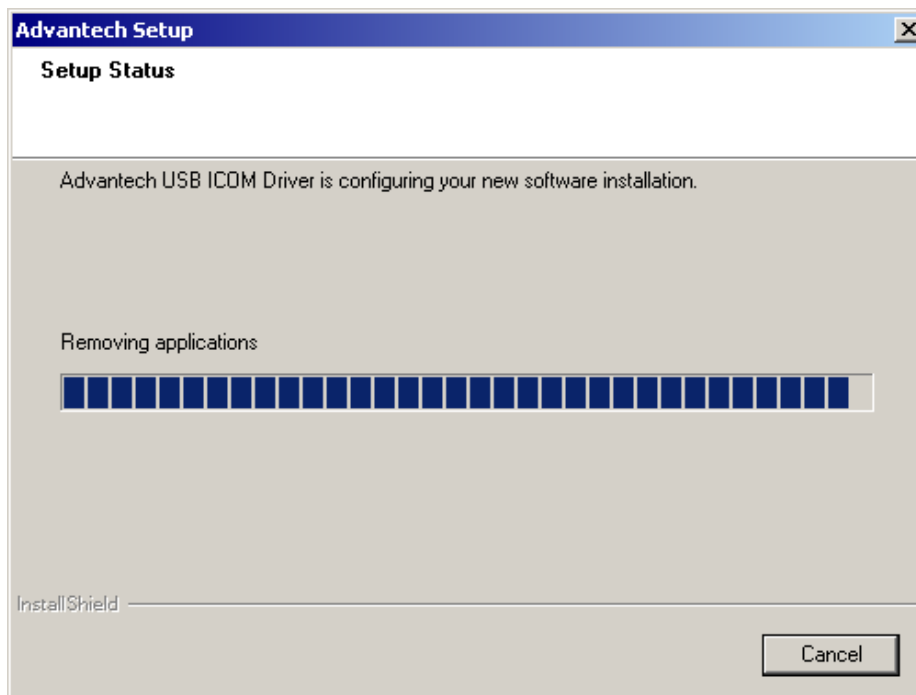
3. Click "Next" to start



- The computer reports that the system has enough memory to install and click "Next" to Continue.



- Then the driver installation is done.



After the installation, you will find the readme.htm in the following path.
C:\Program Files\Advantech\ICOM\USB ICOM\Readme\Readme.htm

There are some FAQs about how to install / uninstall / configure the module.

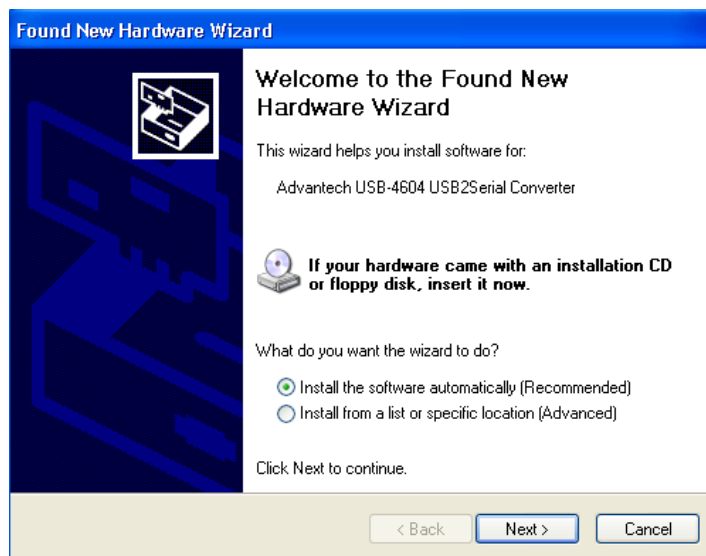
2.2 Hardware Installation

When the USB-4600 Series plug into the USB port, the Found New Hardware Wizard would show up. Through the Wizard, the module could be installed step by step.

1. Windows will automatically detect the USB devices and try to install the driver.



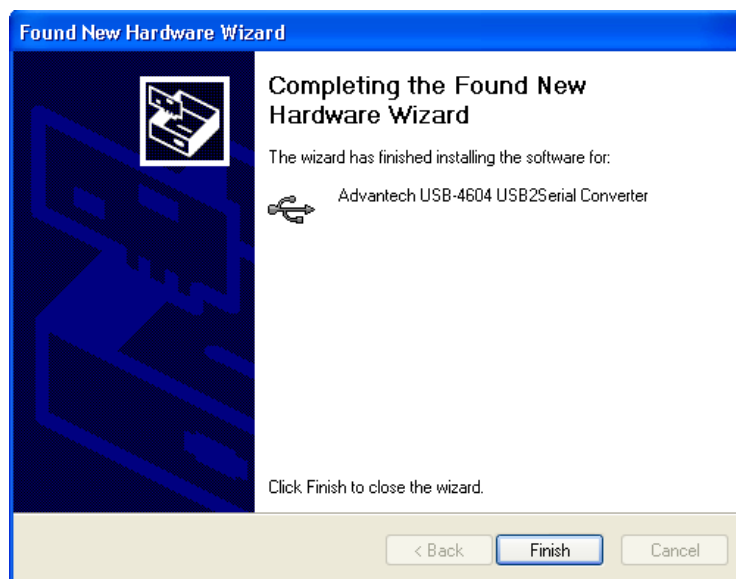
2. Select to Install the software automatically and click "Next."



3. The driver detects the Advantech USB Serial Port and click "Continue Anyway."



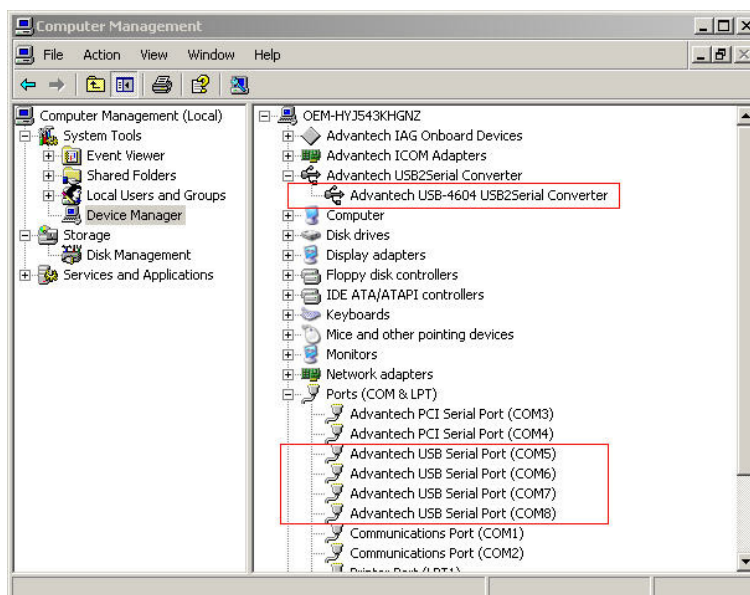
4. The installation of one COM port is finished.



It would take four times to install the COM ports if you are using USB-4604B/4604BM due to 4 COM ports.

2.3 Verifying Driver Setup

After you have installed your card, go to Control Panel/System/Device Manager to look for the Device Name that will appear after you have installed the driver.



Note! *If your device has not been properly installed, there will be an exclamation mark (!) on the device name to indicate a conflicting device. If this is the case, just remove that device and start the driver installation process all over again.*



2.4 Limitations

USB-4600 Series might need the external power input (10~48VDC) when the USB port can not provide enough current. Typically, USB-4604B/4604BM and USB-4602B/4602BM requires at least 130mA@5VDC and 100mA@5VDC from USB bus power.

If the current is not enough, you would observe the system keeps showing connection / disconnection to the USB devices. In this situation, it is necessary to input the external voltage to the 2-pin green connector for power input.

Generally, if you attach several USB-4600 Series Converters on your PC and the serial ports are running at high speed such as 921.6 kbps, the CPU loading would become too high to run smoothly. It is recommended to apply the proper amount of USB-4600 Series modules to your PC depending on the CPU performance of your system.

2.5 Unplugging the Converters

Though the Advantech USB to Serial Converter are hot-swappable, we still recommend you to follow the hardware un-installation procedure to avoid any unpredictable damages to your device or your system.

1. Close the applications with any opened port of USB to Serial Converter.
2. Click the "Safely Remove Hardware" in windows task bar



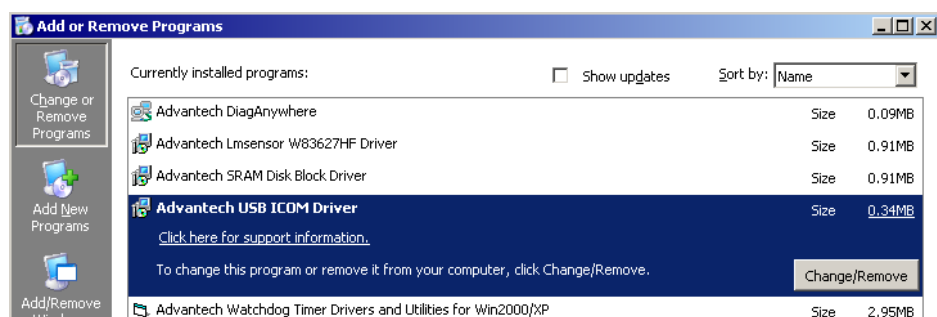
3. Click "Stop Advantech USB-xxxx USB2Serial Converter".
4. Click "OK" on the Safe to Remove Hardware dialog box.



5. Unplug the USB to Serial Converter from the USB port.

2.6 Updating the Drivers

1. Close the applications with any opened port of the USB to Serial Converter.
2. Open "Windows Device Manager". Double click on the "Advantech USB-xxxx USB2Serial Converter".
3. Click "Update Driver" button



- The "Upgrade Device Driver Wizard" will help you to upgrade device driver.



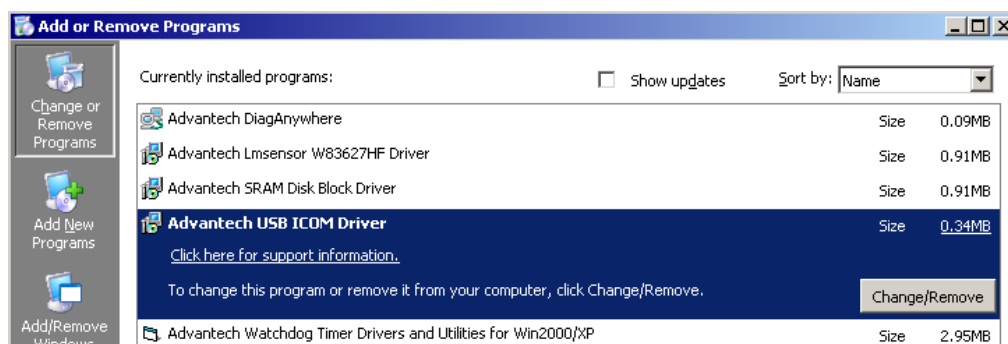
Note! *If you have 2 or more Advantech USB to Serial Converter installed, the above upgrade method won't take effect. You can do follow below steps:*



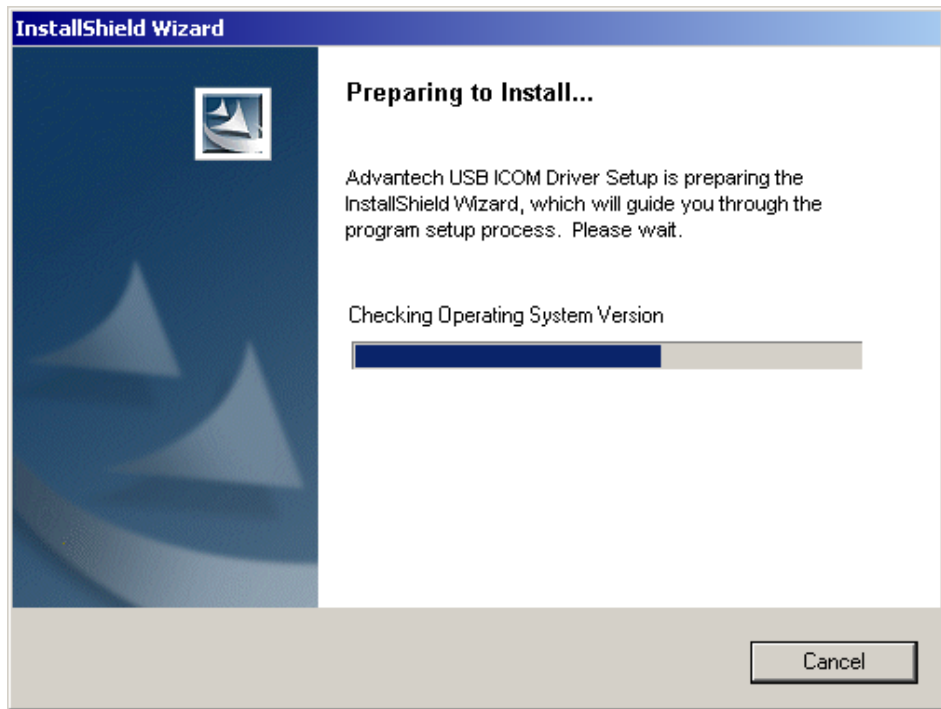
- Unplug all Advantech USB to Serial Converters.
- Install new driver
- Plug in the Advantech USB to Serial Converter.

2.7 Uninstalling the Drivers

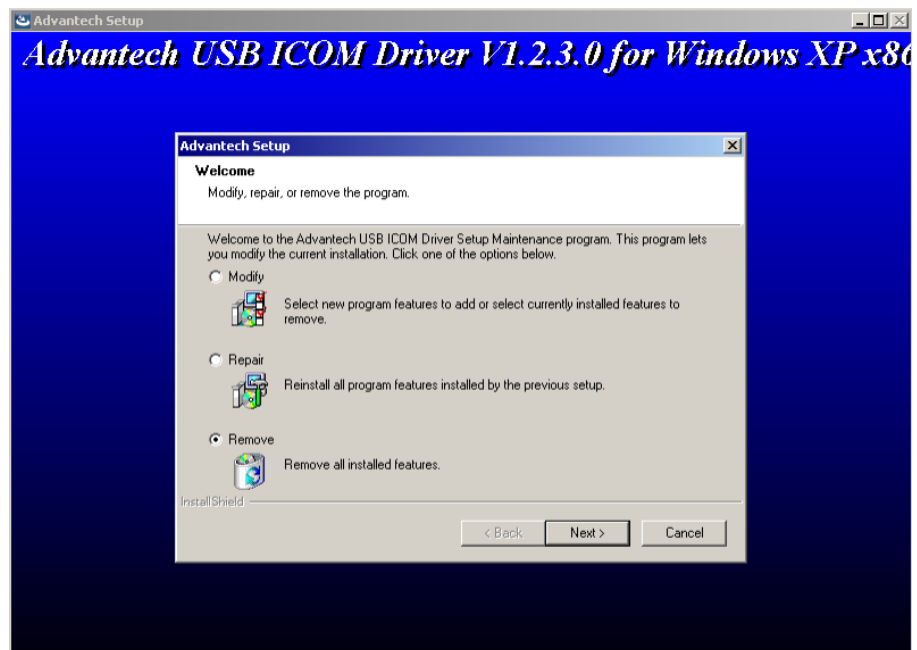
- Close the applications with any opened port of Advantech USB to Serial Converter and unplug Advantech USB to Series Converter from USB port.
- Open "Add or Remove Programs" from "Control Panel"
- Choose "Advantech USB ICOM Driver" and click "Change/Remove" button



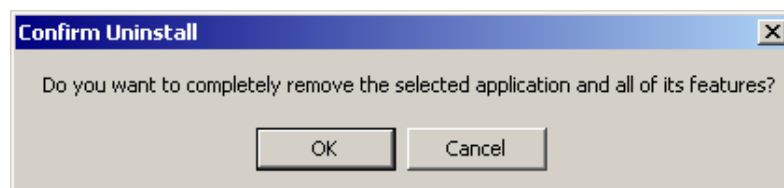
- InstallShield Wizard show up



5. Choose "Remove" and click "Next" button



6. Click "OK" button to confirm uninstall message.



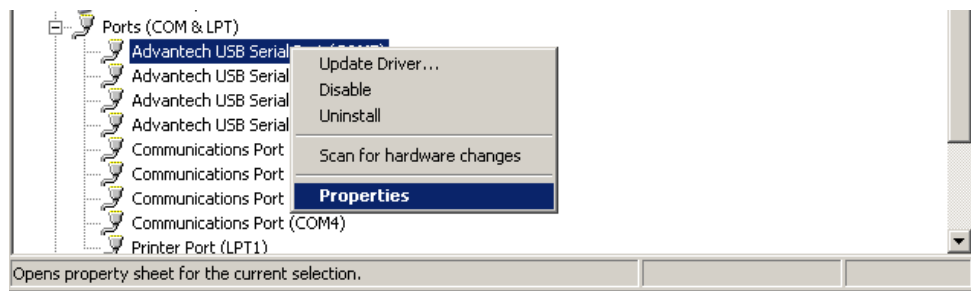
7. The driver uninstallation is complete.

Chapter 3

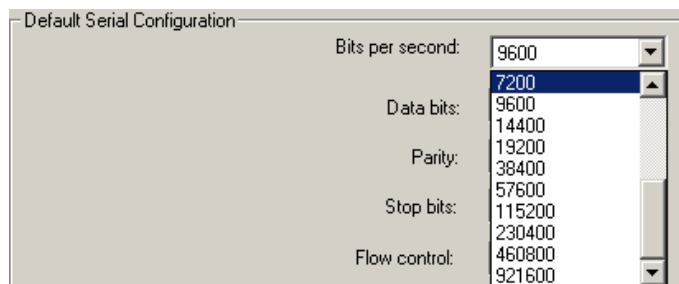
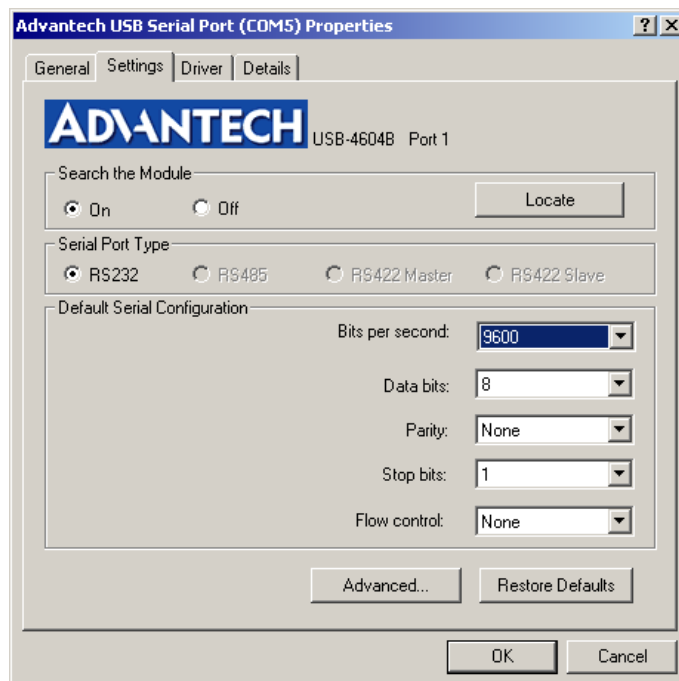
Settings

3.1 Serial Configuration

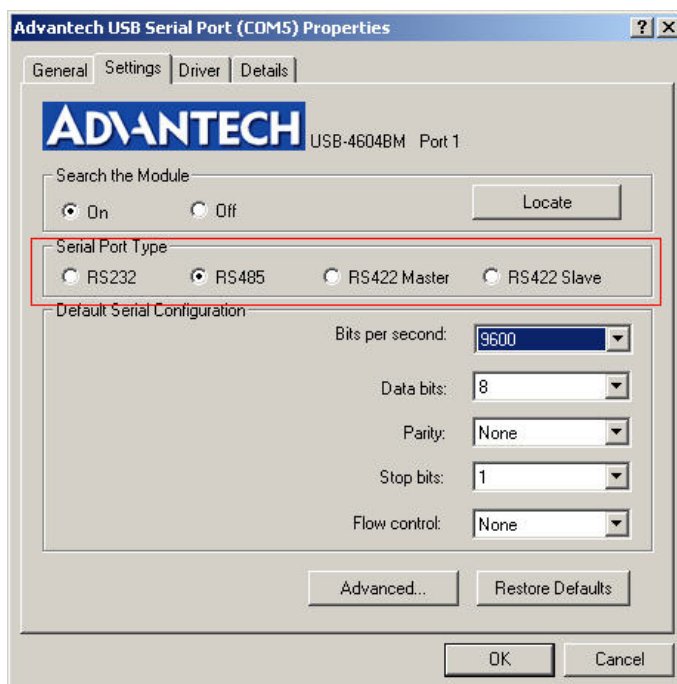
1. Choose “Advantech USB Serial Port” in Control Panel/System/Device Manager
2. Press right button and choose “Properties”



3. You can change the serial configuration setting “Bits per second/Data bits/Parity/Stop bits/Flow control” in here.

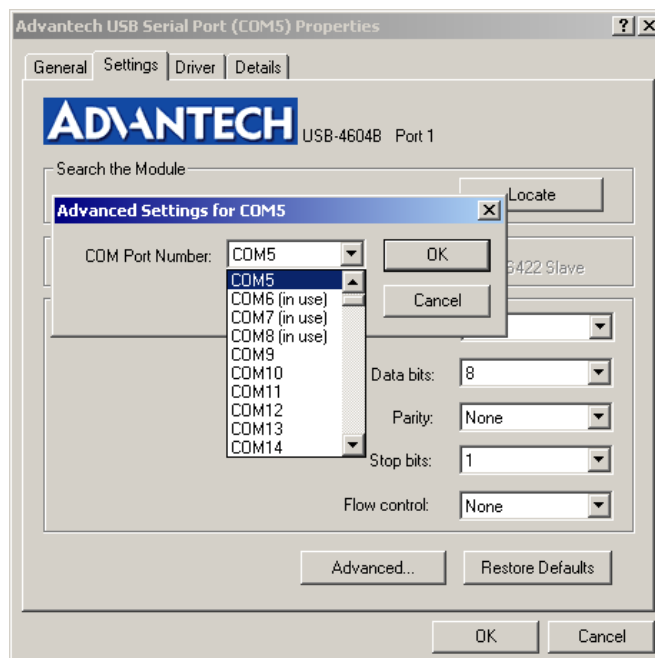


If your product model is USB-4602BM or USB-4604BM, you can choose Serial port Type on the setting tab.



3.2 Changing the Port Number

1. If you want to change the port number, please close the applications with any opened port of USB to Serial Converter.
2. On the setting tab, click "Advanced" button, select from the drop down list the new port number you want to change to.



3. Click "OK" button to save your settings.

Note! *If you select a port number that has been occupied by other ports (marked as "in use"), the port previously using this port number won't work until you remove and reinstall it.*

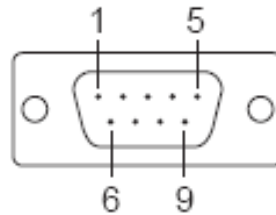


Chapter 4

Signal Connection

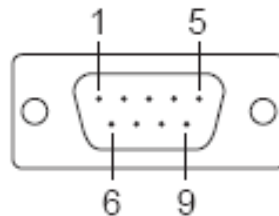
4.1 Pin Assignment

The RS-232 mode pin assignment is as following:



| Pin | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------|-----|----|----|-----|-----|-----|-----|-----|
| RS-232 | DCD | RX | TX | DTR | GND | DSR | RTS | CTS |

The RS-485/422 mode pin assignment is as following:



| Pin | 1 | 2 | 3 | 4 |
|--------|-------|-------|-----|-----|
| RS-422 | TX- | TX+ | RX+ | RX- |
| RS-485 | Data- | Data+ | N/A | N/A |

4.2 LED Status

The USB Module is equipped with a LED indicator to show the current status of the device. When you plug the USB device into the USB port, the LED indicator will blink five times and then stay lit to indicate that it is on. Please refer to the following table for detailed LED indicator status information.

Table 4.1: LED Indicator Status Description

| | LED Status | Description |
|----------------------|---------------|---------------------------|
| USB Indicator | On | Device ready for work |
| | Off | Device not ready for work |
| TX | On | Device ready for work |
| | Off | Device not ready for work |
| | Slow Blinking | Device initialization |
| | Fast Blinking | Device working |
| RX | On | Device ready for work |
| | Off | Device not ready for work |
| | Slow Blinking | Device initialization |
| | Fast Blinking | Device working |

ADVANTECH

*e*Automation

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2008