3One data®

USB232×
USB485×

USB to RS-232/485/422

Operation Instructions for Industrial Control Intelligent Converter

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USB232/485×　Operation Instructions

I. Preparation for Use

Before using USB232/485×, please make sure your computer is IBM PC compatible and meets minimum system requirements below:

(1) Intel compatible 486DX4-100 MHz CPU or higher

(2) A standard USB interface (4-pin), marked with

(3) Windows 98/Me or Windows 2000/XP/Vista operating system, etc.

Notices:

(1) Before using the product, please read carefully the operation instructions thereof.

(2) Before using USB232/485×, it is suggested that you shut down computer and make equipment ground point connected with ground reliably to minimize damage to your system from electrostatic and surge signals on communication line (if used for general purpose, it may not be connected with ground).

(3) The USB port of USB232/485× must be connected with computer and can not be connected with any other device with USB interface, such as digital camera, scanner, printer, etc.

II. Product Description

1： Description of USB232 product

USB232 is an industrial control intelligent converter of USB to RS232.

After the driver program of USB232 is installed, a virtual serial COM port will be formed automatically in your computer system. For example, your computer has both COM1 and COM2 serial ports originally, and after UC driver program is installed, a virtual COM3 port will be formed automatically (generally speaking, it is like this; concrete COM port number is allocated automatically by virtual driver program). If your computer has no RS-232 interface (e.g. relatively new notebook computer), a virtual COM1 port will be formed automatically after the driver program is installed.

The virtual COM port from USB232 driver program and the original COM port from computer are the same for application software. As long as your application software can map (or

select) to the virtual COM port, the communication with RS232 device will be realized, i.e. the conversion process from virtual COM port driver program to calling USB driver program is completely transparent for users, and users need not pay attention to realization details of the process and nothing remains but to consider the serial port communication.

2： Description of USB485× product

USB485× is an industrial control intelligent converter of USB to RS-485/422 and it is the best solution for you to realize communication with RS-485/422 device by means of USB.

Compared with ordinary RS-232 ⇔ RS-485/422 converter, USB485× converter has the advantages below:

Generally, the method of controlling RS-485/422 device by means of computer is to connect a converter of RS-232 to RS-485/422 by means of RS-232 serial interface of computer for data communication. In this mode, application program realizes communication with RS-485/422 device by visiting COM port of computer, but this mode now has some problems below:

(1) RS-232 is a relatively out-of-date communication protocol and many new computers, e.g. notebook computers, have had no the interface;

(2) The speed rate of RS-232 is not high enough (high-speed RS-485 can realize 10Mbps communication rate, and generally, the baud rate of RS-232 port of computer can reach115kbps only, so it fails to meet the requirement of conversion rate);

(3) The passive (without external power supply) converter of RS-232 to RS-485/422 is required to be used in many places, and here the converter must be powered from RS-232 port for normal working, it probably suffers from a power shortage.

While USB⇔RS-485/422 converter covers the above shortage.

(1) USB (universal serial bus) is current prevailing computer interface standard. Many new computers all have USB interfaces;

(2) Compared with RS-232, USB interface has higher communication rate. USB1.1 can reach 12Mbps and USB2.0 can reach 480Mbps, and moreover, multiple rates and communication modes are available, so the requirement of conversion to high speed 485 can be met fully.

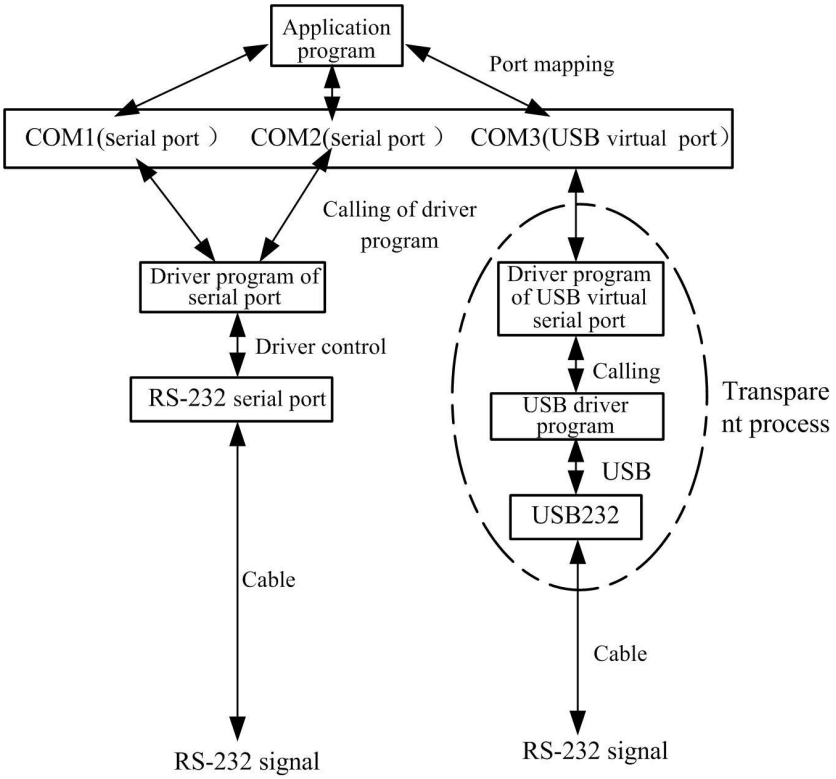
(3) USB interface itself has relatively strong power supply ability. Therefore, USB⇔RS-485/422 converter has no need of external power supply (i.e. it is free from power shortage). In addition, USB has such advantages as hot plug, convenient connection, connecting with multiple devices, etc.

How does USB485× converter realize the application software communication with RS-485/422 device? It is necessary for users to understand the realization process. The detailed principle is described as follows:

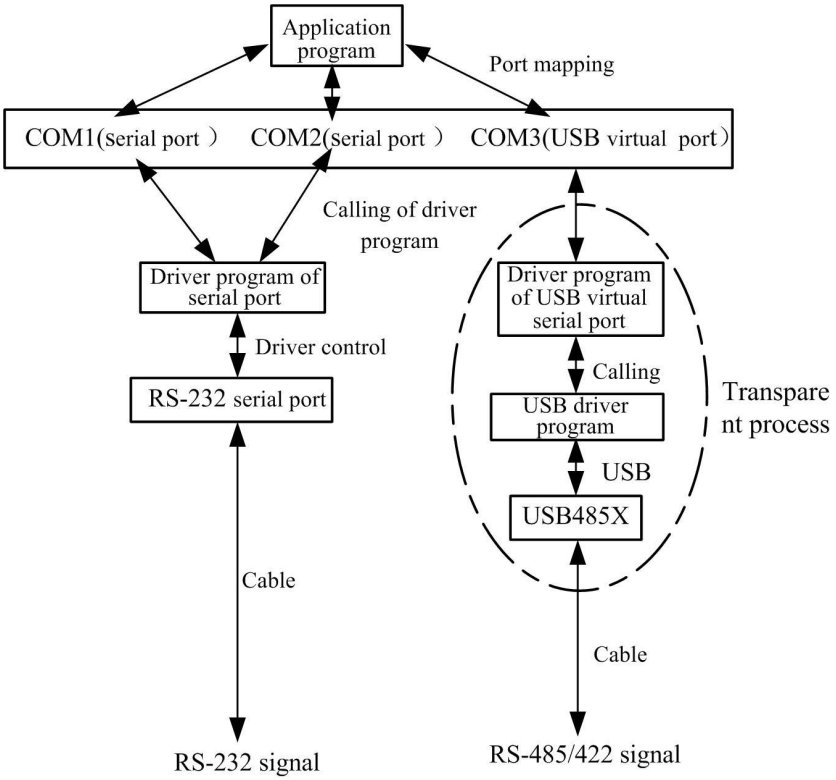
After the driver program of USB485× is installed, a virtual serial COM port will be formed automatically in your computer system. For example, your computer has both COM1 and COM2 serial ports originally, and after USB485× driver program is installed, a virtual COM3 port will be formed automatically (generally speaking, it is like this; concrete COM port number is allocated automatically by virtual driver program). If your computer has no RS-232 interface (e.g. relatively new notebook computer), a virtual COM1 port will be formed automatically after the driver program is installed.

The virtual COM port from USB485× driver program and the original COM port from computer are the same for application software. As long as your application software can map (or select) to the virtual COM port, the communication with RS-485/422 device will be realized, i.e. the conversion process from virtual COM port driver program to calling USB driver program, and then to RS-485/422 is completely transparent for users, and users need not pay attention to realization details of the process and nothing remains but to consider the serial port communication.

The following diagram may help you understand the conversion process:



Illustrated Diagram for USB232 Virtual Serial Port



Illustrated Diagram for USB485X Virtual Serial Port

Note: It is transparent transmission process inside dashed line. It is unnecessary for users to pay attention to realization details.

III. Range of Application

The product is applicable to industrial control automatic system, bar code scanner, Palm, PLC and PLD, PDA (WinCE system), label printer, POS system, data acquisition control system and security access system, etc.

IV. Functional Characteristics

◎Single chip (ASIC) USB port to serial port communication

◎ Support Windows98/ME and Windows2000/XP, Windows Server 2003/2008, Windows 7/Vista

◎ Support MAC Apple and Linux v5.0

◎ Completely compatible USB v2.0 specification

◎ USB full speed connection

◎USB direct power supply, without external power supply

◎ Support automatic handshake protocol

◎ Reach 57.6kbps transmission rate within 1200m (230kbps at short distance); customize short-distance rate 500K bps

◎ Conform to TIA/EIA RS-485/RS-422 standard

◎ Support remote wakeup and power supply management

◎ Support point-to-multi-point (RS-485 port at most can be connected with 32 standard 485 devices)

Notices:

(1) RS-485 communication rate of USB485× is affected by communication distance. Generally, the longer the distance is, the lower the communication rate is. The brief corresponding table is as follows:

Communication distance	0~10m	300m	1200m	3000m
Rate (maximum)	230kbps	115kbps	57.6kbps	9600bps

(Numerical values in the above table are ideal. Concrete communication rate will be affected by actual environment and may not reach the above numerical values)

(2) In theory, RS-485 bus of USB485× at most can be connected with 32 standard 485 devices, but affected by load and communication distance, actual number of at most connecting with devices may not reach the numerical value (generally more than 20).

V. Definition of Serial Port Pin

USB232:USB to RS-232 converter

USB485B:USB to RS-485 converter

USB485C: USB to RS-485/422 converter

RS-232：

1 :DCD **2:** RXD **3** :TXD **4** :DTR **5:** GND

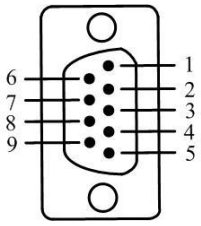
6 :DSR **7** :RTS 8: CTS **9** :RI

RS-485：

1 :D-(B) **2** :D+(A) **5:** GND

RS-422：

1: T- **2:** T+ **3** :R+ **4:** R- **5:** GND



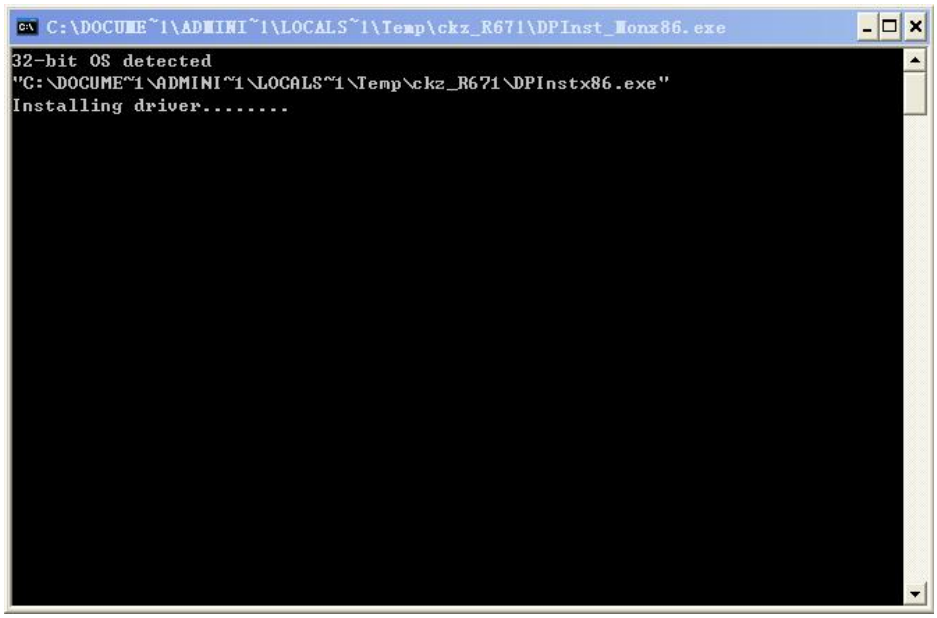
DB9M (male connector, needle type)

VI. Installation of Driver Program

Method I: (Recommended)

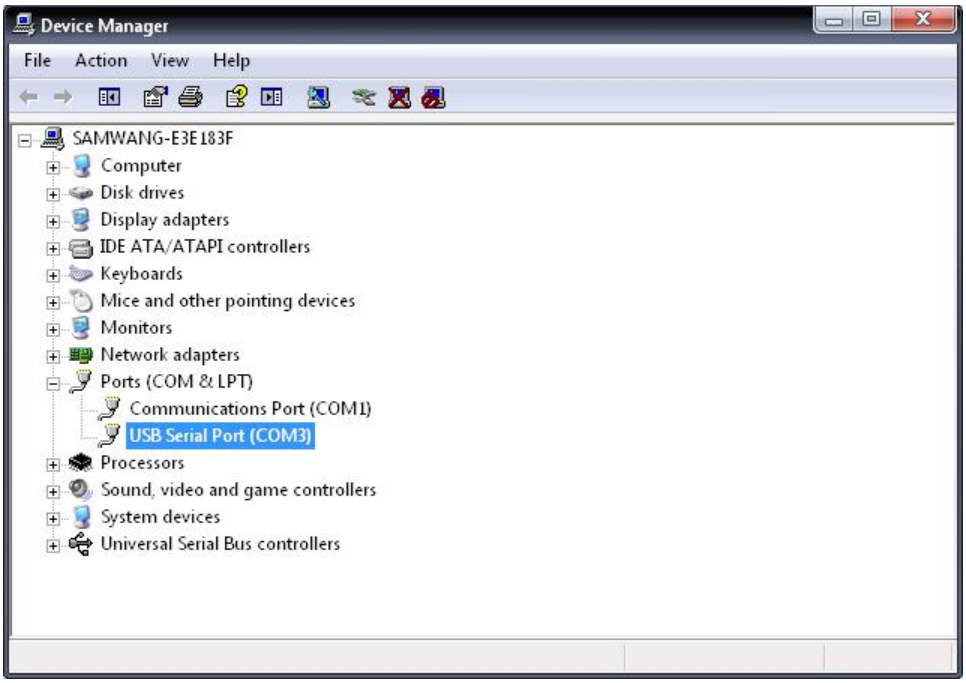
Enter CD catalog-Setup file folder and execute USB_drv.exe automatic installation wizard program, and click Next.

USB485× driver program will be installed automatically in your system.



After installed successfully, the USB485× product can be put into normal service.

Note: after successful installation, the corresponding USB virtual serial port (virtual serial port device (COM3)) can be viewed in device manager.



Method II:

Please install USB to RS485 device driver program in steps below:

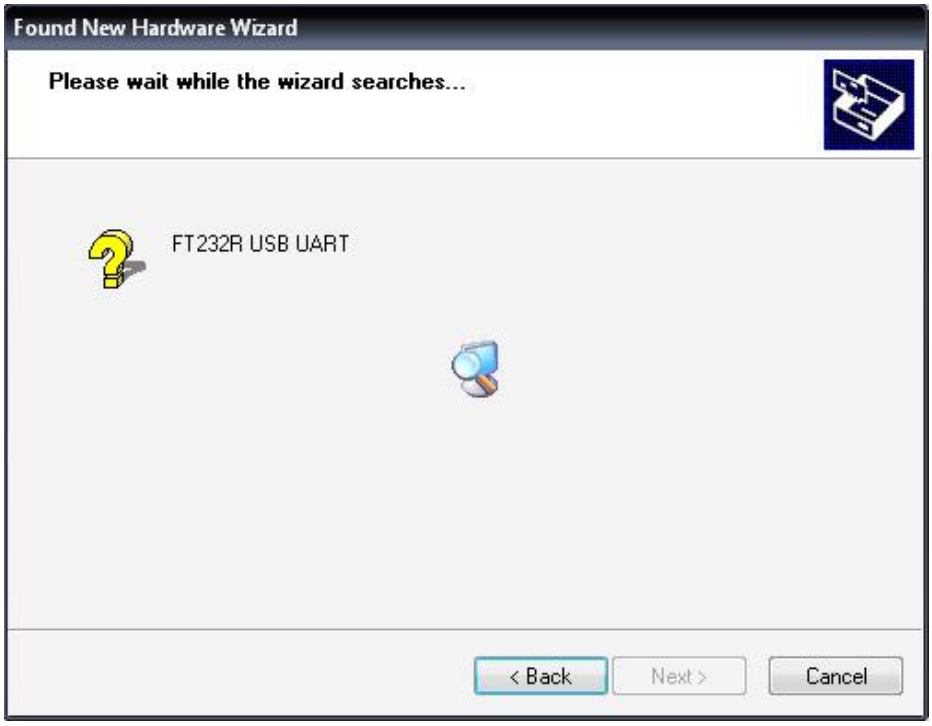
(1) Switch on power supply of the computer connecting with USB to RS485 device, and make sure the USB port to be connected has been started and put into normal service.

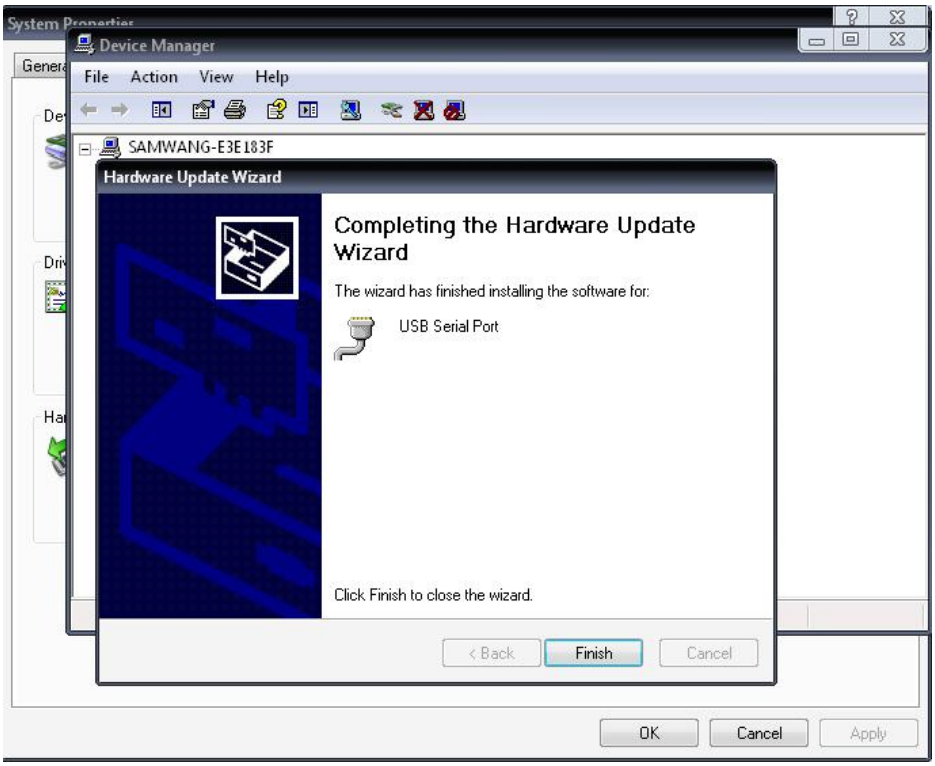
(2) Insert USB connecting line into USB interface, and Windows will detect the device and

execute the wizard for adding new hardware to help you set new device. Install twice in total; install USB <-> Serial for the first time and click Next to continue.

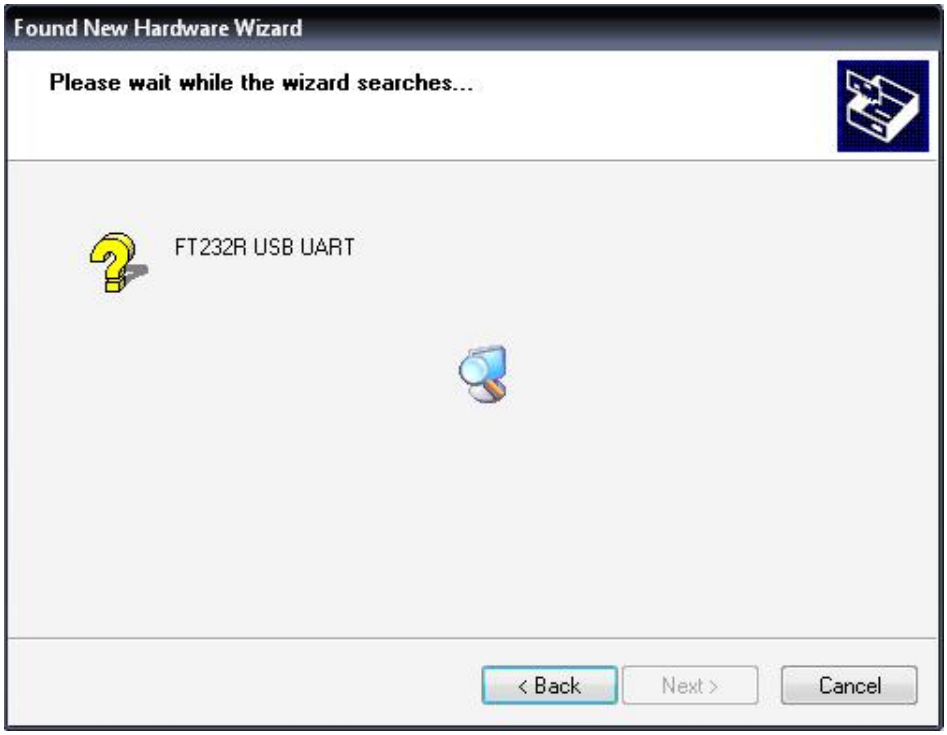
(3) Open USB to serial port line driver CD -CDM 2.04.16 WHQL Certified catalog, and select searching up-to-date driver program for hardware, and then click Next; select installation from CD and then click OK. Or click Browse to manually select driving catalog (CDM 2.04.16 WHQL Certified catalog), and click OK, then click Next to wait for finishing installation.

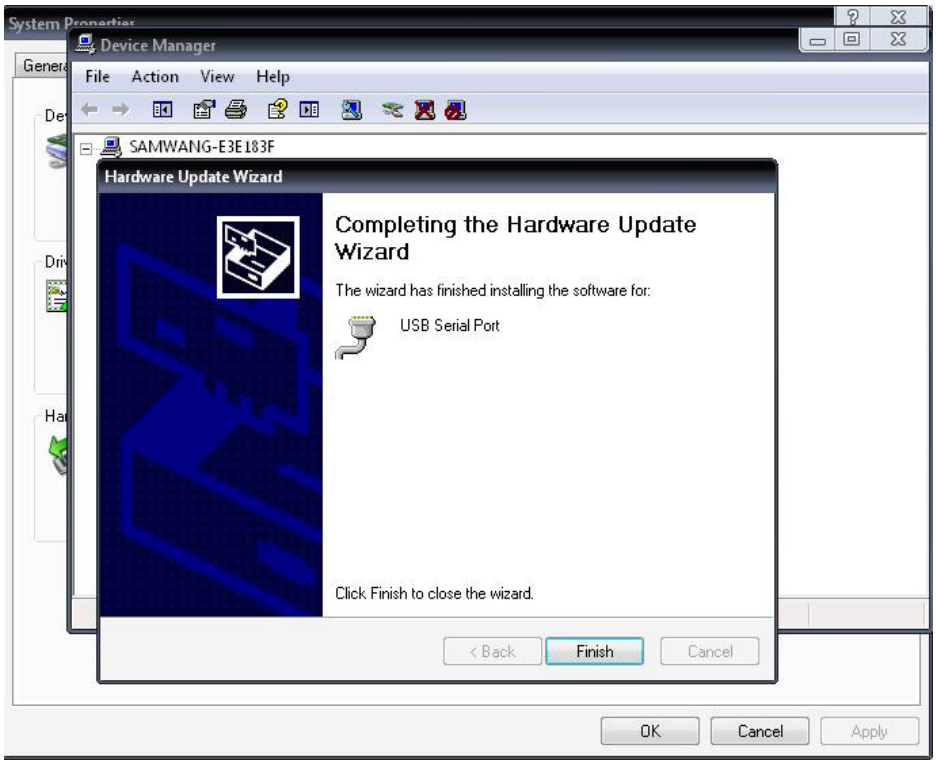

Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media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


Found New Hardware Wizard
Please wait while the wizard searches...
FT232R USB UART
< Back
Next >
Cancel



(4) Click Finish, and you will be prompted to install USB Serial Converter in steps as the above.





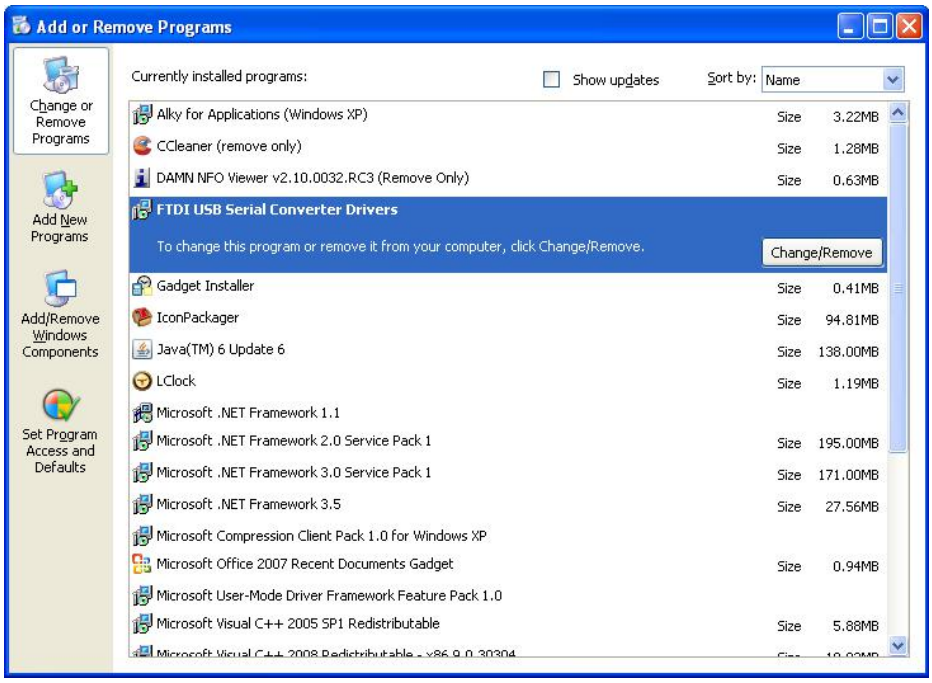
(5) Click Finish, and you may normally use USB485× product.

VII. Deletion of Driver Program

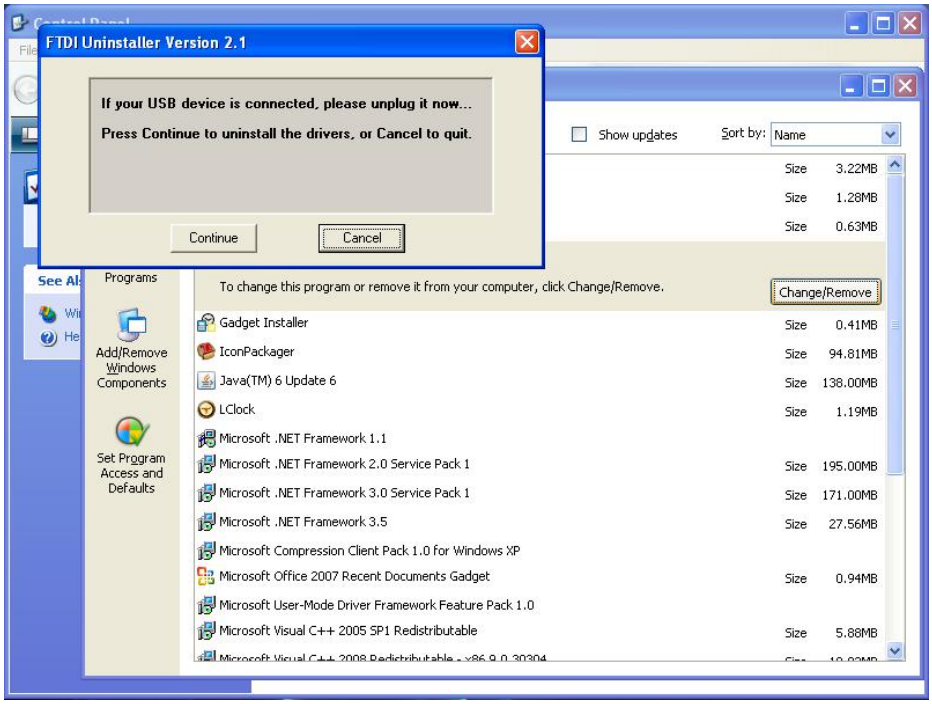
Method I:

(1) With regard to the driver installed by USB_drv.exe, enter control panel—Add or Remove

Programs



(2) Select “Windows driver program package– FTDI CDM Driver Package”, and click Alter/ Delete



(3) Select “Yes (Y)”, and finish uninstallation.

Method II:

With regard to the driver installed by CDM 2.04.16 WHQL Certified, the USB to serial port line driver program is deleted from Windows system in steps below:

(1) Disconnect USB to serial port line from your computer.

(2) Enter CD and execute FTClean.exe, and here display Status：Ready. Click Clean System.

(3) The dialog box prompts “Disconnect all FTDI devices from the PC”, and click “OK”.

(4) The dialog box prompts “You are about to uninstall all FDTI drivers. Do you want to continue?”, and click “Yes”

(5) The dialog box prompts “Do you want to cancel driver uninstallation”, and click “No”.

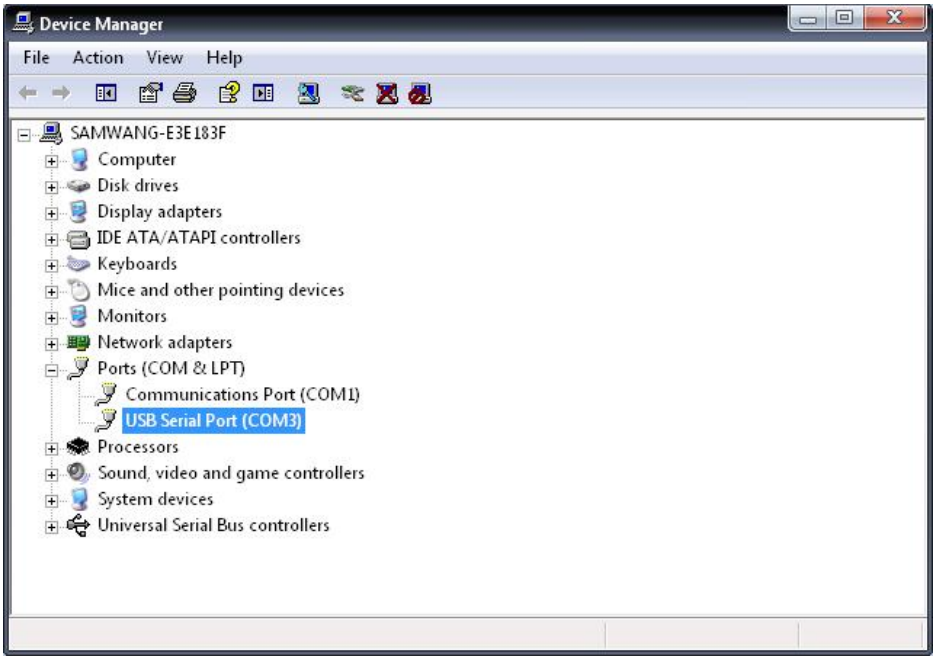
(6) After the driver program has been deleted, display Status：System clean completed, and Clean System button is grey. Click “Exit” to quit uninstallation interface.

(The above is the installation process under windows XP operating system. The installation process under windows 98/2000/vista operating system, etc. is similar to that under windows XP operating system.)

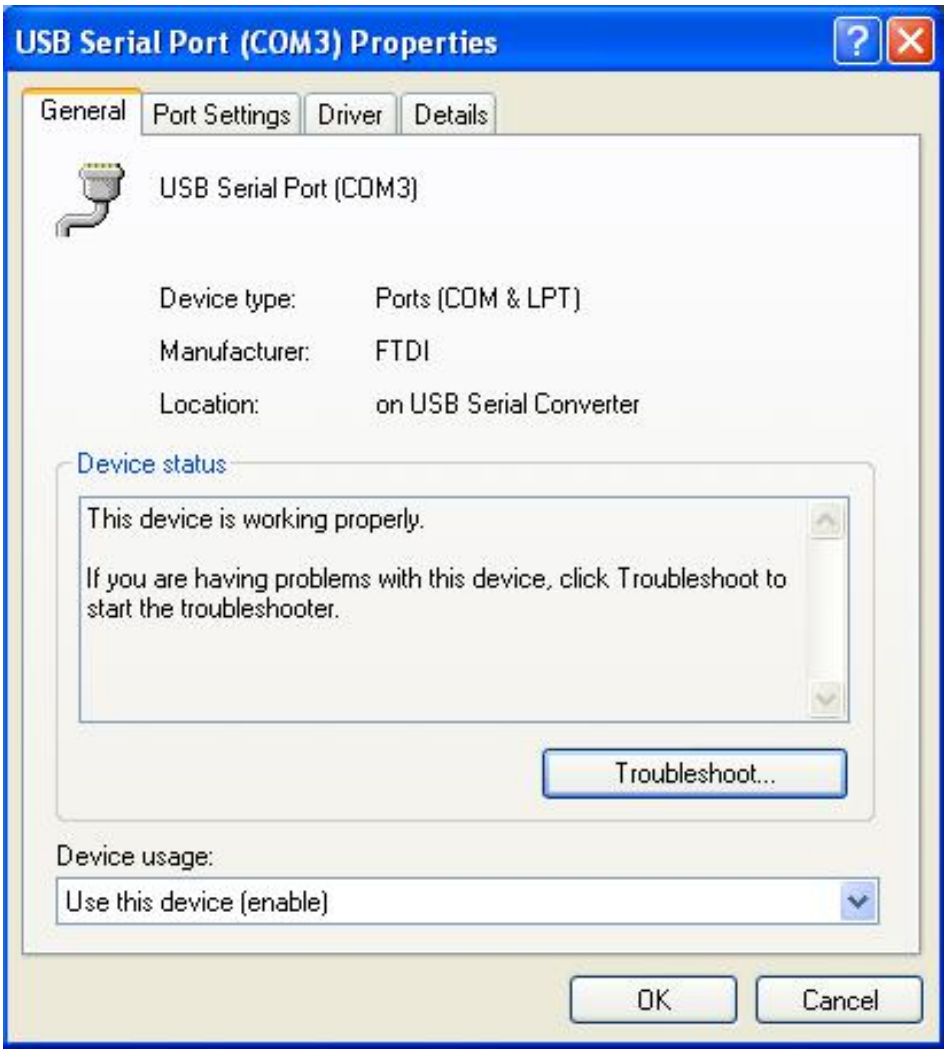
VIII. Modification of Serial Port Number

Sometimes, virtual serial port that the computer automatically allocates does not match with actually used serial port number, and here the serial port number may be modified to meet the demand.

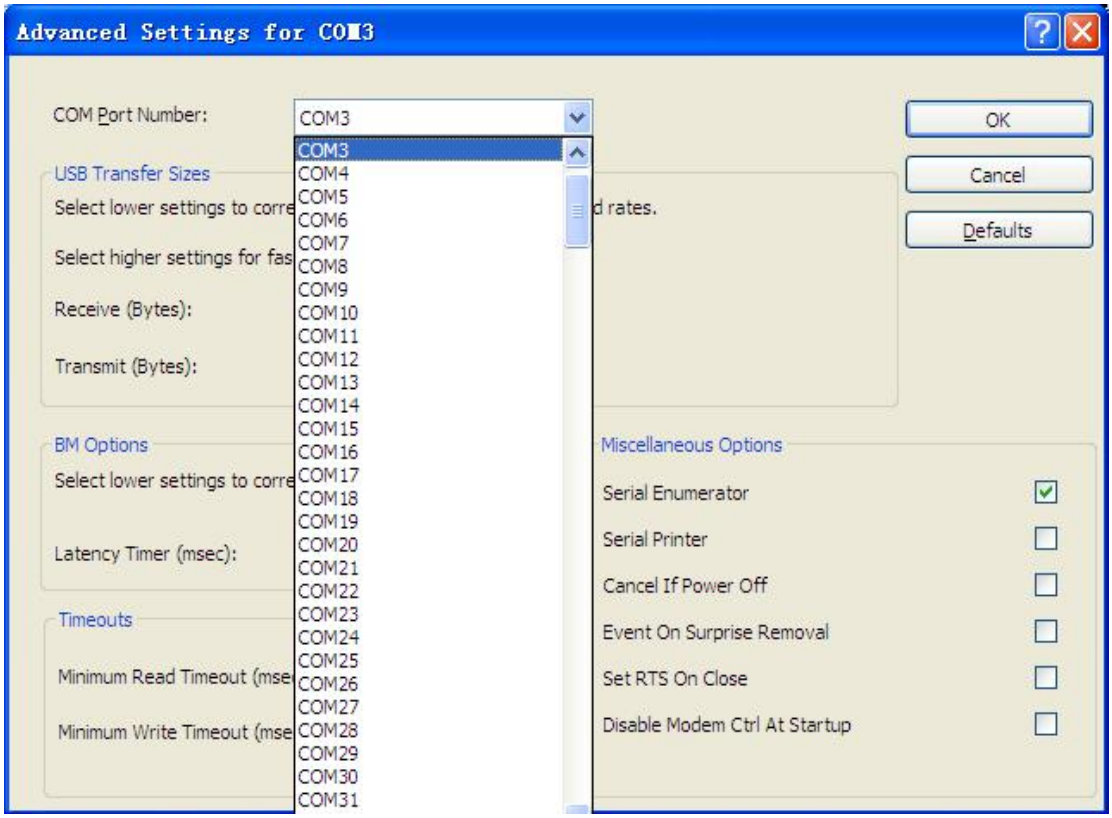
(1) Right-click “USB Serial Port （COM3）” in device manager, and select “Attribute”

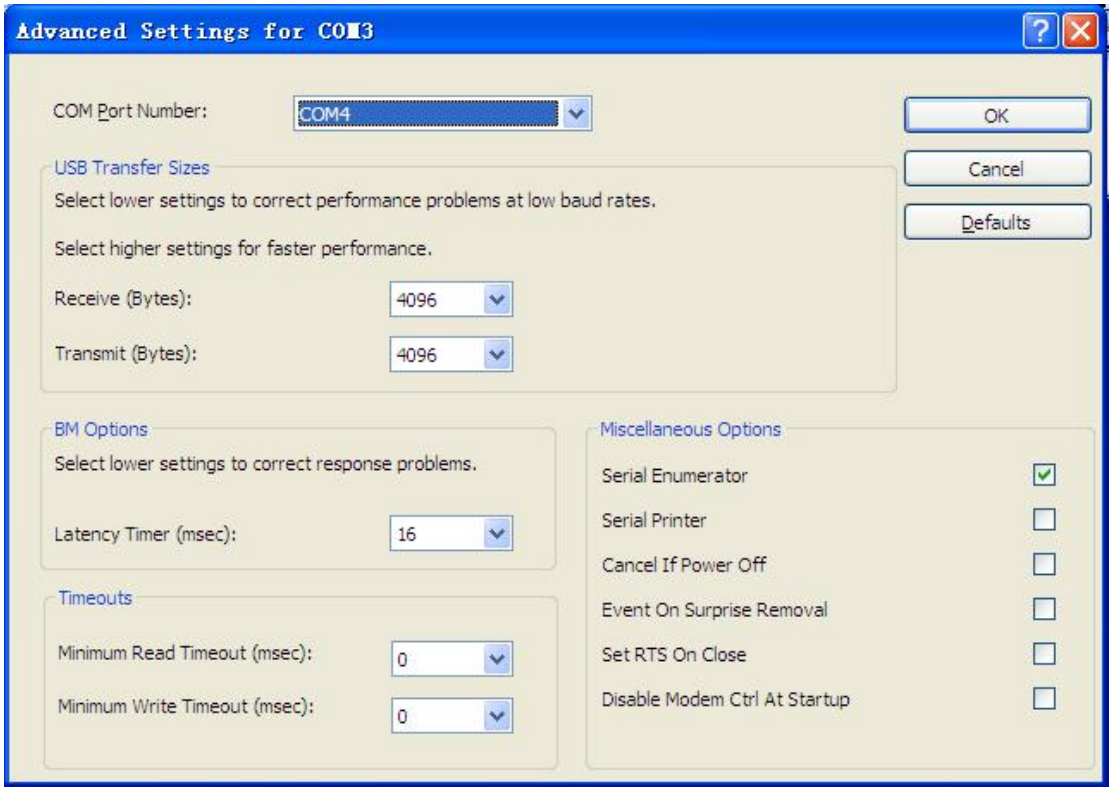


(2) Select “Port Settings” in attribute dialog box, and click “Advanced…”



(3) Select “COM4” in “COM Port Number”, and click “OK”





(4) Rescan hardware, and you will see serial port number has been changed into COM4 from COM3.