Installation Guide of Hi-Speed USB to Industrial 16-Port RS-232/422/485 Adapter

Introduction

The USB to industrial 16-Port RS-232/422/485 Adapter is designed to make serial port expansion quick and simple. Connecting to a USB port on your computer or USB hub, the USB Serial Adapter instantly adds 16 RS-232/422/485 multi-electrical interface serial communication ports to your system. By taking advantage of the USB bus, the USB-16COMi-RM Adapter makes it easier than ever to add 16 serial ports and serial devices to your system with easy plug-and-play and hot plug features. Adapting the new technology, the serial port expansion now takes the new bus with easy and convenient connectivity.

Plugging the USB 16-Port RS-232/422/485 Adapter to the USB port, the adapter is automatically detected and installed. There are no IRQ & COM port conflicts, since the port doesn't require any additional IRQ, DMA, memory as resources on the system. The RS-232, or RS-422/485, port functions as native Windows COM port, and it is compatible with Windows serial communication applications. Each port is individually configurable. The adapter is designed with external switches to set RS-232, RS-422 or RS-485 ports and different operation modes conveniently. There is no need to open the chassis to set the ports.

The USB Serial Adapter provides instant connectivity to RS-232, or RS-422/485, communication devices for factory automation equipment, multi-drop data collection devices, barcode readers, time clocks, scales, data entry terminals, ATMs and serial communication in harsh environment. The USB to Serial Adapter is suitable for remote access, retail and industrial application, data collection and other applications requiring high speed RS-232, or RS-422/485, communication ports.

Specifications & Features

- Adds sixteen high speed RS-232/ 422 / 485 serial ports via USB connection.
- 384 byte receive buffer.
- 128 byte transmit buffer for high speed data throughput.
- Requires no IRQ, DMA, I/O port.
- Data rates: 300 bps to 921.6K bps.
- Serial Connector: one DB-9 male connector.
- Auto transmit buffer control for 2-wire RS-485 half-duplex operation.
- Termination resistors installed on-board.
- RS-232 data signals: DCD ,RxD ,TxD, DTR,GND,DSR,RTS,CTS.
- RS-422 data signals: Tx-, Tx+, Rx+, Rx-, GND, RTS-, RTS+, CTS+, CTS-.
- RS-485 data signals: Tx-, Tx+, Rx+, Rx-(4 wire) and data-, data+ (2 wire).
- Monitor LEDs of TxD, RxD indicating port status.
- AC 100V – 240V input for DC 5V, 4A switching power supply .
- Virtual COM port drivers for Windows 10, 8.1, 8, 7, Server 2012, 2008, Vista, 2003, XP, 2000

Power Supply

- Input : AC 100V ~ 240V, 47 – 63 Hz.
- Output : DC 5.0V 4A.

Hardware Installation

Outside the unit, there are sixteen 4-pin DIP switches which are set to select the mode of operation. You will need to set the switch settings to RS-232 mode, or RS-422, or RS-485 mode as per the requirements of your application.

You need to install driver first, prior to hardware installation. After the setting of DIP switches and connecting power cord to the adapter, you then plug the adapter to USB port to start driver installation.

The Mode Block Configuration Settings are listed as follows:

SW1 (Port-1), SW2 (Port-2), SW3 (Port-3), SW4 (Port-4)
SW5 (Port-5), SW6 (Port-6), SW7 (Port-7), SW8 (Port-8)
SW9 (Port-9), SW10 (Port-10), SW11 (Port-11), SW12 (Port-12)
SW13 (Port-13), SW14 (Port-14), SW15 (Port-15), SW16 (Port-16)

	Operation Mode	S1	S2	S3	S4
RS-232	Standard RS-232 Mode	OFF	ON	ON	ON
RS-422	4 wire with Handshaking	ON	ON	ON	ON
RS-485	Full Duplex (4 wire)	ON	OFF	ON	ON
	Half Duplex (2 wire) - with Echo	ON	OFF	OFF	ON
	Half Duplex (2 wire) - without Echo	ON	OFF	OFF	OFF

JP5 (Port-1), JP6 (Port-2), JP7 (Port-3), JP8 (Port-4)
JP9 (Port-5), JP10 (Port-6), JP11 (Port-7), JP12 (Port-8)
JP13 (Port-9), JP14 (Port-10), JP15 (Port-11), JP16 (Port-12)
JP17 (Port-13), JP18 (Port-14), JP19 (Port-15), JP20 (Port-16)
for Termination and Biasing Option Configuration

Inside the unit, there are sixteen 2 x 7 (14 pin) header blocks which are jumpered to enable Tx, Rx, CTS 120 Ohm termination resistors and Tx, Rx 750 Ohm BIASing resistor.

You will need to open up the metal case and set the jumper setting for RS-422 mode or RS-485 mode as per the requirements of your application.

Settings are listed as follows:

Jumper	**Function**
1-2	Tx Termination of 120 Ohm This jumper should always be populated for RS-485 mode.
3-4	Pull-up Tx+ to VCC by 750 Ohm Bias resistor This jumper should be populated for pull-up Tx+.
5-6	Pull-down Tx- to GND by 750 Ohm Bias resistor This jumper should be populated for pull-down Tx- .
7-8	Rx Termination of 120 Ohm This jumper should always be populated for RS-422 mode.
9-10	Pull-up Rx+ to VCC by 750 Ohm Bias resistor This jumper should be populated for pull-up Rx+
11-12	Pull-down Rx- to GND by 750 Ohm Bias resistor This jumper should be populated for pull-down Rx- .
13-14	CTS Termination of 120 Ohm This jumper should always be populated for RS-422 mode.

Note: Sometimes, when operating in RS-422 or RS-485, it is necessary to configure termination and biasing of the data transmission lines. Generally this must be done in the cabling, since this depends on the installation of connections. Before applying the option, check your cable specification for proper impedance matching.

Installing Windows Drivers

Windows Update

In most cases, the Windows driver of the USB to RS-422/485 Adapter will be installed from Windows Update website automatically. You do not need to install the driver provided in this CD, if your PC can access to Internet.

Install in Windows 10, 8.1, 8, 7, Server 2012, 2008 R2

Connect your computer to Internet and plug the USB to serial adapters to the USB port. The driver will be installed automatically via Internet.

Install in Windows XP, Vista, Server 2003 and 2008

Connect your computer to Internet and plug the USB serial adapters to the USB port, when asked to install the drivers, allow your computer to search the Internet to load and install the drivers from Windows Update website automatically.

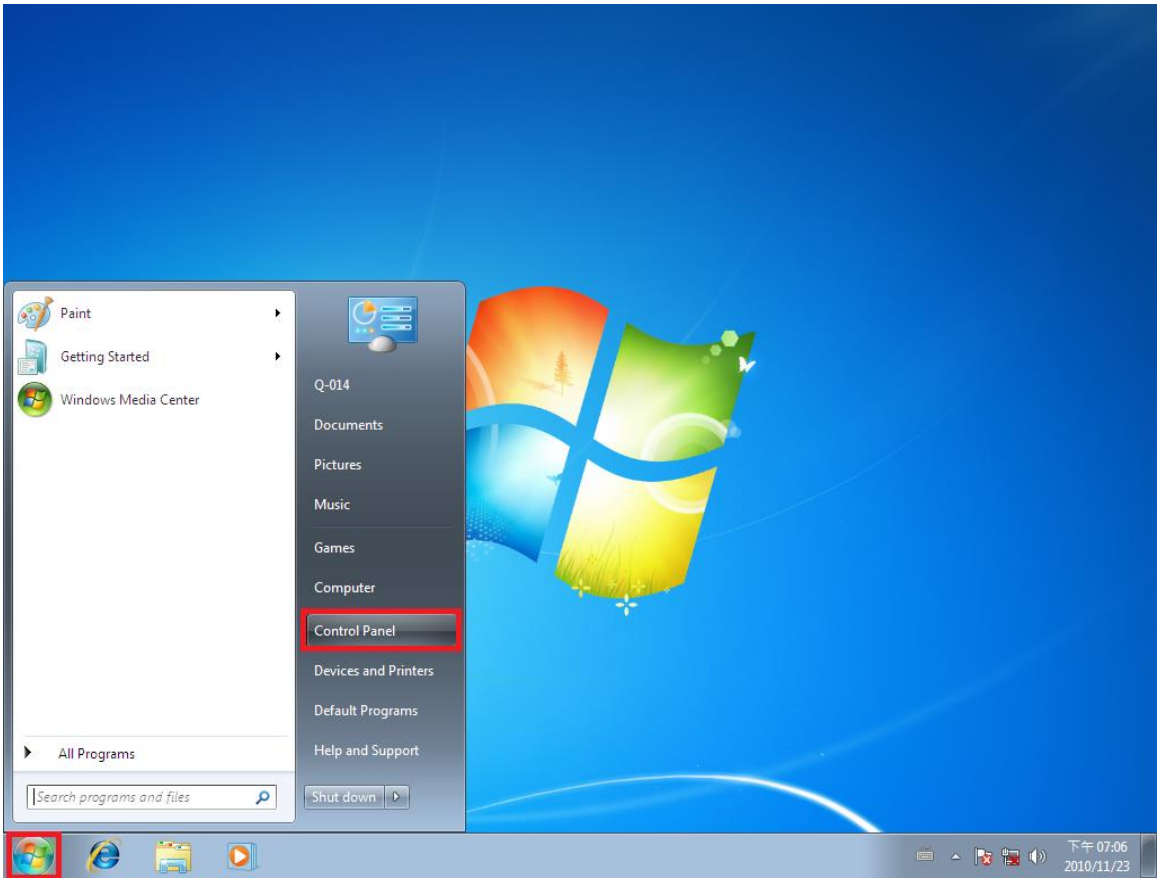
Manual Windows Drivers Installation

In a rare case, if no suitable drivers are automatically found and installed, then please follow the procedures below for driver installation.

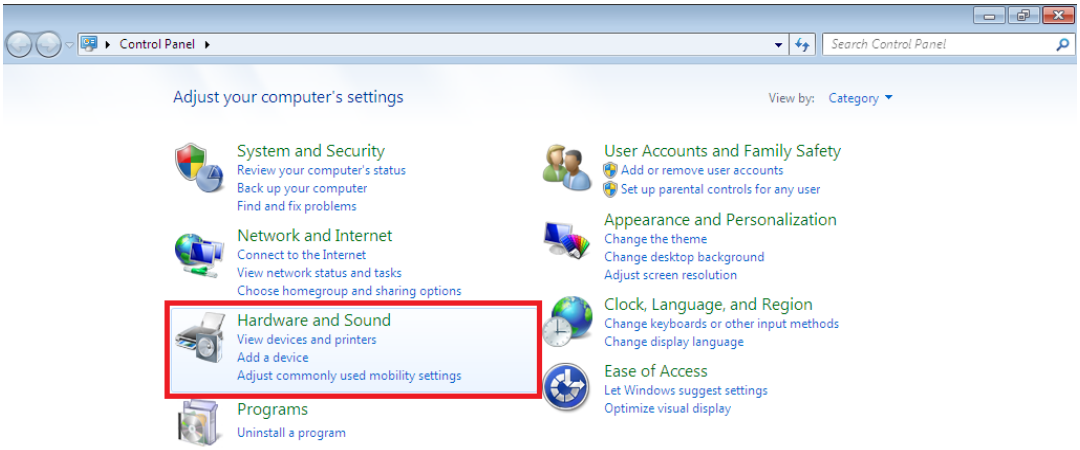
Firstly download the latest Windows driver of the USB to RS-232/ 422/485 adapters from the leading USB to Serial chip supplier FTDI's website http://www.ftdichip.com/FTDrivers.htm , and save them to a known folder on the PC. The desktop can be used so that the driver folder can be easily located.

The following is the guide to manual install the driver for 8-port USB to RS-422/485 Adapter. It is applied to the installation of the 16-port USB-16COMi-RM.

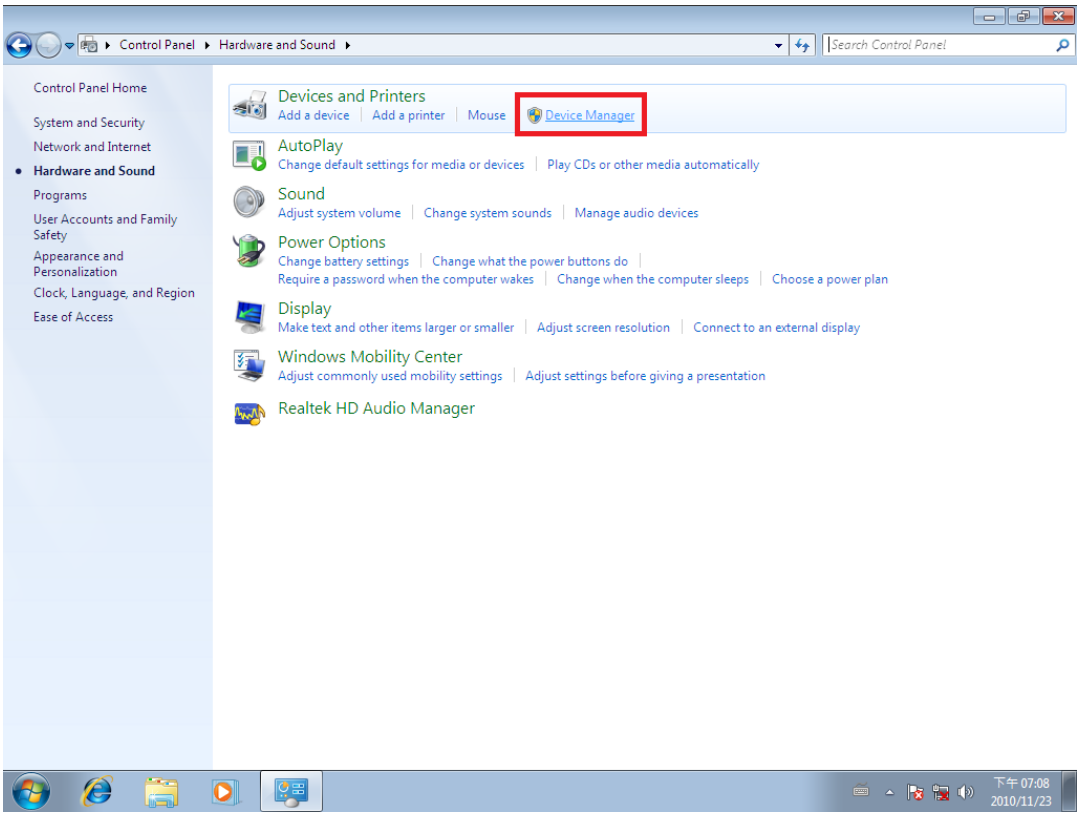
To locate the "Device Manager" on Windows, press "Start" button and select "Control Panel" (right click "Start" button for Windows 10, 8.1).



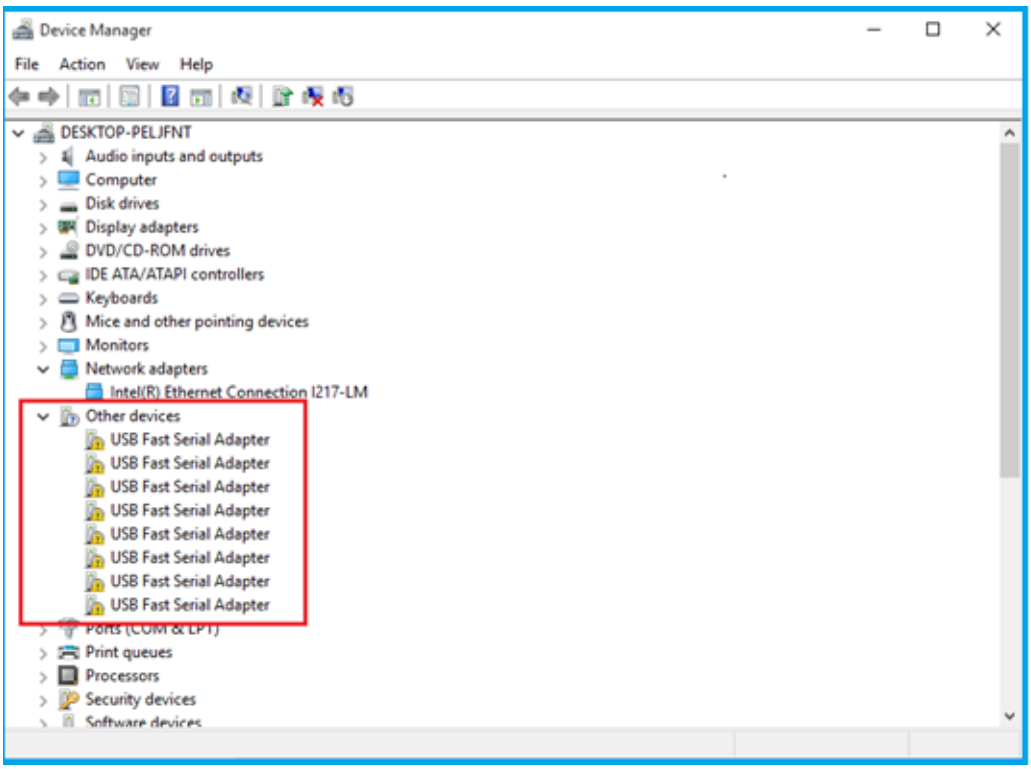
From the select “Control Panel” select “Hardware and Sound”



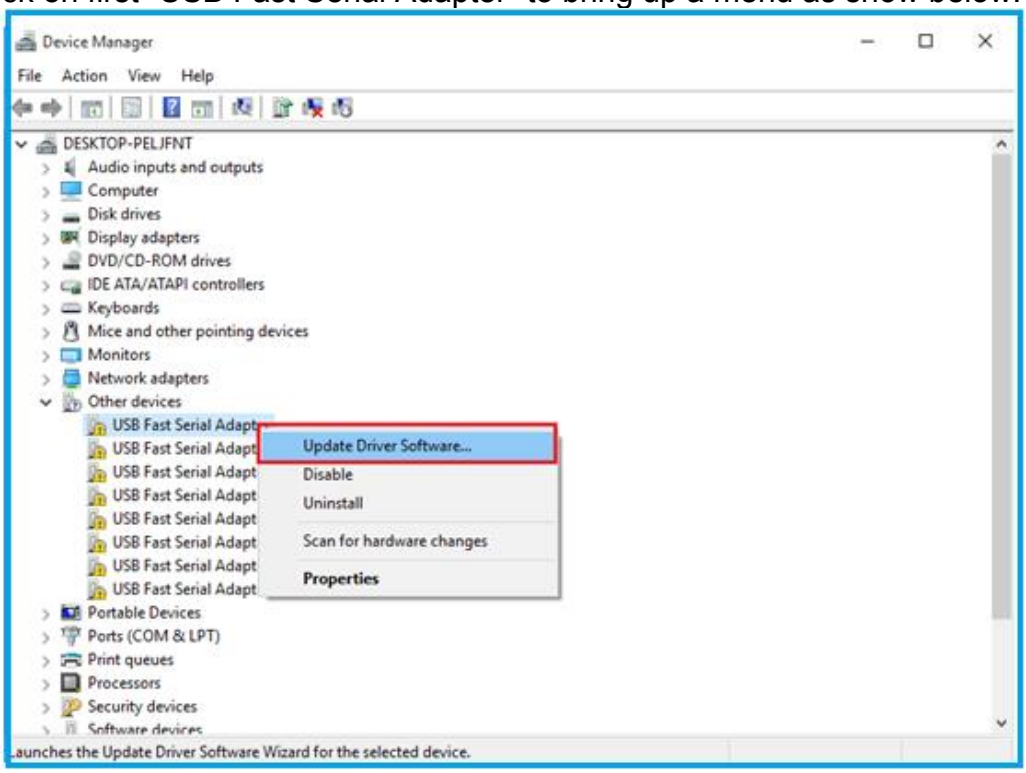
At the next screen select “Device Manager”:



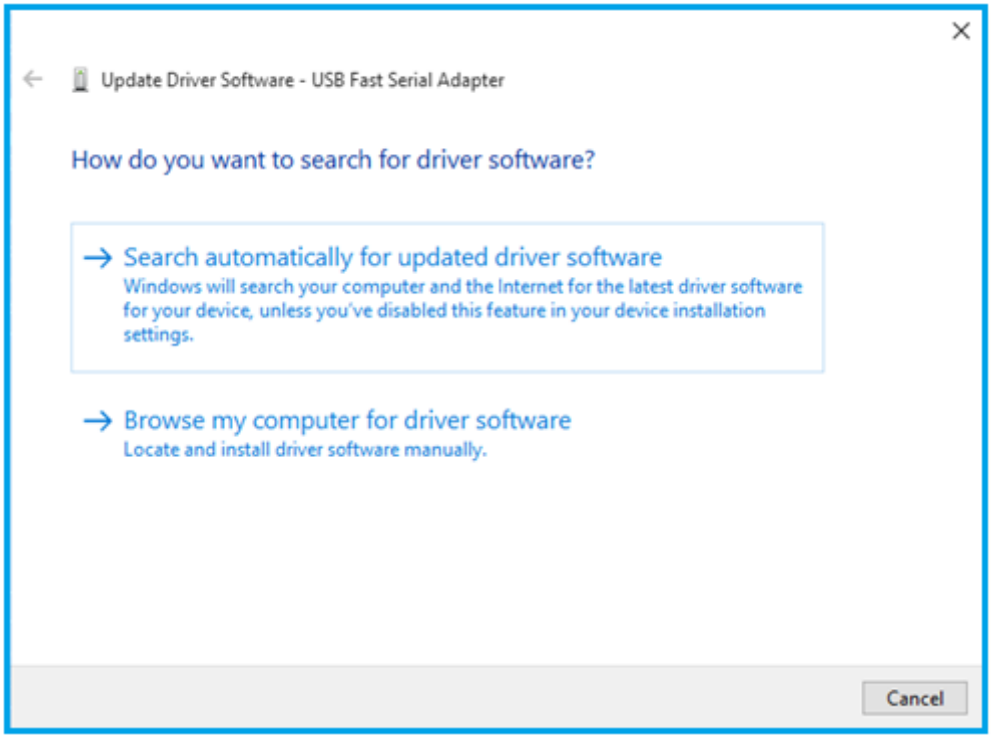
In the “Device Manager” of the System properties, there will be eight “USB Fast Serial Adapter” devices under “Other devices” with a yellow warning symbol to indicate no driver installed.



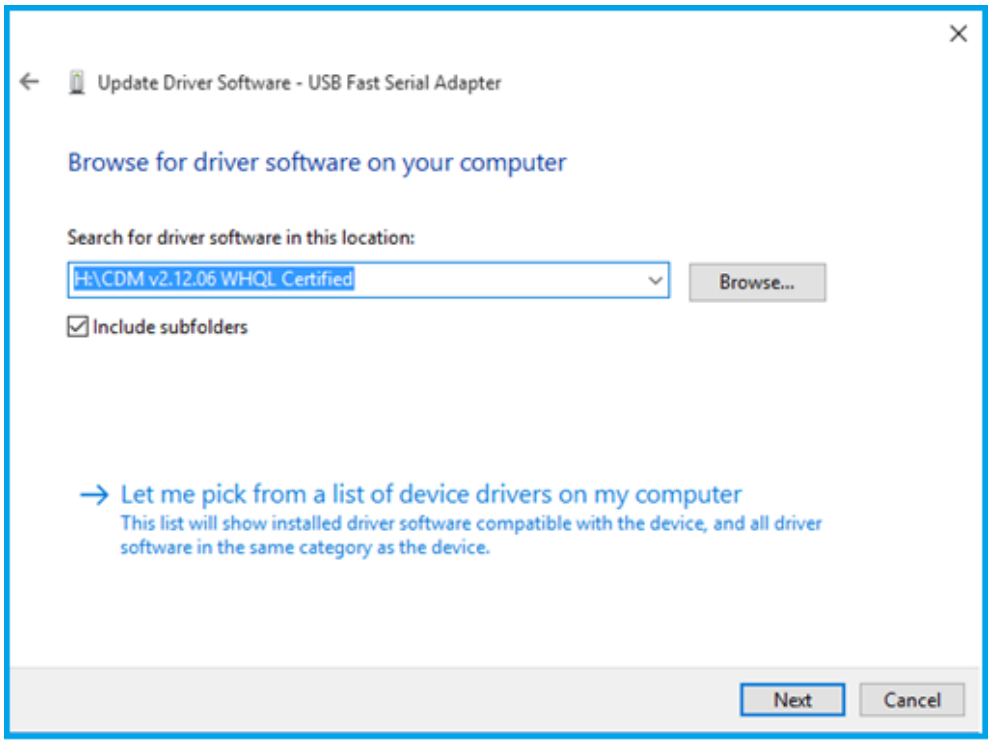
Right click on first “USB Fast Serial Adapter” to bring up a menu as show below.



From the displayed menu select “Update Driver Software…”
This then displays the option for an automatic search or a manual search.



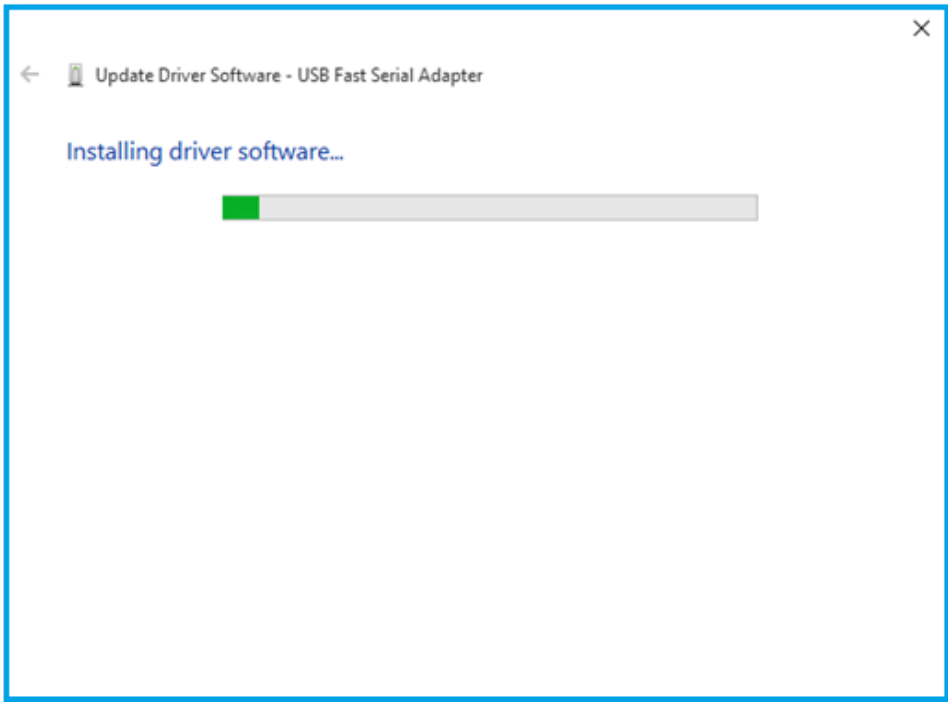
Select the second option to browse manually.



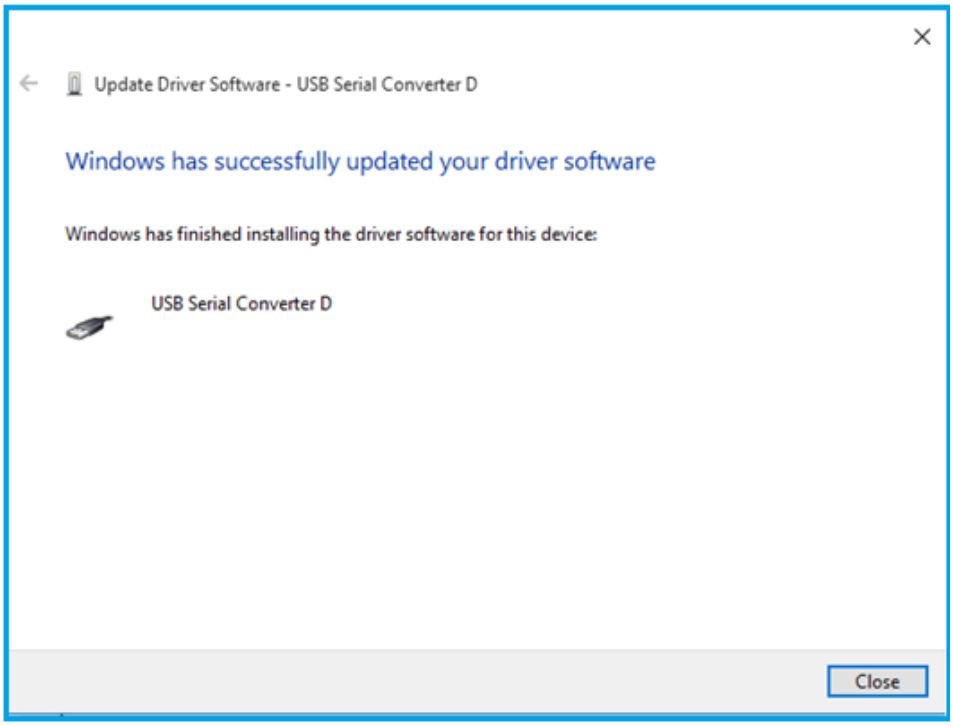
In the address box put the exact location where the Windows drivers have been saved.

This may be on a CD, USB stick or in a folder on the PC. It is not necessarily the exact same location as shown in the screenshot. The drivers could have been saved anywhere of the users choosing.

After entering the address select “Next” to start the installation.



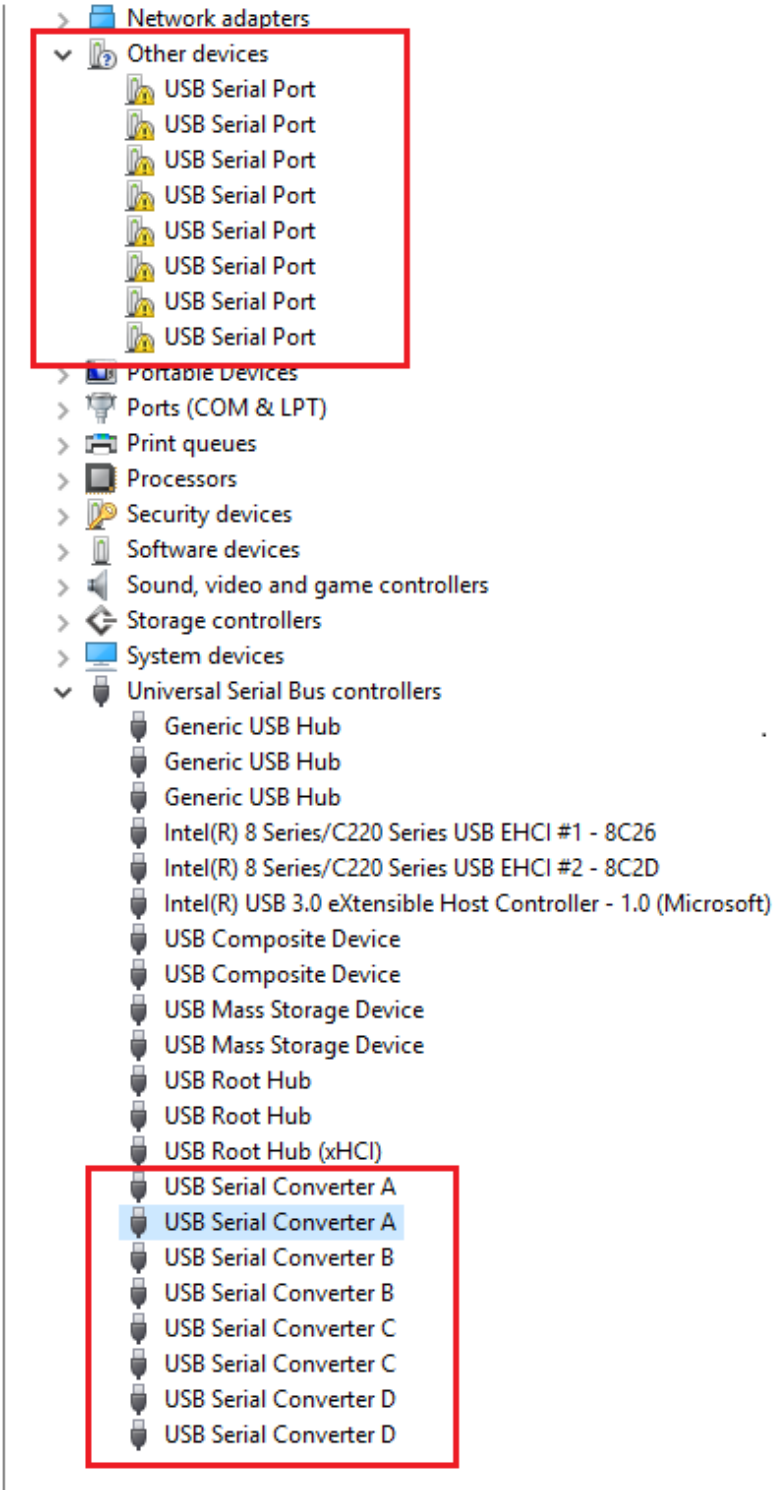
When the installation has finished a completion screen is displayed.



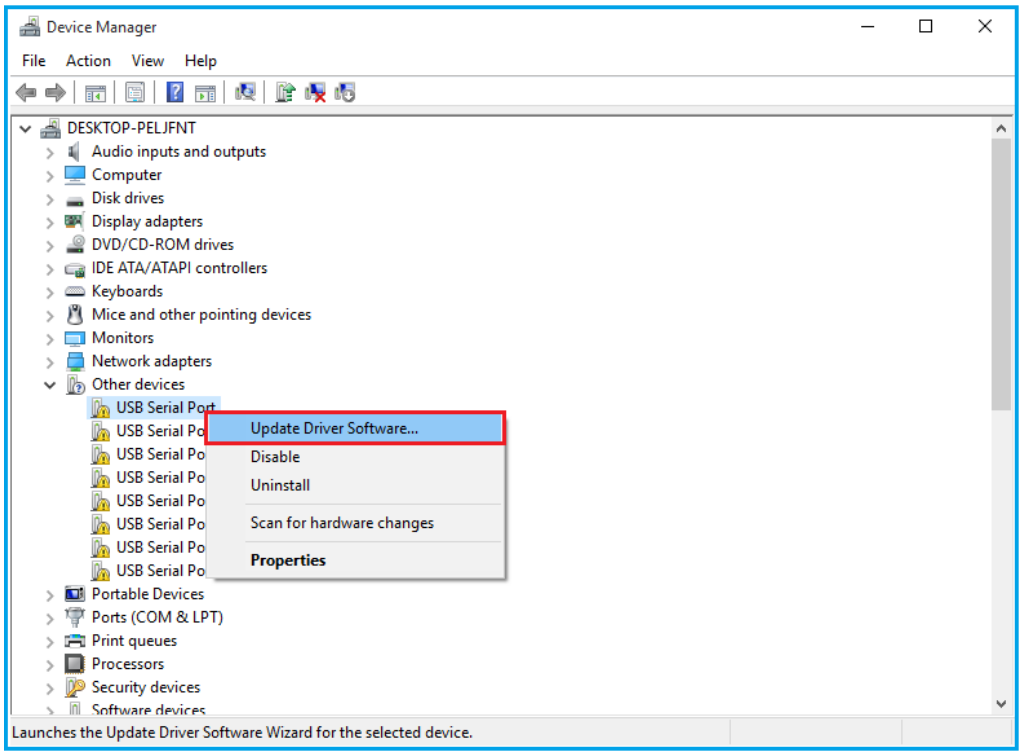
Press “Close” to close this window and go back to the “Device Manager” Windows.

When first “USB Fast Serial Adapter” driver installation is done, select next “USB Fast Serial Adapter” by order and repeat the driver install procedure for all “USB Fast Serial Adapter”.

After all “USB Fast Serial Adapter” driver installation is done successfully, you can find eight “USB Serial Converter X”(X=A,B,C,D) and eight “USB Serial Port” with a yellow warning symbol under Device Manager.

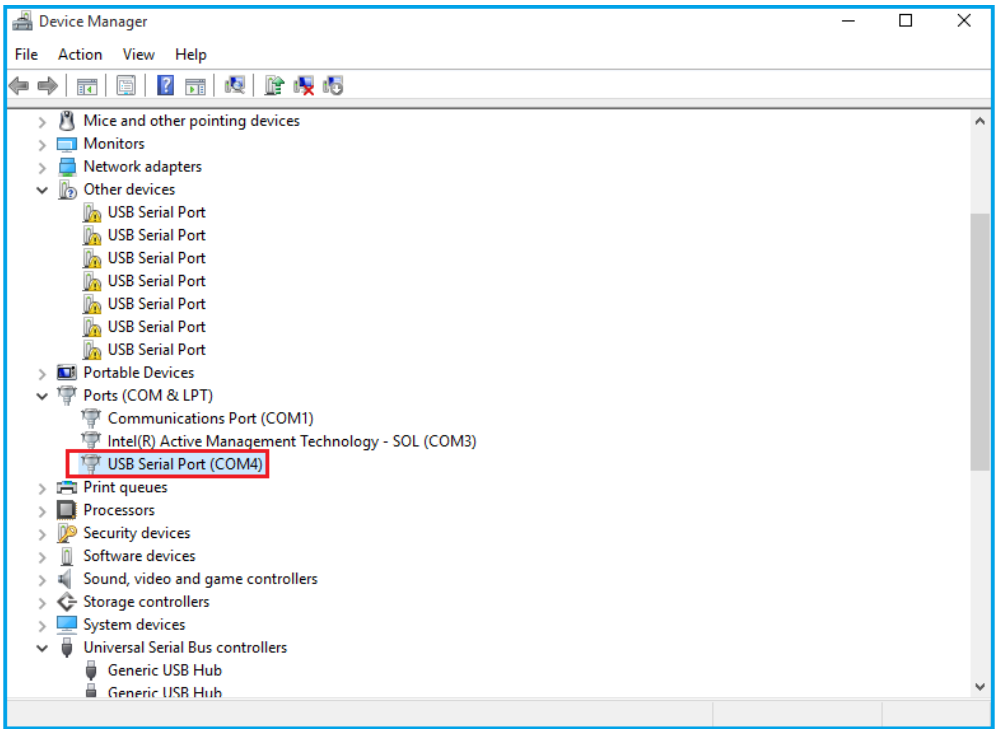


Right click on first “USB Serial Port” to bring up a menu as show below.

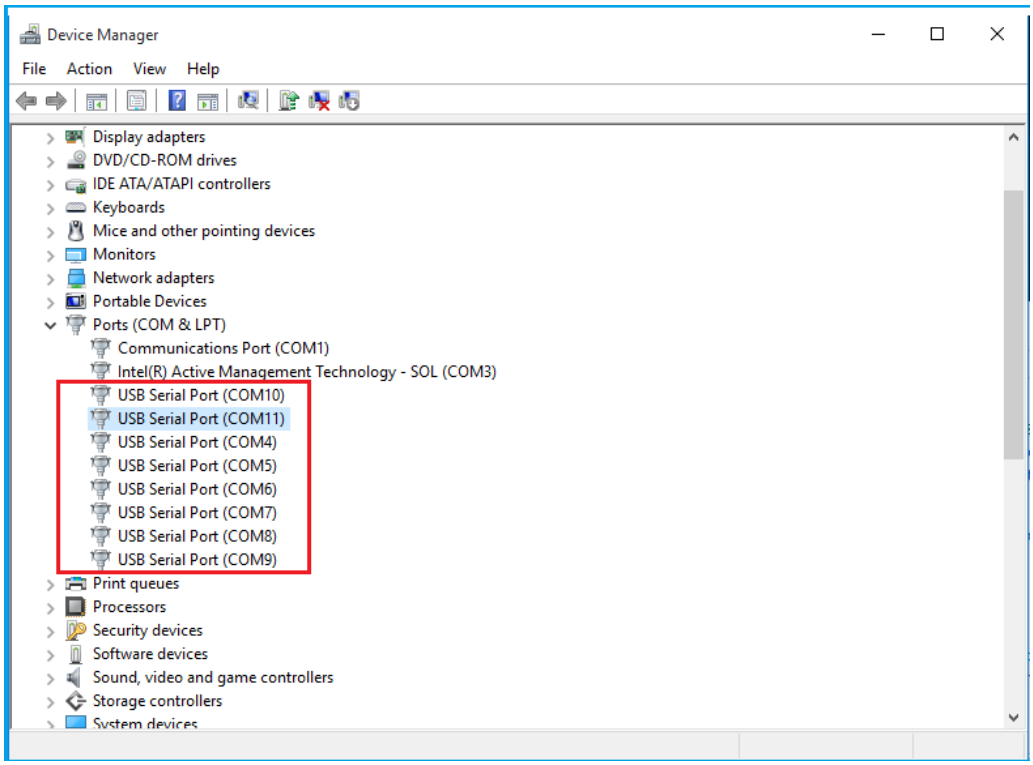


From the displayed menu select “Update Driver Software…”, repeat the same driver install procedure for first “USB Serial Port”.

When first “USB Serial Port” driver installation is done, you can find a “USB Serial Port (COMx)” under “Ports (COM & LPT)” of Device Manager.



After first “USB Serial Port” driver installation is done, select next “USB Serial Port” by order and repeat the driver install procedure for all “USB Serial Port”. When all “USB Serial Port” driver installation is done successfully, you can find eight “USB Serial Port (COMx)” under “Ports (COM & LPT)” of Device Manager.



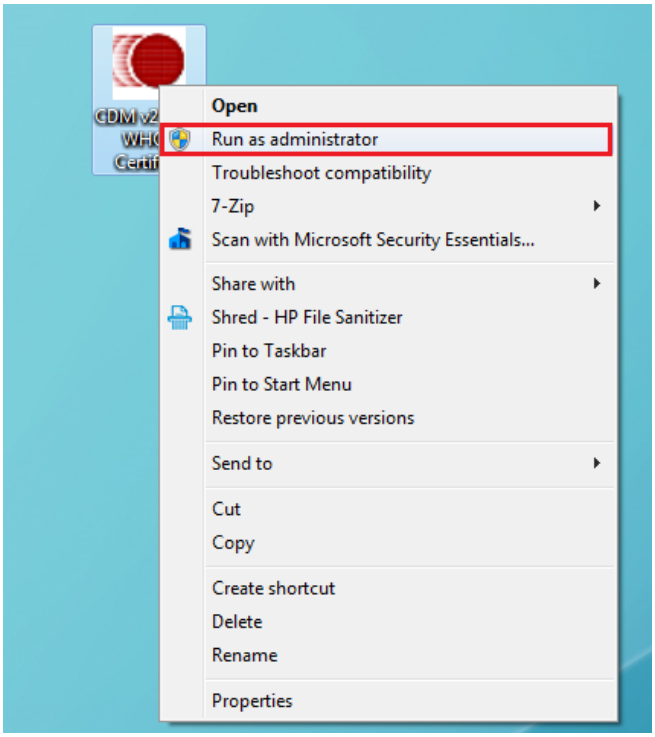
Restart computer to complete installation.

Pre-Installation Windows Driver

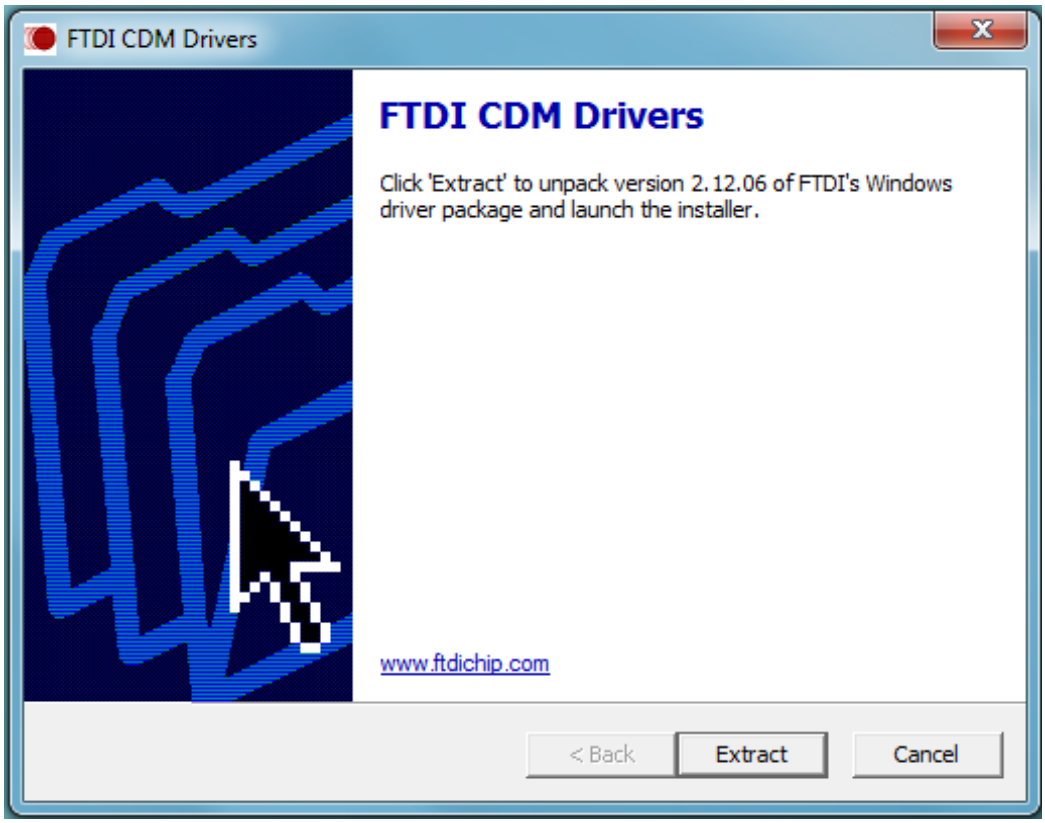
The Windows driver is also available as a setup program (CDMvx.xx.xx WHQL Certified.exe) to pre-install Windows driver into your PC. Before you plug this USB 2.0 to RS-232/422/485 Serial I/O Adapter into the PC, you need to run pre-install program (setup program) first. You can download the setup program (CDMvx.xx.xx WHQL Certified.exe) from http://www.ftdichip.com/FTDrivers.htm.

After downloaded the driver setup program, right click it and select “Run as administrator”.

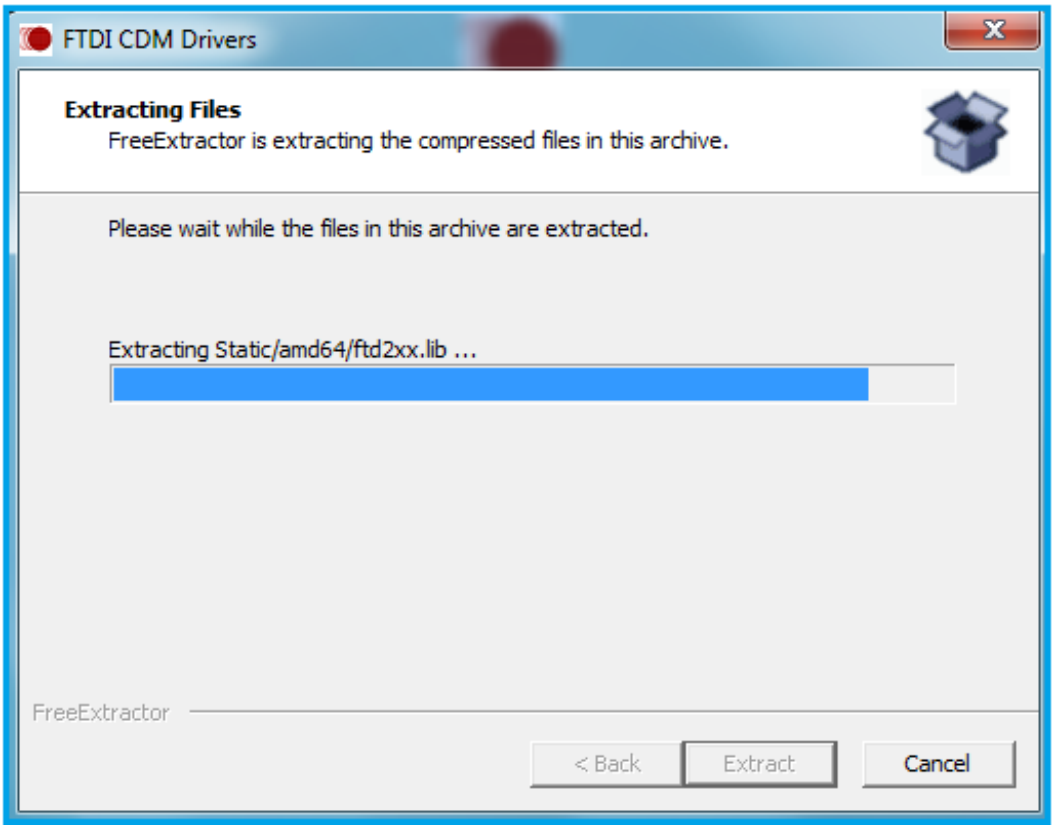
Setup Program



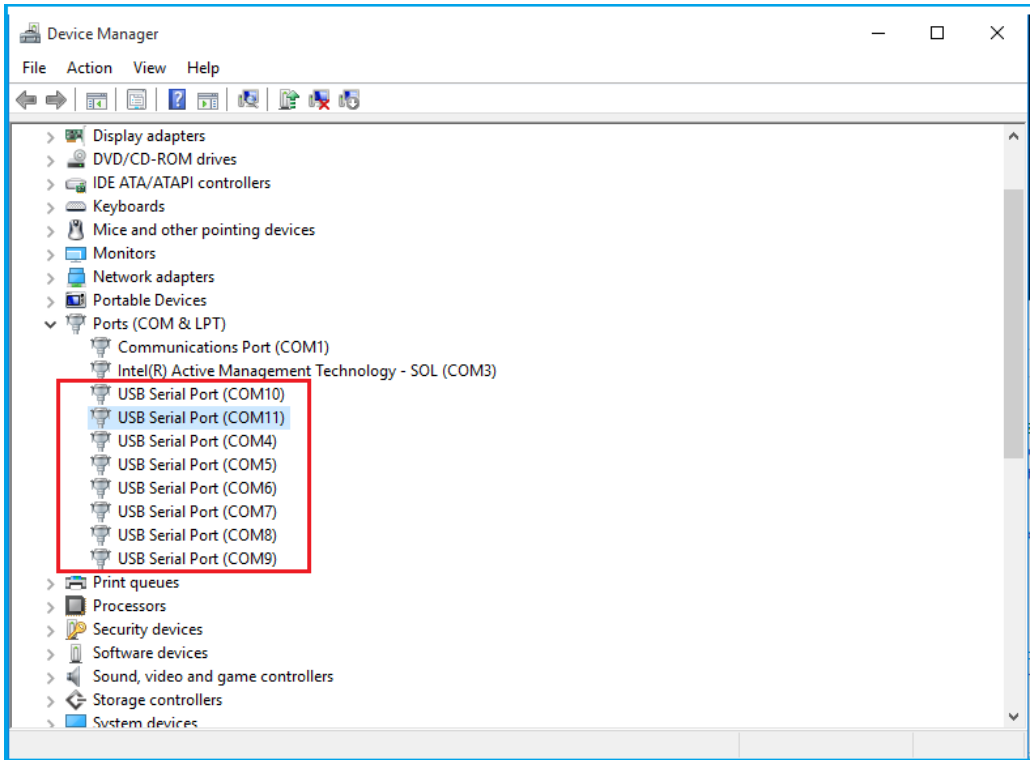
Press the “Extract” button



The driver will now be automatically installed.



Whenever the USB to RS-232/422/485 Serial I/O Adapter is plugged into the PC, the Windows driver will be installed and listed in “Device Manager”.



Uninstall Windows Drivers

Uninstall Windows 10/8.1/8/7/Vista/XP/2003 Drivers

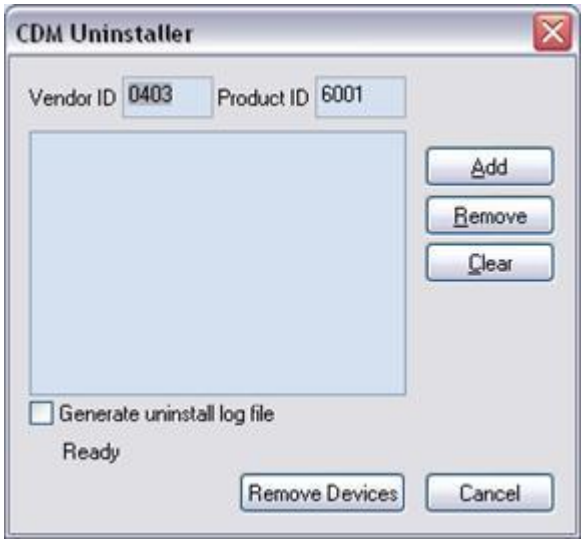
Overview of the functionality of the CDMuninstallerGUI.exe
This application is used to remove installed drivers from the user's system and clean them from the Windows registry.
You can download this application program (CDMUninstaller_v1.4.zip) from
http://www.ftdichip.com/Support/Utilities_htm#CDMUninstaller

Supported Operating Systems
Uninstaller is currently supported on the following operating systems:

- Windows 10/ 8.1/ 8/ 7 (32 and 64 bit)
- Windows Vista (32 and 64 bit)
- Windows XP/ 2003 (32 and 64 bit)

Running the Application
To run the application, simply double click on the .exe file.

Removing a Driver
The figure below shows the window displayed upon running the application. The Vendor ID and Product ID text boxes allow the user to enter a 4 character hex value specifying the device that they wish to remove. All installed device drivers can be viewed from within the Windows Device Manager. The USB Quad/Octal industrial serial adapters use the FTDI default Vendor ID (0x0403). Depending on the specific model of USB Quad/Octal industrial serial adapters, valid Product IDs is: 0x6001.



To remove a device it must be added into the device window; they all must have a unique Vendor ID and Product ID combination. To remove the device(s) click on the '*Remove Devices*' button.
The '*Remove*' button will remove the currently selected item from the device window, and the '*Clear'* button will remove all the devices from the device window.

A message box will confirm successful removal from the system and the device will be removed from the device window. To create an uninstall log file, check '*Generate uninstall log file*' prior to removing the device. This will create a text file outlining all operations that were attempted during the removal process that will be saved in the same directory as the .exe file.

Error Messages

If there are no devices specified within the device window the following message will appear. Make sure that at least one device has been specified within the window by using the '*Add'* button.

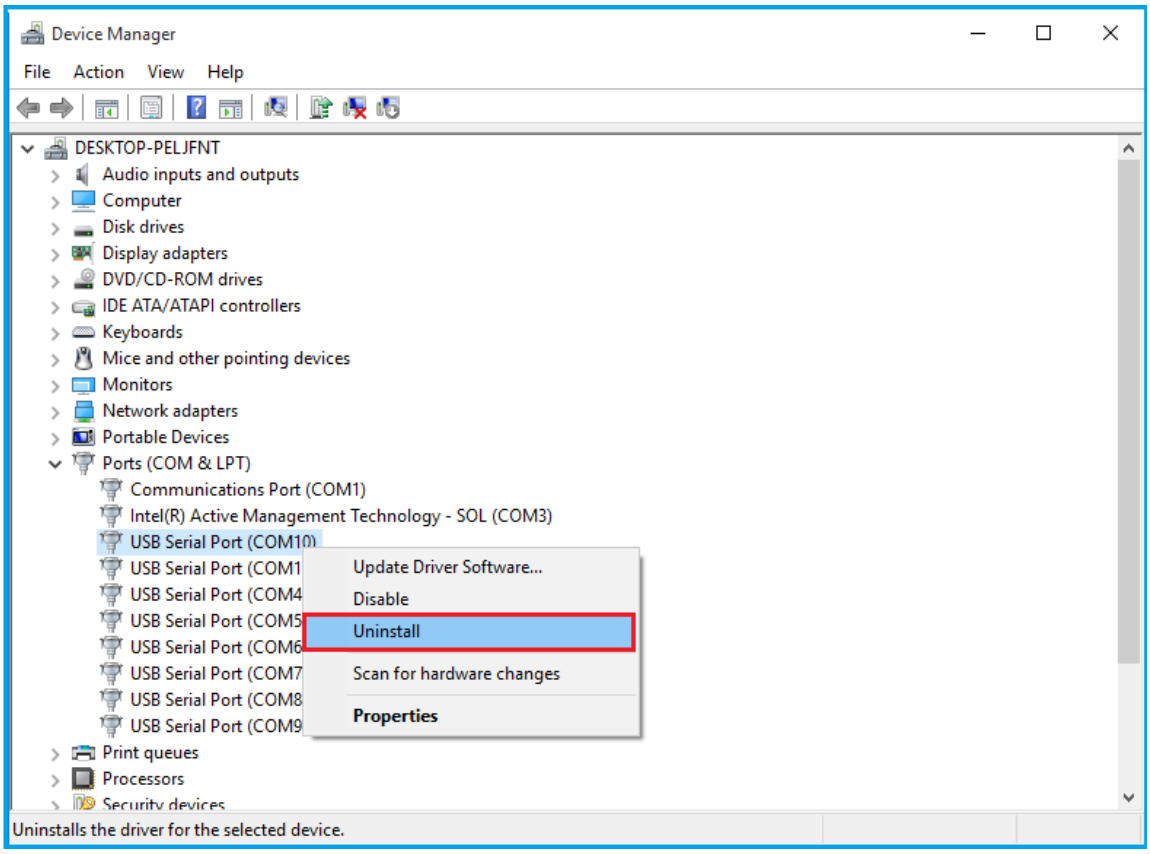
If after attempting to remove a device the application was unable to find any devices matching the Vendor ID and Product ID, the following message box will appear. In this situation make sure that the details that you have entered are indeed correct by checking with the windows device manager.

The Vendor ID and Product ID must be a unique combination, if an attempt is made to add the same device twice the following message box will appear.

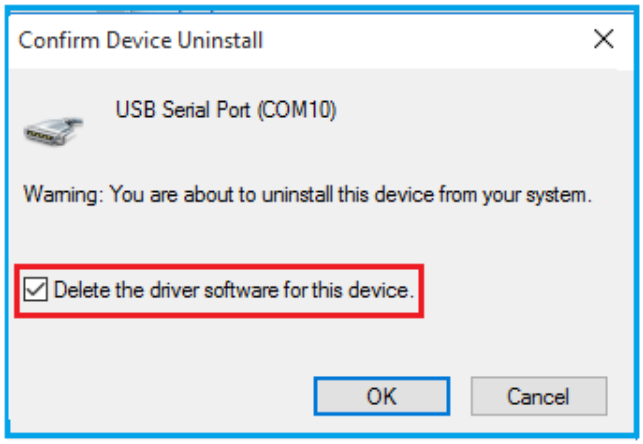
Manual Uninstall Windows 10/ 8.1/ 8/ 7 Driver

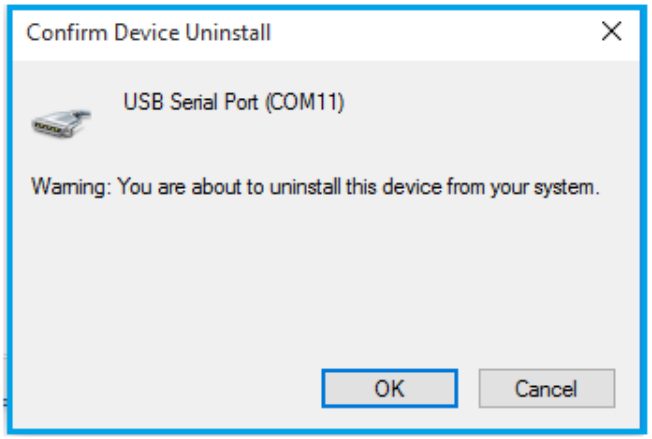
To manual uninstall the Windows 10/ 8.1/ 8/ 7 driver from Device Manager for USB 2.0 to RS-232/422/485 Serial Adapter, please follow the steps below:

Right click on “USB Serial Port (COMx)” in “Device Manager “ to expand to “Device Control” screen. Select “Uninstall” to start “USB Serial Port (COMx)” Windows driver uninstall.



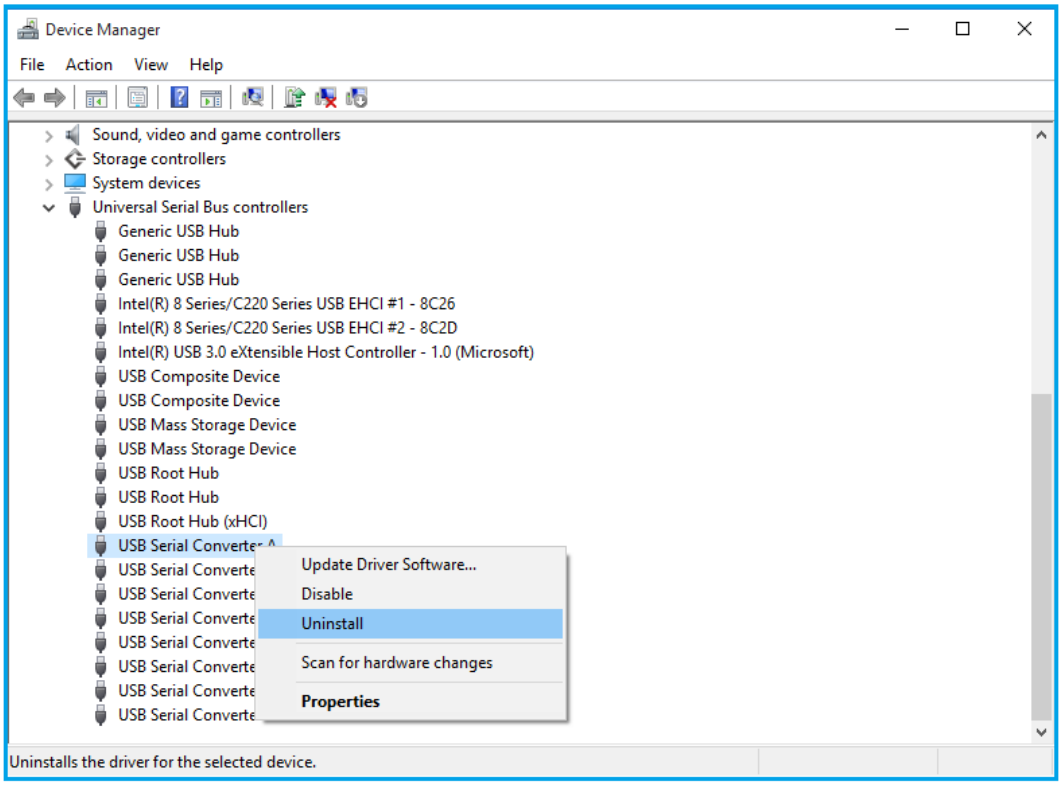
Under “Confirm Device Uninstall” screen, check “Delete the driver software for this device”. Click “OK” to uninstall the software driver. If you do not find “Delete the driver software for this device” message, then just click “OK” to uninstall the software driver.



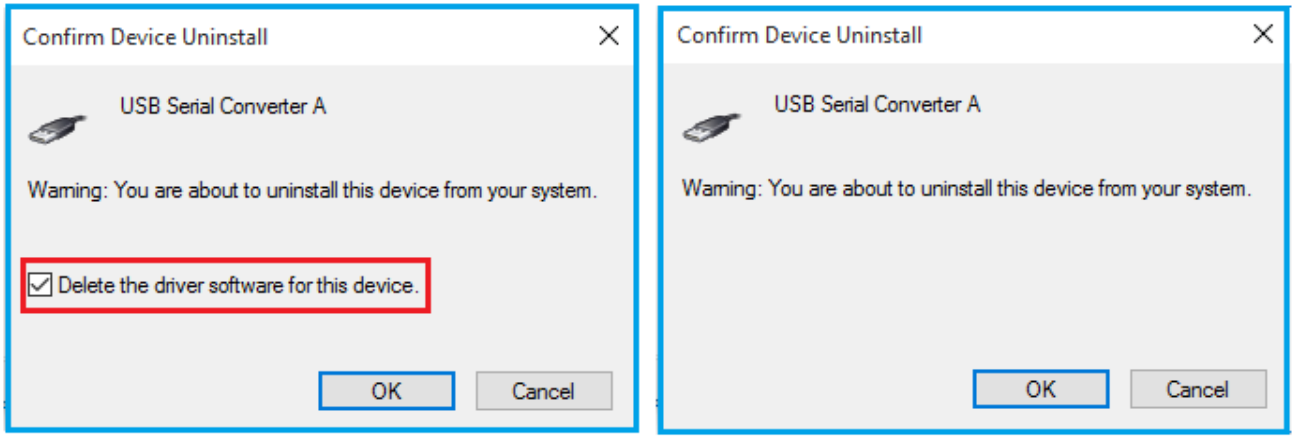


Right click on other “USB Serial Port (COMx)” and repeat the driver uninstall procedure to uninstall all “USB Serial Port” Windows driver.

Right click on “USB Serial Converter X” under “Device Manager” to expand to “Device Control ” screen. Select “Uninstall” to start “USB Serial Converter X” software driver uninstall.



Under “Confirm Device Uninstall” screen, check “Delete the driver software for this device”. Click “OK” to uninstall the software driver. If you do not find “Delete the driver software for this device” message, then just click “OK” to uninstall the software driver.



Right click on other “USB Serial Converter X” and repeat the driver uninstall procedure to uninstall all “USB Serial Converter X” Windows driver.

Check Installation

You can now verify the installation has been completed successfully by looking under Device Manager of the System Properties screen. (Go there by Start-Setting- Control Panel-System Properties-Hardware-Device Manager.

The device should have installed as a "USB Serial Port (COMx)" attached to "USB Serial Converter (A/B or A/B/C/D)".

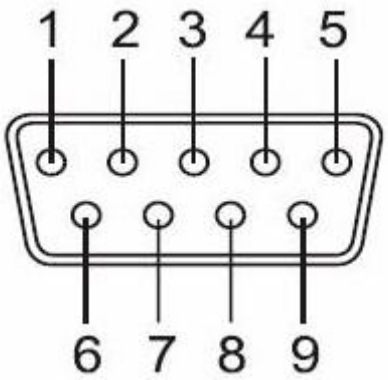
Change COM Port Properties & COM Port Number

This feature is particularly useful for programs, such as HyperTerminal, which only work with COM1 through COM4. Please ensure that you do not change the COM Port Number already in use.

To change the virtual COM port properties:

- Select the "USB Serial Port"
- Click “Properties”.
- Select "Port Setting" and “Advanced”.
- Click the drop down arrow on COM Port Number and scroll to the required COM port. Select "OK".
- Return to the Device Manager Screen. You will see that the USB Serial Port installation has been changed to the new COM Port Number.

RS-232 Signal Pin-outs of DB-9 Male



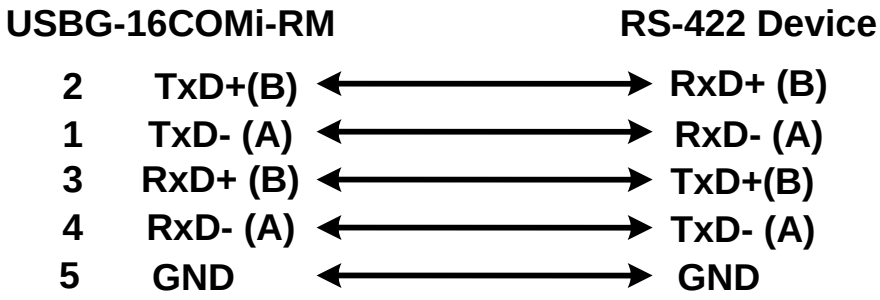
Pin 1	**DCD**
Pin 2	**RxD**
Pin 3	**TxD**
Pin 4	**DTR**
Pin 5	**GND**
Pin 6	**DSR**
Pin 7	**RTS**
Pin 8	**CTS**
Pin 9	**RI**

RS-422 Signal Pin-outs of DB-9 Male

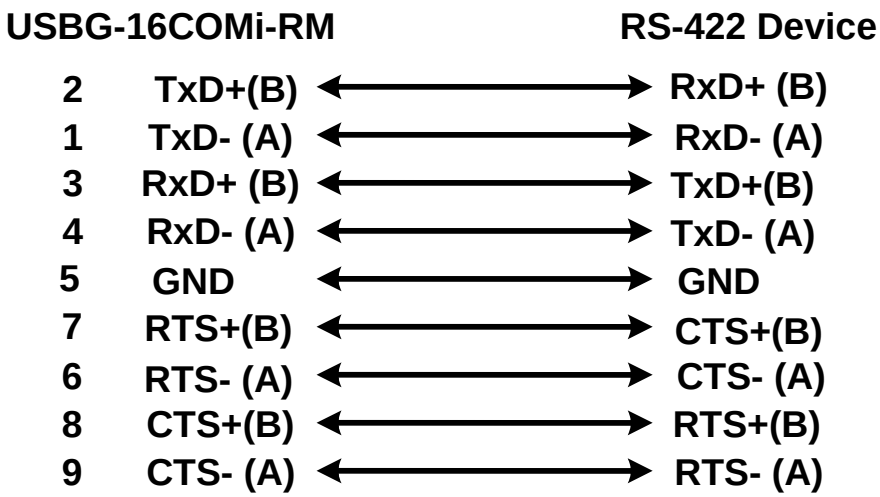
Pin 1	TxD- (A)
Pin 2	TxD+(B)
Pin 3	RxD+(B)
Pin 4	RxD-(A)
Pin 5	GND
Pin 6	RTS- (A)
Pin 7	RTS+(B)
Pin 8	CTS+(B)
Pin 9	CTS- (A)

RS-422 Signal Wiring

- **Point-to-Point 4 Wire Full Duplex**



- **RS-422 with Handshaking**



RS-485 4-Wire (Full duplex) Signal Pin-outs of DB-9 Male

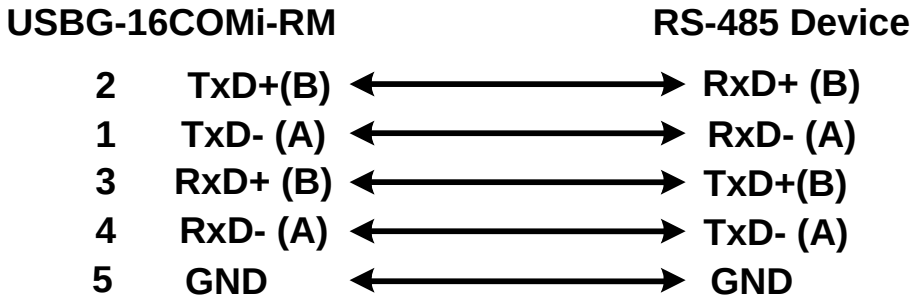
Pin 1	**Tx- (A)**
Pin 2	**Tx+(B)**
Pin 3	**Rx+(B)**
Pin 4	**Rx-(A)**
Pin 5	**GND**

RS-485 2-Wire (Half duplex) Signal Pin-outs of DB-9 Male

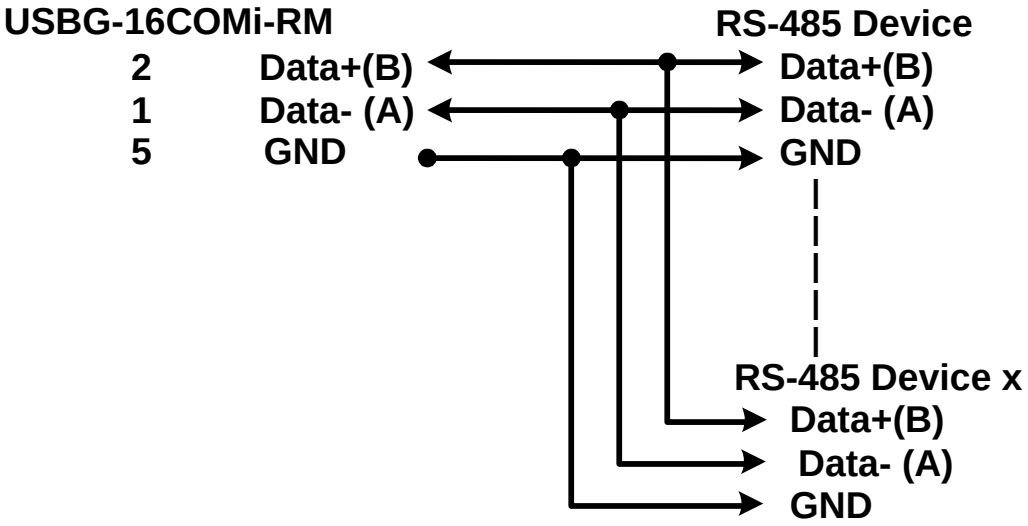
Pin 1	**Data- (A)**
Pin 2	**Data+(B)**
Pin 5	**GND**

RS-485 Signal Wiring

- **Point-to-Point 4-Wire Full Duplex**



- **Multidrop RS-485 2-Wire Half-duplex**



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Manual Part No. USBG076