



**Future Technology Devices
International Ltd.**

Windows 2000 Installation Guide

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1 Welcome to the Windows 2000 Installation Guide

The purpose of this document is to provide users of FTDI chips with a simple procedure for installing drivers for their devices under Windows 2000.

2 Installing FT232BM, FT245BM, FT8U232AM and FT8U245AM Devices

FTDI's 1st and 2nd generation of USB UART and USB FIFO chips can be installed with one of two sets of drivers.

The first driver type is the D2XX direct driver. This provides direct access to the device via a dynamic link library (DLL) supplied with the driver. Applications can then be written which use the functions available in the DLL to directly control the device.

The second driver type is the virtual COM port (VCP) driver. The VCP drivers emulate a standard PC COM port. These can be communicated with in the same manner as any other COM port on the PC.

Under Windows 2000, the Found New Hardware Wizard should be used to install devices when they are connected to the PC for the first time as this is the recommended procedure for reliable device operation.

2.1 Installing D2XX Drivers

To install D2XX drivers for an FT232BM, FT245BM, FT8U232AM or FT8U245AM device under Windows 2000, follow the instructions below:

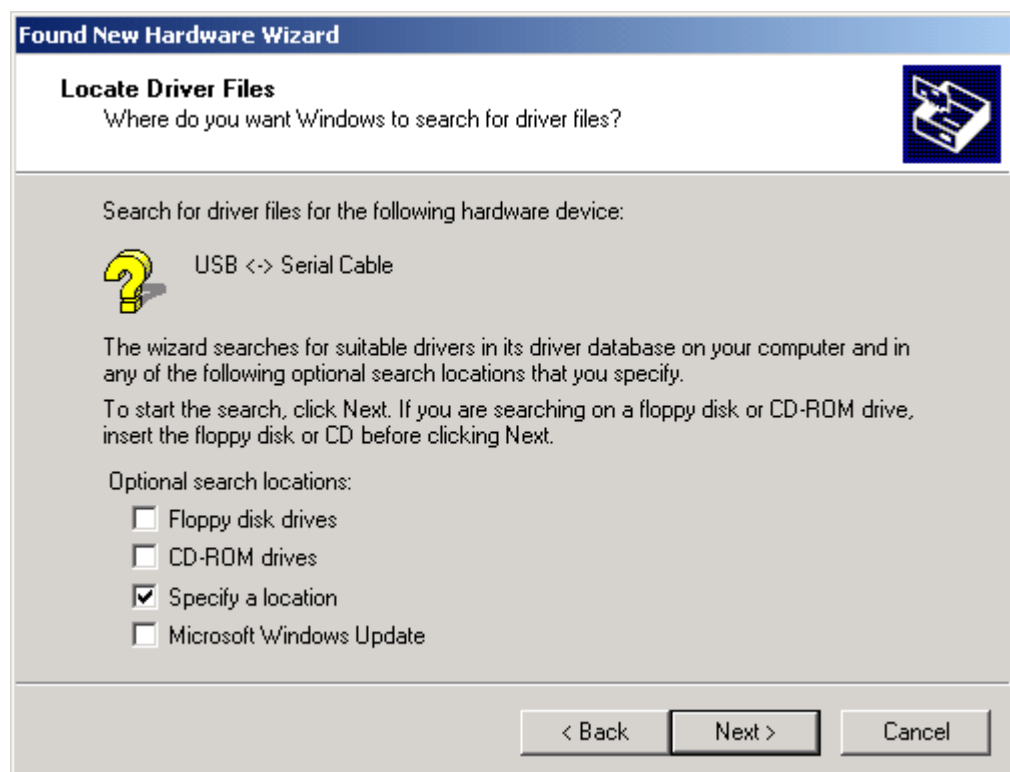
- If a device of the same type has been installed on your machine before and the drivers that are about to be installed are different from those installed already, the original drivers need to be uninstalled. Please refer to the [Uninstalling FT232BM, FT245BM, FT8U232AM and FT8U245AM](#) ^[33] Devices section of this document for further details of this procedure.
- Download the latest available D2XX drivers from the [FTDI website](#) and unzip them to a location on your PC.
- Connect the device to a spare USB port on your PC. This will launch the Windows Found New Hardware Wizard. Click "Next" to proceed with the installation.



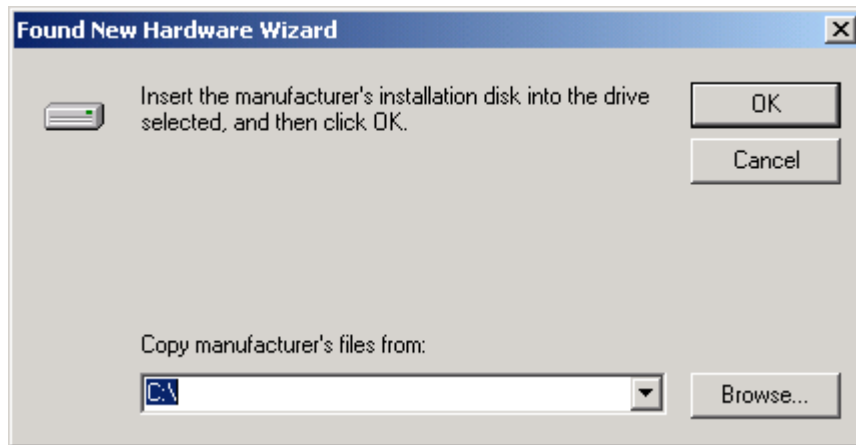
- Select "Search for a suitable driver for my device (recommended)" as shown below and then click "Next".



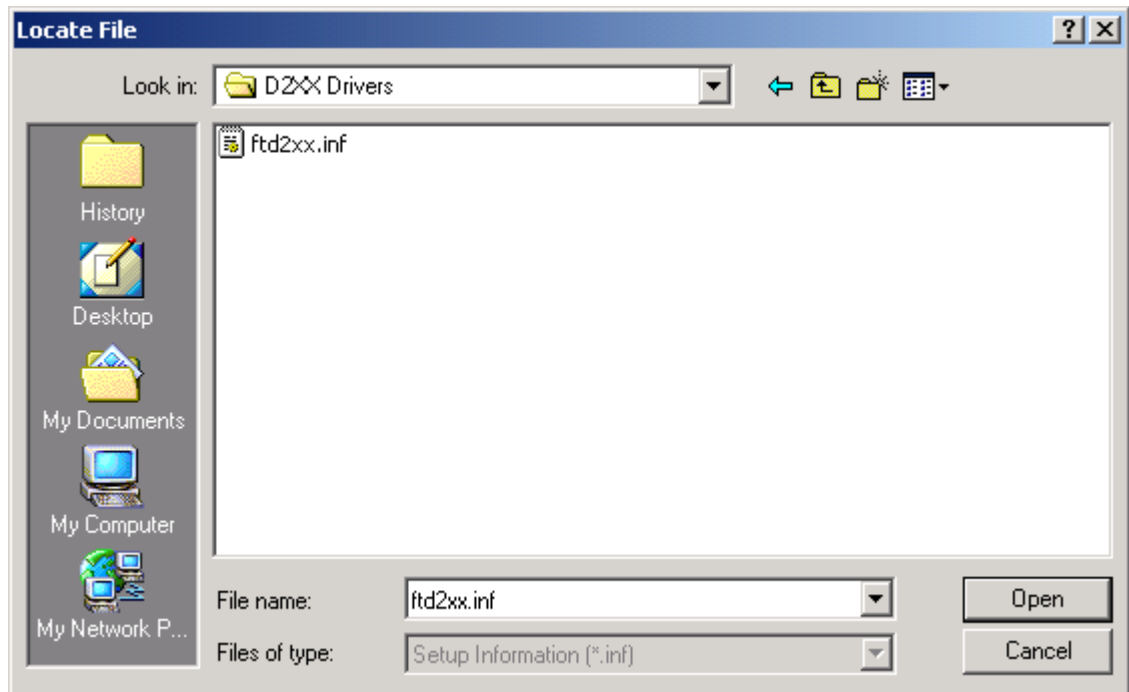
- Check the box next to "Specify a location" and uncheck all others as shown below.



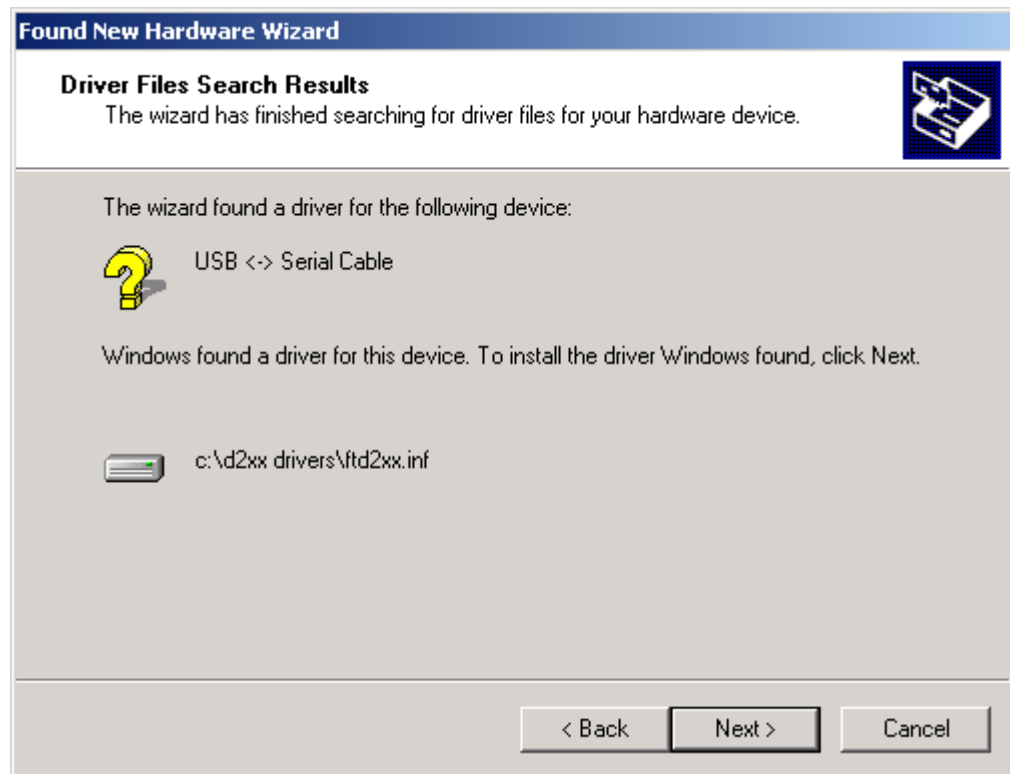
- Clicking "Next" displays a dialog box for you to enter to the location of the drivers.



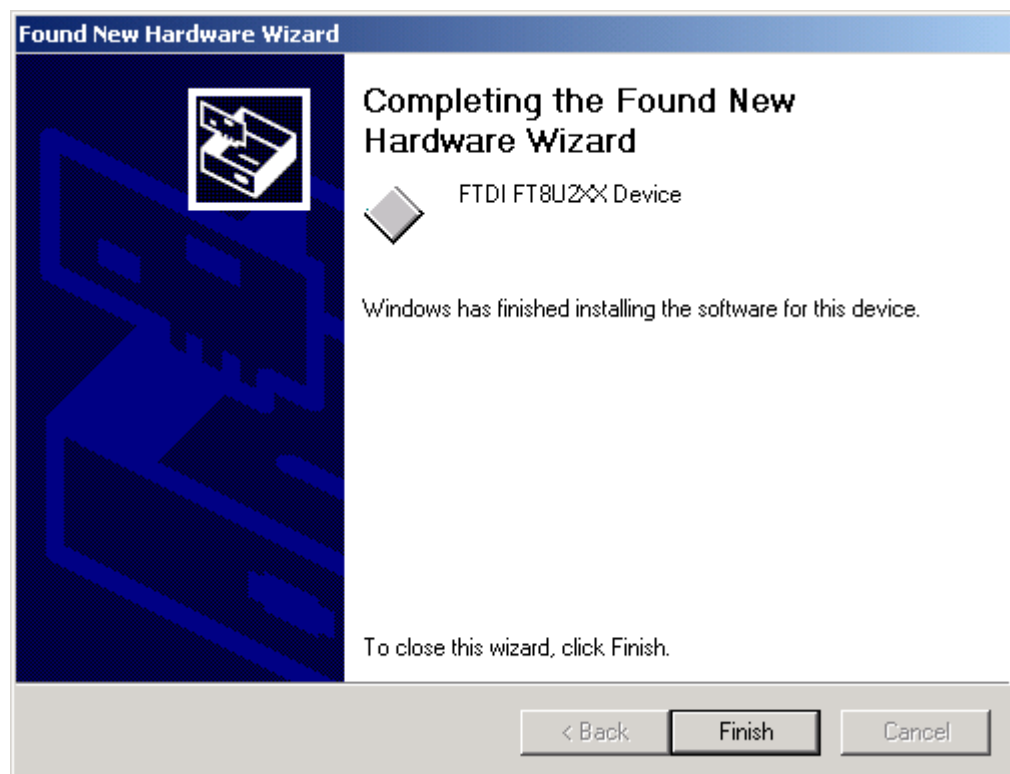
- Click "Browse" to display an open file dialog box.



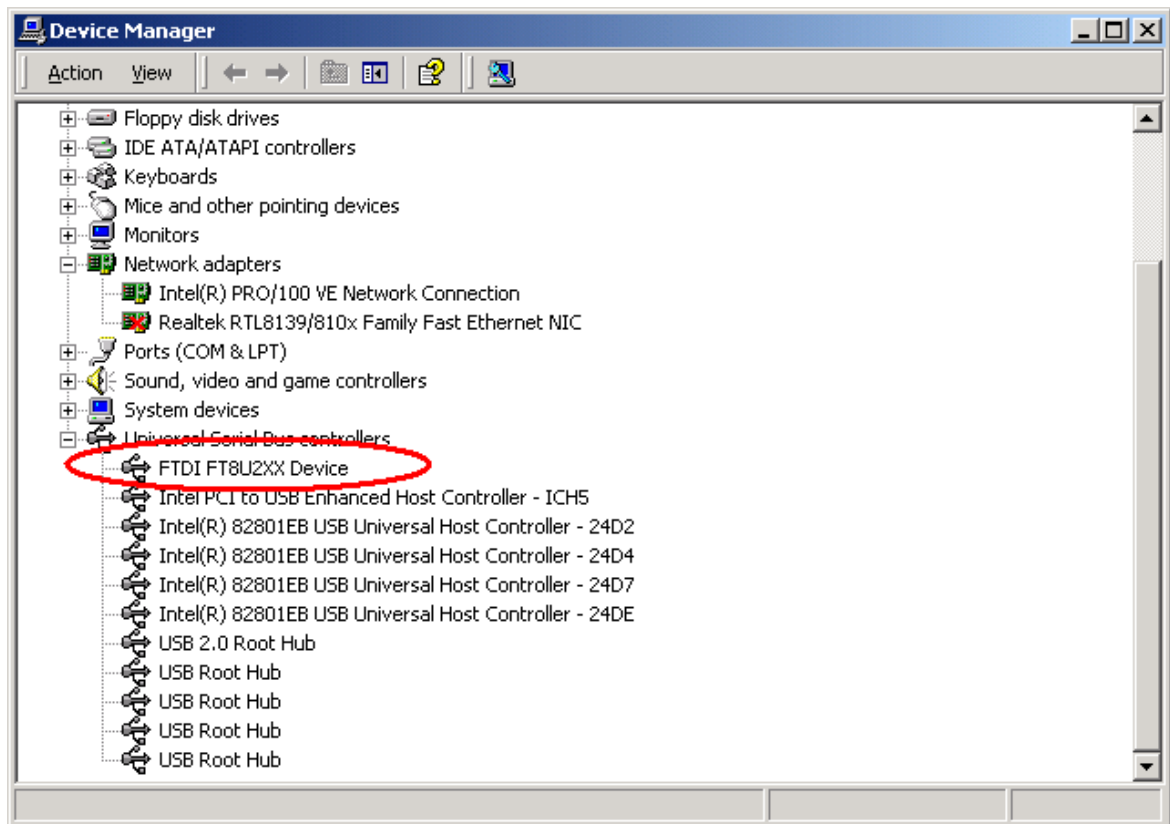
- Locate the folder containing the latest drivers downloaded from the [FTDI website](#) above and click "Open", then click "OK". The PC autoselects the correct INF file, in this case FTD2XX.INF. Once Windows has found the required driver .INF file, click "Next" to proceed.



- Windows should then display a message indicating that the installation was successful. Click "Finish" to complete the installation. The device is now ready for use.



- Open the Device Manager (located in "Control Panel\System" then select the "Hardware" tab and click "Device Manager...") and select "View > Devices by Type". The device appears as a FT8U2XX Device connected to a USB port.



2.2 Installing VCP Drivers

To install VCP drivers for an FT232BM, FT245BM, FT8U232AM or FT8U245AM device under Windows 2000, follow the instructions below:

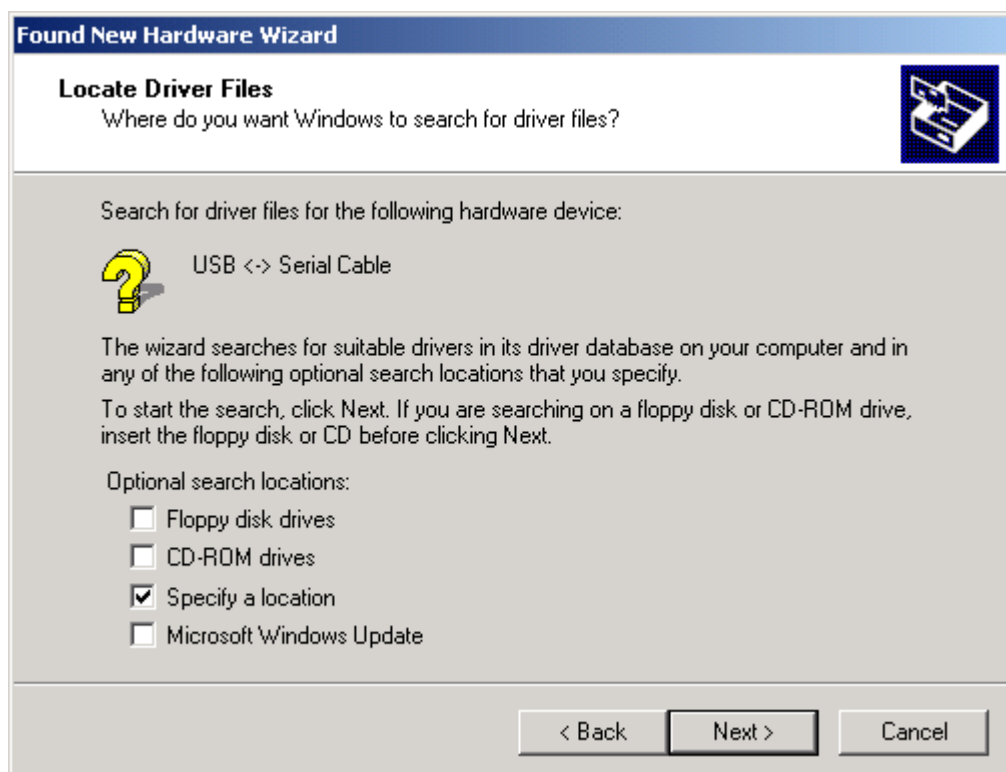
- If a device of the same type has been installed on your machine before and the drivers that are about to be installed are different from those installed already, the original drivers need to be uninstalled. Please refer to the [Uninstalling FT232BM, FT245BM, FT8U232AM and FT8U245AM](#) ^[33] Devices section of this document for further details of this procedure.
- Download the latest available VCP drivers from the [FTDI website](#) and unzip them to a location on your PC.
- Connect the device to a spare USB port on your PC. This will launch the Windows Found New Hardware Wizard. Click "Next" to proceed with the installation.



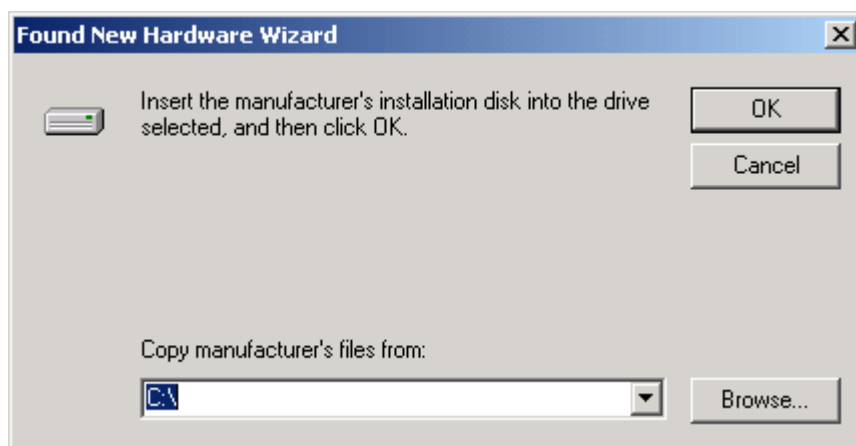
- Select "Search for a suitable driver for my device (recommended)" as shown below and then click "Next".



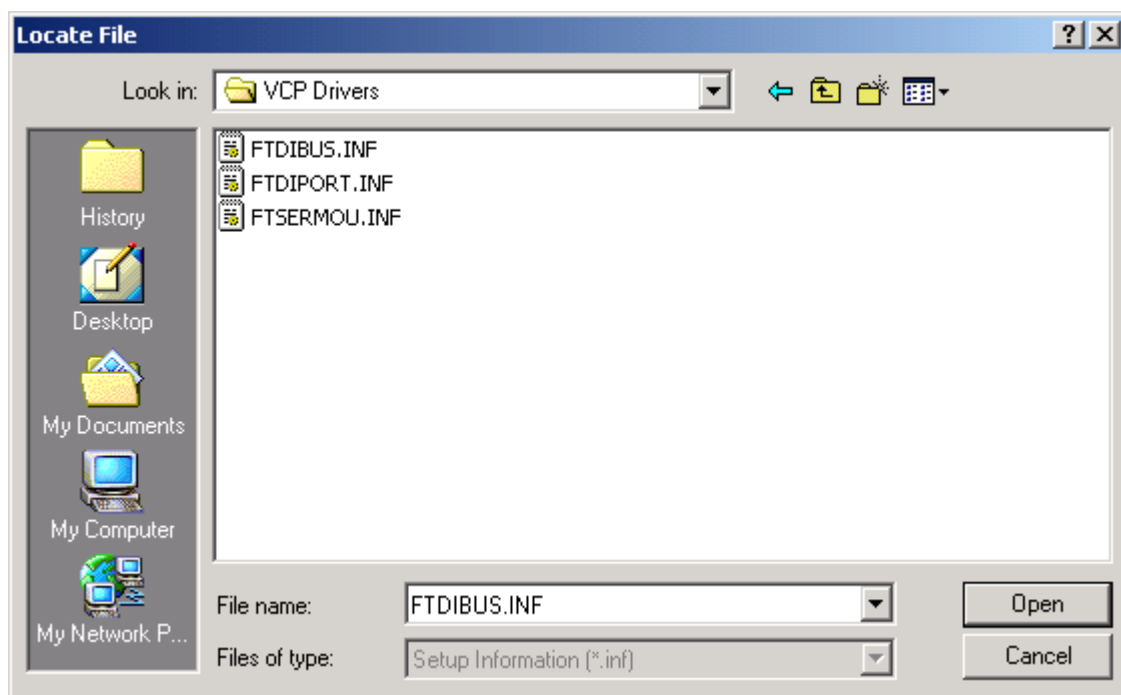
- Check the box next to "Specify a location" and uncheck all others as shown below.



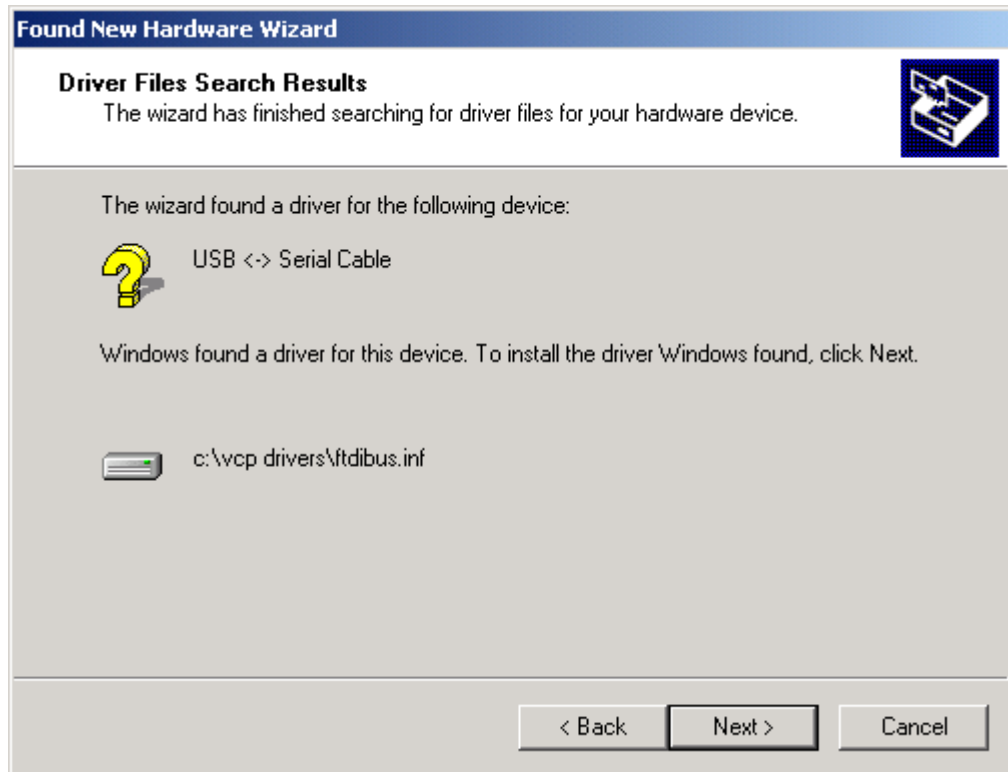
- Clicking "Next" displays a dialog box for you to enter to the location of the drivers.



- Click "Browse" to display an open file dialog box.



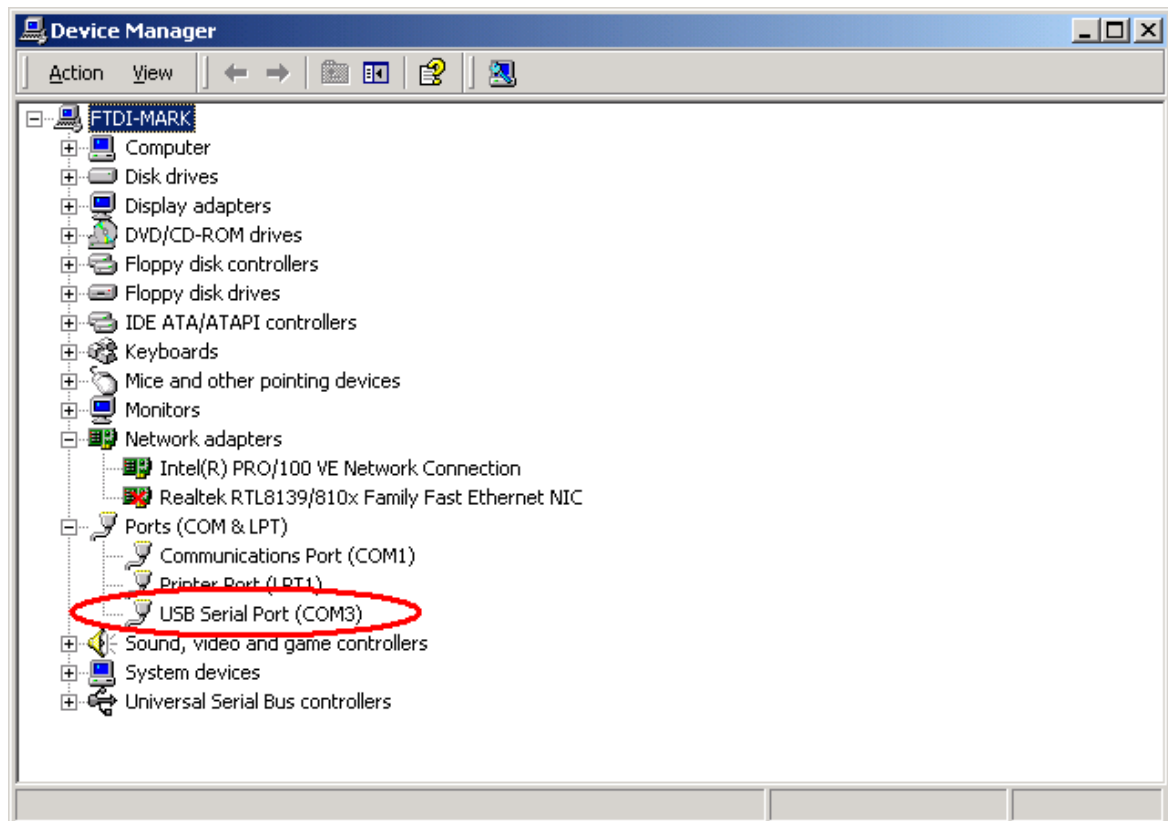
- Locate the folder containing the latest drivers downloaded from the [FTDI website](#) above and click "Open", then click "OK". The PC autoselects the correct INF file, in this case FTDIBUS.INF. Once Windows has found the required driver .INF file, click "Next" to proceed.



- Windows should then display a message indicating that the installation was successful. Click "Finish" to complete the installation. This has installed the serial converter. The COM port emulation driver must be installed after this has completed.



- After clicking "Finish", the Found New Hardware Wizard will continue by installing the COM port emulation driver. The procedure is the same as that above for installing the serial converter driver, except the PC will autoselect the FTDIPORT.INF file.
- Open the Device Manager (located in "Control Panel\System" then select the "Hardware" tab and click "Device Manger...") and select "View > Devices by Type". The device appears as an additional COM port with the label "USB Serial Port".



3 Installing FT2232C Devices

FTDI's 3rd generation chip, the FT2232C, is a composite device with two ports that can be configured to behave as a USB UART or a USB FIFO interface by configuring an external EEPROM. In addition, the FT2232C EEPROM determines which drivers the device will use.

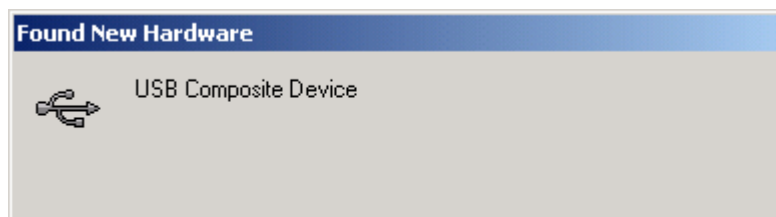
The EEPROM is read on power-up and will configure the chip accordingly before the device is enumerated. If no EEPROM is fitted, the device will default to both channels configured as USB to UART interfaces using VCP drivers.

For Windows 2000 and Windows XP, a combined driver is available. This installs the D2XX driver and then installs the VCP driver layer in addition if required. Under Windows 2000, the Found New Hardware Wizard should be used to install devices when they are connected to the PC for the first time as this is the recommended procedure for reliable device operation.

3.1 Installing D2XX Drivers

To install D2XX drivers for an FT2232C device under Windows 2000, follow the instructions below:

- If a device of the same type has been installed on your machine before and the drivers that are about to be installed are different from those installed already, the original drivers need to be uninstalled. Please refer to the [Uninstalling FT2232C Devices](#)^[37] section of this document for further details of this procedure.
- Download the latest available FTC combined D2XX and VCP drivers from the [FTDI website](#) and unzip them to a location on your PC.
- Connect the device to a spare USB port on your PC. As the FT2232C is a composite device, the Microsoft composite device driver is loaded first.



- Once the composite driver has been installed the Found New Hardware Wizard will launch. Click "Next" to proceed with the installation.

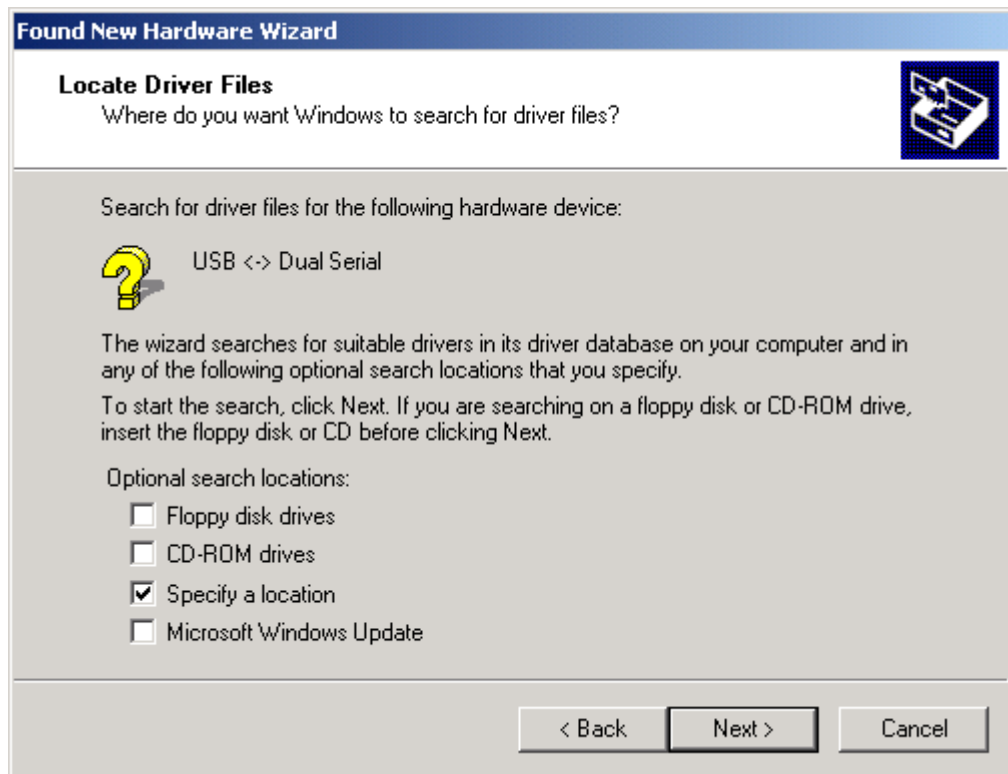


- Select "Search for a suitable driver for my device (recommended)" as shown below and then

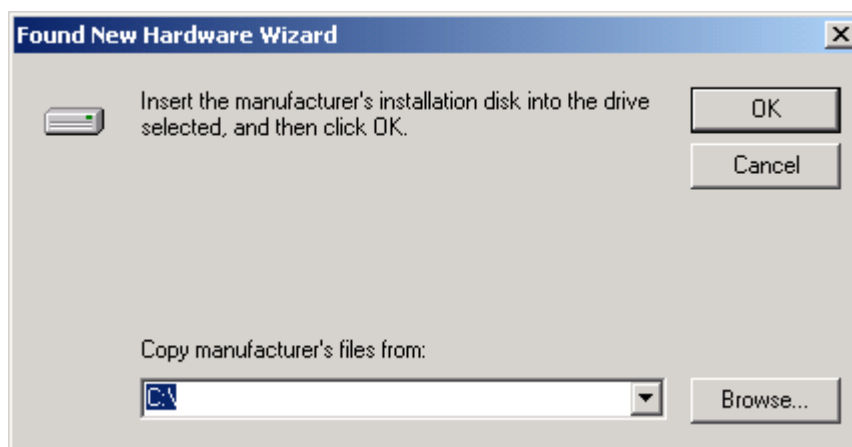
click "Next".



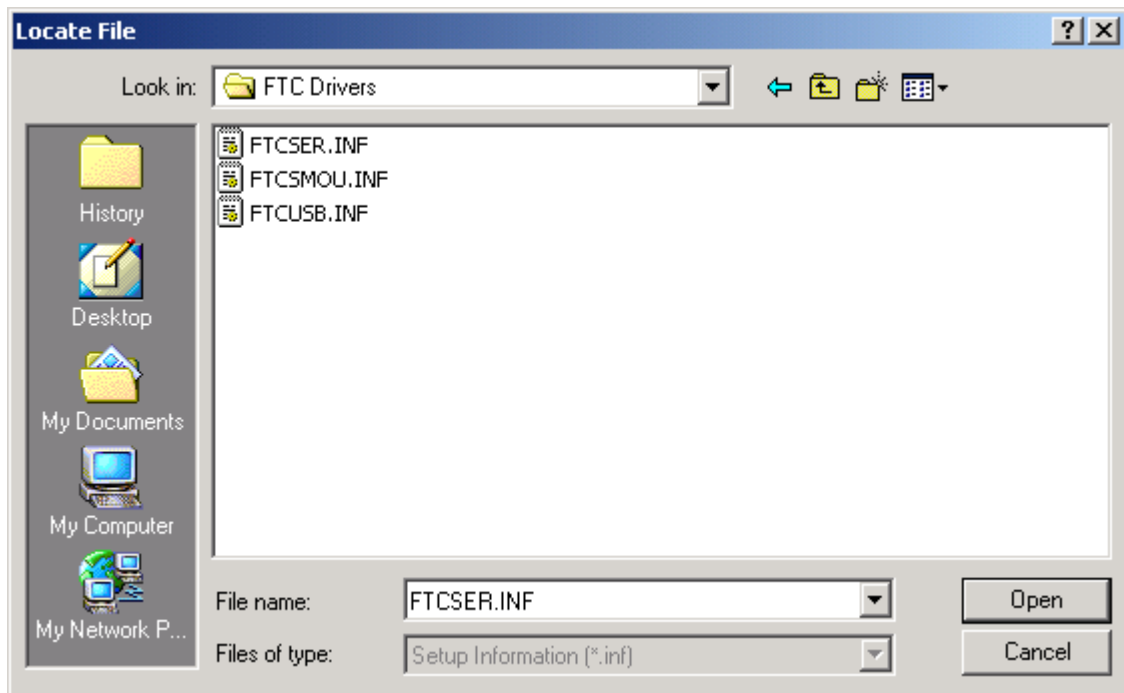
- Check the box next to "Specify a location" and uncheck all others as shown below.



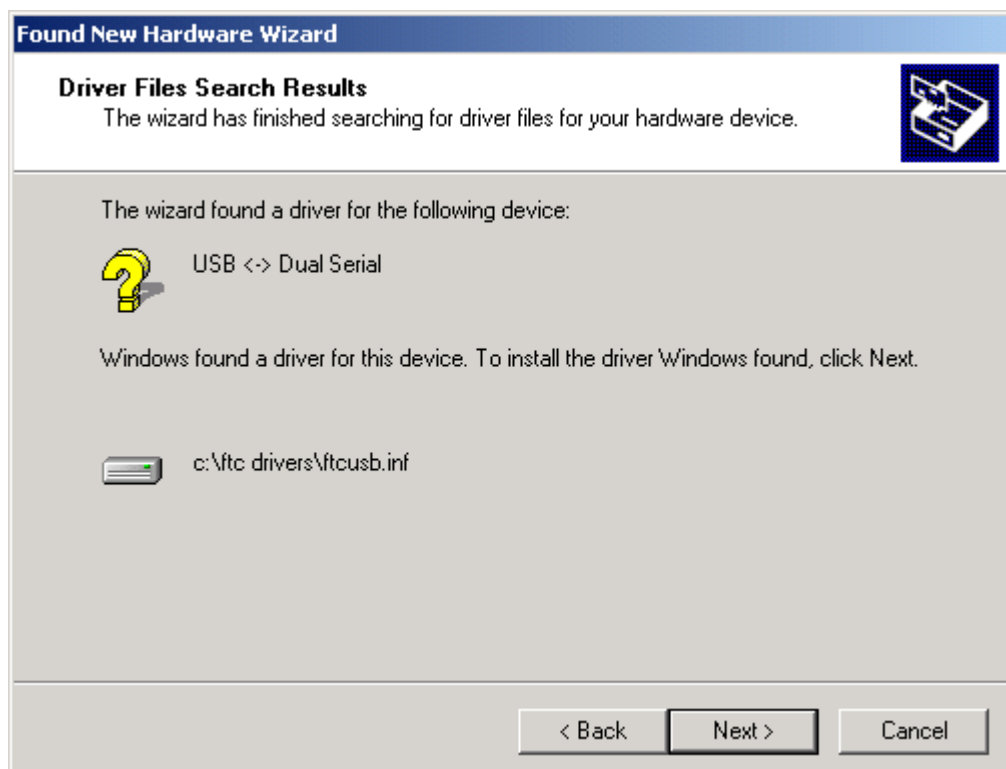
- Clicking "Next" displays a dialog box for you to enter to the location of the drivers.



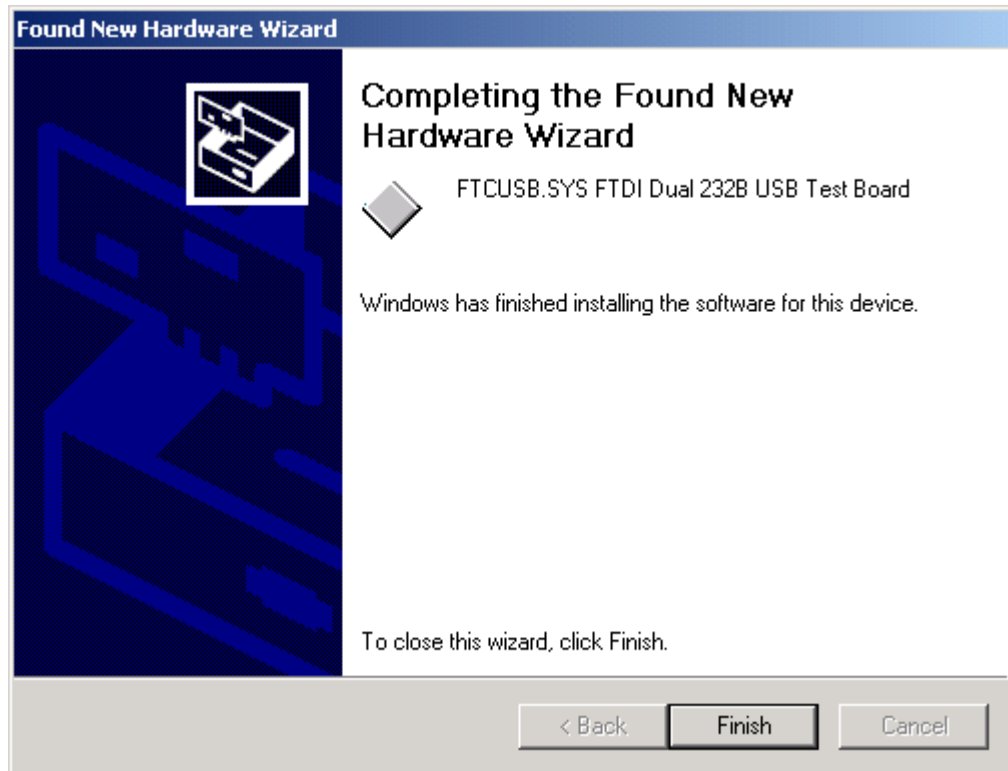
- Click "Browse" to display an open file dialog box.



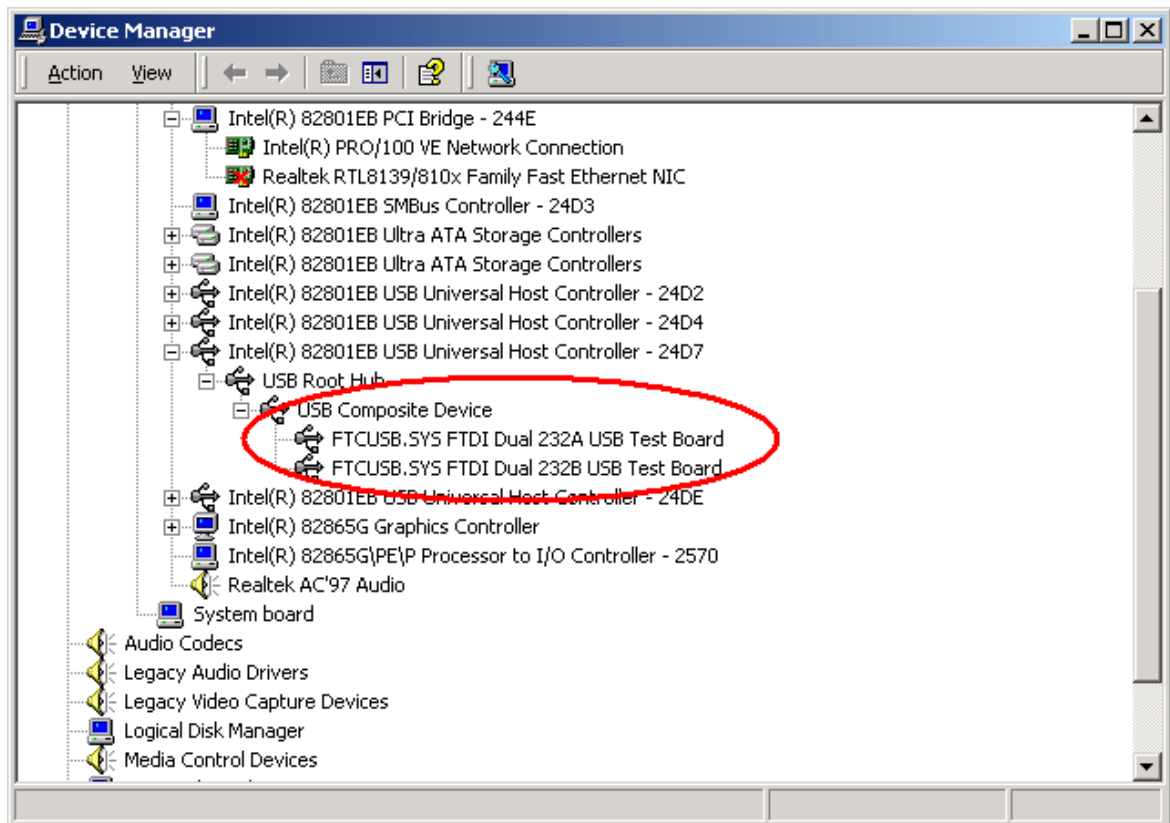
- Locate the folder containing the latest drivers downloaded from the [FTDI website](#) above and click "Open", then click "OK". The PC autoselects the correct INF file, in this case FTCUSB.INF. Once Windows has found the required driver .INF file, click "Next" to proceed.



- Windows should then display a message indicating that the installation was successful. Click "Finish" to complete the installation for this port of the device.



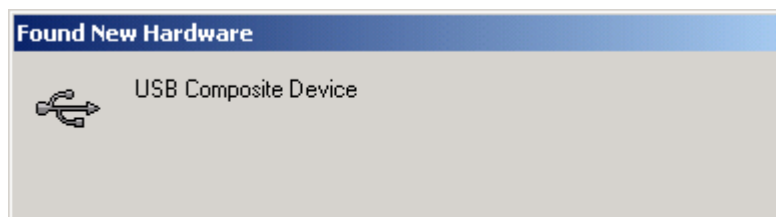
- As the FT2232C has 2 ports available, the second port must also be installed. Under Windows 2000, this will occur automatically.
- By examining the Device Manager (located in "Control Panel\System" then select the "Hardware" tab and click "Device Manger...") and viewing by connection (from "View > Devices by connection"), the device appears as a "USB Composite Device" connected to a USB port with ports A and B respectively denoted as "FTCUSB.SYS FTDI Dual 232A USB Test Board" and "FTCUSB.SYS FTDI Dual 232B USB Test Board".



3.2 Installing VCP Drivers

To install VCP drivers for an FT2232C device under Windows 2000, follow the instructions below:

- If a device of the same type has been installed on your machine before and the drivers that are about to be installed are different from those installed already, the original drivers need to be uninstalled. Please refer to the [Uninstalling FT2232C Devices](#)^[37] section of this document for further details of this procedure.
- Download the latest available FTC combined D2XX and VCP drivers from the [FTDI website](#) and unzip them to a location on your PC.
- Connect the device to a spare USB port on your PC. As the FT2232C is a composite device, the Microsoft composite device driver is loaded first.



- Once the composite driver has been installed the Found New Hardware Wizard will launch. Click "Next" to proceed with the installation.

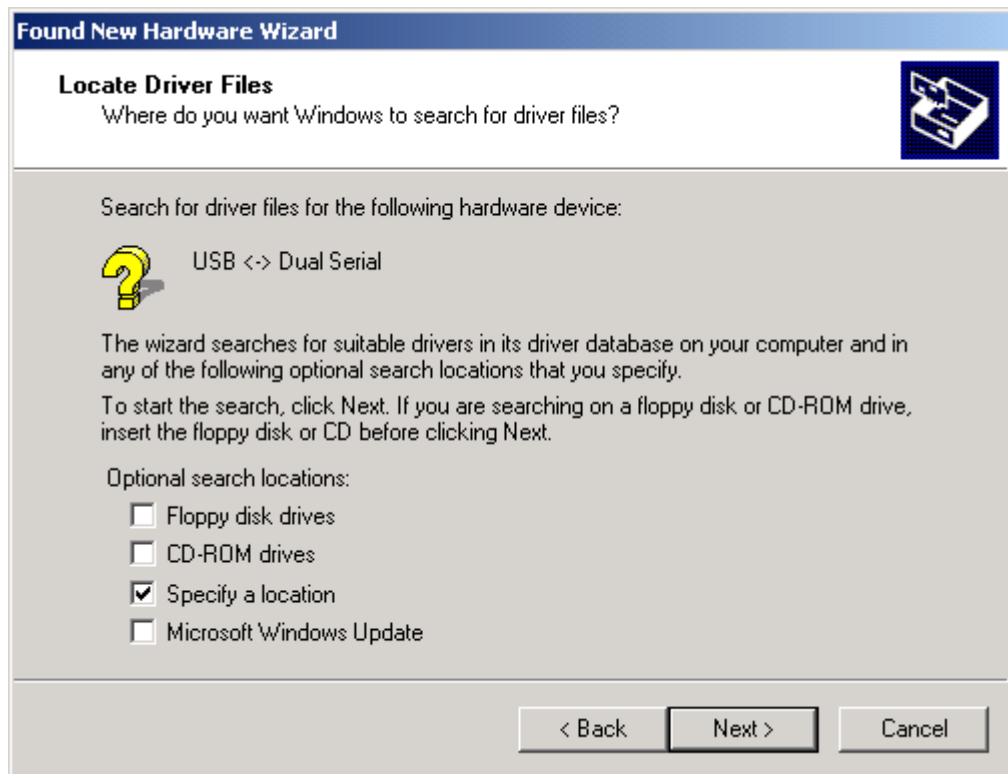


- Select "Search for a suitable driver for my device (recommended)" as shown below and then

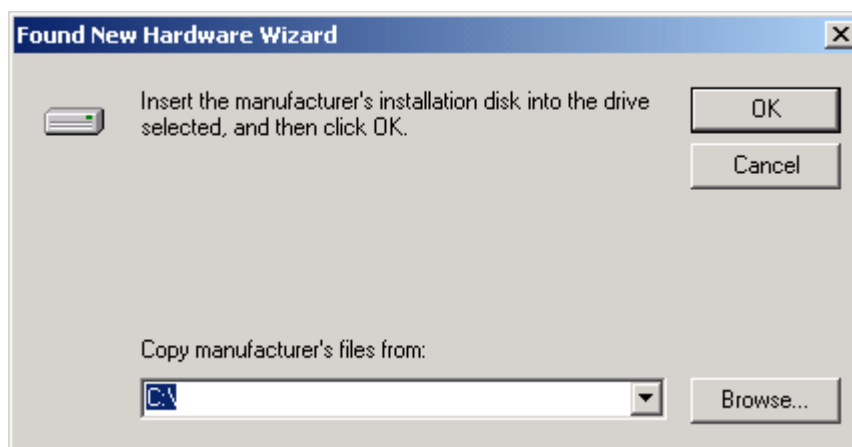
click "Next".



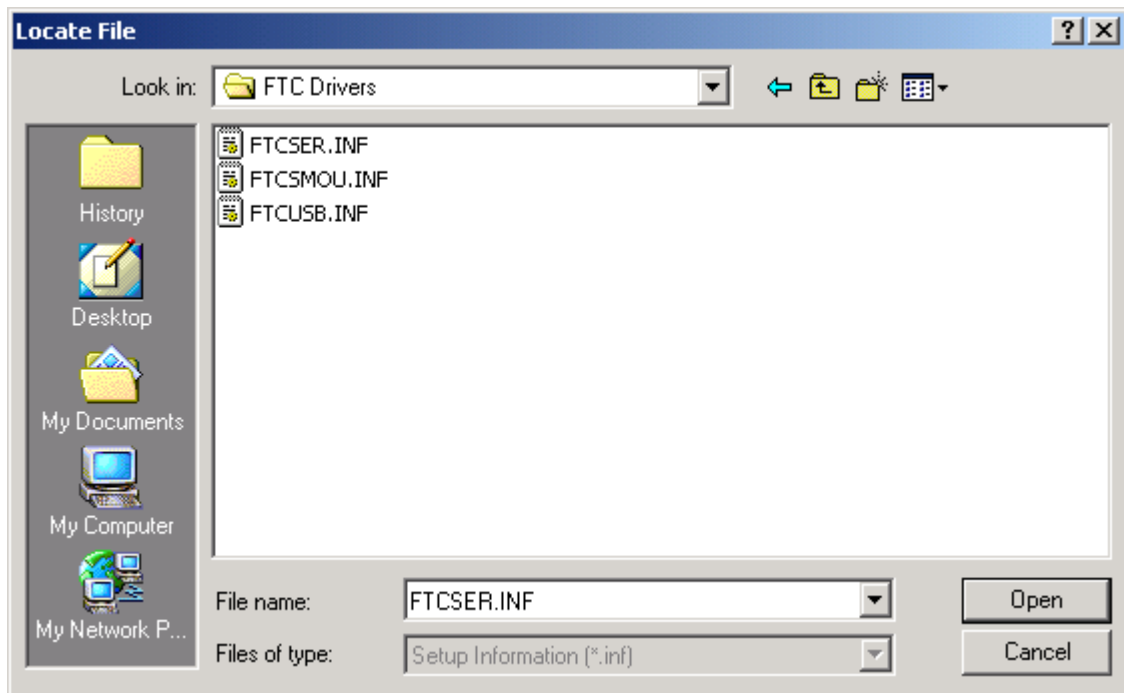
- Check the box next to "Specify a location" and uncheck all others as shown below.



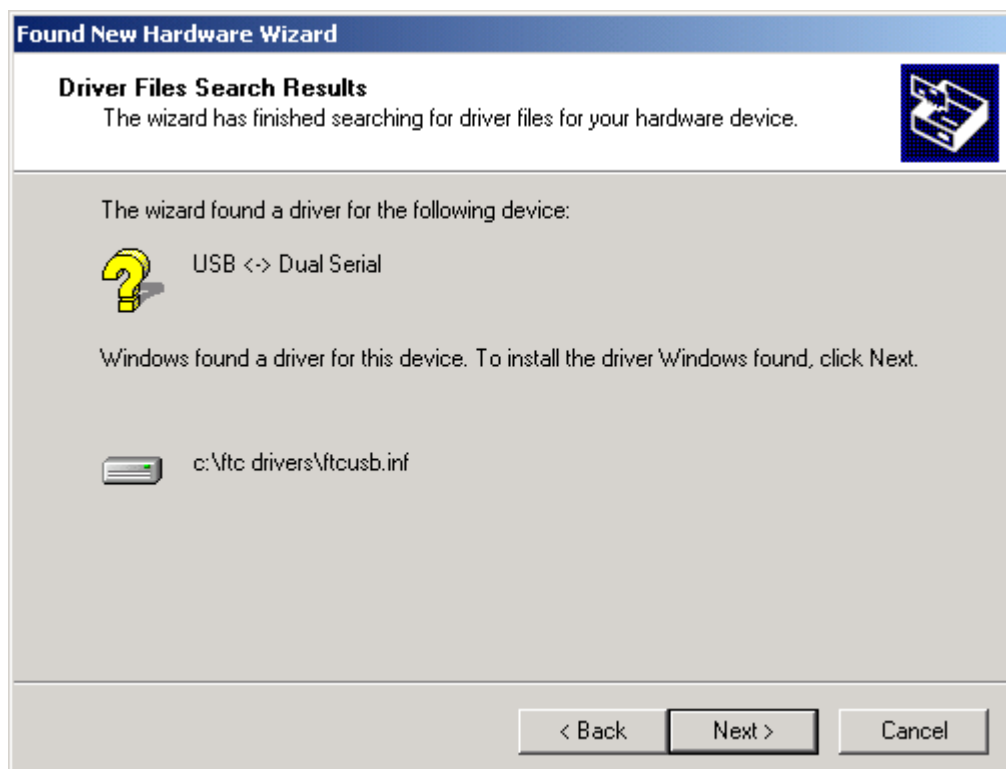
- Clicking "Next" displays a dialog box for you to enter to the location of the drivers.



- Click "Browse" to display an open file dialog box.



- Locate the folder containing the latest drivers downloaded from the [FTDI website](#) above and click "Open", then click "OK". The PC autoselects the correct INF file, in this case FTCUSB.INF. Once Windows has found the required driver .INF file, click "Next" to proceed.



- Windows should then display a message indicating that the installation was successful. Click "Finish" to complete the installation for the serial converter driver for this port of the device. The COM port emulation driver must be installed after this has completed.



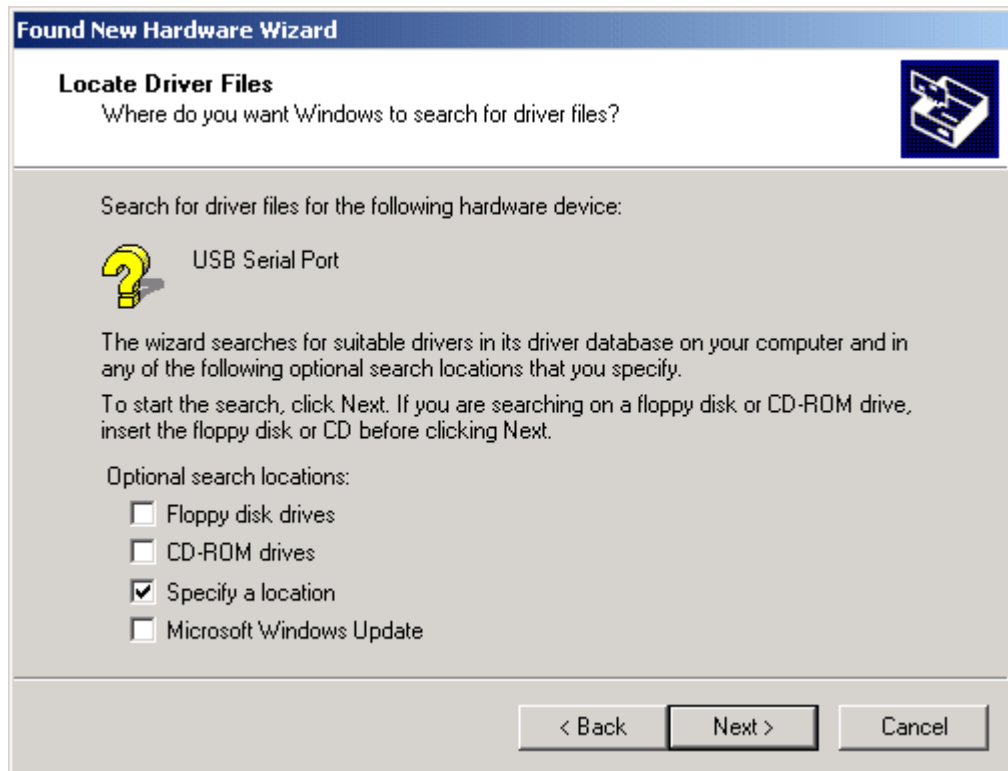
- After clicking "Finish", the Found New Hardware Wizard will continue by installing the COM port emulation driver. Click "Next" to proceed with the serial port installation.



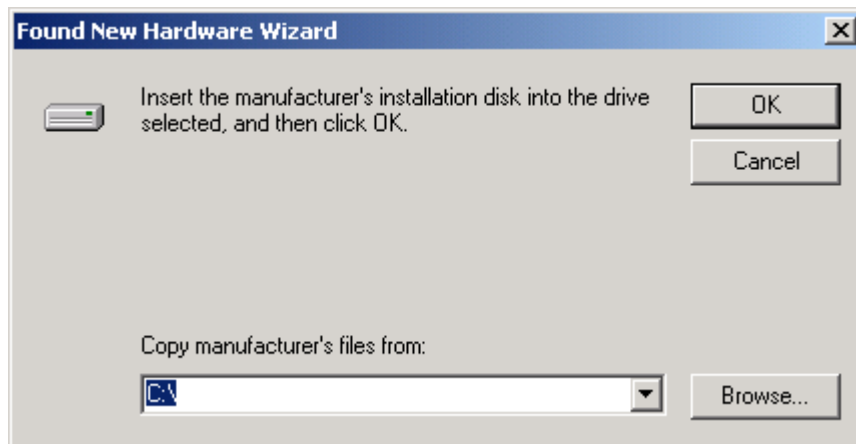
- Select "Search for a suitable driver for my device (recommended)" as shown below and then click "Next".



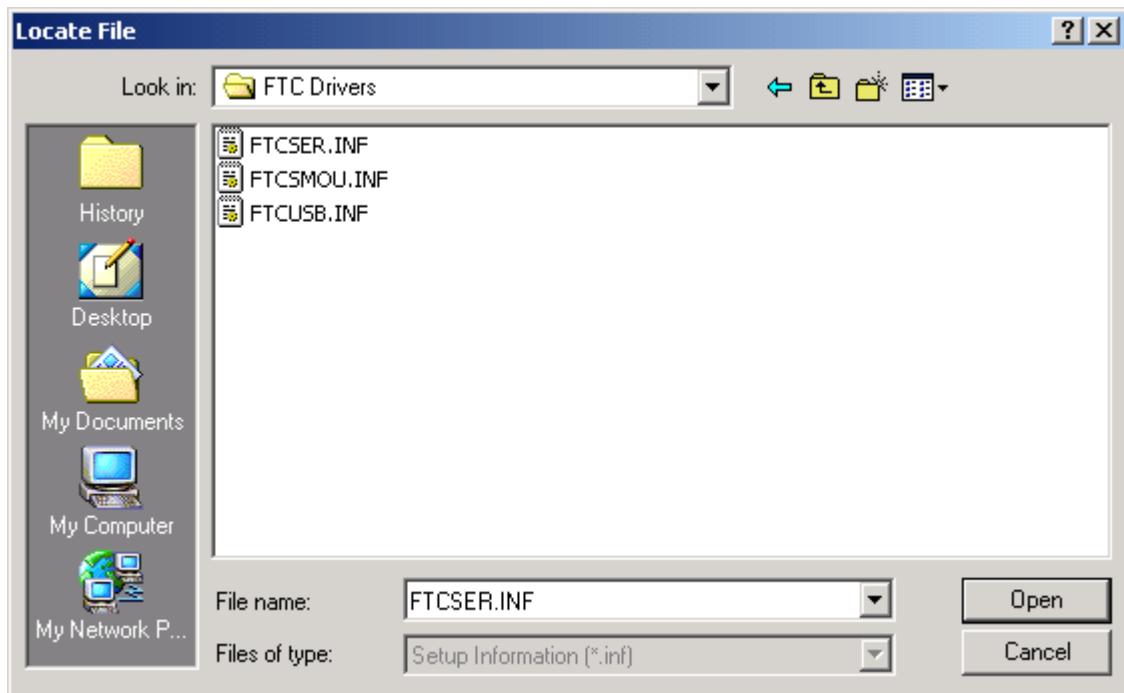
- Check the box next to "Specify a location" and uncheck all others as shown below.



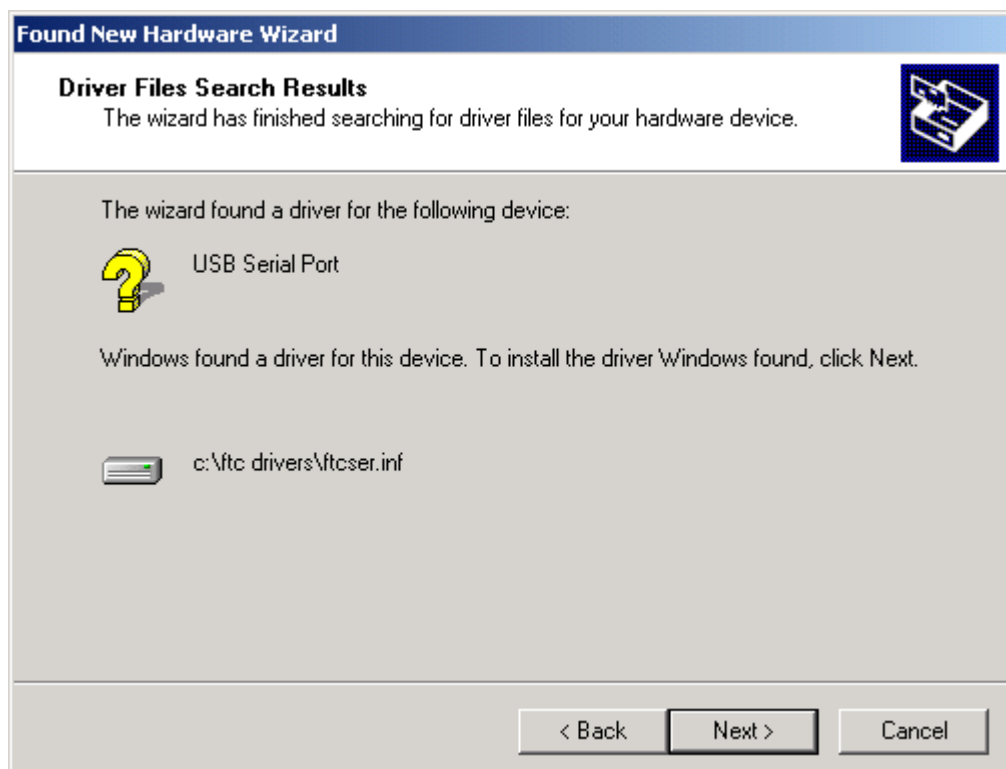
- Clicking "Next" displays a dialog box for you to enter to the location of the drivers.



- Click "Browse" to display an open file dialog box.



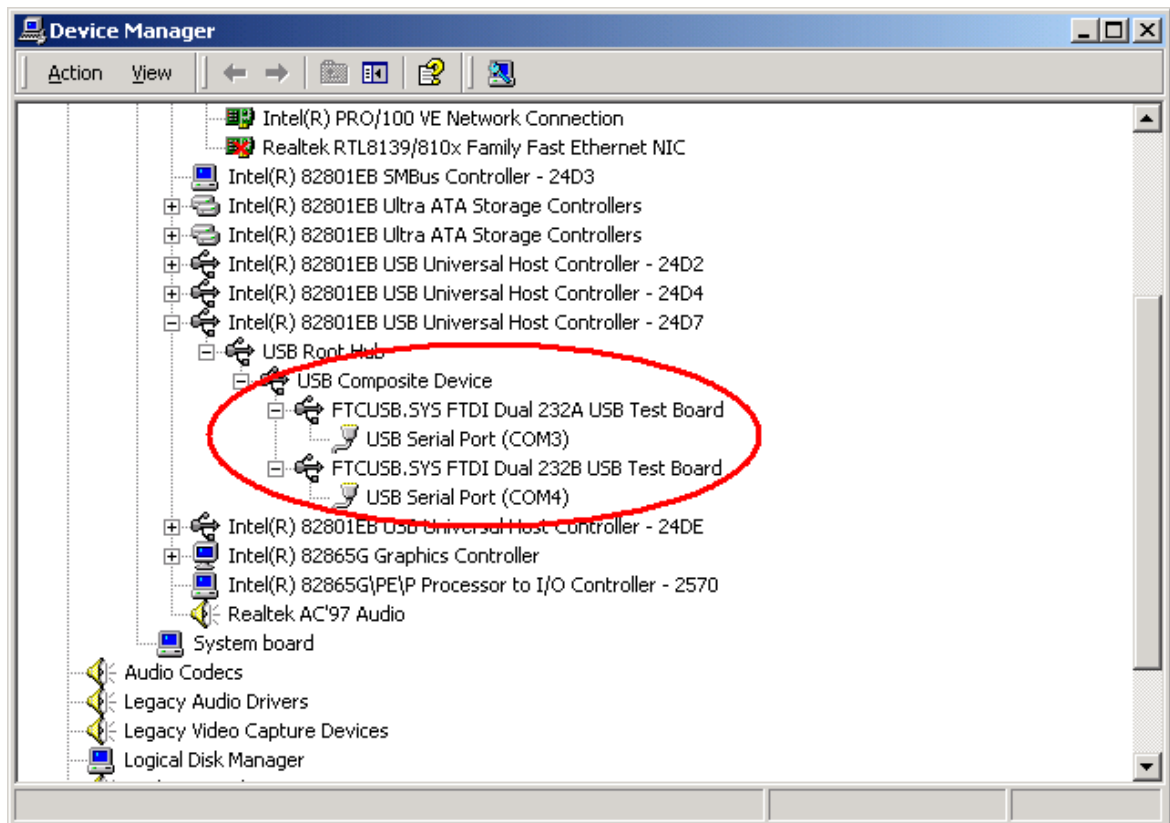
- Locate the folder containing the latest drivers downloaded from the [FTDI website](#) above and click "Open", then click "OK". The PC autoselects the correct INF file, in this case FTCSER.INF. Once Windows has found the required driver .INF file, click "Next" to proceed.



- Windows should then display a message indicating that the installation was successful. Click "Finish" to complete the installation for this port of the device.



- As the FT2232C has 2 ports available, the second port must also be installed. Under Windows 2000, this will occur automatically.
- By examining the Device Manager (located in "Control Panel\System" then select the "Hardware" tab and click "Device Manger...") and viewing by connection ("View > Devices by connection"), the device appears as 2 additional COM ports with the labels "USB Serial Port".



- Port A of the FT2232C will be installed as COMX and port B will be installed as COMX+1 where COMX is the first available COM port number.

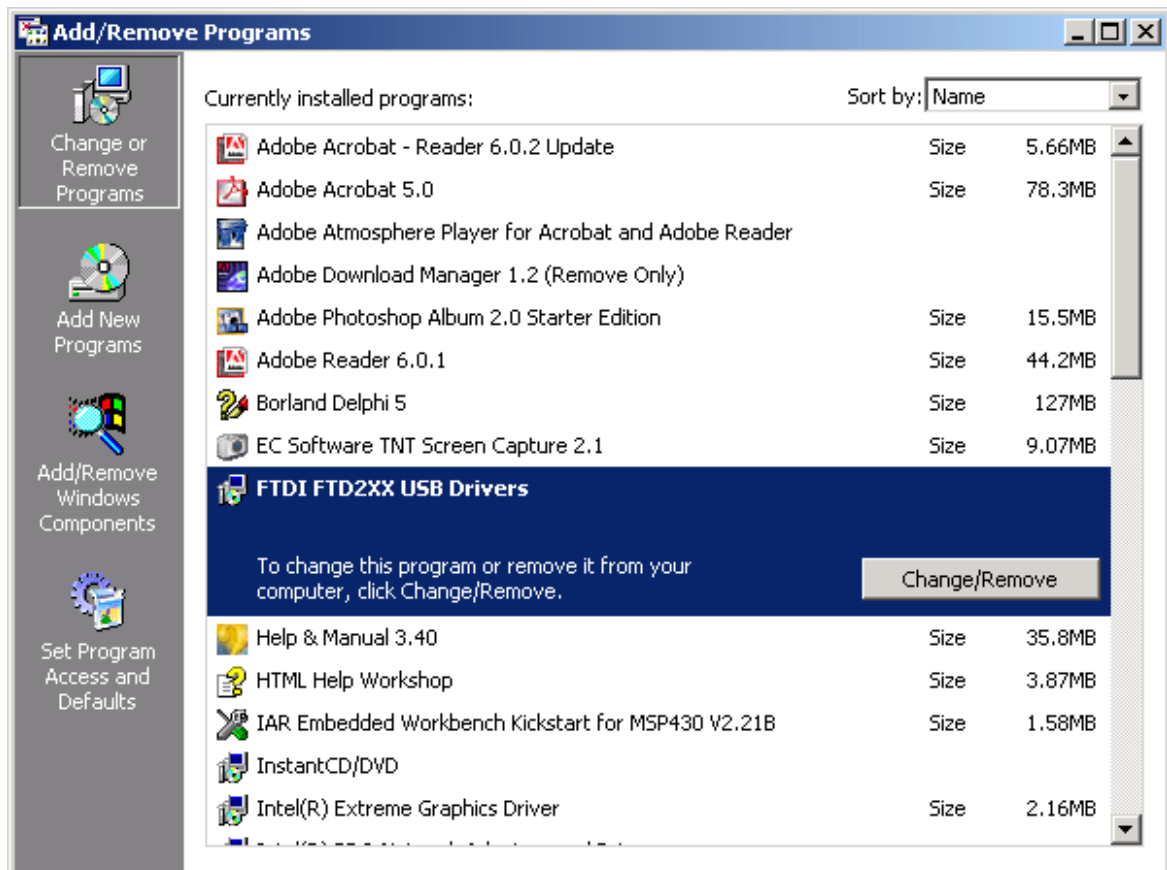
4 Uninstalling FT232BM, FT245BM, FT8U232AM and FT8U245AM Devices

When uninstalling devices from Windows 2000, it should always be done through the Add/Remove Programs utility as this uses the FTDI driver uninstaller program to remove files and registry entries to leave a clean system. Other methods may leave fragments of the driver that may interfere with future installations.

4.1 Uninstalling D2XX Drivers

To uninstall D2XX drivers for FT232BM, FT245BM, FT8U232AM and FT8U245AM devices, follow the instructions below:

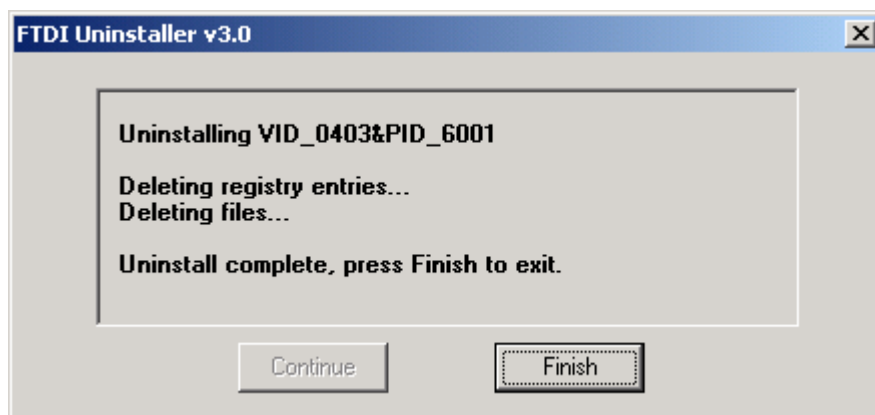
- Disconnect any FTDI devices that are attached to the PC.
- Open the Add/Remove Programs utility located in "Control Panel\Add/Remove Programs". Select "FTDI D2XX USB Drivers" from the list of installed programs.



- Click the "Change/Remove" button. This will run the FTDI uninstaller program. Click "Continue" to run the uninstaller or "Cancel" to exit.



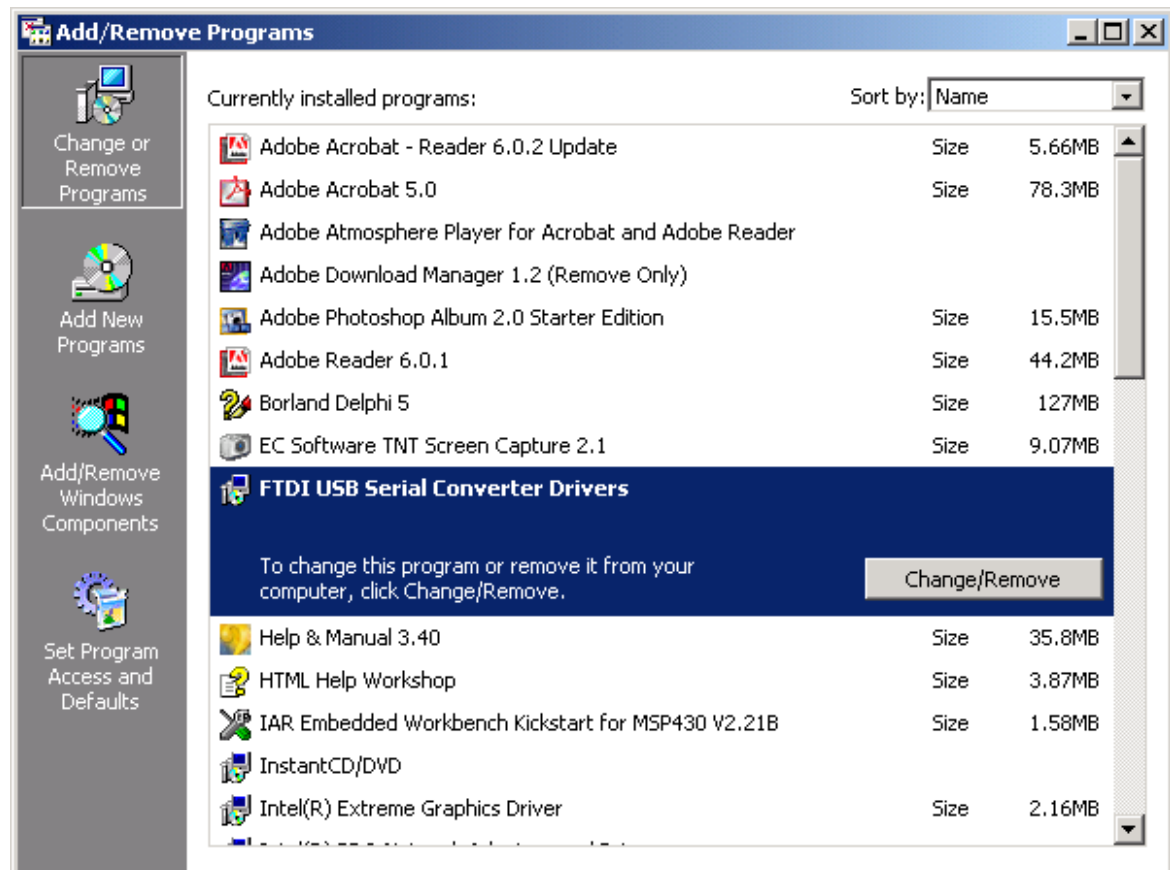
- When the uninstaller has finished removing the device from the system, the caption on the "Cancel" button will change to "Finish". Click "Finish" to complete the process.



4.2 Uninstalling VCP Drivers

To uninstall VCP drivers for FT232BM, FT245BM, FT8U232AM and FT8U245AM devices, follow the instructions below:

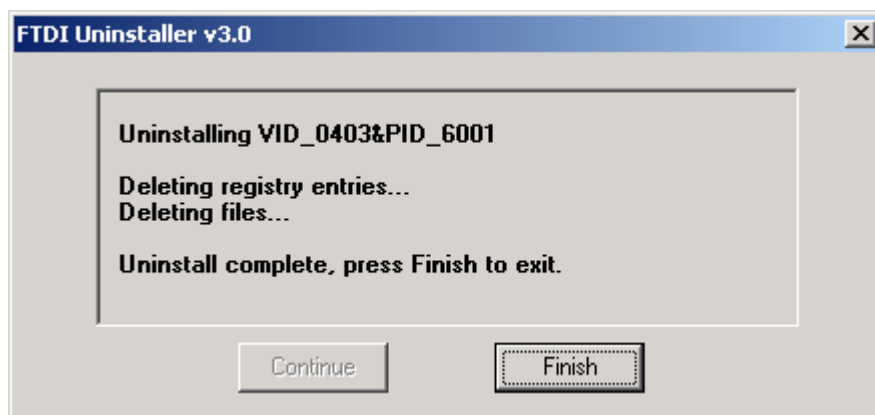
- Disconnect any FTDI devices that are attached to the PC.
- Open the Add/Remove Programs utility located in "Control Panel\Add/Remove Programs". Select "FTDI USB Serial Converter Drivers" from the list of installed programs.



- Click the "Change/Remove" button. This will run the FTDI uninstaller program. Click "Continue" to run the uninstaller or "Cancel" to exit.



- When the uninstaller has finished removing the device from the system, the caption on the "Cancel" button will change to "Finish". Click "Finish" to complete the process.



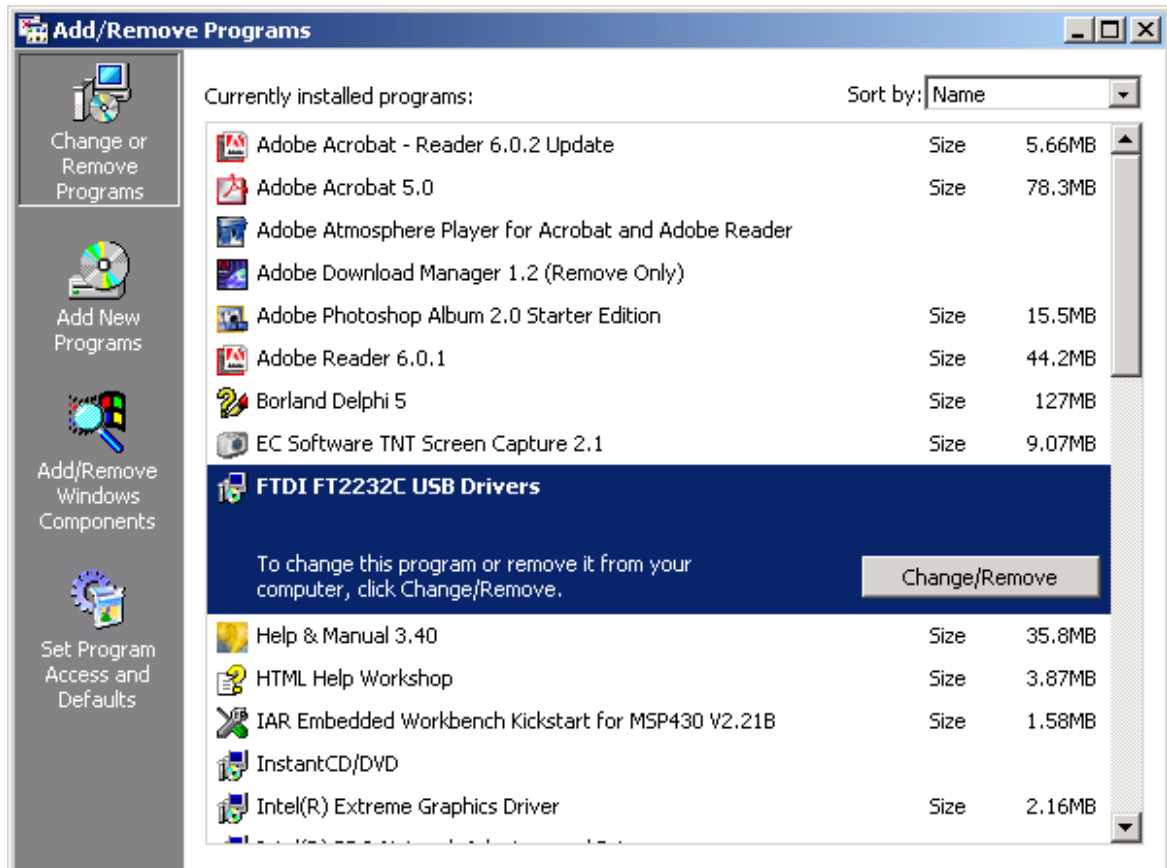
5 Uninstalling FT2232C Devices

When uninstalling devices from Windows 2000, it should always be done through the Add/Remove Programs utility as this uses the FTDI driver uninstaller program to remove files and registry entries to leave a clean system. Other methods may leave fragments of the driver that may interfere with future installations.

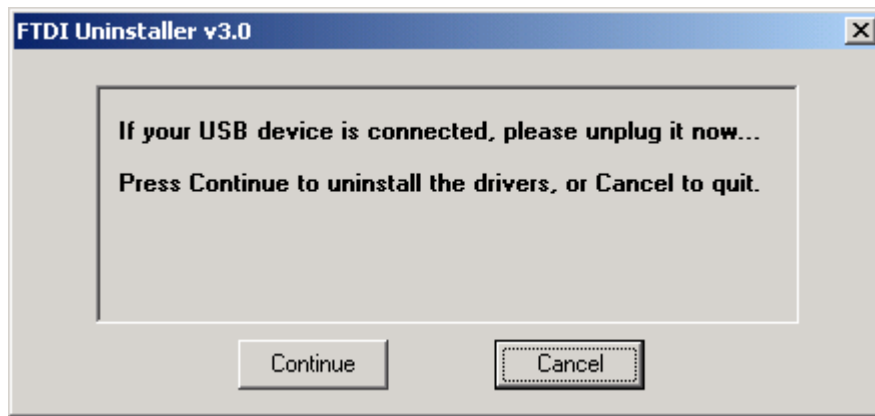
5.1 Uninstalling D2XX Drivers

To uninstall D2XX drivers for FT2232C devices, follow the instructions below:

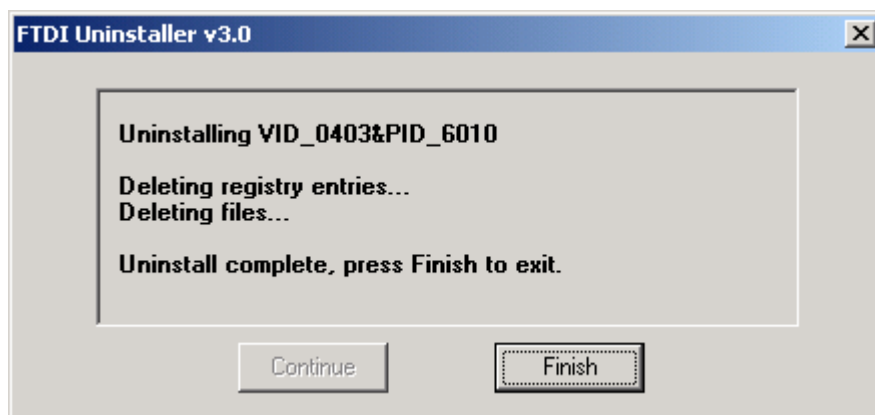
- Disconnect any FTDI devices that are attached to the PC.
- Open the Add/Remove Programs utility located in "Control Panel\Add/Remove Programs". Select "FTDI FT2232C USB Drivers" from the list of installed programs.



- Click the "Change/Remove" button. This will run the FTDI uninstaller program. Click "Continue" to run the uninstaller or "Cancel" to exit.



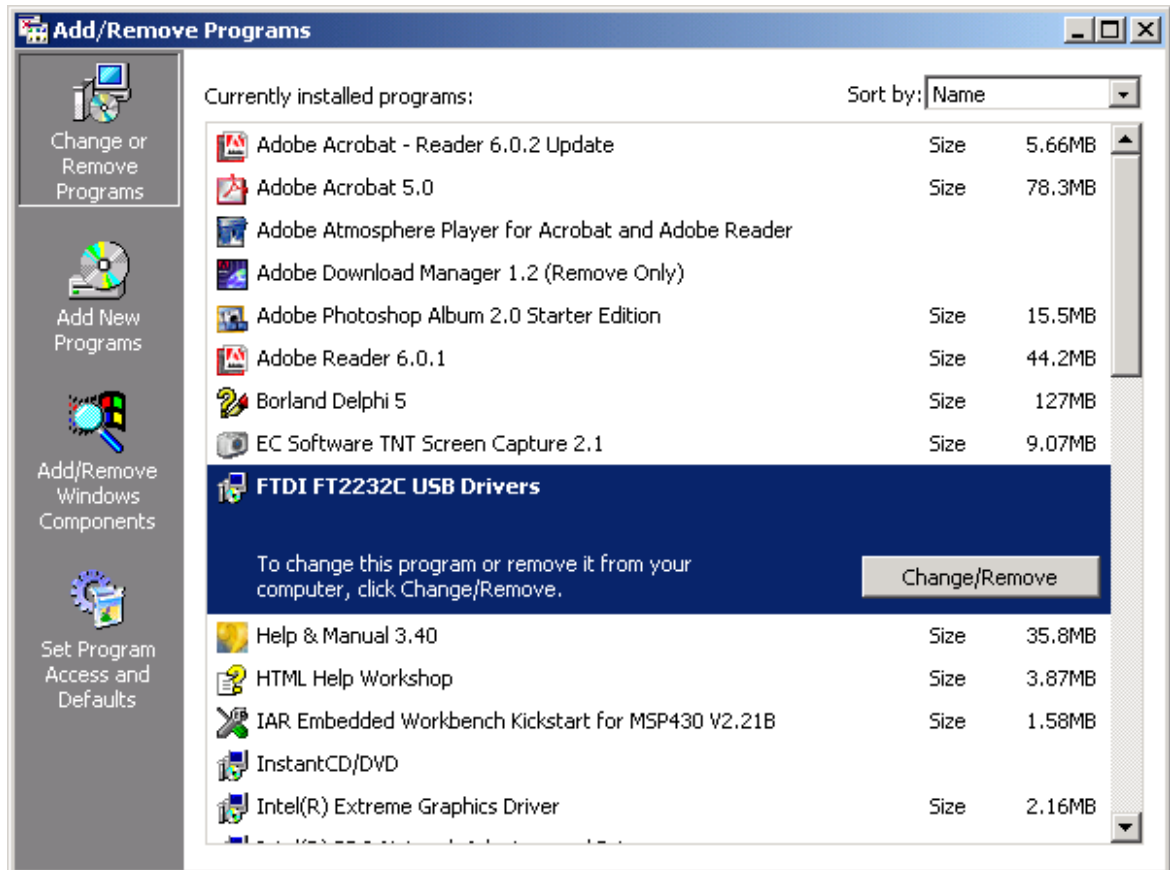
- When the uninstaller has finished removing the device from the system, the caption on the "Cancel" button will change to "Finish". Click "Finish" to complete the process.



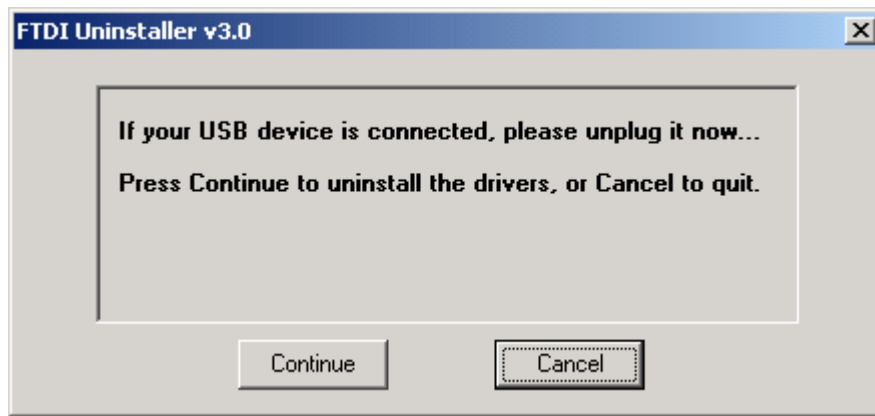
5.2 Uninstalling VCP Drivers

To uninstall VCP drivers for FT2232C devices, follow the instructions below:

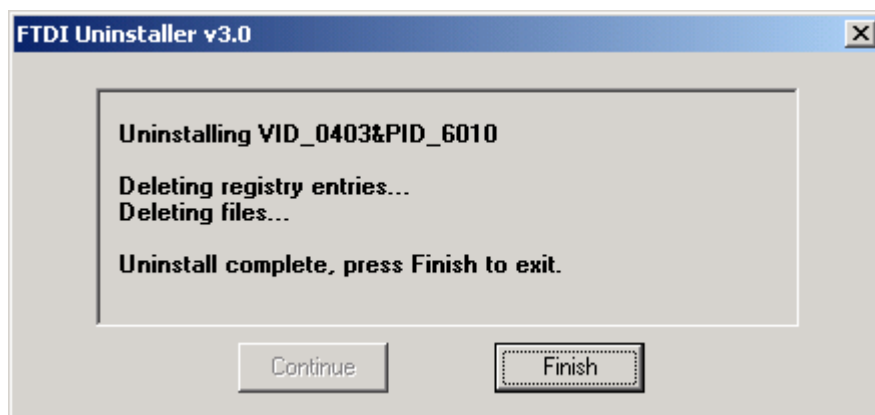
- Disconnect any FTDI devices that are attached to the PC.
- Open the Add/Remove Programs utility located in "Control Panel\Add/Remove Programs". Select "FTDI FT2232C USB Drivers" from the list of installed programs.



- Click the "Change/Remove" button. This will run the FTDI uninstaller program. Click "Continue" to run the uninstaller or "Cancel" to exit.



- When the uninstaller has finished removing the device from the system, the caption on the "Cancel" button will change to "Finish". Click "Finish" to complete the process.



6 Troubleshooting

6.1 Windows 2000 cannot find drivers for my device

This error can occur if the VID and PID programmed into the device EEPROM do not match those listed in the INF files for the driver. The VID and PID programmed into the device EEPROM may be found by using the [USBView](#) utility from the [FTDI website](#). These can then be checked against the VID and PID entries in the driver INF files. If they do not match, that driver cannot be installed for that device without either re-programming the device EEPROM or modifying the list of VID and PID numbers in the INF files.

Please note that only your own company VID and PID or FTDI's VID (0x0403) and FTDI PID issued for use by your company should be used in the EEPROM and INF/INI files.

6.2 Windows 2000 forces a reboot after installing a device

This problem can occur if an application is accessing a file while the New Hardware Wizard is trying to copy it. This usually occurs with the FTD2XX.DLL file. If installing a D2XX device, selecting not to restart the computer then unplugging and re-plugging the device may allow the device to function properly without restarting. Restarting the machine will allow the device to work correctly.

6.3 Driver installation fails and Windows 2000 gives error code 10

Windows error code 10 indicates a hardware error or failed driver installation. This error may appear if a device has insufficient power to operate correctly (e.g. plugged into a bus powered hub with other devices), or may indicate a more serious hardware problem. Also, it may be indicative of USB root hub drivers being incorrectly installed.

Please refer to the example schematics on the [FTDI website](#) for standard device configurations. If the error persists, please contact the [FTDI support](#) department.

6.4 FT232BM or FT245BM device hangs randomly during operation under Windows 2000

This is not caused by the driver, but is a hardware compatibility problem. Some newer USB 2.0 hubs and host controllers can be susceptible to noise and can cause random device failures. This can be overcome by fitting 47pF capacitors to ground on the USBDP and USBDM lines on the USB connector side of the 27 Ω series resistors.

6.5 Windows 2000 automatically installs a device driver but the other driver is desired

In the cases of FT8U232AM, FT8U245AM, FT232BM and FT245BM devices, this can happen if there is a device already installed on the system with the same VID and PID. Windows 2000 will detect that the device being installed has the same VID and PID combination as a device already installed and will install the same driver for it. This causes the limitation that a system can only contain devices using VCP drivers or D2XX drivers.

In the case of FT2232C devices, the driver setting in the EEPROM dictates which drivers are loaded when using the FTC combined drivers. The MProg utility available from the [Utilities](#) section of the [FTDI website](#) can be used to check or change the driver setting in the EEPROM.

7 Revision History

Version	Release Date	Comments
1.0	January 2005	Initial release

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