19-0677; Rev 0; 11/06

MAXIM

USB-to-COM Port Adapter Board User Guide

USBTO232

General Description

The USBTO232 is an adapter board that converts a PC's USB port into a standard COM port. A COM port is also known as the standard serial port that uses Recommended Standard 232 (RS-232).

The USBTO232 is included with selected Maxim EV kits and EV systems that were originally designed for the PC COM port and later updated to also support the USB port. Data sheets for EV kits and EV systems that can use the USBTO232 have been updated to reflect compatibility and also provide ordering information. Use of the USBTO232 in applications other than those EV kits specified by Maxim is not supported.

Important: Before using the USBTO232, see the *Quick Start* section of this data sheet to correctly install the USB driver for the appropriate Windows® operating system.

Windows is a registered trademark of Microsoft Corp.

Features

- ♦ **USB Powered**
- ♦ **USB Driver for Windows 98SE/2000/XP Operating Systems**
- ♦ **USB and I/O Power LED Indicators**
- ♦ **Two GPIO LED Indicators**
- ♦ **USB Cable Included**
- ♦ **8-Pin Signal Header**
- ♦ **Proven PCB Layout**
- ♦ **Fully Assembled and Tested**

Ordering Information

PART	PC INTERFACE	OPERATING SYSTEMS SUPPORTED
USBTO232+	USB	Windows 98SE/2000/XP

+ Denotes lead-free and RoHS compliance.

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	0.01µF ±10%, 50V X7R ceramic capacitor (0603) TDK C1608X7R1H103K
C2, C3	2	47pF ±5%, 50V COG ceramic capacitors (0603) TDK C1608C0G1H470J
C4–C8, C11, C12	7	0.1µF ±10%, 16V X7R ceramic capacitors (0603) TDK C1608X7R1C104K
C9	1	4.7µF ±10%, 6.3V X5R ceramic capacitor (0603) TDK C1608X5R0J475K
C10	1	1µF ±10%, 6.3V X5R ceramic capacitor (0603) TDK C1608X5R0J105K
D1	1	Red LED (0603) Panasonic LNJ208R8ARA
D2	1	Green LED (0603) Stanley Electric BG1111C-TR Panasonic LNJ314G8TRA
FB1	1	40Ω @ 100MHz, 1.5A ferrite bead (0805) Steward MI0805K400R-10
H1	1	8-pin header
JU1, JU2, JU3	3	3-pin headers
P1	1	USB type B right-angle female receptacle connector Assmann AU-Y1007-R
P2	1	Short DB9 right-angle male receptacle connector (without cable-locking screws)
R1, R2	2	270Ω ±5% resistors (0603) (use lead-free parts only)
U1	1	USB-to-UART converter FTDI FT232RL (28-pin SSOP)
U2	1	MAX213EEAI+ (28-pin SSOP)
—	3	Shunts
—	1	USBTO232+ PCB
—	1	USB high-speed A-to-B 6ft cable

Component Supplier

SUPPLIER	PHONE	WEBSITE
TDK	847-803-6100	www.component.tdk.com

Note: *Indicate the Maxim EV kit that you are using when contacting this component supplier.*

For pricing, delivery, and ordering information, please contact Maxim/Dallas Direct! at 1-888-629-4642, or visit Maxim's website at www.maxim-ic.com.

USB-to-COM Port Adapter Board User Guide

Quick Start

The following instructions are for installing USB drivers and the EV kit software. Once the USB drivers and EV kit software have been installed, refer to the *Quick Start* section of the appropriate EV kit data sheet for EV kit-specific instructions.

Recommended Equipment

- USBTO232 board (USB cable included)
- Maxim EV kit (or EV system) with a COM port PC connection
- Corresponding EV kit data sheet
- User-supplied PC with a USB port

Note: In the following sections, software-related items are identified by bolding. Text in **bold** refers to items directly from the EV kit software. Text in **bold and underlined** refers to items from the Windows 98SE/2000/XP operating system.

Procedure

1) Visit the Maxim website (www.maxim-ic.com/evkit-software) to download the latest version of the EV kit software that supports USB. Save the EV kit software to a temporary folder and uncompress the file, if it is a .zip file.
2) Install the EV kit software on your computer by running the INSTALL.EXE program inside the temporary folder. The program files are copied to **C:\Program Files\MAXxxxxx** and icons are created in the Windows **Start | Programs** menu.
3) Uncompress the USB driver file copied into **C:\Program Files\MAXxxxxx** after the software is installed. If you are using Windows 98SE, uncompress the **USB_Driver_98_ME_V1.09.zip** file. If you are using Windows 2000/XP, uncompress the **USB_Driver_XP_2K_V2.00.zip** file. Uncompress the contents of the .zip file into **C:\Program Files\MAXxxxxx**.
4) Verify that the following USBTO232 jumpers are in the default positions:

   JU1: (1-2)

   JU2: (2-3)

   JU3: (2-3)
5) Connect the included USB cable from the PC's USB port (Type A) to the Type B USB connector on the USBTO232 board.
6) Verify that the red VCC power LED (D1) lights up. Also verify that the green VCCIO power LED (D2) lights up.
7) Go to the appropriate USB *Driver Installation* section in this data sheet for the version of Windows you are using and return to step 8 when finished. For example, if you are using Windows XP, go to the *Windows XP USB Driver Installation* section.

   Windows XP: Page 3

   Windows 2000: Page 11

   Windows 98SE: Page 25
8) Connect the USBTO232 board to the EV kit (or EV system) by connecting the male DB9 connector on the USBTO232 board to the female DB9 connector on the EV kit.
9) Refer to the *Quick Start* section of the appropriate EV kit data sheet for further EV kit-specific instructions.

Detailed Description of Hardware

The USBTO232 is an adapter board that converts a PC's USB port into a standard COM port. The USBTO232 board has three configurable jumpers: JU1, JU2, and JU3. Jumper JU1 is the I/O supply selection (see Table 1), jumper JU2 is the USB power-supply indicator (see Table 2), and jumper JU3 is the 3.3V power-supply indicator (see Table 3).

Table 1. I/O Supply Selection (VCCIO)

JUMPER	SHUNT POSITION	DESCRIPTION
JU1	1-2*	VCCIO = VCC = 5V
	2-3	VCCIO = VCC30 = 3.3V

**Default position.*

Table 2. USB Power-Supply Indicator (VCC–D1)

JUMPER	SHUNT POSITION	DESCRIPTION
JU2	1-2	General-purpose LED connected to CBUS0
	2-3*	Indicates USB power present when red LED (D1) is lit

**Default position.*

Table 3. 3.3V Power-Supply Indicator (VCC30–D2)

JUMPER	SHUNT POSITION	DESCRIPTION
JU3	1-2	General-purpose LED connected to CBUS1
	2-3*	Indicates regulated 3.3V power present when green LED (D2) is lit

**Default position.*

Windows XP USB Driver Installation

1) Once the USBTO232 board is connected to the PC for the first time in Windows XP, a **Found New Hardware Wizard | Welcome** window appears, as shown in Figure 1. Choose the **No, not this time** selection and press the **Next** button to get started. If you do not see a window that is similar to the one described above after 30 seconds, remove the USB cable from the USBTO232 board and reconnect it. Administrator privileges are required to install the USB device driver on Windows 2000/XP.



*Figure 1. Windows XP: **Found New Hardware Wizard |Welcome** Window*

2) A **Found New Hardware Wizard | FTDI FT8U2XX Device** window (Figure 2) appears next. This window asks **What do you want the wizard to do?**. Choose the **Install from a list or specific location (Advanced)** option and press the **Next** button.

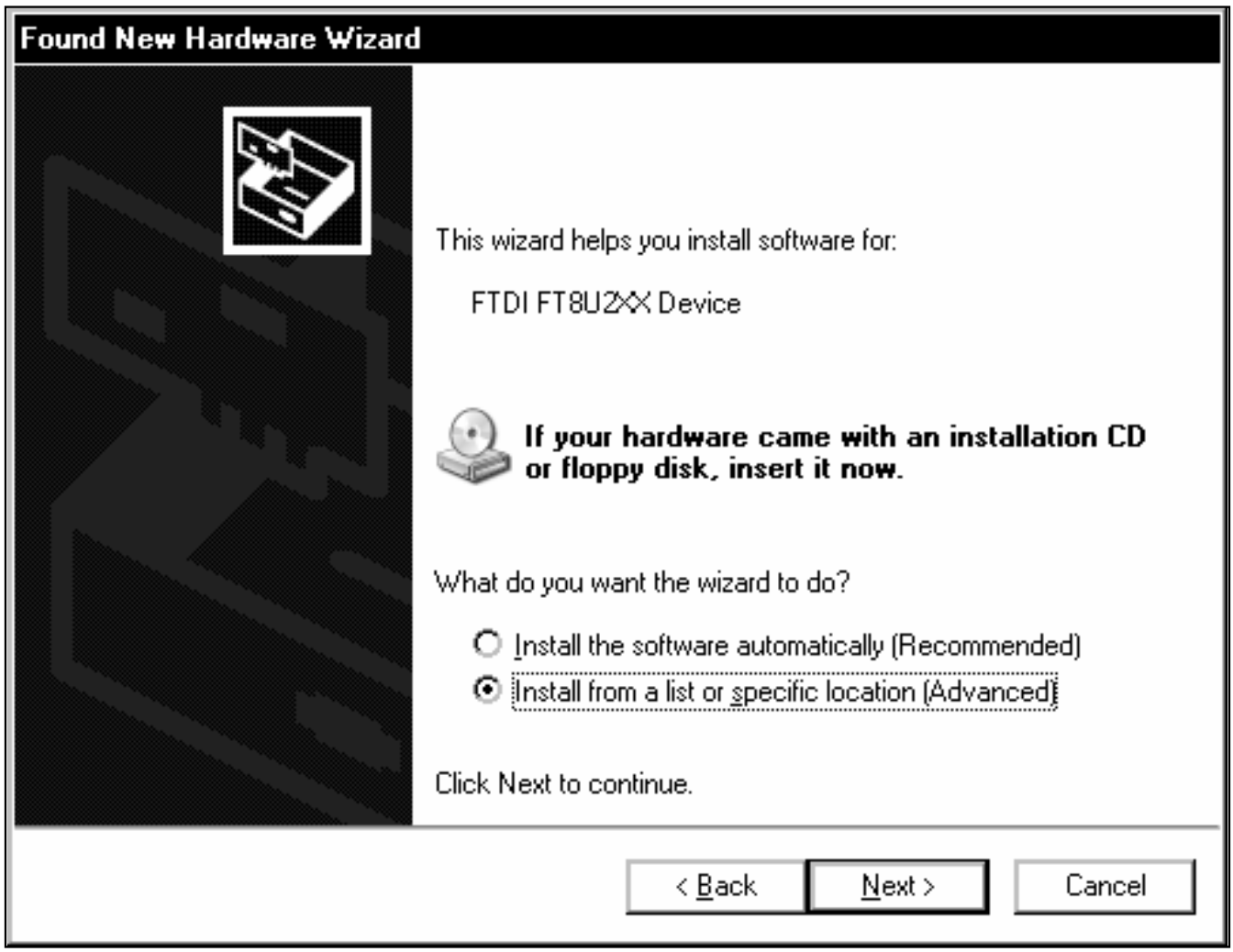


*Figure 2. Windows XP: **Found New Hardware Wizard | FTDI FT8U2XX Device** Window*

3) At the **Found New Hardware Wizard | Search Options** window (Figure 3), choose the **Search for the best driver in these locations** option and check the **Include this location in the search** checkbox. Press the **Browse** button and navigate to the path: **C:\Program Files\MAXxxxxx** (where xxxxx represents the Maxim IC part number on the EV kit being evaluated). Press the **Next** button when finished.

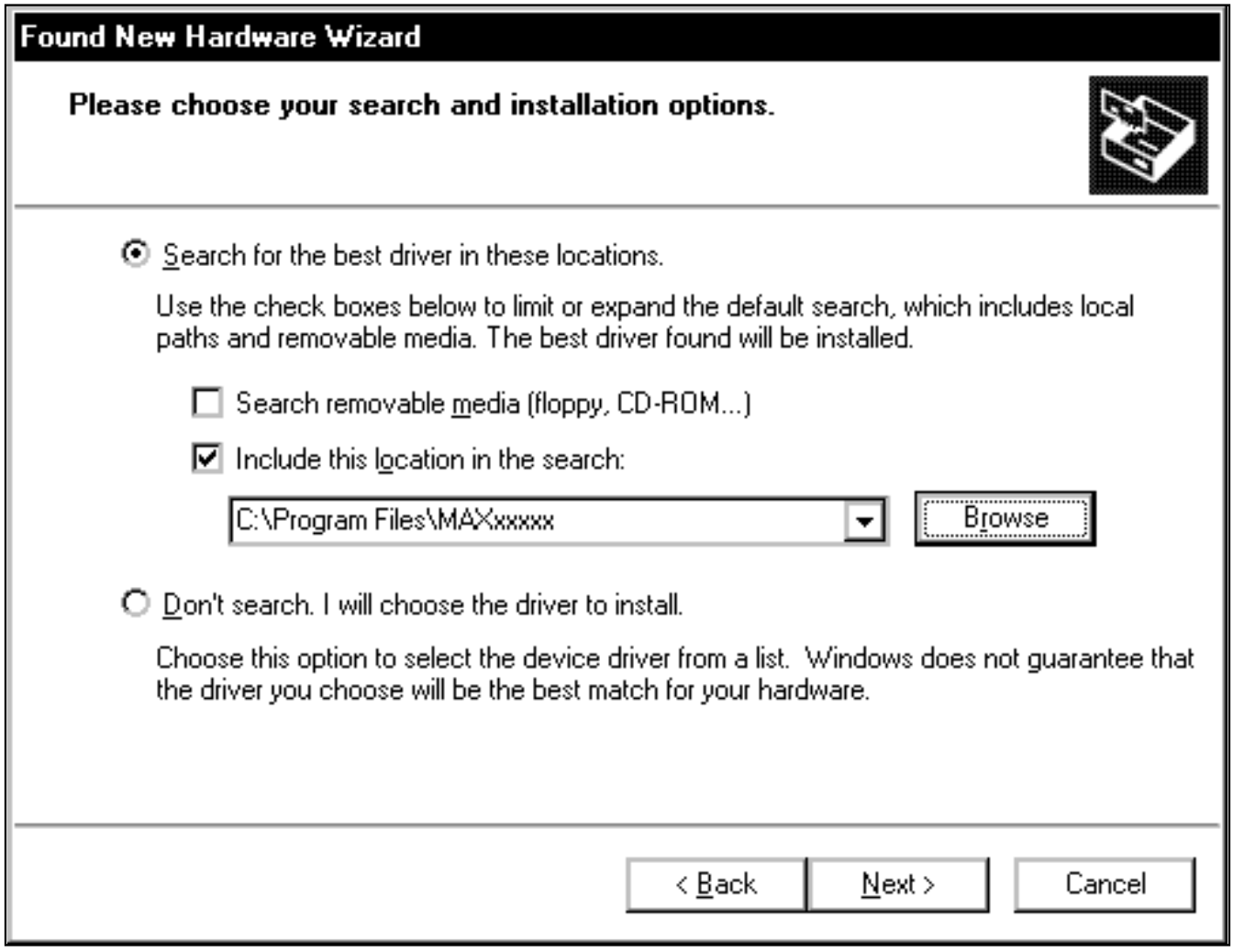


*Figure 3. Windows XP: **Found New Hardware Wizard | Search Options** Window*

4) The **Found New Hardware Wizard | Complete** window appears (Figure 4). Press the **Finish** button.



*Figure 4. Windows XP: **Found New Hardware Wizard | Complete** Window*

5) A **Found New Hardware Wizard | Welcome** window appears again (Figure 5). Choose the **No, not this time** selection and press the **Next** button.



*Figure 5. Windows XP: **Found New Hardware Wizard | Welcome** Window*

6) The next window is the **Found New Hardware Wizard | USB Serial Port** window (Figure 6). This window asks **What do you want the wizard to do?**. Choose the **Install from a list or specific location (Advanced)** option and press the **Next** button.

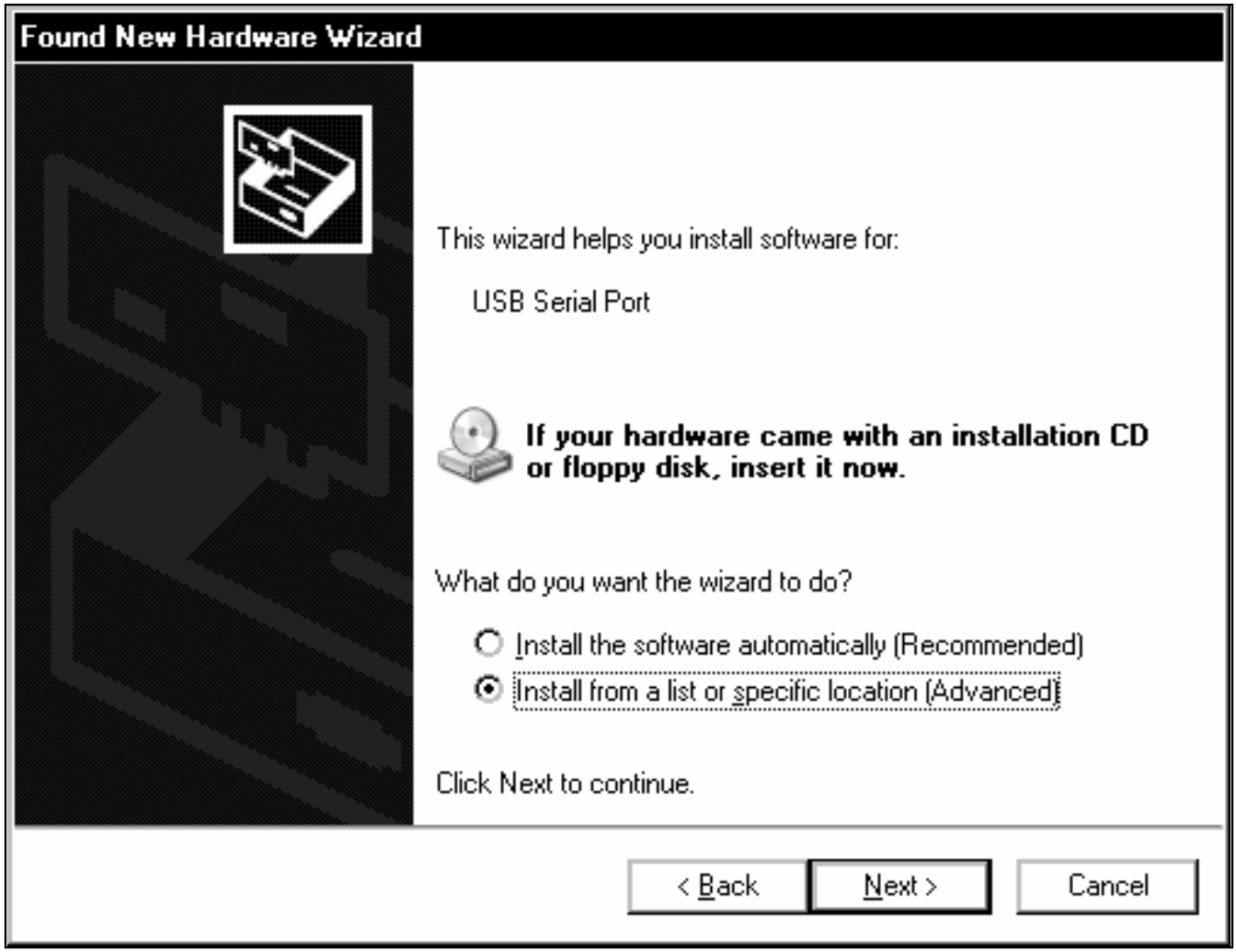


*Figure 6. Windows XP: **Found New Hardware Wizard | USB Serial Port** Window*

7) At the **Found New Hardware Wizard | Search Options** window (Figure 7), choose the **Search for the best driver in these locations** option and check the **Include this location in the search** checkbox. Press the **Browse** button and navigate to the path: **C:\Program Files\MAXxxxxx**. Press the **Next** button when finished.

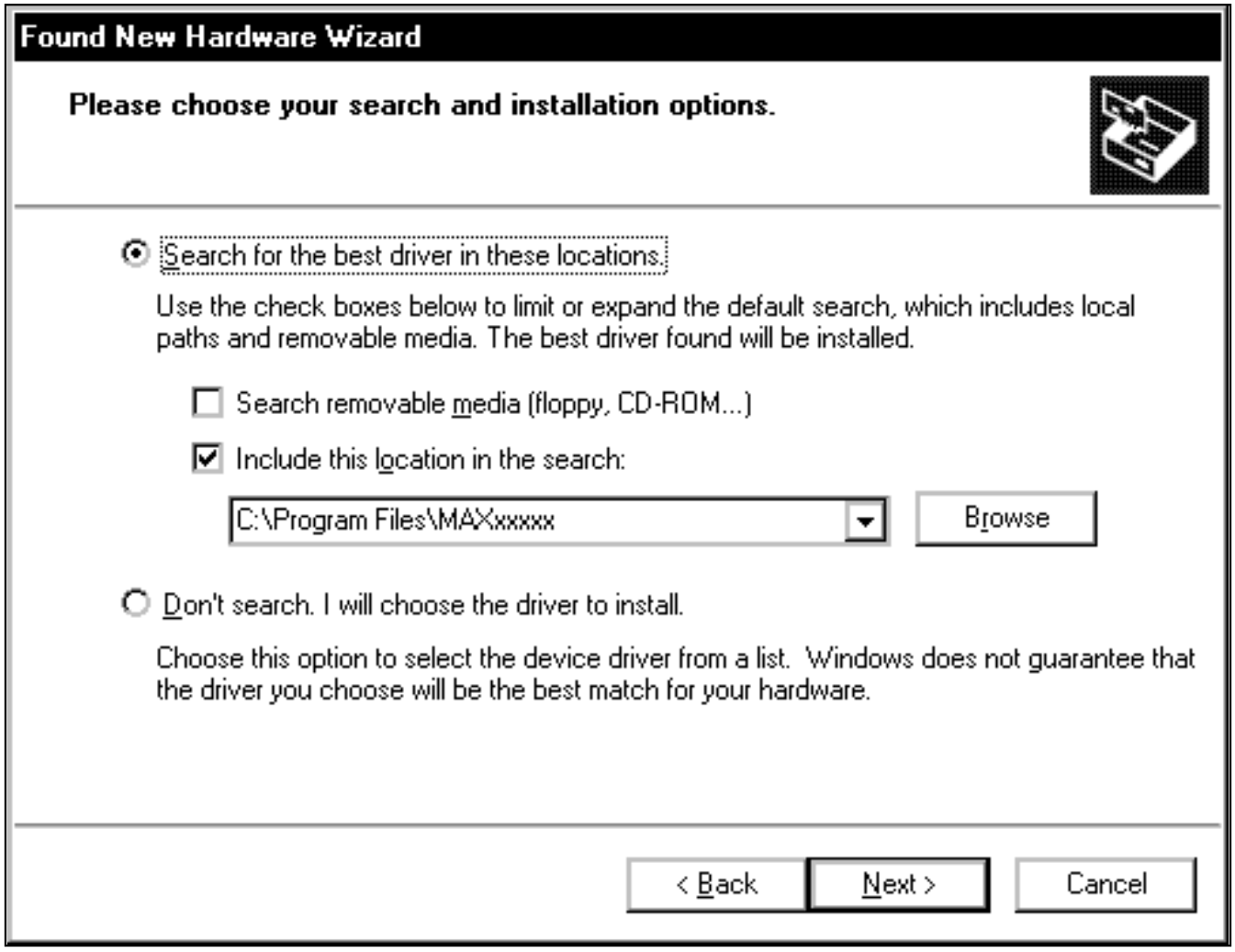


*Figure 7. Windows XP: **Found New Hardware Wizard | Search Options** Window*

8) The next window is the **Found New Hardware Wizard I Complete** window (Figure 8). Press the **Finish** button.

9) When finished, return to step 8 of the USBTO232 *Quick Start* section.



*Figure 8. Windows XP: **Found New Hardware Wizard I Complete** Window*

Windows 2000 USB Driver Installation

1) Once the USBTO232 board is connected to the PC for the first time in Windows 2000, a **Found New Hardware** window appears, as shown in Figure 9.



*Figure 9. Windows 2000: **Found New Hardware** Window*

2) A **Found New Hardware Wizard | Welcome** window then appears (Figure 10). Press the **Next** button.



*Figure 10. Windows 2000: **Found New Hardware Wizard | Welcome** Window*

3) At the **Found New Hardware Wizard | Install Hardware Device Drivers** window (Figure 11), choose **Search for a suitable driver for my device (recommended)** and press the **Next** button when finished.

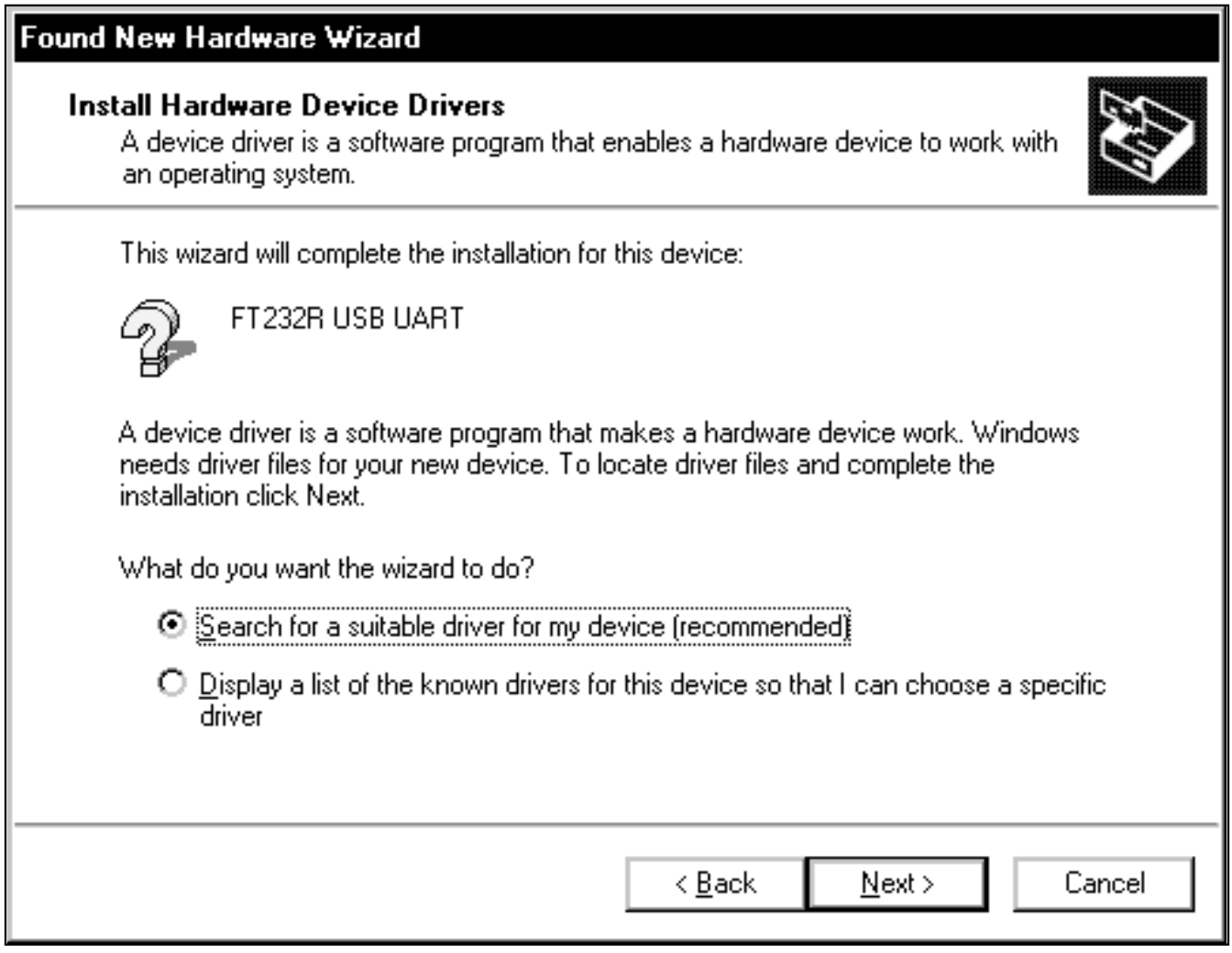


*Figure 11. Windows 2000: **Found New Hardware Wizard | Install Hardware Device Drivers** Window*

4) The **Found New Hardware Wizard | Locate Driver Files** window appears next (Figure 12). Check the **Specify a location** checkbox and press the **Next** button when finished.

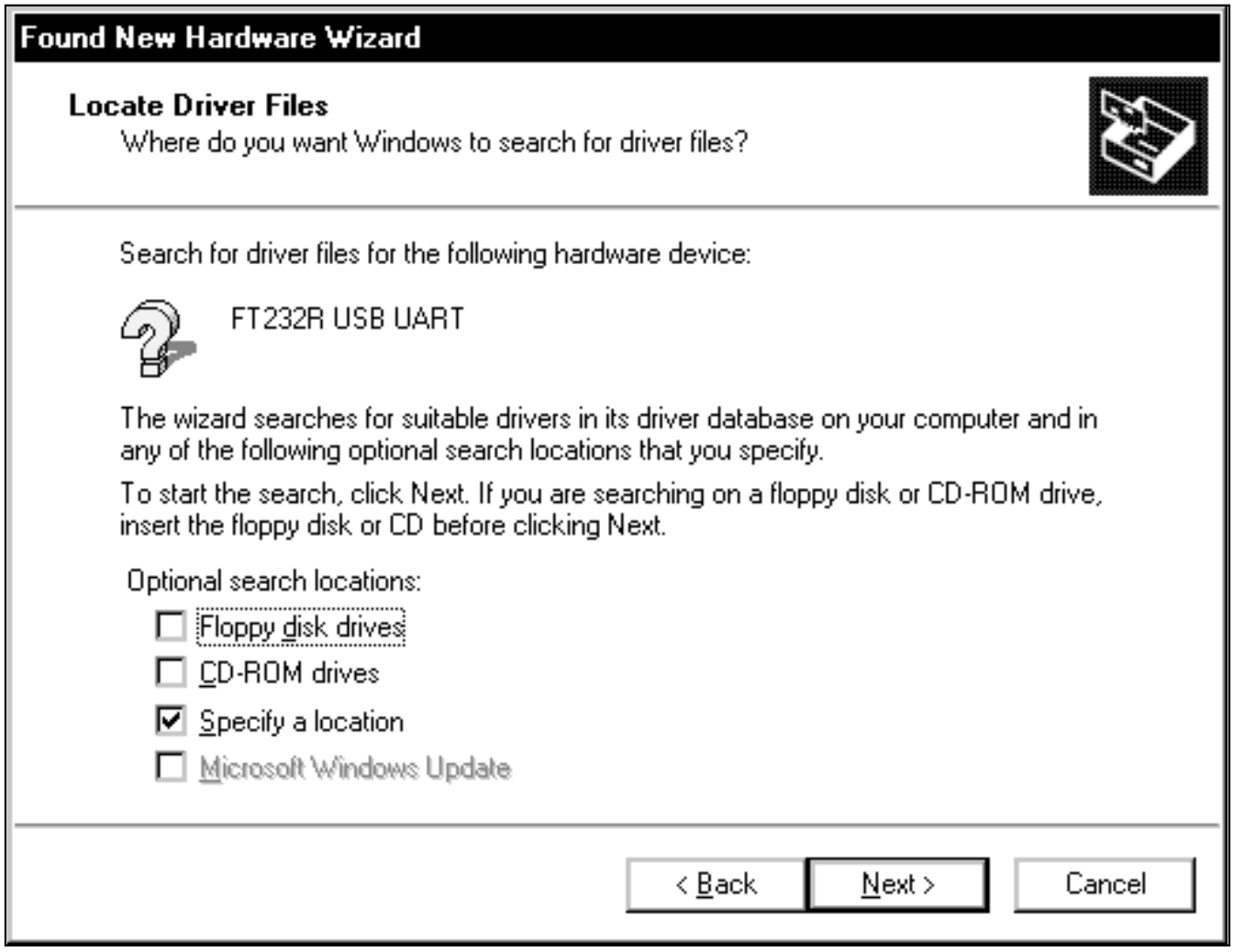


*Figure 12. Windows 2000: **Found New Hardware Wizard | Locate Driver Files** Window*

5) The next window is the **Found New Hardware Wizard | Path** window (Figure 13). Press the **Browse** button and choose the path **C:\Program Files\MAXxxxxx**. Press the **OK** button when finished.

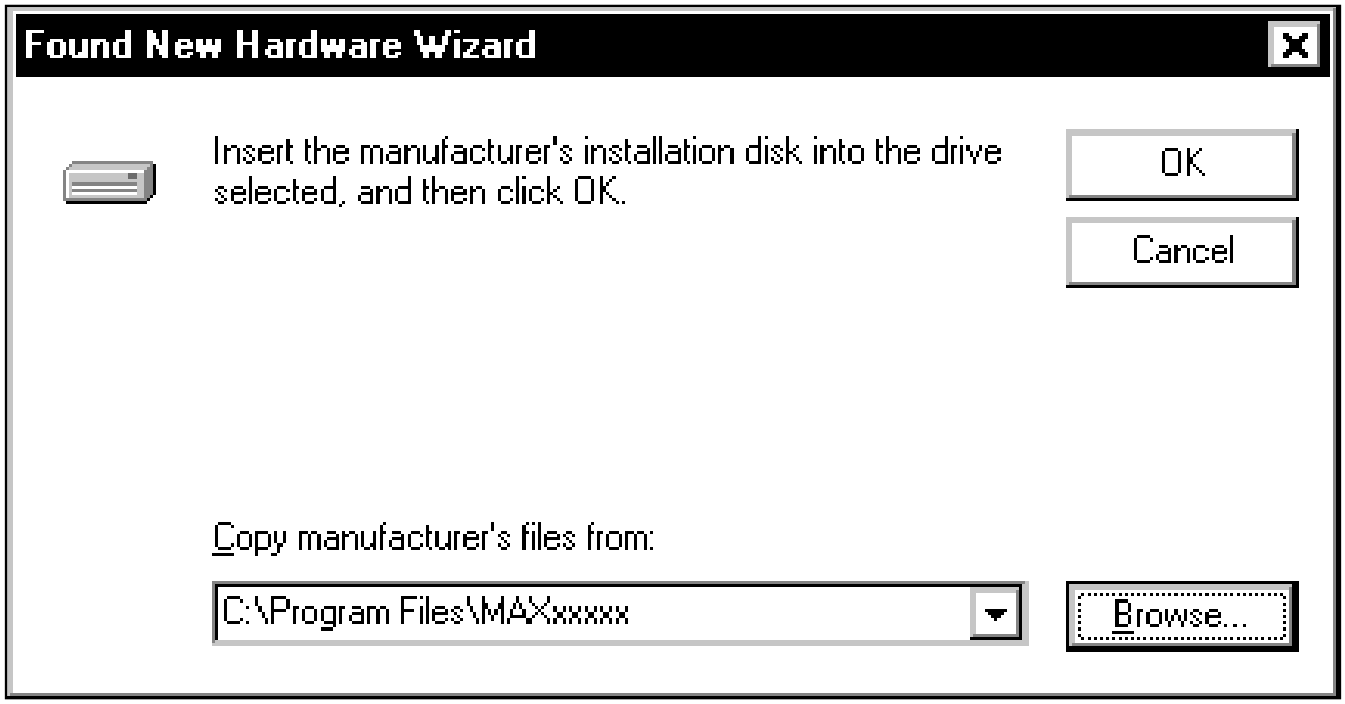


*Figure 13. Windows 2000: **Found New Hardware Wizard | Path** Window*

6) The **Found New Hardware Wizard | Driver Files Search Results** window is shown in Figure 14. Press the **Next** button after the wizard finds the driver.

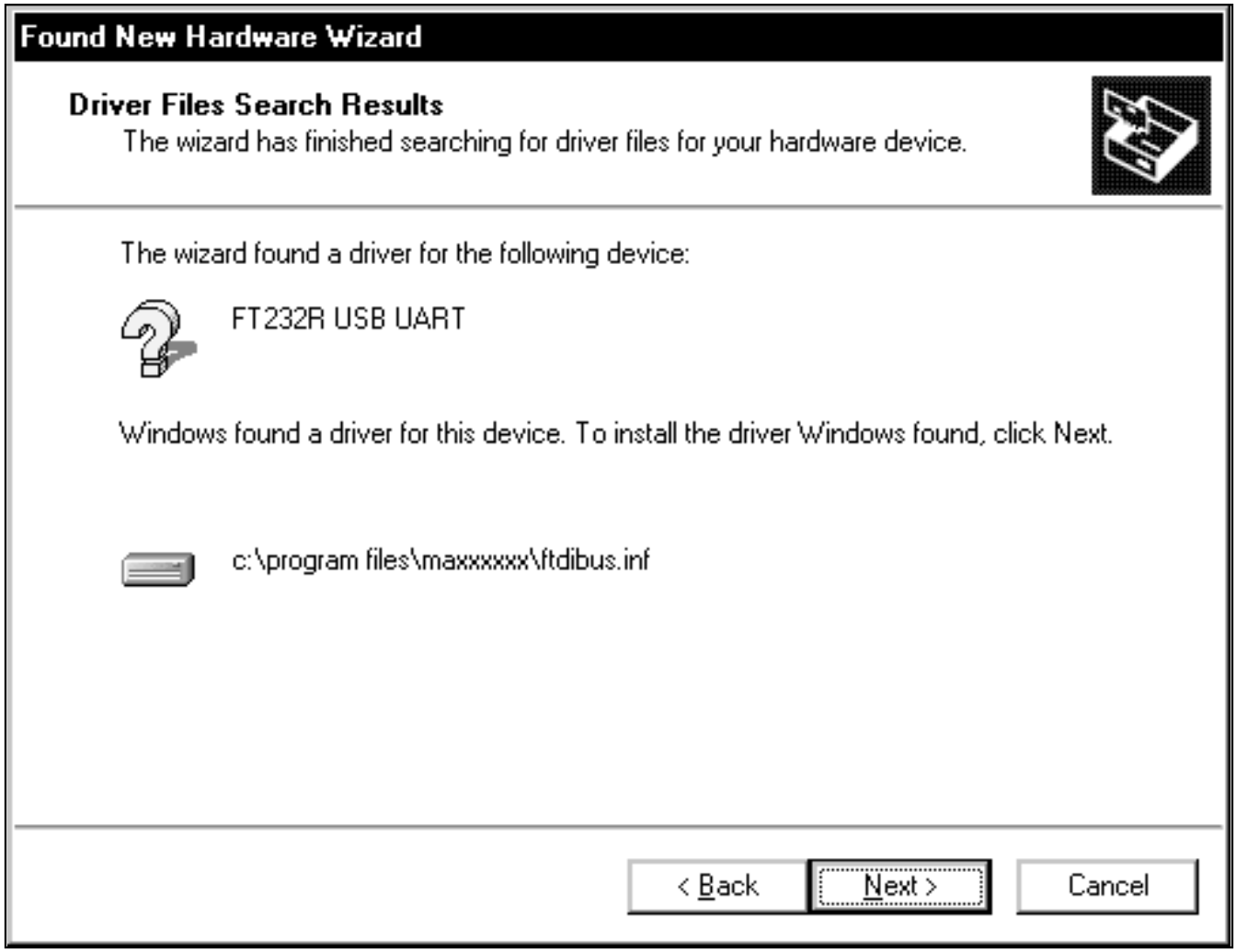


*Figure 14. Windows 2000: **Found New Hardware Wizard | Driver Files Search Results** Window*

7) At the **Found New Hardware Wizard | Complete** window (Figure 15), press the **Finish** button.



*Figure 15. Windows 2000: **Found New Hardware Wizard | Complete** Window*

8) A **Found New Hardware** window appears for the USB Serial Port, as shown in Figure 16.



*Figure 16. Windows 2000: **Found New Hardware** Window*

9) When the **Found New Hardware Wizard | Welcome** window appears (Figure 17), press the **Next** button.



*Figure 17. Windows 2000: **Found New Hardware Wizard | Welcome** Window*

10) At the **Found New Hardware Wizard | Install Hardware Device Drivers** window (Figure 18), choose **Search for a suitable driver for my device (recommended)** and press the **Next** button when finished.

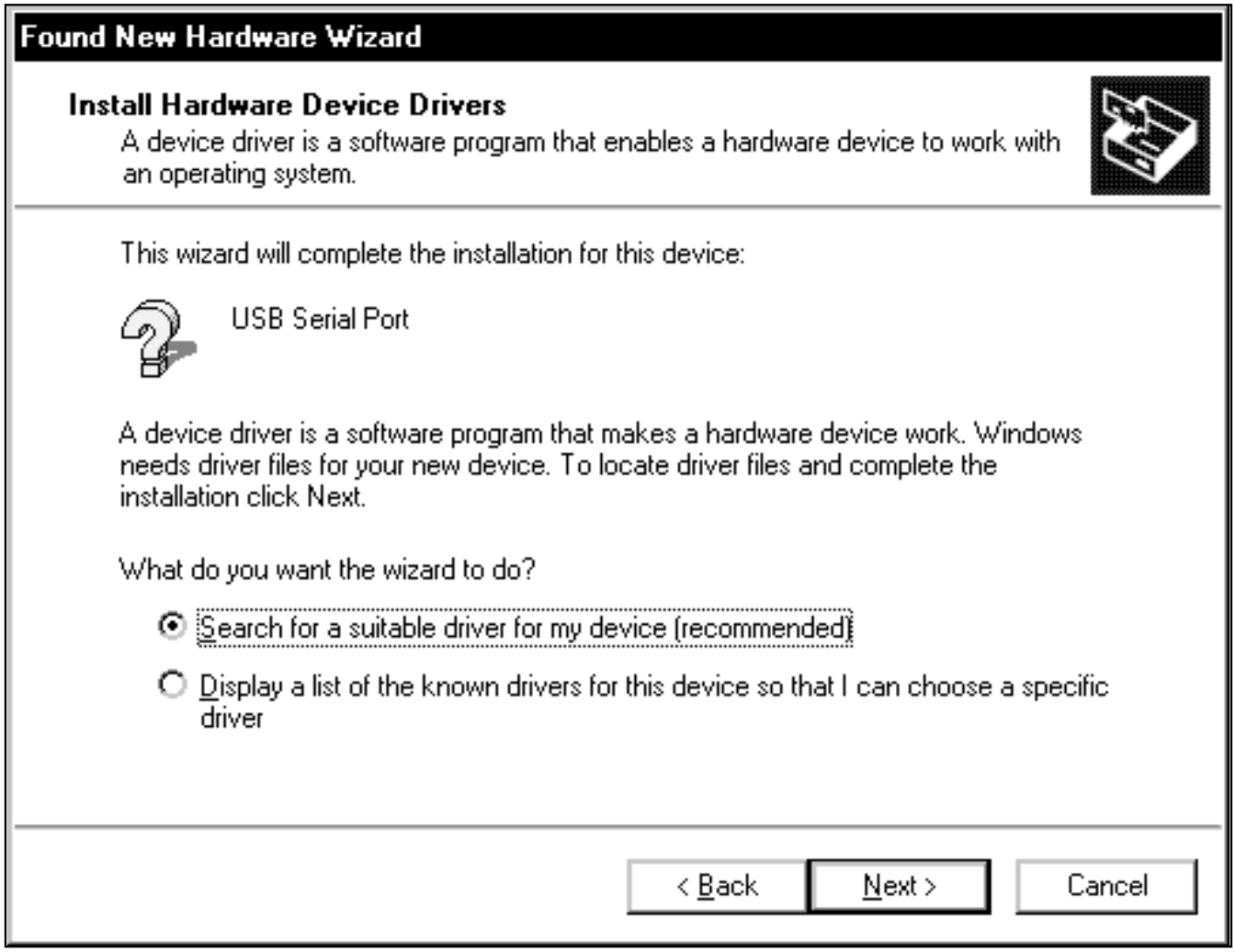


*Figure 18. Windows 2000: **Found New Hardware Wizard | Install Hardware Device Drivers** Window*

11) The **Found New Hardware Wizard | Locate Driver Files** window (Figure 19) appears. Check the **Specify a location** checkbox and press the **Next** button when finished.

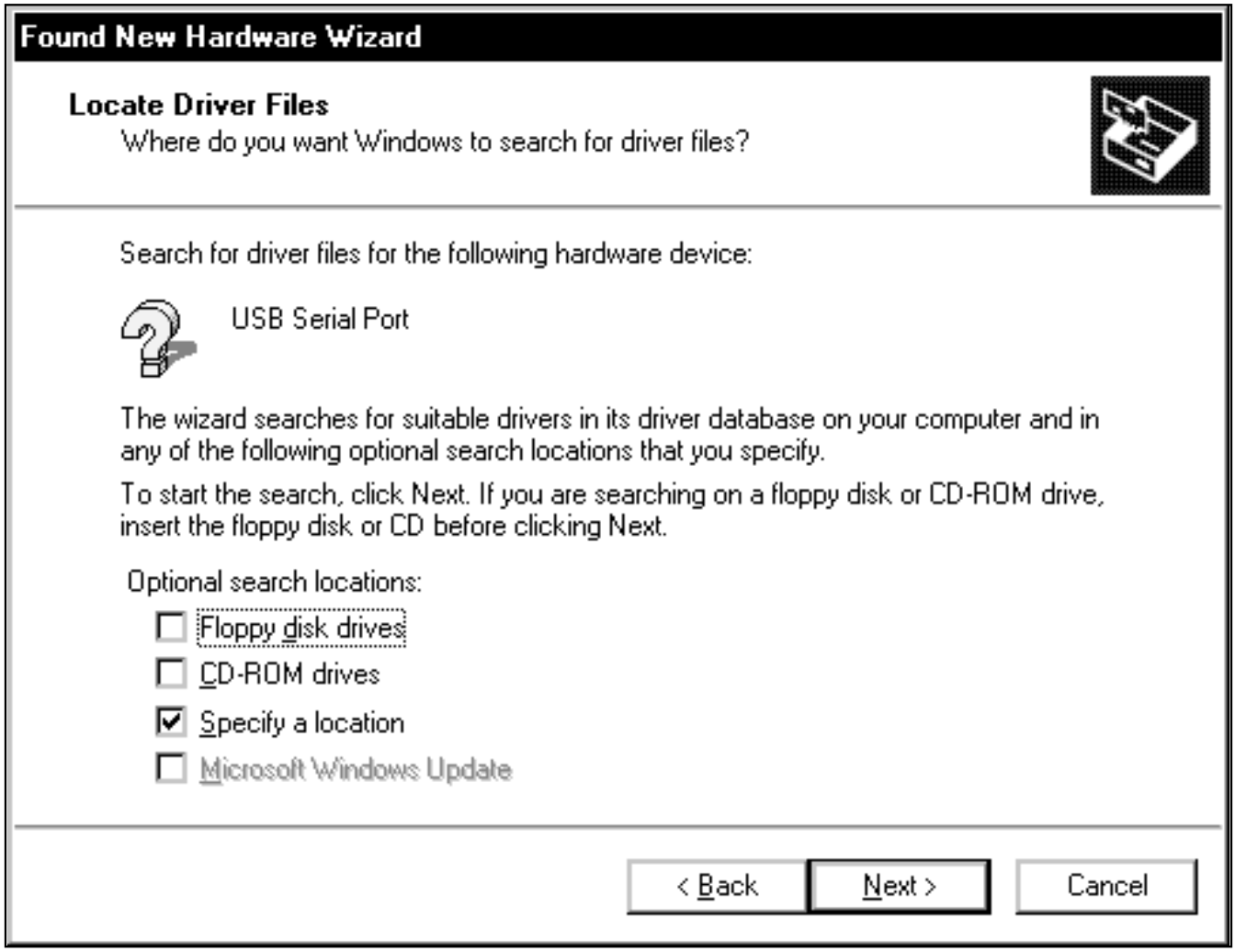


*Figure 19. Windows 2000: **Found New Hardware Wizard | Locate Driver Files** Window*

12) At the **Found New Hardware Wizard | Path** window (Figure 20), press the **Browse** button and choose the path **C:\Program Files\MAXxxxxx**. Press the **OK** button when finished.



*Figure 20. Windows 2000: **Found New Hardware Wizard | Path** Window*

13) The **Found New Hardware Wizard | Driver Files Search Results** window (Figure 21) appears. Press the **Next** button after the wizard finds the driver.

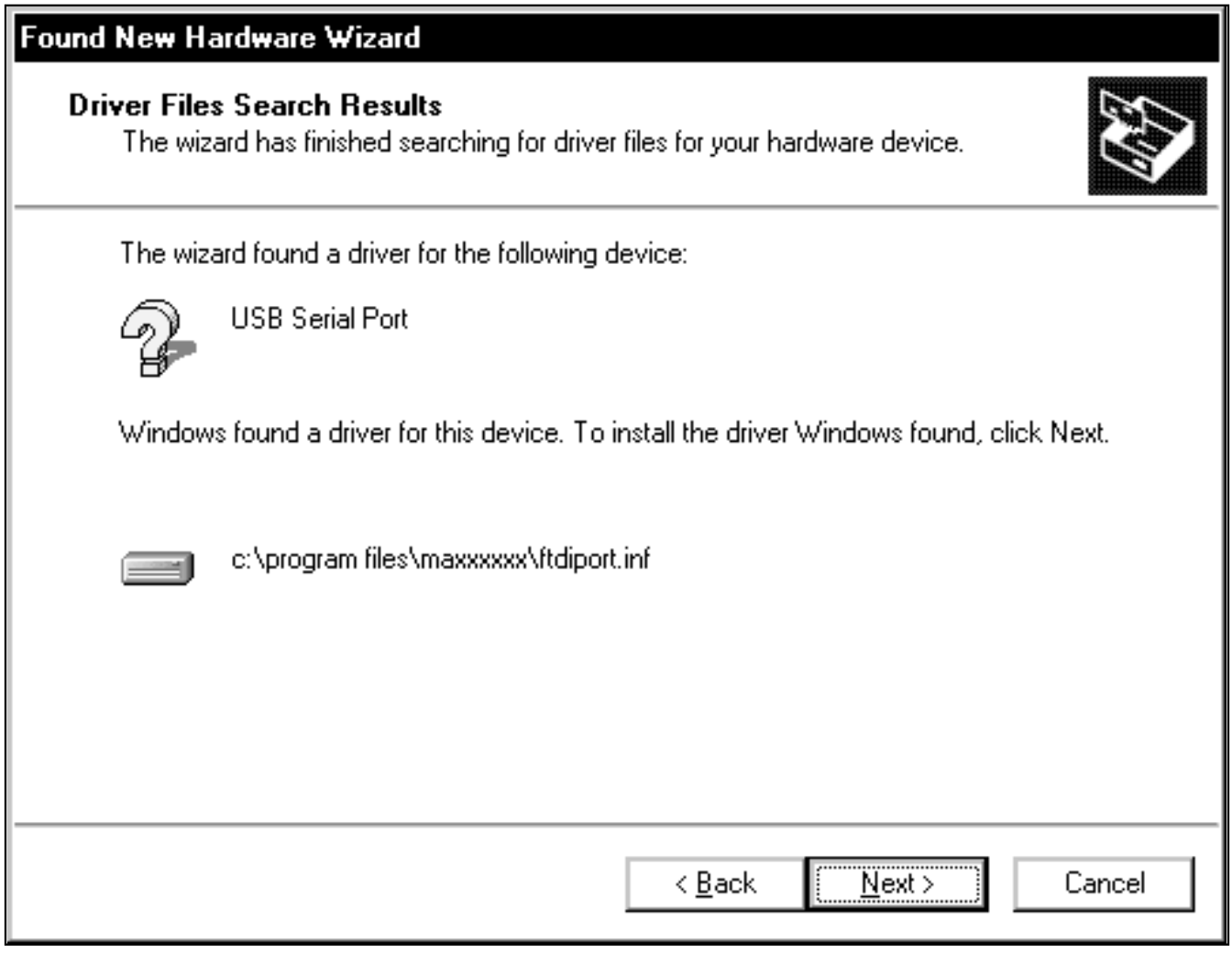


*Figure 21. Windows 2000: **Found New Hardware Wizard | Driver Files Search Results** Window*

14) The next window is the **Found New Hardware Wizard | Complete** window (Figure 22). Press the **Finish** button.

15) When finished, return to step 8 of the USBTO232 *Quick Start* section.



*Figure 22. Windows 2000: **Found New Hardware Wizard | Complete** Window*

Windows 98SE USB Driver Installation

1) Once the USBTO232 board is connected to the PC for the first time in Windows 98SE, an **Add New Hardware Wizard | Start** window appears, as shown in Figure 23. Press the **Next** button to get started.



*Figure 23. Windows 98SE: **Add New Hardware Wizard | Start** Window*

2) An **Add New Hardware Wizard | Options** window appears next (Figure 24). Choose the **Search for the best driver for your device (Recommended)** option and press the **Next** button when finished.

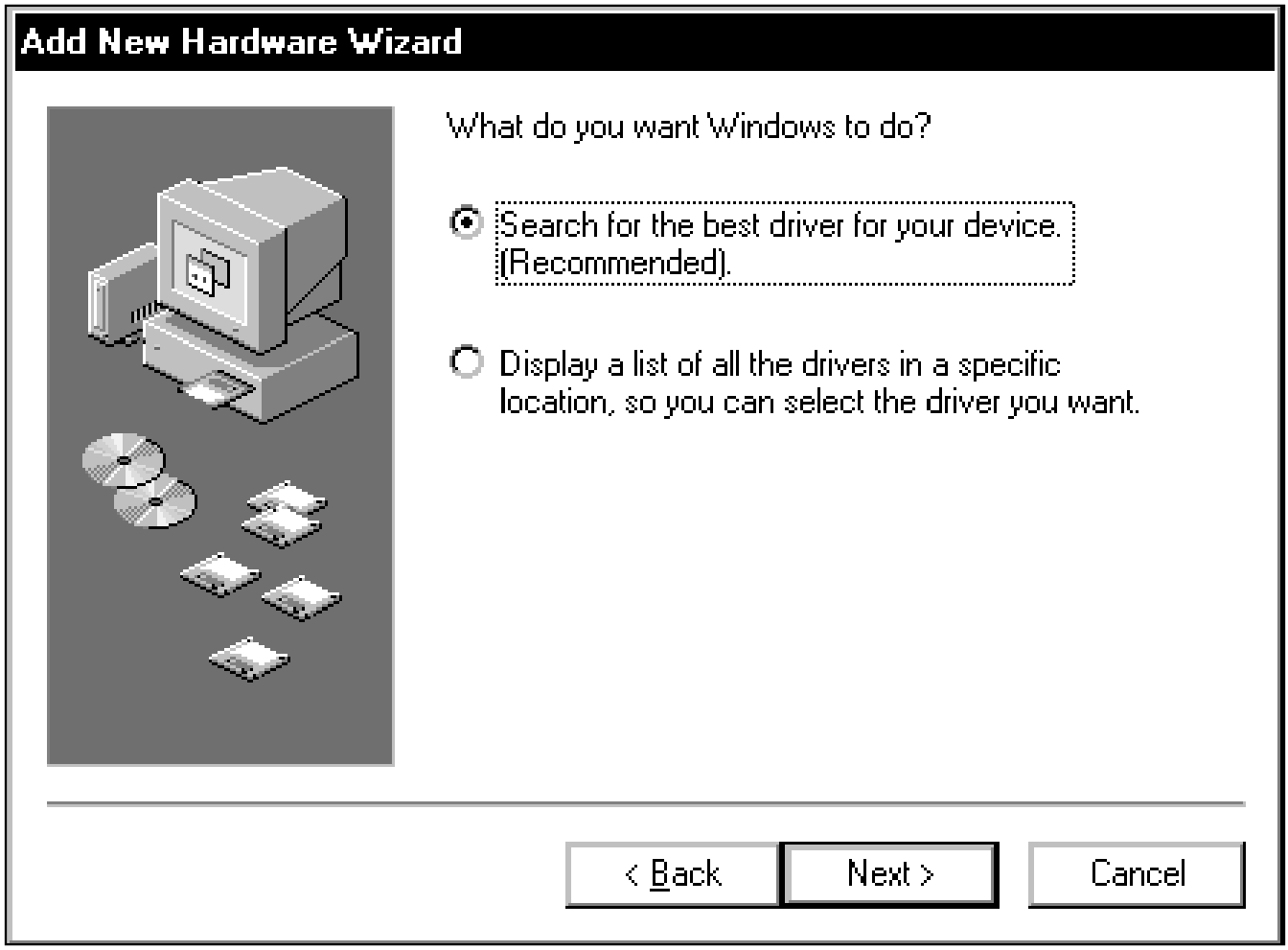


*Figure 24. Windows 98SE: **Add New Hardware Wizard | Options** Window*

3) At the **Add New Hardware Wizard | Specify Location** window (Figure 25), check the **Specify a location** checkbox and press the **Browse** button. Choose the path **C:\Program Files\MAXxxxxx\R10906** (where xxxxx represents the Maxim IC part number on the EV kit being evaluated). Press the **Next** button when finished.

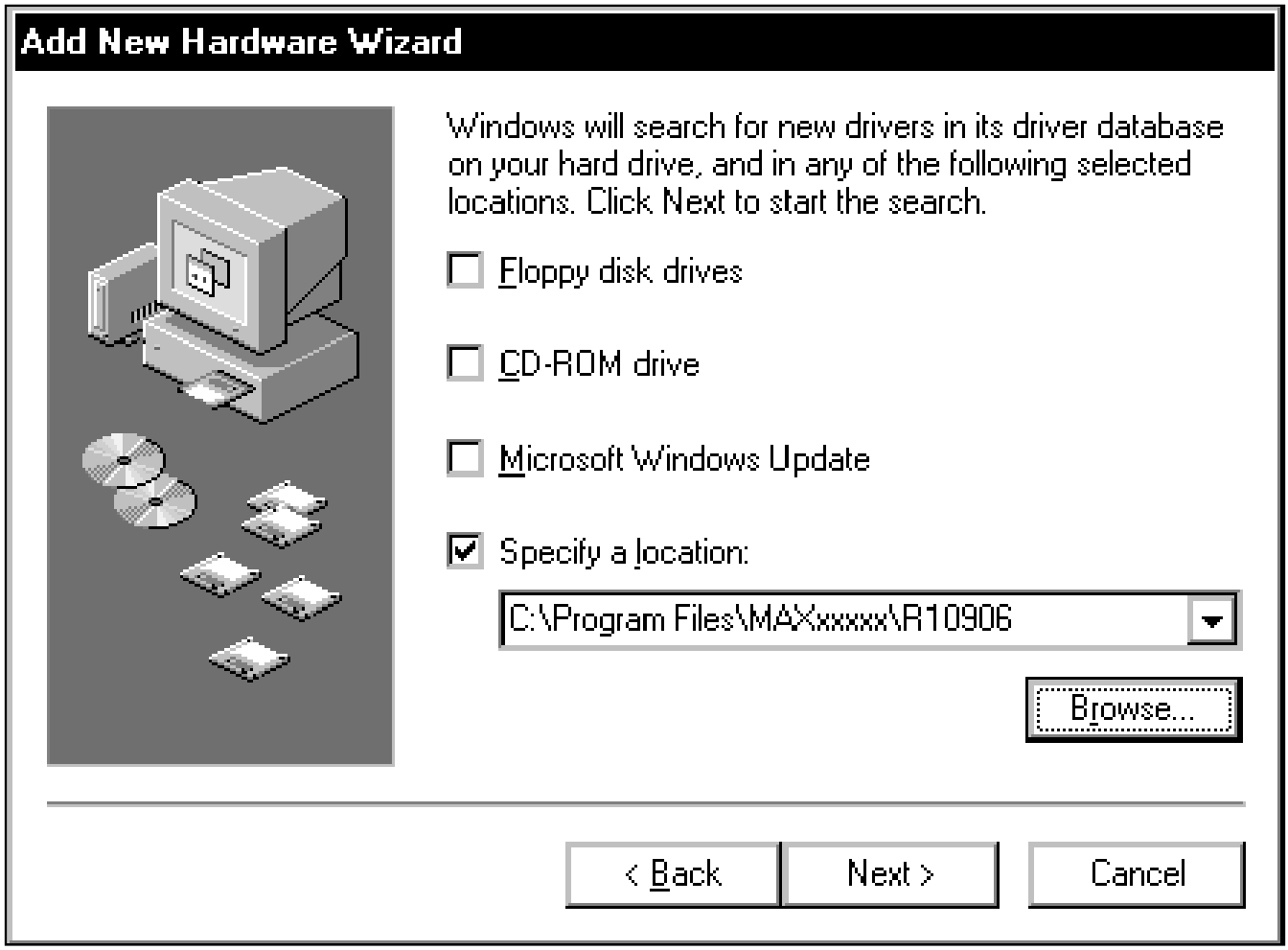


*Figure 25. Windows 98SE: **Add New Hardware Wizard | Specify Location** Window*

4) The **Add New Hardware Wizard | Search** window appears (Figure 26). Press the **Next** button once the driver has been located.

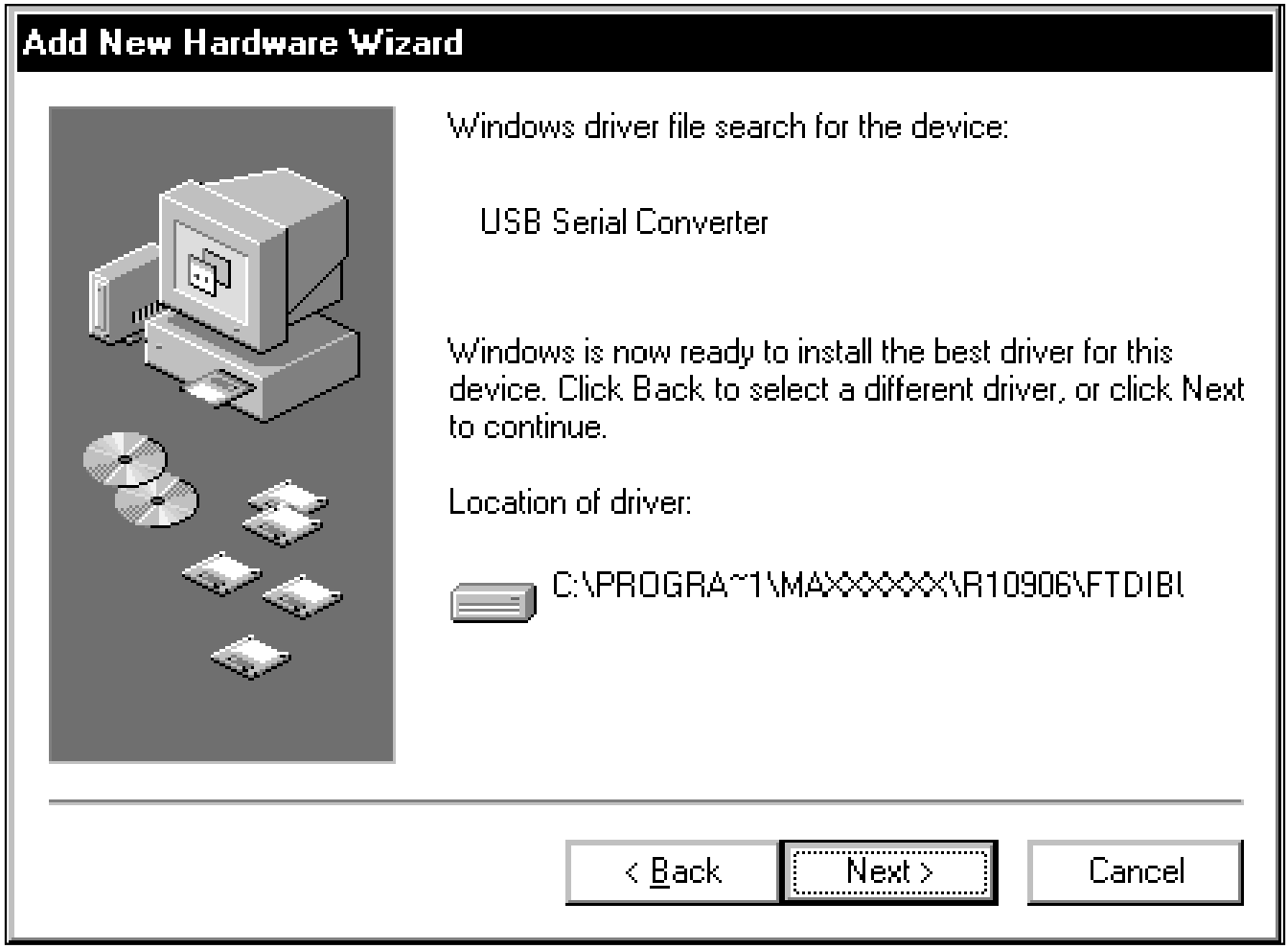


*Figure 26. Windows 98SE: **Add New Hardware Wizard | Search** Window*

5) The next window is the **Add New Hardware Wizard | Complete** window (Figure 27). Press the **Finish** button to complete the driver installation.

6) When finished, return to step 8 of the USBTO232 *Quick Start* section.

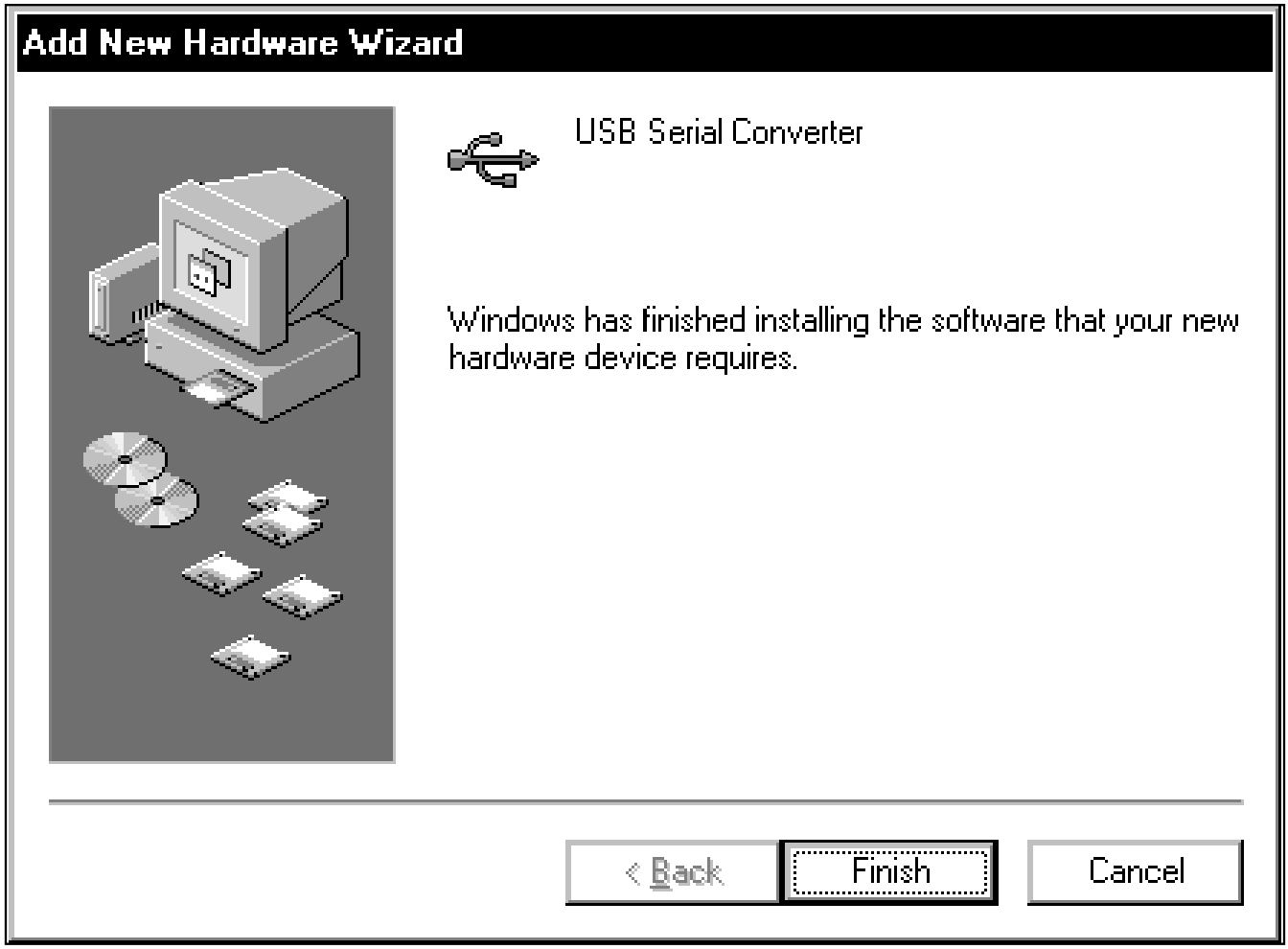


*Figure 27. Windows 98SE: **Add New Hardware Wizard | Complete** Window*

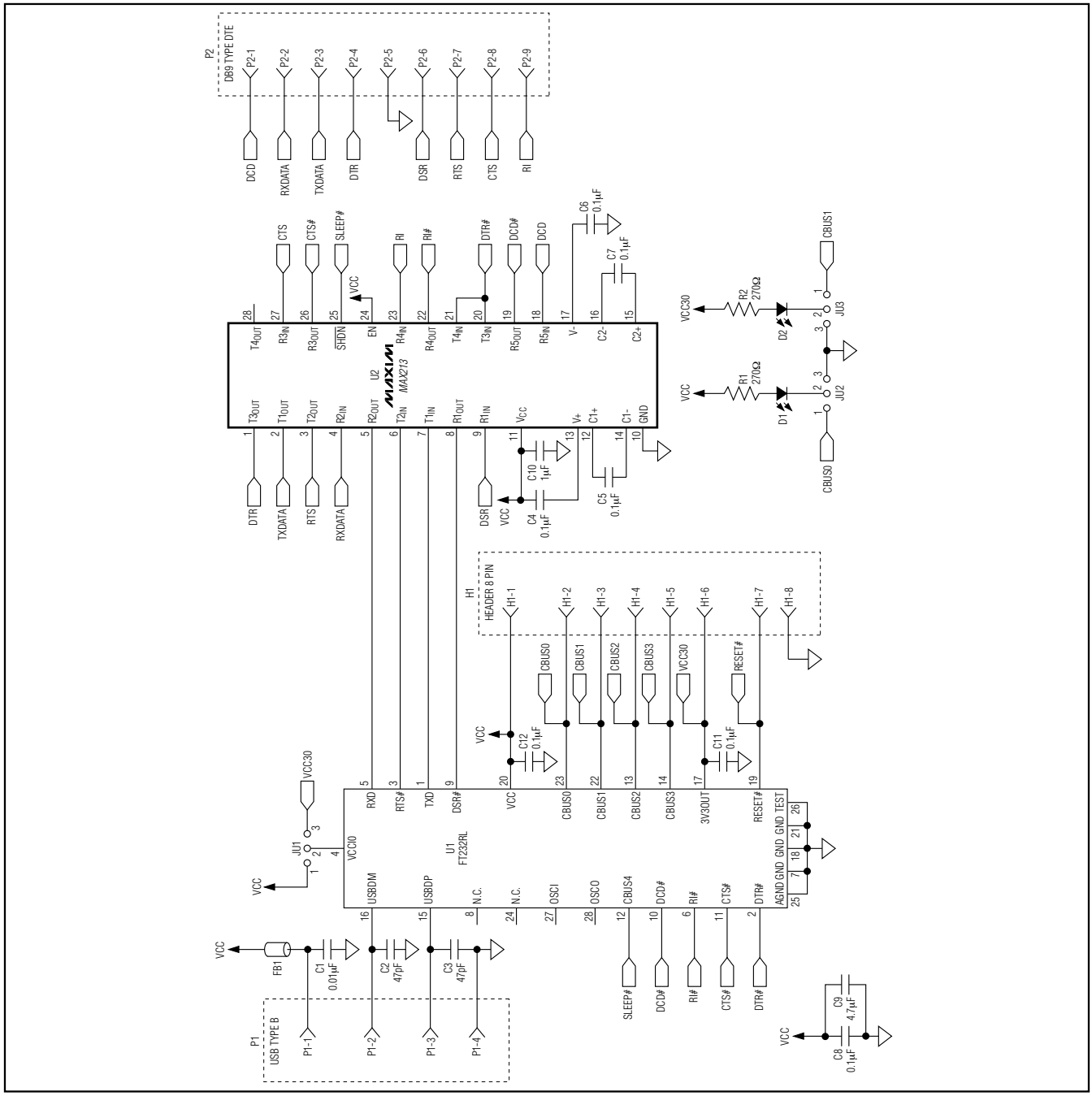


Figure 28. USBTO232 Schematic

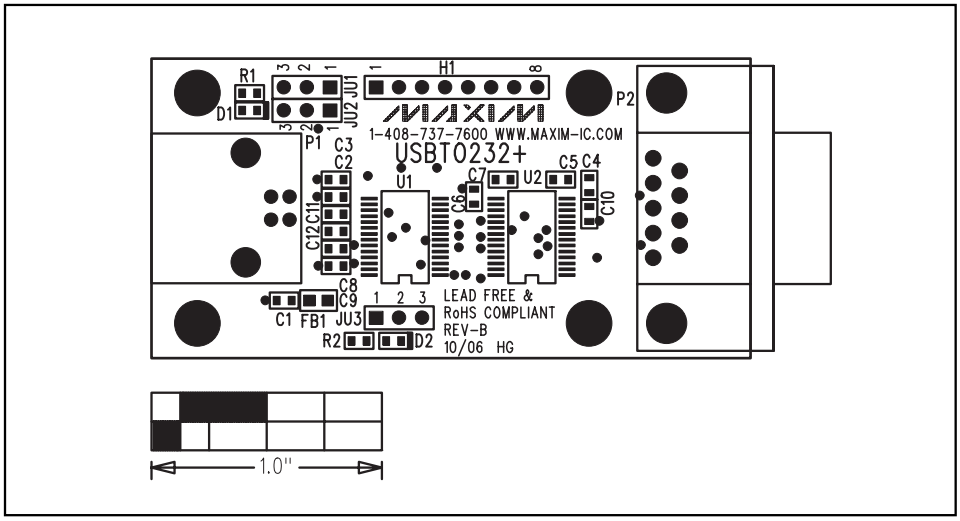


Figure 29. USBTO232 Component Placement Guide—Component Side

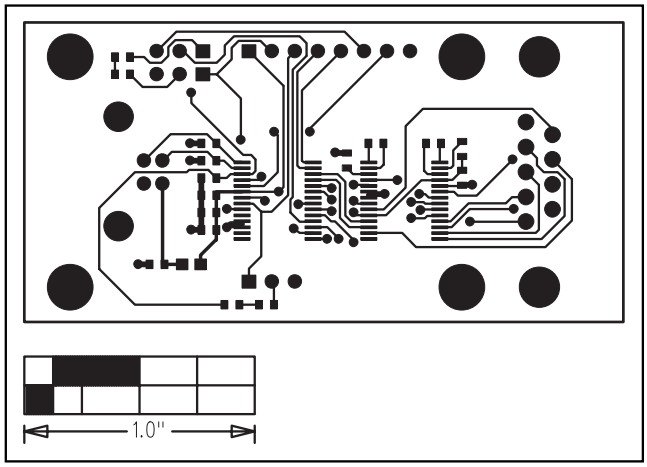


Figure 30. USBTO232 PCB Layout—Component Side

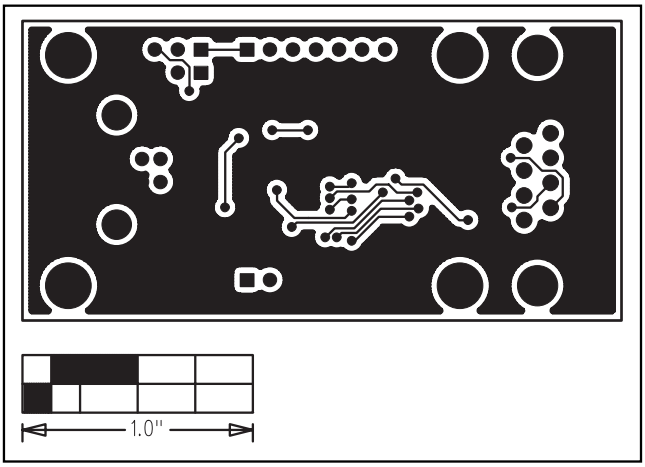


Figure 31. USBTO232 PCB Layout—Solder Side

Maxim cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim product. No circuit patent licenses are implied. Maxim reserves the right to change the circuitry and specifications without notice at any time.

© 2006 Maxim Integrated Products MAXIM is a registered trademark of Maxim Integrated Products, Inc.