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Owner's Manual

U209-004 USB to 4-Port Serial Adapter

U209-008 USB to 8-Port Serial Adapter



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Introduction

This manual describes how to set up and install your USB-to-Serial Adapter.

U209-004 and U209-008 provide four or eight independent RS-232 serial interfaces to the host PC via the Universal Serial Bus (USB) port.

Each adapter uses high-speed UARTs and deep FIFOs, allowing each channel to obtain data rates up to 921.6 kbps. The adapters are powered over their USB connection (bus-powered), eliminating the need for an external power supply. The adapters are Plug-and-Play devices and require no hardware configuration.

Note: These products comply fully with USB Specification version 2.0. They will also operate over slower USB 1.1 connections at a slightly reduced performance level.

System requirements

USB-to-Serial adapters are supported under the Windows 2000/XP (and later) and Linux operating systems. One USB port is required to connect the adapter to your computer. You can use either a built-in USB port or an add-in USB host adapter. We recommend the use of a USB 2.0 port for best performance.

Installing the USB-to-Serial Adapter

Caution!

Be sure to allow the installation process to finish without interruption



This section explains how to install the USB-to-Serial adapter under different operating systems. Please locate and follow the procedure for your computer's operating system.

The USB-to-Serial adapter includes Windows device drivers that enable the serial ports to appear to Windows as standard COM ports.

Installing under Windows XP

Follow these steps to install the adapter under Windows XP.

- 1. Turn the power to your computer ON.** This is the system to which the device is to be connected.
- 2. Plug the wide flat end of the USB cable into the downstream connector.** This is the connector located on the back of the computer or USB hub.
- 3. Plug the square end of the USB cable into the USB-to-Serial adapter.** Windows tells you that it has found new hardware and launches the Found New Hardware Wizard (figure 1).



Figure 1 - The Found New Hardware Wizard launches automatically when you first plug in the USB-to-Serial adapter.

Installing the USB-to-Serial Adapter *(continued)*

- 4. Insert the installation CD into the CD-ROM drive.** This is the CD that shipped with the product.
- 5. Select the "Advanced" option. Click the Next button.** The Choose your search and installation options prompt displays (figure 2).
- 6. Select Search removable media (floppy, CD-ROM).** If necessary, you can also select the Include this location in the search: option and browse to the location with the USB-to-Serial drivers. The complete path is E:\Serial Port Adapters\Drivers\Windows 98, Me, 2000, XP for USB. Replace E:\ with your CD-ROM designation.
- 7. Click the Next button.** Windows searches for drivers for the adapter (figure 3).
- 8. The Wizard locates and starts to install the necessary software.** The Wizard installs the software (figure 4), followed by the Finished installing prompt (figure 5).

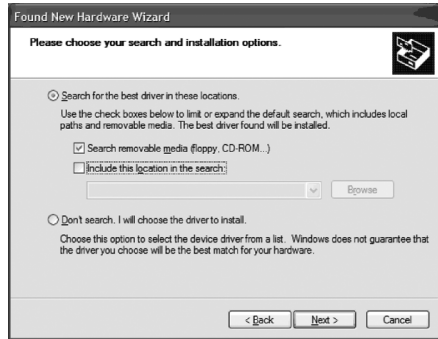


Figure 2 - Windows XP Choose your search and installation options prompt.



Figure 3 - Windows XP Searches for drivers prompt.



Figure 4 - Windows XP Wizard installs the software.

Installing the USB-to-Serial Adapter *(continued)*

9. Press the **Finish** button to continue. The USB adapter installation is complete.



Figure 5 - Windows XP Finished installing prompt indicates that the adapter has been successfully installed.

Installing under Windows 2000

Follow these steps to install the USB-to-Serial adapter under Windows 2000.

1. **Turn on the power to your computer system.** This is the system in which the device is to be installed.
2. **Plug the wide flat end of the USB cable into the downstream connector.** This is the connector located on the back of the computer or USB hub.
3. **Plug the square end of the USB cable into the back of the USB-to-Serial adapter.** Windows tells you that it has found new hardware and launches the Add New Hardware Wizard. The Found new hardware prompt displays (figure 6).
4. **Click the Next button.** The Search for display drivers prompt displays (figure 7).



Figure 6 - Windows 2000 found new hardware prompt.



Figure 7 - Windows 2000 search for display drivers prompt.

Installing the USB-to-Serial Adapter *(continued)*

5. **Insert the installation CD into your CD-ROM drive.** This is the CD that shipped with the adapter.
6. **Select Search for a suitable driver for my device (recommended).**
7. **Click the Next button.** The Locate driver files prompt displays (figure 8).
8. **Select CD-ROM drives.** You can also choose to specify a location and browse to the desired location with the USB-to-Serial drivers. The complete path is E:\Serial Port dapters\Drivers\Windows 98, Me, 2000, XP for USB. Replace E:\ with your CD-ROM drive designation.
9. **Click the Next button.** Windows searches for drivers for the adapter. The Finished searching for driver files prompt displays (figure 9).
10. **Click the Next Button.**
11. **The wizard Proceeds with the Installation.** The Please Wait while the Wizard Installs the Software screen displays, followed the Finished Installing prompt (figure 10).
12. **Press the Finish button to continue.** The USB-to-Serial adapter installation is complete.

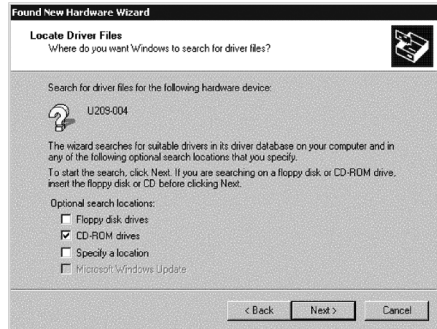


Figure 8 - Windows 2000 Locate driver files prompt.



Figure 9 - Finished searching for driver files.



Figure 10 - Windows 2000 Finished installing prompt indicates that the adapter has been successfully installed.

Installing the USB-to-Serial Adapter *(continued)*

Uninstalling under Windows 2000 or Windows XP

Follow these steps in the event that you need to uninstall or reinstall the USB-to-Serial software.

1. From the Control Panel, select System.
2. Press the Hardware tab.
3. Click on Device Manager.
4. Scroll down to Multi-port serial adapters and expand.
5. Highlight your USB-to-Serial adapter; for example, U209-004 or U209-008
6. Select the Action menu option.
7. Select Uninstall from the drop down menu.
8. Click OK at the Confirmation screen. Note that this also removes all the serial ports associated with your USB-to-Serial adapter.

Making external connections

RS-232 Serial Connections

RS-232 devices are classified by their function as either Data Terminal Equipment (DTE) or Data Communication Equipment (DCE).

Note: A DTE device is the communication source. A DCE device provides a communication channel between two DTE-type devices.

USB-to-Serial adapters are DTE devices that connect to peripheral equipment through a male DB-9 connector. The following table lists the serial port connector definitions.

RS-232 signal description	DB-9
Data Carrier Detect (DCD)	1
Receive Data (Rx/D)	2
Transmit Data (Tx/D)	3
Data Terminal Ready (DTR)	4
Signal Ground (GND)	5
Data Set Ready (DSR)	6
Request To Send (RTS)	7
Clear To Send (CTS)	8
Ring Indicator (RI)	9

DTE- and DCE-type devices have complementary pinouts that allow terminals and modems to connect directly using a one-to-one cable as shown in Figure 13. Two DTE-type devices can be connected by a null modem cable. A typical null modem cable is also shown in the figure.

Note: In many applications, DCEs are unnecessary. This allows you to use a null modem cable (modem eliminator cable) to directly connect two DTE type devices.

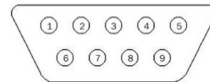


Figure 11 - DB9 connector pinout.

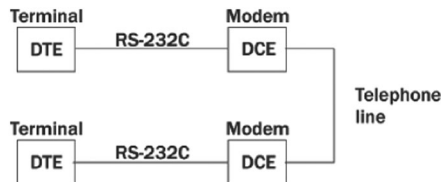


Figure 12 - Use of DTEs and DCEs in a communication link.

Cabling requirements for RS-232C devices



Figure 13 - illustrates the RS232 pinouts for typical DTE- to-DCE and DTE-to-DTE cables with 9-pin connectors.

Making external connections *(continued)*

Testing DB-9 serial ports in HyperTerminal

This section explains how to test the functionality of your USB-to-Serial adapter using HyperTerminal. An RS-232 loopback connector is included with the USB-to-Serial adapter.

Running HyperTerminal

1. **Attach the loopback connector to the DB-9 Connector.**
2. **Launch HyperTerminal.** From the Windows Start Menu, select Programs > Accessories > Communications > HyperTerminal.
3. **Create a new session.** When prompted, give the session any name you wish.
4. **Select the COM # associated with port 1 from the dropdown list.** You are now set up to test the first serial port. Note: Leave all settings at default.
5. **With the session open, type any text.** If the text you type is echoed on the screen, the port is functioning properly.
6. **Close the session.**
7. **Repeat steps 3 through 6 for each serial port.** If the text you type is echoed on the screen, the port is functioning properly.

Using Device Manager

This section explains how to use Device Manager to view the properties of the serial ports enumerated by the USB-to-Serial adapter.

Accessing Device Manager

1. **Select Start > Settings > Control Panel.**
2. **Double click the System icon.** The System Properties dialog box opens. (Note: If you do not see the System icon, you may need to switch to "Classic View".)
3. **Click the Hardware tab, and then press Device Manager.** Device Manager lists all the hardware devices that are registered inside the Windows registry.

Exploring Device Manager Screens

Windows XP and 2000

Device Manager provides two property dialogs that apply to the USB-to-Serial adapter.

- Ports (COM & LPT) device group property box
- Multi-port serial adapters device group property box

Use the Ports (COM & LPT) device group property box to view and set the port settings and to view device usage and driver information for the serial ports. Use the Multi-port serial adapter's device group property box to view and set the advanced options and to view device usage and driver information for the USB-to-Serial adapter.

Using Device Manager *(continued)*

1. **With Device Manager open, expand the Multi-port serial adapters device group.** Your USB-to-Serial adapter should appear in the list.
2. **Double click the USB-to-Serial adapter.** The Properties dialog box opens and displays the General tab (figure 14).
3. **Click the USB Serial Ports Advanced Options tab to view the port setting properties.** The Advanced Options dialog box displays (figure 15).
4. **The RS-232 USB Serial Port Advanced Options dialog box displays the firmware revision of the USB-to-Serial adapter.** There are no user-configurable settings for RS-232 only USB-to-Serial adapters.
5. **Click Cancel to close the property box.**
6. **With Device Manager open, expand the Ports (COM & LPT) device group.** The ports associated with the USB-to-Serial adapter should appear in the list of ports
7. **Double click the desired port.** The USB Serial Port Properties dialog box opens and displays the General tab



Figure 14 - Windows XP/2000 Device Manager properties, General tab.

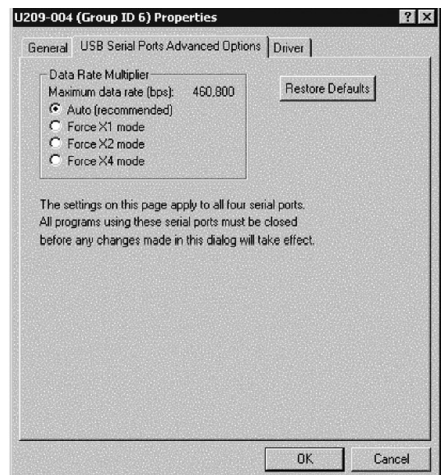


Figure 15 - The Advanced Options dialog box.

Using Device Manager *(continued)*

8. Click the **Port settings** tab. The Port Settings dialog box displays (figure 16).

9. This **Port Settings** tab allows you to set default values for the following:

- Bits per second
- Data bits
- Parity
- Stop bits
- Flow control

Most applications do not make use of these default settings, but prefer to make their own settings. See the Setting advanced options section for details.

10. Press the **Advanced** button. The Advanced Options dialog box opens (figure 17).

11. Use the dropdown box to select the port whose settings you wish to change. Click **Cancel** to return to the Port Settings tab.

12. Click the **Driver** tab to view the driver information and update the driver. The USB Serial Driver properties dialog box displays (figure 18).

13. You have several options:

- View detailed driver information
- Update the device drivers
- Uninstall your USB-to-Serial adapter* (XP only)
- Return to the previously installed driver.
- Save your changes and exit
- Abandon your changes and return to the Device Manager

* Uninstall the entire device instead by using the Driver dialog for the multiport serial adapter.



Figure 16 - USB Ports Settings box, which lets you set the default port settings, view the advanced options, and restore the default settings.

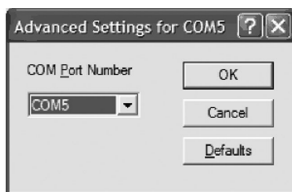


Figure 17 - Windows XP/2000 USB serial port, Advanced settings box.



Figure 18 - Windows XP/2000 USB serial port properties, Driver box.

Using Device Manager (continued)

14. Click the **Driver Details** button to view detailed driver information. The Driver File Details dialog box opens (figure 19).

15. **Driver File Details** dialog box displays the following information:

- Provider
- File version
- Copyright
- Digital Signer (Windows XP only)

This is the version of the installed software
Indicates whether Microsoft has approved this version.

16. Click **Cancel** to close the dialog.



Figure 19 - Windows XP/2000 USB serial port, Driver file details box.

Troubleshooting

This section lists some common problems and their causes. If the information below does not provide a solution, then contact technical support.

Note: Any unauthorized repairs or modifications will void the adapter's warranty.

Problem	Cause	Solution
The USB-to-Serial adapter cannot communicate with other equipment.	The cables are not connected correctly.	1. Check all cables to make sure that they are connected correctly. 2. Make sure that each cable is securely attached.
	The device driver is not installed.	1. Double check the Device Manager per the instructions in Using Device Manager to ensure that drivers are installed correctly and that all devices are working properly. 2. Try uninstalling the USB adapter from the Device Manager window and then repeat the hardware installation instructions.
	The USB port is faulty.	If possible, connect a known good USB device to the PC or hub connector and see if it operates properly.

Appendix A

Specifications

Bus interface	USB Specification 2.0, high speed 480 Mbps. Backward compatible with USB 1.1 full speed 12 Mbps.
Baud rates	Up to 921,600 bps. Factors impacting performance include: <ul style="list-style-type: none">• Hardware flow control• Horsepower of the host computer• Quality of and length of cables• Continuous or "bursty" data
Ports	U209-004: 4 U209-008: 8
UARTs	Custom high-speed UARTs with 1024-byte FIFOs for both transmit and receive. Automatic hardware and software flow control.
Transceivers	<u>RS-232 Output</u> : Voltage Swing: +/-5V min, +/-5.4V typical <u>RS-232 Input</u> : Voltage Range: -15V min, +15V max; Input Threshold Low: 0.6V min, 1.0V typical; Input Threshold High: 2.4V max, 1.5V typical
Connectors	DB-9 Male
Dimensions	9.18" L x 5.25" W x 2.363" H
Power Requirements	USB bus powered (no external power connection required) Suspend Power: < 500 uA Unconfigured Power: < 100 mA Configured Power: < 500 mA
Temperature:	Operating: 0° to 70° C Storage: -50° to 80° C
Humidity	10 to 90%
OS Support	Windows 2000, Windows XP

Warranty and Warranty Registration

5-YEAR LIMITED WARRANTY

TRIPP LITE warrants its products to be free from defects in materials and workmanship for a period of five (5) years from the date of initial purchase. TRIPP LITE's obligation under this warranty is limited to repairing or replacing (at its sole option) any such defective products. To obtain service under this warranty, you must obtain a Returned Material Authorization (RMA) number from TRIPP LITE or an authorized TRIPP LITE service center. Products must be returned to TRIPP LITE or an authorized TRIPP LITE service center with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase. This warranty does not apply to equipment that has been damaged by accident, negligence or misapplication or has been altered or modified in any way.

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