SURFboard Cable Modem SB4220 Series User Guide

Click your selection:

Introduction

Introduces your SURFboard cable modem and the controls on the Top and Front Panel and Rear Panel.

Before You Begin

Lists the items needed to install your SURFboard cable modem and describes Precautions, Signing Up for Service, and Computer System Requirements.

Installation and Configuration Overview

Provides an overview and links to cable and configure your SURFboard cable modem, including Setting Up a USB Driver.

Troubleshooting

Provides suggestions to fix common problems.

Contact Us

Provides contact information.

Frequently Asked Questions

Provides answers to common questions about the SURFboard cable modem.

SURFboard®
Cable Modem

Next page

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS DEVICE TO RAIN OR MOISTURE. THE DEVICE SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE DEVICE.

CAUTION: TO ENSURE REGULATORY AND SAFETY COMPLIANCE, USE ONLY THE PROVIDED POWER AND INTERFACE CABLES. TO PREVENT ELECTRICAL SHOCK, DO NOT USE THIS PLUG WITH AN EXTENSION CORD, RECEPTACLE, OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

CAUTION: DO NOT OPEN THE CABLE MODEM. DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE INSTALLATION AND TROUBLESHOOTING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL.

It is recommended that the customer install an AC surge arrestor in the AC outlet to which this device is connected. This is to avoid damaging the equipment by local lightning strikes and other electrical surges.

This product was qualified under test conditions that included the use of the supplied cable between system components. To be in compliance with regulations, the user must use this cable and install it properly.

Different types of cord sets may be used for connections to the main supply circuit. Use only a main line cord that complies with all applicable product safety requirements of the country of use.

Installation of this product must be in accordance with national wiring codes.

To prevent overheating, do not block the ventilation holes on the sides of the cable modem.

Wipe the cable modem with a clean, dry cloth. Never use cleaning fluid or similar chemicals. Do not spray cleaners directly on the unit or use forced air to remove dust.

This product is provided with a separate Regulatory and Safety Information and Software License and Warranty Information card. If one is not provided with this product, please ask your service provider or point-of-purchase representative, as the case may be.

- THIS PRODUCT IS IN COMPLIANCE WITH ONE OR MORE OF THE STANDARDS LISTED ON THE REGULATORY AND SAFETY INFORMATION CARD. NOT ALL STANDARDS APPLY TO ALL MODELS.
- NO WARRANTIES OF ANY KIND ARE PROVIDED BY MOTOROLA WITH RESPECT TO THIS PRODUCT, EXCEPT AS STATED ON THE SOFTWARE LICENSE AND WARRANTY INFORMATION CARD. MOTOROLA'S WARRANTIES DO NOT APPLY TO PRODUCT THAT HAS BEEN REFURBISHED OR REISSUED BY YOUR SERVICE PROVIDER.

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Introduction

Easier!

Unlike dial-up modems or ISDN, you're always on, always connected. For easiest set-up, use the Installation Assistant on the SURFboard Cable Modem CD-ROM.

Faster!

Your cable modem is up to 100 times faster than a dial-up modem. It lets you enjoy surfing the web without the long wait. Because many network and other factors can affect performance, the actual speed will vary.

Better!

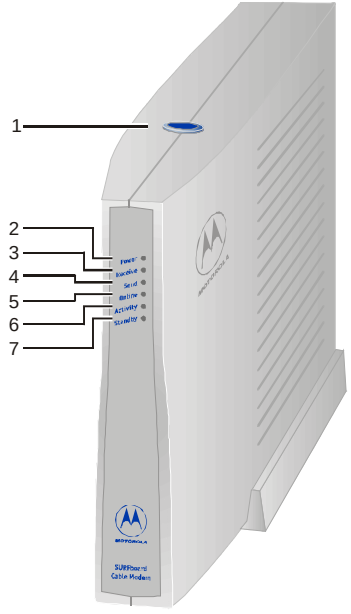
Your cable modem is made by the company with over 50 years of cable TV expertise.

Congratulations, you have a new Motorola® SURFboard cable modem! It provides high-speed access to the Internet and other online services. This cable modem transmits and receives data much faster than traditional dial-up or ISDN modems. Unlike a dial-up modem, your SURFboard cable modem is always online. *Just open your browser and surf!*

You can use your high-speed, upgradeable cable modem to connect one or more computers in your home or business to the Internet. You can connect:

- A single computer equipped with a Universal Serial Bus (USB) port directly to the USB port on the SURFboard cable modem
- A single computer equipped with an Ethernet adapter directly to the Ethernet port on the SURFboard cable modem
- Two computers; one to the USB port and one to the Ethernet port
- Up to 32 computers to a single SURFboard cable modem using an Ethernet hub

The model number and Standby button position on your cable modem may be different than in the illustrations and screen images in this guide.



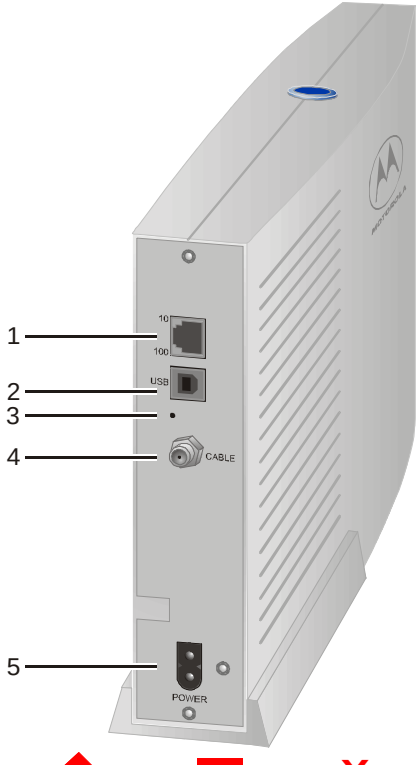
Top and Front Panel

For added security, you can press the Standby button **(1)** to suspend your Internet connection. No data is transmitted or received and the Standby button lights. All other lights turn off until you press the Standby button again.

The lights provide information about power, communications, and errors:

Key	Light	Flashing	On
2	**Power**	Startup diagnostics in progress	The cable modem is powered on
3	**Receive**	Scanning for a receive (downstream) channel connection	The downstream channel is connected
4	**Send**	Scanning for a send (upstream) channel connection.	The upstream channel is connected
5	**Online**	Scanning for a network connection	The startup process is complete
6	**Activity**	Transmitting or receiving data	Transferring a large amount of data
7	**Standby**	This light does not flash	Internet service is blocked because the Standby button was pressed. If this light is on, all other lights are off.

During normal operation, the Power, Receive, Send, and Online lights are on and the Activity light flashes when the cable modem is transferring data.



Rear Panel

The rear panel provides cabling connectors, status lights, and the power receptacle.

Key	Item	Description
1		The Ethernet port provides a connection to Ethernet equipped computers using a cable terminated with an RJ-45 connector. The adjacent lights are: **10** — On if there is a 10Base-T Ethernet connection. It flashes during data transfer. **100** — On if there is a 100Base-T Ethernet connection. It flashes during data transfer.
2	**USB**	The USB port provides a connection to USB equipped computers.
3	•	If you experience a problem, you can push this recessed button to reset the cable modem (see "Troubleshooting" on page 35). Resetting may take 5 to 30 minutes because the cable modem must find and lock on the appropriate communications channels.
4	**CABLE**	The CABLE port provides a connection to the coaxial cable (coax) outlet.
5	**POWER**	The POWER connector provides power to the cable modem.

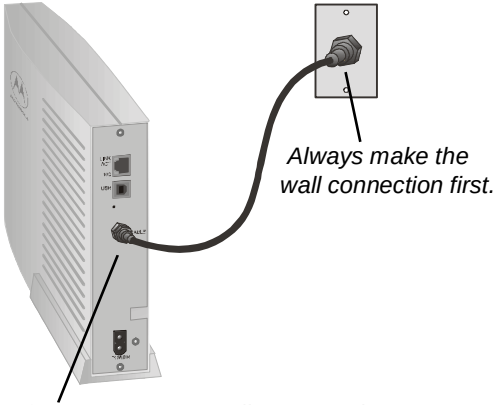
Before You Begin

Before you begin the installation, check that you received the following items with your SURFboard cable modem:

Item		Description
Power cord		Connects the SURFboard cable modem to the AC electrical outlet
10/100Base-T Ethernet cable		Connects to the Ethernet port
USB cable		Connects to the USB port
***SURFboard Cable Modem* CD-ROM**		Contains the User Guide and USB drivers

You will need 75-ohm coaxial cable (coax) with F-type connectors to connect your cable modem to the nearest cable outlet. If a TV is connected to the cable outlet, you may need a 5-900 MHz RF splitter and two additional coaxial cables to use both the TV and the cable modem. The coaxial cable and RF splitter are available at consumer electronic stores. To connect your SB4220 to an Ethernet hub as described in “Cabling for Multiple Users” on page 33, you may need a crossover cable. Check the documentation provided with your hub.

To avoid damaging your cable modem or PC with static electricity:



Before you connect or disconnect the USB or Ethernet cable, *always touch the coaxial cable connector on the cable modem*.

Precautions

Postpone cable modem installation until there is no risk of thunderstorm or lightning activity in the area.

To avoid damaging the cable modem with static electricity:

- Always first connect the coaxial cable to the grounded cable TV wall outlet.
- Before you connect or disconnect the USB or Ethernet cable from your cable modem or PC, always touch the coaxial cable connector on the cable modem to release any static charges.

To prevent overheating the cable modem, do not block the ventilation holes on its sides.

Do not open the cable modem. Refer all service to your cable service provider.

Wipe the cable modem with a clean, dry cloth. Never use cleaning fluid or similar chemicals. Do not spray cleaners directly on the unit or use forced air to remove dust.

Signing Up for Service

You must sign up with a cable service provider to access the Internet and other online services.

To activate your service, call your local cable service provider.

You need to provide the MAC address printed on the bar code label marked HFC MAC ID on the rear panel. You can record your cable modem MAC address here:

00 : _____ : _____ : _____ : _____ : _____

You should ask your cable service provider the following questions:

- Do you have any special system requirements?
- When can I begin to use my cable modem?
- Are there any files I need to download after I am connected?
- Do I need a user name or password to access the Internet or use e-mail?

You can use any web browser such as Microsoft® Internet Explorer or Netscape® Navigator® with your SURFboard cable modem*.*

For Microsoft Windows computers, the Installation Assistant application automatically checks your system configuration. You can start the Installation Assistant from the Main Menu on the *SURFboard Cable Modem* CD-ROM.

Computer System Requirements

Your SURFboard cable modem is compatible with Microsoft Windows®, Macintosh®, and UNIX® computers.

Ethernet Card

You can use the Ethernet connection with any Windows, Macintosh, or UNIX computer equipped with a 10Base-T or 10/100Base-T Ethernet card.

Windows 95, UNIX, or Macintosh computers must use the Ethernet connection.

If you use an Ethernet card, it must be installed in your computer before you install the cable modem*.* If it is not installed, follow the installation instructions provided with your Ethernet card.

USB Connection

You can use the USB connection with any PC running Windows 98, Windows 2000, Windows Me, or Windows XP that has a USB interface. The USB connection requires special USB driver software that is supplied on the *SURFboard Cable Modem* CD-ROM.

You can upgrade the USB drivers from the Internet. For information, check our website http://www.motorola.com/broadband.

Installation and Configuration Overview

To connect a single PC running Microsoft Windows to a SURFboard cable modem, we recommend using the Installation Assistant application.

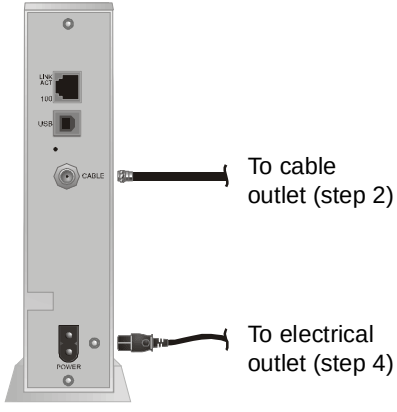
You can start the Installation Assistant from the Main Menu on the *SURFboard Cable Modem* CD-ROM. In most cases, the Installation Assistant automatically configures your cable modem

To install and configure your cable modem for a single PC running Microsoft Windows, you can use the Installation Assistant.

Otherwise, to install and configure your cable modem:

1. Install the cables as described in *one* of:
   - "Cabling and Startup for a Single User" on page 9
   - "Cabling for Multiple Users" on page 33
2. If you are using the USB port *only*, go to "Setting Up a USB Driver" on page 11. *Ethernet users can skip this step.*
3. Configure TCP/IP and verify the IP address for your computer following *one* of:
   - "Configuring TCP/IP" on page 22
   - Your Macintosh or UNIX user manual

Cabling and Startup for a Single User



SURFboard cable modem

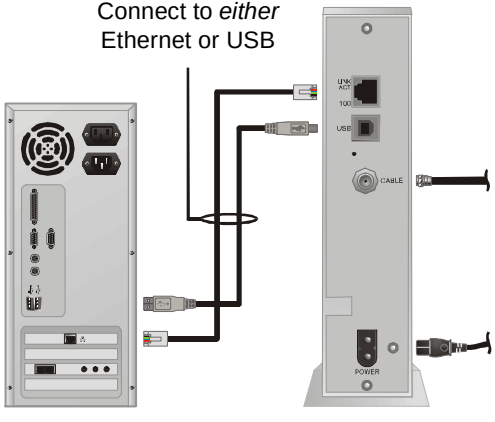
Allow 5 to 30 minutes to power up the first time because the SURFboard cable modem must find and lock on the appropriate channels for communications.

1. Be sure your computer is on and the cable modem is unplugged.
2. Connect one end of the coaxial cable to the cable outlet or splitter. Connect the other end of the coaxial cable to the CABLE connector on the cable modem. *Hand-tighten the connectors to avoid damaging them.*
3. Insert the *SURFboard Cable Modem* CD-ROM into your CD-ROM drive.
4. Plug the power cord into the POWER connector on the cable modem and the electrical outlet. *This turns your SURFboard cable modem on. You do not need to unplug it when not in use.*
5. Check that the lights on the front of the cable modem cycle through this sequence:
   - Power flashes during the self-test and changes to solid green when the self-test is successfully complete.
   - Receive flashes while scanning for the receive channel and changes to solid green when the receive channel is locked.
   - Send flashes while scanning for the send channel and changes to solid green when the send channel is locked.
   - Online flashes while the cable modem downloads configuration data and changes to solid green when the download is complete.

Cabling and Startup for a Single User, continued

Caution

Do not connect *both* the Ethernet and USB cables to the same computer.



6 Connect your computer to the cable modem using USB or Ethernet:

USB: *Be sure the SURFboard Cable Modem CD-ROM is inserted in your CD-ROM drive.* Connect the USB cable to the USB port on the cable modem. Connect the other end to the USB port on your computer. Then perform "Setting Up a USB Driver" on page 11.

Ethernet: Connect the provided straight-through Ethernet cable to the Ethernet connector on the cable modem. Connect the other end to the Ethernet port on your computer. *Ethernet users do not need to set up USB.*

7 Perform the procedures for "Configuring TCP/IP" on page 22.

Setting Up a USB Driver

Be sure the SURFboard Cable Modem CD-ROM is inserted in your CD-ROM drive before you plug in the USB cable.

The following subsections describe setting up a USB driver. Perform the appropriate procedure for your Windows version:

- "Setting Up a USB Driver in Windows 98" on page 12
- "Setting Up a USB Driver in Windows 2000" on page 16
- "Setting Up a USB Driver in Windows Me" on page 20
- "Setting Up a USB Driver in Windows XP" on page 21

The SURFboard cable modem USB driver does not support Macintosh or UNIX computers. For those systems, you can connect through Ethernet *only*.

Setting Up a USB Driver in Windows 98

Be sure the SURFboard Cable Modem CD-ROM is inserted in your CD-ROM drive before you plug in the USB cable. This CD contains the USB drivers and must be inserted and read by the PC before you connect the cable modem to the PC.

A few seconds after you complete the USB connection, the Add New Hardware Wizard window is displayed.

1. Click **Next**.
2. Be sure “Search for the best driver for your device” is selected as in the window at bottom left.
3. Click **Next**.

Setting Up a USB Driver in Windows 98, continued

4 Be sure “CD-ROM drive” is the only box checked, as in the window at top left.

5 Click **Next**. The message “Please wait while Windows searches for a new driver for this device” is displayed.

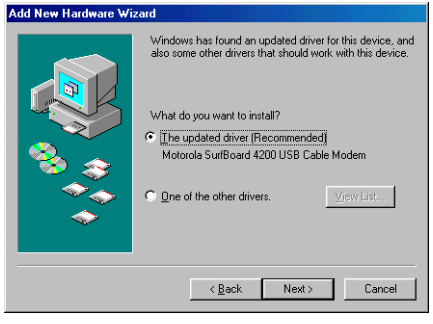
If your computer successfully locates the driver, you can skip to step 8.

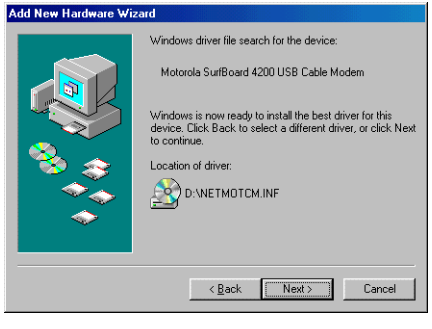
6 If your computer does not locate the driver, the previous window is displayed again. Select **Specify a location** and type the location of your CD-ROM drive as shown at bottom left.

To load the driver successfully, you may need to click **Browse** to manually select the SB4220.sys file on the CD-ROM.

7 Click **Next**.

Setting Up a USB Driver in Windows 98, continued





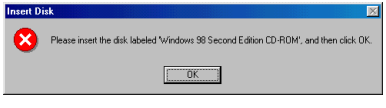
8 Select **The updated driver...** and click **Next.**

If this window is not displayed, verify that the *SURFboard Cable Modem* CD-ROM is properly inserted in the CD-ROM drive. If you still cannot find the correct driver file, click **Cancel** to cancel the installation and perform the procedure for "Removing the USB Driver from Windows 98 or Me" on page 38. Then repeat this procedure.

9 After the window at bottom left is displayed, click **Next**.

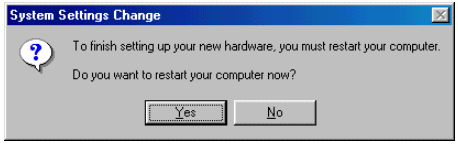
If a window with the message *Copying Files...* displays and asks for your CD-ROM drive, type your CD-ROM drive *letter* (for example, "D:") and click **OK**.

If an Insert Disk window similar to the one below is displayed, Windows 98 system files are needed to complete the installation. To install the files, insert your Windows 98 CD-ROM is in the CD-ROM drive and click **OK**.



Although your SURFboard cable modem model number may be different than in the images in this guide, the procedure is the same.

Setting Up a USB Driver in Windows 98, continued



After all the necessary files are loaded, the window at upper left is displayed confirming a successful installation.

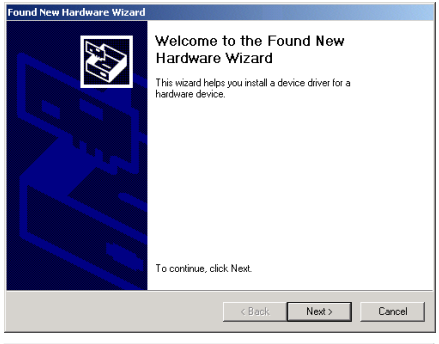
10 Click **Finish.** The window at bottom left is displayed.

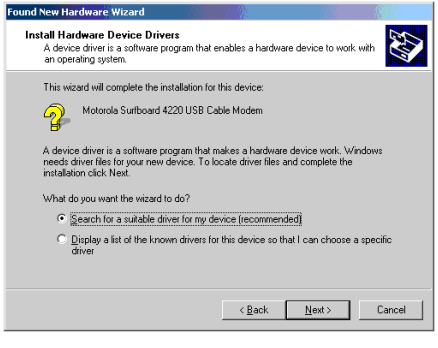
11 Click **Yes** to restart your computer.

When you finish setting up the USB driver, you can continue with "Configuring TCP/IP" on page 22.

If you have difficulties setting up the USB driver, perform "Removing the USB Driver from Windows 98 or Me" on page 38 and repeat this procedure. If that does not correct your problem, see the *Software License and Warranty Information* card provided with your SURFboard cable modem for information about obtaining warranty service.

Setting Up a USB Driver in Windows 2000



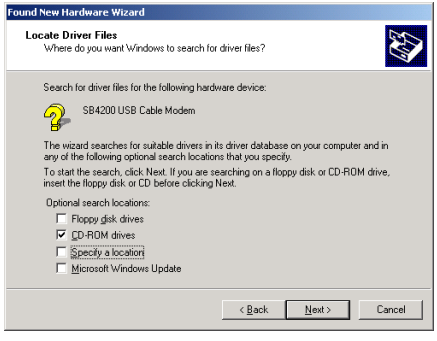


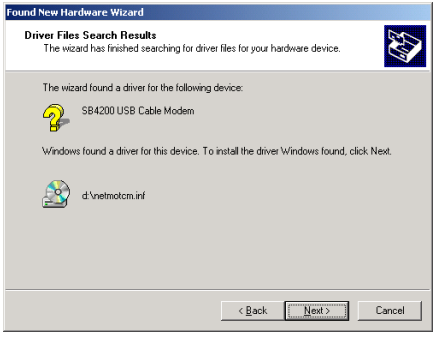
Be sure the *SURFboard Cable Modem* CD-ROM is inserted into the CD-ROM drive before you plug in the USB cable. A few seconds after you complete the USB connection, the Found New Hardware window is displayed.

1. Click **Next**.
2. Be sure “Search for a suitable driver for my device” is selected.
3. Click **Next**.

Although your SURFboard cable modem model number may be different than in the images in this guide, the procedure is the same.

Setting Up a USB Driver in Windows 2000, continued





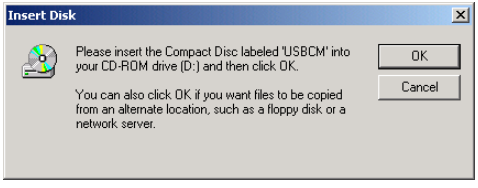
4 Be sure “CD-ROM drives” is the only box checked, as in the window at top left.

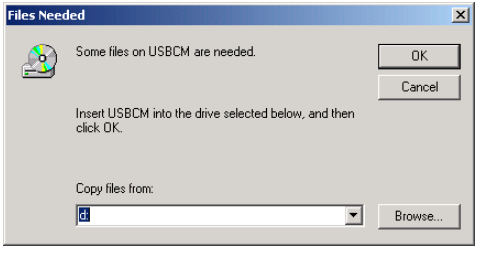
5 Click **Next**. The lower window is displayed.

6 Click **Next**.

If the Insert Disk window is displayed, be sure the *SURFboard Cable Modem* CD-ROM is in the CD-ROM drive and follow steps 7 to 12. Otherwise, you can skip to step 13.

Setting Up a USB Driver in Windows 2000, continued





7 On the Insert Disk window, click **OK**. The Files Needed window is displayed.

8 If necessary, select your CD-ROM drive in the Copy files from list.

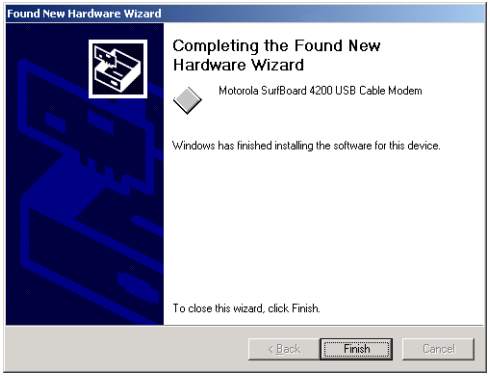
9 Click **Browse**.

10 Locate the SB4220.sys file in the CD-ROM root directory.

11 Double-click the **SB4220.sys** file. The Files Needed window is displayed.

12 Click **OK**. The Found New Hardware Wizard window is displayed.

Setting Up a USB Driver in Windows 2000, continued



13 Click **Finish** to complete the installation.

When you finish setting up the USB driver, you can continue with "Configuring TCP/IP" on page 22.

If you have any difficulties setting up the USB driver, perform "Removing the USB Driver from Windows 2000" on page 42 and repeat this procedure.

Setting Up a USB Driver in Windows Me

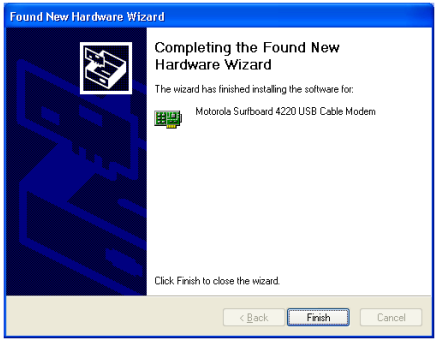
Be sure the *SURFboard Cable Modem* CD-ROM is inserted into the CD-ROM drive before you plug in the USB cable. A few seconds after you complete the USB connection, the Add New Hardware Wizard window is displayed.

1. Click **Next**. Windows automatically searches for the correct USB drivers and installs them. If the installation is successful, the window at bottom left is displayed.
2. If the window at bottom left is displayed, click **Finish**. Otherwise, be sure the *SURFboard Cable Modem* CD-ROM is correctly inserted in your CD-ROM drive.

When you finish setting up the USB driver, you can continue with "Configuring TCP/IP" on page 22.

> Although your SURFboard cable modem model number may be different than in the images in this guide, the procedure is the same.

Setting Up a USB Driver in Windows XP



Be sure the *SURFboard Cable Modem* CD-ROM is inserted into the CD-ROM drive before you plug in the USB cable. A few seconds after you complete the USB connection, the Found New Hardware Wizard window is displayed.

1. Be sure “Install the software automatically” is selected.
2. Click **Next**. Windows automatically searches for the correct USB drivers and installs them. If the installation is successful, the window at bottom left is displayed.
3. Click **Finish** to complete the installation. Otherwise, be sure the *SURFboard Cable Modem* CD-ROM is correctly inserted in your CD-ROM drive.

When you finish setting up the USB driver, you can continue with “Configuring TCP/IP” on page 22.

> Although your SURFboard cable modem model number may be different than in the images in this guide, the procedure is the same.

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Configuring TCP/IP

The SURFboard cable modem contains all required software. You do not need to configure the cable modem, but you must be sure that your computer is configured for TCP/IP (a protocol for communication between computers). Perform *one* of:

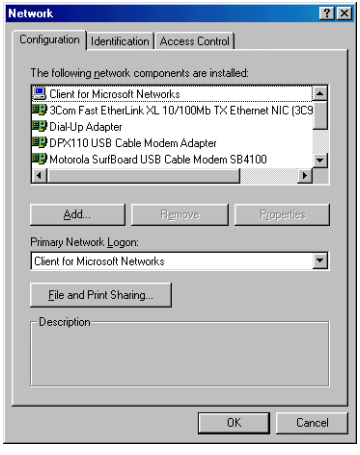
- "Configuring TCP/IP in Windows 95, 98, or Me" on page 23
- "Configuring TCP/IP in Windows 2000 or XP" on page 26
- Follow the instructions in your Macintosh or UNIX user manual

After configuring TCP/IP, perform *one* of the following to verify the IP address:

- "Verifying the IP Address in Windows 95, 98, or Me" on page 30
- "Verifying the IP Address in Windows 2000 or XP" on page 31
- Follow the instructions in your Macintosh or UNIX user manual

Your cable service provider may provide additional instructions to set up your computer.

Configuring TCP/IP in Windows 95, 98, or Me

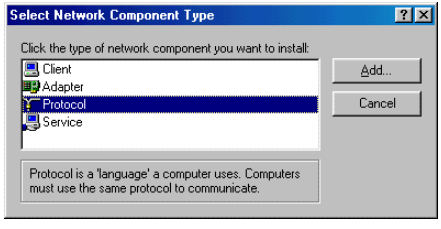


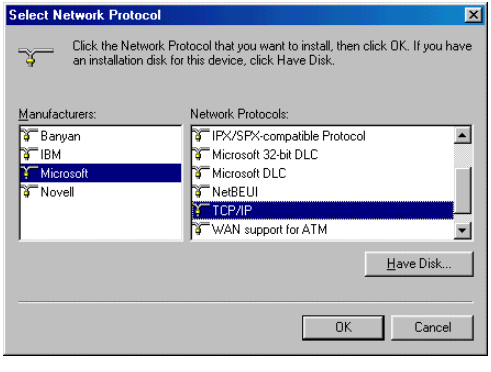
The following instructions are for Windows 95, 98 and Me. For Windows 2000 or XP, see "Configuring TCP/IP in Windows 2000 or XP" on page 26. For a Macintosh or UNIX system, refer to your user guide.

1. On the Windows Desktop, click **Start**.
2. Select **Settings** and then **Control Panel** from the pop-up menus.
3. Double-click the **Network** icon on the Control Panel window.
4. Select the **Configuration** tab on the Network window.
5. If TCP/IP is displayed in the list of network components, it is installed and you can skip to step 10. If TCP/IP is not displayed on the list, continue with step 6.

> Although your SURFboard cable modem model number may be different than in the images in this guide, the procedure is the same.

Configuring TCP/IP in Windows 95, 98, or Me, continued





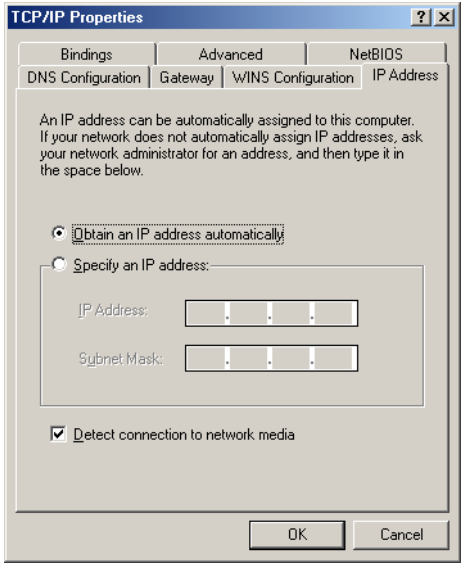
6 Click **Add.**

7 Double-click the **Protocol** option on Select Network Component Type window.

8 Click **Microsoft** in the Manufacturers section and click **TCP/IP** in the Network Protocol section of Select Network Protocol window.

9 Click **OK**.

Configuring TCP/IP in Windows 95, 98, or Me, continued



10 Click **TCP/IP** on the Network window. If there is more than one TCP/IP entry, choose the one for the Ethernet card or USB port connected to the cable modem.

11 Click **Properties**. The TCP/IP window is displayed.

12 Click the **IP Address** tab.

13 Click **Obtain an IP address automatically**.

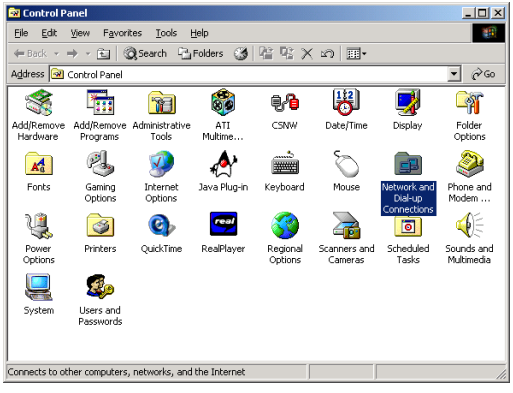
14 Click **OK** to accept the TCP/IP settings.

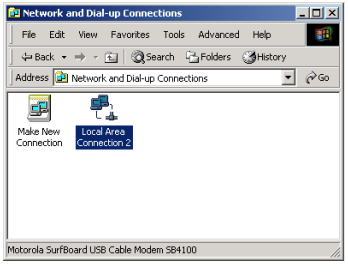
15 Click **OK** to close the Network window.

16 Click **OK** when prompted to restart your computer and click **OK** again.

When you complete TCP/IP configuration, go to "Verifying the IP Address in Windows 95, 98, or Me" on page 30.

Configuring TCP/IP in Windows 2000 or XP

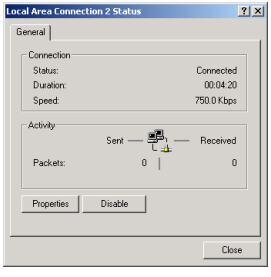


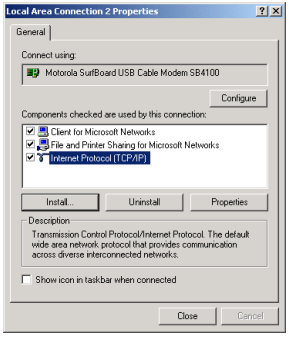


The following instructions are for Windows 2000 or XP. For Windows 95, 98, or Me, see "Configuring TCP/IP in Windows 95, 98, or Me" on page 23. For a Macintosh or UNIX system, refer to your user guide.

1. On the Windows Desktop, click **Start**.
2. Select **Settings** and then **Control Panel** from the pop-up menus.
3. Double-click the **Network and Dial-up Connections** icon on the Control Panel window.
4. On the Network and Dial-up Connections window, click **Local Area Connection** *number*. The value of *number* varies from system to system. The Local Area Connection *number* Status window is displayed.

Configuring TCP/IP in Windows 2000 or XP, continued



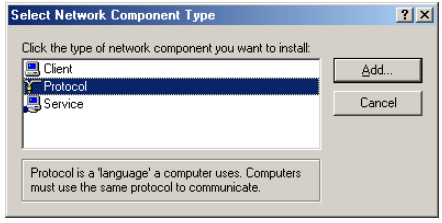


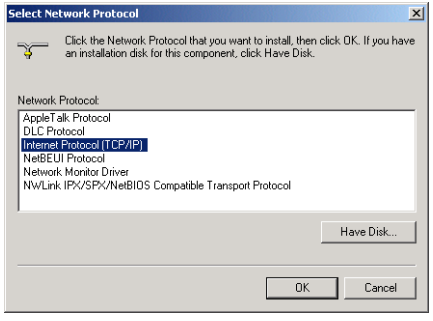
5 Click **Properties**. Information similar to the lower window is displayed.

6 If Internet Protocol (TCP/IP) is in the list of components, TCP/IP is installed. You can skip to step 10.

If Internet Protocol (TCP/IP) is not in the list, click **Install**. The Select Network Component Type window is displayed. Continue with step 7.

Configuring TCP/IP in Windows 2000 or XP, continued



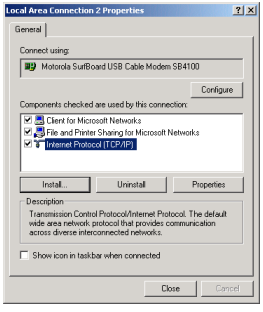


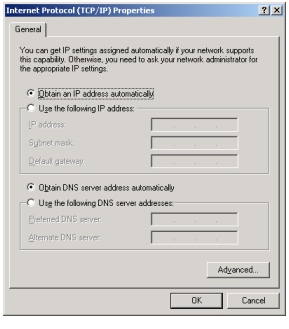
7 Click **Protocol** on the Select Network Component Type window and click **Add**. The Select Network Protocol window is displayed.

8 Click **Internet Protocol (TCP/IP)** in the Network Protocol section on the Select Network Protocol window.

9 Click **OK**. The Local Area Connection *number* Properties window is re-displayed.

Configuring TCP/IP in Windows 2000 or XP, continued





10 On the Local Area Connection *number* Properties window, be sure the box next to **Internet Protocol (TCP/IP)** is checked.

11 Click **Properties**. The Internet Protocol (TCP/IP) Properties window is displayed as shown at bottom left.

12 Be sure **Obtain IP address automatically** and **Obtain DNS server address automatically** are selected.

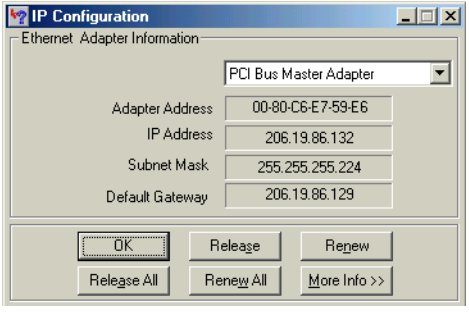
13 Click **OK** to accept the TCP/IP settings.

14 Click **OK** to close the Local Area Connection *number* Properties window.

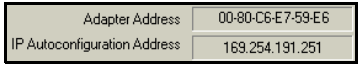
15 Click **OK** when prompted to restart your computer and click **OK** again.

When you complete the TCP/IP configuration, go to "Verifying the IP Address in Windows 2000 or XP" on page 31.

Verifying the IP Address in Windows 95, 98, or Me



The values for Adapter Address, IP Address, Subnet Mask, and Default Gateway on your PC will be different than in the image above.



In Windows 98, if autoconfiguration is displayed before the IP Address, call your service provider.

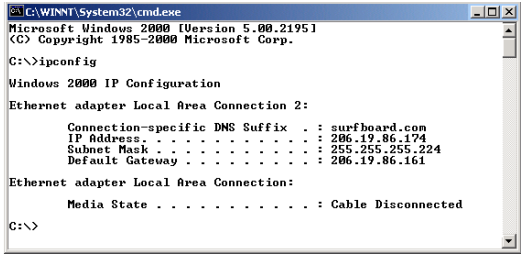
The following instructions are for Windows 95, 98, or Me. For information about Windows 2000 or XP, see "Verifying the IP Address in Windows 2000 or XP" on page 31. For a Macintosh or UNIX system, refer to your user guide.

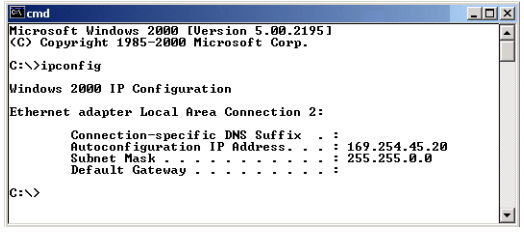
To check the IP address:

1. On the Windows Desktop, click **Start**.
2. Select **Run**. The Run window is displayed.
3. Type **winipcfg.exe** and click **OK.** A window similar to the example at top left is displayed.
4. Select your adapter name — the Ethernet card or USB device.
5. Click **Renew**.
6. Click **OK** after the system displays an IP address.

If after performing this procedure your computer cannot access the Internet, call your cable service provider for help.

Verifying the IP Address in Windows 2000 or XP





The following instructions are for Windows 2000 or Windows XP. For information about Windows 95, 98, or Me, see "Verifying the IP Address in Windows 95, 98, or Me" on page 30. For a Macintosh or UNIX system, refer to your user guide.

To check the IP address:

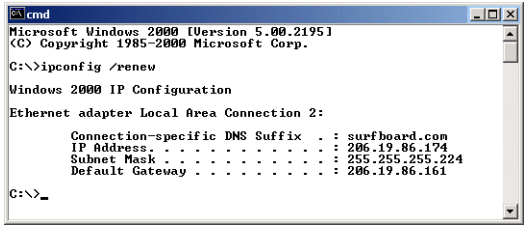
1. On the Windows Desktop, click **Start**.
2. Select **Run**. The Run window is displayed.
3. Type **cmd** and click **OK.** A window like the one at upper left is displayed.
4. Type **ipconfig** and press ENTER to display your IP configuration. A display, like the window at upper left, indicates a normal configuration.

   If an Autoconfiguration IP Address is displayed as in the window at bottom left, there is an incorrect connection between your PC and the cable modem or there are cable network problems. Check:

   - Your cable connections
   - Whether you can see cable-TV channels on your television

After verifying your cable connections and proper cable-TV operation, you can renew your IP address.

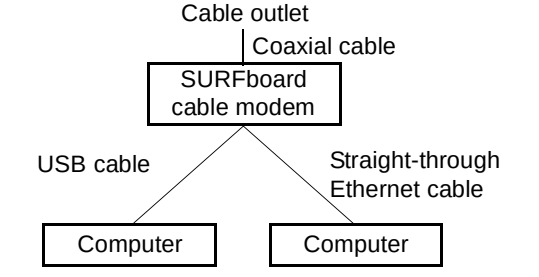
Verifying the IP Address in Windows 2000 or XP, continued

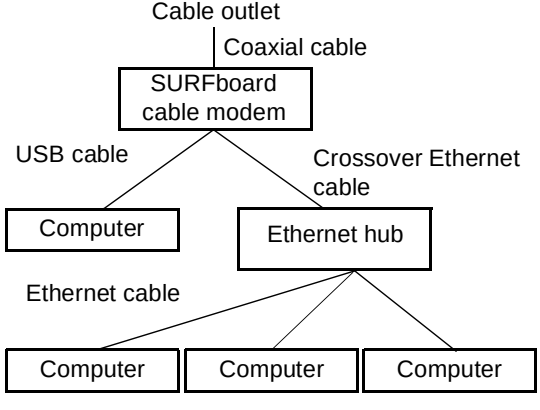


To renew your IP address:

1. Type **ipconfig /renew** and press ENTER. If a valid IP address is displayed as shown at left, Internet access should be available.
2. Type **exit** and press ENTER to return to Windows.

If after performing this procedure your computer cannot access the Internet, call your cable service provider for help.





Cabling for Multiple Users

The SURFboard cable modem supports several multiple user configurations. Along with an optional hub or router, it can serve as an Internet gateway for up to 32 computers.

For information about multiple user service, contact your cable service provider.

Ethernet and USB

You can connect the USB port on one computer and the Ethernet port on another computer directly to the cable modem, as shown at top left.

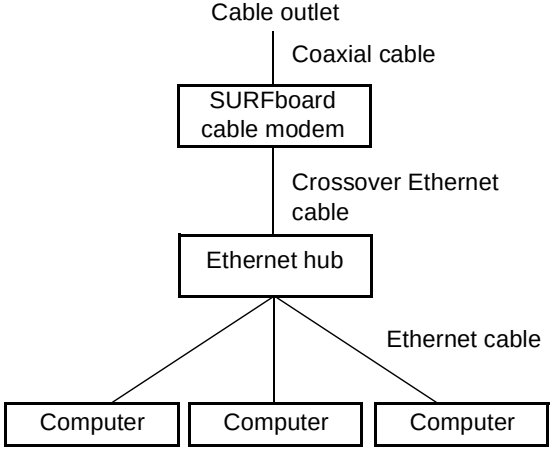
Caution

Do not connect *both* the Ethernet and USB cables to the same computer.

You can connect a single computer to the USB port and from one to 31 remaining users to an Ethernet hub, as shown at bottom left. You cannot connect more than one computer to the cable modem through the USB port.

Cabling for Multiple Users, continued

Ethernet



You can connect up to 32 computers to an Ethernet hub connected to a SURFboard cable modem, as shown at left.

Troubleshooting

If the solutions listed here do not solve your problem, contact your cable service provider. Before calling your service provider, try pressing the reset button on the rear panel. Resetting the cable modem may take 5 to 30 minutes. Your service provider may ask for the status of the front-panel lights as described in "Front-Panel Lights and Error Conditions" on page 37.

Problem	Possible Solutions
Green POWER light is off	Check that the power cord is properly plugged into the electrical outlet and the cable modem. Check that the electrical outlet is working. If the Standby light is on, the Internet connection is off. Press the Standby button to reconnect to the Internet. Press the Reset button.

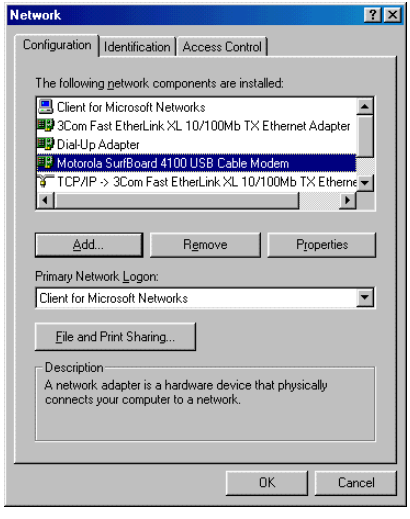
Problem	Possible Solutions
Cannot send or receive data	Check the lights on the front panel. Note the first light from top to bottom that is off. This light indicates where the error occurred as described in "Front-Panel Lights and Error Conditions" on page 37. If all lights are off except the Standby light, the cable modem is in Standby mode. Press the Standby button to reconnect your Internet service. If you have cable TV, check that your TV is working and the picture is clear. If you cannot receive your regular TV channels, your data service will not function. Check the coaxial cable at the cable modem and wall outlet. Hand-tighten if necessary. Check the IP address. Follow the steps in "Verifying the IP Address in Windows 95, 98, or Me" on page 30 or "Verifying the IP Address in Windows 2000 or XP" on page 31. Call your cable service provider if you need an IP address. Check that the USB or Ethernet cable is properly connected to the cable modem and your computer.
Problems related to unsuccessful USB driver installation	Remove the USB driver. Follow the instructions in *one* of: ■ "Removing the USB Driver from Windows 98 or Me" on page 38 ■ "Removing the USB Driver from Windows 2000" on page 42

Front-Panel Lights and Error Conditions

Light	Turns Off During Startup If	Turns Off During Normal Operation If
Receive	The receive channel cannot be acquired	The receive channel is lost
Send	The send channel cannot be acquired	The send channel is lost
Online	IP registration is unsuccessful	The IP registration is lost
Power	The cable modem is not properly plugged into the power outlet	The cable modem is unplugged or is in standby mode. Press the Standby button

For more information about the lights, see “Top and Front Panel” on page 2.

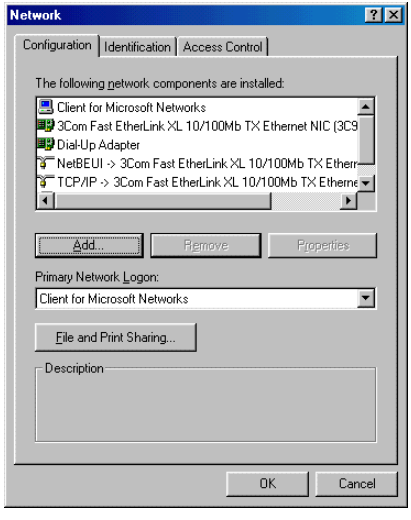
Removing the USB Driver from Windows 98 or Me

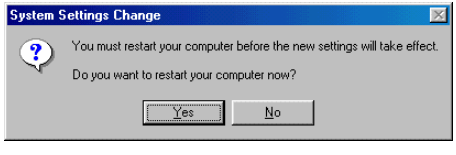


1. On your Windows Desktop, right-click the **Network Neighborhood** icon and select **Properties**. The Network window is displayed.
2. Click the **Motorola SurfBoard USB Cable Modem**.

> Although your SURFboard cable modem model number may be different than in the images in this guide, the procedure is the same.

Removing the USB Driver from Windows 98 or Me, continued





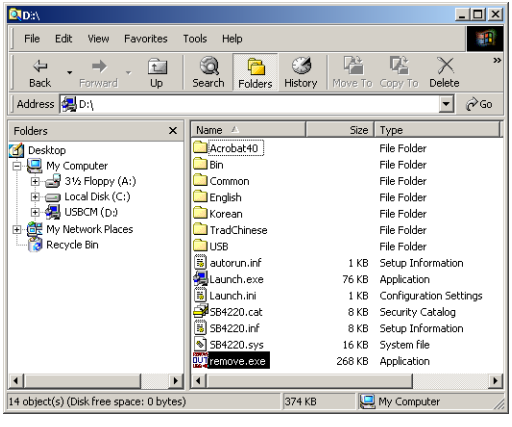
3 Click **Remove.** The Network window no longer displays Motorola SurfBoard USB Cable Modem in the list.

4 Click **OK**. The System Settings Change window is displayed.

5 *Disconnect the USB cable from your PC or* cable modem.

6 Click **Yes** to restart your computer.

Removing the USB Driver from Windows 98 or Me, continued



7 Insert the *SURFboard Cable Modem* CD-ROM in the CD-ROM drive. After a short time, a window with language choices is displayed.

8 Press the **Esc** key on the keyboard to exit the start-up screens.

9 To start Windows Explorer, click **Start** and select **Run.**

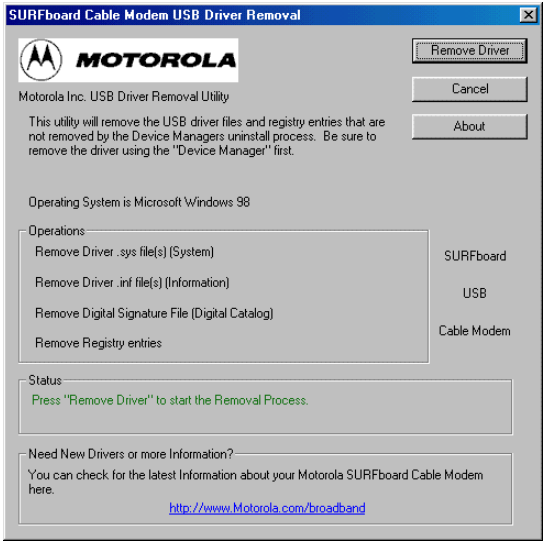
10 In the Run window, type **explorer** and click **OK.** The Exploring window is displayed.

11 Select your CD-ROM drive (D: in the image at left).

12 Double-click **remove** or **remove.exe** to run the Remove utility from the *SURFboard Cable Modem* CD-ROM. The SURFboard Cable Modem USB Driver Removal window is displayed.

> Your Windows Explorer may appear slightly different than in the image on this page. There are slight variations between Windows versions and you can configure Windows Explorer as you like.

Removing the USB Driver from Windows 98 or Me, continued



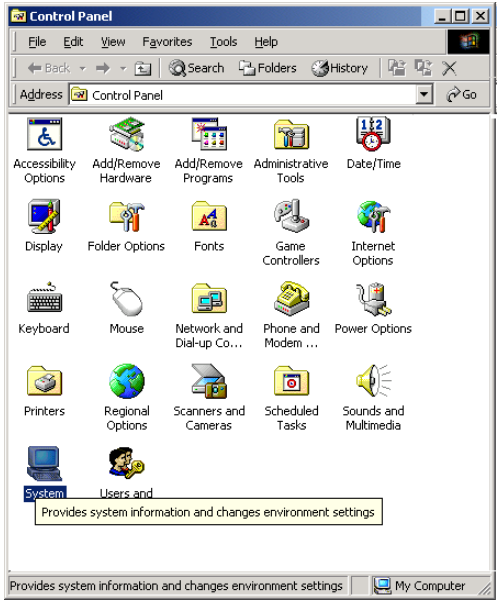
13 Click **Remove Driver** to remove the USB driver.

After you remove the USB driver, re-install the USB driver on your computer:

- "Setting Up a USB Driver in Windows 98" on page 12
- "Setting Up a USB Driver in Windows Me" on page 20

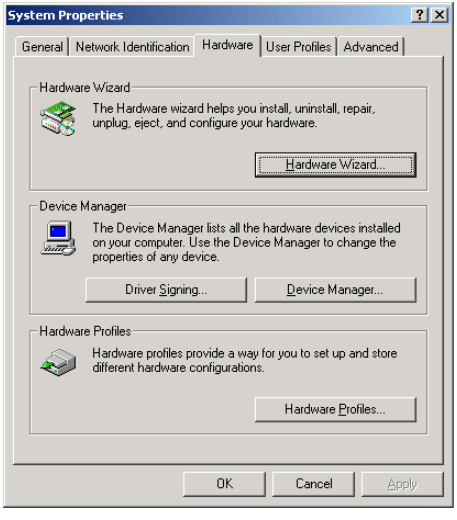
If you continue to have problems, contact your cable service provider.

Removing the USB Driver from Windows 2000



1. On your Windows desktop, click **Start**.
2. Click **Settings**.
3. Click **Control Panel** to display the Control Panel window.
4. Double-click **System** to display the System Properties window.

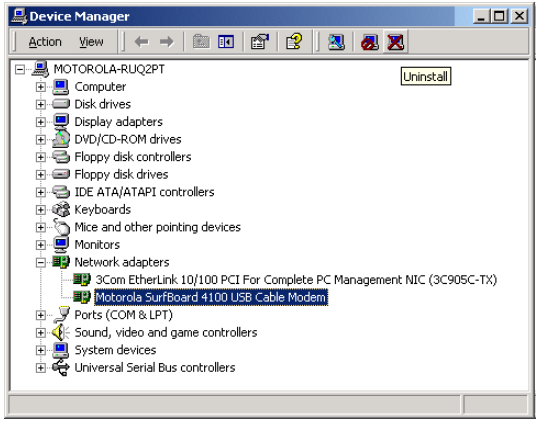
Removing the USB Driver from Windows 2000, continued



5 On the System Properties window, click the **Hardware** tab.

6 Click the **Device Manager** button to display the Device Manager window:

Removing the USB Driver from Windows 2000, continued



7 On the Device Manager window, double-click **Network Adapters**.

8 Click the **Motorola SurfBoard USB Cable Modem**. The Uninstall icon is displayed on the window near the top.

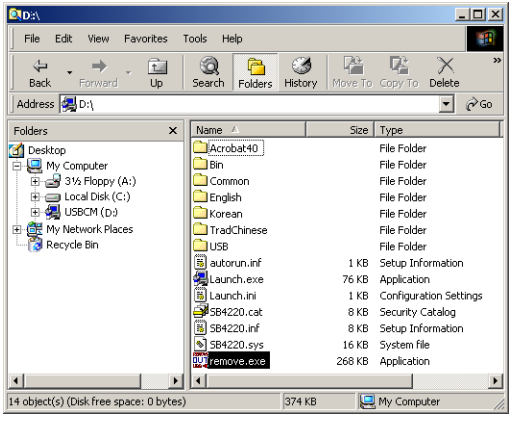
9 Click the **Uninstall** icon.

10 Close the Device Manager window.

11 Close the Control Panel window.

Although your SURFboard cable modem model number may be different than in the images in this guide, the procedure is the same.

Removing the USB Driver from Windows 2000, continued



12 Insert the *SURFboard Cable Modem* CD-ROM in the CD-ROM drive. After a short time, a window with language choices is displayed.

13 Press the **Esc** key on the keyboard to exit the start-up screens.

14 To start Windows Explorer, click **Start** and select **Run.**

15 In the Run window, type **explorer** and click **OK**.

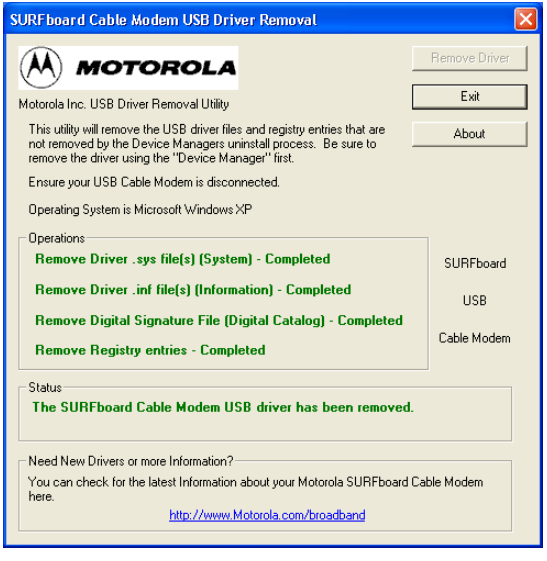
16 Double-click **My Computer**.

17 Double-click the **Motorola** CD icon (D: in the image).

18 Double-click **remove** or **remove.exe** to run the Remove utility from the *SURFboard Cable Modem* CD-ROM. The SURFboard Cable Modem USB Driver Removal window is displayed.

> Your Windows Explorer may appear slightly different than in the image on this page. There are slight variations between Windows versions and you can configure Windows Explorer as you like.

Removing the USB Driver from Windows 2000, continued



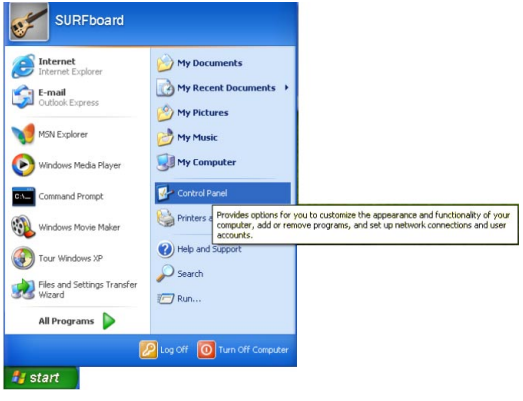
19 The window on the left is displayed. *Be sure the USB cable is disconnected.*

20 Click **Remove Driver.**

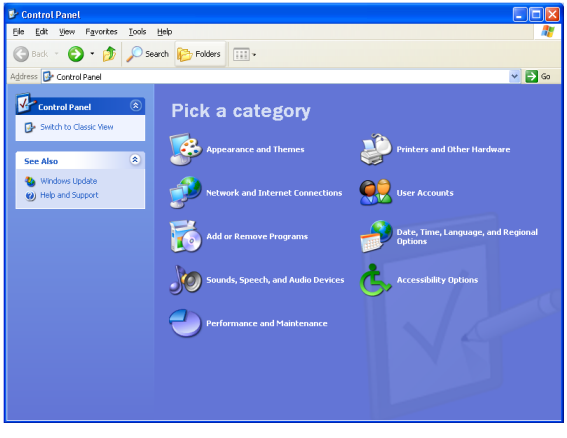
Informational messages similar to the ones shown at left are displayed on the SURFboard Cable Modem USB Driver Removal window.

After you remove the USB driver, re-install the USB driver following “Setting Up a USB Driver in Windows 2000” on page 16. If you continue to have problems, contact your cable service provider.

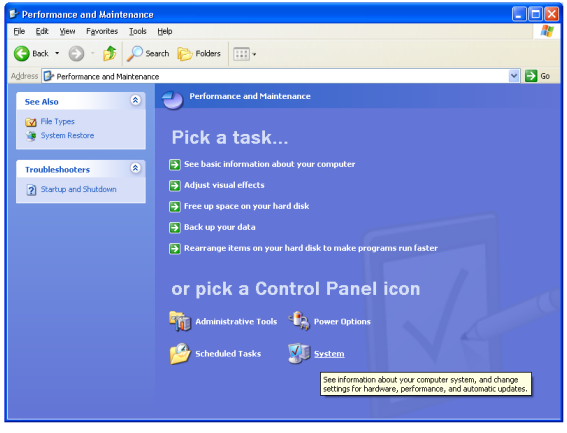
Removing the USB Driver from Windows XP



1. On the Windows desktop, click **Start** to display the Start window shown at left.
2. Click **Control Panel** to display the Control Panel window. The display varies, depending on your Windows XP view options.
3. If a Category view similar to below is displayed, click **Performance and Maintenance**. Otherwise, skip to step 5.

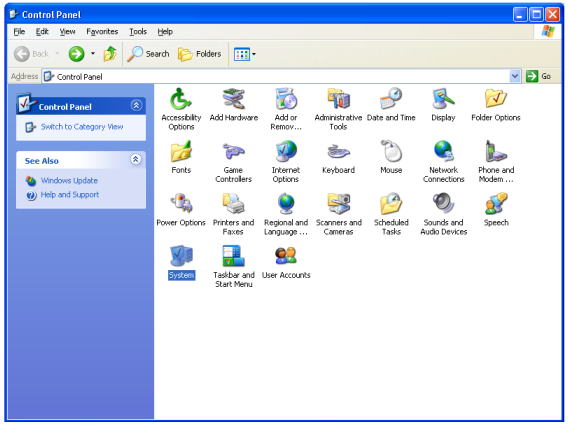


Removing the USB Driver from Windows XP, continued



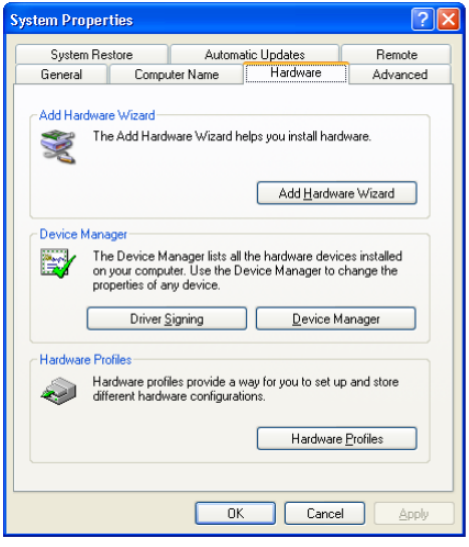
4 On the Performance and Maintenance window, click **System** to display the System Properties window. Skip to step 6.

Removing the USB Driver from Windows XP, continued



5 If a classic view similar to at left is displayed, click System to display the System Properties window.

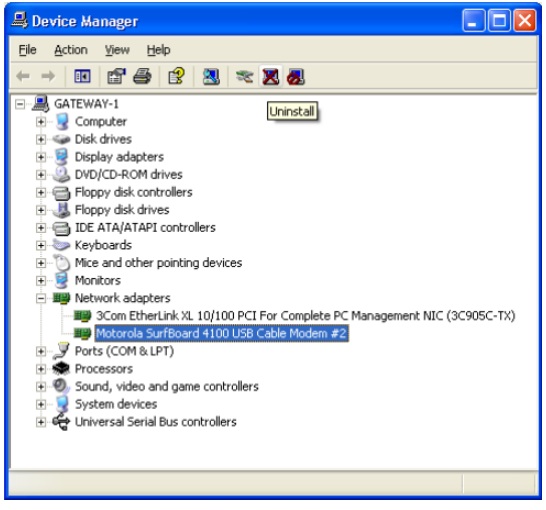
Removing the USB Driver from Windows XP, continued



6 On the System Properties window, click the **Hardware** tab.

7 Double-click the **Device Manager** button to display the Device Manager window.

Removing the USB Driver from Windows XP, continued



8 On the Device Manager window, double-click **Network adapters**.

9 Click the **Motorola SurfBoard USB Cable Modem**. The Uninstall icon is displayed on the window near the top.

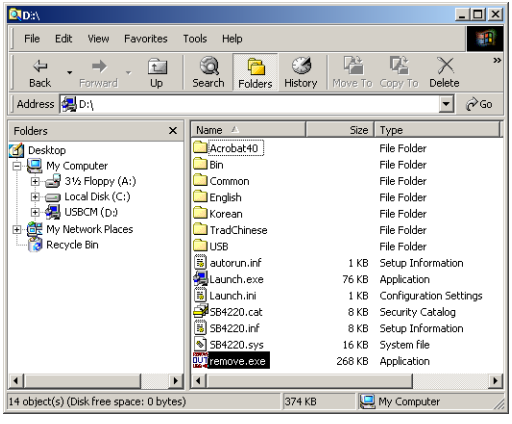
10 Click the **Uninstall** icon.

11 Close the Device Manager window.

12 Close the Control Panel window.

Although your SURFboard cable modem model number may be different than in the images in this guide, the procedure is the same.

Removing the USB Driver from Windows XP, continued



13 Insert the *SURFboard Cable Modem* CD-ROM in the CD-ROM drive. After a short time, a window with language choices is displayed.

14 Press the **Esc** key on the keyboard to exit the start-up screens.

15 To start Windows Explorer, click **Start** and select **Run.**

16 In the Run window, type **explorer** and click **OK**.

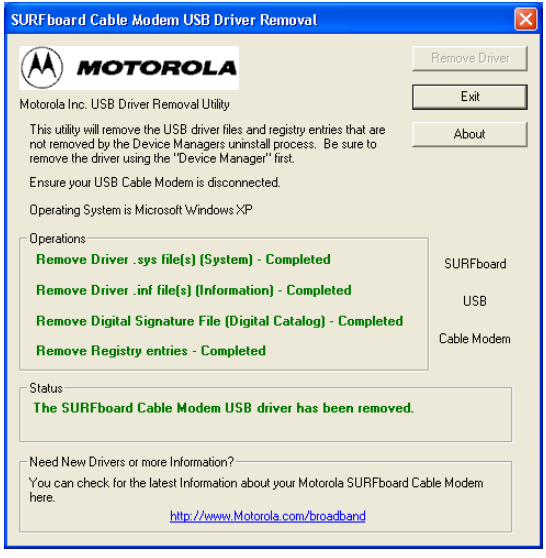
17 Double-click **My Computer**.

18 Double-click the **Motorola** CD icon (D: in the image).

19 Double-click **remove** or **remove.exe** to run the Remove utility from the *SURFboard Cable Modem* CD-ROM. The SURFboard Cable Modem USB Driver Removal window is displayed.

> Your Windows Explorer may appear slightly different than in the image on this page. There are slight variations between Windows versions and you can configure Windows Explorer as you like.

Removing the USB Driver from Windows XP, continued



20 The window on the left is displayed. *Be sure the USB cable is disconnected.*

21 Click **Remove Driver.**

Informational messages similar to the ones shown at left are displayed on the SURFboard Cable Modem USB Driver Removal window.

After you remove the USB driver, re-install the USB driver following “Setting Up a USB Driver in Windows XP” on page 21. If you continue to have problems, contact your cable service provider.

Contact Us

For information about customer service, technical support, or warranty claims, see the *Software License and Warranty Information* card provided with your SURFboard cable modem.

For answers to typical questions, see “Frequently Asked Questions” on page 55.

For information about Motorola consumer cable products, education, and support, visit http://www.motorola.com/broadband.

Frequently Asked Questions

Here are answers to questions our customers frequently ask.

Q What is high-speed cable Internet access?

A Cable Internet access uses cable television wires instead of telephone lines to connect to the Internet. It is extremely fast and affordable and does not tie up telephone lines for incoming or outgoing calls and faxes.

Q How fast are cable modems?

A Cable modems offer Internet access at speeds up to 100 times faster than a traditional phone modem. You can experience speeds of over 1,000 Kbps. Due to network condition such as traffic volume and the speed of the sites you visit, actual speed may vary. Many network and other factors can affect download speeds.

Q Can I still watch cable TV while using my cable modem?

A Yes, your cable TV line can carry the TV signal while you send and receive information on the Internet.

Q What are CableLabs Certified, DOCSIS and Euro-DOCSIS?

A CableLabs® Certified™, DOCSIS™, and Euro-DOCSIS™ are the industry standards for high-speed data distribution over cable television system networks. They are intended to ensure that all compliant cable modems interface with all compliant cable systems. Your Motorola SURFboard cable modem is DOCSIS or Euro-DOCSIS certified.

Q **If I have a cable modem, can I still use my old 28.8 Kbps or 56 Kbps modem?**

A Yes! Although once you've experienced the speed of cable Internet access, you'll never again want to wait for traditional dial-up services.

Q **I have more than one computer. Do I need more than one SURFboard cable modem?**

A No, not if your computers are connected on a network. The SURFboard cable modem supports current Internet connection sharing technologies to enable you to connect up to 32 PCs to the Internet using a single cable modem.

Q **Do I need to change my Internet service provider (ISP)?**

A Currently, most Internet service providers do not provide cable Internet access. Contact your cable company for your specific information.

Q **Do I need to subscribe to cable TV to get cable Internet access?**

A No, but you will need to subscribe to cable Internet service. Some systems require that you subscribe to basic service before you can get Internet access and/or offer a discount when you use your own cable modem. Check with your local cable company for specific information.

Q **What type of technical support is available?**

A For questions about your Internet service, connection, or cable modem, call your cable service provider.

Q **What do I do if my SURFboard cable modem stops working?**

A "Troubleshooting" on page 35 provides tips to diagnose problems and simple solutions. If you continue to have problems, call your cable service provider.

Glossary

coaxial cable (coax)	A type of wire consisting of a center wire surrounded by insulation and a grounded shield of braided wire. The shield minimizes electrical and radio frequency interference.
DOCSIS	The CableLabs Data-Over-Cable Service Interface Specification defines interface standards for cable modems and supporting equipment.
download	To copy a file from one computer to another. You can use the Internet to download files from a server to your home PC. A DOCSIS cable modem downloads its configuration from a server during start-up.
downstream	In a cable data network, downstream describes the direction of data received by your computer from the Internet.
Ethernet	The most widely used type of local area network (LAN). The most commonly installed Ethernet networks are called 10Base-T. 10Base-T provides transmission speeds up to 10 megabits per second (Mbps), usually over twisted-pair wire. Fast Ethernet (100Base-T) provides transmission speeds up to 100 Mbps.
expansion slot	An opening in a computer where a circuit board can be inserted to add new capabilities.
F-type connector	A connector used to connect coaxial cable to equipment.
IP address	An Internet Protocol address is an identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the destination IP address. Your cable service provider assigns your cable modem an IP address to provide a continuous Internet connection.

MAC address	The Media Access Control Address uniquely identifies each device that can be connected to an Ethernet network. It is permanently written to read-only memory (ROM) at the factory and printed on the rear panel of your SURFboard cable modem. You need to provide the MAC address to your cable service provider.
MHz	Mega Hertz. A measure of radio frequency - millions of cycles per second. One MHz means one million cycles per second.
splitter	A splitter is a device that divides the signal power from an input cable equally between two or more signals, each carrying a selected frequency range.
TCP/IP	Transmission Control Protocol/Internet Protocol is a set of protocols that provides standards and rules for communication between networks.
upstream	In a cable data network, upstream describes the direction of data sent from your computer to the Internet.
USB	Universal Serial Bus is a computer interface for add-on devices such as printers, scanners, and cable modems. When you connect your SURFboard cable modem to the USB port, Windows 98 and later versions automatically recognize the cable modem.

Software License

SURFboard Cable Modems

Motorola, Inc., Broadband Communications Sector (“Motorola”)
Cable Data Division
101 Tournament Drive
Horsham, PA 19044

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