

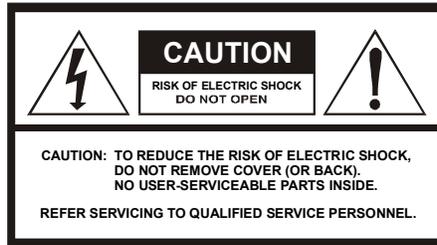
SURFboard®

SB5100 Series Cable Modem

Installation Manual



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Caution

These servicing instructions are for use by qualified personnel only. To reduce the risk of electrical shock, 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.

Special Symbols That Might Appear on the Equipment

	This symbol indicates that dangerous voltage levels are present within the equipment. These voltages are not insulated and may be of sufficient strength to cause serious bodily injury when touched. The symbol may also appear on schematics.
	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.
--	---

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

CAUTION: TO PREVENT ELECTRICAL SHOCK, DO NOT CONNECT THE PLUG INTO AN EXTENSION CORD, RECEPTACLE, OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED WITH NO PART OF THE BLADES EXPOSED.

CAUTION: TO ENSURE REGULATORY AND SAFETY COMPLIANCE, USE ONLY THE PROVIDED POWER AND INTERFACE CABLES.

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.

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

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.

Postpone cable modem installation until there is no risk of thunderstorm or lightning activity in the area. Avoid damaging the cable modem with static by touching the coaxial cable connector when it is attached to the earth grounded coaxial cable TV wall outlet. Always first touch the coaxial cable connector on the cable modem when you are disconnecting or re-connecting your USB or Ethernet cable from the cable modem or your PC.

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

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

Re-orient or relocate the receiving antenna

Increase the separation between the equipment and receiver

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canadian Compliance

This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

FCC Declaration of Conformity

According to 47CFR, Parts 2 and 15 for Class B Personal Computers and Peripherals; and/or CPU Boards and Power Supplies used with Class B Personal Computers, Motorola, Inc. Broadband Communications Sector, 101 Tournament Drive, Horsham, PA 19044, 1-215-323-1000, declares under sole responsibility that the product identifies with 47CFR Part 2 and 15 of the FCC Rules as a Class B digital device. Each product marketed is identical to the representative unit tested and found to be compliant with the standards. Records maintained continue to reflect the equipment being produced can be expected to be within the variation accepted, due to quantity production and testing on a statistical basis as required by 47CFR 2.909. This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept all interference received, including interference that may cause undesired operation. The above named party is responsible for ensuring that the equipment complies with the standards of 47CFR, Paragraph 15.101 to 15.109.

The SURFboard cable modem meets one or more of the standards listed:

Declaration of Conformity		
We	Motorola, Inc. Broadband Communications Sector 101 Tournament Drive Horsham, PA, U.S.A.	
Declare under our sole responsibility that the	SURFboard Cable Modem	
	Model SB5100 Series	
To which the declaration relates is in conformity with one of the following standards:		
EN55022	EN55024	EN60950 (3 rd Edition)
CISPR 22	CISPR 24	IEC60950 (3 rd Edition)
following the provisions of the Directive(s) of the Council of the European Union:		
EMC Directive 89/336/EEC	Low Voltage Directive 73/23/EEC	
Directive 93/68/EEC		

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.

Model	Standards
SB5100	FCC Part 15, ICES-003, UL/C-UL 60950 (3 rd Edition)
SB5100E	EN55022, EN55024, EN60950 (3 rd Edition), CISPR 22, CISPR 24, IEC60950 (3 rd Edition)
SB5100i	EN55022, EN55024, EN60950 (3 rd Edition), CISPR 22, CISPR 24, IEC60950 (3 rd Edition), FCC Part 15, UL/C-UL 60950 (3 rd Edition)

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Section 1

Introduction

The Motorola® SURFboard SB5100 series cable modem provides a link from a home or business computer to a high-speed DOCSIS or Euro-DOCSIS 2.0, 1.1, or 1.0 compliant data network. This network provides a downstream data transfer rate up to 38 Mbps in a single 6 MHz channel (55 Mbps in a 8 MHz channel for Euro-DOCSIS) using 64 QAM and 256 QAM technologies. The SURFboard cable modem provides a USB or Ethernet connection.

The features of the SURFboard cable modem include:

- Windows® 98, Windows® 2000, Windows Me®, and Windows XP™ based USB support
- USB interface for direct connection to USB-equipped computers
- 10/100Base-T Ethernet port supporting up to 32 users
- Standby switch on top of unit
- Remote management through SNMP, internal web pages, or StormWatch™ Diagnostic Suite
- Automatic configuration and address assignment
- Software upgrades over the network
- Compatibility with Windows, Macintosh®, and UNIX® operating system computers running TCP/IP
- Extensive event logs for troubleshooting



Using This Manual

The following sections provide information and instructions to install, configure, and operate the SURFboard cable modem:

Section 1	Introduction provides a product description, the technical help line, and repair/return information.
Section 2	Overview describes the functions of the SURFboard cable modem and identifies the front-panel LEDs and the rear-panel connectors.
Section 3	Installation and Operation provides instructions on how to install the SURFboard cable modem.
Section 4	HTML User Interface provides information on the user interface windows.
Section 5	Troubleshooting provides troubleshooting tips.
Appendix A	Specifications provide the technical specifications.
Appendix B	Event Log Messages provides a description of the format and field codes of the diagnostic events log.
Abbreviations and Acronyms	The Abbreviations and Acronyms list contains the full spelling of the short forms used in this manual.

Document Conventions

Before you begin using the SURFboard cable modem, familiarize yourself with the stylistic conventions used in this manual:

Bold type	Indicates text that you must type exactly as it appears or indicates a default value
SMALL CAPS	Denotes silk screening on the equipment, typically representing front- and rear-panel controls and input/output (I/O) connections, and LEDs
<i>Italic type</i>	Denotes a displayed variable, a variable that you must type, or is used for emphasis
KEY+KEY	Key combinations indicating that you hold down the first key and then press the second key
* (asterisk)	Indicates that several versions of the same model number exist and the information applies to all models; when the information applies to a specific model, the complete model number is given

If You Need Help

If you need assistance while working with the SURFboard cable modem, contact the Motorola Technical Response Center (TRC):

- Inside the U.S.A.: **1-888-944-HELP** (1-888-944-4357)
- Outside the U.S.A.: **1-215-323-0044**
- Online: <http://www.motorola.com/broadband>, click HTML/Modem Version, click Customer Support, then click Web Support.

The TRC is open from 8:00 AM to 7:00 PM Eastern Time, Monday through Friday and 10:00 AM to 6:00 PM Eastern Time, Saturday. When the TRC is closed, emergency service *only* is available on a call-back basis. Web Support offers a searchable solutions database, technical documentation, and low priority issue creation/tracking 24 hours per day, 7 days per week.

Calling for Repairs

If repair is necessary, call the Motorola BCS Repair Facility at **1-800-227-0450** for a Return for Service Authorization (RSA) number before sending the unit. The RSA number must be prominently displayed on all equipment cartons. The Repair Facility is open from 8:00 AM to 5:00 PM Central Time, Monday through Friday.

When calling from outside the United States, use the appropriate international access code and then call **956-541-0600** to contact the Repair Facility.

When shipping equipment for repair, follow these steps:

- 1 Pack the unit securely.
- 2 Enclose a note describing the exact problem.
- 3 Enclose a copy of the invoice that verifies the warranty status.
- 4 Ship the unit **PREPAID** to the following address:

Motorola Corporation
Broadband Communications Sector
Attn: RSA # _____
5964 E. 14th Street
Brownsville, TX 78521

Section 2

Overview

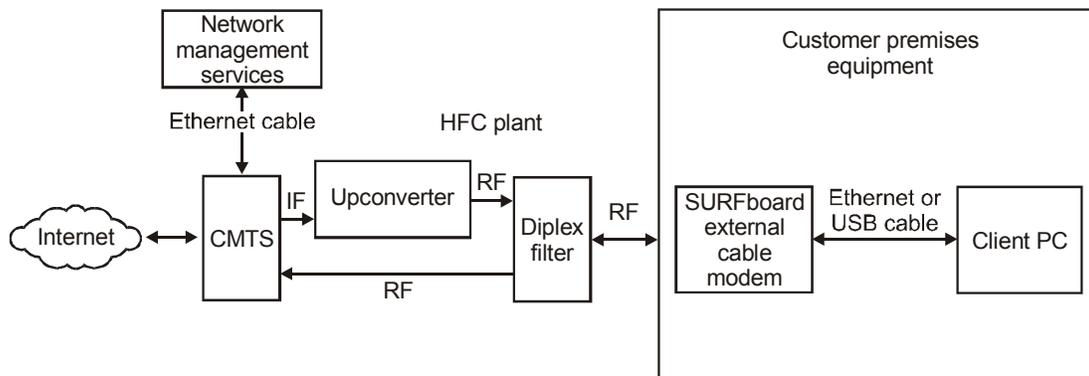
The SURFboard cable modem delivers digital multimedia content in a two-way transmission system. It provides access to a cable data network, which provides access to the Internet and World Wide Web.

The SURFboard cable modem is authorized by a cable modem terminations system (CMTS) for use on the network and automatically configures itself with parameters received from the CMTS or headend. When the SURFboard cable modem is powered on, it:

- Scans the frequency spectrum to locate the data frequency and automatically locks on to the channel.
- Searches for a message containing the upstream parameters such as frequency, modulation, symbol rate, and forward error correction (FEC) format.
- Transmits a message to the CMTS requesting additional information enabling network connection.
- Establishes Internet Protocol (IP) connectivity using Dynamic Host Configuration Protocol (DHCP)
- Receives a configuration file using the Trivial File Transfer Protocol (TFTP). This file contains additional parameters required by the SURFboard cable modem.
- Registers with the CMTS and is authorized to use the network.

Figure 2-1 illustrates the SURFboard cable modem data path:

Figure 2-1
SURFboard cable modem data path



The SURFboard cable modem supports 64 QAM and 256 QAM signals that are necessary for the DOCSIS/Euro-DOCSIS data network. This network carries IP data in standard MPEG-2 packets. The RF downstream receives data at rates up to 38 Mbps (55 Mbps for Euro-DOCSIS) and the RF upstream transfers data rates of up to 30 Mbps. The actual speeds will vary; speeds of 30 Mbps are only attainable with A-TDMA or S-CDMA technology.

The SURFboard cable modem provides an HTML user interface to:

- Monitor the cable modem and data signals
- Troubleshoot network connections

Top and Front Panel

The six front-panel LEDs provide status and activity information. The Standby button enables the subscriber to disconnect the Ethernet and USB interfaces from the cable modem network. The LEDs and Standby button are illustrated in Figure 2-2:

Figure 2-2
Front panel LEDs and Standby button



Table 2-1 describes the front-panel LEDs and Standby button:

Table 2-1
Front-panel LEDs and Standby button

Key	Item	Description
1	Standby Button	<p>Press this button to suspend the Internet connection (Ethernet and USB ports remain active for the local area network). When the Standby button is activated, all other LEDs turn off.</p> <p>Press this button again to enable the channel connections for transmitting and receiving data.</p> <p>The Standby button offers Internet security.</p>

Key	Item	When Flashing	When On
2	Power	Startup diagnostics in process.	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 configuration server connection.	The network connection is acquired.
6	PC/ Activity	Transmitting or receiving data.	A device, such as a computer or hub, is connected to the USB or Ethernet connectors on the back panel.
7	Standby	This light does not flash.	Press the Standby button and the light is on indicating the Internet service is suspended. The connections to the Local Area Network remain active. When this light is on, all other lights are off. The Standby button offers added Internet security.

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

Rear Panel

The SURFboard cable modem rear panel provides the cabling connectors, status LEDs, and power plug as illustrated in Figure 2-3:

Figure 2-3
Rear-panel connections and LEDs

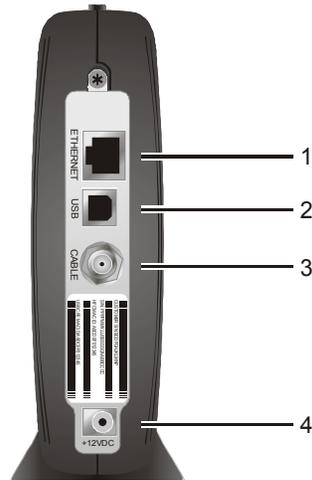


Table 2-2 describes the SURFboard cable modem rear-panel connections and LEDs:

Table 2-2
Rear-panel connections and LEDs

Key	Item	Description
1	ETHERNET	The Ethernet port provides a connection to Ethernet equipped computers using a cable terminated with an RJ-45 connector.
2	USB	This port provides a direct connection to USB equipped computers.
3	CABLE	This port provides a connection to the coaxial cable outlet.
4	+12VDC	This connector provides power to the cable modem.

Section 3

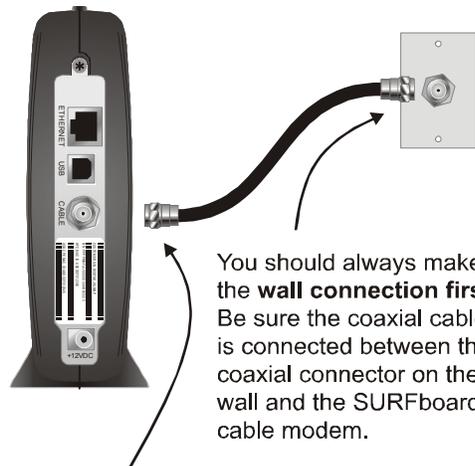
Installation and Operation

This section provides instructions for cabling all SURFboard cable modem models and checking their operation.

To complete the installation, you must:

- Connect the cables
- Configure the subscriber's computer

Avoid damaging the SURFboard cable modem or your PC with static electricity.



You should always make the **wall connection first**. Be sure the coaxial cable is connected between the coaxial connector on the wall and the SURFboard cable modem.

To release any static charges, **touch the coaxial cable connection on the modem** before connecting or disconnecting the USB or Ethernet cables.

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

Before You Begin

Before you begin the installation, take a few minutes to review the installation information, gather the required items, and complete the tasks listed below to make the installation as quick and easy as possible:

- 1 Verify that the following items are included with the SURFboard cable modem:

Power adapter	Connects the SURFboard cable modem to the AC electrical outlet
SURFboard cable modem CD-ROM	Contains the User Guide and USB drivers
10/100Base-T Ethernet cable	Required to connect an Ethernet computer port to the cable modem
USB cable	Required to connect a USB-equipped computer to the cable modem
- 2 Acquire the following items that are not included with the SURFboard cable modem:

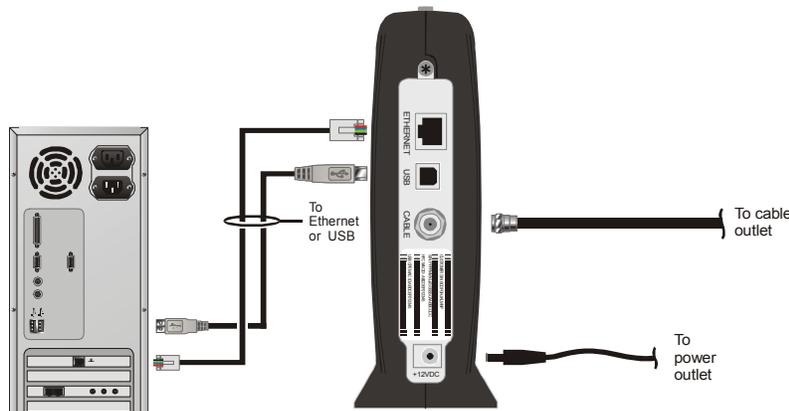
75-ohm coaxial TV cable with F-type connectors	Required to connect the SURFboard cable modem to the nearest cable outlet
Laptop or PC with TCP/IP and HTML browser	Required to access the internal web server for diagnostics
RF splitter	You may need a 5-900 MHz RF splitter if there is a TV connected to the cable outlet.
- 3 Determine if you are installing a single user or a multiple user configuration. Verify that the subscriber's computer has:
 - A USB connector for installing a single user configuration.
 - For a single user connecting to the USB port, be sure to disable the Legacy USB Support in BIOS. The SURFboard cable modem does not support Legacy USB architecture. Refer to the subscriber's system information to access the BIOS of the subscriber's computer.
 - An Ethernet card for installing a multiple user configuration (can be used for single user in place of a USB). *It must be installed before installing the cable modem.*

Installing a Single User

You can connect a single user to a SURFboard cable modem using the USB or Ethernet port. 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. To install the SURFboard cable modem for a single user:

- 1 Be sure the *subscriber's* computer is on and the cable modem is unplugged.
- 2 Connect one end of the coaxial cable to the cable outlet or splitter (Always make the wall connection first). Connect the other end of the coaxial cable to the CABLE connector on the cable modem. *Hand-tighten the connectors to avoid damaging them.* Figure 3-1 illustrates the cable connections:

Figure 3-1
Cable connections



- 3 Insert the *SURFboard Cable Modem* CD-ROM into the CD-ROM drive.
- 4 Plug the power cord into the +12VDC connector on the cable modem and the electrical outlet. *This turns the SURFboard cable modem on.* The cable modem does not need to be unplugged when not in use.
- 5 Check that the LEDs 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. Configuration data includes the DHCP server IP address, configuration, and time and date stamp.

- If an error occurs:

When	What occurs	Provides
During power up	Specific LEDs are off. For example, if the downstream channel is not acquired, the RECEIVE LED goes from flashing to off.	Immediate feedback as to where the problem has occurred.
	The SURFboard cable modem automatically loads configuration updates.	The SURFboard cable modem automatically reboots if the IP address and the cable modem configuration file is not found.
During normal operation	The LED corresponding to the failure is off. For example, if the downstream channel is lost, the RECEIVE LED goes from on to off.	By noting the LED status, you can determine the source of the problem.

For more information on errors, refer to Section 5, “Troubleshooting”.

It is not necessary to turn the cable modem off when it is not in use.

- 6 Connect the computer to the cable modem using the 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 one of following:

- “Setting Up a USB Driver for Windows 98,” on page 3-5
- “Setting Up a USB Driver for Windows 2000,” on page 3-10
- “Setting Up a USB Driver for Windows Me,” on page 3-14
- “Setting Up a USB Driver for Windows XP,” on page 3-16

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

Ethernet: Connect the 10/100Base-T Ethernet cable to the SURFboard cable modem connector marked ETHERNET and the other end to the Ethernet jack on the back of the computer. *Ethernet users do not need to set up USB.*

- 7 Configure TCP/IP using *one* of the following:
 - “Configuring for TCP/IP in Windows 95, Windows 98, or Windows Me,” on page 3-18
 - “Configuring for TCP/IP in Windows 2000,” on page 3-21
 - “Configuring for TCP/IP in Windows XP,” on page 3-25
 - The instructions in your Macintosh or UNIX user manual

Setting Up a USB Driver

The following subsections provide instructions for setting up a USB driver for Windows 98, Windows 2000, Windows Me, and Windows XP.

Setting Up a USB Driver for Windows 98

To set up a USB driver for Windows 98:

- 1 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.

- 2 Be sure the disc load activity is complete before plugging in the USB cable.

System files are needed when loading the USB drivers. These files may already be on the PC or you may be required to load them from the Microsoft CD that came with the *subscriber's* PC.

The PC automatically recognizes the USB connection and after several seconds, the following window is displayed:



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

- 3 Click **Next** and the following window is displayed:



- 4 Ensure that the **Search for the best driver for your device** is selected as shown on the window above.
- 5 Click **Next**, and the window below is displayed showing a location:



- 6 Ensure that the **CD-ROM drive** is the only box checked as shown in the window above.
- 7 Click **Next**.
If the computer successfully locates the driver, skip to step 11.

- 8 If the 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:



In this example, to load the driver successfully, you may need to click **Browse** to manually select the NetMotCM.sys files on the CD-ROM.

- 9 Click **Next** to display the following window:



- 10 Select **the updated driver...** and click **Next**.

If the window above 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 Windows Me” on page 3-33 and then repeat this procedure.

11 When the window below 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 in the CD-ROM drive and click **OK**.



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

After all the necessary files are loaded, the window below is displayed confirming a successful installation:



12 Click **Finish**. The window below is displayed:



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

When you have successfully finished setting up the USB driver, you can continue with “Configuring for TCP/IP in Windows 95, Windows 98, or Windows Me,” on page 3-18

If you have difficulties setting up the USB driver, perform the procedure for “Removing the USB Driver from Windows 98 or Windows Me” on page 3-33, and then repeat this procedure.

Setting Up a USB Driver for Windows 2000

To set up a USB driver for Windows 2000:

- 1 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.

- 2 Be sure disc load activity is complete before plugging in the USB cable.

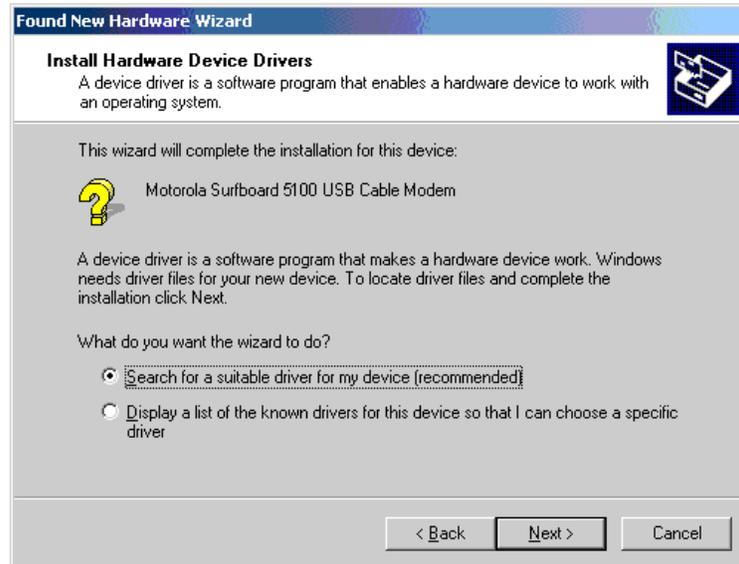
System files are needed when loading the USB drivers. These files may already be on the PC or you may be required to load them from the Microsoft CD that came with the *subscriber's* PC.

The PC automatically recognizes the USB connection and after several seconds, the following window is displayed:



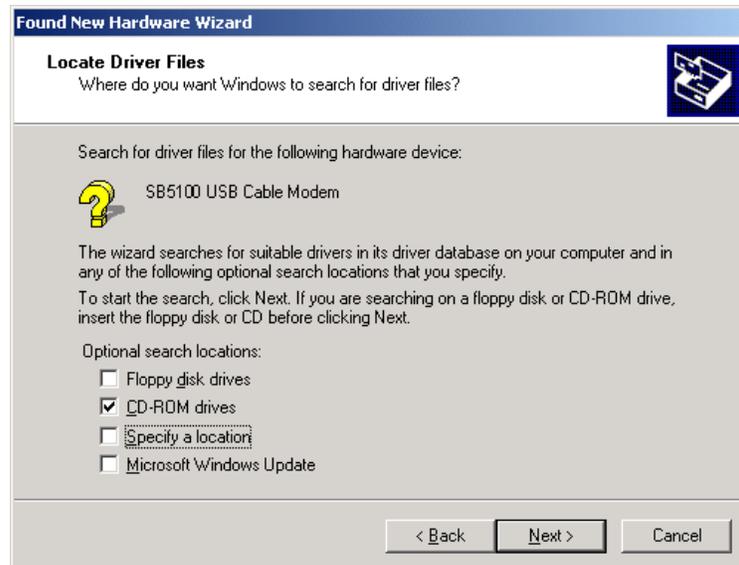
Although your SURFboard cable modem model number may be different than in the images in this manual, the procedure is the same.

- 3 Click **Next**, and the following window is displayed:



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

- 4 Ensure that **Search for a suitable driver for my device** is selected.
- 5 Click **Next** and the following window is displayed:



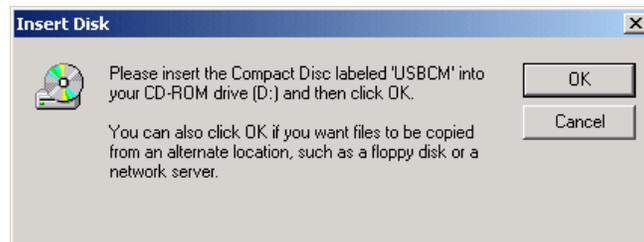
- 6 Ensure that the box next to the **CD-ROM drives** is the only one checked as shown in the window above.

- 7 Click **Next** and the window shown below is displayed:

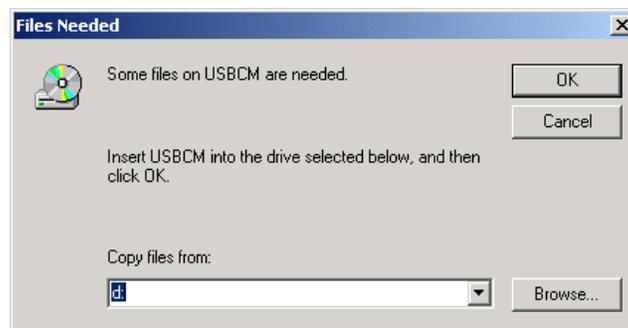


Although your SURFboard cable modem model number may be different than in the images in this manual, the procedure is the same.

- 8 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 8 to 12. Otherwise, you can skip to step 12.



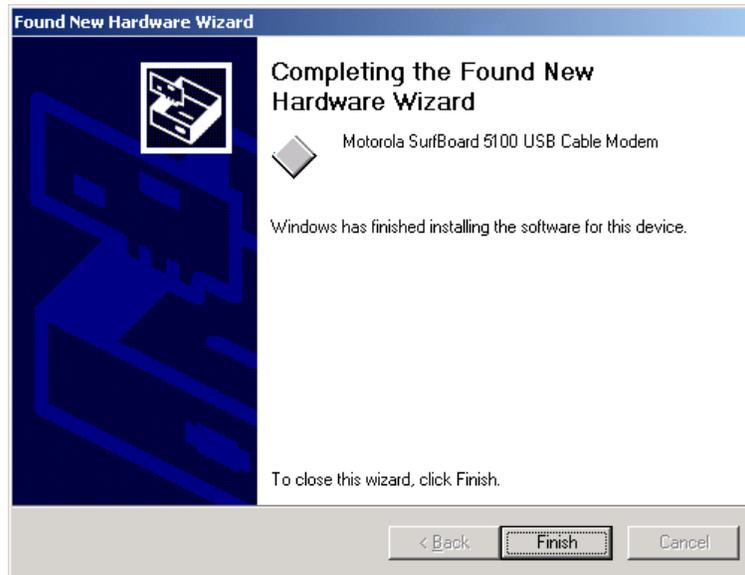
- 9 On the Insert Disk window, click **OK**. The following window is displayed:



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

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

- 11 Double-click the **NetMotCM.sys** file. The Files Needed window is displayed.
- 12 Click **OK**. The Found New Hardware Wizard window is displayed:



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

When you have successfully finished setting up the USB driver, you can continue with “Configuring for TCP/IP in Windows 2000,” on page 3-21.

If you have any difficulties setting up the USB driver, follow the instructions for “Removing the USB Driver from Windows 2000” on page 3-37.

Setting Up a USB Driver for Windows Me

To set up a USB driver for Windows Me:

- 1 Be sure the *SURFboard Cable Modem* CD-ROM is inserted into the 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.

- 2 Be sure disc load activity is complete before plugging in the USB cable.

System files are needed when loading the USB drivers. These files may already be on the PC or you may be required to load them from the Microsoft CD that came with the *subscriber's* PC.

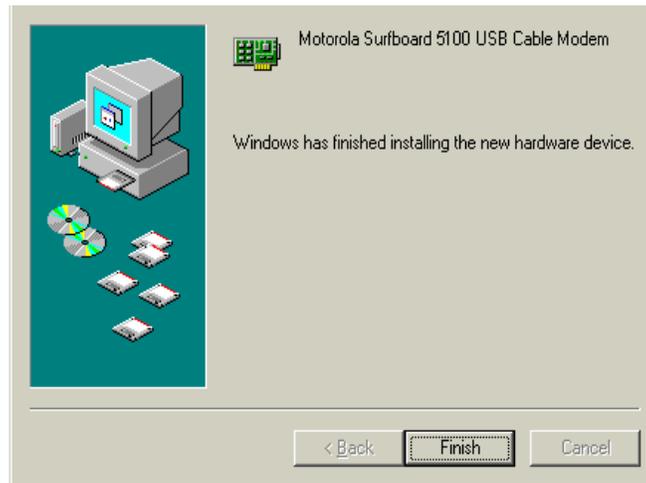
The PC automatically recognizes the USB connection and after several seconds, the following window is displayed:



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

- 14 Click **Next**. Windows Me automatically searches for the correct USB drivers and installs them.

15 If the window below is displayed, click **Finish**:



Otherwise, ensure that the SURFboard Cable Modem CD-ROM is correctly inserted in your CD-ROM drive.

When you have successfully finished setting up the USB driver, you can continue with "Configuring for TCP/IP in Windows 95, Windows 98, and Windows Me," on page 3-18.

Setting Up a USB Driver for Windows XP

To set up a USB driver for Windows XP:

- 1 Be sure the *SURFboard Cable Modem* CD-ROM is inserted into the 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.

- 2 Be sure disc load activity is complete before plugging in the USB cable.

System files are needed when loading the USB drivers. These files may already be on the PC or you may be required to load them from the Microsoft CD that came with the subscriber's PC.

The PC automatically recognizes the USB connection and after several seconds, the following window is displayed:



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

- 3 Ensure that **Install the software automatically** is selected.

- 4 Click **Next**. Windows XP automatically searches for the correct USB drivers and installs them. The following window is displayed:



- 5 Click **Finish** to complete the installation.

If you have difficulties setting up the USB driver, follow the instructions for “Removing the USB Driver from Windows XP” on page 3-41.

When you have successfully finished setting up the USB driver, you can continue with “Configuring for TCP/IP in Windows XP,” on page 3-21.

Configuring the Computer for TCP/IP

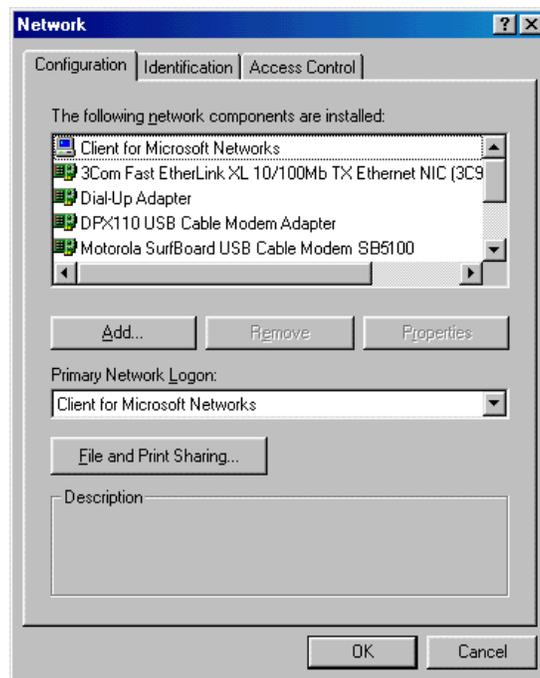
The computer must be configured for TCP/IP. An IP address is assigned automatically during the TCP/IP configuration process. Instructions are provided for Windows 95, Windows 98, Windows Me, Windows 2000, and Windows XP users.

The SURFboard cable modem contains all required software. You do not need to configure the cable modem, but you must configure your computer for TCP/IP (a software protocol for communication between computers) and check for an IP address. Your service provider may provide additional instructions for setting up your computer.

Configuring for TCP/IP in Windows 95, Windows 98, and Windows Me

To configure for TCP/IP for Windows 95, Windows 98, and Windows Me:

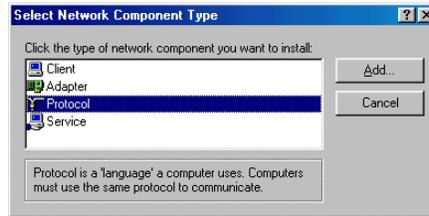
- 1 On the Windows Desktop, click **Start**. The pop-up menu is displayed.
- 2 Click **Settings** and then **Control Panel** from the Windows pop-up menus.
- 3 Double-click the **Network** icon on the Control Panel window. The Network window is displayed:



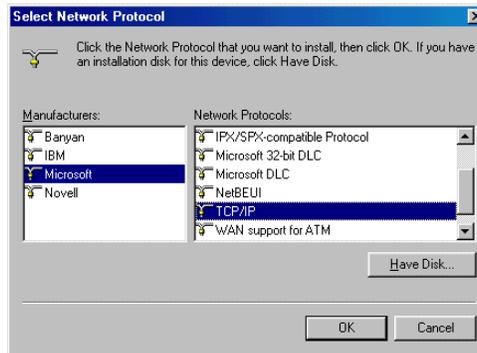
Although your SURFboard cable modem model number may be different than in the images in this manual, the procedure is the same.

- 4 Click the **Configuration** tab on the Network window.
- 5 Verify that TCP/IP is installed for the adapter that will be used to connect to the SURFboard cable modem. If TCP/IP is installed, then skip to step 10. If TCP/IP is not installed for the adapter, continue with step 6.

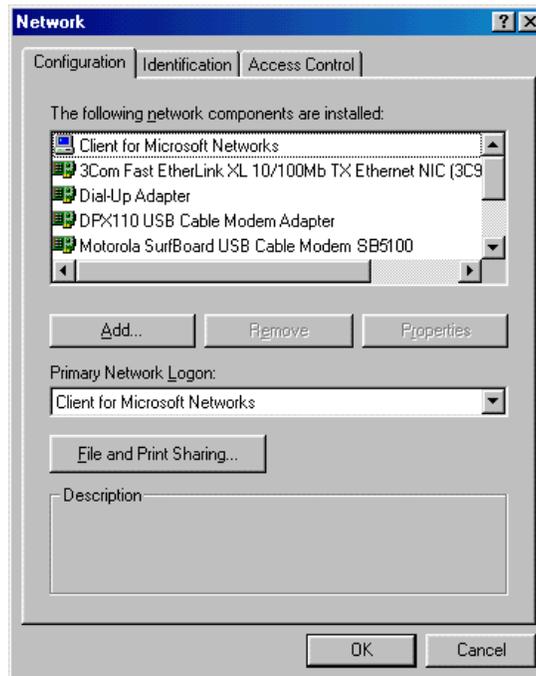
- 6 Select the adapter to be used for the SURFboard cable modem connection and then click **Add**. The Select Network Component Type window is displayed:



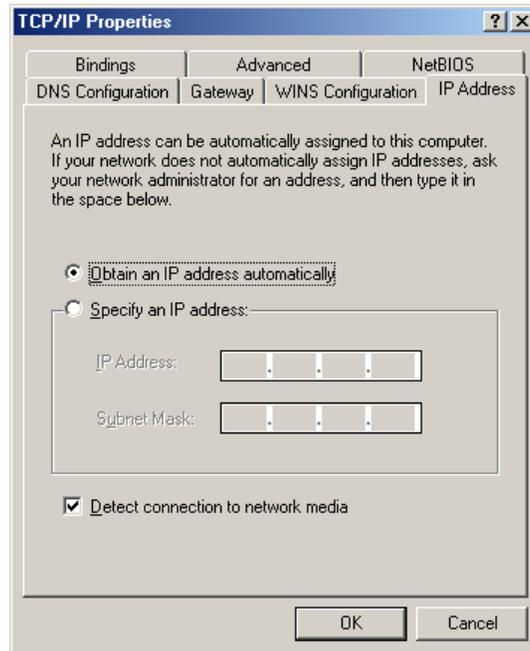
- 7 Double-click the **Protocol** option. The Select Network Protocol window is displayed:



- 8 Click **Microsoft** in the Manufacturers section and then click **TCP/IP** in the Network Protocols section.
- 9 Click **OK**. The Network window is displayed:



- 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 Properties window is displayed:



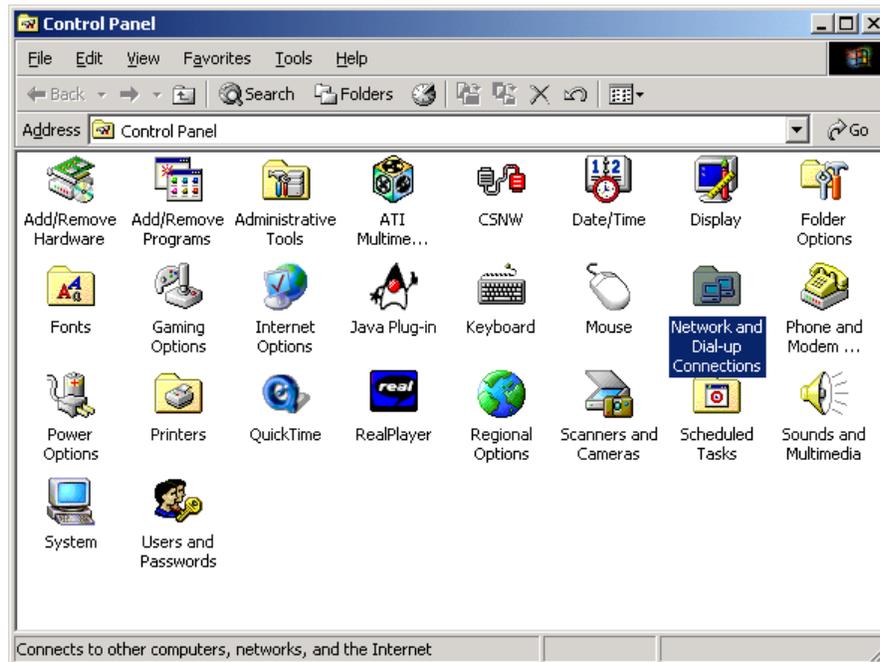
- 12 Click the **IP Address** tab.
- 13 Click **Obtain an IP address automatically**.
- 14 Click **OK** to accept the TCP/IP settings.
- 15 Click **OK** to close the Network window.
- 16 Click **OK** when prompted to restart the computer and then click **OK** again.

When you complete TCP/IP configuration, go to “Verifying an IP Address in Windows 95, Windows 98, and Windows Me” on page 3-27.

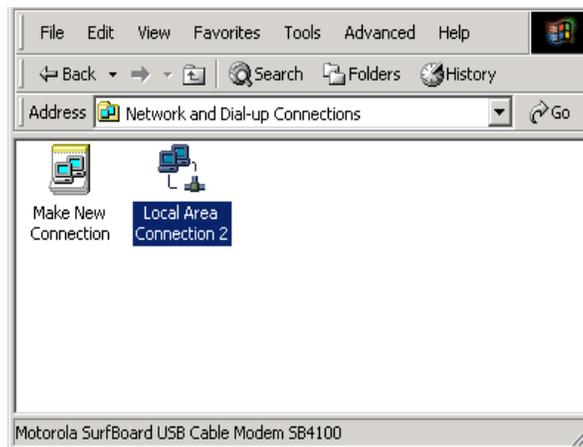
Configuring for TCP/IP in Windows 2000

To configure for TCP/IP for Windows 2000:

- 1 On the Windows Desktop, click **Start**.
- 2 Click **Settings** and then **Control Panel** from the pop-up menus:

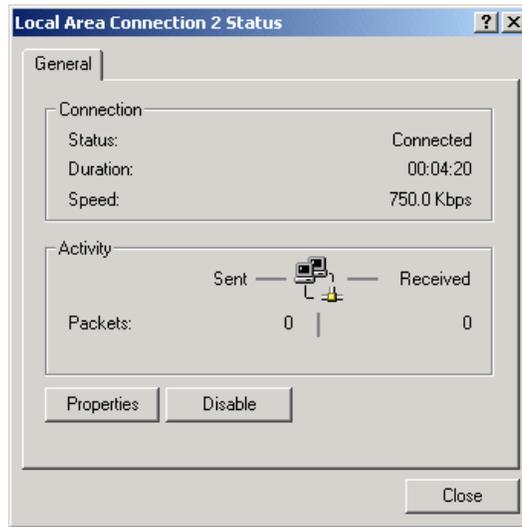


- 3 Double-click the **Network and Dial-up Connections** icon on the Control Panel window to display the window shown below:

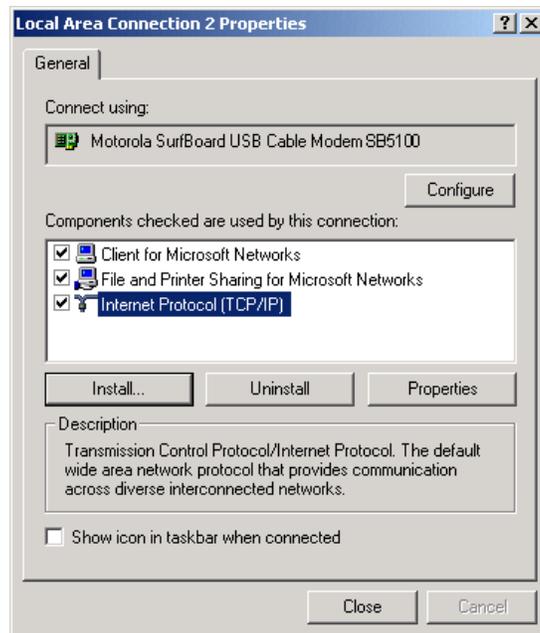


- 4 On the Network and Dial-up Connections window, double-click **Local Area Connection number**. The value of this *number* varies from system to system.

The Local Area Connection number Status window is displayed:

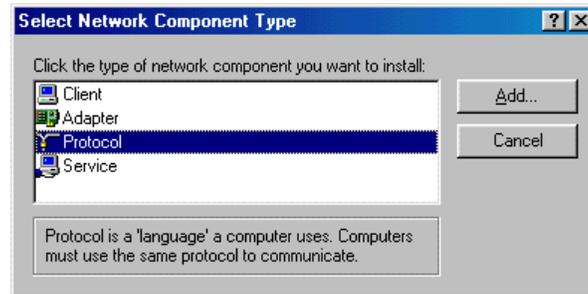


5 Click **Properties**. A window similar to the following is displayed:

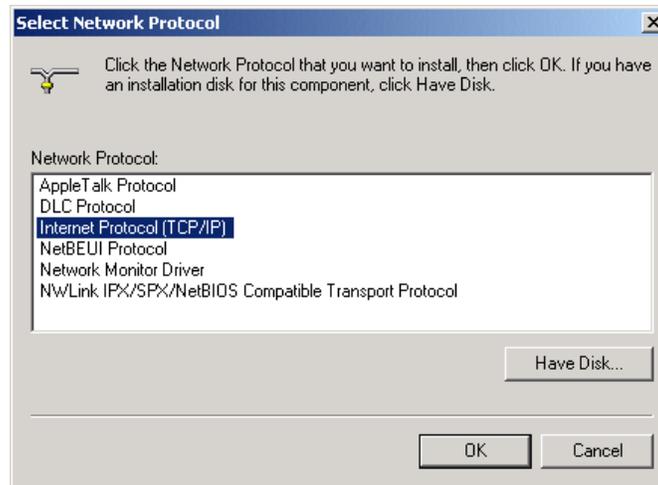


6 If Internet Protocol (TCP/IP) is displayed in the list of network components, TCP/IP is installed. You can skip to step 10.

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

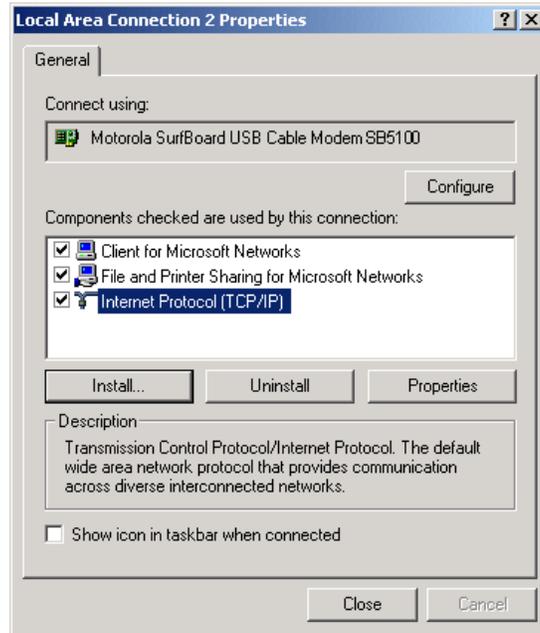


- 7 Click **Protocol** on the Select Network Component Type window and then click **ADD**. The Select Network Protocol window is displayed similar to the one shown below:

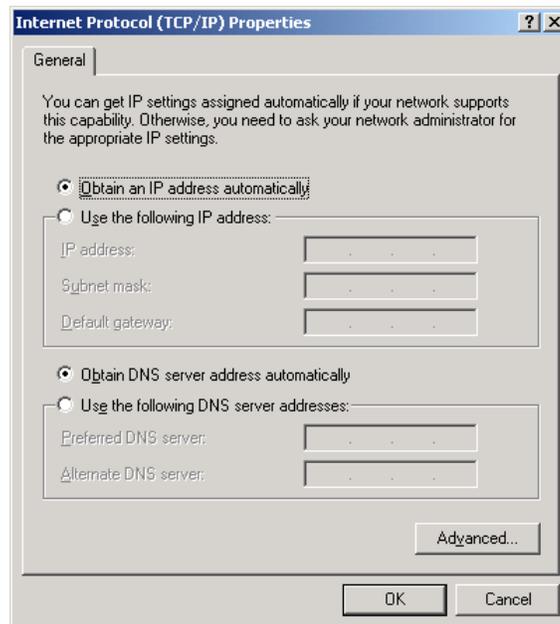


- 8 Click **Internet Protocol (TCP/IP)** in the Network Protocol section of Select Network Protocol window.
- 9 Click **OK**.

The Local Area Connection number Properties window is re-displayed:



- 10 On the Local Area Connection *number* Properties window, ensure that the box next to **Internet Protocol (TCP/IP)** is checked.
- 11 Click **Properties**. The Internet Protocol (TCP/IP) Properties window is displayed:



- 12 Ensure that **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 the computer and then click **OK** again.

When you complete the TCP/IP configuration, go to “Verifying an IP Address in Windows 2000 or Windows XP” on page 3-29.

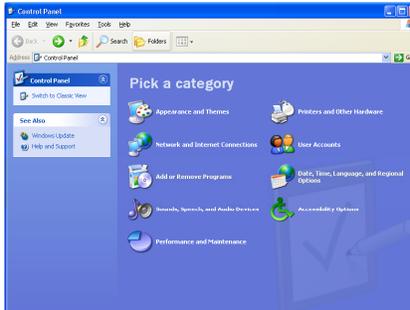
Configuring for TCP/IP in Windows XP

To configure for TCP/IP for Windows XP:

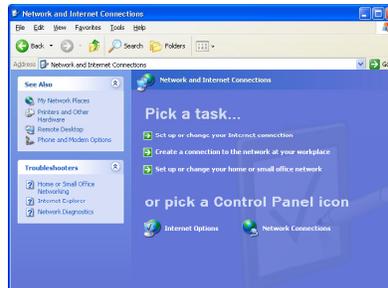
- 1 On the Windows Desktop, click **Start** to display the Start window:



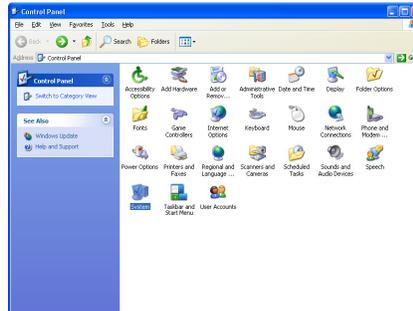
- 2 Click **Control Panel** to display the Control Panel window. The display varies, depending on your Windows XP view options. If the display is a Category view as shown in the following illustration, continue to step 3. Otherwise, skip to step 5.



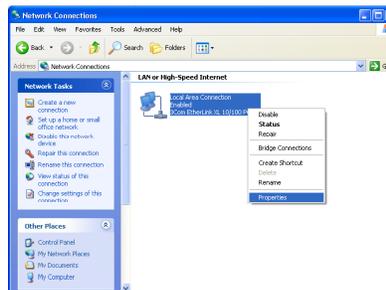
- 3 Click **Network and Internet Connections** to display the Network and Internet Connections window.
- 4 On the Network and Internet Connections Pick a task window, click **Network Connections** to display the LAN or High-speed Internet connections. Skip to step 6.



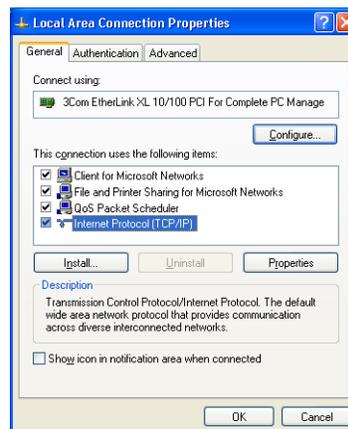
- 5 If a classic view similar to the illustration below is displayed, click **Network Connections** to display the LAN or High-speed Internet connections.



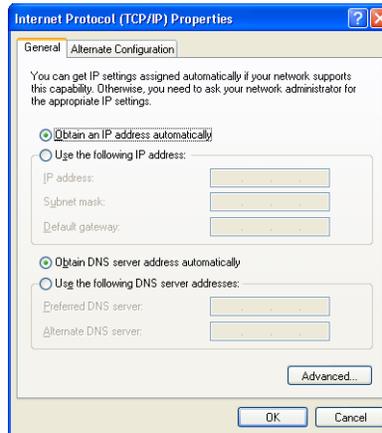
- 6 Right-click on your network connection. If more than one connection is displayed, be sure to select the one for your network interface.
- 7 Select **Properties** from the pop-up menu to display the Local Area Connection Properties window:



- 8 On the Local Area Connection Properties window, be sure Internet Protocol (TCP/IP) is checked. If it is not checked, check it.
- 9 Select **Internet Protocol (TCP/IP)** and click **Properties** to display the Internet Protocol (TCP/IP) Properties window:



- 10 Verify that the settings are correct, as shown in the illustration below:



- 11 Click **OK** to close the TCP/IP Properties window.
- 12 Click **OK** to close the Local Area Connection Properties window.

When you complete the TCP/IP configuration, go to “Verifying an IP Address in Windows 2000 and Windows XP on page 3-29

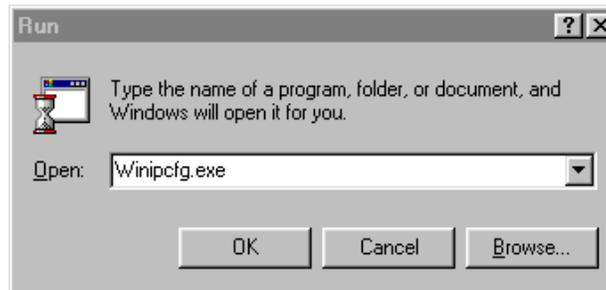
Verifying an IP Address

The following sections describe how to verify an IP address. Instructions are provided for Windows 95, Windows 98, Windows Me, Windows 2000, and Windows XP users.

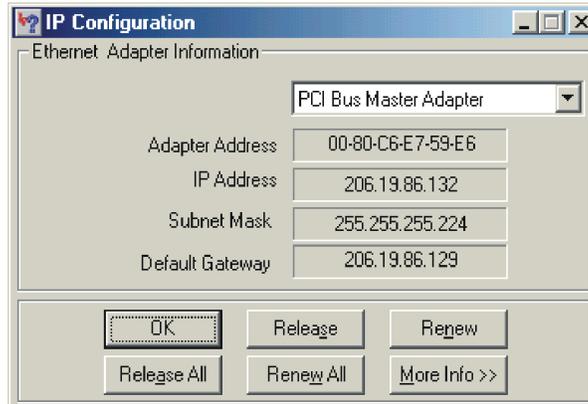
Verifying an IP Address in Windows 95, Windows 98, and Windows Me

To check the IP address on a computer running Windows 95, Windows 98 or Windows Me:

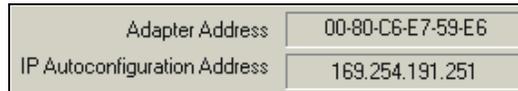
- 1 On the Windows Desktop, click **Start**. The pop-up menu is displayed.
- 2 Click **Run**, and the Run dialog box is displayed:



- 3 Type **winipcfg.exe** and then click **OK**. The IP Configuration window is displayed:



In Windows 98, IP Autoconfiguration should not be shown before IP address or an error condition exists. An example is shown below.



The values shown for Adapter Address, IP Address, Subnet Mask, and Default Gateway on your PC will be different from those shown in the examples.

If an IP address is not displayed or has all zeros in Windows 95, an error condition exists.

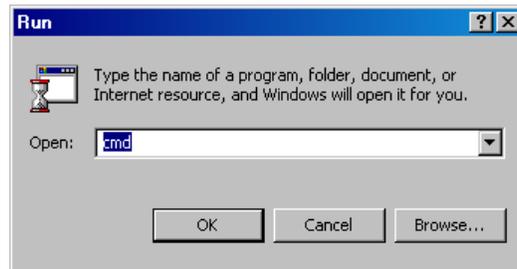
If Autoconfiguration is displayed before IP Address in Windows 98, an error condition exists.

- 4 Select the adapter — the Ethernet card or USB device.
- 5 Click **Renew**.
- 6 After the system displays an IP address, click **OK**.

Verifying an IP Address in Windows 2000 and Windows XP

To check the IP address on a computer running Windows 2000 or Windows XP:

- 1 On the Windows Desktop, click **Start**.
- 2 Click **Run**. The Run window is displayed:



- 3 Type **cmd** and click **OK**. A DOS window is displayed:

```
C:\WINNT\System32\cmd.exe
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ipconfig

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection 2:

    Connection-specific DNS Suffix  . : surfboard.com
    IP Address. . . . .                : 206.19.86.174
    Subnet Mask . . . . .              : 255.255.255.224
    Default Gateway . . . . .          : 206.19.86.161

Ethernet adapter Local Area Connection:

    Media State . . . . .              : Cable Disconnected

C:\>
```

- 4 Type **ipconfig** and press **ENTER** to display the computer's IP configuration:

```
cmd
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ipconfig /renew

Windows 2000 IP Configuration

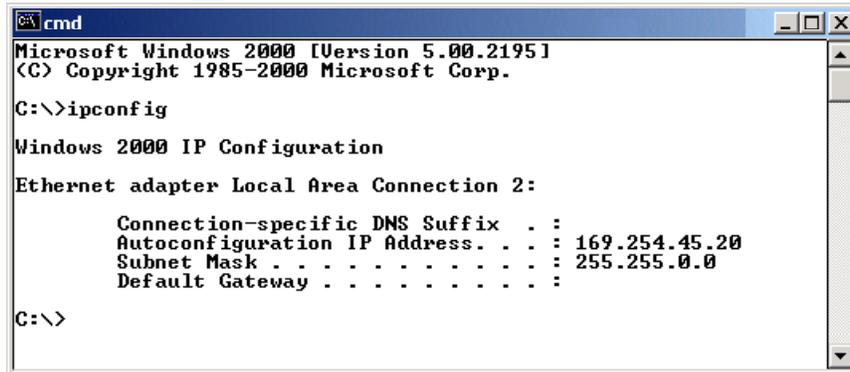
Ethernet adapter Local Area Connection 2:

    Connection-specific DNS Suffix  . : surfboard.com
    IP Address. . . . .                : 206.19.86.174
    Subnet Mask . . . . .              : 255.255.255.224
    Default Gateway . . . . .          : 206.19.86.161

C:\>_
```

- 5 Type **exit** and press **ENTER** to return to the Windows operating system.

Improper connections between the subscriber's PC, the SURFboard cable modem, and the cable network are indicated when you receive an Autoconfiguration IP Address. An example is displayed below. Check the subscriber's cabling and determine if you can see the regular cable-TV channels on the subscriber's television.



```
cmd
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ipconfig

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection 2:

    Connection-specific DNS Suffix . . :
    Autoconfiguration IP Address. . . : 169.254.45.20
    Subnet Mask . . . . . : 255.255.0.0
    Default Gateway . . . . . :

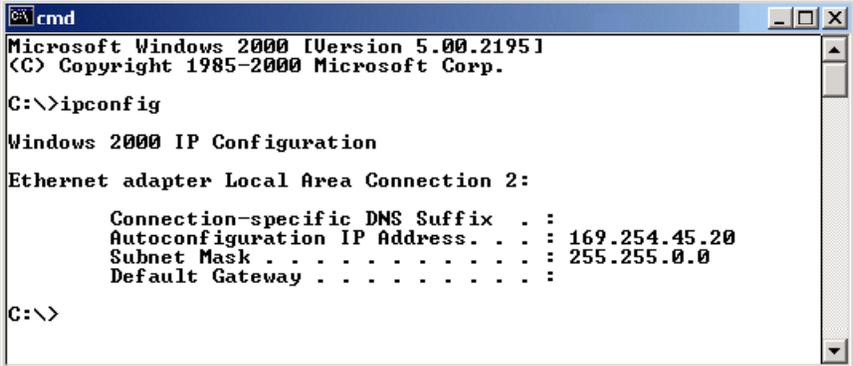
C:\>
```

After verifying the subscriber's cable connections and proper operation of the cable-TV system by looking at the channels on the TV, you can renew the IP address.

Renewing an IP Address

To renew an IP address:

- 1 Type **ipconfig /renew** and then press **ENTER**. If a valid IP address is displayed, then Internet access should be available.



```

cmd
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ipconfig

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection 2:

    Connection-specific DNS Suffix  . . . :
    Autoconfiguration IP Address. . . . : 169.254.45.20
    Subnet Mask . . . . .                : 255.255.0.0
    Default Gateway . . . . .            :

C:\>
  
```

- 2 Type **exit** and then press **ENTER** to return to Windows.

Installing Multiple Users

The SURFboard cable modem can serve as a gateway to the Internet for up to 32 users when using an optional hub or switch. The users must be on the LAN and the SURFboard cable modem must be attached to the LAN and the cable system.

The following three diagrams illustrate sample configurations. Figure 3-2 illustrates the basic connections with one interface:

Figure 3-2
Ethernet - Multiple users

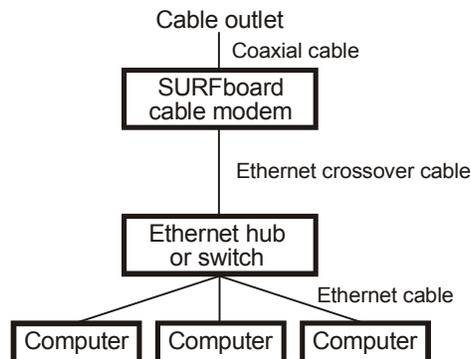
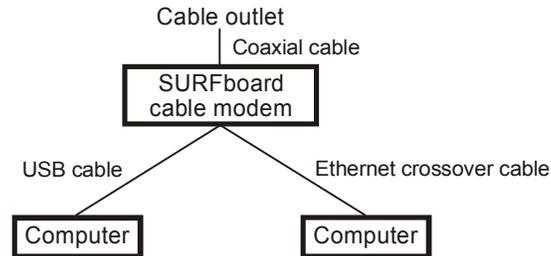


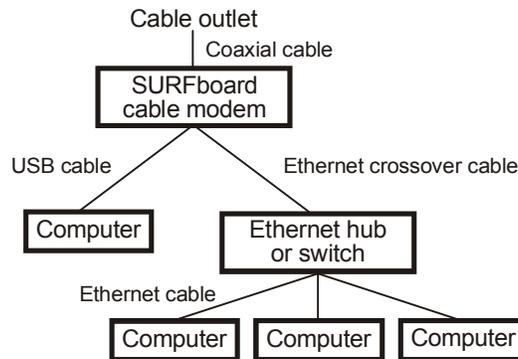
Figure 3-3 illustrates connecting one computer to the USB port and a second computer to the Ethernet port:

Figure 3-3
Ethernet - Two users with two interfaces



You can use the Ethernet and USB interfaces to connect multiple users. Connect a single user to the USB port and up to 31 users to the Ethernet hub or switch. Figure 3-4 illustrates both interfaces:

Figure 3-4
Ethernet - Multiple users with two interfaces



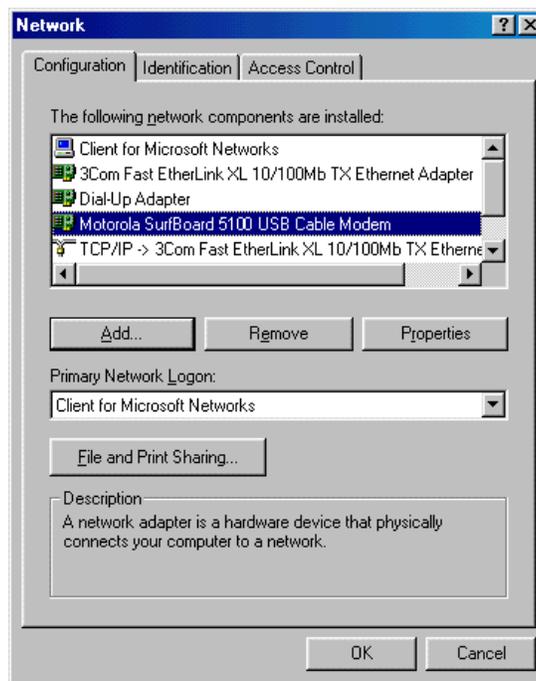
Removing the USB Driver

The following sections describe how to remove the device listings from the SURFboard cable modem. Instructions are provided for Windows 98, Windows Me, Windows 2000, and Windows XP users.

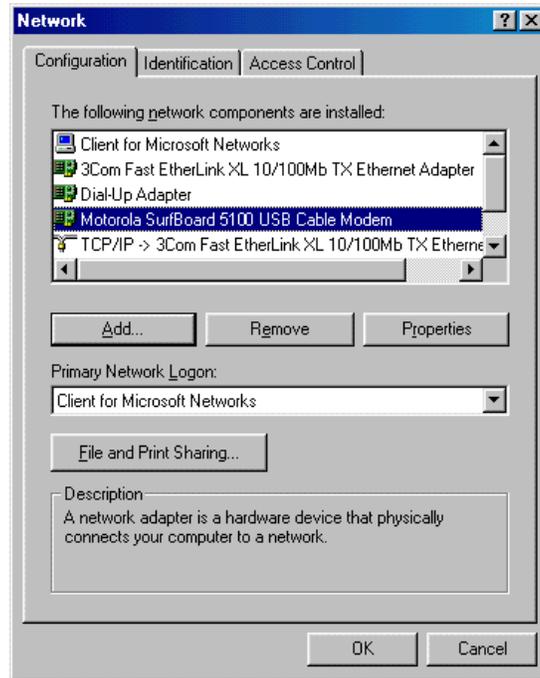
Removing the USB Driver from Windows 98 or Windows Me

To remove the USB driver from Windows 98 or Windows Me:

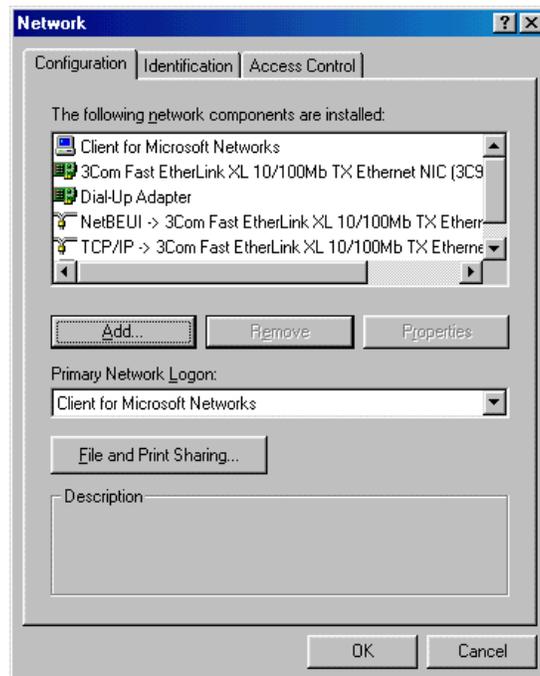
- 1 Ensure that the USB cable is removed from your PC or cable modem.
The USB cable must be unplugged prior to restarting or the PC will re-detect the modem and reinstall the USB driver.
- 2 On the Windows Desktop, right-click the **Network Neighborhood** icon for Windows 98 or **My Network Places** for Windows Me and then click **Properties**. The Network window is displayed:



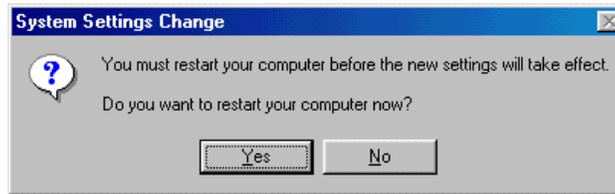
- 3 Select **Motorola SurfBoard USB Cable Modem** (although your SurfBoard cable modem model number may be different than the images in this guide, the procedure is the same):



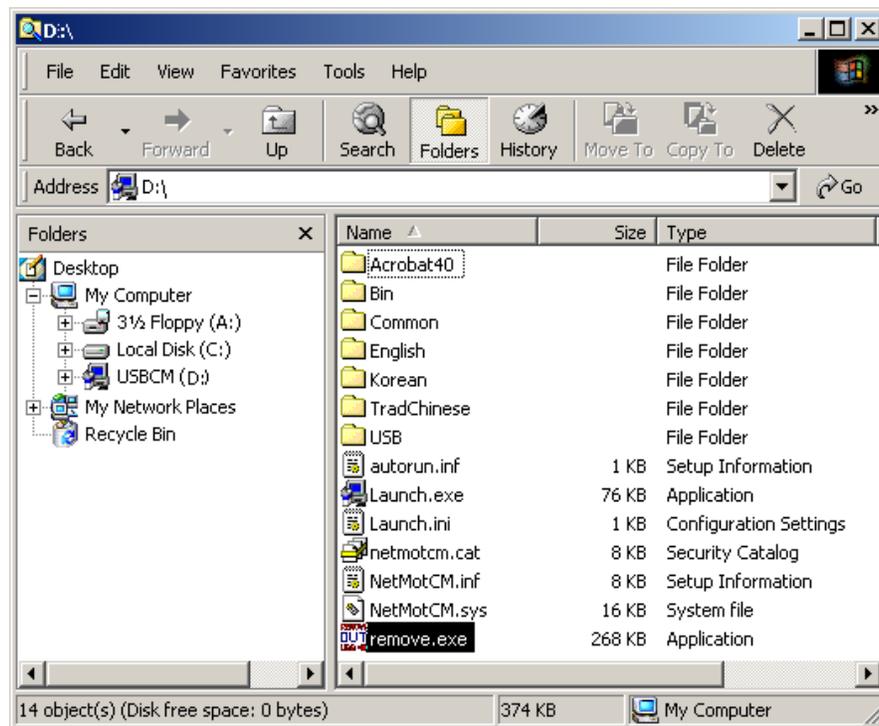
- 4 Click **Remove**. The Network window no longer shows the Motorola SURFboard USB Cable Modem in the list:



- Click **OK**, and the System Settings Change window is displayed:

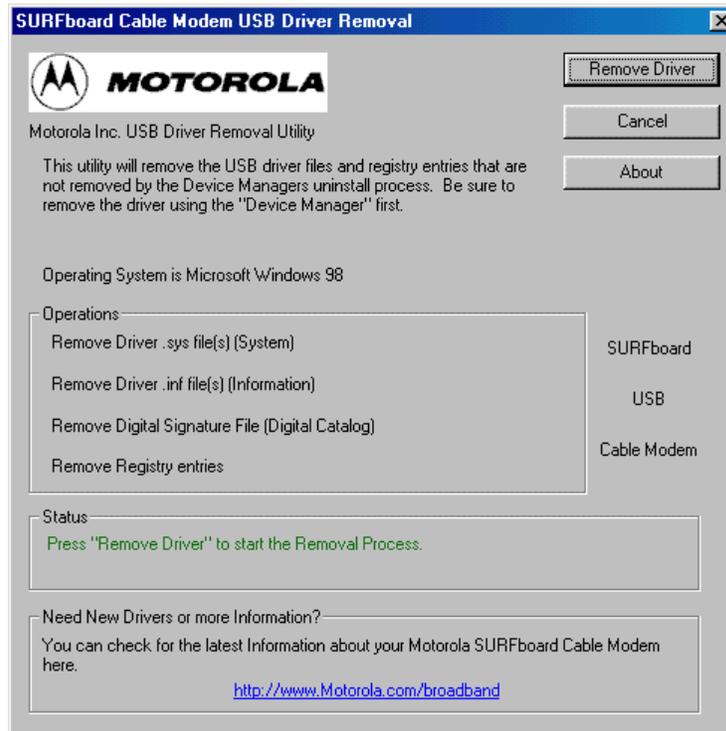


- Click **Yes** to restart your computer.
- Insert the *SURFboard Cable Modem* CD-ROM in the CD-ROM drive. After a short time, a window with language choices is displayed.
- Press the **Esc** key on the keyboard to exit the start-up screens.
- To start Windows Explorer, click **Start** and select **Run**.
- In the Run window, type **explorer** and click **OK**. The Explorer window is displayed.
- Double-click the CD-ROM drive icon (drive D: in our example).



- Double-click the **remove.exe** icon to run the Remove utility from the *SURFboard Cable Modem* CD-ROM.

The SURFboard Cable Modem USB Driver Removal window is displayed:



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

After you remove the USB driver, re-install the USB driver following either:

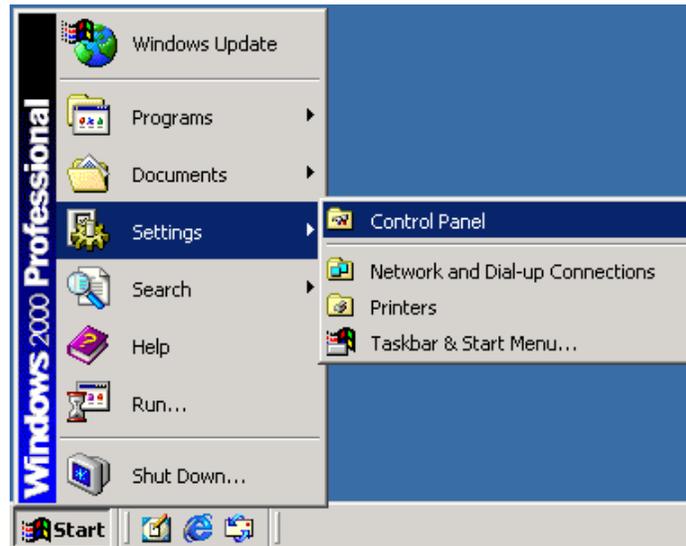
“Setting Up a USB Driver for Windows 98,” on page 3-5.

“Setting Up a USB Driver for Windows Me,” on page 3-14

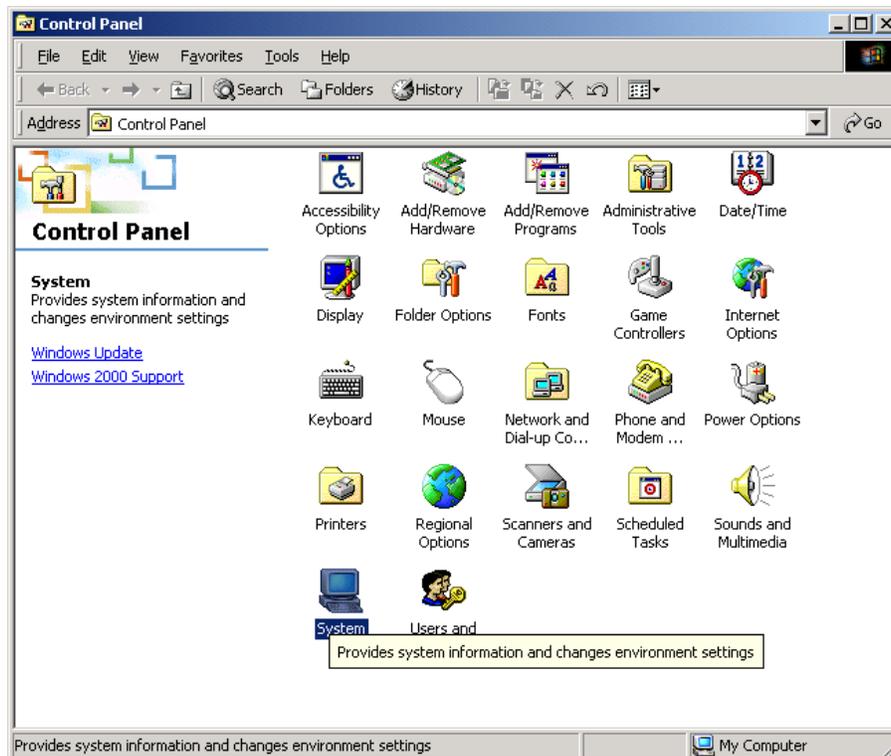
Removing the USB Driver from Windows 2000

To remove the USB driver from Windows 2000:

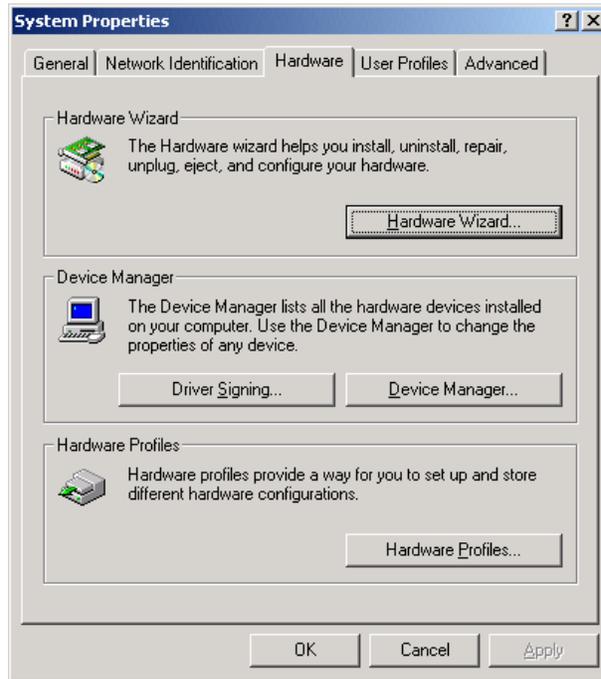
- 1 From the Windows 2000 desktop, click **Start**.
- 2 Click **Settings**:



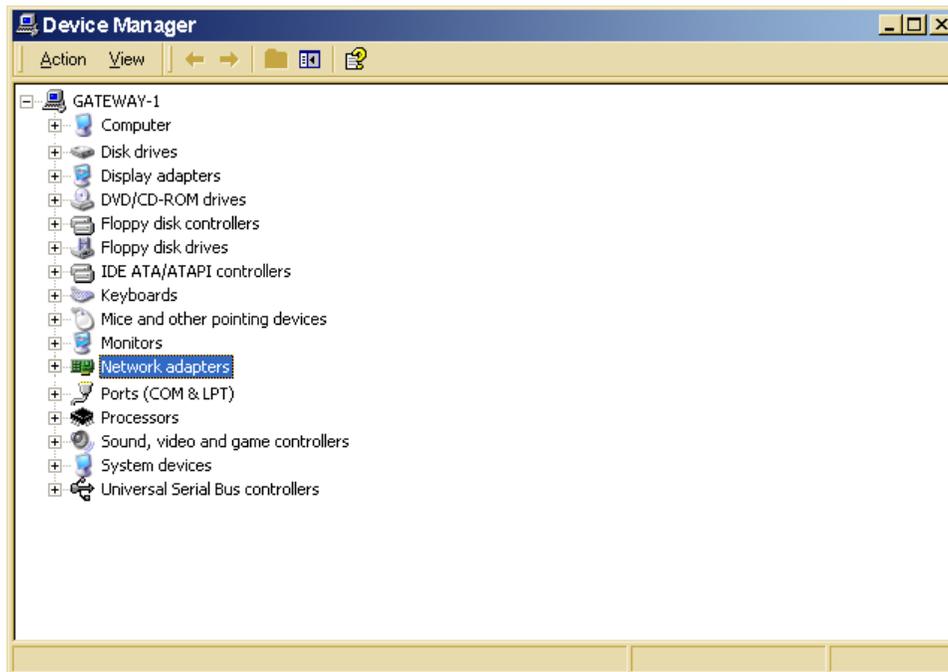
- 3 Click the **Control Panel** icon and the Control Panel window is displayed:



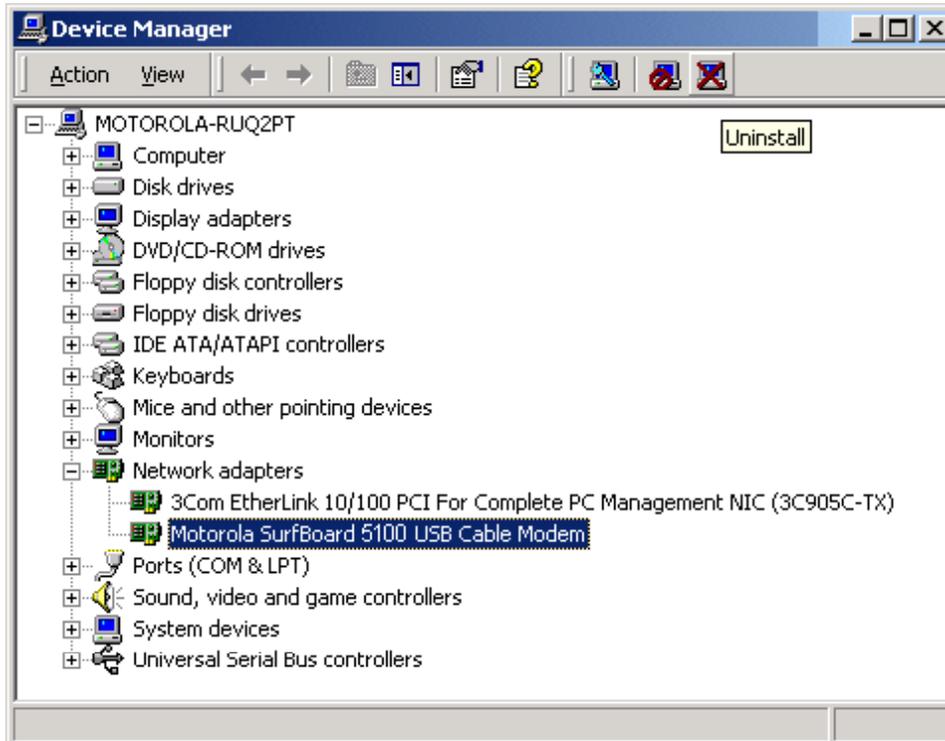
- 4 Double-click **System** and the System Properties window is displayed:



- 5 Click the **Hardware** tab then click on **Device Manager** to display the Device Manager window.
- 6 Double-click **Network Adapters**:

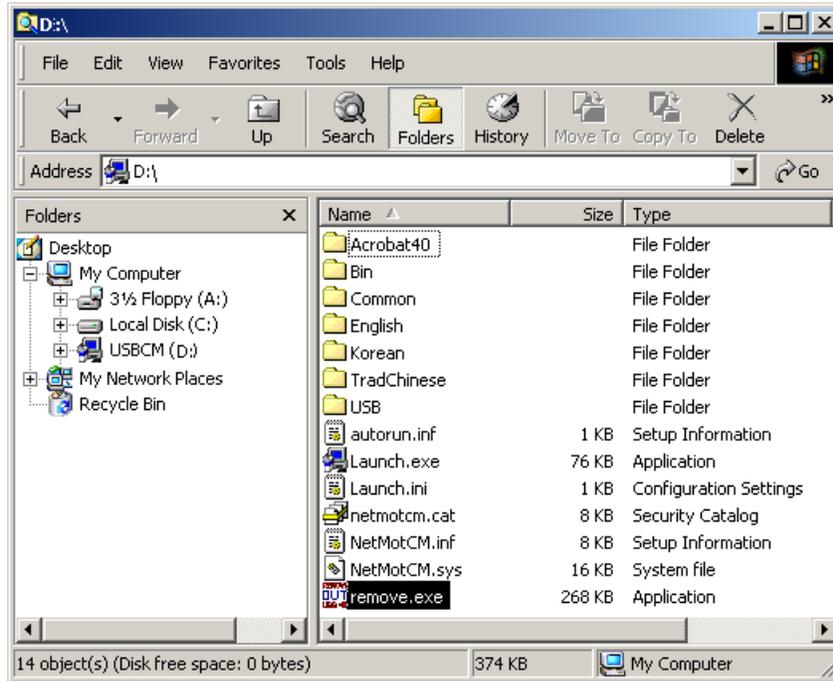


- Click **Motorola Surfboard USB Cable Modem**. The Uninstall icon is displayed on the window near the top:

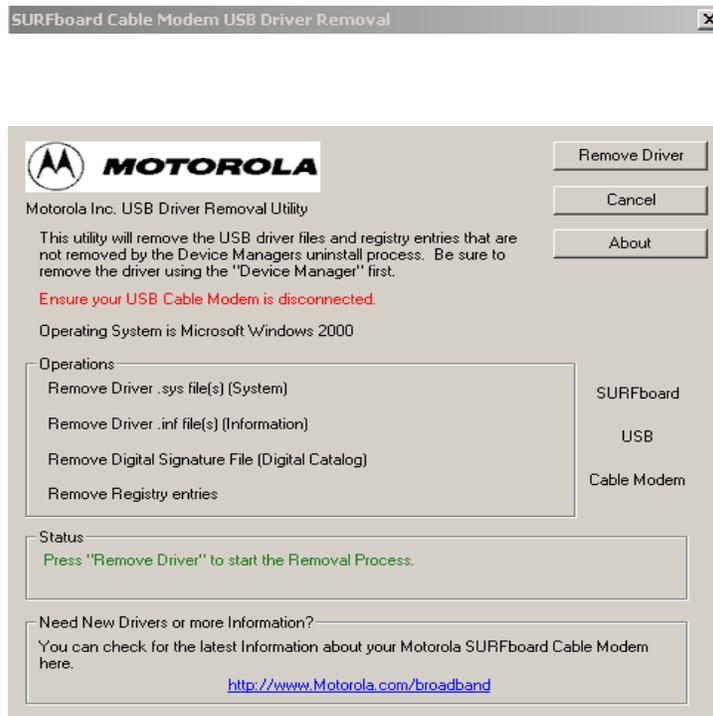


- Click the **Uninstall** icon
- Close the Device Manager window.
- Close the Control Panel window.
- Insert the *SURFboard Cable Modem* CD-ROM in the CD-ROM drive. After a short time, a window with language choices is displayed.
- Press the **Esc** key on the keyboard to exit the start-up screens.
- To start Windows Explorer, click **Start** and select **Run**.
- In the Run window, type **Explorer** and click **OK**.
- Double-click **My Computer**.

- 16 Double-click the CD-ROM drive icon (drive D: in our example).



- 17 Double-click the **remove.exe** icon. The SURFboard Cable Modem USB Driver Removal window is displayed:



The USB cable must be disconnected before running the REMOVE utility.

18 Click Remove Driver.

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

After you remove the USB driver, re-install the USB driver from “Setting Up a USB Driver for Windows 2000,” on page 3-10.

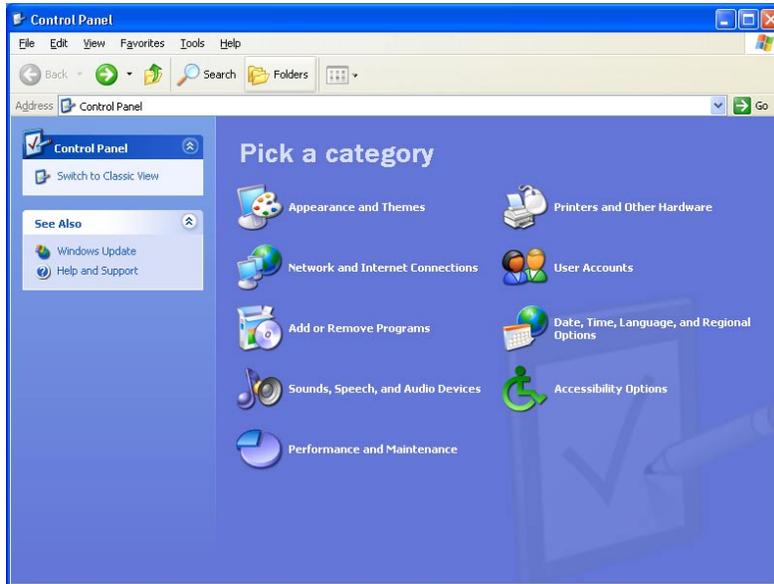
Removing USB Driver from Windows XP

To remove USB driver from Windows XP:

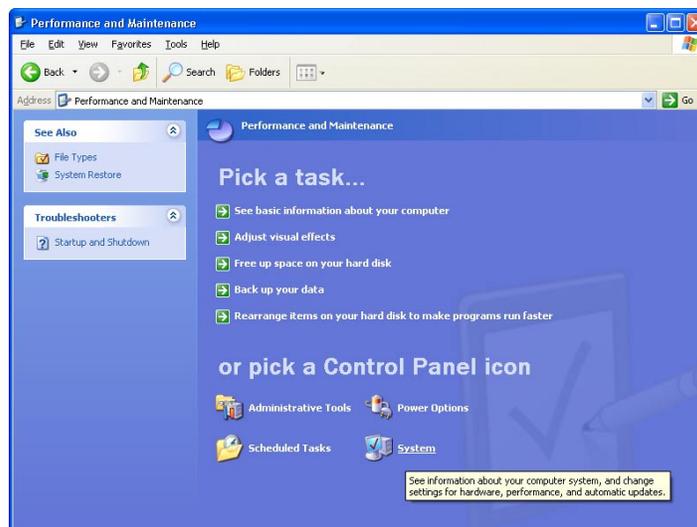
- 1 Click **Start** to display the Windows XP Start window:



- 2 Click **Control Panel** to display the Control Panel window (the display varies, depending on your Windows XP view options).

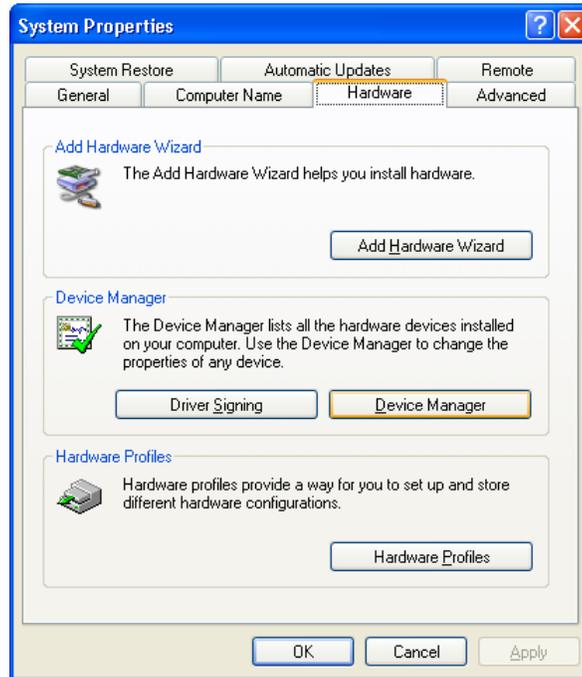


- 3 If a Category view similar to the one illustrated above is displayed, click **Performance and Maintenance**. The Performance and Maintenance window is displayed:

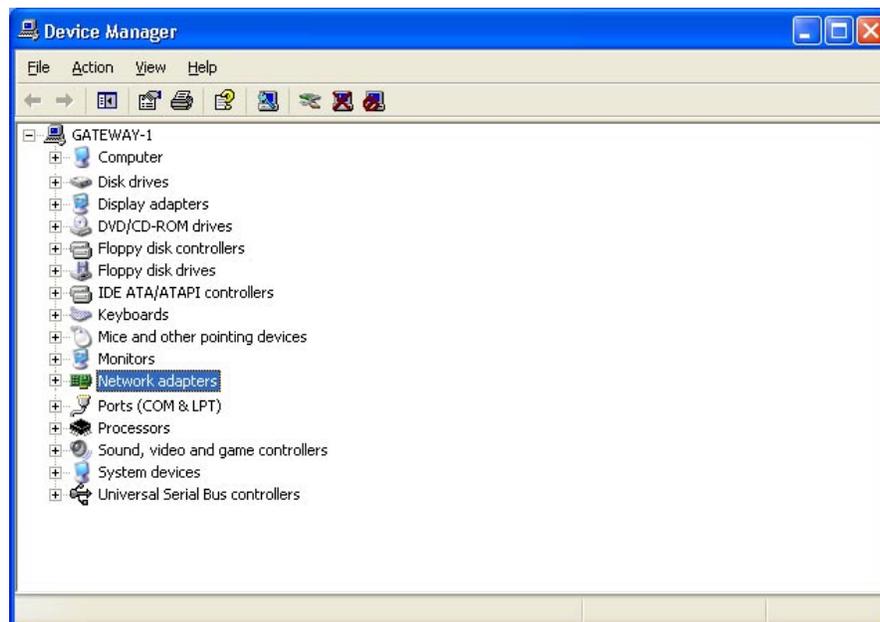


- 4 Click **System** to display the System Properties window.

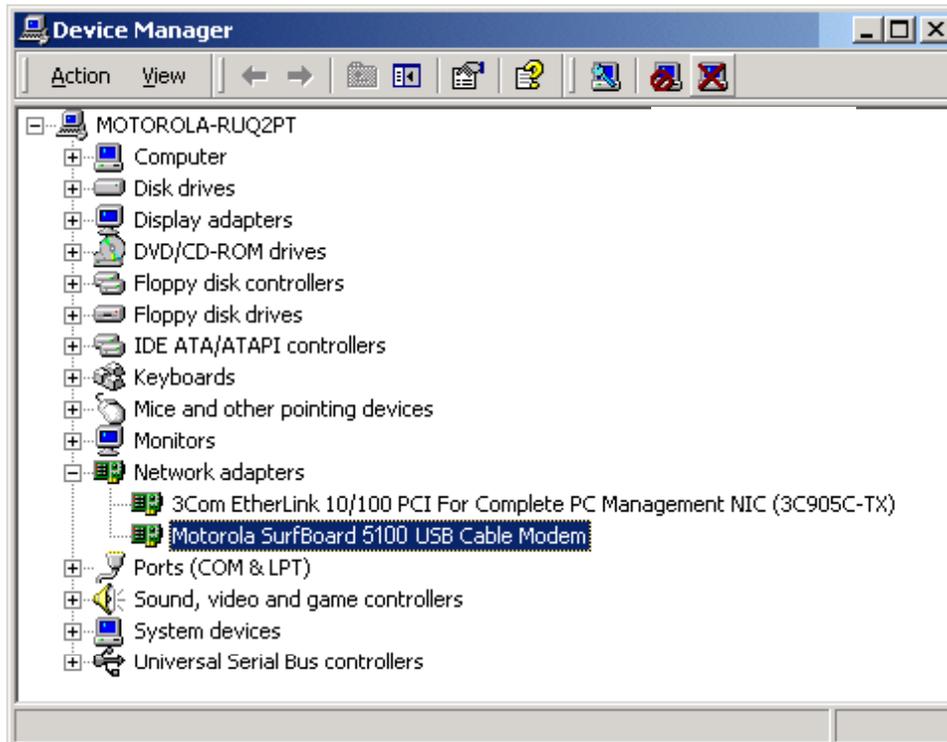
- 5 If a classic view is displayed, click **System** to display the System Properties window:



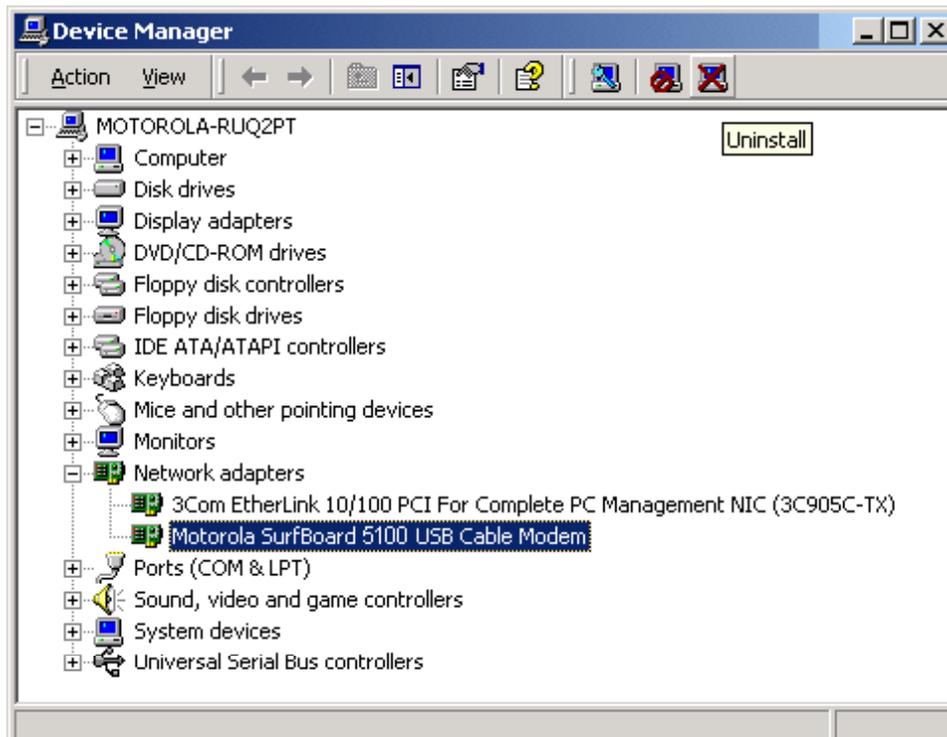
- 6 Click the **Hardware** tab.
- 7 Double-click the Device Manager button to display the Device Manager window:



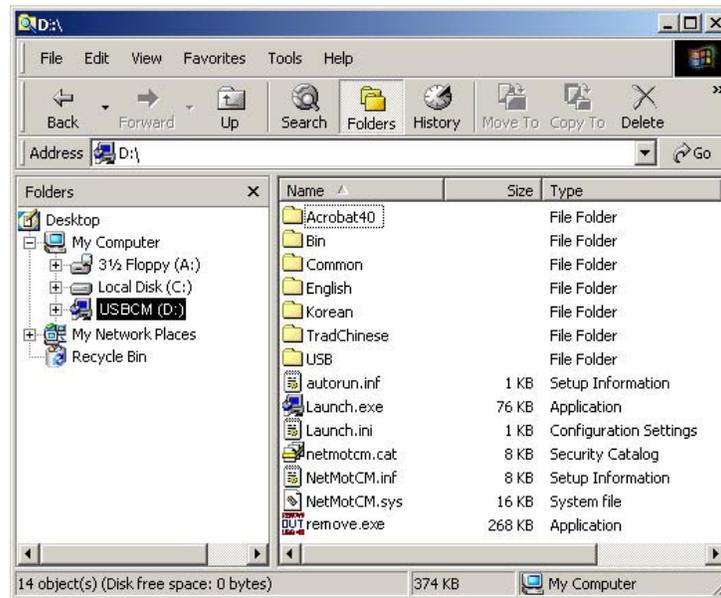
- 8 Double-click **Network adapters**. The adapters are displayed:



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

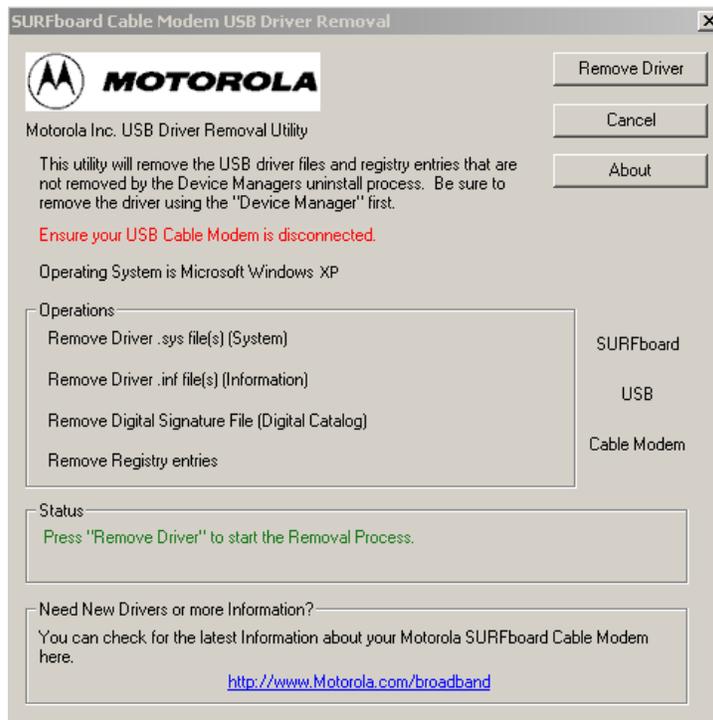


- 10 Click the **Uninstall** icon.
- 11 Close the Device Manager window.
- 12 Close the Control Panel window.
- 13 Insert the *SURFboard Cable Modem* CD-ROM in the CD-ROM drive. After a short time, a window with language choices is displayed.
- 14 Press **ESC** to exit the start-up screens.
- 15 To start 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 CD-ROM drive icon (drive D: in our example).

- 19 Double-click the **remove.exe** icon. The SURFboard Cable Modem USB Driver Removal window is displayed:



The USB cable must be disconnected before running the REMOVE utility.

- 20 Click **Remove Driver**.

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

After you remove the USB driver, re-install the USB driver from “Setting Up a USB Driver for Windows XP,” on page 3-16.

Recovering from Windows 98 or Win98_SE Installation Errors

This section discusses recovering from installation errors using the Motorola Remove program or Solution procedures.

If you cannot successfully install the USB driver or an error is displayed during driver installation, there may be invalid entries in the Windows Device Manager. Depending on where the error occurred, run the Motorola Remove program or perform the Solution procedures.

Remove Program

The Motorola Remove program deletes improper Windows entries that may have occurred during installation. It performs the same function as the device removals in Solutions 1 and 2. *The Remove program and the latest drivers can be downloaded from the website <ftp://ftp.surfboard.com/>. The files are in the following directory path:* pub/Downloads/SURFboard_USB_Driver/v20_Drivers.exe.

Before running the Remove program, unplug the USB cable from the cable modem.

Solutions

If you choose not to run the Motorola Remove program, you can perform the procedures in Solution 1 or Solution 2. Review both solutions before choosing which one to run.

Solution 1

- 1 Leave the USB cable plugged into the SURFboard cable modem and the computer.
- 2 From the Windows Desktop, right-click the **My Computer** icon to display a list of options.
- 3 Click **Properties** at the bottom of the list. The System Properties window is displayed.
- 4 On the System Properties window, click the **Device Manager** tab.
- 5 Expand the Universal Serial Bus controllers branch and see if there is an entry for **USB Composite Device**. The following additional entries are automatically removed when the USB Composite Device is removed:
 - Windows 98 Second Edition may list two entries as **USB Cable Modem** under **Other Devices**.
 - Windows 98 may list two entries as **Unknown Devices** under **Other Devices**.These additional entries are automatically removed when the USB Composite Device is removed.
- 6 Select the **USB Composite Device** and click **Remove**.

CAUTION!

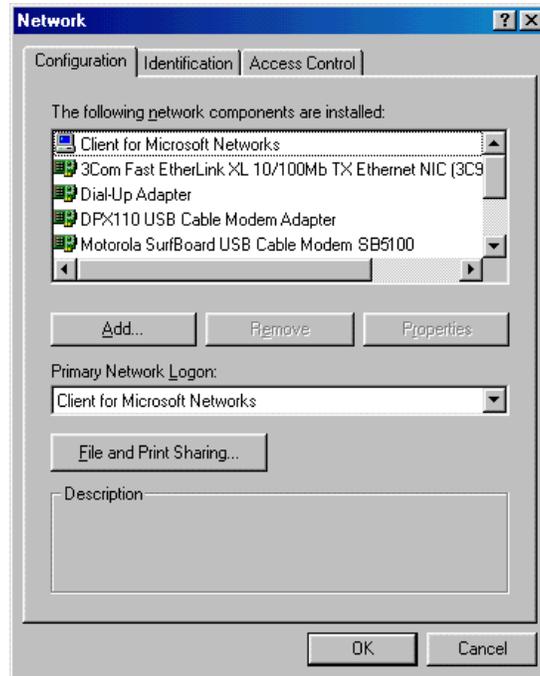


Extremely Important: After removing the USB composite device, disconnect the USB cable from the SURFboard cable modem and reboot the PC. To reinstall the USB drivers, follow the instructions in "Setting Up a USB Driver for Windows 98", page 3-5

Solution 2

The USB drivers may have loaded, but a protocol was not bound to the adapter. To test this:

- 1 Remove the USB cable from the SURFboard cable modem.
- 2 From the Windows Desktop, right-click the **Network Neighborhood** icon to display a list of options.
- 3 Click **Properties** at the bottom of the list. The Network window is displayed:



- 4 Click the **Configuration** tab, select the **Motorola Surfboard USB Cable Modem** entry, and then click **Properties**.
- 5 Click the **Bindings** tab. If TCP/IP is not listed, either add the protocol to the adapter or remove the entry for **Motorola SURFboard USB Cable Modem**.
- 6 To remove the entry, in the Network window, select **Motorola SURFboard USB Cable Modem** and click **Remove**.

CAUTION!



Extremely Important: After removing the device, restart the computer. To reinstall the USB drivers, follow the instructions in "Setting Up a USB Driver for Windows 98", page 3-5

The Motorola Remove program deletes improper Windows 98, Windows 98 Second Edition, Windows Me, Windows 2000, and Windows XP entries that may have occurred in the installation process.

*The Remove program and the latest drivers are available for download from the website <ftp://ftp.surfboard.com/>. The files are in the following directory path:
pub/Downloads/SURFboard_USB_Driver/v20_Drivers.exe.*

Prior to running the Remove program, unplug the USB cable from the SURFboard cable modem. The Remove program performs the same function as the removal of devices performed in Solution 1 and Solution 2 on the previous pages.

Setting the Frequency Using StormWatch

StormWatch™, the SURFboard Cable Modem Diagnostic Suite, is a cable modem utility that is available from Motorola. It runs from a CD-ROM and does not require installation on a hard drive. It can be used when installing the SURFboard cable modem to set the frequency and save startup time.

To set the frequency:

- 1 For the SURFboard cable modem, ensure that a laptop or PC is connected to the SURFboard cable modem rear-panel Ethernet port.
- 2 Turn on the PC and ensure that the SURFboard cable modem is booted up.
- 3 Connect StormWatch to 192.168.100.1.
- 4 Click **Configure** and then click **Channel Parameter**.
- 5 Type the desired *frequency* in Hertz; for example, 411 MHz = 411000000, in the **Downstream Frequency** field.
- 6 Type the *upstream channel ID* in the Upstream Channel ID field. (Not required)
- 7 Select a *frequency plan* type in the Frequency Plan field.
- 8 Click **Save** and then restart the cable modem.

Section 4

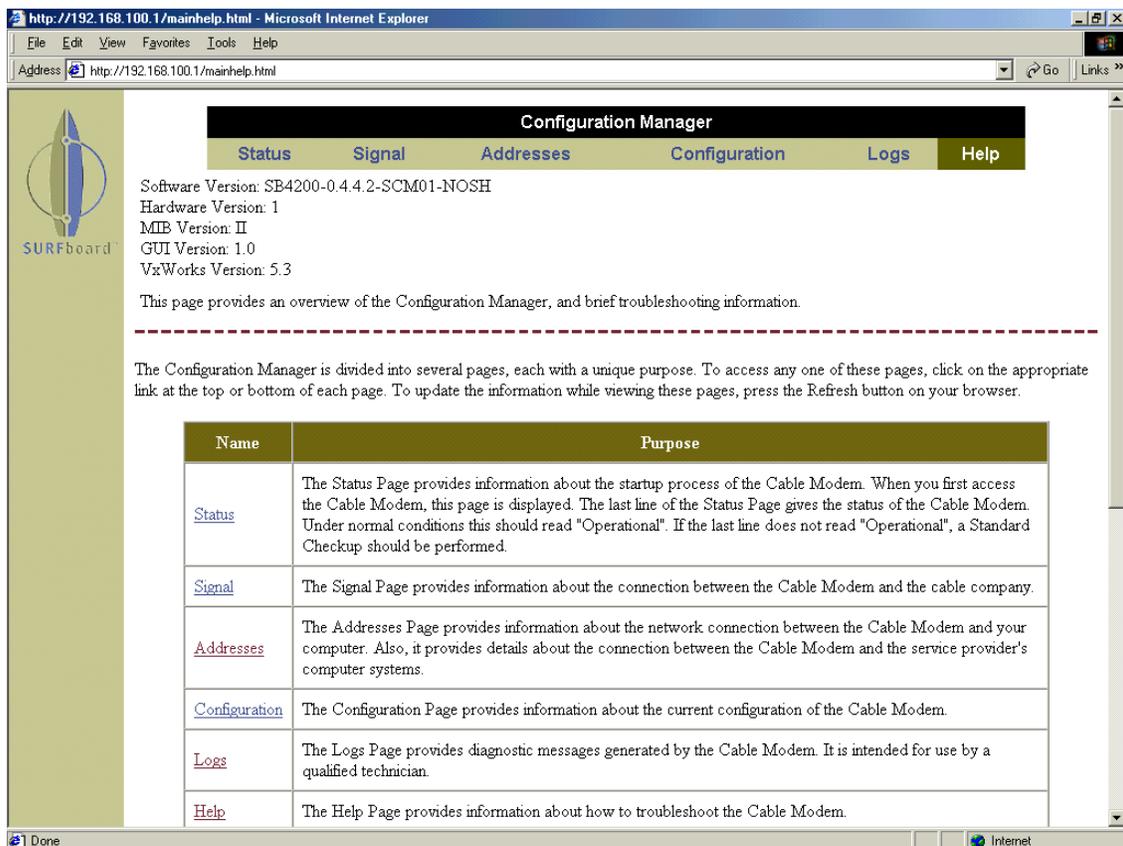
HTML User Interface

This section provides instructions for using the SURFboard cable modem HTML user interface. The windows — Help, Startup, Signal, Addresses, Configuration, and Logs — provide configuration and troubleshooting information, such as MAC and IP addresses and frequency and Event logs.

The IP address for this user interface is 192.168.100.1. To use the HTML user interface:

- 1 Connect a cable from the laptop or PC Ethernet port to the cable modem Ethernet port on the SURFboard cable modem rear panel.
- 2 Turn on the PC and verify that the SURFboard cable modem is plugged in.
- 3 Open the browser.
- 4 Type <http://192.168.100.1/mainhelp.html>. A Configuration Manager Help window is displayed as illustrated in Figure 4-1:

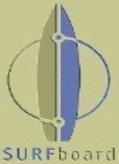
Figure 4-1
Configuration Manager Help window



This window provides an overview of the other windows and a standard troubleshooting checklist. From this window you can select any of the other windows by clicking on the buttons on the bottom toolbar.

- 5 Click **Status**, and the Configuration Manager Startup window is displayed:

Figure 4-2
Configuration Manager Startup window



Configuration Manager

[Status](#) | [Signal](#) | [Addresses](#) | [Wireless](#) | [Configuration](#) | [Logs](#) | [Help](#)

This page provides information about the startup process of the Cable Modem. If there is a problem with the startup, the word "Failed" may appear in the Status column. Should this occur, visit the Help area and perform the Checkup procedures listed there. If the problem continues, click on the word "Failed" for more detailed information about the failure, or call your service provider for assistance.

Task	Status
Acquire Downstream Channel	Done
Obtain Upstream Parameters	Done
Establish IP Connectivity using DHCP	Done
Establish Time Of Day	Done
Transfer Operational Parameters through TFTP	Done
Register Connection	Done
Initialize Baseline Privacy	Done
Cable Modem Status	Operational

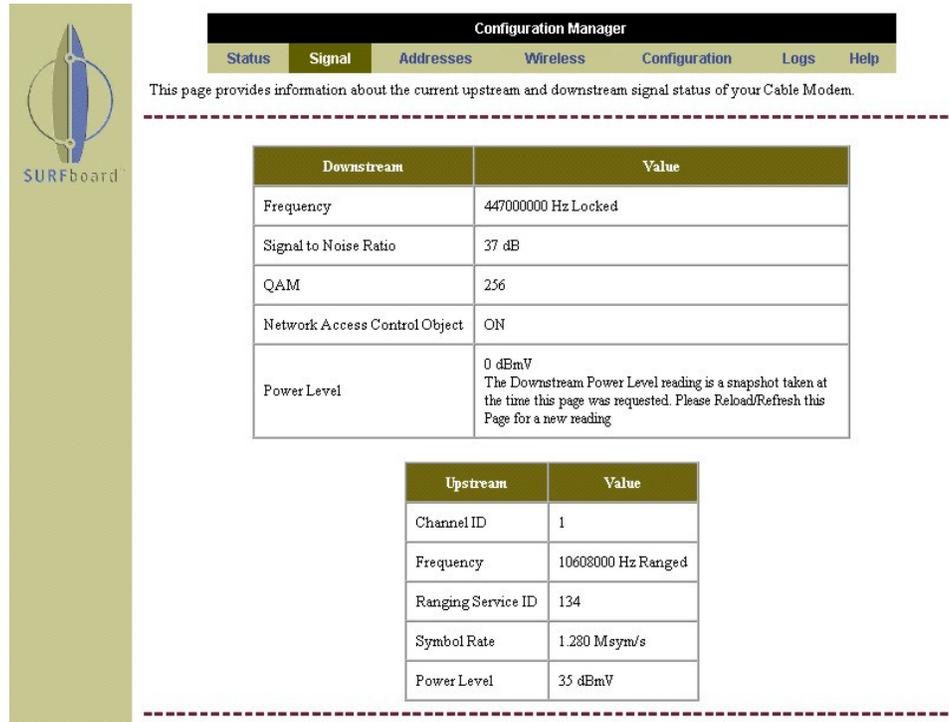
[Status](#) | [Signal](#) | [Addresses](#) | [Configuration](#) | [Logs](#) | [Help](#)



This window provides a power-up status for each item on the Task list. The last Status entry should be Operational as illustrated in Figure 4-2.

- 6 Click **Signal** to display the Configuration Manager Signal window:

Figure 4-3
Configuration Manager Signal window



The screenshot shows the Configuration Manager interface. On the left is the SURFboard logo. The main area has a navigation bar with 'Signal' selected. Below the navigation bar is a text box: "This page provides information about the current upstream and downstream signal status of your Cable Modem." Below this text are two tables.

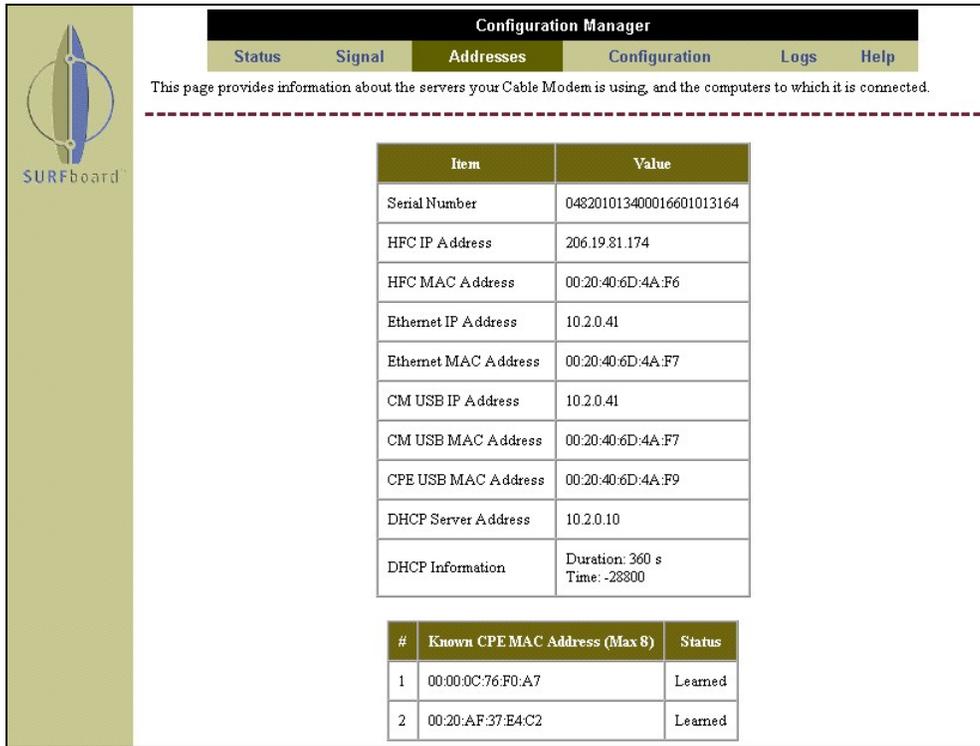
Downstream	Value
Frequency	447000000 Hz Locked
Signal to Noise Ratio	37 dB
QAM	256
Network Access Control Object	ON
Power Level	0 dBmV The Downstream Power Level reading is a snapshot taken at the time this page was requested. Please Reload/Refresh this Page for a new reading

Upstream	Value
Channel ID	1
Frequency	10608000 Hz Ranged
Ranging Service ID	134
Symbol Rate	1.280 Msym/s
Power Level	35 dBmV

This window provides the current downstream and upstream information.

- 7 Click **Addresses** to display the Configuration Manager Addresses window:

Figure 4-4
Configuration Manager Addresses window



Configuration Manager

Status Signal **Addresses** Configuration Logs Help

This page provides information about the servers your Cable Modem is using, and the computers to which it is connected.

Item	Value
Serial Number	048201013400016601013164
HFC IP Address	206.19.81.174
HFC MAC Address	00:20:40:6D:4A:F6
Ethernet IP Address	10.2.0.41
Ethernet MAC Address	00:20:40:6D:4A:F7
CM USB IP Address	10.2.0.41
CM USB MAC Address	00:20:40:6D:4A:F7
CPE USB MAC Address	00:20:40:6D:4A:F9
DHCP Server Address	10.2.0.10
DHCP Information	Duration: 360 s Time: -28800

#	Known CPE MAC Address (Max 8)	Status
1	00:00:0C:76:F0:A7	Learned
2	00:20:AF:37:E4:C2	Learned

This window provides a serial number, a list of current addresses, and DHCP information.

- 8 Click **Configuration** to display the Configuration Manager Configuration window:

Figure 4-5
Configuration window

The screenshot shows the Configuration Manager interface for a SURFboard cable modem. The interface has a navigation bar with tabs for Status, Signal, Addresses, Configuration, Logs, and Help. The Configuration tab is selected, displaying the following information:

- Configuration**
 - Frequency Plan: North American Standard/HRC/IRC
 - Upstream Channel ID: 1
 - Frequency (Hz): 447000000
- DHCP Server Enabled**

The SURFboard cable modem can be used as a gateway to the Internet by a maximum of 32 users on a Local Area Network (LAN). When the Cable Modem is disconnected from the Internet, users on the LAN can be dynamically assigned IP Addresses by the Cable Modem DHCP Server. These addresses are assigned from an address pool which begins with 192.168.100.11 and ends with 192.168.100.42. Statically assigned IP addresses for other devices on the LAN should be chosen from outside of this range.
- Reset All Defaults** (button)
- Note:**

Resetting the cable modem to its factory default configuration will remove all stored parameters learned by the cable modem during prior initializations. The process to get back online from a factory default condition could take from 5 to 30 minutes. Please reference the cable modem User Guide for details on the power up sequence.
- Restart Cable Modem** (button)

At the bottom of the window, there is a navigation bar with links for [Status](#), [Signal](#), [Addresses](#), [Configuration](#), [Logs](#), and [Help](#). The Motorola logo and copyright information (© Copyright 1997-2000) are also present.

The Configuration window displays the Frequency Plan, Upstream Channel ID, and Frequency that the cable modem currently uses for communication.

- 9 Type <http://192.168.100.1/logs.html>, and the Configuration Manager Logs window is displayed:

Figure 4-6
Configuration Manager Logs window



Configuration Manager					
Status	Signal	Addresses	Wireless	Configuration	Logs
This page displays detailed information intended for use by an authorized Motorola Corporation Cable Modem technician.					
Time	Priority	Code	Message		
001019171929	7- Information	I503.0	Cable Modem is OPERATIONAL		
001019171926	7- Information	F502.1	Bridge Forwarding Enabled.		
001019171926	7- Information	F502.3	Bridge Learning Enabled.		
001019171926	7- Information	E0.0	Baseline Privacy		
001019171923	7- Information	I500.0	Registration Completed		
001019171923	7- Information	I0.0	REG-RSP Registration Response		
001019171923	7- Information	I0.0	REG-REQ Registration Request		
001019171923	7- Information	D509.0	Retrieved TFTP Config cfg_default.bin SUCCESS		
001019171923	7- Information	D507.0	Retrieved Time..... SUCCESS		

This is a sample Events Log that is generated during startup and during operation. Refer to Appendix B, “Event Log Messages,” for the format and code definitions.

Section 5

Troubleshooting

This section provides information to assist you in quickly detecting, isolating, and resolving error conditions that might occur when using the SURFboard cable modem.

If you are still having trouble after trying the solutions found in this section, contact the Motorola Technical Response Center (TRC) at 1-888-944-HELP. Fill out the Troubleshooting Checklist (Table 5-2) before calling TRC.

If the SURFboard cable modem was off, it may require up to 10 minutes to scan for the upstream and downstream channels again. Table 5-1 lists fault indications, their symptoms, and possible resolutions:

Table 5-1
Troubleshooting guidelines

Problem	Possible Solution
Green POWER LED is off	<p>Check that the power cord is properly plugged into the outlet and SURFboard cable modem.</p> <p>Check that the electrical outlet is working.</p> <p>Press the Standby button to reconnect to the Internet service.</p> <p>Press the Reset button.</p>
Cannot receive or send data	<p>Check the LEDs. From top to bottom, note the first LED that is off. This LED indicates where the error occurred. If the first LED that is off is:</p> <p>Receive During startup, the downstream receive channel is not acquired. During normal operation, the downstream receive channel is lost.</p> <p>Send During startup, the upstream transmit channel is not acquired. During normal operation, the upstream transmit channel is lost.</p> <p>Online During startup, the IP registration was not successful. During normal operation, the IP registration is lost.</p> <p>Power The modem may be in standby mode, press the Standby button.</p> <p>Verify that the TV is working and has a clear picture.</p> <p>Check the coaxial cable at the modem and outlet and hand-tighten if necessary.</p> <p>Check the IP address (follow the steps in Section 3, "Installation and Operation").</p>

Table 5-2 is the troubleshooting checklist that provides TRC with needed information:

Table 5-2
Troubleshooting checklist

Complete description of the problem

Network layout and IP addresses

Firmware version *

CMTS:

Type

Operating system version

DHCP:

Operating system

Software version

Copy of the Event Log *

Copy of cable modem TFTP configuration file

Where in boot sequence does the SURFboard cable modem:

- fail
- monitor the LEDs
- monitor the console cable output if active

Does it acquire a downstream frequency lock?

Does it acquire an upstream channel?

Does it complete DHCP registration?

Does it get a successful TFTP download?

Did it work at one time, and if so, what has changed?

Does this issue affect other DOCSIS vendor modems?

Does this issue affect all nodes in the cable system?

Does the SURFboard cable modem work if provisioned in the headend, for example system test point or right at the node?

What application, if any, is failing and in what way?

If multi-user, is the MAX-CPE turned on in the DOCSIS TFTP configuration file?

* The firmware version and Event Log are accessible using the StormWatch Diagnostic Suite.

Appendix A

Specifications

Downstream

Modulation	64 QAM or 256 QAM
Data rate	38 Mbps maximum (limited by such factors as customer provider equipment (CPE) and service provider restrictions)
Frequency	88 MHz to 860 MHz (30 kHz minimum step size)
Bandwidth	6 MHz
Symbol rate:	
64 QAM	5.069 Msym/s maximum
256 QAM	5.361 Msym/s maximum
Operating level	-15 dBmV to +15 dBmV
Input impedance	75 ohms nominal

Upstream

Modulation	16 QAM or QPSK (variable symbol rates)
Transmission rate	30 Mbps maximum
Bandwidth	200 kHz to 3200 kHz
Frequency	5 MHz to 42 MHz (edge to edge)
Symbol rates	160, 320, 640, 1280, and 2560 ksym/s
Operating levels:	
16 QAM	+8 dBmV to +55 dBmV
QPSK	+8 dBmV to +53 dBmV
Output impedance	75 ohms nominal

General

Data protocol	TCP/IP
Interface to PC	Ethernet 10/100Base-T and USB
Power	Approximately 9 Watts (+12VDC)
Power adapter input	North America: 105 to 125 Vac, 60 Hz International: 100 to 240 Vac, 50 to 60 Hz
Dimensions	6.2" H x 2.3" W x 6.0" L
Operating temperature	0 to +40° C
Storage temperature	-30° C to +80° C
Operating humidity	0% to 95% RH, non-condensing

Appendix B

Event Log Messages

This appendix defines the messages in the Events Log. This log is generated during startup and operation and contains up to 200 entries.

Event Message Format

The entries can be 80 characters long and contain a time stamp, the priority level, and a letter and numeric code.

The format is MMDDHHMMSS P XNNN.N event message.

MMDDHHMMSS	Time stamp consisting of 10 characters. ***** is displayed until the time is retrieved from the timeserver
P	Log priority level (refer to Table B-1)
X	Letter code associated with the message
NNN.N	Numeric code associated with the message
Event message	String reporting status or error (can contain specific values which apply to the event being reported)

Priority Levels

Table B-1 describes the priority level:

Table B-1
Priority level

Priority Level	Description	Log Priority Level
1	Emergency	A panic condition that is broadcasted to all users.
2	Alert	A condition to be corrected immediately, such as a corrupted system database.
3	Critical	A critical condition such as hard device errors.
4	Error	Error messages.
5	Warning	Warning messages.
6	Notice	Conditions that are not error conditions but may require special handling.
7	Information	Informative messages.
8	Debug	Messages that contain information normally used to debug a program.

Predefined Log Messages

SP-RFI_I05-991105 – Error Codes for MAC Management Messages

SYNC Timing Synchronization

Code	Event Log Messages	Level	Cable Modem Actions
T00.0	SYNC Timing Synchronization		
T01.0	Failed to acquire QAM/QPSK symbol timing. Error stats? Retry #s?		
T02.0	Failed to acquire FEC framing. Error stats? Retry #s? # of bad frames?		
T02.1	Acquired FEC framing. Failed to acquire MPEG2 Sync. Retry #s?		
T03.0	Failed to acquire MAC framing. Error stats? Retry #s? # of bad frames?		
T04.0	Failed to Receive MAC SYNC frame within time-out period.		
T05.0	Loss of Sync. (Missed 5 in a row, after having Synced at one time)		

UCD Upstream Channel Descriptor

Code	Event Log Messages	Level	Cable Modem Actions
U00.0	UCD Upstream Channel Descriptor		
U01.0	No UCDs Received. Time-out.		
U02.0	UCD invalid or channel unusable.		
U03.0	UCD valid, BUT no SYNC received. TIMED OUT.		
U04.0	UCD & SYNC valid, NO MAPS for THIS Channel.		
U05.0	UCD received with invalid or out of order Configuration Change Count.		
U06.0	US Channel wide parameters not set before Burst Descriptors		

MAP Upstream Bandwidth Allocation

Code	Event Log Messages	Level	Cable Modem Actions
M00.0	MAP Upstream Bandwidth Allocation		
M01.0	A transmit opportunity was missed because the MAP arrived too late		

RNG-RSP Ranging Response

Code	Event Log Messages	Level	Cable Modem Actions
R00.0	RNG-RSP Ranging Response		
R01.0	NO Maintenance Broadcasts for Ranging opportunities Received T2 time-out.		
R02.0	No Ranging Response received, T3 time-out		
R03.0	Ranging Request Retries exhausted.		
R04.0	Received Response to Broadcast Maintenance Request, But no Unicast Maintenance opportunities received. T4 time-out.		
R05.0	Started Unicast Maintenance Ranging no Response received. T3 time-out.		
R06.0	Unicast Maintenance Ranging attempted, No Response, Retries exhausted.		
R07.0	Unicast Ranging Received Abort Response, Re-initializing MAC.		

RNG-REQ Ranging Request

Code	Event Log Messages	Level	Cable Modem Actions
R100.0	RNG-REQ Ranging Request		
R101.0	No Ranging Requests received from POLLED CM (CMTS generated polls)		
R102.0	Retries exhausted for polled CM (report SID). After 16 R101.0 errors.		
R103.0	Unable to Successfully Range CM (report SID) Retries Exhausted. Note: this is different from R102.0 in that it was able to try; i.e., got REQs but failed to Range properly.		
R104.0	Failed to receive Periodic RNG-REQ from modem (SID X), Timing-out SID.		

REG-REQ Registration Request

Code	Event Log Messages	Level	Cable Modem Actions
I100.0	REG-REQ Registration Request	7 (Info)	No action taken
I101.0	Invalid MAC header.		
I102.0	Invalid SID, not in use.		

Code	Event Log Messages	Level	Cable Modem Actions
I103.0	Required TLVs out of order.		
I104.0	Required TLVs not present.		
I105.0	Down Stream Frequency format invalid in length.	4 (Error)	Won't be saved to memory
I105.1	Down Stream Frequency not in use.		
I105.2	Down Stream Frequency invalid, not a multiple of 62500Hz.	4 (Error)	CM will continue reading next bytes of Config file. Set to 0 value
I106.0	Up Stream Channel invalid, unassigned.	4 (Error)	
I106.1	Up Stream Channel Change followed with (RE-) Registration REQ.		
I107.0	Up Stream Channel overloaded.		
I108.0	Network Access configuration has invalid parameter (length).	4 (Error)	Continue reading next bytes of Config file. Set to 0 value
I109.0	Class of Service configuration is invalid.		
I110.0	Class of Service ID is not in TFTP config.	7 (Info)	No action taken
I111.0	Class of Service ID out of range.	4 (Error)	Continue reading next bytes of Config file. Log it. If Reg-Response returns OK, reboot to notify CMTS the range error
I111.1	Class of Service ID invalid length	4 (Error)	
I112.0	Max Downstream Bit rate configuration has invalid length	4 (Error)	Continue reading next bytes of Config file. Set to 0 value
I112.1	Max Downstream Bit Rate configuration is not in TFTP config.	7 (Info)	Continue reading next bytes of Config file. Set to 0 value
I113.0	Max Upstream Bit rate configuration has invalid length	4 (Error)	Continue reading next bytes of Config file. Set to 0 value
I113.1	Max Upstream Bit Rate configuration is not in TFTP config	7 (Info)	Continue reading next bytes of Config file.
I114.0	Up Stream Priority configuration invalid format.	4 (Error)	
I114.1	Up Stream Priority configuration setting out of range.	4 (Error)	Continue reading next bytes of Config file. Set to 7 value as lowest priority
I114.2	Upstream Priority configuration has invalid length	4 (Error)	Set to correct length and continue reading next bytes of Config file.
I114.3	Vendor Spec has invalid length/type of vendor ID	4 (Error)	Set to correct length and continue reading next bytes of Config file.
I114.4	Vendor Spec has invalid length	4 (Error)	Set to correct length and continue reading next bytes of Config file.
I115.0	Min Upstream Channel Bit Rate configuration setting invalid length	4 (Error)	Continue reading next bytes of Config file. Set to 0 value

Code	Event Log Messages	Level	Cable Modem Actions
I115.1	Guaranteed Min Up Stream Channel Bit Rate configuration setting exceeds Max Upstream Bit Rate.	4 (Error)	Continue reading next bytes of Config file. Set to Max
I115.2	Guaranteed Min Up Stream Channel Bit Rate configuration setting out of range		
I116.0	Max Upstream Channel Transmit Burst configuration setting invalid length	4 (Error)	Continue reading next bytes of Config file. Set to 0 value
I116.1	Max Up Stream Channel Transmit Burst configuration setting out of range	4 (Error)	Continue reading next bytes of Config file. Set to 255
I117.0	Modem Capabilities configuration setting invalid format.	7 (Info)	Continue reading next bytes of Config file. Set to 0 value
I117.1	Modem Capabilities configuration setting.	7 (Info)	No action taken

REG-RSP Registration Response

Code	Event Log Messages	Level	Cable Modem Actions
I00.0	REG-RSP Registration Response	7 (Info)	No action taken
I01.0	Registration RSP invalid format or not recognized	4 (Error)	Ignore it and continue reading next bytes of REG-RSP msg
I02.0	Registration RSP not received.	4 (Error)	Reset the board.
I03.0	Registration RSP with bad SID.	4 (Error)	Continue reading next bytes of REG-RSP msg.
I04.0	Service not available. Reason: Other		
I04.1	Service not available. Reason: Unrecognized configuration setting		
I04.2	Service not available. Reason: Temporarily unavailable		
I04.3	Service not available. Reason: Permanent		

UCC-REQ Upstream Channel Change Request

Code	Event Log Messages	Level	Cable Modem Actions
C00.0	UCC-REQ Upstream Channel Change Request	7 (Info)	No action taken
C01.0	Async Msg received with invalid US Channel ID length.	4 (Error)	CM will fix to correct length, continue parsing the channel ID value, and send UCC-RSP to CMTS.
C02.0	UCC-REQ received unable to send UCC-RSP, no TX opportunity.		

UCC-RSP Upstream Channel Change Response

Code	Event Log Messages	Level	Cable Modem Actions
C100.0	UCC-RSP Upstream Channel Change Response	7 (Info)	No action taken
C101.0	UCC-RSP not received on previous channel ID.		
C102.0	UCC-RSP received with invalid channel ID.		
C103.0	UCC-RSP received with invalid channel ID on new channel.		

DHCP CM Net Configuration Download and Time of Day

Code	Event Log Messages	Level	Cable Modem Actions
D00.0	DHCP CM Net Configuration download and Time of Day	7 (Info)	No action taken
D01.0	Discover sent no Offer received, No available DHCP Server.	4 (Error)	
D02.0	Request sent, no Response.	4 (Error)	
D03.0	Requested Info not supported.	4 (Error)	
D03.1	DHCP response doesn't contain ALL the valid fields as described in the RF spec	4 (Error)	
D04.0	Time of Day, none set or invalid data.		
D04.1	Time of Day Request sent no Response received	5 (Warn)	CM will time out in 10 secs and retry 2 nd time. If still fails, ignore it
D04.2	Time of Day Response received but invalid data/format.	5 (Warn)	CM will time out in 10 secs and retry 2 nd time. If still fails, ignore it
D05.0	TFTP Request sent, No Response/No Server.	1 (Alert)	<p>CM will keep retrying 3 times. If unsuccessful, reset the board and acquire the same frequency.</p> <p>If still failed after 3 attempts, again, reset the board 2nd time and try to acquire the 2nd frequency in memory.</p> <p>If still failed after 3 attempts, reset the board 3rd time and try to scan the next frequency in the frequency plan. The board will eventually reboot due to incomplete registration</p> <p>Notes: To avoid repeated retrying, type "clrscanflag" and reset the board. It will acquire the current frequency over and over when 3 TFTP attempts are failed</p>
D06.0	TFTP Request Failed, configuration file NOT FOUND.	1 (Alert)	
D07.0	TFTP Failed, OUT OF ORDER packets.		

Code	Event Log Messages	Level	Cable Modem Actions
D08.0	TFTP complete, but failed Integrity Check (MIC).	1 (Alert)	Same as D05.0
D09.0	TFTP, Unable to allocate spaces, CONTINUE	4 (Error)	CM continues reading the next bytes of REG-RSP msg
D10.0	REG-RESP, Serv Not Avail Resp Len	4 (Error)	CM set to correct length and continue reading the next bytes

Baseline Privacy

B00.0	Baseline Privacy	7 (Info)	No action taken
B01.0	TBD		

SURFboard Cable Modem Specific Log Messages

The SB5100 supports only DOCSIS required log messages and does not support x500 messages.

Baseline Privacy

Code	Event Log Messages	Level	Cable Modem Actions
B500.0	Error occurred while reading MAC messages for BLP	4 (Error)	Discard the msg and wait for the next one
B502.0	Unmatched Id when received Auth Reply [ReqId] [ReclId]	2 (Alert)	Discard the msg and wait for the next one
B502.1	Unmatched Id when received Key Reply [ReqId] [ReclId]	2 (Alert)	Discard the msg and wait for the next one
B502.2	Unmatched Id when received Auth Invalid [ReqId] [ReclId]	2 (Alert)	Unsolicited ID. Continue parsing next bytes
B502.3	Unmatched Id when received TEK Invalid Msg [ReqId] [ReclId]	2 (Alert)	Unsolicited ID. Continue parsing next bytes
B503.0	Invalid Key Seq Num type [invalid type num] from Auth Reply Msg	4 (Error)	Ignore it. Continue parsing next bytes
B503.1	Invalid type [type] from Auth Reject or TEK Invalid Msg	4 (Error)	Ignore it. Continue parsing next bytes
B503.2	Invalid Auth key type [type] from Auth Reply Msg	4 (Error)	Ignore it. Continue parsing next bytes
B503.3	Invalid Error Code type [invalid type num] from Auth Reject or TEK Invalid Msg	4 (Error)	Discard the Auth Reject or TEK Invalid Msg
B503.4	Invalid Error String type from Auth Reject or Auth Invalid Msg	4 (Error)	Ignore it. Continue parsing next bytes
B503.5	Invalid Auth key type [type] from Auth Reply Msg	4 (Error)	Ignore it. Continue parsing next bytes
B504.0	Invalid type [type] from Key Reply Msg	4 (Error)	Ignore it. Continue parsing next bytes
B504.1	Invalid SID [Sid Num] from Key Reply Msg	4 (Error)	Discard the msg and call HandleTekInvalid() to issue another key request to CMTS

Code	Event Log Messages	Level	Cable Modem Actions
B504.2	Invalid HMAC Digest type [type] from Key Reply Msg	4 (Error)	Ignore it.
B504.3	Invalid Msg type [type] from Key Reject or TEK Inv	4 (Error)	Ignore it. Continue parsing next bytes
B504.4	Invalid SID [sid] from Key Reject or TEK Inv	4 (Error)	Discard the msg.
B505.0	BC3220 driver supports up to [nsid] Sids and CMTS sent [nsids] Sids	5 (Warn)	Set up to nsids(4) BC3220 supports
B506.0	Unmatched Identifier when received Auth Reject Msg, ReqId = [reqid], Rec Id = [recid]	2 (Alert)	Unsolicited ID. Continue parsing next bytes
B507.0	Received BLP MAC code type [Type] from CMTS	7 (Info)	For information purposes.
B507.1	Received Invalid BLP MAC code type [type] from CMTS	7 (Info)	Continue parsing next bytes
B508.0	Received BLP Internal Msg [Msg]	7 (Info)	For information purposes.
B509.0	Authentication HMAC digest Failed. Invalid Packet	4 (Error)	Ignore it. CMTS send 0 HMAC Digest value.
B510.0	Driver has forwarded INVALID TEK Sid.	5 (Warn)	Discard the message
B510.1	SNMP forwarded INVALID Sid %d. Unable to enable it	5 (Warn)	Discard the message
B510.2	SNMP forwarded INVALID Sid %d or it's already disabled	5 (Warn)	Discard the message
B511.0	KEK bad state on HandleTimer()	2 (Alert)	Discard the message
B511.1	KEK bad state on HandleStartup()	2 (Alert)	Discard the message
B511.2	KEK bad state [state] on HandleAuthOk()	2 (Alert)	Discard the message
B511.3	KEK bad state on HandleAuthReject()	2 (Alert)	Discard the message
B511.4	KEK bad state on HandleAuthInvalid()	2 (Alert)	Discard the message
B511.5	KEK bad state on ForceReauth()	2 (Alert)	Discard the message
B512.0	Author Reject error code [error code]	4 (Error)	Report error code to SNMP event log
B513.0	Error writing BLP data to MAC pipe	4 (Error)	No action taken
B514.0	Driver allows [NumSid] Sids, CMTS provided [NumSid] Sids	5 (Warn)	Set to nSids in Driver
B515.0	Throw away this Sid [NumSid]	5 (Warn)	No action taken
B516.0	TEK bad state on HandleTimer()	2 (Alert)	Discard the message
B516.1	TEK bad state on HandleStartup()	2 (Alert)	Discard the message
B516.2	TEK bad state on HandleStop()	2 (Alert)	Discard the message
B516.3	TEK bad state on HandleAuthPending()	2 (Alert)	Discard the message
B516.4	TEK bad state on HandleAuthComplete()	2 (Alert)	Discard the message
B516.5	TEK bad state on HandleTekInvalid()	2 (Alert)	Discard the message

Code	Event Log Messages	Level	Cable Modem Actions
B516.6	TEK bad state %d on Key Reply()	2 (Alert)	Discard the message
B516.7	TEK bad state on HandleKeyReject()	2 (Alert)	Discard the message
B517.0	Received Auth Invalid with error code [ErrorCode]	4 (Error)	Report error code to SNMP event log
B517.1	Received SNMP Rekey. Unauthorized CM	4 (Error)	Report error code to SNMP event log
B517.2	Received Key Reject with error code [ErrorCode]	4 (Error)	Report error code to SNMP event log
B517.3	Received TEK Invalid Msg with error code [ErrorCode]	4 (Error)	Report error code to SNMP event log
B518.0	Baseline privacy is skipped	7 (Info)	For information purposes
B519.0	Missing required attributes from Key Reply msg [number]	2 (Alert)	Silently discarded and send another Key Request to CMTS
B520.0	Missing required attributes from Auth Reply msg [number]	2 (Alert)	MUST silently discarded according to PICS. However, current image, CM always received up to 3 attributes vs. 4 from CMTS, we have to take it anyway. Need to fix it later to silently discard.
B521.0	BPKM message packet len [packet len value] > length field [length field value]	7 (Info)	Ignore it. Continue parsing the msg
B521.1	BPKM message packet len [packet len value] < length field [length field value]	7 (Info)	Discard the message
B522.0	Ignore invalid error code [error code].	7 (Info)	Discard the message
B523.0	Error extracting Author Reject Msg	4 (Error)	Discard the message
B523.1	Error extracting Key Reject Msg	4 (Error)	Discard the message
B523.2	Error extracting Author Invalid Msg	4 (Error)	Discard the message
B523.3	Error extracting TEK Invalid Msg	4 (Error)	Discard the message
B524.0	Unmatched Identifier when received Key reject Msg [ReqlId] [ReclId]	2 (Alert)	Unsolicited ID. Continue parsing the next bytes
B530.0	Unable to allocate private key	1 (Emerg)	No action taken. For future development will reset the CM
B531.0	Unable to create decryption algorithm object	1 (Emerg)	No action taken. For future development will reset the CM
B532.0	Unable to set decryption algorithm object	1 (Emerg)	No action taken. For future development will reset the CM
B533.0	Unable to initialize RSA decryption	1 (Emerg)	No action taken. For future development will reset the CM
B534.0	Unable to perform RSA decryption	1 (Emerg)	No action taken. For future development will reset the CM
B535.0	Unable to finalize RSA decryption	1 (Emerg)	No action taken. For future development will reset the CM
B551.0	Invalid Sid From Key Reply, Issue Another Key Req	1 (Emerg)	Discard the message and issue another Key request

Code	Event Log Messages	Level	Cable Modem Actions
B555.0	First DRIVER_TEK_INVALID Msg	7 (Info)	Information purpose to indicate that CM just receives a first TEK Invalid Message from the driver due to CRC failed.
B555.1	Just received another TEK_INVALID Msg	7 (Info)	Information purpose to indicate that CM received another TEK Invalid message from the driver due to CRC failed
B556.0	BLP – Authorization Wait Timeout out of range	4 (Error)	Log it
B556.1	BLP – Reauthorization Wait Timeout out of range	4 (Error)	Log it
B556.2	BLP – Operational Wait Timeout out of range	4 (Error)	Log it
B556.3	BLP – Rekey Wait Timeout out of range	4 (Error)	Log it
B556.4	BLP – TEK Grace Timeout out of range	4 (Error)	Log it
B556.5	BLP – Authorization Reject Wait Timeout out of range	4 (Error)	Log it
B556.6	BLP – Authorization Grace Timeout out of range	4 (Error)	Log it

DHCP / TFTP

Code	Event Log Messages	Level	Cable Modem Actions
D500.0	Error in initializing DHCP Client	4 (Error)	
D501.0	TFTP - Unable to allocate spaces for Modem Capabilities data.	4 (Error)	Set value to 0. Possibly reset the board
D501.1	TFTP, Unable to allocate space for software upgrade filename, CONTINUE	4 (Error)	Set to NULL.
D501.2	TFTP, Unable to allocate spaces for Class of Service, CONTINUE	4 (Error)	Set to NULL.
D501.3	TFTP, Unable to allocate spaces for SNMP Access Ctrl Obj, CONTINUE	4 (Error)	Set to NULL.
D501.4	TFTP, Unable to allocate space for SNMP Access Ctrl, CONTINUE	4 (Error)	Set to NULL.
D501.5	TFTP, Unable to allocate spaces for SNMP MIB Obj, CONTINUE	4 (Error)	Set to NULL.
D501.6	TFTP, Unable to allocate spaces for whole buffer	4 (Error)	Set to NULL. The board will reset
D501.7	TFTP, Unable to allocate spaces for Vendor Spec Data, CONTINUE	4 (Error)	Set to NULL
D501.8	TFTP, Unable to allocate spaces for vendor spec	4 (Error)	Set to NULL

Code	Event Log Messages	Level	Cable Modem Actions
D501.9	TFTP, Unable to allocate spaces for SNMP Write Access Control Data, CONTINUE	4 (Error)	Set to NULL
D502.0	TFTP, Invalid CM MIC Len, CONTINUE	4 (Error)	Continue parsing the next bytes
D502.1	TFTP, Invalid CMTS MIC Len, CONTINUE	4 (Error)	Continue parsing the next bytes
D502.2	TFTP, Invalid Vendor ID Len, CONTINUE	4 (Error)	Continue parsing the next bytes
D502.3	TFTP, Invalid SNMP MIB Obj Len, CONTINUE	4 (Error)	Continue parsing the next bytes
D502.4	TFTP, Modem IP Addr Len, CONTINUE	4 (Error)	Continue parsing the next bytes
D502.5	TFTP, Serv Not Avail Resp Len, CONTINUE	4 (Error)	Continue parsing the next bytes
D502.6	TFTP, CPE Ether MAC Addr Len, CONTINUE	4 (Error)	Continue parsing the next bytes
D502.7	TFTP, SNMP IP Addr Len, CONTINUE	4 (Error)	Continue parsing the next bytes
D502.8	Invalid Class Of Service Privacy Enable Length	4 (Error)	Continue parsing the next bytes
D503.0	TFTP, Max CPEs exceed its limit of 32 allowed by CM. Set to 32 only.	4 (Error)	Set to 32
D503.1	TFTP, Invalid type, CONTINUE	4(Error)	Ignore that type
D507.0	Retrieved Time SUCCESS	7 (Info)	No action taken
D507.1	Retrieved Time FAILED	7 (Info)	No action taken
D508.0	Unable to retrieve Time from Time Server. Continue.	4 (Error)	CM will retry 2 nd time. If still fails, ignore it.
D509.0	Retrieved TFTP ConfigSUCCESS	7 (Info)	
D510.0	Unable to create Timer client socket	5 (Warn)	CM will retry 2 nd time. If still fails, ignore it.
D511.0	Retrieved DHCPSUCCESS	7 (Info)	
D512.0	Unable to send Timer Request	5 (Warn)	CM will retry 2 nd time. If still fails, ignore it.
D514.0	Unable to write config params to NVRAM.	1 (Emerg)	Reports flash corruption to event log.
D514.1	Unable to write logs to NVRAM.	1 (Emerg)	Reports flash corruption to event log.
D515.0	Unable to retrieve config params from NVRAM	3 (Critical)	Set to defaults
D516.0	Unable to write DHCP_LEASE_RENEWAL_FAILED to pipe	1 (Emerg)	Continue
D517.0	DHCP Lease Renewal	7 (Info)	

Code	Event Log Messages	Level	Cable Modem Actions
D518.0	Unable to write DHCP_LEASE_RENEWAL_ABOUT_TO_FAIL to pipe	1 (Emerg)	Continue
D519.0	DHCP Client shutting down	7 (Info)	Continue
D520.0	DHCP Client unable to bind HFC interface	1 (Emerg)	Retry 2 more times
D521.0	DHCP Lease Renewal Failure	5 (Warn)	Renew Lease function fails
D522.0	DHCP Lease Expired	1 (Emerg)	Logged when event occurs
D523.0	DHCP Rebinding Timer Event	5 (Warn)	Logged if the 87% point is reached in the lease
D530.0	DHCP - Invalid IP Address	4 (Error)	Logged if the Address is 0 or FFFFFFFF return NULL pointer to SC
D530.1	DHCP - Invalid Subnet Mask	4 (Error)	Logged if the Address is 0 or FFFFFFFF return NULL pointer to SC
D530.2	DHCP - Invalid TFTP Server IP Address	4 (Error)	Logged if the Address is 0 or FFFFFFFF return NULL pointer to SC
D530.3	DHCP - Invalid TFTP Boot File	4 (Error)	Logged if the Boot File has a strlen of 0 return NULL pointer to SC
D530.4	DHCP - Invalid Security IP Address	4 (Error)	Logged if the Address is 0 or FFFFFFFF return NULL pointer to SC
D530.5	DHCP - Invalid Time Server IP Address	4 (Error)	Logged if the Address is 0 or FFFFFFFF return NULL pointer to SC
D530.6	DHCP - Invalid Time Offset	4 (Error)	Logged if timeoffset = 0 return NULL pointer to SC
D531.0	Class of Service is not in TFTP Config	7 (Info)	No action taken
D532.0	Missing End Data Marker, rejecting TFTP Config file.	4 (Error)	Fail TFTP. Retry twice. If still failed, reboot the board and start scanning next frequency in the plan
D533.0	Net Access Ctrl Data out of range	4 (Error)	Keep reading the next bytes of TFTP config. If Reg-Response returns OK, reboot the CM to notify the CMTS range error
D534.0	Missing Net Access Ctrl Object, rejecting TFTP Config file.	4 (Error)	Fail TFTP. Retry twice. If still failed, reboot the board and start scanning next frequency in the plan
D536.0	Invalid filename [filename]	4 (Error)	Can't retrieve the config file, retry a few times.
D537.0	Class-of-Service Privacy Enable out of range	4 (Error)	Log it and continue reading next bytes of Config file.

Code	Event Log Messages	Level	Cable Modem Actions
D538.0	TFTP - Invalid COS encoding type, CONTINUE	4 (Error)	Log it and continue reading next bytes of Config file.
D539.0	CM reset due to config value out of range	1 (Emerg)	Save all event logs to flash before resetting

Filtering

Code	Event Log Messages	Level	Cable Modem Actions
F501.0	Bridge Hook. Init failed to get Ethernet Interface Pointer	1 (Emerg)	The CM would not return a pointer to Ethernet interface. Contact your vendor.
F501.1	BridgeHook. Init failed to get HFC Interface Pointer.	1 (Emerg)	The CM would not return a pointer to Cable interface. Contact your vendor.
F501.2	BridgeHook. Init failed to get Ethernet MAC address.	1 (Emerg)	The CM would not return the Ethernet MAC address. Contact your vendor.
F501.3	BridgeHook. Init failed to get HFC MAC address.	1 (Emerg)	The CM would not return the HFC MAC address. Contact your vendor.
F501.4	BridgeHook. Init failed to get Ethernet IP Address.	1 (Emerg)	The CM would not return the Ethernet IP address. Contact your vendor.
F502.1	Bridge Forwarding Enabled.	7 (Info)	Bridge Forwarding has been enabled. No other action.
F502.2	Bridge Forwarding Disabled.	7 (Info)	Bridge Forwarding has been disabled. No other action.
F502.3	Bridge Learning Enabled	7 (Info)	Bridge Learning has been enabled. No other action.
F502.4	Bridge Learning Disabled	7 (Info)	Bridge Learning has been disabled. No other action.
F502.5	Bridge MCNS BPDU Forwarding Enabled	7 (Info)	DOCSIS BPDU forwarding has been enabled. No other action.
F502.6	Bridge MCNS BPDU Forwarding Disabled	7 (Info)	DOCSIS BPDU forwarding has been disabled. No other action.
F504.1	Bridge Ethernet Hook. Failed to learn CPE MAC Address	7 (Info)	Bridge failed to learn a CPE MAC address for its filtering table. Table is either full or corrupted. No other action taken.
F504.2	Bridge Ethernet Hook. Failed to learn Multicast Filter.	4 (Error)	Bridge failed to learn Multicast filter. Table is either full or corrupted. No other action taken by CM.
F506.0	Bridge Multicast Aging. Failed to start WatchDog Timer.	5 (Warn)	Bridge couldn't start timer for aging multicast filters. Error at system level. No other action taken.

Code	Event Log Messages	Level	Cable Modem Actions
F506.1	Bridge Multicast Aging. Failed to get mbuf to Send Igmp Request.	5 (Warn)	Bridge failed to get an mbuf to send an Igmp request for aging multicast filters. CM continues through aging loop.
F506.2	Bridge Multicast Aging. Failed to set WD timer to schedule Deletes	5 (Warn)	Could not set second watchdog timer for aging Multicast filters. CM continues through aging loop.
F507.0	MAC Filters. Constructor can't allocate memory for hash table.	1 (Emerg)	Bridge could not allocate memory for the MAC filter hash table. Startup will receive error from Bridge Init. Bridge will not be started. CM will not be able to forward traffic. Contact your vendor.
F507.1	MAC Filters. Constructor can't allocate memory for entries array.	1 (Emerg)	Bridge could not allocate memory to hold entries for MAC filter hash table. Startup will receive error from bridge Init. Bridge will not be started. CM will not be able to forward traffic. Contact your vendor.
F507.2	MAC Filters. Set Max Entries setting max to 32. Requested max too large	5 (Warn)	Config file tried to set the MAX CPEs value to > 32. The SURFboard cable modem only supports a max of 32. Set max to 32 and write this message to log.
F507.3	MAC Filters. Set Max Entries. Can't get memory for address entries	1 (Emerg)	Bridge could not allocate memory to hold MAX CPE # of entries in MAC address hash table. Startup will receive an error. Bridge will not be started. CM will not be able to forward traffic. Contact your vendor.
F507.4	MAC Filters. Can't set Max Entries. Already have entries in the table	4 (Error)	An attempt was made to set MAX CPEs after the MAC filter table already had entries. Max not changed. No other action taken.
F507.5	MAC Filters. Add MAC Address can't add entry. Table is full.	4 (Error)	An attempt was made to add either a MAC filter or a Multicast filter to a hash table that is full. Entry not added. No other action taken.
F507.6	MAC Filters. Add MAC Address can't add entry. Table is corrupted.	4 (Error)	An attempt was made to add either a MAC filter or a Multicast filter to a hash table that is corrupted. Entry not added. Contact your vendor.
F507.7	MAC Filters. Delete MAC Address can't delete entry. Entry not found	4 (Error)	An attempt was made to delete a MAC filter or Multicast filter that did not exist. Nothing deleted.
F508.0	LLC Filters. Failed to add filter. Table full.	4 (Error)	SNMP tried to add an LLC filter and the table is full. Filter not added. Error returned to SNMP.

Code	Event Log Messages	Level	Cable Modem Actions
F508.1	LLC Filters. Failed to add filter. Filter already exists.	4 (Error)	SNMP tried to add an LLC filter that already exists. Filter not added. Error returned to SNMP.
F508.2	LLC Filters. Failed to add filter. Invalid Protocol Type.	4 (Error)	SNMP tried to add an LLC filter with an invalid protocol type. Filter not added. Error returned to SNMP.
F508.3	LLC Filters. Failed to delete filter. Filter not found.	4 (Error)	SNMP tried to delete an LLC filter that does not exist. Nothing deleted. Error returned to SNMP.
F508.4	LLC Filters. Failed to delete filter. Invalid Protocol Type	4 (Error)	SNMP tried to delete a filter with an invalid protocol type. Nothing deleted. Error returned to SNMP.
F508.5	LLC Filters. Failed to return filter matches. Filter not found.	4 (Error)	SNMP tried to read an LLC filter that doesn't exist in the table. Error returned to SNMP.
F508.6	LLC Arp Storm Filtering. Failed to Enable Filter. Already Enabled.	4 (Error)	An attempt was made to enable Arp storm filtering when it was already enabled. No action taken.
F508.7	LLC Arp Storm Filtering. Failed to start WatchDog Timer	4 (Error)	CM was unable to start timer for clearing ARP counters for ARP Storm Filters. Contact your vendor.
F509.0	IP Filter Set Default Action failed. Invalid action.	4 (Error)	SNMP tried to set docsDevFilterIpDefault to an invalid value. Default is not changed. Error returned to SNMP.
F509.1	IP Filters. Failed to add IP Filter. Invalid direction.	4 (Error)	SNMP tried to add an IP filter with an invalid value for direction. Filter is not added to filter table. Error returned to SNMP.
F509.2	IP Filters. Failed to add IP Filter. Index already exists.	4 (Error)	SNMP tried to add an IP filter with an index of a filter that already exists. Filter is not added to filter table. Error returned to SNMP.
F509.3	IP Filters. Failed to add IP Filter. Inbound filter table full.	4 (Error)	SNMP tried to add an inbound filter and the inbound filter table is full. Filter is not added to filter table. Error returned to SNMP.
F509.4	IP Filters. Failed to add IP Filter. Cannot allocate memory for entry.	1 (Emerg)	SNMP tried to add an inbound IP filter and bridge could not allocate memory to store the filter. Filter not stored. Error returned to SNMP. Contact your vendor.
F509.5	IP Filters. Failed to add IP Filter. Outbound filter table full.	4 (Error)	SNMP tried to add an outbound filter and the outbound filter table is full. Filter is not added to filter table. Error returned to SNMP.

Code	Event Log Messages	Level	Cable Modem Actions
F509.6	IP Filters. Failed to add IP Filter. Cannot allocate memory for entry.	1 (Emerg)	SNMP tried to add an outbound IP filter and bridge could not allocate memory to store the filter. Filter not stored. Error returned to SNMP. Contact your vendor.
F509.7	IP Filters. Failed to delete IP Filter. Index does not exist.	4 (Error)	SNMP tried to delete an IP filter that doesn't exist. Error returned to SNMP.
F509.8	IP Filters. Failed to return IP filter match count. Filter not found.	4 (Error)	SNMP asked to read a filter that doesn't exist. Error returned to SNMP.
F510.0	Bridge Api. Pipe creation for filter add and delete routines failed.	1 (Emerg)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.1	Bridge Api. Semaphore creation for filter add/delete routines failed	1 (Emerg)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.2	Bridge Api. Failed to Add CPE filter. Semaphore take failed	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.3	Bridge Api. Failed to Add CPE. Failed to open filter pipe	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.4	Bridge Api. Add CPE failed to retrieve add status from pipe	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.5	Bridge Api. Failed to Delete CPE filter. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.6	Bridge Api. Delete CPE failed. Failed to open filter pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.7	Bridge Api. Delete CPE failed to retrieve add status from pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.8	Bridge Api. Failed Get CPE List. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.9	Bridge Api. Failed Get CPE List. Failed to open filter pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.10	Bridge Api. Get CPE List failed to retrieve return value from pipe	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.11	Bridge Api. Failed to Add LLC filter. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.

Code	Event Log Messages	Level	Cable Modem Actions
F510.12	Bridge Api. Add LLC Filter failed. Failed to open filter pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.13	Bridge Api. Add LLC Filter failed to retrieve add status from pipe	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.15	Bridge Api. Failed to Delete LLC filter. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.16	Bridge Api. Delete LLC Filter failed. Failed to open filter pipe	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.17	Bridge Api. Delete LLC Filter failed to retrieve add status from pipe	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.18	Bridge Api. Failed to Add IP filter. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.19	Bridge Api. Failed to Add IP Filter. Failed to open filter pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.20	Bridge Api. Add IP Filter failed to retrieve add status from pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.21	Bridge Api. Failed to Delete IP filter. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.22	Bridge Api. Failed to Delete IP Filter. Failed to open filter pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.23	Bridge Api. Delete IP Filter failed to retrieve add status from pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.25	Bridge.Api. Failed to Set IpSpoofEnroll. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.26	Bridge Api. Failed to set IpSpoofEnroll. Failed to open filter pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.27	Bridge Api. Set IP Spoof Enroll failed to retrieve set status from pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.28	Bridge Api. Failed to Set IpSpoofMax. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.29	Bridge Api. Failed to set IpSpoofMax. Failed to open filter pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.

Code	Event Log Messages	Level	Cable Modem Actions
F510.30	Bridge Api. Set IP Spoof Max failed to retrieve set status from pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.31	Bridge Api. Failed to Add IP Spoof Entry. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.32	Bridge Api. Failed to Add IP Spoof Entry. Failed to open filter pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.33	Bridge Api. Add IP Spoof Entry failed to retrieve add status from pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor.
F510.34	Bridge Api. Failed to Del IP Spoof Entry. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.35	Bridge Api. Failed to Delete IP Spoof Entry. Failed open filter pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor
F510.36	Bridge Api. Delete IP Spoof Entry. Failed to retrieve del status from pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor
F510.37	Bridge Api. Failed to Get IP Spoof Entries. Semaphore take failed.	2 (Alert)	The CM experienced a problem using a semaphore. This is serious. Contact your vendor.
F510.38	Bridge Api. Failed to Get IP Spoof Entries. Failed open filter pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor
F510.39	Bridge Api. Get IP Spoof Entries. Failed to retrieve get status from pipe.	2 (Alert)	The CM experienced a problem using a pipe. This is serious. Contact your vendor
F510.40	Bridge Api. Failed to Set IP Default Action. Semaphore take failed	2 (Alert)	SNMP tried to change the value of docsDevFilterIPDefault. Action failed because system was not able to get necessary semaphore. This is serious. Contact your vendor
F510.41	Bridge Api. Failed Set IP Default Action. Failed to open filter pipe	2 (Alert)	SNMP tried to change the value of docsDevFilterIPDefault. Action failed because system was not able to open a necessary pipe. This is serious. Contact your vendor
F510.42	Bridge Api. Set IP Default Action failed to retrieve pipe status	2 (Alert)	SNMP tried to change the value of docsDevFilterIPDefault. Action failed because system was not able to write to a necessary pipe. This is serious. Contact your vendor

Code	Event Log Messages	Level	Cable Modem Actions
F511.1	Bridge Api. Failed to Add LLC filter. Invalid interface	4 (Error)	A management station attempted to add an LLC filter for an interface other than Ethernet or Hfc. Retry the add with the correct interface number.
F511.2	Bridge Api. Failed to Read IP filter stats. Invalid interface.	2 (Alert)	A management station attempted to add an IP filter for an interface other than Ethernet or Hfc. Retry the add with the correct interface number.
F511.3	Bridge Api. Failed Set IP Spoof Enroll. Can't get memory to clear table.	2 (Alert)	An attempt was made to set docsDevFilterCpeEnroll to –a new value. CM could not get enough memory to make necessary modifications to docsDevFilterCpeTable entries. Contact your vendor.
F511.4	Bridge Api. Failed Set IP Spoof Max. New Max won't hold existing filter entries.	4 (Error)	An attempt was made to decrease the size of docsDevFilterCpeMax and there were already more entries in docsDevFilterCpeTable than the new max would hold. Delete filters from docsDevFilterCpeTable and retry decrease of docsDevFilterCpeMax.
F511.5	Bridge Api. Failed to get Ip Spoofing Filter Entries. Can't allocate memory.	2 (Alert)	An attempt was made to query the system for docsDevFilterCpeTable entries. There was not enough system memory to return the entries. Contact your vendor.

Driver

Code	Event Log Messages	Level	Cable Modem Actions
H501.1	HFC: Shutting Upstream Down	7 (Info)	
H501.2	HFC: Shutting Downstream Down	7 (Info)	
H501.3	HFC: US BABBLE PHY ERROR	3 (Critical)	
H501.4	HFC: LOST TRC SYNC- trying to recover	3 (Critical)	
H501.5	HFC: TRC RECOVERY FAILED	3 (Critical)	
H501.6	HFC: TRC LOCK Recovery OK	7 (Info)	
H501.7	HFC: T2 Timer Expired	3 (Critical)	
H501.8	HFC: T4 Timer Expired	3 (Critical)	
H501.9	HFC: T1 Timer Expired	3 (Critical)	
H501.10	HFC: Bandwidth request failure	5 (Warn)	
H501.11	HFC: FEC LOCK recovery failed	3 (Critical)	
H501.12	HFC: FEC LOCK recovery OK	7 (Info)	

Code	Event Log Messages	Level	Cable Modem Actions
H501.13	HFC: Invalid UCD	3 (Critical)	
H501.14	HFC: Lost FEC LOCK - trying to recover	3 (Critical)	
H501.15	HFC: FEC LOCK recovery OK	7 (Info)	
H501.16	HFC: FEC LOCK recovery failed	3 (Critical)	
H501.17	HFC: UCD Minislot size change	7 (Info)	
H501.18	HFC: UCD Symbol rate change	7 (Info)	
H501.19	HFC: UCD Invalid minislot size	3 (Critical)	
H501.20	HFC: UCD Invalid symbol rate	3 (Critical)	
H501.21	HFC: UCD Invalid upstream freq	3 (Critical)	
H501.22	HFC: UCD Invalid actual preamble length	3 (Critical)	

Registration

Code	Event Log Messages	Level	Cable Modem Actions
I500.0	Registration Completed	7 (Info)	
I502.0	Error transmitting Registration Request message	4 (Error)	Time out and the board will reset
I503.0	Cable Modem is OPERATIONAL	7 (Info)	No action taken
I504.0	REG-RESP Invalid Vendor ID Len, CONTINUE	4 (Error)	Ignore and continue reading the next bytes
I505.0	Registration RSP with COV failure	1 (Emerg)	Resend Reg-Req up to 3x before power cycle
I506.0	Retried 2nd time and REG-RSP is still failed. Retransfer TFTP config	1 (Emerg)	Retransfer TFTP Config
I507.0	Retried 3 rd time and REG-RSP is still failed. Power Cycle	1 (Emerg)	Power Cycle
I508.0	Registration RSP with authentication failure	1 (Emerg)	Resend Reg-Req up to 3 times before power cycle
I509.0	TFTP Server Provisioned Modem Address format invalid in length	4 (Error)	Ignore and continue reading the next bytes
I509.1	TFTP Server Timestamp format invalid in length	4 (Error)	Ignore and continue reading the next bytes
I510.0	***BOOTING [sw_version]***	7 (Info)	
I511.0	Reset due to SNMP docsDevResetNow	7 (Info)	

Miscellaneous

Code	Event Log Messages	Level	Cable Modem Actions
M500.0	Startup pipe cannot be retrieved	1 (Emerg)	When time out, the board will reset
M500.1	Startup pipe cannot be created	1 (Emerg)	When time out, the board will reset
M503.0	Unable to initialize HTTP Server, no HTML supported	5 (Warn)	No action taken
M503.1	Unable to initialize UI, no HTML supported	5 (Warn)	No action taken
M504.0	Unable to create or start WDT. No automate Reset supported	5 (Warn)	When Timeout, the board will reset
M505.0	Unable to create SnmpDelayReset task	5 (Warn)	
M510.0	ReadFromFlash - flash Semaphore NULL, cannot access flash	1 (Emerg)	
M510.1	WriteToFlash - flash Semaphore NULL, cannot access flash	1 (Emerg)	
M550.0	Hash Table failed to allocate memory for entries.	1 (Emerg)	Attempt was made to create a hash table. System did not have enough memory. Contact your vendor.
M550.1	Hash Table failed to allocate memory for hash table.	1 (Emerg)	Attempt was made to create a hash table. System did not have enough memory. Contact your vendor.
M550.2	Hash Table failed to add entry. Hash Key out of table range.	1 (Emerg)	System attempted to hash into a hash table. Hash key that was calculated was out of the table range. Contact your vendor.
M550.3	Hash Table failed to delete entry. Hash Key out of table range	1 (Emerg)	System attempted to hash into a hash table. Hash key that was calculated was out of the table range. Contact your vendor.
M550.4	Hash Table failed to delete entry. Entry not found	4 (Error)	An attempt was made to delete an entry from a hash table and the entry did not exist in the table.
M550.5	Hash Table can't allocate memory to resize table.	1 (Emerg)	An attempt was made to change the size of a Hash Table. The system was not able to allocate enough memory to perform the operation. Contact your vendor.
M550.6	Hash Table failed to resize table. Current entries > new size.	4 (Error)	An attempt was made to decrease the size of an existing hash table that has more entries than the new size will hold. If possible delete some of the entries and try the operation again.
M551.0	***** REACHED MAX ENTRIES, LOG IS WRAPPED *****	7 (Info)	No action taken
M552.0	Unable to set SMNPv3 my engine info	4 (Error)	No action taken SNMPv3 won't work
M553.0	Unable to create SNMPv3 group	4 (Error)	No action taken SNMPv3 won't work
M553.1	Unable to build or install group	4 (Error)	No action taken SNMPv3 won't work

Code	Event Log Messages	Level	Cable Modem Actions
M554.0	Error setting read string for SNMPv3 access	4 (Error)	No action taken SNMPv3 won't work
M555.0	Error setting write string for SNMPv3	4 (Error)	No action taken SNMPv3 won't work
M556.0	Error setting notify string for SNMPv3	4 (Error)	No action taken SNMPv3 won't work
M557.0	Error creating SNMPv3 2275 view	4 (Error)	No action taken SNMPv3 won't work

Acquisition

Code	Event Log Messages	Level	Cable Modem Actions
T500.0	Acquired Upstream SUCCESS	7 (Info)	
T501.0	Acquired Downstream [Curr Freq in Hz] SUCCESS	7 (Info)	
T502.0	Scan Downstream [Curr Freq in Hz] for [enum] time with status [status enum]	8 (Debug)	No action taken
T503.0	Acq DS [Curr Freq in Hz] with status [status string]	8 (Debug)	No action taken
T503.1	Acquire US with status [status string] powerLevel [value] tempSid [SID]	8 (Debug)	No action taken
T503.2	Move Downstream with status [status]	8 (Debug)	
T504.0	Both Downstream & Upstream have been changed	8 (Debug)	No action taken
T505.0	Acquired Upstream with status [status enum]	8 (Debug)	No action taken
T506.0	Downstream Frequency has been changed	8 (Debug)	No action taken
T507.0	Received Async Error [UCC Type]	2 (Alert)	Shutdown3220 and reset the board.
T508.0	Fail to Acquire Upstream. Error Stats [statnum], Retry [num]	4 (Error)	After received a UCC-REQ to change upstream, attempt to acquire upstream with new data and it failed. Keep acquiring upstream until success
T509.0	Acquired DS with status %s, DS Freq %d, US Id %d	8 (Debug)	No action taken
T510.0	Acquire DS after RR Chg with status [status]	8 (Debug)	No action taken

Unit Update

Code	Event Log Messages	Level	Cable Modem Actions
X500.0	Attempting Unit Update.	7(Info)	No action needed.
X501.0	Can't allocate memory to read UU data from flash	2(Alert)	Continue using current image. CM is out of memory. Try rebooting CM. If problem persists contact your vendor.
X501.1	Can't read Unit Update data from flash.	4(Error)	Update will complete. If problem persists contact your vendor
X501.2	Can't write Unit Update data to flash.	4(Error)	Update will complete, but value for docsDevSwOperStatus may be incorrect after CM reboots. If problem persists contact your vendor.
X501.4	Provisioned Unit Update skipped. Image is current.	7(Info)	CM did not perform a provisioned Unit Update because it is already running the image it was told to download. No Action needed.
X501.5	Unable to create UnitUpdate Task.	2(Alert)	Update failed. CM was unable to create the task to do the update. Reboot CM and try the update again. If problem persists contact your vendor.
X501.6	Unit Update Failed. Reached Max Retries.	4(Error)	Unit Update failed. The TFTP transfer failed 16 times in a row.
X501.7	Unable to write image file to flash	4 (Error)	Continue using current image file. Possibly troubleshoot flash.
X501.8	Unit Update From SNMP..... SUCCESS	7(Info)	No action taken
X501.9	Unit Update From CLI..... SUCCESS	7(Info)	No action taken
X501.10	Unit Update From Config File..... SUCCESS	7(Info)	No action taken
X501.11	Unit Update Image length is invalid. Length = [length]	4 (Error)	Continue using current image. Unit update failed. Image is too large, probably bad image file. Obtain new image file.
X501.12	Unit Update MD5 Checksum Failed. Image corrupt.	4(Error)	Continue using current image. Update failed. Image is corrupted. Get new copy of image file.
X501.13	Unit Update: Could not write App image to flash.	2(Alert)	Continue using current image. Update failed. System could not write the new image to the flash. Try operation again. If problem persists, contact your vendor.
X501.14	Unit Update: Could not write Header to flash.	2(Alert)	Continue using current image. Update failed. System could not write the new image header to the flash. Try operation again. If problem persists, contact your vendor.

Code	Event Log Messages	Level	Cable Modem Actions
X501.15	Unit Update: Could not write Bootrom to flash..	2(Alert)	Update failed. System could not write the new bootrom to flash. Try operation again. If problem persists, contact your vendor.
X501.16	Unable to start TFTP of software update image. Out of resources.	4(Error)	Continue using current image. CM was unable to transfer the new image from the server. Check for network problems, that file exists, that docsDevSwServer is the correct address of the Software Server and retry the operation.
X501.17	Unable to retrieve software image. TFTP failed. Select timed out.	4(Error)	Continue using current image. CM was unable to transfer the new image from the server. Check for network problems, that file exists, that docsDevSwServer is the correct address of the Software Server and retry the operation
X501.18	Unit Update, Unable to allocate memory for image.	2(Alert)	Continue using current image. Update failed. CM is out of memory. Try rebooting CM. If problem persists contact your vendor.
X501.19	Unit Update – TFTP of image failed.	4(Error)	Continue using current image. CM was unable to transfer the new image from the server. Check for network problems, that file exists, that docsDevSwServer is the correct address of the Software Server and retry the operation.
X501.20	Unit Update, Unable to allocate memory for Bootrom image.	2(Alert)	Continue using current image. Update failed. CM is out of memory. Try rebooting CM. If problem persists contact your vendor.
X501.21	Unit Update – Error retrieving image file.	4(Error)	Continue using current image. CM was unable to transfer the new image from the server. Check for network problems, that file exists, that docsDevSwServer is the correct address of the Software Server and retry the operation.
X501.22	Unit Update – Read wrong number of bytes for Bootrom.	4(Error)	Continue using current image. Update failed. The image file is most likely corrupt. Obtain a new copy of the image file.
X501.23	Unit Update failure. No data read from file.	4(Error)	Continue using current image. CM was unable to transfer the new image from the server or the image is corrupt. Check for network problems, that file exists, that docsDevSwServer is the correct address of the Software Server and retry the operation. Obtain a new copy of the image file.

Code	Event Log Messages	Level	Cable Modem Actions
X501.24	Unit Update – error reading header from [filename]	4 (Error)	Continue using current image. Update failed. CM was unable to transfer the new image from the server or the image is corrupt. Check for network problems, that file exists, that docsDevSwServer is the correct address of the Software Server and retry the operation. Obtain a new copy of the image file.
X501.25	Unit Update – error reading image file header.	4 (Error)	Continue using current image. Update failed. CM was unable to transfer the new image from the server or the image is corrupt. Check for network problems, that file exists, that docsDevSwServer is the correct address of the Software Server and retry the operation. Obtain a new copy of the image file.
X501.27	Unit Update – can't update from <image name> to <image name>	4 (Error)	Continue using current image file. Illegal update. Can't go from installed image to requested image. Either image is for wrong product, or an illegal downgrade was attempted.
X501.28	Unit Update – Not updating. This image is not for this platform.	4 (Error)	Continue using current image file. Illegal update. Can't go from installed image to requested image. Image is wrong image for this product.
X501.29	No need to update to <name of image> - same image	7 (Info)	No action taken. Attempted to update to image that is already loaded on CM.
X501.30	Can't allocate memory to write SNMP Uu Parameters to Flash.	4(Error)	See previous messages to determine if Update completed. Value of docsDevSwOperStatus may be incorrect after reboot. If problem persists contact your vendor.
X501.31	Unable to save SNMP Uu Parameters to Flash.	4(Error)	See previous messages to determine if Update completed. Value of docsDevSwOperStatus may be incorrect after reboot. If problem persists contact your vendor.
X501.32	Unit Update. Can't perform Unit Update, Unit Update already in progress.	4(Error)	SNMP attempted to start a Unit Update while another Unit Update was already in progress.
X501.33	SNMP Unit Update was in progress before reboot. Retrying Update.	4(Error)	SNMP was attempting a Unit Update when the CM rebooted for some reason. CM will reattempt the Unit Update.
X501.34	Unit Updated Failed. Reached Max Download Retries.	4(Error)	Unit Update failed. The image requested was corrupt.

Code	Event Log Messages	Level	Cable Modem Actions
X501.35	Unit Update Failed	4(Error)	Unit Update failed. See previous log messages for more detail on reason for failure.
X501.36	Failed to restore image after error.	4(Error)	There was a problem with the image placed into flash during Unit Update and the program was not able to restore the previous image to flash. The image in flash now likely to be corrupt and the CM may not be able to boot.

Abbreviations and Acronyms

CMTS	Cable Modem Termination System
CPE	Customer Premises Equipment
DHCP	Dynamic Host Configuration Protocol
FEC	Forward error correction
IP	Internet Protocol
LAN	Local area network
LED	Light-emitting diode
MIB	Management Information Base
PC	Personal computer
QAM	Quadrature amplitude modulation
RF	Radio frequency
SNMP	Simple Network Management Protocol
TCP/IP	Transport Control Protocol/Internet Protocol
TFTP	Trivial File Transfer Protocol
TRC	Technical Response Center
USB	Universal Serial Bus



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