

## EMTA Cable Modem

# D3CM1604V Administrator Manual

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[Preconfiguration Guidelines](#)

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## Preface

The D3CM1604V EMTA Cable Modem is ideal all-in-one wired solution for the home or business environment. SMC is proud to provide you with a powerful, yet simple communication device for connecting your local-area network (LAN) to the Internet.

This Administrator manual contains all the information you need to install and configure your new D3CM1604V EMTA Cable Modem.



## Key Features

The following list summarizes the EMTA's key features.

- Y Integrated, CableLabs-compliant DOCSIS 1.1/ 2.0 /3.0 cable modem.
- Y Integrated cable modem port for Internet connection to cable modem service.
- Y One 10/100/1000 Mbps Auto-Sensing LAN ports with Auto-MDI/MDIX.
- Y Dynamic Host Configuration Protocol (DHCP) for dynamic IP configuration, and Domain Name System (DNS) for domain name mapping.
- Y Two Plain Old Telephone System (POTS) RJ-11 telephone ports to allow Public Switch Telephone Network (PSTN) analog phone connections.
- Y Advanced SPI firewall EMTA for enhanced network security from attacks over the Internet:
  - Firewall protection with Stateful Packet Inspection
  - Client privileges
  - Hacker prevention
  - Protection from denial of service (DoS) attacks
  - Network Address Translation (NAT)
- Y Effortless plug-and-play installation.
- Y Intuitive graphical user interface (GUI) configuration, regardless of operating system.
- Y Comprehensive front panel LEDs for network status and troubleshooting.
- Y Compatible with all popular Internet applications.

## Document Organization

This document consists of five chapters and two appendixes.





- Y **Chapter 1** – describes the contents in the EMTA package, system requirements, and an overview of the EMTA's front, rear, top, and bottom panels.
- Y **Chapter 2** – describes how to install the EMTA.
- Y **Chapter 3** – describes how to configure TCP/IP settings on the computer you will use to configure the EMTA.
- Y **Chapter 4** – describes how to configure the EMTA.
- Y **Chapter 5** – provides troubleshooting information you can use in the unlikely event you encounter a problem with the EMTA.
- Y **Appendix A** - is a glossary that defines the technical terms in this document.
- Y **Appendix B** - contains compliance information.

## Document Conventions

This document uses the following conventions to draw your attention to certain information.

### Safety and Warnings

This document uses the following symbols to draw your attention to certain information.

Symbol	Meaning	Description
	Note	Notes emphasize or supplement important points of the main text.
	Tip	Tips provide helpful information, guidelines, or suggestions for performing tasks more effectively.
	Warning	Warnings indicate that failure to take a specified action could result in damage to the device.
	Electric Shock Hazard	This symbol warns users of electric shock hazard. Failure to take appropriate precautions such as not opening or touching hazardous areas of the equipment could result in injury or death.

## Typographic Conventions

This document also uses the following typographic conventions.

Convention	Description
<b>Bold</b>	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels.
<i>Italic</i>	Indicates a variable, which is a placeholder for actual text provided by the user or system. Angled brackets (< >) are also used to indicate variables.
screen/code	Indicates text that is displayed on screen or entered by the user.
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Italic font is also used to indicate variables.
[ ] square brackets	Indicates optional values.
{ } braces	Indicates required or expected values.
vertical bar	Indicates that you have a choice between two or more options or arguments.



# 1 Getting to Know the EMTA

Before you install your D3CM1604V EMTA Cable Modem, check the package contents and become familiar with the EMTA's front and back panels.

The topics covered in this chapter are:

- Y Unpacking Package Contents (page 10)
- Y System Requirements (page 10)
- Y Front Panel (page 11)
- Y Rear Panel (page 12)
- Y Using the Reset Button (page 15)

## Unpacking Package Contents

Unpack the items in your D3CM1604V EMTA Cable Modem contents and confirm that no items are missing or damaged. Your package should include:

- Y One D3CM1604V EMTA Cable Modem
- Y One Category 5E Ethernet cable
- Y One power supply
- Y One set of quick-installation instructions

If any items are missing or damaged, please contact your cable service provider. Keep the carton, including the original packing material, in case you need to store the product or return it.

## System Requirements

To complete your installation, you need the following items:

- Y Provisioned Internet access on a cable network that supports cable modem service.
- Y A computer with a wired network adapter with TCP/IP installed.
- Y A Java-enabled Web browser, such as Microsoft Internet Explorer 5.5 or above.
- Y Microsoft® Windows® 2000 or higher for USB driver support.
- Y An analog telephone and two RJ-11 cables if you want to connect the EMTA to an analog telephone and PSTN telephone line.

## Front Panel








The front panel of your D3CM1604V EMTA Cable Modem contains a set of light-emitting diode (LED) indicators. These LEDs show the status of the EMTA and simplify troubleshooting.

Figure 1-1 shows the front panel of the D3CM1604V EMTA Cable Modem. Table 1 describes the front panel LEDs.



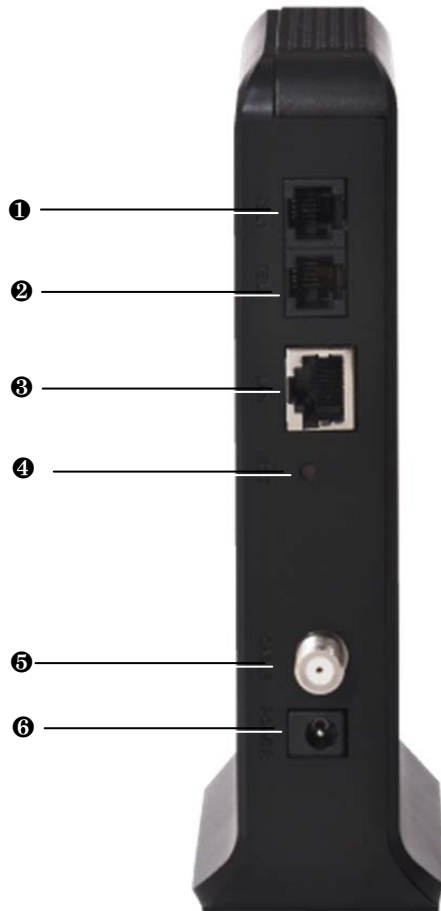
**Figure 1-1. Front Panel of the D3CM1604V EMTA Cable Modem**

**Table 1. Front Panel LEDs**

Symbol	LED	Color	Description
	POWER	—	OFF = DC power is not supplied to the EMTA.
		Green	ON = DC power is supplied to the EMTA and power switch is in the ON position.
	DS	Blue	Blinking = scanning for downstream channel. ON = locked on DOCSIS 3.0 downstream channel. OFF = no power.
		Green	On = locked on DOCSIS 2.0 downstream channel.
	US	Blue	Blinking = ranging is in progress. ON = ranging is complete, DOCSIS 3.0 bonded upstream. OFF = no power or not locked on upstream channel.
		Green	ON = ranging is complete, DOCSIS 2.0 bonded upstream.
	ONLINE	Blue	Blinking = DHCP and registration in progress. ON = online in DOCSIS 3.0 mode. OFF = no power or upstream ranging not complete.
		Green	ON = online in DOCSIS 2.0 mode
	LINK	Blue	Blinking = data activity. ON = Gigabit Ethernet LAN device connected. OFF = no LAN devices connected.
		Green	Blinking = data activity. ON = 10/100 Ethernet LAN device connected.
	Tel1	White	Blinking = telephone line 1 is in use. ON = EMTA's telephone 1 port is online. OFF = EMTA's telephone 1 port is not online.
	Tel2	White	Blinking = telephone line 2 is in use. ON = EMTA's telephone 2 port is online. OFF = EMTA's telephone 2 port is not online.

## Rear Panel

The rear panel of your D3CM1604V EMTA Cable Modem contains a reset button and the ports for attaching the supplied power adapter and making additional connections. Figure 1-2 shows the rear panel components and Table 2 describes their meanings.



**Figure 1-2. Rear View of the D3CM1604V EMTA Cable Modem**

**Table 2. D3CM1604V EMTA Cable Modem Rear Panel Components**

	Label	Description
① and ②	TEL1 and TEL2	Connect an analog telephone to one port and an analog (PSTN) telephone line to the other port.
③	LAN	One 10/100/1000 auto-sensing RJ-45 switch port. Connect a device on your LAN such as a computer, hub, or switch to these ports.
④	RST	Use this button to reset the power or restore the default factory settings (see "Using the Reset Button" on page 15).
⑤	CABLE	Connect your coaxial cable line to this port.
⑥	POWER	Connect the supplied power cord.

## Using the Reset Button

Using the reset button on the rear panel (see Figure 1-2 on page 13), you can perform two types of reset operations with the EMTA:

- Y Software reset – this reset operation power-cycles the EMTA and retains its current configuration settings.
- Y Factory default reset – this operation removes all overrides made to the EMTA's factory default configuration and returns the EMTA to its original factory default settings.

The number of seconds you press the reset button determines which reset operation is performed. To protect against accidental resets, the reset button is recessed on the EMTA rear panel.



**Note:** You can also reset the EMTA and retain its current configuration settings using the RESET method described under “Configuring Security Settings” on page 40.

To use the reset button to perform a software or factory default reset:

1. Leave power plugged into the EMTA.
2. Find the reset button at the top of the back panel, then use a thin object to press and hold the reset button as follows:
  - To perform a software reset, press the reset button for at least 10 seconds.
  - To perform a factory default reset, press the reset button for at least 15 seconds.
3. Release the reset button.

## 2 Installing the EMTA

This chapter describes how to install your D3CM1604V EMTA Cable Modem. The topics covered in this chapter are:

- Y Finding a Suitable Location (page 17)
- Y Connecting to the LAN (page 18)
- Y Connecting the WAN (page 19)
- Y Connecting to the Public Telephone Network (page 19)
- Y Powering on the EMTA (page 20)



## Finding a Suitable Location

Your D3CM1604V EMTA Cable Modem can be installed in any location with access to the cable network. All of the cables connect to the rear panel of the EMTA for better organization and utility. The LED indicators on the front panel are easily visible to provide you with information about network activity and status.

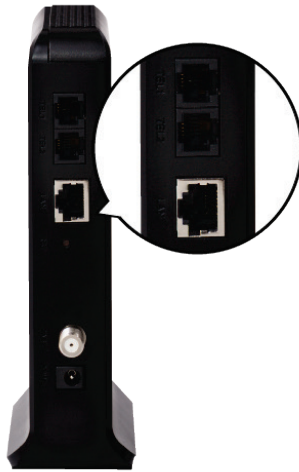
For optimum performance, the location you choose should:

- Y Be close to a working AC power outlet when powering the EMTA using AC power.
- Y Allow at least one foot of space around the sides and top of the EMTA to provide sufficient air flow around the device.
- Y Not expose the EMTA to a dusty or wet environment.
- Y Be an elevated location such as a high shelf, keeping the number of walls and ceilings between the EMTA and your other devices to a minimum.
- Y Be away from electrical devices that are potential sources of interference, such as ceiling fans, home security systems, microwaves, or the base for a cordless phone.
- Y Be away from any large metal surfaces, such as a solid metal door or aluminum studs. Large expanses of other materials such as glass, insulated walls, fish tanks, mirrors, brick, and concrete can also affect your wireless signal.
- Y Should allow the EMTA to connect to an AC outlet that is not controlled by a wall switch.

## Connecting to the LAN

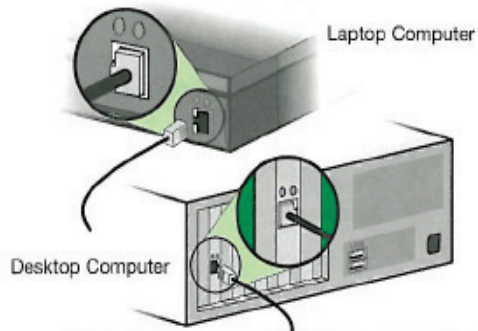
Using an Ethernet LAN cable, you can connect the EMTA to a desktop computer, notebook, hub, or switch. The EMTA supports auto-MDI/MDIX, so you can use either a standard straight-through or crossover Ethernet cable.

1. Connect either end of an Ethernet cable to the **LAN** port on the rear panel of the EMTA (see Figure 2-1).



**Figure 2-1. Connecting to an Ethernet Port on the EMTA Rear Panel**

2. Connect the other end of the cable to your computer's network-interface card (NIC) or to another network device (see Figure 2-2).



**Figure 2-2. Connecting the EMTA to the a Laptop or Desktop Computer**

## Connecting the WAN

To connect the EMTA to a Wide Area Network (WAN) interface:

1. Connect a coaxial cable to the port labeled **CABLE** on the rear panel of the EMTA from a cable port in your home or office (see Figure 1-2 on page 13). Use only manufactured coaxial patch cables with F-type connectors at both ends for all connections.
2. Hand-tighten the connectors to secure the connection.
3. If the modem was not installed by your cable provider (ISP) or is replacing another cable modem, contact your cable operator to register the D3CM1604V . If the modem is not registered with your cable operator, it cannot connect to the cable network system.

## Connecting to the Public Telephone Network

The rear panel of the EMTA has two RJ-11 telephone-style connectors labeled **TEL1** and **TEL2**. Each of these connectors can provide telephone service to multiple telephones, fax machines, and analog modems.

The maximum number of telephone devices connected to each RJ-11 port is limited by the total Ringing Load of the telephone devices that are connected. Many telephone devices are marked with a Ringer Equivalent Number (REN). Each telephone port on the EMTA can support up to a 5 REN load. The sum of the REN load on all of the telephone devices attached to each port must not exceed 5 REN.

Before you use the EMTA's RJ-11 connectors to power the analog devices in your home or office, disconnect the telephone lines from any other provider at the demarcation point. If the incoming phone line is connected to another provider, such as an incumbent telephone company, it can result in potentially harmful voltage to the analog telephone line.



**Note:** The customer or the customer's wire contractor is responsible for adhering to all local codes for wiring.

To set up the ability to place calls using a regular analog telephone line (PSTN), perform the following procedure.

1. Disconnect the phone lines from any other provider at the demarcation point, if appropriate.
2. Connect the RJ-11 cable on an analog device to the **TEL1** connector on the rear panel of the EMTA.
3. Connect the RJ-11 cable on another analog device to the **TEL2** connector on the rear panel of the EMTA.

## Powering on the EMTA

After making your connections, use the following procedure to power on the EMTA:

1. Connect the supplied power cord to the power port on the rear panel of the EMTA (see Figure 1-2 on page 13).
2. Connect the other end of the power adapter to a working power outlet. The EMTA powers on automatically, the **POWER** LED on the front panel goes ON, and the other front panel LEDs show the EMTA's status (see Table 1 on page 12).



**WARNING:** Only use the power supply supplied with the EMTA. Using a different power supply can damage the EMTA and void the warranty.

## 3 Preconfiguration Guidelines

After you install your D3CM1604V Wireless EMTA Cable Modem, use the information in this chapter to configure the TCP/IP settings on the computer that is used to configure the EMTA. This chapter also covers other preconfiguration guidelines you should review before configuring the EMTA.

The topics covered in this chapter are:

- Y Configuring Your Computer for TCP/IP (page 22)
- Y Disabling Proxy Settings (page 31)
- Y Disabling Firewall and Security Software (page 32)
- Y Confirming the EMTA's Online Status (page 32)
- Y Confirming Your Computer's Link Status (page 32)

## Configuring Your Computer for TCP/IP

Before you configure the EMTA using its Web management interface, configure TCP/IP settings on the computer that is used to configure the EMTA. The TCP/IP procedure to use depends on the operating system installed on the computer.

- Y For Microsoft Windows 2000, see the procedure below
- Y For Microsoft Windows XP, see page 23
- Y For Microsoft Windows Vista, see page 24
- Y For Microsoft Windows 7, see page 27
- Y For Apple Macintosh, see page 30

### Configuring Microsoft Windows 2000

Use the following procedure to configure your computer if your computer has Microsoft Windows 2000 installed.

1. On the Windows taskbar, click **Start**, point to **Settings**, and then click **Control Panel**.
2. In the Control Panel window, double-click the **Network and Dial-up Connections** icon. If the Ethernet adapter in your computer is installed correctly, the **Local Area Connection** icon appears.
3. Double-click the **Local Area Connection** icon for the Ethernet adapter connected to the EMTA. The Local Area Connection Status dialog box appears (see Figure 3-1).

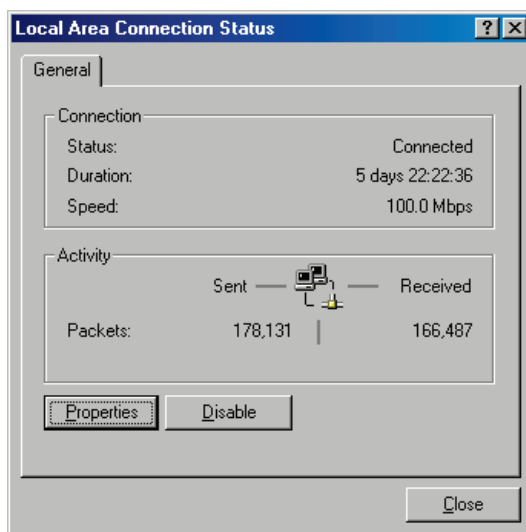


Figure 3-1. Local Area Connection Status Window

4. In the Local Area Connection Status dialog box, click the **Properties** button. The Local Area Connection Properties dialog box appears.
5. In the Local Area Connection Properties dialog box, verify that **Internet Protocol (TCP/IP)** is checked. Then select **Internet Protocol (TCP/IP)** and click the **Properties** button.
6. Click **Obtain an IP address automatically** to configure your computer for DHCP.
7. Click the **OK** button to save this change and close the Local Area Connection Properties dialog box.
8. Click the **OK** button again to save these new changes.
9. Restart your computer.

### Configuring Microsoft Windows XP

Use the following procedure to configure your computer if your computer has Microsoft Windows XP installed. If you use the Classic interface, where the icons and menus resemble previous Windows versions, perform the procedure under “Configuring Microsoft Windows 2000” on page 22.

1. On the Windows taskbar, click **Start**, click **Control Panel**, and then click **Network and Internet Connections**.
2. Click the **Network Connections** icon.
3. Click **Local Area Connection** for the Ethernet adapter connected to the EMTA. The Local Area Connection Status dialog box appears.
4. In the Local Area Connection Status dialog box, click the **Properties** button (see Figure 3-2). The Local Area Connection Properties dialog box appears.

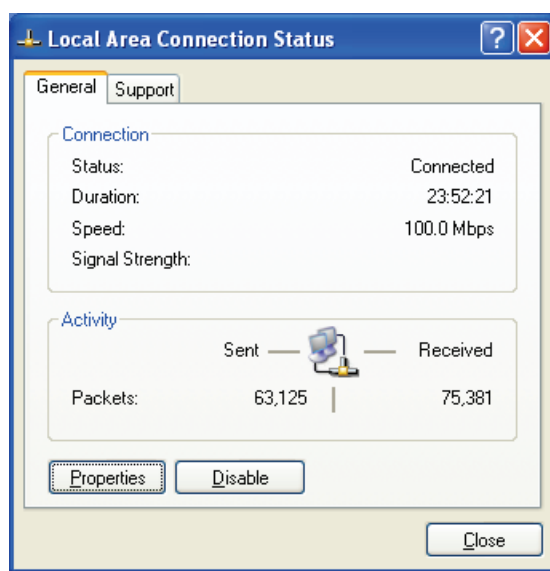


Figure 3-2. Local Area Connection Status Window

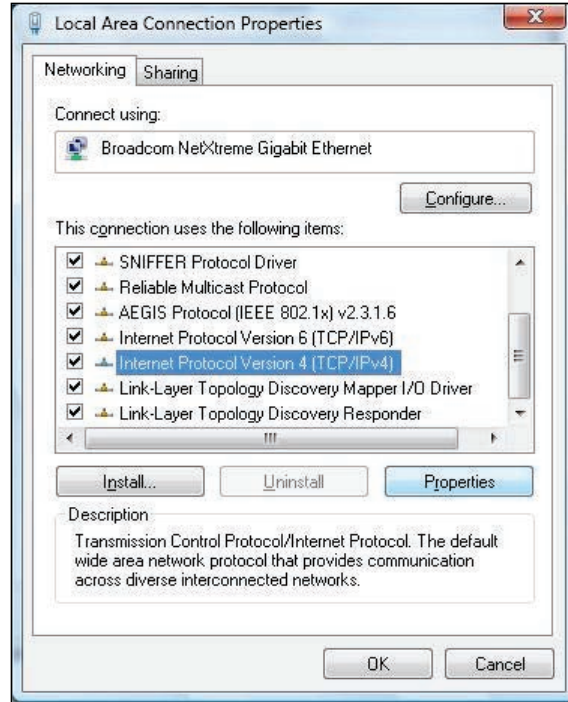
5. In the Local Area Connection Properties dialog box, verify that **Internet Protocol (TCP/IP)** is checked. Then select **Internet Protocol (TCP/IP)** and click the **Properties** button. The Internet Protocol (TCP/IP) Properties dialog box appears.
6. In the Internet Protocol (TCP/IP) Properties dialog box, click **Obtain an IP address automatically** to configure your computer for DHCP. Click the **OK** button to save this change and close the Internet Protocol (TCP/IP) Properties dialog box.
7. Click the **OK** button again to save your changes.
8. Restart your computer.

### Configuring Microsoft Windows Vista

Use the following procedure to configure a computer running Microsoft Windows Vista with the default interface. If you use the Classic interface, where the icons and menus resemble previous Windows versions, perform the procedure under “Configuring Microsoft Windows 2000” on page 22.

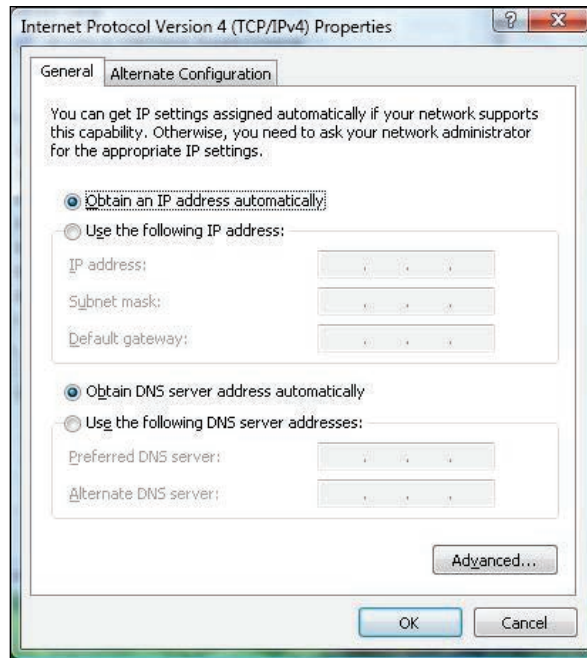
1. On the Windows taskbar, click **Start**, click **Control Panel**, and then select **Network and Internet** icon.
2. Click **View Networks Status and tasks** and then click **Management Networks Connections**.
3. Right-click the **Local Area Connection** icon and click **Properties**.
4. Click **Continue**. The Local Area Connection Properties dialog box appears.
5. In the Local Area Connection Properties dialog box, verify that **Internet Protocol (TCP/IPv4)** is checked. Then select **Internet Protocol (TCP/IPv4)** and click the **Properties** button (see Figure 3-3). The Internet Protocol Version 4 Properties dialog box appears.





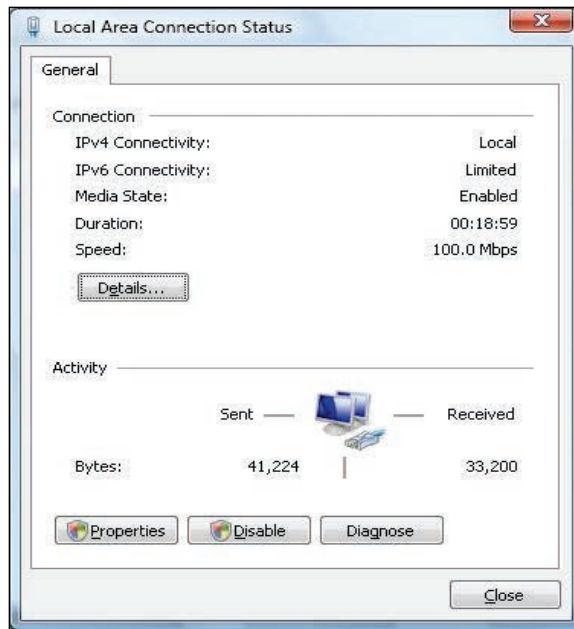
**Figure 3-3. Local Area Connection Properties Window**

6. In the Internet Protocol Version 4 Properties dialog box, click **Obtain an IP address automatically** to configure your computer for DHCP (see Figure 3-4).



**Figure 3-4. Internet Protocol Properties Window**

7. Click the **OK** button to save your changes and close the dialog box.
8. Click the **OK** button again to save your changes.

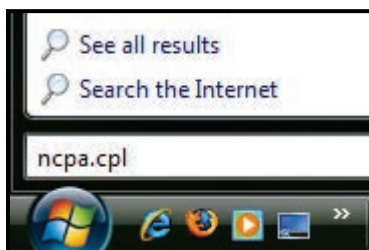


**Figure 3-5. Local Area Connection Status Window**

## Configuring Microsoft Windows 7

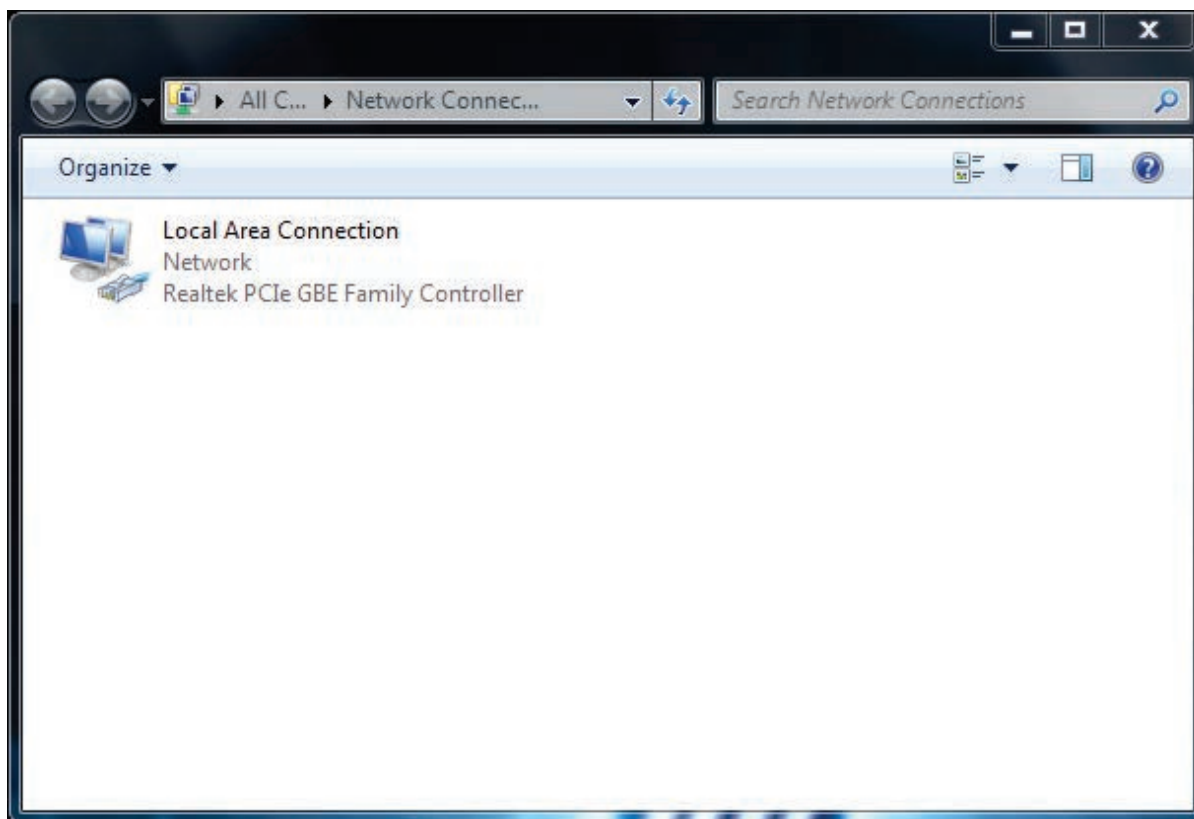
Use the following procedure to configure a computer running Microsoft Windows 7.

1. In the Start menu search box, type: **ncpa.cpl**



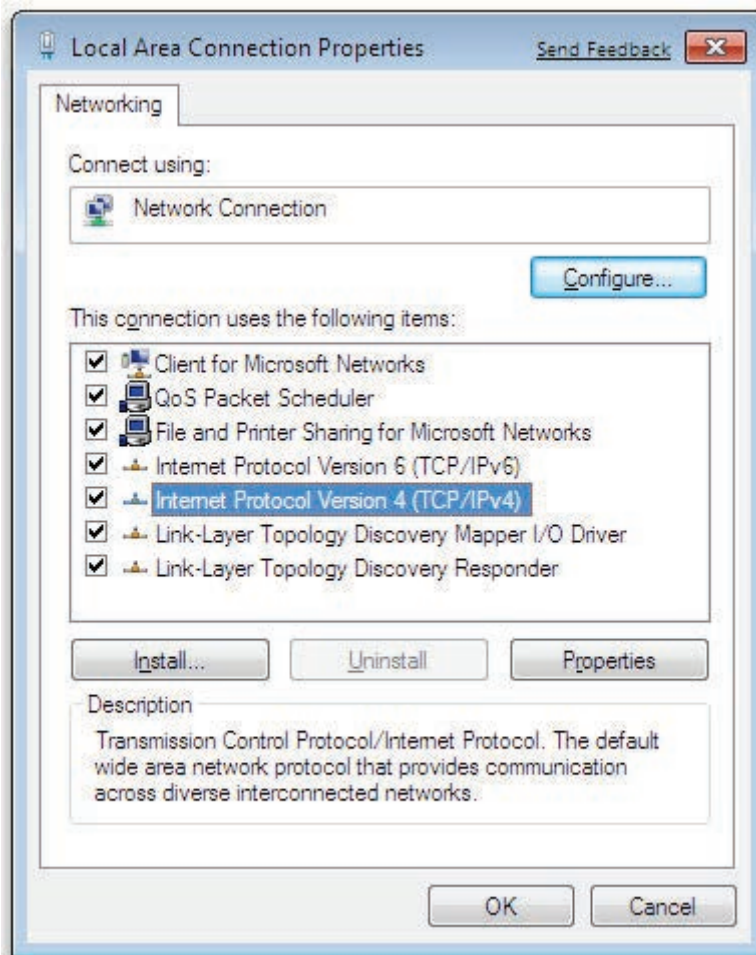
**Figure 3-6. Typing ncpa.cpl in the Start Menu Box**

The Network Connections List appears.



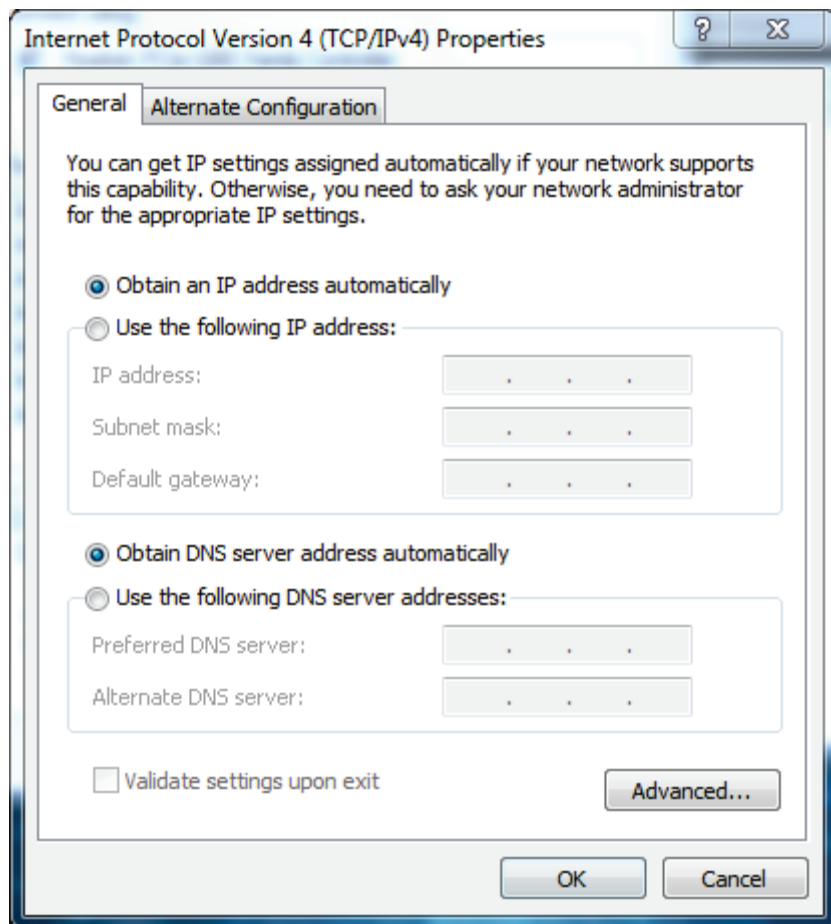
**Figure 3-7. Example of Network Connections List**

2. Right-click the **Local Area Connection** icon and click **Properties**.
3. In the **Networking** tab, click either **Internet Protocol Version 4 (TCP/IPv4)** or **Internet Protocol Version 6 (TCP/IPv6)**, and then click **Properties**.



**Figure 3-8. Local Area Network Connection Properties Dialog Box**

4. In the properties dialog box, click **Obtain an IP address automatically** to configure your computer for DHCP (see Figure 3-9).



**Figure 3-9. Properties Window**

5. Click the **OK** button to save your changes and close the dialog box.
6. Click the **OK** button again to save your changes.

## Configuring an Apple® Macintosh® Computer

The following procedure describes how to configure TCP/IP on an Apple Macintosh running Mac OS 10.2. If your Apple Macintosh is running Mac OS 7.x or later, the steps you perform and the screens you see may differ slightly from the following. However, you should still be able to use this procedure as a guide to configuring your Apple Macintosh for TCP/IP.

1. Pull down the Apple Menu, click **System Preferences**, and select **Network**.
2. Verify that the NIC connected to the D3CM1604V is selected in the **Show** field.
3. In the **Configure** field on the **TCP/IP** tab, select **Using DHCP** (see Figure 3-10).
4. Click **Apply Now** to apply your settings and close the TCP/IP dialog box.

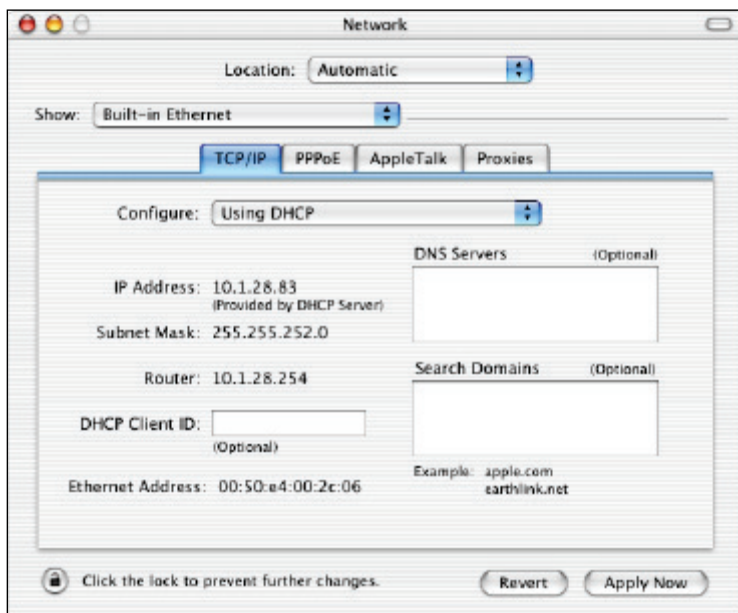


Figure 3-10. Selecting Using DHCP in the Configure Field

## Disabling Proxy Settings

Disable proxy settings in your Web browser. Otherwise, you will not be able to view the EMTA's Web-based configuration pages.

### Disabling Proxy Settings in Internet Explorer

The following procedure describes how to disable proxy settings in Internet Explorer 5 and later.

1. Start Internet Explorer.
2. On your browser's **Tool** menu, click **Options**. The Internet Options dialog box appears.
3. In the Internet Options dialog box, click the **Connections** tab.
4. In the **Connections** tab, click the **LAN settings** button. The Local Area Network (LAN) Settings dialog box appears.
5. In the Local Area Network (LAN) Settings dialog box, uncheck all check boxes.
6. Click **OK** until the Internet Options window appears.
7. In the Internet Options window, under **Temporary Internet Files**, click **Settings**.
8. For the option **Check for newer versions of stored pages**, select **Every time I visit the webpage**.
9. Click **OK** until you close all open browser dialog boxes.

### Disabling Proxy Settings in Firefox

The following procedure describes how to disable proxy settings in Firefox.

1. Start Firefox.
2. On your browser's **Tools** menu, click **Options**. The Options dialog box appears.
3. Click the **Advanced** tab.
4. In the **Advanced** tab, click the **Network** tab.
5. Click the **Settings** button.
6. Click **Direct connection to the Internet**.
7. Click the **OK** button to confirm this change.

## Disabling Proxy Settings in Safari

The following procedure describes how to disable proxy settings in Safari.

1. Start Safari.
2. Click the **Safari** menu and select **Preferences**.
3. Click the **Advanced** tab.
4. In the **Advanced** tab, click the **Change Settings** button.
5. Choose your location from the **Location** list (this is generally **Automatic**).
6. Select your connection method. If using a wired connection, select **Built-in Ethernet**. For wireless, select **Airport**.
7. Click the **Proxies** tab.
8. Be sure each proxy in the list is unchecked.
9. Click **Apply Now** to finish.

## Disabling Firewall and Security Software

Disable any firewall or security software that may be running on your computer. For more information, refer to the documentation for your firewall. After you configure the EMTA, please re-enable your computer firewall.

## Confirming the EMTA's Online Status

Confirm that the **Online** LED on the EMTA front panel is ON (see Figure 1-1 on page 11). If the LED is OFF, replace the coaxial cable connecting the EMTA to the cable service. If the **Online** LED does not go ON after several minutes, please contact your cable provider to confirm that the service is active.

## Confirming Your Computer's Link Status

Be sure there is an Ethernet cable connecting your computer to the EMTA. Then confirm that the LEDs for the EMTA port connected to your computer are blinking. If the LEDs are OFF, the connection between your computer and EMTA is not working properly.



## 4 Configuring the EMTA

After configuring your computer for TCP/IP and following the preconfiguration guidelines in Chapter 3, use that computer's Web browser to configure your D3CM1604V EMTA. This chapter describes how to use your computer's Web browser to configure the EMTA.

The topics covered in this chapter are:

- Y Accessing the EMTA's Web Management (page 34)
- Y Understanding the Web Management Interface (page 35)
- Y Web Management Interface Menus (page 36)

## Accessing the EMTA's Web Management

After configuring your computer for TCP/IP and reviewing the guidelines on the previous page, configure the EMTA using its Web-based management interface. From your Web browser, log in to the interface to define system parameters, change password settings, view status windows to monitor network conditions, and control the EMTA and its ports.

To display the D3CM1604V EMTA Cable Modem's Web-based management screens, use the following procedure.

1. Launch a Web browser.



**Note:** Your computer does not have to be online to configure the EMTA.

2. In the browser address bar, type <http://192.168.100.1> and press the Enter key.
3. When the Login screen appears, enter the default username and default password furnished by SMC Networks. The default login is:
  - Username: MSO
  - Password: Admin

Both are case sensitive. For security, each password character is masked as a dot (●).



**Note:** Your cable modem operator may customize the login password, so please check with your operator for the correct password to use.

4. Click the **LOGIN** button to access the EMTA's Web interface. The Connection page appears, showing information about the status of the cable modem's HFC and IP network connectivity. You can also display this page any time by clicking **Status > Connection** in the menu bar.



**Tip:** For security purposes, we recommend you change the login password after logging in to the Web management interface for the first time (see "Configuring Security Settings" on page 40).

## Understanding the Web Management Interface

The top and left sides of the Web management interface contain menus and submenus for selecting pages to configure the EMTA. When you click a menu at the top, a set of submenus appear at the left side. The configuration settings associated with the currently selected submenu appear in the workspace (see Figure 4-1).

**Menus**

- Status
- MTA

**Submenus**

- About
- Connection
- Security

**Workspace**

### Status

**Connection**

This page displays information on the status of the cable modem's HFC and IP network connectivity.

**Startup Procedure**

Procedure	Status	Comment
Acquire Downstream Channel	663000000 Hz Locked	
Connectivity State	OK	Operational
Boot State		
Configuration File	OK	
Security	Enabled	BPI+

**Downstream Bonded Channels**

Channel Lock	Status	Modulation	Channel ID	Frequency	Power	SNR	Correctables	Uncorrectables
1		QAM256		663000000 Hz	-6.8 dBmV	42.9 dB	1	0
2		QAM256		621000000 Hz	-6.1 dBmV	40.5 dB	0	0
3		QAM256		627000000 Hz	-6.0 dBmV	40.0 dB	0	0
4		QAM256		633000000 Hz	-6.0 dBmV	40.0 dB	0	0
5		QAM256		639000000 Hz	-6.1 dBmV	40.4 dB	4	0
6		QAM256		645000000 Hz	-6.1 dBmV	43.4 dB	1	0
7		QAM256		651000000 Hz	-6.3 dBmV	43.3 dB	0	0
8		QAM256		657000000 Hz	-6.5 dBmV	43.1 dB	0	0
9		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
10		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
11		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
12		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
13		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
14		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
15		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
16		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0

**Total Correctables Total Uncorrectables**

6 0

**Upstream Bonded Channels**

Channel Lock	Status	US	Channel Type	Channel ID	Symbol Rate	Frequency	Power
1			ATDMA		5120 Ksym/sec	10000000 Hz	39.3 dBmV
2			ATDMA		5120 Ksym/sec	20000000 Hz	39.0 dBmV
3			ATDMA		5120 Ksym/sec	30000000 Hz	39.5 dBmV
4			ATDMA		5120 Ksym/sec	38000000 Hz	40.8 dBmV

**CM IP Address Duration Expires**

D: -- H: -- M: -- S: --

Frequency Select (DS 1) (in MHz)

Current System Time: Tue Sep 24 11:25:47 2013

Figure 4-1. Main Areas on the Web Management Interface

## Web Management Interface Menus

Table 3 describes the menus in the Web management interface.

**Table 3. Web Management Interface Menus and Submenus**

Menus and Submenus	Description	See Page
Status > About	Shows information about the current system software.	37
Status > Connection	Shows the status of the cable modem's HFC and IP network connectivity.	38
Status > Security	Configures administration access privileges and the ability to restore factory defaults to the system.	40
MTA > Status	Shows initialization status of the MTA.	41
MTA > DHCP	Shows the MTA DHCP lease information.	42
MTA > QoS	Shows the MTA QoS parameters.	43
MTA > Provisioning	Shows the MTA provisioning information.	44
MTA > Event Log	Shows the MTA event log.	45

## Viewing System Software Settings

**Path: Status > About**

The Software page shows information about the current system software. The information is organized into the following sections:

Y Information

Shows the EMTA's DOCSIS-compliance information, hardware and software versions, and the cable modem Media Access Control (MAC) address, serial number, and certificate.

Y Status

Shows how long the EMTA has been operational, whether network access is allowed, and the cable modem IP address.

The screenshot shows the SMC Networks MTA Status page. The page is divided into a left sidebar and a main content area. The sidebar contains the SMC Networks logo and three navigation buttons: 'About', 'Connection', and 'Security'. The main content area has a blue header with 'Status' and 'MTA'. Below the header, the title 'Status' is followed by the sub-section 'Software'. A paragraph states: 'This page displays information on the current system software.' The information is presented in two tables. The first table, titled 'Information', lists: Standard Specification Compliant (DOCSIS 3.0), Hardware Version (1.0), Software Version (0142.559mp1.392115mp1.799.001), Cable Modem MAC Address (b8:9b:c9:f4:ef:3a), Cable Modem Serial Number (C21330000007), and CM certificate (Installed). The second table, titled 'Status', lists: System Up Time (0 days 02h:28m:38s), Network Access (Allowed), and Cable Modem IP Address (empty).

Information	
<b>Standard Specification Compliant</b>	DOCSIS 3.0
<b>Hardware Version</b>	1.0
<b>Software Version</b>	0142.559mp1.392115mp1.799.001
<b>Cable Modem MAC Address</b>	b8:9b:c9:f4:ef:3a
<b>Cable Modem Serial Number</b>	C21330000007
<b>CM certificate</b>	Installed

Status	
<b>System Up Time</b>	0 days 02h:28m:38s
<b>Network Access</b>	Allowed
<b>Cable Modem IP Address</b>	

## Viewing Network Connectivity

### Path: Status > Connection

The Connection page shows information about the status of the cable modem's HFC and IP network connectivity. The information is organized into the following sections:

Y Startup Procedure

Shows the procedures performed by the EMTA at startup, their status, and any comment associated with the procedures.

Y Downstream Bonded Channels

Shows the channel, lock status, modulation, channel ID, frequency, power, signal-to-noise ratio (SNR), and total correctables and uncorrectables.

Y Upstream Bonded Channels

Shows the channel, lock status, US channel type, channel ID, symbol rate, frequency, and power.

Y CM IP Address


Shows the cable modem IP address duration and expiration date/time.

Y Frequency Select (DS1)

Lets you set the frequency to be used for communications over Digital Signal 1 (DS1). Click **TUNE** to apply your setting.

Y Current system date and time.

Status
MTA



About

Connection

Security

### Status

**Connection**

This page displays information on the status of the cable modem's HFC and IP network connectivity.

**Startup Procedure**

Procedure	Status	Comment
Acquire Downstream Channel	663000000 Hz Locked	
Connectivity State	OK	Operational
Boot State		
Configuration File	OK	
Security	Enabled	BPI+

**Downstream Bonded Channels**

Channel Lock	Status	Modulation	Channel ID	Frequency	Power	SNR	Correctables	Uncorrectables
1		QAM256		663000000 Hz	-6.8 dBmV	42.9 dB	1	0
2		QAM256		621000000 Hz	-6.1 dBmV	40.5 dB	0	0
3		QAM256		627000000 Hz	-6.0 dBmV	40.0 dB	0	0
4		QAM256		633000000 Hz	-6.0 dBmV	40.0 dB	0	0
5		QAM256		639000000 Hz	-6.1 dBmV	40.4 dB	4	0
6		QAM256		645000000 Hz	-6.1 dBmV	43.4 dB	1	0
7		QAM256		651000000 Hz	-6.3 dBmV	43.3 dB	0	0
8		QAM256		657000000 Hz	-6.5 dBmV	43.1 dB	0	0
9		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
10		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
11		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
12		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
13		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
14		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
15		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0
16		Unknown		0 Hz	0.0 dBmV	0.0 dB	0	0

**Total Correctables Total Uncorrectables**

6	0
---	---

**Upstream Bonded Channels**

Channel Lock	Status	US Channel Type	Channel ID	Symbol Rate	Frequency	Power
1		ATDMA		5120 Ksym/sec	10000000 Hz	39.3 dBmV
2		ATDMA		5120 Ksym/sec	20000000 Hz	39.0 dBmV
3		ATDMA		5120 Ksym/sec	30000000 Hz	39.5 dBmV
4		ATDMA		5120 Ksym/sec	38000000 Hz	40.8 dBmV

**CM IP Address Duration Expires**

D: -- H: -- M: -- S: -----

Frequency Select (DS 1) (in MHz)

**Current System Time:** Tue Sep 24 11:25:47 2013

## Configuring Security Settings

**Path: Status > Security**

The Security page lets you change the user ID and password you use to log on to the Web management interface, enable or disable the EMTA's firewall, and restore the EMTA to its factory default settings. After you enter your security settings on this page, click **Apply** to have them take effect.

Option	Description
Password Change User ID	To change your logon user ID, enter the new logon user ID.
New Password	To change your logon password, enter the new case-sensitive password. For security, each typed password character is masked as a dot (●).
Re-Enter New Password	Re-enter the same case-sensitive password you entered in the New Password field. For security, each typed password character is masked as a dot (●).
Current User ID Password	To change your logon user ID, enter your current logon user ID.
Firewall Protection	Enables or disables the EMTA's built-in firewall.
Restore Factory Defaults	Restores the EMTA to its factory default settings. Any factory default settings you changed will be discarded.
Apply button	Click this button to save the settings you entered on this page.



## Viewing the MTA Initialization Status

**Path: MTA > Status**

The Status page displays initialization status information about the EMTA's multimedia terminal adapter (MTA). The information is organized into the following sections:

- Y Startup Procedure = shows the tasks performed at startup and their status.
- Y MTA Line State = shows the state of Line 1 (**TEL1**) and Line 2 (**TEL2**).

**MTA**

**Status**

This page displays initialization status of the MTA.

Startup Procedure	
Task	Status
Telephony DHCP	Completed
Telephony Security	Disabled
Telephony TFTP	Completed
Telephony Call Server Registration	L1: No Security Association / L2: No Security Association
Telephony Registration Complete	Fail Other Reason

**MTA Line State**

**Lines Hook State**

Line 1 N/A (Endpoint Disabled)

Line 2 N/A (Endpoint Disabled)

## Viewing DHCP Information

**Path: Path > DHCP**

The DHCP page shows MTA Dynamic Host Configuration Protocol (DHCP) lease information. The information is organized into the following sections:

Y Lease Parameters

Shows the fully qualified domain name (FQDN), IP address and submask information, bootfile path, and IP addresses for the primary and secondary Domain Name Systems (DNS).

Y Lease Timers

Shows the amount of time remaining for the DHCP lease, rebind, and renew.

Y Packetable DHCP Option 122

Shows PacketCable DHCP Option 122, which provides the MTA with a list of PacketCable DHCP servers from which the MTA is allowed to accept DHCP offers, as specified in RFCs 3495 and 3594.

The screenshot shows the MTA DHCP configuration page. On the left is a navigation menu with buttons for Status, DHCP, QoS, Provisioning, and Event Log. The main content area is titled 'MTA DHCP' and contains the following sections:

- Lease Parameters**

FQDN	MTA-SMCD3CM1604V-F4EF3B.denlab.smccb.net
IP Address/Submask	10.30.11.124 / 255.255.255.0
Gateway	10.30.11.1
Bootfile	tftp://[192.168.2.130]/MATT_BCMv1.cfg
Primary DNS	192.168.2.111
Secondary DNS	172.16.2.200
- Lease Timers**

Lease Time Remaining	D: 00 H: 23 M: 59 S: 01
Rebind Time Remaining	D: 00 H: 11 M: 59 S: 01
Renew Time Remaining	D: 00 H: 02 M: 59 S: 01
- PacketCable DHCP Option 122**

SNMP Entity (Sub-option 3)	superfluid.denlab.smccb.net
Kerberos Realm (Sub-option 6)	BASIC.1
Provisioning Timer (Sub-option 8)	

## Viewing Quality of Service Information

**Path:** Path > QoS

The QoS page shows MTA QoS settings. The information is organized into the following sections:

- Y Error Codewords
  - Shows the number of code words that had no errors, errors that were corrected, and errors that could not be corrected.
- Y Payload header Suppression
  - Shows whether the Payload Header Suppression (PHS) status is ON or OFF.
- Y Service Flows
  - Shows PacketCable DHCP Option 122, which provides the MTA with a list of PacketCable DHCP servers from which the MTA is allowed to accept DHCP offers, as specified in RFCs 3495 and 3594.

Status
MTA

Status

DHCP

**QoS**

Provisioning

Event Log

### MTA

#### QoS

This page displays the MTA QoS parameters.

---

**Error Codewords**

Unerrored Codewords	410186400
Correctable Codewords	1
Uncorrectable Codewords	0

**Payload Header Suppression**

PHS Status	ON
------------	----

**Service Flows**

SFID	Service Class Name	Direction	Primary Flow	Packets
59855		Upstream	No	4084
59856		Downstream	No	0

## Viewing Provisioning Information

**Path: Path > Provisioning**

The Provisioning page shows MTA provisioning information. The information is organized into the following sections:

Y MTA Config File

Shows the filename and contents of the MTA configuration file.

Y Enterprise MIBs

Shows the Object Identifiers (OIDs) and their corresponding values in the enterprise Management Information Bases (MIBs).

**MTA**

**Provisioning**

This page displays the MTA provisioning details.

**MTA Config File**

Filename `ftp://[192.168.2.130]/MATT_BCMv1.cfg`  
 Contents

**Enterprise MIBs**

OID	Value
<code>emtaInhibitSwDownloadDuringCall</code>	<code>false(2)</code>
<code>emtaFirewallEnable</code>	<code>true(1)</code>
<code>emtaRingWithDCOffset</code>	<code>false(2)</code>
<code>emtaIncludedInCmMaxCpe</code>	<code>true(1)</code>
<code>emtaDhcpOption</code>	<code>cableLabsClientConfiguraton(122)</code>
<code>emtaUseAlternateTelephonyRootCert</code>	<code>false(2)</code>
<code>emtaEnableDQoS Lite</code>	<code>true(1)</code>
<code>emtaInhibitNcsSyslog</code>	<code>true(1)</code>
<code>emtaMaintenanceWindowBegin</code>	<code>Thu Jan 01 00:00:00 1970</code>
<code>emtaMaintenanceWindowDuration</code>	<code>0</code>
<code>emtaMaintenanceControlMask</code>	<code>0x10 [maintenanceOnCMSLoss(3)]</code>
<code>emtaMaintenanceQuarantineTimeout</code>	<code>120</code>
<code>emtaMaintenanceDisconnectedTimeout</code>	<code>120</code>
<code>emtaMaintenanceRFDisconnectTimeout</code>	<code>300</code>
<code>emtaSignalingAnnouncementCtrl</code>	<code>0x00</code>
<code>emtaSignalingVoiceJitterBufferType</code>	<code>jitterBufferTypeAdaptive(2)</code>
<code>emtaSignalingVoiceJitterNomValue</code>	<code>0</code>
<code>emtaSignalingVoiceJitterMinValue</code>	<code>0</code>
<code>emtaSignalingVoiceJitterMaxValue</code>	<code>0</code>
<code>emtaSignalingDataJitterNomValue</code>	<code>60</code>
<code>emtaSignalingDtmfToneRelayRFC2833Support</code>	<code>true(1)</code>
<code>emtaSignalingRtpBaseReceiveUdpPort</code>	<code>53456</code>
<code>emtaSignalingEndptConnectionCleanupTimeout</code>	<code>0</code>
<code>emtaSignalingEmtaResetCleanupTimeout</code>	<code>0</code>
<code>emtaSignalingT38FaxRelaySupport</code>	<code>true(1)</code>

## Viewing the Event Log

Path: Path > Event Log

The Event Log page shows the time, priority, ID, and text description of system events. This page can be very useful, as it shows what has happened to the EMTA since power on.

All entries are date and time stamped. The log space is used in a cyclic manner, with the most recent entry at the top.

The screenshot displays the MTA Event Log page. On the left is a navigation menu with the SMC Networks logo and buttons for Status, DHCP, QoS, Provisioning, and Event Log (which is selected). The main content area is titled 'MTA Event Log' and includes a description: 'This page displays the MTA Event Log.' Below this is a table with the following columns: Time, Priority, ID, and Text. The table contains 24 rows of event logs, alternating between blue and white background colors. Each row represents a system event with a timestamp, priority level, ID number, and a descriptive text.

Time	Priority	ID	Text
2013-09-24 18:26:15	5-Information	4000951502	Provisioning Complete - Fail
2013-09-24 18:26:15	5-Information	4000950904	Configuration File Error - Missing Parameter
2013-09-24 18:15:42	5-Information	4000951502	Provisioning Complete - Fail
2013-09-24 18:15:42	5-Information	4000950904	Configuration File Error - Missing Parameter
2013-09-24 18:05:08	5-Information	4000951502	Provisioning Complete - Fail
2013-09-24 18:05:08	5-Information	4000950904	Configuration File Error - Missing Parameter
2013-09-24 17:54:35	5-Information	4000951502	Provisioning Complete - Fail
2013-09-24 17:54:35	5-Information	4000950904	Configuration File Error - Missing Parameter
2013-09-24 17:44:02	5-Information	4000951502	Provisioning Complete - Fail
2013-09-24 17:44:02	5-Information	4000950904	Configuration File Error - Missing Parameter
2013-09-24 17:33:28	5-Information	4000951502	Provisioning Complete - Fail
2013-09-24 17:33:28	5-Information	4000950904	Configuration File Error - Missing Parameter
2013-09-24 17:22:55	5-Information	4000951502	Provisioning Complete - Fail
2013-09-24 17:22:55	5-Information	4000950904	Configuration File Error - Missing Parameter
2013-09-24 17:12:21	5-Information	4000951502	Provisioning Complete - Fail
2013-09-24 17:12:21	5-Information	4000950904	Configuration File Error - Missing Parameter
2013-09-24 17:01:48	5-Information	4000951502	Provisioning Complete - Fail
2013-09-24 17:01:48	5-Information	4000950904	Configuration File Error - Missing Parameter
2013-09-24 16:51:16	5-Information	4000951502	Provisioning Complete - Fail
2013-09-24 16:51:16	5-Information	4000950904	Configuration File Error - Missing Parameter
2013-09-24 16:40:43	5-Information	4000951502	Provisioning Complete - Fail

## 5 Troubleshooting Procedures

Successful troubleshooting requires a logical, consistent approach that narrows down the source of a problem by ascertaining what is and isn't working until a single cause is identified. This chapter provides suggestions for identifying and resolving problems in the unlikely event you encounter a problem using the EMTA. It also provides tips for tuning your configuration to optimize your wired and wireless networking experience.

The topics covered in this chapter are:

Topic	Subtopics
Basic Troubleshooting Procedures	See page 47
Advanced Troubleshooting Procedures	<ul style="list-style-type: none"> <li>• Troubleshooting Physical Network Problems (page 49)</li> <li>• Troubleshooting Configuration Problems (page 50)</li> <li>• Determining Your IP Address (page 50)</li> <li>• Troubleshooting Software-Interaction Problems (page 54)</li> </ul>
Specific Troubleshooting Procedures	<ul style="list-style-type: none"> <li>• Unable to Log In to (page 55)</li> <li>• Local Networked Devices Unable to Access the (page 55)</li> <li>• Unable to Access the Internet (page 56)</li> <li>• Unable to Access Networked Devices (page 57)</li> <li>• Using the Ping Utility to Troubleshoot (page 57)</li> <li>• EMTA Disconnects from the Internet (page 60)</li> <li>• Slow Web Browsing (page 61)</li> <li>• Unable to Configure Port Forwarding (page 61)</li> <li>• EMTA is Not Passing DHCP Address to a computer (page 62)</li> <li>• Determining a Computer's MAC Address (page 62)</li> </ul>

## Basic Troubleshooting Procedures

The following covers basic troubleshooting procedures. Carefully review the sections to make sure you follow the recommended procedures.

### Always start your network using the following sequence

1. Unplug the EMTA and any other routers or switches.
2. Shut down connected computers.
3. Plug in the EMTA first and wait for the lights to cycle through the startup routine. This prevents another device from taking the DHCP lease.
4. Plug in any other routers and switches.
5. Start up your computer.

### Check basic EMTA functions

After you turn on power to the EMTA, check that the following LED sequences have occurred (and see “Front Panel” on page 11):

1. When power is first applied, verify that the **POWER** LED is ON.
2. After about a minute, verify the statuses of the following LEDs on the front panel of the EMTA (see Figure 1-1 on page 11):
  - γ **ONLINE** = ON (EMTA is operational)
  - γ **DS** = ON (EMTA is connected to the Internet)
  - γ **US** = ON (EMTA is connected to the Internet)

If this behavior does not occur, see Table 4. If the incorrect behavior persists, use the Reset button to return the EMTA to its factory default configuration settings (see “Using the Reset Button” on page 15).

**Table 4. Checking Basic EMTA Functions**

If...	Perform This Procedure
The <b>POWER</b> and other LEDs are OFF.	<ol style="list-style-type: none"> <li>1. Turn off the EMTA and then turn it on again to see whether the problem is resolved.</li> <li>2. Check that you are using the power adapter supplied with the EMTA.</li> <li>3. Be sure the power cord is connected to the EMTA and to a functioning power outlet.</li> <li>4. Plug a working device, such as a lamp, into the power outlet to confirm that the outlet is working.</li> <li>5. Be sure the power outlet is not controlled by a wall switch that can inadvertently remove power from the outlet.</li> </ol>
The <b>DS</b> and <b>US</b> LEDs are OFF.	<ol style="list-style-type: none"> <li>1. Be sure the Ethernet cable connections are secure at the EMTA and at the computer.</li> <li>2. Be sure that power is turned on to the computer connected to the EMTA.</li> <li>3. Be sure you are using the Ethernet cable supplied with the EMTA or one configured similarly to it.</li> </ol>

**Check the EMTA’s telephone interfaces**

To confirm that the EMTA’s two telephone interfaces are working properly:

1. Lift the handset of the device connected to the EMTA’s telephone 1 interface, and confirm that the **Tel1** LED goes ON. Hang up the device (place the device onhook) and confirm that the **Tel1** LED goes OFF.
2. Lift the handset of the device connected to the EMTA’s telephone 2 interface, and confirm that the **Tel2** LED goes ON. Hang up the device (place the device onhook) and confirm that the **Tel2** LED goes OFF.



## Advanced Troubleshooting Procedures

Most advanced troubleshooting procedures fall into one of the following categories:

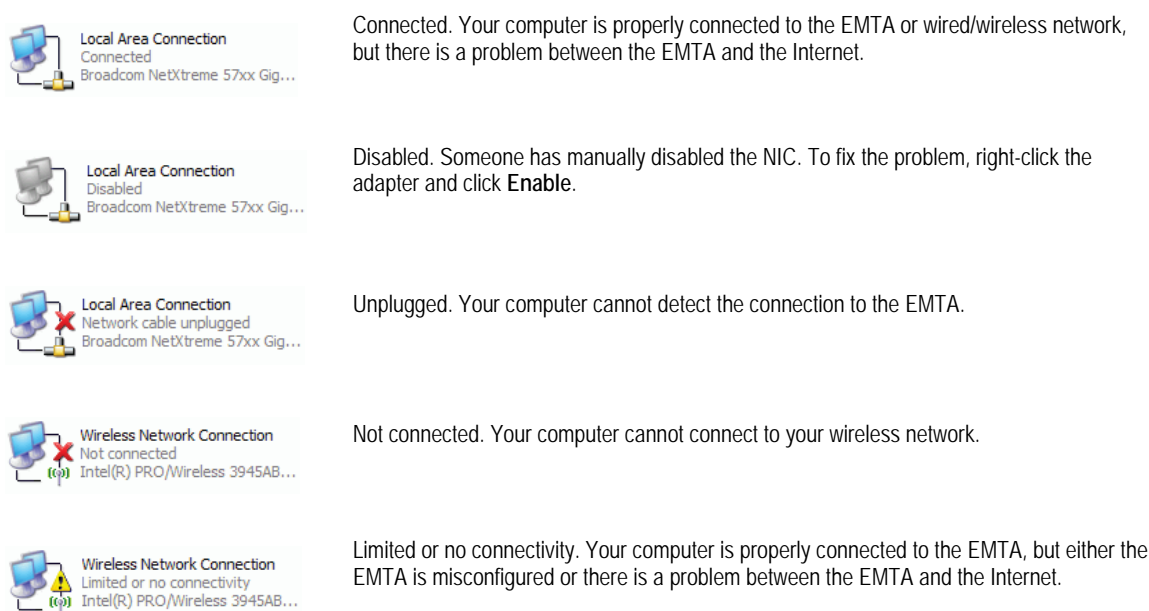
- Y Physical - an underlying problem with cables, a bad EMTA, or similar hardware problem. See page 49.
- Y Configuration - a problem with the configuration of one or more of network components. See page 50.
- Y Software - a failure of one or more software applications, an undesired interaction between two or more applications, or an undesired application that has been introduced into the network. See page 54.

### Troubleshooting Physical Network Problems

When you experience network troubles, start by checking the physical network devices and connections. These problems are the most easily fixed and include:

- Y Performing a thorough physical inspection of your network.
- Y Checking that all hardware devices, including the EMTA, are plugged in and physically connected to the network.
- Y Making sure you are using the proper network cables (for example, not using a crossover cable with a NIC that requires a straight-through cable).
- Y Making sure all network cables are in good condition and well seated. Often, reseating the cable into a connector is all that is required to ensure a firm connection.

In addition, some operating systems, such as Microsoft Windows XP, show errors, such as when a network cable is unplugged. Figure 2, for instance, shows examples of how Microsoft Windows XP shows connection statuses in the Network Connections window. For information about other operating systems, refer to the documentation for those operating systems.



**Figure 5-1. Examples of Connectivity Statuses for Microsoft Windows XP**

## Troubleshooting Configuration Problems

After confirming that your hardware is working properly, examine your networking configuration to determine whether there is a misconfiguration of IP addresses, subnet masks, EMTAs, or broadcast addresses. Common configuration problems can be caused by misconfiguring newly connected or configured devices.

### Determining Your IP Address

An IP address uniquely identifies computers and computing devices, such as the EMTA, on a TCP/IP network. IP addresses are normally expressed in dotted-decimal format, with four numbers (or “octets”) separated by periods, such as **10.1.10.1**.

For troubleshooting purposes, all the numbers in the IP addresses of your networked devices must be consistent across the network. This means:

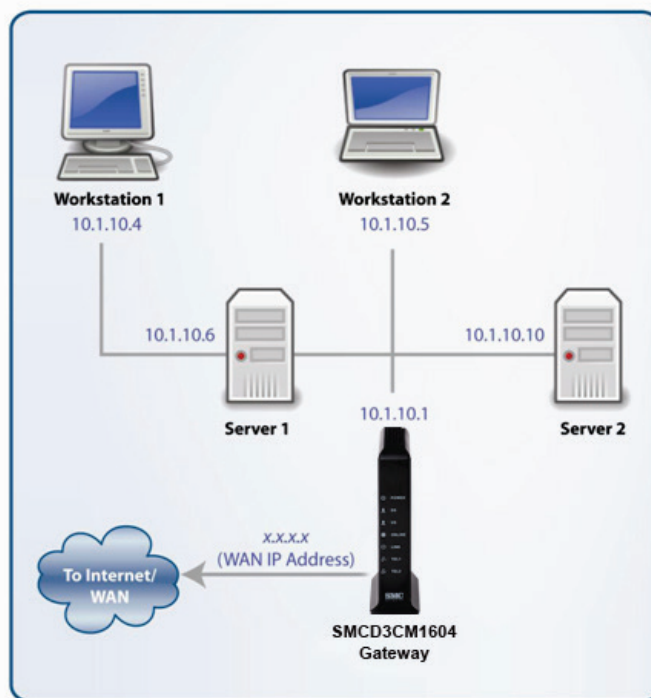
- Y The first three numbers (i.e., the first three octets) in the IP addresses are the same for all the devices on the network.
- Y The last three numbers (i.e., the last octet) in the IP addresses are different and not in use by other devices on the network (assuming your subnet mask is **255.255.255.000**).

For example, if the IP address for the EMTA is **10.1.10.1**, the other devices on the network must have an IP address whose:

- Y First three octets are **10.1.10**.

- Y Last octet is any unique number from 0 to 255 (there are restrictions on using 0 and 255, so avoid using them). You would not use 1 as the last number, since that number is the last octet in the EMTA IP address in our example.

Figure 5-2 shows an example of IP addresses assigned to devices on the network.



**Figure 5-2. Example of IP Addresses for Networked Devices**

You define the computer's IP address using the procedure appropriate for your operating system, as described in Chapter 3.



**Tip:** The following Windows sections describe how to use the command-line program Windows IP Configuration (ipconfig) to see the IP address of a computer running a Windows operating system. However, if you want even more information, such as IP routing and DHCP information, type **ipconfig /all** instead of **ipconfig** in the Windows sections that follow.

The most common problem associated when viewing IP addresses is that either:

- Y A computer's IP address is not on the same subnet as the other networked devices. In other words, the first nine numbers (three octets) in the device's IP address are not identical to those of the other networked devices.
- Y A computer shows an IP address that starts with the digits 169.254. When this happens, it often means the computer could not retrieve a network address from a DHCP server and therefore automatically assigned itself an address from the base

network address 169.254. This would be fine if all the computers on your network used IP addresses from the 169.254 base network address. If one of them isn't, however, that computer will have problems connecting to the other network computers.

Possible causes for an IP address not being assigned are:

- Defective cables. Replace the cable if it is worn or defective.
- An Ethernet cable may not be firmly connected at both ends. Secure the cable at both ends. Often, just reseating the cable into a connector is all that is required.
- The NIC may be bad or the network cable connected to it may be the wrong kind (for example, it might be a straight-through cable when a crossover cable is required). If you have another NIC and cable available, try using them instead.
- The EMTA port may be bad. Plug the network cable into a different port on the EMTA.
- The DHCP server that would automatically assign IP addresses is not configured for DHCP.
- Wrong WEP or WPA settings are configured on the EMTA or access point for wireless connections.

The sections that follow describe how to identify the IP addresses on devices running Windows and Macintosh operating systems.

### Microsoft Windows 2000

To find the IP address of a computer running Microsoft Windows 2000:

1. From the Windows task bar, click **Start** and select **Run**.
2. In the **Open** field, type **cmd** and click **OK**. A DOS command window appears.
3. In the DOS command window, type **ipconfig** and then press Enter. Your IP address will be listed (see Figure 5-3).
4. When you finish, type **exit** at the command prompt and press Enter to close the window

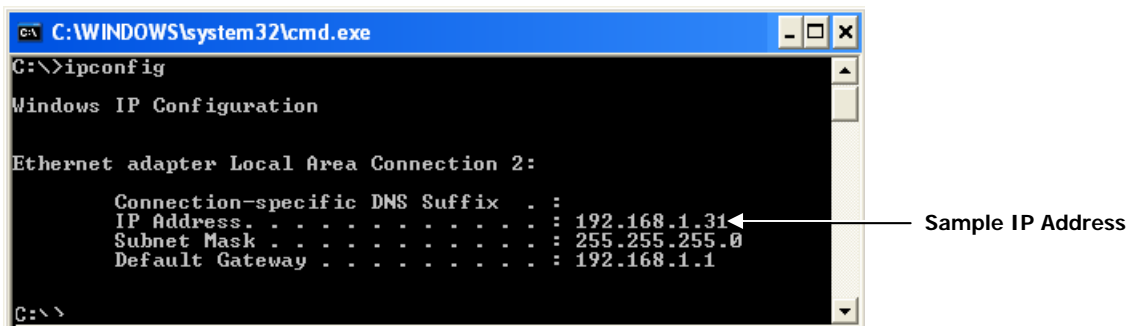


Figure 5-3. Example of an IP Address

## Microsoft Windows XP, Vista, and 7

To find the IP address of a computer running Microsoft Windows XP, Vista, or 7:

1. Click on **Start** and in the Start Search box type **cmd**.
2. Press Enter on your keyboard or click **cmd.exe** in your search list (see Figure 5-4).



**Figure 5-4. Example of md.exe in the Search List**

3. In the DOS command window, type **ipconfig** and then press Enter. Your IP address will be listed (see Figure 5-3).
4. When you finish, type **exit** at the command prompt and press Enter to close the window.

## Apple Macintosh OS X

To find the IP address of a Mac OS X OS X 10.6 or 10.5 computer:

1. From the Apple menu, select **System Preferences...**
2. In **System Preferences**, from the **View** menu, select **Network**.
3. In the Network preference window, click a network port (for example, **Ethernet**, **AirPort**, **modem**). If you are connected, the IP address appears below **Status**.
4. Close the window when finished.

To find the IP address of a Mac OS X 10.4 or 10.3 computer:

1. From the Apple menu, select **Location**, and then **Network Preferences...**

2. In the Network Preference window, next to **Show**, select **Network Status**. Your network status and IP address appear.
3. Close the window when finished.

### Via the Web

There are various Web sites, such as <http://whatismyipaddress.com/>, that display your IP address and other information about your system. If the page does not display, you may not have a working Internet connection and should try one of the methods described above to find your IP address.

## Troubleshooting Software-Interaction Problems

If the physical network and basic configuration procedures in the preceding sections do not resolve your problem, focus on software problems. The most common software problems are related to firewalls.

Many third-party antivirus programs include built-in firewalls. You may not realize that you installed the firewall component when you installed the antivirus software, and now the firewall may be interfering with your network connectivity.

To troubleshoot software problems:

1. Disconnect your network from the Internet so that you can safely disable any firewalls or antivirus software while you troubleshoot.
2. Disconnect the EMTA from the Internet and unplug the EMTA.
3. After you are off the Internet, disable any antivirus or firewall programs you have, including Internet Connection Firewall or Windows Firewall, on all the computers that have problems. If this step solves the problem, the problem exists with one of these Windows features or products. Enable one at a time and see when things break again. When they do, you know where the problem is and you can either replace that product with one that does not cause problems or change the program's configuration to resolve the problem.
4. When you have everything working, reconnect your devices to the Internet.
5. Restart all your computers.

## Specific Troubleshooting Procedures

The following sections cover specific troubleshooting suggestions you may find helpful if the basic and advanced troubleshooting procedures in the previous sections did not resolve your problem.

## Unable to Log In to EMTA

If you are unable to log in to the EMTA's Web management interface:

1. Confirm that the Ethernet cable connecting the computer and EMTA is connected securely at both ends. Often, just reseating the cable into a connector is all that is required.
2. If you have more than one network port available on the EMTA, plug the cable into a different port. If the network connection works, the original port on the EMTA is faulty. However, you can continue to use the other ports.
3. The NIC in your computer might have failed. If possible, connect a different computer to the same network cable. If the connection works, the problem is with the NIC. Contact the NIC manufacturer for support or install a new NIC. If the new computer also fails to connect, replace the Ethernet cable with a new cable, as you might have a faulty cable. If the problem persists, contact technical support for the EMTA.
4. Be sure you are using the correct login information.

## Local Networked Devices Unable to Access the EMTA

If devices on the local network cannot access the EMTA:

1. Go to **Status > Connection**.
2. Under the **Startup Procedure**, check for error statuses. If your statuses show no local network connection and/or no clients connected, proceed to the next step.<<true??>>
3. Be sure the computer connected to the EMTA is configured to use the same subnet mask and EMTA settings as shown on the **Status > DHCP** page (see "Viewing DHCP Information" on page 42).
4. Ping the EMTA from a computer on the same subnet as the EMTA (see "Testing the Path from a Computer to the EMTA" on page 57). If the ping fails and there is no firewall software installed, your network configuration, NIC, or cabling is probably at fault.
5. Release and renew the NIC's IP address:
  - a. From the Windows task bar, click **Start** and select **Run**.
  - b. In the **Open** field, type **cmd** and click **OK**.
  - c. At the first command prompt, type **ipconfig/release** and press Enter.
  - d. At the next command prompt, type **ipconfig/renew** and press Enter.
  - e. Check whether your computer obtained an IP address other than **169.254.x.x** or **0.0.0.0**.
6. If the problem continues, power cycle the EMTA and computer:
  - a. Turn off the computer and turn off EMTA.
  - b. Turn on the EMTA and turn on computer.

7. For secured wireless connections, be sure you entered the correct security key when connecting to a secured wireless network.

### Unable to Access the Internet

If the EMTA cannot access the Internet, it could be due to several reasons, such as a failed Internet connection, a misconfigured EMTA, or a misconfigured NIC.

1. Unplug the EMTA.



**Note:** If the EMTA is located where you cannot easily unplug it, you can restart it using the Restore / Reboot EMTA page (see “Configuring Security Settings” on page 40).

2. Turn off the EMTA for three minutes.
3. Turn off all computers attached to your network.
4. Plug in the EMTA first, turn it on, and let it boot.
5. After the EMTA completes its connection to the ISP, restart your computer.
6. Check that the EMTA’s **ONLINE** LED is ON. If it is OFF, replace the coaxial cable connecting the EMTA to the cable service. If the **ONLINE** LED does not go ON after the EMTA has been powered up for several minutes, contact your cable provider to confirm that the service is active.
7. If the **ONLINE** LED is ON, click **Status > About** and confirm that the **Network** field shows **Active** (see Viewing System Software Settings on page 37). If it doesn’t, contact your cable provider to confirm that the service is active.
8. If you have more than one network port available on the EMTA, plug the cable into a different port. If the network connection works, the original port on the EMTA is faulty. However, you can continue to use the other ports.
9. Close any network applications that you might have opened, especially file-sharing and peer-to-peer applications. These applications can consume large amounts of bandwidth that can prevent you from being able to browse the Web.
10. Ping a location on the Internet (see “Testing the Path from a Computer to the Internet” on page 59). For example, `ping www.yahoo.com`. If the ping succeeds, proceed to the next step. If the ping fails:
  - Y Your Web browser may be misconfigured. Be sure you do not have an incorrect proxy server setting in your Web browser.
  - Y If your computer is running a Microsoft Windows operating system, check whether the computer has a corrupt winsock registry entry (refer to your Windows documentation).
  - Y The site might be down. Try to ping another site.



- Y If your additional pings fail, please contact technical support.
- 11. Check your computer's operating system to see whether the computer has connectivity (for example, see Figure 5-1 and refer to the documentation for your operating system). If it doesn't, try using another computer and NIC attached to the EMTA to connect to the Internet.
- 12. Try accessing the Internet with a different browser. If you succeed, the problem exists with the previous browser you used.

### Unable to Access Networked Devices

If you are on a network, but cannot connect to any resources on the network:

1. The Ethernet cable may be worn. Replace the cable if it is worn.
2. The Ethernet cable may not be firmly connected at both ends. Secure the cable at both ends. Often, just reseating the cable into a connector is all that is required.
3. The port on the EMTA may be bad. Plug the network cable into a different port on the EMTA.
4. The NIC may be bad or the cable connected to the NIC may be the wrong kind of network cable (for example, you may be using a straight-through cable when a crossover cable is required). If you have another NIC available, try using it instead of the one currently used.
5. Ping the IP address of other computers and devices on your network.
6. For Windows operating systems:
  - Try connecting to a computer on the network using **Start \ Run** and enter **\\PCname**, where **PCname** is the name of the computer you want to connect to.
  - Add the computer and its IP address to the `LMHOSTS` file. This is a text file that resides in the `Windows\System32\drivers\etc` directory (for Windows2000 or XP) and has the format `IP_Address Computer_Name`.



**Tip:** Browsing is a fairly complicated issue and has a lot of places for failure. If you need to have resources available, create shortcuts on your desktop instead.

### Using the Ping Utility to Troubleshoot

You can use your computer's ping utility to test the path from the computer to the EMTA and from your computer to the Internet.

### Testing the Path from a Computer to the EMTA

You can ping the EMTA to verify that the LAN path from your computer to the EMTA is set up correctly. To ping the EMTA from a Windows computer:

1. From the Windows task bar, click **Start** and select Run.
2. In the **Open** field, type **ping** followed by the IP address of the EMTA.
3. Click **OK**. A message similar to the following appears (in this example, 192.168.0.1 is the IP address entered as part of the **ping** command):

```
Pinging 192.168.0.1 with 32 bytes of data
```

If the destination IP address was contacted successfully, a message similar to the following appears:

```
Reply from 192.168.0.1: bytes=32 time=NN ms TTL=xxx
```

If the path was not contacted successfully, a message similar to the following appears:

```
Request timed out
```

If the path is not working properly:

- Y The physical connections may be wrong. Be sure the EMTA's **ONLINE** LED is ON. If it is OFF, review "Basic " on page 47.
- Y Check that the corresponding LEDs on the NIC installed in your computer are ON (refer to the documentation for your NIC). If they are OFF, verify that the Ethernet card driver software and TCP/IP software are both installed and configured properly on your computer.
- Y Verify that the IP addresses for the EMTA and your computer are correct and that both addresses are on the same subnet (for example, 192.168.1.x/255.255.255.0).

## Testing the Path from a Computer to the Internet

After verifying that the path between your computer and EMTA is working properly, use the following procedure to test the path from your computer to the Internet.

To test the path using ping from a Windows PC:

1. From the Windows task bar, click **Start** and select **Run**.
2. In the **Open** field, type **cmd** and click **OK**. A DOS command window appears.
3. At the **>** prompt, type **ping -n 10 IPaddress** where **IPaddress** is the IP address of a remote device (such as your ISP's server) or Web site (such as www.yahoo.com).
4. Press Enter. If the path is working, a reply similar to the one in the previous section appears. If you do not receive replies:
  - Y Confirm that your computer has the IP address of the EMTA listed as the default EMTA. If your computer's IP address is obtained automatically through DHCP, this information will not be visible in your computer's Control Panel. Verify that the EMTA's IP address is shown as the TCP/IP default EMTA.
  - Y Check whether your computer's network address (the portion of the IP address specified by the netmask) is different than the network address of the remote device.
5. When you finish, type **exit** at the command prompt and press Enter to close the window.

## Using Ping on a Macintosh

To ping on a Macintosh:

1. Click on **Go > Applications > Utilities**.
2. Click on **Network Utility**, and then click the **Ping** tab. A page similar to the one in Figure 5-5 appears.
3. In the first field, enter the IP address you want to ping.
4. Using the options below the field, select an unlimited number of pings or send a specific number of pings.
5. Click the **Ping** button. If you receive:
  - Y **reply from...**, the destination IP address was contacted successfully.
  - Y **request timed out**, the destination IP address was not contacted successfully.
  - Y **destination host unreachable**, you are not on the same subnet as the destination address. Change your IP address to communicate with the destination address.

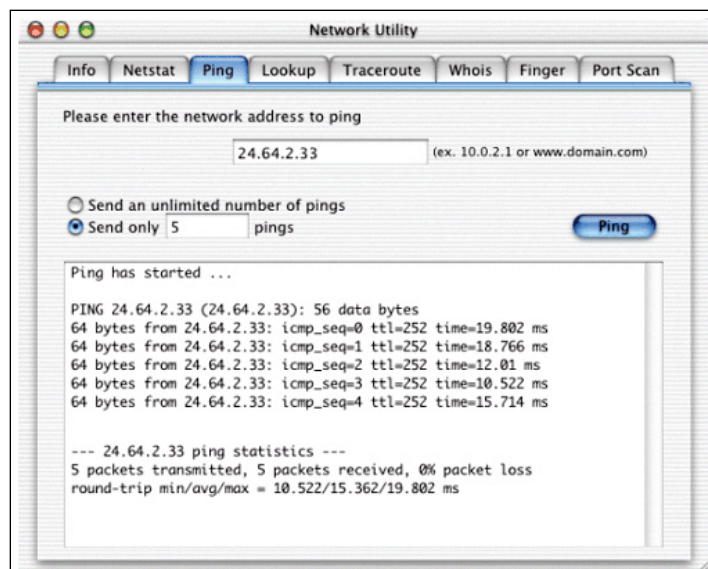


Figure 5-5. Ping Tab on the Network Utility Page

### EMTA Disconnects from the Internet

If the EMTA has been connected to the Internet for an extended period and holds an IP address (DHCP lease) for a longer period of time than your ISP allows, it is not uncommon for the EMTA to disconnect from the Internet. This is normal and does not indicate any issue with the EMTA.

1. Press the EMTA reset switch.



**Note:** If your DHCP lease time seems to be extremely short, click **MTA > DHCP** and check the **Lease Timer** settings on the DHCP page (see “Viewing DHCP Information” on page 42). Contact your ISP to determine whether there are other issues on the network.

2. Connect a computer to one of the EMTA’s LAN ports.
3. Restart your computer.
4. Reset the EMTA to its factory default settings using either the Reset button (see “Using the Reset Button” on page 15) or the **Restore Factory Defaults** setting on the Security page (see “Configuring Security Settings” on page 40).



**Note:** This step removes all overrides made to the EMTA’s default settings and returns the EMTA to its original factory default settings.

In certain network scenarios, it may be helpful to turn off all the equipment on your network, and then turn the equipment all back on. Leaving some devices unplugged for up to five minutes can also help.

### **If the disconnections are limited to wired clients only**

Check your NIC settings and all cable routing, connections, and power supplies.

### **If the disconnections are limited to wireless clients only**

Focus on factors that affect wireless clients, such as:

- Y Network selection and security
- Y Hardware access control
- Y Client TCP/IP settings
- Y Signal strength
- Y Sources of interference

### **Can you connect to the Internet directly?**

1. Set up a computer to connect to the Internet directly, without using the EMTA.
2. If you cannot connect to the Internet without the EMTA, contact your ISP for assistance.

### **Slow Web Browsing**

If you experience slow Web browsing with the EMTA:

1. Check for possible intrusions by spyware and viruses.
2. Clear browser settings and cache (refer to the documentation for your Web browser).
3. Stop other programs running in the background that are consuming bandwidth.
4. A specific site may be suffering from server issues. Try another site.
5. Update the EMTA firmware.

### **Unable to Configure Port Forwarding**

If you are not able to configure port forwarding for software applications, external servers, or gaming:

- Y Ascertain the port(s) that the application or game calls for.
- Y Some ISPs block ports, such as ports 20, 21, and 80. Check with ISP to confirm whether it is blocking ports.
- Y Reserve IP addresses for the computers to ensure they receive the appropriate IP address(es) for the service created.
- Y Disable firewalls and stateful packet inspection (SPI) applications.
- Y Create a dynamic DNS (DynDNS) account for dynamic IP addresses from the ISP.
- Y Update the EMTA firmware.

## EMTA is Not Passing DHCP Address to a computer

If the EMTA is not passing DHCP addresses to a computer over a wired or wireless connection:

1. Be sure the computer's IP is not statically set already.
2. Release and renew the NIC's IP address:
  - a. From the Windows task bar, click **Start** and select **Run**.
  - b. In the **Open** field, type **cmd** and click **OK**.
  - c. At the first command prompt, type **ipconfig/release** and press Enter.
  - d. At the next command prompt, type **ipconfig/renew** and press Enter.
3. For wired connections, be sure the physical cable connections are correct.

## Determining a Computer's MAC Address

The following sections describe how to obtain a computer's MAC address.

### Microsoft Windows

To determine the MAC address on a Windows computer:

1. From the Windows task bar, click **Start** and select **Run**.
2. In the **Open** field, type **cmd** and click **OK**. A DOS command window appears.
3. In the DOS command window, type **ipconfig/all** and press Enter.
4. This window displays your networking information. The MAC address appears as a **Physical Address** below **Ethernet adapter Local Area Connection**. In the example in Figure 5-6, the MAC address is **00-1E-8C-94-09-EA**, which is the physical address of the NIC card.
5. When you finish, type **exit** at the command prompt and press Enter to close the window.

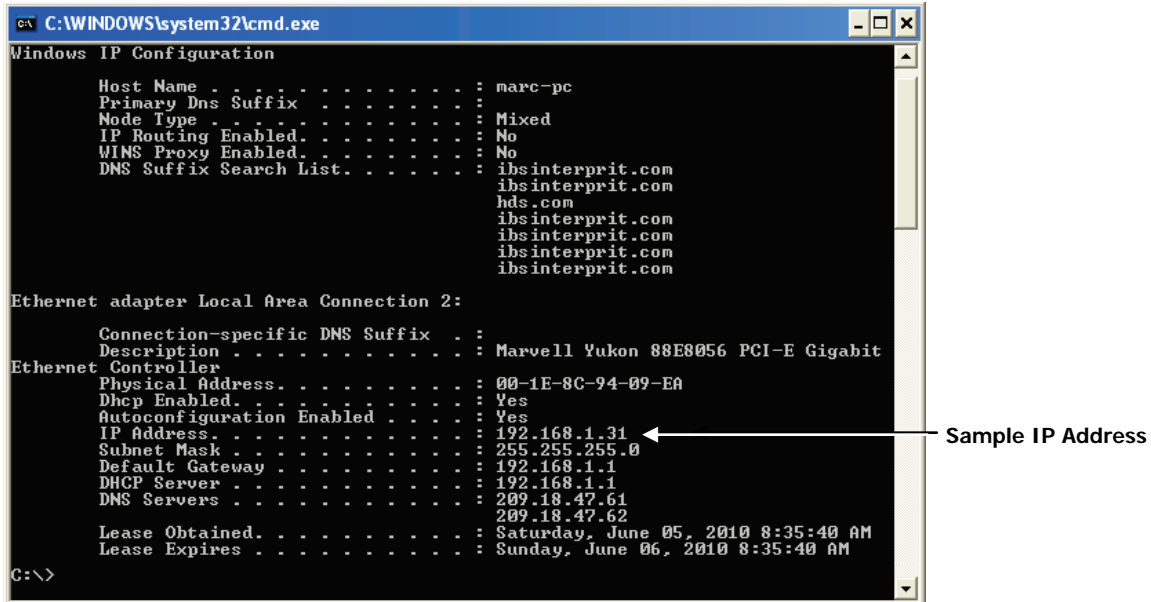


Figure 5-6. Example of MAC Address

### Apple Macintosh Windows OS X

To determine the MAC address on a Mac running OS X, perform the following procedure. The MAC address appears in the form of 00 0D 93 13 51 1A.

1. From the dock, select **System Preferences**.
2. Select **Network**, **Select Location**, **Select Interface**.
3. Perform one of the following steps:
  - Y For a wired Mac running Mac OS 10.2 or earlier, select the **TCP/IP** tab. The number next to the **Ethernet Address** is your MAC address.
  - Y For a wired MAX running OS 10.3 and later), select the **Ethernet** tab. The number next to the **Ethernet ID** is your MAC address.
  - Y For a wireless connection (AirPort), select **AirPort** tab. The number next to the **AirPort ID** is your MAC address.

## Appendix A - Glossary

Term	Definition
Correctables	Number of codewords that were detected to be damaged, but could be repaired by the EMTA.
Downstream	The direction from the head-end toward the subscriber. The downstream channel carries data from the ISP's head end (UBR) to your EMTA.
DS1	Digital Signal 1. A T-carrier signaling method that is widely used standard in telecommunications in North America and Japan to transmit voice and data between devices.
EMTA	Embedded Multimedia Terminal Adapter. A device that combines a DOCSIS cable modem and analog telephone adapter. The cable modem provides the data interface and the telephone adapter provides the voice over IP (VOIP) interface for one or more telephones. The terminal adapter provides the conversion between analog voice signals and IP packets, delivers dial tone, and manages the call setup.
Payload Header Suppression	A feature of DOCSIS 1.1 and 2.0 in which header bytes that are common in a sequence of packets of a Service Flow are replaced by a 1-byte PHSI Index (PHSI) when transmitting the packet on the RF network.
Uncorrectables	Number of codewords that were detected to be damaged beyond possibility of repair by the EMTA. If this count is increasing, the downstream signal conditions are unacceptable, regardless of how good the SNR and power figures look on the Connection page (see "Viewing Network Connectivity" on page 38). Uncorrectables disappear after a reboot because the EMTA resets its counters to zero without store that data permanently in its memory.
Upstream	The direction from the subscriber toward the head-end. The upstream channel carries data from your EMTA to the ISP's head-end.



## Appendix B - Compliance

### FCC Interference Statement

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 radio interference in a commercial environment. This equipment can generate, use and radiate radio frequency energy and, if not installed and used in accordance with the instructions in this manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures are necessary to correct the interference. 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:

- Y Reorient or relocate the receiving antenna.
- Y Increase the separation between the equipment and receiver.
- Y Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Y Consult the dealer or an experienced radio/TV technician for help.

The 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 any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IEEE 802.11b or 802.11g operation of this product in the U.S.A is firmware-limited to channels 1 through 11.

#### **IMPORTANT NOTE:**

##### **FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

Note to CATV System Installer - This reminder is provided to call the CATV systems installer's attention to Section 820-93 of the National Electric Code which provide guideline for proper grounding and, in particular, specify that the Coaxial cable shield shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

### **FCC Part 68 Statement**

This equipment complies with Part 68 of the FCC Rules. A label is attached to the equipment that contains, among other information, its FCC registration number and ringer equivalence number. If requested, this information must be provided to the telephone company.

This equipment uses the following USOC Jack: RJ-11.

An FCC-compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack, which is FCC Part 68 compliant. Connection to the telephone network should be made by using the standard modular telephone jack.

The REN is useful to determine the quantity of devices that may be connected to the telephone line and still have all of those devices ring when your telephone number is called. In most, but not all areas, the sum of RENs should not exceed 5. To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to determine the maximum REN for the calling area.

If this equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.

In the event this equipment should fail to operate properly, disconnect the unit from the telephone line. Try using another FCC approved device in the same telephone jack. If the trouble persists, call the telephone company repair service bureau. If the trouble does not persist and appears to be with this unit, disconnect the unit from the telephone line and discontinue use of the unit until it is repaired. Please note that the telephone company may ask that you disconnect the equipment from the telephone network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

The user must use the accessories and cables supplied by the manufacturer to get optimum performance from the product.

No repairs may be done by the customer. If trouble is experienced with this equipment, please contact your authorized support provider for repair and warranty information. If the trouble is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved. This equipment cannot be used on telephone company provided coin service. Connection to Party Line Service is subject to state tariffs.

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<http://www.smc.com>

Document number: D3CM160410102013