Model DPR2320, DPR2325, EPR2320, and EPR2325 Cable Modem Gateways with Wireless Access Point

Installation and Operation Guide

Please Read

Important

Please read this entire guide. If this guide provides installation or operation instructions, give particular attention to all safety statements included in this guide.

Notices

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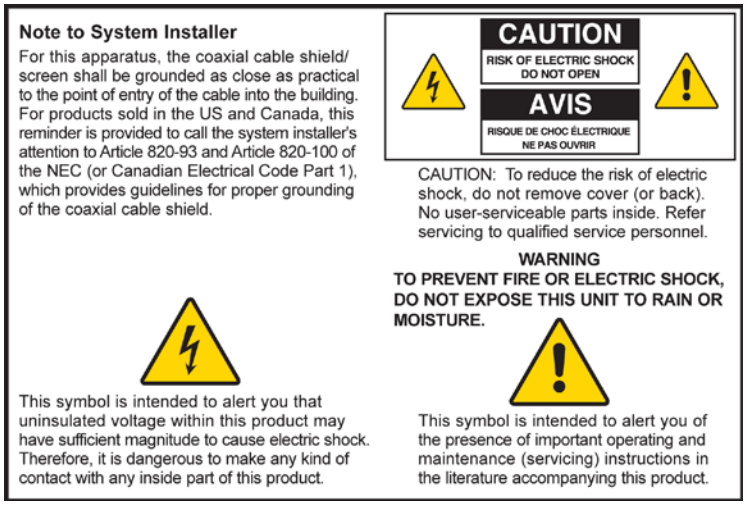
IMPORTANT SAFETY INSTRUCTIONS

Notice to Installers

The servicing instructions in this notice are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions, unless you are qualified to do so.



20070112 SysInstaller 820 English

Notice à l'attention des installateurs de réseaux câblés

Les instructions relatives aux interventions d'entretien, fournies dans la présente notice, s'adressent exclusivement au personnel technique qualifié. Pour réduire les risques de chocs électriques, n'effectuer aucune intervention autre que celles décrites dans le mode d'emploi et les instructions relatives au fonctionnement, à moins que vous ne soyez qualifié pour ce faire.

20070112 SysInstaller 820 French

Mitteilung für CATV-Techniker

Die in dieser Mitteilung aufgeführten Wartungsanweisungen sind ausschließlich für qualifiziertes Fachpersonal bestimmt. Um die Gefahr eines elektrischen Schlags zu reduzieren, sollten Sie keine Wartungsarbeiten durchführen, die nicht ausdrücklich in der Bedienungsanleitung aufgeführt sind, außer Sie sind zur Durchführung solcher Arbeiten qualifiziert.

Mitteilung an den Systemtechniker

Für dieses Gerät muss der Koaxialkabelschutz/ Schirm so nahe wie möglich am Eintrittspunkt des Kabels in das Gebäude geerdet werden Dieser Erinnerungshinweis liegt den in den USA oder Kanada verkauften Produkten bei. Er soll den Systemtechniker auf Paragraph 820-93 und Paragraph 820-100 der US-Elektrovorschrift NEC (oder der kanadischen Elektrovorschrift Canadian Electrical Code Teil 1) aufmerksam machen, in denen die Richtlinien für die ordnungsgemäße Erdung des Koaxial-kabelschirms festgehalten sind.

Dieses Symbol weist den Benutzer auf das Vorhandensein von nicht isolierten gefährlichen Spannungen im Gerät hin, die Stromschläge verursachen können. Ein Kontakt mit den internen Teilen dieses Produktes ist mit Gefahren verbunden.

ACHTUNG: Zur Vermeidung eines Stromschlags darf die Abdeckung (bzw. die Geräterückwand) nicht entfernt werden. Das Gerät enthält keine vom Benutzer wartbaren Teile. Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal durchgeführt werden.

WARNUNG

DAS GERÄT NICHT REGEN ODER FEUCHTIGKEIT AUSSETZEN, UM STROMSCHLAG ODER DURCH EINEN KURZSCHLUSS VERURSACHTEN BRAND ZU VERMEIDEN.

Dieses Symbol weist den Benutzer darauf hin, dass die mit diesem Produkt gelieferte Dokumentation wichtige Betriebs- und Wartungsanweisungen für das Gerät enthält.

20070112 SysInstaller 820 German

Aviso a los instaladores de sistemas CATV

Las instrucciones de reparación contenidas en el presente aviso son para uso exclusivo por parte de personal de mantenimiento cualificado. Con el fin de reducir el riesgo de descarga eléctrica, no realice ninguna otra operación de reparación distinta a las contenidas en las instrucciones de funcionamiento, a menos que posea la cualificación necesaria para hacerlo.

Nota para el instalador del sistema

En lo que se refiere a este aparato, el blindaje del cable coaxial debe conectarse a tierra lo más cerca posible al punto por el cual el cable entra en el edificio. En el caso de los productos vendidos en los EE. UU. y Canadá, el presente aviso se suministra para llamar la atención del instalador del sistema sobre los Artículos 820-93 y 820-100 del NEC (o Código Eléctrico de Canadá, Parte 1), que proporcionan directrices para una correcta conexión a tierra del blindaje del cable coaxial.

Este símbolo tiene como fin advertirle de que una tensión sin aislamiento en el interior de este producto podría ser de una magnitud suficiente como para provocar una descarga eléctrica. Por consiguiente, resulta peligroso realizar cualquier tipo de contacto con alguno de los componentes internos de este producto.

ATENCIÓN: con el fin de reducir el riesgo de descarga eléctrica, no retire la tapa (ni la parte posterior). No existen en el interior componentes que puedan ser reparados por el usuario. Encargue su revisión a personal de mantenimiento cualificado.

ADVERTENCIA

PARA EVITAR EL RIESGO DE INCENDIO O DESCARGA ELÉCTRICA, NO EXPONGA LA UNIDAD A LA LLUVIA O A LA HUMEDAD.

Este símbolo tiene como fin alertarle de la presencia de importantes instrucciones de operación y mantenimiento (revisión) contenidas en la literatura que acompaña al producto.

20070112 SysInstaller 820 Spanish

Read These Instructions

Keep These Instructions

Heed All Warnings

Follow All Instructions

Power Source Warning

A label on this product indicates the correct power source for this product. Operate this product only from an electrical outlet with the voltage and frequency indicated on the product label. If you are uncertain of the type of power supply to your home or business, consult your service provider or your local power company.

The AC inlet on the unit must remain accessible and operable at all times.

Ground the Product

WARNING:

Avoid electric shock and fire hazard! Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

If this product connects to coaxial cable wiring, be sure the cable system is grounded (earthed). Grounding provides some protection against voltage surges and built-up static charges.

Protect the Product from Lightning

For added protection, unplug this apparatus during lightning storms or when unused for long periods of time. In addition to disconnecting the AC power from the wall outlet, disconnect the signal inputs.

Verify the Power Source from the On/Off Power Light

When the on/off power light is not illuminated, the apparatus may still be connected to the power source. The light goes out when the apparatus is turned off, regardless of whether it is still plugged into an AC power source.

Eliminate AC Mains Overloads

WARNING:

Avoid electric shock and fire hazard! Do not overload AC mains, outlets, extension cords, or integral convenience receptacles. For products that require battery power or other power sources to operate them, refer to the operating instructions for those products.

Prevent Power Cord Damage

Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where the cord exits from the apparatus.

Provide Ventilation and Select a Location

- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not place this apparatus on a bed, sofa, rug, or similar surface.
- Do not place this apparatus on an unstable surface.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not install this apparatus in an enclosure, such as a bookcase or rack, unless the installation provides proper ventilation.
- Do not place entertainment devices (such as VCRs or DVDs), lamps, books, vases with liquids, or other objects on top of this product.

Protect from Exposure to Moisture and Foreign Objects

Do not use this apparatus near water.

WARNING:

Avoid electric shock and fire hazard! Do not expose this product to liquids, rain, or moisture.

WARNING:

Avoid electric shock and fire hazard! Unplug this product before cleaning. Clean only with a dry cloth. Do not use a liquid cleaner or an aerosol cleaner. Do not use a magnetic/static cleaning device (dust remover) to clean this product.

WARNING:

Avoid electric shock and fire hazard! Never push objects through the openings in this product. Foreign objects can cause electrical shorts that can result in electric shock or fire.

Accessories Warning

WARNING:

Avoid electric shock and fire hazard! Only use attachments/accessories specified by your service provider or the manufacturer.

Service Warnings

WARNING:

Avoid electric shock! Do not open the cover of this product. Opening or removing the cover may expose you to dangerous voltages. If you open the cover, your warranty will be void. This product contains no user-serviceable parts. Refer all servicing to qualified service personnel.

Servicing is required when the apparatus has been damaged in any way, such as a power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Check Product Safety

Upon completion of any service or repairs to this product, the service technician must perform safety checks to determine that this product is in proper operating condition.

Protect the Product When Moving It

Always disconnect the power source when moving the apparatus or connecting or disconnecting cables.

WARNING:

Avoid personal injury and damage to this product! Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart / apparatus combination to avoid injury from tip-over.

20070802 Modem Cable w/out Battery

FCC Compliance

United States FCC Compliance

This device 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 such interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it 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 or more of the following measures:

- Reorient 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 cable company or an experienced radio/television technician for help.

Any changes or modifications not expressly approved by Cisco, Inc., could void the user's authority to operate the equipment.

The information shown in the FCC Declaration of Conformity paragraph below is a requirement of the FCC and is intended to supply you with information regarding the FCC approval of this device. *The phone numbers listed are for FCC-related questions only and not intended for questions regarding the connection or operation for this device. Please contact your cable service provider for any questions you may have regarding the operation or installation of this device.*

FC Declaration of Conformity

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: 1) the device may not cause harmful interference, and 2) the device must accept any interference received, including interference that may cause undesired operation.

Cable Modem Gateway with Wireless Access Point
Models:
DPR2320/DPR2325/EPR2320/EPR2325
Manufactured by:
Cisco Systems, Inc.
5030 Sugarloaf Parkway
Lawrenceville, Georgia 30044 USA
Telephone: 678 277-1120

Canada EMI Regulation

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la class B est conforme à la norme NMB-003 du Canada.

20060628 FCC Standard

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. To maintain compliance with the FCC RF exposure guidelines, this equipment should be installed and operated with minimum distance of at least 7.8 in. (20cm) from all persons.

Contents

About This Guide

Introduction

This installation and operation guide applies to the Model DPR2320, DPR2325, EPR2320, and EPR2325 Cable Modem Gateway with Wireless Access Point (cable modem gateways). The DPR2320, DPR2325, EPR2320, and EPR2325 offer high-end performance and unsurpassed reliability at data rates up to three times that of conventional Data Over Cable System Interface Specifications (DOCSIS) 2.0 (DPR2320/DPR2325) and EuroDOCSIS 2.0 (EPR2320/EPR2325) cable modem gateways. This guide includes procedures and recommendations for placing, installing, configuring, operating, and troubleshooting your cable modem gateways.

Scope

This guide also provides the following design, performance, and technical information for understanding basic cable modem gateway operation and function to familiarize you with the cable modem gateways:

- Design and performance features
- Theory of operation for cable modem gateways
- Procedures for installing, operating, maintaining, and troubleshooting the cable modem gateways using the Cable Modem Access Protection and WebWizard features
- Appendixes that includes technical specifications

Note: This guide does not contain installation procedures for cable modem gateway headend equipment. Consult the documentation supplied with your equipment for the correct installation procedures.

Purpose

After reading this guide, you will be able to install, operate, maintain, and troubleshoot the DPR2320, DPR2325, EPR2320, and EPR2325 cable modem gateways.

Audience

This guide is written for cable service providers, system operators, cable modem gateway installers, system engineers, customer service representatives, cable modem gateway marketing personnel, and Cisco Services engineers.

Document Version

This is the fourth release of this document. This revision supports new models of the DPR2320, DPR2325, EPR2320, and EPR2325 along with updated product software.

1

Introducing the Model DPR2320, DPR2325, EPR2320, and EPR2325 Cable Modem Gateways

Introduction

The Model DPR2320, DPR2325, EPR2320, and EPR2325 cable modem gateways are among the fastest cable modems available on the market today. These cable modem gateways offer high-end performance and unsurpassed reliability for both home and small office networking.

These cable modem gateways provide broadband network operators with a cost-effective way to offer high-speed data services to subscribers. In addition, the cable modem gateways contain a 10/100BASE-T Ethernet port (4 ports on the DPR/EPR2325), a USB 2.0 port, and an 802.11g wireless access point to provide connectivity for high-speed data wired or wireless services or other Internet devices.

This chapter provides an overview of the outstanding design and performance features of the cable modem gateways, the front and back panel components, and a theory of operation for cable modems. This chapter also provides the requirements for the cable system and the subscriber's site.

In This Chapter

Cable Modem Gateway Features

This section contains an overview of some of the design and performance features of the DPR2320, DPR2325, EPR2320, and EPR2325.

Design and Performance Features

The cable modem gateways offer the following additional outstanding design and performance features:

- Provide a high-speed broadband Internet connection that energizes your online experience, which makes downloading and sharing files and photos with your family and friends trouble free
- Offer a 10/100BASE-T Ethernet port with Auto-negotiate and Auto-MDIX (4 ports on the DPR2325/EPR2325)
- Integrated router featuring Network Access Translation (NAT), a Dynamic Host Configuration Protocol (DHCP) server, and parent control technology
- Lockdown mode prevents unauthorized or accidental reset of gateway settings
- Include a USB 2.0 data port that is backward compatible with USB 1.1
- Support for up to 64 users (1 USB port and up to 63 users on user-supplied Ethernet hubs)
- Utilize freestanding vertical, horizontal, or vertical or horizontal wall-mount placement
- Allow automatic software upgrades by your service provider
- Configurable either locally or remotely through the WebWizard interface, the configuration file, or Simple Network Management Protocol (SNMP)
- Provide an 802.11g compliant wireless access point
- CableHome 1.1 compliant
- Service provider defined CableHome, Residential Gateway (default), or Bridge modes of operation
- Ensure interoperability with most service providers by complying with the following specifications:
  - DPR2320 and DPR2325—DOCSIS 2.0 and backward compatibility for operation in DOCSIS 1.1 and DOCSIS 1.0 networks
  - EPR2320 and EPR2325—EuroDOCSIS 2.0 and backward compatibility for operation in EuroDOCSIS 1.1 and EuroDOCSIS 1.0 networks

WebWizard

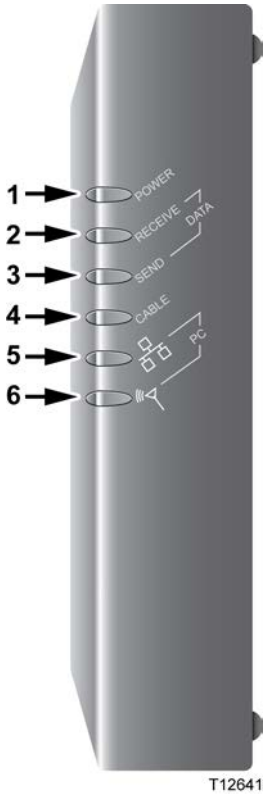
The cable modem gateways include the WebWizard, a browser-based interface that facilitates cable modem set up and troubleshooting. The WebWizard verifies set-up and troubleshooting results and eliminates the need to load additional setup software on the consumer premise equipment (CPE). In addition, front-panel LED status indicators provide an informative and easy-to-understand display that indicates cable modem status along with a visual feedback of real-time data transmissions and modem operating status.

Note: For more information on the WebWizard feature, see ***WebWizard*** (on page 106).

Cable Modem Gateway Components

DPR2320 and EPR2320 Front Panel LED Status Indicators

The front panel of your cable modem gateway provides LED status indicators that indicate how well and at what state your cable modem gateway is operating. See ***DPR2320 and EPR2320 Front Panel LED Status Indicator Functions*** (on page 122) for more information on front panel LED status indicator functions.



1 **POWER—**Illuminates solid green to indicate that power is being applied to the cable modem gateway

2 **RECEIVE DATA—**Blinks to indicate that the cable modem gateway is receiving data from the cable network

3 **SEND DATA—**Blinks to indicate that the cable modem gateway is sending data to the cable network

4 **CABLE—**Illuminates solid green when the cable modem gateway is registered on the network and fully operational. This indicator blinks to indicate one of the following conditions:

- The cable modem gateway is booting up and not ready for data
- The cable modem gateway is scanning the network and attempting to register
- The cable modem gateway has lost registration on the network and will continue blinking until it registers again

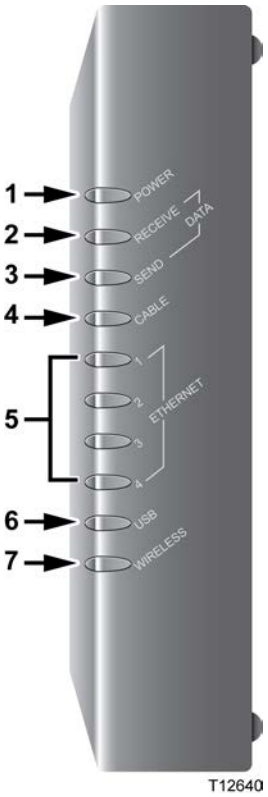
5 **PC (Ethernet/USB)—**Illuminates solid green to indicate that an Ethernet/USB carrier is present and blinks to indicate that Ethernet/USB data is being transferred between the PC and the cable modem gateway

6 **PC (Wireless)—**Illuminates solid green to indicate that a wireless access point is enabled and blinks to indicate that wireless data is being transferred over the wireless connection

Note: After the cable modem gateway is successfully registered on the network, the **POWER** (LED 1) and **CABLE** (LED 4) indicators illuminate continuously to indicate that the cable modem gateway is online and fully operational.

DPR2325 and EPR2325 Front Panel LED Status Indicators

The front panel of your cable modem gateway provides LED status indicators that indicate how well and at what state your cable modem gateway is operating. See ***DPR2325 and EPR2325 Front Panel LED Status Indicator Functions*** (on page 124) for more information on front panel LED status indicator functions.



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- The cable modem gateway has lost registration on the network and will continue blinking until it registers again

5 **ETHERNET (1-4)—** Illuminates solid green to indicate that an Ethernet carrier is present and blinks to indicate that Ethernet data is being transferred between the PC and the cable modem gateway

6 **USB—** Illuminates solid green to indicate that a USB carrier is present and blinks to indicate that data is being transferred on a USB connection to the cable modem gateway

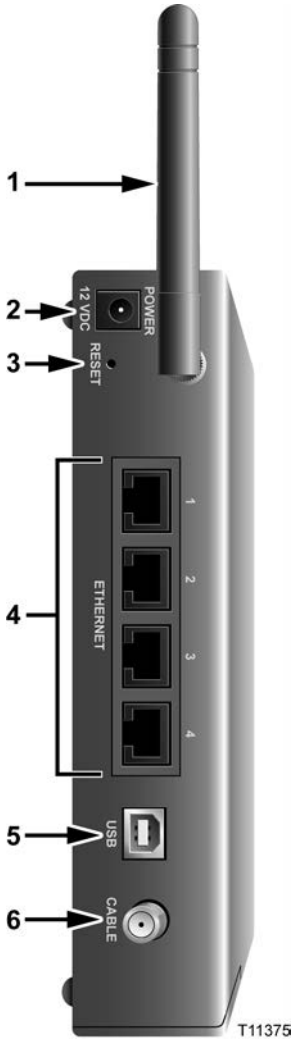
7 **Wireless—** Illuminates solid green to indicate that a wireless access point is enabled and blinks to indicate that wireless data is being transferred over the wireless connection

Note: After the cable modem gateway is successfully registered on the network, the **POWER** (LED 1) and **CABLE** (LED 4) indicators illuminate continuously to indicate that the cable modem gateway is online and fully operational.

DPR2325 and EPR2325 Back Panel Components

The following illustration shows the description and function of the back panel components of the DPR2325 and EPR2325 cable modem gateways.

Important: Do not connect your PC to *both* the Ethernet and USB ports at the same time. Your Internet service may not function properly if both the Ethernet and USB ports are connected to the same PC at the same time.



1 **ANTENNA—**Provides a communication connection for the built-in wireless access point (WAP) to allow wireless devices to communicate with the cable modem

2 **POWER—**Connects the cable modem to the DC output of the AC power adapter that is provided with your cable modem

> **CAUTION:**
>
> **Avoid damage to your equipment. Only use the AC power adapter that is provided with your cable modem gateway.**

3 **RESET—**Activating this switch resets the cable modem gateway to factory default values and reboots the cable modem gateway

Note: This switch is for maintenance purposes only. Do not use unless directed to do so by your service provider.

4 **ETHERNET—**One RJ-45 Ethernet port (on DPR2320 and EPR2320 modems) or four RJ-45 Ethernet ports (on DPR2325 and EPR2325 modems) connect to the Ethernet port on your PC or to an Ethernet hub or router on your home network

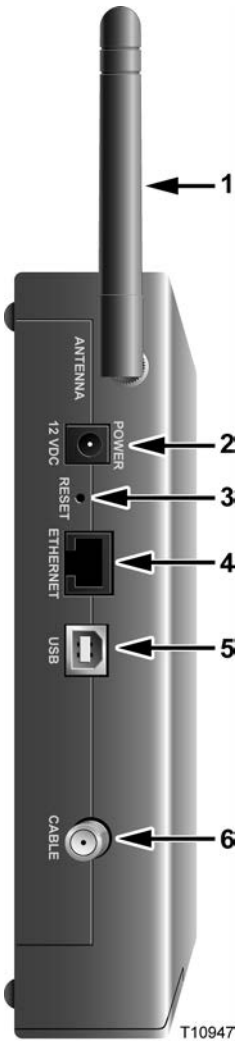
5 **USB—**12 Mbps USB port connects to the USB port on your PC

6 **CABLE—**F-connector connects to an active cable signal from your service provider

DPR2320 and EPR2320 Back Panel Components

The following illustration shows the description and function of the back panel components of the DPR2320 and EPR2320 cable modem gateways.

Important: Do not connect your PC to *both* the Ethernet and USB ports at the same time. Your Internet service may not function properly if both the Ethernet and USB ports are connected to the same PC at the same time.



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Theory of Operation

This section summarizes the theory of operation for cable modem gateways and provides a high-level overview of the operational stages for the cable modem gateway. Reading this chapter provides a better understanding of how cable modem gateways operate.

Note: This section is not intended to be a specification for the cable modem gateway.

Cable Modem Initialization

A cable modem gateway must establish a communication link with the headend before it becomes fully operational. This section describes the eight DOCSIS-required operational stages through which a cable modem gateway progresses in establishing this communication link.

This section provides a detailed explanation of each of the following operational stages.

1. Scan for Downstream Channel
2. Obtain Upstream Parameters
3. Adjust Timing Offset and Power Level
4. Establish IP Connectivity
5. Establish Time of Day
6. Transfer Operational Parameters
7. Register with the Cable Modem Termination System (CMTS)
8. Initialize Baseline Privacy

Scan for Downstream Channel

When a cable modem gateway powers on, the cable modem gateway starts to scan the network for the CMTS downstream channel. The downstream channel is the channel used to send data from the CMTS to the cable modem gateway. The cable modem gateway identifies a valid downstream data channel as a channel that has QAM signal timing, forward error correction (FEC) framing, MPEG packets, and downstream media access control (MAC) messages. The CMTS terminates the cable modem gateway signal at an upstream location and provides the cable modem gateway with a network connection.

This section discusses the cable modem gateway downstream scanning routine along with two features that speed up the downstream scanning process: the Valid CMTS Frequency Table and the WebWizard Gscan function.

Downstream Scanning Routine

The cable modem gateway starts its own standard scanning algorithm. The scanning routine of the cable modem gateway is now optimized to seek out the CMTS downstream channel as quickly as possible. The actual scanning process varies slightly depending on the television frequency channel plan for your particular country.

For example, in North America the standard downstream scanning routine works in three phases and may take several minutes. The cable modem gateway stops scanning when the cable modem gateway finds a valid downstream data channel. The cable modem gateway then proceeds to the next stage: obtain upstream parameters.

In this example, the cable modem gateway scans for the downstream channel in the following three phases.

1. The cable modem gateway starts to scan the network at 453 MHz and scans up in 6 MHz increments to end at 855 MHz.
2. The cable modem gateway starts scanning the network at 447 MHz and then scans in 6 MHz increments down to 93 MHz.
3. The process is then repeated for the National Television Systems Committee (NTSC) Harmonic Related Carrier (HRC) frequency plan in 6.0003 MHz increments.

Important: There are specialized frequency plans to optimize the acquisition of the downstream signal that depend on the video format used in the country of deployment. Check with the representative who handles your account for more information about alternate scanning routines outside of North America.

Improved Downstream Scanning Features

The cable modem gateways contain two outstanding features that can speed up the scanning process: the Valid CMTS Frequency Table and the WebWizard Gscan function.

Valid CMTS Frequency Table

The Valid CMTS Frequency Table feature works automatically and requires no user intervention. When a cable modem gateway finds a valid downstream data channel so that it can complete the ranging stage, the cable modem gateway stores this frequency in nonvolatile memory (NVM). The cable modem gateway checks the frequencies stored in NVM before starting the standard scanning algorithm to search for a downstream data channel.

Note: The cable modem gateways store up to 10 valid CMTS frequencies in the table.

The standard scanning algorithm also regularly interrupts progressive scanning to check the last known valid CMTS frequency, and then the cable modem gateway resumes its standard scanning algorithm where it left off.

WebWizard Gscan Function

When installing a cable modem gateway, you can speed up the process by using the WebWizard Gscan function. To access the WebWizard Gscan function, you must first connect a PC to the cable modem. Then, using your Web Browser, you can access the WebWizard Gscan function.

Note: For more information on the WebWizard Gscan function, see ***WebWizard*** (on page 106).

Obtain Upstream Parameters

After finding a valid downstream data channel, the cable modem gateway reviews the upstream parameters needed to perform the next stage: ranging and automatic adjustments. The upstream parameters enable the cable modem gateway to send data to the CMTS. When the cable modem gateway finds the correct upstream parameters, the cable modem gateway proceeds to the ranging and automatic adjustments stage.

If the cable modem gateway cannot find valid upstream parameters, it returns to the scan for downstream channel stage. Then the cable modem gateway starts to scan again at the next available channel.

Adjust Timing Offset and Power Level

After the cable modem gateway obtains its upstream parameters, it begins the ranging and automatic adjustments stage. In this stage, the cable modem gateway adjusts the timing offset and the power level for communicating with the CMTS.

The cable modem gateway uses MAC messages to determine the upstream channel frequency and adjusts timing offsets to verify the synchronized timing between the CMTS and the cable modem gateway. This process also determines the upstream signal transmit power level from the cable modem gateway to communicate with the CMTS.

After the cable modem gateway completes the ranging stage and registers with the CMTS, it repeats this routine regularly to fine-tune the settings established in the previous stages. These regular adjustments are considered routine maintenance and do not affect normal operations of your cable modem gateway service.

Note: If the cable modem gateway fails to achieve the proper settings when performing ranging and automatic adjustments, it terminates the session and restarts the initialization process at the scan for downstream channel stage.

Establish IP Connectivity

After completing the ranging and automatic adjustments stage, the cable modem gateway attempts to establish Internet Protocol (IP) connectivity. In this stage, the cable modem gateway obtains network connection information and a cable modem gateway IP address from provisioning servers that are located on the network side of the CMTS interface.

The cable modem gateway achieves this connectivity using a protocol called Dynamic Host Configuration Protocol (DHCP).

Note: If the cable modem gateway fails to establish IP connectivity, it terminates the session and restarts the initialization process at the scan for downstream channel stage.

Establish Time of Day

After the cable modem gateway establishes IP connectivity, the cable modem gateway requests the time of day from the network interface. This stage allows the cable modem gateway to know the system time so that when the cable modem gateway logs an event, it associates a time with that event.

Note: The cable modem gateway can operate *without* establishing the time of day; however, it logs the failure, generates an alert to simple network management protocol (SNMP), and then proceeds to the next stage. The cable modem gateway periodically repeats this stage to attempt to establish the time of day.

Transfer Operational Parameters

After the cable modem gateway requests the time of day, the cable modem gateway then requests the transfer of the cable modem gateway configuration file. The cable modem gateway makes the request to the Trivial File Transfer Protocol (TFTP) server. The configuration file contains parameters for how the system operator wants the cable modem gateway to function on the cable network.

Typical operation parameters for the cable modem gateway include:

- Upstream and downstream rate limits
- Specific frequencies
- Number of CPE devices
- IP filters
- Port filters
- MAC/LLC filters
- Vendor-specific settings
- Software version installed

Notes:

- If the cable modem gateway does not contain the software version requested by the configuration file, the cable modem gateway requests that software version from the TFTP server. When the software installation is complete, the cable modem gateway restarts the entire initialization process again at the scan for downstream channel stage.
- If the system instructs the cable modem gateway to use a different frequency from what the cable modem gateway is currently using, the cable modem gateway cannot proceed to the next stage: register with the CMTS. The cable modem gateway must repeat the scan for downstream channel stage or reestablish ranging on a new upstream channel.

Register with the CMTS

After the cable modem gateway completes the transfer operational parameters stage, the cable modem gateway now registers with the CMTS. After the cable modem gateway receives a reply from the CMTS confirming its registration request, the cable modem gateway is now authorized to forward network traffic from the CPE.

Initialize Baseline Privacy

Baseline Privacy functions in the CMTS and in the cable modem gateway are used to encrypt data being transferred to and from the cable modem gateway. Following registration with the CMTS, if the cable modem gateway is provisioned to run with baseline privacy, the cable modem gateway must initialize baseline privacy operations. Using baseline privacy means that all data transferred is secure.

2

Installing the Cable Modem Gateway for Internet Service

Introduction

This chapter provides information and procedures to assist you in placing, installing, configuring, operating, and troubleshooting the DPR2320/DPR2325/EPR2320/EPR2325 for high-speed Internet service.

In This Chapter

Before You Begin

This section provides the minimum requirements for installing the cable modem gateways on your system and at user sites.

Cable System Requirements

To allow successful installation and operation, verify that your system meets the following minimum requirements:

- For the DPR2320 and DPR2325: DOCSIS 2.0, 1.1, or 1.0
- For the EPR2320 and EPR2325: EuroDOCSIS 2.0, 1.1, or 1.0

Important: This guide does not cover installing cable modem gateway network and headend equipment on your system. For information on installing network and headend equipment, refer to the documentation provided with your network and headend equipment.

Equipment Checklist

Before you install the cable modem gateway, check the items in the carton. The carton contains the following items, except as noted:

- One DPR2320, DPR2325, EPR2320, or EPR2325 cable modem gateway
- One Ethernet cable (CAT5/RJ-45)
- One USB cable
- One AC power adapter
- One CD-ROM containing the user's guide and the USB drivers

Notes:

- An additional cable signal splitter and coaxial cable are needed to connect to a VCR, a digital set-top converter, or a TV to the same cable connection as your cable modem gateway.
- Cables and other equipment needed for telephony service must be purchased separately.

Hardware and Software Requirements

This section provides hardware and software requirements for connecting your cable modem gateway to a PC for high-speed Internet service.

Note: You will also need an active cable input line and an Internet connection.

PC Requirements

- A PC with a Pentium MMX 133 processor or greater
- 32 MB of RAM
- Netscape or Internet Explorer
- CD-ROM drive

Macintosh Requirements

- MAC OS 7.5 or later
- 32 MB of RAM

Ethernet Requirements

- A PC with Microsoft Windows 95 operating system (or later) with TCP/IP protocol installed, or an Apple Macintosh computer with TCP/IP protocol installed
- An active 10/100BASE-T Ethernet network interface card (NIC) installed in your PC

USB Requirements

- A PC with a Microsoft Windows 2000 or XP operating system
- A host USB port installed in your PC

Contacting Your Local Service Provider

Before you can use your cable modem gateway, you need to have a high-speed Internet access account. If you do not have a high-speed Internet access account, you need to set up an account with your local service provider. Choose one of the two options in this section.

I Do Not Have a High-Speed Internet Access Account

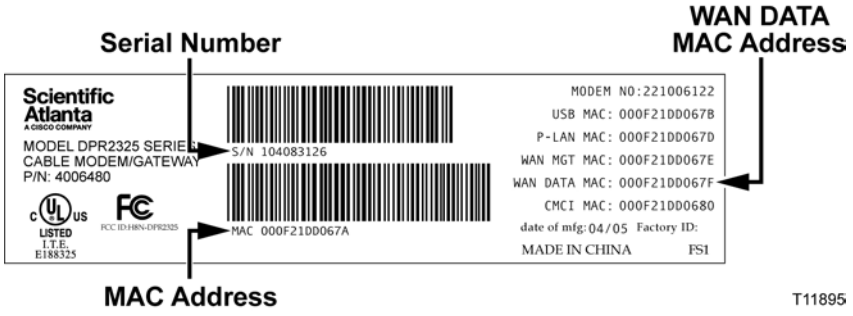
If you do *not* have a high-speed Internet access account, your service provider will set up your account and become your Internet Service Provider (ISP). Internet access enables you to send and receive e-mail, access the World Wide Web, and receive other Internet services.

You will need to give your service provider the following information:

- The serial number of the modem
- The Media Access Control (MAC) address of the modem
- The WAN DATA MAC address of the modem

These numbers appear on a bar code label located on the cable modem gateway. The serial number consists of a series of alphanumeric characters preceded by S/N. The MAC address consists of a series of alphanumeric characters preceded by **MAC**. The WAN Data MAC address consists of a series of alphanumeric characters preceded by **WAN DATA MAC.** The following illustration shows a sample bar code label.

Note: Due to minor design changes, the label on your cable modem gateway may differ slightly from the one shown here.



Write down these numbers in the space provided here.

Serial Number _____

MAC Address _____

WAN DATA MAC Address _____

I Already Have an Existing High-Speed Internet Access Account

If you have an existing high-speed Internet access account, you must give your service provider the serial number and the MAC address of the cable modem gateway. Refer to the serial number and MAC address information listed previously in this section.

Note: You might not be able to continue to use your existing e-mail account with your cable modem gateway. Contact your service provider for more information.

Where Is the Best Location for My Cable Modem Gateway?

The ideal location for your cable modem gateway is where it has access to outlets and other devices. Think about the layout of your home or office, and consult with your service provider to select the best location for your cable modem gateway. Read this user's guide thoroughly before you decide where to place your cable modem gateway.

Consider these recommendations:

- Position your PC and cable modem gateway so that they are located near an AC power outlet.
- Position your PC and cable modem gateway so that they are located near an existing cable input connection to eliminate the need for an additional cable outlet. There should be plenty of room to guide the cables away from the modem and the PC without straining or crimping them.
- Airflow around the cable modem gateway should not be restricted.
- Choose a location that protects the cable modem gateway from accidental disturbance or harm.

How Do I Mount the Cable Modem Gateway on the Wall?

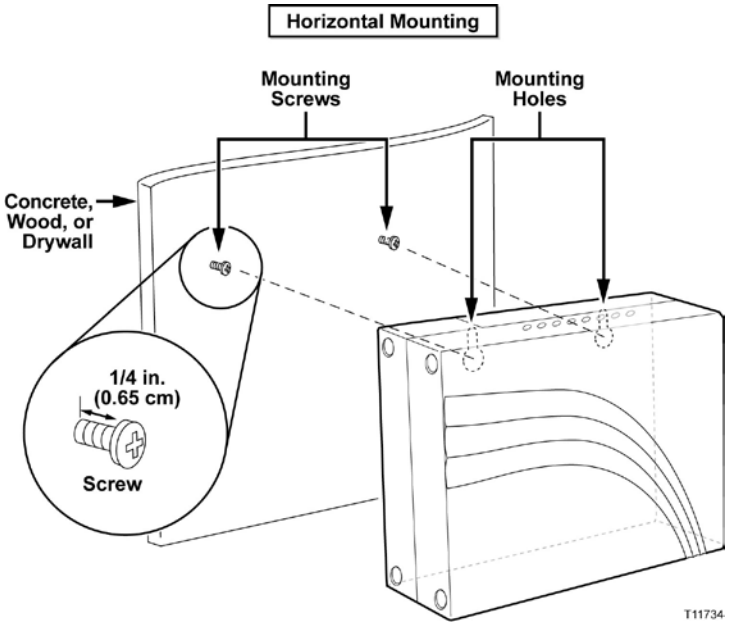
Before You Begin

Before you begin, choose an appropriate mounting place. The wall can be made of cement, wood, or drywall. The mounting location should be free of obstructions on all sides, and the cables should be able to easily reach the cable modem gateway without strain. Leave sufficient clearance between the bottom of the cable modem gateway, and any flooring or shelving underneath, to allow access to cabling. In addition, leave enough slack in all cables so that the cable modem can be removed for any required maintenance without disconnecting the cables. Also, verify that you have the following items:

- Two wall anchors for #8 x 1 inch screws
- Two #8 x 1 inch pan head sheet metal screws
- Drill with a 3/16-in. wood or masonry bit
- A copy of the wall-mounting illustrations shown on the following pages

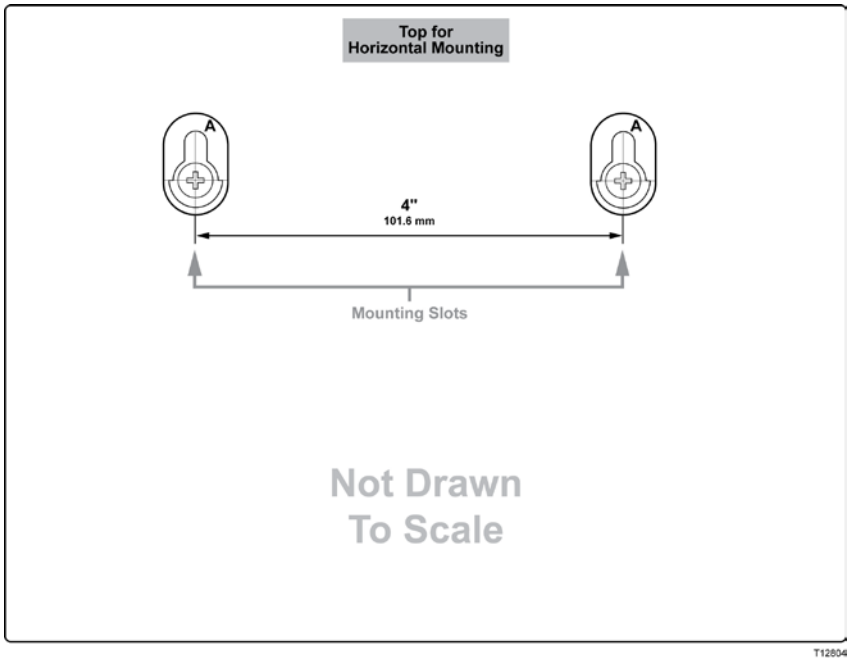
Mounting Instructions

You can mount the DPR2320/DPR2325/EPR2320/EPR2325 cable modem gateway directly on a wall using two wall anchors, two screws, and the mounting slots on the bottom of the modem. The modem can be mounted vertically or horizontally.



Location and Dimensions of the Wall-Mounting Slots

The following illustration shows the location and dimensions of the wall-mounting slots on the bottom of the modem. Use the information on this page as a guide for mounting your modem to the wall.



Wall Mounting Instructions

Complete these steps to mount the modem to the wall.

1. Using a drill with a 3/16-in bit, drill two holes at the same height and 4 inches apart.
2. Are you mounting the cable modem gateway into a drywall or concrete surface where a wooden stud is not available?
   - If **yes**, drive the anchor bolts into the wall and then go to step 3.
   - If **no**, go to step 3.
3. Install the mounting screws into the wall or the anchor bolts, as appropriate, and leave a gap of about 1/4-in. between the screw head and the wall.
4. Verify that no cables or wires are connected to the cable modem.
5. Lift the cable modem gateway into position. Slip the large end of both mounting slots (located on the back of the modem) over the mounting screws, and then slide the modem down until the narrow end of the keyhole slot contacts the shaft of the screw.

   Important: Verify that the mounting screws securely support the modem before you release the unit.

Configure TCP/IP

This section contains instructions for configuring the cable modem gateway to run in Microsoft Windows or Macintosh environments. In addition, TCP/IP protocol in a Microsoft Windows environment is different for the Windows 95, 98, 98SE, ME, 2000, or XP versions. Go to the appropriate section and follow the instructions to configure the TCP/IP protocol.

Configuring TCP/IP on Windows 95, 98, 98SE, or ME Systems

1. Click **Start**, select **Settings**, and choose **Control Panel**.
2. Double-click the **Network** icon in the Control Panel window.
3. Read the list of installed network components under the **Configuration** tab to verify that your PC contains the TCP/IP protocol/Ethernet adapter.
4. Is TCP/IP protocol listed in the installed network components list?
   - If **yes**, go to step 7.
   - If **no**, click **Add**, click **Protocol**, click **Add**, and then go to step 5.
5. Click **Microsoft** in the Manufacturers list.
6. Click **TCP/IP** in the Network Protocols list, and then click **OK**.
7. Click the **TCP/IP Ethernet Adapter** protocol, and then choose **Properties**.
8. Click the **IP Address** tab, and then select **Obtain an IP address automatically**.
9. Click the **Gateway** tab and verify that these fields are empty. If they are not empty, highlight and delete all information from the fields.
10. Click the **DNS Configuration** tab, and then select **Disable DNS**.
11. Click **OK**.
12. Click **OK** when the system finishes copying the files, and then close all networking windows.
13. Click **YES** to restart your computer when the System Settings Change dialog box opens. The computer restarts. The TCP/IP protocol is now configured on your PC, and your Ethernet devices are ready for use.
14. Try to access the Internet. If you cannot access the Internet, go to ***Having Difficulty?*** (on page 134). If you still cannot access the Internet, contact your service provider for further assistance.

Configuring TCP/IP on Windows 2000 Systems

1. Click **Start**, select **Settings**, and choose **Network and Dial-up Connections**.
2. Double-click the **Local Area Connection** icon in the Network and Dial-up Connections window.
3. Click **Properties** in the Local Area Connection Status window.

4 Click **Internet Protocol (TCP/IP)** in the Local Area Connection Properties window, and then click **Properties**.

5 Select both **Obtain an IP address automatically** and **Obtain DNS server address automatically** in the Internet Protocol (TCP/IP) Properties window, and then click **OK**.

6 Click **Yes** to restart your computer when the Local Network window opens. The computer restarts. The TCP/IP protocol is now configured on your PC, and your Ethernet devices are ready for use.

7 Try to access the Internet. If you cannot access the Internet, go to ***Having Difficulty?*** (on page 134). If you still cannot access the Internet, contact your service provider for further assistance.

Configuring TCP/IP on Windows XP Systems

1 Click **Start**, and depending on your Start menu setup, choose one of the following options:

- If you are using the Windows XP Default Start Menu, select **Connect to**, choose **Show all connections**, and then go to step 2.
- If you are using the Windows XP Classic Start Menu, select **Settings**, choose **Network Connections**, click **Local Area Connection**, and then go to step 3.

2 Double-click the **Local Area Connection** icon in the LAN or High-Speed Internet section of the Network Connections window.

3 Click **Properties** in the Local Area Connection Status window.

4 Click **Internet Protocol (TCP/IP)**, and then click **Properties** in the Local Area Connection Properties window.

5 Select both **Obtain an IP address automatically** and **Obtain DNS server address automatically** in the Internet Protocol (TCP/IP) Properties window, and then click **OK**.

6 Click **Yes** to restart your computer when the Local Network window opens. The computer restarts. The TCP/IP protocol is now configured on your PC, and your Ethernet devices are ready for use.

7 Try to access the Internet. If you cannot access the Internet, go to ***Having Difficulty?*** (on page 134). If you still cannot access the Internet, contact your service provider for further assistance.

Configuring TCP/IP on Macintosh Systems

1 Click the **Apple** icon in the upper-left corner of the Finder. Scroll down to **Control Panels**, and then click **TCP/IP**.

2 Click **Edit** on the Finder at the top of the screen. Scroll down to the bottom of the menu, and then click **User Mode**.

3 Click **Advanced** in the User Mode window, and then click **OK**.

4. Click the Up/Down selector arrows located to the right of the Connect Via section of the TCP/IP window, and then click **Using DHCP Server**.
5. Click **Options** in the TCP/IP window, and then click **Active** in the TCP/IP Options window.

   Note: Make sure that the **Load only when needed option** is *unchecked*.
6. Verify that the **Use 802.3** option located in the upper-right corner of the TCP/IP window is unchecked. If there is a check mark in the option, uncheck the option, and then click **Info** in the lower-left corner.
7. Is there a Hardware Address listed in this window?
   - If **yes**, click **OK**. To close the TCP/IP Control Panel window, click **File**, and then scroll down to click **Close**. You have completed this procedure.
   - If **no**, you must power off your Macintosh.
8. With the power off, simultaneously press and hold down the **Command (Apple)**, **Option**, **P**, and **R** keys on your keyboard. Keeping those keys pressed down, power on your Macintosh but do not release these keys until you hear the Apple chime at least three times, then release the keys and let the computer restart.
9. When your computer fully reboots, repeat steps 1 through 7 to verify that all TCP/IP settings are correct. If your computer still does not have a Hardware Address, contact your authorized Apple dealer or Apple technical support center for further assistance.

Install USB Drivers

This section contains instructions for installing the cable modem gateway USB drivers if your PC is equipped with a USB interface and a Microsoft Windows 2000 or Windows XP operating system. The USB driver installation procedures are different for each operating system. Follow the appropriate instructions in this section for your operating system.

Note: If your PC does not have a USB interface, you may skip this section.

Installing USB Drivers on Windows 2000 Systems

1. Insert the **USB Cable Modem Driver Installation Disk** into the CD-ROM drive of your PC.
2. Wait until the **POWER** and **ONLINE** LED status indicators on the front panel of the cable modem gateway illuminate solid green.
3. Click **Next** in the Found New Hardware Wizard window.
4. Select **Search for a suitable driver for my device (recommended)** in the Found New Hardware Wizard window, and then click **Next**.
5. Select **CD-ROM drives** in the Found New Hardware Wizard window, and then click **Next**.
6. Click **Next** in the Found New Hardware Wizard window. The system searches for the driver file for your hardware device.
7. After the system finds the USB driver, the Digital Signature Not Found window opens and displays a confirmation message to continue the installation.
8. Click **Yes** to continue the installation. The Found New Hardware Wizard window reopens with a message that the installation is complete.
9. Click **Finish** to close the Found New Hardware Wizard window. The USB drivers are installed on your PC, and your USB devices are ready for use.
10. Try to access the Internet. If you cannot access the Internet, go to ***Having Difficulty?*** (on page 134). If you still cannot access the Internet, contact your service provider for further assistance.

Installing USB Drivers on Windows XP Systems

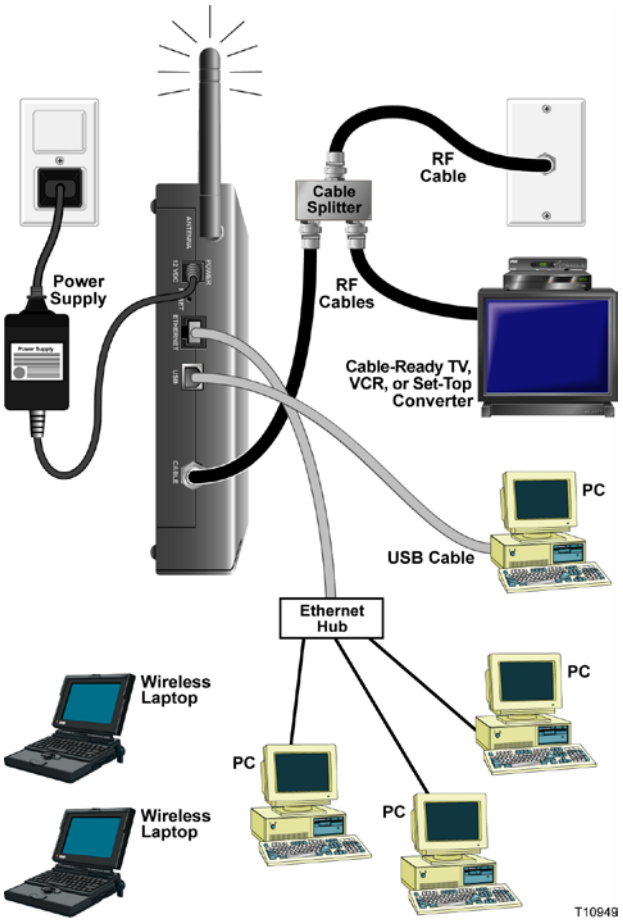
1. Insert the **USB Cable Modem Driver Installation Disk** into the CD-ROM drive of your PC.
2. Wait until the **POWER** and **ONLINE** LED status indicators on the front panel of the cable modem gateway illuminate solid green.
3. Select **Install from a list or specific location (Advanced)** in the Found New Hardware Wizard window, and then click **Next**.
4. Select **Search removable media (floppy, CD-ROM)** in the Found New Hardware Wizard window, and then click **Next**.

5. Click **Continue Anyway** in the Hardware Installation window to continue the installation. The Found New Hardware Wizard window reopens with a message that the installation has finished.
6. Click **Finish** to close the Found New Hardware Wizard window. The USB drivers are installed on your PC, and your USB devices are ready for use.
7. Try to access the Internet. If you cannot access the Internet, go to ***Having Difficulty?*** (on page 134). If you still cannot access the Internet, contact your service provider for further assistance.

Install the Cable Modem Gateway

Installation Diagram

The following diagram illustrates one of the various installation and connection options that are available to you.



Note: Professional installation may be available. Contact your local service provider for further assistance.

Connecting the Modem for High-Speed Data Service

> **WARNING:**
>
> **To avoid personal injury or damage to your equipment, follow these steps in the exact order shown.**

1. Power off your PC and unplug it from the power source.
2. Connect your PC to *either* the **ETHERNET** port *or* the **USB** port using the appropriate data cable. Do *not* connect your PC to *both* the Ethernet and USB ports at the same time. You can connect two separate PCs to the cable modem gateway at the same time by connecting one PC to the Ethernet port and one PC to the USB port.
3. Connect the active RF coaxial cable to the **CABLE** connector. Use an optional cable signal splitter to add a TV, a DHCT or set-top converter, or a VCR.
4. Insert the AC power cord into the **POWER** connector on the back of the cable modem gateway, and then plug the cord into an AC power source.
5. Plug in and power on your networked devices including your PC. The cable modem gateway will then begin an automatic search to locate and sign on to the broadband data network. This process may take up to 5 minutes. The modem will be ready for use when the **CABLE** LED status indicator on the front panel stops blinking and illuminates continuously.
6. The next step in setting up your cable modem gateway is to configure your Internet devices for Internet access. Choose one of the following options:
   - If you want to use Ethernet connections, you must configure the TCP/IP protocol. To configure the TCP/IP protocol, go to ***Configure TCP/IP*** (on page 20).
   - If you want to use USB connections, you must install the USB drivers. To install the USB Drivers for USB, go to ***Install USB Drivers*** (on page 23).

3

Basic Configuration

Introduction

This chapter provides procedures for configuring the basic operational features of the DPR2320/DPR2325/EPR2320/EPR2325. This chapter also provides a description of the basic features along with sample WebWizard HTML pages.

Access to these HTML pages is defined and configured by the system operator; therefore, you may or may not have access to the WebWizard. The system operator can enable other pages after registration by using a configuration variable.

In This Chapter

Configure Basic Settings

Accessing the Cable Modem Gateway

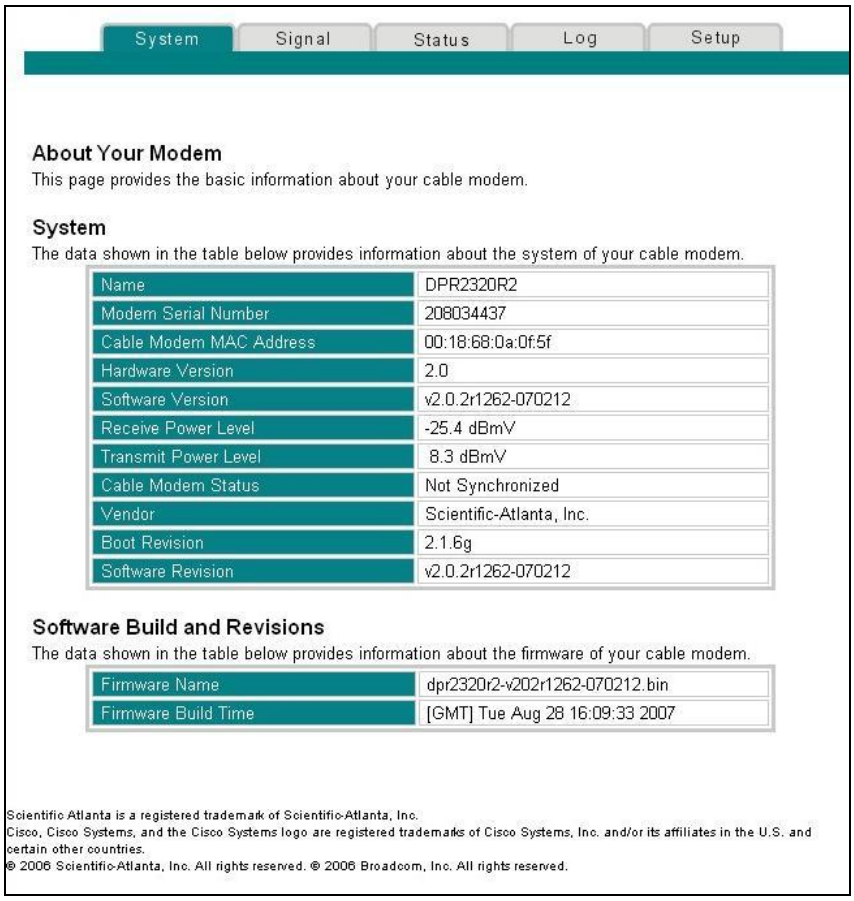
You must access the WebWizard in order to configure the cable modem gateway. To gain access to the WebWizard, use the Web browser on the PC attached to the gateway and complete the following steps.

1. Type the following IP address and then select **Go**: **http://192.168.0.1**. An authentication window similar to the following window opens.

2. Leave the User Name field blank and enter your password in the Password field. The Web browser accesses the WebWizard and displays the default **About Your Modem** page. This page displays information about your cable modem along with a series of tabs for accessing other WebWizard configuration and operation features.

About Your Modem Page Example

The following illustration is an example of the About Your Modem page.



About Your Modem Page Description

The following tables provide a description of each field within the About Your Modem page.

System Section

Field Name	Description
Name	The name of the cable modem gateway
Modem Serial Number	A unique sequential series of alphanumeric characters provided to every modem during manufacturing
Cable Modem MAC Address	A unique alphanumeric address for the cable modem coaxial interface, which is used to connect to the cable modem termination system (CMTS) at the headend. A media access control (MAC) address is a hardware address that uniquely identifies each node of a network

Field Name	Description
Hardware Version	Identifies the revision of the circuit board design
Software Version	Identifies the software version placed into the modem at the time of manufacturing
Receive Power Level	The input level of the downstream CMTS carrier
Transmit Power Level	Indicates the upstream power level
Cable Modem Status	Lists one of the following possible current states of the modem: ■ other ■ notReady ■ notSynchronized ■ phySynchronized ■ usParametersAcquired ■ rangingComplete ■ ipComplete ■ todEstablished ■ securityEstablished ■ psrsmTransferComplete ■ registrationComplete ■ operational ■ accessDenied
Vendor	The name of the manufacturer
Boot Revision	Identifies the boot revision code version
Software Revision	Identifies the software version placed into the cable modem gateway at the time of manufacturing

Software Build and Revisions Section

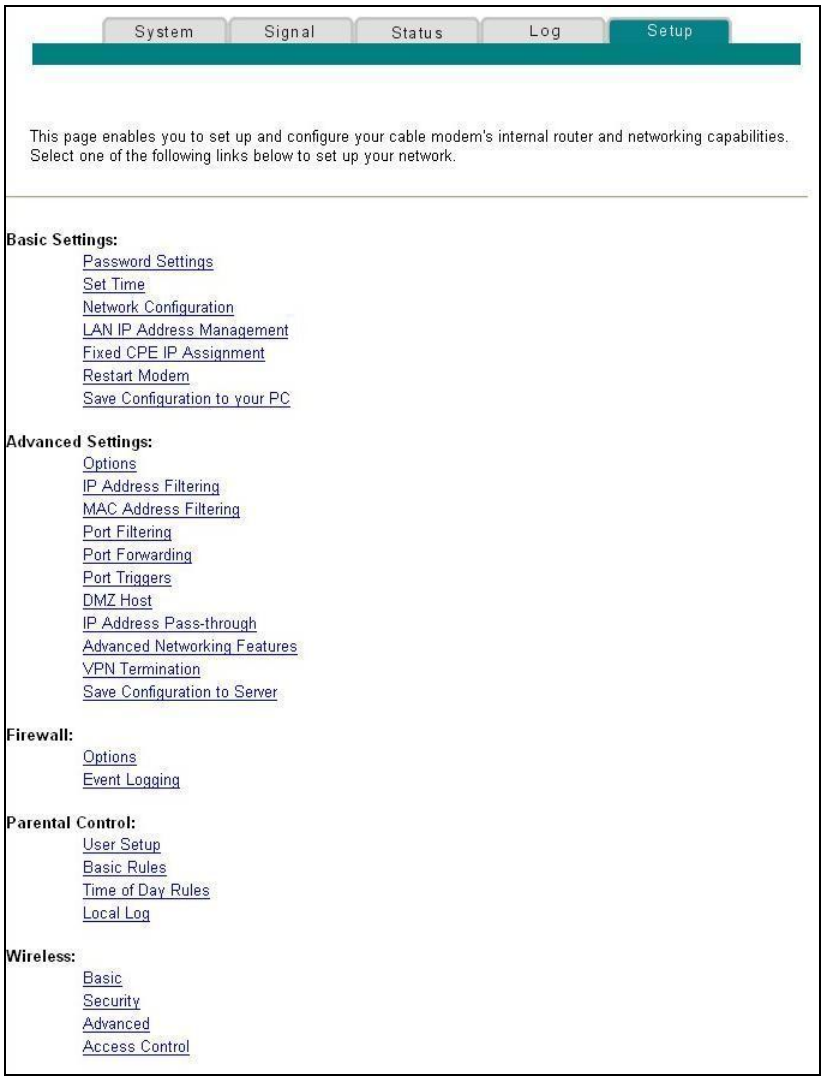
Field Name	Description
Firmware Name	Identifies the version of the firmware
Firmware Build Time	Identifies the time and date that the firmware was built

Setting Configuration Options

Click the Setup tab located in the upper portion of the About Your Modem screen to access the Setup page. Use the Setup page to access the various configuration options for the cable modem gateway. Detailed descriptions of each configuration option follow later in this guide.

Setup Page Example

The following illustration is an example of the Setup page.



Setup Page Section Headings

The Setup page is divided into the following section headings:

- Basic Settings
- Advanced Settings
- Firewall

- Parental Control
- Wireless

In the Setup page, click the selections listed within these sections to access the WebWizard page for that selection. A description of the selections available in each section follows next.

Basic Settings

The following table provides a description of the pages available from within the Basic Settings section of the Setup page.

Field Name	Description
Password Settings	Use this page to set or modify your password settings
Set Time	Use this page to enable or disable time synchronization by Network Time protocol
Network Configuration	Use this page to enter or modify the basic settings for your network
LAN IP Address Management	Use this page to configure how Internet protocol (IP) addresses are assigned and managed in your network
Fixed CPE IP Assignment	Use this page to reserve IP addresses in the DHCP pool that will be used as static IP addresses in your local network
Restart Modem	Use this page to restart your cable modem gateway
Save Configuration to your PC	Use this page to save your cable modem RG configuration to your local PC and to restore the RG configuration to your cable modem gateway, if necessary

Advanced Settings

The following table provides a description of the pages available from within the Advanced Settings section of the Setup page.

Field Name	Description
Options	Use this page to enable or disable advanced features on your network
IP Address Filtering	Use this page to configure IP address filters. These filters prevent designated IP addresses from accessing the Internet
MAC Address Filtering	Use this page to configure MAC address filters. These filters prevent designated MAC addresses from accessing the Internet

Field Name	Description
Port Filtering	Use this page to configure transmission control protocol (TCP) and user datagram protocol (UDP) port filters. These filters prevent a range of TCP/UDP ports from accessing the Internet
Port Forwarding	Use this page to configure port forwarding for local IP addresses. Port forwarding allows you to run a server on the local area network (LAN) by specifying the mapping of TCP/UDP ports to local PCs or to the IP address of other devices. This is a static setting that holds the ports open at all times
Port Triggers	Use this page to configure TCP/UDP port triggers. Port triggering is similar to port forwarding, but is a dynamic function. In other words, the ports are not held open, and the ports close if no outgoing data is detected on the selected ports for a period of 10 minutes
DMZ Host (Demilitarized Zone)	Use this page to configure an IP address that is visible to the wide area network (WAN). DMZ hosting is commonly referred to as "exposed host," and allows you to specify the "default" recipient of WAN traffic that Network Address Translation (NAT) is unable to translate to a known local PC A DMZ is used by a company that wants to host its own Internet services without sacrificing unauthorized access to its private network. DMZ allows one IP address to be unprotected while others remain protected. The DMZ is located between the Internet and an internal network's line of defense that is a combination of firewalls and bastion hosts Typically, the DMZ contains devices accessible to Internet traffic, such as Web (HTTP) servers, FTP servers, SMTP (e-mail) servers, and domain name system (DNS) servers
IP Address Pass-through	Use this page to bypass NAT by adding or deleting passthrough CPEs
Advanced Networking Features	Use this page to configure Routing Information Protocol (RIP) parameters related to authentication, IP addresses, subnet masks, and reporting intervals
VPN Termination	Use this page to create, configure, and control Virtual Private Network (VPN) protocols and manage Internet Protocol Security (IPsec) VPN tunnels
Save Configuration to Server	Use this page to save your configuration to the server

Firewall

The following table provides a description of the pages available from within the Firewall section of the Setup page.

Field Name	Description
Options	Use this page to configure webpage filtering and firewall protection
Event Logging	Use this page to access the firewall event log and to enter your e-mail address in order to receive e-mail alerts related to firewall attacks by hackers

Parental Control

The following table provides a description of the pages available from within the Parental Control section of the Setup page.

Field Name	Description
User Setup	Use this page to add or delete user profiles and to apply access rules to those users
Basic Rules	Use this page to setup access rules that block certain Internet content and certain websites
Time of Day Rules	Use this page to configure Web access filters to block all Internet traffic to and from specific network devices based on time of day settings that you select
Local Log	Use this page to view events captured by Parental Control event log feature

Wireless

The following table provides a description of the pages available from within the Wireless section of the Setup page.

Field Name	Description
Basic	Use this page to configure your wireless access point (WAP) parameters, including service set identifier (SSID) and channel number
Security	Use this page to configure your WAP authentication and data encryption. Using encryption and authentication prevents unauthorized access to your wireless devices
Advanced	Use this page to configure your WAP data rates and wireless fidelity (WiFi) thresholds
Access Control	Use this page to configure the WAP to restrict access to only selected wireless client devices. Authorized clients are selected by MAC address. Use this page to select Open System or Share Key authentication and to enable and disable broadcast of the WAP SSID

Configuring Your Password Settings

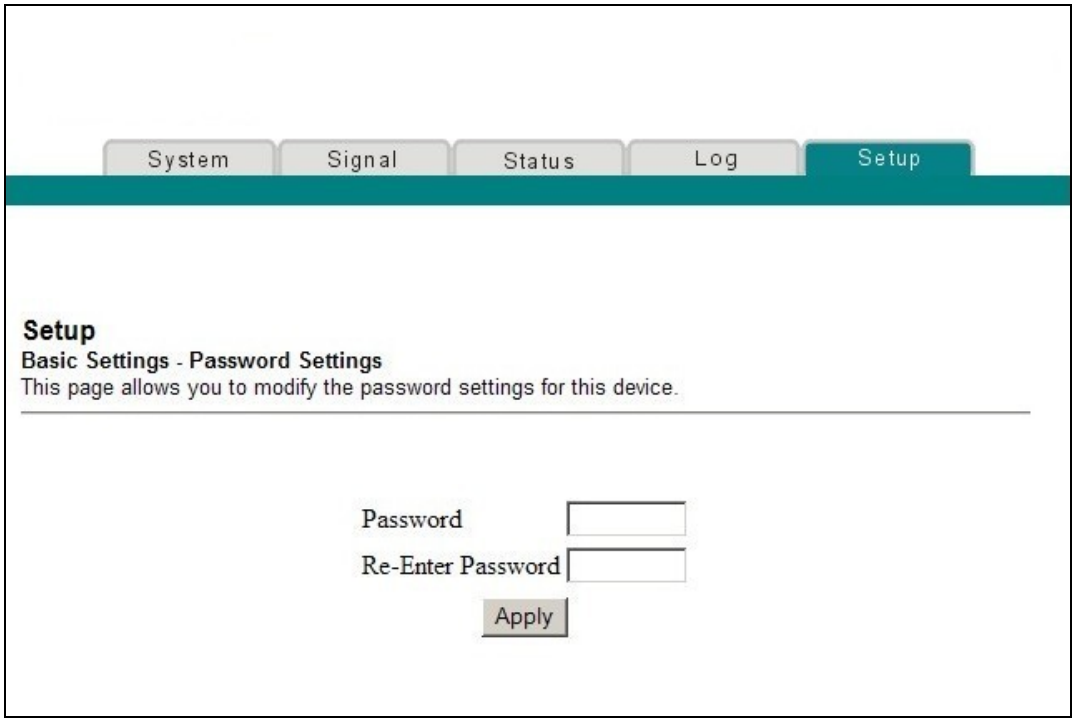
Use the Basic Settings - Password Settings page to set up a password to restrict unauthorized persons from accessing to your cable modem gateway settings. Click **Password Settings** in the Basic Settings section of the Setup page to access the Password Settings page.

Notes:

- Your cable modem gateway comes from the factory with no password enabled. We highly recommend that you set up a user password to prevent unauthorized users from modifying the settings of your network.
- If you do choose to set up a password, use a password that you can easily remember. Do *not* forget your password.

Setup Basic Settings - Password Settings Page Example

The following illustration is an example of the Basic Settings - Password Settings page.



To set up your password

To set up your password, type your password in the Password field, and then re-type your password in the Re-Enter Password field. Then, click **Apply** to save your password.

Note: If you set a password, on subsequent access to the WebWizard pages, a screen similar to the following appears. Do *not* forget your password. Write your password and store it in a secure location known only to you.

Configuring Network Time Synchronization

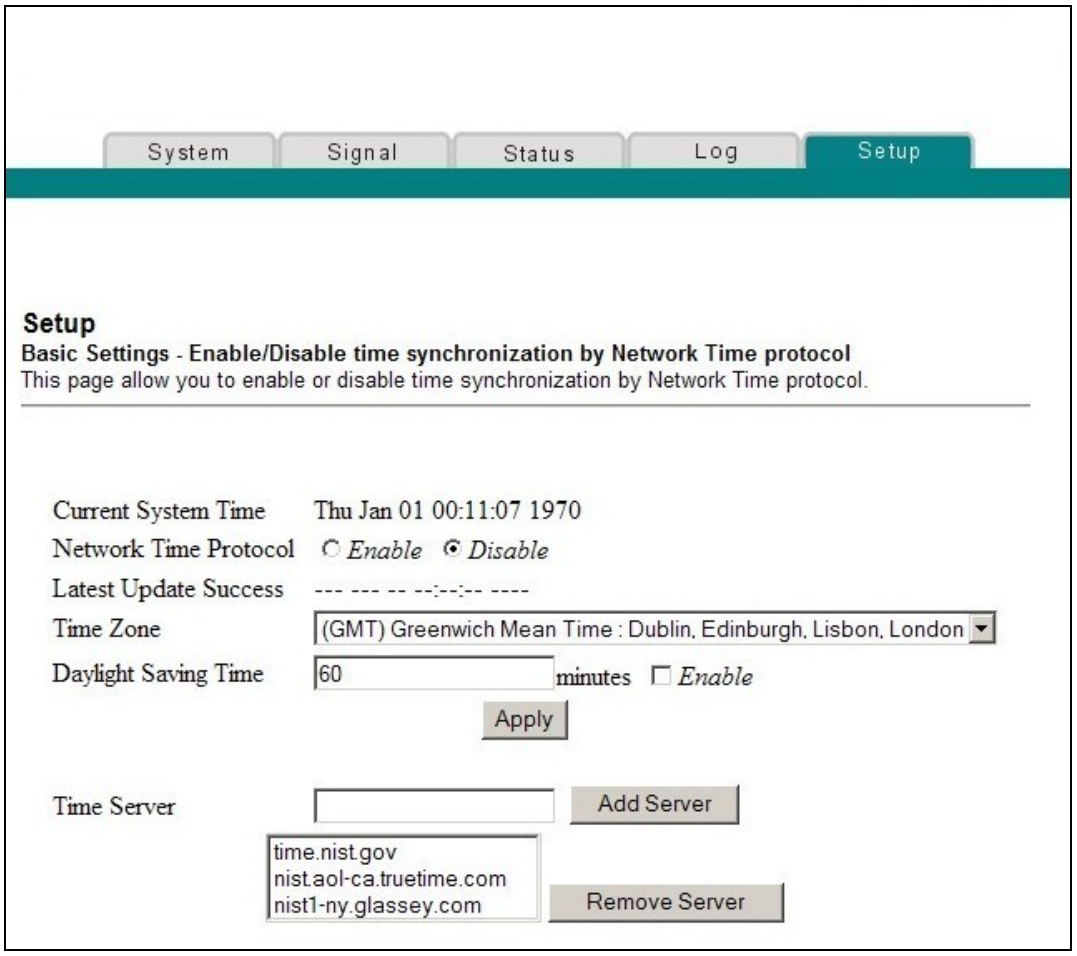
Use the Basic Settings Enable/Disable time synchronization by Network Time protocol page to enable or disable time synchronization by Network Time protocol.

Note: If you are not familiar with the time configuration procedures detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default time synchronization configuration settings.

Click **Set Time** in the Basic Settings section of the Setup page to access the Basic Settings Enable/Disable time synchronization by Network Time protocol page.

Setup Basic Settings - Enable/Disable Time Synchronization by Network Time Protocol Page Example

The following illustration is an example of the Basic Settings Enable/Disable time synchronization by Network Time protocol page.



Setup Basic Settings - Enable/Disable Time Synchronization by Network Time Protocol Page Description

The following table provides a description of the fields within the Basic Settings Enable/Disable time synchronization by Network Time protocol page.

Field Name	Description
Current System Time	Displays the current system time and date
Network Time Protocol	Allows you to enable or disable network time protocol **Note:** The cable modem gateway will automatically use the time server in your broadband network. Should there be no current time displayed or if the network time is incorrect, enable Network Time Protocol to use a public Internet time server to set the clock in the gateway.
Latest Update Success	Displays the time and date of the last successful time update
Time Zone	Displays the current time zone. The drop-down list allows you to select your local time zone
Daylight Saving Time	Allows you to adjust the time during periods when Daylight Saving Time is in effect. Check the **Enable** box to enable or disable this setting **Note:** If the offset for Daylight Savings Time is other than 60 minutes, enter the offset in the minutes field.
Time Server	Add and delete time server URLs or IP addresses to and from the list, as required. When using Network Time Protocol, multiple time servers can be specified for the gateway to query for time of day. The gateway will sequentially step through the listed time servers until it acquires the current time. There are three well known public time servers entered as default servers

Function Keys

Key	Description
Apply	Saves all additions, edits, and changes
Add Server	Allows you to add a network time server
Remove Server	Allows you to remove a network time server

Configuring the Default Network Settings

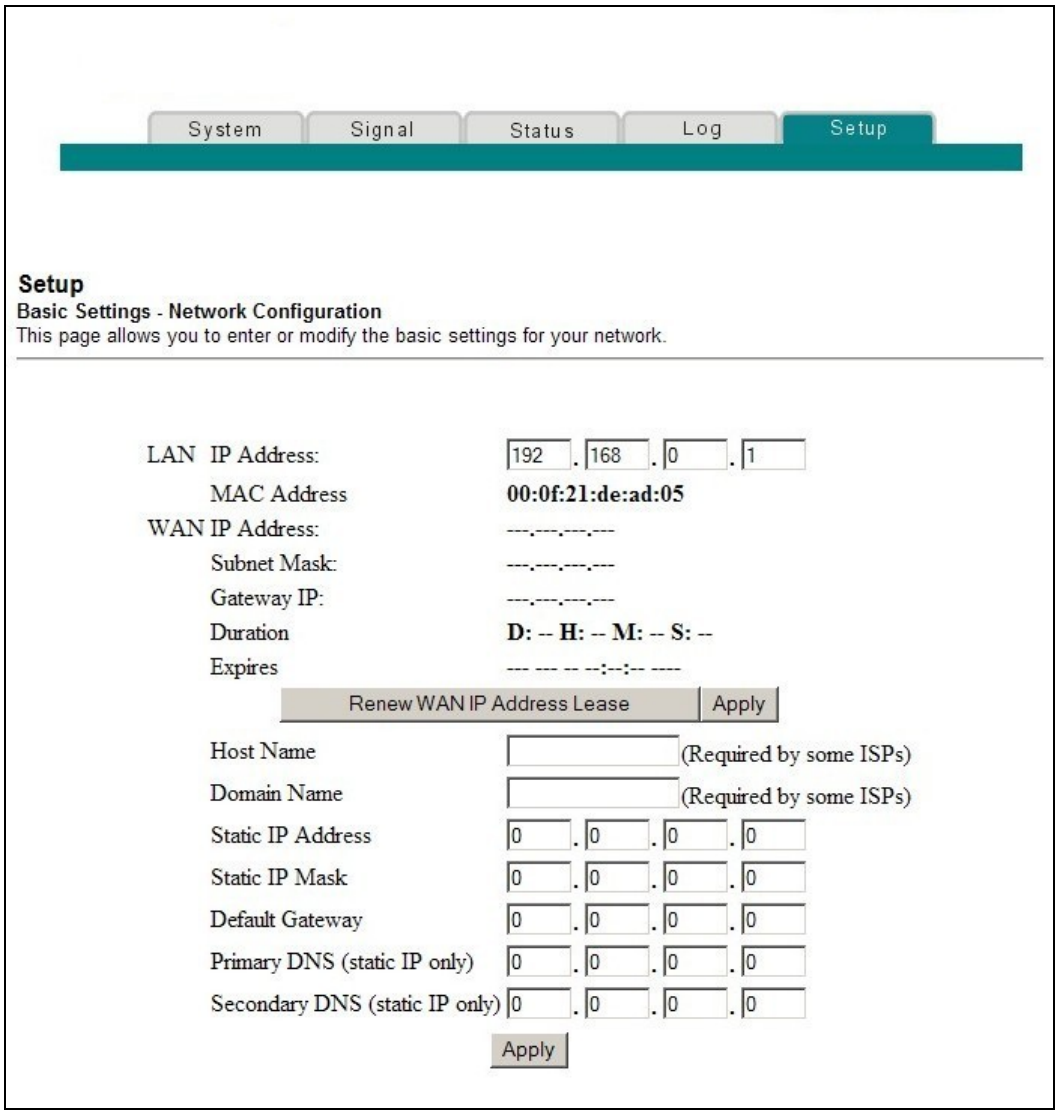
You can use the default network settings, or if your system requires different settings to operate correctly, you can change the default network settings using the Setup Basic Settings - Network Configuration page.

Note: If you are not familiar with the network configuration procedures detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default network configuration settings.

Click **Network Configuration** in the Basic Settings section of the Setup page to access the Setup Basic Settings - Network Configuration page.

Setup Basic Settings - Network Configuration Page Example

The following illustration is an example of the Setup Basic Settings - Network Configuration page.



Setup Basic Settings - Network Configuration Page Description

The following table provides a description of the fields within the Setup Basic Settings - Network Configuration page.

Field Name	Description
LAN IP Address	Displays the base IP address of the private home LAN and the WebWizard IP address. Your cable modem gateway assigns private IP addresses to your attached computers by its internal dynamic host configuration protocol (DHCP) server
MAC Address	Displays the MAC address for the WAN. The factory assigned MAC address for the WAN is also referred to as the WLAN Data MAC
WAN IP Address	Displays the public IP address assigned to your gateway by your ISP. The WAN port will be assigned a public IP address automatically by your ISP except when a static IP address is set up as described below. The WAN IP address will be shared by all the PCs in your private local area network to access the Internet
Subnet Mask	Displays the subnet mask for your WAN port. This address is automatically assigned to your WAN port by your ISP except when a static IP address is set up as described later in this table
Gateway IP	Displays a Gateway IP address for your WAN port. This address is automatically assigned to your WAN port by your ISP except when a static IP address is set up as described later in this table
Duration	Displays the length of time your WAN IP address is valid
Expires	Displays the date and time your WAN IP address expires
Host Name	Displays the host name that is usually downloaded to your gateway by your ISP. However, some ISPs require this information to be entered manually. If manual entry is required, your ISP will provide the information for you to enter into this field.
Domain Name	Displays the domain name that is usually downloaded to your gateway by your ISP. However, some ISPs require this information to be entered manually. If manual entry is required, your ISP will provide the information for you to enter into this field.
Static IP Address	Manual entry is required. Your ISP will provide the information for you to enter into this field. **Note:** When setting a static IP address, you must enter the IP address, subnet mask, and default gateway before the static IP address will become operational.
Static IP Mask	Manual entry is required. Your ISP will provide the information for you to enter into this field

Field Name	Description
Default Gateway	Manual entry is required, your ISP will provide the information for you to enter into this field
Primary DNS (static IP only)	Manual entry is required. Your ISP will provide the information for you to enter into this field
Secondary DNS (static IP only)	Manual entry is required. Your ISP will provide the information for you to enter into this field

Function Keys

The following function keys appear on the Setup Basic Settings - Network Configuration page.

Key	Description
Renew WAN IP Address Lease	Forces a release and renewal of your WAN IP address
Apply	Saves the values you enter into the fields without closing the screen

Configuring and Managing IP Addresses

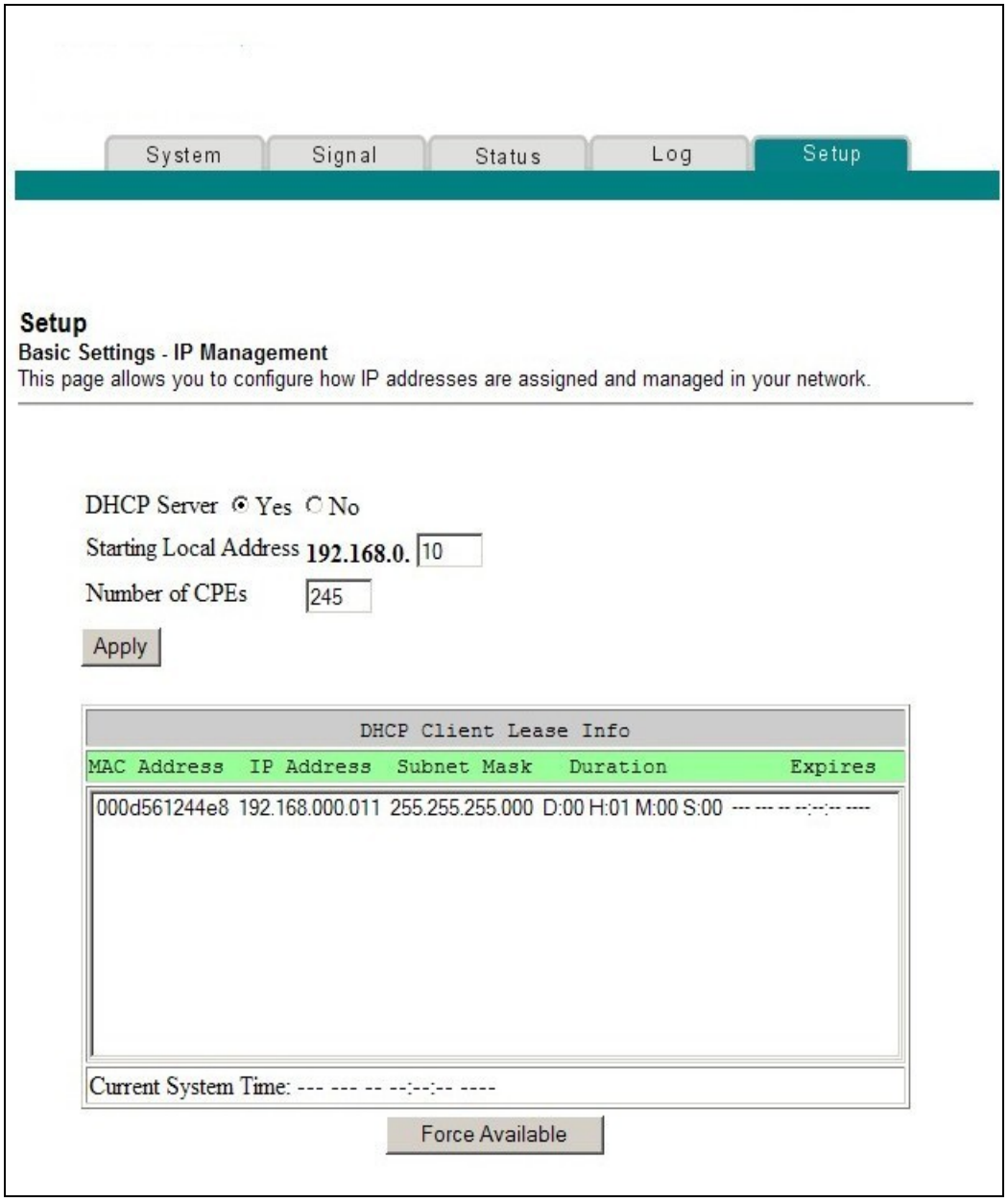
Use the Setup Basic Settings - IP Management page to configure how your system manages and assigns IP addresses in your network.

Note: If you are not familiar with the IP management procedures detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default IP management settings.

Click **LAN IP Address Management** in the Basic Settings section of the Setup page to access the Setup Basic Settings - IP Management page.

Setup Basic Settings - IP Management Page Example

The following illustration is an example of the Setup Basic Settings - IP Management page.



Setup Basic Settings - IP Management Page Description

The following tables provide a description of the fields within the Setup Basic Settings - IP Management page.

Field Name	Description
DHCP Server	Allows you to enable or disable the DHCP server in the cable modem gateway
Starting Local Address	Displays the starting address used by the built-in DHCP server to distribute Private LAN IP addresses. In the example shown, addresses between 2 and 9 can be used for devices on your Private LAN that require fixed IP addresses such as printers or a device assigned as a DMZ host **Note:** The LAN IP address ending in 1 is reserved for the internal gateway server. The LAN IP address ending in 255 is also reserved and should not be used for CPE devices.
Number of CPEs	Enter the maximum number of devices allowed to connect to the Private LAN **Note:** The Factory Default is 245. The maximum number of devices is 253. This is the combined total of addresses reserved for static IP addresses, for example, the sum of the IP addresses between 2 and the value entered in the Starting Local Address field and the value entered in the Number of CPEs field. **Note:** The sum of the value entered in the Starting Local Address field and the value entered in the Number of CPEs field must always be 255 or less.
DHCP Client Lease Info	Displays the MAC address, IP Address, Subnet Mask, Duration and Expiration date of all devices issued an IP address by the built-in DHCP server. This field also displays the current system time and date

Function Keys

The following function keys appear on the Basic Settings - IP Management page.

Key	Description
Apply	Saves the values you enter into the fields without closing the screen
Force Available	Forces the release of an IP address for you to re-use

Reserving IP Addresses

Use the Setup Basic Settings - Fixed CPE IP Assignment page to reserve IP addresses. This feature allows you to assign a fixed IP address to any device in your network by setting static IP addresses in your PC or other network device.

These addresses will be removed from the pool of the IP addresses to be used by your gateway's DHCP server when issuing IP addresses to devices that are connected to your local network.

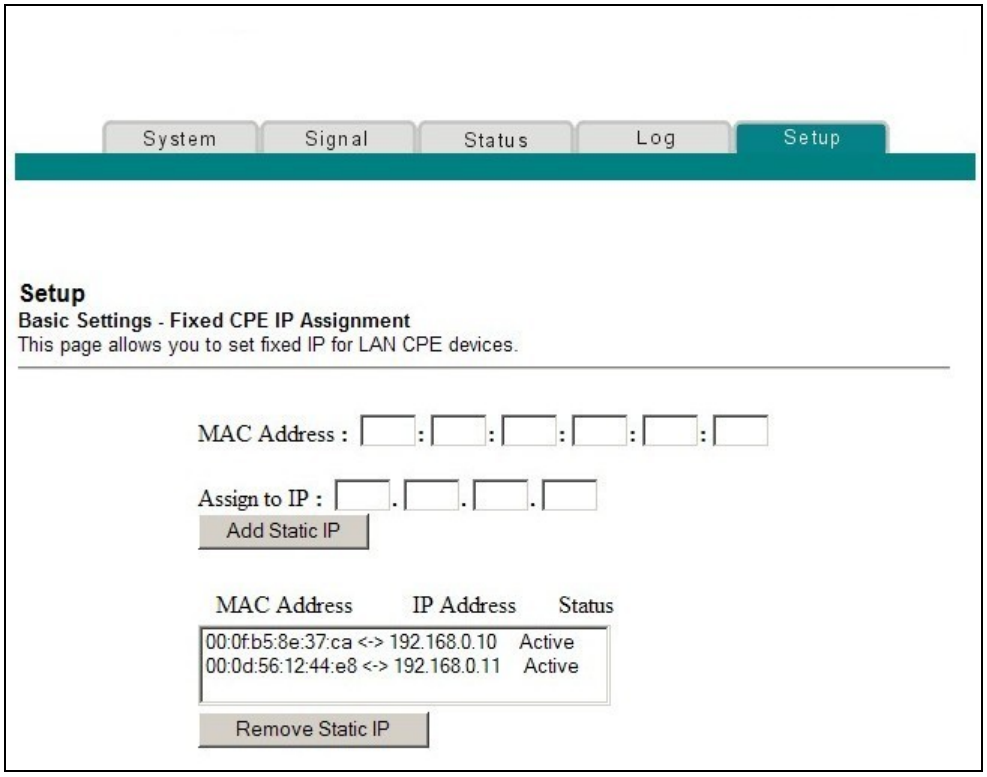
Reserving IP addresses is useful in making sure that there are no IP address conflicts on the network, for example, two devices using the same IP address. Another example: when using DMZ Host, the IP address for the DMZ Host should always have the same IP address.

Note: If you are not familiar with the Fixed CPE IP Assignment procedures detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default Fixed CPE IP Assignment settings.

Click **Fixed CPE IP Assignment** in the Basic Settings section of the Setup page to access the Setup Basic Settings - Fixed CPE IP Assignment page.

Setup Basic Settings - Fixed CPE IP Assignment Page Example

The following illustration is an example of the Setup Basic Settings - Fixed CPE IP Assignment page.



Setup Basic Settings - Fixed CPE IP Assignment Page Description

The following tables provide a description of the fields within the Setup Basic Settings - Fixed CPE IP Assignment page.

Field Name	Description
MAC Address	The MAC address of the PC or device (for example, a printer) for which you want to reserve a specific IP address on the network
Assign to IP	The IP address you assign to the PC or device for which you want to reserve a specific IP address on the network. Only MAC addresses within the range of the gateway's DHCP address pool can be reserved with this feature **Note:** The factory configuration of your gateway sets aside IP addresses 192.168.0.2 through 192.168.0.9 for static IP addresses.

Function Keys

Key	Description
Add Static IP	Adds the Static IP address to the list of assigned IP addresses
Remove Static IP	Removes the Static IP address from the list of assigned IP addresses

Restarting the Cable Modem Gateway

Use the Setup Basic Settings - Restart Cable Modem page to restart your cable modem gateway.

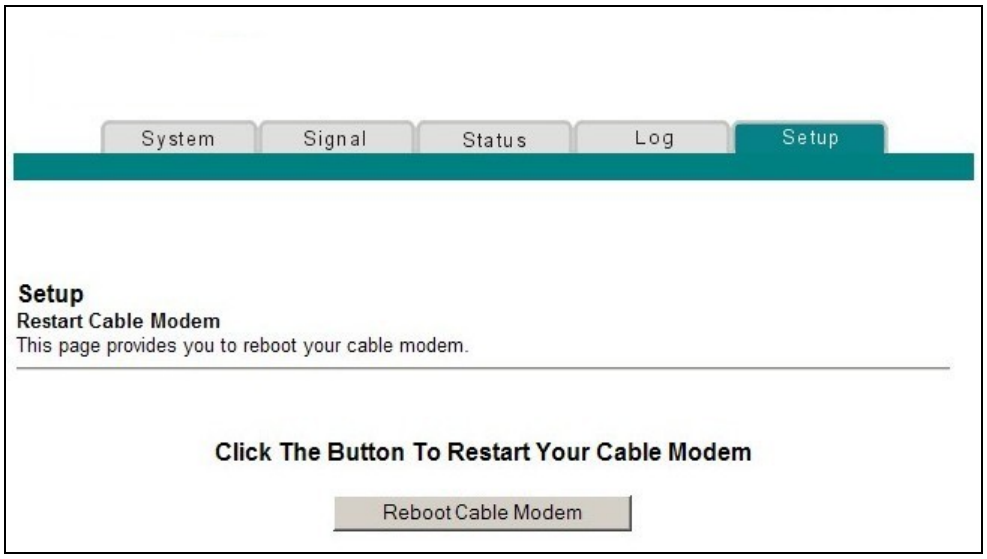
Click **Restart Modem** in the Basic Settings section of the Setup page to access the Basic Settings - Restart Cable Modem page.

Click **Reboot Cable Modem** to restart the cable modem gateway.

Note: Restarting your cable modem gateway does not reset any of the settings.

Setup Basic Settings - Restart Cable Modem Page Example

The following illustration is an example of the Restart Cable Modem page.



Saving Your Configuration

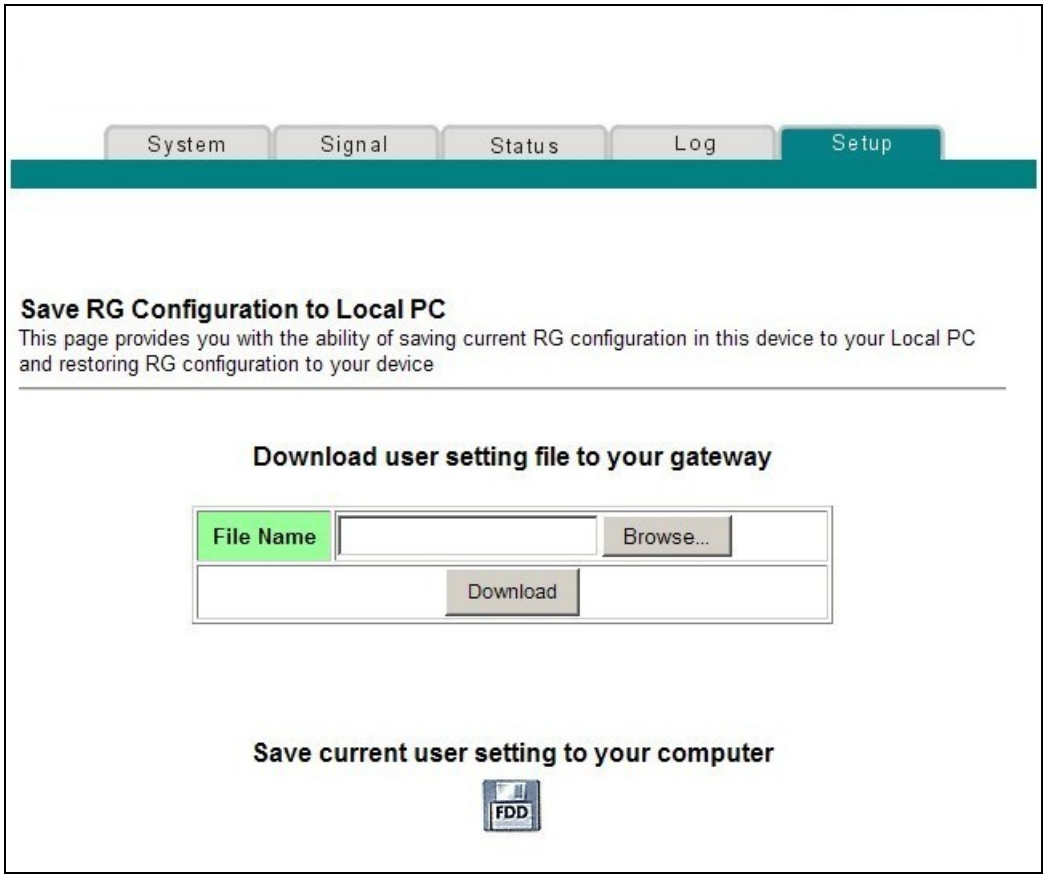
Use the Setup Basic Settings - Save RG Configuration to Local PC page to save your current cable modem gateway configuration to the hard drive on your PC or to a floppy disk. You will then be able to restore the cable modem gateway configuration, if necessary.

Note: If you are not familiar with the procedures detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default settings.

Click **Save Configuration to your PC** in the Basic Settings section of the Setup page to access the Setup Basic Settings - Save RG Configuration to Local PC page.

Setup Basic Settings - Save RG Configuration to Local PC Page Example

The following illustration is an example of the Setup Basic Settings - Save RG Configuration to Local PC page.



To **Save** your current setting to your computer, click the floppy disk icon in the lower portion of the screen. You will be prompted to provide a file name and location for the backup configuration file.

To **Restore** your setting, click **Browse** and select the backup configuration file name that you saved on your PC. The path and filename of the backup configuration appears in the File Name field. Then, click **Download** to restore your configuration file. A **Download Success** message appears when the restore is complete.

4

Advanced Features

The WebWizard pages described in this chapter allow you to configure several advanced features on your cable modem gateway. In addition, this chapter provides the information you need to configure the following advanced features:

- Advanced features
  - WAN blocking
  - Ipsec PassThrough
  - PPTP PassThrough
  - Remote Config Management
  - Multicast Enable
  - UPnP Enable
- IP address filters
- MAC address filters
- TCP and UDP port filters
- Port forwarding for local IP addresses
- TCP/UDP port triggers
- DMZ host
- IP address pass-through
- Advanced networking
- VPN termination
- Save configuration to a server

In This Chapter

Configure Advanced Features

Enabling and Disabling Advanced Features

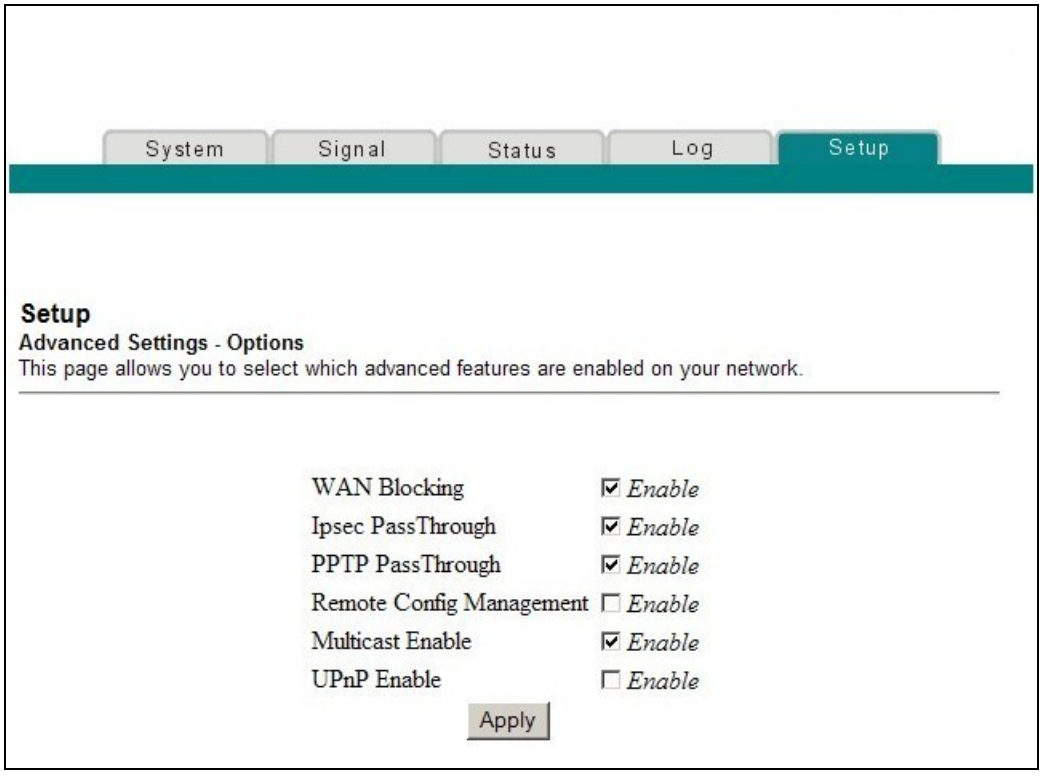
Use the Setup Advanced Settings - Options page to enable or disable advanced features on your network. When the wireless interface is disabled, the transmitter is turned off.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default advanced options settings.

Click **Options** in the Advanced Settings section of the Setup page to access the Setup Advanced Settings - Options page.

Setup Advanced Settings - Options Page Example

The following illustration is an example of the Setup Advanced Settings - Options page.



Setup Advanced Settings - Options Page Description

The following table provides a description of the fields within the Setup Advanced Settings - Options page.

Note: If you make changes in the Setup Advanced Settings - Options page, click Apply to apply and save your new IP address filter settings.

Field Name	Description
WAN Blocking	Checking this box prevents the cable modem gateway from being visible to the WAN. For example, pings to the WAN IP address are not returned
Ipsec PassThrough	Checking this box allows applications that use IPsec (IP Security) to pass through the firewall
PPTP PassThrough	Checking this box allows applications that use Point to Point Tunneling Protocol (PPTP) to pass through the firewall
Remote Config Management	Checking this box enables Remote Configuration Management that allows the user or network operator to view and/or modify the gateway set-up parameters from a location on the WAN, as opposed to the LAN side of the gateway. Access to the set-up parameters is obtained by using the password to access the WebWizard Enable this feature by checking the **Remote Config Management** box on the Setup Advanced Settings - Options page. To access your gateway from a remote location, you must also know the WAN IP address of the gateway. To find the WAN IP address, go to the Network Configuration page under Basic Settings. You will find the gateway's WAN IP address list on this page Enter the WAN IP address of your gateway into the address field of any Web browser using the following format: http://xxx.xxx.xxx.xxx:8080 where xxx.xxx.xxx.xxx represents the WAN IP address of your gateway Be sure to follow the syntax exactly, and then click **Go** or press **Enter**. Your gateway webpages will appear on the remote computer. You will still need to enter your password to access the Setup pages of your gateway **Note:** If you choose to enable (check) this feature, be sure to set up a user password to prevent unauthorized access to your gateway settings.
Multicast Enable	Checking this box allows multicasts to pass from the WAN side through to the private network
UPnP Enable	Checking this box enables Universal Plug and Play features

Configuring IP Address Filters

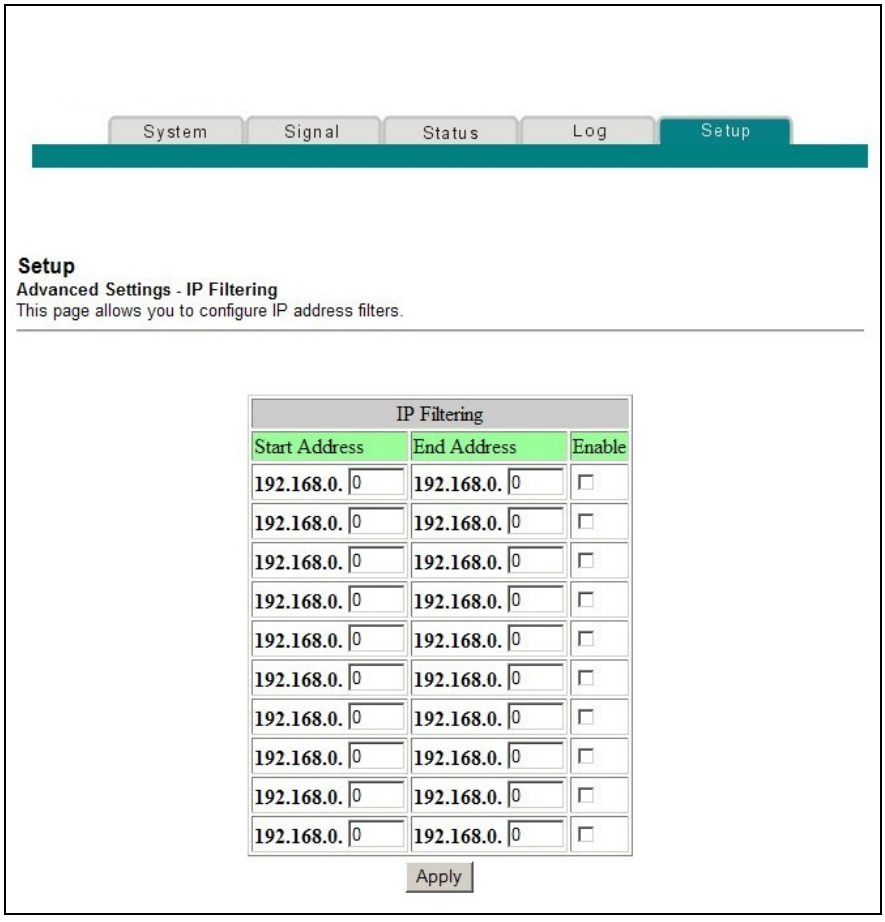
Use the Setup Advanced Settings - IP Filtering page to configure IP address filters. These filters block a range of IP addresses from accessing the Internet.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default advanced IP filtering settings.

Click **IP Address Filtering** in the Advanced Settings section of the Setup page to access the Setup Advanced Settings - IP Filtering page.

Setup Advanced Settings - IP Filtering Page Example

The following illustration is an example of the Setup Advanced Settings - IP Filtering page.



Setup Advanced Settings - IP Filtering Page Description

Use this page to specify and enable a range of IP addresses that cannot have access to the Internet. Click **Apply** to apply and save your new IP address filter settings.

Configuring MAC Address Filters

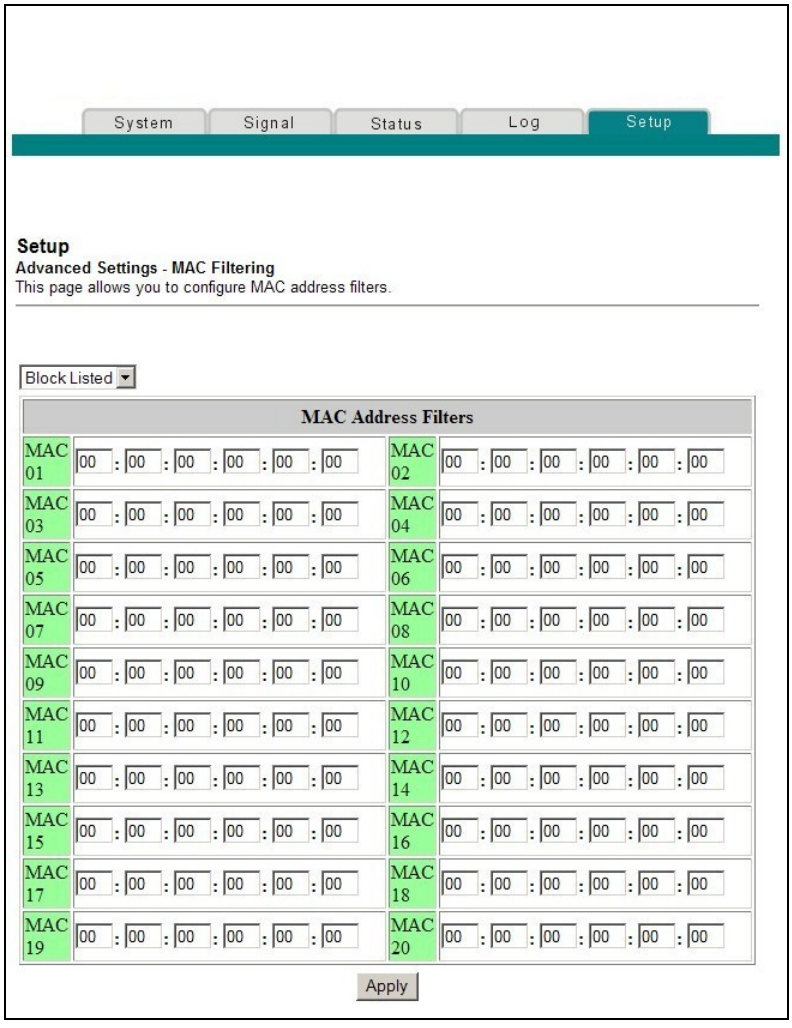
Use the Setup Advanced Settings - MAC Filtering page to configure MAC address filters. These filters allow you to deny or block access to the Internet by the individual MAC addresses listed in the table. You can also prevent individual PCs from sending outgoing TCP/UDP traffic to the WAN using their MAC address.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default advanced MAC filtering settings.

Click **MAC Address Filtering** in the Advanced Settings section of the Setup page to access the Setup Advanced Settings - MAC Filtering page.

Setup Advanced Settings - MAC Filtering Page Example

The following illustration is an example of the Setup Advanced Settings - MAC Filtering page.



Setup Advanced Settings - MAC Filtering Page Description

Use this page to enter the MAC address or MAC addresses of devices whose Internet access you want to control. Click **Apply** to apply and save your new MAC address filter settings.

Field Name	Description
Block Listed (Default)	Select **Block** to deny Internet access to the MAC addresses of the devices you list in the table. All other MAC addresses will be allowed Internet access
Pass	Select **Pass** to allow Internet access only to the MAC addresses of the devices you list in the table. Any MAC addresses *not* listed in the table will be denied Internet access

Setting Up MAC Address Filters

The Block/Pass drop down menu allows you to block or pass Internet access to the MAC addresses of the devices you list in the MAC Address Filters table. The following table describes the function of the Block/Pass drop down menu.

Configuring and Enabling TCP and UDP Port Filters

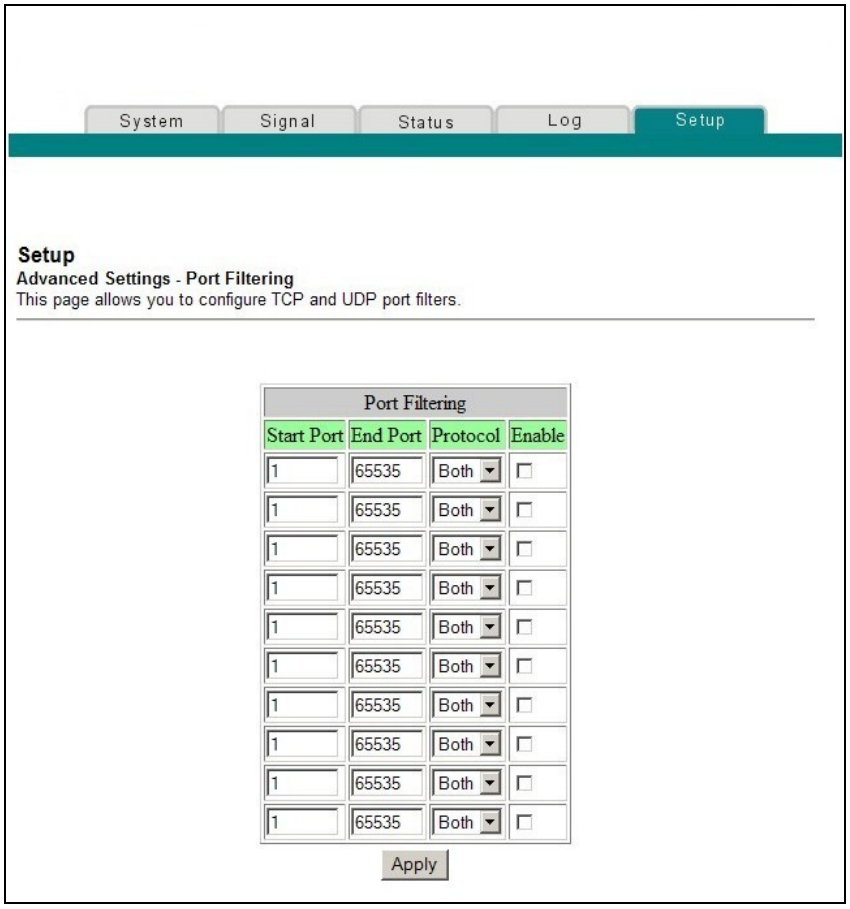
Use the Setup Advanced Settings - Port Filtering page to configure and enable TCP and UDP port filters. These filters prevent a range of TCP/UDP ports from accessing the Internet. You can also prevent PCs from sending outgoing TCP/UDP traffic to the WAN on specific IP port numbers. This filter is not IP address- or MAC address-specific. The system blocks the specified port ranges for all PCs.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default advanced port filtering settings.

Click **Port Filtering** in the Advanced Settings section of the Setup page to access the Setup Advanced Settings - Port Filtering page.

Setup Advanced Settings - Port Filtering Page Example

The following illustration is an example of the Setup Advanced Settings - Port Filtering page.



Setup Advanced Settings - Port Filtering Page Description

Use this page to enter and enable the desired port filtering ranges and protocols in the appropriate fields, and then click **Apply** to apply and save your new port filtering settings.

Configuring Port Forwarding for Local IP Addresses

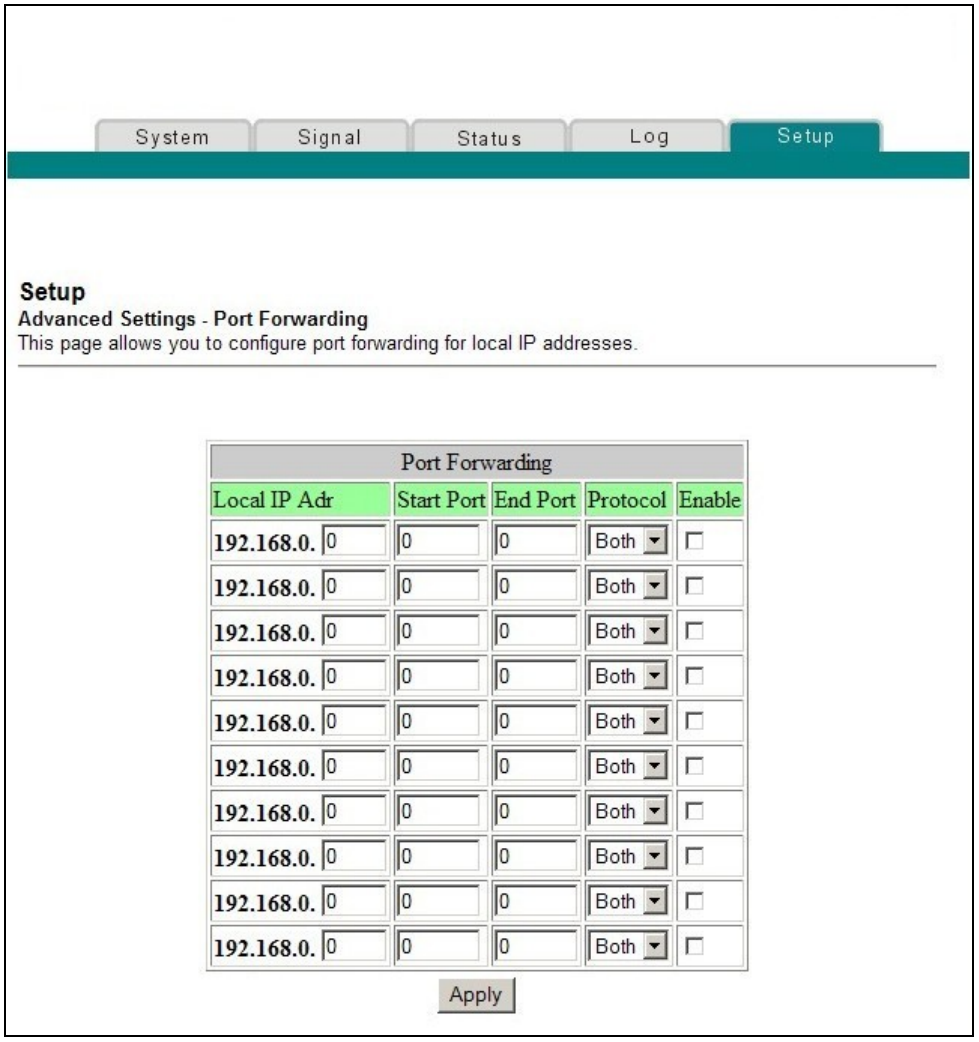
Use the Setup Advanced Settings - Port Forwarding page to configure port forwarding for local IP addresses. Port forwarding allows you to run a server on the LAN by specifying the mapping of TCP/UDP ports to a local PC. You must also set up a fixed private LAN IP address for the destination device.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default advanced port forwarding settings.

Click **Port Forwarding** in the Advanced Settings section of the Setup page to access the Setup Advanced Settings - Port Forwarding page.

Setup Advanced Settings - Port Forwarding Page Example

The following illustration is an example of the Setup Advanced Settings - Port Forwarding page.



Setup Advanced Settings - Port Forwarding Page Description

The following example illustrates how to use the port forwarding feature to configure the Microsoft X-Box Online Live for Internet gaming.

Note: For most widely used applications (including Microsoft X-Box Online Live), the built-in firewall automatically maps and opens ports required for that application while the application is in use.

1. Set the device to be used for port forward to a fixed IP address, for example, **192.168.0.5**.
2. In the first entry of the Port Forwarding area of the page, enter the same IP address (192.168.0.5) in the Local IP Address field.
3. In the same row, enter the appropriate port numbers in the Start Port and End Port fields.
4. In the same row, select the appropriate protocol from the drop-down list in the Protocol field, and then select the box in the **Enable** field.
5. To add additional ports, repeat steps 1 through 4, and then go to step 6.
6. Click **Apply** to apply and save your new port forwarding settings.

Configuring TCP/UDP Port Triggers

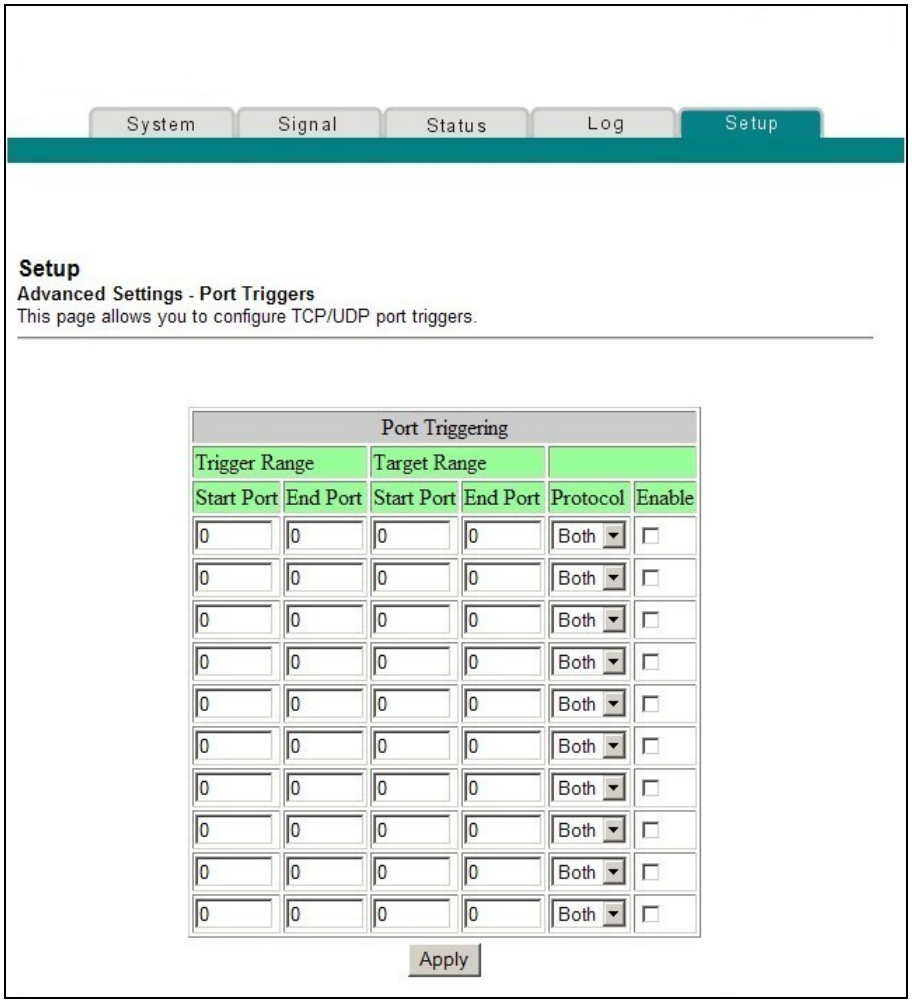
Use the Setup Advanced Settings - Port Triggers page to configure TCP/UDP port triggers. Port triggering is similar to port forwarding but is dynamic. In other words, the system does not hold the ports open indefinitely. For example, when the cable modem gateway detects outgoing data on a specific IP port number set in the "Trigger Range," the resulting ports set in the "Target Range" opens for incoming data. If the system detects no outgoing traffic on the "Trigger Range" ports for a period of 10 minutes, the "Target Range" ports close. This is a safer method for opening specific ports for special applications, such as video conferencing programs, interactive gaming, and file transfer in chat programs. This is safe because the ports are dynamically triggered and not held open continuously or left open erroneously by the router administrator. Therefore, these ports are not exposed and are not vulnerable for potential hackers to discover.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default advanced port triggers settings.

Click **Port Triggers** in the Advanced Settings section of the Setup page to access the Setup Advanced Settings - Port Triggers page.

Setup Advanced Settings - Port Triggers Page Example

The following illustration is an example of the Setup Advanced Settings - Port Triggers page.



Setup Advanced Settings - Port Triggers Page Description

Use this page to enter and enable the port forwarding trigger and target range start and end ports along with protocol information in the appropriate fields. The following example illustrates how to use the port triggering feature to configure the Microsoft X-Box Online Live for Internet gaming.

Note: For most widely used applications (including Microsoft X-Box Online Live), the built-in firewall automatically maps and opens ports required for that application while the application is in use.

1. In the first row, enter **88** in both Start Port and End Port fields.
2. In the same row, select **UDP** from the drop-down list in the Protocol field, and then select the box in the **Enable** field.
3. In the second row, enter **3074** in both Start Port and End Port fields.
4. In the same row as the second entry, select **Both**, and then select the box in the Enable field.
5. Click **Apply** to apply and save your new port forwarding settings.

Configuring the DMZ Host

Use the Setup Advanced Settings - DMZ Host page to configure an IP address that is visible to the WAN. DMZ hosting is commonly referred to as "exposed host." DMZ hosting allows you to specify the "default" recipient of WAN traffic that Network Address Translation (NAT) is unable to translate to a known local PC. DMZ allows one IP address to be unprotected while others remain protected.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default advanced DMZ host settings.

Click **DMZ Host** in the Advanced Settings section of the Setup page to access the Setup Advanced Settings - DMZ Host page.

Setup Advanced Settings - DMZ Host Page Example

The following illustration is an example of the Setup Advanced Settings - DMZ Host page.

Setup Advanced Settings - DMZ Host Page Description

Use this page to place a Private LAN IP device; for example, an FTP, Mail, or Web server directly on the Internet (bypassing the firewall). You set the server with a fixed IP address as a DMZ Host by entering its IP address in the DMZ Address field. Make sure the IP address used is not in the range of addresses delivered by the built-in DHCP server. After setting up a DMZ Host, all ports on this device are open to the Internet. You may configure only one PC to be the DMZ host. DMZ is generally used for PCs running "problem" applications that use random port numbers and do not function correctly with the specific port triggers or port forwarding setups described earlier in this guide. After entering a DMZ Address, click **Apply** to apply and save your new DMZ Host setting.

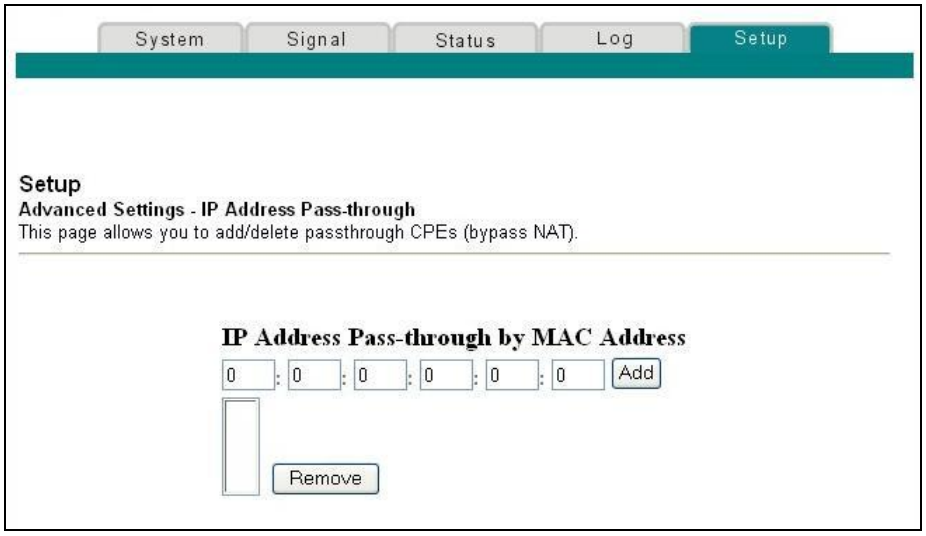
Configuring IP Address Pass-Through

Use the Setup Advanced Settings – IP Address Pass-through page to bypass NAT by adding MAC addresses for passthrough CPEs. You can also use this page to remove MAC addresses for passthrough CPEs you have entered previously.

Click **IP Address Pass-through** in the Advanced Settings section of the Setup page to access the Setup Advanced Settings – IP Address Pass-through page.

Setup Advanced Settings - IP Address Pass-through Page Example

The following illustration is an example of the Setup Advanced Settings - IP Address Pass-through page.



Setup Advanced Settings - IP Address Pass-through Page Description

The Setup Advanced Settings – IP Address Pass-through page allows you to bypass NAT by adding MAC addresses for passthrough CPEs. You can also use this page to remove MAC addresses for passthrough CPEs you have entered previously.

Function Keys

The following table describes the function keys associated with the Setup Advanced Settings – IP Address Pass-through page.

Key	Description
Add	Click to add a MAC address you have entered
Remove	Click to remove a MAC address you have previously entered

Configuring Advanced Networking Features

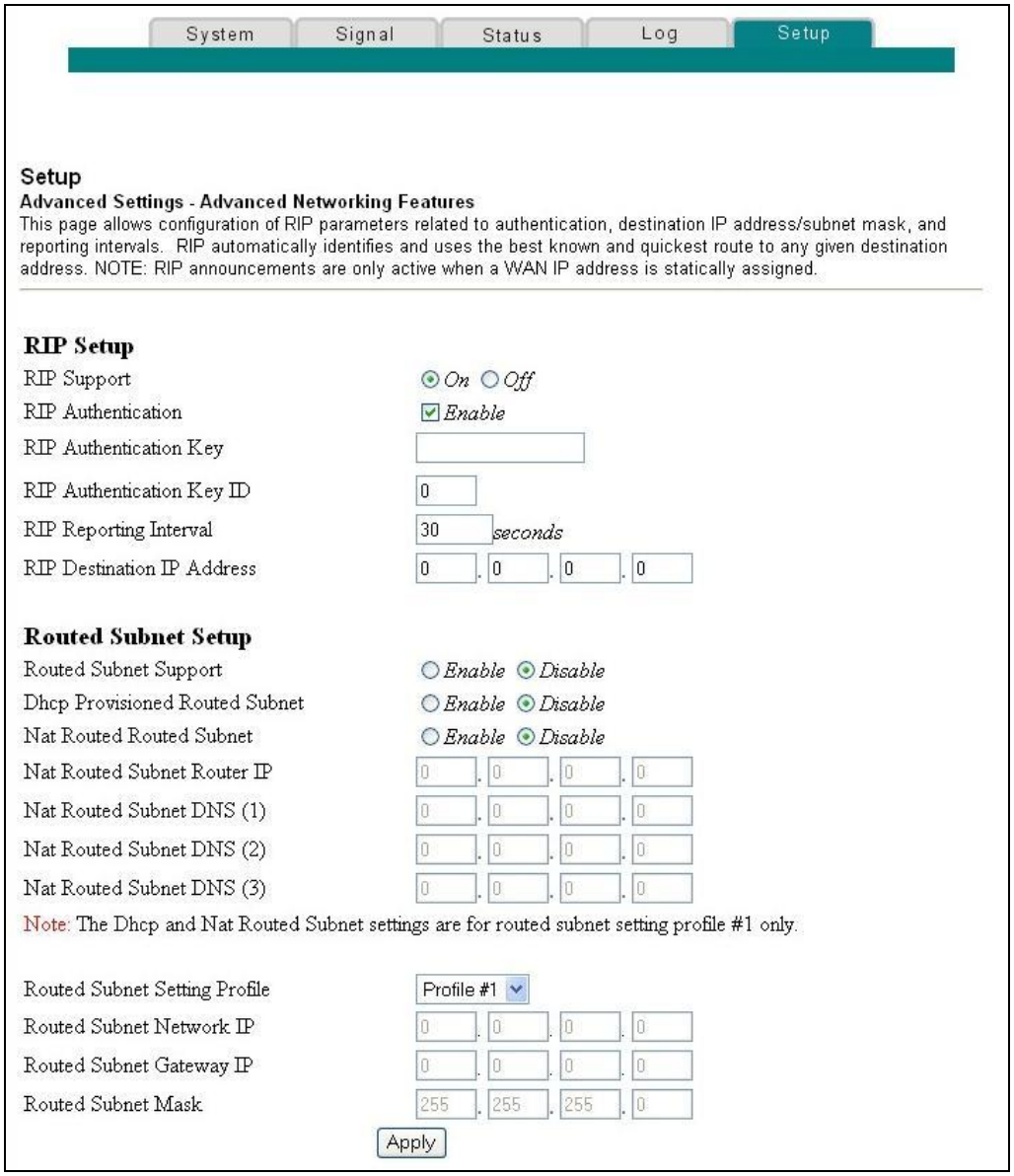
Use the Setup Advanced Settings – Advanced Networking Features page to configure RIP parameter related to authentication, destination IP address/subnet mask, and reporting intervals. RIP automatically identifies and uses the best known and quickest route to any given destination address. RIP announcements are only active when a WAN IP address is statically assigned.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the wireless home gateway defaults advanced networking settings.

Click **Advanced Networking Features** in the Advanced Settings section of the Setup page to access the Setup Advanced Settings – Advanced Networking Features page.

Setup Advanced Settings - Advanced Networking Features Page Example

The following illustration is an example of the Setup Advanced Settings - Advanced Networking Features page.



Setup Advanced Settings - Advanced Networking Features Page Description

This section describes the section heads and field descriptions of the Setup Advanced Settings – Advanced Networking Features page.

RIP Setup Section

Field Name	Description
RIP Support	Turns RIP support on or off
RIP Authentication	Enables or disables RIP authentication
RIP Authentication Key	MD5 Key Value
RIP Authentication Key ID	Key ID value for MD5 authentication
RIP Reporting Interval	Interval in Seconds for the RIP Reporting interval
RIP Destination IP Address	RIP unicast destination IP Address for RIP Reports

Routed Subnet Setup Section

Field Name	Description
Routed Subnet Support	Enables or disables routed subnet support
Dhcp Provisioned Routed Subnet	Enables or disables routing of the DHCP provisioned subnet
Nat Routed Routed Subnet	Enables or disables routing of the NAT routed subnet
Nat Routed Subnet Router IP	LAN IP address of the gateway
Nat Routed Subnet DNS (1)	IP address of the primary DNS server
Nat Routed Subnet DNS (2)	IP address of the secondary DNS server
Nat Routed Subnet DNS (3)	IP address of the tertiary DNS server
Routed Subnet Setting Profile	The subnet setting profile you are currently using
Routed Subnet Network IP	LAN IP network
Routed Subnet Gateway IP	LAN IP address of the gateway
Routed Subnet Mask	LAN IP subnet mask

Configuring VPN Termination

Use the Setup Advanced Settings - VPN Termination page to configure VPN protocols and manage VPN tunnels. A VPN is a connection between two endpoints in different networks that allows private data to be sent securely and transparently over public networks or other private networks. With a VPN, you can send data securely between these two locations or networks. This is accomplished by creating a "VPN tunnel." A VPN tunnel connects the two PCs or networks and allows data to be transmitted over the Internet as if it were still within those networks. The VPN tunnel uses IPsec (Internet Protocol security) to encrypt the data sent between the two networks and encapsulate the data within a normal Ethernet/IP frame so as to transport the private network securely and seamlessly through other public or private networks.

A VPN provides a cost-effective and more secure alternative to using a private, dedicated, leased line for a private network. Using industry standard encryption and authentication techniques, an Internet Protocol Security (IPsec) VPN creates a secure connection that operates as if you were directly connected to your local network.

For example, a VPN allows users to sit at home and connect to his/her employer's corporate network and receive an IP address in their private network just as though they were sitting in their office connected to their corporate LAN.

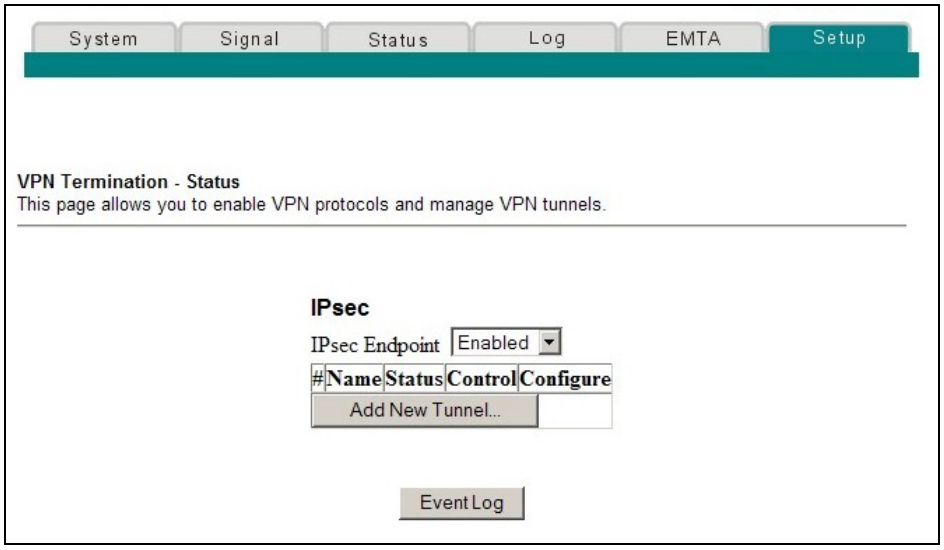
Another advantage of a VPN network is that it all proprietary Microsoft Windows-based networking protocols can pass through the router using the VPN tunnel to access corporate shared network drives.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the wireless home gateway defaults advanced VPN Termination settings.

Click **VPN Termination** in the Advanced Settings section of the Setup page to access the Setup Advanced Settings - VPN Termination - Status page. The VPN Termination - Status page allows you to create, configure, and control IPsec VPN tunnels.

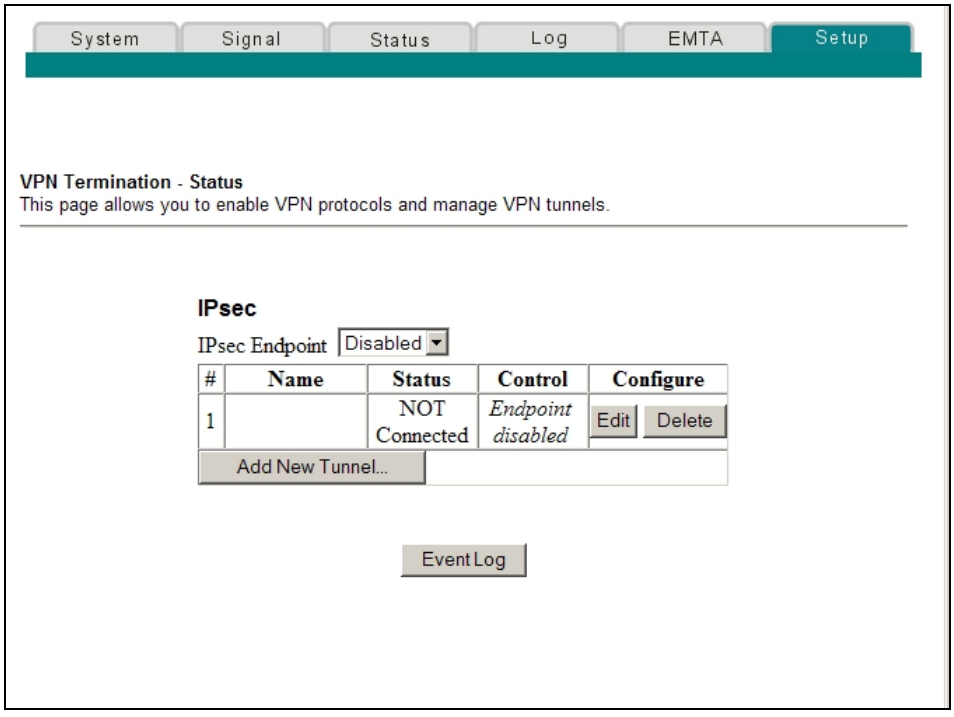
Setup Advanced Settings - VPN Termination - Blank Status Page Example

The following illustration is an example of a blank Setup Advanced Settings - VPN Termination - Status page. No VPN tunnels are configured.



Setup Advanced Settings - VPN Termination - Status Page with VPN Tunnel Configured

The following illustration is an example of the Setup Advanced Settings - VPN Termination - Status page with a VPN tunnel configured.



Setup Advanced Settings - VPN Termination - Status Page Description

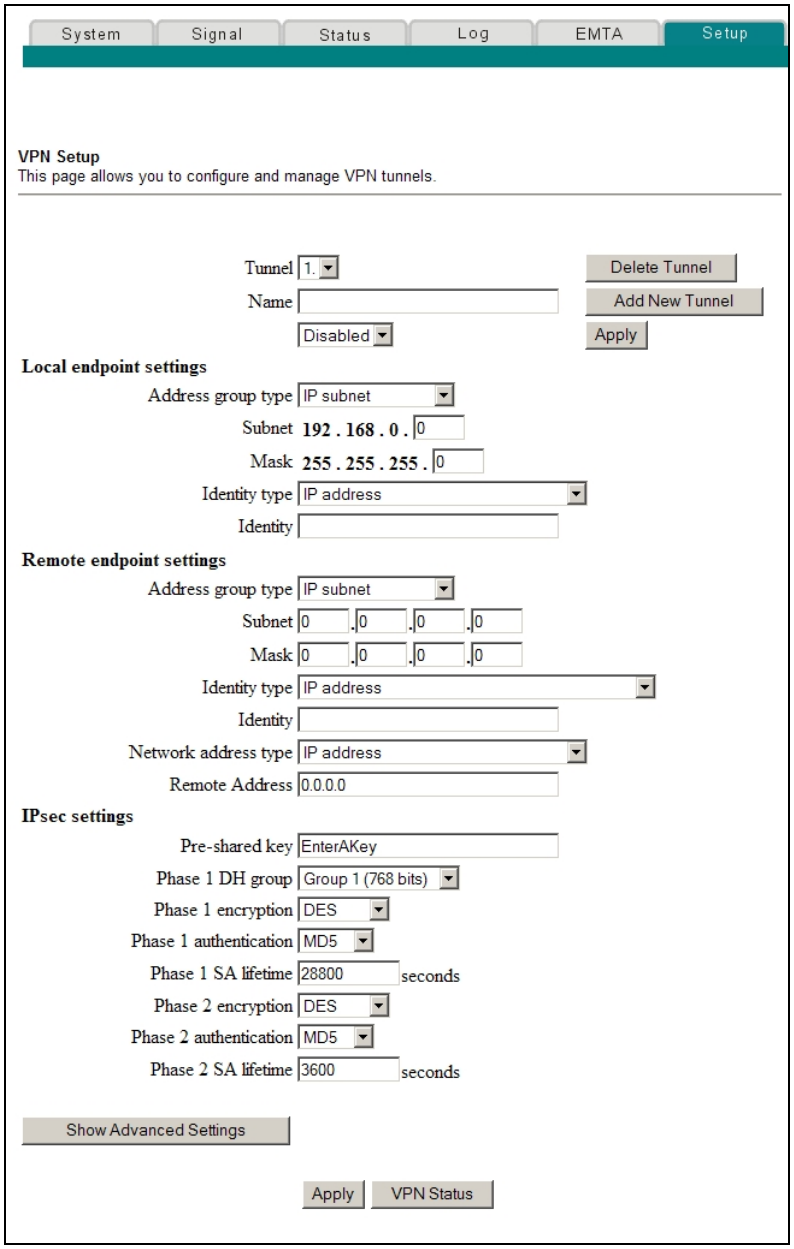
This section describes the section headings and field descriptions of the Setup Advanced Settings - VPN Termination - Status page. This page allows you to create, configure, and control IPsec VPN tunnels.

Note: You can set up and mange up to 50 different VPN tunnels.

Field Name	Description
IPsec Endpoint	Enables/disables the IP sec endpoint mode
Name	Displays the user-defined tunnel name entered from the VPN Setup page
Status	Displays the current connection state (Connected/NOT Connected)
Control	Displays one of the following three keys based on the current tunnel enable and connection state: ■ Enable ■ Connect ■ Endpoint disabled
Configure	Displays Edit or Delete keys used for settings management
Add New Tunnel	Allows you to create a new tunnel configuration. When you click **Add New Tunnel**, the **VPN Setup** page opens
Event Log	Allows you to access the Event Log page. The Event Log page shows a history of VPN connections and activity in chronological order and also displays the IP address of both endpoints on the tunnel (local and remote) **Note:** On the Event Log page, pressing the **Refresh** key updates the Event Log table to show any changes since the page was loaded. Pressing the **Clear** key clears the log table of its current contents and only the most recent data appears.

Creating and Configuring IPsec VPN Tunnels

To create and configure IPsec VPN tunnels, click **Add New Tunnel** on the VPN Termination - Status page. The VPN Setup page opens. The following illustration is an example of the VPN Setup page.



Setup Advanced Settings - VPN Setup Page Description

This section describes the section headings and field descriptions of the Setup Advanced Settings - VPN Setup page. This page allows you create, configure, and control IPsec VPN tunnels.

Tunnel Section

Field Name	Description
Tunnel	Displays existing tunnels and allows each tunnel to be individually configured
Name	Displays the name of a group of settings for a single tunnel. If no name is entered, the tunnels are named sequentially 1, 2, 3, and so on
Enable/Disable	Enables/disables a VPN tunnel after the tunnel is named and configured. Click **Apply** to activate the selected setting (Enabled or Disabled)

Function Keys

The following table describes the function keys associated with the Tunnel section of the VPN Setup page.

Key	Description
Delete Tunnel	Allows you to delete a tunnel
Add New Tunnel	Allows you to create a heading for the tunnel settings that you can select using the Tunnel drop-down menu
Apply	Activates the selected setting (Enabled or Disabled)

Local endpoint settings Section

The following table describes the fields in the Local endpoint settings section of the VPN Setup page.

Field Name	Description
Address group type	Allows you to select the address group type for the local VPN access group. The following types are available: ■ IP subnet ■ Single IP address ■ IP address range
Subnet	Allows you to enter Subnet information based on the selected Address group type: ■ For IP subnet, enter the subnet ■ For Single IP address, enter only the specific IP address ■ For IP address range, enter the starting and ending IP addresses

Field Name	Description
Mask	Allows you to enter Mask information based on the selected Address group type: ■ For IP subnet, enter the subnet mask ■ For Single IP address, enter only the specific IP address in the Subnet field. Leave this field blank. ■ For IP address range, enter the starting IP and ending IP addresses
Identity type	Allows you to select the local Identity type from one of the following options: ■ WAN IP address of the router(default) ■ User-specified IP address ■ Fully qualified domain name (FQDN) ■ Email address This is the identity that the far endpoint will use for identification of the VPN termination point. The remote VPN endpoint on the other end of the tunnel should match these settings for its remote endpoint settings
Identity	Allows you to enter the identity string after you have selected the identity type using one of the following formats: ■ For IP address mode use the format xxx.xxx.xxx.xxx ■ For FQDN use the format “yourdomain.com” ■ For email address use the format “yourname@yourdomain.com” The remote VPN endpoint on the other end of the tunnel should match these settings for its remote endpoint settings

Remote endpoint settings Section

These settings control how the local endpoint (router) connects to the far VPN termination point (the other end of the VPN tunnel).

Field Name	Description
Address group type	Allows you to select the address group type for the remote VPN access group. The following types are available: ■ IP subnet ■ Single IP address ■ IP address range The remote VPN endpoint on the other end of the tunnel should match these settings for its remote endpoint settings

Field Name	Description
Subnet	Allows you to enter Subnet information based on the selected Address group type: ■ For IP subnet, enter the subnet ■ For Single IP address, enter only the specific IP address ■ For IP address range, enter the starting and ending IP addresses
Mask	Allows you to enter Mask information based on the selected Address group type: ■ For IP subnet, enter the subnet mask ■ For Single IP address, enter only the specific IP address in the Subnet field. Leave this field blank. ■ For IP address range, enter the starting IP and ending IP addresses
Identity type	Allows you to select the remote Identity type from one of the following options: ■ WAN IP address of the router(default) ■ User-specified IP address ■ Fully qualified domain name (FQDN) ■ Email address This is the identity that the far endpoint will use for identification of the VPN termination point. The remote VPN endpoint on the other end of the tunnel should match these settings for its remote endpoint settings
Identity	Allows you to enter the identity string after you have selected the identity type using one of the following formats: ■ For IP address mode use the format xxx.xxx.xxx.xxx ■ For FQDN use the format “yourdomain.com” ■ For email address u se the format “yourname@yourdomain.com” The remote VPN endpoint on the other end of the tunnel should match these settings for its remote endpoint settings
Network address type	Allows you to enter the address type for the endpoint WAN. Choose one of the following options: ■ IP address ■ FQDN
Remote address	Allows you to enter either the IP address or the FQDN of the remote endpoint depending on what Network Address type you selected

IPsec settings Section

With VPN tunnels there are two phases of Security Association (SA).

- Phase 1 creates an Internet Key Exchange (IKE) SA
- When Phase 1 is complete, Phase 2 creates one or more IPsec SAs that are then used to key IPsec sessions

Field	Description
Pre-shared key	Allows you to enter the Pre-shared key of the firewall identifier if one side of the VPN tunnel is using a unique firewall
Phase 1 DH group	Allows you to select one of following three Diffie-Hellman (DH) encryption/decryption groups: ■ 768 bits ■ 1024 bits ■ 1536 bits Diffie-Hellman is a cryptographic technique that uses public and private keys for encryption and decryption. The higher number of bits selected, the more secure the connection
Phase 1 encryption	Allows you to select the form of encryption to secure the VPN connection between endpoints. Select from the following five encryption types: ■ DES ■ 3DES ■ AES-128 ■ AES-192 ■ AES-256 You may choose any encryption type as long as the other end of the VPN tunnel uses the same method
Phase 1 authentication	Allows you to select an authentication type for another level of security. Select one of the following authentication types: ■ MD5 ■ SHA You may choose either authentication type as long as the other end of the VPN tunnel uses the same method **Note:** SHA is recommended because it is more secure.

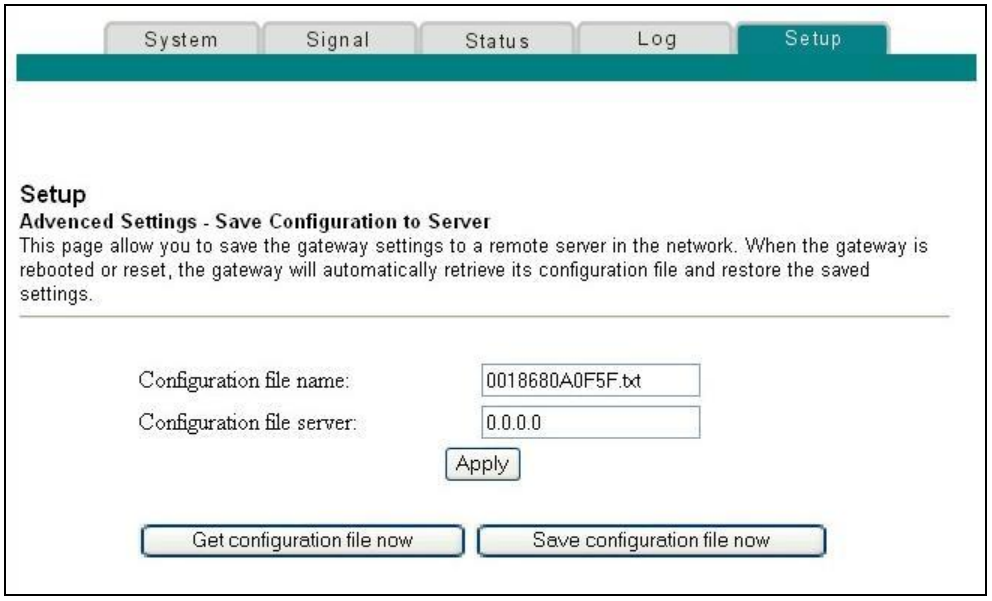
Field	Description
Phase 1 SA lifetime	Allows you to enter the number of seconds for an individual rotating key to last until a re-key negotiation between each endpoint occurs. Smaller lifetimes are generally more secure since it would give a hacker a smaller amount of time to try to crack the key. However, key negotiation does take up bandwidth, so network throughput is sacrificed with small lifetimes. The default setting is 28,800 seconds
Phase 2 encryption	Allows you to select the form of encryption to secure the VPN connection between endpoints. Select from the following five encryption types: ■ DES ■ 3DES ■ AES-128 ■ AES-192 ■ AES-256 You may select any form of encryption as long as long as the other end of the VPN tunnel uses the same method **Note:** 3DES encryption is commonly used, but AES is recommended because it is very difficult to crack.
Phase 2 authentication	Allows you to select an authentication type for another level of security. Select one of the following three authentication types: ■ MD5 ■ SHA ■ Null (none) You may choose any authentication type as long as the other end of the VPN tunnel uses the same method **Note:** SHA is recommended because it is more secure.
Phase 2 SA lifetime	Allows you to enter the number of seconds for an individual rotating key to last until a re-key negotiation between each endpoint occurs. Smaller lifetimes are generally more secure since it would give a hacker a smaller amount of time to try to crack the key. However, key negotiation does take up bandwidth, so network throughput is sacrificed with small lifetimes. The default setting for Phase 2 is 3,600 seconds.

Save Configuration to Server

Use the Setup Advanced Settings – Save Configuration to Server page to save the gateway settings to a remote server in the network. When the gateway is rebooted or reset, the gateway will automatically retrieve its configuration file and restore the saved settings.

Setup Advanced Settings - Save Configuration to Server Page Example

The following illustration is an example of the Setup Advanced Settings - Save Configuration to Server page.



Setup Advanced Settings - Save Configuration to Server Page Description

The following table describes the fields available on the Setup Advanced Settings – Save Configuration to Server page.

Field Name	Description
Configuration file name	The name of the file that is used to store the gateway's settings
Configuration file server	The IP address of a host (TFTP server) with the configuration file

Function Keys

The following table describes the function keys available on the Setup Advanced Settings – Save Configuration to Server page.

Key	Description
Get configuration file now	Downloads gateway configuration file from a host and applies the settings stored in that file
Save configuration file now	Saves and uploads gateway configuration file to a host
Apply	Saves and applies the values you enter into the fields without closing the screen

5

Security

Introduction

We use computers for everything from banking and investing to shopping and communicating with others through email or chat programs. Although you may not consider your communications "top secret," you probably do not want strangers reading your email, using your computer to attack other systems, sending forged email from your computer, or examining personal information stored on your computer (such as financial statements).

Security is the process of preventing and detecting unauthorized use of your computer. Prevention measures help you to stop unauthorized users (also known as "intruders") from accessing any part of your computer system. Detection helps you to determine whether or not someone attempted to break into your system, if they were successful, and what they may have done.

Use the WebWizard pages in this chapter to set up security on your system by configuring webpage filtering and firewall protection. These pages allow you to enable various firewall protection filters.

In This Chapter

Configure Security Settings

Configuring Firewall Protection

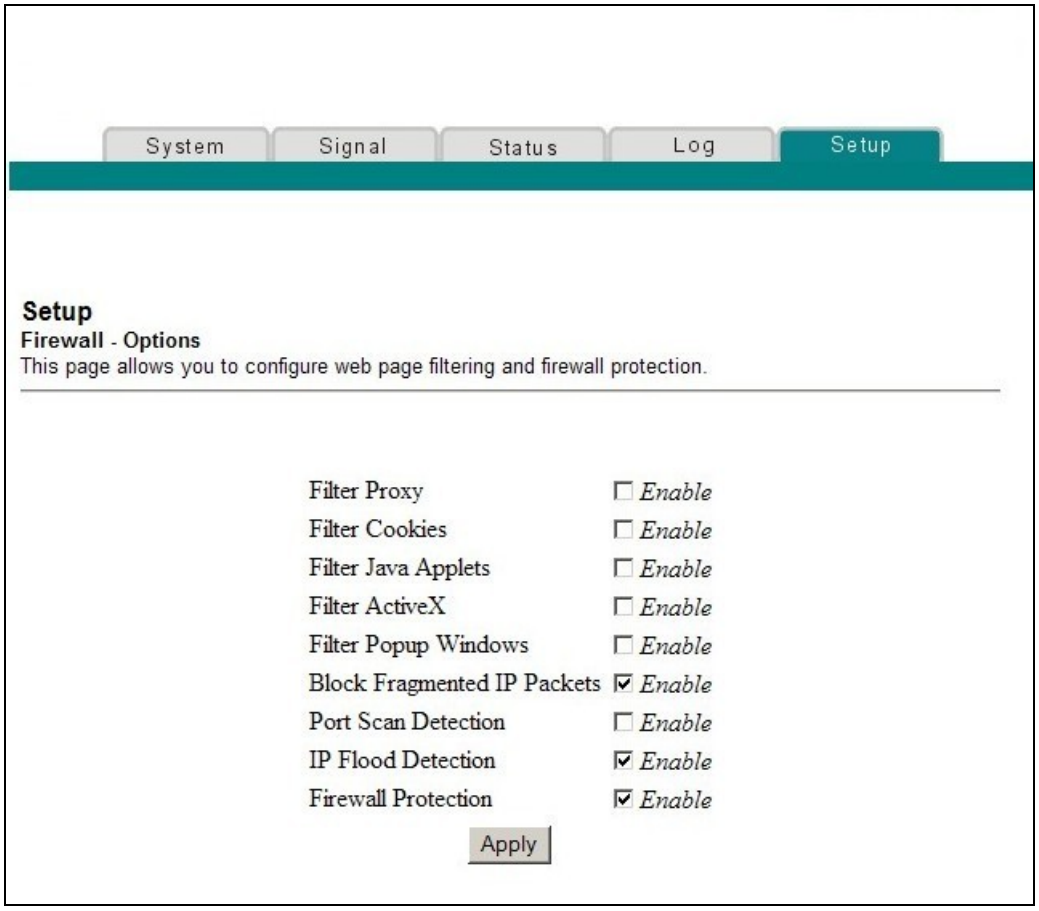
Use the Setup Firewall - Options page to configure webpage filtering and firewall protection. This page allows you to enable various firewall protection filters.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default firewall options settings.

Click **Options** in the Firewall section of the Setup page to access the Setup Firewall - Options page.

Setup Firewall - Options Page Example

The following illustration is an example of the Setup Firewall - Options page.



Setup Firewall - Options Page Description

This section describes the section headings and fields descriptions of the Setup Firewall - Options page.

Note: If you make changes in any of the fields in the Setup Firewall - Options page, click **Apply** to apply and save your Firewall settings.

The following table provides a description of each field name within the Setup Firewall - Options page.

Field Name	Description
Filter Proxy	Enables/disables proxy
Filter Cookies	Enables/disables cookie blocking. This feature filters the unsolicited delivery of cookies to devices from the Internet to devices in your private local network. Cookies are computer files that contain personal information or Web surfing behavior data
Filter Java Applets	Enables/disables java applets. This feature helps to protect the devices in your private network from irritating or malicious Java applets that are sent, unsolicited, to devices in your private network from the Internet. These applets run automatically when they are received by a PC
Filter ActiveX	Enables/disables ActiveX controls. This feature helps to protect the devices in your private network from irritating or malicious ActiveX controls that are sent, unsolicited, to devices in your private network from the Internet. These ActiveX controls run automatically when they are received by a PC
Filter Popup Windows	Enables/disables popup windows. Some commonly used applications employ popup windows as part of the application. If you disable popup windows, it may interfere with some of these applications
Block Fragmented IP Packets	Enables/disables filtering of fragmented IP packets. This feature helps protect your private local network from Internet based denial of service attacks
Port Scan Detection	Enables/disables the gateway from responding to Internet based port scans. This feature is designed to protect your private local network from Internet based hackers who attempt to gain unsolicited access your network by detecting open IP ports on your gateway
IP Flood Detection	Blocks malicious devices that are attempting to flood devices or networks with illegal broadcast packets. Also referred to as “broadcast storm”

Field Name	Description
Firewall Protection	Enables/disables the firewall. When the firewall is enabled, the firewall will allow most commonly used applications to automatically open IP ports and pass data without any special setup or manual port configuration

Configuring Firewall Event Logging and E-mail Alerts

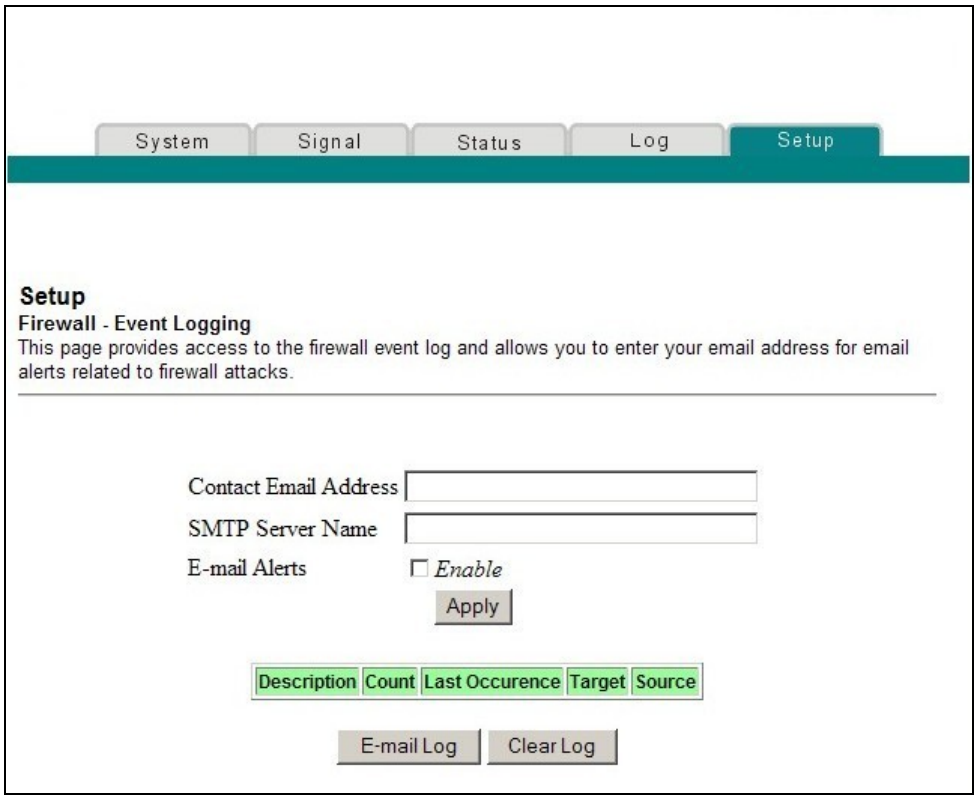
Use the Setup Firewall - Event Logging page to access the firewall event log and allows you to enter your e-mail address in order for you to receive e-mail alerts related to firewall attacks by hackers.

Note: If you are not familiar with the settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default firewall event logging settings.

Click **Event Logging** in the Firewall section of the Setup page to access the Setup Firewall - Event Logging page.

Setup Firewall - Event Logging Page Example

The following illustration is an example of the Setup Firewall - Event Logging page.



Setup Firewall - Event Logging Page Description

The Setup Firewall - Event Logging page shows events captured by the firewall. The log displays the following items:

- Description of the event
- Number of events that have occurred
- Last occurrence of an event
- Target and source addresses

You can configure the system to e-mail log events to the administrator in order for the administrator to monitor the firewall.

This section describes the section headings and fields descriptions of the Setup Firewall - Event Logging page.

Field Name	Description
Enable Email Address	Allows you to enter the e-mail address of the person who monitors the firewall. When an event occurs, it will be logged and an email will be sent to this address automatically reporting the event
SMTP Server Name	Allows you to enter the mail server name of your outgoing mail server, or the mail server of your Internet service provider (ISP)
E-mail Alerts	Allows you to enable or disable sending e-mail alerts
Description	Describes what event was detected by the gateway's firewall
Count	Displays the number of times the event has been detected
Last Occurrence	Displays the time the last occurrence of this event was detected
Target	Displays the IP address of the device in your private local network to which the event was directed along with the IP port number targeted by the event
Source	Displays the IP address of the Internet based source of the event along with the IP port number used by that device

Function Keys

The following function keys appear on the Setup Firewall - Event Logging page.

Key	**Description**
Apply	Saves the values you enter into the fields without closing the screen
E-mail Log	Allows you to force the system to send an e-mail alert even if the E-mail Alerts box is left unchecked
Clear Log	Allows you to clear all entries in the log

6

Parental Control

Introduction

The safety of our children while they are online is of paramount importance in today's open Internet environment. Help ensure your children's safety on the Internet and enjoy a worry-free online experience using the parental control features of the cable modem gateway.

These parental control features allows you to protect your children from inappropriate online content, control who can communicate with your child by IM or email, decide how long your children can be online, and monitor your children's Internet activity.

The WebWizard pages described in this chapter allow you to configure the parent control feature on the cable modem gateway.

In This Chapter

Configure Parental Control Settings

Configuring Parental Control

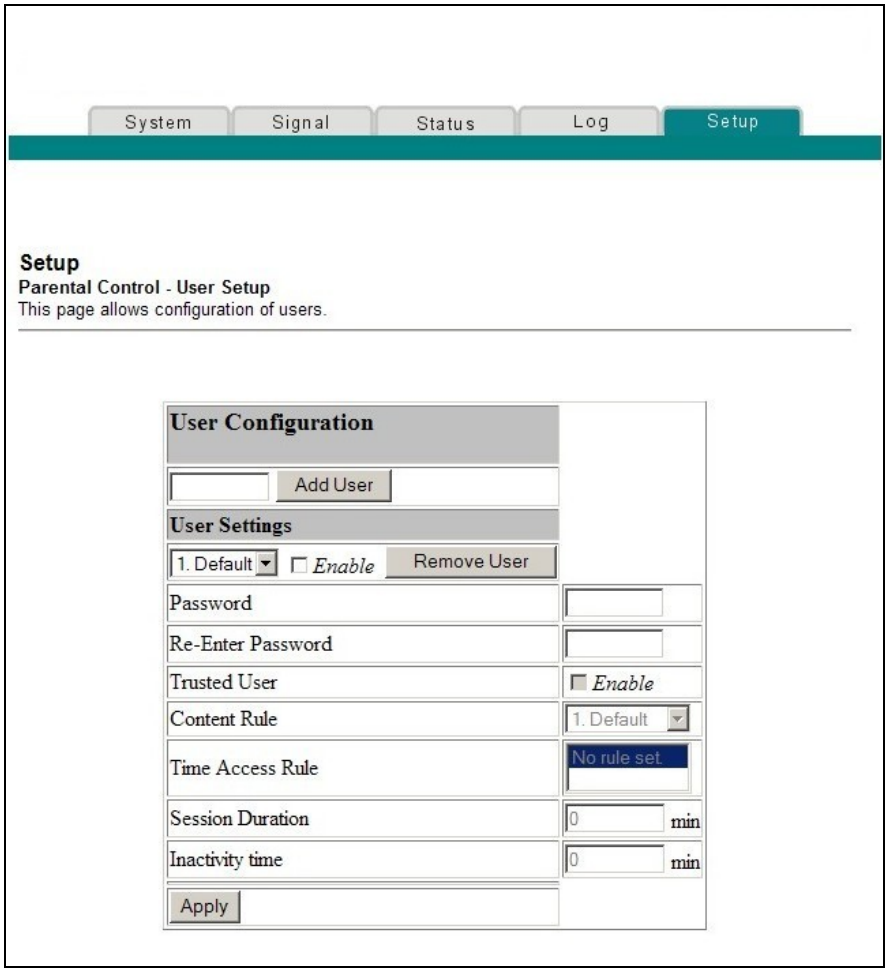
Use the Setup Parental Control - User Setup page to configure parental controls on the cable modem gateway, and to add or delete the individuals who are authorized to set parental controls.

Note: If you are not familiar with the settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default parental control settings.

Click **User Setup** in the Parental Control section of the Setup page to access the Setup Parental Control - User Setup page.

Setup Parental Control - User Setup Page Example

The following illustration is an example of the Setup Parental Control - User Setup page.



Setup Parental Control - User Setup Page Description

This section describes the section headings and fields descriptions of the Setup Parental Control - User Setup page. This page allows you to set up user profiles. Each profile can be assigned customized levels of Internet access as defined by the access rules assigned to that user's profile.

Note: Once you define and enable user profiles, each user must sign-on each time they wish to access the Internet. The user can sign-on when the pop-up sign-on screen appears in their Web browser. The user must enter their correct user name and password in order to gain Internet access.

Important:

- Make sure to disable pop-up blockers on your Web browser when using user profiles.
- User names and passwords are case-sensitive.

Field Name	Description
Add User	Allows you to add a new user profile. Enter the name of the user and click the **Add User** button to add the user to the list
User Settings	Allows you to edit a user profile by using the drop-down menu to edit a user profile. The drop-down menu allows you to recall the profile to be edited. User names and passwords are case-sensitive Make sure to check the **Enable** box to activate the user profile. If a profile is not active, that user will not have any access to the Internet To remove a user profile, use the drop-down menu to select the user to be removed and click the **Remove User** button
Password	Enter the selected user's password in this field. Each user must enter their User Name and Password each time they use the Internet. User names and passwords are case-sensitive **Note:** The Gateway will allow each user access to the Internet, subject to the rules selected on this page for that user.
Re-Enter Password	Re-enter the same password for confirmation of the password in the previous field
Trusted User	Check this box if the currently selected user is to be designated a trusted user. Trusted users are not subject to Internet access rules

Field Name	Description
Content Rule	Select the Content Rule for the current user profile. Content Rules must first be defined by going to the Rules Configuration page. You can access the Rule Configuration page by clicking on the "Basic Rules" link under the Parental Control section of the Setup page
Time Access Rule	Select the Time Access Rule for the current user profile. Time Access Rules must first be defined by going to the Time of Day Filter page. You can access the Time of Day Filter page by clicking on the "Time of Day Rules" link under the Parental Control section of the Setup page
Session Duration	1440 minutes (factory default) Enter the amount of time in minutes that the user will be granted Internet access beginning at the time they sign on using their User Name and Password **Note:** Set the Session Duration to 0 (zero) to prevent session timeout.
Inactivity time	60 minutes (factory default) Enter the amount of time during a user session where there is no Internet access activity, indicating that the user is no longer online. If the inactivity timer is triggered, the user session will be closed automatically. In order to regain Internet access, the user must log in again with their User Name and Password **Note:** Set the Inactivity time value to 0 (zero) to prevent timeout due to inactivity.
Available Rules	Lists available rules. Apply a rule by selecting it from the list and adding it to the current user profile **Note:** Create rules using the Parental Control Setup pages that follow next.
Current Used Rules	Lists rules in use for the current user profile. You can apply a maximum of four rules to each user profile

Function Keys

The following function keys appear on the Setup Parental Control - User Setup page.

Key	Description
Add User	Adds and saves a new user to the list of user profiles
Remove User	Removes the selected user from the list of user profiles
Apply	Saves all additions, edits, and changes

Configuring Parental Control Basic Rules

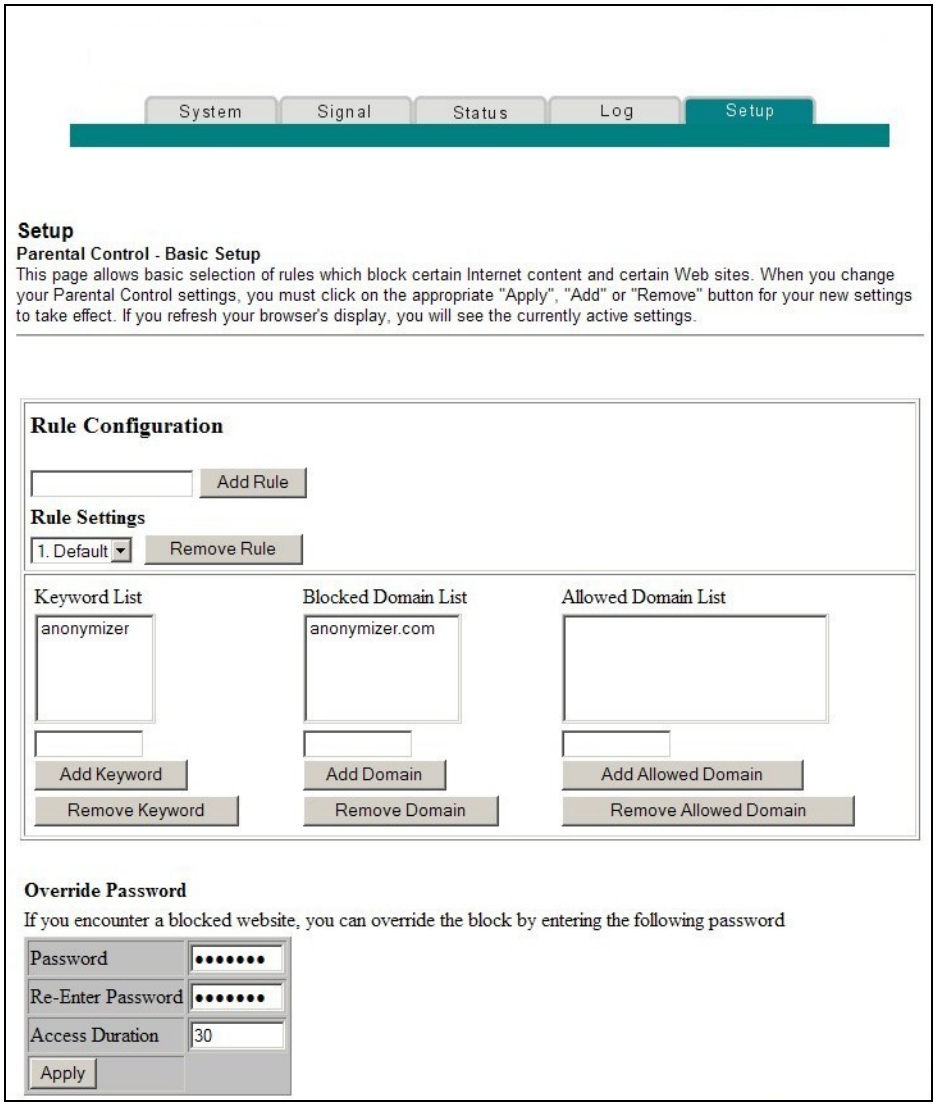
Use the Setup Parental Control - Basic Setup page to create and select the rules that block certain Internet content and certain websites.

Note: If you are not familiar with the settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default parental control settings.

Click **Basic Rules** in the Parental Control section of the Setup page to access the Setup Parental Control - Basic Setup page.

Setup Parental Control - Basic Setup Page Example

The following illustration is an example of the Setup Parental Control - Basic Setup page.



Setup Parental Control - Basic Setup Page Description

This section describes the section headings and fields descriptions of the Setup Parental Control - Basic Setup page. This page allows you to create Internet access rules based on the content found in the URLs of Internet sites.

Field Name	Description
Rule Configuration	Allows you to add a new content rule. Enter the name of the rule and click the **Add Rule** button to add the content rule to the list. Content rules are used to restrict Internet access based on IP addresses, domains, and keywords found in the URLs of Internet sites **Note:** It may be useful to set up your first rule as "No Rule," without any restrictions or settings. This setting will allow you to assign "No Rule" status to users who are not subject to "content-related" access restrictions.
Rule Settings	Allows you to edit a content rule by using the drop-down menu to recall the rule to be edited To remove a user profile, use the drop-down menu to select the rule to be removed and click on the **Remove Rule** button.
Keyword List	Allows you to create a list of keywords. Any attempt to access a URL that contains any of the keywords in this list will be blocked by the gateway
Blocked Domain List	Allows you to create a list of Domains that the gateway should block access to. Any attempt to access any of the Domains in this list will be blocked by the gateway
Allowed Domain List	Allows you to create a list of Domains to which the gateway allows access
Override Password	Allows you to create a password to temporarily override user access restrictions to a blocked Internet site
Re-enter Password	Re-enter the same password for confirmation of the override password in the previous field
Duration	Allows you to designate an amount of time in minutes that the Override password will allow temporary access to a restricted Internet site

Function Keys

The following function keys appear on the Setup Parental Control - Basic Setup page.

Key	Description
Add Rule	Adds and saves a new Rule to the list of content Rules
Remove Rule	Removes the selected rule from the content rule list
Add/Remove Keyword	Allows you to add new keywords to the list or to delete selected keywords from the list
Add/Remove Domain	Allows you to add new domains to the list or to delete selected domains from the list
Add/Remove Allowed Domain	Allows you to add new domains to the list or to delete selected domains from the list
Apply	Saves all additions, edits, and changes

To use keyword and domain blocking

Keyword and Domain blocking allows you to restrict access to Internet sites by blocking access to those sites based on a word or a text string contained in the URLs used to access those Internet sites.

Domain blocking allows you to restrict access to websites based on the site's Domain Name. The Domain Name is the portion of the URL that precedes the familiar .COM, .ORG, or .GOV extension.

Keyword blocking allows you to block access to Internet sites based on a Keyword or text string being present anywhere in the URL, not just in the Domain Name.

Note: The Domain blocking feature blocks access to any Domain in the Domain List. It will also block Domains, any portion of which contains an exact match to entries in the list.

For example, if you enter **example.com** as a Domain, any site that contains "example.com" will be blocked. Generally, you do not want to include "www." in a Domain Name since doing so limits the blocking to only the site that matches that Domain Name exactly. For instance, if you enter www.example.com into the list, only the one site that matches that name exactly will be blocked. Consequently, if you do not include the "www.," then all sites within and associated with "example.com" will be blocked.

Configuring Parental Control Time of Day Access Filters

Use the Setup Parental Control - Time of Day Access Filter page to configure Web access filters to block all Internet traffic to and from specific network devices based on day of week and time of day settings that you select on this page.

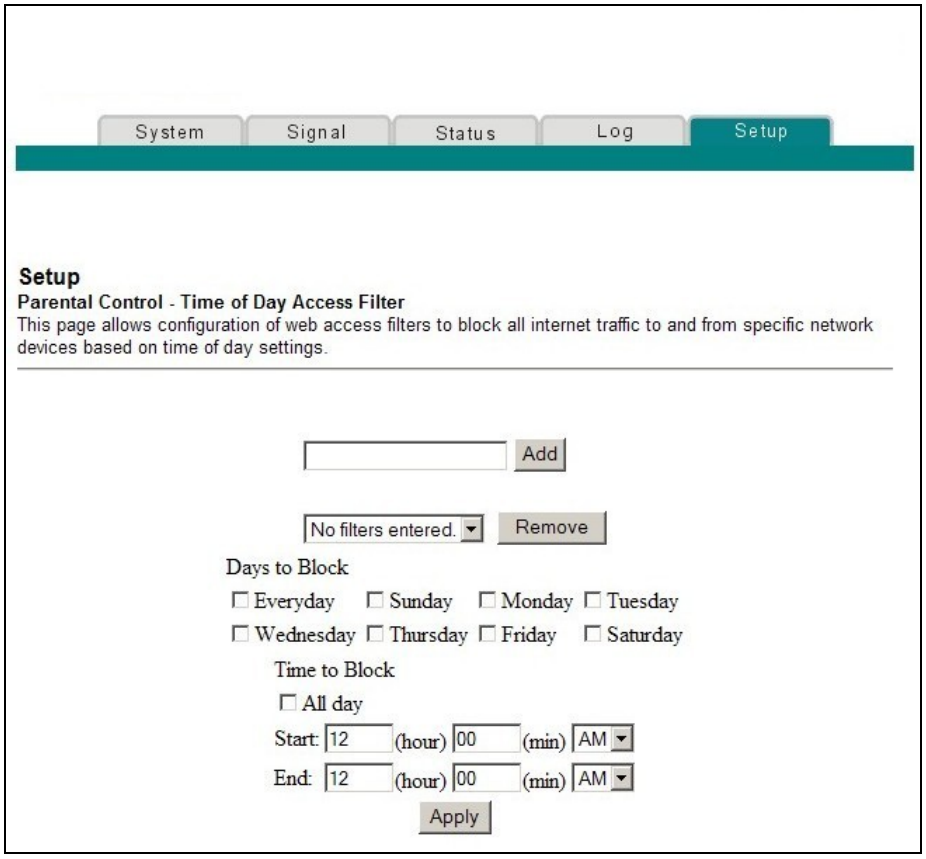
Note: If you are not familiar with the settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default parental control settings.

Click **Time of Day Rules** in the Parental Control section of the Setup page to access the Parental Control - Time of Day Access Filter page.

Setup Parental Control - Time of Day Access Filter Page Example

The following illustration is an example of the Setup Parental Control - Time of Day Access Filter page.

Note: The cable modem gateway uses the network time of day clock that is managed by your data service provider. The time of day clock must be accurate and represent the time of day in your time zone for this feature to operate properly. Verify that the Status and Set Time pages reflect the correct time of day. If they do not reflect the correct time of day, contact your service provider. You can also adjust your settings to account for the difference.



Function Keys

The following function keys appear on the Setup Parental Control - Time of Day Access Filter page.

Key	Description
Add	Allows you to add a new Time of Day access filter or rule. Enter the name of the filter and click the Add key to add the filter to the list. Time of Day rules are used to restrict Internet access based on the day and time
Remove	Removes the selected filter from the Time of Day filter list
Apply	Saves all additions, edits, and changes with closing the screen

Configure Parental Control Event Reporting

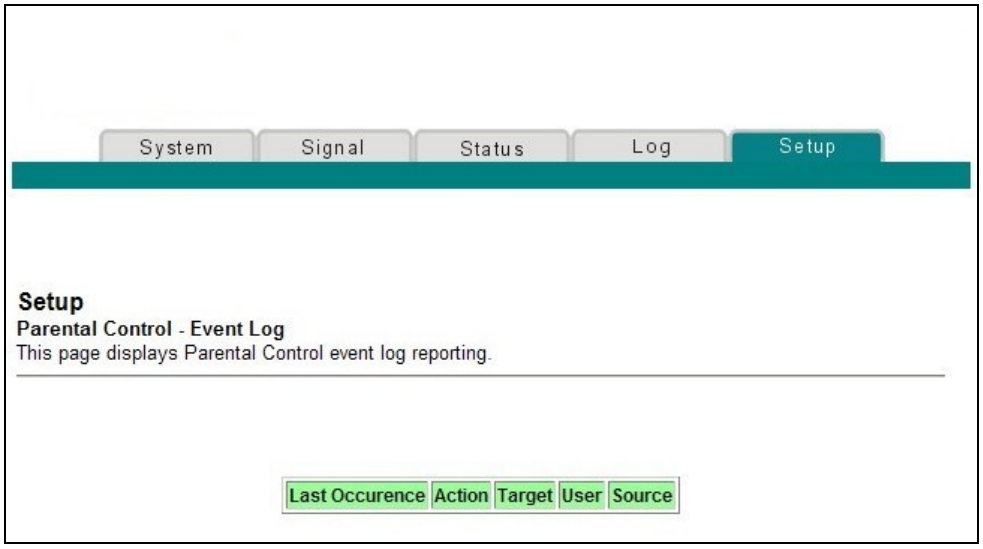
Use the Setup Parental Control - Event Log page to view events captured by the parental control event-reporting feature.

Note: If you are not familiar with the settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default parental control settings.

Click **Local Log** in the Parental Control section of the Setup page to access the Setup Parental Control - Event Log page.

Setup Parental Control - Event Log Page Example

The following illustration is an example of the Setup Parental Control - Event Log page.



Setup Parental Control - Event Log Page Description

This section describes the section headings and fields descriptions of the Setup Parental Control - Event Log page. This page allows you to track, by user, any attempts made by that user to access Internet sites that are restricted.

Field Name	Description
Last Occurrence	Displays the time of the most recent attempt to access a restricted Internet site
Action	Displays the action the user attempted
Target	Displays the URL of the restricted site
User	Displays the user who attempted a restricted site
Source	Displays the IP address of the PC which was used when attempting to access a restricted website

7

Wireless

Introduction

The ease of use and the convenience of wireless technology is of supreme importance in today's high-speed home and business networking environment. The cable modem gateway contains an 802.11g WAP. This WAP enables you to connect seamlessly and without wires to other devices in your home network to allow for high-speed sharing of files and data.

Use the WebWizard pages described in this chapter to configure the WAP to meet your specific requirements and needs.

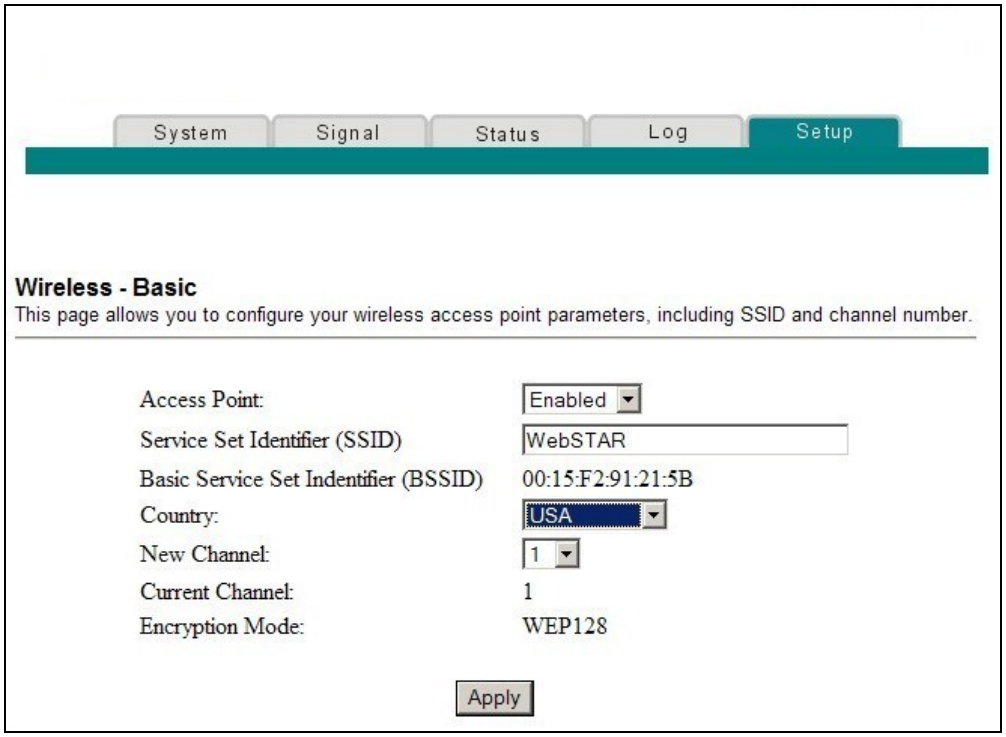
In This Chapter

Configure the Wireless Access Point

Configuring Wireless Access Point Basic Parameters

Setup Wireless - Basic Page Example

The following illustration is an example of the Setup Wireless - Basic page showing the factory default settings.



Setup Wireless - Basic Page Description

This section describes the section headings and fields descriptions of the Setup Wireless - Basic page.

Note: If you make changes in the Setup Wireless - Basic page, click **Apply** to apply and save your wireless basic settings.

Field Name	Description
Access Point	Allows you to turn the access point on the gateway on or off
Service Set Identifier (SSID)	The name assigned to this access point **Note:** The factory default for the SSID field should contain the product name **WebSTAR**.

Field Name	Description
Basic Service Set Identifier (BSSID)	The MAC address of the access point
Country	Allows you to select the country in which you are using your access point
New Channel (1-11)	Allows setting a communications channel for your access point **Note:** Wireless networking channels overlap. Channels 1, 6, and 11 do not overlap with each other. For best performance, select one of these channels. If there are other access points in use in the area, select one of these channels that is farthest away from the other access points. **Example:** If channel 8 is in use by another access point, use channel 1 for your wireless network. **Note:** If your wireless network is not operating correctly, or if external devices are interfering with your signal, select a different channel. Use your PC wireless utility software to scan for other access points in your area.
Current Channel	Present channel the WAP is using
Encryption Mode	Shows current encryption mode

Configuring Your Wireless Network Security and Encryption Parameters

Use the Setup Wireless - Security page to configure your WAP wireless equivalent privacy (WEP) and Wi-Fi Protected Access (WPA) encryption keys and authentication.

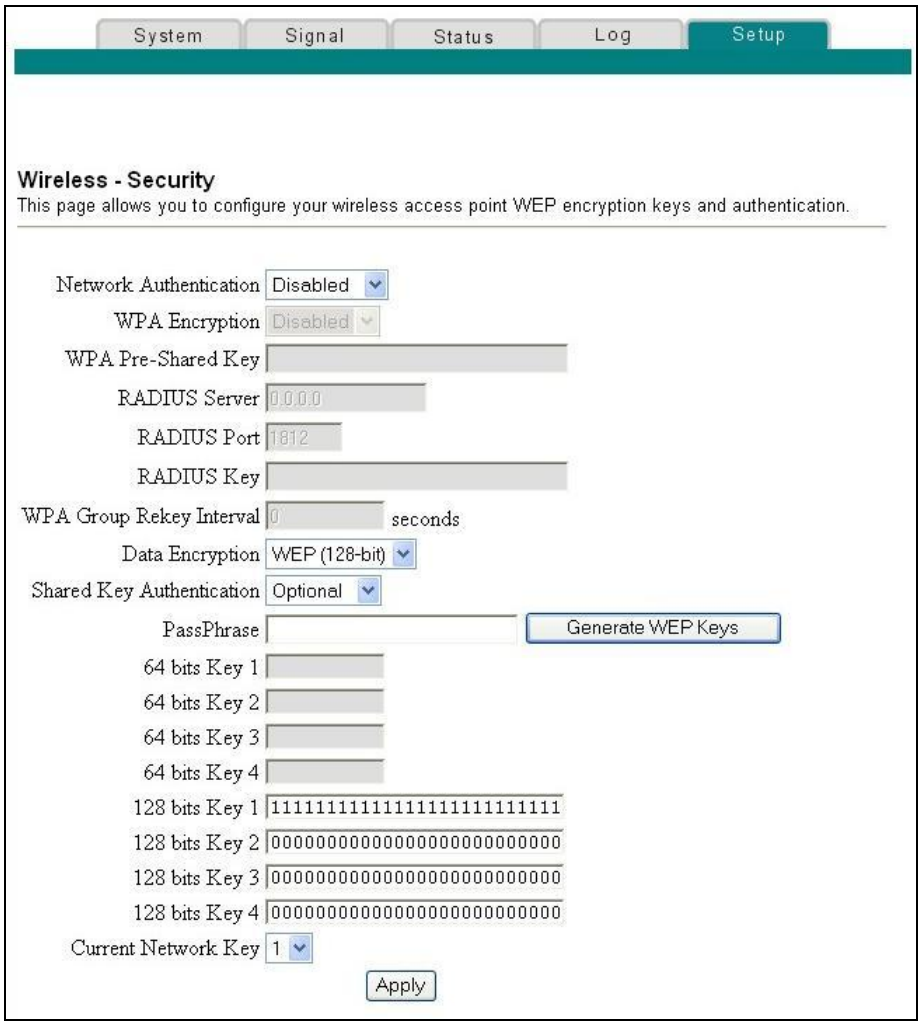
Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default wireless privacy settings.

Click **Security** in the Wireless section of the Setup page to access the Setup Wireless - Security page.

Important: Your cable modem gateway ships from the factory with 128-bit WEP encryption enabled to provide you with a *basic* level of wireless network security. To gain initial access to your wireless network, select 128-bit WEP encryption on your computer's wireless adapter and enter the 128-bit encryption key to match the key setup in your gateway. The factory default 128-bit key in the gateway is 26 ones (see the following example). You can continue to use this factory default key. However, to maximize your wireless security, it is highly recommended that you use something other than the factory default key.

Setup Wireless - Security Page Example

The following illustration is an example of the Setup Wireless - Security page.



Setup Wireless - Security Page Description

This section describes the section headings and fields descriptions of the Setup Wireless - Security page.

Note: If you make changes in the Setup Wireless - Security page, click Apply to apply and save your wireless security settings.

Field Name	Description
Network Authentication	Network Authentication allows only authorized users to gain access to your wireless network. Only users with an authorized user name, password, or pre-shared key (PSK) are allowed access to the wireless network Select from the following Network Authentication protocols: ■ Disabled (factory default) ■ 802.1x ■ WPA ■ WPA-PSK **Note:** Network Authentication restricts access to your wireless network to only authorized computers or users. Authentication does not protect the data you send over the wireless network connection. You must enable encryption to protect data that is transmitted over your wireless network.
WPA Encryption	■ Disabled when Network Authentication is disabled or when 802.1x Network Authentication is selected ■ Enables TKIP (Temporal Key Integrity Protocol) WPA encryption when WPA or WPA-PSK Network Authentication is selected
WPA Pre-Shared Key	Allows you to set a WPA Pre-Shared encryption key. Enter a text string in this field. The text string or phrase is used to generate a unique set of encryption keys for your network. Use this string to set up wireless devices in your network ■ The PSK can be either a text string or a 64 character hexadecimal number. ■ The text string must be an ASCII character string with a minimum of 8 characters but no more than 63. **Note:** Not all wireless adapter devices support PSK. For these devices, you must enter the encryption keys exactly as they appear in the in wireless gateway fields in the preceding illustration of the Setup Wireless Security page.

Field Name	Description
RADIUS Server	Allows you to enter the IP address of the RADIUS server used for authentication and encryption key derivation ■ This field is used with 802.1x and WPA Network Authentication ■ The factory default for this field is 0.0.0.0
RADIUS Port	Determines the port number of the RADIUS server. The port number is usually 1812 (factory default) or 1645, depending on the server used This field is used with 802.1x and WPA Network Authentication
RADIUS Key	Allows you to set the Shared Secret key for your RADIUS connection ■ The factory default for this field is empty ■ This field is used with 802.1x and WPA Network Authentication
WPA Group Rekey Interval	Allows you to set the WPA Group Rekey Interval in seconds. This only applies when WPA and WPA-PSK Network Authentication is enabled Set this value to 0 (factory default) to disable periodic rekeying. The valid range is 1 to 4,294,967,295 seconds

Field Name	Description
Data Encryption	Allows you to enable data encryption to help secure the data that is sent over your wireless network ■ WEP 128-bit (factory default) – 128-bit or-64 bit static key data encryption can be selected when the network is configured to have no authentication – 128-bit static key data encryption is automatically selected when 802.1x network authentication is enabled **Note:** Static key authentication uses one of the four encryption keys, as define below, to encrypt your data. You must manually change keys. The keys do not change or rotate automatically as they do with TKIP. ■ TKIP data encryption is automatically enabled when WPA and WPA-PSK network authentication is enabled **Notes:** ■ 64-bit and 40-bit encryption are two different names for the same encryption ■ 128-bit and 104-bit encryption are two different names for the same encryption
Shared Key Authentication	Allows you to determine is Shared Key Authentication is used in the network. Shared Key Authentication can be used when there is no other network authentication in the network ■ Optional - (factory default) Wireless clients can associate with the wireless access point without authentication ■ Required - Only wireless clients with a valid network key are allowed to associate with the access point
PassPhrase	Automatically generates WEP encryption keys required to communicate with the network Although not required for WEP operation, use of a PassPhrase can simplify the configuration and setup of each of your client wireless adapters Using a PassPhrase eliminates the need to manual enter lengthy encryption keys and reduces the chance of error associated with entering entry of large numbers

Field Name	Description
64 Bit Keys 1 through 4	Select these keys for use with Encryption Mode set to 64-bit encryption. Enter 5-byte values for a Key. You do not have to set all four Keys. Only one Key is used for a home network. Each value is represented in hexadecimal. Use only these numbers or letters: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, and f to set up your encryption keys **Note:** It is generally a good practice to use only lowercase letters when entering WEP encryption keys. Uppercase letters can sometimes be confused with numbers. For example, the uppercase letter "B" is often mistaken for the number "8." Using lowercase characters minimizes the risk of confusing characters when copying keys from one device to another. Uppercase characters will automatically be converted to lowercase when the key or keys are applied and saved to memory. Use two numbers or letters in each box. Record your Key values. You will need these Key values when you set up your client wireless adapter. The Key values in each wireless network device must match
128 Bit Keys 1 through 4	Select these keys for use with Encryption Mode set to 128-bit encryption. Enter 13-byte values for a Key. You do not have to set all four Keys. Usually only one is needed for a home network. Each value is represented in hexadecimal. Use only these numbers or letters: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, and f to set up your encryption keys **Note:** The Factory Default setting is 26 ones: 11111111111111111111111111 It is generally a good practice to use only lowercase letters when entering WEP encryption keys. Uppercase letters can sometimes be confused with numbers. For example, the uppercase letter "B" is often mistaken for the number "8." Using lowercase characters minimizes the risk of confusing characters when copying keys from one device to another. Uppercase characters will automatically be converted to lowercase when the key or keys are applied and saved to memory Use two numbers or letters in each box. Record your Key values. You will need these Key values when you set up your client wireless adapter. The Key values in each wireless network device *must* match

Field Name	Description
Current Network Key	Allows you to select which of the four 64-bit or 128-bit keys to use to encrypt your data when you are using encryption that requires the manual entry of an encryption key. Only one WEP key is in use at a time. You must manually change keys. They do not change automatically **Notes:** ■ 64-bit and 40-bit encryption are two different names for the same encryption ■ 128-bit and 104-bit encryption are two different names for the same encryption

Function Keys

Keys	Description
Generate WEP Keys	Automatically generates four WEP keys based on the PassPhrase entry **Notes:** ■ For 64-bit WEP, four unique 64-bit WEP keys will be generated ■ For 128-bit WEP, only one 128-bit WEP key will be generated. The same key will be entered into all four key locations.
Apply	Saves all additions, edits, and changes without closing the screen

Configuring Wireless Data Rates and WiFi Thresholds

Use the Setup Wireless - Advanced page to configure your WAP data rates and wireless fidelity (WiFi) thresholds.

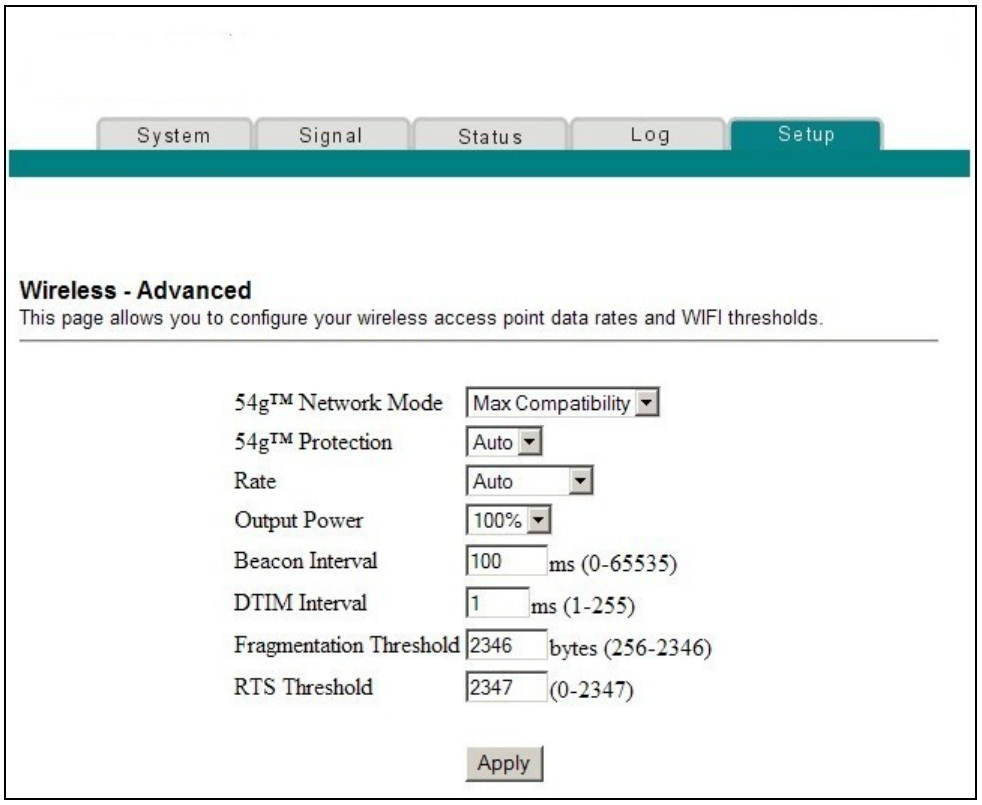
Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default wireless advanced settings.

Click **Advanced** in the Wireless section of the Setup page to access the Setup Wireless - Advanced page.

Setup Wireless - Advanced Page Example

The following illustration is an example of the Setup Wireless - Advanced page.

Note: We recommend that you do not change the default wireless settings that are shown in the preceding illustration unless you are instructed to do so by your service provider.



Setup Wireless - Advanced Page Description

This section describes the section headings and fields descriptions of the Setup Wireless - Advanced page.

Note: If you make changes in the Setup Wireless - Advanced page, click Apply to apply and save your wireless advanced settings.

Field Name	Description
54g Network Mode	Allows you to optimize the performance of your wireless network using one of the following options: ■ Max compatibility (factory default) Allows the access point to interoperate with both 802.11b and 802.11g wireless client devices and minimizes interference with nearby 802.11b wireless networks ■ 54g Only The wireless access point will only accept 802.11g wireless clients ■ Max Performance Maximum throughput. In this mode, the wireless access point accepts only 802.11g wireless clients. Setting the device in this mode may degrade the operation of near by 802.11b wireless networks
54g Protection	Allows you to prioritize 802.11g communication when there is a mix of 802.11b and 802.11g devices in the wireless network using one of the following options: ■ Auto (factory default) Maximize 802.11g performance in networks with a mix of 802.11b and 802.11g wireless client devices ■ Off Maximum performance. Networks with 802.11g-only wireless client devices
Rate	Allows you to fix the data rate for wireless connections. The following data rates are available: Auto (factory default), 1 Mbps, 2 Mbps, 5.5 Mbps, 6 Mbps, 9 Mbps, 11 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps **Note:** In the automatic mode, data rate is a function of signal strength and signal quality.
Output Power	Allows you to adjust the relative output power of your gateway wireless transmitter. The following settings are available: 100% (factory default), 75%, 50%, and 25%
Beacon Interval	Displays the time interval that the WAP uses to announce itself to remote devices. The Beacon Interval should be left at 100ms for compliance with most client cards. The Beacon Interval specifies how often packets are sent by the Access Point (AP) to synchronize a wireless network and its clients

Field Name	Description
DTIM Interval	Displays the time interval between Broadcasts/Multicast transmissions. The DTIM (Delivery Traffic Indication Message) Interval is a countdown informing the wireless clients of the next window for listening to broadcast and multicast messages. When the AP has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. AP clients hear the beacons and awaken to receive the broadcast and multicast messages. The DTIM Interval should be left at 3 ms for compliance with most client cards
Fragmentation Threshold	Allows you to set the fragmentation threshold. This threshold should be set equivalent to the maximum Ethernet frame size allowable on the link including overhead (1536 bytes). Lesser settings can damage data throughput as large frames could be fragmented or collisions could occur. The factory default is 2346
RTS Threshold	Determines at what packet size beyond which the ready to send/clear to send (RTS/CTS) mechanism is invoked. The factory default is 2347

Configuring Wireless Access Point Access Control

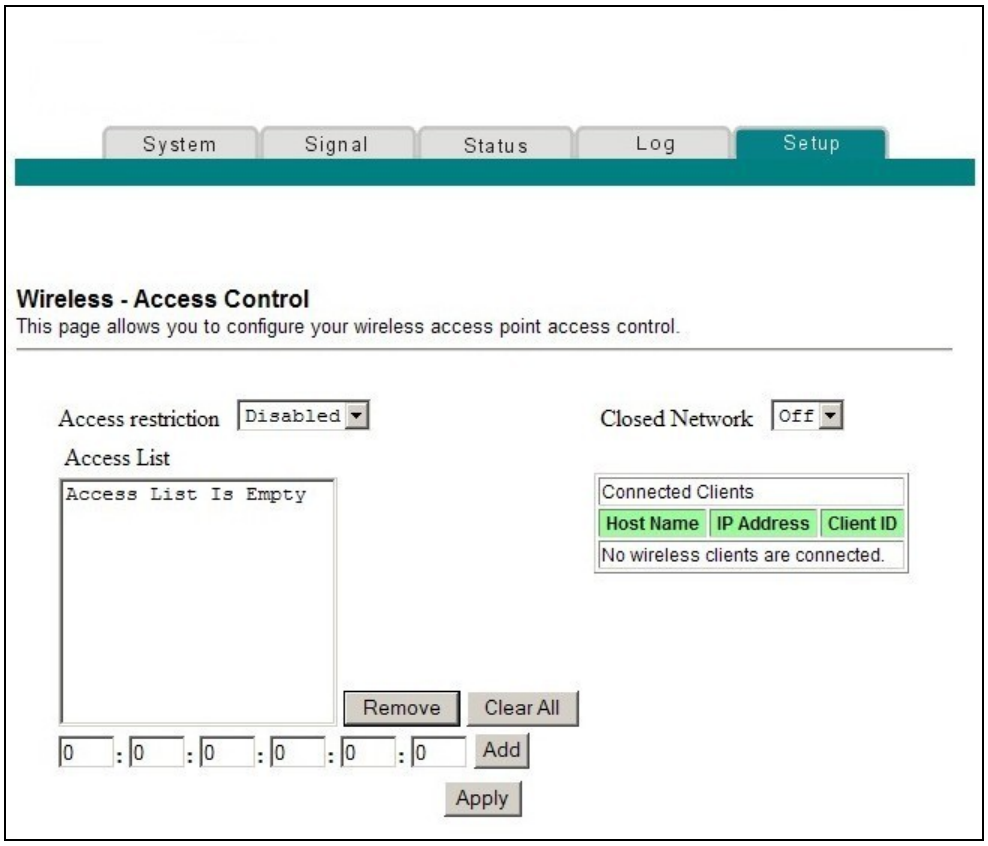
Use the Setup Wireless - Access Control page to configure your configure your wireless access point access control.

Note: If you are not familiar with the advanced settings detailed in this section, contact your service provider before you attempt to change any of the cable modem gateway default wireless advanced settings.

Click **Access Control** in the Wireless section of the Setup page to access the Setup Wireless - Access Control page.

Setup Wireless Access Control Page Example

The following illustration is an example of the Setup Wireless - Access Control page.



Setup Wireless - Access Control Page Description

This section describes the section headings and field descriptions of the Setup Wireless - Access Control page.

Field Name	Description
Access restriction	When encryption is enabled, this selection allows you to choose one of the following options from the drop-down list: ■ Disable (factory default)–No access restrictions based on MAC address of wireless access devices ■ Allow–Allows wireless access to only the MAC addresses listed in the Access List ■ Deny–Denies wireless access to only the MAC address listed in the Access List

Field Name	Description
Closed Network	Allows you to disable or enable the network to access by wireless clients. When ON is selected, the access point does not broadcast the SSID. The client device must be configured manually with the SSID and the MAC address of the access point in order to access with wireless network
Access List	Displays the MAC address of the clients that are subject to wireless access control
Connected Clients	Displays the Host Name, IP Address, and Client ID of wireless clients that are connected to (associated with) the gateway modem

Function Keys

The following function keys appear on the Setup Firewall - Event Logging page.

Key	Description
Apply	Applies and saves the values you enter into the fields without closing the screen
Clear All	Clears the Access List
Remove	Removes entries from the Access List
Add	Adds a client to the Access List using the MAC address of the client

8

Operating the Cable Modem Gateways

Introduction

This chapter discusses the operational features related to the cable modem gateways, the WebWizard, and Cable Modem Access Protection. This chapter also provides a description of WebWizard features along with sample WebWizard HTML pages.

Access to these HTML pages is defined and configured by the system operator; therefore, you may or may not have access to the WebWizard. The system operator can enable other pages after registration by using a configuration variable.

In This Chapter

WebWizard

The WebWizard is a multi-level access Web browser interface that provides a method for network operators and subscribers (when requested and authorized by the network administrator) to access key information about the configuration and operational status of the cable modem. This multi-level access facilitates setup and troubleshooting on the cable modem gateways.

The WebWizard eliminates the need to load additional setup software on the CPE because the WebWizard software is embedded in the cable modem. In addition to the WebWizard, the lights on the front panel of the cable modem gateway provide visual feedback of real-time data transmission and operating status.

WebWizard Features

The WebWizard includes the following outstanding features:

- Web browser-based interface
- Industry standard IP addressing scheme
- Multiple levels of access
- Integrated DHCP and HTML server
- Hyperlinks to facilitate access to our website

WebWizard Operation

After you power on, the cable modem gateway provides each connected CPE with a temporary IP address that allows the CPE to access the WebWizard prior to registering on the network. The following guidelines apply:

- The cable modem gateway uses the industry default IP address of 192.168.100.1 for the WebWizard.
- Prior to registering on the network, the CPE has access to the WebWizard HTML pages.
- If enabled, the System, Signal, Status, Log, and HTML pages are embedded links and are available to the user.

  Note: Access to these HTML pages is defined and configured by the system operator. By default, only the System page is available after registration. The system operator can enable other pages after registration by using a configuration variable.
- The Scan or any other Hidden or Expert User HTML pages are accessible to the CPE prior to registering on the network and each time the modem CPE is granted Level 2 access.

Important: In addition, users must know and be able to type in the complete URL in order to access the Hidden or Expert User pages from the CPE.

Note: All of these HTML pages are presented and described later in this chapter.

Access Levels

While registering on the network, the cable modem gateway must receive a manufacturer's specific configuration parameter that corresponds to the access level the CPE has to the WebWizard.

The setting of the MIB parameter supports a common (global) setting for all cable modem gateways or a unique (addressable) setting where each cable modem gateway in the system is assigned its own level of access to the WebWizard using an SNMP transaction.

There are three access levels available: Level 0, Level 1, and Level 2.

Level 0 (zero) – No Access After Registration

Level 0 (zero) does not provide any CPE access to the WebWizard after registration on the network is complete and the cable modem gateway is assigned a network IP address. Only the network administrator or other devices with the appropriate IP address and subnet configuration are allowed to access the cable modem gateway's WebWizard.

Level 1 – Restricted Access After Registration (Default or Factory Setting)

The intent of restricting access after registration is to enhance network security. If the cable modem gateway receives Level 1 access to the WebWizard from the configuration file, the cable modem gateway provides CPE access only to the WebWizard System page using the original default IP address of 192.168.100.1. No other pages are accessible at this level of access even if the user has knowledge of the URLs associated with hidden or expert user pages.

Level 1 access is intended to provide basic information about the cable modem gateway itself, but the access does not provide information about the network. The access includes the following basic information:

- Model number
- Serial number
- MAC address
- Hardware revision
- Software revision
- Operational status

Important: The remaining WebWizard pages contain detailed information about your DOCSIS network (for example, configuration file name, downstream frequency, upstream frequency, public and private IP address scheme). Limiting access to this data makes it more difficult for a potential hacker to launch an attack and bring down your network. If the cable modem gateway is registered and operational, there is no need for the CPE to have access to this information.

Level 2 – Full Access After Registration

If the cable modem gateway receives Level 2 access to the WebWizard, as determined from the configuration file, the cable modem gateway provides the CPE the same level of access to the WebWizard *after* registration as it did *before* registration using the original default IP address of 192.168.100.1.

Power Cycling and Reboots

When power is restored after a power outage, the cable modem gateway reboots normally.

Reset

The cable modem gateway returns to the factory default level of access when you activate the factory reset switch. Press and hold the factory reset switch for 10 seconds to return the cable modem gateway to its factory default settings.

Display Basic Cable Modem Gateway Information

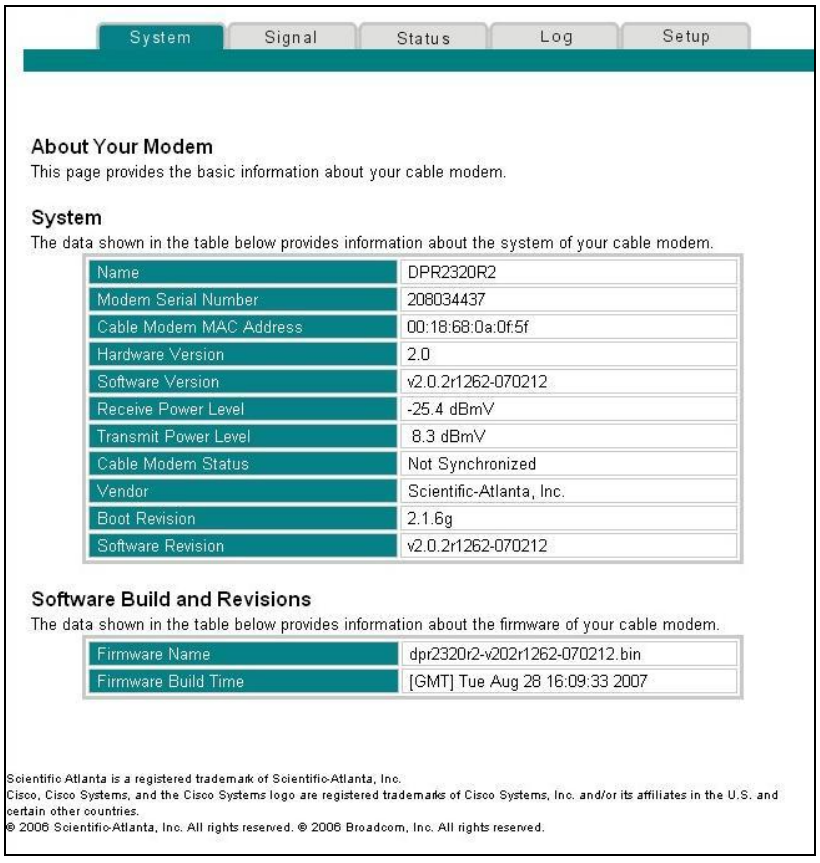
This section provides a sample System page used by the WebWizard feature, as well as detailed information about Cable Modem Access Protection. The System page (About Your Modem) displays basic information about the cable modem gateway.

System Page Example (Cable Modem Access Protection Set to INACTIVE)

The following illustration is an example of the System page.

Notes:

- The CPE can access this page prior to registration and at Access Levels 1 and 2.
- When the network administrator sets the cable modem gateway access protection right to **Inactive** (the factory default setting), the control panel and all references to the Cable Modem Access Protection right are removed from the Web browser to eliminate confusion about the availability of the feature.



Cable Modem Access Protection

Cable Modem Access Protection is a security right for cable modem gateway users that prevents access to their PCs by hackers, other users, or devices from the network side of the cable modem gateway network. This right provides CPE access protection as if the unit was physically disconnected from the cable modem gateway network.

Cable Modem Access Protection provides the following features:

- Prevents network side access, when enabled by the user, to a CPE device
- Provides a convenient Web browser-based interface
- Allows local area network operation when access protection mode is enabled
- Disables automatically using the Reset switch on the cable modem gateway back panel

Network Control of the Cable Modem Access Protection Feature (Active or Inactive)

To support the ability for the cable modem gateway network operator to offer this feature as a premium or "for fee" service, the network administrator has the ability to activate (set to Active) or deactivate (set to Inactive) the Cable Modem Access Protection right in any (or all) cable modems. The network administrator uses a custom MIB setting in the cable modem configuration file or an SNMP transaction to perform this task.

Note: The factory or default setting for this feature is Inactive (deactivated).

Basic Functionality

When the Network Administrator sets the cable modem gateway access protection to Active, the end user has complete control over the settings of the feature. These user-controlled settings are as follows:

- **Enable** (access protection enabled manually)
- **Disable** (access protection disabled manually)
- **Automatic** (access protection controlled automatically)

Important: Do not confuse the capability of the CPE to control the setting (Enable / Disable / Automatic) and the Cable Modem Access Protection right. The right is the Network Administrator's ability to activate or deactivate the availability of the feature on the cable modem gateway.

Manual Operation

When Access Protection is set to *Enable* by the end user of the WebWizard, inbound data destined for the CPE is blocked at the cable modem gateway. This data is not allowed to pass through to the CPE, but the local network on the CPE side of the cable modem gateway remains fully operational. This fully operational state includes maintaining an "up" status for the link between the cable modem gateway and the CPE.

Important: When cable modem gateway access protection is set to *Enable*, the Network Administrator has the ability to operate, maintain, and provision the cable modem gateway at all times just as though there were no access protection in place. The exception to this is that the network operator will not be able to communicate directly with any CPE while the cable modem gateway is in the access protection enabled mode, even though the link status to the CPE may read "Operational."

Notes:

- CPE devices bridged together between the USB and Ethernet ports are still able to communicate with each other, and the Ethernet link status responds as "Operational" should the Network Administrator ping the cable modem gateway to determine the status of the CPE links.
- After Cable Modem Access Protection is enabled by the CPE through the WebWizard, the cable modem gateway remains in the Access Protection mode until the mode is manually set to *Disable* by the CPE through the WebWizard interface, or, if necessary, by pressing the cable modem gateway **Reset** button.

Automatic Mode

Cable Modem Access Protection also supports an *Automatic* mode of CPE access protection. In this mode, the cable modem gateway monitors outbound data from the CPE to the network, and, based on that traffic, makes a decision as to when to activate the access protection mode.

If no user outbound activity occurs (no user-generated upstream transactions) for a user-defined period of time, the cable modem gateway activates the protection mode automatically and remains in that mode until it detects outbound data activity. When outbound data activity resumes, the cable modem gateway automatically disables the access protection mode and resumes normal operation.

Important: The user defines the time setting for the duration of inactivity that must occur before the system automatically enables the access protection mode.

Note: Some background programs running on the CPE may prevent the cable modem gateway from going into Access Protection. These programs generate Internet traffic on a regular basis that can reset the automatic timer.

Activating Cable Modem Access Protection

Cable Modem Access Protection can only be activated in a cable modem gateway that is configured with Level 1 or Level 2 access to the WebWizard browser interface.

Note: If the cable modem gateway is configured at Level 0 (No Access to the WebWizard after registration), the CPE will not have an interface mechanism to control the access protection feature.

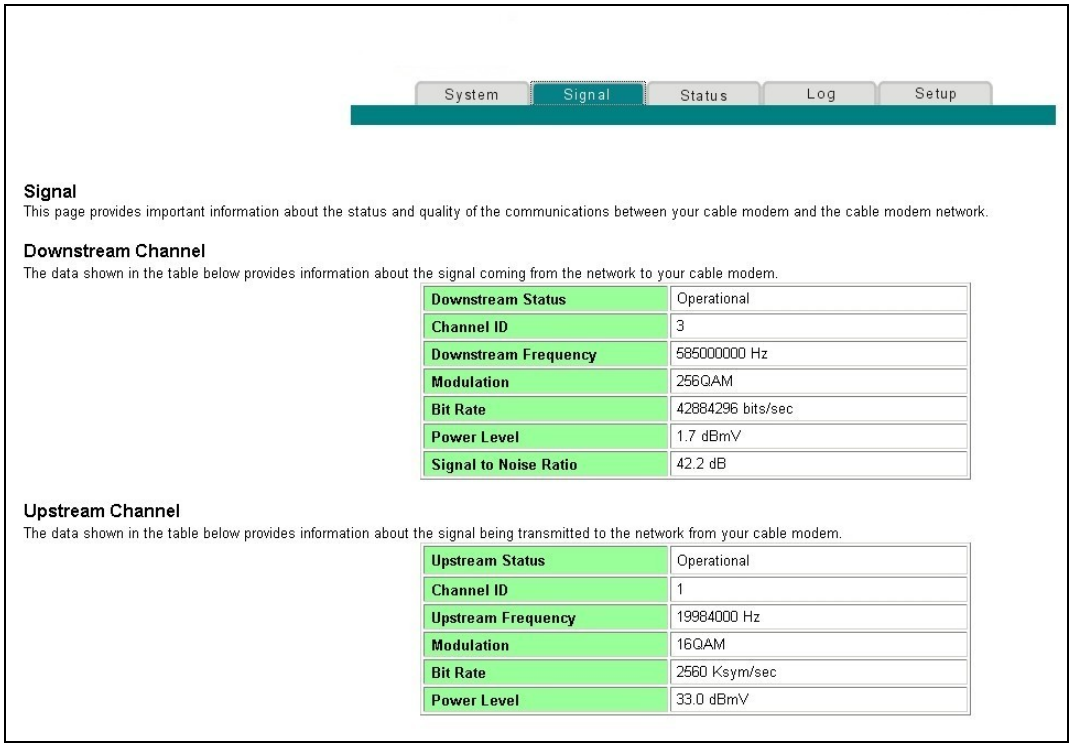
Display Network Communication Status

This section provides an example of the Signal page. The Signal page displays information about the status and quality of the communications between the cable modem gateway and the cable modem gateway network. This example also shows the status options that display on each page.

Note: The CPE can access this page prior to registration and at Access Level 2.

Signal Page Example

The following illustration is an example of the Signal page.



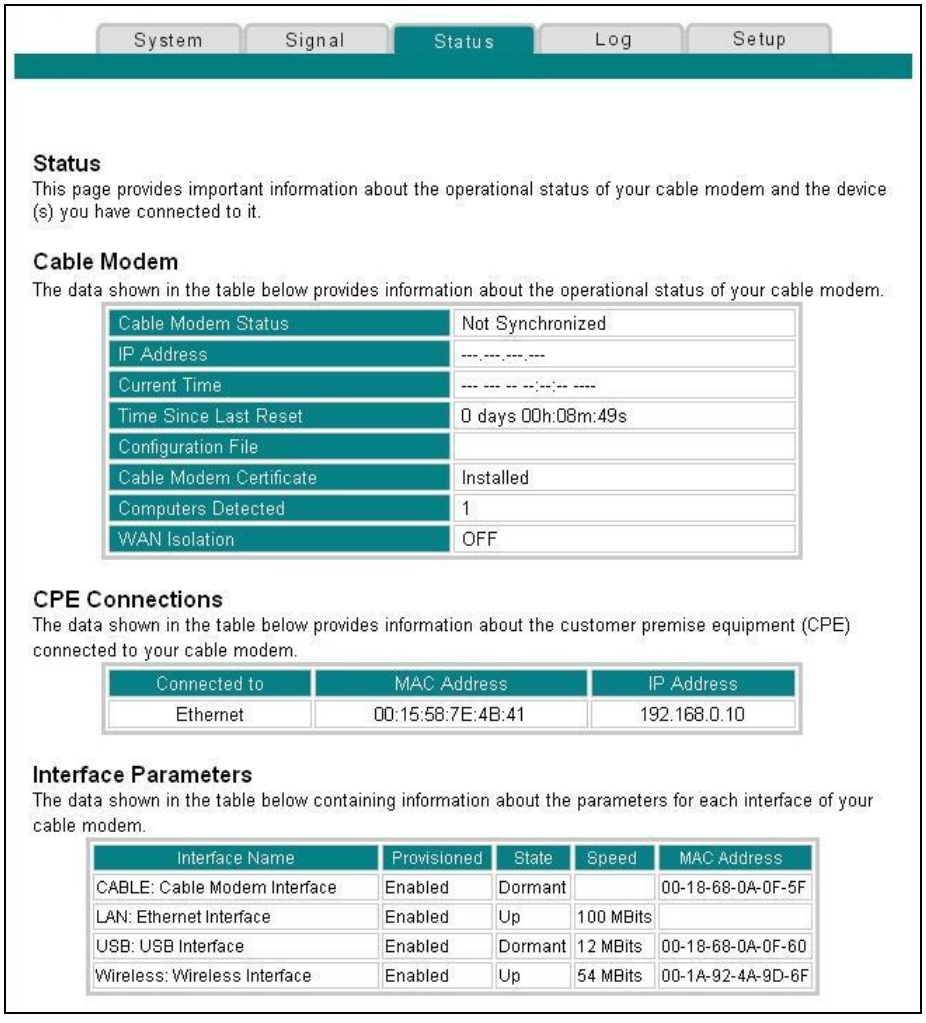
Display Cable Modem Operational Status

This section provides an example of the Status page. The Status page provides important information about the operation status of the cable modem gateway and the devices connected to it. This example also shows the status options that display on each page.

Note: The CPE can access this page prior to registration and at Access Level 2.

Status Page Example

The following illustration is an example of the Status page.



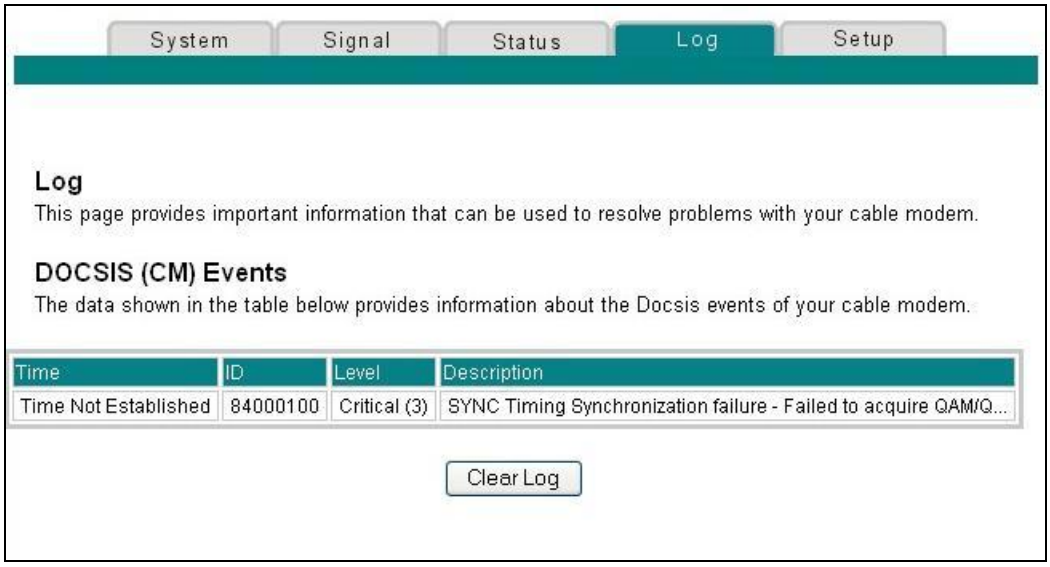
Display the Cable Modem Log

This section provides an example of the Log page. The Log page provides important information that can be used to resolve problems with your cable modem gateway.

Note: The CPE can access this page prior to registration and at Access Level 2.

Log Page Example

The Log page displays up to 50 events in the order they occur with the most recent event at the top of the list. The following illustration is an example of the Log page.

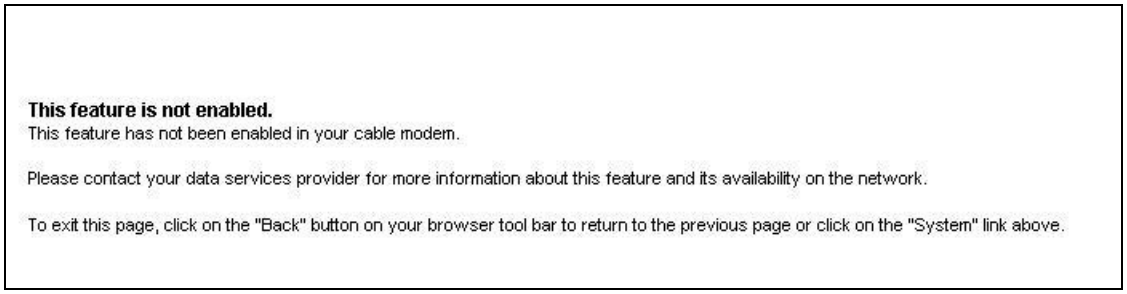


Display the Default Webpage

This section provides an example of the default webpage. This page appears when other pages are not authorized or when a feature is not enabled.

Default Webpage Example

The following illustration is an example of the default webpage.



Display the Scan Page (Frequency Values)

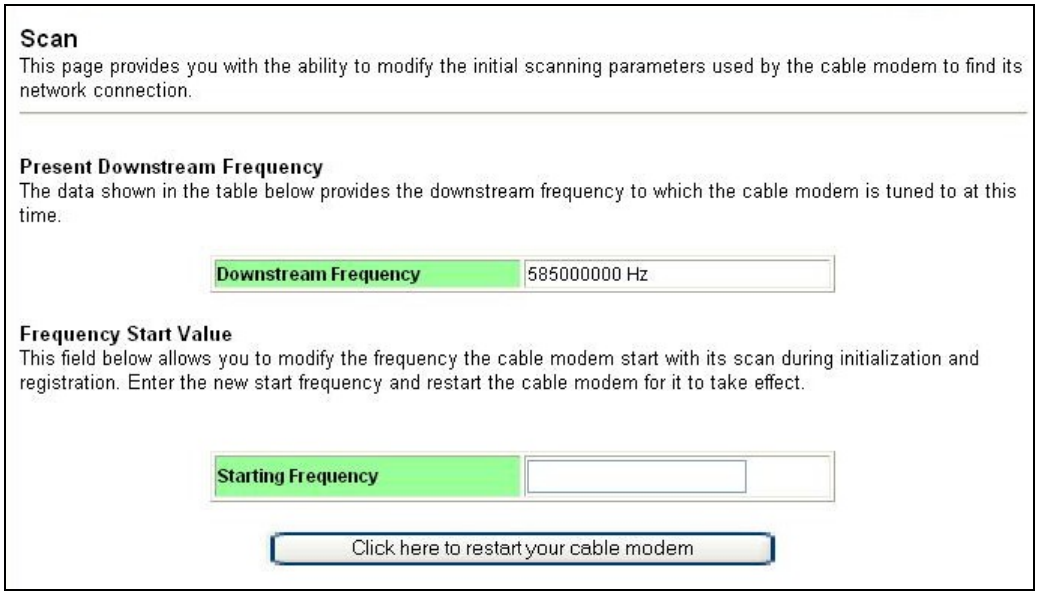
This section provides an example of the Scan page. The Scan page displays the present downstream frequency and the frequency start value, and also allows you to modify the initial scanning parameters used by the cable modem gateway to find a network connection.

The Scan page is an Expert User page. The CPE can access this page by direct URL access only from the following URL: **http://192.168.100.1/gscan.asp**

Scan Page Example

The following illustration is an example of the Scan page.

Note: This page is not accessible by an HTML link from the other WebWizard pages. To view this page, you must use the URL shown above.



9

Troubleshooting the Installation

Introduction

This chapter provides descriptions of possible cable modem gateway performance and installation issues that may occur after the cable modem gateway is installed. This chapter also shows specific examples of the condition as shown by the LED status indicators on the front panel of the cable modem gateway. These indicators provide visual feedback so you can troubleshoot the situation quickly.

Audience

This chapter contains detailed troubleshooting instructions for Customer Support Representatives (CSRs), cable modem gateway installers, and network support engineers who troubleshoot performance situations and conditions that occur with the cable modem gateways.

Important: For all of the scenarios listed in this chapter, you will have full access to the WebWizard from the CPE until the cable modem gateway is registered on the network. The vendor-specific MIB for controlling access to the WebWizard does not take effect until after the cable modem gateway registers with the CMTS.

In This Chapter

Troubleshooting Overview

This section provides a table that illustrates a summary of the visual status of the front-panel LED status indicators for the various cable modem gateway situations and conditions described in this chapter.

Summary of Front Panel LED Status Indicators

The following table provides a summary of the visual status of the front panel LED status indicators for the various cable modem gateway situations and conditions described in this chapter when AC power is applied to the cable modem gateway. Use this table as a quick reference for troubleshooting your cable modem gateway.

Note: Detailed troubleshooting procedures for each of the conditions described in this table follow later in this chapter.

Front Panel Indicator	**No Power**	**No Downstream Signal Lock**	**Ranging Not Complete**	**IP Connectivity Not Complete**	**Registration Not Complete**
POWER	OFF	ON	ON	ON	ON
RECEIVE DATA	OFF	BLINKING	ON	ON	ON
SEND DATA	OFF	OFF	BLINKING	ON	ON
CABLE	OFF	OFF	OFF	BLINKING	BLINKING
PC	OFF	ON or BLINKING when connected to CPE OFF when not connected to CPE			
PC WIRELESS	OFF	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled			

DPR2320 and EPR2320 Front Panel LED Status Indicator Functions

Initial Power Up, Calibration, and Registration

The following chart illustrates the sequence of steps and the corresponding appearance of the cable modem gateway front panel LED status indicators during power up, calibration, and registration on the network when AC power is applied to the cable modem gateway. Use this chart to troubleshoot the power up, calibration, and registration process of your cable modem gateway.

Note: After the cable modem gateway completes step 7 (Registration Completed), the modem proceeds immediately to ***Normal Operations*** (on page 123).

DPR2320 and EPR2320 Front Panel LED Status Indicators During Initial Power Up, Calibration, and Registration								
Step →		**1**	**2**	**3**	**4**	**5**	**6**	**7**
Front Panel Indicator		**Self Test**	**Downstream Scan**	**Downstream Signal Lock**	**Ranging**	**Requesting IP Address**	**Registering**	**Registration Completed**
1	Power	ON	ON	ON	ON	ON	ON	ON
2	Receive Data	ON	BLINKING	ON	ON	ON	ON	OFF or BLINKING
3	Send Data	ON	OFF	OFF	BLINKING	ON	ON	OFF or BLINKING
4	Cable	ON	OFF	OFF	OFF	OFF	BLINKING	ON
5	PC	ON	ON or BLINKING when connected to CPE OFF when not connected to CPE					
6	PC Wireless	ON	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled					

Normal Operations

The following chart illustrates the appearance of the cable modem gateway front panel LED status indicators during normal operations.

DPR 2320 and EPR2320 Front Panel LED Status Indicators During Normal Operations		
Step →		**8**
Front Panel Indicator		**Normal Operations**
1	Power	ON
2	Receive Data	BLINKS - To indicate data is being transferred between the modem and the network
3	Send Data	BLINKS - To indicate data is being transferred between the modem and the network
4	Cable	ON
5	PC	ON - When a single device is connected to either the Ethernet or USB port and no data is being sent to or from the modem BLINKS - When only one Ethernet or USB device is connected and data is being transferred between the consumer premise equipment (CPE) and the cable modem OFF - When no devices are connected to either the Ethernet or USB ports **Note:** With both Ethernet and USB devices connected to the modem at the same time, when data is being transferred through only one of the devices (Ethernet or USB), the indicator will illuminate continuously. Whenever data is being sent through both data ports (Ethernet and USB) simultaneously, the indicator will blink as described above.
6	PC Wireless	ON - When the wireless access point is operational BLINKS - To indicate data is being transmitted through the wireless access point OFF - When the user disables the wireless access point

DPR2325 and EPR2325 Front Panel LED Status Indicator Functions

Initial Power Up, Calibration, and Registration

The following chart illustrates the sequence of steps and the corresponding appearance of the cable modem gateway front panel LED status indicators during power up, calibration, and registration on the network when AC power is applied to the cable modem gateway. Use this chart to troubleshoot the power up, calibration, and registration process of your cable modem gateway.

Note: After the cable modem gateway completes step 7 (Registration Completed), the modem proceeds immediately to ***Normal Operations*** (on page 125).

DPR2325 and EPR2325 Front Panel LED Status Indicators During Initial Power Up, Calibration, and Registration								
Step →		**1**	**2**	**3**	**4**	**5**	**6**	**7**
Front Panel Indicator		**Self Test**	**Downstream Scan**	**Downstream Signal Lock**	**Ranging**	**Requesting IP Address**	**Registering**	**Registration Completed**
1	Power	ON	ON	ON	ON	ON	ON	ON
2	Receive Data	ON	BLINKING	ON	ON	ON	ON	OFF
3	Send Data	ON	OFF	OFF	BLINKING	ON	ON	OFF
4	Cable	ON	OFF	OFF	OFF	OFF	BLINKING	ON
5	Ethernet (4 LEDs)	ON	ON or BLINKING when connected to CPE OFF when not connected to CPE					
6	USB	ON	ON or BLINKING when connected to CPE OFF when not connected to CPE					
7	Wireless	ON	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled					

Normal Operations

The following chart illustrates the appearance of the cable modem gateway front panel LED status indicators during normal operations.

DPR2325 and EPR2325 Front Panel LED Status Indicators During Normal Operations		
Step →		**8**
Front Panel Indicator		**Normal Operations**
1	Power	ON
2	Receive Data	BLINKS - To indicate data is being transferred between the modem and the network
3	Send Data	BLINKS - To indicate data is being transferred between the modem and the network
4	Cable	ON
5	Ethernet (4 LEDs)	ON - When a device is connected to an Ethernet port and no data is being sent to or from the modem BLINKS - When data is being transferred between the consumer premise equipment (CPE) and the cable modem OFF - When no devices are connected to the Ethernet ports
6	USB	ON - When a device is connected to the USB port and no data is being sent to or from the modem BLINKS - When data is being transferred between the consumer premise equipment (CPE) and the cable modem OFF - When no devices are connected to the USB port
7	Wireless	ON - When the wireless access point is operational BLINKS - To indicate data is being transmitted through the wireless access point OFF - When the user disables the wireless access point

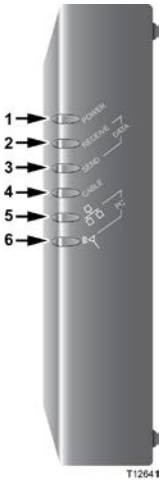
No Downstream Signal Lock

After a cable modem gateway powers on and performs an internal self-test, the cable modem gateway starts to scan for the CMTS downstream channel. The cable modem gateway starts its standard scanning algorithm.

Note: For more information on this process, see ***Scan for Downstream Channel*** (on page 8).

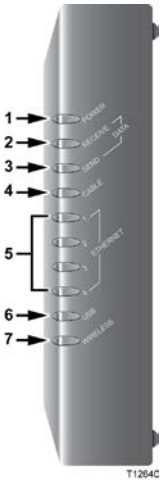
The following table illustrates the status of the front-panel LED status indicators when the **no downstream signal lock** condition exists.

DPR/EPR2320



LED	Label	Status
1	Power	ON
2	Receive Data	BLINKING
3	Send Data	OFF
4	Cable	OFF
5	PC	ON or BLINKING when connected to CPE OFF when not connected to CPE
6	PC Wireless	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled

DPR/EPR2325



LED	Label	Status
1	Power	ON
2	Receive Data	BLINKING
3	Send Data	OFF
4	Cable	OFF
5	Ethernet	ON or BLINKING when connected to CPE OFF when not connected to CPE
6	USB	ON or BLINKING when connected to CPE OFF when not connected to CPE
7	Wireless	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled

Check and Correct

1. On initial installation, or after a reset, allow the cable modem gateway 5 to 8 minutes to locate and lock on to the downstream channel.
2. Using the Web browser on the PC attached to the cable modem gateway, access the WebWizard by entering the following IP address: **http://192.168.100.1**. The Web browser accesses the WebWizard and the Default page opens.
3. Select the **Signal** page and verify that the cable modem gateway locks to the downstream channel of the CMTS.
4. Check the power level and the Signal-to-Noise ratio to verify if it is outside of the operating range.
5. Is the ratio outside of the operating range?
   - If **yes**, correct the downstream channel to the cable modem gateway.
   - If **no**, go to step 6.
6. Check the status of the CMTS.
7. Check the status of the CMTS signal on the node attached to the cable modem gateway.

Ranging Not Complete

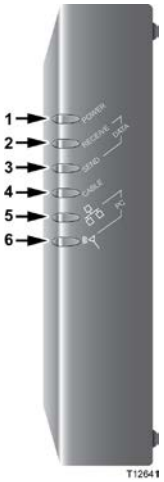
Description

After the cable modem gateway finds the CMTS downstream channel and upstream parameters, it starts the ranging and automatic adjustments stage. This stage adjusts the timing offset and the power level for communication with the CMTS.

Note: For more information on this process, see ***Adjust Timing Offset and Power Level*** (on page 10).

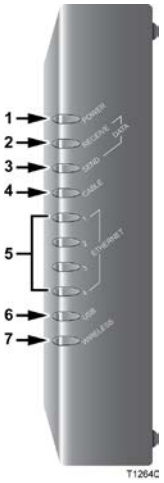
The following table illustrates the status of the front-panel LED status indicators when the **ranging not complete** condition exists.

DPR/EPR2320



LED	Label	Status
1	Power	ON
2	Receive Data	ON
3	Send Data	BLINKING
4	Cable	OFF
5	PC	ON or BLINKING when connected to CPE OFF when not connected to CPE
6	PC Wireless	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled

DPR/EPR2325



LED	Label	Status
1	Power	ON
2	Receive Data	ON
3	Send Data	BLINKING
4	Cable	OFF
5	Ethernet	ON or BLINKING when connected to CPE OFF when not connected to CPE KING
6	USB	ON or BLINKING when connected to CPE OFF when not connected to CPE
7	Wireless	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled

Check and Correct

1. Using the Web browser on the PC attached to the cable modem gateway, access the WebWizard by entering the following IP address: **http://192.168.100.1**. The Web browser accesses the WebWizard and the Default Page opens.
2. Select the **Signal** page and verify that the cable modem locks to the downstream channel of the CMTS.
3. Check the upstream power level and the Signal-to-Noise ratio to verify if it is outside of the operating range.
4. Is the upstream level or the ratio outside of the operating range?
   - If **yes**, correct the upstream channel to the cable modem.
   - If **no**, go to step 5.
5. Check the status of the CMTS.
6. Check the status of the CMTS signal on the node attached to the cable modem gateway.

IP Connectivity Not Complete

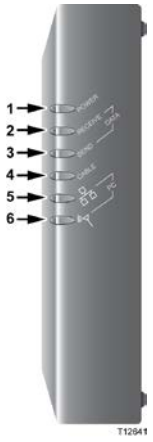
Description

After completing the ranging stage, the cable modem gateway then tries to establish IP connectivity. In this process the cable modem gateway obtains network connection information and a cable modem gateway IP address from provisioning servers located on the network side of the CMTS interface. The cable modem gateway accomplishes this with a protocol called Dynamic Host Configuration Protocol (DHCP). If the cable modem fails the establish IP connectivity stage it returns back to the scan for downstream channel stage.

Note: For more information on this process, see ***Establish IP Connectivity*** (on page 11).

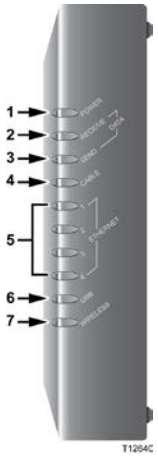
The following table illustrates the status of the front-panel LED status indicators when the **IP connectivity not complete** condition exists.

DPR/EPR2320



LED	Label	Status
1	Power	ON
2	Receive Data	ON
3	Send Data	ON
4	Cable	OFF
5	PC	ON or BLINKING when connected to CPE OFF when not connected to CPE
6	PC Wireless	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled

DPR/EPR2325



LED	Label	Status
1	Power	ON
2	Receive Data	ON
3	Sent Data	ON
4	Cable	OFF
5	Ethernet	ON or BLINKING when connected to CPE OFF when not connected to CPE
6	USB	ON or BLINKING when connected to CPE OFF when not connected to CPE
7	Wireless	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled

Check and Correct

1. Using the Web browser on the PC attached to the cable modem gateway, access the WebWizard by entering the following IP address: **http://192.168.100.1**. The Web browser accesses the WebWizard and the Default page opens.
2. Open the **Signal** page, and then select **Cable Modem Status**. The Cable Modem Status list appears.

   Example:

   The following list shows an example of the Cable Modem Status list that you could use to check the status of your cable modem:
   notReady
   notSynchronized
   phySynchronized
   usParametersAcquired
   rangingComplete – (The cable modem gateway should be at this status)
   ipComplete
3. If the cable modem gateway shows the status of **rangingComplete**, the cable modem gateway has a problem receiving the DHCP response from the provisioning server. In this case, you should activate DHCP tracing on the CMTS.
4. If the CMTS shows the cable modem gateway DHCP traffic, check the DHCP server for possible problems.

Registration Not Complete

Description

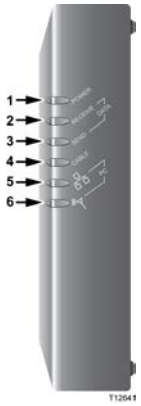
In this phase, the cable modem gateway requests the time of day and the configuration file. The configuration file contains operational parameters for how the user wants the cable modem gateway to operate on the system. If the cable modem gateway receives an invalid configuration file, it may not be able to complete the registration process.

Depending on the type of error received, the cable modem gateway may try to immediately sign on again or resume the downstream scan. After the cable modem gateway completes the transfer operational parameters stage, the cable modem gateway is able to register with the CMTS.

Note: The CMTS may reject the registration of the cable modem gateway, or the CMTS may be unable to provide certain services requested by the cable modem gateway.

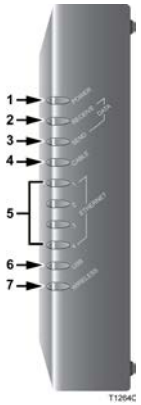
The following table illustrates the status of the front-panel LED status indicators when the **registration not complete** condition exists.

DPR/EPR2320



LED	Label	Status
1	Power	ON
2	Receive Data	ON
3	Send Data	ON
4	Cable	BLINKING
5	PC	ON or BLINKING when connected to CPE OFF when not connected to CPE
6	PC Wireless	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled

DPR/EPR2325



LED	Label	Status
1	Power	ON
2	Receive Data	ON
3	Send Data	ON
4	Cable	BLINKING
5	Ethernet	ON or BLINKING when connected to CPE OFF when not connected to CPE
6	USB	ON or BLINKING when connected to CPE OFF when not connected to CPE
7	Wireless	ON or BLINKING when wireless interface is enabled OFF when wireless interface is disabled

Check and Correct

1. Using the Web browser on the PC attached to the cable modem gateway, access the WebWizard by entering the following IP address: **http://192.168.100.1**. The Web browser accesses the WebWizard and the Default page opens.
2. Open the **Signal** page, and then select **Cable Modem Status**. The Cable Modem Status list appears.

   Example:

   The following list shows an example of the Cable Modem Status list that you could use to check the status of your cable modem:
   usParametersAcquired
   rangingComplete
   ipComplete – (The cable modem gateway should be at this status)
   todEstablished
   prsmTransferComplete
   registrationComplete
   operation
   accessDenied
3. On the Status page of the WebWizard, verify that the cable modem IP address is listed. If it is not listed, review the check and correct procedures in ***IP Connectivity Not Complete*** (on page 130).
4. On the Status page of the WebWizard, verify that the configuration file name displays in the Configuration field.

   Note: This configuration file name is the name of the configuration file you created.
5. Does the configuration file name exist?
   - If **yes**, go to step 6.
   - If **no**, verify that the TFTP server is receiving the request and responding to the cable modem.
6. Access the WebWizard and select the **Log** page**.** Under the Level column, look for "Informational," and then locate the description "Processing Configuration File."
7. In the Processing Configuration File description, verify any SNMP or set errors. If SNMP or set errors are listed, examine the configuration file for possible invalid entries.
8. Check the CMTS to verify if it is operationally able to create new sessions. For instance, you may see a large number of **T timeout** errors or that the CMTS has rejected services requested by the cable modem.

   Important: If you determine that your CMTS is not operating correctly, contact technical support for your CMTS manufacturer.

Having Difficulty?

I cannot connect to the Internet

- Verify that the plug to your cable modem gateway AC power is properly inserted into an electrical outlet.
- Verify that your cable modem gateway AC power cord is not plugged into an electrical outlet that is controlled by a wall switch. If a wall switch controls the electrical outlet, make sure the switch is in the **ON** position.
- Verify that the **POWER** and **CABLE** indicator lights on the front panel of your cable modem gateway are illuminated.
- Verify that the indicator lights on your router or other network connection equipment are illuminated.
- Verify that all cables are properly connected, and that you are using the correct cables.
- Verify that your cable service is active and that it supports two-way service.
- Verify that TCP/IP is properly installed and configured on all devices if you are using the Ethernet connections.
- Verify that you have followed the procedure in ***Install USB Drivers*** (on page 23) if you are using the USB connection.
- Verify that you have called your service provider and given them the serial number and MAC address of your cable modem gateway.
- If you are using a cable signal splitter so that you can connect the cable signal to other devices, remove the splitter and reconnect the cable so that the cable modem gateway is connected directly to the main cable input. If the cable modem gateway now functions properly, the cable signal splitter may be defective and may need to be replaced.
- For best performance over an Ethernet connection, your PC should be equipped with a 10/100BASE-T network interface card.

My cable modem gateway does not register an Ethernet connection

Even new devices do not always have Ethernet capabilities. Verify that your device has an Ethernet card and that the Ethernet driver software is properly installed. If you purchase and install an Ethernet card, follow the installation instructions very carefully.

My cable modem gateway does not recognize the cable network

- The cable modem gateway works with a standard, 75-ohm, RF coaxial cable. If you are using a different cable, your cable modem gateway will not function properly. Contact your service provider to determine if you are using the correct cable.
- You may need to renew the IP address on your PC. Refer to **How Do I Renew the IP Address on My PC?**, in this section, for instructions on how to renew the IP address for your particular operating system.
- Your USB interface may be malfunctioning. Refer to the troubleshooting information in your USB documentation.

How do I renew the IP address on my PC?

If your PC cannot access the Internet after the cable modem gateway is online, it is possible that your PC did not renew its IP address. Follow the appropriate instructions in this section for your operating system to renew the IP address on your PC.

Renewing the IP address on Windows 95, 98, 98SE, and ME Systems

1. Click **Start**, and then click **Run** to open the Run window.
2. Type **winipcfg** in the Open field, and click **OK** to execute the winipcfg command. The IP Configuration window opens.
3. Click the down arrow to the right of the top field, and select the Ethernet adapter that is installed on your PC. The IP Configuration window displays the Ethernet adapter information.
4. Click **Release**, and then click **Renew**. The IP Configuration window displays a new IP address.
5. Click **OK** to close the IP Configuration window, you have completed this procedure.

   Note: If you cannot access the Internet, contact your service provider for further assistance.

Renewing the IP Address on Windows NT, 2000, or XP Systems

1. Click **Start**, and then click **Run**. The Run window opens.
2. Type **cmd** in the Open field and click **OK**. A window with a command prompt opens.
3. Type **ipconfig/release** at the C:/ prompt and press **Enter**. The system releases the IP address.
4. Type **ipconfig/renew** at the C:/ prompt and press **Enter**. The system displays a new IP address.
5. Click the **X** in the upper-right corner of the window to close the Command Prompt window. You have completed this procedure.

   Note: If you cannot access the Internet, contact your service provider for further assistance.

A

Specifications

Introduction

Consumers can self-install the cable modem gateways either horizontally or vertically, and then easily connect them to the cable TV, Ethernet lines, or telephone lines to suit their individual needs.

This appendix contains the technical specifications for the DPR2320, DPR2325, EPR2320, and EPR2325 cable modem gateways.

In This Appendix

Technical Specifications

DPR2320 and DPR2325 Specifications

This section provides the technical specifications for the DPR2320 and DPR2325 cable modem gateways.

Specifications Table

The following tables show the technical specifications for the Model DPR2320 and DPR2325 cable modem gateways.

Wireless Access Point	
Frequency Range	2.412~2.462 GHz, 11 Channels (North America; FCC) 2.412~2.472 GHz, 13 Channels (Europe; CE/ETSI)
Modulation	DSSS (Direct Sequence Spread Spectrum)
Data Rate: 802.11g	54 Mbps with Auto Fall-Back
Security	RC4 with 64-bit and 128-bit WEP
Transmit Power	18 dBm (typical for 802.11g)
Antenna System	One (1) external One (1) internal

RF Downstream	
Frequency Range	88 to 860 MHz
Demodulation	64 QAM or 256 QAM
Maximum Data Rate	30 Mbps for 64 QAM or 43 Mbps for 256 QAM
Bandwidth	6 MHz
Operating Level Range	-15 to +15 dBmV
Input Impedance	75 ohms

RF Upstream	
Frequency Range	5 to 42 MHz (Standard) 5 to 55 MHz (Japan)
Modulation	QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM ATDMA, 128 QAM SCDMA
Maximum Data Rate	■ 5.12 Mbps for QPSK ■ 10.2 Mbps for 16 QAM ■ 30.72 Mbps for ATDMA and SCDMA
Bandwidth	200 kHz to 6.4 MHz
Operating Level Range	+8 to +58 dBmV (QPSK) +8 to +55 dBmV (8QAM, 16QAM) +8 to +54 dBmV (32QAM, 64QAM)
Output Impedance	75 ohms

Electrical	
Input Voltage	12 VDC
Power Consumption	6.2 Watts (maximum)
Data Ports	Ethernet 10/100BASE-T (Auto-sensing with Auto-MDIX): RJ-45 Ethernet (4 ports on the DPR2325; 1 port on the DPR2320) USB: Type 2 (1)
RF	One female “F” type

Mechanical	
Dimensions (H x D x W)	■ Not including “F” connector: – 6.625 in. x 5.0 in. x 1.375 in. (16.5 cm x 12.5 cm x 3.5 cm) ■ Including “F” connector: – 6.625 in. x 5.5 in. x 1.375 in. (16.5 cm x 14 cm x 3.5 cm)
Mounting	■ Free standing, horizontal or vertical on a flat surface ■ Wall mounting, 4 in. on center, tear-drop mounting holes molded into the bottom of the housing for horizontal or vertical wall mounting

Mechanical	
Weight (approximate)	12.0 oz (0.34 kg)
Operating Temperature	32˚ to 104˚F (0˚ to 40˚C)
Operating Humidity	0-90% RH non-condensing
Storage Temperature	-4˚ to 158˚F (-20˚ to 70˚C)

Standards Compliance and Compatibility

The DPR2320 and DPR2325 cable modem gateways are designed to comply with the following standards:

- DOCSIS 2.0
- CableHome 1.1
- WEP, WPA, and WPA2
- IEEE 802.11g
- WHQL

Regulatory Compliance

Certified as required per country where the DPR2320 and DPR2325 cable modem gateways will be used.

Model EPR2320 and EPR2325 Specifications

This section provides the technical specifications for the EPR2320 and EPR2325 cable modem gateways.

Specifications Table

The following tables show the technical specifications for the Model EPR2320 and EPR2325 cable modem gateways.

Wireless Access Point	
Frequency Range	2.412~2.472 GHz, 13 Channels (Europe; CE/ETSI)
Modulation	DSSS (Direct Sequence Spread Spectrum)
Data Rate: 802.11g	54 Mbps with Auto Fall-Back
Security	RC4 with 64-bit and 128-bit WEP
Transmit Power	14 dBm (typical for 802.11g)
Antenna System	One (1) external One (1) internal

RF Downstream	
Frequency Range	112 to 860 MHz
Demodulation	64 QAM or 256 QAM
Maximum Data Rate	41.4 Mbps for 64 QAM and 55.2 Mbps for 256 QAM
Bandwidth	8 MHz
Operating Level Range	43 to 73 dBµV for 64 QAM 47 to 77 dBµV for 256 QAM
Input Impedance	75 ohms

RF Upstream	
Frequency Range	5 to 65 MHz
Modulation	QPSK, 16 QAM, 64 QAM ATDMA, 128 QAM SCDMA
Maximum Data Rate	■ 5.12 Mbps for QPSK ■ 10.2 Mbps for 16 QAM ■ 30.72 Mbps for ATDMA and SCDMA
Bandwidth	200 kHz to 6.4 MHz

RF Upstream	
Operating Level Range	+8 to +58 dBmV +8 to +55 dBmV (8QAM, 16QAM) +8 to +54 dBmV (32QAM, 64QAM)
Output Impedance	75 ohms

Electrical	
Input Voltage	12 VDC
Power Consumption (modem module)	6.25 Watts (maximum)
Data Ports	Ethernet 10/100BASE-T (Auto-sensing with Auto-MDIX): RJ-45 Ethernet (4 ports on the EPR2325; 1 port on the EPR2320) USB: Type 2 (1)
RF	One female “F” type

Mechanical	
Dimensions (H x D x W)	■ Not including “F” connector: – 16.5 cm x 12.5 cm x 3.5 cm (6.625 in. x 5.0 in. x 1.375 in.) ■ Including “F” connector: – 16.5 cm x 14 cm x 3.5 cm (6.625 in. x 5.5 in. x 1.375 in.)
Mounting	■ Free standing, horizontal or vertical on a flat surface ■ Wall mounting, 4 in. on center, tear-drop mounting holes molded into the bottom of the housing for horizontal or vertical wall mounting
Weight (approximate)	0.34 kg (12.0 oz)
Operating Temperature	0˚ to 40˚C (32˚ to 104˚F)
Operating Humidity	0-90% RH non-condensing
Storage Temperature	-20˚ to 70˚C (-4˚ to 158˚F)

Standards Compliance and Compatibility

The EPR2320 and EPR2325 cable modem gateways are designed to comply with the following standards:

- EuroDOCSIS 2.0, 1.1, and 1.0
- CableHome 1.1
- WEP, WPA, and WPA2
- IEEE 802.11g
- WHQL
- RoHS

Regulatory Compliance

Certified as required per country where the EPR2320 and EPR2325 cable modem gateways will be used.

B

Cable Modem Warranty and RMA Information

Introduction

This appendix contains Warranty and Return Materials Authorization (RMA) information for our cable modem products and includes an FAQ section.

In This Appendix

Warranty and RMA Information

Cable Modem Warranty Information

These cable modems enable you to access the Internet on your home computer through your cable TV line. Your local cable service provider becomes your Internet service provider. Should you experience problems, always consult with your local cable service provider to determine whether the problem is related to the cable network or your cable modem.

Frequently Asked Questions

What does your warranty cover?

- Any defect in materials or workmanship that arises during the term of this warranty.

What is the duration of your warranty?

- The warranty for labor and parts is 60 months from purchase date.
- All warranty claims must be made during the 60-month period.

What will we do?

- Repair or replace, at our option, the cable modem, at no expense to you, within a reasonable time after we receive the cable modem from you.
- We will repair or replace defective Product or parts, at our option, with a new or reconditioned cable modem or parts with equivalent or enhanced features. All repair or replacement of the cable modem must be performed by Cisco or by a Cisco Authorized Service Provider. Reconditioned cable modems or parts will be equal in performance to the original cable modem or parts. All original cable modems or parts replaced by Cisco become property of Cisco. Any replaced or repaired cable modem or part is warranted under the same terms as this Limited Warranty for a period of 90 days after the date of repair or replacement, or for the remainder of the initial warranty period, whichever is longer.

How do you obtain warranty service?

- In order to receive warranty service, you must contact Cisco Services within 30 days after discovering that your cable modem has a defect in materials or workmanship. Proof of purchase for the cable modem may be required in order to validate warranty eligibility. If the cable modem requires service, you will be given a return authorization number and instructions for shipping the cable modem to Cisco or the location of the nearest Cisco Authorized Service Provider. You must pre-pay all transportation costs, taxes, duties and insurance charges incurred for shipment to Cisco or an Authorized Service Provider, and you must properly pack the cable modem for shipment in the original packaging or equivalent. You will not be reimbursed for these expenses. If the cable modem is not insured and the cable modem is lost or damaged during transit, you are responsible for such loss or damage.

What is not covered by your warranty?

- Customer instruction. (Your owner's manual clearly describes how to install, adjust, and operate your cable modem. Obtain additional information from your cable service provider)
- Improper installation, maintenance or handling, storage, transportation, testing, repair or related adjustments
- Signal reception problems not caused by your cable modem
- Damage from misuse or neglect
- Any defect that arises after the original purchaser of the cable modem transfers the cable modem to a subsequent owner
- A cable modem with a trade name or logo other than Cisco
- A cable modem that has been modified or incorporated into other products or is used for institutional or other commercial purposes
- A cable modem purchased or serviced outside the U.S.A. and/or Canada
- Cosmetic problems or defects resulting from normal wear and tear under ordinary use, which do not affect the performance or use of the cable modem
- Acts of God, such as but not limited to lightning damage
- External electrical fault or electrical surges
- Service other than by Cisco or a Cisco Authorized Service Provider

- Any other cause outside of normal usage parameters
- Damage to or loss of any programs or data, or the costs of recovering such programs or data
- Repairs that do not involve defective materials or workmanship are not covered by this warranty. Costs of such repairs are the sole responsibility of the purchaser

What additional provisions should I be aware of?

- Because it is impossible for us to know the purposes for which you acquired this cable modem or the uses to which you will put this cable modem, you assume full responsibility for the selection of the cable modem and for its installation and use. While every reasonable effort has been made to ensure that you will receive a cable modem that you can use and enjoy, Cisco does not warrant that the functions of the cable modem will meet your requirements or that the operation of the cable modem will be uninterrupted or error-free. Cisco is not responsible for problems caused by changes in the operating characteristics of the hardware or software you are using that are made after the release date of the version of software accompanying the cable modem, nor is Cisco responsible for problems in the interaction of the cable modem with any other software or hardware.

How does state law or province law relate to this warranty?

- This warranty gives you specific legal rights, and you may also have other rights that vary from state to state or province to province.

What if you purchased your modem outside the United States?

- This warranty does not apply. Contact your dealer for warranty information.

RMA Returns Policy and Procedure for Cable Modems

If for any reason your cable modem supplied by Cisco needs to be returned for repair, please use the following procedure.

Return Material Authorization (RMA) Procedure

1. Web- and Retail-Purchased Modems

   Contact the vendor to arrange for repair and/or replacement.

2. Cable Service Provider-Purchased Modems

   If for any reason your cable modem supplied by Cisco needs to be returned for repair, please use the following procedure that applies to your geographic region:

   - **North America**

     Telephone Cisco's Customer Service Center at 1-800-722-2009 to request a Return Material Authorization (RMA) number. You will be asked for your name, company, telephone, and fax number. In addition we will need to know the model number, quantity of product returns, and the reason for product return together with the repair disposition authority and details of any current Service Contract entered into with Cisco. An RMA fax request form is available upon request. Complete the RMA fax request form and fax it to: Customer Service, fax number: (770) 236-5477.

   - **Latin America**

     Telephone Cisco's Customer Service Center, telephone number: +1-770-236-5662 to request a Return Material Authorization (RMA) number. You will be asked for your name, company, telephone, and fax number. In addition, we will need to know the model number, quantity of product returns, and the reason for product return together with the repair disposition authority and details of any current Service Contract entered into with Cisco. An RMA fax request form is available upon request. Complete the fax request form and fax it to: Customer Service, fax number: +1-770-236-5888.

- **Asia/Pacific**

  Telephone Cisco's Customer Service Center at +852-2522-5059 to request a Return Material Authorization (RMA) number. You will be asked for your name, company, telephone, and fax number. In addition we will need to know the model number, quantity of product returns, and the reason for product return together with the repair disposition authority and details of any current Service Contract entered into with Cisco. An RMA fax request form is available upon request. Complete the fax request form and fax it to: Customer Service, fax number: +852-2522-5624.

- **Europe**

  Telephone Cisco's Customer Service Centre at +44 (0)1923-271422 during UK office hours or at +44 (0)1923-271460 (24 hr Voicemail) to request a Return Material Authorization (RMA) number. You will be asked for your name, company, telephone, and fax number. In addition we will need to know the model number, quantity of product returns, and the reason for product return together with the repair disposition authority and details of any current Service Contract entered into with Cisco. An RMA fax request form is available upon request. Complete the fax request form and fax it to: Customer Service, fax number: +44 (0)1923-269018.

Important: It is important to tell the Customer Service Representative the quantity of defective cable modems and defective external power supplies you are returning.

PLEASE DO NOT RETURN NON-DEFECTIVE POWER SUPPLIES, POWER CORDS AND ACCESSORY CABLES. Should you require that we ship replacement Ethernet/USB cables, power cords, power supplies or installation CDs with the return of your repaired cable modem(s), please be sure to request either our RepairCare or RepairCare Plus service option. Charges WILL APPLY for our RepairCare or RepairCare Plus service options regardless of the warranty status of the cable modem.

3 A purchase order number or advance payment to cover "estimated" or "not to exceed" repair costs will be requested at the time the RMA is issued. However, should you be unable to issue a purchase order (for any reason) at the time of your RMA request, a proforma invoice will be sent to you upon completion of the repair that lists all costs incurred.

Note: In-warranty equipment can incur costs through damage/misuse, cosmetic, or "no problem found." Equipment incurring costs will not be returned to the customer without a valid purchase order number or alternative method of payment such as credit card. Valid method of payment must be provided within 15 days of receipt of proforma invoice.

4. On issuance of an RMA number, goods returned to Cisco should be clearly marked to the attention of Factory Service, at the address given by the customer service representative (CSR). A confirmation fax will be sent to you by the CSR that details the RMA number, product and quantities authorized, shipping address details, and RMA Terms and Conditions. For both in- and out-of-warranty repairs, you are responsible for paying your outbound freight expense. Cisco will pay the return freight expense. This is standard procedure unless otherwise modified by contractual agreement.
5. Cable modems returned for repair both in- and out-of-warranty should have a tag attached that details the failure mode. A supply of these tags (Cable Modem Repair Tag, part number 745330) will be issued free by calling the Customer Service Center and requesting them.
6. It is preferable that the original packing, including any anti-static and foam wrapping, be used on all returned equipment. Should the original equipment packing not be available, then use adequate packing that takes into account the method of shipment of the returned goods. You are responsible for delivering the returned goods to Cisco safely and undamaged. Improperly packaged shipments, which may have caused additional damage, may be refused and returned to you at your expense.
7. The RMA number should be clearly marked on all returned boxes and packages including all accompanying paperwork. RMAs received by the Factory Service receiving department that are not clearly marked may be refused and returned to you at your expense.
8. International shipments should be consigned to Cisco with the notified party on the airway bill stated as “Expediters International for Customs clearance.”
9. On receipt of equipment returned under an RMA that matches the authorized quantities and/or product (model or part number), a fax will be sent to you by Repair Receiving that confirms receipt of product and details the anticipated repair/exchange completion date.
10. If equipment returned under an RMA does not match the authorized quantities and/or product (model or part number), Repair Receiving will send a fax to you that details the nature of the discrepancy. A Cisco representative will contact you to resolve the discrepancy.
11. Equipment returned under an RMA that does not match the authorized quantities and/or product (model or part number) will be held for 5 days (domestic) and 10 days (international) while the Customer Service Representative tries to resolve the discrepancy and/or exception with you. RMAs that are still discrepant at the end of this period will be amended to reflect the received quantities and/or product (model or part number) as being correct. You will then receive a fax from Repair Receiving that informs you of the changes made to the RMA.

12 Return Material Authorization RMA numbers are only valid for 60 days. RMA numbers older than 60 days need to be revalidated by you before the equipment is returned. Failure to comply with the above may delay the processing of your RMA or result in the equipment being refused and being returned to you at your expense.

13 Equipment that has been repaired in accordance with the instructions given to the CSR at the time the RMA was issued and where charges have been incurred for which there is no covering purchase order, the following conditions apply:

- Completed repairs that are aged greater than 30 days following the end of repair for which no purchase order number or letter of credit (L/C) is provided will incur an interest charge of 1.5% per month of the repair charges.
- Completed repairs that are aged greater than 90 days following the end of repair for which no purchase order number or L/C is provided will become the property of Cisco to dispose of to enable recovery of the repair expense.

Important: Please help us to process your repairs/claims as quickly as possible by following the above procedure.

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