



Cisco Model DPC3000 Cable Modem 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.

<p>Note to System Installer</p> <p>For this apparatus, the coaxial cable shield/ screen shall be grounded as close as practical to the point of entry of the cable into the building. For products sold in the US and Canada, this reminder is provided to call the system installer's attention to Article 820-93 and Article 820-100 of the NEC (or Canadian Electrical Code Part 1), which provides guidelines for proper grounding of the coaxial cable shield.</p>	
 <p>This symbol is intended to alert you that uninsulated voltage within this product may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this product.</p>	<p>CAUTION: To reduce the risk of electric shock, do not remove cover (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.</p> <p>WARNING TO PREVENT FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.</p>  <p>This symbol is intended to alert you of the presence of important operating and maintenance (servicing) instructions in the literature accompanying this product.</p>

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.

<p>Remarque à l'attention de l'installateur du système</p> <p>Avec cet appareil, le blindage/écran du câble coaxial doit être mis à la terre aussi près que possible du point d'entrée du câble dans le bâtiment. En ce qui concerne les produits vendus aux États-Unis et au Canada, ce rappel est fourni pour attirer l'attention de l'installateur sur les articles 820-93 et 820-100 du Code national de l'électricité (ou Code de l'électricité canadien, Partie 1) qui fournissent des lignes directrices concernant la mise à la terre correcte du blindage (écran) du câble coaxial.</p>	
 <p>Ce symbole a pour but de vous prévenir que des tensions électriques non isolées existent à l'intérieur de ce produit, pouvant être d'une intensité suffisante pour causer des chocs électriques. Il est donc dangereux d'établir un contact quelconque avec l'une des pièces comprises à l'intérieur de ce produit.</p>	<p>ATTENTION : Pour réduire les risques de chocs électriques, ne pas enlever le couvercle (ou le panneau arrière). Ne contient aucune pièce réparable par l'utilisateur. Confier les interventions aux techniciens d'entretien qualifiés.</p> <p>AVERTISSEMENT POUR ÉVITER LES INCENDIES OU LES CHOCs ÉLECTRIQUES, NE PAS EXPOSER L'APPAREIL À LA PLUIE OU À L'HUMIDITÉ.</p>  <p>Ce symbole a pour but de vous prévenir de la présence d'instructions importantes relatives au fonctionnement ou à l'entretien (et aux réparations) dans la documentation accompagnant ce produit.</p>

IMPORTANT SAFETY INSTRUCTIONS

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.

<p>Mitteilung an den Systemtechniker</p> <p>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 Koaxialkabelschirms festgehalten sind.</p>	
 <p>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.</p>	<p>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.</p> <p>WARNUNG</p> <p>DAS GERÄT NICHT REGEN ODER FEUCHTIGKEIT AUSSETZEN, UM STROMSCHLAG ODER DURCH EINEN KURZSCHLUSS VERURSACHTEN BRAND ZU VERMEIDEN.</p> 
	<p>Dieses Symbol weist den Benutzer darauf hin, dass die mit diesem Produkt gelieferte Dokumentation wichtige Betriebs- und Wartungsanweisungen für das Gerät enthält.</p>

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.

<p>Nota para el instalador del sistema</p> <p>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.</p>	
 <p>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.</p>	<p>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.</p> <p>ADVERTENCIA</p> <p>PARA EVITAR EL RIESGO DE INCENDIO O DESCARGA ELÉCTRICA, NO EXPONGA LA UNIDAD A LA LLUVIA O A LA HUMEDAD.</p> 
	<p>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.</p>

20080814_Installer820_intl

IMPORTANT SAFETY INSTRUCTIONS

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) 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 are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12)  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.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) 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.

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! 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.

IMPORTANT SAFETY INSTRUCTIONS

Protect the Product from Lightning

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 may go 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.

Provide Ventilation and Select a Location

- Remove all packaging material before applying power to the product.
- 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 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.
- Do not block ventilation openings.

Protect from Exposure to Moisture and Foreign Objects



WARNING: Avoid electric shock and fire hazard! Do not expose this product to dripping or splashing liquids, rain, or moisture. Objects filled with liquids, such as vases, should not be placed on this apparatus.



WARNING: Avoid electric shock and fire hazard! Unplug this product before cleaning. 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.

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.

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.

20090915_Modem No Battery_Safety

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 service provider or an experienced radio/television technician for help.

Any changes or modifications not expressly approved by Cisco Systems, 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 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 Model: DPC3000 Manufactured by: Cisco Systems, Inc. 5030 Sugarloaf Parkway Lawrenceville, Georgia 30044 USA Telephone: 770-236-1077

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.

Radiation Exposure Statements

Note: This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 7.9 inches (20 cm) between the radiator and your body.

US

This system has been evaluated for RF exposure for humans in reference to ANSI C 95.1 (American National Standards Institute) limits. The evaluation was based in accordance with FCC OET Bulletin 65C rev 01.01 in compliance with Part 2.1091 and Part 15.27. The minimum separation distance from the antenna to general bystander is 7.9 inches (20 cm) to maintain compliance.

Canada

This system has been evaluated for RF exposure for humans in reference to ANSI C 95.1 limits. The evaluation was based on evaluation per RSS-102 Rev 2. The minimum separation distance from the antenna to general bystander is 7.9 inches (20 cm) to maintain compliance.

EU

This system has been evaluated for RF exposure for humans in reference to the ICNIRP (International Commission on Non-Ionizing Radiation Protection) limits. The evaluation was based on the EN 50385 Product Standard to Demonstrate Compliance of Radio Base Stations and Fixed Terminals for Wireless Telecommunications Systems with basic restrictions or reference levels related to Human Exposure to Radio Frequency Electromagnetic Fields from 300 MHz to 40 GHz. The minimum separation distance from the antenna to general bystander is 20 cm (7.9 inches).

Australia

This system has been evaluated for RF exposure for humans as referenced in the Australian Radiation Protection standard and has been evaluated to the ICNIRP (International Commission on Non-Ionizing Radiation Protection) limits. The minimum separation distance from the antenna to general bystander is 20 cm (7.9 inches).

20091016 FCC DSL_Dom and Intl

Contents

About This Guide	xv
Chapter 1 Introducing the Model DPC3000 Cable Modem	1
DPC3000 Features	2
DPC3000 Components	4
Theory of Operation	6
Chapter 2 Install the DPC3000 Cable Modem for Internet Service	11
Before You Begin.....	12
Mount the Cable Modem on the Wall if Desired	16
Install the Cable Modem.....	20
Install USB Drivers on the PC or Macintosh Computer	22
Chapter 3 Troubleshooting the Installation	25
Troubleshooting Overview.....	27
No Downstream Signal Lock	31
Ranging Not Complete	33
IP Connectivity Not Complete.....	35
Registration Not Complete.....	37
Frequently Asked Questions.....	39
Tips for Improved Performance	44
Check Cable Modem Status Messages.....	45
Event Logs.....	48
Chapter 4 Operating the DPC3000	55
WebWizard	56
Display Basic Cable Modem Information	59

Contents

Appendix A Specifications	73
Technical Specifications	74
Appendix B Scan Plan Algorithm for the DPC3000 Cable Modem	77
Scan Plan Algorithm Overview	78
Appendix C MIB for the DPC3000 Cable Modem	85
MIB Descriptions	86
Appendix D Cable Modem Warranty and RMA Information	147
Warranty and RMA Information.....	148
Index	155

About This Guide

Introduction

This installation and operation guide applies to the Cisco® Model DPC3000 Cable Modem. The DPC3000 cable modem provides DOCSIS® broadband service providers with a cost-effective solution for delivering high-speed bi-directional data services. The DPC3000 cable modem provides a faster connection to the Internet by incorporating four bonded downstream channels along with four bonded upstream channels. These bonded channels deliver downstream data rates in excess of 160 Mbps and upstream data rates up to 120 Mbps, up to four times faster than conventional single-channel DOCSIS 2.0 cable modems.

The DPC3000 is designed to meet DOCSIS 3.0 specifications as well as offering backward compatibility for operation in DOCSIS 2.0, 1.1 and 1.0 networks.

Scope

This guide provides the following design, performance, and technical information for understanding basic cable modem operation and function to familiarize you with the DPC3000 cable modem:

- Design and performance features
- Theory of operation
- Procedures for installing, operating, maintaining, and troubleshooting the DPC3000 using the WebWizard feature
- Appendixes that include technical specifications and the scan plan algorithm.

Note: This guide does not contain installation procedures for cable modem 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 DPC3000 cable modem.

About This Guide

Audience

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

Related Documents (for Cable Service Providers Only)

You can access other cable modem documents at the following website:

http://www.cisco.com/web/consumer/support/prod_modems.html

Important: This site is intended for our customers only.

Document Version

This is the first formal release of this document.

1

Introducing the Model DPC3000 Cable Modem

Introduction

This chapter provides an overview of the design and performance features of the DPC3000, the front and back panel components, and a theory of operation overview. This chapter also provides the requirements for the cable system and the subscriber's site.

In This Chapter

- DPC3000 Features 2
- DPC3000 Components 4
- Theory of Operation 6

DPC3000 Features

This section describes the features that your Cisco DPC3000 cable modem offers.

Design and Performance Features

The DPC3000 cable modem offers the following design and performance features:

Home Networking

- Provides a high-speed broadband Internet connection that energizes your online experience and helps enable trouble-free downloading and sharing files and photos with your family and friends
- Includes bridged Gigabit Ethernet (GigE) and 10/100BASE-T auto-sensing/auto-MDIX Ethernet ports. Some models also include a USB 2.0 data port for high-speed data services to other devices
- Supports up to 64 users (1 USB port and up to 63 users on user-supplied Ethernet hubs)
- Allows you to attach multiple devices in your home or office to the cable modem for high-speed networking and sharing of files and folders without first copying them onto a CD or diskette

Performance

- Provides a faster connection to the Internet by incorporating four bonded downstream channels along with four bonded upstream channels, up to four times faster than conventional single-channel DOCSIS 2.0 cable modems
- Enhances interoperability with most service providers by complying with the DOCSIS 3.0 specification to deliver high-end performance and reliability, and is backward compatible with DOCSIS 2.0, 1.1, and 1.0

Design and Function

- Color-coded connectors and cables for easy installation and setup
- Features Plug and Play operation for easy set up and installation
- Uses an attractive compact design and a versatile orientation to lie flat or stand vertically on a desktop or shelf, or mount easily on a wall

- LED status indicators on the front panel provide an informative and easy-to-understand display that indicates the cable modem status and real-time data transmission activity
- Includes the WebWizard graphical user interface for simple setup

Management

- Allows automatic software upgrades by your service provider

WebWizard

The DPC3000 includes 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, five 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.

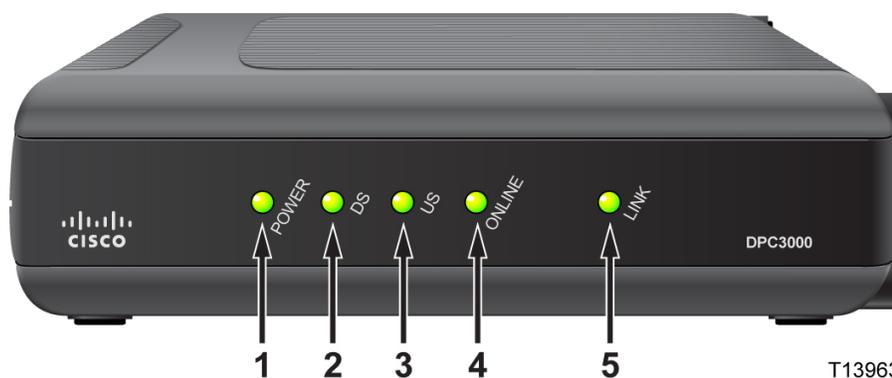
Note: For more information on the WebWizard feature, see *Display Basic Cable Modem Information* (on page 59).

DPC3000 Components

Front Panel Description

The front panel of the DPC3000 provides LED indicators. These 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.

See *Functions of Front Panel LED Status Indicators* (on page 28) for more information on front-panel LED status indicator functions.

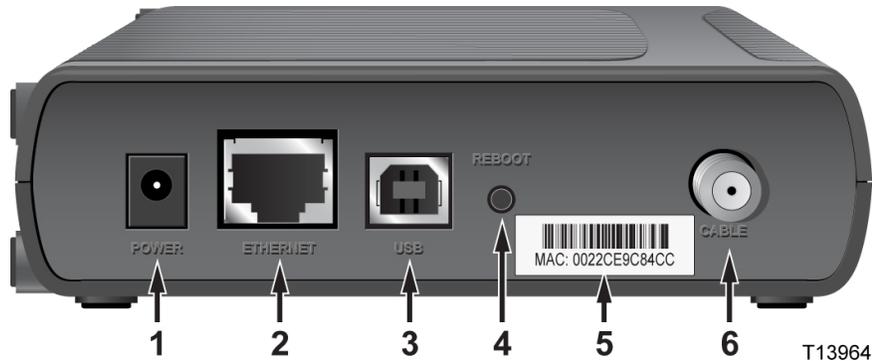


- 1 **POWER** – Illuminates solid green to indicate that power is being applied to the cable modem
- 2 **DS (Downstream)** – Illuminates to indicate that the cable modem is locked onto the downstream signal(s). The DS LED blinks to indicate that the cable modem is scanning for the downstream signal.
- 3 **US (Upstream)** – Illuminates to indicate that the upstream connection is operational
- 4 **ONLINE** – Illuminates to indicate that the cable modem is registered on the network and fully operational
- 5 **LINK** – Off when no Ethernet or USB device is present, illuminates to indicate that an Ethernet or USB device is connected, and blinks to indicate that data is being transferred between the PC and the cable modem

Note: After the cable modem is successfully registered on the network, the **POWER** (LED 1) **DS** (LED 2), **US** (LED 3), and **ONLINE** (LED 4) indicators illuminate continuously to indicate that the cable modem is online and fully operational.

Back Panel Description

The following illustration describes the back panel components of the DPC3000 DOCSIS 3.0 cable modem.



- 1 **POWER** – Connects the cable modem to the 12 VDC 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 and power cord that is provided with your cable modem.

- 2 **ETHERNET** – Bridged RJ-45 1000/100/10 BASE-T Ethernet port connects to the Ethernet port on your PC.
- 3 **USB** – USB 2.0 port connects to the USB port on your PC.
Note: The USB port may not be included on all modems.
- 4 **REBOOT** – Reset-to-Default momentary switch (Factory Reset)
Note: This button is for maintenance purposes only. Do not use unless told to do so by your service provider.
- 5 **MAC Address Label** – Displays the MAC address of the cable modem
- 6 **CABLE** – F-Connector connects to an active cable signal from your service provider

Theory of Operation

This section summarizes the theory of operation for the DPC3000 cable modem and provides a high-level overview of the operational stages for the cable modem. Reading this chapter provides a better understanding of how the DPC3000 cable modem operates.

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

Cable Modem Initialization

A cable modem 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 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 Service Group Discovery and Ranging
- 3 Early Authentication and Encryption (EAE)
- 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 (if EAE not in use)

Scan for Downstream Channel

When the cable modem powers on, it 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. The cable modem 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 signal at an upstream location and provides the cable modem with a network connection.

This section discusses the cable modem downstream scanning routine along with following features that speed up the downstream scanning process:

- Valid CMTS Frequency Table
- WebWizard Scan Page

Downstream Scanning Routine

The cable modem starts its own standard scanning algorithm. The scanning routine of the cable modem 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 stops scanning when the cable modem finds a valid downstream data channel. The cable modem then proceeds to the next stage: obtain upstream parameters.

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

- 1 The cable modem starts to scan the network at 453 MHz and scans up in 6 MHz increments to end at 998 MHz.
- 2 The cable modem 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.

Speed Up Downstream Scanning

The cable modem contains two features 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 finds a valid downstream data channel so that it can complete the ranging stage, the cable modem stores this frequency in nonvolatile memory (NVM). The cable modem checks the frequencies stored in NVM before starting the standard scanning algorithm to search for a downstream data channel.

Note: The cable modems 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 resumes its standard scanning algorithm where it left off.

WebWizard Scan Page

When installing a cable modem, you can speed up the process by using the WebWizard Scan page. To access the WebWizard Scan page, you must first connect a PC to the cable modem. Then, using your Web browser, you can access the WebWizard Scan page.

Note: For more information on the WebWizard Scan page see *Use the WebWizard to Verify Configuration* (on page 61).

Service Group Discovery and Ranging

After finding a valid downstream channel, the cable modem must attempt to collect information about the channel bonding configuration supported in DOCSIS 3.0. If there is no DOCSIS 3.0 information available on the downstream, then the cable modem will attempt to continue in a DOCSIS 2.0 non-channel-bonded configuration.

If the cable modem successfully collects DOCSIS 3.0 information, it will proceed to determine both the Downstream Service group and the Upstream Service group, collectively known as the Cable Modem Service Group (CM-SG).

During both DOCSIS 3.0 and 2.0 registration, it is necessary to establish communication with the CMTS in the upstream direction. In this stage, the cable modem adjusts the timing offset and the power level for communicating with the CMTS.

The cable modem 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. This process also determines the upstream signal transmit power level from the cable modem to communicate with the CMTS.

In a DOCSIS 3.0 network utilizing upstream channel bonding, the cable modem may be required to initialize upstream communication on multiple upstream channels. After the cable modem completes the ranging stage and registers with the CMTS, it regularly fine-tunes the upstream power and timing. These regular adjustments are considered routine maintenance and do not affect normal operations of your cable modem service.

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

Early Authentication and Encryption (EAE)

A new feature for DOCSIS 3.0 is the capability to encrypt messages exchanged with the network during the provisioning process. Early Authentication and Encryption (EAE) must be enabled from the CMTS and uses a similar process to DOCSIS Baseline Privacy for establishing the encrypted link. If EAE is enabled, the cable modem will not need to perform Baseline Privacy initialization later in the provisioning process.

Establish IP Connectivity

After completing the ranging and automatic adjustments stage, the cable modem attempts to establish Internet Protocol (IP) connectivity. Based on the network configuration, the cable modem is able to receive either an IPv4 address, an IPv6 address, or both. In this stage, the cable modem obtains network connection information and a cable modem IP address from provisioning servers that are located on the network side of the CMTS interface.

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

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

Note: The cable modem 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 periodically repeats this stage to attempt to establish the time of day.

Transfer Operational Parameters

After the cable modem requests the time of day, the cable modem then requests the transfer of the cable modem configuration file. The cable modem makes the request to the Trivial File Transfer Protocol (TFTP/TFTPv6) server. The configuration file contains parameters for how the system operator wants the cable modem to function on the cable network.

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

Register with the CMTS

After the cable modem completes the transfer operational parameters stage, the cable modem now registers with the CMTS. During this stage for DOCSIS 3.0, the CMTS will also inform the cable modem of the upstream/downstream channel bonding configuration that should be used. After the cable modem receives a reply from the CMTS confirming its registration request, the cable modem is now authorized to forward network traffic from the CPE.

Initialize Baseline Privacy (if EAE not in use)

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

2

Install the DPC3000 Cable Modem for Internet Service

Introduction

This chapter provides information and procedures to assist you in placing, installing, configuring, operating, and troubleshooting the DPC3000 for high-speed Internet service.

In This Chapter

- Before You Begin..... 12
- Mount the Cable Modem on the Wall if Desired 16
- Install the Cable Modem..... 20
- Install USB Drivers on the PC or Macintosh Computer..... 22

Before You Begin

This section provides the minimum requirements for installing the DPC3000 in your system and in subscribers' homes.

Cable System Requirements

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

- DOCSIS 3.0
- DOCSIS 2.0
- DOCSIS 1.1
- DOCSIS 1.0

Important: This guide does not cover installing cable modem 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, check the items in the carton. The carton contains the following items, except as noted:

- One DPC3000 cable modem
- One Ethernet cable (CAT5/RJ-45)
- One USB cable (optional)
- One AC power adapter
- One CD-ROM containing the user guide and the USB drivers

Notes:

- An optional 1 GHz cable signal splitter and an additional standard RF coaxial cable is needed to connect to a VCR, a digital set-top converter, or a TV to the same cable connection as your cable modem.
- 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 the cable modem 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
- Web-browsing software, such as 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 Gigabit Ethernet or 10/100BaseT Ethernet network interface card (NIC) installed in your PC

USB Requirements (Optional)

- A PC with Microsoft Windows 98SE, ME, 2000, XP or Vista operating system
- A master USB port installed in your PC

Note: Not all models support the USB port.

Contacting the Local Service Provider

Before you can use your cable modem, 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

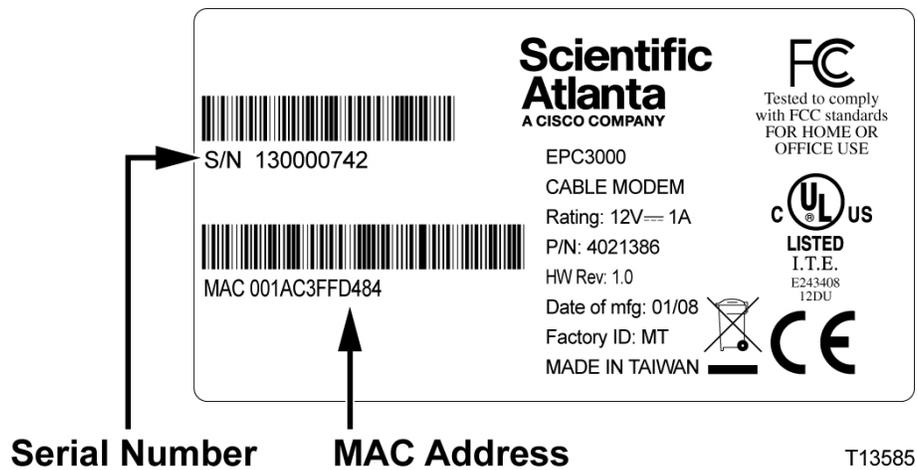
If you do *not* have a high-speed Internet access account, your service provider will set up your account and become your Internet Service Provider (ISP). Internet access enables you to send and receive e-mail, access the World Wide Web, and receive other Internet services.

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

These numbers appear on a bar code label located on the cable modem. 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 **CM MAC**. The following illustration shows a sample bar code label.

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



Write down these numbers in the space provided here.

Serial Number _____

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. 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. Contact your service provider for more information.

Locating the DPC3000

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

Consider these recommendations:

- Position the PC and cable modem so that they are located near an AC power outlet.
- Position the PC and cable modem 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 should not be restricted.
- Choose a location that protects the cable modem from accidental disturbance or harm.

Mount the Cable Modem on the Wall if Desired

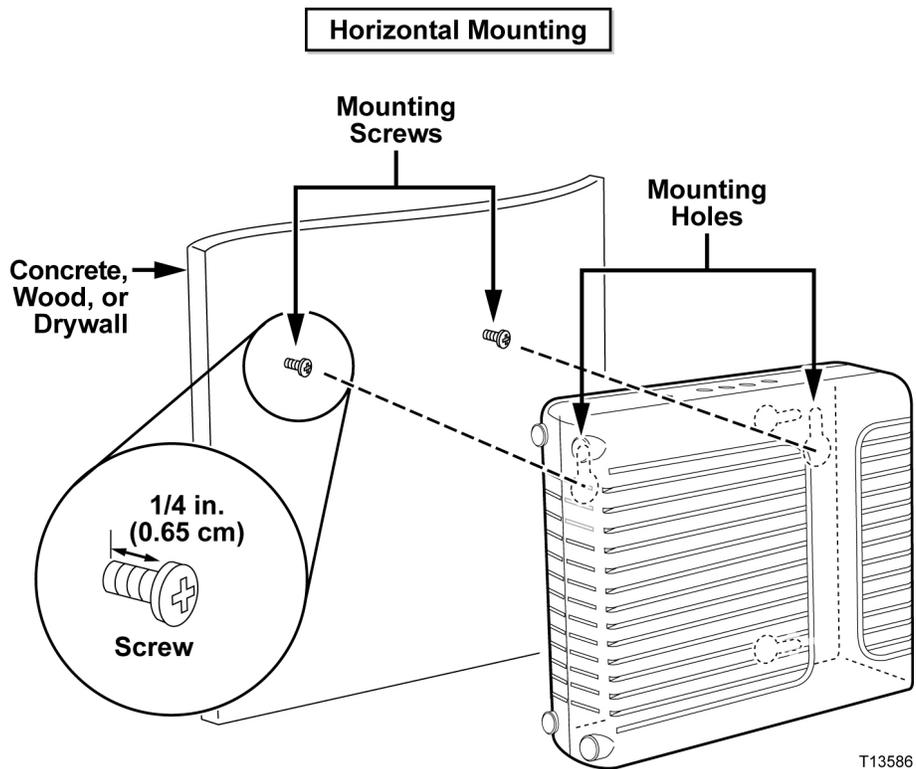
Before You Begin

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 without strain. Leave sufficient clearance between the bottom of the cable modem, 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

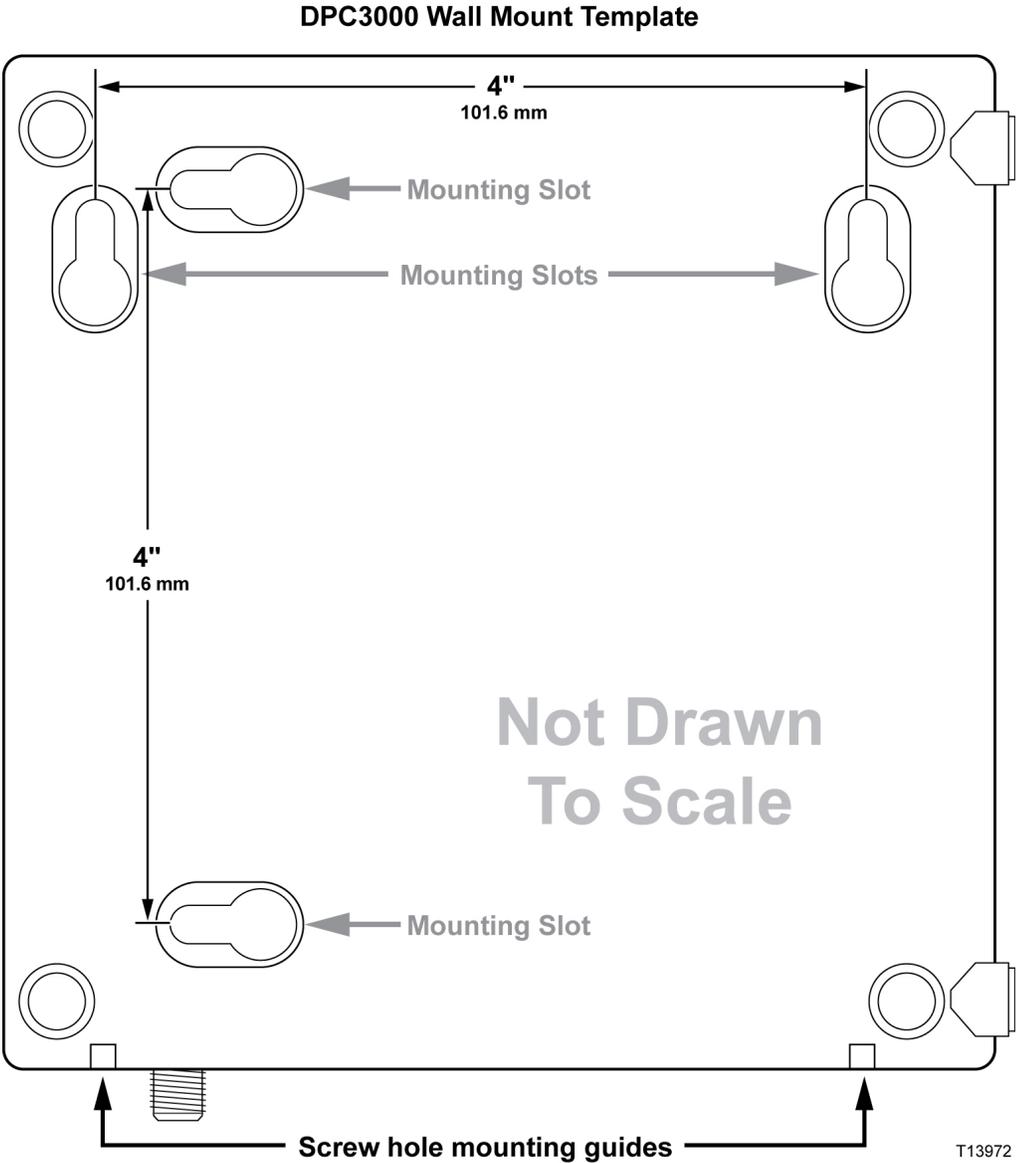
Mounting Instructions

You can mount the DPC3000 cable modem 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. Mount the modem as shown in the following illustration.



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 Locate the place where you want to mount the modem to the wall.
- 2 Hold the modem level against the wall and at an angle so that the screw hole mounting guides are facing up and against the wall.
- 3 Lay a pencil, pen, or other marking tool into each guide and mark the place on the wall where you want to drill the mounting holes.
- 4 Using a drill with a 3/16-inch bit, drill two holes at the same height and 4 inches apart.
- 5 Are you mounting the cable modem 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 6.
 - If **no**, go to step 6.
- 6 Install the mounting screws into the wall or the anchor bolts, as appropriate, and leave a gap of about 1/4-inch between the screw head and the wall.
- 7 Verify that no cables or wires are connected to the cable modem.
- 8 Lift the cable modem 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.

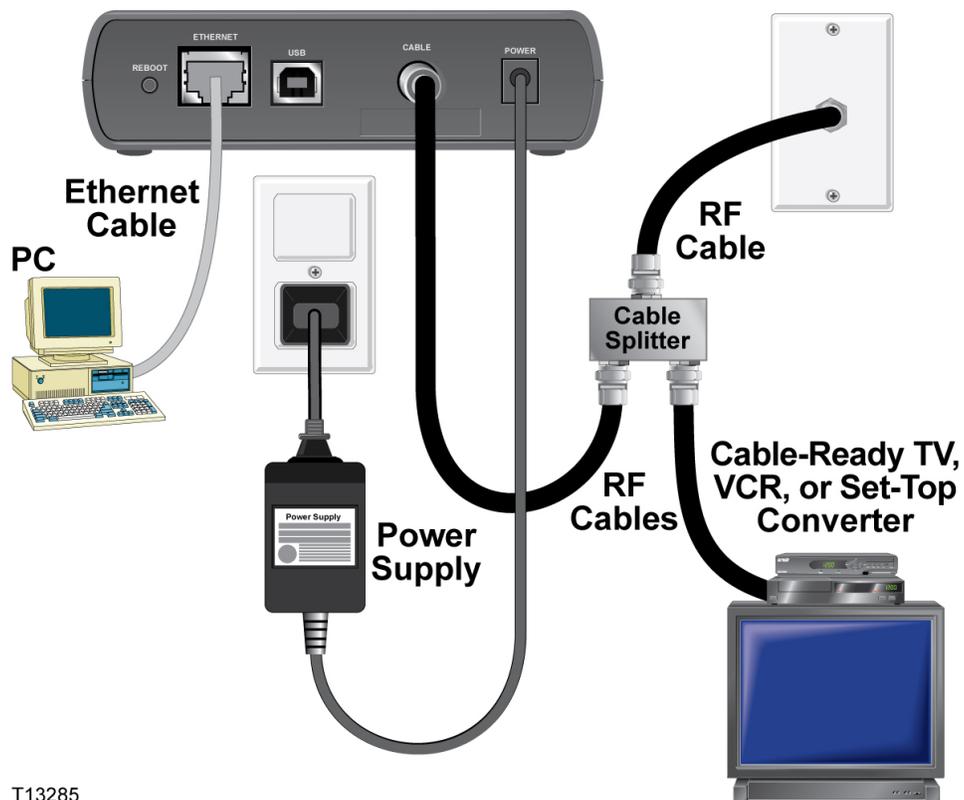
Important: Verify that the mounting screws securely support the modem before you release the unit.
- 9 Connect the cables and wires to the modem.

Install the Cable Modem

You can use the cable modem to access the Internet. You can also share that Internet connection with other Internet devices in your home or office. Sharing one connection among many devices is called networking. This section describes how to install the cable modem in the home.

Installation Diagram

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



T13285

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.

Wiring and connections must be properly insulated to prevent electrical shock.

Disconnect power from the modem before attempting to connect to any device.

- 1 Power off your PC and other networking devices; then, unplug them from the power source.
- 2 Connect the active RF coaxial cable from your service provider to the coax connector labeled **CABLE** on the back of the modem.
Note: To connect a TV, DHCT, set-top box, or VCR from the same cable connection, you will need to install a cable signal splitter (not included).
- 3 Locate the yellow Ethernet cable. Connect one end of the Ethernet cable to the Ethernet port on your PC and then connect the other end to the **ETHERNET** port on the modem. The Ethernet port is the yellow connector on the back panel of the modem.
Note: To install more Ethernet devices than ports provided, use an external multi-port Ethernet switch(es).
- 4 Insert the AC power cord into the **POWER** connector on the back of the cable modem, 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 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 **ONLINE** LED status indicator on the front panel stops blinking and illuminates continuously.
- 6 The next step in setting up your cable modem 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 *Q. How Do I Configure TCP/IP Protocol?* (on page 39).
 - 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 the PC or Macintosh Computer* (on page 22).

Install USB Drivers on the PC or Macintosh Computer

This section contains instructions for installing the cable modem 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

- 1 Insert the **USB Cable Modem Driver Installation Disk** into the CD-ROM drive of your PC.
- 2 Make sure the power is connected to your cable modem and that the **POWER** LED status indicator on the front panel of the cable modem illuminates solid green.
- 3 Connect the USB cable to your computer's USB port. Then, connect the other end of the USB cable to the USB port on the gateway.
- 4 Click **Next** in the Found New Hardware Wizard window.
- 5 Select **Search for a suitable driver for my device (recommended)** in the Found New Hardware Wizard window, and then click **Next**.
- 6 Select **CD-ROM drives** in the Found New Hardware Wizard window, and then click **Next**.
- 7 Click **Next** in the Found New Hardware Wizard window. The system searches for the driver file for your hardware device.
- 8 After the system finds the USB driver, the Digital Signature Not Found window opens and displays a confirmation message to continue the installation.
- 9 Click **Yes** to continue the installation. The Found New Hardware Wizard window reopens with a message that the installation is complete.
- 10 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.
- 11 Try to access the Internet. If you cannot access the Internet, go to *Frequently Asked Questions* (on page 39). 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 **ONLINE** LED status indicator on the front panel of the cable modem illuminates 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 *Frequently Asked Questions* (on page 39). If you still cannot access the Internet, contact your service provider for further assistance.

3

Troubleshooting the Installation

Introduction

This chapter provides descriptions of possible cable modem performance and installation issues that may occur after the cable modem 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. 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 installers, and network support engineers.

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 is registered on the network. The vendor-specific MIB for controlling access to the WebWizard does not take effect until after the cable modem registers with the CMTS.

In This Chapter

■ Troubleshooting Overview	27
■ No Downstream Signal Lock	31
■ Ranging Not Complete	33
■ IP Connectivity Not Complete.....	35
■ Registration Not Complete.....	37
■ Frequently Asked Questions.....	39
■ Tips for Improved Performance	44
■ Check Cable Modem Status Messages.....	45
■ Event Logs	48

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 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 situations and conditions described in this chapter. Use this table as a quick reference for troubleshooting your cable modem.

Note: Detailed troubleshooting procedures for each of the conditions described in this table follow next 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
DS	OFF	BLINKING (1 time per second)	ON	ON	ON
US	OFF	OFF	BLINKING (1 time per second)	ON	ON
ONLINE	OFF	OFF	OFF	OFF	BLINKING (1 time per second)
LINK	OFF	ON or BLINKING	ON or BLINKING	ON or BLINKING	ON or BLINKING

Functions of Front Panel LED Status Indicators

Initial Power Up, Calibration, and Registration

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

Note: After the cable modem completes step 8 (Registration Complete), the modem proceeds immediately to step 9, Normal Operations. See the table in *Normal Operations* (on page 29).

Front Panel LED Status Indicators During Initial Power-Up, Calibration, and Registration									
Step		1	2	3	4	5	6	7	8
Front Panel Indicator		Power Up	Self Test	Down-stream Scan	Down-stream Signal Lock	Ranging	Requesting IP Address	Registering	Registration Complete
1	POWER	On	On	On	On	On	On	On	On
2	DS	Blinks	On 1 sec	Blinks	On	On	On	On	On*
3	US	Blinks	On 1 sec	Off	Off	Blinks	On	On	On
4	ONLINE	Blinks	On 1 sec	Off	Off	Off	Off	Blinks	On
5	LINK	Off	On 1 sec	Off - When no devices are connected to the Ethernet or USB ports On - When devices are connected to the Ethernet or USB ports Blinks - When data activity is present					
* The DS LED can illuminate green or amber. Green denotes normal operation. Amber denotes that the modem has failed to go online channel bonded and has reverted to narrow band operation.									

Normal Operations

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

Front Panel LED Status Indicators During Normal Operations		
Step	9	
Front Panel Indicator	Normal Operations	
1	POWER	On
2	DS	On
3	US	On
4	ONLINE	On
5	LINK	<p>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</p> <p>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</p> <p>Off - When no devices are connected to either the Ethernet or USB ports</p> <p>Notes:</p> <ul style="list-style-type: none"> ■ When both Ethernet and USB devices are connected to the modem at the same time, and data is being transferred through only one of the devices (Ethernet or USB), the LINK LED status indicator illuminates continuously. ■ Whenever data is being sent through <i>both</i> data ports (Ethernet and USB) simultaneously, the indicator blinks as described above.

Special Conditions

The following table describes the appearance of the cable modem front panel LED status indicators during special conditions to show that you have been denied network access.

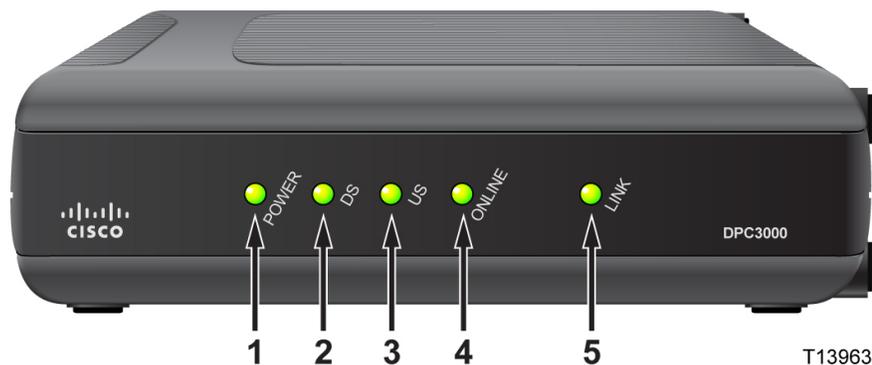
Front Panel LED Status Indicators During Special Conditions		
Front Panel Indicator		Network Access Denied
1	POWER	On
2	DS	Blinking 2 times per second
3	US	Blinking 2 times per second
4	ONLINE	Blinking 2 times per second
5	LINK	<p>ON - When a single device is connected to either the Ethernet or USB port and no data is being sent to or from the modem</p> <p>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</p> <p>OFF - When no devices are connected to either the Ethernet or USB ports</p> <p>Notes:</p> <ul style="list-style-type: none"> ■ When both Ethernet and USB devices are connected to the modem at the same time, and data is being transferred through only one of the devices (Ethernet or USB), the LINK LED status indicator illuminates continuously. ■ Whenever data is being sent through <i>both</i> data ports (Ethernet and USB) simultaneously, the indicator blinks as described above

No Downstream Signal Lock

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

Note: For more information on this process, see *Scan for Downstream Channel* (on page 6).

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



LED	Label	Status
1	POWER	ON
2	DS	BLINKING 1 time per second
3	US	OFF
4	ONLINE	OFF
5	LINK	ON or BLINKING

Check and Correct

- 1 On initial installation, or after a reset, allow the cable modem 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, access the WebWizard by entering the following IP address: **http://192.168.100.1**. The Web browser accesses the WebWizard and the Status page opens with the DOCSIS WAN tab in the forefront.
- 3 Select the **DOCSIS Signal** tab.
- 4 When the DOCSIS Signal page opens, verify that the cable modem locks to the downstream channel of the CMTS.
- 5 Check the power level and the Signal-to-Noise ratio to verify if it is outside of the operating range.

Note: When the cable modem is unable to lock on to any downstream channel, there will be no Signal-to-Noise ratio entry.

Chapter 3 Troubleshooting the Installation

- 6 Is the ratio outside of the operating range?
 - If **yes**, correct the downstream channel to the cable modem.
 - If **no**, go to step 7.
- 7 Check the status of the CMTS.
- 8 Check the status of the CMTS signal on the node attached to the cable modem.

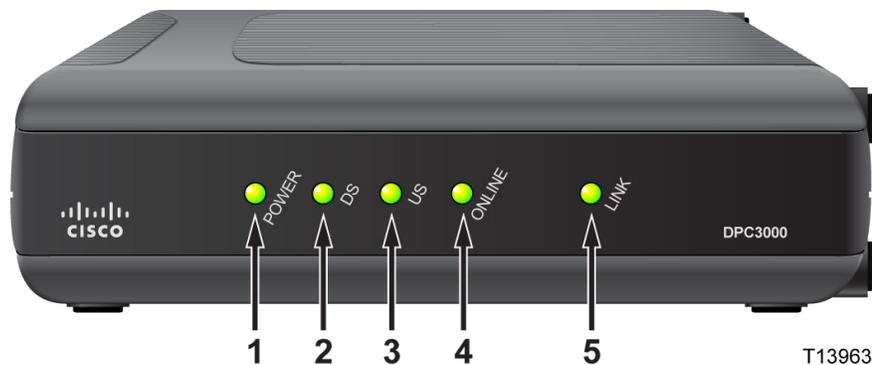
Ranging Not Complete

Description

After the cable modem 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 *Service Group Discovery and Ranging* (on page 8).

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



LED	Label	Status
1	POWER	ON
2	DS	ON
3	US	BLINKING 1 time per second
4	ONLINE	OFF
5	LINK	ON or BLINKING

Check and Correct

- 1 Using the Web browser on the PC attached to the cable modem, access the WebWizard by entering the following IP address: **http://192.168.100.1**. The Web browser accesses the WebWizard and the Status page opens with the DOCSIS WAN tab in the forefront.
- 2 Select the **DOCSIS Signal** tab.
- 3 When the DOCSIS Signal page opens, verify that the cable modem locks to the downstream channel of the CMTS.
- 4 Check the upstream power level and the Signal-to-Noise ratio to verify if it is outside of the operating range.

Chapter 3 Troubleshooting the Installation

- 5 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 6.
- 6 Check the status of the CMTS.
- 7 Check the status of the CMTS signal on the node attached to the cable modem.

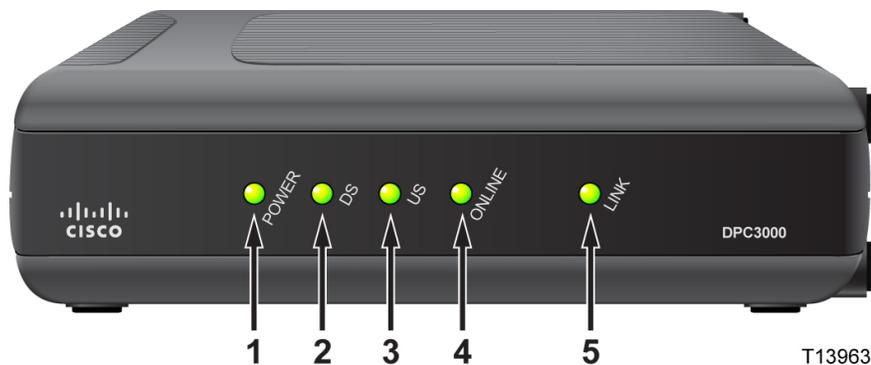
IP Connectivity Not Complete

Description

After completing the ranging stage, the cable modem then tries to establish IP connectivity. In this process the cable modem obtains network connection information and a cable modem IP address from provisioning servers located on the network side of the CMTS interface. The cable modem 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 9).

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



LED	Label	Status
1	POWER	ON
2	DS	ON
3	US	ON
4	ONLINE	OFF
5	LINK	ON or BLINKING

Check and Correct

- 1 Using the Web browser on the PC attached to the cable modem, access the WebWizard by entering the following IP address: **http://192.168.100.1**. The Web browser accesses the WebWizard and the Status page opens with the DOCSIS WAN tab in the forefront.
- 2 Select the **DOCSIS Status** tab and verify the setting listed for the **Cable Modem Status**.

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 should be at this status)  
DHCPV4_COMPLETE
```

- 3 If the cable modem shows the status of **rangingComplete**, the cable modem 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 DHCP traffic, check the DHCP server for possible problems.

Registration Not Complete

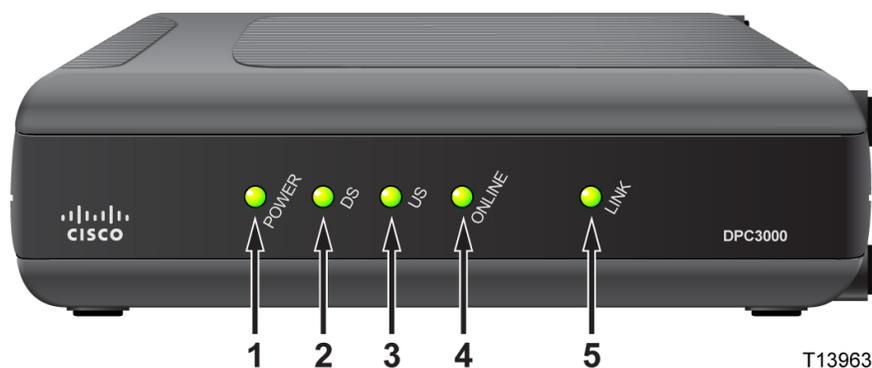
Description

In this phase, the cable modem requests the time of day and the configuration file for the cable modem. The configuration file contains operational parameters for how the user wants the cable modem to operate on the system. If the cable modem 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 may try to immediately sign on again or resume the downstream scan. After the cable modem completes the transfer operational parameters stage, the cable modem is able to register with the CMTS.

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

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



LED	Label	Status
1	POWER	ON
2	DS	ON
3	US	ON
4	ONLINE	BLINKING (1 time per second)
5	LINK	ON or BLINKING

Check and Correct

- 1 Using the Web browser on the PC attached to the cable modem, access the WebWizard by entering the following IP address: **http://192.168.100.1**. The Web browser accesses the WebWizard and the Status page opens with the DOCSIS WAN tab in the forefront.
- 2 Select the **DOCSIS Status** tab and verify the setting listed for the Cable Modem Status.

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
DHCPV4_COMPLETE - (The cable modem should be at this status)
todEstablished
CONFIG_FILE_DOWNLOAD_COMPLETE
registrationComplete
operation
accessDenied
```

- 3 On the **DOCSIS 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 35).
- 4 On the **DOCSIS 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 Select the **DOCSIS Log** tab. 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.

Frequently Asked Questions

Q. How Do I Configure TCP/IP Protocol?

A. To configure TCP/IP protocol, you need to have an Ethernet Network Interface Card (NIC) with TCP/IP communications protocol installed on your system. TCP/IP is a communications protocol used to access the Internet. This section contains instructions for configuring TCP/IP on your Internet devices to operate with the cable modem in Microsoft Windows or Macintosh environments.

TCP/IP protocol in a Microsoft Windows environment is different for each operating system. Follow the appropriate instructions in this section for your operating system.

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, 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.

Chapter 3 Troubleshooting the Installation

- 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, 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 page. 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.

Q. How Do I Renew the IP Address on My PC?

A. If your PC cannot access the Internet after the cable modem 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 **wiipcfg** in the Open field, and click **OK** to execute the wiipcfg 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.

Q. What if I don't subscribe to cable TV?

A. If cable TV is available in your area, data service may be made available with or without subscribing to cable TV service. Contact your local service provider for complete information on cable services, including high-speed Internet access.

Q. How do I arrange for installation?

A. Call your service provider to inquire about professional installation. A professional installation ensures proper cable connection to the modem and to your PC, and it ensures the proper configuration of all hardware and software settings. Contact your service provider for more information about installation.

Q. How does the cable modem connect to my computer?

A. The cable modem connects to the USB port or to the 1000/100BASE-T Ethernet port on your PC. If you want to use an Ethernet interface, Ethernet cards available from your local PC or office supply retailer, or from your service provider. For best performance over an Ethernet connection, your PC should be equipped with a Gigabit Ethernet card.

Q. After my cable modem is connected, how do I access the Internet?

A. Your local service provider becomes your Internet Service Provider (ISP). They offer a wide range of services including e-mail, chat, news, and information services. Your service provider will provide the software you will need.

Q. Can I watch TV and surf the Internet at the same time?

A. Absolutely! If you subscribe to cable television service, you can watch TV and use your cable modem at the same time by connecting your TV and your cable modem to the cable network using an optional cable signal splitter.

Q. Can I run more than one device on the modem?

A. Yes. If your service provider permits, a single cable modem can support up to 63 Ethernet devices utilizing user-supplied Ethernet hubs or routers that you can purchase at your local PC or office supply retailer. Another user at your location can simultaneously connect to the USB port on the cable modem. Contact your service provider for further assistance.

Common Troubleshooting Issues

I don't understand the front panel status indicators

See *Summary of Front Panel LED Status Indicators* (on page 27), for more detailed information on front panel LED status indicator operation and function.

The cable modem does not register an Ethernet connection

- Verify that your computer 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.
- Verify the status of the front panel status indicator lights.

The cable modem does not register an Ethernet connection after connecting to a hub

If you are connecting multiple PCs to the cable modem, you should first connect the modem to the uplink port of the hub using the correct crossover cable. The LINK LED of the hub will illuminate continuously.

The cable modem does not register a cable connection

- The modem works with a standard 75-ohm RF coaxial cable. If you are using a different cable, your cable modem will not function properly. Contact your cable service provider to determine whether you are using the correct cable.
- Your NIC card or USB interface may be malfunctioning. Refer to the troubleshooting information in the NIC or USB documentation.

Tips for Improved Performance

Check and Correct

If your cable modem does not perform as expected, the following tips may help. If you need further assistance, contact your service provider.

- Verify that the plug to your cable modem AC power is properly inserted into an electrical outlet.
- Verify that your cable modem 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 **ONLINE** LED status indicator on the front panel of your cable modem is illuminated.
- Verify that your cable service is active and that it supports two-way service.
- Verify that all cables are properly connected, and that you are using the correct cables.
- Verify that your TCP/IP is properly installed and configured if you are using the Ethernet connection.
- Verify that you have followed the procedures in *Install USB Drivers on the PC or Macintosh Computer* (on page 22) 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.
- If you are using a cable signal splitter so that you can connect the cable modem to other devices, remove the splitter and reconnect the cables so that the cable modem is connected directly to the cable input. If the cable modem 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 Gigabit Ethernet card.

Check Cable Modem Status Messages

The following cable modem state information is available from the cable modem system status web page and docsIfCmStatusValue MIB. This field indicates the current cable modem connectivity state, as specified in the RF Interface Specification.

- 1 other(1)
- 2 notReady(2)
- 3 notSynchronized(3)
- 4 phySynchronized(4)
- 5 usParametersAcquired(5)
- 6 rangingComplete(6)
- 7 DHCPV4Complete(7)
- 8 todEstablished(8)
- 9 securityEstablished(9)
- 10 CONFIG_FILE_DOWNLOAD_COMPLETE(10)
- 11 registrationComplete(11)
- 12 operational(12)
- 13 accessDenied(13)
- 14 EAE_IN_PROGRESS
- 15 DHCPV4_IN_PROGRESS
- 16 DHCPV6_IN_PROGRESS
- 17 REGISTRATION_IN_PROGRESS
- 18 BPI_INIT
- 19 FORWARDING_DISABLED
- 20 DS_TOPOLOGY_RESOLUTION_IN_PROGRESS
- 21 RANGING_IN_PROGRESS
- 22 RF_MUTE_ALL

other

'other' indicates any state not described below.

notReady

'notReady' indicates that the CM has not started the registration process yet.

notSynchronized

'notSynchronized' indicates that the CM has not initiated or completed the synchronization of the downstream physical layer.

phySynchronized

'phySynchronized' indicates that the CM has completed the synchronization of the downstream physical layer.

usParametersAcquired

'usParametersAcquired' indicates that the CM has completed the upstream parameters acquisition or have completed the downstream and upstream service groups resolution, whether the CM is registering in a pre-3.0 or a 3.0 CMTS.

rangingComplete

'rangingComplete' indicates that the CM has completed initial ranging and received a Ranging Status of success from the CMTS in the RNG-RSP message.

DHCPV4_COMPLETE

'DHCPV4_COMPLETE' indicates that the CM has received a DHCPv4 ACK message from the CMTS.

todEstablished

'todEstablished' indicates that the CM has successfully acquired time of day. If the ToD is acquired after the CM is operational, this value SHOULD not be reported.

securityEstablished

'securityEstablished' indicates that the CM has successfully completed the BPI initialization process.

CONFIG_FILE_DOWNLOAD_COMPLETE

'CONFIG_FILE_DOWNLOAD_COMPLETE' indicates that the CM has completed the configuration file download process.

registrationComplete

'registrationComplete' indicates that the CM has successfully completed the Registration process with the CMTS.

accessDenied

'accessDenied' indicates that the CM has received a registration aborted notification from the CMTS.

operational

'operational' indicates that the CM has completed all necessary initialization steps and is operational.

EAE_IN_PROGRESS

'EAE_IN_PROGRESS' indicates that Early Authentication and Encryption is in progress.

DHCPV4_IN_PROGRESS

'DHCPV4_IN_PROGRESS' indicates IPv4 address is being acquired.

DHCPV6_IN_PROGRESS

'DHCPV6_IN_PROGRESS' indicates IPv6 address is being acquired.

DHCPV6_COMPLETE

'DHCPV6_COMPLETE' indicates IPv6 address obtained.

REGISTRATION_IN_PROGRESS

'REGISTRATION_IN_PROGRESS' indicates that the modem is registering with CMTS.

BPI_INIT

'BPI_INIT' indicates Baseline Privacy is initializing.

FORWARDING_DISABLED

'FORWARDING_DISABLED' indicates that the bridging mode is disabled.

DS_TOPOLOGY_RESOLUTION_IN_PROGRESS

'DS_TOPOLOGY_RESOLUTION_IN_PROGRESS' indicates downstream service group resolution in progress.

RANGING_IN_PROGRESS

'RANGING_IN_PROGRESS' indicates Upstream ranging in progress.

RF_MUTE_ALL

'RF_MUTE_ALL' indicates that the RF connection is disconnected.

Event Logs

Event logs provide additional information about the modem that can be used for troubleshooting. The following event groups and logs are supported.

Ranging Logs

Priority	Group	Object
Critical	RANGING	Received Response to Broadcast Maintenance Request, But no Unicast Maintenance opportunities received - T4 time out
Critical	RANGING	No Ranging Response received - T3 time-out
Critical	RANGING	Ranging Request Retries exhausted
Critical	RANGING	Started Unicast Maintenance Ranging - No Response received - T3 time-out

TOD (Time of Day) Logs

Priority	Group	Object
Warning	TOD	ToD request sent - No Response received
Warning	TOD	ToD Response received - Invalid data format
Error	TOD	ToD request sent- No Response received
Error	TOD	ToD Response received – Invalid data format

DHCP (Dynamic Host Configuration Protocol) Logs

Priority	Group	Object
Critical	DHCP	DHCP FAILED - Discover sent, no offer received
Critical	DHCP	DHCP FAILED - Request sent, No response
Critical	DHCP	DHCP FAILED - Requested Info not supported.
Critical	DHCP	DHCP FAILED - Response doesn't contain ALL the valid fields as described in the RFI spec Annex D
Critical	DHCP	DHCP failed – RS sent, no RA received
Critical	DHCP	DHCP Failed – Invalid RA
Critical	DHCP	DHCP failed – DHCP Solicit sent, No DHCP Advertise received
Error	DHCP	DHCP RENEW sent – No response for <P1>
Error	DHCP	DHCP REBIND sent – No response for <P1>
Error	DHCP	DHCP RENEW sent – Invalid DHCP<P1> option
Error	DHCP	DHCP REBIND sent – Invalid DHCP option
Error	DHCP	Primary lease failed, IPv4 fallback initiated
Critical	DHCP	DHCP failed – DHCP Request sent, No DHCP REPLY received
Error	DHCP	Primary address acquired, secondary failed
Error	DHCP	Primary address failed, secondary active
Notice	DHCP	DHCP Reconfigure received
Notice	DHCP	DHCP Renew - lease parameters <P1> modified

TFTP (Trivial File Transfer Protocol) Logs

Priority	Group	Object
Critical	TFTP	TFTP failed - Request sent - No Response
Critical	TFTP	TFTP failed - configuration file NOT FOUND
Critical	TFTP	TFTP Failed - OUT OF ORDER packets
Critical	TFTP	TFTP file complete - but failed Message Integrity check MIC
Critical	TFTP	TFTP file complete - but missing mandatory TLV
Critical	TFTP	TFTP Failed - file too big
Critical	TFTP	TFTP file complete- but doesn't enable 2.0 Mode - conflicts with current US channel type

IPv6 Address Acquisition Logs

Priority	Group	Object
z Critical	IPv6 Address Acquisition	Link-Local address failed DAD
Critical	IPv6 Address Acquisition	DHCP lease address failed DAD

Init (BPI+) Logs

Priority	Group	Object
Error	Init (BPI+)	Missing BP Configuration Setting TLV Type: <P1>
Alert	Init (BPI+)	Invalid BP Configuration Setting Value: <P1> for Type: <P2>

BPKM (Baseline Privacy Key Management) Logs

Priority	Group	Object
Warning	BPKM	Auth Reject - No Information
Warning	BPKM	Auth Reject - Unauthorized CM
Warning	BPKM	Auth Reject - Unauthorized SAID
Error	BPKM	Auth Reject - Permanent Authorization Failure
Warning	BPKM	Auth Reject - Time of Day not acquired
Alert	BPKM	CM Certificate Error
Informational	BPKM	Auth Reject - EAE disabled
Warning	BPKM	Auth Invalid - No Information
Warning	BPKM	Auth Invalid - Unauthorized CM
Warning	BPKM	Auth Invalid - Unsolicited
Warning	BPKM	Auth Invalid - Invalid Key Sequence Number
Warning	BPKM	Auth Invalid - Message (Key Request) Authentication Failure
Warning	BPKM	Unsupported Crypto Suite
Informational	BPKM	Authorized
Informational	BPKM	Auto Pend
Informational	BPKM	Auth Comp
Informational	BPKM	Stop
Warning	BPKM	Key Reject - No Information
Warning	BPKM	Key Reject - Unauthorized SAID
Warning	BPKM	TEK Invalid - No Information
Warning	BPKM	TEK Invalid - Invalid Key Sequence Number

Dynamic SA

Priority	Group	Object
Informational	Dynamic SA	SA Map State Machine Started
Warning	Dynamic SA	Unsupported Crypto Suite
Error	Dynamic SA	Map Request Retry Timeout
Informational	Dynamic SA	Unmap
Warning	Dynamic SA	Map Reject - Not Authorized for Requested Downstream Traffic Flow (EC=7)
Informational	Dynamic SA	Map Reject - Downstream Traffic Flow Not Mapped to BPI+ SAID (EC=8)
Warning	Dynamic SA	Mapped to Existing SAID
Warning	Dynamic SA	Mapped to New SAID

SW Upgrade General Failure

Priority	Group	Object
Error	SW UPGRADE GENERAL FAILURE	SW Upgrade Failed during download – Max retry exceed (3)
Error	SW UPGRADE GENERAL FAILURE	SW Upgrade Failed Before Download – Server not Present
Error	SW UPGRADE GENERAL FAILURE	SW upgrade Failed before download – File not Present
Error	SW UPGRADE GENERAL FAILURE	SW upgrade Failed before download –TFTP Max Retry Exceeded
Error	SW UPGRADE GENERAL FAILURE	SW upgrade Failed after download –Incompatible SW file
Error	SW UPGRADE GENERAL FAILURE	SW upgrade Failed after download – SW File corruption
Error	SW UPGRADE GENERAL FAILURE	Disruption during SW download – Power Failure
Error	SW UPGRADE GENERAL FAILURE	Improper Code File Controls
Error	SW UPGRADE GENERAL FAILURE	Code File Manufacturer CVC Validation Failure
Error	SW UPGRADE GENERAL FAILURE	Code File Manufacturer CVS Validation Failure
Error	SW UPGRADE GENERAL FAILURE	Code File Co-Signer CVC Validation Failure
Error	SW UPGRADE GENERAL FAILURE	Code File Co-Signer CVS Validation Failure

DCC Request

Priority	Group	Object
Error	DCC Request	DCC rejected already there
Informational	DCC Request	DCC depart old
Informational	DCC Request	DCC arrive new
Critical	DCC Request	DCC aborted no UCD for new upstream channel
Critical	DCC Request	DCC aborted unable to communicate on new upstream channel
Error	DCC Request	DCC rejected required parameter not present
Error	DCC Request	DCC rejected parameter invalid for context
Error	DCC Request	DCC rejected 2.0 mode disabled

DCC Acknowledgement

Priority	Group	Object
Error	DCC Acknowledgement	DCC-ACK rejected message syntax error

SW Upgrade Init

Priority	Group	Object
Notice	SW UPGRADE INIT	SW Download INIT – Via NMS
Notice	SW UPGRADE INIT	SW Download INIT – Via Config file <P1>

SW Upgrade Success

Priority	Group	Object
Notice	SW UPGRADE SUCCESS	SW download Successful – Via NMS
Notice	SW UPGRADE SUCCESS	SW download Successful – Via Config file

UCC Request

Priority	Group	Object
Error	UCC Request	UCC-REQ received with invalid or out of range US channel ID
Error	UCC Request	UCC-REQ received unable to send UCC-RSP

Verification of CVC

Priority	Group	Object
Error	VERIFICATION OF CVC	Improper Configuration File CVC Format
Error	VERIFICATION OF CVC	Configuration File CVC Validation Failure
Error	VERIFICATION OF CVC	Improper SNMP CVC Format
Error	VERIFICATION OF CVC	SNMP CVC Validation Failure

4

Operating the DPC3000

Introduction

This chapter discusses the operational features related to the DPC3000 including the WebWizard pages. This chapter 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 56
- Display Basic Cable Modem Information 59

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 modems.

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 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 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 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.

Access Levels

While registering on the network, the cable modem 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 modems or a unique (addressable) setting where each cable modem 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 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'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 receives Level 1 access to the WebWizard from the configuration file, the cable modem 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 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 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 receives Level 2 access to the WebWizard, as determined from the configuration file, the cable modem 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 reboots normally.

Reset

The cable modem 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 to its factory default settings.

Display Basic Cable Modem Information

Log On to the Cable Modem

Follow these instructions to use the WebWizard to log on to the cable modem.

- 1 On your PC, open the web browser that you prefer to use.
- 2 In the address field, enter the following IP address: **192.168.100.1** and press **Enter**. The Log In page opens and displays basic operational information about the cable modem.

The screenshot shows the web interface of a cable modem. At the top, there is a 'Status' button and a 'DOCSIS WAN' indicator. The main content area is divided into several sections:

- Log In:** Contains fields for 'User Name' and 'Password', a 'Language Selection' dropdown set to 'English', and a 'Log In' button.
- About:** Displays system information:

Model:	DPC3000
Vendor:	Cisco
Hardware Revision:	2.0
Serial Number:	Sample-09
MAC Address:	00:22:CE:8B:F7:B4
Bootloader Revision:	PSPU-Boot 1.0.0.4
Current Software Revision:	dpc3000-v303r2391-091106a
Firmware Name:	dpc3000-v303r2391-091106a.bin
Firmware Build Time:	20091107084049
Cable Modem Status:	Operational
- Downstream Channels:** A table showing power levels and signal-to-noise ratios for four channels.

	Power Level	Signal to Noise Ratio
Channel 0:	7.6 dBmV	40.9 dBmV
Channel 1:	6.9 dBmV	39.9 dBmV
Channel 2:	7.4 dBmV	40.9 dBmV
Channel 3:	7.2 dBmV	40.9 dBmV
- Upstream Channels:** A table showing power levels for four channels.

	Power Level
Channel 0:	33.0000 dBmV
Channel 1:	0.0000 dBmV
Channel 2:	0.0000 dBmV
Channel 3:	0.0000 dBmV

- 3 Enter the pre-configured **User Name**.
- 4 Enter the pre-configured **Password**.

- 5 Select a **Language** and then click **Log In**. The Status page opens with the DOCSIS WAN page in the forefront, similar to the following example.

Important: The SpeedTest option is reserved for future use.

The screenshot shows the web interface for a DPC3000 cable modem. At the top, there are navigation tabs: 'Status' (highlighted), 'SpeedTest', and 'Log Off'. Below this is a secondary set of tabs: 'DOCSIS WAN' (highlighted), 'DOCSIS Signal', 'DOCSIS Status', 'Channels Selection', and 'DOCSIS Log'. The main content area is divided into three sections: 'About', 'Downstream Channels', and 'Upstream Channels'. The 'About' section lists various modem specifications. The 'Downstream Channels' section shows a table of signal levels and SNR for four channels. The 'Upstream Channels' section shows a table of power levels for four channels. A 'Refresh' button is located at the bottom right of the main content area.

Model:	DPC3000
Vendor:	Cisco
Hardware Revision:	2.0
Serial Number:	Sample-09
MAC Address:	00:22:CE:8B:F7:B4
Bootloader Revision:	PSPU-Boot 1.0.0.4
Current Software Revision:	dpc3000-v303r2391-091106a
Firmware Name:	dpc3000-v303r2391-091106a.bin
Firmware Build Time:	20091107084049
Cable Modem Status:	Operational

	Power Level	Signal to Noise Ratio
Channel 0:	7.5 dBmV	41.6 dBmV
Channel 1:	6.9 dBmV	39.9 dBmV
Channel 2:	7.4 dBmV	40.9 dBmV
Channel 3:	7.2 dBmV	40.9 dBmV

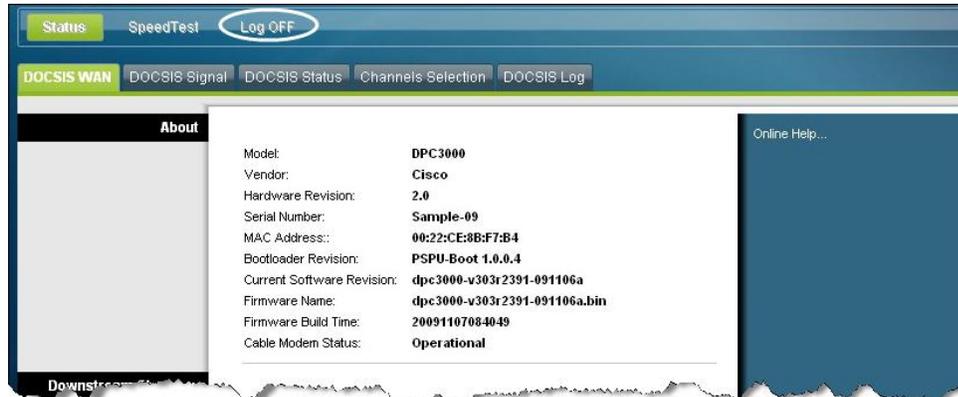
	Power Level
Channel 0:	33.0000 dBmV
Channel 1:	0.0000 dBmV
Channel 2:	0.0000 dBmV
Channel 3:	0.0000 dBmV

- 6 After logging on to the cable modem , you can do either of the following tasks:
 - Use the WebWizard to verify the configuration of the cable modem. For assistance, see *Use the WebWizard to Verify Configuration* (on page 61).
 - Log off the cable modem. For assistance, see *Log Off the Cable Modem* (on page 61).

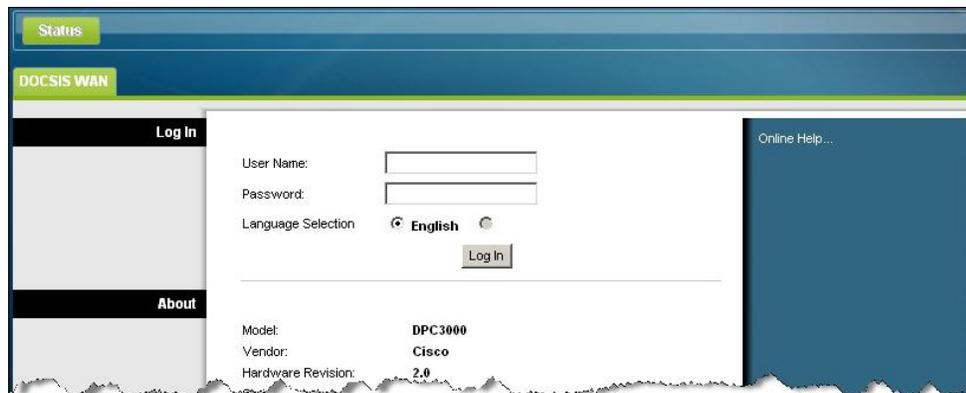
Log Off the Cable Modem

Follow these instructions to use the WebWizard to log off of the cable modem.

- 1 From any page within the WebWizard, click **Log OFF**.



- 2 After logging off, the DOCSIS WAN page opens and shows Log In prompts, similar to the following example.



Use the WebWizard to Verify Configuration

This section provides examples of WebWizard pages and explanations for information shown on WebWizard pages.

DOCSIS WAN Page

After you have logged on to the cable modem, the DOCSIS WAN page opens. The DOCSIS WAN page displays basic information about the cable modem.

The cable modem can access this page prior to registration and at Access Levels 1 and 2.

Important: When the network administrator sets the Cable Modem 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. Removing the references eliminates confusion about the availability of the feature.

The following illustration is an example of the DOCSIS WAN page.

The screenshot shows the DOCSIS WAN page interface. At the top, there are navigation tabs: Status, SpeedTest, and Log OFF. Below that, the DOCSIS WAN page is active, with sub-tabs for DOCSIS Signal, DOCSIS Status, Channels Selection, and DOCSIS Log. The main content area is divided into three sections: About, Downstream Channels, and Upstream Channels. The About section lists various modem details. The Downstream Channels section shows a table with Power Level and Signal to Noise Ratio for four channels. The Upstream Channels section shows a table with Power Level for four channels. A Refresh button is located at the bottom right of the page.

Model:	DPC3000
Vendor:	Cisco
Hardware Revision:	2.0
Serial Number:	Sample-09
MAC Address::	00:22:CE:8B:F7:B4
Bootloader Revision:	PSPU-Boot 1.0.0.4
Current Software Revision:	dpc3000-v303r2391-091106a
Firmware Name:	dpc3000-v303r2391-091106a.bin
Firmware Build Time:	20091107084049
Cable Modem Status:	Operational

	Power Level	Signal to Noise Ratio
Channel 0:	7.5 dBmV	41.6 dBmV
Channel 1:	6.9 dBmV	39.9 dBmV
Channel 2:	7.4 dBmV	40.9 dBmV
Channel 3:	7.2 dBmV	40.9 dBmV

	Power Level
Channel 0:	33.0000 dBmV
Channel 1:	0.0000 dBmV
Channel 2:	0.0000 dBmV
Channel 3:	0.0000 dBmV

The following table provides a description of each field within the DOCSIS WAN page.

About Section

Field Name	Description
Model	Model number of the cable modem
Vendor	Manufacturer of the cable modem
Hardware Revision	The revision of the circuit board design
Serial Number	A unique sequential series of alphanumeric characters provided to every cable modem during manufacturing
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
Bootloader Revision	Identifies the bootloader code version
Current Software Revision	Identifies the software version placed into the cable modem at the time of manufacturing
Firmware Name	Identifies the version of the firmware
Firmware Build Time	Displays the built time of the firmware
Cable Modem Status	Lists one of the following possible current states of the cable modem: <ul style="list-style-type: none"> ■ other ■ notReady ■ notSynchronized ■ phySynchronized ■ usParametersAcquired ■ rangingComplete ■ DHCPV4Complete ■ todEstablished ■ securityEstablished ■ psrsmTransferComplete ■ registrationComplete ■ operational ■ accessDenied

Downstream Channels Section

This section displays the power level and the signal to noise ratio for each of the downstream channels.

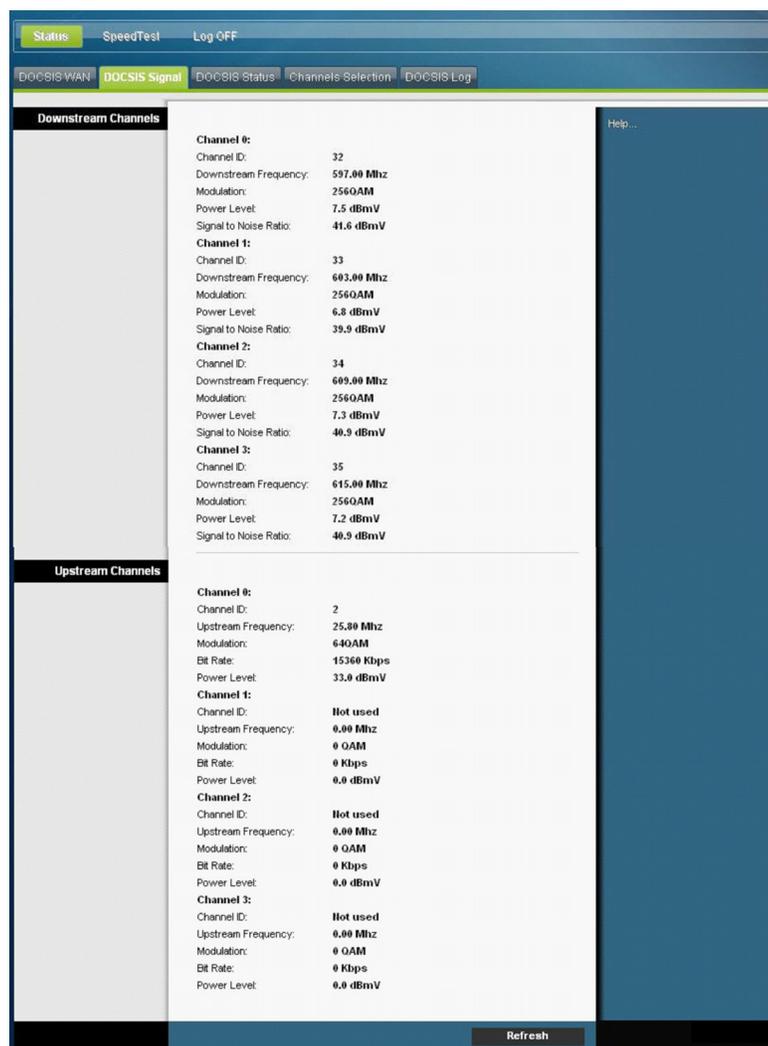
Upstream Channels Section

This section displays the power level for each of the upstream channels.

DOCSIS Signal Page

The DOCSIS Signal page displays information about the status and quality of the communications between the cable modem and the cable modem network. The following example of the DOCSIS Signal page shows the status options that display on each page.

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



The following tables provide a description of each field within the DOCSIS Signal page.

Downstream Channels Section

The Downstream Channels section provides the current operating parameters for downstream channels 0 through 3.

Field Name	Description
Channel ID	The identifier for this channel
Downstream Frequency	The downstream frequency for this channel in Hz
Modulation	The modulation type that is currently in use for this channel Note: Options include QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM, or 128 QAM
Power Level	The input level of the CMTS carrier for this channel in dBmv
Signal to Noise Ratio	The signal-to-noise ratio for this channel in dBmv

Upstream Channels Section

The Upstream Channels section provides the current operating parameters for upstream channels 0 through 3.

Field Name	Description
Channel ID	The identifier for this channel
Upstream Frequency	The upstream frequency for this channel in Hz
Modulation	The modulation type that is currently in use for this channel Note: Options include QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM, or 128 QAM
Bit Rate	The bit rate for this channel in kBits/sec
Power Level	The upstream power level for this channel I in dBmv

DOCSIS Status Page

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

Select the DOCSIS Status tab to open the DOCSIS Status page.

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

The screenshot displays the DOCSIS Status page with a navigation bar at the top containing 'Status', 'SpeedTest', and 'Log OFF'. Below the navigation bar are tabs for 'DOCSIS WAN', 'DOCSIS Signal', 'DOCSIS Status' (selected), 'Channels Selection', and 'DOCSIS Log'. The main content area is divided into several sections:

- DOCSIS Status:** A list of key metrics including Cable Modem Status (Operational), IP Address (10.11.5.211), Mask (255.255.248.0), Gateway (10.11.0.1), TFTP Server (192.168.19.224), Current Time (Mon Nov 23 2009 14:08:23), Time Server (192.168.19.224), Time Offset (-18000 Seconds), Time Since Last Reset (2 days 23h:14m:18s), Configuration File (DPC3000_cm_test_upgrade.bin), Cable Modem Certificate (Installed), IP Time Lease (0.3 Days / 43200 Seconds), IP Time Rebind (0.2 Days / 37800 Seconds), and IP Time Renew (0.0 Days / 21600 Seconds).
- Ethernet:** A table showing interface status:

Interface Name	LINK Status	LINK Speed	LINK Duplex
LAN: Ethernet Interface	Link DOWN	-1 Mbits	No
- QoS:** A table providing QoS information for the cable modem:

SFID	Direction	Primary	Packets	Service Class Name
29386	upstream	Yes	0	(null)
29387	downstream	Yes	0	(null)
- Config Parameters:** A section titled 'The data shown in the table below provides information about the configuration files of your cable modem.' containing a list of configuration parameters for the CM Configuration File, such as NetworkAccess 1, SnmpMibObject settings for various IP addresses and strings, and SnmpMibObject settings for integers and IP addresses.

The following tables provide a description of the items displayed in the DOCSIS Status page.

DOCSIS Status Section

Field Name	Description
Cable Modem Status	One of the following possible current states of the cable modem: <ul style="list-style-type: none"> ■ other ■ notReady ■ notSynchronized ■ phySynchronized ■ usParametersAcquired ■ rangingComplete ■ DHCPV4Complete ■ todEstablished ■ securityEstablished ■ psrsmTransferComplete ■ registrationComplete ■ operational ■ accessDenied
Cable Modem IP Address	The IP address of the cable modem
Cable Modem Mask	The IP subnet mask of the cable modem
Cable Modem Gateway	The IP address of the cable modem
Cable Modem TFTP Server	The IP address of the cable modem TFTP server
Current Time	The current time
Time Server	The IP address of the Network Time Protocol (NTP) server
Time Offset	The offset from Greenwich Mean Time (GMT)
Time Since Last Reset	The number of days, hours, minutes, and seconds since the cable modem was reset
Configuration File	The name of the configuration file currently in use by the cable modem
Cable Modem Certificate	Indicates whether the cable modem certificate is installed or not installed
IP Time Lease	The time remaining in the IP address lease
IP Time Rebind	T1 and T2 timers
IP Time Renew	The length of time to elapse before the cable modem retries DHCP requests

Ethernet Section

Field Name	Description
Interface Name	The name of the Ethernet port
LINK Status	Indicates whether the port is connected (Link Up) or not connected (Link Down)
LINK Speed	The connection speed of the connected port
LINK Duplex	Indicates whether the port is operating in a bidirectional mode

QoS Section

Field Name	Description
SFID	Service Flow ID
Direction	Upstream or Downstream
Primary	Primary or Secondary
Packets	Number of Packets
Service Class Name	Name of the service class that is configured on the CMTS device

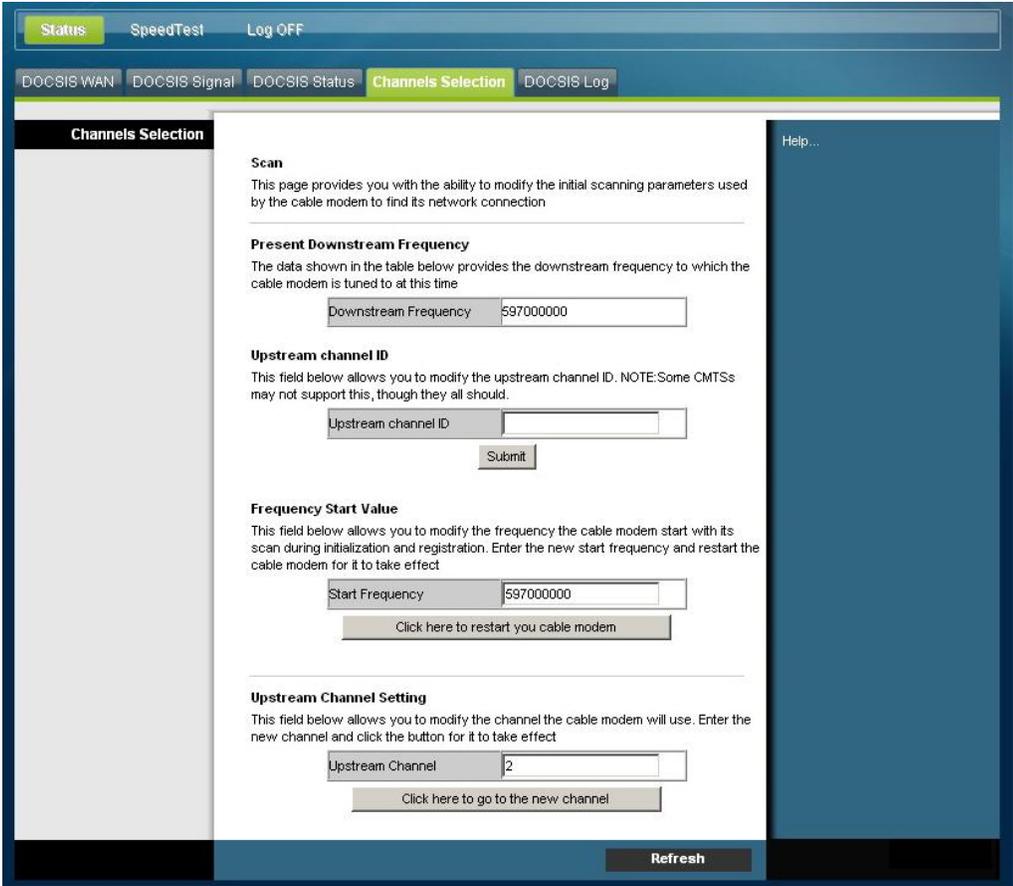
Config Parameters Section

Displays the content of the configuration file along with the names of the MIB objects currently in use on the cable modem

Channels Selection Page

This section provides an example of the Channels Selection page. As shown in the following example, this page displays the present downstream frequency, the upstream channel ID, the frequency start value, and the upstream channel setting. The Channels Selection Scan page also allows you to modify the initial scanning parameters used by the cable modem to find a network connection.

Select the Channels Selection tab to open the Channels Selection Scan page.



The following table provides a description of the items displayed in the Channels Selection Scan page.

Field Name	Description
Present Downstream Frequency	The data shown in this field provides the downstream frequency to which the cable modem is presently tuned
Upstream Channel ID	This field allows you to modify the upstream channel ID. Click Submit to reset the upstream channel ID Note: Some CMTSs may not support this feature.
Frequency Start Value	This field allows you to modify the frequency at which the cable modem starts its scan during initialization and registration. Enter a new start frequency and then restart the cable modem for the start frequency to take effect.
Upstream Channel Setting	This field allows you to modify the channel that the cable modem will use. Enter the new channel and then restart the cable modem for the new channel to take effect.

DOCSIS Log Page

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

Select the DOCSIS Log tab to open the DOCSIS Log page.

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



Display Basic Cable Modem Information

The following table provides a description of the events displayed in the DOCSIS Log page.

Field Name	Description
Time	Displays the time of the event
ID	Displays a unique numeric value that uniquely identifies the event
Level	Displays a type and severity of the event
Description	Displays a detailed description of the event
Clear Log	Allows you to clear the DOCSIS log

A

Specifications

Introduction

This appendix contains the technical specifications for the DPC3000 cable modem.

In This Appendix

- Technical Specifications 74

Technical Specifications

Model DPC3000 Specifications

This section provides the technical specifications for the Model DPC3000 cable modem.

Specifications Table

The following tables show the technical specifications for the DPC3000 cable modem.

RF Downstream	
Operating Frequency Range	54 to 1002 MHz 88 to 1002 MHz (Japan)
Tuner Frequency Range	88 to 1000 MHz
Tuner	(1) Frequency agile block tuner, 82 MHz bandpass
Demodulation	4 demodulators, each demodulator; 64 QAM or 256 QAM
Maximum Data Rate	4 downstream channels, each channel: 43 Mbps for 256 QAM and 30 Mbps for 64 QAM
Bandwidth	6 or 8 MHz
Operating Level Range	-15 dBmV to +15 dBmV
Input Impedance	75 ohms

RF Upstream	
Operating Frequency Range	5 to 42 MHz 5 to 65 MHz (Japan)
Transmitter Frequency Range	5 to 42 MHz 5 to 65 MHz (Japan)
Upstream Transmission	4 upstream channels
Modulation	QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM at ATDMA mode QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM, 128 QAM at SCDMA mode.

RF Upstream					
Maximum Data Rate per channel		Channel	Raw		
		Modulation	Bandwidth (MHz)	Data Rate (Mbps)	
		QPSK	1.6	2.56	
		16 QAM	1.6	5.12	
		QPSK	3.2	5.12	
		16 QAM	3.2	10.2	
		32 QAM	3.2	12.8	
		64 QAM	3.2	15.4	
		16 QAM	6.4	20.5	
		32 QAM	6.4	25.6	
	64 QAM	6.4	30.7		
Bandwidth	200 kHz to 6.4 MHz				
Operating Level Range (all values +/- 0.5 dBmV)	TDMA	One Channel	2 Channels	3 or 4 Channels	
		QPSK	+61 dBmV	+58 dBmV	+55dBmV
		8 QAM	+58 dBmV	+55 dBmV	+52dBmV
		16 QAM	+58 dBmV	+55 dBmV	+52dBmV
		32 QAM	+57 dBmV	+54 dBmV	+51dBmV
		64 QAM	+57 dBmV	+54 dBmV	+51dBmV
	SCDMA	QPSK	+56 dBmV	+53 dBmV	+53 dBmV
		8 QAM	+56 dBmV	+53 dBmV	+53 dBmV
		16 QAM	+56 dBmV	+53 dBmV	+53 dBmV
		32 QAM	+56 dBmV	+53 dBmV	+53 dBmV
		64 QAM	+56 dBmV	+53 dBmV	+53 dBmV
		128 QAM	+56 dBmV	+53 dBmV	+53 dBmV

Appendix A Specifications

Electrical	
Input Voltage	12 V DC
Power Consumption (modem module)	~ 6 Watts
Data Ports	GigE (Auto-negotiate with Auto-MDIX): RJ-45 Ethernet (1) USB 2.0: USB Type 2 (1)
RF	Female "F" type
Output Impedance	75 ohms

Mechanical	
Dimensions (H x D x W)	1.5 in. x 5.6 in. x 5.3 in. (3.85 cm x 14.3 cm x 13.5 cm)
Weight	10.3 oz. (0.292 kg)
Operating Temperature	32° to 104°F (0° to 40°C)
Operating Humidity	0 to 95% RH non-condensing
Storage Temperature	-4° to 158°F (-20° to 70°C)

Standards Compliance and Compatibility

The DPC3000 is designed to comply with DOCSIS 3.0 specifications.

Regulatory Compliance

Approvals as required per country where the DPC3000 will be used.

B

Scan Plan Algorithm for the DPC3000 Cable Modem

Introduction

This appendix lists the Scan Plan Algorithm for the DPC3000 cable modem.

In This Appendix

- Scan Plan Algorithm Overview 78

Scan Plan Algorithm Overview

This section describes the following channel-plan scanning algorithms that capture the DOCSIS or EuroDOCSIS downstream carrier in less than three minutes.

- Plan A - North America (NTSC, STD, and HRC)
- Plan B - International Hybrid (PAL I, PAL G, and NTSC)
- Plan C - Euro-DOCSIS Frequency Plan with Dual Mode (PAL G, PAL I, and NTSC)
- Plan D - Japan (NTSC Japan)
- Plan H - Korea (Hybrid) with Dual Mode
- Plan K - Korea (Hybrid) with Dual Mode

Plan A - North America

The North America scan plan algorithm uses the following scan frequency plans:

- National Television System committee (NTSC)
- Standard frequency (STD)
- Harmonically related carrier (HRC)

The following table summarizes the scan-plan algorithm for DPC3000 cable modems deployed in North America.

Start Frequency (MHz)	End Frequency (MHz)	Increment or Step Size (MHz)	Description
Initialize Scan			
LKF	—	—	LKF (Last Known Frequency) - The frequency of the most recent CMTS to which the DPC3000 has successfully registered. The factory default for the LKF is 453.000 MHz .
—	—	—	LKF List - Lists the 10 most recent frequencies of the CMTSs to which the DPC3000 has successfully registered. If no frequencies are in the LKF List, the DPC3000 goes directly to the Power-up List scan.

Start Frequency (MHz)	End Frequency (MHz)	Increment or Step Size (MHz)	Description
—	—	—	Power-Up List - A one-time scan of these frequencies. If no frequencies are specified for the Power-Up List, the DPC3000 skips this step and begins the regional scan plan.
Regional Scan Plan for North America			The DPC3000 scans the LKF and LKF List every 60 channels.
453.0000	999.0000	6.0	Quickscan UP from start frequency (NTSC Standard)
447.0000	93.0000	6.0	Quickscan DOWN from start frequency (NTSC Standard)
451.7725	997.7998	6.0003	Quickscan UP from start frequency (NTSC HRC)
445.7722	91.7545	6.0003	Quickscan DOWN from start frequency (NTSC HRC)
Return to the Regional Scan Plan for North America			

Plan B - International Hybrid

The International Hybrid scan plan algorithm uses the following scan frequency plans:

- Phase Alternating Line (PAL)
- European NTSC
- Séquentiel couleur à mémoire (SECAM)

The following table summarizes the scan-plan algorithm for DPC3000 cable modems deployed internationally.

Start Frequency (MHz)	End Frequency (MHz)	Increment or Step Size (MHz)	Description
Initialize Scan			
LKF	—	—	LKF (Last Known Frequency) - The frequency of the most recent CMTS to which the DPC3000 has successfully registered. The factory default for the LKF is 331.000 MHz .

Appendix B
Scan Plan Algorithm for the DPC3000 Cable Modem

Start Frequency (MHz)	End Frequency (MHz)	Increment or Step Size (MHz)	Description
–	–	–	<p>LKF List - Lists the 10 most recent frequencies of the CMTSs to which the DPC3000 has successfully registered.</p> <p>If no frequencies are in the LKF List, the DPC3000 goes directly to the Power-up List scan.</p>
–	–	–	<p>Power-Up List - A one-time scan of these frequencies.</p> <p>If no frequencies are specified for the Power-Up List, the DPC3000 skips this step and begins the regional scan plan.</p>
Regional Scan Plan for International Hybrid			The DPC3000 scans the LKF and LKF List every 60 channels.
299.000	995.000	8.0	Quickscan UP from start frequency (PAL I)
298.000	994.000	8.0	Quickscan UP from start frequency (PAL G)
93.000	999.000	6.0	Quickscan UP from start frequency (NTSC Standard)
88.000	999.000	1.0	Quickscan UP from start frequency
88.750	999.750	1.0	Quickscan UP from start frequency
88.500	999.500	1.0	Quickscan UP from start frequency
88.250	999.250	1.0	Quickscan UP from start frequency
Return to Regional Scan Plan for International Hybrid			

Plan C - Euro-DOCSIS with Dual Mode

The Euro-DOCSIS with Dual Mode scan plan algorithm uses the following scan frequency plans:

- Dual Mode
- Euro-DOCSIS
- DOCSIS

The following table summarizes the scan-plan algorithm for DPC3000 cable modems that support Euro-DOCSIS.

Start Frequency (MHz)	End Frequency (MHz)	Increment or Step Size (MHz)	Description
Initialize Scan			
LKF	–	–	LKF (Last Known Frequency) - The frequency of the most recent CMTS to which the DPC3000 has successfully registered. The factory default for the LKF is 331.000 MHz .
–	–	–	LKF List - Lists the 10 most recent frequencies of the CMTSs to which the DPC3000 has successfully registered. If no frequencies are in the LKF List, the DPC3000 goes directly to the Power-up List scan.
–	–	–	Power-Up List - A one-time scan of these frequencies. If no frequencies are specified for the Power-Up List, the DPC3000 skips this step and begins the regional scan plan.
Regional Scan Plan for Euro-DOCSIS with Dual Mode			The DPC3000 scans the LKF and LKF List every 60 channels.
994.000	298.000	8.0	Quickscan DOWN start frequency (PAL G)
115.000	995.000	8.0	Quickscan UP from start frequency (PAL I)
111.000	999.000	6.0	Quickscan UP from start frequency (NTSC Standard)
108.000	999.000	1.0	Quickscan UP from start frequency
108.750	999.750	1.0	Quickscan UP from start frequency
108.500	999.500	1.0	Quickscan UP from start frequency
108.250	999.250	1.0	Quickscan UP from start frequency

Appendix B
Scan Plan Algorithm for the DPC3000 Cable Modem

Start Frequency (MHz)	End Frequency (MHz)	Increment or Step Size (MHz)	Description
			Return to Scan Plan for Euro-DOCSIS with Dual Mode

Plan D - Japan

The Japan scan plan algorithm consists of several scanning segments that are prioritized to minimize the average CMTS acquisition time and to accommodate eccentricities and pending changes in the Japanese frequency plan.

The following table summarizes the scan-plan algorithm for DPC3000 cable modems deployed in Japan.

Start Frequency (MHz)	End Frequency (MHz)	Increment or Step Size (MHz)	Description
Initialize Scan			
LKF	—	—	LKF (Last Known Frequency) - The frequency of the most recent CMTS to which the DPC3000 has successfully registered. The factory default for the LKF is 465.000 MHz .
—	—	—	LKF List - Lists the 10 most recent frequencies of the CMTSs to which the DPC3000 has successfully registered. If no frequencies are in the LKF List, the DPC3000 goes directly to the Power-up List scan.
—	—	—	Power-Up List - A one-time scan of these frequencies. If no frequencies are specified for the Power-Up List, the DPC3000 skips this step and begins the regional scan plan.
Regional Scan Plan for Japan			
465.0000	231.0000	6.0	Quickscan DOWN from start frequency (NTSC Standard)
251.0000	233.0000	6.0	Quickscan DOWN from start frequency (NTSC Japan)
225.0000	195.0000	6.0	Quickscan DOWN from start frequency (NTSC Standard)

Start Frequency (MHz)	End Frequency (MHz)	Increment or Step Size (MHz)	Description
191.0000	167.0000	6.0	Quickscan DOWN from start frequency (NTSC Japan)
159.0000	93.0000	6.0	Quickscan DOWN from start frequency (NTSC Standard)
473.0000	995.0000	6.0	Quickscan UP from start frequency (NTSC Japan)
999.000	471.000	6.0	Quickscan DOWN from start frequency (NTSC Standard)
Return to Regional Scan Plan for Japan			

Plan H - Korea (Hybrid) with Dual Mode

The following table summarizes the scan-plan algorithm for hybrid DPC3000 cable modems deployed in Korea that support Dual Mode.

Start Frequency (MHz)	End Frequency (MHz)	Increment or Step Size (MHz)	Description
Initialize Scan			
LKF	–	–	LKF (Last Known Frequency) - The frequency of the most recent CMTS to which the DPC3000 has successfully registered. The factory default for the LKF is 000.000 MHz .
–	–	–	LKF List - Lists the six most recent frequencies of the CMTSs to which the DPC3000 has successfully registered. If no frequencies are in the LKF List, the DPC3000 goes directly to the Power-up List scan.
Regional Scan Plan for Korea Hybrid with Dual Mode			
615.0000	93.0000	6.0	Scan DOWN from start frequency (NTSC)
927.0000	615.0000	6.0	Scan DOWN from start frequency (NTSC)
450.0000	928.0000	2.0	Scan UP from start frequency
450.000	92.0000	2.0	Scan DOWN from start frequency
Return to Regional Scan Plan for Korea Hybrid with Dual Mode			

Plan K - Korea (Hybrid) with Dual Mode

The following table summarizes the scan-plan algorithm for hybrid DPC3000 cable modems deployed in Korea that support Dual Mode.

Start Frequency (MHz)	End Frequency (MHz)	Increment or Step Size (MHz)	Description
Initialize Scan			
LKF	–	–	LKF (Last Known Frequency) - The frequency of the most recent CMTS to which the DPC3000 has successfully registered. The factory default for the LKF is 000.000 MHz .
–	–	–	LKF List - Lists the six most recent frequencies of the CMTSs to which the DPC3000 has successfully registered. If no frequencies are in the LKF List, the DPC3000 goes directly to the Power-up List scan.
Regional Scan Plan for Korea Hybrid with Dual Mode			
450.0000	600.0000	6.0	Scan UP from start frequency
600.0000	450.0000	6.0	Scan DOWN from start frequency
453.0000	609.0000		Scan Up from start frequency
609.000	453.0000		Scan DOWN from start frequency
93.000	85.0000	2.0	Scan UP from start frequency
Return to Regional Scan Plan for Korea Hybrid with Dual Mode			

C

MIB for the DPC3000 Cable Modem

Introduction

This appendix lists our private MIBs for DOCSIS 3.0 cable modems. This list is provided for reference only.

Management Information Bases (MIBs) are used to control and configure different aspects of the DPC3000. The DPC3000 supports most industry specification MIBs for DOCSIS and Management as well as proprietary MIBs from Cisco.

In This Appendix

- MIB Descriptions 86

MIB Descriptions

This section provides a list of the MIBs for the DPC3000 cable modem. This list is provided for reference only and may not contain the latest information. Refer to software CD that was shipped with the cable modem for the latest MIBs.

```
--*****  
--  
-- Copyright 2009 Scientific Atlanta, A Cisco Company  
-- All Rights Reserved  
-- No portions of this material may be reproduced in any  
-- form without the written permission of:  
--     Cisco Systems Inc.  
--     5030 Sugarloaf Pkwy  
--     Lawrenceville, Georgia 30044  
--  
--*****
```

```
SA-CM-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY,
```

```
    OBJECT-TYPE,enterprises,
```

```
    Counter32,
```

```
    Integer32,
```

```
    IpAddress
```

```
        FROM SNMPv2-SMI
```

```
    MODULE-COMPLIANCE,
```

```
    OBJECT-GROUP
```

```
        FROM SNMPv2-CONF
```

```
    TEXTUAL-CONVENTION,
```

MacAddress, DisplayString,

TruthValue, RowStatus

FROM SNMPv2-TC

SnmpAdminString

FROM SNMP-FRAMEWORK-MIB -- RFC2571

ifIndex

FROM IF-MIB;

sa OBJECT IDENTIFIER ::= { enterprises 1429 }

saCmMib MODULE-IDENTITY

LAST-UPDATED "0910010000Z"

ORGANIZATION "Cisco Systems, Inc."

CONTACT-INFO "Damon Thompson: damthomp@cisco.com"

DESCRIPTION

"(Scientific Atlanta)Cisco Cable Modem MIB definition"

-- history

REVISION "0910010000Z"

DESCRIPTION

"Added saCmStatusMessageOnBattery,
saMddIpModeOverride, saCmDocsisCapableVersion"

REVISION "0908240000Z"

DESCRIPTION

"Modified saCmFtpControl,
vendorONLINELEDTreatment.

"

Appendix C
MIB for the DPC3000
Cable Modem

REVISION "0908130000Z"

DESCRIPTION "Added saPUFTable"

REVISION "0908120000Z"

DESCRIPTION

"Added saCmFtpIpStackInterface

saCmFtpServerAddressType

saCmFtpServerAddress

saCmFtpServerPort,

saCmFtpUserName

saCmFtpPassword

saCmFtpFilename

saCmFtpControl

saCmFtpStatus

saCmFtpPayloadBytesResult

saCmFtpTotalBytesResult

saCmFtpElapsedTimeResult

saCmFtpThroughputResult

vendorUSLEDTreatment

vendorONLINELEDTreatment

Modified vendorDSLEDTreatment and
vendorLINKLEDTreatment.

"

REVISION "0907290000Z"

DESCRIPTION "Added saCmWebAccessNoActivityTimeout"

REVISION "0904100000Z"

DESCRIPTION

"Added vendorLINKLEDTreatment"

REVISION "0902050000Z"

DESCRIPTION

"Added vendorDSLEDTreatment

Corrected typo in saCmNarrowbandFallbackInterval description. "

REVISION "0901150000Z"

DESCRIPTION

"Added saCmSoftwareDownloadTFTPServer

Updated Copyright date. "

REVISION "0811040000Z"

DESCRIPTION

"Changed the default values and range for saCmNarrowbandFallbackInterval
and saCmResiliencyInterval. "

REVISION "0801170000Z"

DESCRIPTION

"Added half-duplex-1Gbps(6) and full-duplex-1Gbps(7)
to cmEthernetOperation

Changed values to lowercase in cmUpstreamMode
and cmDocsis1xQpskBurstPreamble"

REVISION "0711160000Z"

DESCRIPTION

"Added saCmInternalDhcpServer (1859)

Changed DEFVAL for saCmArpRateLimit (1862)"

REVISION "0711030000Z"

Appendix C
MIB for the DPC3000
Cable Modem

DESCRIPTION

"Added saCmNarrowbandFallbackInterval (10123)"

REVISION "0710100000Z"

DESCRIPTION

"Added saCmResiliencyInterval (10101)"

REVISION "0708140000Z"

DESCRIPTION

"Corrected SEQUENCE objects for tables."

REVISION "0705010000Z"

DESCRIPTION

"Changed saCmWebAccessAdvancedType default to 1
Changed logic for HW specific SW download:
no filename required in each row
Removed saCmSwUpgradeFromMgt(1) from saCmSwAdminStatus
Changed cmRGresetdefault
remoteProvisionFilename
remoteProvisionOperStatus
remoteProvisionAdminStatus status to obsolete (move to RG)
Added saCmDsBonding (10086)"

REVISION "0701110000Z"

DESCRIPTION

"Changed description of saCmWebAccessAdvancedPassword
Changed description of some objects in saCmIdentityDownload
Added saCmForceDualscan (10021)"

REVISION "0611220000Z"

DESCRIPTION

"Changed cmAPWeb and cmRemoteWebAccess
status to obsolete (892)"

REVISION "0610120000Z"

DESCRIPTION

"Added saCmCpeMacAging (1003)
Added saCmBpiForward (1017)
Added saCmDocsisLock (1018)
Added default to cmAPFtpSwitch (985,5326)"

REVISION "0609250000Z"

DESCRIPTION

"Added saCmIdentityDownload (950)"

REVISION "0609080000Z"

DESCRIPTION

"Added saCmTodRenewal (909)
Added saCmAutoResetNoActivity (912)"

REVISION "0609050000Z"

DESCRIPTION

"Changed saCmSwCvcReference and saCmSoftwareCvcTable
status to obsolete (887)"

REVISION "0608180000Z"

DESCRIPTION

"Added saCmWebAccess tree (892,5271)"

Appendix C
MIB for the DPC3000
Cable Modem

REVISION "0607260000Z"

DESCRIPTION

"Added DEFVAL to cmConsoleMode (5239)"

REVISION "0606200000Z"

DESCRIPTION

"Changed logic for HW specific SW download:
no server required in each row."

REVISION "0601170000Z" -- 2006/01/17

DESCRIPTION

"Added saCmArpRateLimit"

REVISION "0512210000Z" -- 2005/12/21

DESCRIPTION

"Added saCmSoftwareDownload tree"

REVISION "0105300000Z"

DESCRIPTION

"Initial Compilable Version."

::= { sa 77 } -- cableModem assign here

-- Generic information

dpxCmMibObjects OBJECT IDENTIFIER ::= { saCmMib 1 }

--

-- General Information about the CableModem

```
--
cmSysInfo      OBJECT IDENTIFIER ::= { dpxCmMibObjects 1}
cmVendorInfo   OBJECT IDENTIFIER ::= { dpxCmMibObjects 2}
cmAPInfo       OBJECT IDENTIFIER ::= { dpxCmMibObjects 3}
cmInterfaceInfo OBJECT IDENTIFIER ::= { dpxCmMibObjects 4}
rgAPinfo       OBJECT IDENTIFIER ::= { dpxCmMibObjects 5}
```

```
rgRemoteProvision OBJECT IDENTIFIER ::= { rgAPinfo 1}
```

```
cpuUtilization OBJECT-TYPE
```

```
SYNTAX      Integer32
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"CableModem CPU utilization"
```

```
::= { cmSysInfo 1 }
```

```
memUtilization OBJECT-TYPE
```

```
SYNTAX      Integer32
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"CableModem Memory utilization"
```

```
::= { cmSysInfo 2 }
```

```
memFragmentation OBJECT-TYPE
```

```
SYNTAX      Integer32
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

"CableModem MemFragemntation"
 ::= { cmSysInfo 3 }

ethTxBufferNum OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"CableModem EthTxBufferNum"

::= { cmSysInfo 4 }

usbTxBufferNum OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"CableModem UsbTxBufferNum"

::= { cmSysInfo 5 }

macTxBufferNum OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"CableModem MacTxBufferNum"

::= { cmSysInfo 6 }

macRxBufferNum OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"CableModem MacRxBufferNum"

::= { cmSysInfo 7 }

cmUpstreamMode OBJECT-TYPE

SYNTAX INTEGER {

docsis1(1),

atdma(2),

scdma(3)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Status of the upstream communication type the cable modem is currently using with the CMTS.

1) DOCSIS 1.0 or 1.1 style TDMA

2) DOCSIS 2.0 ATDMA

3) DOCSIS 2.0 SCDMA"

::= { cmSysInfo 8 }

vendorDefaultDSfreq OBJECT-TYPE

SYNTAX Integer32 (93000000..855000000)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"

DOCSIS:

initial downstream frequency,

Appendix C
MIB for the DPC3000
Cable Modem

range: 93000000 to 855000000 Hz

EuroDOCSIS:

initial downstream frequency,

range: 88000000 to 859000000 Hz

"

::= { cmVendorInfo 6 }

vendorDSLEDTreatment OBJECT-TYPE

SYNTAX INTEGER {

signalNB(0),

signalWB(1),

signalWBNBG(2),

signalWBNBA(3)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"

This MIB is only valid in DOCSIS 3.0 enabled modems with dual LEDs.

This MIB determines the DS LED color, green or amber, to be used to indicate DS state.

signalNB: DS LED = amber for narrowband; DS LED = green when DS w-online wideband.

signalWB: DS LED = amber for wideband; DS LED = green when DS online narrowband.

signalWBNBG: Both WB and NB states are indicated using the Green LED.

signalWBNBA: Both WB and NB states are indicated using the Amber LED.

```

"
DEFVAL { 0 }
 ::= { cmVendorInfo 7 }

vendorLINKLEDTreatment OBJECT-TYPE
    SYNTAX INTEGER {
        default(0),
        showlinkspeed(1),
        d3Amberledslowspeed(2),
        d3Greenledslowspeed(3)
    }
    MAX-ACCESS    read-write
    STATUS        current
    DESCRIPTION
        "
        This MIB will determine Link Speed using blink rate for DOCSIS 2.0
modems or
        using LED color for DOCSIS 3.0 Modems as seen with the LINK LED.

        default: LINK LED behavior follows standard behavior as defined per
User Guide

        FOR DOCSIS 2.0
        1: showlinkspeed: When connected, LED blinks 1x/2sec for 10/100
operation
        and blinks 2x/1sec for Gigabit operation. Traffic is still reflected as
        2x/1sec.

        FOR DOCSIS 3.0
        On dual LED D3.0 modems the operator can choose to have 10/100
operation indicated by either

```

Appendix C
MIB for the DPC3000
Cable Modem

a green LED or an amber LED. Modems that support 1000 Mb speeds shall indicate using the alternate LED.

2: d3Greenledslowspeed indicates 10/100 operation using the Green LED.

3: d3Amberledslowspeed indicates 10/100 operation using the Amber LED.

"

DEFVAL { 0 }

::= { cmVendorInfo 8 }

vendorUSLEDTreatment OBJECT-TYPE

SYNTAX INTEGER {

signalWBNBG(0),

signalNB(1),

signalWB(2),

signalWBNBA(3)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"

This MIB is only valid in DOCSIS 3.0 enabled modems with dual LEDs.

This MIB determines the US LED color, green or amber to be used to indicate US state.

signalWBNBG: Both WB and NB states are indicated using the Green LED.

signalNB: US LED = amber for narrowband; US LED = green when US w-online wideband.

signalWB: US LED = amber for wideband; US LED = green when US online narrowband.

signalWBNBA: Both WB and NB states are indicated using the Amber LED.

"

DEFVAL { 0 }

::= { cmVendorInfo 9 }

vendorONLINELEDTreatment OBJECT-TYPE

SYNTAX INTEGER {

signalWBNBG(0),

signalNB(1),

signalWB(2),

signalWBNBA(3)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"

This MIB is only valid in DOCSIS 3.0 enabled modems with dual LEDs.

This MIB provides a way to select the ONLINE LED color, green or amber to distinguish between

wideband online or online(NB).

signalWBNBG: Both WB and NB states are indicated using the Green LED.

signalNB: ONLINE LED = amber for narrowband; ONLINE LED = green when DS w-online wideband.

signalWB: ONLINE LED = amber for wideband; ONLINE LED = green when DS online narrowband.

signalWBNBA: Both WB and NB states are indicated using the Amber LED.

NOTE: This LED will only provide indication of a Downstream Bonded environment and does not

indicate the presence of Upstream bonding.

"

DEFVAL { 0 }

::= { cmVendorInfo 10 }

cmAPIgmp OBJECT-TYPE

SYNTAX INTEGER {

disableIGMP(0),

enableIGMP(1)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"

0: disable IGMP proxy,

1: enable IGMP proxy"

::= { cmAPIInfo 1 }

cmAPWeb OBJECT-TYPE

SYNTAX INTEGER {

no-cpe-access(0),

restricted-access(1),

open-access(2)

}

MAX-ACCESS read-write

STATUS obsolete

DESCRIPTION

"Web page access level.

0: no CPE access to any page

1: access to syetm page only

2: access to all pages"

::= { cmAPInfo 2 }

cmAPagingOut OBJECT-TYPE

SYNTAX INTEGER {

 disableAgingOut(0),

 enableAgingOut(1)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"

0: disable ARP aging out

1: enable ARP aging out"

::= { cmAPInfo 4 }

cmAPBpi2CertStatus OBJECT-TYPE

SYNTAX INTEGER {

 installed(0),

 notInstalled(1),

 invalidCertificate(2),

 other(3)

}

Appendix C
MIB for the DPC3000
Cable Modem

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of this object is the option way of
the CM certificated."

::= { cmAPInfo 5 }

cmAPWebSwitch OBJECT-TYPE

SYNTAX INTEGER {

disable(0),

enable(1)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object is used to turn on/off web pages.

Once we change the value of this object,

CM will reboot and the new value will take effect."

::= { cmAPInfo 6 }

cmAPWebAccessLvIPassword OBJECT-TYPE

SYNTAX DisplayString (SIZE (0..40))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object is used to for changing the password

that controls the level of access to the Web Wizard."

::= { cmAPInfo 7 }

cmAPFtpSwitch OBJECT-TYPE

```
SYNTAX INTEGER {
    disable(0),
    enable(1)
}
```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object is used to switch ON/OFF ftp improvement function."

DEFVAL { 1 }

::= { cmAPInfo 8 }

cmRGresetdefault OBJECT-TYPE

```
SYNTAX INTEGER {
    disable(0),
    enable(1)
}
```

MAX-ACCESS read-write

STATUS obsolete

DESCRIPTION

"If enable, RG setting can be reset by ResetToDefault button"

::= { cmAPInfo 9 }

cmRemoteWebAccess OBJECT-TYPE

```
SYNTAX INTEGER {
    disable(0),
    enable(1)
}
```

MAX-ACCESS read-write

STATUS obsolete

Appendix C
MIB for the DPC3000
Cable Modem

DESCRIPTION

"If enable, MSO can read/write web page from WAN side"

::= { cmAPInfo 10 }

cmAPDsPlan OBJECT-TYPE

SYNTAX DisplayString (SIZE (0..1))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object is used to change DS frequency plan.

a - North America (NTSC)

b - International DOCSIS (PAL-I, PAL-G, NTSC and 1 MHz step routine)

c - International Euro-DOCSIS/DOCSIS (PAL-G, PAL-I, NTSC and 1 MHz step routine)

d - Japanese (NTSC Japan)

"

::= { cmAPInfo 11 }

cmAPConsoleEnablePassword OBJECT-TYPE

SYNTAX DisplayString (SIZE (0..40))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object is used to for changing the password
that enables or disables the console port."

::= { cmAPInfo 12 }

cmAPMulticastPromiscuousMode OBJECT-TYPE

SYNTAX INTEGER {

disable(0),

enable(1)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Support for transparent multicast pass-thru using Promiscuous Multicast Mode.

The setting will be stored in non-volatile memory and will be retained through a power cycle. It can be forcibly cleared with a factory reset."

::= { cmAPInfo 13 }

cmDocsis1xQpskBurstPreamble OBJECT-TYPE

SYNTAX INTEGER {

qpsk0(0),

qpsk1(1)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Controls the default setting of the preamble type when running in DOCSIS 1.x mode.

In DOCSIS 2.0 mode the preamble types is specified by the CMTS via the Upstream Channel

Descriptor.

0: Use QPSK0 Preamble type as the default

1: Use QPSK1 Preamble type as the default"

Appendix C
MIB for the DPC3000
Cable Modem

DEFVAL { 0 }
 ::= { cmAPInfo 14 }

cmAPInternalInterface OBJECT-TYPE

SYNTAX INTEGER {
 disable(0),
 enable(1)
}
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "Controls the state of local interface.
 0: Shut down local interface,
 1: Leave local interface as is."
DEFVAL { 1 }
 ::= { cmAPInfo 15 }

cmAPWebAccessLvlUsername OBJECT-TYPE

SYNTAX DisplayString (SIZE (0..40))
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "This object is used for changing the username
 that controls the level of access to the Web Wizard."
 ::= { cmAPInfo 16 }

cmAPResetNow OBJECT-TYPE

SYNTAX TruthValue
MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Setting this object to true(1) causes the device to reset as momentary activation of reset switch, which reset only the DOCSIS parameters to factory default values.

Reading this object always returns false(2)."

::= { cmAPInfo 17 }

cmAPFactoryReset OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Can be set with a sequence of values to activate a remote factory reset.

This is the same as a sustained (3 seconds or more) reset switch.

Reading this object always returns false(2)."

::= { cmAPInfo 18 }

saCmArpRateLimit OBJECT-TYPE

SYNTAX INTEGER (0..100)

UNITS "packets-per-second"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Setting ARP rate-limit defines the number of ARP packets that can be processed per second. Limitation of this number prevents denial-of-service attacks. A value of 20 pps is a good reference. Setting the value to 0 allows unlimited

Appendix C
MIB for the DPC3000
Cable Modem

incoming ARP messages"

DEFVAL { 0 }

::= { cmAPInfo 19 }

saCmInternalDhcpServer OBJECT-TYPE

SYNTAX INTEGER {

disable(0),

enable(1)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Controls the DHCP server that is used when CM is offline.

0: disable internal DHCP server

1: enable internal DHCP server"

DEFVAL { 1 }

::= { cmAPInfo 20 }

remoteProvisionServer OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS read-write

STATUS obsolete

DESCRIPTION

"The address of the TFTP server used for RG config download or upload.

If the TFTP server is unknown, return 0.0.0.0."

::= { rgRemoteProvision 1 }

remoteProvisionFilename OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (0..64))

MAX-ACCESS read-write

STATUS obsolete

DESCRIPTION

"The file name of the config file to be download or upload.

If unknown, the string '(unknown)' is returned."

::= { rgRemoteProvision 2 }

remoteProvisionOperStatus OBJECT-TYPE

SYNTAX INTEGER {

inProgress(1),

complete(2),

failed(3),

other(4)

}

MAX-ACCESS read-only

STATUS obsolete

DESCRIPTION

"InProgress(1) indicates that a TFTP download or upload is underway,

Complete(2) indicates that the last download or upload is successful,

failed(3) indicates that the last attempted download or upload is failed."

::= { rgRemoteProvision 3 }

remoteProvisionAdminStatus OBJECT-TYPE

SYNTAX INTEGER {

download(1),

upload(2)

}

Appendix C
MIB for the DPC3000
Cable Modem

MAX-ACCESS read-write

STATUS obsolete

DESCRIPTION

"If set to download(1), the device will initiate a TFTP RG config file download using remoteProvisionFilename. If set to upload(2), the device will initiate a TFTP RG config file upload to remoteProvisionServer. The filename will be the same as remoteProvisionFilename.

At initial startup, this object has the default value of download(1)."

::= { rgRemoteProvision 4 }

virusProtectionSoftwareURL OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (0..255))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This string is the The Virus Protection Software URL.

It will be used as download link when click Virus Protection/software download in Setup page."

::= { rgAPinfo 2 }

--

cmEthernetOperation OBJECT-TYPE

SYNTAX INTEGER {

autoNegotiation(0),

half-duplex-10Mbps(1),

```

full-duplex-10Mbps(2),
half-duplex-100Mbps(3),
full-duplex-100Mbps(4),
ethernetNotConnected(5),
half-duplex-1Gbps(6),
full-duplex-1Gbps(7)
}
MAX-ACCESS    read-write
STATUS        current
DESCRIPTION
    "Sets Ethernet mode.
    0: autoNegotiation(0),
    1: half-duplex-10Mbps(1),
    2: full-duplex-10Mbps(2),
    3: half-duplex-100Mbps(3),
    4: full-duplex-100Mbps(4),
    5: ethernetNotConnected(5),
    6: half-duplex-1Gbps(6),
    7: full-duplex-1Gbps(7)"
 ::= { cmInterfaceInfo 1 }

```

cmAccessProtectionRight OBJECT-TYPE

```

SYNTAX INTEGER {
    disable(0),
    enable(1)
}
MAX-ACCESS    read-write
STATUS        current
DESCRIPTION
    "Default is Disable.

```

If you want to use AccessProtection, you must select Enable

or AccessProtection can't be selected."

::= { cmInterfaceInfo 2 }

cmAccessProtection OBJECT-TYPE

SYNTAX INTEGER {

inactive(1),

active(2),

automatic(3)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Default is Disable.

inactive(1): It detect traffic from CPE. CM is on normal situation.

active(2) : CM is on sleep situation.

automatic(3): CM will detect automatically. You can set time on AccessProtectionDelay.

If CM detect traffic from CPE,if will show disable again. "

::= { cmInterfaceInfo 3 }

cmAccessProtectionDelay OBJECT-TYPE

SYNTAX Integer32 (1..255)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Default is 5 mins. The range is 1 to 255min.

But the function is effective when AccessProtection set automatic."

::= { cmInterfaceInfo 4 }

cmMsgLED OBJECT-TYPE

SYNTAX INTEGER {

 disable(0),

 enable(1)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

""

::= { cmInterfaceInfo 6 }

cmConsoleMode OBJECT-TYPE

SYNTAX INTEGER {

 disable(0),

 readOnly(1),

 readWrite(2)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"To Control console port is disabled, read only, or read write"

DEFVAL { 0 }

::= { cmInterfaceInfo 7 }

cmTimerT4 OBJECT-TYPE

SYNTAX INTEGER (30..60)

Appendix C
MIB for the DPC3000
Cable Modem

UNITS "seconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"T4 timeout definition."
DEFVAL { 30 }
::= { cmInterfaceInfo 8 }

saCmTodRenewal OBJECT-TYPE

SYNTAX INTEGER
UNITS "hours"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Defines how often to update time with ToD protocol.
0: never
1: together with DHCP renewal
2-11: reserved
12+: number of hours"
DEFVAL { 0 }
::= { cmInterfaceInfo 9 }

saCmAutoResetNoActivity OBJECT-TYPE

SYNTAX INTEGER (0..43200)
UNITS "minutes"
MAX-ACCESS read-write
STATUS current
DESCRIPTION

"Setting this object to any value $N > 0$ will cause the CM to reboot autonomously

3/4th of N minutes after the modem has detected that there is no connectivity to the CM gateway after three unsuccessful pings.

NOTE: The default value of 0 means the feature is disabled."

DEFVAL { 0 }

::= { cmInterfaceInfo 10 }

saCmCpeMacAging OBJECT-TYPE

SYNTAX INTEGER

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Setting this object to any value $N > 0$ will cause the CM to remove a MAC address

from its CPE table N seconds after the modem has detected no traffic from it.

This feature applies ONLY to devices connected to the CM, not the embedded ones

(as MTA or CableHome).

NOTE: The default value of 0 means the feature is disabled."

DEFVAL { 0 }

::= { cmInterfaceInfo 11 }

saCmBpiForward OBJECT-TYPE

SYNTAX INTEGER {

macTable(1),

allPackets(2)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object controls whether to forward traffic that is not destined for any CPE (not in CPE table) when running BPI.

1: follow DOCSIS rules. Do not forward traffic when destination MAC not in the CPE table.

2: when BPI is enabled, forward all traffic (if security association matches, otherwise cannot decrypt packets).

When BPI is disabled, this object does not have effect."

DEFVAL { 1 }

::= { cmInterfaceInfo 12 }

saCmDocsisLock OBJECT-TYPE

SYNTAX INTEGER {

euCmSkip(0),

euCmLock(1)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Setting this object allows a Euro-DOCSIS modem to operate on a DOCSIS channel. Normally, Euro-DOCSIS will only operate on a Euro-DOCSIS channel.

0: Euro-DOCSIS modem will keep scanning until it finds a Euro-DOCSIS or DOCSIS channel. It will lock on that channel, get configuration file and if it is a DOCSIS channel, it will un-lock and continue scanning further.

1: Euro-DOCSIS modem will stay locked if it locates a DOCSIS or Euro-DOCSIS channel.

NOTE: This object is only applied on Euro-DOCSIS models.

DOCSIS models ignore this object.

Equivalent to VSIF 109."

DEFVAL { 0 }

::= { cmInterfaceInfo 13 }

saCmForceDualscan OBJECT-TYPE

SYNTAX INTEGER {

useFactorySetting(0),

enable(1)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The MIB will choose whether to force dualscan operation for the device. Dualscan refers to the CM ability to automatically scan for both 6MHz and 8MHz carriers.

0 : Will not force dualscan. In this case, the factory configuration for dualscan will take effect.

*note: Factory Dualscan configuration is typically only enabled for EPC products.

1 : Will force dualscan to be enabled. In this case, dualscan will be enabled regardless of the factory setting.

This MIB value will be stored to NonVolatile memory(NVM) and will persist across reboots. If the MIB is set via the config file, the CM will store the new setting and begin using it on next reboot. Removing the setting from the config

file will not change the value stored in NVM the CM will continue to operate using the previously stored value.

However, if an SNMP SET is used to modify the value, then the CM will not use the new setting until the next reboot occurs or is commanded.

A factory reset of the CM will set the stored value back to 0."

::= { cmInterfaceInfo 14 }

saCmDsBonding OBJECT-TYPE

```
SYNTAX INTEGER {  
    disable(0),  
    enable(1)  
}
```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The MIB will choose whether to enable downstream channel bonding for bonding-capable modems.

Non-bonding modems will ignore this MIB object.

0 : Disable downstream channel bonding.

1 : Enable downstream channel bonding.

This MIB will take effect at the next reboot.

This MIB value will be stored to NonVolatile memory(NVM) and will persist across reboots. If the MIB is set via the config file, the CM will store the new setting and reboot if a change is necessary. Removing the setting from the config

file will not change the value stored in NVM: the CM will continue to operate using the previously stored value.

If an SNMP SET is used to modify the value, then the CM will not use the new setting until the next reboot occurs or is commanded.

A factory reset of the CM will set the stored value back to 1."

DEFVAL { 1 }

::= { cmInterfaceInfo 15 }

saCmResiliencyInterval OBJECT-TYPE

SYNTAX INTEGER (0..86400)

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Setting to a non-zero number activates the Bonded Channel Resiliency feature and the set integer value becomes the period, in seconds, that the secondary downstream channels are evaluated. If the modem falls back to single

downstream channel mode and the previously rejected (or accepted) secondary downstream channels are deemed to be operational the modem will reset the cable interface in order to come up in bonded channel mode. The secondary channels will indefinitely be evaluated every (set period) seconds and downstream bonding restored if possible.

Setting the value to zero will disable this feature. Values under 60 will be set as 60."

DEFVAL { 600 }

::= { cmInterfaceInfo 16 }

Appendix C
MIB for the DPC3000
Cable Modem

saCmNarrowbandFallbackInterval OBJECT-TYPE

SYNTAX INTEGER (0..86400)

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Setting this MIB to a non-zero number will allow channel bonded modems to revert to Narrowband mode when wideband channels are failing. The setting is

an approximate number of seconds and can vary +/- 30 seconds depending on bonded channel conditions.

Narrowband fallback will require a re-registration with the CMTS.

If set to 0, then the modem will NOT attempt to re-connect the wideband channels

until a DHCP lease timeout occurs. During this time, no data service will be available

to the subscriber. Values under 10 will be set as 10."

DEFVAL { 30 }

::= { cmInterfaceInfo 17 }

saCmFtpIpStackInterface OBJECT-TYPE

SYNTAX INTEGER (1..8)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Use this MIB to specify the interface on which the FTP file will be received on or sent to.

The interface must have a valid IP address in order for this tool to function. The default interface is the

Cable Modem IP address."

```

DEFVAL { 1 }
 ::= { cmInterfaceInfo 18 }

```

saCmFtpServerAddressType OBJECT-TYPE

```

SYNTAX INTEGER {
  ipv4(0),
  ipv6(1)
}

```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This MIB defines the type of internet address to be used for the FTP Server.

0 : IPv4 FTP Server Address

1 : IPv6 FTP Server Address (reserved for future support)

NOTE: The default value of 0 indicates support for IPv4 IP address."

```

DEFVAL { 0 }
 ::= { cmInterfaceInfo 19 }

```

saCmFtpServerAddress OBJECT-TYPE

```

SYNTAX IpAddress

```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This MIB defines a network FTP Server address of a valid network FTP server. The FTP

Server address must be a routable network address in order for the FTP tool to function

correctly. If the FTP server is unknown, return 0.0.0.0."

```

 ::= { cmInterfaceInfo 20 }

```

saCmFtpServerPort OBJECT-TYPE

Appendix C
MIB for the DPC3000
Cable Modem

SYNTAX INTEGER (0..65536)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This MIB defines the TCP port to be used on the FTP Server for file transfer."

DEFVAL { 21 }

::= { cmInterfaceInfo 21 }

saCmFtpUserName OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (0..40))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Specify the username to be used for logging into the FTP Server."

DEFVAL { "admin" }

::= { cmInterfaceInfo 22 }

saCmFtpPassword OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (0..40))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Specify the password to be used for logging into the FTP Server."

::= { cmInterfaceInfo 23 }

saCmFtpFilename OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (0..40))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Specify the filename and path of the file to be downloaded or uploaded to the FTP Server."

DEFVAL { "" }

::= { cmInterfaceInfo 24 }

saCmFtpControl OBJECT-TYPE

SYNTAX INTEGER {

cancel(0),

get(1),

put(2)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This MIB initiates the file transfer and allows the user to choose either a get or a put."

DEFVAL { 0 }

::= { cmInterfaceInfo 25 }

saCmFtpStatus OBJECT-TYPE

SYNTAX INTEGER {

idle(0),

fileStatusOk(150),

serviceReady(200),

sessionReady(221),

transferComplete(226),

passwordOk(230),

userNameOk(331),

serviceNotAvail(421),

invalidLogin(530),

Appendix C
MIB for the DPC3000
Cable Modem

```
fileNotFound(550),  
socketConnectFailure(600)  
}
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This MIB provides a file transfer status report indicating the status of the latest transfer.

In the event a file transfer was not activated this field shall return a value of idle(0)."

```
::= { cmInterfaceInfo 26 }
```

saCmFtpPayloadBytes OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Provides the number of bytes transferred during the test in the data payload. The

result is representative of the most recent or current transfer. This number should

equal the size of the file transferred once the transfer completes."

```
::= { cmInterfaceInfo 27 }
```

saCmFtpTotalBytes OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Provides the total number of bytes transfered during the test including all file data and

payload. The result is representative of the most recent or current transfer. The final

value should equal the size the of the file transferred once the transfer completes."

::= { cmInterfaceInfo 28 }

saCmFtpElapsedTime OBJECT-TYPE

SYNTAX Counter32

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Provides the total number of bytes transfered during the test including all file data and

payload. The result is representative of the most recent or current transfer. The final

value should equal the size the of the file transferred once the transfer completes."

::= { cmInterfaceInfo 29 }

saCmFtpThroughput OBJECT-TYPE

SYNTAX Unsigned32

UNITS "bits per second"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Provides the calculated throughput for the file transfer which is either in progress or most

recently completed. This value = saCmFtpTotalBytes / saCmFtpElapsedTime."

::= { cmInterfaceInfo 30 }

saCmStatusMessageOnBattery OBJECT-TYPE

```
SYNTAX INTEGER {  
    batteryMessages (1),  
    batteryAndQAMMessages(2)  
}
```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This MIB selects the type of CM-STATUS messages to be sent in Docsis3.0 mode

while operating on battery and thereafter restoration of AC power.

atteryMessages would enable sending CM-STATUS messages 9 and 10 ONLY which is Spec compliant.

BatteryAndQAMMessages would enable sending CM-STATUS messages 9 and 10 for battery operation,

1-4 for NonPriMddFailure/Recovery, 2-5 QAM/FEC lock failure/recovery for Non Primary DS only"

```
DEFVAL { 2 }
```

```
::= { cmInterfaceInfo 31 }
```

saMddIpModeOverride OBJECT-TYPE

```
SYNTAX INTEGER {  
    honorMDD(0),  
    ipv4(1),  
    ipv6(2),  
    apm(3),  
    dpm(4)
```

```

}
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "
    This MIB is only valid on IPv6 capable modems.
    This MIB provides a way to override the MDD TLV for IP mode
initialization.
    If set in the config file and IP mode is different than currently
initialized
    the modem must DHCP release and reinitialize to proper IP mode.
    If set via SNMP in operational state the modem must not reinitialize.

    honorMDD: Honor the IP mode in the MDD message.
        ipv4 : Override IP mode to IPv4 if necessary.
            ipv6 : Override IP mode to IPv6 if necessary.
            apm : Override IP mode to APM if necessary.
            dpm : Override IP mode to DPM if necessary.

    NOTE: The new setting will persist during reboots.
    "
DEFVAL { 0 }
::= { cmInterfaceInfo 32 }

saCmDocsisCapableVersion OBJECT-TYPE
    SYNTAX SnmpAdminString
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Displays the string value for CM DHCP DISCOVER option 60 text.

```

Appendix C
MIB for the DPC3000
Cable Modem

This mib is only readable through SNMP. This MIB object can be queried to identify the device's docsis version that it supports."

```
::= {cmInterfaceInfo 33 }
```

```
-- =====  
-- HW SPECIFIC SOFTWARE DOWNLOAD OBJECTS  
-- =====  
--  
-- This table defines an alternative method of downloading  
-- new software to cable modems.  
-- When a SA modem reads the config file and finds this table present,  
-- it will do the following, for each row in the table:  
-- 1. Compare saCmSwModel name to its own name.  
--   If not the same, go to the next row in the table.  
--   If not present or the same, go to 2.  
-- 2. Compare saCmSwHwVer name to its own hardware version.  
--   If not the same, go to the next row in the table.  
--   If not present or the same, go to 3.  
-- 3. Compare saCmSwBootLoader to its own boot loader.  
--   If not the same, go to the next row in the table.  
--   If not present or the same, go to 4.  
-- 4. Compare saCmSwProto to its own signaling protocol.  
--   If not present or the same or any(0), go to 5.  
--   If not the same, go to the next row in the table.
```

```

-- 5. If saCmSwFilename is present, copy the value to docsDevSwFilename.
-- If saCmSwAdminStatus is present, copy the value to docsDevSwAdminStatus.
-- If saCmSwServer is present, copy the value to docsDevSwServer.
-- 6. If saCmSwMethod = unsecure(2), assume VSIF 38 = 1. If secure (1),
-- use CVC that comes with software.
-- 7. Exit the table.
-- If no rows are left, use config file TLVs for upgrading software.
--
-- Hint: The most specific rows (the ones that use saCmSwModel,
-- saCmSwHwVer and saCmSwProto) should be placed in the beginning
-- of the table.

```

```
saCmSoftwareDownload OBJECT IDENTIFIER ::= { dpxCmMibObjects 6 }
```

```
saCmSoftwareTable OBJECT-TYPE
```

```
SYNTAX SEQUENCE OF SaCmSoftwareEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Table for hardware specific software download."
```

```
::= { saCmSoftwareDownload 1 }
```

```
saCmSoftwareEntry OBJECT-TYPE
```

```
SYNTAX SaCmSoftwareEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Entries for hardware specific software download."
```

```
INDEX { saCmSwIndex }
```

```
::= { saCmSoftwareTable 1 }
```

Appendix C
MIB for the DPC3000
Cable Modem

```
SaCmSoftwareEntry ::= SEQUENCE
{
    saCmSwIndex    INTEGER,
    saCmSwModel    SnmpAdminString,
    saCmSwHwVer    SnmpAdminString,
    saCmSwBootLoader SnmpAdminString,
    saCmSwProtocol INTEGER,
    saCmSwFilename SnmpAdminString,
    saCmSwServer   IpAddress,
    saCmSwAdminStatus INTEGER,
    saCmSwMethod   INTEGER,
    saCmSwCvcReference INTEGER
}
```

```
saCmSwIndex OBJECT-TYPE
    SYNTAX    INTEGER (1..30)
    MAX-ACCESS not-accessible
    STATUS    current
    DESCRIPTION
        "Index used to order the application of access entries."
    ::= { saCmSoftwareEntry 1 }
```

```
saCmSwModel OBJECT-TYPE
    SYNTAX SnmpAdminString
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Model name of the cable modem product."
```

If not set, applies to all models.

example: DPC2100"

::= { saCmSoftwareEntry 2 }

saCmSwHwVer OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Hardware version of the cable modem product.

If not set, applies to all versions."

DEFVAL { "any" }

::= { saCmSoftwareEntry 3 }

saCmSwBootLoader OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Boot loader version of the cable modem product.

If not set, applies to all versions."

DEFVAL { "any" }

::= { saCmSoftwareEntry 4 }

saCmSwProtocol OBJECT-TYPE

SYNTAX INTEGER {

any(0),

ncs(1),

sip(2)

}

Appendix C
MIB for the DPC3000
Cable Modem

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Protocol used in cable modem product."

DEFVAL { 0 }

::= { saCmSoftwareEntry 5 }

saCmSwFilename OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (0..64))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Filename of the software image."

::= { saCmSoftwareEntry 6 }

saCmSwServer OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"TFTP server IP address where software image is located."

::= { saCmSoftwareEntry 7 }

saCmSwAdminStatus OBJECT-TYPE

SYNTAX INTEGER {

saCmSwAllowProvisioningUpgrade(2),

saCmSwIgnoreProvisioningUpgrade(3)

}

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"See docsDevSwAdminStatus for details."

::= { saCmSoftwareEntry 8 }

saCmSwMethod OBJECT-TYPE

SYNTAX INTEGER {

secure(1),

unsecure(2)

}

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Method of software download."

DEFVAL { 1 }

::= { saCmSoftwareEntry 9 }

saCmSwCvcReference OBJECT-TYPE

SYNTAX INTEGER

MAX-ACCESS not-accessible

STATUS obsolete

DESCRIPTION

"reference to CVC table row.

If not specified or 0, TLV-32 CVC will be used."

DEFVAL { 0 }

::= { saCmSoftwareEntry 10 }

saCmSoftwareCvcTable OBJECT-TYPE

Appendix C
MIB for the DPC3000
Cable Modem

SYNTAX SEQUENCE OF SaCmSoftwareCvcEntry

MAX-ACCESS not-accessible

STATUS obsolete

DESCRIPTION

"CVC table for hardware specific software download."

::= { saCmSoftwareDownload 2 }

saCmSoftwareDownloadTFTPServer OBJECT-TYPE

SYNTAX INTEGER {

sameAsCM(1),

dhcpOption54(2)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"When CM configuration file initiated software upgrade is needed,
the TFTP request will be sent to SwUpgradeServer IP address.

When the value of SwUpgradeServer is not specified in the CM
configuration file then the TFTP request will be sent to the same
TFTP server used for CM configuration file download (1) or to the
IP address specified in DHCP Option 54 (2)."

DEFVAL { 1 }

::= { saCmSoftwareDownload 3 }

saCmSoftwareCvcEntry OBJECT-TYPE

SYNTAX SaCmSoftwareCvcEntry

MAX-ACCESS not-accessible

STATUS obsolete

DESCRIPTION

"Entries for hardware specific software download CVC."

INDEX { saCmSwCvcIndex }

::= { saCmSoftwareCvcTable 1 }

SaCmSoftwareCvcEntry ::= SEQUENCE

```
{
  saCmSwCvcIndex  INTEGER,
  saCmSwMfgCvc   SnmpAdminString
}
```

saCmSwCvcIndex OBJECT-TYPE

SYNTAX INTEGER (1..5)

MAX-ACCESS not-accessible

STATUS obsolete

DESCRIPTION

"Index used to order the application of access entries."

::= { saCmSoftwareCvcEntry 1 }

saCmSwMfgCvc OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS not-accessible

STATUS obsolete

DESCRIPTION

"The length of the CVC is 200 hex characters (100 Bytes)

except for the last block.

Multiple objects can be specified in a row as CVC is usually

longer than 100 bytes."

::= { saCmSoftwareCvcEntry 2 }

Appendix C
MIB for the DPC3000
Cable Modem

```
-- =====  
-- END OF HW SPECIFIC SOFTWARE DOWNLOAD OBJECTS  
-- =====  
  
-- =====  
-- WEB ACCESS TREE  
-- =====  
  
saCmWebAccess OBJECT IDENTIFIER ::= { dpxCmMibObjects 7 }  
  
saCmWebAccessTable OBJECT-TYPE  
    SYNTAX      SEQUENCE OF SaCmWebAccessEntry  
    MAX-ACCESS  not-accessible  
    STATUS      current  
    DESCRIPTION  
        "Table for web access levels."  
    ::= { saCmWebAccess 1 }  
  
saCmWebAccessEntry OBJECT-TYPE  
    SYNTAX      SaCmWebAccessEntry  
    MAX-ACCESS  not-accessible  
    STATUS      current  
    DESCRIPTION  
        "Entries for web access levels."  
    INDEX { ifIndex }  
    ::= { saCmWebAccessTable 1 }  
  
SaCmWebAccessEntry ::= SEQUENCE  
    {
```

```
saCmWebAccessLevel    INTEGER
}
```

saCmWebAccessLevel OBJECT-TYPE

```
SYNTAX INTEGER {
    off(0),
    systemOnly(1),
    basic(2),
    advanced(3)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Access level for individual interface."
 ::= { saCmWebAccessEntry 1 }
```

-- index 2-4 reserved for Basic type/user/pass

saCmWebAccessAdvancedType OBJECT-TYPE

```
SYNTAX INTEGER {
    plain(1),
    potd(2)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Type of password for advnaced pages."
DEFVAL { 1 }
 ::= { saCmWebAccess 5 }
```

Appendix C
MIB for the DPC3000
Cable Modem

saCmWebAccessAdvancedUsername OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (0..40))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Username for advanced web pages."

DEFVAL { "admin" }

::= { saCmWebAccess 6 }

saCmWebAccessAdvancedPassword OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (0..40))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Password (depends on type) for advanced web pages.

If type = 1, the password is the string value.

If type = 2, the password is the 16-byte octet (hex) string

of MD5 of seed generated by the PoTD tool."

::= { saCmWebAccess 7 }

saCmWebAccessNoActivityTimeout OBJECT-TYPE

SYNTAX INTEGER

UNITS "seconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Timeout for a web session if no activity is present. If the timer expires, user will be logged out of Advanced webpage. If 0, web session will not timeout. Valid values are 0, 30-86400"

```

DEFVAL { 900 }
 ::= { saCmWebAccess 8 }

```

```

-- =====
-- END OF WEB ACCESS TREE
-- =====

```

```

-- =====
-- CERT DOWNLOAD
-- =====

```

```

saCmIdentityDownload OBJECT IDENTIFIER ::= { dpxCmMibObjects 8 }

```

```

saCmIdentityDownloadServer OBJECT-TYPE

```

```

  SYNTAX IpAddress

```

```

  MAX-ACCESS read-write

```

```

  STATUS current

```

```

  DESCRIPTION

```

```

    "Defines the IP address of TFTP server with identities.

```

```

    For an identity for MAC address of M1:M2:M3:M4:M5:M6, the
    filename requested will be M1M2M3/M4/M5/M6.bin.

```

```

    The default value of this object equals the siaddr from DHCP offer."

```

```

 ::= { saCmIdentityDownload 1 }

```

```

saCmIdentityDownloadServerDir OBJECT-TYPE

```

```

  SYNTAX SnmpAdminString

```

```

  MAX-ACCESS read-write

```

```

  STATUS current

```

```

  DESCRIPTION

```

Appendix C
MIB for the DPC3000
Cable Modem

"Defines the relative directory where the certificates are located.
For an identity for MAC address of M1:M2:M3:M4:M5:M6, and the object
set to 'cert/test' the filename requested will be
cert/test/M1M2M3/M4/M5/M6.bin for device identity and
and cert/test/sprca.cer for the SPRCA."

```
DEFVAL { "" }  
::= { saCmIdentityDownload 2 }
```

saCmIdentityDownloadType OBJECT-TYPE

```
SYNTAX INTEGER {  
    cm(1),  
    mta(2),  
    sprca(3)  
}
```

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Index for the download table.
Device identities are encrypted while SPRCA are not."

```
::= { saCmIdentityDownload 3 }
```

saCmIdentityDownloadTable OBJECT-TYPE

```
SYNTAX SEQUENCE OF SaCmIdentityDownloadEntry
```

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Defines parameters for the identity download."

```
::= { saCmIdentityDownload 4 }
```

saCmIdentityDownloadEntry OBJECT-TYPE

SYNTAX SaCmIdentityDownloadEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

""

INDEX { saCmIdentityDownloadType }

::= { saCmIdentityDownloadTable 1 }

SaCmIdentityDownloadEntry ::= SEQUENCE {

saCmIdentityDownloadFilename SnmpAdminString,

saCmIdentityDownloadTimestamp SnmpAdminString,

saCmIdentityDownloadStatus INTEGER

}

saCmIdentityDownloadFilename OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Defines the filename (and path) for Service Provider Root certificate
or device identity."

::= { saCmIdentityDownloadEntry 1 }

saCmIdentityDownloadTimestamp OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(12))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

Appendix C
MIB for the DPC3000
Cable Modem

"Defines the timestamp (YYYYMMDDHHMM) for the identity download.

If the date is later than stored in the modem, the download may proceed.

If the date is older or the same than in the modem, nothing happens.

If the download is successful, the modem will write the new date to non-vol."

::= { saCmIdentityDownloadEntry 2 }

saCmIdentityDownloadStatus OBJECT-TYPE

SYNTAX INTEGER {

idle(1),

download(2),

success(3),

errorTimestamp(4),

errorServer(5),

errorFileNotFound(6),

errorBadIdentity(7)

}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Commands to download the identity when set to download(2).

Default value of idle(1) is to ignore download.

Possible read-only values returned when queried :

- idle(1): the modem has not attempted to download the identities since last reboot

- success(3): downloaded the identities successfully

- errorTimestamp(4): the timestamp specified is not newer than in the modem

- errorServer(5): TFTP server did not respond

- errorFileNotFound(6): no identity file on the server

- errorBadIdentity(7): the identity file is not good"

```

DEFVAL { 1 }
 ::= { saCmIdentityDownloadEntry 3 }

-- =====
-- END OF CERT DOWNLOAD
-- =====

saCmStbSpecific OBJECT IDENTIFIER ::= { dpxCmMibObjects 9 }
-- SETTOP SPECIFIC, maintained externally.

-- =====
-- PUF table
-- =====
--
-- This table defines PUF table
--

saPUF OBJECT IDENTIFIER ::= { dpxCmMibObjects 10 }

saPUFTable OBJECT-TYPE
    SYNTAX SEQUENCE OF SaPUFEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A table of PowerUp Frequencies scanned first."
    ::= { saPUF 1 }

saPUFEntry OBJECT-TYPE
    SYNTAX SaPUFEntry
    MAX-ACCESS not-accessible

```

STATUS current

DESCRIPTION

"A row in the table that specifies a single frequency."

INDEX { saPUFIndex }

::= { saPUFTable 1 }

```
SaPUFEntry ::= SEQUENCE {
    saPUFIndex INTEGER,
    saPUFRowStatus RowStatus,
    saPUFFrequency Integer32
}
```

saPUFIndex OBJECT-TYPE

SYNTAX INTEGER (1..32)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Indicates the instance of this table row."

::= { saPUFEntry 1 }

saPUFRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-write

-- MAX-ACCESS read-create //see note below, shall be read-create HERE ????

STATUS current

DESCRIPTION

"Controls and reflects the status of rows in this table. Rows in this table may be created by either the create-and-go or create-and-wait paradigms. There is no restriction on changing values in a row of

this table while the row is active. Setting the value of this object to active (either directly or indirectly via create-and-go) will cause the row to be written to non-volatile storage. Changing the value of saPUFFrequency while the row is active will also cause the row to be written to non-volatile storage."

```
::= { saPUFEntry 2 }
```

saPUFFrequency OBJECT-TYPE

SYNTAX Integer32 (93000000..999000000)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Frequency in Hz"

```
::= { saPUFEntry 3 }
```

-- NOTE: (section 7.3. in rfc2578)

-- If any columnar object in a conceptual row has "read-create" as its
 -- maximal level of access, then no other columnar object of the same
 -- conceptual row may have a maximal access of "read-write". (Note that
 -- "read-create" is a superset of "read-write".)

END

D

Cable Modem Warranty and RMA Information

Introduction

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

In This Appendix

- Warranty and RMA Information..... 148

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 varies. Contact the representative who handles your account.
- 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 us or by an 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 we replace become our property. 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 your Customer Service Center 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 us or to the location of the nearest Authorized Service Provider. You must pre-pay all transportation costs, taxes, duties and insurance charges incurred for shipment to us or to 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 our logo
- 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 us or an Authorized Service Provider
- Any other cause outside of normal usage parameters

Appendix D
Cable Modem Warranty and RMA Information

- 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, we do 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. We are 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 are we 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 us needs to be returned for repair, please use the following procedure.

Important: Please help us to process your repairs/claims as quickly as possible by following this 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 us needs to be returned for repair, please use the following procedure that applies to your geographic region:

■ North America

Telephone our 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 us. An RMA fax request form is available upon request. Complete the RMA fax request form and fax it to: Customer Service, fax number: +1-770-236-5477. Or you can send an email to your Customer Service coordinator using the following format: (firstname.lastname@sciatl.com).

■ Latin America

Telephone our 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 us. 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. Or you can send an email to your Customer Service coordinator using the following format: (firstname.lastname@sciatl.com).

Appendix D
Cable Modem Warranty and RMA Information

■ **Asia/Pacific**

Telephone our 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 us. 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. Or you can send an email to your Customer Service coordinator using the following format: (firstname.lastname@sciatl.com).

■ **Europe**

Telephone our 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 us. 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. Or you can send an email to your Customer Service coordinator using the following format: (firstname.lastname@sciatl.com).

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 us 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. We 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 us 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 us with the notified party on the airway bill stated as "Expeditors 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 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.

Appendix D
Cable Modem Warranty and RMA Information

- 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 our property to dispose of to enable recovery of the repair expense.

Index

A

Access Levels • 56

B

Back Panel Description • 5

Before You Begin • 12, 16

BPKM (Baseline Privacy Key Management)
Logs • 50

C

Cable Modem Initialization • 6

Cable Modem Warranty Information • 147

Cable System Requirements • 12

Channels Selection Page • 69

Check and Correct • 31, 33, 36, 38

Check Cable Modem Status Messages • 45

Common Troubleshooting Issues • 42

Configuring TCP/IP on Macintosh Systems • 40

Configuring TCP/IP on Windows 2000 Systems
• 39

Configuring TCP/IP on Windows XP Systems •
39

Connecting the Modem for High-Speed Data
Service • 21

Contacting the Local Service Provider • 13

D

DCC Acknowledgement • 52

DCC Request • 52

Design and Performance Features • 2

DHCP (Dynamic Host Configuration Protocol)
Logs • 49

Display Basic Cable Modem Information • 59

DOCSIS Log Page • 70

DOCSIS Signal Page • 64

DOCSIS Status Page • 66

DOCSIS WAN Page • 62

DPC3000 Components • 4

DPC3000 Features • 2

Dynamic SA • 51

E

Early Authentication and Encryption (EAE) • 8

Equipment Checklist • 12

Establish IP Connectivity • 9

Establish Time of Day • 9

Event Logs • 48

F

Frequently Asked Questions • 39

Front Panel Description • 4

Functions of Front Panel LED Status Indicators •
28

H

Hardware and Software Requirements • 13

I

Init (BPI+) Logs • 50

Initial Power Up, Calibration, and Registration •
28

Initialize Baseline Privacy (if EAE not in use) •
10

Install the Cable Modem • 20

Install for Internet Service • 11

Install USB Drivers on the PC or Macintosh
Computer • 22

Installation Diagram • 20

Installing USB Drivers • 22

Installing USB Drivers on Windows XP Systems
• 23

Introducing the Model DPC3000 Cable Modem •
1

IP Connectivity Not Complete • 35

IPV6 Address Acquisition Logs • 50

L

- Locating the DPC3000 • 15
- Location and Dimensions of the Wall-Mounting Slots • 18
- Log Off the Cable Modem • 61
- Log On to the Cable Modem • 59

M

- MIB Descriptions • 86
- Model DPC3000 Specifications • 74
- Mount the Cable Modem on the Wall if Desired • 16
- Mounting Instructions • 17

N

- No Downstream Signal Lock • 31
- Normal Operations • 29

O

- Operating the DPC3000 • 55

P

- Plan A - North America • 78
- Plan B - International Hybrid • 79
- Plan C - Euro-DOCSIS with Dual Mode • 81
- Plan D - Japan • 82
- Plan H - Korea (Hybrid) with Dual Mode • 83
- Plan K - Korea (Hybrid) with Dual Mode • 84
- Power Cycling and Reboots • 58

Q

- Q. How Do I Configure TCP/IP Protocol? • 39
- Q. How Do I Renew the IP Address on My PC? • 41

R

- Ranging Logs • 48
- Ranging Not Complete • 33
- Register with the CMTS • 10
- Registration Not Complete • 37
- Regulatory Compliance • 76
- Renewing the IP Address on Windows 95, 98, 98SE, and ME Systems • 41

- Renewing the IP Address on Windows NT, 2000, or XP Systems • 41
- Reset • 58
- Return Material Authorization (RMA) Procedure • 151
- RMA Returns Policy and Procedure for Cable Modems • 151

S

- Scan for Downstream Channel • 6
- Scan Plan Algorithm Overview • 78
- Service Group Discovery and Ranging • 8
- Special Conditions • 30
- Specifications Table • 74
- Standards Compliance and Compatibility • 76
- Summary of Front Panel LED Status Indicators • 27
- SW Upgrade General Failure • 51
- SW Upgrade Init • 52
- SW Upgrade Success • 52

T

- Technical Specifications • 74
- TFTP (Trivial File Transfer Protocol) Logs • 49
- Theory of Operation • 6
- Tips for Improved Performance • 44
- TOD (Time of Day) Logs • 48
- Transfer Operational Parameters • 9
- Troubleshooting Overview • 27
- Troubleshooting the Installation • 25

U

- UCC Request • 52
- Use the WebWizard to Verify Configuration • 61

V

- Verification of CVC • 53

W

- Wall Mounting Instructions • 19
- Warranty and RMA Information • 148
- WebWizard • 3, 56
- WebWizard Features • 56
- WebWizard Operation • 56



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February 2010 Printed in United States of America

Part Number 4027702 Rev A