Reference Manual for the 54 Mbps ADSL Modem Wireless Router Model DG834G

NETGEAR

NETGEAR, Inc.
4500 Great America Parkway
Santa Clara, CA 95054 USA

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Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

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

Federal Communications Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.
This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

European Union Statement of Compliance

Hereby, NETGEAR, Inc. declares that this modem router is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Èesky [Czech]	NETGEAR, Inc. tímto prohlašuje, že tento 54 Mbps ADSL Modem Wireless Router Model DG834G je ve shodì se základními požadavky a dalšími pøíslušnými ustanoveními smìrnice 1999/5/ES.
Dansk [Danish]	Undertegnede NETGEAR, Inc. erklærer herved, at følgende udstyr 54 Mbps ADSL Modem Wireless Router Model DG834G overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt NETGEAR, Inc., dass sich das Gerät 54 Mbps ADSL Modem Wireless Router Model DG834G in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab NETGEAR, Inc. seadme 54 Mbps ADSL Modem Wireless Router Model DG834G vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, NETGEAR, Inc., declares that this 54 Mbps ADSL Modem Wireless Router Model DG834G is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente NETGEAR, Inc. declara que el 54 Mbps ADSL Modem Wireless Router Model DG834G cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ NETGEAR, Inc. ΔΗΛΩΝΕΙ ΟΤΙ 54 Mbps ADSL Modem Wireless Router Model DG834G ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Français [French]	Par la présente NETGEAR, Inc. déclare que l'appareil 54 Mbps ADSL Modem Wireless Router Model DG834G est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente NETGEAR, Inc. dichiara che questo 54 Mbps ADSL Modem Wireless Router Model DG834G è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo NETGEAR, Inc. deklarç, ka 54 Mbps ADSL Modem Wireless Router Model DG834G atbilst Direktîvas 1999/5/EK bûtiskajâm prasîbâm un citiem ar to saistîtajiem noteikumiem.
Lietuviø [Lithuanian]	Šiuo NETGEAR, Inc. deklaruoja, kad šis 54 Mbps ADSL Modem Wireless Router Model DG834G atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.

Nederlands [Dutch]	Hierbij verklaart NETGEAR, Inc. dat het toestel 54 Mbps ADSL Modem Wireless Router Model DG834G in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, NETGEAR, Inc., jiddikjara li dan 54 Mbps ADSL Modem Wireless Router Model DG834G jikkonforma mal-tiijiet essenzjali u ma provvedimenti orajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Magyar [Hungarian]	Alulírott, NETGEAR, Inc. nyilatkozom, hogy a 54 Mbps ADSL Modem Wireless Router Model DG834G megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
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Português [Portuguese]	NETGEAR, Inc. declara que este 54 Mbps ADSL Modem Wireless Router Model DG834G está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	NETGEAR, Inc. izjavlja, da je ta 54 Mbps ADSL Modem Wireless Router Model DG834G v skladu z bistvenimi zahtevami in ostalimi relevantnimi doloèili direktive 1999/5/ES.
Slovensky [Slovak]	NETGEAR, Inc. týmto vyhlasuje, že 54 Mbps ADSL Modem Wireless Router Model DG834G spåòa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	NETGEAR, Inc. vakuuttaa täten että 54 Mbps ADSL Modem Wireless Router Model DG834G tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar NETGEAR, Inc. att denna *[utrustningstyp]* står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

A printed copy of the EU Declaration of Conformity certificate for this product is provided in the DG834G v3 product package.

Bestätigung des Herstellers/Importeurs

Es wird hiermit bestätigt, daß das 54 Mbps ADSL Modem Wireless Router Model DG834G gemäß der im BMPT-AmtsblVfg 243/1991 und Vfg 46/1992 aufgeführten Bestimmungen entstört ist. Das vorschriftsmäßige Betreiben einiger Geräte (z.B. Testsender) kann jedoch gewissen Beschränkungen unterliegen. Lesen Sie dazu bitte die Anmerkungen in der Betriebsanleitung.

Das Bundesamt für Zulassungen in der Telekommunikation wurde davon unterrichtet, daß dieses Gerät auf den Markt gebracht wurde und es ist berechtigt, die Serie auf die Erfüllung der Vorschriften hin zu überprüfen.

Certificate of the Manufacturer/Importer

It is hereby certified that the 54 Mbps ADSL Modem Wireless Router Model DG834G has been suppressed in accordance with the conditions set out in the BMPT-AmtsblVfg 243/1991 and Vfg 46/1992. The operation of some equipment (for example, test transmitters) in accordance with the regulations may, however, be subject to certain restrictions. Please refer to the notes in the operating instructions.

Federal Office for Telecommunications Approvals has been notified of the placing of this equipment on the market and has been granted the right to test the series for compliance with the regulations.

Voluntary Control Council for Interference (VCCI) Statement

This equipment is in the second category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential areas.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read instructions for correct handling.

Customer Support

Refer to the Support Information Card that shipped with your 54 Mbps ADSL Modem Wireless Router Model DG834G.

World Wide Web

NETGEAR maintains a World Wide Web home page that you can access at the universal resource locator (URL) *http://www.netgear.com*. A direct connection to the Internet and a Web browser such as Internet Explorer or Netscape are required.

Product and Publication Details

Model Number:	DG834G v3
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Product Name:	54 Mbps ADSL Modem Wireless Router Model DG834G
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Channel

The Wireless Channel sets the radio frequency used for communication.

Access Points use a fixed Channel. You can select the Channel used. This allows you to choose a Channel which provides the least interference and best performance. In the USA and Canada, 11 channel are available. In the Europe, 1-13 channel are available.

If using multiple Access Points, it is better if adjacent Access Points use different Channels to reduce interference.

In "Infrastructure" mode, Wireless Stations normally scan all Channels, looking for an Access Point. If more than one Access Point can be used, the one with the strongest signal is used. (This can only happen within an ESS.)

If using "Ad-hoc" mode (no Access Point), all Wireless stations should be set to use the same Channel. However, most Wireless stations will still scan all Channels to see if there is an existing "Ad-hoc" group they can join.

Contents

Reference Manual for the ADSL Modem Wireless Router DG834G

Chapter 1
About This Manual

Audience, Scope, Conventions, and Formats 1-1
How to Print this Manual 1-2

Chapter 2
Introduction

About the Modem Router 2-1
Key Features 2-2
A Powerful, True Firewall 2-2
802.11 Standards-based Wireless Networking 2-3
Easy Installation and Management 2-3
Protocol Support 2-4
Virtual Private Networking (VPN) 2-5
Auto Sensing and Auto Uplink™ LAN Ethernet Connections 2-5
Content Filtering 2-6
Trend Micro Home Network Security 2-6
What's in the Box? 2-7
The Router's Front Panel 2-8
The Router's Rear Panel 2-9
Connecting the Router to the Internet 2-10

Chapter 3
Wireless Configuration

Considerations for a Wireless Network 3-1
Observe Performance, Placement, and Range Guidelines 3-1
Implement Appropriate Wireless Security 3-2
Understanding Wireless Settings 3-3
How to Set Up and Test Basic Wireless Connectivity 3-6

How to Restrict Wireless Access to Your Network 3-7
Choosing WEP Authentication and Security Encryption Methods 3-10
How to Configure WEP 3-12
How to Configure WPA-PSK 3-13
How to Configure WPA-802.1x 3-14

Chapter 4
Protecting Your Network

Protecting Access to Your 54 Mbps ADSL Modem Wireless Router Model DG834G 4-1
How to Change the Built-In Password 4-1
Changing the Administrator Login Timeout 4-2
Configuring Basic Firewall Services 4-3
Blocking Keywords, Sites, and Services 4-3
How to Block Keywords and Sites 4-3
Firewall Rules 4-5
Inbound Rules (Port Forwarding) 4-6
Outbound Rules (Service Blocking) 4-9
Order of Precedence for Rules 4-11
Services 4-12
How to Define Services 4-12
Setting Times and Scheduling Firewall Services 4-13
How to Set Your Time Zone 4-13
How to Schedule Firewall Services 4-15
Trend Micro Home Network Security 4-15
Security Service Settings 4-16
Parental Controls Settings 4-18

Chapter 5
Managing Your Network

Backing Up, Restoring, or Erasing Your Settings 5-1
How to Back Up the Configuration to a File 5-1
How to Restore the Configuration from a File 5-2
How to Erase the Configuration 5-2
Upgrading the Modem Router's Firmware 5-2
How to Upgrade the Modem Router Firmware 5-3
Network Management Information 5-4
Viewing Modem Router Status and Usage Statistics 5-4

Viewing Attached Devices 5-9
Viewing, Selecting, and Saving Logged Information 5-9
Examples of Log Messages 5-12
Enabling Security Event E-mail Notification 5-13
Running Diagnostic Utilities and Rebooting the Modem Router 5-15
Enabling Remote Management 5-16
Configuring Remote Management 5-16

Chapter 6
Advanced Configuration

Configuring Advanced Security 6-1
Setting Up A Default DMZ Server 6-2
Connect Automatically, as Required 6-3
Disable Port Scan and DOS Protection 6-3
Respond to Ping on Internet WAN Port 6-4
MTU Size 6-4
Configuring LAN IP Settings 6-4
DHCP 6-6
How to Configure LAN TCP/IP Settings 6-8
Configuring Dynamic DNS 6-9
How to Configure Dynamic DNS 6-9
Using Static Routes 6-11
Static Route Example 6-11
How to Configure Static Routes 6-12
Universal Plug and Play (UPnP) 6-13

Chapter 7
Virtual Private Networking

Overview of VPN Configuration 7-2
Client-to-Gateway VPN Tunnels 7-2
Gateway-to-Gateway VPN Tunnels 7-3
Planning a VPN 7-4
VPN Tunnel Configuration 7-6
How to Set Up a Client-to-Gateway VPN Configuration 7-7
Step 1: Configuring the Client-to-Gateway VPN Tunnel on the DG834G v3 7-7
Step 2: Configuring the NETGEAR ProSafe VPN Client on the Remote PC 7-12
How to Set Up a Gateway-to-Gateway VPN Configuration 7-21

VPN Tunnel Control 7-29
Activating a VPN Tunnel 7-29
Verifying the Status of a VPN Tunnel 7-33
Deactivating a VPN Tunnel 7-35
Deleting a VPN Tunnel 7-37
How to Set Up VPN Tunnels in Special Circumstances 7-38
Using Auto Policy to Configure VPN Tunnels 7-38
Using Manual Policy to Configure VPN Tunnels 7-48

Chapter 8
Troubleshooting

Basic Functioning 8-1
Power LED Not On 8-2
Test LED Never Turns On or Test LED Stays On 8-2
LAN or Internet Port LEDs Not On 8-2
Troubleshooting the Web Configuration Interface 8-3
Troubleshooting the ISP Connection 8-4
ADSL link 8-4
Obtaining a WAN IP Address 8-5
Troubleshooting PPPoE or PPPoA 8-6
Troubleshooting Internet Browsing 8-7
Troubleshooting a TCP/IP Network Using the Ping Utility 8-7
Testing the LAN Path to Your Router 8-7
Testing the Path from Your Computer to a Remote Device 8-8
Restoring the Default Configuration and Password 8-9
Using the Reset button 8-9
Problems with Date and Time 8-9

Appendix A
Technical Specifications

Appendix B
NETGEAR VPN Configuration

DG834G v3 to FVL328 ..... B-1
Configuration Profile B-1
Step-By-Step Configuration B-2
DG834G v3 with FQDN to FVL328 ..... B-6
Configuration Profile B-6

Step-By-Step Configuration B-8
Configuration Summary (Telecommuter Example) B-14
Setting Up the Client-to-Gateway VPN Configuration (Telecommuter Example) B-15
Step 1: Configuring the Client-to-Gateway VPN Tunnel on the VPN Router at the Employer's Main Office B-15
Step 2: Configuring the NETGEAR ProSafe VPN Client on the Remote PC at the Telecommuter's Home Office B-18
Monitoring the VPN Tunnel (Telecommuter Example) B-28
Viewing the PC Client's Connection Monitor and Log Viewer B-28
Viewing the VPN Router's VPN Status and Log Information B-29
Appendix C
Related Documents

Chapter 1
About This Manual

This chapter describes the intended audience, scope, conventions, and formats of this manual.

Audience, Scope, Conventions, and Formats

This reference manual assumes that the reader has basic to intermediate computer and Internet skills. However, basic computer network, Internet, firewall, and VPN technologies tutorial information is provided in the Appendices and on the Netgear website.

	Note: Product updates are available on the NETGEAR, Inc. Web site at *http://kbserver.netgear.com/products/DG834G v3.asp*.

This guide uses the following typographical conventions:

Table 1-1.

italics	Emphasis, books, CDs, URL names
bold	User input
`fixed`	Screen text, file and server names, extensions, commands, IP addresses

This guide uses the following formats to highlight special messages:

	Note: This format is used to highlight information of importance or special interest.

	Tip: This format is used to highlight a procedure that will save time or resources.

	Warning: Ignoring this type of note may result in a malfunction or damage to the equipment.

	Danger: This is a safety warning. Failure to take heed of this notice may result in personal injury or death.

This manual is written for the ADSL Modem Wireless Router according to these specifications:

Table 1-2. Manual Scope

Product Version	54 Mbps ADSL Modem Wireless Router Model DG834G
Manual Publication Date	January 2006

How to Print this Manual

To print this manual you can choose one of the following several options, according to your needs.

- **Printing a Page in the HTML View**.

  Each page in the HTML version of the manual is dedicated to a major topic. Use the *Print* button on the browser toolbar to print the page contents.

- **Printing a Chapter**.

  Use the *PDF of This Chapter* link at the top left of any page.

  — Click the *PDF of This Chapter* link at the top right of any page in the chapter you want to print. The PDF version of the chapter you were viewing opens in a browser window.

  — Your computer must have the free Adobe Acrobat reader installed in order to view and print PDF files. The Acrobat reader is available on the Adobe Web site at *http://www.adobe.com*.

— Click the print icon in the upper left of the window.

	Tip: If your printer supports printing two pages on a single sheet of paper, you can save paper and printer ink by selecting this feature.

- **Printing the Full Manual**.

  Use the *Complete PDF Manual* link at the top left of any page.

  — Click the *Complete PDF Manual* link at the top left of any page in the manual. The PDF version of the complete manual opens in a browser window.

  — Click the print icon in the upper left of the window.

	Tip: If your printer supports printing two pages on a single sheet of paper, you can save paper and printer ink by selecting this feature.

Chapter 2
Introduction

This chapter describes the features of the NETGEAR 54 Mbps ADSL Modem Wireless Router Model DG834G. The ADSL Modem Wireless Router is a combination of a built-in ADSL modem, modem router, 4-port switch, and firewall which enables your entire network to safely share an Internet connection that otherwise would be used by a single computer.

	Note: If you are unfamiliar with networking and routing, refer to "Internet Networking and TCP/IP Addressing" in Appendix C to become more familiar with the terms and procedures used in this manual.

About the Modem Router

The 54 Mbps ADSL Modem Wireless Router Model DG834G provides continuous, high-speed 10/100 Ethernet access between your Ethernet devices. With minimum setup, you can install and use the modem router within minutes.

The ADSL Modem Wireless Router provides multiple Web content filtering options, reporting, and instant alerts. Parents and network administrators can establish restricted access policies based on time of day, Web site addresses, and address keywords. They can also share high-speed ADSL Internet access for up to 253 personal computers. The included firewall and Network Address Translation (NAT) features protect you from hackers.

The DG834G v3 also supports Trend Micro Home Network Security, a bundle of services that includes router-based Parental Controls and network-wide protection from viruses, Trojans, spyware, spam, and other Internet threats.

Key Features

The ADSL Modem Wireless Router provides the following features:

- A built-in ADSL modem
- A powerful, true firewall
- 802.11g standards-based wireless networking
- Easy, Web-based setup for installation and management
- Extensive Internet protocol support
- Trustworthy VPN Communications over the Internet
- VPN Wizard for easy VPN configuration
- Auto Sensing and Auto Uplink™ LAN Ethernet connections
- Content filtering
- Support for Trend Micro Home Network Security

These features are discussed below.

A Powerful, True Firewall

Unlike simple Internet sharing NAT routers, the DG834G v3 is a true firewall, using stateful packet inspection to defend against hacker attacks. Its firewall features include:

- Denial of Service (DoS) protection
  Automatically detects and thwarts Denial of Service (DoS) attacks such as Ping of Death, SYN Flood, LAND Attack and IP Spoofing.
- Blocks unwanted traffic from the Internet to your LAN.
- Blocks access from your LAN to Internet locations or services that you specify as off-limits.
- Logs security incidents
  The DG834G v3 will log security events such as blocked incoming traffic, port scans, attacks, and administrator logins. You can configure the modem router to email the log to you at specified intervals. You can also configure the modem router to send immediate alert messages to your email address or email pager whenever a significant event occurs.

802.11 Standards-based Wireless Networking

The ADSL Modem Wireless Router includes an 802.11g-compliant wireless access point, providing continuous, high-speed 10/100 Mbps access between your wireless and Ethernet devices. The access point provides:

- 802.11g Standards-based wireless networking at up to 54 Mbps
- Works with both 802.11g and 802.11b wireless devices
- 64-bit and 128-bit WEP encryption security
- WEP keys can be entered manually or generated by passphrase
- Support for Wi-Fi Protected Access Pre-Shared Key (WPA-PSK) encryption and 802.1x authentication
- Wireless access can be restricted by MAC address

Easy Installation and Management

You can install, configure, and operate the DG834G v3 within minutes after connecting it to the network. The following features simplify installation and management tasks:

- Browser-based management
  Browser-based configuration allows you to easily configure your modem router from almost any type of personal computer, such as Windows, Macintosh, or Linux. A user-friendly Setup Wizard is provided and online help documentation is built into the browser-based Web Management Interface.
- Smart Wizard
  The firmware in the modem router automatically senses the type of Internet connection, asking you only for the information required for your type of ISP account.
- Remote management
  The modem router allows you to log in to the Web management interface from a remote location via the Internet. For security, you can limit remote management access to a specified remote IP address or range of addresses, or you can choose a nonstandard port number.
- Diagnostic functions
  The modem router incorporates built-in diagnostic functions such as Ping, DNS lookup, and remote reboot. These functions allow you to test Internet connectivity and reboot the modem router. You can use these diagnostic functions directly from the DG834G v3 when you are connected on the LAN or when you are connected over the Internet via the remote management function.

- Visual monitoring
  The modem router's front panel LEDs provide an easy way to monitor its status and activity.
- Flash erasable programmable read-only memory (EPROM) for firmware upgrades.

Protocol Support

The DG834G v3 supports Transmission Control Protocol/Internet Protocol (TCP/IP) and Routing Information Protocol (RIP). "Internet Networking and TCP/IP Addressing" in Appendix C provides further information on TCP/IP.

- The Ability to Enable or Disable IP Address Sharing by NAT
  The DG834G v3 allows several networked PCs to share an Internet account using only a single IP address, which may be statically or dynamically assigned by your Internet service provider (ISP). This technique, known as Network Address Translation (NAT), allows the use of an inexpensive single-user ISP account. This feature can also be turned off completely while using the DG834G v3 if you want to manage the IP address scheme yourself.
- Automatic Configuration of Attached PCs by DHCP
  The DG834G v3 dynamically assigns network configuration information, including IP, modem router, and domain name server (DNS) addresses, to attached PCs on the LAN using the Dynamic Host Configuration Protocol (DHCP). This feature greatly simplifies configuration of PCs on your local network.
- DNS Proxy
  When DHCP is enabled and no DNS addresses are specified, the modem router provides its own address as a DNS server to the attached PCs. The modem router obtains actual DNS addresses from the ISP during connection setup and forwards DNS requests from the LAN.
- Classical IP (RFC 1577)
  Some Internet service providers, in Europe for example, use Classical IP in their ADSL services. In such cases, the modem router is able to use the Classical IP address from the ISP.
- PPP over Ethernet (PPPoE)
  PPP over Ethernet is a protocol for connecting remote hosts to the Internet over an ADSL connection by simulating a dial-up connection. This feature eliminates the need to run a login program such as EnterNet or WinPOET on your computer.
- PPP over ATM (PPPoA)
  PPP over ATM is a protocol for connecting remote hosts to the Internet over an ADSL connection by simulating an ATM connection.

- Dynamic DNS
  Dynamic DNS services allow remote users to find your network using a domain name when your IP address is not permanently assigned. The modem router contains a client that can connect to many popular Dynamic DNS services to register your dynamic IP address.
- Universal Plug and Play (UPnP)
  UPnP is a networking architecture that provides compatibility between networking technologies. UPnP compliant routers provide broadband users at home and small businesses with a seamless way to participate in online games, videoconferencing and other peer-to-peer services.

Virtual Private Networking (VPN)

The ADSL Modem Wireless Router provides a secure encrypted connection between your local area network (LAN) and remote networks or clients. It includes the following VPN features:

- Supports 5 VPN connections.
- Supports industry standard VPN protocols
  The ADSL Modem Wireless Router supports standard Manual or IKE keying methods, standard MD5 and SHA-1 authentication methods, and standard DES and 3DES encryption methods. It is compatible with many other VPN products.
- Supports 3DES encryption for maximum security.
- VPN Wizard based on VPNC recommended settings.

Auto Sensing and Auto Uplink™ LAN Ethernet Connections

With its internal 4-port 10/100 switch, the DG834G v3 can connect to either a 10 Mbps standard Ethernet network or a 100 Mbps Fast Ethernet network. The local LAN ports are autosensing and capable of full-duplex or half-duplex operation.

The modem router incorporates Auto Uplink™ technology. Each local Ethernet port will automatically sense whether the Ethernet cable plugged into the port should have a ‘normal’ connection such as to a computer or an ‘uplink’ connection such as to a switch or hub. That port will then configure itself to the correct configuration. This feature also eliminates the need to worry about crossover cables, as Auto Uplink will accommodate either type of cable to make the right connection.

Content Filtering

With its content filtering feature, the DG834G v3 prevents objectionable content from reaching your PCs. The modem router allows you to control access to Internet content by screening for keywords within Web addresses. You can configure the modem router to log and report attempts to access objectionable Internet sites.

Trend Micro Home Network Security

This service bundle from Trend Micro has three components:

- **Trend Micro dashboard**
  This component is free for unlimited use. From the dashboard you can:
  - Scan your computer and entire network for security vulnerabilities
  - View individual computer and network-wide security reports
  - Detect and remove spyware
  - View attempts to access content restricted by Parental Controls
  - Purchase subscriptions for Parental Controls and Trend Micro Internet Security
- **Trend Micro Internet Security**
  You can install this program on up to 10 computers and try it free for 60 days. Its features include:
  - Real-time and scheduled scanning to remove viruses, Trojans, spyware, and other Internet threats
  - Personal firewall
  - Network intruder detection
  - Anti-spam
- **Router-based Parental Controls**
  This service restricts home network users from viewing inappropriate Web content. It is free for 60 days, and when you register your free trial of Trend Micro Internet Security, your free use of Parental Controls is automatically extended to one year.

For instructions on activating these services, refer to “Trend Micro Home Network Security” on page 4-15.

What's in the Box?

The product package should contain the following items:

- 54 Mbps ADSL Modem Wireless Router Model DG834G
- AC power adapter (varies by region)
- Category 5 (Cat 5) Ethernet cable
- Telephone cable with RJ-11 connector
- Microfilters (quantity and type vary by region)
- *DG834G ADSL Modem Wireless Router Resource CD*, including this guide
- Two plastic feet that can be used to stand the ADSL Modem Wireless Router on end
- Warranty and Support Information cards

If any of the parts are incorrect, missing, or damaged, contact your NETGEAR dealer. Keep the carton, including the original packing materials, in case you need to return the product for repair.

The Router's Front Panel

The front panel shown below contains status LEDs.

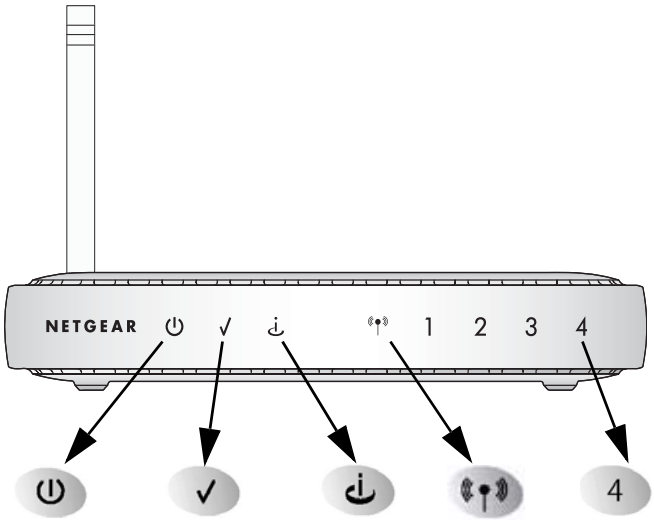


Figure 2-1

You can use the LEDs to verify various conditions. Table 2-1 describes each LED.

Table 2-1. LED Descriptions

Label	Activity	Description
1. Power	On Off	Power is supplied to the router. Power is not supplied to the router.
2. Test	On Off	The system is initializing. The system is ready and running.
3. Internet	Blink -- Amber On -- Green Blink -- Green	Indicates ADSL training. The Internet port has detected a link with an attached device. Data is being transmitted or received by the Internet port.
4. Wireless	On Off	Indicates that the Wireless port is initialized. The Wireless Access Point is turned off.
5. LAN	On (Green) Blink (Green) On (Amber) Blink (Amber) Off	The Local port has detected a link with a 100 Mbps device. Data is being transmitted or received at 100 Mbps. The Local port has detected a link with a 10 Mbps device. Data is being transmitted or received at 10 Mbps. No link is detected on this port.

The Router's Rear Panel

The rear panel of the 54 Mbps ADSL Modem Wireless Router Model DG834G (Figure 2-2) contains port connections.

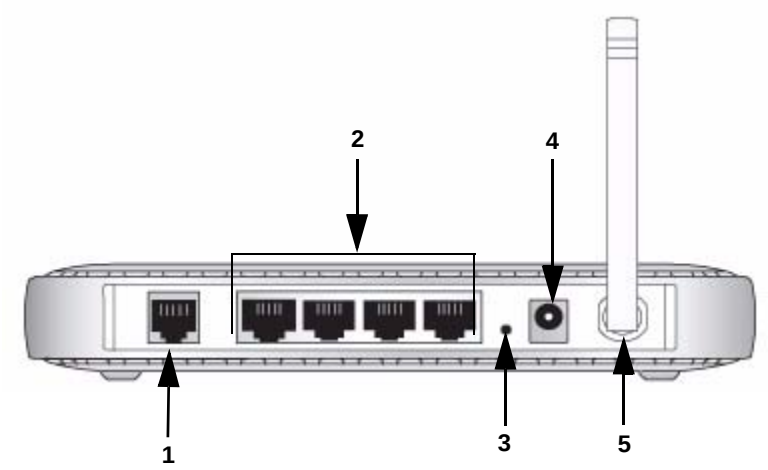


Figure 2-2

Viewed from left to right, the rear panel contains the following elements:

1. RJ-11 ADSL port for connecting the firewall to an ADSL line
2. Four Local Ethernet RJ-45 LAN ports for connecting the firewall to the local computers
3. Factory Default Reset push button
4. AC power adapter outlet
5. Wireless antenna

Connecting the Router to the Internet

To connect your ADSL Modem Wireless Router to the Internet, refer to the *ADSL Modem Wirelesss Router Setup Manual* on the *DG834G ADSL Modem Wireless Router Resource CD* or online as shown in the following table.

Table 2-2.

Language	URL
Dutch	*http://documentation.netgear.com/dg834g/nld/208-10039-01/*
English	*http://documentation.netgear.com/dg834g/enu/208-10033-01/*
French	*http://documentation.netgear.com/dg834g/fra/208-10034-01/*
German	*http://documentation.netgear.com/dg834g/deu/208-10035-01/*
Italian	*http://documentation.netgear.com/dg834g/ita/208-10036-01/*
Spanish	*http://documentation.netgear.com/dg834g/esp/208-10037-01/*
Swedish	*http://documentation.netgear.com/dg834g/sve/208-10038-01/*

Chapter 3
Wireless Configuration

This chapter describes how to configure the wireless features of your 54 Mbps ADSL Modem Wireless Router Model DG834G.

Considerations for a Wireless Network

In planning your wireless network, you should consider the level of security required. You should also select the physical placement of your modem router in order to maximize the network speed.

To ensure proper compliance and compatibility between similar products in your area, the operating channel and region must be set correctly.

Observe Performance, Placement, and Range Guidelines

The operating distance or range of your wireless connection can vary significantly based on the physical placement of the wireless firewall. The latency, data throughput performance, and notebook power consumption also vary depending on your configuration choices.

	Note: Failure to follow these guidelines can result in significant performance degradation or inability to wirelessly connect to the router. For complete range/performance specifications, please see Appendix A, “Technical Specifications”.

For best results, place your firewall:

- Near the center of the area in which your computers will operate
- In an elevated location such as a high shelf where the wirelessly connected computers have line-of-sight access (even if through walls)
- Away from sources of interference, such as computers, microwaves, and cordless phones
- With the Antenna tight and in the upright position
- Away from large metal surfaces

The time it takes to establish a wireless connection can vary depending on both your security settings and placement. WEP connections can take slightly longer to establish. Also, WEP encryption can consume more battery power on a notebook computer.

Implement Appropriate Wireless Security

	Note: Indoors, computers can connect over 802.11g wireless networks at a maximum range of up to 300 feet. Such distances can allow for others outside of your immediate area to access your network.

Unlike wired network data, your wireless data transmissions can extend beyond your walls and can be received by anyone with a compatible adapter. For this reason, use the security features of your wireless equipment. The ADSL Modem Wireless Router provides highly effective security features which are covered in detail in this chapter. Deploy the security features appropriate to your needs.

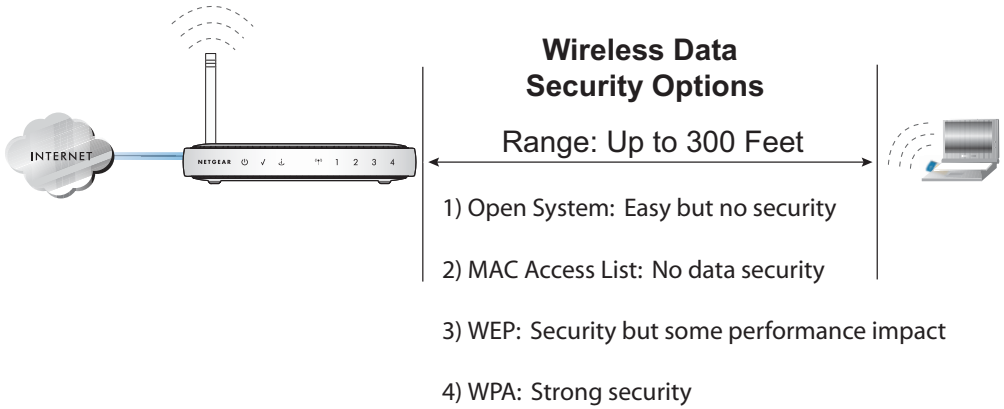


Figure 3-1

There are several ways you can enhance the security of your wireless network:

- **Restrict Access Based on MAC Address.** You can allow only trusted PCs to connect so that unknown PCs cannot wirelessly connect to the DG834G v3. Restricting access by MAC address adds an obstacle against unwanted access to your network, but the data broadcast over the wireless link is fully exposed.
- **Turn Off the Broadcast of the Wireless Network Name SSID.** If you disable broadcast of the SSID, only devices that have the correct SSID can connect. This nullifies wireless network ‘discovery’ feature of some products, such as Windows XP, but the data is still exposed.

- **WEP.** Wired Equivalent Privacy (WEP) data encryption provides data security. WEP Shared Key authentication and WEP data encryption will block all but the most determined eavesdropper.
- **WPA**. Wi-Fi Protected Access (WPA) data encryption provides data security. The very strong authentication along with dynamic per frame re-keying of WPA make it virtually impossible to compromise. Because this is a new standard, wireless device driver and software availability may be limited.

Understanding Wireless Settings

To configure the Wireless interface of your modem router, click the **Wireless Settings** link in the Setup section of the main menu. The Wireless Settings menu will appear, similar to that shown below:

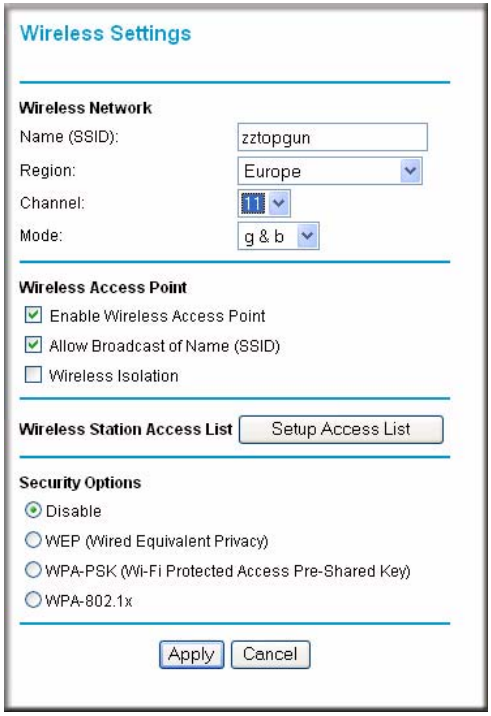


Figure 3-2

The following parameters are in the Wireless Settings menu:

- **Wireless Network**.
  - — **Name (SSID)**. The Service Set ID, also known as the wireless network name. Enter a value of up to 32 alphanumeric characters. The same Name (SSID) must be assigned to all wireless devices in your network. The default SSID is **NETGEAR**, but NETGEAR strongly recommends that you change your network Name to a different value.

    Note: This value is case sensitive. For example, **Wireless** is not the same as **wireless**.

  - — **Region**. Select your country/region from the drop-down list. This field displays the region of operation for which the wireless interface is intended.

    Note: In the USA, the Region is preset according to regulatory requirements and cannot be changed. In other areas, you can and must set the Region. It may not be legal to operate the wireless access point in a region other than one of those identified in this field.

  - — **Channel**. This field determines which operating frequency will be used. It should not be necessary to change the wireless channel unless you notice interference problems with another nearby access point.
  - — **Mode**. The default is "g & b", which allows both "g" and "b" wireless stations to access this device. “g only” allows only 802.11g wireless stations to be used. “b only” allows 802.11b wireless stations; 802.11g wireless stations can still be used if they can operate in 802.11b mode.
- **Wireless Access Point**.
  - — **Enable Wireless Access Point**. This field lets you turn off or turn on the wireless access point built in to the modem router. The wireless icon on the front of the modem router will also display the current status of the Wireless Access Point to let you know if it is disabled or enabled. The wireless access point must be enabled to allow wireless stations to access the Internet.
  - — **Allow Broadcast of Name (SSID)**. If enabled, the SSID is broadcast to all Wireless Stations. Stations which have no SSID (or a "null" value) can then adopt the correct SSID for connections to this Access Point.

— **Wireless Isolation.** If enabled, Wireless Stations will not be able to communicate with each other or with Stations on the wired network. This feature should normally be disabled.

- **Wireless Station Access List**.

  — By default, any wireless computer that is configured with the correct wireless network name or SSID will be allowed access to your wireless network. For increased security, you can restrict access to the wireless network to only specific computers based on their MAC addresses. Click **Setup Access List** to display the Wireless Station Access List menu.

- **Security Options**

Table 3-1. Wireless Security Options

Field	Description
Disable	Wireless security is not used.
WEP (Wired Equivalent Privacy)	You can select the following WEP options: **Authentication Type** • Open: the DG834G v3 does not perform any authentication. • Shared: WEP shared key authentication. For a full explanation of WEP shared key, see "Wireless Communications" in Appendix C. **Encryption Strength** • If Shared or Open Network Authentication is enabled, you can choose 64- or 128-bit WEP data encryption. **Note**: With Open Network Authentication and 64- or 128-bit WEP Data Encryption, the DG834G v3 *does* perform 64- or 128-bit data encryption but *does not* perform any authentication. **Security Encryption (WEP) Key** These key values must be identical on all wireless devices in your network (key 1 must be the same for all, key 2 must be the same for all, and so on). The DG834G v3 provides two methods for creating WEP encryption keys: • Passphrase. These characters *are* case sensitive. Enter a word or group of printable characters in the Passphrase box and click the **Generate** button. **Note**: Not all wireless adapters support passphrase key generation. • Manual. These values *are not* case sensitive. 64-bit WEP: enter 10 hexadecimal digits (any combination of 0-9, a-f, or A-F). 128-bit WEP: enter 26 hexadecimal digits (any combination of 0-9, a-f, or A-F).

Table 3-1. Wireless Security Options (continued)

Field	Description
WPA-PSK (Wi-Fi Protected Access Pre-Shared Key)	WPA Pre-Shared-Key uses a pre-shared key to perform the authentication and generate the initial data encryption keys. Then, it dynamically varies the encryption key. For a full explanation of WPA, see "Wireless Communications" in Appendix C. **Note**: Not all wireless adapters support WPA. Furthermore, client software is required on the client. Windows XP and Windows 2000 with Service Pack 3 do include the client software that supports WPA. Nevertheless, the wireless adapter hardware and driver must also support WPA.
WPA-802.1x	User authentication is implemented using 802.1x and RADIUS servers. For a full explanation of WPA, see "Wireless Communications" in Appendix C. Fill in the following: • Radius Server Name/IP Address This field is required. Enter the name or IP address of the Radius Server on your LAN. • Radius Port Enter the port number used for connections to the Radius Server. • Radius Shared Key Enter the desired value for the Radius shared key. This key enables the DG834G v3 to log in to the Radius server and must match the value used on the Radius server.

How to Set Up and Test Basic Wireless Connectivity

Follow the instructions below to set up and test basic wireless connectivity. Once you have established basic wireless connectivity, you can enable security settings appropriate to your needs.

1. Log in to the DG834G v3 firewall at its default LAN address of http://192.168.0.1 with its default user name of **admin** and default password of **password**, or using whatever LAN address and password you have set up.
2. Click the **Wireless Settings** link in the main menu of the DG834G v3 firewall.
3. Choose a suitable descriptive name for the wireless network name (SSID). In the SSID box, enter a value of up to 32 alphanumeric characters. The default SSID is **Wireless**.

Note: The SSID of any wireless access adapters must match the SSID you configure in the 54 Mbps ADSL Modem Wireless Router Model DG834G. If they do not match, you will not get a wireless connection to the DG834G v3.

4. Set the Region. Select the region in which the wireless interface will operate.

5. Set the Channel. The default channel is 11.

This field determines which operating frequency will be used. It should not be necessary to change the wireless channel unless you notice interference problems with another nearby wireless router or access point. Select a channel that is not being used by any other wireless networks within several hundred feet of your firewall. For more information on the wireless channel frequencies please refer to "Wireless Communications" in Appendix C.

6. For initial configuration and test, leave the Wireless Card Access List set to allow everyone access by making sure that **Turn Access Control On** is not selected in the Wireless Station Access List. In addition, leave the Encryption Strength set to "Disabled."

7. Click **Apply** to save your changes.

	Note: If you are configuring the firewall from a wireless computer and you change the firewall's SSID, channel, or security settings, you will lose your wireless connection when you click **Apply**. You must then change the wireless settings of your computer to match the firewall's new settings.

8. Configure and test your computers for wireless connectivity.

Program the wireless adapter of your computers to have the same SSID and channel that you configured in the router. Check that they have a wireless link and are able to obtain an IP address by DHCP from the firewall.

Once your computers have basic wireless connectivity to the firewall, you can configure the advanced wireless security functions of the firewall.

How to Restrict Wireless Access to Your Network

By default, any wireless PC that is configured with the correct SSID will be allowed access to your wireless network. For increased security, the 54 Mbps ADSL Modem Wireless Router Model DG834G provides several ways to restrict wireless access to your network:

- Turn off wireless connectivity completely
- Restrict access based on the Wireless Network Name (SSID)
- Restrict access based on the Wireless Card Access List

These options are discussed below.

Figure 3-3

Restricting Access to Your Network by Turning Off Wireless Connectivity

You can completely turn off the wireless portion of the DG834G v3. For example, if your notebook computer is used to wirelessly connect to your router and you take a business trip, you can turn off the wireless portion of the router while you are traveling. Other members of your household who use computers connected to the router via Ethernet cables will still be able to use the router.

Restricting Wireless Access Based on the Wireless Network Name (SSID)

The DG834G v3 can restrict wireless access to your network by not broadcasting the wireless network name (SSID). However, by default, this feature is turned off. If you turn this feature on, wireless devices will not ‘see’ your DG834G v3. You must configure your wireless devices to match the wireless network name (SSID) you configure in the ADSL Modem Wireless Router.

	Note: The SSID of any wireless access adapters must match the SSID you configure in the 54 Mbps ADSL Modem Wireless Router Model DG834G. If they do not match, you will not get a wireless connection to the DG834G v3.

Restricting Wireless Access Based on the Wireless Station Access List

This list determines which wireless hardware devices will be allowed to connect to the firewall.

To restrict access based on MAC addresses, follow these steps:

1. Log in to the DG834G v3 firewall at its default LAN address of http://192.168.0.1 with its default user name of **admin** and default password of **password**, or using whatever LAN address and password you have set up.

2. From the Wireless Settings menu, Wireless Station Access List section, click the **Setup Access List** button to display the list, shown below:

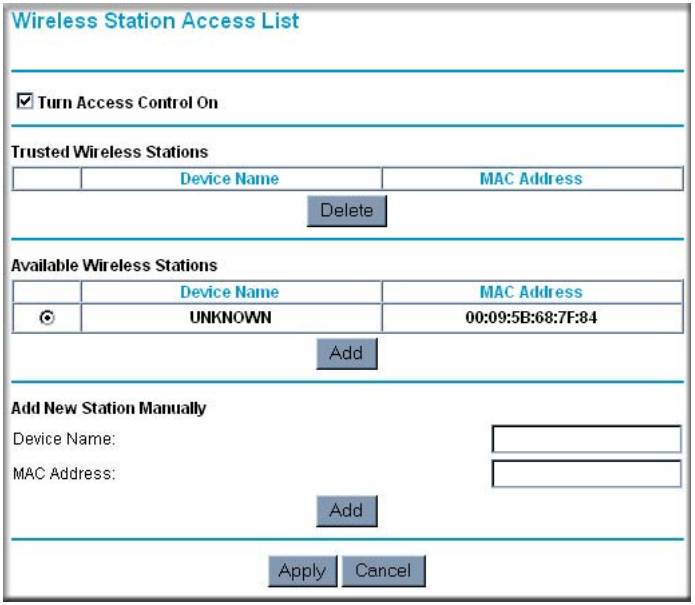


Figure 3-4

3. Select the **Turn Access Control On** check box to enable restricting wireless computers by their MAC addresses.

4. If the wireless station is currently connected to the network, you can select it from the Available Wireless Stations list. Click **Add** to add the station to the Trusted Wireless Stations list.

5. If the wireless station is not currently connected, you can enter its address manually. Enter the MAC address of the authorized computer. The MAC address is usually printed on the wireless card, or it may appear in the modem router's DHCP table. The MAC address will be 12 hexadecimal digits.

   Click **Add** to add your entry. You can add several stations to the list, but the entries will be discarded if you do not click **Apply**.

You can copy and paste the MAC addresses from the modem router's Attached Devices menu into the MAC Address box of this menu. To do this, configure each wireless computer to obtain a wireless link to the modem router. The computer should then appear in the Attached Devices menu.

	Note: If you are configuring the modem router from a wireless computer whose MAC address is not in the Trusted Wireless Stations list, and you select **Trusted Wireless Stations only**, you will lose your wireless connection when you click **Apply**. You must then access the modem router from a wired computer to make any further changes.

6. Make sure the Turn Access Control On check box is selected, then click **Apply**.

Now, only devices on this list will be allowed to wirelessly connect to the DG834G v3. This prevents unauthorized access to your network.

Choosing WEP Authentication and Security Encryption Methods

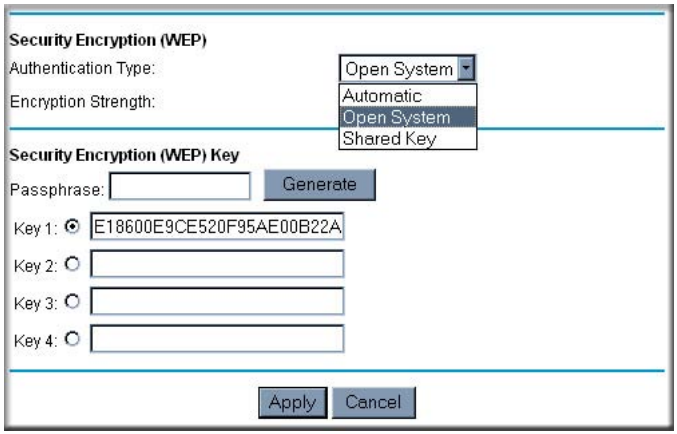


Figure 3-5

Restricting wireless access prevents intruders from connecting to your network. However, the wireless data transmissions are still vulnerable to snooping. Using the WEP data encryption settings described below will prevent a determined intruder from eavesdropping on your wireless data communications. Also, if you are using the Internet for such activities as purchases or banking, those Internet sites use another level of highly secure encryption called SSL. You can tell if a web site is using SSL because the web address begins with HTTPS rather than HTTP.

Authentication Type Selection

The DG834G v3 lets you select the following wireless authentication schemes.

- Automatic
- Open System
- Shared key

	Note: The authentication scheme is separate from the data encryption. You can choose an authentication scheme which requires a shared key but still leave the data transmissions unencrypted. If you require strong security, use both the Shared Key and WEP encryption settings.

Set your wireless adapter according to the authentication scheme you choose for the ADSL Modem Wireless Router. Please refer to "Wireless Communications" in Appendix C for a full explanation of each of these options, as defined by the IEEE 802.11g wireless communication standard.

Encryption Choices

Please refer to "Wireless Communications" in Appendix C for a full explanation of each of the following choices, as defined by the IEEE 802.11g wireless communication standard. Choose the encryption strength from the drop-down list:

Disable. No encryption will be applied. This setting is useful for troubleshooting your wireless connection, but leaves your wireless data fully exposed.

64 or 128 bit WEP. When 64 Bit WEP or 128 Bit WEP is selected, WEP encryption will be applied.

If WEP is enabled, you can manually or automatically program the four data encryption keys. These values must be identical on all computers and access points in your network.

There are two methods for creating WEP encryption keys:

- Passphrase. Enter a word or group of printable characters in the Passphrase box and click the **Generate** button.
- Manual. 64-bit WEP: Enter 10 hexadecimal digits (any combination of 0-9, a-f, or A-F). 128-bit WEP: Enter 26 hexadecimal digits (any combination of 0-9, a-f, or A-F).

Select the radio button for the key you want to make active.

How to Configure WEP

To configure WEP data encryption, follow these steps:

1. Log in to the DG834G v3 firewall at its default LAN address of http://192.168.0.1 with its default user name of **admin** and default password of **password**, or using whatever LAN address and password you have set up.
2. Click the **Wireless Settings** link in the Setup section of the main menu for the DG834G v3 modem router.
3. In the Security Options section, select the **WEP (Wired Equivalent Privacy)** radio button
4. Go to the WEP Security Encryption portion of the page:

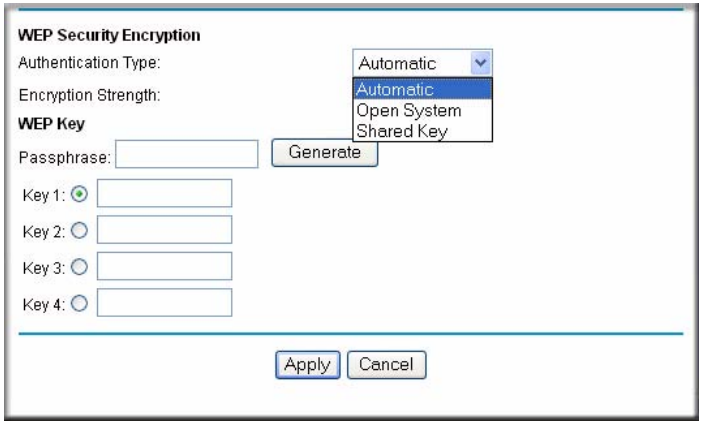


Figure 3-6

5. Select the **Authentication Type**.
6. Select the **Encryption Strength** setting.

7. Enter the encryption keys. You can manually or automatically program the four data encryption keys. These values must be identical on all computers and Access Points in your network.
   - Automatic — enter a word or group of printable characters in the Passphrase box and click the **Generate** button. The four key boxes will be automatically populated with key values.
   - Manual — enter hexadecimal digits (any combination of 0-9, a-f, or A-F).
     Select which of the four keys will be active.
8. Select the radio button for the key you want to make active.

   Be sure you clearly understand how the WEP key settings are configured in your wireless adapter. Wireless adapter configuration utilities such as the one included in Windows XP only allow entry of one key which must match the default key you set in the DG834G v3.
9. Click **Apply** to save your settings.

	Note: When configuring the modem router from a wireless computer, if you configure WEP settings, you will lose your wireless connection when you click **Apply**. You must then either configure your wireless adapter to match the modem router WEP settings or access the modem router from a wired computer to make any further changes.

How to Configure WPA-PSK

	Note: Not all wireless adapters support WPA. Consult the product document for your wireless adapter for instructions on configuring WPA settings.

To configure WPA-PSK, follow these steps:

1. Log in at the default LAN address of http://192.168.0.1, with the default user name of **admin** and default password of **password**, or using whatever LAN address and password you have set up.
2. Click **Wireless Settings** in the Setup section of the main menu of the DG834G v3.
3. Choose the **WPA-PSK** radio button. The WPA-PSK page will display a WPA-PSK Security Encryption section.
4. Enter the pre-shared key in the Passphrase field.
5. Click **Apply** to save your settings.

How to Configure WPA-802.1x

	Note: Not all wireless adapters support WPA. Consult the product document for your wireless adapter for instructions on configuring WPA settings.

To configure WPA-802.1x, follow these steps:

1. Log in at the default LAN address of http://192.168.0.1, with the default user name of **admin** and default password of **password**, or using whatever LAN address and password you have set up.
2. Click **Wireless Settings** in the Setup section of the main menu of the DG834G v3.
3. Choose the **WPA-802.1x** radio button. The page will display the WPA-802.1x section.
4. Enter the Radius server name/IP address.
5. Enter the Radius port number.
6. Enter the Shared Key.
7. Click **Apply** to save your settings.

Chapter 4
Protecting Your Network

This chapter describes how to use the basic firewall features of the 54 Mbps ADSL Modem Wireless Router Model DG834G to protect your network. It also describes how to configure Trend Micro Home Network Security.

Protecting Access to Your 54 Mbps ADSL Modem Wireless Router Model DG834G

For security reasons, the modem router has its own user name and password. Also, after a period of inactivity for a set length of time, the administrator login will automatically disconnect. When prompted, enter **admin** for the modem router User Name and **password** for the modem router Password. You can use procedures below to change the modem router's password and the amount of time for the administrator's login timeout.

	Note: The user name and password are not the same as any user name or password your may use to log in to your Internet connection.

NETGEAR recommends that you change this password to a more secure password. The ideal password should contain no dictionary words from any language, and should be a mixture of both upper and lower case letters, numbers, and symbols. Your password can be up to 30 characters.

How to Change the Built-In Password

1. Log in to the modem router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever Password and LAN address you have chosen for the modem router.

Figure 4-1

2. From the Main Menu of the browser interface, under the Maintenance heading, select **Set Password** to bring up the menu shown.

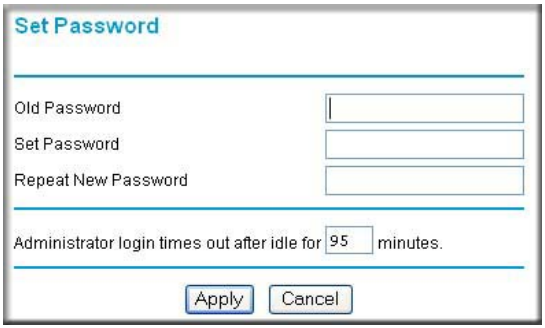


Figure 4-2

3. To change the password, first enter the old password, and then enter the new password twice.
4. Click **Apply** to save your changes.

	Note: After changing the password, you will be required to log in again to continue the configuration. If you have backed up the modem router settings previously, you should do a new backup so that the saved settings file includes the new password.

Changing the Administrator Login Timeout

For security, the administrator's login to the modem router configuration will timeout after a period of inactivity. To change the login timeout period:

1. In the Set Password menu, type a number in ‘Administrator login times out’ field. The suggested default value is 5 minutes.
2. Click **Apply** to save your changes or click **Cancel** to keep the current period.

Configuring Basic Firewall Services

Basic firewall services you can configure include access blocking and scheduling of firewall security. These topics are presented below.

Blocking Keywords, Sites, and Services

The modem router provides a variety of options for blocking Internet based content and communications services. With its content filtering feature, the ADSL Modem Wireless Router prevents objectionable content from reaching your PCs. The modem router allows you to control access to Internet content by screening for keywords within Web addresses. Key content filtering options include:

- Keyword blocking of HTTP traffic.
- Outbound Service Blocking limits access from your LAN to Internet locations or services that you specify as off-limits.
- Denial of Service (DoS) protection. Automatically detects and thwarts Denial of Service (DoS) attacks such as Ping of Death, SYN Flood, LAND Attack and IP Spoofing.
- Blocking unwanted traffic from the Internet to your LAN.

The section below explains how to configure your modem router to perform these functions.

How to Block Keywords and Sites

The ADSL Modem Wireless Router allows you to restrict access to Internet content based on functions such as Web addresses and Web address keywords.

1. Log in to the modem router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever Password and LAN address you have chosen for the modem router.

2. Select the **Block Sites** link of the Security menu.

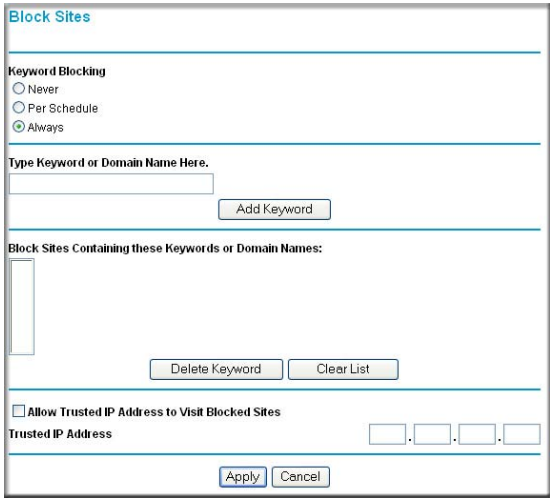


Figure 4-3

3. To enable keyword blocking, select one of the following:
   - **Per Schedule**—to turn on keyword blocking according to the settings on the Schedule page.
   - **Always**—to turn on keyword blocking all of the time, independent of the Schedule page.
4. Enter a keyword or domain in the Keyword box, click **Add Keyword**, then click **Apply**.

   Some examples of Keyword application follow:
   - If the keyword “XXX” is specified, the URL <http://www.badstuff.com/xxx.html> is blocked.
   - If the keyword “.com” is specified, only Web sites with other domain suffixes (such as .edu or .gov) can be viewed.
   - Enter the keyword “.” to block all Internet browsing access.

   Up to 32 entries are supported in the Keyword list.
5. To delete a keyword or domain, select it from the list, click **Delete Keyword**, then click **Apply**.
6. To specify a trusted user, enter that computer’s IP address in the Trusted IP Address box and click **Apply**.

You can specify one trusted user, which is a computer that will be exempt from blocking and logging. Since the trusted user will be identified by an IP address, you should configure that computer with a fixed IP address.

7. Click **Apply** to save your settings.

	Note: The Block Sites feature is disabled when the Trend Micro Home Security feature is enabled. This is because the Trend security system has incorporates its own site-blocking capability.

Firewall Rules

Firewall rules are used to block or allow specific traffic passing through from one side of the router to the other. Inbound rules (WAN to LAN) restrict access by outsiders to private resources, selectively allowing only specific outside users to access specific resources. Outbound rules (LAN to WAN) determine what outside resources local users can have access to.

A firewall has two default rules, one for inbound traffic and one for outbound. The default rules of the DG834G v3 are:

- Inbound: Block all access from outside except responses to requests from the LAN side.
- Outbound: Allow all access from the LAN side to the outside.

You can define additional rules that will specify exceptions to the default rules. By adding custom rules, you can block or allow access based on the service or application, source or destination IP addresses, and time of day. You can also choose to log traffic that matches or does not match the rule you have defined.

You can change the order of precedence of rules so that the rule that applies most often will take effect first. See “Order of Precedence for Rules” on page 4-11 for more details.

To access the rules configuration of the DG834G v3, click the **Firewall Rules** link on the main menu, then click **Add** for either an Outbound or Inbound Service.

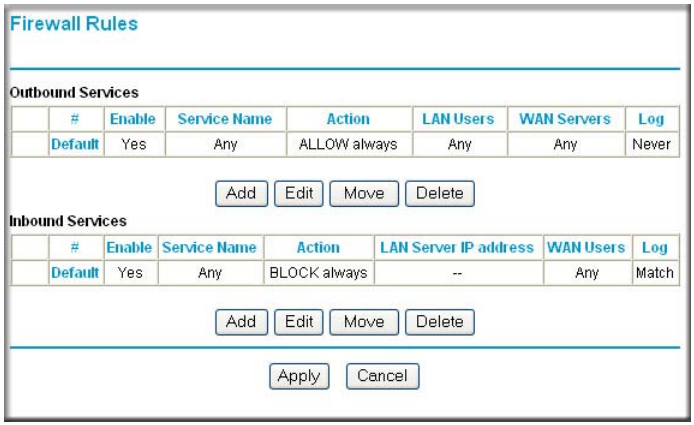


Figure 4-4

- To edit an existing rule, select its button on the left side of the table and click **Edit**.
- To delete an existing rule, select its button on the left side of the table and click **Delete**.
- To move an existing rule to a different position in the table, select its button on the left side of the table and click **Move**. At the script prompt, enter the number of the desired new position and click **OK**.

Inbound Rules (Port Forwarding)

Because the DG834G v3 uses Network Address Translation (NAT), your network presents only one IP address to the Internet, and outside users cannot directly address any of your local computers. However, by defining an inbound rule you can make a local server (for example, a Web server or game server) visible and available to the Internet. The rule tells the modem router to direct inbound traffic for a particular service to one local server based on the destination port number. This is also known as port forwarding.

	Note: Some residential broadband ISP accounts do not allow you to run any server processes (such as a Web or FTP server) from your location. Your ISP may periodically check for servers and may suspend your account if it discovers any active services at your location. If you are unsure, refer to the Acceptable Use Policy of your ISP.

Remember that allowing inbound services opens holes in your firewall. Only enable those ports that are necessary for your network. Following are two application examples of inbound rules:

Inbound Rule Example: A Local Public Web Server

If you host a public Web server on your local network, you can define a rule to allow inbound Web (HTTP) requests from any outside IP address to the IP address of your Web server at any time of day. This rule is shown:

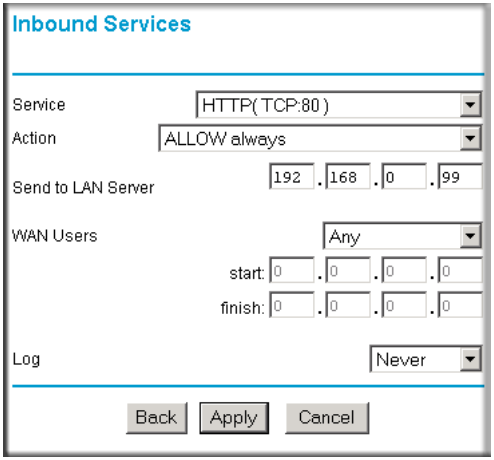


Figure 4-5

The parameters are:

- **Service—**From this list, select the application or service to be allowed or blocked. The list already displays many common services, but you are not limited to these choices. Use the Services menu to add any additional services or applications that do not already appear.
- **Action—**Choose how you want this type of traffic to be handled. You can block or allow always, or you can choose to block or allow according to the schedule you have defined in the Schedule menu.
- **Send to LAN Server—**Enter the IP address of the computer or server on your LAN which will receive the inbound traffic covered by this rule.

- **WAN Users—**These settings determine which packets are covered by the rule, based on their source (WAN) IP address. Select the desired option:
  - Any — all IP addresses are covered by this rule.
  - Address range — if this option is selected, you must enter the **Start** and **Finish** fields.
  - Single address — enter the required address in the Start field.

- **Log—**You can select whether the traffic will be logged. The choices are:
  - **Never** — no log entries will be made for this service.
  - **Always** — any traffic for this service type will be logged.
  - **Match** — traffic of this type which matches the parameters and action will be logged.
  - **Not match** — traffic of this type which does not match the parameters and action will be logged.

Inbound Rule Example: Allowing Videoconferencing

If you want to allow incoming videoconferencing to be initiated from a restricted range of outside IP addresses, such as from a branch office, you can create an inbound rule. In the example shown here, CU-SeeMe connections are allowed only from a specified range of external IP addresses. In this case, we have also specified logging of any incoming CU-SeeMe requests that do not match the allowed parameters.

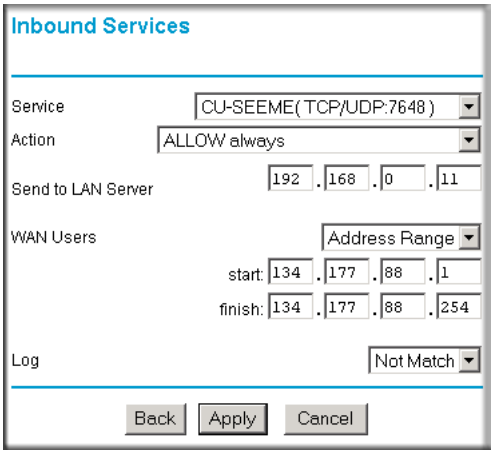


Figure 4-6

Considerations for Inbound Rules

If your external IP address is assigned dynamically by your ISP, the IP address may change periodically as the DHCP lease expires. Consider using the Dynamic DNS feature in the Advanced menu so that external users can always find your network.

If the IP address of the local server computer is assigned by DHCP, it may change when the computer is rebooted. To avoid this, use the Reserved IP address feature in the LAN IP menu to keep the computer's IP address constant.

Local computers must access the local server using the computer's local LAN address (192.168.0.11 in the example above). Attempts by local computers to access the server using the external WAN IP address will fail.

Outbound Rules (Service Blocking)

The DG834G v3 allows you to block the use of certain Internet services by computers on your network. This is called service blocking or port filtering. You can define an outbound rule to block Internet access from a local computer based on:

- IP address of the local computer (source address)
- IP address of the Internet site being contacted (destination address)
- Time of day
- Type of service being requested (service port number)

Following is an application example of outbound rules.

Outbound Rule Example: Blocking Instant Messenger

If you want to block Instant Messenger usage by employees during working hours, you can create an outbound rule to block that application from any internal IP address to any external address according to the schedule that you have created in the Schedule menu. You can also have the modem router log any attempt to use Instant Messenger during that blocked period.

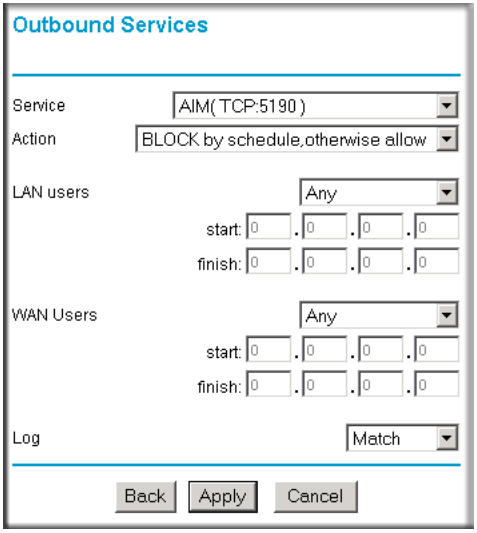


Figure 4-7

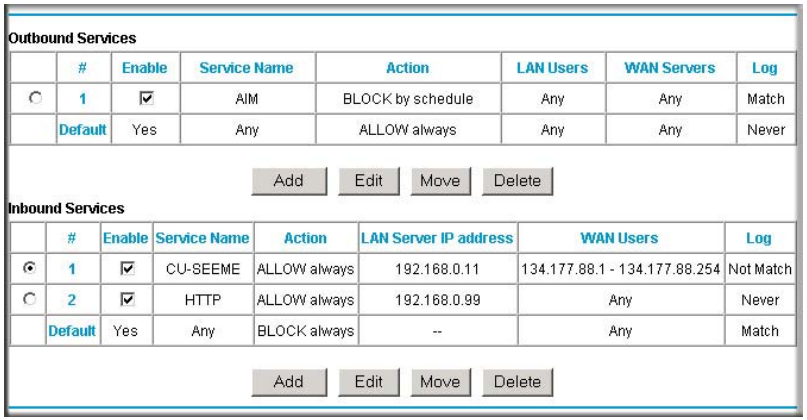
The parameters are:

- **Service—**From this list, select the application or service to be allowed or blocked. The list already displays many common services, but you are not limited to these choices. Use the Add Custom Service feature to add any additional services or applications that do not already appear.
- **Action—**Choose how you want this type of traffic to be handled. You can block or allow always, or you can choose to block or allow according to the schedule you have defined in the Schedule menu.
- **LAN Users—**These settings determine which packets are covered by the rule, based on their source LAN IP address. Select the desired option:
  - **Any** — all IP addresses are covered by this rule.
  - **Address range** — if this option is selected, you must enter the **Start** and **Finish** fields.
  - **Single address** — enter the required address in the Start field.

- **WAN Users—**These settings determine which packets are covered by the rule, based on their destination WAN IP address. Select the desired option:
  - **Any** — all IP addresses are covered by this rule.
  - **Address range** —if this option is selected, you must enter the Start and Finish fields.
  - **Single address** — enter the required address in the Start field.
- **Log—**You can select whether the traffic will be logged. The choices are:
  - **Never** — no log entries will be made for this service.
  - **Always** — any traffic for this service type will be logged.
  - **Match** — traffic of this type that matches the parameters and action will be logged.
  - **Not match** — traffic of this type that does not match the parameters and action will be logged.

Order of Precedence for Rules

As you define new rules, they are added to the tables in the Rules menu, as shown:



Outbound Services

	#	Enable	Service Name	Action	LAN Users	WAN Servers	Log
○	1	☑	AIM	BLOCK by schedule	Any	Any	Match
	Default	Yes	Any	ALLOW always	Any	Any	Never

Add Edit Move Delete

Inbound Services

	#	Enable	Service Name	Action	LAN Server IP address	WAN Users	Log
◉	1	☑	CU-SEEME	ALLOW always	192.168.0.11	134.177.88.1 - 134.177.88.254	Not Match
○	2	☑	HTTP	ALLOW always	192.168.0.99	Any	Never
	Default	Yes	Any	BLOCK always	--	Any	Match

Add Edit Move Delete

Figure 4-8

For any traffic attempting to pass through the firewall, the packet information is subjected to the rules in the order shown in the Rules Table, beginning at the top and proceeding to the default rules at the bottom. In some cases, the order of precedence of two or more rules may be important in determining the disposition of a packet. The Move button allows you to relocate a defined rule to a new position in the table.

Services

Services are functions performed by server computers at the request of client computers. For example, Web servers serve Web pages, time servers serve time and date information, and game hosts serve data about other players' moves. When a computer on the Internet sends a request for service to a server computer, the requested service is identified by a service or port number. This number appears as the destination port number in the transmitted IP packets. For example, a packet that is sent with destination port number 80 is an HTTP (Web server) request.

The service numbers for many common protocols are defined by the Internet Engineering Task Force (IETF) and published in RFC1700, "Assigned Numbers." Service numbers for other applications are typically chosen from the range 1024 to 65535 by the authors of the application.

Although the DG834G v3 already holds a list of many service port numbers, you are not limited to these choices. Use the procedure below to create your own service definitions.

How to Define Services

1. Log in to the modem router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever Password and LAN address you have chosen for the modem router.
2. Select the **Services** link of the Security menu to display the Services menu shown:

Figure 4-9

- To create a new Service, click the **Add Custom Service** button.

- To edit an existing Service, select its button on the left side of the table and click **Edit Service**.
- To delete an existing Service, select its button on the left side of the table and click **Delete Service**.

3. Use the page shown below to define or edit a service.

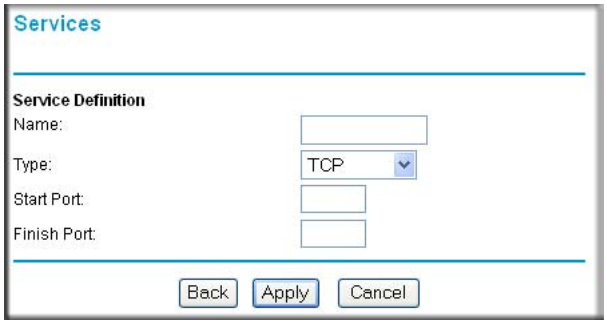


Figure 4-10

4. Click **Apply** to save your changes.

Setting Times and Scheduling Firewall Services

The ADSL Modem Wireless Router uses the Network Time Protocol (NTP) to obtain the current time and date from one of several Network Time Servers on the Internet.

How to Set Your Time Zone

In order to localize the time for your log entries, you must specify your Time Zone:

1. Log in to the modem router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever Password and LAN address you have chosen for the modem router.

2. Select the **Schedule** link of the Security menu to display menu shown below.

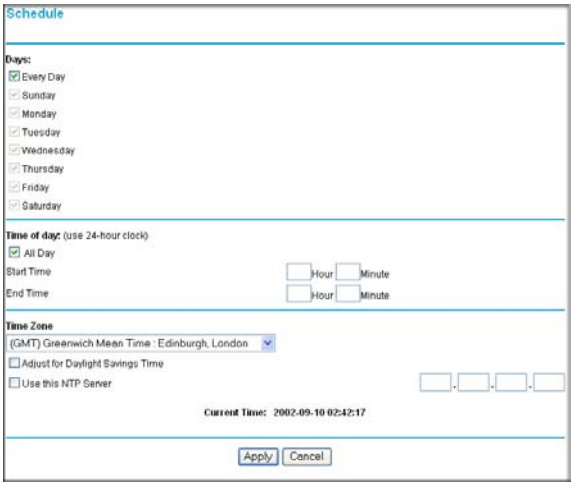


Figure 4-11

3. Select your time zone. This setting will be used for the blocking schedule according to your local time zone and for time-stamping log entries.

   Select the **Adjust for daylight savings time** check box if your time zone is currently in daylight savings time.

	Note: If your region uses Daylight Savings Time, you must manually select **Adjust for Daylight Savings Time** on the first day of Daylight Savings Time, and clear it at the end. Enabling Daylight Savings Time will cause one hour to be added to the standard time.

4. The modem router has a list of NETGEAR NTP servers. If you would prefer to use a particular NTP server as the primary server, enter its IP address under Use this NTP Server.

5. Click **Apply** to save your settings.

How to Schedule Firewall Services

If you enabled services blocking in the Block Services menu or Port forwarding in the Ports menu, you can set up a schedule for when blocking occurs or when access is not restricted.

1. Log in to the modem router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever Password and LAN address you have chosen for the modem router.
2. Select the **Schedule** link of the Security menu to display menu shown above.
3. To block Internet services based on a schedule, select **Every Day** or select one or more days. If you want to limit access completely for the selected days, select **All Day**. Otherwise, to limit access during certain times for the selected days, enter Start Blocking and End Blocking times.
4. Enter the values in 24-hour time format. For example, 10:30 am would be 10 hours and 30 minutes and 10:30 pm would be 22 hours and 30 minutes. If you set the start time after the end time, the schedule will be effective through midnight the next day.
5. Click **Apply** to save your changes.

Trend Micro Home Network Security

You can enable Home Network Security as if you didn't do so when you originally set up your router. Home routers provide an enhanced Internet experience, but the likelihood of attacks also increases. Trend Micro Home Network Security addresses the security needs of computers accessing the Internet via home routers.

	Note: The 54 Mbps ADSL Modem Wireless Router Model DG834G supports Home Network Security. To take advantage of this feature you must register an account with Trend Micro. For more information, refer to the Home Network Security *Quick Start Guide* on the NETGEAR Resource CD, or to *http://www.trendmicro.com/offers/netgear*. The Trend Micro software requires Microsoft Internet Explorer 5.5 or higher.

To begin using Home Network Security, configure the Security Service and Parental Controls menus on your ADSL Modem Wireless Router. Each screen has a GUI button to click that will take you to the Trend Micro Web site to open your Trend Micro account.

	Note: Because of overlapping functionality, the Block Sites feature, described in "How to Block Keywords and Sites" on page 4-3, is disabled if you enable Trend Micro Home Security.

Security Service Settings

Click **Security Service** under Content Filtering on the Main menu to get the Security Service Settings menu shown below:

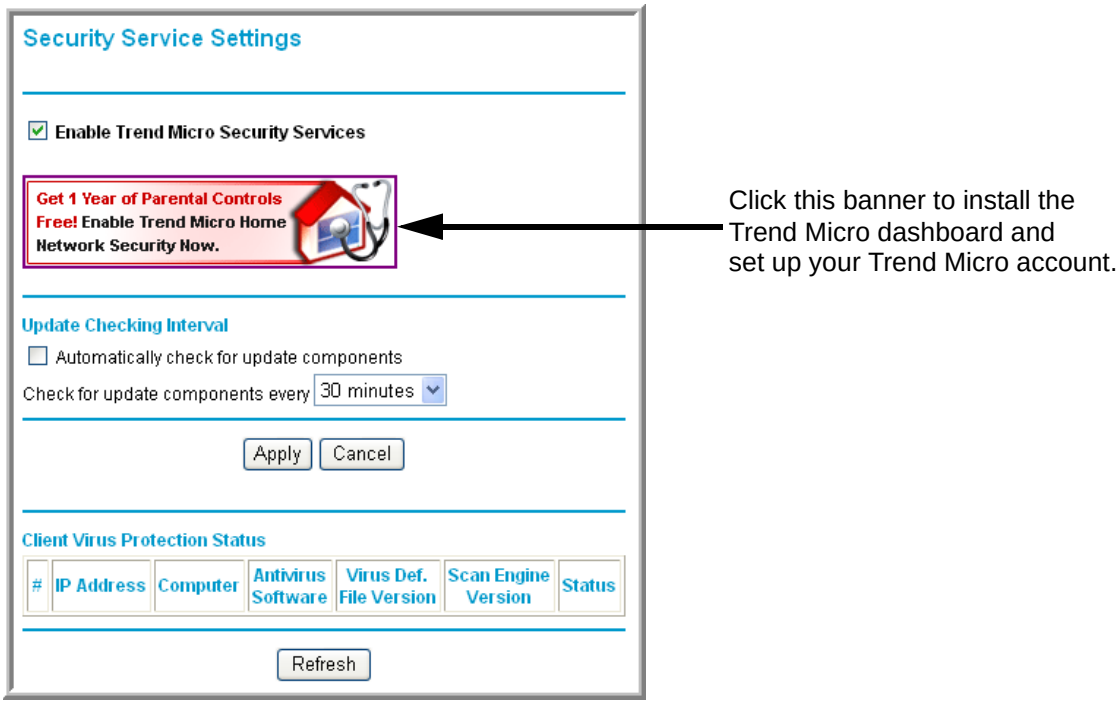


Figure 4-12

To install Home Network Security, click the Trend Micro banner and then follow the on-screen instructions. For assistance, refer to the Home Network Security *Quick Start Guide* included on the NETGEAR Resource CD. (You can download this document and the Home Network Security *User's Guide* at *http://www.trendmicro.com/en/support/tmss/netgear*.)

- **Enable Trend Micro Security Services**. Select this check box and then click **Apply** to enable the Security Service features on this page (automatic updates and Client Virus Protection Status information).
- **Automatically check for update components**. Select this check box to automatically check for updates to Trend Micro scanning components. Choose the desired checking interval from the list, and then click **Apply**.

	Note: If your ISP bills by the amount of time or traffic you use, set the update frequency to once a day.

- **Client Virus Protection Status**. Provides information on all computers on your network.
  - **IP Address**: The computer's IP address
  - **Computer Name**: The name of the computer (as shown in Control Panel > System)
  - **Antivirus Software**: The type of antivirus software installed on the computer
  - **Virus Def. File Version**: The version of the virus pattern file in use by the antivirus software
  - **Scan Engine**: The version of the scan engine in use by the antivirus software
  - **Status**: Indicates if the virus pattern file or scan engine require updating (if no recognized antivirus software is found, the status is "Potential Threat")

Parental Controls Settings

Click **Parental Controls** under Content Filtering on the Main menu to get the Trend Micro Parental Controls menu shown below:

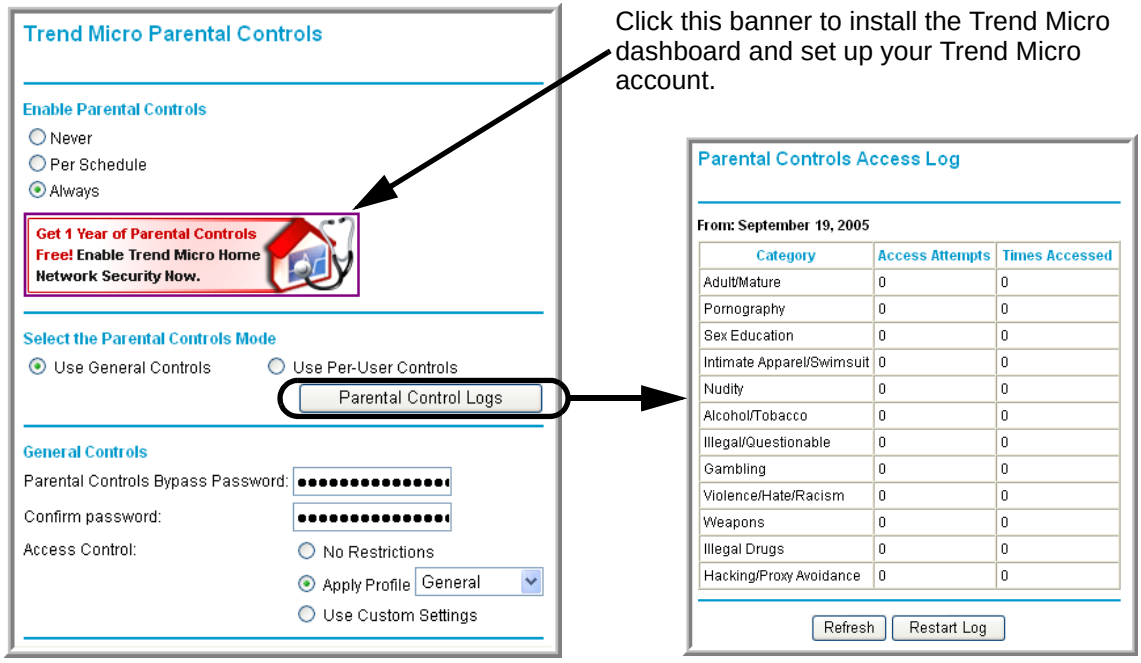


Figure 4-13: Trend Micro Parental Controls menu

To configure Parental Controls:

- Click **Always** to turn on Parental Controls all the time.
- Click **Never** to turn off Parental Controls.
- Click **Per Schedule** to turn on Parental Controls at the times specified on the Schedule page.

	Note: After changing Parental Controls settings, click **Apply** to save changes.

To select Parental Controls Mode:

- Click **Use General Controls** to select General mode. In General mode, one access profile applies to all users.
- Click **Use Per-User Controls** to select Per-User mode. In Per-User mode, each user has an individual access profile.

	Note: When in Per-User mode, everyone accessing the Internet through the router is required to log in.

To configure General mode:

1. Enter a password in the Parental Controls Bypass Password box, re-enter it in the Confirm password box, and then click **Apply**. This password allows users to access pages that are blocked by Parental Controls.
2. Select the access profile that will apply to all users, as follows:
   - To select a predefined profile, click **Apply Profile** and then choose a profile from the list.
   - To create a custom profile, click **Use Custom Settings** and then select the check boxes as desired. (For additional choices, click **More Categories**).
   - To allow unrestricted Internet access, click **No Restrictions**.
3. Click **Apply**.

To configure Per-User mode:

The User Account Information table in Per-User mode shows each user's name, access profile, and status. Users with Active status can access the Internet sites permitted by their access profiles. Users with Inactive status cannot log in and cannot access any Internet sites.

To add a new user:

1. Click **Add**. Type the new user's login name and password, and then re-enter the password in the Confirm password box.
2. Select the new user's status. To allow Internet access, click **Active**. To completely disable this user's Internet access, click **Inactive**.
3. Select the access profile that will apply to this user, as follows:
   - To select a predefined profile, click **Apply Profile** and then choose a profile from the list.

- To create a custom profile, click **Use Custom Settings** and then select the check boxes as desired. (For additional choices, click **More Categories**).
- To allow unrestricted Internet access, click **No Restrictions**.

4. Click **Apply**.

To change a user's account information:

1. Select the user's name in the User Account Information table and then click **Edit**.
2. Make the desired changes, and then click **Apply**.

To delete a user, select the user's name in the User Account Information table and then click **Delete**.

Parental Controls Logs

Click **Parental Controls Logs** to view attempts to access restricted sites, and actual accesses.

Blocking criteria for potentially offensive categories

Trend Micro has defined twelve potentially offensive categories of Web sites. Following are the blocking criteria for each category:

- **Adult/Mature Content**: Sites that contain material of an adult nature but without excessive violence, sexual content, or nudity. These sites may include profane or vulgar content not appropriate for children.
- **Alcohol/Tobacco**: Sites that promote or sell alcohol and tobacco products. Includes sites that glamorize or otherwise encourage alcohol or tobacco use. Does not include sites that sell alcohol or tobacco as a subset of another business.
- **Gambling**: Sites where users can place bets or participate in betting pools (including lotteries) online. Also includes sites that provide information, assistance, recommendations, or training on placing bets or participating in games of chance. Does not include sites that sell gambling-related products or machines. Also does not include offline casino and hotel sites, unless meeting one of the foregoing criteria).
- **Hacking/Proxy Avoidance**: Sites providing information on illegal or questionable access to, or use of, communications equipment and software, or that provide information on how to bypass proxy server features or gain unauthorized access to URLs.
- **Illegal Drugs**: Sites that promote, offer, sell, supply, or advocate the illegal use, cultivation, manufacture, or distribution of drugs, pharmaceuticals, intoxicating plants and chemicals, and related paraphernalia.

- **Illegal/Questionable**: Sites that advocate or advise on performing illegal acts such as service theft, evading law enforcement, fraud, burglary techniques, and plagiarism. Also includes sites that provide or sell questionable educational materials, such as term papers.
- **Intimate Apparel/Swimsuit**: Sites that contain images of swimsuits, intimate apparel, or other suggestive clothing. Does not include sites selling undergarments as a subset of another business.
- **Nudity**: Sites containing nude or seminude depictions of the human body. Such depictions need not be sexual in intent or effect. May include sites containing nude paintings or photo galleries of an artistic nature. This category includes nudist or naturist sites.
- **Pornography**: Sites that contain sexually explicit material.
- **Sex Education**: Sites that provide information (sometimes graphic) on reproduction, sexual development, safe sex practices, sexuality, birth control, and sexual development. Also includes sites that offer tips for better sex as well as products used for sexual enhancement.
- **Violence/Hate/Racism**: Sites depicting or advocating physical harm to people or property. Includes sites that convey hostility or aggression toward, or the denigration of, an individual or group on the basis of race, religion, gender, nationality, ethnic origin, and so forth.
- **Weapons**: Sites that sell, review, or describe guns, knives, martial arts devices, and related accessories. Does not include sites that promote weapons collecting, or groups that either support or oppose weapons ownership.

Chapter 5
Managing Your Network

This chapter describes how to perform network management tasks with your 54 Mbps ADSL Modem Wireless Router Model DG834G.

Backing Up, Restoring, or Erasing Your Settings

The configuration settings of the ADSL Modem Wireless Router are stored in a configuration file in the modem router. This file can be backed up to your computer, restored, or reverted to factory default settings. The procedures below explain how to do these tasks.

How to Back Up the Configuration to a File

1. Log in to the modem router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever User Name, Password and LAN address you have chosen for the modem router.
2. From the Maintenance heading of the Main Menu, select the **Backup Settings** menu shown.

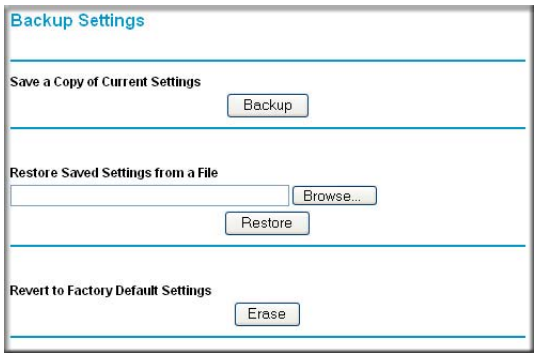


Figure 5-1

3. Click **Backup** to save a copy of the current settings.
4. Store the `.cfg` file on a computer on your network.

How to Restore the Configuration from a File

1. Log in to the modem router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever User Name, Password and LAN address you have chosen for the modem router.
2. From the Maintenance heading of the Main Menu, select the **Settings Backup** menu.
3. Enter the full path to the file on your network or click the **Browse** button to locate the file.
4. When you have located the `.cfg` file, click the **Restore** button to upload the file to the modem router.
5. The modem router will then reboot automatically.

How to Erase the Configuration

It is sometimes desirable to restore the modem router to the factory default settings. This can be done by using the Erase function.

1. To erase the configuration, from the Maintenance menu Settings Backup link, click the **Erase** button on the screen.
2. The modem router will then reboot automatically.

   After an erase, the modem router's password will be **password**, the LAN IP address will be 192.168.0.1, and the modem router's DHCP client will be enabled.

	Note: To restore the factory default configuration settings without knowing the login password or IP address, you must use the Default Reset button on the rear panel of the modem router. See "The Router's Rear Panel" on page 2-9.

Upgrading the Modem Router's Firmware

The software of the ADSL Modem Wireless Router is stored in FLASH memory, and can be upgraded as new software is released by NETGEAR.

Upgrade files can be downloaded from NETGEAR's Web site. If the upgrade file is compressed (.ZIP file), you must first extract the binary (.BIN or .IMG) file before uploading it to the modem router.

How to Upgrade the Modem Router Firmware

NETGEAR recommends that you back up your configuration before doing a firmware upgrade. After the upgrade is complete, you may need to restore your configuration settings.

1. Download and unzip the new software file from NETGEAR.

   The Web browser used to upload new firmware into the modem router must support HTTP uploads. NETGEAR recommends using Microsoft Internet Explorer 5.0 or above, or Netscape Navigator 4.7 or above.

2. Log in to the modem router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever User Name, Password and LAN address you have chosen for the modem router.

3. From the Main Menu of the browser interface, under the Maintenance heading, select the **Modem Router Upgrade** heading to display the menu shown.

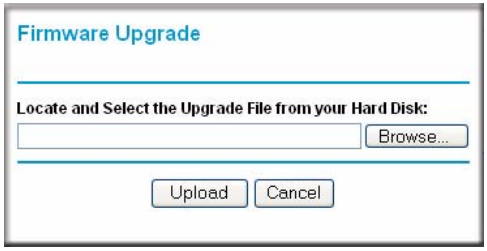


Figure 5-2

4. In the Modem Router Upgrade menu, click the **Browse** to locate the binary (.BIN or .IMG) upgrade file.

5. Click **Upload**.

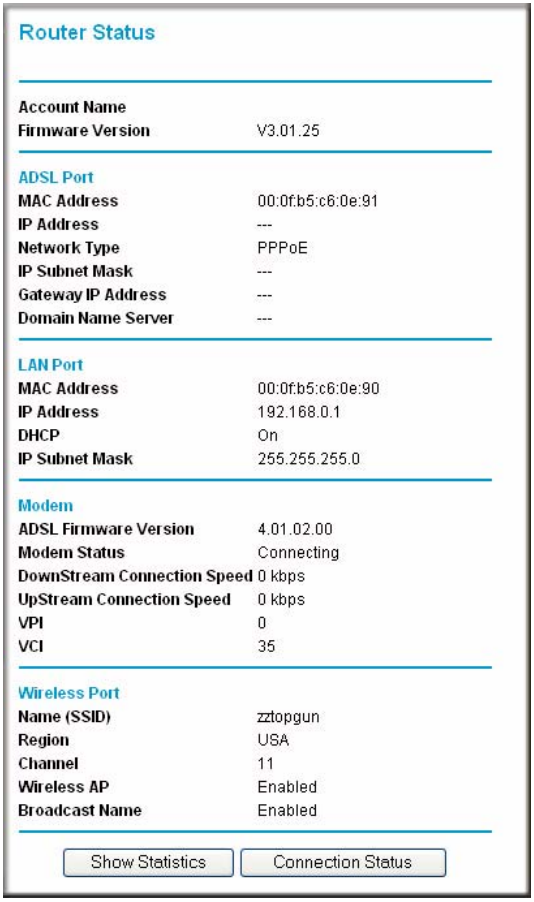
⚠	**Warning:** When uploading software to the modem router, it is important not to interrupt the Web browser by closing the window, clicking a link, or loading a new page. If the browser is interrupted, it may corrupt the software. When the upload is complete, your modem router will automatically restart. The upgrade process will typically take about one minute. In some cases, you may need to clear the configuration and reconfigure the modem router after upgrading.

Network Management Information

The DG834G v3 provides a variety of status and usage information which is discussed below.

Viewing Modem Router Status and Usage Statistics

From the Main Menu, under Maintenance, click **Modem Router Status** to view this screen.



Router Status

Account Name	
Firmware Version	V3.01.25
ADSL Port	
MAC Address	00:0f:b5:c6:0e:91
IP Address	---
Network Type	PPPoE
IP Subnet Mask	---
Gateway IP Address	---
Domain Name Server	---
LAN Port	
MAC Address	00:0f:b5:c6:0e:90
IP Address	192.168.0.1
DHCP	On
IP Subnet Mask	255.255.255.0
Modem	
ADSL Firmware Version	4.01.02.00
Modem Status	Connecting
DownStream Connection Speed	0 kbps
UpStream Connection Speed	0 kbps
VPI	0
VCI	35
Wireless Port	
Name (SSID)	zztopgun
Region	USA
Channel	11
Wireless AP	Enabled
Broadcast Name	Enabled

Show Statistics | Connection Status

Figure 5-3

The Modem Router Status menu provides status and usage information.

This screen shows the following parameters:

Table 5-1. Menu 3.2 - Modem Router Status Fields

Field	Description
Account Name	The Host Name assigned to the modem router in the Basic Settings menu.
Firmware Version	This field displays the modem router firmware version.
ADSL Port	These parameters apply to the Internet (ADSL) port of the modem router.
MAC Address	This field displays the Ethernet MAC address being used by the Internet (ADSL) port of the modem router.
IP Address	This field displays the IP address being used by the Internet (ADSL) port of the modem router. If no address is shown, the modem router cannot connect to the Internet.
Network Type	The network type depends is determined by your ISP. Common network types are PPPoE and PPPoA.
IP Subnet Mask	This field displays the IP Subnet Mask being used by the Internet (ADSL) port of the modem router.
Domain Name Server (DNS)	This field displays the DNS Server IP addresses being used by the modem router. These addresses are usually obtained dynamically from the ISP.
LAN Port	These parameters apply to the Local (ADSL) port of the modem router.
MAC Address	This field displays the Ethernet MAC address being used by the Local (LAN) port of the modem router.
IP Address	This field displays the IP address being used by the Local (LAN) port of the modem router. The default is 192.168.0.1.
DHCP	If OFF, the modem router will not assign IP addresses to PCs on the LAN. If ON, the modem router will assign IP addresses to PCs on the LAN.
IP Subnet Mask	This field displays the IP Subnet Mask being used by the Local (LAN) port of the modem router. The default is 255.255.255.0.
Modem	These parameters apply to the Local (WAN) port of the modem router.
ADSL Firmware Version	The version of the firmware.
Modem Status	The connection status of the modem.

Table 5-1. Menu 3.2 - Modem Router Status Fields (continued)

Field	Description
Downstream Speed	The speed at which the modem is receiving data from the ADSL line.
Upstream Speed	The speed at which the modem is transmitting data to the ADSL line.
VPI	The Virtual Path Identifier setting.
VCI	The Virtual Channel Identifier setting.
Wireless Port	These are the settings as set in the Wireless Settings page; see "Understanding Wireless Settings" in Chapter 3 for details.
Name (SSID)	The Service Set ID, also known as the wireless network name.
Region	The country where the unit is set up for use.
Channel	The current channel, which determines the operating frequency.
Wireless AP	Indicates if the Access Point feature is disabled or not. If not enabled, the Wireless LED on the front panel will be off.
Broadcast Name	Indicates if the DG834G v3 is configured to broadcast its SSID.

Click the **Show Statistics** button to display modem router usage statistics, as shown below:

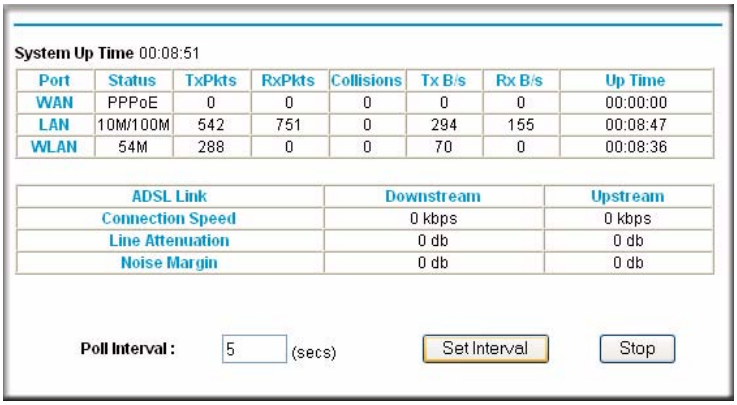


Figure 5-4

This screen shows the following statistics:

Table 5-2. Router Statistics Fields

Field	Description
WAN or LAN Port	The statistics for the WAN (Internet) and LAN ports.
Status	The link status of the port.
TxPkts	The number of packets transmitted on this port since reset or manual clear.
RxPkts	The number of packets received on this port since reset or manual clear.
Collisions	The number of collisions on this port since reset or manual clear.
Tx B/s	The current line utilization—percentage of current bandwidth used on this port.
Rx B/s	The average line utilization for this port.
Up Time	The time elapsed since the last power cycle or reset.
ADSL Link Downstream or Upstream	The statistics for the upstream and downstream ADSL link. These statistics will be of interest to your technical support representative if you are having problems obtaining or maintaining a connection.
Connection Speed	Typically, the downstream speed is faster than the upstream speed.
Line Attenuation	The line attenuation will increase the further you are physically located from your ISP's facilities.
Noise Margin	This is the signal-to-noise ratio and is a measure of the quality of the signal on the line.
Poll Interval	Specifies the interval at which the statistics are updated in this window. Click **Stop** to freeze the display.

Click the **Connection Status** button to display modem router connection status, shown below:

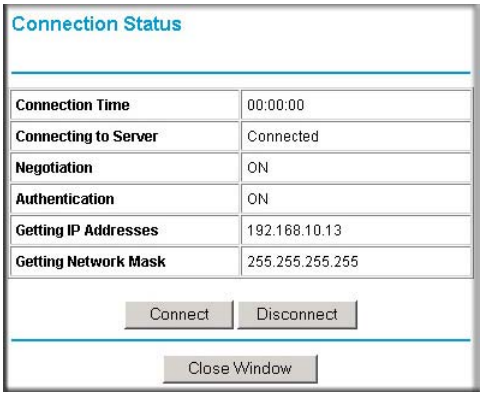


Figure 5-5

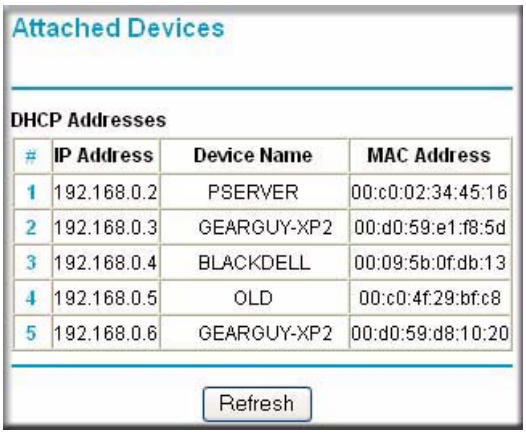
This screen shows the following statistics:

Table 5-3. Connection Status Fields for PPPoA

Field	Description
Connection Time	The time elapsed since the last connection to the Internet via the ADSL port.
Connecting to Sender	The connection status.
Negotiation	ON or OFF
Authentication	ON or OFF
IP Address	The IP Address assigned to the WAN port by the ADSL Internet Service Provider.
Network Mask	The Network Mask assigned to the WAN port by the ADSL Internet Service Provider.

Viewing Attached Devices

The Attached Devices menu contains a table of all IP devices that the modem router has discovered on the local network. From the Main Menu of the browser interface, under the Maintenance heading, select **Attached Devices** to view the table, shown:



Attached Devices

DHCP Addresses

#	IP Address	Device Name	MAC Address
1	192.168.0.2	PSERVER	00:c0:02:34:45:16
2	192.168.0.3	GEARGUY-XP2	00:d0:59:e1:f8:5d
3	192.168.0.4	BLACKDELL	00:09:5b:0f:db:13
4	192.168.0.5	OLD	00:c0:4f:29:bf:c8
5	192.168.0.6	GEARGUY-XP2	00:d0:59:d8:10:20

Refresh

Figure 5-6

For each device, the table shows the IP address, Device Name if available, and the Ethernet MAC address. Note that if the modem router is rebooted, the table data is lost until the modem router rediscovers the devices. To force the modem router to look for attached devices, click the **Refresh** button.

Viewing, Selecting, and Saving Logged Information

The modem router will log security-related events such as denied incoming service requests, hacker probes, and administrator logins. If you enabled content filtering in the Block Sites menu, the Logs page can show you when someone on your network tries to access a blocked site. If you enabled e-mail notification, you will receive these logs in an e-mail message. If you do not have e-mail notification enabled, you can view the logs here.

An example of the logs file is shown below.

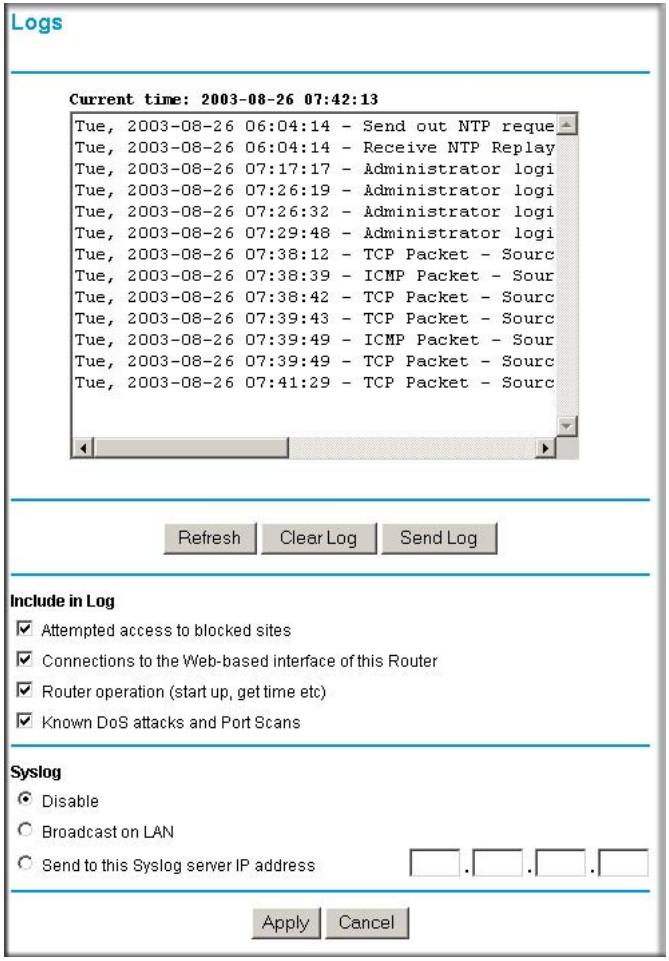


Figure 5-7

Log entries are described in Table 5-4 below:

Table 5-4. Security Log entry descriptions

Field	Description
Date and Time	The date and time the log entry was recorded.
Description or Action	The type of event and what action was taken if any.
Source IP	The IP address of the initiating device for this log entry.
Source port and interface	The service port number of the initiating device, and whether it originated from the LAN or WAN
Destination	The name or IP address of the destination device or Web site.
Destination port and interface	The service port number of the destination device, and whether it's on the LAN or WAN.

Log action buttons are described in Table 5-5 below:

Table 5-5. Security Log action buttons

Field	Description
Refresh	Refresh the log screen.
Clear Log	Clear the log entries.
Send Log	Email the log immediately.
Apply	Apply the current settings.
Cancel	Clear the current settings.

Selecting What Information to Log

Besides the standard information listed above, you can choose to log additional information. Those optional selections are as follows:

- Attempted access to blocked site
- Connections to the Web-based interface of the modem router
- Modem Router operation (start up, get time, etc.)
- Known DoS attacks and Port Scans

Saving Log Files on a Server

You can choose to write the logs to a computer running a syslog program. To activate this feature, select to Broadcast on Lan or enter the IP address of the server where the Syslog file will be written.

Examples of Log Messages

Following are examples of log messages. In all cases, the log entry shows the timestamp as: Day, Year-Month-Date Hour:Minute:Second.

Activation and Administration

```
Tue, 2002-05-21 18:48:39 - NETGEAR activated
```

[This entry indicates a power-up or reboot with initial time entry.]

```
Tue, 2002-05-21 18:55:00 - Administrator login successful - IP:192.168.0.2
Thu, 2002-05-21 18:56:58 - Administrator logout - IP:192.168.0.2
```

[This entry shows an administrator logging in and out from IP address 192.168.0.2.]

```
Tue, 2002-05-21 19:00:06 - Login screen timed out - IP:192.168.0.2
```

[This entry shows a time-out of the administrator login.]

```
Wed, 2002-05-22 22:00:19 - Log emailed
```

[This entry shows when the log was emailed.]

Dropped Packets

```
Wed, 2002-05-22 07:15:15 - TCP packet dropped - Source:64.12.47.28,4787,WAN -
Destination:134.177.0.11,21,LAN - [Inbound Default rule match]
Sun, 2002-05-22 12:50:33 - UDP packet dropped - Source:64.12.47.28,10714,WAN -
Destination:134.177.0.11,6970,LAN - [Inbound Default rule match]
Sun, 2002-05-22 21:02:53 - ICMP packet dropped - Source:64.12.47.28,0,WAN -
Destination:134.177.0.11,0,LAN - [Inbound Default rule match]
```

[These entries show an inbound FTP (port 21) packet, User Datagram Protocol (UDP) packet (port 6970), and Internet Control Message Protocol (ICMP) packet (port 0) being dropped as a result of the default inbound rule, which states that all inbound packets are denied.]

Enabling Security Event E-mail Notification

In order to receive logs and alerts by e-mail, you must provide your e-mail information in the E-mail subheading:

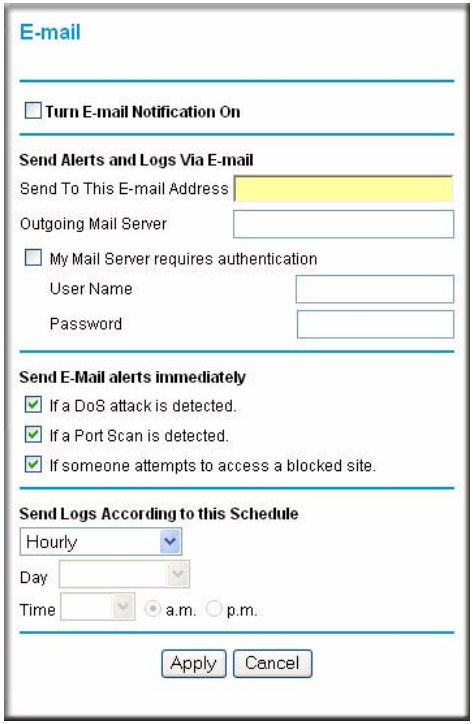


Figure 5-8

- **Turn e-mail notification on**. Select this check box if you want to receive e-mail logs and alerts from the modem router.
- **Send alerts and logs via email**.
  - — **Send To This E-mail Address** Enter the e-mail address where you want to send the alerts and logs. Use a full e-mail address, such as ChrisXY@myISP.com.
  - — **Outgoing Mail Server**. Enter the name or IP address of the outgoing SMTP mail server of your ISP (such as mail.myISP.com).
  - — Check **My Mail Server requires authentication** if you need to login to your SMTP server to send E-mail. If you check this box, you must enter the user name and password for the mail server.

	Tip: If you cannot remember the above information from when you set up your e-mail account, check the settings in your e-mail program.

- **Send alert immediately.** Select the corresponding check box if you would like immediate notification of a significant security event, such as a known attack, port scan, or attempted access to a blocked site.
- **Send logs according to this schedule.** Specifies how often to send the logs: Hourly, Daily, Weekly, or When Full.
  - – Day for sending log
    Specifies which day of the week to send the log. Relevant when the log is sent weekly or daily.
  - – Time for sending log
    Specifies the time of day to send the log. Relevant when the log is sent daily or weekly.

  If the Weekly, Daily or Hourly option is selected and the log fills up before the specified period, the log is automatically e-mailed to the specified e-mail address. After the log is sent, it is cleared from the modem router's memory. If the modem router cannot e-mail the log file, the log buffer may fill up. In this case, the modem router overwrites the log and discards its contents.

Running Diagnostic Utilities and Rebooting the Modem Router

The ADSL Modem Wireless Router has a diagnostics feature. You can use the diagnostics menu to perform the following functions from the modem router:

- Ping an IP Address to test connectivity to see if you can reach a remote host.
- Perform a DNS Lookup to test if an Internet name resolves to an IP address to verify that the DNS server configuration is working.
- Display the Routing Table to identify what other modem routers the modem router is communicating with.
- Reboot the modem router to enable new network configurations to take effect or to clear problems with the modem router's network connection.

From the Main Menu of the browser interface, under the Maintenance heading, select the **Modem Router Diagnostics** heading to display the menu shown.

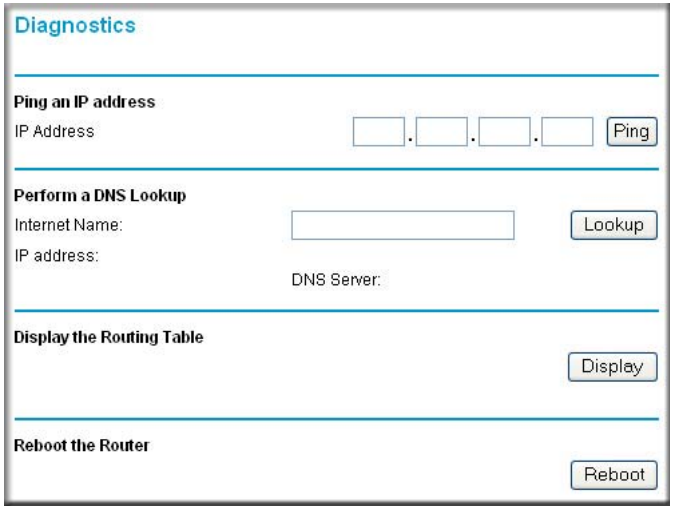


Figure 5-9

Enabling Remote Management

Using the Remote Management page, you can allow a user or users on the Internet to configure, upgrade and check the status of your 54 Mbps ADSL Modem Wireless Router Model DG834G.

	Tip: Be sure to change the modem router's default password to a very secure password. The ideal password should contain no dictionary words from any language, and should be a mixture of letters (both upper and lower case), numbers, and symbols. Your password can be up to 30 characters.

Configuring Remote Management

1. Log in to the modem router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever User Name, Password and LAN address you have chosen for the modem router.
2. From the Advanced section of the main menu, select the **Remote Management** link.

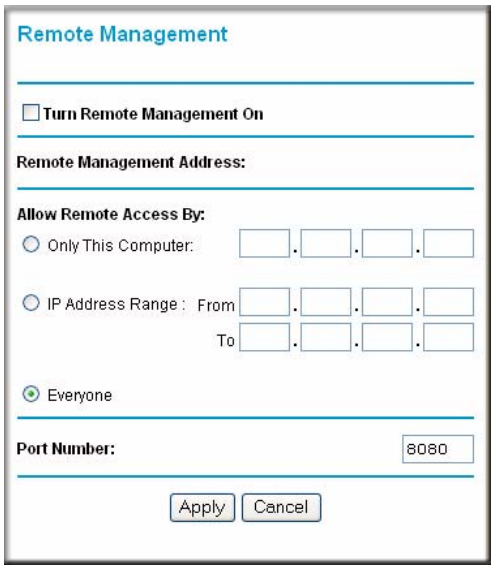


Figure 5-10

3. Select the **Turn Remote Management On** check box.

4. Specify what external addresses will be allowed to access the modem router's remote management.
For security, restrict access to as few external IP addresses as practical:

- To allow access from any IP address on the Internet, select **Everyone**.
- To allow access from a range of IP addresses on the Internet, select **IP address range**. Enter a beginning and ending IP address to define the allowed range.
- To allow access from a single IP address on the Internet, select **Only this Computer**. Enter the IP address that will be allowed access.

5. Specify the Port Number that will be used for accessing the management interface.

Web browser access normally uses the standard HTTP service port 80. For greater security, you can change the remote management Web interface to a custom port by entering that number in the box provided. Choose a number between 1024 and 65535, but do not use the number of any common service port. The default is 8080, which is a common alternate for HTTP.

6. Click **Apply** to have your changes take effect.

When accessing your modem router from the Internet, you will type your modem router's WAN IP address in your browser's Address (in IE) or Location (in Netscape) box, followed by a colon (:) and the custom port number. For example, if your external address is 134.177.0.123 and you use port number 8080, enter in your browser:

```
http://134.177.0.123:8080
```

	Note: In this case, the http:// must be included in the address.

Chapter 6
Advanced Configuration

This chapter describes how to configure the advanced features of your 54 Mbps ADSL Modem Wireless Router Model DG834G.

Configuring Advanced Security

The 54 Mbps ADSL Modem Wireless Router Model DG834G provides a variety of advanced features, such as:

- Setting up a Demilitarized Zone (DMZ) Server
- Connecting Automatically, as Required
- Disabling Port Scan and DOS Protection
- Responding to a Ping on the Internet WAN Port
- MTU Size
- Flexibility on configuring your LAN TCP/IP settings
- Using the Router as a DHCP Server
- Configuring Dynamic DNS
- Configuring Static Routes

These features are discussed below.

Setting Up A Default DMZ Server

The Default DMZ Server feature is helpful when using some online games and videoconferencing applications that are incompatible with NAT. The modem router is programmed to recognize some of these applications and to work properly with them, but there are other applications that may not function well. In some cases, one local computer can run the application properly if that computer's IP address is entered as the Default DMZ Server.

⚠	**Warning:** For security reasons, you should avoid using the Default DMZ Server feature. When a computer is designated as the Default DMZ Server, it loses much of the protection of the firewall, and is exposed to many exploits from the Internet. If compromised, the computer can be used to attack your network.

Incoming traffic from the Internet is normally discarded by the modem router unless the traffic is a response to one of your local computers or a service that you have configured in the Ports menu. Instead of discarding this traffic, you can have it forwarded to one computer on your network. This computer is called the Default DMZ Server.

How to Configure a Default DMZ Server

To assign a computer or server to be a Default DMZ server, follow these steps:

1. Log in to the modem router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever Password and LAN address you have chosen for the modem router.

2. From the Main Menu, under Advanced, click the **WAN Setup** link to view the page shown:

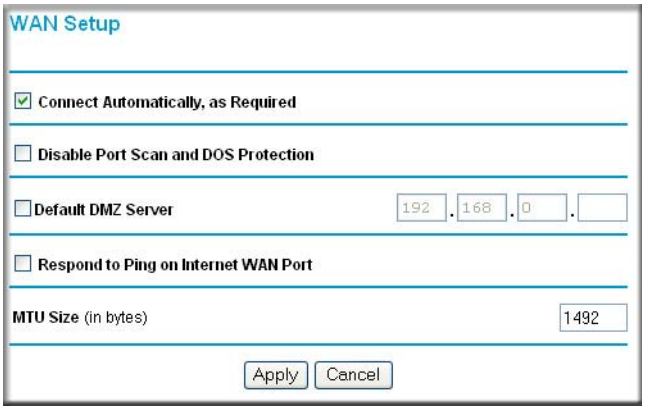


Figure 6-1

3. Select the **Default DMZ Server** check box.
4. Type the IP address for that server.
5. Click **Apply** to save your changes.

Connect Automatically, as Required

Normally, this option should be enabled, so that an Internet connection will be made automatically, whenever Internet-bound traffic is detected. If this causes high connection costs, you can disable this setting.

If disabled, you must connect manually, using the sub-screen accessed from the "Connection Status" button on the Status screen.

If you have an "Always on" connection, this setting has no effect.

Disable Port Scan and DOS Protection

The Firewall protects your LAN against Port Scans and Denial of Service (DOS) attacks. This should be disabled only in special circumstances.

Respond to Ping on Internet WAN Port

If you want the modem router to respond to a 'ping' from the Internet, select the **Respond to Ping on Internet WAN Port** check box. This should only be used as a diagnostic tool, since it allows your modem router to be discovered. Do not select this box unless you have a specific reason to do so.

MTU Size

The normal MTU (Maximum Transmit Unit) value for most Ethernet networks is 1500 Bytes, or 1492 Bytes for PPPoE connections. For some ISPs you may need to reduce the MTU. But this is rarely required, and should not be done unless you are sure it is necessary for your ISP connection.

Configuring LAN IP Settings

The LAN IP Setup menu allows configuration of LAN IP services such as DHCP and RIP. These features can be found under the Advanced heading in the Main Menu of the browser interface.

The modem router is shipped preconfigured to use private IP addresses on the LAN side, and to act as a DHCP server. The modem router’s default LAN IP configuration is:

- LAN IP addresses—192.168.0.1
- Subnet mask—255.255.255.0

These addresses are part of the Internet Engineering Task Force (IETF)-designated private address range for use in private networks, and should be suitable in most applications. If your network has a requirement to use a different IP addressing scheme, you can make those changes in this menu.

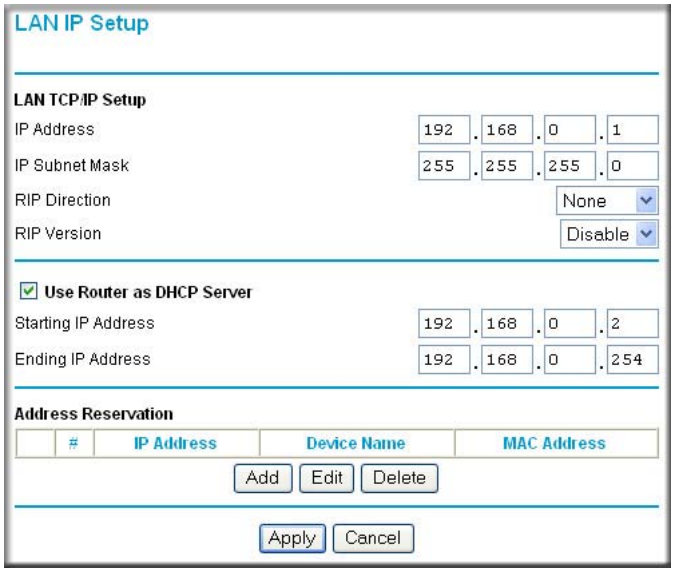


Figure 6-2

The LAN TCP/IP Setup parameters are:

- IP Address
  This is the LAN IP address of the modem router.

⚠	**Warning:** If you change the LAN IP address of the modem router while connected through the browser, you or anyone else using the router will be disconnected. You must then open a new connection to the new IP address and log in again. Others using the router will have to restart their computer and connect to the router again.

- IP Subnet Mask
  This is the LAN Subnet Mask of the modem router. Combined with the IP address, the IP Subnet Mask allows a device to know which other addresses are local to it, and which must be reached through a gateway or modem router.

- RIP Direction
  RIP (Router Information Protocol) allows a modem router to exchange routing information with other routers. The RIP Direction selection controls how the Modem Router sends and receives RIP packets. Both is the default.
  - When set to Both or Out Only, the modem router will broadcast its routing table periodically.
  - When set to Both or In Only, it will incorporate the RIP information that it receives.
  - When set to None, it will not send any RIP packets and will ignore any RIP packets received.
- RIP Version
  This controls the format and the broadcasting method of the RIP packets that the modem router sends. It recognizes both formats when receiving. By default, this is set for RIP-1.
  - RIP-1 is universally supported. RIP-1 is probably adequate for most networks, unless you have an unusual network setup.
  - RIP-2 carries more information. Both RIP-2B and RIP-2M send the routing data in RIP-2 format.
    - RIP-2B uses subnet broadcasting.
    - RIP-2M uses multicasting.

DHCP

By default, the modem router will function as a DHCP (Dynamic Host Configuration Protocol) server, allowing it to assign IP, DNS server, and default gateway addresses to all computers connected to the modem router's LAN. The assigned default gateway address is the LAN address of the router. IP addresses will be assigned to the attached PCs from a pool of addresses specified in this menu. Each pool address is tested before it is assigned to avoid duplicate addresses on the LAN.

For most applications, the default DHCP and TCP/IP settings of the router are satisfactory. See “Internet Networking and TCP/IP Addressing” in Appendix C for an explanation of DHCP and information about how to assign IP addresses for your network.

Use Router as DHCP server

If another device on your network will be the DHCP server, or if you will manually configure the network settings of all of your computers, clear the ‘Use router as DHCP server’ check box. Otherwise, leave it selected.

Specify the pool of IP addresses to be assigned by setting the Starting IP Address and Ending IP Address. These addresses should be part of the same IP address subnet as the router's LAN IP address. Using the default addressing scheme, you should define a range between 192.168.0.2 and 192.168.0.254, although you may want to save part of the range for devices with fixed addresses.

The router will deliver the following parameters to any LAN device that requests DHCP:

- An IP Address from the range you have defined
- Subnet Mask
- Gateway IP Address is the router's LAN IP address
- Primary DNS Server, if you entered a Primary DNS address in the Basic Settings menu; otherwise, the router's LAN IP address
- Secondary DNS Server, if you entered a Secondary DNS address in the Basic Settings menu
- WINS Server, short for *Windows Internet Naming Service Server*, determines the IP address associated with a particular Windows computer. A WINS server records and reports a list of names and IP address of Windows PCs on its local network. If you connect to a remote network that contains a WINS server, enter the server's IP address here. This allows your PCs to browse the network using the Network Neighborhood feature of Windows.

Reserved IP addresses

When you specify a reserved IP address for a computer on the LAN, that computer will always receive the same IP address each time it access the router's DHCP server. Reserved IP addresses should be assigned to servers that require permanent IP settings.

To reserve an IP address:

1. Click the **Add** button.
2. In the IP Address box, type the IP address to assign to the computer or server. Choose an IP address from the router's LAN subnet, such as 192.168.0.x.
3. Type the MAC Address of the computer or server.

	Tip: If the computer is already present on your network, you can copy its MAC address from the Attached Devices menu and paste it here.

4. Click **Apply** to enter the reserved address into the table.

	Note: The reserved address will not be assigned until the next time the computer contacts the router's DHCP server. Reboot the computer or access its IP configuration and force a DHCP release and renew.

To edit or delete a reserved address entry:

1. Click the button next to the reserved address you want to edit or delete.
2. Click **Edit** or **Delete**.

How to Configure LAN TCP/IP Settings

1. Log in to the router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever User Name, Password and LAN address you have chosen for the router.
2. From the Main Menu, under Advanced, click the **LAN IP Setup** link to view the menu, shown:

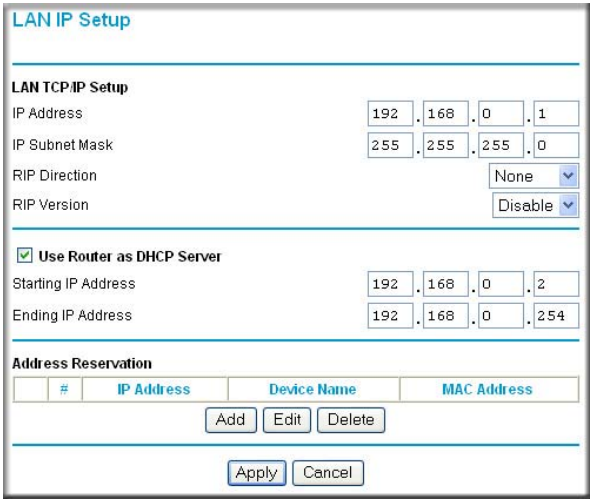


Figure 6-3

3. Enter the TCP/IP, DHCP, or Reserved IP parameters.
4. Click **Apply** to save your changes.

Configuring Dynamic DNS

If your network has a permanently assigned IP address, you can register a domain name and have that name linked with your IP address by public Domain Name Servers (DNS). However, if your Internet account uses a dynamically assigned IP address, you will not know in advance what your IP address will be, and the address can change frequently. In this case, you can use a commercial dynamic DNS service that will allow you to register your domain to their IP address, and will forward traffic directed at your domain to your frequently-changing IP address.

The router contains a client that can connect to a dynamic DNS service provider. To use this feature, you must select a service provider and obtain an account with them. After you have configured your account information in the router, whenever your ISP-assigned IP address changes, your router will automatically contact your dynamic DNS service provider, log in to your account, and register your new IP address.

How to Configure Dynamic DNS

⚠	**Warning:** If your ISP assigns a private WAN IP address such as 192.168.x.x or 10.x.x.x, the dynamic DNS service will not work because private addresses will not be routed on the Internet.

1. Log in to the router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever User Name, Password and LAN address you have chosen for the router.

2. From the Main Menu of the browser interface, under Advanced, select **Dynamic DNS** to display the page below.

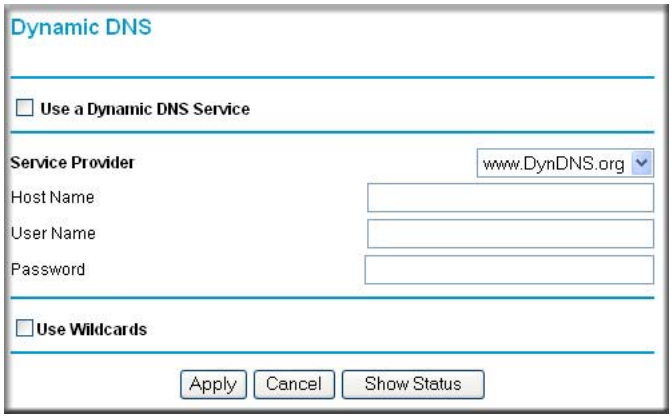


Figure 6-4

3. Access the Web site of one of the dynamic DNS service providers whose names appear in the 'Service Provider' box, and register for an account.
   For example, for dyndns.org, go to www.dyndns.org.
4. Select the **Use a dynamic DNS service** check box.
5. Select the name of your dynamic DNS Service Provider.
6. Type the Host Name that your dynamic DNS service provider gave you.
   The dynamic DNS service provider may call this the domain name. If your URL is myName.dyndns.org, then your Host Name is "myName."
7. Type the User Name for your dynamic DNS account.
8. Type the Password (or key) for your dynamic DNS account.
9. If your dynamic DNS provider allows the use of wildcards in resolving your URL, you can select the **Use wildcards** check box to activate this feature.
   For example, the wildcard feature will cause *.yourhost.dyndns.org to be aliased to the same IP address as yourhost.dyndns.org
10. Click **Apply** to save your configuration.

Using Static Routes

Static Routes provide additional routing information to your router. Under normal circumstances, the router has adequate routing information after it has been configured for Internet access, and you do not need to configure additional static routes. You must configure static routes only for unusual cases such as multiple routers or multiple IP subnets located on your network.

Static Route Example

As an example of when a static route is needed, consider the following case:

- Your primary Internet access is through a cable modem to an ISP.
- You have an ISDN router on your home network for connecting to the company where you are employed. This router's address on your LAN is 192.168.0.100.
- Your company's network is 134.177.0.0.

When you first configured your router, two implicit static routes were created. A default route was created with your ISP as the modem router, and a second static route was created to your local network for all 192.168.0.x addresses. With this configuration, if you attempt to access a device on the 134.177.0.0 network, your router will forward your request to the ISP. The ISP forwards your request to the company where you are employed, and the request will likely be denied by the company's firewall.

In this case you must define a static route, telling your router that 134.177.0.0 should be accessed through the ISDN router at 192.168.0.100. The static route would look like Figure 6-6.

In this example:

- The Destination IP Address and IP Subnet Mask fields specify that this static route applies to all 134.177.x.x addresses.
- The Modem Router IP Address fields specifies that all traffic for these addresses should be forwarded to the ISDN router at 192.168.0.100.
- A Metric value of 1 will work since the ISDN router is on the LAN.
  This represents the number of routers between your network and the destination. This is a direct connection so it is set to 1.
- Private is selected only as a precautionary security measure in case RIP is activated.

How to Configure Static Routes

1. Log in to the router at its default LAN address of http://192.168.0.1 with its default User Name of **admin**, default password of **password**, or using whatever User Name, Password and LAN address you have chosen for the router.
2. From the Main Menu of the browser interface, under Advanced, click **Static Routes** to view the Static Routes menu, shown in Figure 6-5.

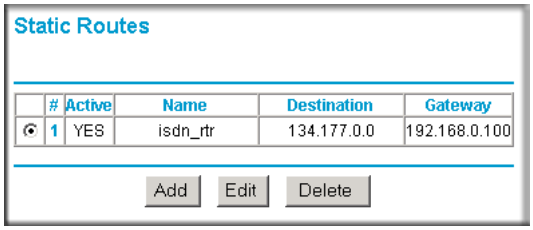


Figure 6-5

3. To add or edit a Static Route:
   a. Click the **Edit** button to open the Edit Menu, shown in Figure 6-6.

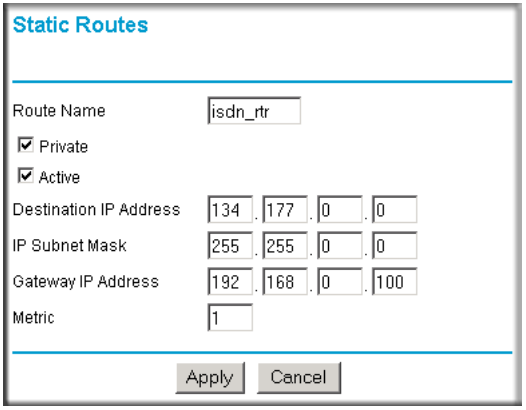


Figure 6-6

   b. Type a route name for this static route in the Route Name box under the table. This is for identification purpose only.
   c. Select **Private** if you want to limit access to the LAN only. The static route will not be reported in RIP.

d. Select **Active** to make this route effective.

e. Type the Destination IP Address of the final destination.

f. Type the IP Subnet Mask for this destination.
If the destination is a single host, type 255.255.255.255.

g. Type the Gateway IP Address, which must be a router on the same LAN segment as the router.

h. Type a number between 1 and 15 as the Metric value.
This represents the number of routers between your network and the destination. Usually, a setting of 2 or 3 works, but if this is a direct connection, set it to 1.

4. Click **Apply** to have the static route entered into the table.

Universal Plug and Play (UPnP)

Universal Plug and Play (UPnP) helps devices, such as Internet appliances and computers, access the network and connect to other devices as needed. UPnP devices can automatically discover the services from other registered UPnP devices on the network.

1. Click **UPnP** on the main menu to invoke the UPnP menu:

Figure 6-7

2. Fill out the UPnP screen:

- **Turn UPnP On**: UPnP can be enabled or disabled for automatic device configuration. The default setting for UPnP is enabled. If disabled, the Router will not allow any device to automatically control the resources, such as port forwarding (mapping), of the Router.

- **Advertisement Period**: The Advertisement Period is how often the Router will advertise (broadcast) its UPnP information. This value can range from 1 to 1440 minutes. The default period is for 30 minutes. Shorter durations will ensure that control points have current device status at the expense of additional network traffic. Longer durations may compromise the freshness of the device status but can significantly reduce network traffic.
- **Advertisement Time To Live**: The time to live for the advertisement is measured in hops (steps) for each UPnP packet sent. A hop is the number of steps allowed to propagate for each UPnP advertisement before it disappears. The number of hops can range from 1 to 255. The default value for the advertisement time to live is 4 hops, which should be fine for most home networks. If you notice that some devices are not being updated or reached correctly, then it may be necessary to increase this value a little.
- **UPnP Portmap Table**: The UPnP Portmap Table displays the IP address of each UPnP device that is currently accessing the Router and which ports (Internal and External) that device has opened. The UPnP Portmap Table also displays what type of port is opened and if that port is still active for each IP address.

3. To save, cancel or refresh the table:

a. Click **Apply** to save the new settings to the Router.

b. Click **Cancel** to disregard any unsaved changes.

c. Click **Refresh** to update the portmap table and to show the active ports that are currently opened by UPnP devices.

Chapter 7
Virtual Private Networking

This chapter describes how to use the virtual private networking (VPN) features of the ADSL Modem Wireless Router. VPN communications paths are called tunnels. VPN tunnels provide secure, encrypted communications between your local network and a remote network or computer. See "Virtual Private Networking (VPN)" in Appendix C to learn more about VPN.

This chapter is organized as follows:

- "Overview of VPN Configuration" on page 7-2 provides an overview of the two most common VPN configurations: Client-to-Gateway and Gateway-to-Gateway.
- "Planning a VPN" on page 7-4 provides a worksheet for recording the configuration parameters of the VPN you want to set up, along with the VPN Committee (VPNC) recommended default parameters set by the VPN Wizard.
- "VPN Tunnel Configuration" on page 7-6 summarizes the three ways to configure a VPN tunnel: VPN Wizard (recommended for most situations), Auto Policy, and Manual Policy.
- "How to Set Up a Client-to-Gateway VPN Configuration" on page 7-7 provides the steps needed to configure a VPN tunnel between a remote PC and a network gateway using the VPN Wizard and the NETGEAR ProSafe VPN Client.
- "How to Set Up a Gateway-to-Gateway VPN Configuration" on page 7-21 provides the steps needed to configure a VPN tunnel between two network gateways using the VPN Wizard.
- "VPN Tunnel Control" on page 7-29 provides the step-by-step procedures for activating, verifying, deactivating, and deleting a VPN tunnel once the VPN tunnel has been configured.
- "How to Set Up VPN Tunnels in Special Circumstances" on page 7-38 provides the steps needed to configure VPN tunnels when there are special circumstances and the VPNC recommended defaults of the VPN Wizard are inappropriate. The two alternatives for configuring VPN tunnels are Auto Policy and Manual Policy.

Overview of VPN Configuration

Two common scenarios for configuring VPN tunnels are between a remote personal computer and a network gateway and between two or more network gateways. The DG834G v3 supports both of these types of VPN configurations. The ADSL Modem Wireless Router supports up to five concurrent tunnels.

Client-to-Gateway VPN Tunnels

Client-to-Gateway VPN Tunnels provide secure access from a remote PC, such as a telecommuter connecting to an office network.

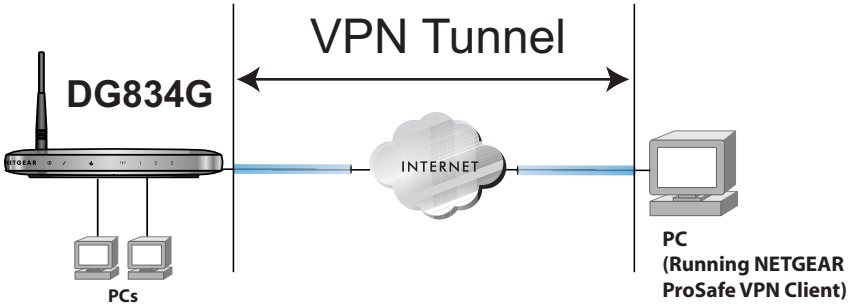


Figure 7-1

A VPN client access allows a remote PC to connect to your network from any location on the Internet. In this case, the remote PC is one tunnel endpoint, running the VPN client software. The ADSL Modem Wireless Router on your network is the other tunnel endpoint. See "How to Set Up a Client-to-Gateway VPN Configuration" on page 7-7 to set up this configuration.

Gateway-to-Gateway VPN Tunnels

- Gateway-to-Gateway VPN Tunnels provide secure access between networks, such as a branch or home office and a main office.

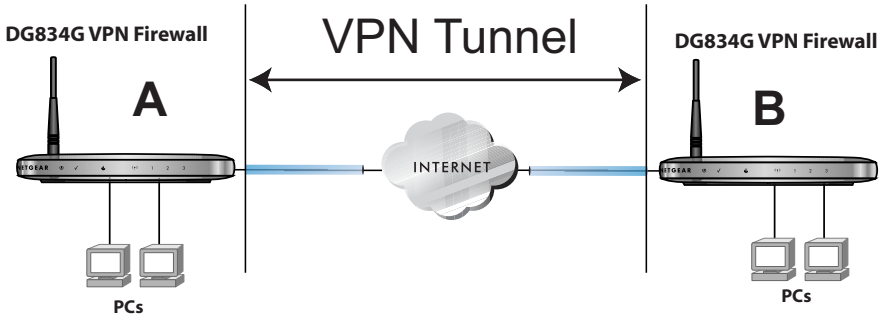


Figure 7-2

A VPN between two or more NETGEAR VPN-enabled routers is a good way to connect branch or home offices and business partners over the Internet. VPN tunnels also enable access to network resources across the Internet. In this case, use DG834G v3s on each end of the tunnel to form the VPN tunnel end points. See "How to Set Up a Gateway-to-Gateway VPN Configuration" on page 7-21 to set up this configuration.

Planning a VPN

When you set up a VPN, it is helpful to plan the network configuration and record the configuration parameters on a worksheet:

Table 7-1. VPN Tunnel Configuration Worksheet

Connection Name:	
Pre-Shared Key:	
Secure Association -- Main Mode or Manual Keys:	
Perfect Forward Secrecy -- Enabled or Disabled:	
NETBIOS -- Enabled or Disabled:	
Encryption Protocol -- DES or 3DES:	
Authentication Protocol -- MD5 or SHA-1:	
Diffie-Hellman (DH) Group -- Group 1 or Group 2:	
Key Life in seconds:	
IKE Life Time in seconds:	

VPN Endpoint	Local IPSec ID	LAN IP Address	Subnet Mask	FQDN or Gateway IP (WAN IP Address)

To set up a VPN connection, you must configure each endpoint with specific identification and connection information describing the other endpoint. You must configure the outbound VPN settings on one end to match the inbound VPN settings on other end, and vice versa.

This set of configuration information defines a security association (SA) between the two VPN endpoints. When planning your VPN, you must make a few choices first:

- Will the local end be any device on the LAN, a portion of the local network (as defined by a subnet or by a range of IP addresses), or a single PC?

- Will the remote end be any device on the remote LAN, a portion of the remote network (as defined by a subnet or by a range of IP addresses), or a single PC?
- Will either endpoint use Fully Qualified Domain Names (FQDNs)? FQDNs supplied by Dynamic DNS providers (see "The Use of a Fully Qualified Domain Name (FQDN)" on page B-8) can allow a VPN endpoint with a dynamic IP address to initiate or respond to a tunnel request. Otherwise, the side using a dynamic IP address must always be the initiator.
- What method will you use to configure your VPN tunnels?
  - The VPN Wizard using VPNC defaults (see Table 7-2)
  - The typical automated Internet Key Exchange (IKE) setup (see "Using Auto Policy to Configure VPN Tunnels" on page 7-38)
  - A Manual Keying setup in which you must specify each phase of the connection (see "Using Manual Policy to Configure VPN Tunnels" on page 7-48)?

Table 7-2. Parameters Recommended by the VPNC and Used in the VPN Wizard

Parameter	Factory Default
Secure Association	Main Mode
Authentication Method	Pre-shared Key
Encryption Method	3DES
Authentication Protocol	SHA-1
Diffie-Hellman (DH) Group	Group 2 (1024 bit)
Key Life	8 hours
IKE Life Time	1 hour
NETBIOS	Enabled

- What level of IPSec VPN encryption will you use?
  - DES - The Data Encryption Standard (DES) processes input data that is 64 bits wide, encrypting these values using a 56 bit key. Faster but less secure than 3DES.
  - 3DES - (Triple DES) achieves a higher level of security by encrypting the data three times using DES with three different, unrelated keys.
- What level of authentication will you use?
  - MDS: 128 bits, faster but less secure.
  - SHA-1: 160 bits, slower but more secure.

VPN Tunnel Configuration

There are two tunnel configurations and three ways to configure them:

- Use the VPN Wizard to configure a VPN tunnel (recommended for most situations):
  - See "How to Set Up a Client-to-Gateway VPN Configuration" on page 7-7.
  - See "How to Set Up a Gateway-to-Gateway VPN Configuration" on page 7-21.
- See "Using Auto Policy to Configure VPN Tunnels" on page 7-38 when the VPN Wizard and its VPNC defaults (see Table 7-2) are not appropriate for your special circumstances, but you want to automate the Internet Key Exchange (IKE) setup.
- See "Using Manual Policy to Configure VPN Tunnels" on page 7-48 when the VPN Wizard and its VPNC defaults (see Table 7-2) are not appropriate for your special circumstances and you must specify each phase of the connection. You manually enter all the authentication and key parameters. You have more control over the process, however the process is more complex and there are more opportunities for errors or configuration mismatches between your DG834G v3 and the corresponding VPN endpoint gateway or client workstation.

	Note: NETGEAR publishes additional interoperability scenarios with various gateway and client software products. Look on the NETGEAR web site at *www.netgear.com* for these interoperability scenarios.

How to Set Up a Client-to-Gateway VPN Configuration

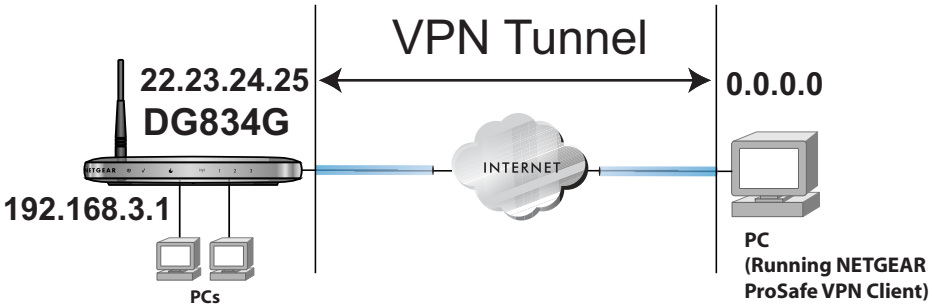


Figure 7-3

Setting up a VPN between a remote PC running the NETGEAR ProSafe VPN Client and a network gateway involves the following two steps:

- "Step 1: Configuring the Client-to-Gateway VPN Tunnel on the DG834G v3" on page 7-7 uses the VPN Wizard to configure the VPN tunnel between the remote PC and network gateway.
- "Step 2: Configuring the NETGEAR ProSafe VPN Client on the Remote PC" on page 7-12 configures the NETGEAR ProSafe VPN Client endpoint.

Step 1: Configuring the Client-to-Gateway VPN Tunnel on the DG834G v3

	Note: This section uses the VPN Wizard to set up the VPN tunnel using the VPNC default parameters listed in Table 7-2 on page 7-5. If you have special requirements not covered by these VPNC-recommended parameters, refer to "How to Set Up VPN Tunnels in Special Circumstances" on page 7-38 to set up the VPN tunnel.

The worksheet below identifies the parameters used in the following procedure. A blank worksheet is at "Planning a VPN" on page 7-4.

Table 7-3. VPN Tunnel Configuration Worksheet

Connection Name:	**RoadWarrior**
Pre-Shared Key:	**12345678**
Secure Association -- Main Mode or Manual Keys:	**Main**
Perfect Forward Secrecy -- Enabled or Disabled:	**Disabled**
NETBIOS -- Enabled or Disabled:	**Enabled**
Encryption Protocol -- DES or 3DES:	**3DES**
Authentication Protocol -- MD5 or SHA-1:	**SHA-1**
Diffie-Hellman (DH) Group -- Group 1 or Group 2:	**Group 2**
Key Life in seconds:	**28800 (8 hours)**
IKE Life Time in seconds:	**3600 (1 hour)**

VPN Endpoint	Local IPSec ID	LAN IP Address	Subnet Mask	FQDN or Gateway IP (WAN IP Address)
Client	**toDG834**	**—**	**—**	**Dynamic**
DG834G v3	**toClient**	**192.168.3.1**	**255.255.255.0**	**22.23.24.25**

Follow this procedure to configure a client-to-gateway VPN tunnel using the VPN Wizard.

1. Log in to the DG834G v3 at its LAN address of http://192.168.0.1 with its default user name of **admin** and password of **password**. Click the **VPN Wizard** link in the main menu to display this screen. Click **Next** to proceed.

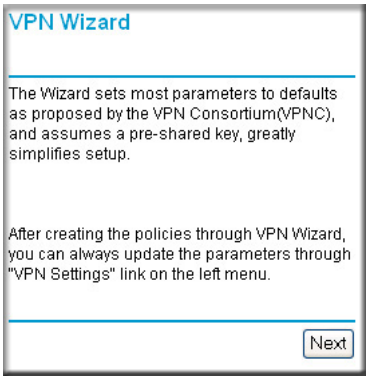
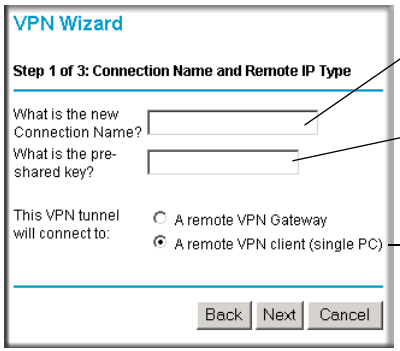


Figure 7-4

2. Fill in the Connection Name and the pre-shared key, select the type of target end point, and click **Next** to proceed.



Enter the new Connection Name:
(e.g., **RoadWarrior**)

Enter the pre-shared key:
(e.g., **12345678**)

Select the radio button:
A remote VPN client (single PC)

Figure 7-5

	Tip: The Connection Name is arbitrary and not relevant to how the configuration functions.

The Summary screen below displays.

Figure 7-6

To view the VPNC recommended authentication and encryption settings used by the VPN Wizard, click the "**here**" link. Click **Back** to return to the Summary screen.

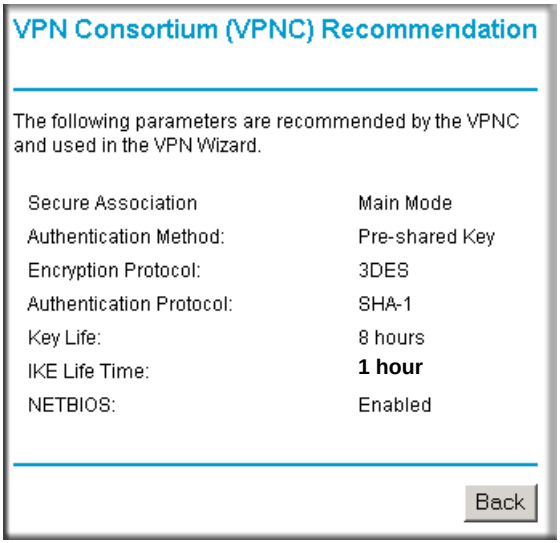


Figure 7-7

3. Click **Done** on the Summary screen to complete the configuration procedure. The VPN Policies menu below displays showing that the new tunnel is enabled.

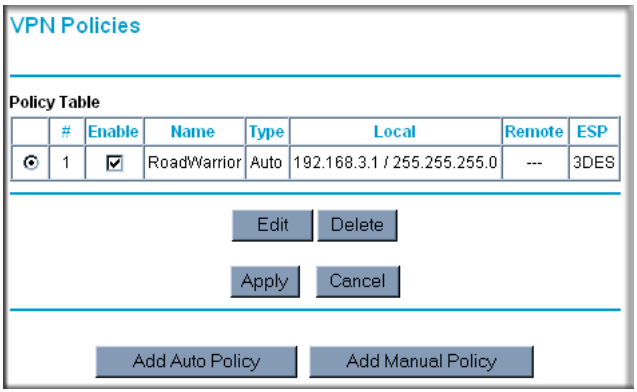


Figure 7-8

To view or modify the tunnel settings, select the radio button next to the tunnel entry and click **Edit**.

	Note: Refer to "Using Auto Policy to Configure VPN Tunnels" on page 7-38 to enable the IKE keepalive capability on an existing VPN tunnel.

Step 2: Configuring the NETGEAR ProSafe VPN Client on the Remote PC

This procedure describes how to configure the NETGEAR ProSafe VPN Client. We will assume the PC running the client has a dynamically assigned IP address.

The PC must have the NETGEAR ProSafe VPN Client program installed that supports IPSec. Go to the NETGEAR website (*http://www.netgear.com*) and select **VPN01L_VPN05L** in the Product Quick Find drop-down menu for information on how to purchase the NETGEAR ProSafe VPN Client.

	Note: Before installing the NETGEAR ProSafe VPN Client software, be sure to turn off any virus protection or firewall software you may be running on your PC.

1. Install the NETGEAR ProSafe VPN Client on the remote PC and reboot.

- You may need to insert your Windows CD to complete the installation.
- If you do not have a modem or dial-up adapter installed in your PC, you may see the warning message stating "The NETGEAR ProSafe VPN Component requires at least one dial-up adapter be installed." You can disregard this message.
- Install the IPSec Component. You may have the option to install either the VPN Adapter or the IPSec Component or both. The VPN Adapter is not necessary.
- The system should show the ProSafe icon ( ) in the system tray after rebooting.
- Double-click the system tray icon to open the Security Policy Editor.

2. Add a new connection.

a. Run the NETGEAR ProSafe Security Policy Editor program and, using the "VPN Tunnel Configuration Worksheet" on page 7-8, create a VPN Connection.

b. From the Edit menu of the Security Policy Editor, click **Add**, then **Connection**.

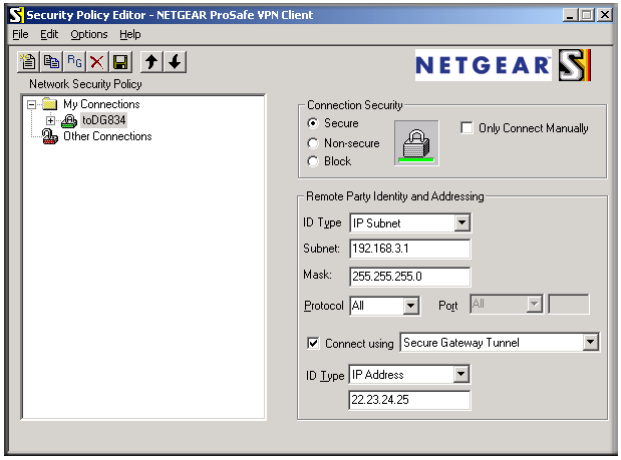


Figure 7-9

A “New Connection” listing appears in the list of policies. Rename the “New Connection” so that it matches the Connection Name you entered in the VPN Settings of the DG834G v3 on LAN A.

	Note: In this example, the Connection Name used on the client side of the VPN tunnel is **toDG834** and it does not have to match the **RoadWarrior** Connection Name used on the gateway side of the VPN tunnel because Connection Names are arbitrary to how the VPN tunnel functions.

	Tip: Choose Connection Names that make sense to the people using and administering the VPN.

c. Select **Secure** in the Connection Security check-box group.

d. Select **IP Subnet** in the ID Type menu.

e. In this example, type **192.168.3.1** in the Subnet field as the network address of the DG834G v3.

f. Enter **255.255.255.0** in the Mask field as the LAN Subnet Mask of the DG834G v3.

g. Select **All** in the Protocol menu to allow all traffic through the VPN tunnel.

h. Select the **Connect using Secure Gateway Tunnel** check box.

i. Select **IP Address** in the ID Type menu below the check box.

j. Enter the public WAN IP Address of the DG834G v3 in the field directly below the ID Type menu. In this example, **22.23.24.25** would be used.

k. The resulting Connection Settings are shown in Figure 7-10.

3. Configure the Security Policy in the NETGEAR ProSafe VPN Client software:

a. In the Network Security Policy list, expand the new connection by double clicking its name or clicking on the "+" symbol. My Identity and Security Policy subheadings appear below the connection name.

b. Click on the **Security Policy** subheading to show the Security Policy menu.

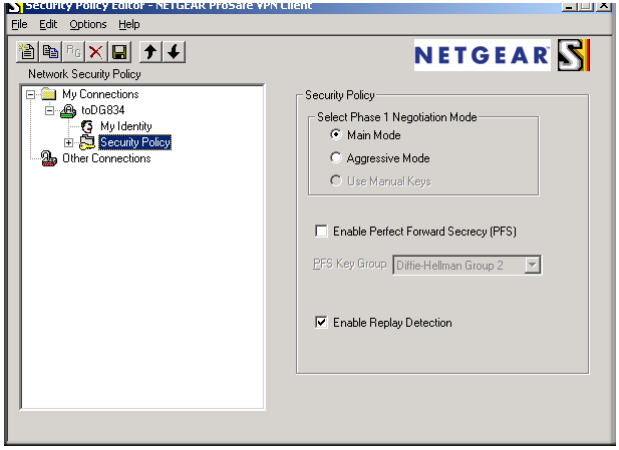


Figure 7-10

c. Select the **Main Mode** in the Select Phase 1 Negotiation Mode check-box group.

4. Configure the VPN Client Identity.

In this step, you will provide information about the remote VPN client PC. You will need to provide the Pre-Shared Key that you configured in the DG834G v3 and either a fixed IP address or a "fixed virtual" IP address of the VPN client PC.

a. In the Network Security Policy list on the left side of the Security Policy Editor window, click on **My Identity**.

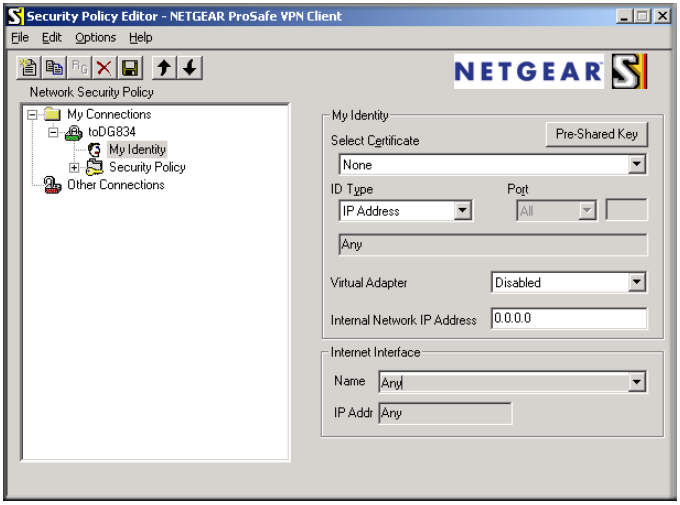


Figure 7-11

b. Choose **None** in the Select Certificate menu.

c. Select **IP Address** in the ID Type menu. If you are using a virtual fixed IP address, enter this address in the Internal Network IP Address box. Otherwise, leave this box empty.

d. In the Internet Interface box, select the adapter you use to access the Internet. Select **PPP Adapter** in the Name menu if you have a dial-up Internet account. Select your Ethernet adapter if you have a dedicated Cable or DSL line. You may also choose Any if you will be switching between adapters or if you have only one adapter.

e. Click the **Pre-Shared Key** button. In the Pre-Shared Key dialog box, click the **Enter** Key button. Enter the DG834G v3's Pre-Shared Key and click **OK**. In this example, **12345678** is entered. This field is case sensitive.

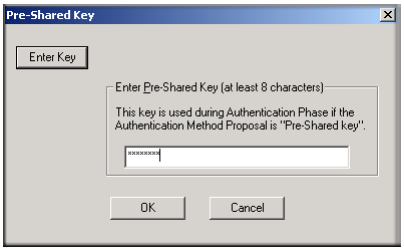


Figure 7-12

5. Configure the VPN Client Authentication Proposal.

In this step, you will provide the type of encryption (DES or 3DES) to be used for this connection. This selection must match your selection in the DG834G v3 configuration.

a. In the Network Security Policy list on the left side of the Security Policy Editor window, expand the Security Policy heading by double clicking its name or clicking on the "+" symbol.

b. Expand the Authentication subheading by double clicking its name or clicking on the "+" symbol. Then select **Proposal 1** below Authentication.

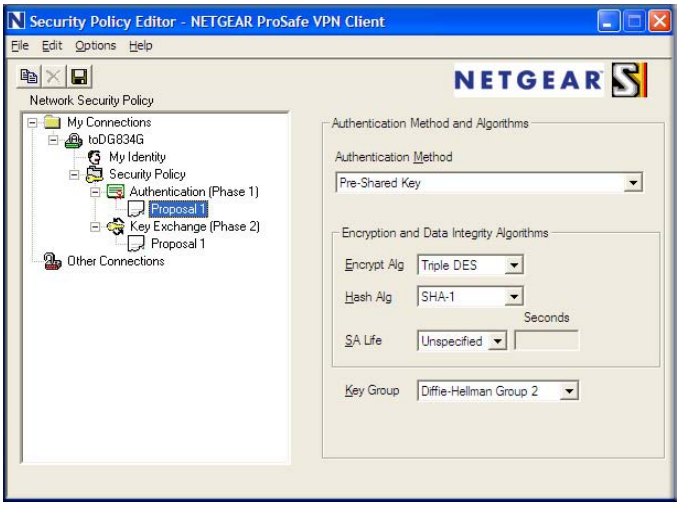


Figure 7-13

c. In the Authentication Method menu, select **Pre-Shared key**.

d. In the Encrypt Alg menu, select the type of encryption to correspond with what was configured for the Encryption Protocol in the DG834G v3 in Table 7-3 on page 7-8. In this example, use Triple DES.

e. In the Hash Alg menu, select **SHA-1**.

f. In the SA Life menu, select **Unspecified**.

g. In the Key Group menu, select **Diffie-Hellman Group 2**.

6. Configure the VPN Client Key Exchange Proposal.

In this step, you will provide the type of encryption (DES or 3DES) to be used for this connection. This selection must match your selection in the DG834G v3 configuration.

a. Expand the Key Exchange subheading by double clicking its name or clicking on the "+" symbol. Then select **Proposal 1** below Key Exchange.

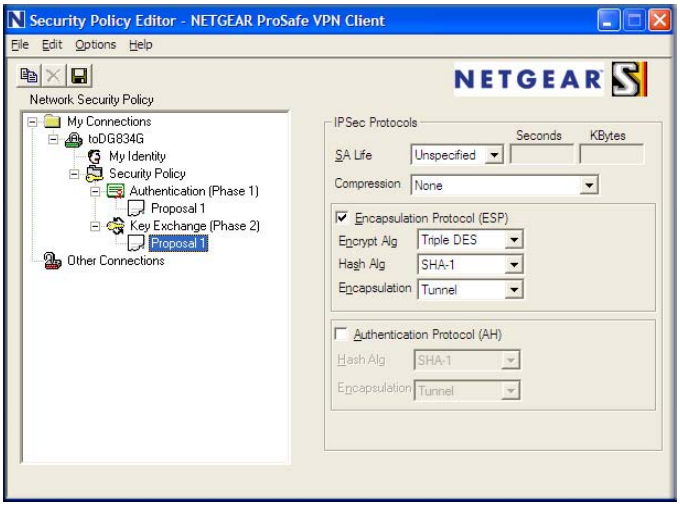


Figure 7-14

b. In the SA Life menu, select **Unspecified**.

c. In the Compression menu, select **None**.

d. Check the Encapsulation Protocol (ESP) checkbox.

e. In the Encrypt Alg menu, select the type of encryption to correspond with what was configured for the Encryption Protocol in the DG834G v3 in Table 7-3 on page 7-8. In this example, use Triple DES.

f. In the Hash Alg menu, select **SHA-1**.

g. In the Encapsulation menu, select **Tunnel**.

h. Leave the Authentication Protocol (AH) checkbox unchecked.

7. Save the VPN Client Settings.

From the File menu at the top of the Security Policy Editor window, select **Save**.

After you have configured and saved the VPN client information, your PC will automatically open the VPN connection when you attempt to access any IP addresses in the range of the remote VPN router's LAN.

8. Check the VPN Connection.

To check the VPN Connection, you can initiate a request from the remote PC to the DG834G v3's network by using the "Connect" option in the NETGEAR ProSafe menu bar. The NETGEAR ProSafe client will report the results of the attempt to connect. Since the remote PC has a dynamically assigned WAN IP address, it must initiate the request.

To perform a ping test using our example, start from the remote PC:

a. Establish an Internet connection from the PC.

b. On the Windows taskbar, click the **Start** button, and then click **Run**.

c. Type `ping -t 192.168.3.1` , and then click **OK**.

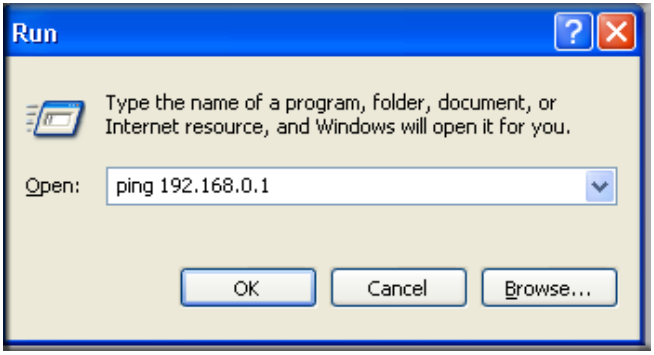


Figure 7-15

This will cause a continuous ping to be sent to the first DG834G v3. After between several seconds and two minutes, the ping response should change from “timed out” to “reply.”

```
C:\>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:

Reply from 192.168.0.1: bytes=32 time<1ms TTL=64
Reply from 192.168.0.1: bytes=32 time<1ms TTL=64
Reply from 192.168.0.1: bytes=32 time=1ms TTL=64
```

Figure 7-16

Once the connection is established, you can open the browser of the PC and enter the LAN IP address of the remote DG834G v3. After a short wait, you should see the login screen of the Modem Router (unless another PC already has the DG834G v3 management interface open).

Information on the progress and status of the VPN client connection can be viewed by opening the NETGEAR ProSafe Log Viewer.

To launch this function, click on the **Windows Start** button, then select **Programs**, then NETGEAR ProSafe VPN Client, then Log Viewer. The Log Viewer screen for a successful connection is shown below:

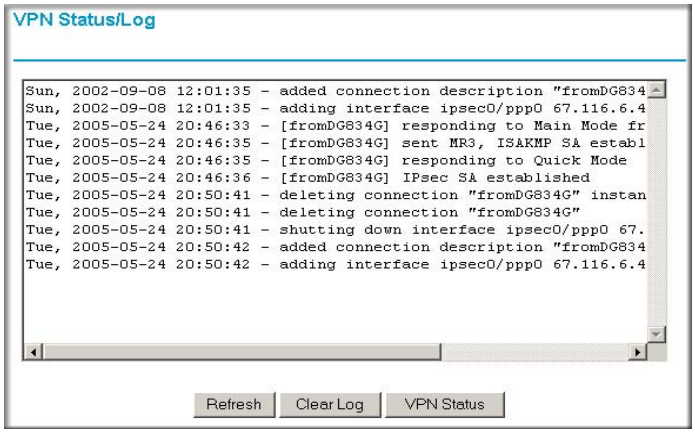


Figure 7-17

	Note: Use the active VPN tunnel information and pings to determine whether a failed connection is due to the VPN tunnel or some reason outside the VPN tunnel.

9. The Connection Monitor screen for this connection is shown below:

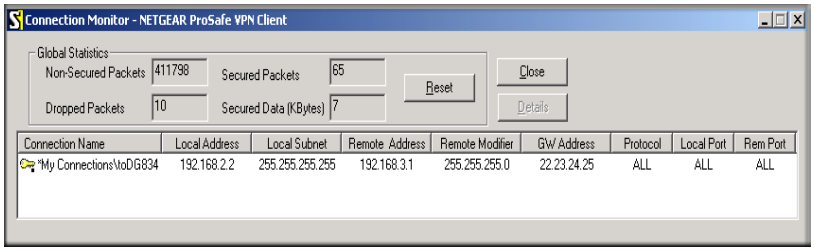


Figure 7-18

In this example you can see the following:

- The DG834G v3 has a public IP WAN address of 22.23.24.25.
- The DG834G v3 has a LAN IP address of 192.168.3.1.
- The VPN client PC has a dynamically assigned address of 192.168.2.2.

While the connection is being established, the Connection Name field in this menu will say “SA” before the name of the connection. When the connection is successful, the “SA” will change to the yellow key symbol shown in the illustration above.

	Note: While your PC is connected to a remote LAN through a VPN, you might not have normal Internet access. If this is the case, you will need to close the VPN connection in order to have normal Internet access.

How to Set Up a Gateway-to-Gateway VPN Configuration

Note: This section uses the VPN Wizard to set up the VPN tunnel using the VPNC default parameters listed in Table 7-2 on page 7-5. If you have special requirements not covered by these VPNC-recommended parameters, refer to "How to Set Up VPN Tunnels in Special Circumstances" on page 7-38 to set up the VPN tunnel.

Follow this procedure to configure a gateway-to-gateway VPN tunnel using the VPN Wizard.

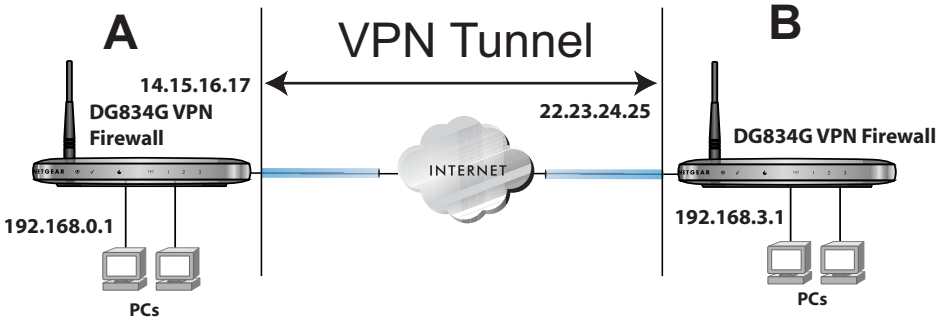


Figure 7-19

Set the LAN IPs on each DG834G v3 to different subnets and configure each properly for the Internet. The examples below assume the following settings:

Table 7-4. VPN Tunnel Configuration Worksheet

Connection Name:	**GtoG**
Pre-Shared Key:	**12345678**
Secure Association -- Main Mode or Manual Keys:	**Main**
Perfect Forward Secrecy -- Enabled or Disabled:	**Disabled**
NETBIOS -- Enabled or Disabled:	**Enabled**
Encryption Protocol -- DES or 3DES:	**3DES**
Authentication Protocol -- MD5 or SHA-1:	**SHA-1**
Diffie-Hellman (DH) Group -- Group 1 or Group 2:	**Group 2**
Key Life in seconds:	**28800 (8 hours)**
IKE Life Time in seconds:	**3600 (1 hour)**

VPN Endpoint	Local IPSec ID	LAN IP Address	Subnet Mask	FQDN or Gateway IP (WAN IP Address)
DG834G v3_A	**GW_A**	**192.168.0.1**	**255.255.255.0**	**14.15.16.17**
DG834G v3_B	**GW_B**	**192.168.3.1**	**255.255.255.0**	**22.23.24.25**

Note: The LAN IP address ranges of each VPN endpoint must be different. The connection will fail if both are using the NETGEAR default address range of 192.168.0.x.

Follow this procedure to configure a gateway-to-gateway VPN tunnel using the VPN Wizard.

1. Log in to the DG834G v3 on LAN A at its default LAN address of http://192.168.0.1 with its default user name of **admin** and password of **password**. Click the **VPN Wizard** link in the main menu to display this screen. Click **Next** to proceed.

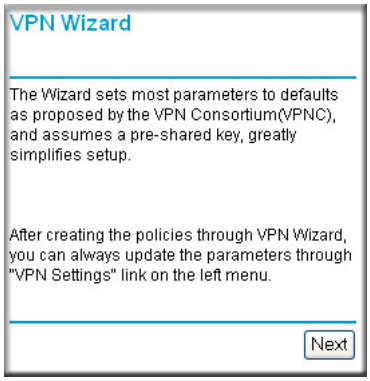
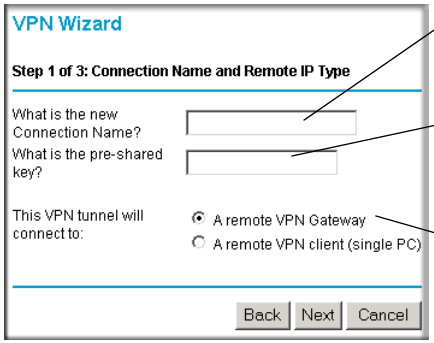


Figure 7-20

2. Fill in the Connection Name and the pre-shared key, select the type of target end point, and click **Next** to proceed.



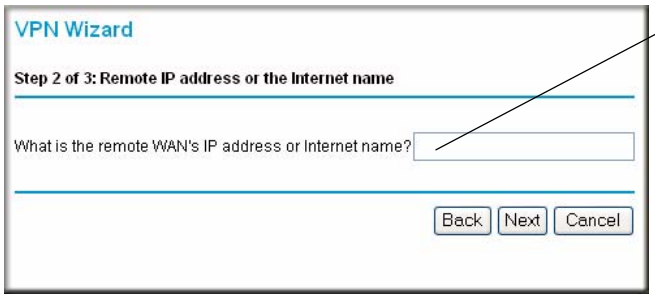
Enter the new Connection Name:
(e.g., **GtoG**)

Enter the pre-shared key:
(e.g., **12345678**)

Select the radio button:
A remote VPN Gateway

Figure 7-21

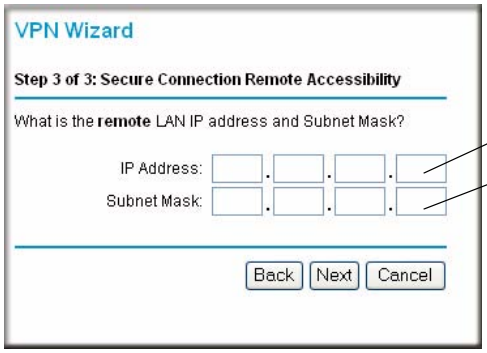
3. Fill in the IP Address or FQDN for the target VPN endpoint WAN connection and click **Next**.



Enter the WAN IP address of the remote VPN gateway: (e.g., **22.23.24.25**)

Figure 7-22

4. Identify the IP addresses at the target endpoint which can use this tunnel, and click **Next**.



Enter the LAN IP settings of the remote VPN gateway:

- IP Address (e.g., **192.168.3.1**)
- Subnet Mask (e.g., **255.255.255.0**)

Figure 7-23

The Summary screen below displays.

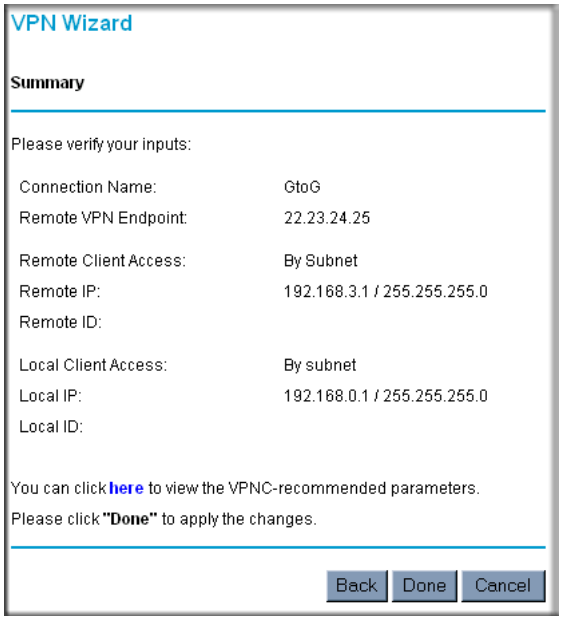


Figure 7-24

To view the VPNC recommended authentication and encryption settings used by the VPN Wizard, click the "**here**" link (see Figure 7-24). Click **Back** to return to the Summary screen.

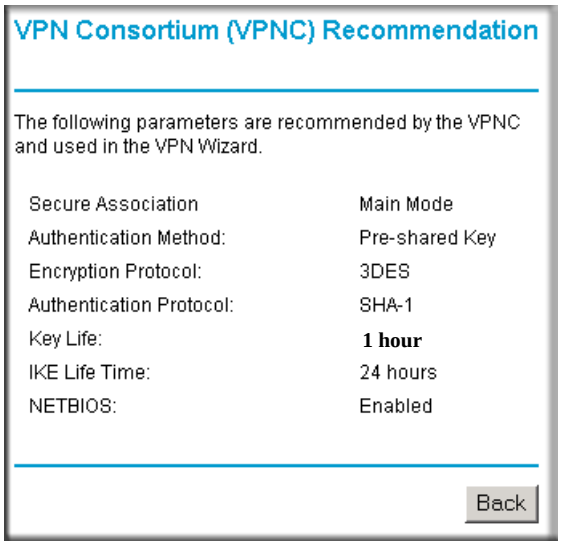


Figure 7-25

5. Click **Done** on the Summary screen (see Figure 7-24) to complete the configuration procedure. The VPN Settings menu below displays showing that the new tunnel is enabled.

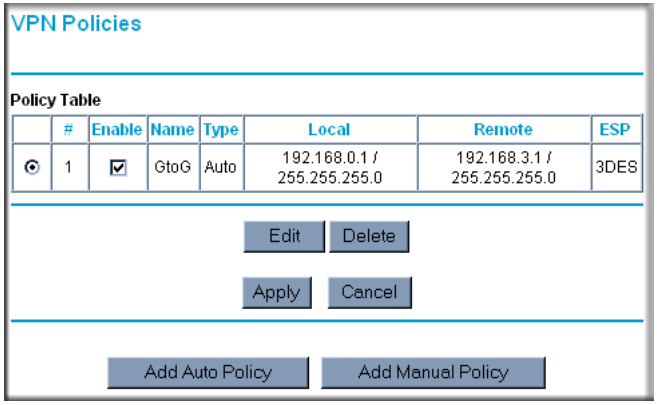


Figure 7-26

Note: Refer to "Using Auto Policy to Configure VPN Tunnels" on page 7-38 to enable the IKE keepalive capability on an existing VPN tunnel.

6. Repeat for the DG834G v3 on LAN B and pay special attention to use the following network settings as appropriate.

- WAN IP of the remote VPN gateway (e.g., **14.15.16.17**)
- LAN IP settings of the remote VPN gateway:
  - IP Address (e.g, **192.168.0.1**)
  - Subnet Mask (e.g., **255.255.255.0**)
  - Preshared Key (e.g., **12345678**)

7. Use the VPN Status screen to activate the VPN tunnel by performing the following steps:

Note: The VPN Status screen is only one of three ways to active a VPN tunnel. See "Activating a VPN Tunnel" on page 7-29 for information on the other ways.

a. Open the DG834G v3 management interface and click on **VPN Status** to get the VPN Status/Log screen (Figure 7-27).

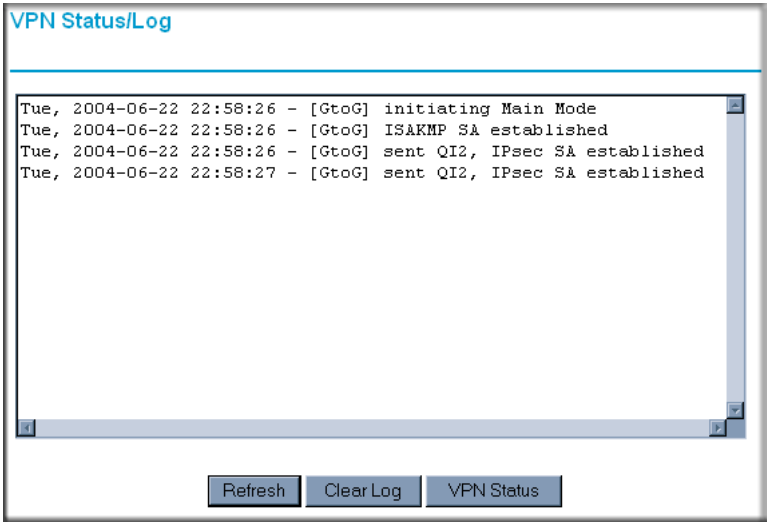


Figure 7-27

b. Click on **VPN Status** (Figure 7-29) to get the Current VPN Tunnels (SAs) screen (Figure 7-28). Click on **Connect** for the VPN tunnel you want to activate.

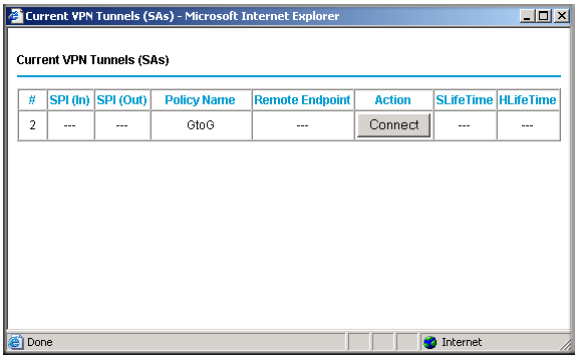


Figure 7-28

c. Look at the VPN Status/Log screen (Figure 7-27) to verify that the tunnel is connected.

VPN Tunnel Control

Activating a VPN Tunnel

There are three ways to activate a VPN tunnel:

- Use the VPN Status page.
- Activate the VPN tunnel by pinging the remote endpoint.
- Start using the VPN tunnel.

Note: Refer to "Using Auto Policy to Configure VPN Tunnels" on page 7-38 to enable the IKE keepalive capability on an existing VPN tunnel.

Using the VPN Status Page to Activate a VPN Tunnel

To use the VPN Status screen to activate a VPN tunnel, perform the following steps:

1. Log in to the Modem Router.
2. Open the DG834G v3 management interface and click on **VPN Status** to get the VPN Status/Log screen (Figure 7-29).

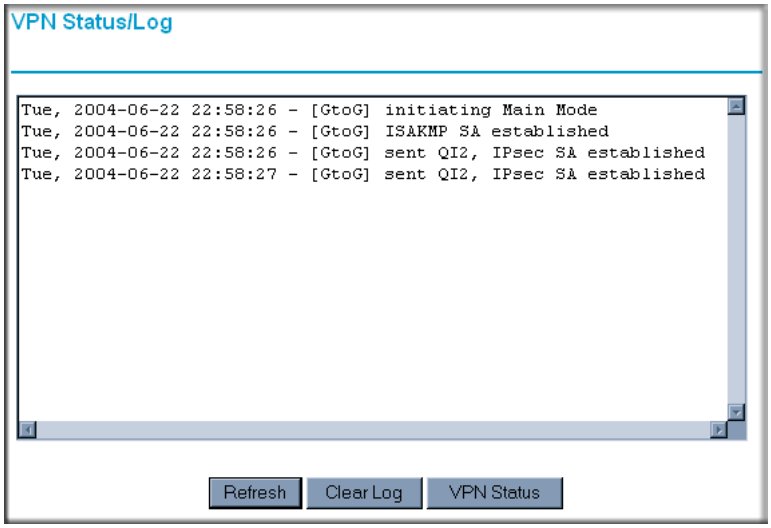


Figure 7-29

3. Click on **VPN Status** (Figure 7-29) to get the Current VPN Tunnels (SAs) screen (Figure 7-30). Click on **Connect** for the VPN tunnel you want to activate.

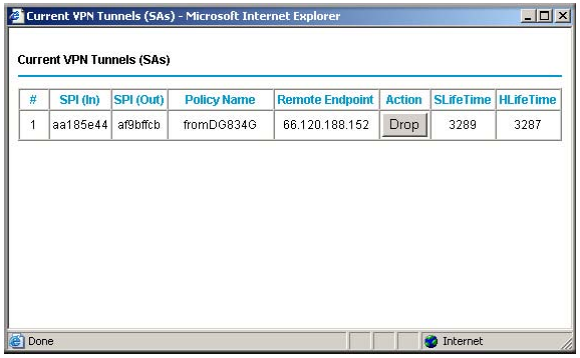


Figure 7-30

Activate the VPN Tunnel by Pinging the Remote Endpoint

	Note: This section uses 192.168.3.1 for an example remote endpoint LAN IP address.

To activate the VPN tunnel by pinging the remote endpoint (e.g., 192.168.3.1), do the following steps depending on whether your configuration is client-to-gateway or gateway-to-gateway:

- **Client-to-Gateway Configuration**—to check the VPN Connection, you can initiate a request from the remote PC to the DG834G v3's network by using the "Connect" option in the NETGEAR ProSafe menu bar. The NETGEAR ProSafe client will report the results of the attempt to connect. Since the remote PC has a dynamically assigned WAN IP address, it must initiate the request.

  To perform a ping test using our example, start from the remote PC:

  a. Establish an Internet connection from the PC.

  b. On the Windows taskbar, click the **Start** button, and then click **Run**.

  c. Type **`ping -t 192.168.3.1`** and then click **OK**.

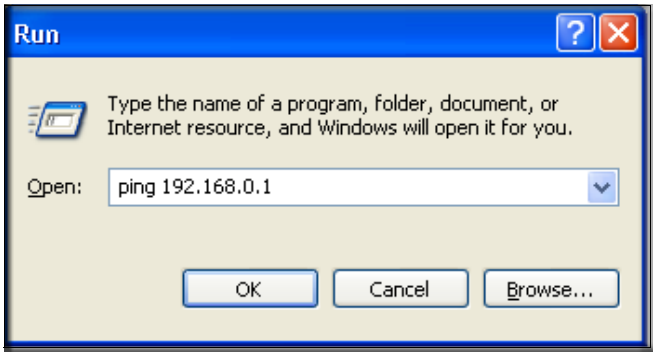


Figure 7-31: Running a Ping test to the LAN from the PC

This will cause a continuous ping to be sent to the first DG834G v3. After between several seconds and two minutes, the ping response should change from “timed out” to “reply.”

	Note: Use **Ctrl-C** to stop the pinging.

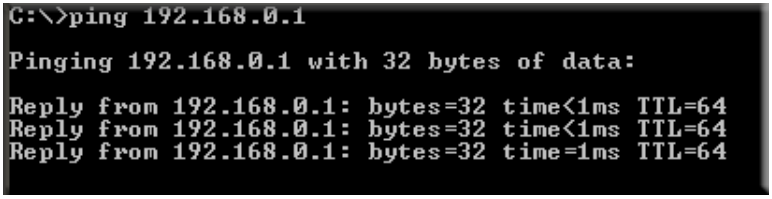


Figure 7-32

Once the connection is established, you can open the browser of the PC and enter the LAN IP address of the remote DG834G v3. After a short wait, you should see the login screen of the Modem Router (unless another PC already has the DG834G v3 management interface open).

- **Gateway-to-Gateway Configuration**—test the VPN tunnel by pinging the remote network from a PC attached to the DG834G v3.

  a. Open command prompt (i.e., Start -> Run -> cmd).

b. ping 192.168.3.1.

```
Pinging 192.168.3.1 with 32 bytes of data:

Reply from 192.168.3.1: bytes=32 time=20ms TTL=254
Reply from 192.168.3.1: bytes=32 time=10ms TTL=254
Reply from 192.168.3.1: bytes=32 time=20ms TTL=254
```

Figure 7-33

Note: The pings may fail the first time. If so, then try the pings a second time.

Start Using a VPN Tunnel to Activate It

To use a VPN tunnel, use a Web browser to go to a URL whose IP address or range is covered by the policy for that VPN tunnel.

Verifying the Status of a VPN Tunnel

To use the VPN Status page to determine the status of a VPN tunnel, perform the following steps:

1. Log in to the Modem Router.
2. Open the DG834G v3 management interface and click on **VPN Status** to get the VPN Status/Log screen (Figure 7-34).

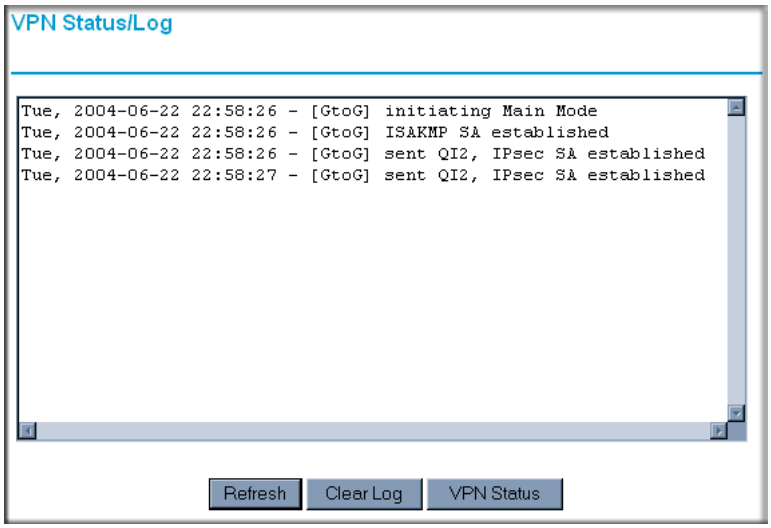
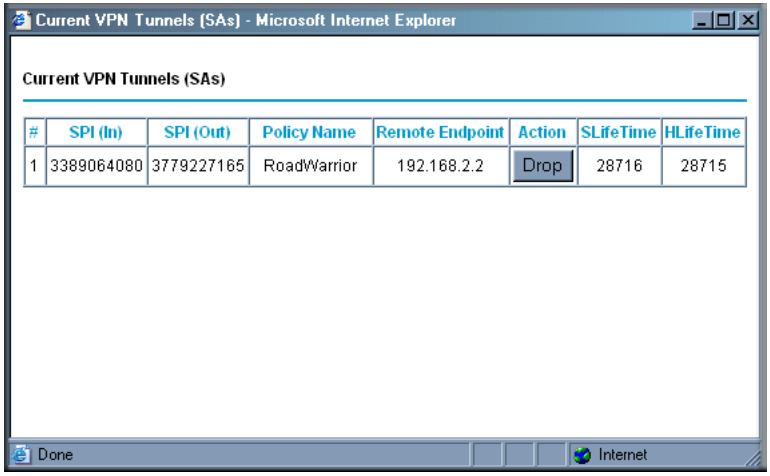


Figure 7-34

Log—this log shows the details of recent VPN activity, including the building of the VPN tunnel. If there is a problem with the VPN tunnel, refer to the log for information about what might be the cause of the problem.

- Click **Refresh** to see the most recent entries.
- Click **Clear Log** to delete all log entries.

3. Click on **VPN Status** (Figure 7-29) to get the Current VPN Tunnels (SAs) screen.



#	SPI (In)	SPI (Out)	Policy Name	Remote Endpoint	Action	SLifeTime	HLifeTime
1	3389064080	3779227165	RoadWarrior	192.168.2.2	Drop	28716	28715

Figure 7-35

This table lists the following data for each active VPN Tunnel.

- **SPI**—each SA has a unique SPI (Security Parameter Index) for traffic in each direction. For "Manual" key exchange, the SPI is specified in the Policy definition. For "Automatic" key exchange, the SPI is generated by the IKE protocol.
- **Policy Name**—the name of the VPN policy associated with this SA.
- **Remote Endpoint**—the IP address on the remote VPN Endpoint.
- **Action**—the action will be either a "Drop" or a "Connect" button.
- **SLifeTime (Secs)**—the remaining Soft Lifetime for this SA in seconds. When the Soft Lifetime becomes zero, the SA (Security Association) will re-negotiated.
- **HLifeTime (Secs)**—the remaining Hard Lifetime for this SA in seconds. When the Hard Lifetime becomes zero, the SA (Security Association) will be terminated. (It will be re-established if required.)

Deactivating a VPN Tunnel

Sometimes a VPN tunnel must be deactivated for testing purposes. There are two ways to deactivate a VPN tunnel:

- Policy table on VPN Policies page
- VPN Status page

Using the Policy Table on the VPN Policies Page to Deactivate a VPN Tunnel

To use the VPN Policies page to deactivate a VPN tunnel, perform the following steps:

1. Log in to the Modem Router.
2. Open the DG834G v3 management interface and click on **VPN Policies** to get the VPN Policies screen (Figure 7-36).

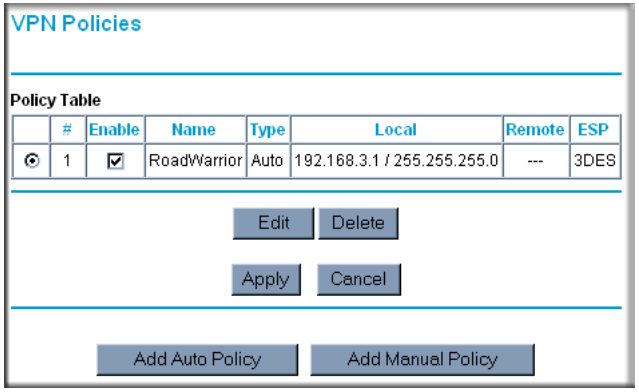


Figure 7-36

3. Clear the Enable check box for the VPN tunnel you want to deactivate and click **Apply**. (To reactivate the tunnel, check the Enable box and click **Apply**.)

Using the VPN Status Page to Deactivate a VPN Tunnel

To use the VPN Status page to deactivate a VPN tunnel, perform the following steps:

1. Log in to the Modem Router.

2. Open the DG834G v3 management interface and click on **VPN Status** to get the VPN Status/ Log screen (Figure 7-37).

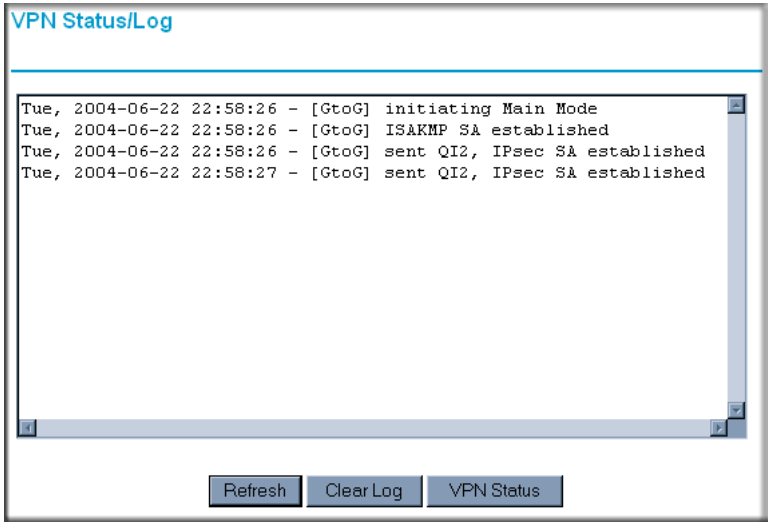


Figure 7-37

3. Click **VPN Status** (Figure 7-37) to get the Current VPN Tunnels (SAs) screen (Figure 7-38). Click **Drop** for the VPN tunnel you want to deactivate.

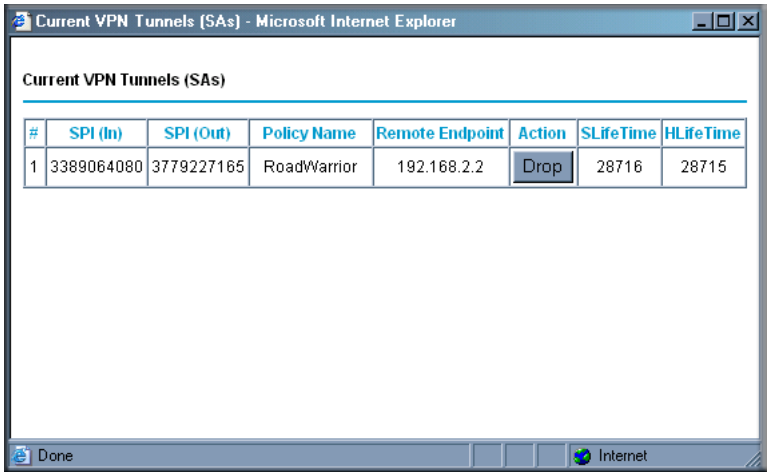


Figure 7-38