Reference Manual for the Model DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router

NETGEAR

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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 radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

EN 55 022 Declaration of Conformance

This is to certify that the DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class B (CISPR 22).

Bestätigung des Herstellers/Importeurs

Es wird hiermit bestätigt, daß das DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router 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 DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router 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 DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router.

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.

Regulatory Approvals

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against 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 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.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

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.

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. 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.

CAUTION:

1) To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.

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

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Technical Specifications

Chapter 1
About This Guide

Thank you for purchasing the NETGEAR™ DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router.

Audience, Conventions, Scope

This reference manual assumes that the reader has basic-to-intermediate computer and Internet skills. However, basic computer network, Internet, firewall, and networking technology tutorial information is provided in the Appendices.

This guide uses the following typographical conventions:

Table 1. Typographical conventions

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

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

This manual is written for the DG834PN RangeMax Wireless ADSL Modem Router according to these specifications:

Table 1-1. Manual Specifications

Product Version	DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router
Manual Publication Date	August 2005

Note: Product updates are available on the NETGEAR, Inc. Web site at *http://kbserver.netgear.com/DG834PN.asp*.

How to Print this Manual

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

- **Printing a "How To" Sequence of Steps in the HTML View**. Use the *Print* button on the upper right of the toolbar to print the currently displayed topic. Using this button when a step-by-step procedure is displayed will send the entire procedure to your printer–you do not have to worry about specifying the correct range of pages.
- **Printing a Chapter**. Use the PDF of This Chapter link at the top right of any page.
  - Click "PDF of This Chapter" link at the top right of any page in the chapter you want to print. A new browser window opens showing the PDF version of the chapter you were viewing.
  - 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 PDF button in the toolbar at the top right of the browser window.
  - Click PDF button. A new browser window opens showing the PDF version of the chapter you were viewing.
  - 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 DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router. The DG834PN RangeMax Wireless ADSL Modem Router is a combination of a built-in ADSL modem, wireless ADSL modem router, 4-port switch, firewall, and up to 108 Mbps wireless access point that enables your entire network to safely share an Internet connection that otherwise is used by a single computer.

	Note: If you are unfamiliar with networking and routing, refer to Appendix B, "Network and Routing Basics" to become more familiar with the terms and procedures used in this manual.

About the Wireless ADSL Modem Router

The DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router provides continuous, high-speed 10/100 Ethernet access between your Ethernet devices. The DG834PN RangeMax Wireless ADSL Modem Router enables your entire network to share an Internet connection through the built-in ADSL modem that otherwise is used by a single computer. With minimum setup, you can install and use the wireless ADSL modem router within minutes.

The DG834PN RangeMax Wireless ADSL Modem Router provides multiple Web content filtering options, plus e-mail browsing activity, 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.

Key Features

The DG834PN RangeMax Wireless ADSL Modem Router provides the following features:

- 802.11g wireless networking, with the ability to operate in Auto 108 Mbps mode, 108 Mbps "turbo-g" only, the 802.11b+g modes, 802.11g-only, and 802.11b-only.
- A built-in ADSL modem
- A powerful, true firewall
- Easy, Web-based setup for installation and management
- Extensive Internet protocol support
- Content filtering
- Auto Sensing and Auto Uplink™ LAN Ethernet connections

These features are discussed below.

802.11g Wireless Networking

The DG834PN RangeMax Wireless ADSL Modem Router includes an 802.11g wireless access point, providing continuous, high-speed 54 Mbps access between your wireless and Ethernet devices. The access point provides:

- 802.11g wireless networking at up to 108 Mbps.
- 802.11g wireless networking, with the ability to operate in the following modes, thus providing backwards compatibility with 802.11b devices or dedicating the wireless network to the higher bandwidth 802.11g or 108 Mbps only devices:
  - — Auto 108 Mbps mode (i.e., all 802.11g, 802.11b, and Netgear 108 Mbps wireless stations can be used; this mode is the second fastest mode)
  - — 108 Mbps only (fastest)

    Note: Only use the 108 Mbps only mode when all wireless adapters in your open network bear the 108 Mbps logo.

Figure 2-1: 108 Mbps Logo

  - 802.11b+g modes
  - 802.11g-only
  - 802.11b-only
- 64-bit and 128-bit WEP encryption security.
- WEP keys can be generated manually or by passphrase.
- Wireless access can be restricted by MAC address.
- Wireless network name broadcast can be turned off so that only devices that have the network name (SSID) can connect.

A Powerful, True Firewall

Unlike simple Internet sharing NAT routers, the DG834PN 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 DG834PN will log security events such as blocked incoming traffic, port scans, attacks, and administrator logins. You can configure the wireless ADSL modem router to email the log to you at specified intervals. You can also configure the wireless ADSL modem router to send immediate alert messages to your email address or email pager whenever a significant event occurs.

Easy Installation and Management

You can install, configure, and operate the DG834PN 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 wireless ADSL 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 wireless ADSL 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 wireless ADSL 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, and you can choose a nonstandard port number.
- Diagnostic functions
  The wireless ADSL 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 wireless ADSL modem router. You can use these diagnostic functions directly from the DG834PN when you are connected on the LAN or when you are connected over the Internet via the remote management function.
- Visual monitoring
  The wireless ADSL 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 DG834PN supports Transmission Control Protocol/Internet Protocol (TCP/IP) and Routing Information Protocol (RIP). Appendix B, "Network and Routing Basics" provides further information on TCP/IP.

- The Ability to Enable or Disable IP Address Sharing by NAT
  The DG834PN 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 DG834PN if you want to manage the IP address scheme yourself.
- Automatic Configuration of Attached PCs by DHCP
  The DG834PN dynamically assigns network configuration information, including IP, wireless ADSL 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 wireless ADSL modem router provides its own address as a DNS server to the attached PCs. The wireless ADSL 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 wireless ADSL 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 wireless ADSL 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.

Content Filtering

With its content filtering feature, the DG834PN prevents objectionable content from reaching your PCs. The wireless ADSL modem router allows you to control access to Internet content by screening for keywords within Web addresses. You can configure the wireless ADSL modem router to log and report attempts to access objectionable Internet sites.

Auto Sensing and Auto Uplink™ LAN Ethernet Connections

With its internal 4-port 10/100 switch, the DG834PN 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 wireless ADSL 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.

What's in the Box?

The product package should contain the following items:

- DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router
- AC power adapter (varies by region)
- Category 5 (Cat 5) Ethernet cable
- Telephone cable
- Microfilters (quantity and type vary by region)
- *Resource CD*, including:
  - This guide
  - Application Notes
- A printed Quick Installation Guide
- 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 DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router front panel shown below contains status LEDs.

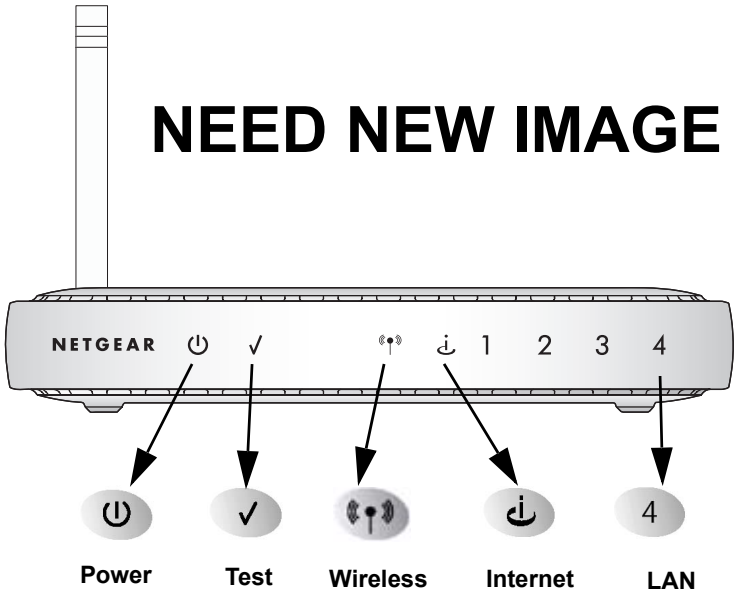


Figure 2-2: DG834PN Front Panel

You can use the LEDs to verify various conditions. Table 2-1 lists and describes each LED on the front panel of the router. These LEDs are green when lit.

Table 2-1. LED Descriptions

Label	Activity	Description
Power	On Off	Power is supplied to the router. Power is not supplied to the router.
Test	On Off	The system is initializing. The system is ready and running.
Wireless	On Off	Indicates that the Wireless port is initialized. The Wireless Access Point is turned off.
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.
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 DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router (Figure 2-3) contains port connections.

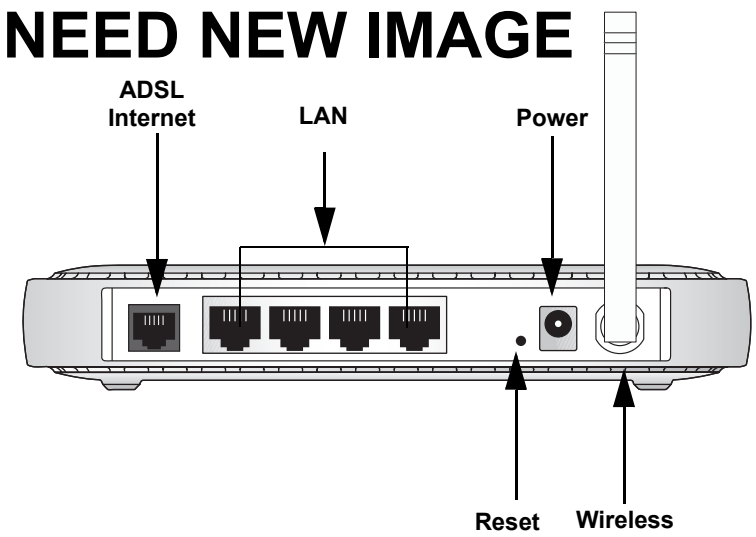


Figure 2-3: DG834PN Rear Panel

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

- ADSL port for connecting the router to an ADSL line
- Four Local Ethernet RJ-45 LAN ports for connecting the router to the local computers
- Factory Default Reset push button
- DC power in
- Wireless antenna

Chapter 3
Connecting the Router to the Internet

This chapter describes how to set up the router on your Local Area Network (LAN) and connect to the Internet. It describes how to configure your DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router for Internet access using the Setup Wizard, or how to manually configure your Internet connection.

What You Need Before You Begin

You need to prepare the following before you can establish an Internet connection through your router:

1. The router connected to an ADSL line and a computer properly connected to the router as explained below.
2. Active Internet service such as that provided by an ADSL account.
3. The Internet Service Provider (ISP) configuration information for your DSL account.

Note: If you purchased the DG834PN in a country where a microfilter is not included, you must acquire one.

ADSL Microfilter Requirements

ADSL technology uses the same wires as your telephone service. However, ADSL adds signals to the telephone lines which create noise in the telephone service. You must use ADSL microfilters to filter out these signals before they reach your telephone.

ADSL Microfilter

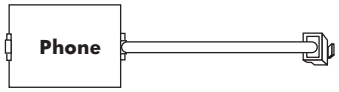


Figure 3-1: ADSL microfilter

Each device such as a telephone, fax machine, answering machine, or caller ID display will require an ADSL microfilter.

Note: Do not connect the DG834PN to the ADSL line through a microfilter unless the microfilter is a combination microfilter/splitter specifically designed for this purpose. Doing so will prevent the built-in ADSL modem in the DG834PN from establishing a connection to the Internet. If you have any doubts about this, connect the DG834PN directly to the ADSL line.

ADSL Microfilter with Built-In Splitter

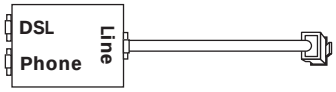


Figure 3-2: ADSL microfilter with built-in splitter

Use an ADSL microfilter with built-in splitter when there is a single wall outlet which must provide connectivity for both the DG834PN and telephone equipment.

Ethernet Cabling Requirements

The DG834PN RangeMax Wireless ADSL Modem Router connects to your Ethernet LAN via twisted-pair cables. If the computer will connect to your network at 100 Mbps, you must use a Category 5 (CAT5) cable such as the one provided with your wireless ADSL modem router.

Computer Hardware Requirements

To use the DG834PN RangeMax Wireless ADSL Modem Router on your network, each computer must have an installed Ethernet adapter and an Ethernet cable, or a 802.11g wireless adapter.

LAN Configuration Requirements

For the initial connection to the Internet and configuration of your router, you need to connect a computer to the router which is set to automatically get its TCP/IP configuration from the router via DHCP.

Note: Please refer to Appendix C, “Preparing Your Network” for assistance with DHCP configuration.

Internet Configuration Requirements

Depending on how your ISP set up your Internet account, you need one or more of these configuration parameters to connect your router to the Internet:

- Virtual Path Identifier (VPI)/Virtual Channel Indentifier (VCI) parameters
- Multiplexing Method
- Host and Domain Names
- ISP Login Name and Password
- ISP Domain Name Server (DNS) Addresses
- Fixed or Static IP Address

Where Do I Get the Internet Configuration Parameters?

There are several ways you can gather the required Internet connection information.

- Your ISP should have provided you with all the information needed to connect to the Internet. If you cannot locate this information, you can ask your ISP to provide it or you can try one of the options below.
- If you have a computer already connected using the active Internet access account, you can gather the configuration information from that computer.
    - For Windows 95/98/ME, open the Network control panel, select the TCP/IP entry for the Ethernet adapter, and click Properties.
    - For Windows 2000/XP, open the Local Area Network Connection, select the TCP/IP entry for the Ethernet adapter, and click Properties.
    - For Macintosh computers, open the TCP/IP or Network control panel.
- You can also refer to the *DG834PN Resource CD* for the NETGEAR Router ISP Guide which provides Internet connection information for many ISPs.

Once you locate your Internet configuration parameters, you may want to record them on the next page.

Record Your Internet Connection Information

Print the following page. Fill in the configuration parameters from your Internet Service Provider (ISP).

ISP Multiplexing Method and Virtual Circuit Number: The default settings of your DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router will work fine for most ISPs. However, some ISPs use a specific Multiplexing Method or a Virtual Circuit Number for either the Virtual Path Identifier (VPI) or Virtual Channel Identifier (VCI). If your ISP provided you with a specific Multiplexing Method or VPI/VCI number, then fill in the following:

Multiplexing Method, circle one: LLC-based or VC-based
VPI: _____ A number between 0 and 255.
VCI: _____ A number between 1 and 65535.

ISP Login Name: The login name and password are case sensitive and must be entered exactly as given by your ISP. Some ISPs use your full e-mail address as the login name. The Service Name is not required by all ISPs. If you use a login name and password, then fill in the following:

Login Name: _____ Password: _____

Service Name: _____

Fixed or Static IP Address: If you have a static IP address, record the following information. For example, 169.254.141.148 could be a valid IP address.

Fixed or Static Internet IP Address: _____._____._____._____
Wireless ADSL Modem Router IP Address: _____._____._____._____
Subnet Mask: _____._____._____._____

ISP DNS Server Addresses: If you were given DNS server addresses, fill in the following:

Primary DNS Server IP Address: _____._____._____._____

Secondary DNS Server IP Address: _____._____._____._____

Host and Domain Names: Some ISPs use a specific host or domain name like **CCA7324-A** or **home**. If you did not get host or domain names, use the following examples as a guide:

- If your main e-mail account with your ISP is **aaa@yyy.com**, then use **aaa** as your host name. Your ISP might call this your account, user, host, computer, or system name.
- If your ISP's mail server is **mail.xxx.yyy.com**, then use **xxx.yyy.com** as the domain name.

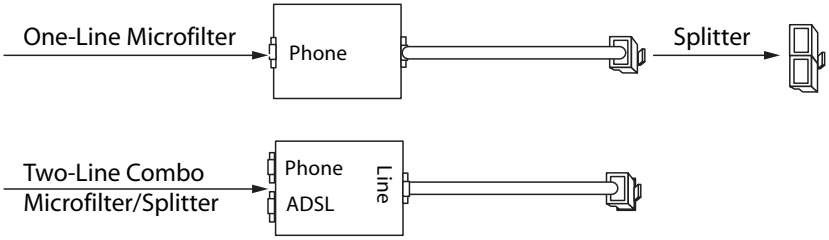
ISP Host Name: _____ ISP Domain Name: _____

For Wireless Access: For configuration of the wireless network, record the following:
Wireless Network Name (SSID): _____
WEP Authentication (circle one): Automatic, Open System, or Shared Key
WEP Encryption (circle one): 64 or 128; Passphrase or Key: _____

Set up the Router

1. Connect the DG834PN to the ADSL Line

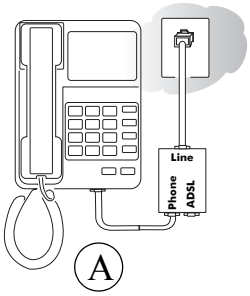
ADSL signals degrade phone sound quality. Microfilters block such problems and are required for each phone or fax. There are two types: one-line microfilters; and two-line microfilters, which include a built-in splitter. Sharing a phone outlet with two devices requires a splitter.



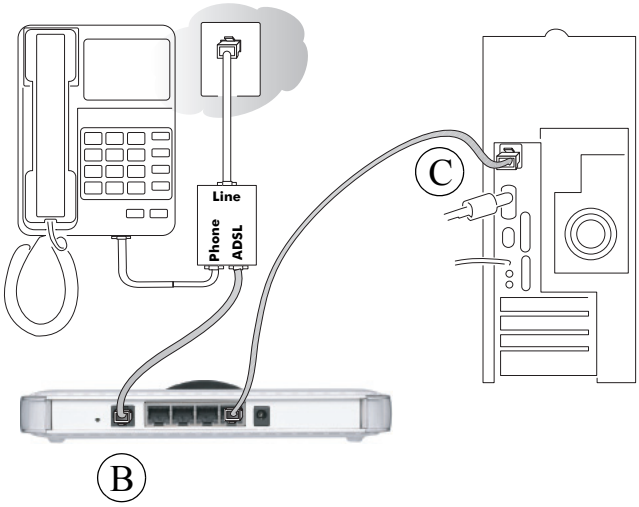
The procedure below illustrates using a two-line combo microfilter/splitter.

You can accomplish the same result using a one-line microfilter with a separate phone line splitter.

a. Insert the filter into the phone outlet and connect the phone to the phone connector (**A**).



b. Turn off your computer.



c. Connect the ADSL port (**B**) of the DG834PN to the ADSL connector of the two-line filter.

Note: Improperly connecting a filter to your DG834PN will block ADSL signals and prevent connecting to the Internet.

d. Connect the NRJ-45 Ethernet cable (**C**) from a LAN port of your DG834PN to the Ethernet adapter in your computer.

Note: The unshielded RJ-45 Ethernet cable is supplied for the connection of the NETGEAR product to your PC and is not intended for connection to the telecommunications network.

e. Plug in the router and verify the following:

- The power light is lit after applying power to the router.
- The ADSL link light is solid green, indicating a link has been established to the ADSL network.

f. Now, turn on your computer and verify the following:

- The local lights 4 are lit for any connected computers.
- If software usually logs you in to the Internet, do not run it.
- The Internet Explorer Tools Internet Options Connections page should be set to “Never dial a connection.”

g. Install a filter on each phone device that shares the phone line with your router.

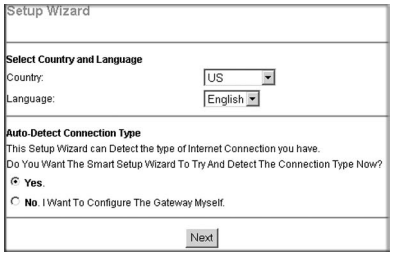
Note: Use one-line filters for connecting additional phones.

2. Log in to the DG834PN

Your computer needs to be configured for DHCP. For help with this, see the *Reference Manual* or tutorials on the *Resource CD*.

a. Connect to the router by typing **http://192.168.0.1** in the address field of your Internet browser.

b. When prompted, enter **admin** for the user name and **password** for the password, both in lower case letters. After logging in, you will see the menu below.



If you do not see the menu above, click the Setup Wizard link on the upper left of the main menu.

3. Connect to the Internet

a. Choose your country and language. Click Next to let the Setup Wizard detect the type of Internet connection your have.

b. Follow the steps in the Setup Wizard to input the Internet configuration parameters from your ISP.

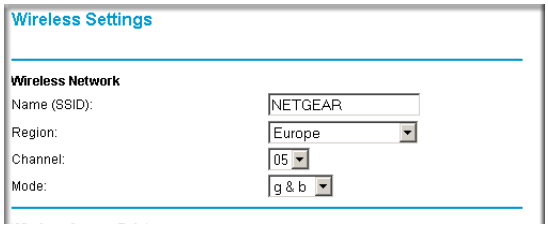
If you were unable to connect to the router, please refer to the Troubleshooting Chapter in the *Reference Manual* on the *Resource CD* that came with the router.

Now, Set Up Wireless Connectivity

1. Configure the DG834PN Wireless Settings

a. If you are not already logged in the DG834PN, type **http://192.168.0.1** in your browser and click **Enter**.

When prompted, type **admin** for the user name and **password** for the password, both in lower case letters.



b. Click **Wireless Settings** in the DG834PN main menu. Select a Region. Do not change the other settings. Click **Apply**.

2. Configure the computer's Wireless Adapter Settings

Configure the wireless adapter of your computer to match these settings exactly.

WIRELESS FEATURE	DEFAULT SETTING
Network Name (SSID)	**NETGEAR**
WEP/WPA Security	**Disabled**

Warning: The SSID is case sensitive. Entering nETgear will not work.

Use these settings to verify that you have wireless connectivity. Set up wireless security after you are sure you have wireless connectivity.

3. Verify Wireless Connectivity

Verify wireless connectivity. Connect to the Internet or log in to the DG834PN from a computer with a wireless adapter. For wireless connectivity problems, see the Troubleshooting Tips below or in the *Reference Manual* on the CD.

You can use the Dome LED link in the main configuration menu to control when the antenna lights are on or turn them off completely.

4. Implement Wireless Security

- Wireless networks are vulnerable to intrusion if you do not use the available security options. The wireless security options you choose depend on the options available in your wireless computers.
- Implement wireless security according to the instructions in the Wireless chapter of the *Reference Manual* on the CD.

You are now wirelessly connected to the Internet!

Troubleshooting Tips

Here are some tips for correcting simple problems you may have.

Be sure to restart your network in the correct sequence.

Always follow this sequence:

1. Unplug and turn off the DG834PN. Turn off the computer.
2. Plug in and turn on the DG834PN, wait two minutes.
3. Turn on the computer.

Make sure the Ethernet cables are securely plugged in.

- For each powered on computer connected to the DG834PN with a securely plugged in Ethernet cable, the corresponding DG834PN LAN port status light will be lit. The label on the bottom of the wireless ADSL modem router identifies the number of each LAN port.
- The Internet port status light on the wireless ADSL modem router will be lit if the phone cable is plugged in securely to the DG834PN ADSL port and the DG834PN is turned on.

Make sure the computer & router wireless settings match exactly.

The Wireless Network Name (SSID) and security settings (WEP/WPA, MAC access control list) of the DG834PN and wireless computer must match exactly.

Make sure the network settings of the computer are correct.

- LAN and wirelessly connected computers *must* be configured to obtain an IP address automatically via DHCP. For help with this, please see the animated tutorials on the CD or the *Reference Manual* Appendix C on the CD.
- Some cable modem ISPs require you to use the MAC address of the computer registered on the account. If so, in the Router MAC Address section of the Basic Settings menu, select, “Use this Computer’s MAC Address.” The router will then capture and use the MAC address of the computer that you are now using. You must be using the computer that is registered with the ISP. Click **Apply** to save your settings. Restart the network in the correct sequence.

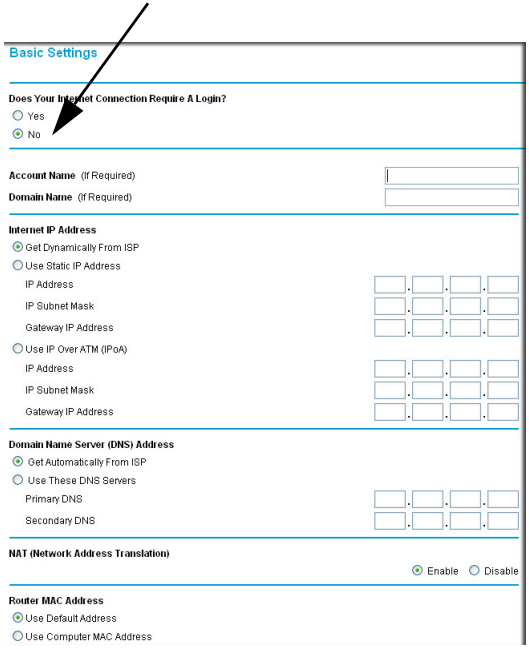
Check the router status lights to verify correct router operation.

- If the Power light does not turn solid green within 2 minutes after turning the router on, reset the router according to the instructions in the *Reference Manual* on the CD.
- If the Wireless light does not come on, verify that the wireless feature is turned on according to the instructions in the *Reference Manual* on the CD.

Manually Configuring Your Internet Connection

You can manually configure your wireless ADSL modem router using the menu below, or you can allow the Setup Wizard to determine your configuration as described in the previous section.

ISP *Does Not* Require Login



ISP *Does* Require Login

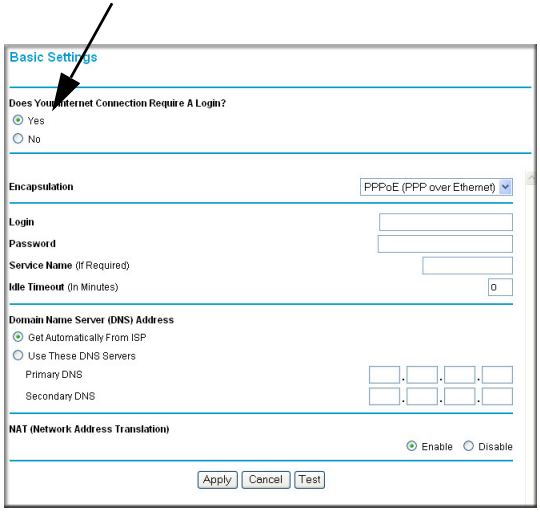


Figure 3-3: Basic Settings menu

How to Perform Manual Configuration

We recommend that you start the manual configuration from the Setup Wizard:

1. Select your country and language. Language choices are English, French, German, and Italian. After you change the language, the remaining setup screens change to the language of your choice.
2. Select No to manually configure your wireless ADSL modem router connection.
3. Click Next.
4. Manually configure the wireless ADSL modem router in the Basic Settings menu shown in Figure 3-3.
5. Follow the instructions below according to the encapsulation method and whether your Internet connection requires a login. The following methods are available:
   - Internet Connection Requires Login and Uses PPPoE
   - Internet Connection Requires Login and Uses PPPoA
   - Internet Connection Does Not Require a Login
6. Usually the default ADSL Settings work fine for most ISPs and you can skip this step. If you have any problems with your connection, check the ADSL Settings. See "ADSL Settings" on page 3-14 for more details.

Internet Connection Requires Login and Uses PPPoE

1. If your Internet connection *does* require login, select Yes and fill in the settings according to the instructions below.

   Note: You will no longer need to launch the ISP's login program on your computer in order to access the Internet. When you start an Internet application, your wireless ADSL modem router automatically logs you in.
2. Choose PPPoE for the encapsulation method.
3. Enter the login name (frequently the email address your ISP provided), password, and service name (if required).
4. If you want to change the login timeout, enter a new value in minutes. This determines how long the wireless ADSL modem router keeps the Internet connection active after there is no Internet activity from the LAN. Entering an Idle Timeout value of zero means never log out.
5. When a connection uses PPPoE, the IP address is normally assigned automatically. However, the DG834PN allows this address to be set manually.
   - Select "Get Automatically from ISP" if your ISP assigns your IP address.
   - Select "Use Static IP Address" if your ISP gave you a statically assigned address.

6. The DNS server is used to look up site addresses based on their names.
   - Select “Get Automatically from ISP” if your ISP uses DHCP to assign your DNS servers. Your ISP will automatically assign this address.
   - Select “Use These DNS Servers” if your ISP gave you one or two DNS addresses. Type the primary and secondary addresses.
7. You should only disable NAT if you are sure you do not require it. NAT automatically assigns private IP addresses (192.168.0.x) to LAN connected devices. When NAT is disabled, only standard routing is performed by this router.
   Classical routing lets you directly manage the IP addresses the DG834PN uses. Classical routing should be selected only by experienced users.

   Note: Disabling NAT will reboot the router and reset all the DG834PN configuration settings to the factory default. Disable NAT only if you plan to install the DG834PN in a setting where you will be manually administering the IP address space on the LAN side of the router.

Internet Connection Requires Login and Uses PPPoA

1. If your Internet connection *does* require login, select Yes and fill in the settings according to the instructions below.

   Note: You will no longer need to launch the ISP’s login program on your computer in order to access the Internet. When you start an Internet application, your wireless ADSL modem router automatically logs you in.
2. Choose PPPoA for the encapsulation method.
3. Enter the login name (frequently the email address your ISP provided), and password.
4. If you want to change the login timeout, enter a new value in minutes. This determines how long the wireless ADSL modem router keeps the Internet connection active after there is no Internet activity from the LAN. Entering an Idle Timeout value of zero means never log out.
5. When a connection uses PPPoA, the IP address is normally assigned automatically. However, the DG834PN allows this address to be set manually.
   - Select “Get Automatically from ISP” if your ISP assigns your IP address.
   - Select “Use Static IP Address” if your ISP gave you a statically assigned address.
6. The DNS server is used to look up site addresses based on their names.
   - Select “Get Automatically from ISP” if your ISP uses DHCP to assign your DNS servers. Your ISP will automatically assign this address.

7. Select "Use These DNS Servers" if your ISP gave you one or two DNS addresses. Type the primary and secondary addresses.You should only disable NAT if you are sure you do not require it. NAT automatically assigns private IP addresses (192.168.0.x) to LAN connected devices. When NAT is disabled, only standard routing is performed by this router. Classical routing lets you directly manage the IP addresses the DG834PN uses. Classical routing should be selected only by experienced users.

   Note: Disabling NAT will reboot the router and reset all the DG834PN configuration settings to the factory default. Disable NAT only if you plan to install the DG834PN in a setting where you will be manually administering the IP address space on the LAN side of the router.

Internet Connection Does Note Require A Login

1. If your Internet connection does *not* require a login, select No and fill in the settings according to the instructions below.
2. Enter your Account Name (may also be called Host Name) and Domain Name. These parameters may be necessary to access your ISP's mail or news servers.
3. Internet IP Address:
   - Select "Get Dynamically from ISP" if your ISP uses DHCP to assign your IP address. Your ISP will automatically assign these addresses.
   - Select "Use Static IP Address" if your ISP has assigned you a permanent, fixed (static) IP address. Enter the IP address that your ISP assigned. Also enter the IP Subnet Mask and the Gateway IP Address. The gateway is the ISP's wireless ADSL modem router to which your wireless ADSL modem router will connect.
   - Select "IP Over ATM (IPoA)" if your ISP uses Classical IP Addresses (RFC1577). Enter the IP address, IP Subnet Mask, and Gateway IP Addresses that your ISP assigned.
4. Domain Name Server (DNS) Address:
   - Select "Get Dynamically from ISP" if your ISP uses DHCP to assign your IP address. Your ISP will automatically assign this address.
   - If you know that your ISP does not automatically transmit DNS addresses to the wireless ADSL modem router during login, select "Use these DNS servers" and enter the IP address of your ISP's Primary DNS Server. If a Secondary DNS Server address is available, enter it also.

   A DNS server is a host on the Internet that translates Internet names (such as www.netgear.com) to numeric IP addresses. Typically your ISP transfers the IP address of one or two DNS servers to your wireless ADSL modem router during login. If the ISP does not transfer an address, you must obtain it from the ISP and enter it manually here.

5. You should only disable NAT if you are sure you do not require it. NAT automatically assigns private IP addresses (192.168.0.x) to LAN connected devices. When NAT is disabled, only standard routing is performed by this router.

   Classical routing lets you directly manage the IP addresses the DG834PN uses. Classical routing should be selected only by experienced users.

   Note: Disabling NAT will reboot the router and reset all the DG834PN configuration settings to the factory default. Disable NAT only if you plan to install the DG834PN in a setting where you will be manually administering the IP address space on the LAN side of the router

6. Wireless ADSL Modem Router MAC Address:
   This section determines the Ethernet MAC address that will be used by the wireless ADSL modem router on the Internet port. Some ISPs will register the Ethernet MAC address of the network interface card in your computer when your account is first opened. They will then only accept traffic from the MAC address of that computer. This feature allows your wireless ADSL modem router to masquerade as that computer by "cloning" its MAC address.

   To change the MAC address, select "Use this Computer's MAC address". The wireless ADSL modem router will then capture and use the MAC address of the computer that you are now using. You must be using the one computer that is allowed by the ISP. Alternatively, select "Use this MAC address" and enter it.

7. Click Apply to save your settings.

8. Click the Test button to test your Internet connection.
   If the NETGEAR Web site does not appear within one minute, refer to Chapter 8, "Troubleshooting".

ADSL Settings

The default settings of your DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router will work fine for most ISPs. However, some ISPs use a specific Multiplexing Method and Virtual Circuit Number for the Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI).

Note: The correct country must be selected from the Setup Wizard's first page for the default ADSL Settings to work.

If your ISP provided you with a specific Multiplexing Method or VPI/VCI number, then fill in the following:

1. Select the ADSL Settings link from the main menu.

2. For the Multiplexing Method, select LLC-based or VC-based.

3. Type a number between 0 and 255 for the VPI. The default is 8.
4. Type a number between 1 and 65535 for the VCI. The default is 35.
5. Click Apply.

Chapter 4
Wireless Configuration

This chapter describes how to configure the wireless features of your DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router.

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 wireless ADSL modem router in order to maximize the network speed. For further information, refer to Appendix D, “Wireless Networking Basics”.

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 DG834PN RangeMax Wireless ADSL Modem Router provides highly effective security features which are covered in detail in this chapter. Deploy the security features appropriate to your needs.

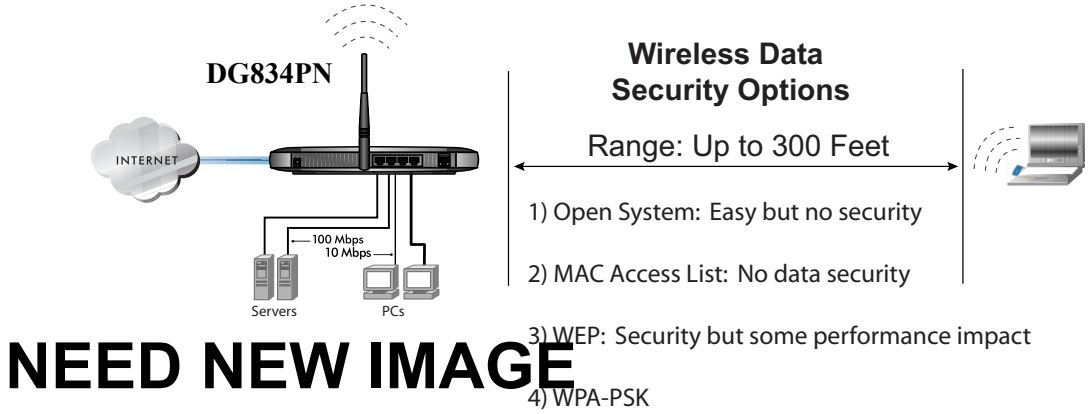


Figure 4-1: DG834PN wireless data security options

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 DG834PN. 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-PSK**. 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 wireless ADSL modem router, click the Wireless link in the main menu of the browser interface. The following Wireless Settings menu will appear after WEP (Wired Equivalent Privacy) under Security Options is subsequently selected:

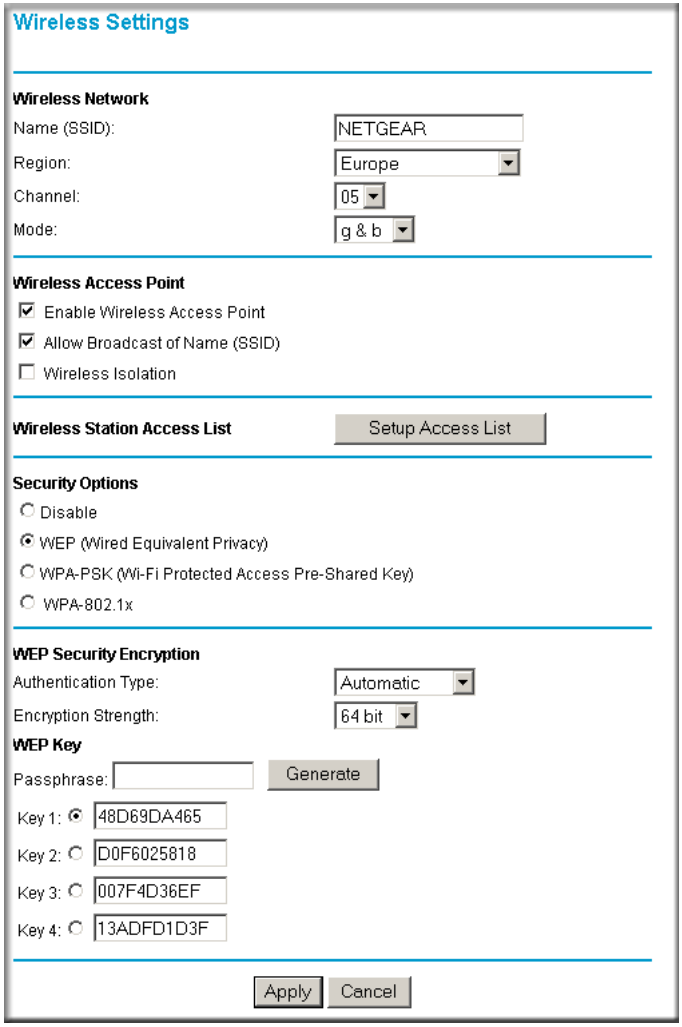


Figure 4-2: Wireless Settings menu

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 region from the drop-down list. This field displays the region of operation for which the wireless interface is intended. It may not be legal to operate the wireless ADSL modem router in a region other than the region shown here.

— **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**.

- "g & b" allows both "g" and "b" wireless stations to access this device (**default**).
- “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.
- “Auto 108 Mbps” means all 802.11g, 802.11b, and Netgear 108 Mbps wireless stations can be used. The Auto 108 Mbps mode is the second fastest mode.
- “108 Mbps only” means only compatible 802.11g wireless stations that support 108 Mbps can connect. The 108 Mbps only mode is the fastest mode.

  Note: Only use the 108 Mbps only mode when all wireless adapters in your open network bear the 108 Mbps logo.

Figure 4-3: 108 Mbps Logo

- **Wireless Access Point**.

— **Enable Wireless Access Point**. This field lets you turn off or turn on the wireless access point built in to the wireless ADSL modem router. The wireless icon on the front of the wireless ADSL 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 4-1. Wireless Security Options

Field	Description
Disable **WEP** (Wired Equivalent Privacy)	Wireless security is not used. You can select the following WEP options: **Authentication Type** • Open: the DG834PN does not perform any authentication. • Shared: WEP shared key authentication. For a full explanation of WEP shared key, see "Authentication and WEP Data Encryption" on page D-2. **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 DG834PN *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 DG834PN 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 4-1. Wireless Security Options

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 "WPA Wireless Security" on page D-8. **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 "WPA Wireless Security" on page D-8. 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 DG834PN 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 DG834PN 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 DG834PN 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 DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router. If they do not match, you will not get a wireless connection to the DG834PN.

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 Channels" on page D-7.

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 Restricting 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 DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router 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.

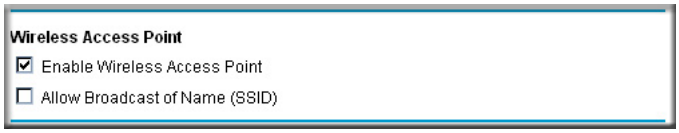


Figure 4-4: Wireless Access Point settings

Restricting Access to Your Network by Turning Off Wireless Connectivity

You can completely turn off the wireless portion of the DG834PN. 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 DG834PN 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 DG834PN. You must configure your wireless devices to match the wireless network name (SSID) you configure in the DG834PN RangeMax Wireless ADSL Modem Router.

Note: The SSID of any wireless access adapters must match the SSID you configure in the DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router. If they do not match, you will not get a wireless connection to the DG834PN.

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 DG834PN 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:

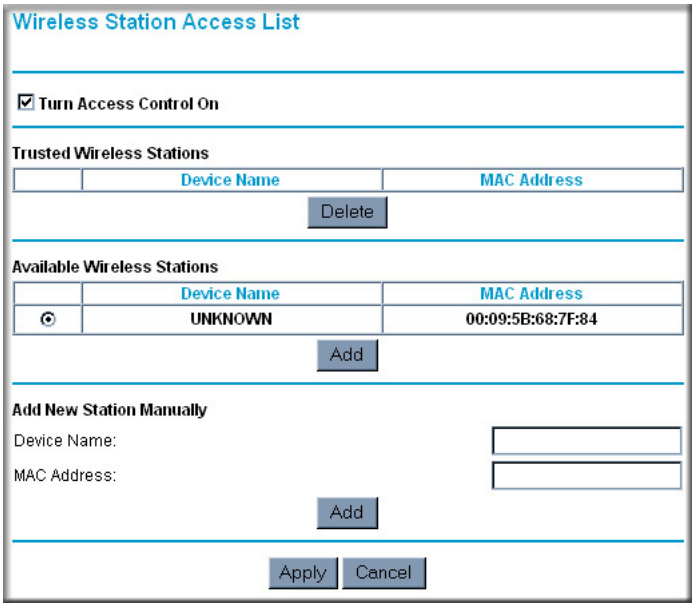


Figure 4-5. Wireless Access menu

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 wireless ADSL 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.

   Note: You can copy and paste the MAC addresses from the wireless ADSL 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 wireless ADSL modem router. The computer should then appear in the Attached Devices menu.

	Note: If you are configuring the wireless ADSL 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 wireless ADSL 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 DG834PN. This prevents unauthorized access to your network.

Choosing WEP Authentication and Security Encryption Methods

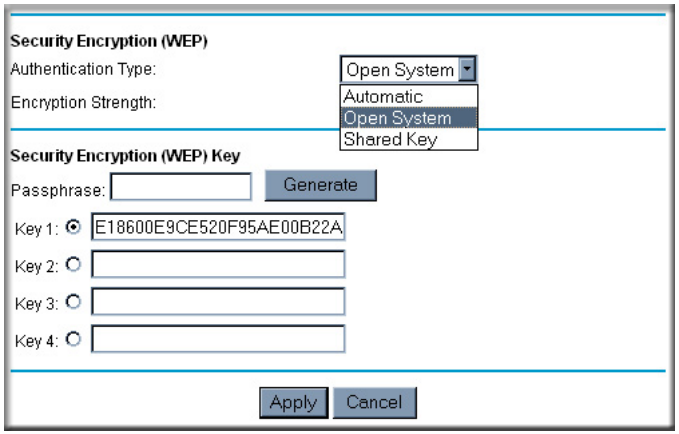


Figure 4-6. Security Encryption section

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 DG834PN 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 DG834PN RangeMax Wireless ADSL Modem Router. Please refer to "Authentication and WEP Data Encryption" on page D-2 for a full explanation of each of these options, as defined by the IEEE 802.11g wireless communication standard.

Encryption Choices

Please refer to "Overview of WEP Parameters" on page D-5 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 DG834PN 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 DG834PN wireless ADSL modem router.
3. Go to the Security Encryption portion of the page:

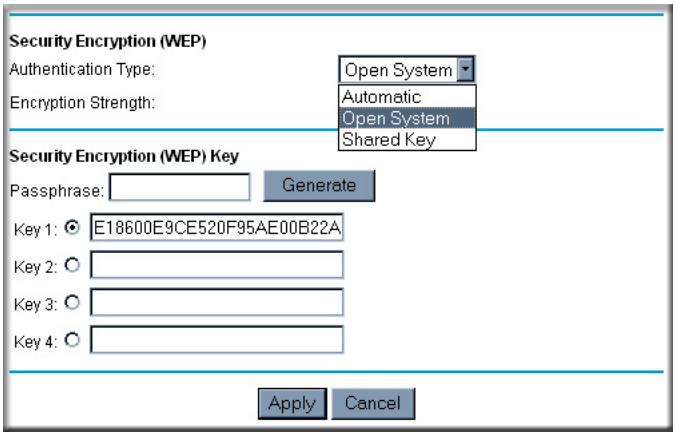


Figure 4-7. Wireless WEP menu

4. Select the Authentication Type.
5. Select the Encryption setting.
6. 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.
7. 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 DG834PN.

8. Click Apply to save your settings.

	Note: When configuring the wireless ADSL 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 wireless ADSL modem router WEP settings or access the wireless ADSL modem router from a wired computer to make any further changes.

How to Configure WPA-PSK

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. Consult the product document for your wireless adapter and WPA client software 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 DG834PN.
3. Choose the **WPA-PSK** radio button. The WPA-PSK menu will open.
4. Enter the pre-shared key in the Passphrase field.
5. Click **Apply** to save your settings.

Chapter 5
Protecting Your Network

This chapter describes how to use the basic firewall features of the DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router to protect your network.

Protecting Access to Your DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router

For security reasons, the wireless ADSL 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 wireless ADSL modem router User Name and **password** for the wireless ADSL modem router Password. You can use procedures below to change the wireless ADSL 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 wireless ADSL 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 wireless ADSL modem router.

Figure 5-1: Log in to the wireless ADSL modem router

2. From the Main Menu of the browser interface, under the Maintenance heading, select Set Password to bring up the menu shown in Figure 5-2.

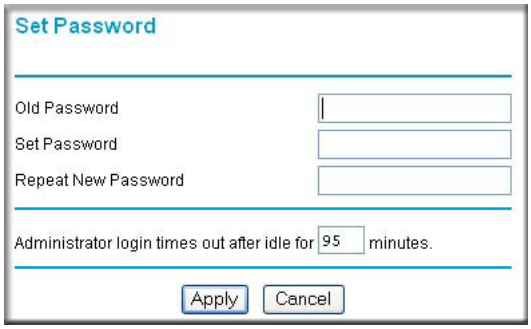


Figure 5-2: Set Password menu

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 wireless ADSL 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 wireless ADSL 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 wireless ADSL modem router provides a variety of options for blocking Internet based content and communications services. With its content filtering feature, the DG834PN RangeMax Wireless ADSL Modem Router prevents objectionable content from reaching your PCs. The wireless ADSL 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 wireless ADSL modem router to perform these functions.

How to Block Keywords and Sites

The DG834PN RangeMax Wireless ADSL Modem 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 wireless ADSL 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 wireless ADSL modem router.
2. Select the Block Sites link of the Security menu.

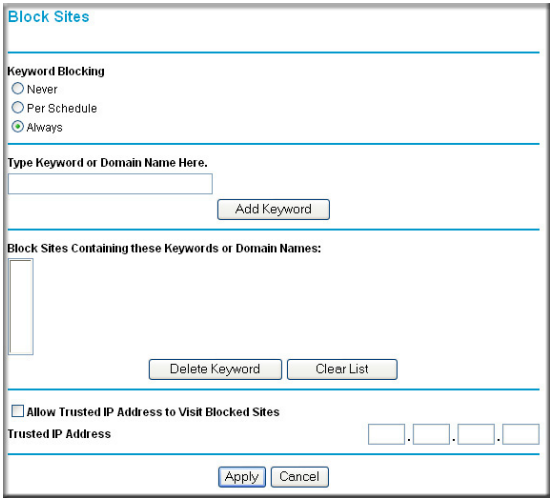


Figure 5-3: Block Sites menu

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.

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 DG834PN 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 5-11 for more details.

To access the rules configuration of the DG834PN, click the Firewall Rules link on the main menu, then click Add for either an Outbound or Inbound Service.

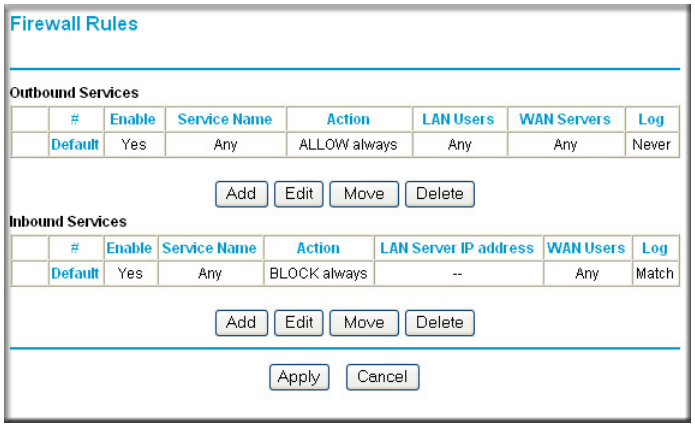


Figure 5-4: Rules menu

- 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 DG834PN 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 wireless ADSL 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 in Figure 5-5:

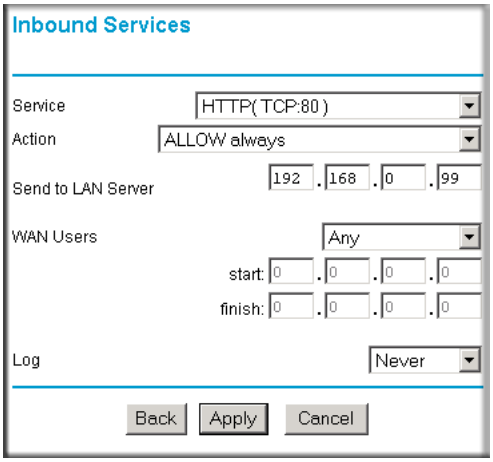


Figure 5-5: Rule example: A Local Public Web Server

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 in Figure 5-6, 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.

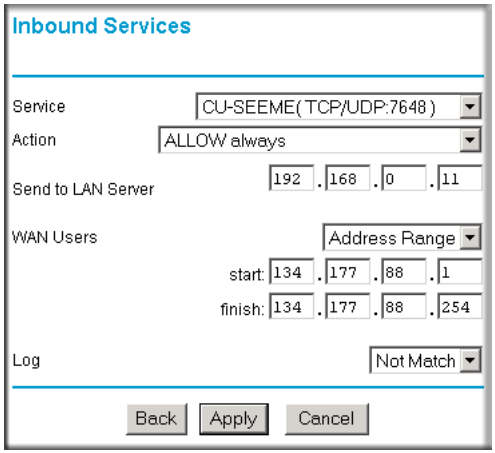


Figure 5-6: Rule example: Videoconference from Restricted Addresses

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 in Figure 5-6 above). Attempts by local computers to access the server using the external WAN IP address will fail.

Outbound Rules (Service Blocking)

The DG834PN 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 wireless ADSL modem router log any attempt to use Instant Messenger during that blocked period.

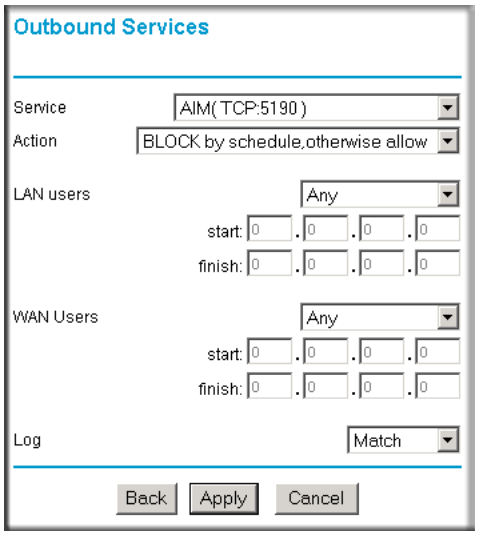


Figure 5-7: Rule example: Blocking Instant Messenger

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 in Figure 5-8:

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 5-8: Rules table with examples

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 DG834PN 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 wireless ADSL 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 wireless ADSL modem router.
2. Select the Services link of the Security menu to display the Services menu shown in Figure 5-9:

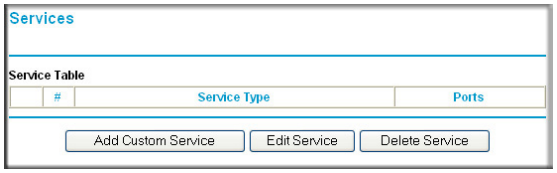


Figure 5-9: Services menu

- 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.

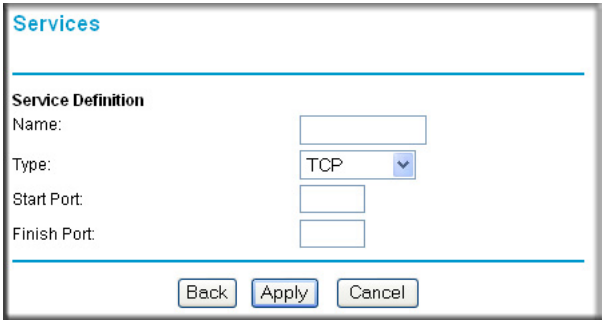


Figure 5-10: Add Services menu

4. Click Apply to save your changes.

Setting Times and Scheduling Firewall Services

The DG834PN RangeMax Wireless ADSL Modem 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 wireless ADSL 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 wireless ADSL modem router.
2. Select the Schedule link of the Security menu to display menu shown below.

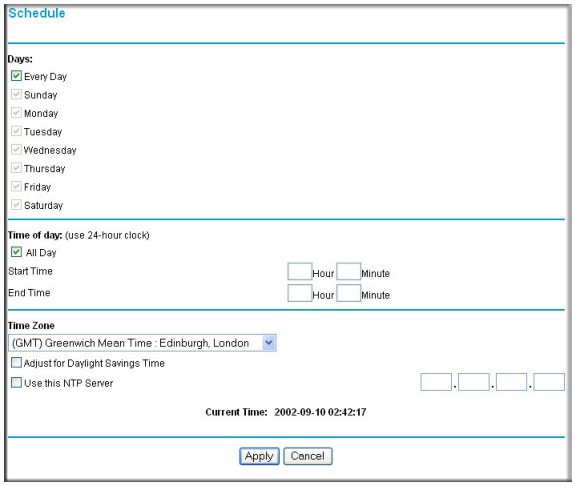


Figure 5-11: Schedule Services menu

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 wireless ADSL 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 wireless ADSL 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 wireless ADSL modem router.
2. Select the Schedule link of the Security menu to display menu shown above in the Schedule Services menu.
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.

   Note: 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.
4. Click Apply to save your changes.

Chapter 6
Managing Your Network

This chapter describes how to perform network management tasks with your DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router.

Backing Up, Restoring, or Erasing Your Settings

The configuration settings of the DG834PN RangeMax Wireless ADSL Modem Router are stored in a configuration file in the wireless ADSL 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 wireless ADSL 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 wireless ADSL modem router.
2. From the Maintenance heading of the Main Menu, select the Backup Settings menu as seen in Figure 6-1.

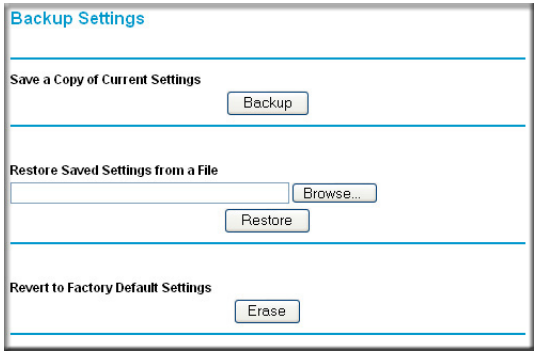


Figure 6-1: Backup Settings menu

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 wireless ADSL 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 wireless ADSL modem router.
2. From the Maintenance heading of the Main Menu, select the Settings Backup menu as seen in Figure 6-1.
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 wireless ADSL modem router.
5. The wireless ADSL modem router will then reboot automatically.

How to Erase the Configuration

It is sometimes desirable to restore the wireless ADSL 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 wireless ADSL modem router will then reboot automatically.

   After an erase, the wireless ADSL modem router's password will be **password**, the LAN IP address will be 192.168.0.1, and the wireless ADSL 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 wireless ADSL modem router. See "DG834PN Rear Panel" on page 2-9.

Upgrading the Wireless ADSL Modem Router's Firmware

The software of the DG834PN RangeMax Wireless ADSL Modem 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 wireless ADSL modem router.

How to Upgrade the Wireless ADSL Modem Router Firmware

Note: 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 wireless ADSL 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 wireless ADSL 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 wireless ADSL modem router.

3. From the Main Menu of the browser interface, under the Maintenance heading, select the **Wireless ADSL Modem Router Upgrade** heading to display the menu shown in Figure 6-2.

Figure 6-2: Wireless ADSL Modem Router Upgrade menu

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

5. Click **Upload**.

	Note: When uploading software to the wireless ADSL 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 wireless ADSL 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 wireless ADSL modem router after upgrading.

Network Management Information

The DG834PN provides a variety of status and usage information which is discussed below.

Viewing Wireless ADSL Modem Router Status and Usage Statistics

From the Main Menu, under Maintenance, select Wireless ADSL Modem Router Status to view the screen in Figure 6-3.

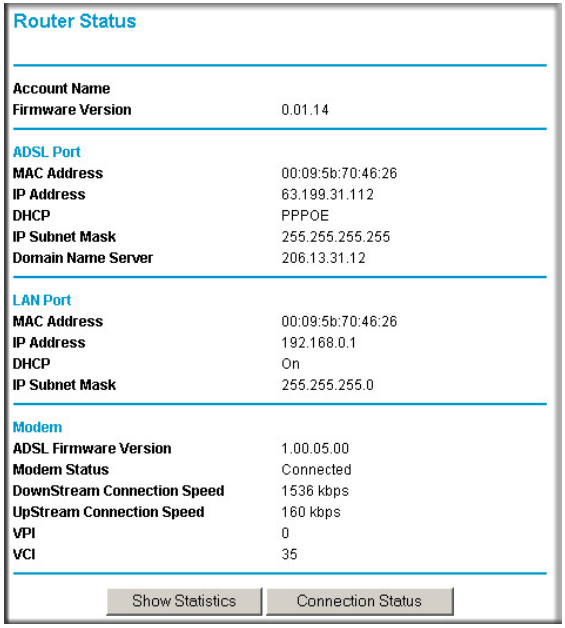


Figure 6-3: Wireless ADSL Modem Router Status screen

The Wireless ADSL Modem Router Status menu provides status and usage information.

This screen shows the following parameters:

Table 6-1. Menu 3.2 - Wireless ADSL Modem Router Status Fields

Field	Description
Account Name	The Host Name assigned to the wireless ADSL modem router in the Basic Settings menu.
Firmware Version	This field displays the wireless ADSL modem router firmware version.
ADSL Port	These parameters apply to the Internet (ADSL) port of the wireless ADSL modem router.
MAC Address	This field displays the Ethernet MAC address being used by the Internet (ADSL) port of the wireless ADSL modem router.
IP Address	This field displays the IP address being used by the Internet (ADSL) port of the wireless ADSL modem router. If no address is shown, the wireless ADSL modem router cannot connect to the Internet.
DHCP	If None, the wireless ADSL modem router will use a fixed IP address on the ADSL. If Client, the wireless ADSL modem router will obtain an IP address dynamically from the ISP.
IP Subnet Mask	This field displays the IP Subnet Mask being used by the Internet (ADSL) port of the wireless ADSL modem router.
Domain Name Server (DNS)	This field displays the DNS Server IP addresses being used by the wireless ADSL modem router. These addresses are usually obtained dynamically from the ISP.
LAN Port	These parameters apply to the Local (ADSL) port of the wireless ADSL modem router.
MAC Address	This field displays the Ethernet MAC address being used by the Local (LAN) port of the wireless ADSL modem router.
IP Address	This field displays the IP address being used by the Local (LAN) port of the wireless ADSL modem router. The default is 192.168.0.1.
DHCP	If OFF, the wireless ADSL modem router will not assign IP addresses to PCs on the LAN. If ON, the wireless ADSL 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 wireless ADSL modem router. The default is 255.255.255.0.
Modem	These parameters apply to the Local (WAN) port of the wireless ADSL modem router.
ADSL Firmware Version	The version of the firmware.
Modem Status	The connection status of the modem.
Downstream Speed	The speed at which the modem is receiving data from the ADSL line.

Table 6-1. Menu 3.2 - Wireless ADSL Modem Router Status Fields

Field	Description
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.

Click the Show Statistics button to display wireless ADSL modem router usage statistics, as shown in Figure 6-3 below:

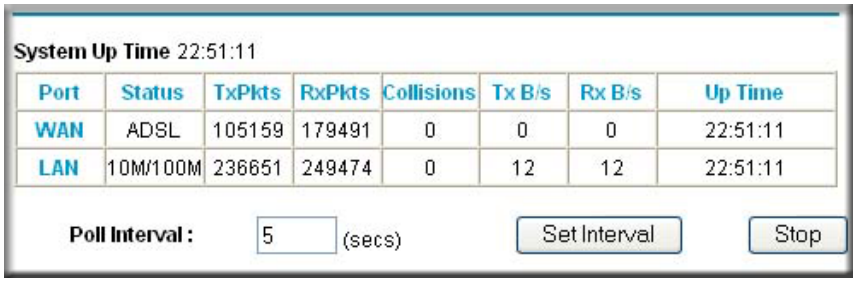


Figure 6-4: Wireless ADSL Modem Router Statistics screen

This screen shows the following statistics:.

Table 6-1. Router Statistics Fields

Field	Description
WAN, LAN, or Serial Port	The statistics for the WAN (Internet), LAN (local), and Serial ports. For each port, the screen displays:
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.
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 wireless ADSL modem router connection status, as shown in Figure 6-5 and Figure 6-6.

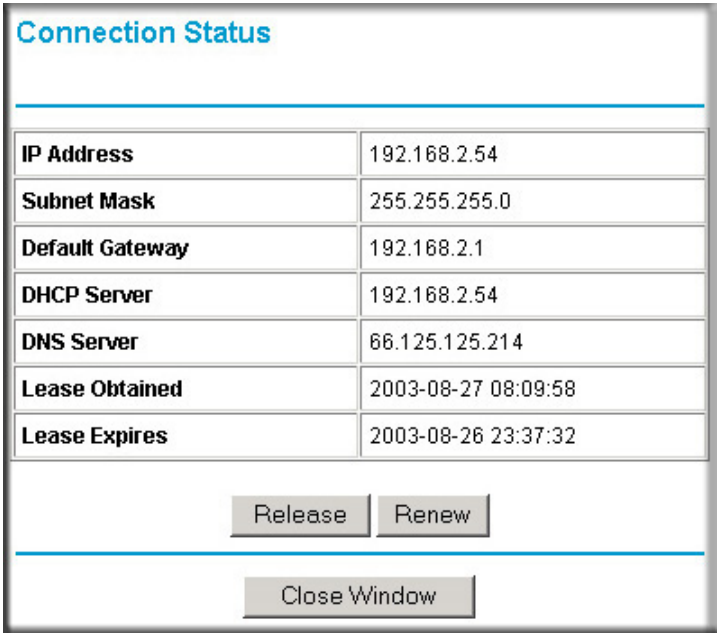


Figure 6-5: Connection Status screen for Dynamic IP

Clicking the Renew button updates the status information.

This screen shows the following statistics:

Table 6-1. Connection Status Fields for Dynamic IP

Field	Description
IP Address	The IP Address assigned to the WAN port by the ADSL Internet Service Provider.
Subnet Mask	The Network Mask assigned to the WAN port by the ADSL Internet Service Provider.
Default Gateway	The default gateway wireless ADSL modem router assigned to the WAN port by the ADSL Internet Service Provider.
DHCP Server	The DHCP server's IP address.
DNS Server	The DNS server's IP address.
Lease Obtained	Date and time the lease was obtained.
Lease Expires	Date and time the lease expires.

An alternate view of the Connection Status screen is shown in Figure 6-6 below:

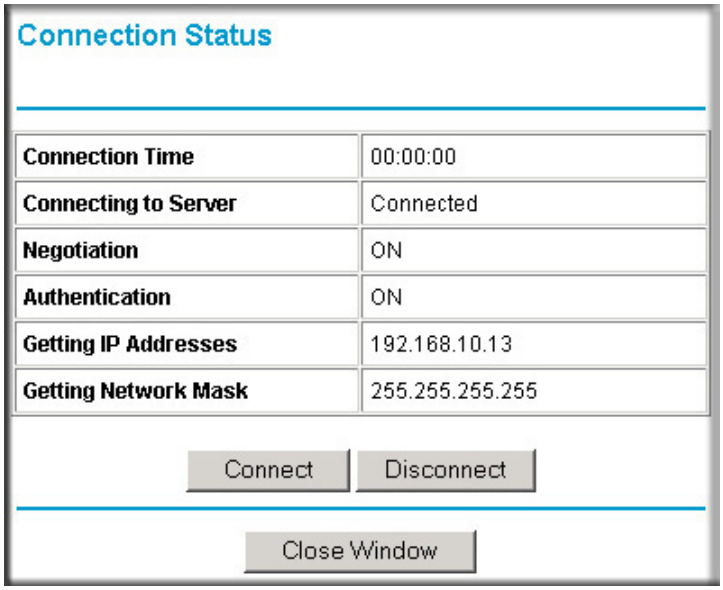


Figure 6-6: Connection Status screen for PPPoA

Clicking the Renew button updates the status information.

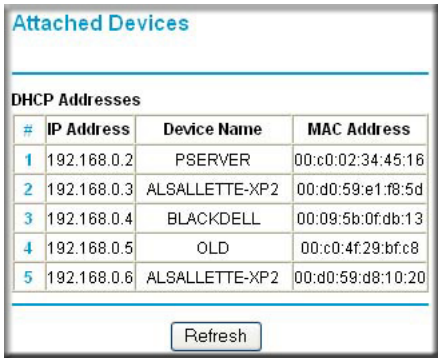
This screen shows the following statistics:

Table 6-1. 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 wireless ADSL 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 in Figure 6-7:



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	ALSALLETTE-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	ALSALLETTE-XP2	00:d0:59:d8:10:20

Refresh

Figure 6-7: Attached Devices menu

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

Viewing, Selecting, and Saving Logged Information

The wireless ADSL 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.

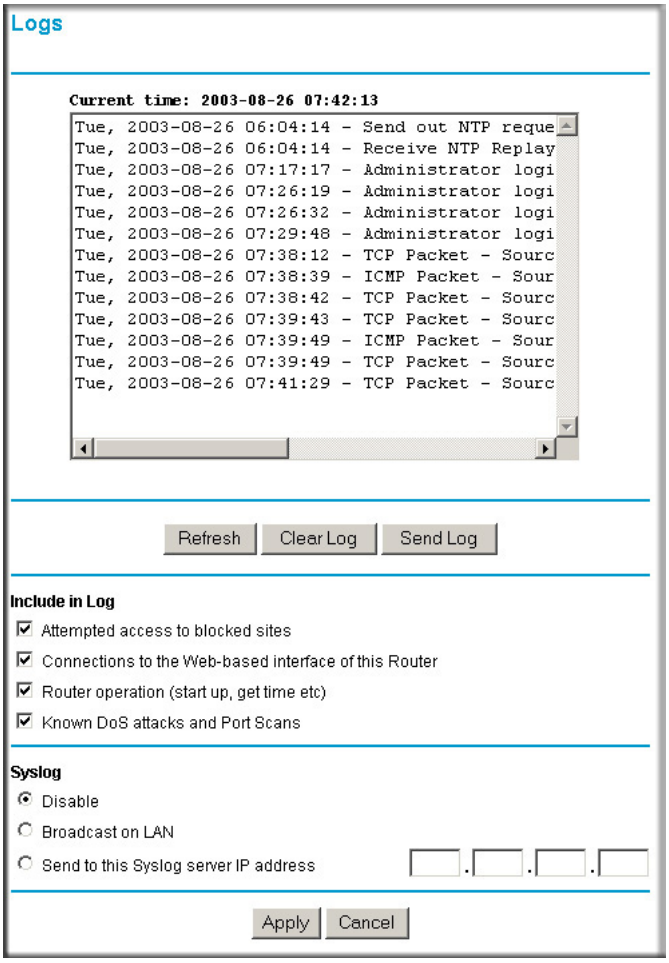


Figure 6-8: Security Logs menu

Log entries are described in Table 6-1 below:

Table 6-1. 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 6-2 below:

Table 6-2. 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 wireless ADSL modem router
- Wireless ADSL 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:

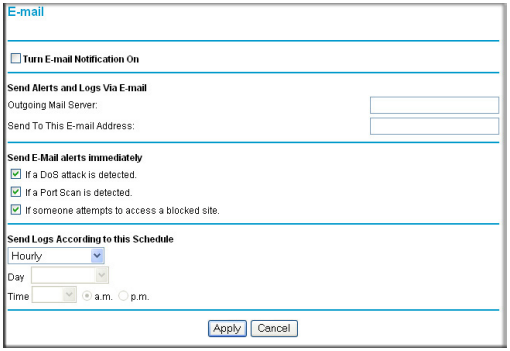


Figure 6-9: E-mail menu

- **Turn e-mail notification on**. Select this check box if you want to receive e-mail logs and alerts from the wireless ADSL modem router.
- **Send alerts and logs via email**. Enter the name or IP address of your ISP's outgoing (SMTP) mail server (such as mail.myISP.com). You may be able to find this information in the configuration menu of your e-mail program. Enter the e-mail address to which logs and alerts are sent. This e-mail address will also be used as the From address. If you leave this box blank, log and alert messages will not be sent via e-mail.
- **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 wireless ADSL modem router's memory. If the wireless ADSL modem router cannot e-mail the log file, the log buffer may fill up. In this case, the wireless ADSL modem router overwrites the log and discards its contents.

Running Diagnostic Utilities and Rebooting the Wireless ADSL Modem Router

The DG834PN RangeMax Wireless ADSL Modem Router has a diagnostics feature. You can use the diagnostics menu to perform the following functions from the wireless ADSL 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 wireless ADSL modem routers the wireless ADSL modem router is communicating with.
- Reboot the wireless ADSL modem router to enable new network configurations to take effect or to clear problems with the wireless ADSL modem router's network connection.

From the Main Menu of the browser interface, under the Maintenance heading, select the Wireless ADSL Modem Router Diagnostics heading to display the menu shown in Figure 6-10.

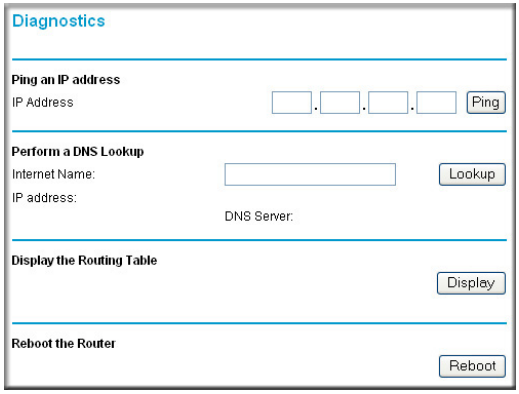


Figure 6-10: Diagnostics menu

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 DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router.

	Note: Be sure to change the wireless ADSL 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 wireless ADSL 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 wireless ADSL modem router.
2. From the Advanced section of the main menu, select the Remote Management link.
3. Select the Turn Remote Management On check box.
4. Specify what external addresses will be allowed to access the wireless ADSL 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 wireless ADSL modem router from the Internet, you will type your wireless ADSL 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 7
Advanced Configuration

This chapter describes how to configure the advanced features of your DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router.

Configuring Advanced Security

The DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router 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 wireless ADSL 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.

	Note: 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 wireless ADSL 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 wireless ADSL 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 wireless ADSL modem router.
2. From the Main Menu, under Advanced, click the WAN Setup link to view the page shown in Figure 7-1:

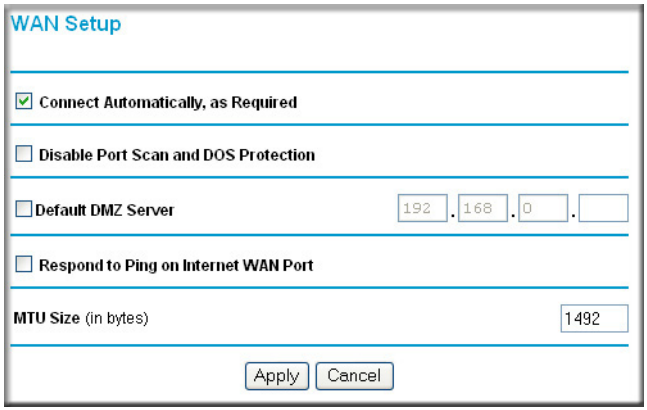


Figure 7-1: WAN Setup Page

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 wireless ADSL 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 wireless ADSL 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 wireless ADSL modem router is shipped preconfigured to use private IP addresses on the LAN side, and to act as a DHCP server. The wireless ADSL 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.

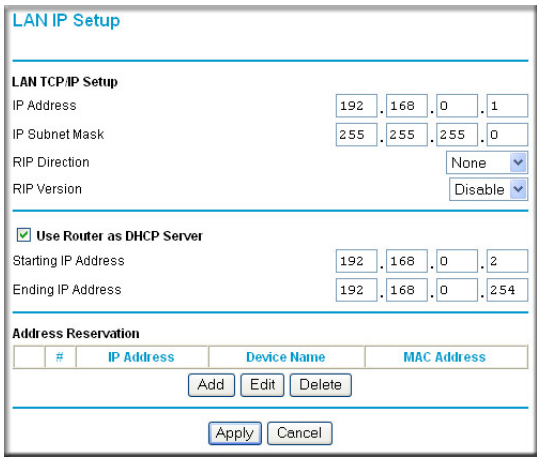


Figure 7-2: LAN IP Setup Menu

The LAN TCP/IP Setup parameters are:

- IP Address
  This is the LAN IP address of the wireless ADSL modem router.
- IP Subnet Mask
  This is the LAN Subnet Mask of the wireless ADSL 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 wireless ADSL modem router.
- RIP Direction
  RIP (Router Information Protocol) allows a wireless ADSL modem router to exchange routing information with other routers. The RIP Direction selection controls how the Wireless ADSL Modem Router sends and receives RIP packets. Both is the default.
  - When set to Both or Out Only, the wireless ADSL 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 wireless ADSL 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.

	Note: If you change the LAN IP address of the wireless ADSL modem router while connected through the browser, you will be disconnected. You must then open a new connection to the new IP address and log in again.

DHCP

By default, the wireless ADSL 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 wireless ADSL 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 "IP Configuration by DHCP"on page B-9 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 in Figure 7-3:

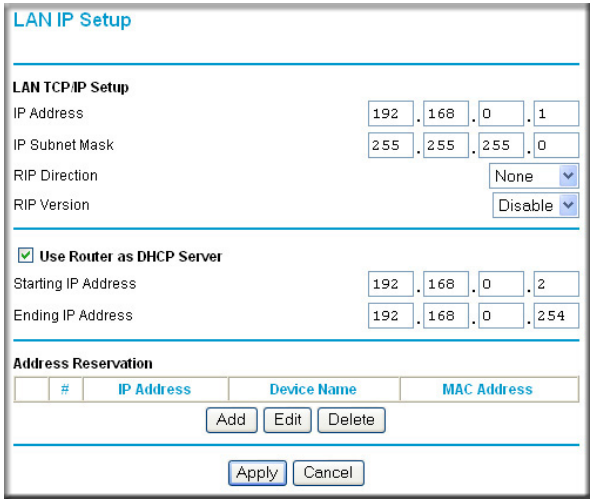


Figure 7-3: LAN IP Setup Menu

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

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.

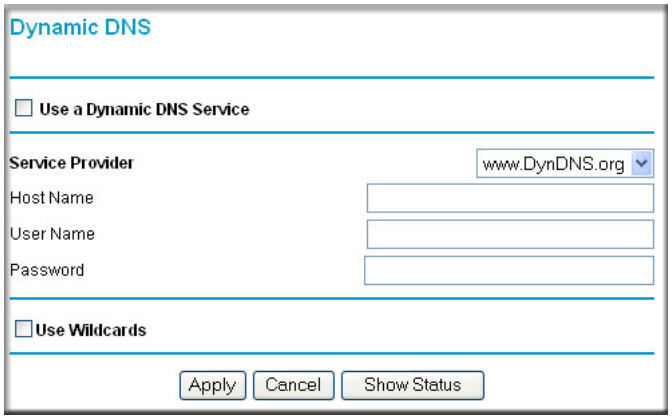


Figure 7-4: Dynamic DNS menu

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.

	Note: 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.

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 wireless ADSL 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 7-6.

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 Wireless ADSL 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 7-5.

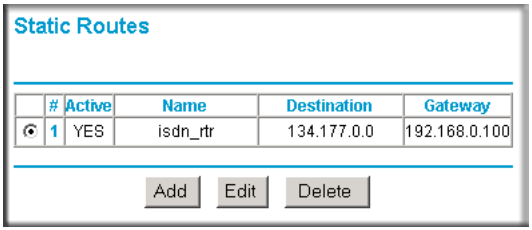


Figure 7-5: Static Routes Table

3. To add or edit a Static Route:

   a. Click the **Edit** button to open the Edit Menu, shown in Figure 7-6.

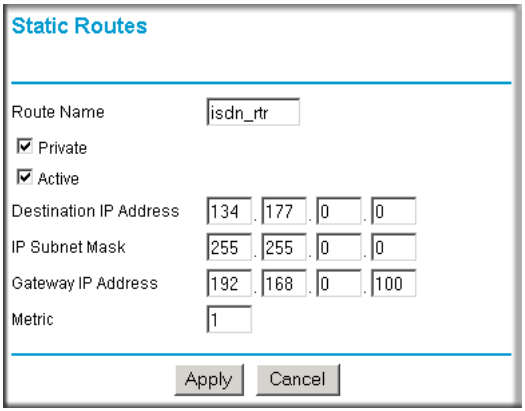


Figure 7-6: Static Route Entry and Edit Menu

   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.

Chapter 8
Troubleshooting

This chapter gives information about troubleshooting your DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router. After each problem description, instructions are provided to help you diagnose and solve the problem. For the common problems listed, go to the section indicated.

- Is the router on?
- Have I connected the router correctly?

  Go to "Basic Functioning" on page 8-1.
- I can't access the router's configuration with my browser.

  Go to "Troubleshooting the Web Configuration Interface" on page 8-3.
- I've configured the router but I can't access the Internet.

  Go to "Troubleshooting the ISP Connection" on page 8-4.
- I can't remember the router's configuration password.
- I want to clear the configuration and start over again.

  Go to "Restoring the Default Configuration and Password" on page 8-9.

Basic Functioning

After you turn on power to the router, the following sequence of events should occur:

1. When power is first applied, verify that the Power LED is on (see "The Router's Front Panel" on page 2-6 for an illustration and explanation of the LEDs).
2. Verify that the Test LED lights within a few seconds, indicating that the self-test procedure is running.
3. After approximately 10 seconds, verify that:
   a. The Test LED is not lit.
   b. The LAN port LEDs are lit for any local ports that are connected.
   c. The WAN port LED is lit.

If a port's LED is lit, a link has been established to the connected device. If a LAN port is connected to a 100 Mbps device, verify that the port's LED is green. If the port is 10 Mbps, the LED will be amber.

If any of these conditions does not occur, refer to the appropriate following section.

Power LED Not On

If the Power and other LEDs are off when your router is turned on:

- Make sure that the power cord is properly connected to your router and that the power supply adapter is properly connected to a functioning power outlet.
- Check that you are using the 12 V DC power adapter supplied by NETGEAR for this product.

If the error persists, you have a hardware problem and should contact technical support.

Test LED Never Turns On or Test LED Stays On

When the router is turned on, the Test LED turns on for about 10 seconds and then turns off. If the Test LED does not turn on, or if it stays on, there is a fault within the router.

If you experience problems with the Test LED:

- Cycle the power to see if the router recovers and the LED blinks for the correct amount of time.

If all LEDs including the Test LED are still on one minute after power up:

- Cycle the power to see if the router recovers.
- Clear the router's configuration to factory defaults. This will set the router's IP address to 192.168.0.1. This procedure is explained in "Using the Reset button" on page 8-9.

If the error persists, you might have a hardware problem and should contact technical support.

LAN or WAN Port LEDs Not On

If either the LAN LEDs or WAN LED do not light when the Ethernet connection is made, check the following:

- Make sure that the Ethernet cable connections are secure at the router and at the hub or workstation.

- Make sure that power is turned on to the connected hub or workstation.
- Be sure you are using the correct cable:
  - When connecting the router's WAN ADSL port, use the cable that was supplied with the DG834PN.

Troubleshooting the Web Configuration Interface

If you are unable to access the router's Web Configuration interface from a computer on your local network, check the following:

- If you are using an Ethernet-connected computer, check the Ethernet connection between the computer and the router as described in the previous section.
- Make sure your computer's IP address is on the same subnet as the router. If you are using the recommended addressing scheme, your computer's address should be in the range of 192.168.0.2 to 192.168.0.254. Refer to "Verifying TCP/IP Properties" on page C-6 or "Verifying TCP/IP Properties for Macintosh Computers" on page C-17 to find your computer's IP address. Follow the instructions in Appendix C to configure your computer.

  Note: If your computer's IP address is shown as 169.254.x.x:
  Recent versions of Windows and MacOS will generate and assign an IP address if the computer cannot reach a DHCP server. These auto-generated addresses are in the range of 169.254.x.x. If your IP address is in this range, check the connection from the computer to the router and reboot your computer.
- If your router's IP address was changed and you do not know the current IP address, clear the router's configuration to factory defaults. This will set the router's IP address to 192.168.0.1. This procedure is explained in "Using the Reset button" on page 8-9.
- Make sure your browser has Java, JavaScript, or ActiveX enabled. If you are using Internet Explorer, click Refresh to be sure the Java applet is loaded.
- Try quitting the browser and launching it again.
- Make sure you are using the correct login information. The factory default login name is **admin** and the password is **password**. Make sure that CAPS LOCK is off when entering this information.

If the router does not save changes you have made in the Web Configuration Interface, check the following:

- When entering configuration settings, be sure to click the APPLY button before moving to another menu or tab, or your changes are lost.

- Click the Refresh or Reload button in the Web browser. The changes may have occurred, but the Web browser may be caching the old configuration.

Troubleshooting the ISP Connection

If your router is unable to access the Internet, you should check the ADSL connection, then the WAN TCP/IP connection.

ADSL link

If your router is unable to access the Internet, you should first determine whether you have an ADSL link with the service provider. The state of this connection is indicated with the WAN LED.

WAN LED Green or Blinking Green

If your WAN LED is green or blinking green, then you have a good ADSL connection. You can be confident that the service provider has connected your line correctly and that your wiring is correct.

WAN LED Blinking Yellow

If your WAN LED is blinking yellow, then your wireless ADSL modem router is attempting to make an ADSL connection with the service provider. The LED should turn green within several minutes.

If the WAN LED does not turn green, disconnect all telephones on the line. If this solves the problem, reconnect the telephones one at a time, being careful to use a microfilter on each telephone. If the microfilters are connected correctly, you should be able to connect all your telephones.

If disconnecting telephones does not result in a green WAN LED, there may be a problem with your wiring. If the telephone company has tested the ADSL signal at your Network Interface Device (NID), then you may have poor quality wiring in your house.

WAN LED Off

If the WAN LED is off, disconnect all telephones on the line. If this solves the problem, reconnect the telephones one at a time, being careful to use a microfilter on each telephone. If the microfilters are connected correctly, you should be able to connect all your telephones.

If disconnecting telephones does not result in a green WAN LED the problem may be one of the following:

- Check that the telephone company has made the connection to your line and tested it.
- Verify that you are connected to the correct telephone line. If you have more than one phone line, be sure that you are connected to the line with the ADSL service. It may be necessary to use a swapper if you ADSL signal is on pins 1 and 4 or the RJ-11 jack. The DG834PN RangeMax Wireless ADSL Modem Router uses pins 2 and 3.

Obtaining a WAN IP Address

If your wireless ADSL modem router is unable to access the internet, and your WAN LED is green or blinking green, you should determine whether the wireless ADSL modem router is able to obtain a WAN IP address from the ISP. Unless you have been assigned a static IP address, your wireless ADSL modem router must request an IP address from the ISP. You can determine whether the request was successful using the browser interface.

To check the WAN IP address from the browser interface:

1. Launch your browser and select an external site such as www.netgear.com.
2. Access the Main Menu of the wireless ADSL modem router's configuration at http://192.168.0.1.
3. Under the Maintenance heading check that an IP address is shown for the WAN Port.
   If 0.0.0.0 is shown, your wireless ADSL modem router has not obtained an IP address from your ISP.

If your router is unable to obtain an IP address from the ISP, the problem may be one of the following:

- Your ISP may require a Multiplexing Method or Virtual Path Identifier/Virtual Channel Identifier parameter.
  Verify with your ISP the Multiplexing Method and parameter value, and update the router's ADSL Settings accordingly.
- Your ISP may require a login program.
  Ask your ISP whether they require PPP over Ethernet (PPPoE) or PPP over ATM (PPPOA) login.
- If you have selected a login program, you may have incorrectly set the Service Name, User Name and Password. See "Troubleshooting PPPoE or PPPoA", below.

- Your ISP may check for your computer's host name.
  Assign the computer Host Name of your ISP account to the wireless ADSL modem router in the browser-based Setup Wizard.
- Your ISP only allows one Ethernet MAC address to connect to Internet, and may check for your computer's MAC address. In this case:

  Inform your ISP that you have bought a new network device, and ask them to use the router's MAC address.

  OR

  Configure your router to spoof your computer's MAC address. This can be done in the Basic Settings menu. Refer to "Manually Configuring Your Internet Connection" on page 3-10.

Troubleshooting PPPoE or PPPoA

The PPPoA or PPPoA connection can be debugged as follows:

1. Access the Main Menu of the router at http://192.168.0.1.
2. Under the Maintenance heading, select the Router Status link.
3. Click the Connection Status button.
4. If all of the steps indicate "OK" then your PPPoE or PPPoA connection is up and working.
5. If any of the steps indicates "Failed", you can attempt to reconnect by clicking "Connect". The wireless ADSL modem router will continue to attempt to connect indefinitely.

If you cannot connect after several minutes, you may be using an incorrect Service Name, User Name or Password. There also may be a provisioning problem with your ISP.

	Note: Unless you connect manually, the wireless ADSL modem router will not authenticate using PPPoE or PPPoA until data is transmitted to the network.

Troubleshooting Internet Browsing

If your wireless ADSL modem router can obtain an IP address but your computer is unable to load any Web pages from the Internet:

- Your computer may not recognize any DNS server addresses.

A DNS server is a host on the Internet that translates Internet names (such as www addresses) to numeric IP addresses. Typically your ISP will provide the addresses of one or two DNS servers for your use. If you entered a DNS address during the wireless ADSL modem router's configuration, reboot your computer and verify the DNS address as described in "Verifying TCP/IP Properties" on page C-6. Alternatively, you can configure your computer manually with DNS addresses, as explained in your operating system documentation.

- Your computer may not have the wireless ADSL modem router configured as its TCP/IP wireless ADSL modem router.

  If your computer obtains its information from the wireless ADSL modem router by DHCP, reboot the computer and verify the wireless ADSL modem router address as described in "Verifying TCP/IP Properties" on page C-6.

Troubleshooting a TCP/IP Network Using the Ping Utility

Most TCP/IP terminal devices and routers contain a ping utility that sends an echo request packet to the designated device. The device then responds with an echo reply. Troubleshooting a TCP/IP network is made very easy by using the ping utility in your computer.

Testing the LAN Path to Your Router

You can ping the router from your computer to verify that the LAN path to your router is set up correctly.

To ping the router from a PC running Windows 95 or later:

1. From the Windows toolbar, click the Start button and select Run.
2. In the field provided, type Ping followed by the IP address of the router, as in this example:

   ping 192.168.0.1

3. Click OK.

   You should see a message like this one:

   Pinging <IP address> with 32 bytes of data

   If the path is working, you see this message:

   Reply from < IP address >: bytes=32 time=NN ms TTL=xxx

   If the path is not working, you see this message:

   Request timed out

If the path is not functioning correctly, you could have one of the following problems:

- Wrong physical connections
  - — Make sure the LAN port LED is on. If the LED is off, follow the instructions in "LAN or WAN Port LEDs Not On" on page 8-2.
  - — Check that the corresponding Link LEDs are on for your network interface card and for the hub ports (if any) that are connected to your workstation and router.
- Wrong network configuration
  - — Verify that the Ethernet card driver software and TCP/IP software are both installed and configured on your PC or workstation.
  - — Verify that the IP address for your router and your workstation are correct and that the addresses are on the same subnet.

Testing the Path from Your Computer to a Remote Device

After verifying that the LAN path works correctly, test the path from your PC to a remote device. From the Windows run menu, type:

```
PING -n 10 <IP address>
```

where <*IP address*> is the IP address of a remote device such as your ISP's DNS server.

If the path is functioning correctly, replies as in the previous section are displayed. If you do not receive replies:

- — Check that your PC has the IP address of your router listed as the default wireless ADSL modem router. If the IP configuration of your PC is assigned by DHCP, this information will not be visible in your PC's Network Control Panel. Verify that the IP address of the router is listed as the default wireless ADSL modem router as described in "Verifying TCP/IP Properties" on page C-6.
- — Check to see that the network address of your PC (the portion of the IP address specified by the netmask) is different from the network address of the remote device.
- — Check that your cable or DSL modem is connected and functioning.
- — If your ISP assigned a host name to your PC, enter that host name as the Account Name in the Basic Settings menu.

— Your ISP could be rejecting the Ethernet MAC addresses of all but one of your PCs. Many broadband ISPs restrict access by only allowing traffic from the MAC address of your broadband modem, but some ISPs additionally restrict access to the MAC address of a single PC connected to that modem. If this is the case, you must configure your router to "clone" or "spoof" the MAC address from the authorized PC. Refer to "Manually Configuring Your Internet Connection" on page 3-10.

Restoring the Default Configuration and Password

This section explains how to restore the factory default configuration settings, changing the router's administration password to **password** and the IP address to 192.168.0.1. You can erase the current configuration and restore factory defaults in two ways:

- Use the Erase function of the Web Configuration Manager (see "Backing Up, Restoring, or Erasing Your Settings" on page 6-1).
- Use the Default Reset button on the rear panel of the router. Use this method for cases when the administration password or IP address is not known.

Using the Reset button

To restore the factory default configuration settings without knowing the administration password or IP address, you must use the Default Reset button on the rear panel of the router.

1. Press and hold the Default Reset button until the Test LED turns on (about 10 seconds).
2. Release the Default Reset button and wait for the router to reboot.

Problems with Date and Time

The E-mail menu in the Content Filtering section displays the current date and time of day. The DG834PN RangeMax Wireless ADSL Modem Router uses the Network Time Protocol (NTP) to obtain the current time from one of several Network Time Servers on the Internet. Each entry in the log is stamped with the date and time of day. Problems with the date and time function can include:

- Date shown is January 1, 2000
  Cause: The router has not yet successfully reached a Network Time Server. Check that your Internet access settings are configured correctly. If you have just completed configuring the router, wait at least five minutes and check the date and time again.

- Time is off by one hour
  Cause: The router does not automatically sense Daylight Savings Time. In the E-mail menu, check or uncheck the box marked “Adjust for Daylight Savings Time”.

Appendix A
Technical Specifications

This appendix provides technical specifications for the DG834PN 108 Mbps RangeMax™ Wireless ADSL Modem Router.

Network Protocol and Standards Compatibility	
Data and Routing Protocols:	TCP/IP, RIP-1, RIP-2, DHCP, PPP over Ethernet (PPPoE) or PPP over ATM (PPPoA), RFC 1483 Bridged or Routed Ethernet, and RFC 1577 Classical IP over ATM
Power Adapter	
North America:	120V, 60 Hz, input
United Kingdom, Australia:	240V, 50 Hz, input
Europe:	230V, 50 Hz, input
Japan:	100V, 50/60 Hz, input
All regions (output):	15 V DC @ 1.0A output, 30W maximum
Physical Specifications	
Dimensions:	10" x 6.7" x 1.3" 255 mm x 169 mm x 34 mm
Weight:	1.4 lbs. 0.62 kg
Environmental Specifications	
Operating temperature:	0° to 40° C (32º to 104º F)
Operating humidity:	90% maximum relative humidity, noncondensing

Electromagnetic Emissions	
Meets requirements of:	FCC Part 15 Class B
	VCCI Class B
	EN 55 022 (CISPR 22), Class B
Interface Specifications	
LAN:	10BASE-T or 100BASE-Tx, RJ-45
WAN:	ADSL, RJ-11, pins 2 and 3 T1.413, G.DMT, G.Lite ITU Annex A (model DG834PN) or B (model DG834PNB)