

NETGEAR®

C3000 WiFi Cable Modem Router User Manual



Note: This document is for certification purposes only. Images are for position only and might differ from the actual product.

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San Jose, CA 95134
USA

Support

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Connect to the Modem Router

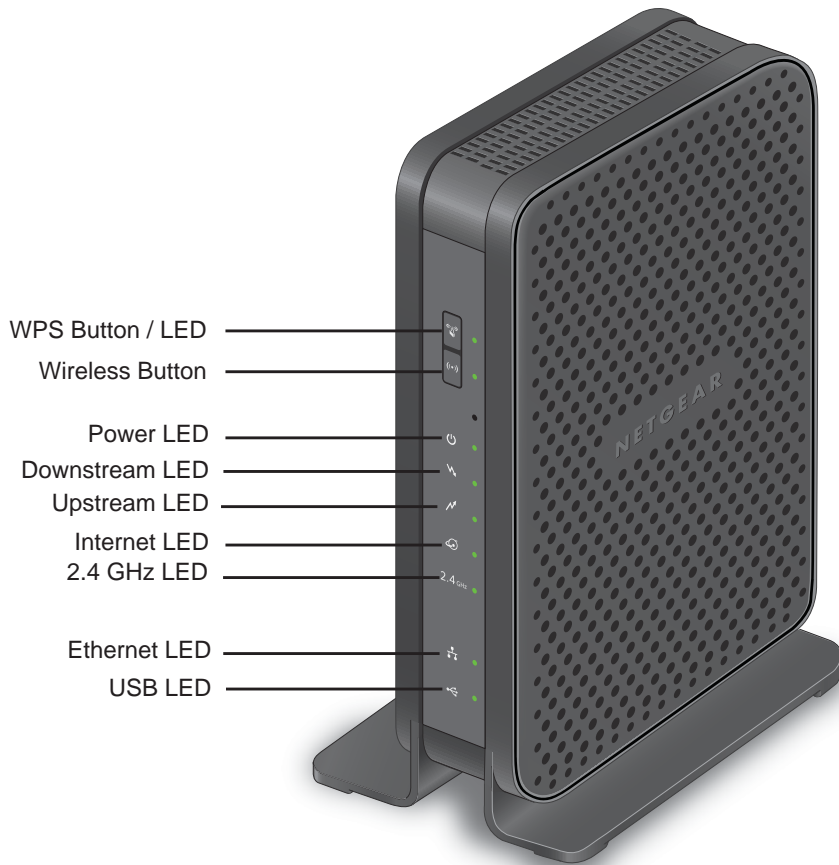
1

Getting to know your modem router

This chapter describes how to configure the Internet connection of your gateway and includes these sections:

- *Gateway Front Panel*
- *Gateway Rear Panel*
- *Gateway Label*
- *Position Your Gateway*
- *Log In to Your Gateway*
- *View the Modem Router Home Screens*
- *Join the Wireless Network*

Gateway Front Panel



You can use the LEDs to verify status and connections. The following table lists and describes each LED and button on the front panel of the modem router.

Table 1. LEDs










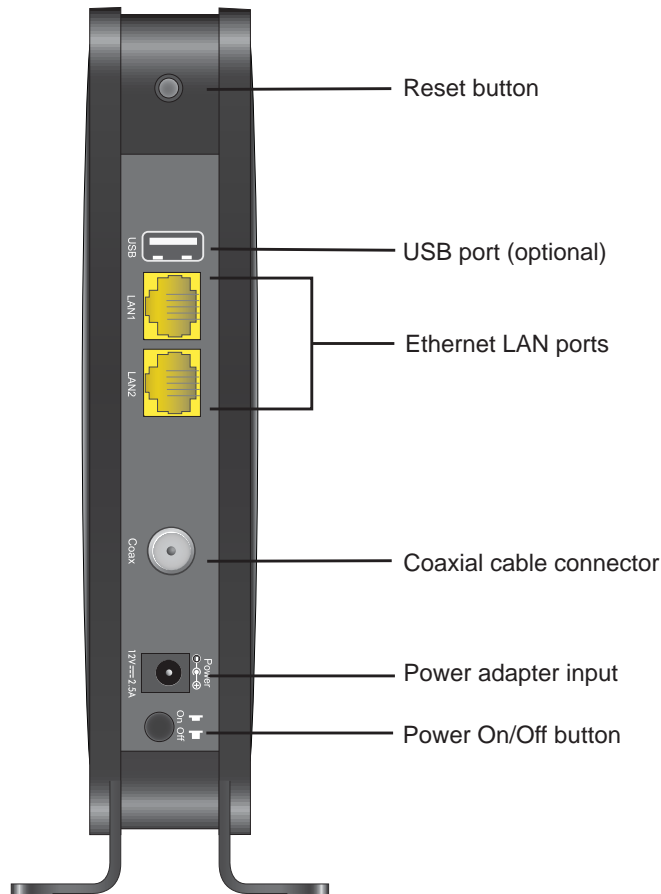
LED	Description
	<ul style="list-style-type: none"> • Green. Wireless security is enabled. • Off. No WPS connection exists.
	<ul style="list-style-type: none"> • Green. The wireless radio is operating. • Off. The wireless radio is off.
	<ul style="list-style-type: none"> • Green. Power is supplied to the modem router. • Off. No power is supplied to the modem router.

Table 1. LEDs (continued)

LED	Description
Downstream 	<ul style="list-style-type: none"> • Solid green. One or more downstream channels are locked. • Blinking green. The unit is scanning for a downstream channel. • Off. No downstream channel is locked.
Upstream 	<ul style="list-style-type: none"> • Solid green. One or more upstream channels are locked. • Blinking green. The unit is scanning for an upstream channel. • Off. No upstream channel is locked.
Internet 	<ul style="list-style-type: none"> • Solid green. The modem router is online. • Blinking green. The modem router is synchronizing with the cable provider's cable modem termination system (CMTS). • Off. The modem router is offline.
2.4 GHz radio 	<ul style="list-style-type: none"> • Green. The 2.4 GHz radio is on. • Off. The 2.4 GHz radio is off.
Ethernet 	<ul style="list-style-type: none"> • Green. A device is connected to an Ethernet port and powered on. • Off. No device is detected to an Ethernet port.
USB 	<ul style="list-style-type: none"> • Green. A USB device is connected to the port on the back panel. • Off. No USB device is connected to the port on the back panel.

Gateway Rear Panel



The rear panel includes the following connections when viewed from top to bottom:

- **Reset button.** You can return the modem router to its factory settings. Press and hold the Reset button for over 7 seconds. The modem router resets and returns to its factory settings. See [Factory Default Settings](#) on page 71.
- **Phone port.** A telephone connection for an analog phone line.
- **Two Gigabit Ethernet LAN ports.** Use these ports to connect local computers.
- **Coaxial cable connector.** Attach a coaxial cable to the cable service provider connection.
- **Power adapter input.** Connect the power adapter unit here.
- **Power On/Off button.** Press to turn on power. Press again to turn off power.

Power Supply Manufacturers and Models

Use only power supplies listed here:

- Adaptor of CWT
Manufacturer: Channel Well Technology Co Ltd
Model: SAL018F2
- Adaptor of PI
Manufacturer: PI Electronics (H.K.) Ltd.
Model: AD817000

Gateway Label

The label on the bottom of the modem router shows the WPS PIN, login information, MAC address, and serial number.

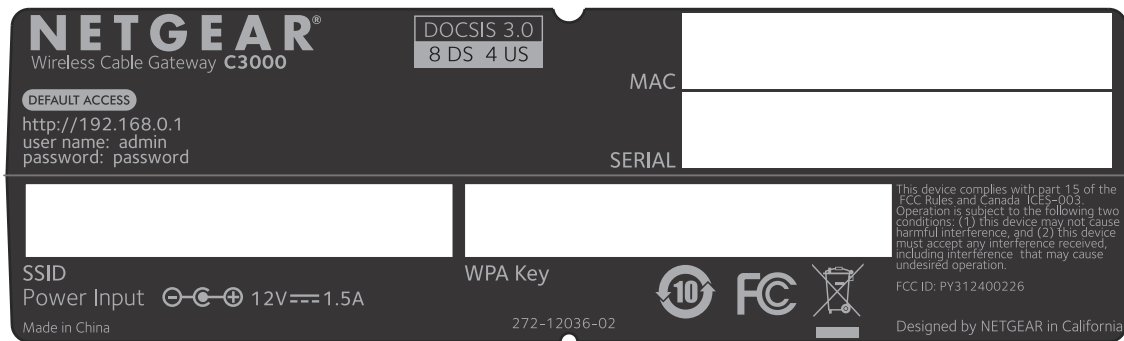


Figure 1. The label shows unique information about your modem router

Position Your Gateway

The operating distance or range of your wireless connection can vary based on the physical placement of the gateway. For best results, place your gateway:

- Near the center of the area in which your computers operate.
- In an elevated location such as a high shelf.
- Away from potential sources of interference, such as computers, microwave ovens, and cordless phones.
- Away from large metal surfaces.

Note: Failure to follow these guidelines can result in significant performance degradation or inability to connect wirelessly to the modem router.

Log In to Your Gateway

You can log in to the modem router to view or change its settings.

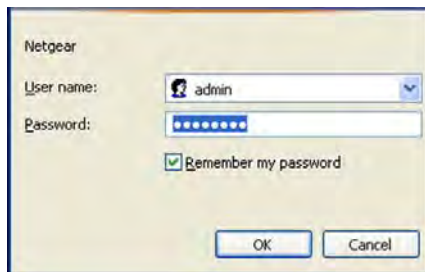
Note: To connect to the modem router, use a computer that is configured for DHCP (most computers are). For help with configuring DHCP, see the instructions that came with your computer.

The modem router automatically logs you out after 5 minutes of no activity.

➤ **To log in to the modem router:**

1. On the computer that is connected to the modem router with an Ethernet cable, type **http://192.168.0.1** in the address field of your Internet browser.

A login window opens.



2. Log in with the user name **admin** and its default password of **password**.

The modem router Basic Home screen displays when you log in (see [Basic Home Screen](#) on page 12).

View the Modem Router Home Screens

The modem router home screens include a Basic Home screen and an Advanced Home screen.

Basic Home Screen

When you connect to the modem router, the gateway dashboard (Basic Home screen) displays.

Menus (Click the Advanced tab to view more)



The Basic Home screen has a dashboard that shows the status of your Internet connection and network. You can click the sections of the dashboard to view more detailed information. The left column has menus and an Advanced tab appears at the top that is used to access more menus and screens.

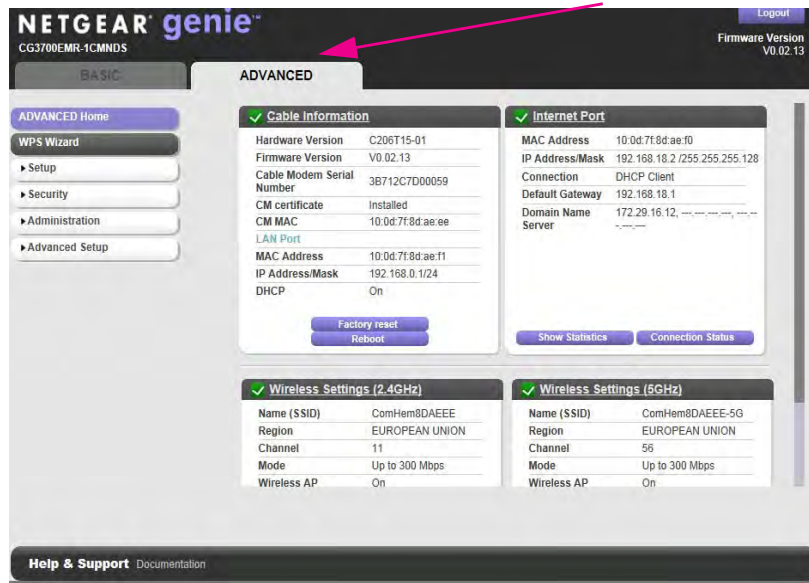
- **Home.** This dashboard screen displays when you log in to the modem router or select the Home tab.
- **Cable Connection.** This option displays the cable signal quality, the upstream power, the downstream power, and the connection status.
- **Wireless.** Select this option to view or change the wireless settings for your modem router.
- **Network Map.** Select this option to view the devices that are connected to your network.
- **Voice.** This option displays the voice status.
- **Advanced tab.** Select the Advanced tab to set up the modem router for unique situations such as when remote access by IP or by domain name from the Internet is needed. See [Advanced Home Screen](#) on page 13. Using this tab requires a solid understanding of networking concepts.

For more information about the Basic settings, see [Chapter 2, NETGEAR genie Basic Settings](#).

Advanced Home Screen

Note: Using the Advanced Home screen requires a solid understanding of networking concepts.

To view the Advance Home screen, select the **Advanced** tab from the top menu.



The modem router Advanced Home screen has a dashboard that lets you see the configuration of your modem router and network at a glance. You can click any of the sections of the dashboard to view more detailed information. The left column has the menus, and at the top there is a Basic tab that is used to the basic menus and screens.

- **Advanced Home.** This dashboard screen displays when you select the Advanced tab.
- **Setup.** Set up the Internet connection, wireless, WAN, and LAN.
- **Security.** Block sites, block services, and set up email notifications.
- **Administration.** View gateway status, logs, and event logs, back up and restore the configuration file, and change the gateway password.
- **Advanced Setup.** Configure advanced network features such as port forwarding, port triggering, Dynamic DNS, and UPnP.
- **Home tab.** Return to the Basic Home screen. See [Basic Home Screen](#) on page 12.

For more information about the Advanced settings, see [Chapter 3, NETGEAR genie Advanced Home](#).

Join the Wireless Network

➤ **To join the wireless network:**

1. Open the software that manages your wireless connections on the wireless device (laptop computer, gaming device, iPhone) that you want to connect to your modem router.

This software scans for all wireless networks in your area.

2. Look for your network and select it.

If you did not change the name of your network during the setup process, look for the default WiFi network name (SSID) and select it. The default SSID is on the label on the bottom of the modem router.

3. Enter the modem router password and click **Connect**.

The default password is on the label on the bottom of the modem router.

2. NETGEAR genie Basic Settings

2

Your Internet connection and network

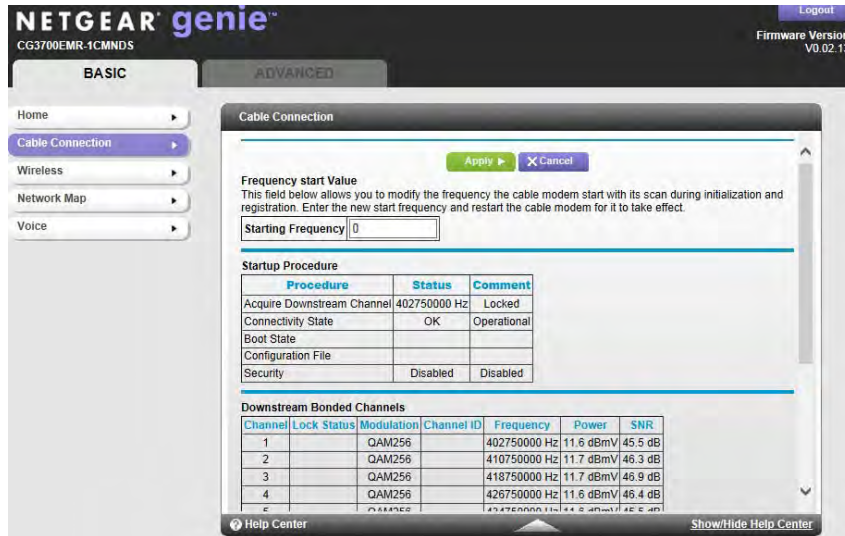
This chapter explains the features available from the genie Basic Home screen. This chapter contains the following sections:

- *Cable Connection*
- *View or Configure Your Wireless Network*
- *Network Map*
- *Voice Status*

Cable Connection

- To change the starting frequency:

From the Basic tab, select **Cable Connection**.



The Starting Frequency is automatically generated. Most of the time, you do not need to enter a value in this field. If you need to enter a starting frequency, contact your Internet service provider.

Use the Cable Connection screen to track the initialization procedure of the modem router, and to get details about the downstream and upstream cable channel. The time is displayed after the modem router is initialized.

The modem router automatically goes through the following steps in the provisioning process:

- Scans and locks the downstream frequency and then ranges the upstream channels.
- Obtains a WAN address for the modem router.
- Connects to the Internet.

View or Configure Your Wireless Network

The Wireless screen lets you view or configure the wireless network set-up.

The wireless cable gateway comes with preset security. This feature means that the WiFi network name (SSID), network key (password), and security option (encryption protocol) are preset in the factory. You can find the preset SSID and password on the bottom of the unit.

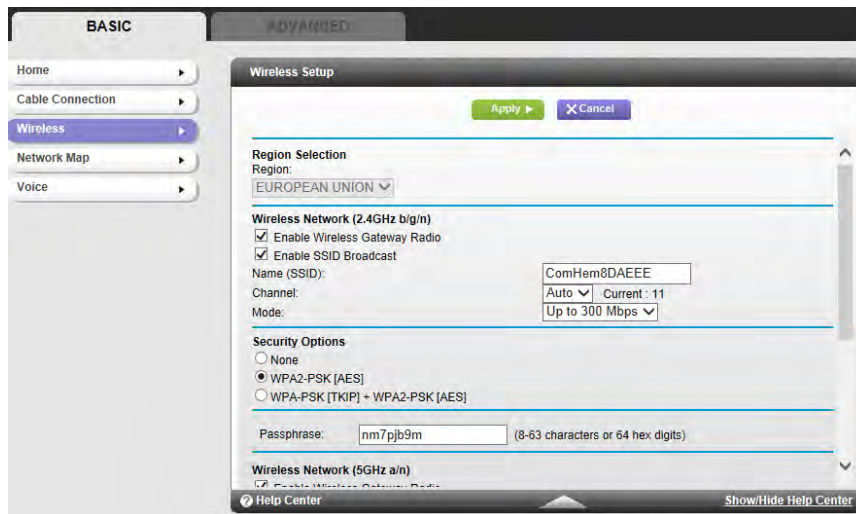
Note: The preset SSID and password are uniquely generated for every device to protect and maximize your wireless security.

NETGEAR recommends that you do not change your preset security settings. If you do decide to change your preset security settings, make a note of the new settings and store it in a safe place.

If you use a wireless computer to change the wireless network name (SSID) or other wireless security settings, you are disconnected when you click the Apply button. To avoid this problem, use a computer with a wired connection to access the modem router.

➤ **To view or change basic wireless settings:**

1. From the Basic tab, select **Wireless**.



The screen sections, settings, and procedures are explained in the following sections.

2. Make the appropriate changes.
3. Click the **Apply** button.
Your settings are saved.
4. Set up and test your wireless devices and computers to make sure that they can connect wirelessly. If they do not, check the following:
 - Is your wireless device or computer connected to your network or another wireless network in your area? Some wireless devices automatically connect to the first open network (without wireless security) that they discover.
 - Does your wireless device or computer appear on the Network Map screen? If it does, it is connected to the network.
 - If you are not sure what the network name (SSID) or password is, look on the label on your modem router.

Wireless Screen Fields

The Fragmentation Length, CTS/RTS Threshold, and Preamble Mode options in this screen are reserved for wireless testing and advanced configuration only. Do not change these settings unless you have a specific reason to do so.

- **Region Selection.** Select the location where the modem router is used.
- **Enable Wireless Gateway Radio.** This setting allows the modem router to broadcast its SSID so wireless stations can see this wireless name (SSID) in their scanned network lists. This check box is selected by default. To turn off the SSID broadcast, clear the **Enable SSID Broadcast** check box, and click the **Apply** button.
- **Enable SSID Broadcast.** This feature allows the modem router to broadcast its SSID so wireless stations can see this wireless name (SSID) in their scanned network lists. This check box is selected by default. To turn off the SSID broadcast, clear this check box, and click the **Apply** button.
- **Name (SSID).** The SSID is also known as the wireless network name. Enter a 32-character (maximum) name in this field. This field is case-sensitive. The default SSID is randomly generated, and **NETGEAR strongly recommends that you do not change the SSID.**
- **Channel.** This setting is the wireless channel that the modem router uses. Choose a value from 1 through 13. (For products in the North America market, only Channels 1 through 11 can be operated.) Do not change the channel unless you experience interference (such as lost connections or slow data transfers). If any interference happens, experiment with different channels to see which is the best.
- **Mode.** Up to 145 Mbps is the default and allows 802.11n and 802.11g wireless devices to join the network. g & b supports up to 54 Mbps. The 300-Mbps setting allows 802.11n devices to connect at this speed.

Security Options Settings

The Security Options section of the Wireless screen lets you change the security option and password. **NETGEAR recommends that you do not change the security option or password,** but if you want to change these settings, this section explains how.

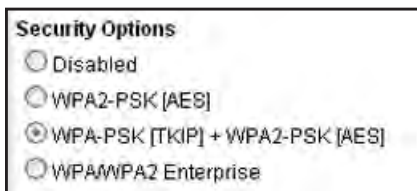


CAUTION:

Do not disable security.

➤ To change the WPA security option and password:

1. Under Security Options, select the WPA option that you want.



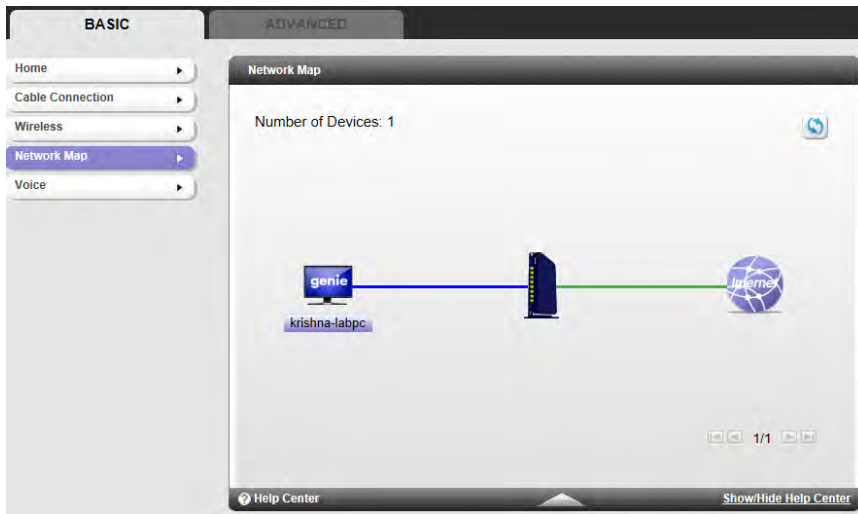
2. In the password field that displays when you select a WPA security option, enter the network key (password) that you want to use. It is a text string from 8 to 63 characters.

Network Map

You can view all computers or devices that are currently connected to your network here.

- **To view a map of attached devices:**

From the Basic tab, select **Network Map**.



Wired devices are connected to the modem router with Ethernet cables. Wireless devices have joined the wireless network.

- **IP Address.** The IP address that the modem router assigned to this device when it joined the network. This number can change when a device disconnects and then rejoins the network.
- **Device Name.** If the device name is known, it is shown here.

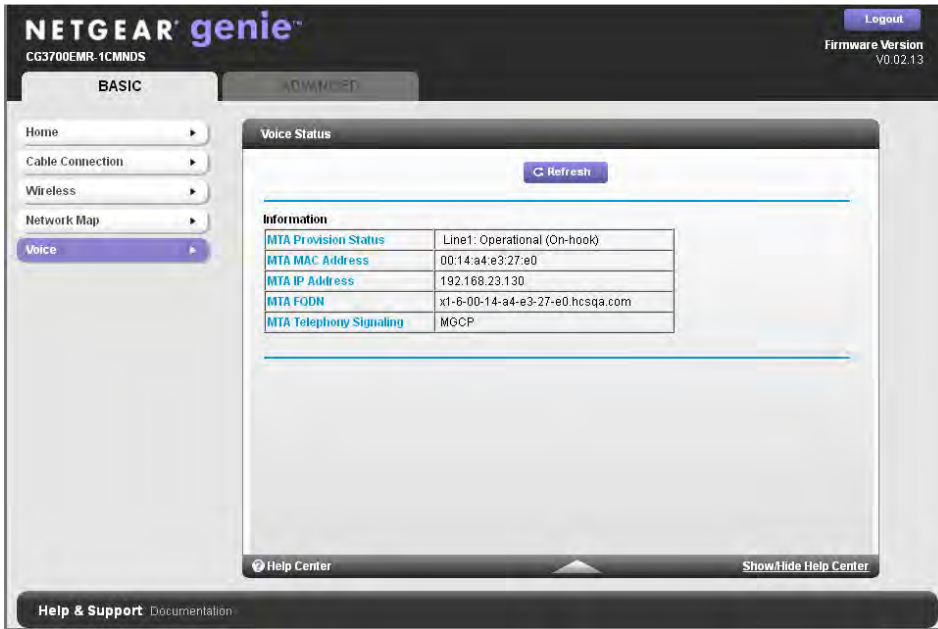
You can click **Refresh** to update this screen.

Voice Status

You can review specific details about the voice connection.

➤ **To view the status of the voice connection:**

From the Basic tab, select **Voice**.



The following fields display:

- **MTA Provision Status.** The gateway status. The values can be Operational, On hook, or Off hook. This status applies to line 1.
- **MTA MAC Address.** The telephony MAC address.
- **MTA IP Address.** The telephony IP address.
- **MTA FQDN.** The Fully Qualified Domain Name (FQDN). The Internet service provider assigns this name.
- **MTA Telephony Signaling.** This value is set to Media Gateway Control Protocol (MGCP), a way of to set up voice calls.

3. NETGEAR genie Advanced Home

3

Specifying custom settings

This chapter explains the features available from the genie Advanced Home screen. This chapter contains the following sections:

- *Internet Setup*
- *Wireless Setup*
- *WAN Setup*
- *LAN Setup*

Some selections on the Advanced Home screen are described in separate chapters:

- **Security.** See *Chapter 4, Security*.
- **Administration.** See *Chapter 5, Administration*.
- **Advanced Setup.** See *Chapter 6, Advanced Settings*.

Internet Setup

The Internet Setup screen is where you view or change ISP information.

➤ **To change the Internet settings:**

1. From the Advanced tab, select **Setup > Internet Setup**.

The screenshot shows the 'Internet Setup' configuration page. The 'Account Name' is 'CG3700EMR-1CMNDS'. The 'Internet IP Address' section has 'Get Dynamically from ISP' selected. The 'Domain Name Server (DNS) Address' section has 'Get Automatically from ISP' selected. The 'Apply' button is highlighted in green.

2. Enter the settings for the IP address and DNS server. The default settings usually work fine. If you have problems with your connection, check the ISP settings.
 3. Click the **Apply** button.
- Your settings are saved.

Internet Setup Screen Fields

The following descriptions explain all of the possible fields in the Internet Setup screen.

Internet IP Address.

- If you log in to your service or your ISP did not provide you with a fixed IP address, the gateway finds an IP address for you automatically when you connect. Select **Get Dynamically from ISP**.
- If you have a fixed (or static) IP address, your ISP has provided you with the required information. Select **Use Static IP Address** and type the IP address, IP subnet mask, and gateway IP address in the correct fields.

For example:

- IP Address. 24.218.156.183
- Subnet Mask. 255.255.255.0
- Gateway IP Address. 24.218.156.1

Domain Name Server (DNS) Address. The DNS server is used to look up site addresses that are based on their names.

- If your ISP gave you one or two DNS addresses, select **Use These DNS Servers** and type the primary and secondary addresses.
- Otherwise, select **Get Automatically from ISP**.

Note: If you get address not found errors when you go to a website, it is likely that your DNS servers are not set up correctly. Contact your ISP to get the DNS server addresses.

Wireless Setup

For information about the fields on this screen, see [View or Configure Your Wireless Network](#) on page 16.

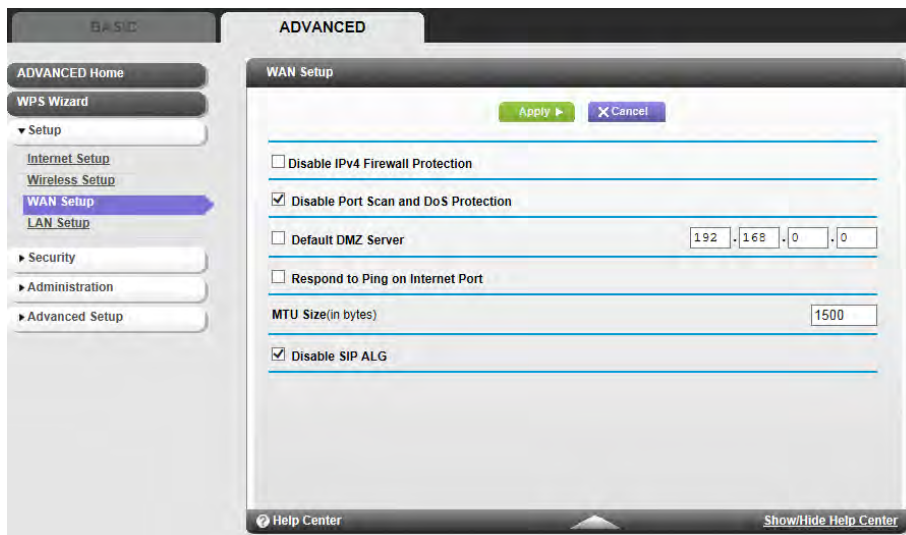
WAN Setup

The WAN Setup screen lets you configure a DMZ (demilitarized zone) server and enable the modem router to respond to a ping on the WAN (Internet) port.

➤ To change the WAN settings:

From the Advanced tab, select **Setup > WAN Setup**.

The following screen displays:



- **Disable IPv4 Firewall Protection.** Firewalls protect your gateway and connected devices from external attacks. The firewall is enabled by default.
- **Disable Port Scan and DoS Protection.** DoS protection protects your LAN against denial of service attacks such as Syn flood, Smurf Attack, Ping of Death, Teardrop

Attack, UDP Flood, ARP Attack, Spoofing ICMP, Null Scan, and many others. This setting should be disabled only in special circumstances.

- **Default DMZ Server.** This feature is sometimes helpful when you are playing online games or videoconferencing. Be careful when using this feature, it makes the firewall security less effective. The default DMZ server feature is helpful when you are using some online games and videoconferencing applications that are incompatible with Network Address Translation (NAT). The gateway is programmed to recognize some of these applications and to work correctly with them, but some applications do not function well. In some cases, one local computer can run the application correctly if the IP address of that computer is entered as the default DMZ server.
- **Respond to Ping on Internet Port.** If you want the modem router to respond to a ping from the Internet, select this check box. Use this feature only as a diagnostic tool because it also allows your modem router to be discovered. Do not select this check box unless you have a specific reason.
- **MTU Size (in bytes).** The normal MTU (maximum transmit unit) value for most Ethernet networks is 1500 bytes, or 1492 bytes for PPPoE connections. For some ISPs, you might need to reduce the MTU. Reduce the MTU only if you are sure that it is necessary for your ISP connection.
- **Disable SIP/ALG.** The Session Initiation Protocol (SIP) Application Level Gateway (ALG) is disabled by default which is useful when running certain applications. To enable SIP/ALG and optimize VoIP phone calls that use the SIP, uncheck the check box.

The default DMZ server feature is helpful when you are using some online games and videoconferencing applications that are incompatible with Network Address Translation (NAT). The modem router is programmed to recognize some of these applications and to work correctly with them, but some applications do not function well. In some cases, one local computer can run the application correctly if the IP address of that computer is entered as the default DMZ server.



WARNING:

DMZ servers pose a security risk. A computer that is designated as the default DMZ server loses much of the protection of the firewall and is exposed to exploits from the Internet. If compromised, the DMZ server computer can be used to attack other computers on your network.

The modem router discards incoming traffic from the Internet unless the traffic is a response to one of your local computers or a service that you have configured in the Port Forwarding/Port Triggering screen. Instead of discarding this traffic, you can have it forwarded to one computer on your network. This computer is called the default DMZ server.

➤ **To set up a default DMZ server:**

1. On the WAN Setup screen, select the **Default DMZ Server** check box.
2. Type the IP address.

3. Click the **Apply** button.

LAN Setup

The LAN Setup screen allows you to configure LAN services such as the IP address of the gateway and DHCP. The TCP/IP and DHCP default values work fine in most cases.

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

- LAN IP address. **192.168.0.1**
- Subnet mask. **255.255.255.0**

These addresses are part of the designated private address range for use in private networks and are suitable for most applications. If your network requires you to use a different IP addressing scheme, make those required changes in the LAN Setup screen.

- **To change the LAN settings:**

Note: If you change the LAN IP address of the modem router while connected through the browser, you are disconnected. Open a new connection to the new IP address and log in again.

1. From the Advanced tab, select **Setup > LAN Setup**.

The following screen displays:

2. Enter the settings that you want to customize. These settings are described in the following section, *LAN Setup Screen Fields*.
3. Click the **Apply** button.
4. Your changes are saved.

LAN Setup Screen Fields

Use this screen to view or change the LAN setup fields.

LAN TCP/IP Setup

- **IP Address.** The LAN IP address of the modem router.
- **IP Subnet Mask.** The LAN subnet mask of the modem router. When combined with the IP address, the IP subnet mask allows a device to know the following:
 - Which other addresses are local to it
 - Which other addresses must be reached through a gateway

DHCP IP Pool

- **Starting IP Address.** Specify the start of the range for the pool of IP addresses in the same subnet as the modem router.
- **Ending IP Address.** Specify the end of the range for the pool of IP addresses in the same subnet as the modem router.

Address Reservation

When you specify a reserved IP address for a computer on the LAN, that computer receives the same IP address each time it accesses the DHCP server of the modem router. Assign reserved IP addresses to servers that require permanent IP settings.

Use the Router as a DHCP Server

By default, the modem router functions as a DHCP server. This capability allows the modem router to assign IP, DNS server, and default gateway addresses to all computers connected to the LAN that is connected to the modem router. The assigned default gateway address is the LAN address of the modem router. The modem router assigns IP addresses to the attached computers from a pool of addresses that are specified in this screen. 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 modem router are satisfactory.

You can specify the pool of IP addresses that can be assigned by setting the starting IP address and ending IP address. These addresses are part of the same IP address subnet as the LAN that is connected to the modem router. Using the default addressing scheme, you define a range between 192.168.0.2 and 192.168.0.254. You can save part of the range for devices with fixed addresses.

The modem router delivers the following parameters to any LAN device that requests DHCP:

- An IP address from the range you have defined
- Subnet mask
- Gateway IP address (the LAN IP address of the modem router)

- Primary DNS server (if you entered a primary DNS address in the Internet Setup screen; otherwise, the LAN IP address of the modem router)
- Secondary DNS server (if you entered a secondary DNS address in the Internet Setup screen)

To use another device on your network as the DHCP server or to configure manually the network settings of all of your computers, clear the **Use Router as DHCP Server** check box and click the **Apply** button. Otherwise, leave this check box selected. If this service is not enabled and no other DHCP server is available on your network, set the IP addresses of your computer manually or other devices cannot access the modem router.

Address Reservation

When you specify a reserved IP address for a computer on the LAN, that computer always receives the same IP address each time it accesses the DHCP server of the modem router. Assign reserved IP addresses to computers or servers that require permanent IP settings.

1. From the Advanced tab, select **Setup > LAN Setup**.

The following screen displays:

The screenshot shows the 'LAN Setup' configuration page in the NETGEAR genie Advanced Home interface. The page is divided into several sections:

- Device Name:** A text field containing 'CG3700EMR-1CMNDS'.
- LAN TCP/IP Setup:**
 - IP Address:** 192 . 168 . 0 . 1
 - IP Subnet Mask:** 255 . 255 . 255 . 0
- DHCP IP Pool:**
 - Starting IP Address:** 192 . 168 . 0 . 10
 - Ending IP Address:** 192 . 168 . 0 . 99
- Address Reservation:** A table with the following structure:

#	IP Address	Device Name	MAC Address

 Below the table are buttons for '+ Add', 'Edit', and 'Delete'.

At the top of the main content area, there are 'Apply' and 'Cancel' buttons. The left sidebar shows navigation options like 'Internet Setup', 'Wireless Setup', 'WAN Setup', 'LAN Setup' (highlighted), 'Security', 'Administration', and 'Advanced Setup'. The bottom of the screen has a 'Help Center' link and a 'Show/Hide Help Center' button.

- Click the **Add** button.

Address Reservation

+ Add X Cancel G Refresh

#	IP Address	Device Name	MAC Address
<input type="radio"/> 1	192.168.0.10	Julias-iPhone	b4:f0:ab:3a:99:a9
<input type="radio"/> 2	192.168.0.11	krishna-labpc	fc:4d:d4:2e:27:33

IP Address: 192 . 168 . 0 .

MAC Address:

Device Name:

Help Center Show/Hide Help Center

- In the IP Address field, type the IP address to assign to the computer or server. (Choose an IP address from the LAN subnet of the modem router, such as 192.168.0.x.)
- Type the MAC address of the computer or server.

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

- To enter the reserved address into the table, click the **Apply** button.

The reserved address is not assigned until the next time the computer contacts the DHCP server of the modem router. Reboot the computer or access its IP configuration and force a DHCP release and renew.

To edit or delete a reserved address entry, select the radio button next to the reserved address you want to edit or delete. Then click **Edit** or **Delete**.

4 Security

4

Keep unwanted content out of your network

This chapter explains how to prevent objectionable content from reaching the computers and other devices that are connected to your network.

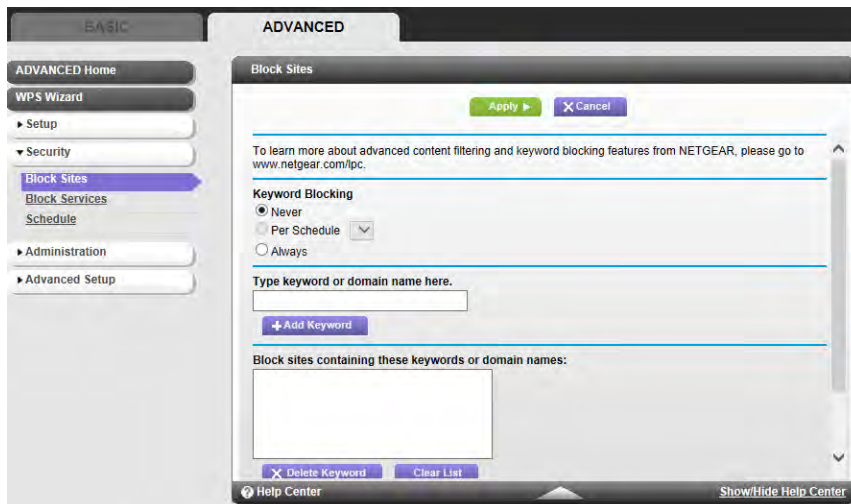
This chapter includes the following sections:

- *Keyword Blocking of HTTP Traffic*
- *Block Services (Port Filtering)*
- *Schedule Blocking*

Keyword Blocking of HTTP Traffic

Use keyword blocking to prevent certain types of HTTP traffic from accessing your network.

1. From the Advanced tab, select **Security > Block Sites**.



2. Select one of the keyword blocking options:
 - **Never.** Turn off keyword blocking.
 - **Per Schedule.** Turn on keyword blocking according to the Schedule screen settings. (See *Schedule Blocking* on page 32.)
 - **Always.** Turn on keyword blocking.
3. In the keyword field, enter a keyword or domain, click **Add URL Keyword**, and click the **Apply** button.

The keyword list supports up to 32 entries. Here are some sample entries:

- Specify XXX to block <http://www.badstuff.com/xxx.html>.
- Specify .com if you want to allow only sites with domain suffixes such as .edu or .gov.
- Enter a period (.) to block all Internet browsing access.

➤ **To delete a keyword or domain:**

1. Select the keyword that you want to delete from the list.
2. Click **Delete URL Keyword**.
3. Click the **Apply** button.
4. Your changes are saved.

➤ **To specify a trusted computer:**

You can exempt one trusted computer from blocking and logging. The computer that you exempt must have a fixed IP address.

1. Select **Allow trusted IP address to visit blocked sites**.

2. In the Trusted IP Address field, enter the IP address.
3. Click the **Apply** button.

Your changes are saved.

Block Services (Port Filtering)

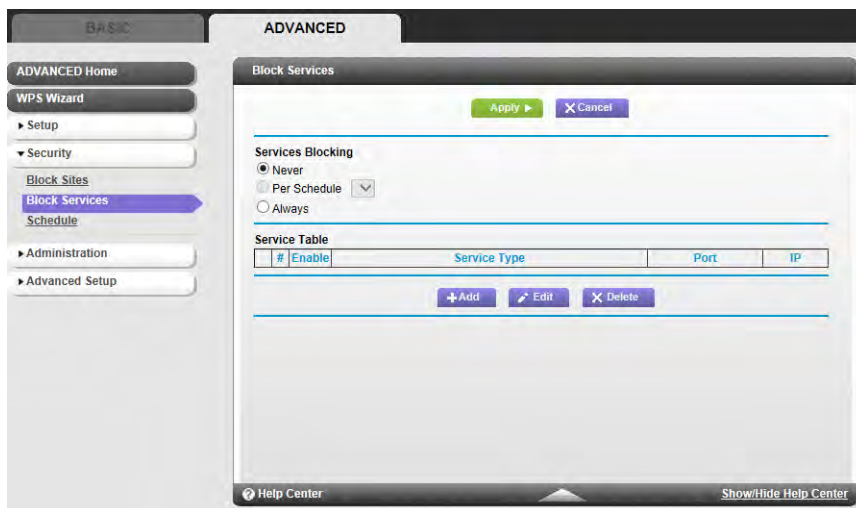
Server computers perform services at the request of client computers. For example, web servers serve web pages, time servers serve time and date information, and game hosts serve data about other players' moves. When a computer on the Internet sends a request for service to a server computer, a service or port number identifies the requested service. This number displays as the destination port number in the transmitted IP packets. For example, a packet that is sent with the 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 at <http://www.ietf.org/>) and published in RFC1700, "Assigned Numbers." Service numbers for other applications are typically chosen from the range 1024 - 65535 by the authors of the application. Although the modem router already holds a list of many service port numbers, you are not limited to these choices. You can often determine port number information by contacting the publisher of the application, by asking user groups or newsgroups, or by searching.

The Block Services screen lets you add and block specific Internet services by computers on your network. This capability is called service blocking or port filtering. To add a service for blocking, first determine which port number or range of numbers the application uses.

➤ To block services:

1. From the Advanced tab, select **Security > Block Services**.



2. Select either **Per Schedule** or **Always**.
3. If you selected Per Schedule, specify a time period in the Schedule screen.
4. To add a service, click the **Add** button.

The Block Services Setup screen displays:

5. From the Service Type list, select the application or service to allow or block. The list already displays several common services, but you are not limited to these choices. To add any additional services or applications that do not already display, select **User Defined**.
6. For User Defined, select the protocol, and enter the name and the range of port numbers of the service. For known services, these fields are filled in automatically.

If you know that the application uses either TCP or UDP, select the appropriate protocol. If you are not sure, select **TCP/UDP**.

7. Enter the starting and ending port numbers. If the application uses a single port number, enter that number in both fields.
8. Enter the IP address of the computer that you want to block.
9. Click **Add** to enable your Block Services Setup selections.

Schedule Blocking

You can specify the days and time that you want to block Internet access.

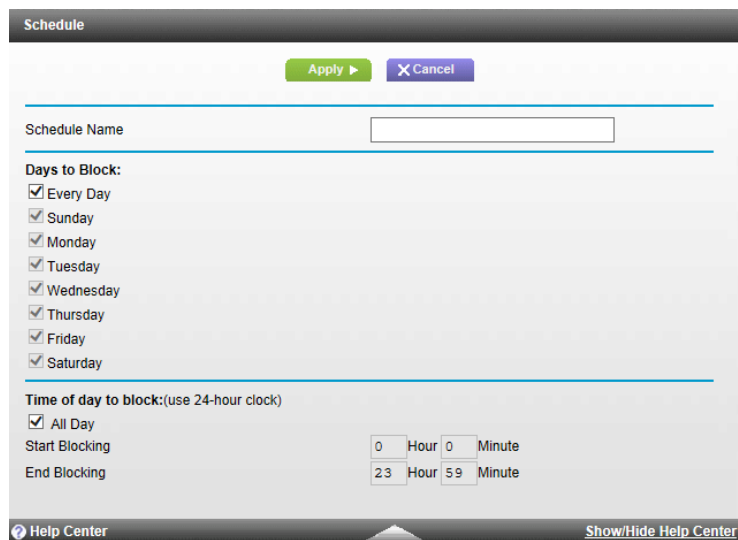
➤ To schedule blocking:

1. From the Advanced tab, select **Security > Schedule**.

The following screen displays.



2. Click the **Add** button.



3. Set up the schedule for blocking keywords and services.
 - **Days to Block.** Select days on which you want to apply blocking by selecting the appropriate check boxes, or select **Every Day** to select the check boxes for all days.
 - **Time of Day to Block.** Select a start and end time in 24-hour format, or select **All Day** for 24-hour blocking.
4. Select your time zone from the list. If you use daylight savings time, select the **Automatically adjust for daylight savings time** check box.
5. Click the **Apply** button.

Your settings are saved.

5 Administration

5

Managing your network

This chapter describes the modem router settings for administering and maintaining your modem router and home network.

This chapter includes the following sections:

- *View Modem Router Status*
- *Router Mode*
- *Network Map*
- *Back Up Settings*
- *Set Password*
- *View Event Logs*
- *Diagnostics*
- *Wireless Channel*

View Modem Router Status

- To view modem router status and usage information:

From the Advanced tab, select **Administration > Gateway Status**.

The following screen displays.

Cable Information

The following settings are displayed:

Hardware Version. The modem router model.

Firmware Version. The version of the modem router firmware. It changes if you upgrade the modem router firmware.

Cable Modem Serial Number. The serial number of the cable modem.

CM certificate. The status of the cable modem certificate. If 'Not installed' displays as the status, contact your Internet service provider.

CM MAC. The MAC address of the cable modem.

LAN Port. The MAC address of LAN port 1.

- **MAC Address.** The Media Access Control address. This address is the unique physical address that the Ethernet (LAN) port of the modem router uses.
- **IP Address.** The IP address that the Ethernet (LAN) port of the modem router uses. The default is 192.168.0.1.
- **DHCP Server.** Identifies whether the built-in DHCP server of the modem router is active for the LAN-attached devices.

To reboot the modem router, click the **Reboot** button.

Internet Port

The following settings describe details about the WAN Internet port:

MAC Address. The MAC address of the WAN Internet port.

IP Address/Mask. The IP address of the WAN Internet port.

Connection. The type of WAN Internet port connection.

Default Gateway. The IP address of the default gateway.

Domain Name Server. The IP address of the domain name server.

Wireless Settings

The following settings display:

Name (SSID). The wireless network name (SSID) that the modem router uses.

Region. The geographic region where the modem router is being used. It is illegal to use the wireless features of the modem router in some parts of the world.

Channel. The operating channel of the wireless port being used. The default channel is Auto. When Auto is selected, the modem router finds the best operating channel available. If you notice interference from nearby devices, you can select a different channel. Channels 1, 6, and 11 do not interfere with each other.

Mode. The wireless communication mode: Up to 54 Mbps, Up to 145 Mbps (default), and Up to 300 Mbps.

Wireless AP. Indicates whether the radio feature of the modem router is enabled. If this feature is not enabled, the Wireless LED on the front panel is off.

Broadcast Name. Indicates whether the modem router is broadcasting its SSID.

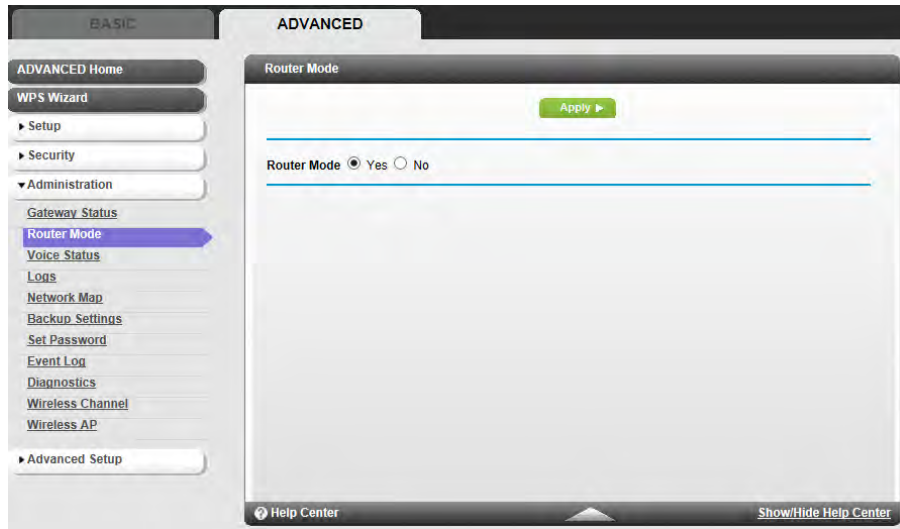
Wireless Isolation. Indicates that the wireless clients can connect to the Internet. However, they cannot access each other or access Ethernet devices on the network.

Wi-Fi Protected Setup. Indicates whether Wi-Fi Protected Setup is configured for this network.

Router Mode

From the Advanced tab, select **Administration > Router Mode**.

The following screen displays.



When you select the Yes radio button, the modem router works as a gateway and provides connected devices with IP addresses.

When you select the No radio button, the modem router works as a bridge and obtains IP addresses from the Internet service provider.

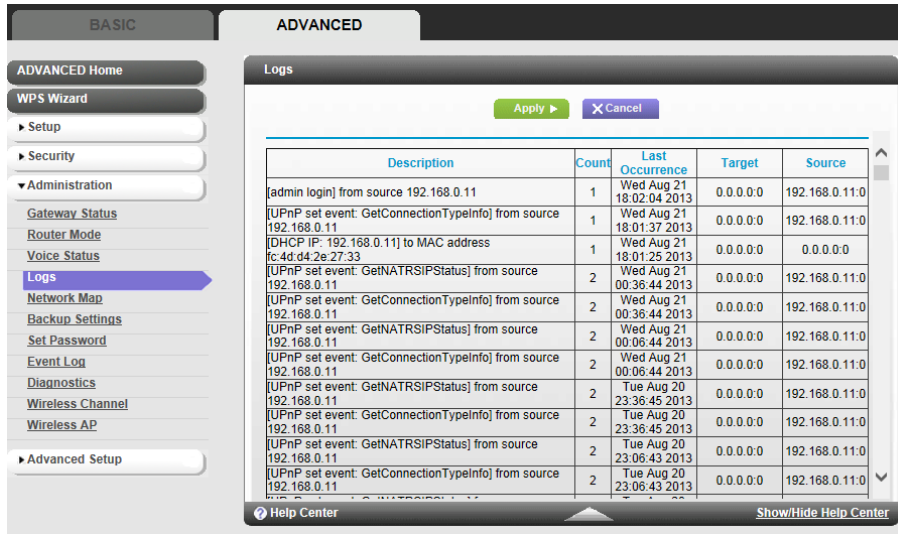
Logs

The log is a detailed record of the websites you have accessed or attempted to access. Up to 256 entries are stored in the log. Log entries display only when keyword blocking is enabled. No log entries are made for the trusted LAN client.

➤ To view the logs:

From the Advanced tab, select **Administration > Logs**.

The following screen displays.



The log screen shows the following information:

- **Date and time.** The date and time the log entry was recorded.
- **Source IP.** The IP address of the initiating device for this log entry.
- **Target address.** The name or IP address of the website or news group visited or to which access was attempted.
- **Action.** Whether the access was blocked or allowed.
- **Known DoS attacks and Port Scans.** To ignore known DoS attacks and port scans, clear this check box.

To refresh the log screen, click the **Refresh** button.

To clear the log entries, click the **Clear Log** button.

To email the log immediately, click the **Send Log** button.

To save your changes, click the **Apply** button.

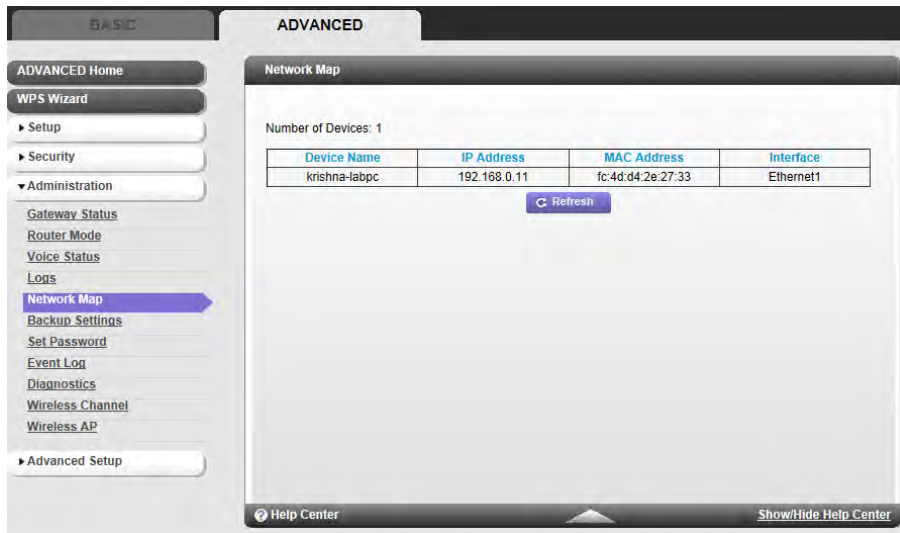
Network Map

The network map displays information about devices connected to your network.

➤ To view the network map:

From the Advanced tab, select **Administration > Network Map**.

The following screen displays.



The following fields display:

Device Name. The name of the connected device.

IP Address. The IP address of the connected device.

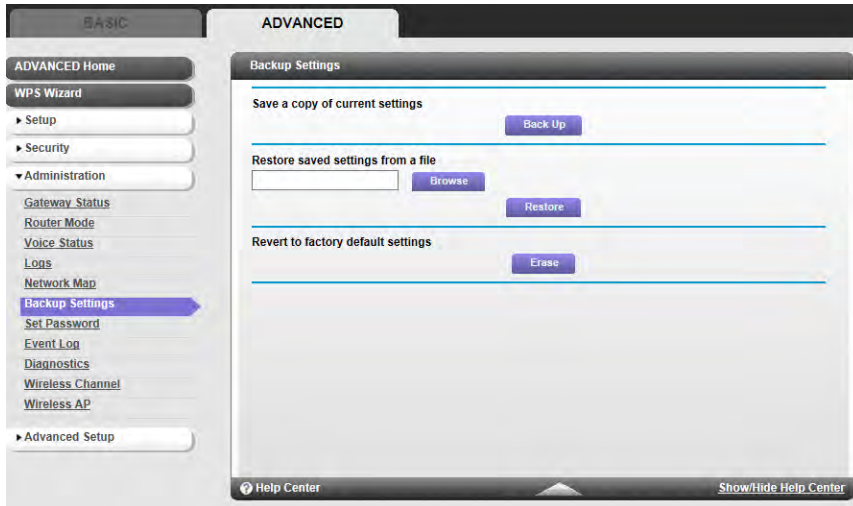
MAC Address. The MAC address of the connected device.

Interface. The way the device is connected; Ethernet1, Ethernet2, or WiFi interface.

Back Up Settings

The configuration settings of the wireless cable gateway are stored within the modem router in a configuration file. You can back up (save) this file to your computer, restore it, or reset it to the factory default settings.

- **To back up the configuration settings of the modem router:**
 1. From the Advanced tab, select **Administration > Backup Settings**.



2. Click the **Back Up** button.
3. A copy of the current settings is saved.
4. Choose a location to store the .cfg file that is on a computer on your network.

Restore Configuration Settings

- **To restore configuration settings that you backed up:**
 1. To find the file, enter the full path to the file on your network or click the **Browse** button.
 2. When you have located the .cfg file, click the **Restore** button to upload the file to the modem router.

Upon completion, the modem router reboots.



WARNING:

Do not interrupt the reboot process.

Erase

Under some circumstances (for example, if you move the modem router to a different network or if you have forgotten the password), you might want to erase the configuration and restore the factory default settings.

Either press the **Restore Factory Settings** button on the back of the modem router (see [Factory Default Settings](#) on page 71) or click the **Erase** button in this screen.

Erase sets the user name to admin, the password to password, and the LAN IP address to 192.168.0.1, and enables the DHCP of the modem router.

Set Password

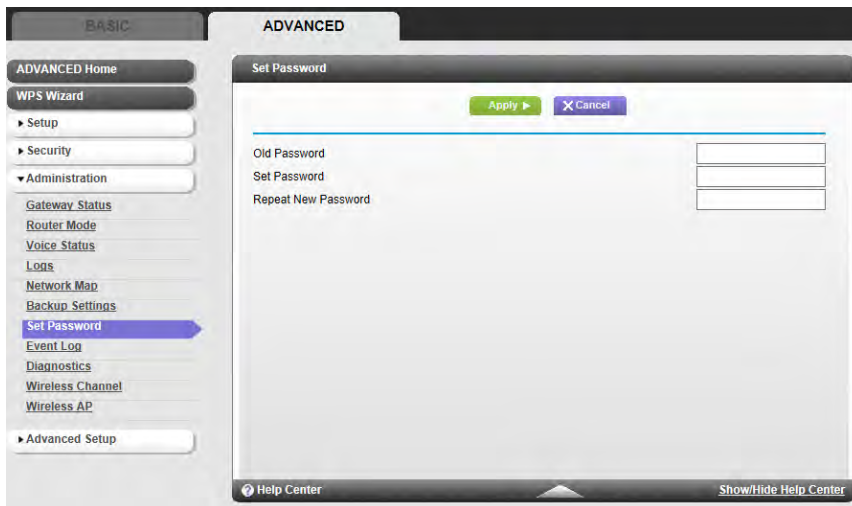
This feature allows you to change the default password that is used to log in to the modem router with the user name admin.

This modem router password is not the same as the password for wireless access. The label on the bottom of your modem router shows your unique wireless network name (SSID) and password for wireless access (see *Gateway Label* on page 10).

➤ **To set the password for the user name admin:**

1. From the Advanced tab, select **Administration > Set Password**.

The following screen displays.



2. Type the old password.
3. Type the new password in the Set Password field.
4. Type the new password in the Repeat New Password field.
5. Click the **Apply** button.

Your changes take effect.

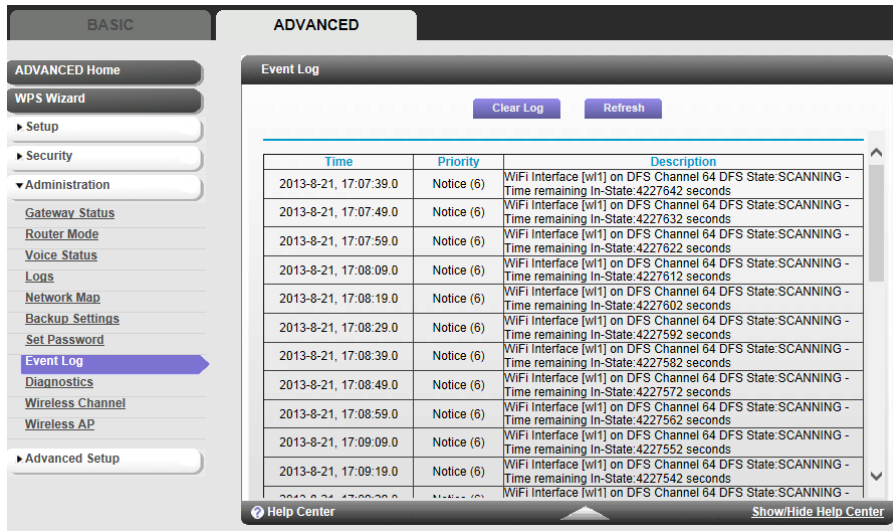
View Event Logs

Event logs capture important modem router events.

➤ **To view the event logs:**

From the Advanced tab, select **Administration > Event Log**.

The Event Logs screen displays.



The log screen shows the following information:

- **Time.** The time the event log entry was recorded.
- **Priority.** The severity for this event log entry.
- **Description.** A description of this event log entry.

To refresh the log screen, click the **Refresh** button.

To clear the log entries, click the **Clear Log** button.

Diagnostics

From the Diagnostics screen, you can run ping, traceroute, DS throughput, and US throughput utilities.

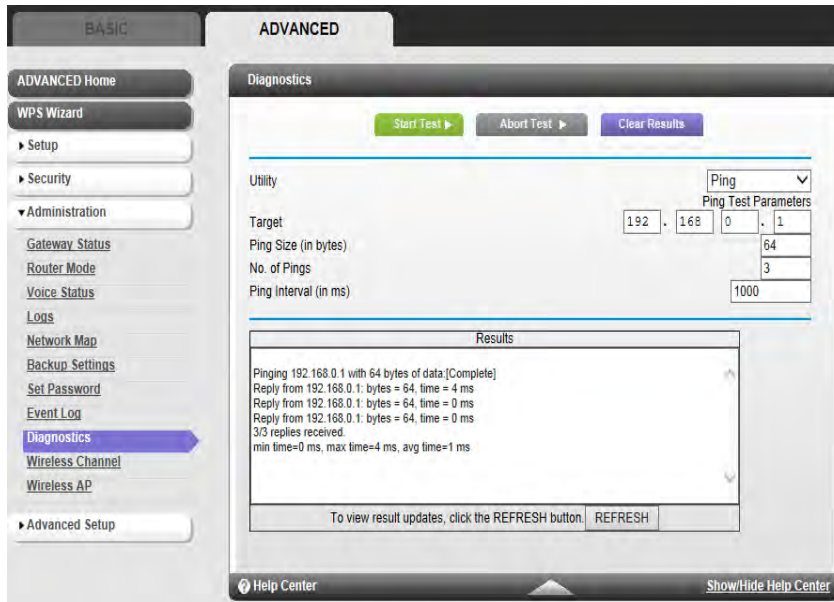
Ping Utility

Ping is an administration utility that tests whether a computer on the network is reachable and measures the time it takes messages sent from the originating device to reach a destination computer and return.

➤ **To run a ping test:**

1. From the Advanced tab, select **Administration > Diagnostics**.

The following screen displays.



2. In the Utility list, select **Ping**.
3. Specify the following parameters for the ping utility.
 - **Target.** The IP address of the ping target computer.
 - **Ping Size.** The size (in bytes) of the ping packet.
 - **No. of Pings.** The number of times to ping the target computer.
 - **Ping Interval.** The time between pings.
4. Click **Start Test**.

The ping results display.

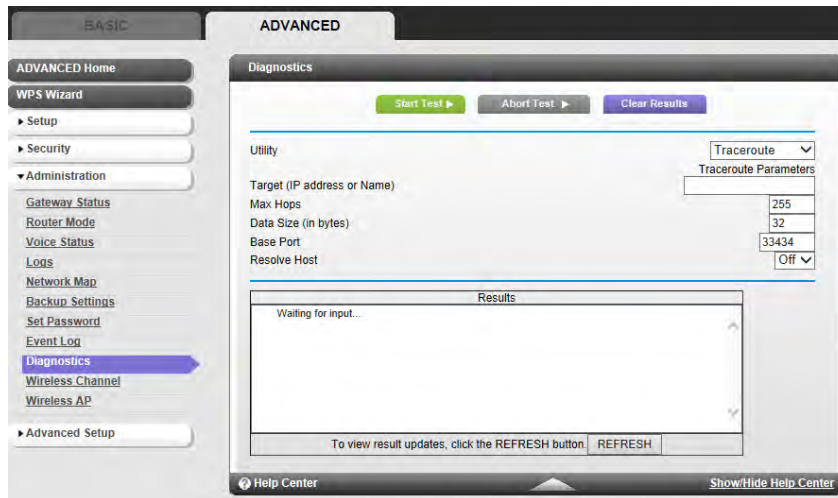
- **To stop a ping test:**
Click **Abort Test**.
- **To clear the results from the display:**
Click **Clear Results**.

Traceroute Utility

To display the route and measure transit delays of packets across an IP, run the traceroute utility.

- **To run a traceroute test:**
 1. From the Advanced tab, select **Administration > Diagnostics**.

The following screen displays.



2. In the Utility list, select **Traceroute**.
3. Specify the following parameters for the traceroute utility.
 - **Target.** The IP address or host name of the computer you are tracing.
 - **Max Hops.** The maximum number of hops to allow when tracing the route.
 - **Data Size.** The input the size (in bytes) of the packet.
 - **Base Port.** The port number to send the packet to.
 - **Resolve Host.** Select **on** to resolve the host name to the IP address.
4. Click **Start Test**.

The traceroute results display.

- **To clear the results from the display:**

Click **Clear Results**.

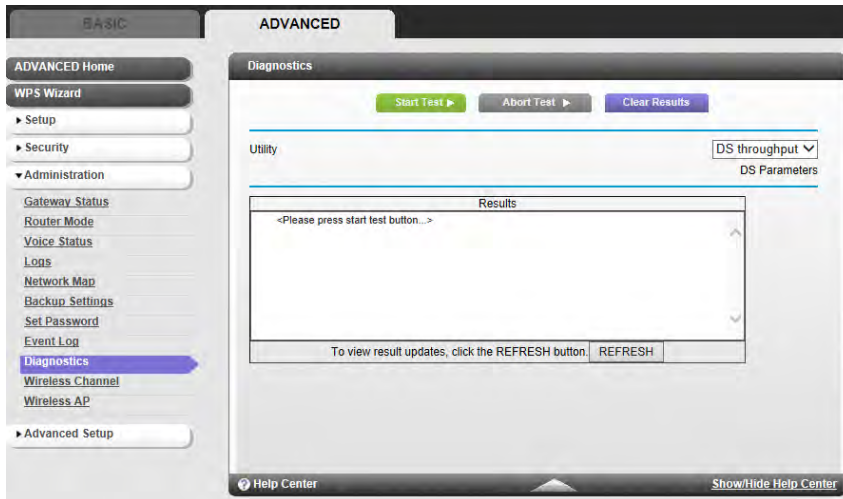
DS Throughput Utility

To display the ??????????????, run the DS throughput utility.

- **To run a DS throughput test:**

1. From the Advanced tab, select **Administration > Diagnostics**.

The following screen displays.



2. In the Utility list, select **DS throughput**.
3. Click **Start Test**.

The DS throughput results display.

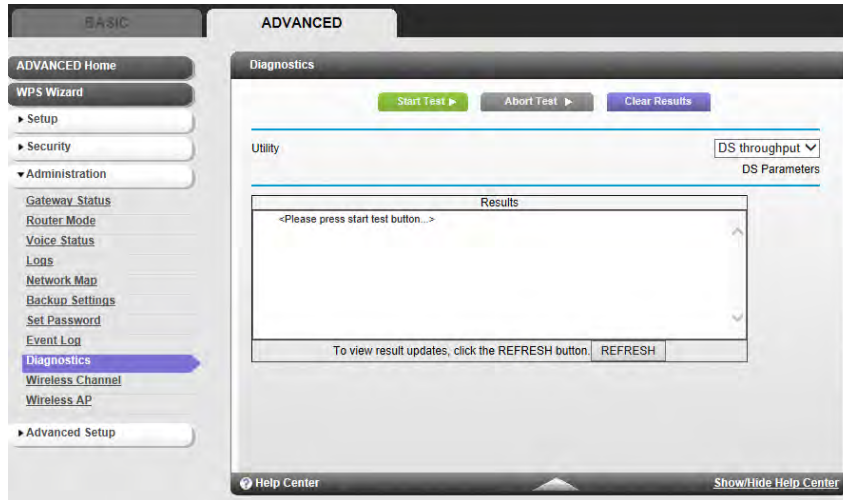
- **To clear the results from the display:**
Click **Clear Results**.

US Throughput Utility

To display the ????????????, run the US throughput utility.

- **To run a US throughput test:**
 1. From the Advanced tab, select **Administration > Diagnostics**.

The following screen displays.



2. In the Utility list, select **US throughput**.
3. Click **Start Test**.

The US throughput results display.

- **To clear the results from the display:**

Click **Clear Results**.

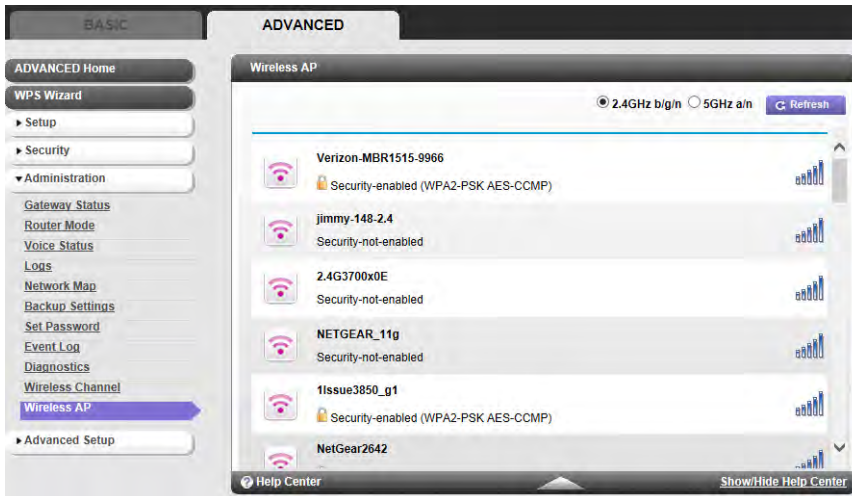
Wireless Channel

You can use the Wireless Channel screen to view wireless networks, or access points, in your area and to select and join a wireless network.

- **To manage your wireless access point (AP):**

From the Advanced tab, select **Administration > Wireless AP**.

The following screen displays:

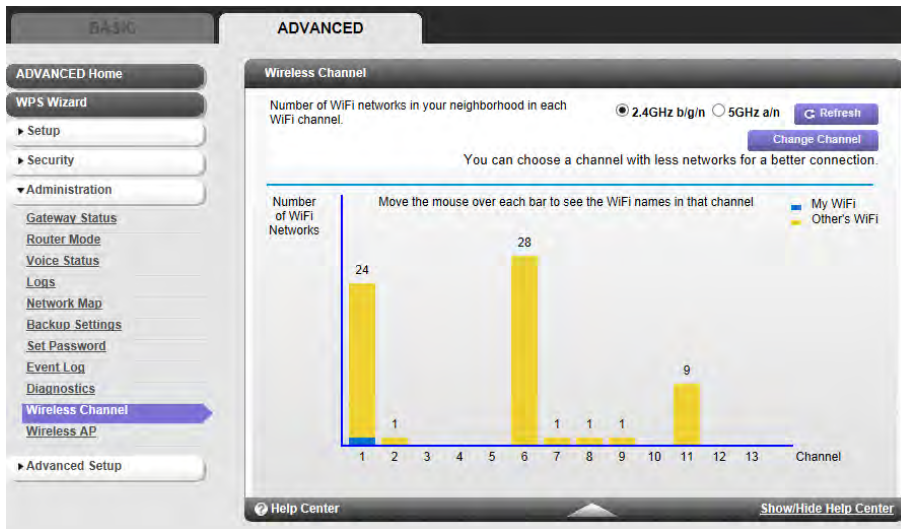


From this screen, you can view wireless access points in use in your area.

➤ **To check your Wireless channel:**

From the Advanced menu, select **Administration > Wireless Channel**.

The following screen displays:



Your network is shown in blue. Yellow shows other networks in your area. Many countries and geographic locations have laws or guidelines about which channels can be used. Depending on your location, some channels might not be available.

If many wireless networks at your location use the same channel as your wireless network, you might experience interference. You can change the channel to avoid the interference.

➤ **To change the wireless channel:**

To change the channel, click the **Change Channel** button.

6 Advanced Settings

6

Fine-tuning your network

This chapter describes the advanced features of your modem router. The information requires a solid understanding of networking concepts. It is for people who want to set up the modem router for unique situations such as when remote access from the Internet by IP or domain name is needed.

This chapter includes the following sections:

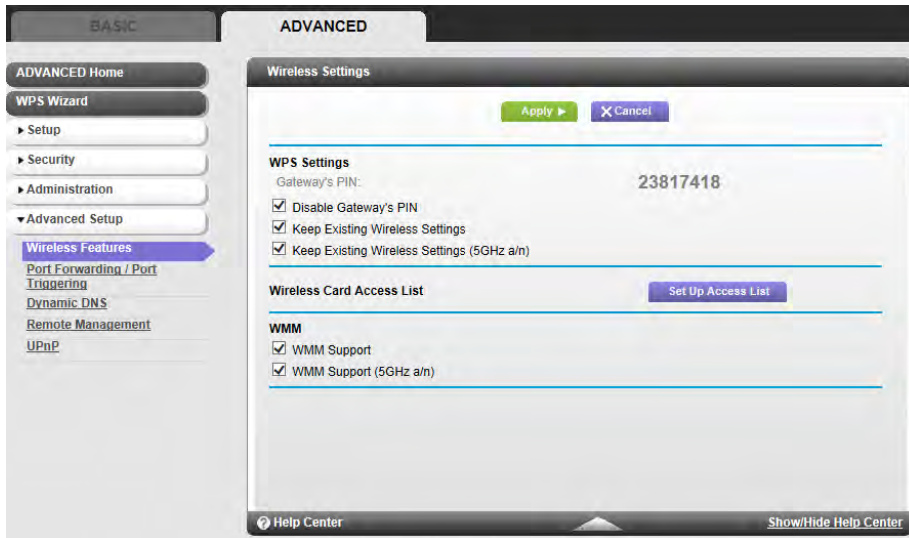
- *Advanced Wireless Settings*
- *Port Forwarding and Port Triggering*
- *Set Up Port Forwarding to Local Servers*
- *Set Up Port Triggering*
- *Dynamic DNS*
- *Remote Management*
- *Universal Plug and Play*

Advanced Wireless Settings

➤ To view the advanced wireless settings:

From the Advanced tab, select **Advanced Setup > Wireless Features**.

The following screen displays.



The following settings are available on this part of the screen:

- **Disable Gateway's PIN.** The PIN function might temporarily be disabled when the modem router detects suspicious attempts to break into the modem router's wireless settings by using the modem router's PIN through WPS. You can manually enable the PIN function by clearing the Disable Gateway's PIN check box.
- **Keep Existing Wireless Settings.** By default, the Keep Existing Wireless Settings check box is selected. NETGEAR recommends that you leave this check box selected.

If you clear this check box, the next time a new wireless client uses WPS to connect to the modem router, the modem router wireless settings change to an automatically generated random SSID and security key.

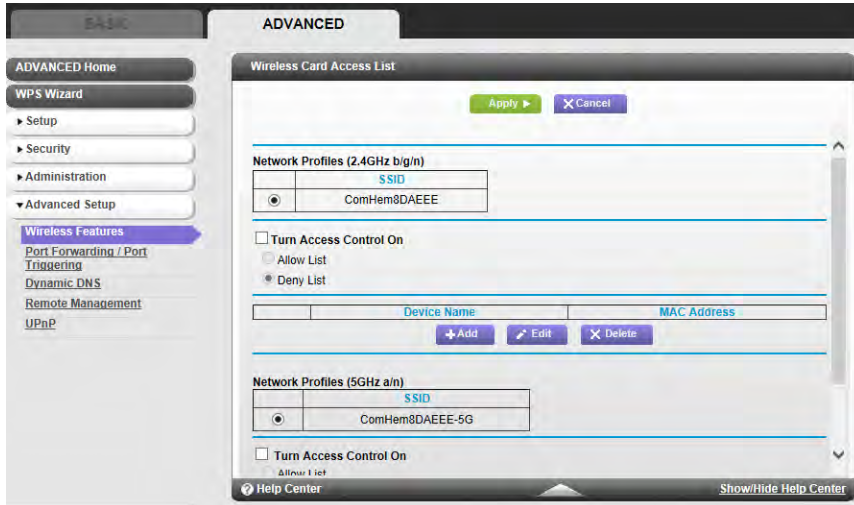
- **WMM Support.** WMM (Wireless Multimedia) is a subset of the 802.11e standard. WMM allows wireless traffic to have a range of priorities, depending on the kind of data. Time-dependent information, like video or audio, has a higher priority than normal traffic. For WMM to function properly, wireless clients must support WMM also.

Wireless Card Access List

By default, any wireless computer or device that is configured with the correct SSID is allowed access to your wireless network. For increased security, allow only specific wireless computers and devices to access the wireless network based on their MAC addresses.

➤ To set up wireless card access:

1. From the Advanced tab, select **Advanced Setup > Wireless Features**.
2. Click the **Set Up Access List** button.

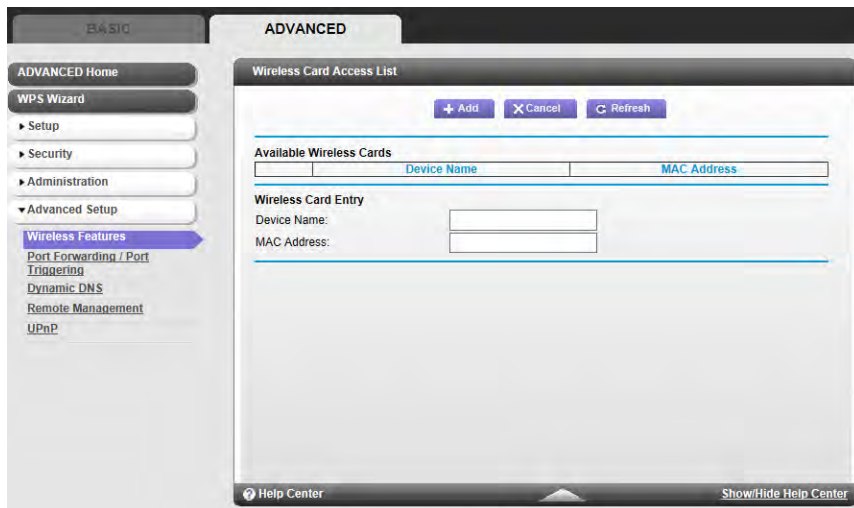


3. Select the **Turn Access Control On** check box.

If the Turn Access Control On check box is selected, and the access control list is blank, then no wireless computers or devices can connect to your wireless network.

4. To add computers or devices to the access list, click the **Add** button.

The Wireless Card Access Setup screen displays.



This screen displays a list of currently active wireless computers and devices and their Ethernet MAC addresses.

5. If the wireless computer or device you want displays in the list, click its radio button to capture its MAC address. Otherwise, type its MAC address. The MAC address is found on the computer or device.
6. If no device name displays, type a descriptive name for the computer or device that you are adding.
7. Click the **Add** button.
The Wireless Card Access List screen displays.
8. Click the **Apply** button.

Port Forwarding and Port Triggering

By default, the modem router blocks inbound traffic from the Internet to your computers except for replies to your outbound traffic. Create exceptions to this rule for these purposes:

- To allow remote computers on the Internet to access a server on your local network.
- To allow certain applications and games to work correctly when your modem router does not recognize their replies.

Your modem router provides two features for creating these exceptions: port forwarding and port triggering. The next sections provide background information to help you understand how port forwarding and port triggering work, and the differences between the two.

Remote Computer Access Basics

When a computer on your network accesses a computer on the Internet, your computer sends your modem router a message containing the source and destination address and process information. Before forwarding your message to the remote computer, your modem router must modify the source information and create and track the communication session so that replies can be routed back to your computer.

Here is an example of normal outbound traffic and the resulting inbound responses:

1. You open a browser, and your operating system assigns port number 5678 to this browser session.
2. You type `http://www.example.com` into the URL field, and your computer creates a web page request message with the following address and port information. The request message is sent to your modem router.

Source address. The IP address of your computer.

Source port number. 5678, which is the browser session.

Destination address. The IP address of `www.example.com`, which your computer finds by asking a DNS server.

Destination port number. 80, which is the standard port number for a web server process.

3. Your modem router creates an entry in its internal session table describing this communication session between your computer and the web server at www.example.com. Before sending the web page request message to www.example.com, your modem router stores the original information and then modifies the source information in the request message, performing Network Address Translation (NAT):
 - The source address is replaced with the public IP address of your modem router. This step is necessary because your computer uses a private IP address that is not globally unique and cannot be used on the Internet.
 - The source port number is changed to a number that is chosen by the modem router, such as 33333. This step is necessary because two computers could independently be using the same session number.

Your modem router then sends this request message through the Internet to the web server at www.example.com.

4. The web server at www.example.com composes a return message with the requested web page data. The return message contains the following address and port information. The web server then sends this reply message to your modem router.

Source address. The IP address of www.example.com.

Source port number. 80, which is the standard port number for a web server process.

Destination address. The public IP address of your modem router.

Destination port number. 33333.

5. Upon receiving the incoming message, your modem router checks its session table to determine whether there is an active session for port number 33333. Finding an active session, the modem router then modifies the message to restore the original address information that is replaced by NAT. Your modem router sends this reply message to your computer, which displays the web page from www.example.com. The message now contains the following address and port information.

Source address. The IP address of www.example.com.

Source port number. 80, which is the standard port number for a web server process.

Destination address. The IP address of your computer.

Destination port number. 5678, which is the browser session that made the initial request.

6. When you finish your browser session, your modem router eventually detects a period of inactivity in the communications. Your modem router then removes the session information from its session table, and incoming traffic is no longer accepted on port number 33333.

Port Triggering to Open Incoming Ports

In the preceding example, requests are sent to a remote computer by your modem router from a particular service port number, and replies from the remote computer to your modem router are directed to that port number. If the remote server sends a reply to a different port number, your modem router does not recognize it and discards it. However, some application

servers (such as FTP and IRC servers) send replies to multiple port numbers. Using the port triggering function of your modem router, you can tell the modem router to open more incoming ports when a particular outgoing port originates a session.

An example is Internet Relay Chat (IRC). Your computer connects to an IRC server at destination port 6667. The IRC server not only responds to your originating source port, but also sends an “identify” message to your computer on port 113. Using port triggering, you can tell the modem router, “When you initiate a session with destination port 6667, you must allow incoming traffic also on port 113 to reach the originating computer.” Using steps similar to the preceding example, the following sequence shows the effects of the port triggering rule you have defined:

1. You open an IRC client program to start a chat session on your computer.
2. Your IRC client composes a request message to an IRC server using a destination port number of 6667, the standard port number for an IRC server process. Your computer then sends this request message to your modem router.
3. Your modem router creates an entry in its internal session table describing this communication session between your computer and the IRC server. Your modem router stores the original information, performs Network Address Translation (NAT) on the source address and port, and sends this request message through the Internet to the IRC server.
4. Noting your port triggering rule and having observed the destination port number of 6667, your modem router creates an additional session entry to send any incoming port 113 traffic to your computer.
5. The IRC server sends a return message to your modem router using the NAT-assigned source port (as in the previous example, say port 33333) as the destination port. The IRC server also sends an identify message to your modem router with destination port 113.
6. Upon receiving the incoming message to destination port 33333, your modem router checks its session table to determine whether there is an active session for port number 33333. Finding an active session, the modem router restores the original address information that is replaced by NAT and sends this reply message to your computer.
7. Upon receiving the incoming message to destination port 113, your modem router checks its session table and learns that there is an active session for port 113, associated with your computer. The modem router replaces the destination IP address of the message with the IP address of your computer and forwards the message to your computer.
8. When you finish your chat session, your modem router eventually senses a period of inactivity in the communications. The modem router then removes the session information from its session table, and incoming traffic is no longer accepted on ports 33333 or 113.

To configure port triggering, you need to know which inbound ports the application needs. Also, you need to know the number of the outbound port that triggers the opening of the inbound ports. You can usually determine this information by contacting the publisher of the application or user groups or newsgroups.

Note: Only one computer at a time can use the triggered application.

Port Forwarding to Permit External Host Communications

In both of the preceding examples, your computer initiates an application session with a server computer on the Internet. However, you need to allow a client computer on the Internet to initiate a connection to a server computer on your network. Normally, your modem router ignores any inbound traffic that is not a response to your own outbound traffic. You can configure exceptions to this default rule by using the port forwarding feature.

A typical application of port forwarding can be shown by reversing the client-server relationship from the previous web server example. In this case, a browser on a remote computer accesses a web server running on a computer in your local network. Using port forwarding, you can tell the modem router, “When you receive incoming traffic on port 80 (the standard port number for a web server process), forward it to the local computer at 192.168.0.123.” The following sequence shows the effects of the port forwarding rule you have defined:

1. The user of a remote computer opens a browser and requests a web page from `www.example.com`, which resolves to the public IP address of your modem router. The remote computer composes a web page request message with the following destination information:

Destination address. The IP address of `www.example.com`, which is the address of your modem router.

Destination port number. 80, which is the standard port number for a web server process.

The remote computer then sends this request message through the Internet to your modem router.

2. Your modem router receives the request message and looks in its rules table for any rules covering the disposition of incoming port 80 traffic. Your port forwarding rule specifies that incoming port 80 traffic is forwarded to local IP address 192.168.0.123. Therefore, your modem router modifies the destination information in the request message:

The destination address is replaced with 192.168.0.123.

Your modem router then sends this request message to your local network.

3. Your web server at 192.168.0.123 receives the request and composes a return message with the requested web page data. Your web server then sends this reply message to your modem router.
4. Your modem router performs Network Address Translation (NAT) on the source IP address, and sends this request message through the Internet to the remote computer, which displays the web page from `www.example.com`.

To configure port forwarding, you need to know which inbound ports the application needs. Usually you can determine this information by contacting the publisher of the application or the relevant user groups and newsgroups.

How Port Forwarding Differs from Port Triggering

The following points summarize the differences between port forwarding and port triggering:

- Port triggering is used by any computer on your network, although only one computer can use it at a time.
- Port forwarding is configured for a single computer on your network.
- Port triggering requires specific outbound traffic to open the inbound ports, and the triggered ports are closed after a period of no activity.
- Port forwarding is always active and is never triggered.

Set Up Port Forwarding to Local Servers

Using the port forwarding feature, you can allow certain types of incoming traffic to reach servers on your local network. For example, you want to make a local web server, FTP server, or game server visible and available to the Internet.

Use the Port Forwarding/Port Triggering screen to configure the modem router to forward specific incoming protocols to computers on your local network. In addition to servers for specific applications, you can also specify a default DMZ server to which all other incoming protocols are forwarded.

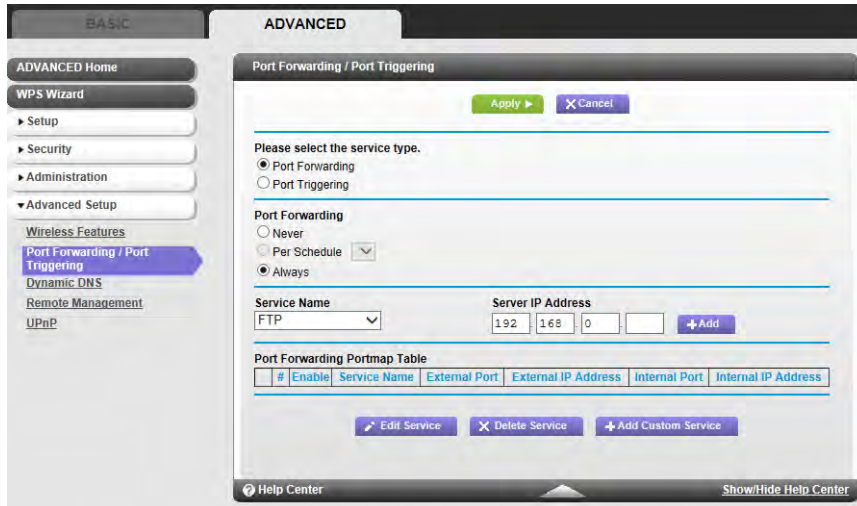
Before starting, you determine which type of service, application, or game you want to provide, and the local IP address of the computer that provides the service. The server computer always must have the same IP address.

➤ To set up port forwarding:

Tip: To ensure that your server computer always has the same IP address, use the reserved IP address feature of your wireless cable gateway.

1. From the Advanced tab, select **Advanced Setup > Port Forwarding/Port Triggering**.

The following screen displays:



Port Forwarding is selected as the service type.

2. From the Service Name list, select the service or game that you host on your network. If the service does not display in the list, see [Add a Custom Service](#) on page 56.
3. In the corresponding Server IP Address field, enter the last digit of the IP address of your local computer that provides this service.
4. Click **Add**. The service displays in the list in the screen.

Add a Custom Service

To define a service, game, or application that does not display in the Service Name list, determine which port number or range of numbers the application uses. You can usually determine this information by contacting the publisher of the application or user groups or newsgroups.

➤ To add a custom service:

1. From the Advanced tab, select **Advanced Setup > Port Forwarding/Port Triggering**.
2. Select **Port Forwarding** as the service type.
3. Click the **Add Custom Service** button.

The following screen displays:

4. In the Service Name field, enter a descriptive name.
5. In the Protocol list, select the protocol. If you are unsure, select **TCP/UDP**.
6. In the Starting Port fields, enter the beginning port number.
 - If the application uses a single port, enter the same port number in the Ending Port field.
 - If the application uses a range of ports, enter the ending port number of the range in the Ending Port field.
7. In the Internal IP Address field, enter the IP address of your local computer that provides this service.
8. Click the **Apply** button.

The service displays in the list in the Port Forwarding/Port Triggering screen.

Edit or Delete a Port Forwarding Entry

➤ To edit or delete a port forwarding entry:

1. In the table, select the radio button next to the service name.
2. Click **Edit Service** or **Delete Service**.

Application example: Making a Local Web Server Public

If you host a web server on your local network, you can use port forwarding to allow web requests from anyone on the Internet to reach your web server.

➤ To make a local web server public:

1. Assign your web server either a fixed IP address or a dynamic IP address using DHCP address reservation. In this example, your modem router always gives your web server an IP address of 192.168.0.33.

2. In the Port Forwarding/Port Triggering screen, configure the modem router to forward the HTTP service to the local address of your web server at **192.168.0.33**. HTTP (port 80) is the standard protocol for web servers.
3. (Optional) Register a host name with a Dynamic DNS service, and configure your modem router to use the name as described in *Dynamic DNS* on page 60. To access your web server from the Internet, a remote user must know the IP address that your ISP assigns. However, if you use a Dynamic DNS service, the remote user can reach your server by a user-friendly Internet name, such as mynetgear.dyndns.org.

Set Up Port Triggering

Port triggering is a dynamic extension of port forwarding that is useful in these cases:

- More than one local computer needs port forwarding for the same application (but not simultaneously).
- An application opens incoming ports that are different from the outgoing port.

When port triggering is enabled, the modem router monitors outbound traffic looking for a specified outbound “trigger” port. When the modem router detects outbound traffic on that port, it remembers the IP address of the local computer that sent the data. The modem router then temporarily opens the specified incoming port or ports, and forwards incoming traffic on the triggered ports to the triggering computer.

While port forwarding creates a static mapping of a port number or range to a single local computer, port triggering can dynamically open ports to any computer that needs them and can close the ports when they are no longer needed.

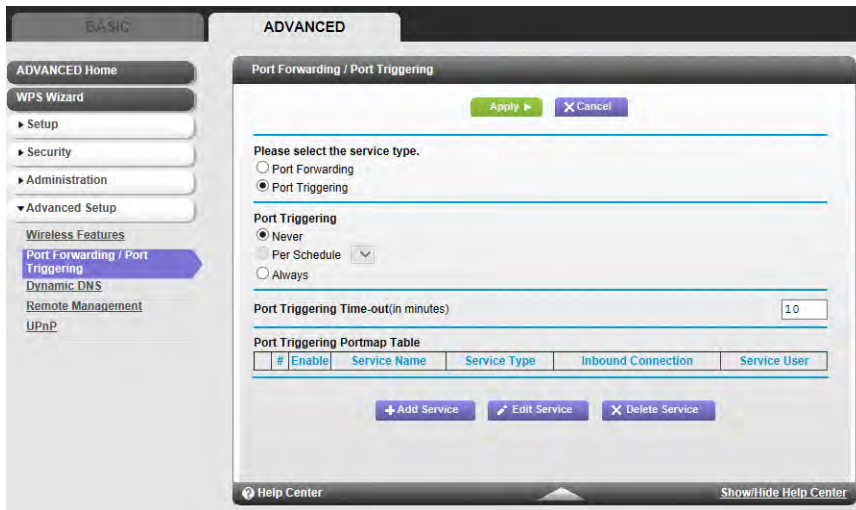
Note: If you use applications such as multiplayer gaming, peer-to-peer connections, real-time communications such as instant messaging, or remote assistance (a feature in Windows XP), enable Universal Plug and Play (UPnP) according to the instructions in *Remote Management* on page 61.

To set up port triggering, you need to know which inbound ports the application needs. Also, you need to know the number of the outbound port that triggers the opening of the inbound ports. You can usually determine this information by contacting the publisher of the application or user groups or newsgroups.

➤ **To set up port triggering:**

1. From the Advanced tab, select **Advanced Setup > Port Forwarding/Port Triggering**.

2. Select the **Port Triggering** radio button.

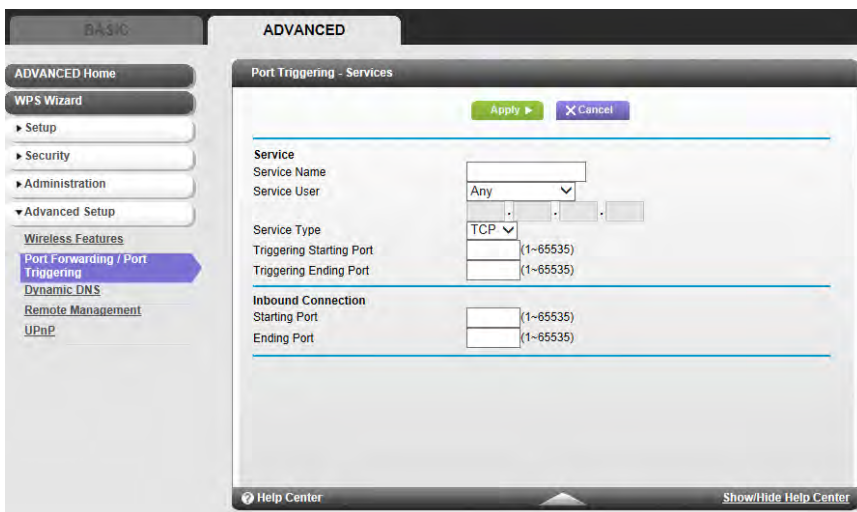


3. Clear the **Disable Port Triggering** check box if it is selected.

Note: If the *Disable Port Triggering* check box is selected after you configure port triggering, port triggering is disabled. However, any port triggering configuration information you added to the modem router is retained even though it is not used.

4. In the Port Triggering Time-out field, enter a value up to 9999 minutes.
5. This value controls the inactivity timer for the designated inbound ports. The inbound ports close when the inactivity time expires. This step is required because the modem router cannot be sure when the application has terminated.
6. Click the **Add Service** button.

The following screen displays:



7. In the Service Name field, type a descriptive service name. No spaces are allowed for the service name field.
8. In the Service User list, select **Any** (the default) to allow any computer on the Internet to use this service. Otherwise, select **Single address**, and enter the IP address of one computer to restrict the service to a particular computer.
9. Select the service type, either **TCP** or **UDP** or both (**TCP/UDP**). If you are not sure, select TCP/UDP.
10. In the Triggering Port field, enter the number of the outbound traffic port that causes the inbound ports open.
11. Enter the inbound connection port information in the Connection Type, Starting Port, and Ending Port fields.
12. Click the **Apply** button.

The service displays in the Port Triggering Portmap table.

Dynamic DNS

If your Internet service provider (ISP) gave you 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 do not know in advance what your IP address is, and the address can change frequently. In this case, you can use a commercial Dynamic DNS service. This type of service lets you register your domain to their IP address and forwards traffic directed at your domain to your frequently changing IP address.

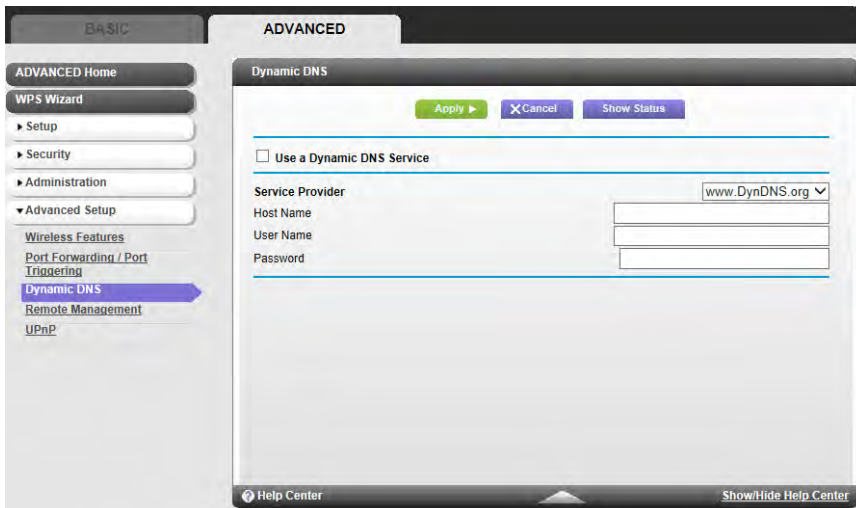
If your ISP assigns a private WAN IP address (such as 192.168.x.x or 10.x.x.x), the Dynamic DNS service does not work because private addresses are not routed on the Internet.

Your modem router contains a client that can connect to the Dynamic DNS service that DynDNS.org provided. First visit their website at <http://www.dyndns.org> and obtain an account and host name that you configure in the modem router. Then, whenever your ISP-assigned IP address changes, your modem router automatically contacts the Dynamic DNS service provider, logs in to your account, and registers your new IP address. If your host name is hostname, for example, you can reach your modem router at <http://hostname.dyndns.org>.

➤ To set up Dynamic DNS:

1. From the Advanced tab, select **Advanced Setup > Dynamic DNS**.

The following screen displays:



2. Register for an account with one of the Dynamic DNS service providers whose names display in the Service Provider list.
3. Select the **Use a Dynamic DNS Service** check box.
4. Select the name of your Dynamic DNS service provider. If your Dynamic DNS service provider is DynDNS.org, for example, select **www.dyndns.org**.
5. Type the host name (or domain name) that your Dynamic DNS service provider gave you.
6. Type the user name for your Dynamic DNS account. This name is the name that you use to log in to your account, not your host name.
7. Type the password (or key) for your Dynamic DNS account.
8. Click the **Apply** button.

Your configuration is saved.

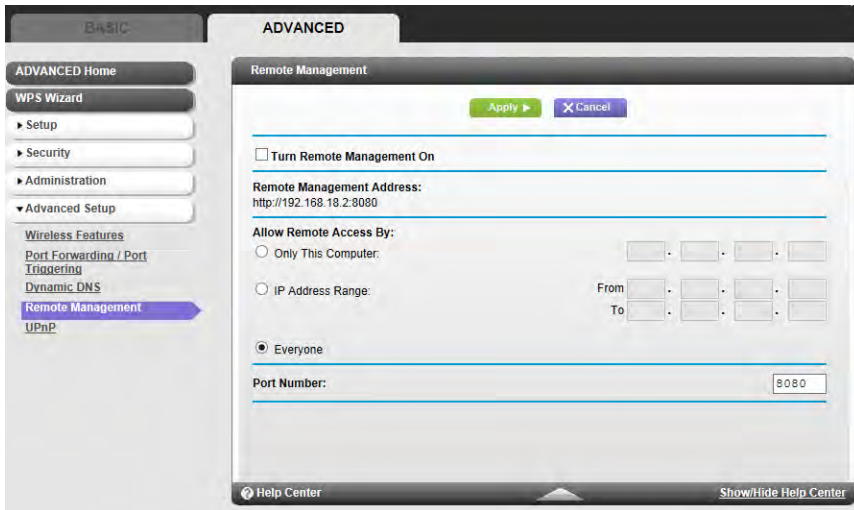
Remote Management

The remote management feature lets you access your modem router over the Internet to view or change its settings.

Note: Be sure to change the modem router default login password to a secure password. The ideal password contains no dictionary words from any language and contains uppercase and lowercase letters, numbers, and symbols. It can be up to 30 characters. See [Set Password](#) on page 41.

➤ **To set up remote management:**

1. From the Advanced tab, select **Advanced Setup > Remote Management**.



2. Select the **Turn Remote Management On** check box.
3. Under Allow Remote Access By, specify the external IP addresses to be allowed to access the modem router's remote management.

Note: For enhanced security, restrict access to as few external IP addresses as practical.

- To allow access from a single IP address on the Internet, select **Only This Computer**. Enter the IP address that will be allowed access.
 - To allow access from a range of IP addresses on the Internet, select **IP Address Range**. To define the allowed range, enter a beginning and ending IP address.
 - To specify IP addresses, select **IP Address List** and type in the allowed IP addresses.
 - To allow access from any IP address on the Internet, select **Everyone**.
4. Specify the port number for accessing the web management interface.
Normal web browser access uses the standard HTTP service port 80. For greater security, enter a custom port number for the remote web management interface. Choose a number from 1024 to 65535, but do not use the number of any common service port. The default is 8080, which is a common alternate for HTTP.
 5. Click the **Apply** button.
Your changes take effect.
 6. When you access your modem router from the Internet, type your modem router's WAN IP address into your browser's address or location field 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 **http://134.177.0.123:8080** in your browser.

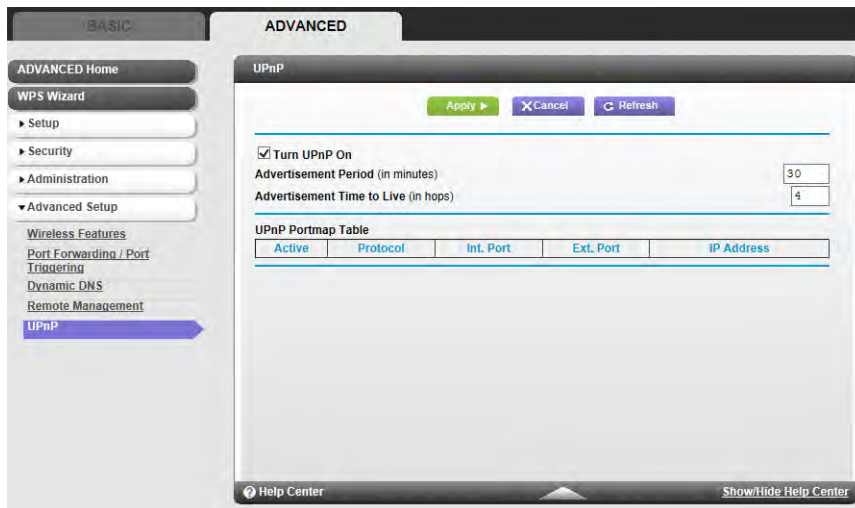
Universal Plug and Play

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

Note: If you use applications such as multiplayer gaming, peer-to-peer connections, or real-time communications such as instant messaging or remote assistance (a feature in Windows XP), enable UPnP.

➤ To turn on Universal Plug and Play:

1. From the Advanced tab, select **Advanced Setup > UPnP**.



2. Specify the following settings:

Turn UPnP On. UPnP can be enabled or disabled for automatic device configuration. The default setting for UPnP is enabled. If this check box is not selected, the modem router does not allow any device to control the resources automatically, such as port forwarding (mapping) of the modem router.

Advertisement Period. The advertisement period is how often the modem router broadcasts its UPnP information. This value can range from 1 to 1440 minutes. The default period is 30 minutes. Shorter durations ensure that control points have current device status at the expense of more network traffic. Longer durations can compromise the freshness of the device status, but can significantly reduce network traffic.

Advertisement Time to Live. The time to live for the advertisement is measured in hops (steps) for each UPnP packet sent. The time to live hop count is the number of steps a broadcast packet is allowed to propagate for each UPnP advertisement before it disappears. The number of hops can range from 1 to 255. The default value for the advertisement time to live is four hops, which are fine for most home networks. If you notice that some devices are not being updated or reached correctly, you should increase this value.

UPnP Portmap Table. The UPnP Portmap Table displays the IP address of each UPnP device that is accessing the modem router and which ports (internal and external) that device has opened. The UPnP Portmap Table also displays what type of port is open and whether that port is still active for each IP address.

3. Click the **Apply** button.

Your settings are saved.

7 Troubleshooting

7

Find and fix common issues

This chapter gives information about troubleshooting your C3000 WiFi Cable Modem Router. For the common problems listed, go to the section indicated.

- Have I connected the modem router correctly?
Go to *Basic Functions* on page 65.
- I cannot access the modem router configuration with my browser.
Go to *Cannot Log In to the Modem Router* on page 66.
- I have configured the modem router but I cannot access the Internet.
Go to *Troubleshoot the ISP Connection* on page 67.
- I cannot remember the configuration password of the modem router or I want to clear the configuration and start over again.
Go to *Factory Default Settings* on page 71.

Tip: NETGEAR provides helpful articles, documentation, and the latest software updates at support.netgear.com.

Basic Functions

After you have turned on power to the modem router, do the following:

1. Check to see that the Power LED is on.
2. Check that the numbered Ethernet LEDs come on momentarily.
3. After a few seconds, check that the local port link LEDs are lit for any local ports that are connected.

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

Using LEDs to Troubleshoot

The following table provides help when using the LEDs for troubleshooting.

LED Behavior	Action
All LEDs are off when the modem router is plugged in.	<p>Make sure that the power cord is properly connected to your modem router and that the power supply adapter is properly connected to a functioning power outlet.</p> <p>Check that you are using the 12V DC power adapter from NETGEAR for this product.</p> <p>If the error persists, you have a hardware problem. Contact technical support.</p>
All LEDs stay on.	<ul style="list-style-type: none"> • Clear the configuration of the modem router to its factory defaults. This operation sets the IP address of the modem router to 192.168.0.1. See Factory Default Settings on page 71. • If the error persists, you have a hardware problem. Contact technical support.
LAN LED is off for a port with an Ethernet connection.	<ul style="list-style-type: none"> • Make sure that the Ethernet cable connections are secure at the modem router and at the hub or computer. • Make sure that power is turned on to the connected hub or computer. • Be sure that you are using the correct cable.
Internet LED is off and the modem router is connected to the cable television cable.	<ul style="list-style-type: none"> • Make sure that the coaxial cable connections are secure at the modem router and at the wall jack. • Make sure that your cable Internet service has been provisioned by your cable service provider. Your provider can verify that the signal quality is good enough for gateway service. • Remove any excessive splitters that you have on your cable line. Run a “home run” back to the point where the cable enters your home.

Cannot Log In to the Modem Router

If you are unable to access the modem router from a computer on your local network, check the following:

- Check the Ethernet connection between the computer and the modem router as described in the previous section.
- Make sure that your IP address of your computer is on the same subnet as the modem router. If you are using the recommended addressing scheme, the address of your computer is in the range of 192.168.0.10 to 192.168.0.254.

Note: If the IP address of your computer is shown as 169.254.x.x: Recent versions of Windows and Mac OS generate and assign an IP address when the computer cannot reach a DHCP server. These autogenerated 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 modem router and reboot your computer.

- If the IP address of your modem router has been changed and you do not know the current IP address, clear the configuration of the modem router to its factory defaults. This operation sets the IP address of the modem router to 192.168.0.1. This procedure is explained in *Factory Default Settings* on page 71.
- Make sure that your browser has Java, JavaScript, or ActiveX enabled. If you are using Internet Explorer, click **Refresh** to make sure that the Java applet is loaded.
- Try quitting the browser and launching it again.
- Make sure that you are using the correct login information. The modem router user name **euskaltel** is lower-case (**Caps Lock** is off). The default password of **euskaltel**.

If the modem router does not save changes you have made, check the following:

- When entering configuration settings, be sure to click the **Apply** button before moving to another screen, or your changes are lost.
- Click the **Refresh** or **Reload** button in the web browser. The changes have occurred, but the web browser might be caching the old configuration.

Troubleshoot the ISP Connection

When your modem router is unable to access the Internet and your Internet LED is on, register the cable MAC address or device MAC address of your modem router with your cable service provider.

Additionally, your computer does not have the modem router that is configured as its TCP/IP gateway. If your computer obtains its information from the modem router by DHCP, reboot the computer and verify the gateway address.

Troubleshoot a TCP/IP Network Using a 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. You can easily troubleshoot a TCP/IP network by using the ping utility in your computer or workstation.

Test the LAN Path to Your Gateway

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

➤ **To ping the modem 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 that is provided, type **ping** and then the IP address of the modem router, as in this example:

```
ping 192.168.0.1
```

3. Click **OK**.

You 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 working correctly, you could have one of the following problems:

- Wrong physical connections.
 - Make sure that the LAN port LED is on. If the LED is off, see [Using LEDs to Troubleshoot](#) on page 66.
 - Check the corresponding link LEDs are on for your network interface card and the hub ports (if any) that are connected to your workstation and modem router.
- Wrong network configuration.
 - Verify that the Ethernet card driver software and TCP/IP software are both installed and configured on your computer or workstation.
 - Verify that the IP address for your modem router and your workstation are correct and that the addresses are on the same subnet.

Test the Path from Your Computer to a Remote Device

After verifying that the LAN path works correctly, test the path from your computer 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 the DNS server of your ISP.

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

- Check that your computer has the IP address of your modem router is listed as the default gateway. If the IP configuration of your computer is assigned by DHCP, this

information is not visible in the Network Control Panel of your computer. Verify that the IP address of the modem router is listed as the default gateway.

- Check that the network address of your computer (the portion of the IP address specified by the netmask) is different from the network address of the remote device.
- Check that your Internet LED is on.
- If your ISP assigned a host name to your computer, enter that host name as the account name in the Basic Settings screen.

Wireless Performance and Modem Router Location

The range of your wireless connection can vary based on the physical placement of the modem router. The latency, data throughput performance, and notebook power consumption of wireless adapters also vary depending on your configuration choices.

For best results, place your modem router according to the following guidelines:

- Near the center of the area in which your computers 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, microwave ovens, and 2.4-GHz cordless phones.
- Away from large metal surfaces.
- To reduce interference when using more than one access point, NETGEAR recommends using 5 channel spacing between adjacent access points (for example, use Channels 1 and 6, or 6 and 11).

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

A. Supplemental Information



This appendix includes the following sections.

- *Factory Default Settings*
- *Technical Specifications*

Factory Default Settings

To return the modem router to its factory settings, press and hold the **Restore Factory Settings** button for over 7 seconds. The modem router resets and returns to the factory configuration settings shown in the following table.

Factory Default Settings		
Gateway login	User login URL	http://192.168.0.1
	User name and password (case-sensitive)	admin / password
Local network (LAN)	LAN IP	192.168.0.1
	Subnet mask	255.255.255.0
	DHCP server	Enabled
	DHCP starting IP address	192.168.0.2
	DHCP ending IP address	192.168.0.254
Firewall	Inbound communication from the Internet	Disabled (except traffic on port 80, the HTTP port)
	Outbound communication to the Internet	Enabled (all)
	Source MAC filtering	Disabled
Internet connection	WAN MAC address	Use default hardware address
Wireless	Wireless communication	Enabled
	SSID name	As shown on the product label
	Security	WPA/WPA2. The default WPA/WPA2 passphrase is on the product label.
	Broadcast SSID	Enabled

Factory Default Settings (continued)		
Wireless (continued)	Transmission speed	Auto*
	Country/region	United States in the US; otherwise varies by region
	RF channel	Auto
	Operating mode	n, g, and b
	Data rate	Best
	Output power	Full
	Access point	Enabled
	Authentication type	Open System
	Wireless card access list	All wireless stations allowed

*. Maximum wireless signal rate derived from IEEE Standard 802.11 specifications. Actual throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, may lower actual data throughput rate.

Technical Specifications

The following table describes the technical specifications for the modem router.

Technical Specifications	
Network protocol and standards compatibility	Data and routing protocols: TCP/IP, DHCP server and client, DNS relay, NAT (many-to-one), TFTP client, VPN passthrough (IPSec, PPTP)
Power adapter	<ul style="list-style-type: none"> North America: 120V, 60 Hz, input All regions (output): 12V DC @ 1.5A output 18W maximum
Physical specifications	<ul style="list-style-type: none"> Dimensions: 7.60 x 4.45 x 1.63 in. (193.04 x 113.03 x 41.40 mm) Weight: 0.775 lb (0.352 kg)
Environmental	<ul style="list-style-type: none"> Operating temperature: -22° to 122°F (-30° to 50°C) Operating humidity: 90% maximum relative humidity, noncondensing Electromagnetic emissions: Meets requirements of: FCC Part 15 Class B.
Interface	Local: 10BASE-T, 100/1000BASE-Tx, RJ-45 802.11n/g/b
	Internet: DOCSIS 3.0. Downward compatible with DOCSIS 2.0, 1.1 and 1.0

B Notification of Compliance



NETGEAR dual band - wireless

Regulatory Compliance Information

This section includes user requirements for operating this product in accordance with National laws for usage of radio spectrum and operation of radio devices. Failure of the end-user to comply with the applicable requirements may result in unlawful operation and adverse action against the end-user by the applicable National regulatory authority.

This product's firmware limits operation to only the channels allowed in a particular Region or Country. Therefore, all options described in this user's guide may not be available in your version of the product.

Europe – EU Declaration of Conformity

Products bearing the **CE** marking comply with the following EU directives:

- EMC Directive 2004/108/EC
- Low Voltage Directive 2006/95/EC

If this product has telecommunications functionality, it also complies with the requirements of the following EU Directive:

- R&TTE Directive 1999/5/EC

Compliance with these directives implies conformity to harmonized European standards that are noted in the EU Declaration of Conformity.

For indoor use only. Valid in all EU member states, EFTA states, and Switzerland.

This device may not be used for setting up outdoor radio links in France and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 - 2483.5 MHz. For detailed information the end-user should contact the national spectrum authority in France.

FCC Requirements for Operation in the United States

FCC Information to User

This product does not contain any user serviceable components and is to be used with approved antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals.

FCC Guidelines for Human Exposure

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

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

FCC Declaration of Conformity

We, NETGEAR, Inc., 350 East Plumeria Drive, San Jose, CA 95134, declare under our sole responsibility that the C3000 WiFi Cable Modem Router complies with Part 15 Subpart B of FCC CFR47 Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

FCC Radio Frequency Interference Warnings & Instructions

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 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 methods:

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

FCC Caution

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- 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.
- For product available in the USA and Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.
- Pour les produits disponibles aux États-Unis / Canada du marché, seul le canal 1 à 11 peuvent être exploités. Sélection d'autres canaux n'est pas possible.
- This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.
- Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (C3000 WiFi Cable Modem Router) does not exceed the Class B limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

CAN ICES-3 (B)/NMB-3(B)

Industry Canada

This device complies with RSS-210 of the Industry Canada 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.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

The device could automatically discontinue transmission in case of absence of information to transmit, or operational failure. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

Le dispositif pourrait automatiquement cesser d'émettre en cas d'absence d'informations à transmettre, ou une défaillance opérationnelle. Notez que ce n'est pas l'intention d'interdire la transmission des informations de contrôle ou de signalisation ou l'utilisation de codes répétitifs lorsque requis par la technologie.

Dynamic Frequency Selection (DFS) for devices operating in the bands 5250- 5350 MHz, 5470-5600 MHz and 5650-5725 MHz.

Sélection dynamique de fréquences (DFS) pour les dispositifs fonctionnant dans les bandes 5250-5350 MHz, 5470-5600 MHz et 5650-5725 MHz.

C3000 WiFi Cable Modem Router

The maximum antenna gain permitted (for devices in the bands 5250-5350 MHz and 5470-5725 MHz) to comply with the e.i.r.p. limit.

Le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la limite de p.i.r.e.

Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

Caution:

The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems.

High power radars are allocated as primary users (meaning they have priority) of 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference and/or damage to LE-LAN devices.

Avertissement:

Le dispositif fonctionnant dans la bande 5150-5250 MHz est réservé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

Les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

IMPORTANT NOTE: Radiation Exposure Statement:

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

NOTE IMPORTANTE: Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

Interference Reduction Table

The following table shows the recommended minimum distance between NETGEAR equipment and household appliances to reduce interference (in feet and meters).

Household Appliance	Recommended Minimum Distance (in feet and meters)
Microwave ovens	30 feet / 9 meters
Baby monitor - analog	20 feet / 6 meters
Baby monitor - digital	40 feet / 12 meters
Cordless phone - analog	20 feet / 6 meters
Cordless phone - digital	30 feet / 9 meters
Bluetooth devices	20 feet / 6 meters
ZigBee	20 feet / 6 meters

