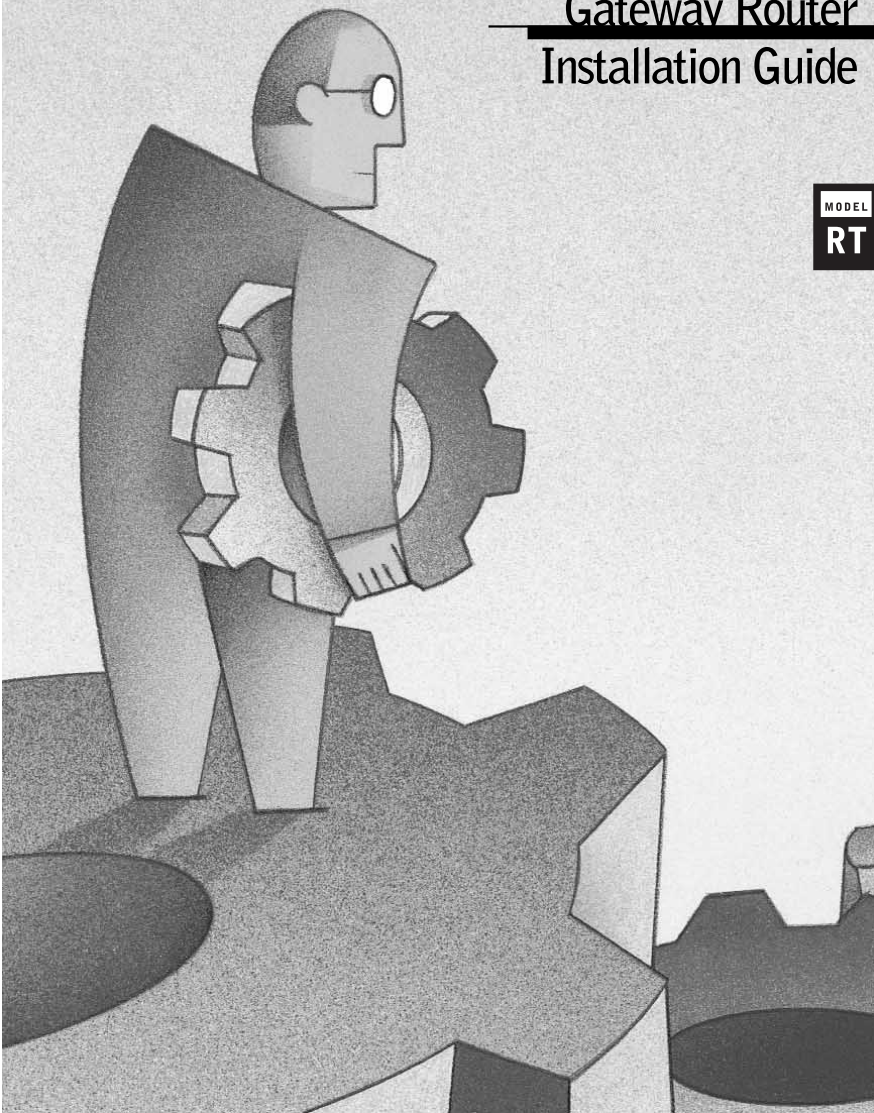


NETGEAR™

Internet Access
Gateway Router
Installation Guide

MODEL
RT 311



START HERE

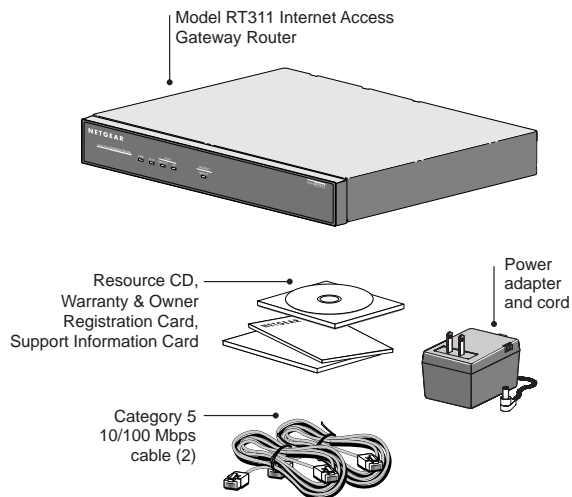
Congratulations on your purchase of a NETGEAR™ Model RT311 Internet Access Gateway Router.

These instructions show you how to configure your Windows® PC network and your NETGEAR router for basic Internet access. For more detailed information about installing your router or configuring advanced features, refer to *Reference Guide for the Model RT311 and RT314 Internet Access Gateway Routers*, included on the *Model RT311 and RT314 Resource CD*.

PACKAGE CONTENTS

Check to make sure that your router package contains the following items, as shown in the illustration below:

- Model RT311 Internet Access Gateway Router
- AC power adapter, 12 V DC output
- Twisted-pair Category 5 Ethernet cable, straight-through wiring (white)
- Twisted-pair Category 5 Ethernet cable, crossover wiring (red)
- The Installation Guide
- *Model RT311 and RT314 Resource CD*, including:
 - *Reference Guide for the Model RT311 and RT314 Internet Access Gateway Routers*
 - Application notes
- Warranty & Owner Registration Card
- Support Information Card

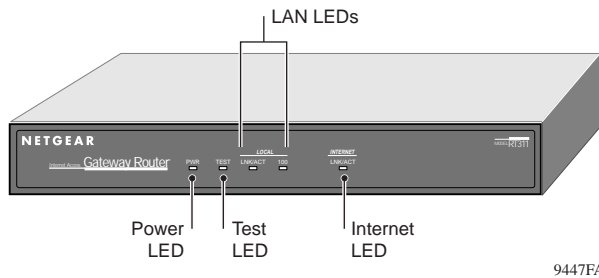


9522FA

PRODUCT ILLUSTRATION

Front Panel

The front panel of the Model RT311 Internet Access Gateway Router contains LEDs that provide diagnostic and connectivity information.



9447FA

The table below describes the LEDs on the front panel of the router.

Label	Activity	Description
PWR (Power)	On	Power is supplied to the router.
TEST	On	The system is not ready, or has failed to start up.
	Off	The system is ready and running.
	Blinking	The system is initializing.
LOCAL LNK/ACT (Link/Activity)	On	The LAN port has detected a link with an attached device.
	Blinking	Data is being transmitted or received by the LAN port.
100 (100 Mbps)	On	The LAN is operating at 100 Mbps.
	Off	The LAN is operating at 10 Mbps.
INTERNET LNK/ACT (Link/Activity)	On	The Internet port has detected a link with an attached device.
	Blinking	Data is being transmitted or received by the Internet port.

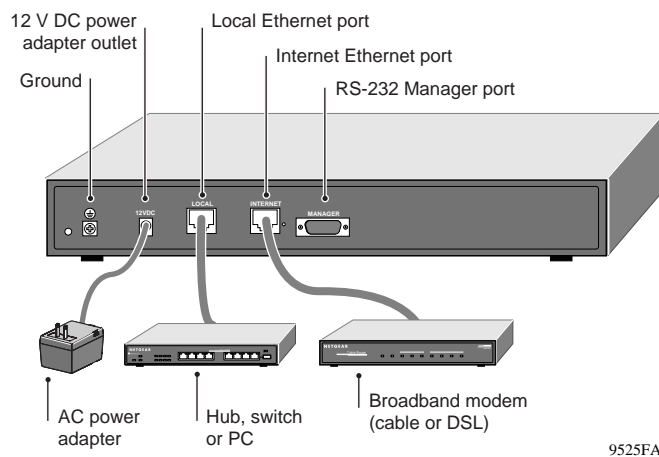
Rear Panel

The rear panel of the Model RT311 Internet Access Gateway Router includes:

- Ground
- 12 V DC power adapter connection
- 10/100 Mbps Ethernet port, for Local (LAN) connections to attached PCs
- 10 Mbps Ethernet port, for Internet (WAN) connection to a broadband access device, such as a cable or DSL modem
- RS-232 serial port, for accessing the Manager interface

HARDWARE INSTALLATION

The illustration below shows how your Model RT311 Internet Access Gateway Router should be installed.



Connecting the Router

1. Connect your PC or hub to the LOCAL port of the router.

Use the red crossover Ethernet cable provided to connect the router directly to a PC, or

Use the white straight-through Ethernet cable provided to connect to a 10 Mbps or 100 Mbps hub or switch. The router senses the speed of the connected port and automatically matches the speed.

ⓘ **Note:** If you are connecting your router to a 100 Mbps or a mixed 10 Mbps or 100 Mbps network, use Category 5 Ethernet cables. Your Model RT311 router package contains Category 5 cables.

2. Connect the Internet port of the router to the Ethernet port on your broadband modem (cable or DSL), using the Ethernet cable that shipped with your modem.
3. Connect the AC power adapter cord to the 12 V DC power connector on the rear panel of the router, and plug the AC power adapter into a wall outlet.

PREPARATION AND SETUP

Before using the router to connect your LAN to the Internet, you must:

- Order Internet service from an Internet service provider (ISP)
- Set up your PCs for using the Transmission Control Protocol/Internet Protocol (TCP/IP) networking protocol

ISP Checklist

Contact an ISP to request a single-user Internet access account that provides a broadband access device, such as a cable modem or DSL modem, to connect the router to the Internet. You can connect a multi-user LAN through a single-user account by using the Network Address Translation (NAT) feature of the router. The modem must have a standard Ethernet interface to connect to your router.

In a single-user account, you are assigned only one registered IP address. This address may be a permanent, fixed address or it may be an address assigned dynamically when your modem connects to the ISP. The NAT feature of your router will map the IP addresses of your PCs to this address for accessing the Internet. Some applications may be incompatible with NAT.

Account Information

Unless the following information is dynamically assigned, your ISP should provide you with this basic account information:

- IP address
- Subnet mask
- Domain name system (DNS) server IP addresses
- Gateway IP address
- Host name and domain name

Your account's full server names may look like this:

mail.xxx.yyy.com

In this example, the domain name is xxx.yyy.com

If an ISP technician configures your PC during modem installation, you may need to obtain the account information from your PC's network setup. Refer to the *Reference Guide for the Model RT311 and RT314 Internet Access Gateway Routers*, on the *Model RT311 and RT314 Resource CD*, for information about this procedure.

Determine whether your account uses a special login protocol:

- If your ISP uses PPP over Ethernet (PPPoE), you will need a login name and password, and you will need to select PPPoE in the router configuration.
- If your ISP is RoadRunner, you should ask whether your PC must run a RoadRunner login program.

PREPARATION AND SETUP CONT.

Network Checklist

The Model RT311 Internet Access Gateway Router uses IP. IP configuration has the following requirements:

- All PCs must have TCP/IP manually installed and selected as the networking protocol.
- All PCs and the router must be assigned IP addresses. The router's DHCP function automatically assigns IP addresses for you, but the PC's IP address must be set to "Obtain an IP address automatically" in the Network Control Panel.
- Check that "Obtain an IP address automatically" is selected in the TCP/IP properties in the Network Control Panel. Refer to "Configuring TCP/IP" in the next section to confirm these settings.

CONFIGURING TCP/IP

Configuring Windows 95 or Windows 98 for IP Networking

All PCs must have an Ethernet network adapter card installed, and must have the TCP/IP networking protocol installed and configured. TCP/IP installation must be done manually as described below.

1. Click on Start from the Windows toolbar.
2. Select Settings; then select Control Panel.
3. Double-click on Network.

In the list of installed components, you must have Client for Microsoft Networks, your Ethernet adapter, and TCP/IP protocol.

- ⊞ **Note:** It is not necessary to remove any other network components shown in the Network window in order to install the adapter, TCP/IP, or Client for Microsoft Networks.

If you need the Ethernet network adapter:

- a. Click on the Add button.
- b. Select Adapter; then click on Add again.
- c. Select the manufacturer and model of your Ethernet adapter, and click on OK.

If you need TCP/IP:

- a. Click on the Add button.
- b. Select Protocol; then click on Add again.
- c. Select Microsoft.
- d. Select TCP/IP and click on OK.

If you need Client for Microsoft Networks:

- a. Click on the Add button.
- b. Select Client; then click on Add again.

Configuring TCP/IP Properties

NETGEAR recommends that you leave the TCP/IP setup parameters at their factory default settings unless you have a specific reason to change them. With the default settings, your PC is configured to obtain its TCP/IP configuration information automatically from a DHCP server on the local network. The Model RT311 Internet Access Gateway Router is shipped preconfigured as a DHCP server, and will assign the TCP/IP configuration information described in the following section.

You must also be certain that your PC is set to "Obtain an IP address automatically" in the Network Control Panel.

To confirm that the IP address will be automatically obtained:

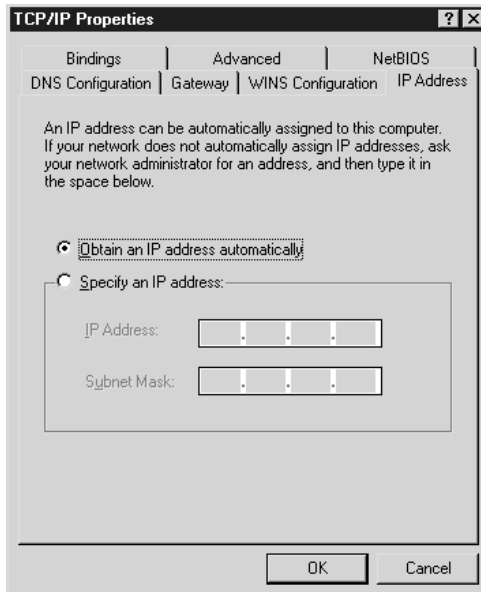
1. Click on Start from the Windows toolbar.
2. Select Settings; then select Control Panel.
3. Double-click on Network.
4. Select the Configuration tab.
5. From the list of network components, select TCP/IP.

If you have several TCP/IP entries in the network components list, choose the one associated with the Ethernet adapter in your PC.

6. Click on Properties.

The TCP/IP menu is displayed.

7. Select the IP address tab, as shown below.



8. Select Obtain an IP address automatically.
9. Click on OK.

To obtain the configuration information from the router:

1. Turn on the router. Be sure the router has been on for at least one minute before continuing to the next step.
2. Reboot each PC on your network.

Verifying TCP/IP Properties

After your PC has been configured and rebooted, you can check the TCP/IP configuration using the Windows utility *wiipcfg.exe* (or for Windows NT® systems, use *ipconfig.exe*). From the Start button, open the Run window, type *wiipcfg* at the prompt, and click on OK. In the *wiipcfg* display window, select your Ethernet adapter from the drop-down menu, and verify that:

- The IP address of the PC is between 192.168.0.2 and 192.168.0.31.
- The subnet mask is 255.255.255.0.
- The default gateway is 192.168.0.1.

Click on More Info, and verify that:

- The DNS server IP address is 192.168.0.1.

CONFIGURING THE ROUTER

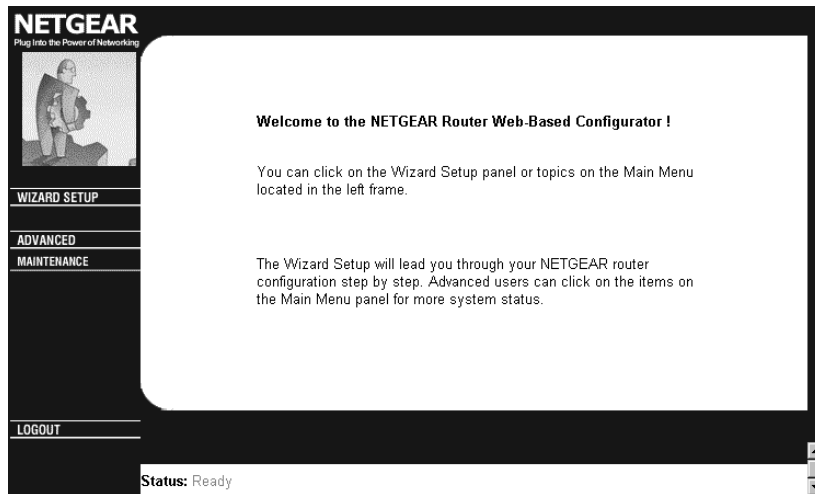
This section describes the steps required to configure your router using a web browser such as Microsoft Internet Explorer or Netscape Navigator. This will provide a basic configuration for Internet access.

☞ **Note:** For advanced configuration options, you can use Telnet or a serial connection to access the Manager interface of the router. Refer to the *Reference Guide for the Model RT311 and RT314 Internet Access Gateway Routers* for instructions on using the Manager interface

1. From any PC on your local network, launch your web browser.
2. In the Address box of your browser, type `http://192.168.0.1` and press ENTER.
3. A log-in box will appear. For Name, enter `admin`. For Password, enter `1234`.

If your router's configuration password has been previously changed from the factory default of `1234`, enter the current password.

4. At the opening screen, select WIZARD SETUP.



5. In the first Wizard screen, enter your account's Host Name and Domain Name, as shown below:

General Setup:
This information is optional, but may be helpful in accessing services of your Internet Service Provider, such as mail and news servers and customer support web pages.

Enter the Host Name(may be called System Name or Account name) that is assigned to you by your Internet Service Provider.

Host Name:

The ISP's Domain Name is often sent automatically by the ISP to the router. If you are having difficulty accessing ISP services, you may need to enter the Domain Name manually in the box below.

For example, if the full address of your ISP's mail server is :
mail.xxx.yyy.myisp.com, then the Domain name is :
xxx.yyy.myisp.com

Domain Name :

6. Click on Next to go to the ISP Parameters screen, shown below:

ISP Parameters for Internet Access

Encapsulation	<input type="text" value="Ethernet"/>
Service Type	<input type="text" value="Standard"/>
User Name	N/A
Password	N/A
Login Server IP	N/A

This screen determines whether a login program will be run.

- a. If your service provider does not require a login program, leave Encapsulation as Ethernet and proceed to Step 7.

b. If your service provider uses PPPoE, select Encapsulation as PPPoE, and enter these additional parameters:

- If your connection supports multiple ISPs, enter the Service Name of the one you use. Otherwise leave Service Name blank.
- Enter the user name and password provided by your ISP. These fields are case sensitive.
- If you wish to change the login timeout, enter a new value in seconds.

Proceed to Step 7.

c. If your service provider is RoadRunner AND you are required to run a RoadRunner login program, leave Encapsulation as Ethernet and select Service Type as either RR-Manager or RR-Toshiba. Enter these additional parameters:.

- If your cable modem is Toshiba, select RR-Toshiba. Otherwise select RR-Manager.
- Enter the user name and password provided by your ISP. These fields are case sensitive.
- If RoadRunner provided an authentication server address, enter it as Login Server IP address. Otherwise, leave this field as 0.0.0.0.

Not all RoadRunner regions require a login program. If your region does not require a login, leave Service Type as Standard.

7. Click on Next to go to the final Wizard screen shown below.

WAN IP Address Assignment

Get automatically from ISP (Default)
 Use fixed IP address

IP Address
IP Subnet Mask
Gateway IP Address

DNS Server Address Assignment

Get automatically from ISP (Default)
 Use fixed IP address --- DNS Server IP Address

WAN MAC address

Factory default
 Spoof this PC's MAC address ... IP Address

Back Finish

a. WAN IP Address Assignment: Unless your ISP has assigned a fixed permanent IP address for your use, select "Get automatically from ISP". Otherwise, enter your IP Address, Subnet Mask, and the IP Address of your ISP's gateway router.

- b. **DNS Server Address Assignment:** If you know that your ISP does not automatically transmit DNS addresses to the router during login, select "Use this server" and enter the IP address of the ISP's DNS server.

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

- c. **WAN MAC address:** If your ISP allows access by only one specific PC's Ethernet MAC address, select "Spoof this PC's MAC address" and enter the IP address of that PC.
- For convenience, the IP address of the PC you are now using should already appear. If this is not the PC whose MAC address is to be used, enter that PC's IP address.
 - Some ISPs will register the Ethernet MAC address of the network interface card in your PC when your account is first opened. They will then only accept traffic from the MAC address of that PC. This feature allows your router to masquerade as that PC by using its MAC address.

8. Click on Finish.

9. Click on the NETGEAR website address to test your Internet connection.

Your Model RT311 Internet Access Gateway Router is now fully configured to provide Internet access for your network. For more information about installing your router, refer to the *Reference Guide for the Model RT311 and RT314 Internet Access Gateway Routers* on the *Model RT311 and RT314 Resource CD*.

ACCESSING THE INTERNET

When your router and PCs are configured correctly, your router automatically accesses the Internet when one of your LAN devices requires access. It is not necessary to run a dialer application, such as Dial-Up Networking or RoadRunner Login, to connect, log in, or disconnect. These functions are performed by the router as needed.

To access the Internet:

1. From the PC connected to your router, launch a browser such as Microsoft Internet Explorer or Netscape Navigator.

You should see the Internet LED blink, indicating communication to the ISP. The browser should begin to display a Web page.

If you have trouble accessing the Internet, refer to the "Troubleshooting" section of this guide.

TROUBLESHOOTING

This section lists the following problems, their probable causes, and solutions:

- If the PWR and other LEDs are not lit when you plug your router into a power outlet make sure:
 - The power cord is properly connected to the router.
 - You are using the correct NETGEAR power adapter supplied with your router.
 - The power adapter is properly connected to a functioning power outlet.
- After you plug the router into a power outlet, the TEST LED should blink for approximately 30 seconds and then turn off.
 - If the TEST LED does not blink, unplug the router; then plug it in again.
- If the LOCAL or INTERNET LNK/ACT LEDs do not light when connected to your PCs or modem:
 - Make sure the Ethernet cable connections are secure at the router and at the device to which you are connected.
 - Make sure the connected device is powered on.
 - Be sure you are using the correct cable:
 - If you are connecting the router directly to a workstation or an uplink (MDI) port of a hub, use the red crossover cable.
 - If you are connecting the router to a normal (MDI-X) port of a hub, use the white straight-through cable.
- If your router is unable to access or load any web pages from the Internet:
 - Your PC may not recognize any DNS server addresses. A DNS server is a host on the Internet that translates Internet names (such as www addresses) to numeric IP addresses. Typically your ISP will provide the addresses of one or two DNS servers for your use. If you entered a DNS address during the configuration, reboot your PC and verify the DNS address as described in "Verifying TCP/IP Properties." Alternatively, you may configure your PC manually with DNS addresses as explained in "Configuring TCP/IP" in the *Reference Guide for the Model RT311 and RT314 Internet Access Gateway Routers*.
 - Your PC may not have the router configured as its TCP/IP gateway. If your PC obtains its information from the router by DHCP, reboot the PC and verify the gateway address as described in "Verifying TCP/IP Properties."
 - Your router may have been unable to obtain a WAN IP address from the ISP. Verify that the router has a WAN IP address by following these steps:
 - Launch a browser and select an external site.
 - Return to the Main Menu of the router's configuration (<http://192.168.0.1>).
 - Under the Advanced heading, click on Maintenance.
 - Check that an IP address is shown for the WAN Port. If 0.0.0.0 is shown, reconfirm the configuration information from your ISP.

Detailed information can be found in the Troubleshooting section of the *Reference Guide for the Model RT311 and RT314 Internet Access Gateway Routers* on the *Model RT311 and RT314 Resource CD*.

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Statement of Conditions

In the interest of improving internal design, operational function, and/or reliability, NETGEAR reserves the right to make changes to the products described in this document without notice.

NETGEAR does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Certificate of the Manufacturer/Importer

It is hereby certified that the Model RT311 Internet Access Gateway Router has been suppressed in accordance with the conditions set out in the BMPT-AmtsblVfg 243/1991 and Vfg 46/1992. The operation of some equipment (for example, test transmitters) in accordance with the regulations may, however, be subject to certain restrictions. Please refer to the notes in the operating instructions.

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

VCCI Statement

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

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

Read instructions for correct handling.

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

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

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

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

EN 55 022 Declaration of Conformance

This is to certify that the Model RT311 Internet Access Gateway Router is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class B (CISPR 22).

Bestätigung des Herstellers/Importeurs

Es wird hiermit bestätigt, daß das Model RT311 Internet Access Gateway Router gemäß der im BMPT-AmtsblVfg 243/1991 und Vfg 46/1992 aufgeführten Bestimmungen entstört ist. Das vorschriftsmäßige Betreiben einiger Geräte (z.B. Testsender) kann jedoch gewissen Beschränkungen unterliegen. Lesen Sie dazu bitte die Anmerkungen in der Betriebsanleitung.

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

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Support Information

See Support Information Card for phone numbers.

Internet / World Wide Web

Go to <http://www.NETGEAR.com> for the NETGEAR Web page.

Defective or damaged merchandise can be returned to your point-of-sale representative.

IMPORTANT!

Please register online. YOU MUST REGISTER TO OBTAIN TECHNICAL SUPPORT. PLEASE RETAIN PROOF OF PURCHASE and this warranty information. To get product support, or to obtain product information and NETGEAR product documentation, direct your Web browser to the <http://www.NETGEAR.com> Web page.

To register online, direct your Web browser to the <http://www.gearguy.com/pub/registration> Web page. If you do not have access to the World Wide Web, you can complete the enclosed registration card and mail it to NETGEAR customer service.



May 2000