

LINKSYS®
A Division of Cisco Systems, Inc.

USER GUIDE

Wireless-G Broadband Router



Model No: **WRT54G**



About This Guide

Icon Descriptions

While reading through the User Guide you may see various icons that call attention to specific items. Below is a description of these icons:



NOTE: This check mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.



WARNING: This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.



WEB: This globe icon indicates a noteworthy website address or e-mail address.

Online Resources

Most web browsers allow you to enter the web address without adding the `http://` in front of the address. This User Guide will refer to websites without including `http://` in front of the address. Some older web browsers may require you to add it.

Resource	Website
Linksys	www.linksys.com
Linksys International	www.linksys.com/international
Glossary	www.linksys.com/glossary
Network Security	www.linksys.com/security

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Chapter 1: Product Overview	1
Front Panel	1
Back Panel	1
Chapter 2: Wireless Security Checklist	2
General Network Security Guidelines	2
Additional Security Tips	2
Chapter 3: Advanced Configuration	3
Setup > Basic Setup	3
Setup > DDNS.	6
Setup > MAC Address Clone.	7
Setup > Advanced Routing	7
Wireless > Basic Wireless Settings	8
Wireless > Wireless Security	9
Wireless > Wireless MAC Filter.	11
Wireless > Advanced Wireless Settings	12
Security > Firewall	13
Firewall	13
Security > VPN Passthrough.	13
Access Restrictions > Internet Access	14
Applications and Gaming > Port Range Forward.	15
Applications & Gaming > Port Triggering	15
Applications and Gaming > DMZ	16
Applications and Gaming > QoS	16
Administration > Management.	17
Administration > Log	18
Administration > Diagnostics	18
Administration > Factory Defaults	19
Administration > Upgrade Firmware	19
Administration > Config Management	19
Status > Router	19
Status > Local Network	20
Status > Wireless	21
Appendix A: Troubleshooting	22
Appendix B: Specifications	23

Appendix C: Warranty and Regulatory Information	24
Limited Warranty24
Wireless Disclaimer25
FCC Statement25
Safety Notices25
Industry Canada (Canada)25
IC Statement25
Règlement d'Industry Canada25
User Information for Consumer Products Covered by EU Directive 2002/96/EC on Waste Electric and Electronic Equipment (WEEE)26

Chapter 1: Product Overview

Thank you for choosing the Linksys Wireless-G Broadband Router. The Router lets you access the Internet via a wireless connection, broadcast at up to 54 Mbps, or through one of its four switched ports. You can also use the Router to share resources such as computers, printers and files. A variety of security features help to protect your data and your privacy while online. Security features include WPA2 security, a Stateful Packet Inspection (SPI) firewall and NAT technology. Configuring the Router is easy using the provided browser-based utility.

Front Panel



SecureEasySetup (Orange/White) The Cisco logo is the Router's SecureEasySetup button. It lights up and will stay orange when the Router is powered on. The color orange indicates that the Router is not using the SecureEasySetup feature, while the color white indicates that the Router is using the SecureEasySetup feature. When the Router enters SecureEasySetup mode, the Cisco logo will turn white and start flashing. After the Router has generated the SSID and WPA Personal key, the Cisco logo will stop flashing and stay white.

To clear the SSID and WPA Personal key, press and hold down the Cisco logo for five seconds. The Cisco logo will flash slowly as the Router resets itself. The Cisco logo will turn orange to indicate a successful reset.



NOTE: SecureEasySetup is a feature that makes it easy to set up your wireless network. If you have SecureEasySetup devices, run the Router's Setup Wizard CD-ROM and follow the on-screen instructions to use SecureEasySetup.

- **Power** (Green) The Power LED lights up and will stay on while the Router is powered on. When the Router goes through its self-diagnostic mode during every boot-up, this LED will flash. When the diagnostic is complete, the LED will be solidly lit.
- **DMZ** (Green) The DMZ LED indicates when the DMZ function is being used. This LED will remain lit as long as DMZ is enabled.
- **WLAN** (Green) The WLAN LED lights up when the wireless feature is enabled. If the LED is flashing, the Router is actively sending or receiving data over the network.
- **1, 2, 3, 4** (Green) These numbered LEDs, corresponding with the numbered ports on the Router's back panel, serve two purposes. If the LED is continuously lit, the Router is successfully connected to a device through that port. A flashing LED indicates network activity over that port.
- **Internet** (Green) The Internet LED lights up when there is a connection made through the Internet port. A flashing LED indicates network activity over the Internet port.

Back Panel



- **Reset** There are two ways to reset the Router's factory defaults. Either press and hold the Reset Button for approximately five seconds, or restore the defaults from Administration > Factory Defaults in the Router's web-based utility.
- **Internet** The Internet port is where you will connect your cable or DSL Internet connection.
- **1, 2, 3, 4** These Ethernet ports (1, 2, 3, 4) connect the Router to PCs on your wired network and other Ethernet network devices.
- **Power** The Power port is where you will connect the power adapter.

Chapter 2: Wireless Security Checklist

Wireless networks are convenient and easy to install, so homes with high-speed Internet access are adopting them at a rapid pace. Because wireless networking operates by sending information over radio waves, it can be more vulnerable to intruders than a traditional wired network. Like signals from your cellular or cordless phones, signals from your wireless network can also be intercepted. Since you cannot physically prevent someone from connecting to your wireless network, you need to take some additional steps to keep your network secure.

1. Change the default wireless network name or SSID

Wireless devices have a default wireless network name or Service Set Identifier (SSID) set by the factory. This is the name of your wireless network, and can be up to 32 characters in length. Linksys wireless products use **linksys** as the default wireless network name. You should change the wireless network name to something unique to distinguish your wireless network from other wireless networks that may exist around you, but do not use personal information (such as your Social Security number) because this information may be available for anyone to see when browsing for wireless networks.

2. Change the default password

For wireless products such as access points and routers, you will be asked for a password when you want to change their settings. These devices have a default password set by the factory. The Linksys default password is **admin**. Hackers know these defaults and may try to use them to access your wireless device and change your network settings. To thwart any unauthorized changes, customize the device's password so it will be hard to guess.

3. Enable MAC address filtering

Linksys routers give you the ability to enable Media Access Control (MAC) address filtering. The MAC address is a unique series of numbers and letters assigned to every networking device. With MAC address filtering enabled, wireless network access is provided solely for wireless devices with specific MAC addresses. For example, you can specify the MAC address of each computer in your home so that only those computers can access your wireless network.

4. Enable encryption

Encryption protects data transmitted over a wireless network. Wi-Fi Protected Access (WPA/WPA2) and Wired Equivalency Privacy (WEP) offer different levels of security for wireless communication. Currently, devices that are Wi-Fi certified are required to support WPA2, but are not required to support WEP.

A network encrypted with WPA/WPA2 is more secure than a network encrypted with WEP, because WPA/WPA2 uses dynamic key encryption. To protect the information as it passes over the airwaves, you should enable the highest level of encryption supported by your network equipment.

WEP is an older encryption standard and may be the only option available on some older devices that do not support WPA.

General Network Security Guidelines

Wireless network security is useless if the underlying network is not secure.

- Password protect all computers on the network and individually password protect sensitive files.
- Change passwords on a regular basis.
- Install anti-virus software and personal firewall software.
- Disable file sharing (peer-to-peer). Some applications may open file sharing without your consent and/or knowledge.

Additional Security Tips

- Keep wireless routers, access points, or gateways away from exterior walls and windows.
- Turn wireless routers, access points, or gateways off when they are not being used (at night, during vacations).
- Use strong passphrases that are at least eight characters in length. Combine letters and numbers to avoid using standard words that can be found in the dictionary.



WEB: For more information on wireless security, visit www.linksys.com/security

Chapter 3: Advanced Configuration

After setting up the Router with the Setup Wizard (located on the CD-ROM), the Router will be ready for use. However, if you'd like to change its advanced settings, use the Router's web-based utility. This chapter describes each web page of the utility and each page's key functions. You can access the utility via a web browser on a computer connected to the Router.

The web-based utility has these main tabs: Setup, Wireless, Security, Access Restrictions, Applications & Gaming, Administration, and Status. Additional tabs will be available after you click one of the main tabs.



NOTE: When first installing the Router, you should use the Setup Wizard on the Setup CD-ROM. If you want to configure advanced settings, use this chapter to learn about the web-based utility.

How to Access the Web-Based Utility

To access the web-based utility, launch the web browser on your computer, and enter the Router's default IP address, **192.168.1.1**, in the *Address* field. Then, press **Enter**.

A password request screen will appear. (Non-Windows XP users will see a similar screen.) Leave the *User name* field blank. The first time you open the Web-based utility, use the default password **admin**. (You can set a new password from the Administration tab's *Management* screen.) Click **OK** to continue.



Password Screen

Setup > Basic Setup

The first screen that appears is the *Basic Setup* screen. This allows you to change the Router's general settings.



Setup > Basic Setup

Internet Setup

The Internet Setup section configures the Router to your Internet connection. Most of this information can be obtained through your ISP.

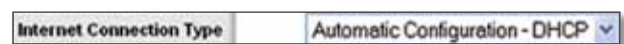
Internet Connection Type

Select the type of Internet connection your ISP provides from the drop-down menu. The available types are:

- Automatic Configuration - DHCP
- Static IP
- PPPoE
- PPTP
- L2TP
- Telstra Cable

Automatic Configuration - DHCP

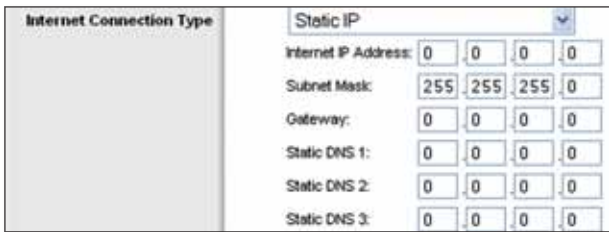
By default, the Router's Internet Connection Type is set to **Automatic Configuration - DHCP**, which should be kept only if your ISP supports DHCP or you are connecting through a dynamic IP address. (This option usually applies to cable connections.)



Internet Connection Type > Automatic Configuration - DHCP

Static IP

If you are required to use a permanent IP address to connect to the Internet, select **Static IP**.



Internet Connection Type > Static IP

Internet IP Address This is the Router's IP address, when seen from the Internet. Your ISP will provide you with the IP Address you need to specify here.

Subnet Mask This is the Router's Subnet Mask, as seen by users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask.

Gateway Your ISP will provide you with the Gateway Address, which is the ISP server's IP address.

DNS Your ISP will provide you with at least one DNS (Domain Name System) Server IP Address.

PPPoE

Some DSL-based ISPs use PPPoE (Point-to-Point Protocol over Ethernet) to establish Internet connections. If you are connected to the Internet through a DSL line, check with your ISP to see if they use PPPoE. If they do, you will have to enable **PPPoE**.



Internet Connection Type > PPPoE

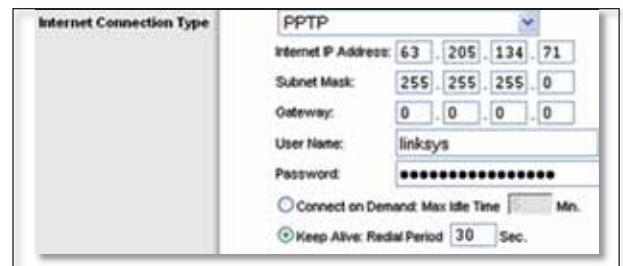
User Name and Password Enter the User Name and Password provided by your ISP.

Connect on Demand: Max Idle Time You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates. The default Max Idle Time is **5** minutes.

Keep Alive: Redial Period If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, select **Keep Alive**. In the *Redial Period* field, you specify how often you want the Router to check the Internet connection. The default Redial Period is **30** seconds.

PPTP

Point-to-Point Tunneling Protocol (PPTP) is a service that applies to connections in Europe only.



Internet Connection Type > PPTP

Internet IP Address This is the Router's IP address, as seen from the Internet. Your ISP will provide you with the IP Address you need to specify here.

Subnet Mask This is the Router's Subnet Mask, as seen by users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask.

Gateway Your ISP will provide you with the Gateway Address.


User Name and Password Enter the User Name and Password provided by your ISP.

Connect on Demand: Max Idle Time You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates. The default Max Idle Time is **5** minutes.

Keep Alive: Redial Period If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, select **Keep Alive**. In the *Redial Period* field, you specify how often you want the Router to check the Internet connection. The default value is **30** seconds.

L2TP

L2TP is a service that applies to connections in Israel only.



Internet Connection Type > L2TP

User Name and Password Enter the User Name and Password provided by your ISP.

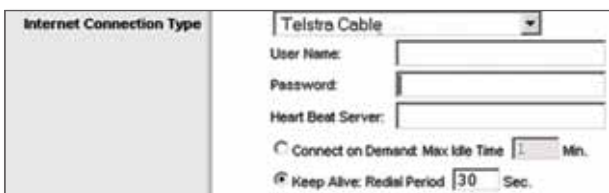
L2TP Server This is the IP address of the L2TP Server. Your ISP will provide you with the IP Address you need to specify here.

Connect on Demand: Max Idle Time You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates. The default Max Idle Time is **5** minutes

Keep Alive: Redial Period If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, select **Keep Alive**. In the *Redial Period* field, you specify how often you want the Router to check the Internet connection. The default Redial Period is **30** seconds.

Telstra Cable

Telstra Cable is a service that applies to connections in Australia only. If your ISP uses HeartBeat Signal (HBS), then select **Telstra**.



Internet Connection Type > Telstra Cable

User Name and Password Enter the User Name and Password provided by your ISP.

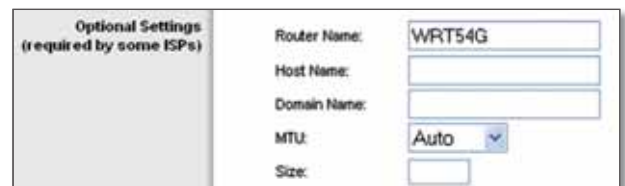
Heart Beat Server This is the IP address of the Heartbeat Server. Your ISP will provide you with the IP Address you need to specify here.

Connect on Demand: Max Idle Time You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. To use this option, select **Connect on Demand**. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates. The default Max Idle Time is **5** minutes

Keep Alive: Redial Period If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, select **Keep Alive**. In the *Redial Period* field, you specify how often you want the Router to check the Internet connection. The default Redial Period is **30** seconds.

Optional Settings

Some of these settings may be required by your ISP. Verify with your ISP before making any changes.



Optional Settings

Router Name In this field, you can enter a name of up to 39 characters to represent the Router.

Host Name/Domain Name These fields allow you to supply a host and domain name for the Router. Some ISPs, usually cable ISPs, require these names as identification. You may have to check with your ISP to see if your broadband Internet service has been configured with a host and domain name. In most cases, leaving these fields blank will work.

MTU MTU is the Maximum Transmission Unit. It specifies the largest packet size permitted for Internet transmission. Select Manual if you want to manually enter the largest packet size that is transmitted. To have the Router select the best MTU for your Internet connection, keep the default setting, **Auto**.

Size When Manual is selected in the *MTU* field, this option is enabled. Leave this value in the 1200 to 1500 range. The default size depends on the Internet Connection Type:

- DHCP, Static IP, or Telstra: **1500**

- PPPoE: **1492**
- PPTP or L2TP: **1460**

Network Setup

The Network Setup section changes the settings on the network connected to the Router's Ethernet ports. Wireless Setup is performed through the Wireless tab.

Router IP

This presents both the Router's IP Address and Subnet Mask as seen by your network.

Router IP Address	Local IP Address: 192.168.1.1
	Subnet Mask: 255.255.255.0

Router IP Address

Network Address Server Settings (DHCP)

The settings allow you to configure the Router's Dynamic Host Configuration Protocol (DHCP) server function. The Router can be used as a DHCP server for your network. A DHCP server automatically assigns an IP address to each computer on your network. If you choose to enable the Router's DHCP server option, make sure there is no other DHCP server on your network.

Network Address Server Settings (DHCP)	DHCP Server: <input checked="" type="radio"/> Enable <input type="radio"/> Disable
	Starting IP Address: 192.168.1.100
	Maximum Number of DHCP Users: 50
	Client Lease Time: 0 minutes (0 means one day)
	Static DNS 1: 0.0.0.0
	Static DNS 2: 0.0.0.0
	Static DNS 3: 0.0.0.0
	WINS: 0.0.0.0

Network Address Server Settings (DHCP)

DHCP Server DHCP is enabled by factory default. If you already have a DHCP server on your network, or you don't want a DHCP server, then select **Disable** (no other DHCP features will be available).

Starting IP Address Enter a value for the DHCP server to start with when issuing IP addresses. Because the Router's default IP address is 192.168.1.1, the Starting IP Address must be 192.168.1.2 or greater, but smaller than 192.168.1.253. The default Starting IP Address is **192.168.1.100**.

Maximum Number of DHCP Users Enter the maximum number of PCs that you want the DHCP server to assign IP addresses to. This number cannot be greater than 253. The default is **50**.

Client Lease Time The Client Lease Time is the amount of time a network user will be allowed connection to the Router with their current dynamic IP address. Enter the amount of time, in minutes, that the user will be "leased"

this dynamic IP address. After the time is up, the user will be automatically assigned a new dynamic IP address. The default is **0** minutes, which means one day.

Static DNS (1-3) The Domain Name System (DNS) is how the Internet translates domain or website names into Internet addresses or URLs. Your ISP will provide you with at least one DNS Server IP Address. If you wish to use another, enter that IP Address in one of these fields. You can enter up to three DNS Server IP Addresses here. The Router will use these for quicker access to functioning DNS servers.

WINS The Windows Internet Naming Service (WINS) manages each PC's interaction with the Internet. If you use a WINS server, enter that server's IP Address here. Otherwise, leave this blank.

Time Setting

Select the time zone in which your network functions from this drop-down menu. (You can even automatically adjust for daylight saving time.)

Time Setting	Time Zone:
	(GMT-08:00) Pacific Time (USA & Canada)
	<input checked="" type="checkbox"/> Automatically adjust clock for daylight saving changes

Time Setting

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

Setup > DDNS

The Router offers a Dynamic Domain Name System (DDNS) feature. DDNS lets you assign a fixed host and domain name to a dynamic Internet IP address. It is useful when you are hosting your own website, FTP server, or other server behind the Router.

Before you can use this feature, you need to sign up for DDNS service with a DDNS service provider, www.dyndns.org or www.TZO.com. If you do not want to use this feature, keep the default setting, **Disable**.

DDNS

The Router offers a Dynamic Domain Name System (DDNS) feature. DDNS lets you assign a fixed host and domain name to a dynamic Internet IP address. It is useful when you are hosting your own website, FTP server, or other server behind the Router.

Before you can use this feature, you need to sign up for DDNS service at one of two DDNS service providers, DynDNS.org or TZO.com. If you do not want to use this feature, keep the default setting, **Disable**.

DDNS Service

If your DDNS service is provided by DynDNS.org, then select **DynDNS.org** from the drop-down menu. If your

DDNS service is provided by TZO, then select **TZO.com**. The features available on the *DDNS* screen will vary, depending on which DDNS service provider you use.

DynDNS.org



Setup > DDNS > DynDNS

User Name Enter the User Name for your DDNS account.

Password Enter the Password for your DDNS account.

Host Name This is the DDNS URL assigned by the DDNS service.

Internet IP Address The Router's Internet IP address is displayed here. Because it is dynamic, it will change.

Status The status of the DDNS service connection is displayed here.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

TZO.com



Setup > DDNS > TZO

E-mail Address, TZO Key, and Domain Name Enter the settings of the account you set up with TZO.

Internet IP Address The Router's Internet IP address is displayed here. Because it is dynamic, it will change.

Status The status of the DDNS service connection is displayed here.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

Setup > MAC Address Clone

A MAC address is a 12-digit code assigned to a unique piece of hardware for identification. Some ISPs will require you to register a MAC address in order to access the Internet. If you do not wish to re-register the MAC address with your ISP, you may assign the MAC address you have currently registered with your ISP to the Router with the MAC Address Clone feature.



Setup > MAC Address Clone

MAC Address Clone

Enable/Disable To have the MAC Address cloned, select **Enable**.

User Defined Entry Enter the MAC Address registered with your ISP here.

Clone Your PC's MAC Clicking this button will clone the MAC address of the computer you are using.

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

Setup > Advanced Routing

This screen is used to set up the Router's advanced routing functions. NAT routes the host Router's network connection to the Internet. Dynamic Routing automatically adjusts how packets travel on your network. Static Routing sets up a fixed route to another network destination.



Setup > Advanced Routing (Gateway)



Setup > Advanced Routing (Router)

Advanced Routing

Operating Mode Select the mode in which this Router will function. If this Router is hosting your network's connection to the Internet, select **Gateway**. If another Router exists on your network, select **Router**. When Router is chosen, **Dynamic Routing** will be available as an option.

Dynamic Routing

RIP This feature enables the Router to automatically adjust to physical changes in the network's layout and exchange routing tables with the other router(s). The Router determines the network packets' route based on the fewest number of hops between the source and the destination. This feature is Disabled by default. From the drop-down menu, you can also select **LAN & Wireless**, which performs dynamic routing over your Ethernet and wireless networks. You can also select **WAN (Internet)**, which performs dynamic routing with data coming from

the Internet. Finally, selecting **Both** enables dynamic routing for both networks, as well as data from the Internet.

Select set number To set up a static route between the Router and another network, select a number from the Static Routing drop-down list. (A static route is a predetermined pathway that network information must travel to reach a specific host or network.) Enter the information described below to set up a new static route. (Click the Delete This Entry button to delete a static route.)

Enter Route Name Enter a name for the Route here, using a maximum of 25 alphanumeric characters.

Destination LAN IP The Destination LAN IP is the address of the remote network or host to which you want to assign a static route.

Subnet Mask The Subnet Mask determines which portion of a Destination LAN IP address is the network portion, and which portion is the host portion.

Default Gateway This is the IP address of the gateway device that allows for contact between the Router and the remote network or host.

Interface This interface tells you whether the Destination IP Address is on the **LAN & Wireless** (Ethernet and wireless networks) or the **WAN (Internet)**.

Delete This Entry To delete a route, select its number from the drop-down menu, and click this button.

Show Routing Table Click **Show Routing Table** to open a screen displaying how data is routed through your local network. For each route, the Destination LAN IP address, Subnet Mask, Gateway, and Interface are displayed. Click **Refresh** to update the information. Click **Close** to exit this screen.

Routing Table Entry List				Refresh
Destination LAN IP	Subnet Mask	Gateway	Interface	
192.168.3.100	255.255.255.0	192.168.3.1	LAN & Wireless	Close

Routing Table

Click **Save Settings** to apply your changes, or click **Cancel Changes** to cancel your changes.

Wireless > Basic Wireless Settings

The basic settings for wireless networking are set on this screen.