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Dual-Band
5GHz +
802.11a
2.4GHz
802.11g

Dual-Band
Wireless A+G

Broadband Router



User Guide

Model No. **WRT55AG ver. 2**



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How to Use This User Guide

This User Guide has been designed to make understanding networking with the Dual-Band Wireless A+G Broadband Router easier than ever. Look for the following items when reading this User Guide:



This checkmark means there is a note of interest and is something you should pay special attention to while using the Dual-Band Wireless A+G Broadband Router.



This exclamation point means there is a caution or warning and is something that could damage your property or the Dual-Band Wireless A+G Broadband Router.



This question mark provides you with a reminder about something you might need to do while using the Dual-Band Wireless A+G Broadband Router.

In addition to these symbols, there are definitions for technical terms that are presented like this:

word: *definition.*

Also, each figure (diagram, screenshot, or other image) is provided with a figure number and description, like this:

Figure 0-1: Sample Figure Description

Figure numbers and descriptions can also be found in the “List of Figures” section in the “Table of Contents”.

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Chapter 1: Introduction

Welcome

Thank you for choosing the Linksys Dual-Band Wireless A+G Broadband Router. The Dual-Band Wireless A+G Broadband Router will allow you to network wirelessly better than ever, sharing Internet access, files and fun, easily and securely.

How does the Dual-Band Wireless A+G Broadband Router do all of this? A router is a device that allows access to an Internet connection over a network. With the Dual-Band Wireless A+G Broadband Router, this access can be shared over the four switched ports or via the wireless broadcast at either up to 11Mbps for Wireless-B or up to 54Mbps for Wireless-A and/or Wireless-G. In addition, the whole network is protected by NAT technology. For wireless networking, you also have a choice of wireless security methods. Additional security features, as well as configuration options, are accessible through the easy-to-use, browser-based utility.

But what does all of this mean?

Networks are useful tools for sharing computer resources. You can access one printer from different computers and access data located on another computer's hard drive. Networks are even used for playing multiplayer video games. So, networks are not only useful in homes and offices, they can also be fun.

PCs on a wired network create a LAN, or Local Area Network. They are connected with Ethernet cables, which is why the network is called "wired".

PCs equipped with wireless cards or adapters can communicate without cumbersome cables. By sharing the same wireless settings, within their transmission radius, they form a wireless network. This is sometimes called a WLAN, or Wireless Local Area Network. The Dual-Band Wireless A+G Broadband Router bridges wireless networks of 802.11a, 802.11b, and 802.11g standards and wired networks, allowing them to communicate with each other.

With your wired and wireless networks connected to each other and the Internet, you can now share files and Internet access—and even play games. All the while, the Dual-Band Wireless A+G Broadband Router protects your networks from unauthorized and unwelcome users.

Linksys recommends using the Setup CD-ROM for first-time installation of the Router. If you do not wish to run the Setup Wizard on the Setup CD-ROM, then use the instructions in this Guide to help you connect the Dual-Band Wireless A+G Broadband Router, set it up, and configure it to bridge your different networks. These instructions should be all you need to get the most out of the Dual-Band Wireless A+G Broadband Router.

nat (*network address translation*): NAT technology translated IP addresses of a local area network to a different IP address for the Internet.

mbps: one million bits per second; a unit of measurement for data transmission.

browser: an application program that provides a way to look at and interact with all the information on the World Wide Web.

lan (*local area network*): the computers and networking products that make up the network in your home or office.

ethernet: an IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium.

802.11a: an IEEE wireless networking standard that specifies a maximum data transfer rate of 54Mbps and an operating frequency of 5GHz.

802.11b: an IEEE wireless networking standard that specifies a maximum data transfer rate of 11Mbps and an operating frequency of 2.4GHz.

802.11g: an IEEE wireless networking standard that specifies a maximum data transfer rate of 54Mbps, an operating frequency of 2.4GHz, and backward compatibility with 802.11b devices.

What's in this Guide?

This user guide covers the steps for setting up and using the Dual-Band Wireless A+G Broadband Router.

- **Chapter 1: Introduction**
This chapter describes the Router's applications and this User Guide.
- **Chapter 2: Planning Your Wireless Network**
This chapter describes the basics of wireless networking.
- **Chapter 3: Getting to Know the Dual-Band Wireless A+G Broadband Router**
This chapter describes the physical features of the Router.
- **Chapter 4: Connecting the Dual-Band Wireless A+G Broadband Router**
This chapter instructs you on how to connect the Router to your network.
- **Chapter 5: Configuring the Dual-Band Wireless A+G Broadband Router**
This chapter explains how to use the Web-Based Utility to configure the settings on the Dual-Band Wireless A+G Broadband Router.
- **Appendix A: Troubleshooting**
This appendix describes some problems and solutions, as well as frequently asked questions, regarding installation and use of the Dual-Band Wireless A+G Broadband Router.
- **Appendix B: Wireless Security**
This appendix explains the risks of wireless networking and some solutions to reduce the risks.
- **Appendix C: Upgrading Firmware**
This appendix instructs you on how to upgrade the firmware on the Router should you need to do so.
- **Appendix D: Windows Help**
This appendix describes how you can use Windows Help for instructions about networking, such as installing the TCP/IP protocol.
- **Appendix E: Finding the MAC Address and IP Address for your Ethernet Adapter.**
This appendix describes how to find the MAC address for your computer's Ethernet adapter so you can use the MAC filtering and/or MAC address cloning feature of the Router.
- **Appendix F: Glossary**
This appendix gives a brief glossary of terms frequently used in networking.

Dual-Band Wireless A+G Broadband Router

- **Appendix G: Specifications**
This appendix provides the technical specifications for the Router.
- **Appendix H: Warranty Information**
This appendix supplies the warranty information for the Router.
- **Appendix I: Regulatory Information**
This appendix supplies the regulatory information regarding the Router.
- **Appendix J: Contact Information**
This appendix provides contact information for a variety of Linksys resources, including Technical Support.

Chapter 2: Planning Your Wireless Network

Network Topology

A wireless local area network (WLAN) is exactly like a regular local area network (LAN), except that each computer in the WLAN uses a wireless device to connect to the network. Computers in a WLAN share the same frequency channel and SSID, which is an identification name shared by the wireless devices belonging to the same wireless network.

Ad-Hoc versus Infrastructure Mode

Unlike wired networks, wireless networks have two different modes in which they may be set up: infrastructure and ad-hoc. An infrastructure configuration is a WLAN and wired LAN communicating to each other through an access point. An ad-hoc configuration is wireless-equipped computers communicating directly with each other. Choosing between these two modes depends on whether or not the wireless network needs to share data or peripherals with a wired network or not.

If the computers on the wireless network need to be accessible by a wired network or need to share a peripheral, such as a printer, with the wired network computers, the wireless network should be set up in Infrastructure mode. The basis of Infrastructure mode centers around a wireless router or an access point, such as the Dual-Band Wireless A+G Broadband Router, which serves as the main point of communications in a wireless network. The Router transmits data to PCs equipped with wireless network adapters, which can roam within a certain radial range of the Router. You can arrange the Router and multiple access points to work in succession to extend the roaming range, and you can set up your wireless network to communicate with your Ethernet hardware as well.

If the wireless network is relatively small and needs to share resources only with the other computers on the wireless network, then the Ad-Hoc mode can be used. Ad-Hoc mode allows computers equipped with wireless transmitters and receivers to communicate directly with each other, eliminating the need for a wireless router or access point. The drawback of this mode is that in Ad-Hoc mode, wireless-equipped computers are not able to communicate with computers on a wired network. And, of course, communication between the wireless-equipped computers is limited by the distance and interference directly between them.

Network Layout

The Dual-Band Wireless A+G Broadband Router has been specifically designed for use with your 802.11a, 802.11b, and 802.11g products. Now, products using these standards can communicate with each other.

network: a series of computers or devices connected for the purpose of data sharing, storage, and/or transmission between users.

ssid: your wireless network's name.

ad-hoc: a group of wireless devices communicating directly to each other (peer-to-peer) without the use of an access point.

infrastructure: a wireless network that is bridged to a wired network via an access point.

adapter: a device that adds network functionality to your PC.

ethernet: IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium.

access point: a device that allows wireless-equipped computers and other devices to communicate with a wired network. Also used to expand the range of a wireless network.

Dual-Band Wireless A+G Broadband Router

The Dual-Band Wireless A+G Broadband Router is compatible with all 802.11a, 802.11b, and 802.11g adapters, such as the Notebook Adapters (WPC55AG, WPC54G, WPC11) for your laptop computers, PCI Adapters (WMP55AG, WMP54G, WMP11) for your desktop PCs, and USB Adapters (WUSB54G, WUSB11) when you want to enjoy USB connectivity. The Router will also communicate with the Wireless PrintServer (WPS54GU2, WPS11) and Wireless Ethernet Bridges (WET54G, WET11).

When you wish to connect your wireless network with your wired network, you can use the Dual-Band Wireless A+G Broadband Router's four LAN ports. To add more ports, any of the Dual-Band Wireless A+G Broadband Router's LAN ports can be connected to any of Linksys's switches (such as the EZXS55W or EZXS88W).

With these, and many other, Linksys products, your networking options are limitless. Go to the Linksys website at www.linksys.com for more information about products that work with the Dual-Band Wireless A+G Broadband Router.

Chapter 3: Getting to Know the Dual-Band Wireless A+G Broadband Router

The Back Panel

The Router's ports and Reset button are located on the back panel of the Router.



Figure 3-1: The Router's Back Panel



IMPORTANT: If you reset the Router, all of your settings, including Internet connection, wireless, and security, will be deleted and replaced with the factory defaults. Do not reset the Router if you want to retain these settings.

RESET Button There are two ways to reset the Router's factory defaults. Either press the **RESET button**, for approximately five seconds, or restore the defaults from the Administration tab - Factory Defaults in the Router's Web-based Utility.

Internet The **Internet** port is where you will connect your broadband Internet connection.

1, 2, 3, 4 These ports (1, 2, 3, 4) connect the Router to your networked PCs and other Ethernet network devices.

POWER The **POWER** port is where you will connect the power adapter.

port: the connection point on a computer or networking device used for plugging in cables or adapters.

broadband: an always-on, fast Internet connection.

The Front Panel

The Router's LEDs, which indicate the status of the Router and network activities, are located on the front panel.



Figure 3-2: The Router's Front Panel

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.
Wireless-A	
WLAN	Green. The WLAN LED flashes when there is a successful Wireless-A connection.
Wireless-G	
WLAN	Green. The WLAN LED flashes when there is a successful Wireless-G connection.
Ethernet	
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.

Chapter 4: Connecting the Dual-Band Wireless A+G Broadband Router

Overview

Linksys recommends using the Setup Wizard on the Setup CD-ROM for first-time installation of the Router. For advanced users, you may follow the instructions in this chapter, and then configure the Router through its Web-based Utility (refer to “Chapter 5: Configuring the Dual-Band Wireless A+G Broadband Router”).



NOTE: For first-time installation of the Router, Linksys recommends using the Setup Wizard on the Setup CD-ROM.

This chapter includes two sets of instructions. If the Dual-Band Wireless A+G Broadband Router will be the only router in your network, follow the instructions in “Hardware Installation for Connection to Your Broadband Modem.” If you want to install the Dual-Band Wireless A+G Broadband Router behind another router in your network, then follow the instructions in “Hardware Installation for Connection to Another Router.”

Hardware Installation for Connection to Your Broadband Modem

1. Power down your network devices.
2. Locate an optimum location for the Router. The best place for the Router is usually at the center of your wireless network, with line of sight to all of your wireless devices.
3. Adjust the antennas. Normally, the higher you place the antennas, the better the performance will be.
4. Using a standard Ethernet network cable, connect the Router’s Internet port to your broadband modem.

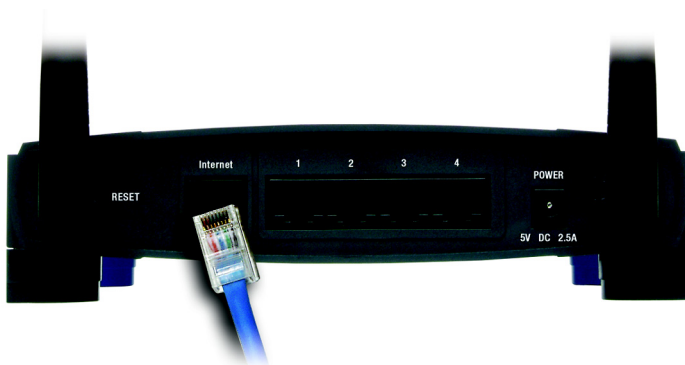


Figure 4-1: Connecting Your Broadband Modem

Dual-Band Wireless A+G Broadband Router

5. Connect your network PCs or Ethernet devices to the Router's numbered ports using standard Ethernet network cabling.

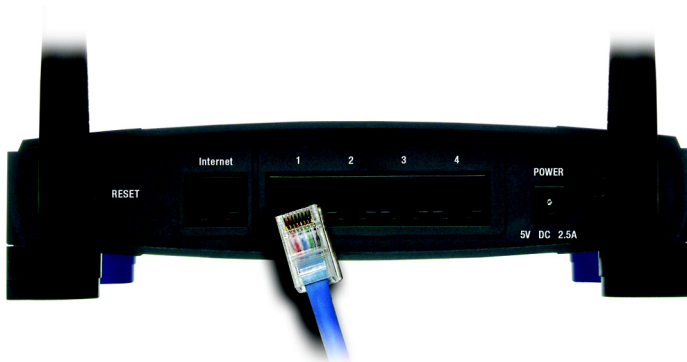


Figure 4-2: Connecting Your Network Devices

6. Connect the AC power adapter to the Router's Power port. Then connect the other end to an electrical outlet. Only use the power adapter supplied with the Router. Use of a different adapter may cause product damage.



Figure 4-3: Connecting the Power



IMPORTANT: Make sure you use the power adapter that is supplied with the Router. Use of a different power adapter could damage the Router.

Now that the hardware installation is complete, proceed to “Chapter 5: Configuring the Dual-Band Wireless A+G Router.”

Hardware Installation for Connection to Another Router

Before you install the Router, you must change the default IP address of the other router. This is mandatory because both routers may be set to the same IP address by default. If you do not change the other router's default IP address, then you may not be able to set up the Router.

First, make sure the Router is NOT connected to your network. Then follow these instructions:

1. To access the other router's Web-based Utility, launch Internet Explorer or Netscape Navigator, and enter the other router's default IP address, **192.168.1.1**, in the *Address* field. Then press **Enter**.
2. A password request page will appear. Leave the *User Name* field blank. In the *Password* field, enter the password you have set (the default password is **admin**). Then click the **OK** button.
3. The first screen that appears will display the Setup tab. In the *Network Setup* section, there is a setting called *Local IP Address* (also called *Router IP*), which is set to 192.168.1.1. Change this to **192.168.2.1**.
4. Click the **Save Settings** button to save your change, and then exit the Web-based Utility.
5. Power down your network devices. Now you will begin the hardware installation of the Router.
6. Locate an optimum location for the Router. The best place for the Router is usually at the center of your wireless network, with line of sight to all of your wireless devices.
7. Adjust the antennas. Normally, the higher you place the antennas, the better the performance will be.
8. Connect a standard Ethernet network cable to the Router's Internet port. Then, connect the other end of the Ethernet cable to one of the numbered Ethernet ports on your other router.

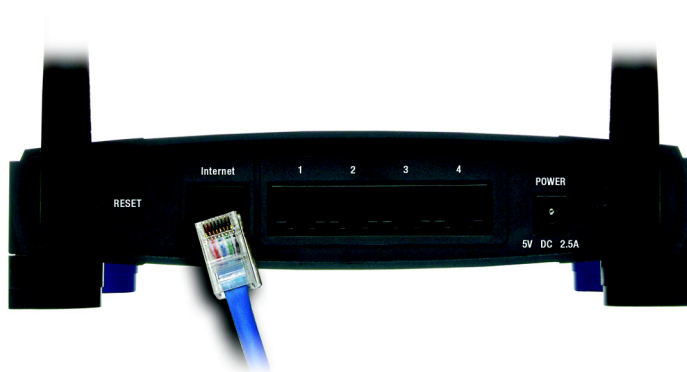


Figure 4-5: Connecting Another Router



NOTE: Steps 1-4 are instructions for a typical Linksys router; however, if you are using a non-Linksys router, refer to the other router's documentation for instructions on how to change its local IP address to 192.168.2.1.

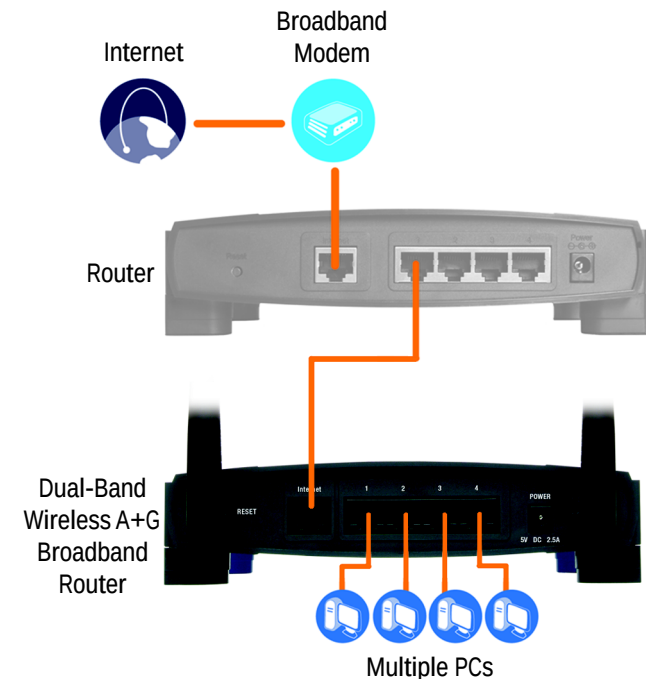


Figure 4-4: Diagram for Connection to Another Router

9. Decide which network computers or Ethernet devices you want to connect to the Router.

Disconnect the selected computers or devices from the other router, and then connect them to the Router's numbered ports using standard Ethernet network cabling.

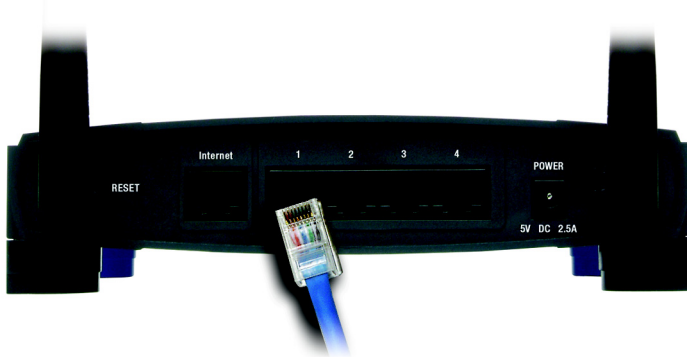


Figure 4-6: Connecting Your Network Devices

10. Connect the AC power adapter to the Router's Power port and the other end into an electrical outlet. Only use the power adapter supplied with the Router. Use of a different adapter may result in product damage.



IMPORTANT: Make sure you use the power adapter that is supplied with the Router. Use of a different power adapter could damage the Router.



Figure 4-7: Connecting the Power

Now that the hardware installation is complete, proceed to “Chapter 5: Configuring the Dual-Band Wireless A+G Router.”

Chapter 5: Configuring the Dual-Band Wireless A+G Broadband Router

Overview

Linksys recommends using the Setup Wizard on the Setup CD-ROM for first-time installation of the Router. For advanced users, you may follow the instructions in the previous chapter, “Chapter 4: Connecting the Dual-Band Wireless A+G Broadband Router”, and then configure the Router through its Web-based Utility.



NOTE: For first-time installation of the Router, Linksys recommends using the Setup Wizard on the Setup CD-ROM.

This chapter will describe each web page in the Utility and each page's key functions. The utility can be accessed via your web browser through use of a computer connected to the Router. For a basic network setup, most users will use these two screens of the Utility:



HAVE YOU: Enabled TCP/IP on your PCs? PCs communicate over the network with this protocol. Refer to “Appendix D: Windows Help” for more information on TCP/IP.

- **Basic Setup.** On the *Basic Setup* screen, enter the settings provided by your ISP.
- **Management.** Click the **Administration** tab and then the **Management** tab. The Router's default password is **admin**. To secure the Router, change the Password from its default.

There are seven 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.

Make the necessary changes through the Web-based Utility. On each screen, click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes. Help information is shown on the right-hand side of the screen. For additional information, click **More**.

How to Access the Web-based Utility

To access the Web-based Utility, launch Internet Explorer or Netscape Navigator, and enter the Router's default IP address, **192.168.1.1**, in the *Address* field. Then press **Enter**.

A password request page will appear. 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.) Then click the **OK** button.

The Setup Tab - Basic Setup

The first screen that appears displays the Setup tab. This allows you to change the Router's general settings.

Internet Setup

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

Internet Connection Type

Choose the type of Internet connection your ISP provides from the drop-down menu.

- **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.



Figure 5-1: Router's IP Address



Figure 5-2: Router Login Screen

ip (internet protocol): a protocol used to send data over a network.

ip address: the address used to identify a computer or device on a network.



Figure 5-3: Setup Tab - Basic Setup

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

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

DNS (1-3). 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**.

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. If you wish to activate Connect on Demand, click the radio button. In the *Max Idle Time* field, enter the number of minutes you want to have elapsed before your Internet connection terminates.

Keep Alive Option: 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, click the radio button next to *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.

Host Name and 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 will be transmitted. The

Figure 5-4: Static IP Connection Type

static ip address: a fixed address assigned to a computer or device connected to a network.

subnet mask: an address code that determines the size of the network.

default gateway: a device that forwards Internet traffic from your local area network.

Figure 5-5: PPPoE Connection Type

pppoe: a type of broadband connection that provides authentication (username and password) in addition to data transport

packet: a unit of data sent over a network

recommended size, entered in the Size field, is 1500. You should leave this value in the 1200 to 1500 range. To have the Router select the best MTU for your Internet connection, keep the default setting, **Auto**.

Network Setup

The Network Setup section changes the Router's local network settings. Changes to the Router's wireless network settings are performed through the Wireless tab.

Router IP

IP Address and Subnet Mask. This shows both the Router's IP Address and Subnet Mask, as seen by your network. The default IP Address is **192.168.1.1**, and the default Subnet Mask is **255.255.255.0**. In most cases, keeping the default values will work.

DHCP Server Settings

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, you must make sure there is no other DHCP server on your network.

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 **Disabled** (no other DHCP features will be available).

Assign Static DHCP. Every time a PC reboots, it is assigned a new local IP address by the Router. If you want a PC to be assigned the same IP address every time it reboots, then click the **Assign Static IP** button.

On the *Static DHCP Client List* screen, enter the static local IP address in the *Assign this IP* field, and enter the MAC address of the PC in the *To this MAC* field. Then click the **Enabled** checkbox. When you have finished your entries, click the **Save Settings** button to save your changes. Click the **Cancel Changes** button to cancel your changes. To exit this screen, click the **Close** button.

If you want to see a list of DHCP clients, click the **DHCP Client Table** button. On the *DHCP Client Table* screen, you will see a list of DHCP clients with the following information: Client Names, Interfaces, IP Addresses, and MAC Addresses. From the *To Sort by* drop-down menu, you can sort the table by Client Name, Interface, IP Address, or MAC Address. If you want to add any of the DHCP clients to the Static DHCP Client List, then click the **Save to Static DHCP Client List** checkbox and then click the **Save Settings** button. Click the **Cancel Changes** button to cancel your changes. To view the most up-to-date information, click the **Refresh** button. To exit this screen, click the **Close** button.

Figure 5-6: Static DHCP Client List

Figure 5-7: DHCP Client Table

Start 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 192.168.1.254. The default Starting IP Address is **192.168.1.100**.

Maximum Number of 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**.

IP Address Range. The range of DHCP addresses is displayed here.

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.

***dynamic ip address:** a temporary IP address assigned by a DHCP server.*

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, type that IP Address in one of these fields. You can type 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 Settings

Change the time zone in which your network functions from this pull-down menu. Click the checkbox if you want the Router to automatically adjust for daylight savings time.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes. Help information is shown on the right-hand side of the screen. For additional information, click **More**.

The Setup Tab - 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.

MAC Address Clone

Enabled/Disabled. To have the MAC Address cloned, select **Enabled** from the drop-down menu.

MAC Address. Enter the MAC Address registered with your ISP here.

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

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes. Help information is shown on the right-hand side of the screen. For additional information, click **More**.



Figure 5-8: Setup Tab - MAC Address Clone

mac address: the unique address that a manufacturer assigns to each networking device.

The Wireless Tab - Basic Wireless Settings

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

Wireless Network

Wireless-A Settings

If you are using a Wireless-A network, then configure these settings.

Mode. To enable Wireless-A (802.11a) networking, select **Enabled**. Otherwise, select **Disabled**.

Turbo Mode. Using this mode enables high-speed connections but severely limits range. To function, Turbo Mode must be enabled on both the Router and wireless PCs. To increase the speed of your wireless transmissions, select **Enabled**. (Keep in mind that the Router's range diminishes in Turbo Mode.) If you do not want to use Turbo Mode, select **Disabled**.

Network Name (SSID). The SSID is the network name shared by all devices in a wireless network. The SSID must be identical for all devices in the wireless network. It is case-sensitive and must not exceed 32 keyboard characters in length. Make sure this setting is the same for all devices in your wireless network. For added security, you should change the default SSID (**linksys-a**) to a unique name.

Channel. Select the appropriate channel from the list provided to correspond with your network settings. All devices in your wireless network must broadcast on the same channel in order to communicate. If you want the Router to automatically scan for a clear channel, then select **Auto (DFS)**.

SSID Broadcast. When wireless clients survey the local area for wireless networks to associate with, they will detect the SSID broadcast by the Router. To broadcast the Router's SSID, keep the default setting, **Enabled**. If you do not want to broadcast the Router's SSID, then select **Disabled**.

Wireless-G Settings

If you are using a Wireless-B, Wireless-G, or Wireless B+G network, then configure these settings.

Mode. From this drop-down menu, you can select the wireless standards running on your network. If you have both 802.11g and 802.11b devices in your network, keep the default setting, **Mixed**. If you have only 802.11g devices, select **Wireless-G Only**. If you have only 802.11b devices, select **Wireless-B Only**. If you do not have any 802.11g and 802.11b devices in your network, select **Disabled**.



Figure 5-9: Wireless Tab - Basic Wireless Settings

Network Name (SSID). The SSID is the network name shared by all devices in a wireless network. The SSID must be identical for all devices in the wireless network. It is case-sensitive and must not exceed 32 keyboard characters in length. Make sure this setting is the same for all devices in your wireless network. For added security, you should change the default SSID (**linksys-g**) to a unique name.

Channel. Select the appropriate channel from the list provided to correspond with your network settings. All devices in your wireless network must broadcast on the same channel in order to communicate.

SSID Broadcast. When wireless clients survey the local area for wireless networks to associate with, they will detect the SSID broadcast by the Router. To broadcast the Router's SSID, keep the default setting, **Enabled**. If you do not want to broadcast the Router's SSID, then select **Disabled**.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes. Help information is shown on the right-hand side of the screen. For additional information, click **More**.

The Wireless Tab - Wireless Security

The Wireless Security settings configure the security of your wireless network. There are three wireless security mode options supported by the Router: Pre-Shared Key, Pre-Shared Key + RADIUS, and WEP. (WEP stands for Wired Equivalent Privacy, while RADIUS stands for Remote Authentication Dial-In User Service.) These three are briefly discussed here. For detailed instructions on configuring wireless security for the Router, turn to “Appendix B: Wireless Security.”

Wireless Security

The security options are the same for your Wireless-A and Wireless-G networks. You can use different wireless security methods for your networks; however, within each network (Wireless-A or Wireless-G), all devices must use the same security method and settings.

Wireless-A Settings

Pre-Shared Key. This method offers two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of encryption method you want to use, **TKIP** or **AES**. Enter the Passphrase, which can have 8 to 63 characters. Then enter the Key Renewal period, which instructs the Router how often it should change the encryption keys.

Pre-Shared Key + RADIUS. This option features a Pre-Shared Key used in coordination with a RADIUS server that uses either EAP-TLS or PEAP as its authentication method. (This should only be used when a RADIUS server is connected to the Router.) First, select the type of encryption method you want to use, **TKIP** or **AES**. Enter the RADIUS server's IP address and port number, along with the authentication key shared by the Router and the server. Last, enter the Key Renewal period, which instructs the Router how often it should change the encryption keys.

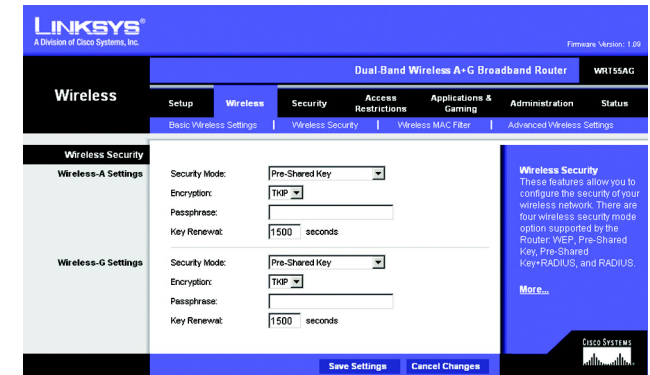


Figure 5-10: Wireless Tab - Wireless Security (Pre-Shared Key)



IMPORTANT: If you are using the Pre-Shared Key or Pre-Shared Key + RADIUS method, always remember that each device in your wireless network **MUST** use the same method and settings, or else the network will not function properly.

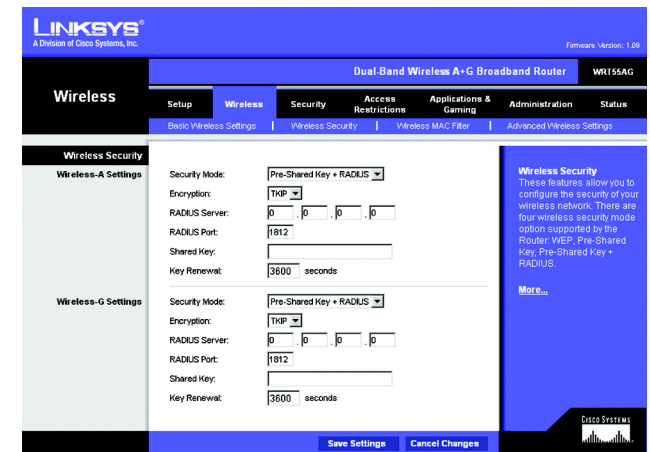


Figure 5-11: Wireless Tab - Wireless Security (Pre-Shared Key + RADIUS)

radius: a protocol that uses an authentication server to control network access.

WEP. WEP is a basic encryption method, which is not as secure as the other two methods, Pre-Shared Key and Pre-Shared Key + RADIUS. Select a level of WEP encryption, **40/64-bit**, **128-bit**, or **152-bit**. If you want to use a Passphrase, then enter it in the *Passphrase* field and click the **Generate** button. If you want to enter the WEP key manually, then enter it in the *WEP Key 1-4* field(s). To indicate which WEP key to use, select the appropriate *TX* Key number.

Wireless-G Settings

Pre-Shared Key. This method offers two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of encryption method you want to use, **TKIP** or **AES**. Enter the Passphrase, which can have 8 to 63 characters. Then enter the Key Renewal period, which instructs the Router how often it should change the encryption keys.

Pre-Shared Key + RADIUS. This option features a Pre-Shared Key used in coordination with a RADIUS server that uses either EAP-TLS or PEAP as its authentication method. (This should only be used when a RADIUS server is connected to the Router.) First, select the type of encryption method you want to use, **TKIP** or **AES**. Enter the RADIUS server's IP address and port number, along with the authentication key shared by the Router and the server. Last, enter the Key Renewal period, which instructs the Router how often it should change the encryption keys.

WEP. WEP is a basic encryption method, which is not as secure as the other two methods, Pre-Shared Key and Pre-Shared Key + RADIUS. Select a level of WEP encryption, **40/64-bit** or **128-bit**. If you want to use a Passphrase, then enter it in the *Passphrase* field and click the **Generate** button. If you want to enter the WEP key manually, then enter it in the *WEP Key 1-4* field(s). To indicate which WEP key to use, select the appropriate *TX* Key number.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes. Help information is shown on the right-hand side of the screen. For additional information, click **More**. For detailed instructions on configuring wireless security for the Router, turn to "Appendix B: Wireless Security."

Figure 5-12: Wireless Tab - Wireless Security (WEP)

wep (*wired equivalent privacy*): a method of encrypting network data transmitted on a wireless network for greater security.



IMPORTANT: If you are using WEP encryption, always remember that each device in your wireless network **MUST** use the same WEP encryption method and encryption key, or else your wireless network will not function properly.

The Wireless Tab - Wireless MAC Filter

Wireless access can be filtered by using the MAC addresses of the wireless devices transmitting within your network’s radius.

Wireless MAC Filter

Access Restrictions

To filter wireless users by MAC Address, either permitting or blocking access, click **Enabled**. If you do not wish to filter users by MAC Address, select **Disabled**.

Prevent PCs listed below from accessing the wireless network. Clicking this radio button will block wireless access by MAC Address.

Permit PCs listed below to access the wireless network. Clicking this radio button will allow wireless access by MAC Address.

Wireless Client List

Wireless Client List. Click the **Wireless Client MAC List** button to display a list of network users by MAC Address. From the *To Sort by* drop-down menu, you can sort the table by Client Name, Interface, IP Address, MAC Address, or Status. If you want to add any of the wireless clients to the Wireless MAC Filter List, then click the **Save to Wireless Client List** checkbox and then click the **Save Settings** button. Click the **Cancel Changes** button to cancel your changes. To view the most up-to-date information, click the **Refresh** button. To exit this screen, click the **Close** button.

List users, by MAC Address, whose wireless access you want to control.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes. Help information is shown on the right-hand side of the screen. For additional information, click **More**.

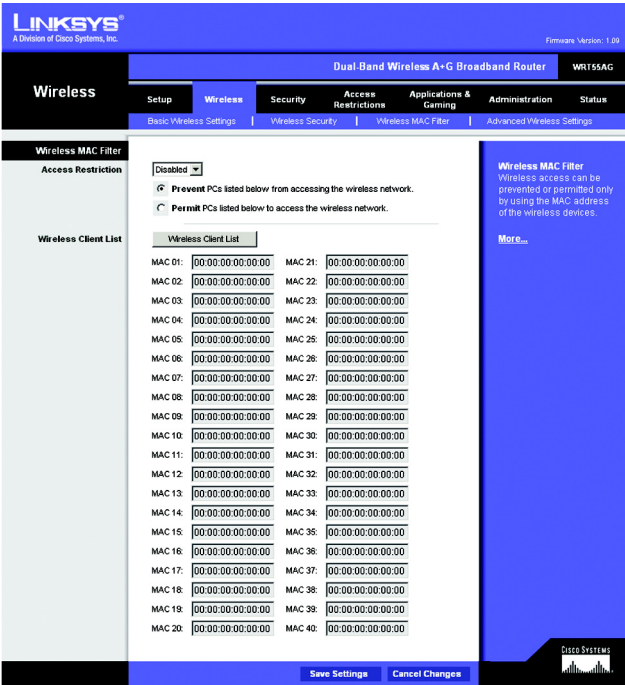


Figure 5-13: Wireless Tab - Wireless MAC Filter

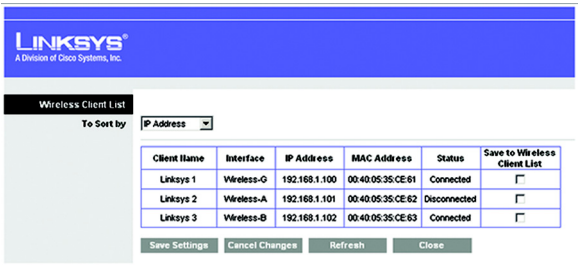


Figure 5-14: Wireless Client List

The Wireless Tab - Advanced Wireless Settings

This tab is used to set up the Router's advanced wireless functions. These settings should only be adjusted by an expert administrator as incorrect settings can reduce wireless performance.

Advanced Wireless

Wireless-A Settings

Authentication Type. The default is set to **Open System (Default)** authentication, when the sender and the recipient do NOT use a WEP key for authentication. With **Shared Key** authentication, the sender and recipient use a WEP key for authentication.

Transmission Rate. The rate of data transmission should be set depending on the speed of your wireless network. You can select from a range of transmission speeds, or you can select **Auto (Default)** to have the Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client. The default value is **Auto (Default)**.

Transmission Power. The greater the transmission power used, the larger the area a wireless network covers. To minimize the likelihood of eavesdropping by unauthorized wireless users, do not use more transmission power than necessary to cover the range needed by your wireless network. Try using the Router at different levels of transmission power, and determine how much power is needed to reach the wireless client, such as a PC or access point, that is farthest from the Router. Then select the appropriate level, **Full (Default)**, **Half**, **Quarter**, **Eighth**, or **Min**, from the drop-down menu. The default is **Full (Default)**.

Frame Burst Mode. Enabling this option should provide your network with greater performance, depending on the manufacturer of your wireless products. If you are not sure how to use this option, keep the default, **Enabled (Default)**.

Beacon Interval. The default value is **100**. The Beacon Interval value indicates the frequency interval of the beacon. A beacon is a packet broadcast by the Router to synchronize the wireless network.

DTIM Interval. This value indicates the interval of the Delivery Traffic Indication Message (DTIM). A DTIM field is a countdown field informing clients of the next window for listening to broadcast and multicast messages. When the Router has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. Its clients hear the beacons and awaken to receive the broadcast and multicast messages. The default value is **1**.

Fragmentation Threshold. This value specifies the maximum size for a packet before data is fragmented into multiple packets. If you experience a high packet error rate, you may slightly increase the Fragmentation

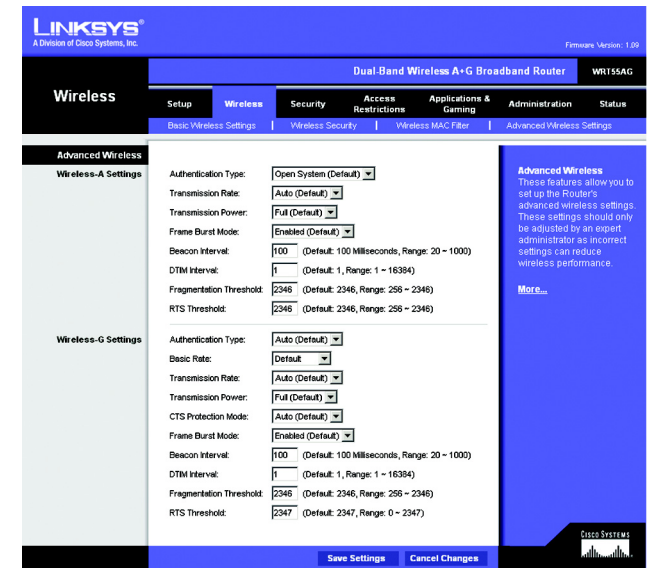


Figure 5-15: Wireless Tab - Advanced Wireless Settings

beacon interval: data transmitted on your wireless network that keeps the network synchronized.

dtim: a message included in data packets that can increase wireless efficiency.

fragmentation: breaking a packet into smaller units when transmitting over a network medium that cannot support the original size of the packet.

Threshold. Setting the Fragmentation Threshold too low may result in poor network performance. Only minor reduction of the default value is recommended. In most cases, it should remain at its default value of **2346**.

RTS Threshold. Should you encounter inconsistent data flow, only minor reduction of the default value, **2346**, is recommended. If a network packet is smaller than the preset RTS threshold size, the RTS/CTS mechanism will not be enabled. The Router sends Request to Send (RTS) frames to a particular receiving station and negotiates the sending of a data frame. After receiving an RTS, the wireless station responds with a Clear to Send (CTS) frame to acknowledge the right to begin transmission. The RTS Threshold value should remain at its default value of **2346**.

Wireless-G Settings

Authentication Type. The default is set to **Auto (Default)**, allows either Open System or Shared Key authentication to be used. With **Open System** authentication, the sender and the recipient do NOT use a WEP key for authentication. With **Shared Key** authentication, the sender and recipient use a WEP key for authentication.

Basic Rate. The Basic Rate setting is not actually one rate of transmission but a series of rates at which the Router can transmit. The Router will advertise its Basic Rate to the other wireless devices in your network, so they know which rates will be used. The Router will also advertise that it will automatically select the best rate for transmission. The default setting is **Default**, when the Router can transmit at all standard wireless rates (1-2Mbps, 5.5Mbps, 11Mbps, 18Mbps, and 24Mbps). Other options are **1-2Mbps**, for use with older wireless technology, and **All**, when the Router can transmit at all wireless rates. The Basic Rate is not the actual rate of data transmission. If you want to specify the Router's rate of data transmission, configure the Transmission Rate setting.

Transmission Rate. The rate of data transmission should be set depending on the speed of your wireless network. You can select from a range of transmission speeds, or you can select **Auto (Default)** to have the Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client. The default value is **Auto (Default)**.

Transmission Power. The greater the transmission power used, the larger the area a wireless network covers. To minimize the likelihood of eavesdropping by unauthorized wireless users, do not use more transmission power than necessary to cover the range needed by your wireless network. Try using the Router at different levels of transmission power, and determine how much power is needed to reach the wireless client, such as a PC or access point, that is farthest from the Router. Then select the appropriate level, **Full (Default)**, **Half**, **Quarter**, **Eighth**, or **Min**, from the drop-down menu. The default is **Full (Default)**.

CTS Protection Mode. CTS (Clear-To-Send) Protection Mode should be set to **Auto (Default)**. The Router will automatically use CTS Protection Mode when your Wireless-G products are experiencing severe problems and are not able to transmit to the Router in an environment with heavy 802.11b traffic. This function boosts the

cts (clear to send): a signal sent by a wireless device, signifying that it is ready to receive data.