

LINKSYS[®]
A Division of Cisco Systems, Inc.



2.4GHz
802.11g **Wireless-G**

**Broadband Router
with SpeedBooster**

User Guide



Model No. **WRT54GS**



Copyright and Trademarks

Specifications are subject to change without notice. Linksys is a registered trademark or trademark of Cisco Systems, Inc. and/or its affiliates in the U.S. and certain other countries. Copyright © 2004 Cisco Systems, Inc. All rights reserved. Other brands and product names are trademarks or registered trademarks of their respective holders.

How to Use This User Guide

This User Guide has been designed to make understanding networking with the Wireless-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 Wireless-G Broadband Router.



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



This question mark provides you with a reminder about something you might need to do while using the Wireless-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”.

Table of Contents

Chapter 1: Introduction	1
Welcome	1
What's in this Guide?	2
Chapter 2: Planning Your Wireless Network	4
Network Topology	4
Ad-Hoc versus Infrastructure Mode	4
Network Layout	4
Chapter 3: Getting to Know the Wireless-G Broadband Router	6
The Back Panel	6
The Front Panel	7
Chapter 4: Connecting the Wireless-G Broadband Router	8
Overview	8
Hardware Installation for Connection to Your Broadband Modem	8
Connecting One Router to Another	10
Chapter 5: Configuring the Wireless-G Broadband Router	13
Overview	13
The Setup Tab - Basic Setup	14
The Setup Tab - DDNS	18
The Setup Tab - MAC Address Clone	19
The Setup Tab - Advanced Routing	20
The Wireless Tab - Basic Wireless Settings	21
The Wireless Tab - Wireless Security	22
The Wireless Tab - Wireless MAC Filter	24
The Wireless Tab - Advanced Wireless Settings	25
The Security Tab - Firewall	27
The Security Tab - VPN Passthrough	27
The Access Restrictions Tab - Parental Control	28
The Access Restrictions Tab - Internet Access	29
The Applications and Gaming Tab - Port Range Forward	31
The Applications and Gaming Tab - DMZ	32
The Administration Tab - Management	33
The Administration Tab - Log	33

Wireless-G Broadband Router with SpeedBooster

The Administration Tab - Diagnostics	34
The Administration Tab - Factory Defaults	35
The Administration Tab - Firmware Upgrade	35
The Status Tab - Router	36
The Status Tab - Local Network	37
The Status Tab - Wireless	38
Chapter 6: Using the Linksys Parental Control Service	39
Overview	39
Introduction	39
Signing up for the Linksys Parental Control Service	40
Signing up for the Linksys Parental Control Service	41
Managing Linksys Parental Controls	44
Support Center	45
Activity Reports	47
Family Settings	49
Suggest a Rating	57
Using the Parental Control Service	57
Appendix A: Troubleshooting	60
Common Problems and Solutions	60
Frequently Asked Questions	69
Appendix B: Wireless Security	75
Security Precautions	75
Security Threats Facing Wireless Networks	75
Appendix C: Upgrading Firmware	78
Appendix D: Windows Help	79
Appendix E: Finding the MAC Address and IP Address for Your Ethernet Adapter	80
Windows 98SE or Me Instructions	80
Windows 2000 or XP Instructions	80
For the Router's Web-based Utility	81
Appendix F: Glossary	82
Appendix G: Specifications	88
Appendix H: Warranty Information	90
Appendix I: Regulatory Information	91
Appendix J: Contact Information	93

List of Figures

Figure 3-1: The Router's Back Panel	6
Figure 3-2: The Router's Front Panel	7
Figure 4-1: Connecting Your Modem	8
Figure 4-2: Connecting Your Network Devices	9
Figure 4-3: Connecting the Power	9
Figure 4-4: Connecting the Router Behind Another	10
Figure 4-5: Diagram for Connection to Another Router	10
Figure 4-6: The Router with the Internet Connection is connected through the Internet Port	11
Figure 4-7: Connecting Your Network Devices	11
Figure 4-8: Connecting the Power	12
Figure 5-1: Password Screen	13
Figure 5-2: Setup Tab - Basic Setup	14
Figure 5-3: DHCP Connection Type	14
Figure 5-4: Static IP Connection Type	14
Figure 5-5: PPPoE Connection Type	15
Figure 5-6: PPTP Connection Type	15
Figure 5-7: HeartBeat Signal Connection Type	16
Figure 5-8: Optional Settings	16
Figure 5-9: Router IP	17
Figure 5-10: Network Address Server Settings	17
Figure 5-11: Time Setting	17
Figure 5-12: Setup Tab - DDNS	18
Figure 5-13: Setup Tab - MAC Address Clone	19
Figure 5-14: Setup Tab - Advanced Routing (Gateway)	20
Figure 5-15: Setup Tab - Advanced Routing (Router)	20
Figure 5-16: Wireless Tab - Basic Wireless Settings	21
Figure 5-17: Wireless Tab - Wireless Security (WPA Pre-Shared Key)	22
Figure 5-18: Wireless Tab - Wireless Security (WPA RADIUS)	22
Figure 5-19: Wireless Tab - Wireless Security (RADIUS)	23
Figure 5-20: Wireless Tab - Wireless Security (WEP)	23

Wireless-G Broadband Router with SpeedBooster

Figure 5-21: Wireless Tab - Wireless MAC Filter	24
Figure 5-22: MAC Address Filter List	24
Figure 5-23: Wireless Tab - Advanced Wireless Settings	25
Figure 5-24: Security Tab - Firewall	27
Figure 5-25: Security Tab - VPN Passthrough	27
Figure 5-26: Access Restrictions Tab - Parental Control	28
Figure 5-27: Access Restrictions Tab - Internet Access	29
Figure 5-28: Internet Policy Summary	29
Figure 5-29: List of PCs	29
Figure 5-30: Port Services	30
Figure 5-31: Applications and Gaming Tab - Port Range Forward	31
Figure 5-32: Applications and Gaming Tab - DMZ	32
Figure 5-33: Administration Tab - Management	33
Figure 5-34: Administration Tab - Log	33
Figure 5-35: Administration Tab - Diagnostics	34
Figure 5-36: The Ping Test	34
Figure 5-37: The Traceroute Test	34
Figure 5-38: Administration Tab - Factory Defaults	35
Figure 5-39: Administration Tab - Firmware Upgrade	35
Figure 5-40: Status Tab - Router	36
Figure 5-41: Status Tab - Local Network	37
Figure 5-42: DHCP Clients Table	37
Figure 5-43: Status Tab - Wireless	38
Figure 6-1: Safe Surfing	40
Figure 6-2: Access Restrictions Tab - Parental Control	40
Figure 6-3: Linksys Service Agreement	41
Figure 6-4: Sign Up	41
Figure 6-5: Purchase Service	42
Figure 6-6: Connecting to the Parental Control Service	43
Figure 6-7: Congratulations	43
Figure 6-8: Parental Controls Login	44
Figure 6-9: Support Center	45
Figure 6-10: Subscribe to Service	45

Figure 6-11: Update Contact Information	46
Figure 6-12: Cancel Your Parental Control Account	46
Figure 6-13: Activity Reports	47
Figure 6-14: Types of Reports	47
Figure 6-15: Web Report	48
Figure 6-16: Family Settings	49
Figure 6-17: New Family Member	49
Figure 6-18: All Settings	50
Figure 6-19: Online Reporting	50
Figure 6-20: Maturity Level	51
Figure 6-21: Time Restrictions	52
Figure 6-22: Web Browsing Restrictions	53
Figure 6-23: Web Site Categories	53
Figure 6-24: Blocked & Allowed Web Sites	54
Figure 6-25: E-mail Restrictions	55
Figure 6-26: E-mail Settings	55
Figure 6-27: Instant-Messaging Restrictions	56
Figure 6-28: Password	56
Figure 6-29: Suggest a Rating	57
Figure 6-30: Security Warning	57
Figure 6-31: Welcome to Parental Controls	58
Figure 6-32: Tray Icon	58
Figure 6-33: Pop-up Screen (Login)	58
Figure 6-34: Pop-up Screen (Sign Out)	59
Figure 6-35: Right-Click Tray Icon	59
Figure 6-36: Re-activate Tray Icon	59
Figure C-1: Upgrade Firmware	78
Figure E-1: IP Configuration Screen	80
Figure E-2: MAC Address/Adapter Address	80
Figure E-3: MAC Address/Physical Address	80
Figure E-4: MAC Address Filter List	81
Figure E-5: MAC Address Clone	81

Chapter 1: Introduction

Welcome

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

How does the Wireless-G Broadband Router with SpeedBooster do all of this? A router is a device that allows access to an Internet connection over a network. With the Wireless-G Broadband Router with SpeedBooster, this access can be shared over the four switched ports or via the wireless network, broadcast at either 11Mbps for Wireless-B or 54Mbps for Wireless-G. In addition, WEP encryption provides greater security opportunities while the whole network is protected through a Stateful Packet Inspection (SPI) firewall and NAT technology. All of these security features, as well as full configurability, are accessed 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 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. The Wireless-G Broadband Router with SpeedBooster bridges wireless networks of both 802.11b and 802.11g standards and wired networks, allowing them to communicate with each other. And since this Router has SpeedBooster technology, your wireless network performance increases by up to 30% from old 802.11g standards. In fact, even non-SpeedBooster-equipped devices on your network will see a speed improvement when communicating with SpeedBooster-enhanced equipment!

With your networks all connected, wired, wireless, and the Internet, you can now share files and Internet access—and even play games. All the while, the Wireless-G Broadband Router with SpeedBooster protects your networks from unauthorized and unwelcome users.

You should always use the Setup CD-ROM when you first install 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 Wireless-G Broadband Router with SpeedBooster, 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 Wireless-G Broadband Router with SpeedBooster.

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

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 Wireless-G Broadband Router with SpeedBooster.

- **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 Wireless-G Broadband Router**
This chapter describes the Router's physical features.
- **Chapter 4: Connecting the Wireless-G Broadband Router**
This chapter instructs you on how to connect the Router to your network.
- **Chapter 5: Configuring the Wireless-G Broadband Router**
This chapter explains how to use the Router's Web-Based Utility.
- **Chapter 6: Using the Linksys Parental Control Service**
This chapter explains how to sign up for the Service, manage your account, and use the Internet when the Service is actively controlling Internet traffic and messages.
- **Appendix A: Troubleshooting**
This appendix describes some problems and solutions, as well as frequently asked questions, regarding installation and use of the Wireless-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 Router's firmware 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 Router's MAC filtering and/or MAC address cloning feature.

Wireless-G Broadband Router with SpeedBooster

- **Appendix F: Glossary**
This appendix gives a brief glossary of terms frequently used in networking.
- **Appendix G: Specifications**
This appendix provides the Router's technical specifications.
- **Appendix H: Warranty Information**
This appendix supplies the Router's warranty information.
- **Appendix I: Regulatory Information**
This appendix supplies the Router's regulatory information.
- **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 is exactly like a regular local area network (LAN), except that each computer in the wireless network uses a wireless device to connect to the network. Computers in a wireless network 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 wireless and wired network 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, 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 Wireless-G Broadband Router has been specifically designed for use with both your 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.

adpater: 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.

Wireless-G Broadband Router with SpeedBooster

The Wireless-G Broadband Router is compatible with all 802.11b and 802.11g adapters, such as the Notebook Adapters (WPC54G, WPC11) for your laptop computers, PCI Adapter (WMP54G, WMP11) for your desktop PC, and USB Adapter (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 Wireless-G Broadband Router's four LAN ports. To add more ports, any of the Wireless-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 Wireless-G Broadband Router.

Chapter 3: Getting to Know the Wireless-G Broadband Router

The Back Panel

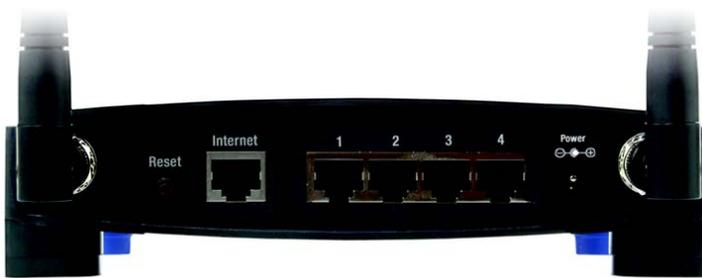


Figure 3-1: The Router's Back Panel

The Router's ports, where the cables are connected, are located on the back panel.

- 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 PCs on your wired network and other Ethernet network devices.
- Power** The **Power** port is where you will connect the power adapter.



Important: Resetting the Router will erase all of your settings (WEP Encryption, network settings, etc.) and replace them with the factory defaults. Do not reset the Router if you want to retain these settings.

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, where information about network activity is displayed, 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.
WLAN	Green. The WLAN LED lights up whenever there is a successful wireless connection. 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.

dmz: removes the Router's firewall protection from one PC, allowing it to be "seen" from the Internet

Chapter 4: Connecting the Wireless-G Broadband Router

Overview

This chapter includes two sets of instructions. If the Wireless-G Broadband Router will be the only router in your network, follow the instructions in “Hardware Installation for Connection to Your Broadband Modem.” You may wish to run some applications, such as Parental Control, for only certain PCs on your network and will need to run the Wireless-G Broadband Router behind another router to do this. If you want to install the Wireless-G Broadband Router behind another router in your network, follow the instructions in “Connecting One Router to Another.”

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 mobile stations.
3. Fix the direction of the antennas. Try to place the Router in a position that will best cover your wireless network. Normally, the higher you place the antenna, the better the performance will be.
4. Connect a standard Ethernet network cable to the Router's Internet port. Then, connect the other end of the Ethernet cable to your cable or DSL broadband modem.

hardware: the physical aspect of computers, telecommunications, and other information technology devices

dsl: an always-on broadband connection over traditional phone lines



Figure 4-1: Connecting Your Modem

Wireless-G Broadband Router with SpeedBooster

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 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 4-3: Connecting the Power

Now that the hardware installation is complete, proceed to “Chapter 5: Configuring the Wireless-G Broadband Router,” for directions on using the Router’s Web-Based Utility to configure the Router’s settings for your network.

Connecting One Router to Another

Some applications, such as Parental Control, apply setting to all PCs connected to the Router. Sometimes, you may not want those settings to apply to all settings in your network. When this is the case, you may want to connect the Router behind another, so you can have some PCs connected to the Router with Parental Control and some connected to a Router without.

Before you connect one Router to another, you must make sure that both have different IP Addresses. This is mandatory because both routers may be set to the same IP address by default, right out of the box. If both routers have the same IP address, then you may not be able to set up the Router with Parental Control.

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**, or whatever IP Address you have set it to, 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*, 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 Broadband Router.
6. Locate an optimum location for the Broadband Router. The best place for the Broadband Router is usually at the center of your wireless network, with line of sight to all of your mobile stations.
7. Fix the direction of the antennas. Try to place the Router in a position that will best cover your wireless network. Normally, the higher you place the antenna, the better the performance will be.

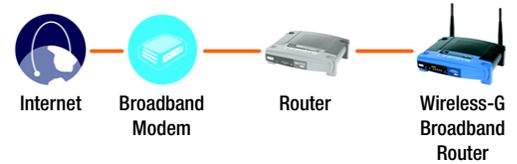


Figure 4-4: Connecting the Router Behind Another



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.

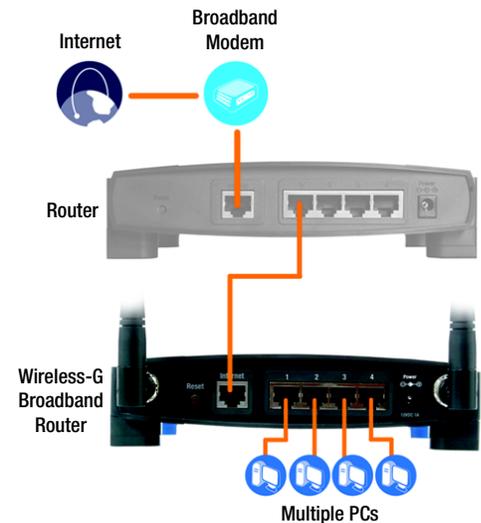


Figure 4-5: Diagram for Connection to Another Router

Wireless-G Broadband Router with SpeedBooster

8. Connect a standard Ethernet network cable to the Broadband 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 4-6: The Router with the Internet Connection is connected through the Internet Port

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



Figure 4-7: Connecting Your Network Devices



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

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

Wireless-G Broadband Router with SpeedBooster

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



Figure 4-8: Connecting the Power

Now that the hardware installation is complete, proceed to “Chapter 5: Configuring the Wireless-G Broadband Router,” for directions on using the Router’s Web-Based Utility to configure the Router’s settings for your network.

Chapter 5: Configuring the Wireless-G Broadband Router

Overview

You should always use the Setup CD-ROM when first installing the Router. If you do not wish to run the Setup Wizard on the Setup CD-ROM, you can use the Web-based Utility to configure the Router. For advanced users, you may configure the Router's advanced settings through the Web-based Utility.

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:

- **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.

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. (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 the **OK** button to continue.



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.



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.



Figure 5-1: Password Screen

The Setup Tab - Basic Setup

The first screen that appears displays the Setup tab. This allows you to change the Router's general settings. Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

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

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

- **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.
- **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.

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.

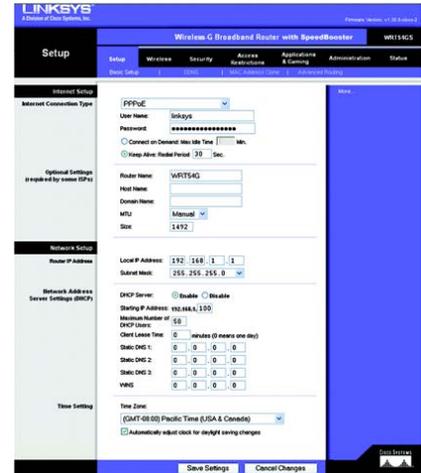


Figure 5-2: Setup Tab - Basic Setup



Figure 5-3: DHCP Connection Type

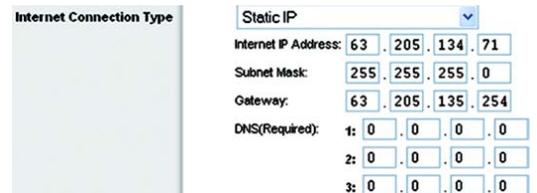


Figure 5-4: Static IP Connection Type

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

- **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.

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

Specify 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. 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.



Figure 5-5: PPPoE Connection Type

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

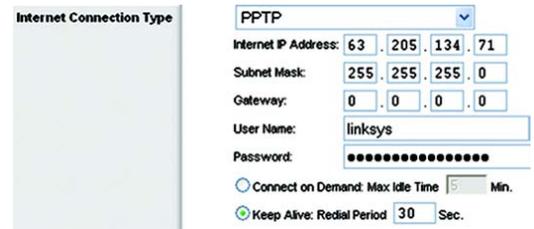


Figure 5-6: PPTP Connection Type

- **HeartBeat Signal.** HeartBeat Signal (HBS) is a service that applies to connections in Australia only.

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

Heart Beat Server. This is the IP address that the Router has, when seen from the Internet. 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. 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.

Router Name. In this field, you can type 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. The default setting, **Manual**, allows you to enter the largest packet size that will be transmitted. The recommended size, entered in the *Size* field, is 1492. You should leave this value in the 1200 to 1500 range. To have the Router select the best MTU for your Internet connection, select **Auto**.

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.

Internet Connection Type: HeartBeat Signal

User Name: []

Password: []

Heart Beat Server: [0].[0].[0].[0]

Connect on Demand: Max Idle Time [] Min.

Keep Alive: Redial Period [30] Sec.

Figure 5-7: HeartBeat Signal Connection Type

Optional Settings (required by some ISPs)

Router Name: WRT54G

Host Name: []

Domain Name: []

MTU: Manual

Size: 1492

Figure 5-8: Optional Settings

packet: a unit of data sent over a network

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

Figure 5-9: Router IP

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, you must configure all of your network PCs to connect to a DHCP server (the Router), and 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 click the **Disable** radio button (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, 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.

Network Address Server Settings (DHCP)

DHCP Server: Enable 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

Figure 5-10: Network Address Server Settings

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

Time Setting

Change the time zone in which your network functions from this pull-down menu. (You can even automatically adjust for daylight savings time.)

Time Setting

Time Zone: (GMT-08:00) Pacific Time (USA & Canada)

Automatically adjust clock for daylight saving changes

Figure 5-11: Time Setting

The Setup Tab - 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 www.dyndns.org or www.TZO.com, DDNS service providers.

DDNS Service. From this pull-down menu, enter the DDNS service with which you have membership.

User Name. Enter the User Name for your DDNS account

Password. Enter the Password for your DDNS account.

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

Internet IP Address. This is the Router's current IP Address as seen on the Internet.

Status. This displays the status of the DDNS connection.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 5-12: Setup Tab - DDNS

ddns: allows the hosting of a website, FTP server, or e-mail server with a fixed domain name (e.g., www.xyz.com) and a dynamic IP address

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.

Enable/Disable. To have the MAC Address cloned, click the radio button beside *Enable*.

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

Clone Your PC's MAC Address. Clicking this button will clone the MAC address.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 5-13: Setup Tab - MAC Address Clone

The Setup Tab - Advanced Routing

This tab is used to set up the Router's advanced functions. Operating Mode allows you to select the type(s) of advanced functions you use. Dynamic Routing will automatically adjust how packets travel on your network. Static Routing sets up a fixed route to another network destination.

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 enabled.

Dynamic Routing. 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**, 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.

Static Routing. 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 pre-determined 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), the **WAN** (Internet), or **Loopback** (a dummy network in which one PC acts like a network—necessary for certain software programs).

Click the **Show Routing Table** button to view the Static Routes you've already set up.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 5-14: Setup Tab - Advanced Routing (Gateway)



Figure 5-15: Setup Tab - Advanced Routing (Router)

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

The Wireless Tab - Basic Wireless Settings

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

Wireless Network 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 **G-Only**. If you have only 802.11b devices, select **B-Only**. If you do not have any 802.11g and 802.11b devices in your network, select **Disable**. SpeedBooster works automatically with all settings, providing the added bonus of increased speed across your entire network and even greater speed when using SpeedBooster products only.

Wireless Network Name (SSID). The SSID is the network name shared among all points 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 characters (use any of the characters on the keyboard). Make sure this setting is the same for all points in your wireless network. For added security, you should change the default SSID (**linksys**) to a unique name.

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

Wireless 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, **Enable**. If you do not want to broadcast the Router's SSID, then select **Disable**.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 5-16: Wireless Tab - Basic Wireless Settings



NOTE: SpeedBooster ONLY works in Infrastructure Mode.

The Wireless Tab - Wireless Security

The Wireless Security settings configure the security of your wireless network. There are four wireless security mode options supported by the Router: WPA Pre-Shared Key, WPA RADIUS, RADIUS, and WEP. (WPA stands for Wi-Fi Protected Access, which is a security standard stronger than WEP encryption. WEP stands for Wired Equivalent Privacy, while RADIUS stands for Remote Authentication Dial-In User Service.) These four are briefly discussed here. For detailed instructions on configuring wireless security for the Router, turn to “Appendix B: Wireless Security.”

WPA Pre-Shared Key. WPA gives you two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of algorithm, **TKIP** or **AES**. Enter a WPA Shared Key of 8-63 characters. Then enter a Group Key Renewal period, which instructs the Router how often it should change the encryption keys.

WPA RADIUS. This option features WPA used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router.) First, select the type of WPA algorithm you want to use, **TKIP** or **AES**. Enter the RADIUS server’s IP Address and port number, along with a key shared between the Router and the server. Last, enter a Key Renewal Timeout, which instructs the Router how often it should change the encryption keys.



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

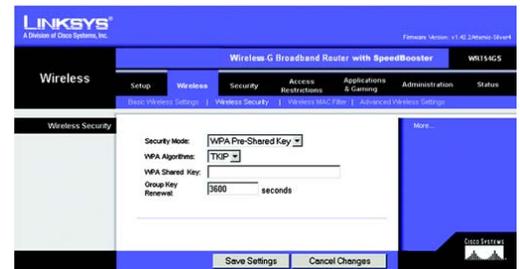


Figure 5-17: Wireless Tab - Wireless Security (WPA Pre-Shared Key)



Figure 5-18: Wireless Tab - Wireless Security (WPA RADIUS)

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

Wireless-G Broadband Router with SpeedBooster

RADIUS. This option features WEP used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router.) First, enter the RADIUS server's IP Address and port number, along with a key shared between the Router and the server. Then, select a Default Transmit Key (choose which Key to use), and a level of WEP encryption, **64 bits 10 hex digits** or **128 bits 26 hex digits**. Last, either generate a WEP key using the Passphrase or enter the WEP key manually.

WEP. WEP is a basic encryption method, which is not as secure as WPA. To use WEP, select a Default Transmit Key (choose which Key to use), and a level of WEP encryption, **64 bits 10 hex digits** or **128 bits 26 hex digits**. Then either generate a WEP key using the Passphrase or enter the WEP key manually.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes. For detailed instructions on configuring wireless security for the Router, turn to "Appendix B: Wireless 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

LINKSYS
A Division of Cisco Systems, Inc. Firmware Version: v1.40.0 (Release: 08/04/04)

Wireless-G Broadband Router with SpeedBooster WRT54GS

Wireless Security

Security Mode: RADIUS
RADIUS Server Address: 0.0.0.0
RADIUS Port: 1812
Shared Key:
Default Transmit Key: 1
WEP Encryption: 64 bits 10 hex digits
Passphrase: [Generate]
Key 1:
Key 2:
Key 3:
Key 4:

Save Settings Cancel Changes

Figure 5-19: Wireless Tab - Wireless Security (RADIUS)

LINKSYS
A Division of Cisco Systems, Inc. Firmware Version: v1.40.0 (Release: 08/04/04)

Wireless-G Broadband Router with SpeedBooster WRT54GS

Wireless Security

Security Mode: WEP
Default Transmit Key: 1
WEP Encryption: 64 bits 10 hex digits
Passphrase: [Generate]
Key 1:
Key 2:
Key 3:
Key 4:

Save Settings Cancel Changes

Figure 5-20: Wireless Tab - Wireless Security (WEP)

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

Prevent. Clicking this button will block wireless access by MAC Address.

Permit Only. Clicking this button will allow wireless access by MAC Address.

Edit MAC Address Filter List. Clicking this button will open the MAC Address Filter List. On this screen, you can list users, by MAC Address, to whom you wish to provide or block access. For easy reference, click the **Wireless Client MAC List** button to display a list of network users by MAC Address.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 5-21: Wireless Tab - Wireless MAC Filter

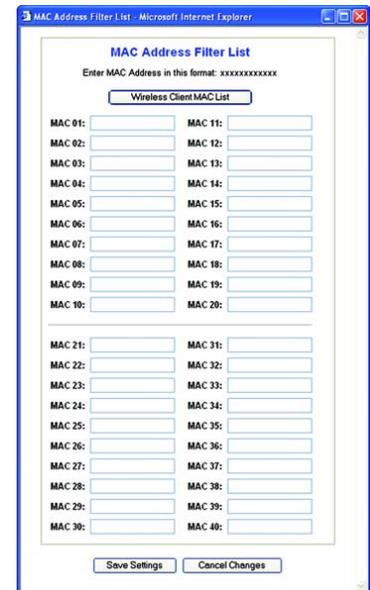


Figure 5-22: MAC Address Filter List

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.

Authentication Type. The default is set to **Auto**, which 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** 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**.

CTS Protection Mode. CTS (Clear-To-Send) Protection Mode should remain disabled unless you are having severe problems with your Wireless-G products not being able to transmit to the Router in an environment with heavy 802.11b traffic. This function boosts the Router's ability to catch all Wireless-G transmissions but will severely decrease performance.

Frame Burst. 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, **Disable**.

Beacon Interval. The default value is **100**. Enter a value between 1 and 65,535 milliseconds. 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, between 1 and 255, 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**.



Figure 5-23: Wireless Tab - Advanced Wireless Settings

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

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

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.

Wireless-G Broadband Router with SpeedBooster

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 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, **2347**, 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 **2347**.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

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

The Security Tab - Firewall

Firewall Protection. Enable this feature to employ Stateful Packet Inspection (SPI) for more detailed review of data packets entering your network environment.

Block WAN Requests. Enable the Block WAN Request feature by checking the box beside **Block Anonymous Internet Requests** and you can prevent your network from being “pinged,” or detected, by other Internet users. The Block WAN Request feature also reinforces your network security by hiding your network ports. Both functions of the Block WAN Request feature make it more difficult for outside users to work their way into your network. This feature is enabled by default.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

The Security Tab - VPN Passthrough

Use the settings on this tab to allow VPN tunnels using IPSec, PPTP, or L2TP protocols to pass through the Router's firewall.

IPSec Pass-through. Internet Protocol Security (IPSec) is a suite of protocols used to implement secure exchange of packets at the IP layer. To allow IPSec tunnels to pass through the Router, click **Enable**. IPSec Pass-Through is enabled by default.

PPTP Pass-through. Point-to-Point Tunneling Protocol (PPTP) allows the Point-to-Point Protocol (PPP) to be tunneled through an IP network. To allow PPTP tunnels to pass through the Router, click **Enable**. PPTP Pass-Through is enabled by default.

L2TP Pass-through. Layer 2 Tunneling Protocol is the method used to enable Point-to-Point sessions via the Internet on the Layer 2 level. To allow L2TP tunnels to pass through the Router, click **Enable**. L2TP Pass-Through is enabled by default.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 5-24: Security Tab - Firewall

firewall: a set of related programs located at a network gateway server that protects the resources of a network from users from other networks.



Figure 5-25: Security Tab - VPN Passthrough

vpn: a Vsecurity measure to protect data as it leaves one network and goes to another over the Internet

ipsec: a VPN protocol used to implement secure exchange of packets at the IP layer

pptp: a VPN protocol that allows the Point to Point Protocol (PPP) to be tunneled through an IP network. This protocol is also used as a type of broadband connection in Europe

The Access Restrictions Tab - Parental Control

(This service is available in the United States and Canada ONLY.)

The *Parental Control* screen allows you to sign up and manage your Linksys Parental Controls account. The Linksys Parental Control Service* gives you powerful tools to control the availability of Internet services, access, and features, customizable for each member of your family. For more information, refer to “Chapter 6: Using the Linksys Parental Control Service.”

The Linksys Parental Control Service supersedes the Router’s Internet Access Policies. In other words, if you are using the Linksys Parental Control Service, then the Internet Access Policies on the Access Restrictions Tab - Internet Access screen will be disabled.

To sign up or manage your Linksys Parental Controls account, you will need an active Internet connection.

Enable/Disable. If you want to use the Linksys Parental Control feature, click the **Enable** radio button. If you want to disable the Linksys Parental Control feature, click the **Disable** radio button.

Sign Up for Parental Control Service. To sign up for a free trial of the Linksys Parental Control Service, click this link. You will be automatically taken to a website where you can create your account. For more information, refer to “Chapter 6: Using the Linksys Parental Control Service.”

More info. If you would like more information about the Linksys Parental Control Service, click the **More info** button.

Status. Displayed here is the status of your Linksys Parental Controls account.

Manage Account. If you have already set up your Parental Controls account, click the **Manage Account** button to access it and make changes.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes. * Available in US and Canada only.



Figure 5-26: Access Restrictions Tab - Parental Control

The Access Restrictions Tab - Internet Access

The *Internet Access* screen allows you to block or allow specific kinds of Internet usage and traffic, such as Internet access, designated services, websites, and inbound traffic during specific days and times.

Internet Access Policy. Access can be managed by a policy. Use the settings on this screen to establish an access policy (after the **Save Settings** button is clicked). Selecting a policy from the drop-down menu will display that policy's settings. To delete a policy, select that policy's number and click the **Delete** button. To view all the policies, click the **Summary** button. (Policies can be deleted from the *Summary* screen by selecting the policy or policies and clicking the **Delete** button. To return to the Internet Access tab, click the **Close** button.)

Status. Policies are disabled by default. To enable a policy, select the policy number from the drop-down menu, and click the radio button beside *Enable*.

You can create two kinds of policies, one kind to manage Internet access and another kind to manage inbound traffic.

To create an Internet Access policy:

1. Select a number from the *Internet Access Policy* drop-down menu.
2. To enable this policy, click the radio button beside *Enable*.
3. Enter a Policy Name in the field provided.
4. Click the **Edit List** button to select which PCs will be affected by the policy. The *List of PCs* screen will appear. You can select a PC by MAC Address or IP Address. You can also enter a range of IP Addresses if you want this policy to affect a group of PCs. After making your changes, click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes. Then click the **Close** button.
5. Click the appropriate option, **Deny** or **Allow**, depending on whether you want to block or allow Internet access for the PCs you listed on the *List of PCs* screen.
6. Decide which days and what times you want this policy to be enforced. Select the individual days during which the policy will be in effect, or select **Everyday**. Then enter a range of hours and minutes during which the policy will be in effect, or select **24 Hours**.



Figure 5-27: Access Restrictions Tab - Internet Access



Figure 5-28: Internet Policy Summary



Figure 5-29: List of PCs

Wireless-G Broadband Router with SpeedBooster

7. You can filter access to various services accessed over the Internet, such as FTP or telnet, by selecting services from the drop-down menus next to *Blocked Services*. (You can block up to 20 services.) Then enter the range of ports you want to filter.

If the service you want to block is not listed or you want to edit a service's settings, then click the **Add/Edit Service** button. Then the *Port Services* screen will appear.

To add a service, enter the service's name in the *Service Name* field. Select its protocol from the *Protocol* drop-down menu, and enter its range in the *Port Range* fields. Then click the **Add** button.

To modify a service, select it from the list on the right. Change its name, protocol setting, or port range. Then click the **Modify** button.

To delete a service, select it from the list on the right. Then click the **Delete** button.

When you are finished making changes on the *Port Services* screen, click the **Apply** button to save changes. If you want to cancel your changes, click the **Cancel** button. To close the *Port Services* screen and return to the *Access Restrictions* screen, click the **Close** button.

8. If you want to block websites with specific URL addresses, enter each URL in a separate field next to *Website Blocking by URL Address*.
9. If you want to block websites using specific keywords, enter each keyword in a separate field next to *Website Blocking by Keyword*.
10. Click the **Save Settings** button to save the policy's settings. To cancel the policy's settings, click the **Cancel Changes** button.

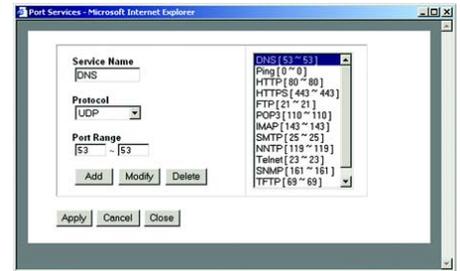


Figure 5-30: Port Services

ftp: a protocol used to transfer files over a TCP/IP network

telnet: a user command and TCP/IP protocol used for accessing remote PCs

url: the address of a file located on the Internet

The Applications and Gaming Tab - Port Range Forward

The Applications and Gaming Tab allows you to set up public services on your network, such as web servers, ftp servers, e-mail servers, or other specialized Internet applications. (Specialized Internet applications are any applications that use Internet access to perform functions such as videoconferencing or online gaming. Some Internet applications may not require any forwarding.)

To forward a port, enter the information on each line for the criteria required. Descriptions of each criteria are described here.

Application. In this field, enter the name you wish to give the application. Each name can be up to 12 characters.

Start/End. This is the port range. Enter the number that starts the port range under **Start** and the number that ends the range under **End**.

Protocol. Enter the protocol used for this application, either **TCP** or **UDP**, or **Both**.

IP Address. For each application, enter the IP Address of the PC running the specific application.

Enable. Click the **Enable** checkbox to enable port forwarding for the relevant application.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

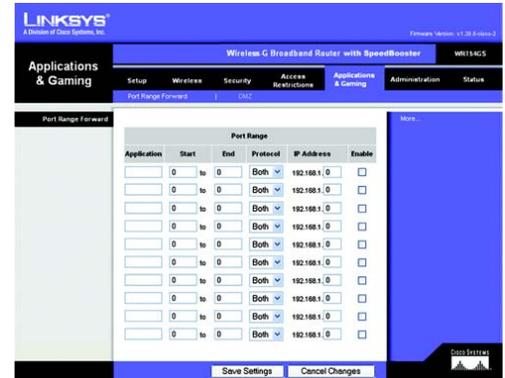


Figure 5-31: Applications and Gaming Tab - Port Range Forward

tcp: a network protocol for transmitting data that requires acknowledgement from the recipient of data sent

udp: a network protocol for transmitting data that does not require acknowledgement from the recipient of the data that is sent.

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

The Applications and Gaming Tab - DMZ

The DMZ feature allows one network user to be exposed to the Internet for use of a special-purpose service such as Internet gaming or videoconferencing. DMZ hosting forwards all the ports at the same time to one PC. The Port Range Forward feature is more secure because it only opens the ports you want to have opened, while DMZ hosting opens all the ports of one computer, exposing the computer to the Internet.

Any PC whose port is being forwarded must have its DHCP client function disabled and should have a new static IP address assigned to it because its IP address may change when using the DHCP function.

To expose one PC, select **Enable**. Then, enter the computer's IP address in the *DMZ Host IP Address* field.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 5-32: Applications and Gaming Tab - DMZ

The Administration Tab - Management

This section of the Administration tab allows the network's administrator to manage specific Router functions for access and security.

Local Router Access. You can change the Router's password from here. Enter a new Router password and then type it again in the *Re-enter to confirm* field to confirm.

Remote Router Access. To access the Router remotely, from outside the network, verify that **Enable** is selected. Then, enter the port number that will be open to outside access. You will need to enter the Router's password when accessing the Router this way, as usual.

UPnP. When using UPnP features, select **Enable**. As allowing this may present a risk to security, this feature is disabled by default.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.

The Administration Tab - Log

The Router can keep logs of all traffic for your Internet connection. To disable the Log function, keep the default setting, **Disable**. To monitor traffic between the network and the Internet, select **Enable**. When you wish to view the logs, click **Incoming Log** or **Outgoing Log**, depending on which you wish to view.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 5-33: Administration Tab - Management



Figure 5-34: Administration Tab - Log

The Administration Tab - Diagnostics

The diagnostic tests (Ping and Traceroute) allow you to check the connections of your network components.

Ping Test. The Ping test will check the status of a connection. Click the **Ping** button to open the *Ping Test* screen. Enter the address of the PC whose connection you wish to test and how many times you wish to test it. Then, click the **Ping** button. The Ping Test screen will show if the test was successful. To stop the test, click the **Stop** button. Click the **Clear Log** button to clear the screen. Click the **Close** button to return to the *Diagnostics* screen.

Traceroute Test. To test the performance of a connect, click the **Traceroute** button. Enter the address of the PC whose connection you wish to test and click the **Ping** button. The Traceroute Test screen will show if the test was successful. To stop the test, click the **Stop** button. Click the **Clear Log** button to clear the screen. Click the **Close** button to return to the *Diagnostics* screen.

Change these settings as described here and click the **Save Settings** button to apply your changes or **Cancel Changes** to cancel your changes.



Figure 5-35: Administration Tab - Diagnostics



Figure 5-36: The Ping Test

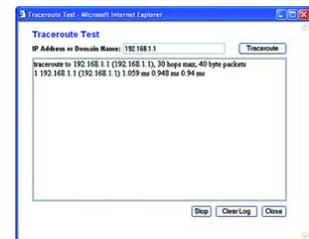


Figure 5-37: The Traceroute Test

The Administration Tab - Factory Defaults

Click the **Yes** button to reset all configuration settings to their default values, and then click the **Save Settings** button. Any settings you have saved will be lost when the default settings are restored. This feature is disabled by default.



Figure 5-38: Administration Tab - Factory Defaults

The Administration Tab - Firmware Upgrade

Firmware can be upgraded by clicking the **Upgrade** button after browsing for the firmware, which you can download from the Linksys website. Do not upgrade your firmware unless you are experiencing problems with the Router. For more information about upgrading firmware, refer to "Appendix C: Upgrading Firmware".



Figure 5-39: Administration Tab - Firmware Upgrade

firmware: the programming code that runs a networking device

download: to receive a file transmitted over a network

upgrade: to replace existing software or firmware with a newer version

The Status Tab - Router

The *Router* screen on the Status Tab displays the Router's current status.

Firmware Version. This is the Router's current firmware.

Current Time. This shows the time, as you set on the Setup Tab.

MAC Address. This is the Router's MAC Address, as seen by your ISP.

Router Name. This is the specific name for the Router, which you set on the Setup Tab.

Host Name. If required by your ISP, this would have been entered on the Setup Tab.

Domain Name. If required by your ISP, this would have been entered on the Setup Tab.

Configuration Type. This shows the information required by your ISP for connection to the Internet. This information was entered on the Setup Tab. You can **Connect** or **Disconnect** your connection here by clicking on that button.



Figure 5-40: Status Tab - Router

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

isp: your internet provider

domain: a specific name for a network of computers

The Status Tab - Local Network

The *Local Network* screen on the Status Tab displays the status of your network.

MAC Address. This is the Router's MAC Address, as seen on your local, Ethernet network.

IP Address. This shows the Router's IP Address, as it appears on your local, Ethernet network.

Subnet Mask. When the Router is using a Subnet Mask, it is shown here.

DHCP Server. If you are using the Router as a DHCP server, that will be displayed here.

Start IP Address. For the range of IP Addresses used by devices on your local, Ethernet network, the beginning of that range is shown here.

End IP Address. For the range of IP Addresses used by devices on your local, Ethernet network, the end of that range is shown here.

DHCP Clients Table. Clicking this button will open a screen to show you which PCs are utilizing the Router as a DHCP server. You can delete PCs from that list, and sever their connections, by checking a **Delete** box and clicking the **Delete** button.



Figure 5-41: Status Tab - Local Network



Figure 5-42: DHCP Clients Table

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

The Status Tab - Wireless

The *Wireless* screen on the Status Tab displays the status of your wireless network.

MAC Address. This is the Router's MAC Address, as seen on your local, wireless network.

Mode. As selected from the Wireless tab, this will display the wireless mode (Mixed, G-Only, or Disabled) used by the network.

SSID. As entered on the Wireless tab, this will display the wireless network name or SSID.

DHCP Server. If you are using the Router as a DHCP server, that will be displayed here.

Channel. As entered on the Wireless tab, this will display the channel on which your wireless network is broadcasting.

Encryption Function. As selected on the Security Tab, this will display what type of encryption the Router uses for security.



Figure 5-43: Status Tab - Wireless

encryption: encoding data transmitted in a network

Chapter 6: Using the Linksys Parental Control Service

Overview

This chapter will describe the Linksys Parental Control Service*, as well as explain how to sign up for the Service, manage your account, and use the Internet when the Service is actively controlling Internet traffic and messages.

Introduction

The Linksys Parental Control Service makes it easy for you to keep your family safe on the Internet. The Service gives you powerful tools to control the availability of Internet services, access, and features, customizable for each member of the family.

Choosing from 16 different web content categories, you control what each family member is allowed to see. Each website request triggers a search through our constantly updated database, which determines whether or not to allow the content through, based on who's logged in. You can also manually block or allow specific websites based on your own judgment.

To protect your family from unsolicited messages, you can set up e-mail and Instant Message filters. You select who can send messages to, and receive messages from, your family. If your children are spending too much time online, you can set time restrictions by hour and day of the week.

To keep you informed of your family's online activities, full reports are available to view or download. You can see each family member's blocked and unblocked Internet activities, to keep you "in the loop" on their changing interests. Setting up and customizing each family member's settings is a snap with the friendly web-based menus—even if you're not the family's usual network administrator. Because the Parental Control Service is based in the Router, not your PCs, it can't be bypassed and keeps every Internet device in your household equally protected.

* Available in US and Canada only.

database: a collection of data that is organized so that its contents can easily be accessed, managed, and updated.

Signing up for the Linksys Parental Control Service

There are two ways to access the website you will use to sign up for your Linksys Parental Controls account.

Setup Wizard

At the end of the Setup Wizard, you will see the *Safe Surfing* screen. Click the **Linksys Parental Control Service** button to sign up for a free trial service. You will be automatically taken to a website where you can create your account. For additional instructions, go to the “Signing up for the Linksys Parental Control Service” section. After you have signed up, you will be asked if you want to manage your account. If so, then you can go directly to the login screen for Linksys Parental Controls Billing and Support Center. Refer to the “Managing Linksys Parental Controls” section.

Web-based Utility

If you are using the Router's Web-based Utility, go to the Access Restrictions tab - Parental Control screen. Click the **Enable** radio button and then the **Save Settings** button. Then click the **Sign up for Parental Control Service** button. You will be automatically taken to a website where you can create your account. For additional instructions, go to the “Signing up for the Linksys Parental Control Service” section. If you would like more information about the Linksys Parental Control Service, click the **More info** button. If you have already set up your Parental Controls account, click the **Manage Account** button to access it and make changes. For more information, go to the “Managing Linksys Parental Controls” section.



Note: To sign up for your Linksys Parental Controls account, you will need an active Internet connection.



Figure 6-1: Safe Surfing

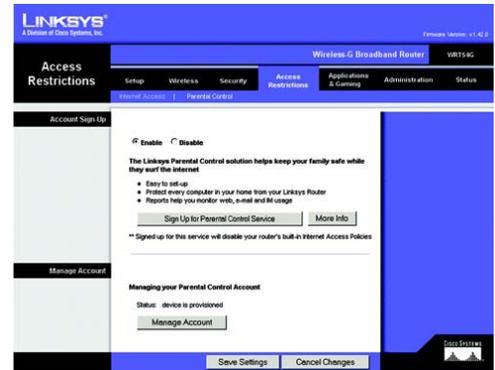


Figure 6-2: Access Restrictions Tab - Parental Control

Signing up for the Linksys Parental Control Service

To sign up for your Linksys Parental Controls account, you will need an active Internet connection. Then follow these instructions:

1. After you click *Linksys Parental Control Service* from the Setup Wizard or the *Sign Up for Parental Control Service* button from the Web-based Utility, the *Linksys Service Agreement* screen will appear. You must scroll down the entire agreement before you can accept the Agreement. Then click the **Accept** button. If you do not want to accept the Agreement, click the **Cancel** button.
2. The *Sign Up* screen will appear. Enter a User Name and Password for your account. Enter the Password again in the *Confirm Password* field. Then enter your e-mail address in the *Email* field (service e-mail notifications will be sent to this e-mail address) and enter it again in the *Confirm Email* field.

You have a choice of two payment plans, **Pay Now** or **Pay Later**. (If the Router you are using is not eligible for the free trial, then you have one choice, Pay Now.)

If you click Pay Now, go to step 3.

If you click Pay Later, go to step 4.



Figure 6-3: Linksys Service Agreement



Figure 6-4: Sign Up

Wireless-G Broadband Router with SpeedBooster

- To pay now, complete the form on the *Purchase Service* screen. Your account information will automatically appear.

In the *User Information* section, enter your address in the *Address1*, *Address2* (if necessary), *City*, *State/Prov*, and *Zip Code* fields. Select your country from the *Country* drop-down menu. (Your phone number is optional.)

In the *Billing Information* section, select your credit card from the *Credit Card* drop-down menu. Complete the *Credit Card Number* field. From the *Expiration Date* drop-down menus, select the month and year your credit card expires. In the *Full Name on Card* field, enter the complete name that appears on the credit card you are using.

Then click the **Finish** button. To cancel your sign-up, click the **Cancel** button.

LINKSYS Parental Control

Purchase Service

By purchasing a subscription to the Linksys Parental Control Service you are taking an important step to ensuring your family safety while on the internet. If you signed up for a free trial you get a discount if you purchase a subscription within the first 15 days of the trial.

Select your subscription option

- **\$24.95** For 6 months (plus get 60 days free => 8 months for \$24.95)
- **\$39.95** For 1 year (plus 60 days free => 14 months for \$39.95)
- **\$59.95** For 2 years (plus 60 days free => 26 months for \$59.95)

Account Information

User Name: First Last

Parental Control Password:

Confirm Password:

Your e-mail address will only be used to send you service administration notices.

Email:

User Information

Address: Address1 Address2

City: State/Prov:

Zip Code: Country:

Phone:

Billing Information

Credit Card:

Credit Card Number:

Expiration Date: /

Full Name on Card:

Figure 6-5: Purchase Service

Wireless-G Broadband Router with SpeedBooster

4. The Router will now connect to the Parental Control Service.



Figure 6-6: Connecting to the Parental Control Service

5. When the sign-up process is complete, you will receive an e-mail message, and you will see the *Congratulations* screen.

If you want to create user profiles for your family members now, click the **Create Profiles** button. For additional instructions, proceed to step 4 of the “Managing Linksys Parental Controls” section.

If you want to access the Internet immediately, click the **Sign in and Surf** button. For more information, go to the “Using the Linksys Parental Control Service” section.



Figure 6-7: Congratulations

Managing Linksys Parental Controls

To manage your Linksys Parental Controls account, you will need an active Internet connection. Then follow these instructions:

1. Open the Router's Web-based Utility.
2. Click the **Access Restrictions** tab.
3. Click the **Manage Account** button on the *Parental Controls* screen. (This screen also lists the status of your Parental Controls account.)
4. The login screen will appear. For future reference, create a bookmark through your web browser. Complete the *Name* (E-mail address) and *Password* fields.
5. Then click the **Go** button. The *Support Center* screen will appear.



Figure 6-8: Parental Controls Login



Note: If you have forgotten your password, click **Send me an E-mail reminder** and follow the on-screen instructions.

Support Center

On the left of the *Support Center* screen, you can access the Activity Reports, Family Settings, and Suggest a Rating webpages. These and the Support Center webpage are accessible from every screen. (Click **Billing and Support** to return to the Support Center webpage.)

On the *Support Center* screen, you also have access to the following:

Subscribe to Service

Click **Subscribe to Service** to sign up for your Parental Controls subscription before your free trial period expires. The *Purchase Linksys Parental Control Service* screen will appear. Follow these instructions:

1. Select a subscription option.
2. Complete the *Billing Contact Info* and *Billing Information* sections. (Fields marked with an asterisk must be filled out.)
3. Click the **Update** button to save your changes, or click the **Cancel** button to cancel changes.

Ask for Help

If you need more information about the Parental Control Service, click this link.

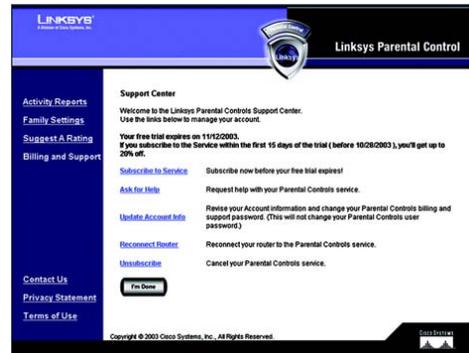


Figure 6-9: Support Center



Figure 6-10: Subscribe to Service

Update Account Info

Click this link to update your contact information or change your Parental Controls billing and support password (this is separate from your Parental Controls user password). The *Update Contact Information* screen will appear. Follow these instructions:

1. Complete the *First Name* and *Last Name* fields. (Fields marked with an asterisk must be filled out.)
2. Enter your new billing and support password in the *Parental Control Password* field. Re-enter the new password in the *Confirm Password* field.
3. Complete the *Email* field (the e-mail address you enter will receive service administration notices only).
4. Click the **Save** button to save your changes, or click the **Cancel** button to cancel changes.

Reconnect Router

If the Router has lost its connection to the Parental Control Service or if you have reset the Router back to its factory default settings after you have signed up for Parental Control Service, click **Reconnect Router** to regain the connection.

Unsubscribe

If you want to cancel your Parental Control Service account, click this link. Click the **Proceed** button on the following screen to cancel your Parental Control Service.

Figure 6-11: Update Contact Information

Figure 6-12: Cancel Your Parental Control Account

Activity Reports

On the *Activity Reports* screen, you will be able to view a report of Internet activities for your entire family or a specific family member. Click **Family** to view family reports, or click an individual's name to view his or her reports. After you have selected Family or a specific name, you will see a choice of reports to view.

Reports

For the family or a specific family member, these are the reports you can view:

- Summary (not available if you selected Family)
- Web Report
- Instant-Messaging Report
- E-mail Report

Summary

Click this link to view a summary of Internet activities, including Top Allowed or Blocked E-mail Addresses, Top Allowed or Blocked Instant-Message Addresses, and Alerts. (This report is not available for the entire family.)

Web Report

Click this link to view all web-browsing activities. Each entry lists details under five column headings: Date, Family Member, Reason, Web Site, and Web Category. You can click a column heading to sort entries. To view the activities during a specific time period, use the *Day Range* drop-down menu. Click the **Refresh** button to update the report. To delete specific entries, click the checkbox next to specific entries, and then click the **Delete** button. To save all reports to your computer, click the **Download** button. The reports will be saved as a tab-delimited text file called PcReport. To scroll through the entries, click **First**, **Previous**, or **Next**.

Instant-Messaging Report

Click **Instant-Messaging Report** to see all activities with Instant Messages. Each entry lists details under five column headings: Date, Family Member, Reason, Local Screen Name, and Remote Screen Name. You can click a column heading to sort entries. To view the activities during a specific time period, use the *Day Range* drop-down menu. Click the **Refresh** button to update the report. To delete specific entries, click the checkbox next to specific entries, and then click the **Delete** button. To save all reports to your computer, click the **Download** button. The reports will be saved as a tab-delimited text file called PcReport. To scroll through the entries, click **First**, **Previous**, or **Next**.



Figure 6-13: Activity Reports

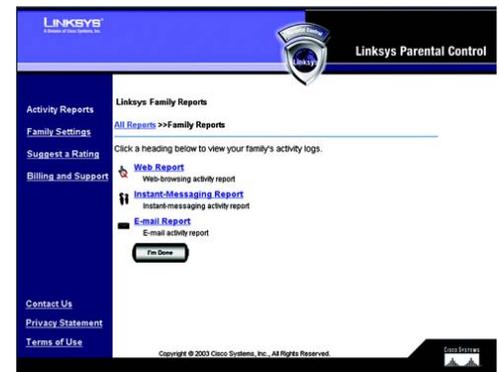


Figure 6-14: Types of Reports

E-mail Report

Click this link to view all e-mail activities. Each entry lists details under five column headings: Date, Family Member, Reason, Sender's E-mail Address, and Receiver's E-mail Address. You can click a column heading to sort entries. To view the activities during a specific time period, use the *Day Range* drop-down menu. Click the **Refresh** button to update the report. To delete specific entries, click the checkbox next to specific entries, and then click the **Delete** button. To save all reports to your computer, click the **Download** button. The reports will be saved as a tab-delimited text file called PcReport. To scroll through the entries, click **First**, **Previous**, or **Next**.

The screenshot shows the Linksys Parental Control web interface. The main content area is titled "Linksys Family Web Report" and includes a "Day Range" dropdown menu set to "All Days" and a "Refresh" button. Below this is a table with the following columns: Date, Family Member, Reason, Web Site, and Web Category. The table contains 10 rows of data, all dated 10-10-03. The "Reason" column includes entries like "Bk Type", "OK Type", and "General Interest". The "Web Site" column lists various domains such as WWW.VICTORIASSECRET.COM, WWW.MSN.COM, HOME.MICROSOFT.COM, and WWW.GOOGLE.COM. The "Web Category" column includes "Lingerie, Swimsuits", "Unknown", and "General Interest". At the bottom of the table, there are buttons for "Delete Selected", "Delete All", and "Download". A page indicator shows "Page 1 of 1 (10 records)" and a "Records per page" dropdown set to "10".

Date	Family Member	Reason	Web Site	Web Category
10-10-03 02:48 PM	child	Bk Type	WWW.VICTORIASSECRET.COM	Lingerie, Swimsuits
10-10-03 02:48 PM	child	OK Type	WWW.MSN.COM	Unknown
10-10-03 02:48 PM	child	OK Type	HOME.MICROSOFT.COM	Unknown
10-10-03 02:22 PM	child	OK Type	WWW.GOOGLE.COM	General Interest
10-10-03 02:22 PM	child	OK Type	WWW.MSN.COM	Unknown
10-10-03 02:22 PM	child	OK Type	HOME.MICROSOFT.COM	Unknown
10-10-03 02:22 PM	child	Bk Type	WWW.GOOGLE.COM	Adult Content
10-10-03 02:22 PM	child	OK Type	WWW.GOOGLE.COM	General Interest
10-10-03 02:22 PM	child	OK Type	VIEWPOINT.COM	Unknown
10-10-03 02:22 PM	child	OK Type	WWW.MSN.COM	Unknown

Figure 6-15: Web Report

Family Settings

On the *Family Settings* screen, you will be able to change the settings for a family member or add a new family member. Click a family member's name to change his or her Internet privileges. You will see the *All Settings* screen, which lists several categories of settings. Refer to the "All Settings" section for more information.

New Family Member

To add a new family member, click the **New Family Member** button. On the *Name & Password* screen, follow these instructions:

1. Enter the nickname and password that the new family member will use to access the Internet. Re-enter the Password in the *Re-enter Password* field. Click the **Cancel** button to cancel your changes. Click the **Next** button to continue.
2. Click the radio button next to the appropriate age category for the new family member. There are five categories: Child (under 12), Youth (12-15), Mature Teen (16-17), Adult, and Family Manager. Read the online category descriptions to learn what types of restrictions are enabled for each category, or refer to the "Maturity Level" section.
3. Click the **Back** button to return to the previous screen. Click the **Cancel** button to cancel your change. Click the **Finish** button to save this new family member profile (the default restrictions of the age category you select will be active).

If you want to customize the restrictions for the new family member, click the **Customize** button. You will see the *All Settings* screen, which lists several categories of settings, such as Time, Web Browsing, E-mail, and Instant-Messaging Restrictions. Follow the on-screen instructions; for more information, refer to the "Time Restrictions," "Web Browsing Restrictions," "E-mail Restrictions," and "Instant-Messaging Restrictions" sections. Click the **I'm Done** button when you are finished with your changes.

I'm Done. When you have finished making changes to your Parental Controls account, click the **I'm Done** button to exit the Parental Controls Billing & Support Center website.



Figure 6-16: Family Settings

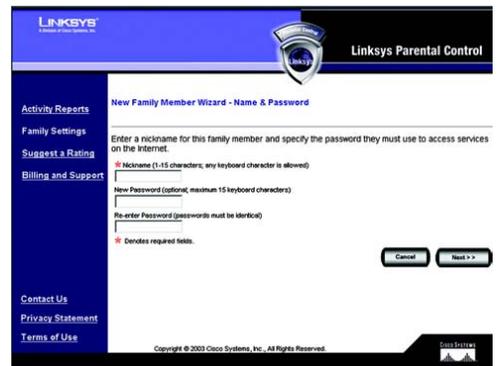


Figure 6-17: New Family Member

All Settings

For each family member you will be able to customize the following privileges:

- Online Reporting
- Maturity Level
- Time Restrictions
- Web Browsing Restrictions
- E-mail Restrictions
- Instant-Messaging Restrictions
- Password
- Delete

I'm Done. When you have finished making changes to your Parental Controls account, click the **I'm Done** button to exit the Parental Controls Billing & Support Center website.

Online Reporting

On the *Online Reporting* screen you can select the kinds of activities you want to monitor. There are three categories: Web Browsing Restrictions, E-mail, and Instant Messaging. For each category, you have three levels of monitoring available. Click the radio button next to your choice in each category.

Web Browsing Restrictions. Select one of the following: **No reporting of Web sites visited**, **Report only blocked Web sites**, or **Report all Web sites visited**.

E-mail. Select one of the following: **No e-mail Reporting**, **Report only Blocked e-mail activity**, or **Report All e-mail activity**.

Instant Messaging. Select one of the following: **No Instant-Messaging/Chat reporting**, **Report only Blocked Instant-Messaging/Chat activity**, or **Report all Instant-Messaging/Chat activity**.

Click the **Save** button to save your changes, or click the **Cancel** button to cancel your changes.



Figure 6-18: All Settings

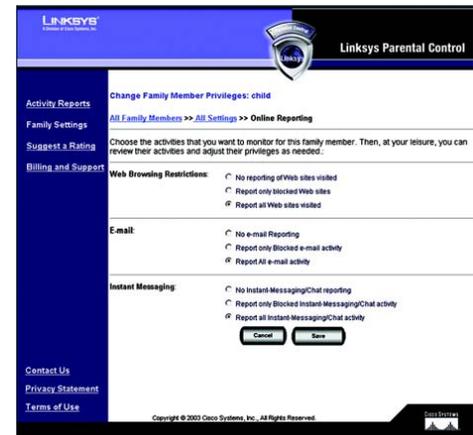


Figure 6-19: Online Reporting

Maturity Level

On the *Maturity Level* screen, click the radio button next to the appropriate age category for the designated family member. There are five categories:

Child (under 12). Web browsing is limited to general interest and unlisted sites. E-mail and instant-messaging services are prohibited. Internet access is allowed from 3 PM to 8 PM on weekdays and from 8 AM to 9 PM on weekends.

Youth (12-15). Web browsing is limited to “Child” categories plus sex education sites. E-mail services are prohibited. Instant-messaging services are restricted to a list of approved correspondents. Internet access is allowed from 3 PM to 10 PM on weekdays, and from 8 AM to 10 PM on weekends.

Mature Teen (16-17). Web browsing is limited to “Youth” categories plus games, lingerie and swimsuits, nudity, and web communication sites. E-mail and instant-messaging services are prohibited. Internet access is allowed from 3 PM to 11 PM on weekdays and from 8 AM to 11 PM on weekends.

Adult. All services are unrestricted. This category is recommended for adults only.

Family Manager. All services are unrestricted. Access to the Parental Controls settings is permitted. This category is recommended for adults only.

Click the **Save** button to save your changes, or click the **Cancel** button to cancel your changes. After you select and save the Maturity Level setting, then you can customize the other settings, such as Time, Web Browsing, E-mail, and Instant-Messaging Restrictions.



Figure 6-20: Maturity Level

Time Restrictions

On the *Time Restrictions* screen, click any hour to allow or deny Internet access (green indicates allowed Internet access, and red indicates blocked Internet access). To allow Internet access for an entire day, click the day of the week in the *Allow All Day* row. To block Internet access for an entire day, click the day of the week in the *Block All Day* row. If you want to reset the Time Restrictions to the default settings for a specific age category, click the appropriate age category in the *Reset to* row. If you want to always block Internet access, click **Always Block**. If you want to always allow Internet access, click **Always Allow**.

To cancel your changes, click **Undo Changes**. Click the **Cancel** button to cancel your changes and return to the previous screen. Click the **Save** button to save your changes.



Figure 6-21: Time Restrictions

Web Browsing Restrictions

On the *Web Browsing Restrictions* screen, click **Web Site Categories** if you want to block and allow Web sites by category. Click **Blocked & Allowed Web sites** if you want to block and allow specific Web sites.

Web Site Categories. On the *Web Site Categories* screen there are 16 categories listed:

- Adult Content
- Alcohol, Drugs, Tobacco
- Anonymizers
- Criminal/Illegal Skills
- Gambling
- Games
- General Interest
- Hate/Discrimination
- Lingerie, Swimsuits
- Nudity
- Personals & Dating
- Sex Education
- Unknown
- Violence
- Weapons
- Web Communications

Click a category title for an online description of the category. Click the checkbox of a category to allow or block access. A checkmark indicates an allowed category, while a stop sign indicates a blocked category. If you want to reset the category blocking to the default settings for a specific age category, click the appropriate age category in the *Reset to* row. If you want to block all categories, click **Block All**. If you want to allow all categories, click **Allow All**.

To cancel your changes, click **Undo Changes**. Click the **Cancel** button to cancel your changes and return to the previous screen. Click the **Save** button to save your changes.

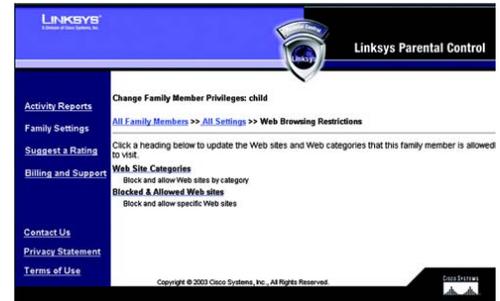


Figure 6-22: Web Browsing Restrictions



Figure 6-23: Web Site Categories

Wireless-G Broadband Router with SpeedBooster

Blocked & Allowed Web Sites. From this screen, you can control access to specific Web sites. To add an allowed Web site, enter the name of the Web site in the *Allow this Web site* field. Then click the **Add** button. To remove an allowed Web site, select the name of the Web site in the *Allow Web Sites* field, and then click the **Remove** button.

To add a blocked Web site, enter the name of the Web site in the *Block this Web site* field. Then click the **Add** button. To remove a blocked Web site, select the name of the Web site in the *Blocked Web Sites* field, and then click the **Remove** button.

Click the **Cancel** button to cancel your changes. Click the **Save** button to save your changes.

The screenshot shows the Linksys Parental Control web interface. The top navigation bar includes the Linksys logo and the text 'Linksys Parental Control'. A left sidebar contains links for 'Activity Reports', 'Family Settings', 'Suggest a Rating', and 'Billing and Support'. The main content area is titled 'Change Family Member Privileges: child' and 'All Family Members >> All Settings >> Web Browsing Restrictions >> Blocked & Allowed Web sites'. Below this, there is a text box for 'Allow this Web site (up to 63 characters, wildcards OK) - Example: www.allow.com or *.allow.com' with an 'Add' button. A list of 'Allowed Web Sites' is shown with a 'Remove' button. Below that is another text box for 'Block this Web site (up to 63 characters, wildcards OK) - Example: www.block.com or *.block.com' with an 'Add' button. A list of 'Blocked Web Sites' is shown with a 'Remove' button. At the bottom of the main area are 'Cancel' and 'Save' buttons. The footer contains 'Contact Us', 'Privacy Statement', 'Terms of Use', and a copyright notice for Cisco Systems, Inc. 2003.

Figure 6-24: Blocked & Allowed Web Sites

E-mail Restrictions

There are three levels of e-mail privileges available:

- May use e-mail freely
- May correspond with approved contacts only
- May not use e-mail

Click the radio button next to the level appropriate for the designated family member. If you restrict e-mails to a list of approved contacts, then click the word **here** of *click here to set up*, next to *May correspond with approved contacts only*. The *E-mail Settings* screen will appear. Then follow these instructions:

4. Enter the family member's e-mail address.
5. Complete the *Incoming Mail Server* and *Account Name* fields. If you are not sure, click the words **Click here** of *Click here to use suggested names*. Suggestions will automatically appear in the *Incoming Mail Server* and *Account Name* fields.
6. Enter the approved contact's e-mail address. Click the **Add Address** button to add the approved contact.

To remove an approved contact, click the contact's e-mail address in the *E-mail Correspondents* field, and then click the **Remove** button.

Click the **Cancel** button to cancel your changes. Click the **Save** button to save your changes.

On the *E-mail Restrictions* screen, click the **Cancel** button to cancel your changes. Click the **Save** button to save your changes.

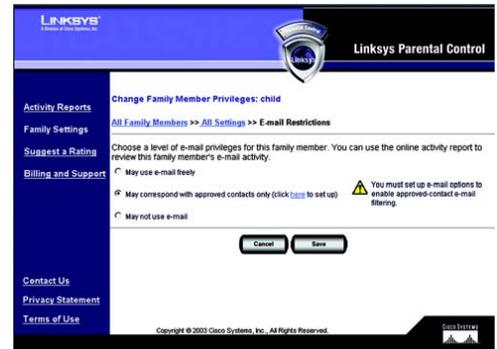


Figure 6-25: E-mail Restrictions

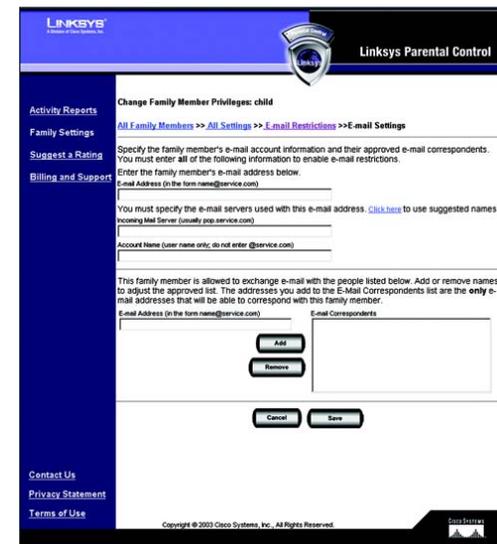


Figure 6-26: E-mail Settings

Instant-Messaging Restrictions

There are three levels of instant-messaging privileges available. Click the radio button next to the level appropriate for the designated family member. If you restrict instant messaging to a list of approved contacts, then follow these instructions for each approved contact:

1. Select an Instant Messaging Service: **AOL**, **Yahoo!**, **MSN**, or **ICQ**.
2. Complete the *Enter Screen Name* field.
3. Click the **Add** button to add the approved contact.

To remove an approved contact, click the contact's name in the *Instant-Messaging Correspondents* field, and then click the **Remove** button.

Click the **Cancel** button to cancel your changes. Click the **Save** button to save your changes.

Password

To access the Internet, the designated family member must use his or her password. You can change this password using the *Password* screen. Enter the new password in the *New Password* and *Re-enter Password* fields. Click the **Cancel** button to cancel your changes. Click the **Save** button to save your changes.

Delete

To delete a family member, click **Delete**.



Figure 6-27: Instant-Messaging Restrictions



Figure 6-28: Password

Suggest a Rating

To find out the categorization or rating of a specific Web site, enter its address and click the **Find** button. If you would like to suggest a different rating for a site or a new rating for an unrated site, enter your comments in the comments field and click the **Submit** button. Click the **Cancel** button to cancel your changes.



Figure 6-29: Suggest a Rating

Using the Parental Control Service

When the Linksys Parental Control Service is actively managing your family's Internet activities, you must sign in with the Linksys Parental Control Service before you can access the Internet. Follow these instructions:

1. Open your web browser.
2. If you are using Internet Explorer 5.5 or higher, you will see a warning screen. It will ask you if you want to install an ActiveX plug-in, which will install an icon in the system tray of your desktop taskbar. Click the **Yes** button.

If you are not using Internet Explorer 5.5 or higher, proceed to step 3.

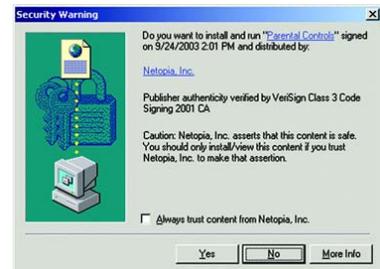


Figure 6-30: Security Warning

Wireless-G Broadband Router with SpeedBooster

3. In your web browser, a *Welcome to Parental Controls* screen will appear. Log into the Linksys Parental Control Service. Select your name from the *SIGN IN* drop-down menu, and enter your password. Select when you want to be automatically logged out. If you want a pop-screen for logout to appear, click the checkbox next to *Show Sign in status pop-up*. Then click the **Sign In** button.

If you are using Internet Explorer 5.5 or higher and installed the ActiveX plug-in, an icon will appear in the system tray, while a separate *Status* screen will appear in the upper right corner of your desktop.

4. Depending on your profile, the Linksys Parental Control Service will permit or deny Internet access, as well as regulate e-mail or Instant Messaging activities.

If you enabled the pop-up screen, then it will appear. You can click the **Status Page** button to return to the *Welcome to Parental Controls* screen and see what your login is.

When you have finished your Internet activities, make sure you sign out to securely end your session. If you have a tray icon, right-click it and click **Sign Out**. If you have a pop-up screen, click the **Sign Out** button.

For more information about the tray icon's additional features, proceed to the "Using the Tray Icon" section.

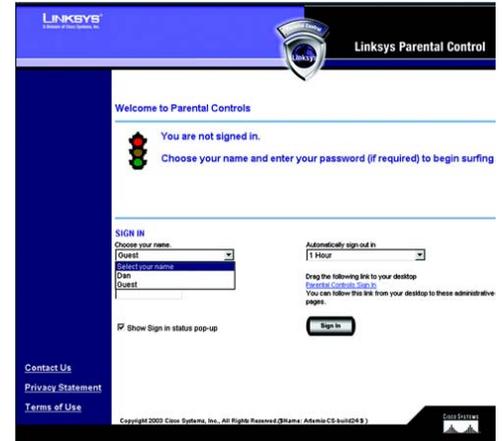


Figure 6-31: Welcome to Parental Controls

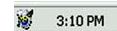


Figure 6-32: Tray Icon



Figure 6-33: Pop-up Screen (Login)

Using the Tray Icon

When you right-click the tray icon, you have other menu choices:

- **Sign In.** Click **Sign In** if you want to log into the Parental Control Service.
- **Switch User.** If you want to log in as a different user, click **Switch User**. The *Welcome to Parental Controls* screen will appear. Click the **Switch Family Members** button.
- **Administration.** If you want to manage your Parental Controls account, click **Administration**. The login screen for the Parental Control Billing & Support Center will appear.
- **Preferences.** To change your preferences for the Status screen, click **Preferences**. You will have these three choices:
 - Enabled.** Enables the *Status* screen.
 - Disabled.** Disables the *Status* screen.
 - Force to top.** Enables the *Status* screen and forces it to appear at the top of your current window.
- **About Parental Controls.** Click **About Parental Controls** to find out which version you are using.
- **Exit.** To close the tray icon, click **Exit**.

If you have exited the tray icon and want to use it, click the **Start** button, **Programs**, **Parental Controls**, and **PCT Helper**. The tray icon will re-appear.



Figure 6-34: Pop-up Screen (Sign Out)



Figure 6-35: Right-Click Tray Icon

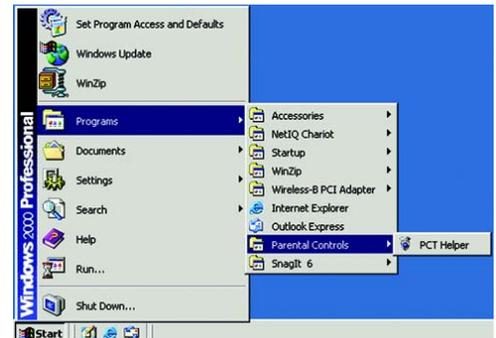


Figure 6-36: Re-activate Tray Icon

Appendix A: Troubleshooting

This appendix consists of two parts: “Common Problems and Solutions” and “Frequently Asked Questions.” Provided are possible solutions to problems that may occur during the installation and operation of the Router. Read the descriptions below to help you solve your problems. If you can’t find an answer here, check the Linksys website at www.linksys.com.

Common Problems and Solutions

1. *I'm trying to access the Router's Web-based Utility, but I do not see the login screen. Instead, I see a screen saying, "404 Forbidden."*

If you are using Windows Explorer, perform the following steps until you see the Web-based Utility's login screen (Netscape Navigator will require similar steps):

1. Click **File**. Make sure *Work Offline* is NOT checked.
2. Press **CTRL + F5**. This is a hard refresh, which will force Windows Explorer to load new webpages, not cached ones.
3. Click **Tools**. Click **Internet Options**. Click the **Security** tab. Click the **Default level** button. Make sure the security level is Medium or lower. Then click the **OK** button.

2. *I need to set a static IP address on a PC.*

You can assign a static IP address to a PC by performing the following steps:

- For Windows 98SE and Me:
 1. Click **Start**, **Settings**, and **Control Panel**. Double-click **Network**.
 2. In The following network components are installed box, select the TCP/IP-> associated with your Ethernet adapter. If you only have one Ethernet adapter installed, you will only see one TCP/IP line with no association to an Ethernet adapter. Highlight it and click the **Properties** button.
 3. In the TCP/IP properties window, select the **IP address** tab, and select **Specify an IP address**. Enter a unique IP address that is not used by any other computer on the network connected to the Router. Make sure that each IP address is unique for each PC or network device.
 4. Click the **Gateway** tab, and in the New Gateway prompt, enter **192.168.1.1**, which is the default IP address of the Router. Click the **Add** button to accept the entry.
 5. Click the **DNS** tab, and make sure the DNS Enabled option is selected. Enter the Host and Domain names (e.g., John for Host and home for Domain). Enter the DNS entry provided by your ISP. If your ISP has not provided the DNS IP address, contact your ISP to get that information or go to its website for the information.
 6. Click the **OK** button in the TCP/IP properties window, and click **Close** or the **OK** button for the Network window.
 7. Restart the computer when asked.

Wireless-G Broadband Router with SpeedBooster

- For Windows 2000:
 1. Click **Start**, **Settings**, and **Control Panel**. Double-click **Network and Dial-Up Connections**.
 2. Right-click the Local Area Connection that is associated with the Ethernet adapter you are using, and select the **Properties** option.
 3. In the Components checked are used by this connection box, highlight **Internet Protocol (TCP/IP)**, and click the **Properties** button. Select **Use the following IP address** option.
 4. Enter a unique IP address that is not used by any other computer on the network connected to the Router.
 5. Enter the Subnet Mask, **255.255.255.0**.
 6. Enter the Default Gateway, **192.168.1.1** (Router's default IP address).
 7. Toward the bottom of the window, select **Use the following DNS server addresses**, and enter the Preferred DNS server and Alternative DNS server (provided by your ISP). Contact your ISP or go on its website to find the information.
 8. Click the **OK** button in the Internet Protocol (TCP/IP) Properties window, and click the **OK** button in the Local Area Connection Properties window.
 9. Restart the computer if asked.
- For Windows XP:

The following instructions assume you are running Windows XP with the default interface. If you are using the Classic interface (where the icons and menus look like previous Windows versions), please follow the instructions for Windows 2000.

 1. Click **Start** and **Control Panel**.
 2. Click the **Network and Internet Connections** icon and then the **Network Connections** icon.
 3. Right-click the **Local Area Connection** that is associated with the Ethernet adapter you are using, and select the **Properties** option.
 4. In the This connection uses the following items box, highlight **Internet Protocol (TCP/IP)**. Click the **Properties** button.
 5. Enter a unique IP address that is not used by any other computer on the network connected to the Router.
 6. Enter the Subnet Mask, **255.255.255.0**.
 7. Enter the Default Gateway, **192.168.1.1** (Router's default IP address).
 8. Toward the bottom of the window, select **Use the following DNS server addresses**, and enter the Preferred DNS server and Alternative DNS server (provided by your ISP). Contact your ISP or go on its website to find the information.
 9. Click the **OK** button in the Internet Protocol (TCP/IP) Properties window. Click the **OK** button in the Local Area Connection Properties window.

3. I want to test my Internet connection.

A Check your TCP/IP settings.

For Windows 98SE, Me, 2000, and XP:

Wireless-G Broadband Router with SpeedBooster

- Refer to “Chapter 5: Configuring the PCs” for details. Make sure Obtain IP address automatically is selected in the settings.
- B** Open a command prompt.
For Windows 98SE and Me:
- Click **Start** and **Run**. In the Open field, type **command**. Press the **Enter** key or click the **OK** button.
- For Windows 2000 and XP:
- Click **Start** and **Run**. In the Open field, type **cmd**. Press the **Enter** key or click the **OK** button. In the command prompt, type **ping 192.168.1.1** and press the **Enter** key.
 - If you get a reply, the computer is communicating with the Router.
 - If you do NOT get a reply, please check the cable, and make sure Obtain an IP address automatically is selected in the TCP/IP settings for your Ethernet adapter.
- C** In the command prompt, type **ping** followed by your Internet or WAN IP address and press the **Enter** key. The Internet or WAN IP Address can be found on the Status screen of the Router’s web-based utility. For example, if your Internet or WAN IP address is 1.2.3.4, you would enter **ping 1.2.3.4** and press the **Enter** key.
- If you get a reply, the computer is connected to the Router.
 - If you do NOT get a reply, try the ping command from a different computer to verify that your original computer is not the cause of the problem.
- D** In the command prompt, type **ping www.yahoo.com** and press the **Enter** key.
- If you get a reply, the computer is connected to the Internet. If you cannot open a webpage, try the ping command from a different computer to verify that your original computer is not the cause of the problem.
 - If you do NOT get a reply, there may be a problem with the connection. Try the ping command from a different computer to verify that your original computer is not the cause of the problem.
- 5. I am not getting an IP address on the Internet with my Internet connection.**
- Refer to “Problem #2, I want to test my Internet connection” to verify that you have connectivity.
 - If you need to register the MAC address of your Ethernet adapter with your ISP, please see “Appendix E: Finding the MAC address and IP Address for Your Ethernet Adapter.” If you need to clone the MAC address of your Ethernet adapter onto the Router, see the System section of “Chapter 6: Configuring the Wireless-G Broadband Router” for details.
 - Make sure you are using the right Internet connection settings. Contact your ISP to see if your Internet connection type is DHCP, Static IP Address, or PPPoE (commonly used by DSL consumers). Please refer to the Setup section of “Chapter 6: Configuring the Wireless-G Broadband Router” for details on Internet connection settings.
 - Make sure you have the right cable. Check to see if the Internet column has a solidly lit Link/Act LED.
 - Make sure the cable connecting from your cable or DSL modem is connected to the Router’s Internet port. Verify that the Status page of the Router’s web-based utility shows a valid IP address from your ISP.
 - Turn off the computer, Router, and cable/DSL modem. Wait 30 seconds, and then turn on the Router, cable/DSL modem, and computer. Check the Status tab of the Router’s web-based utility to see if you get an IP address.

6. I am not able to access the Setup page of the Router's web-based utility.

- Refer to "Problem #2, I want to test my Internet connection" to verify that your computer is properly connected to the Router.
- Refer to "Appendix E: Finding the MAC Address and IP address for Your Ethernet Adapter" to verify that your computer has an IP Address, Subnet Mask, Gateway, and DNS.
- Set a static IP address on your system; refer to "Problem #1: I need to set a static IP address."
- Refer to "Problem #10: I need to remove the proxy settings or the dial-up pop-up window (for PPPoE users)."

7. I need to set up a server behind my Router and make it available to the public.

To use a server like a web, ftp, or mail server, you need to know the respective port numbers they are using. For example, port 80 (HTTP) is used for web; port 21 (FTP) is used for FTP, and port 25 (SMTP outgoing) and port 110 (POP3 incoming) are used for the mail server. You can get more information by viewing the documentation provided with the server you installed.

Follow these steps to set up port forwarding through the Router's web-based utility. We will be setting up web, ftp, and mail servers.

1. Access the Router's web-based utility by going to <http://192.168.1.1> or the IP address of the Router. Go to the Applications & Gaming => Port Forwarding tab.
2. Enter any name you want to use for the Customized Application.
3. Enter the External Port range of the service you are using. For example, if you have a web server, you would enter the range 80 to 80.
4. Check the protocol you will be using, TCP and/or UDP.
5. Enter the IP address of the PC or network device that you want the port server to go to. For example, if the web server's Ethernet adapter IP address is 192.168.1.100, you would enter 100 in the field provided. Check "Appendix E: Finding the MAC Address and IP Address for Your Ethernet Adapter" for details on getting an IP address.
6. Check the **Enable** option for the port services you want to use. Consider the example below:

Application	Start and End	Protocol	IP Address	Enabled
Web server	80 to 80	Both	192.168.1.100	X
FTP server	21 to 21	TCP	192.168.1.101	X
SMTP (outgoing)	25 to 25	Both	192.168.1.102	X
POP3 (incoming)	110 to 110	Both	192.168.1.102	X

When you have completed the configuration, click the **Save Settings** button.

8. I need to set up online game hosting or use other Internet applications.

If you want to play online games or use Internet applications, most will work without doing any port forwarding or DMZ hosting. There may be cases when you want to host an online game or Internet application. This would require you to set up the Router to deliver incoming packets or data to a specific computer. This also applies to the Internet applications you are using. The best way to get the information on what port services to use is to go to the website of the online game or application you want to use. Follow these steps to set up online game hosting or use a certain Internet application:

1. Access the Router's web interface by going to <http://192.168.1.1> or the IP address of the Router. Go to the Applications & Gaming => Port Forwarding tab.
2. Enter any name you want to use for the Customized Application.
3. Enter the External Port range of the service you are using. For example, if you want to host Unreal Tournament (UT), you would enter the range 7777 to 27900.
4. Check the protocol you will be using, TCP and/or UDP.
5. Enter the IP address of the PC or network device that you want the port server to go to. For example, if the web server's Ethernet adapter IP address is 192.168.1.100, you would enter 100 in the field provided. Check "Appendix E: Finding the MAC Address and IP Address for Your Ethernet Adapter" for details on getting an IP address.
6. Check the **Enable** option for the port services you want to use. Consider the example below:

Application	Start and End	Protocol	IP Address	Enabled
UT	7777 to 27900	Both	192.168.1.100	X
Halfife	27015 to 27015	Both	192.168.1.105	X
PC Anywhere	5631 to 5631	UDP	192.168.1.102	X
VPN IPSEC	500 to 500	UDP	192.168.1.100	X

When you have completed the configuration, click the **Save Settings** button.

9. I can't get the Internet game, server, or application to work.

If you are having difficulties getting any Internet game, server, or application to function properly, consider exposing one PC to the Internet using DeMilitarized Zone (DMZ) hosting. This option is available when an application requires too many ports or when you are not sure which port services to use. Make sure you disable all the forwarding entries if you want to successfully use DMZ hosting, since forwarding has priority over DMZ hosting. (In other words, data that enters the Router will be checked first by the forwarding settings. If the port number that the data enters from does not have port forwarding, then the Router will send the data to whichever PC or network device you set for DMZ hosting.)

Wireless-G Broadband Router with SpeedBooster

Follow these steps to set DMZ hosting:

1. Access the Router's web-based utility by going to <http://192.168.1.1> or the IP address of the Router. Go to the Applications & Gaming => Port Forwarding tab.
2. Disable or remove the entries you have entered for forwarding. Keep this information in case you want to use it at a later time.
3. Go to the Applications & Gaming => DMZ tab.
4. Select **Enable** next to DMZ. In the DMZ Host IP Address field, enter the IP address of the computer you want exposed to the Internet. This will bypass the NAT technology for that computer. Please refer to "Appendix E: Finding the MAC Address and IP Address for Your Ethernet Adapter" for details on getting an IP address.
5. Once completed with the configuration, click the **Save Settings** button.

10. I forgot my password, or the password prompt always appears when I am saving settings to the Router.

Reset the Router to factory default by pressing the Reset button for 10 seconds and then releasing it. If you are still getting prompted for a password when saving settings, then perform the following steps:

1. Access the Router's web-based utility by going to <http://192.168.1.1> or the IP address of the Router. Enter the default password admin, and click the Administrations => Management tab.
2. Enter a different password in the Router Password field, and enter the same password in the second field to confirm the password.
3. Click the **Save Settings** button.

11. I am a PPPoE user, and I need to remove the proxy settings or the dial-up pop-up window.

If you have proxy settings, you need to disable these on your computer. Because the Router is the gateway for the Internet connection, the computer does not need any proxy settings to gain access. Please follow these directions to verify that you do not have any proxy settings and that the browser you use is set to connect directly to the LAN.

- For Microsoft Internet Explorer 5.0 or higher:
 1. Click **Start, Settings, and Control Panel**. Double-click Internet Options.
 2. Click the **Connections** tab.
 3. Click the **LAN settings** button and remove anything that is checked.
 4. Click the **OK** button to go back to the previous screen.
 5. Click the option **Never dial a connection**. This will remove any dial-up pop-ups for PPPoE users.
- For Netscape 4.7 or higher:
 1. Start **Netscape Navigator**, and click **Edit, Preferences, Advanced, and Proxies**.
 2. Make sure you have Direct connection to the Internet selected on this screen.
 3. Close all the windows to finish.

12. To start over, I need to set the Router to factory default.

Hold the **Reset** button for 10 seconds and then release it. This will return the password, forwarding, and other settings on the Router to the factory default settings. In other words, the Router will revert to its original factory configuration.

13. My power LED will not stop flashing.

Press and hold the reset button for five seconds. If this does not work, your firmware may be corrupted. To upgrade the firmware, follow the steps in "Appendix C: Upgrading Firmware."

14. I need to upgrade the firmware.

In order to upgrade the firmware with the latest features, you need to go to the Linksys website and download the latest firmware at www.linksys.com.

Follow these steps:

1. Go to the Linksys website at <http://www.linksys.com> and download the latest firmware.
2. To upgrade the firmware, follow the steps in "Appendix C: Upgrading Firmware."

15. The firmware upgrade failed, and/or the Power LED is flashing.

The upgrade could have failed for a number of reasons. Follow these steps to upgrade the firmware and/or make the Power LED stop flashing:

- If the firmware upgrade failed, use the TFTP program (it was downloaded along with the firmware). Open the pdf that was downloaded along with the firmware and TFTP program, and follow the pdf's instructions.
- Set a static IP address on the PC; refer to "Problem #1, I need to set a static IP address." Use the following IP address settings for the computer you are using:
IP Address: 192.168.1.50
Subnet Mask: 255.255.255.0
Gateway: 192.168.1.1
- Perform the upgrade using the TFTP program or the Administration tab of the Router's web-based utility.

16. My DSL service's PPPoE is always disconnecting.

PPPoE is not actually a dedicated or always-on connection. The DSL ISP can disconnect the service after a period of inactivity, just like a normal phone dial-up connection to the Internet.

- There is a setup option to "keep alive" the connection. This may not always work, so you may need to re-establish connection periodically.
 1. To connect to the Router, go to the web browser, and enter <http://192.168.1.1> or the IP address of the Router.
 2. Enter the password, if asked. (The default password is admin.)
 3. On the Setup screen, select the option **Keep Alive**, and set the Redial Period option at 20 (seconds).
 4. Click the **Save Settings** button.
 5. Click the **Status** tab, and click the **Connect** button.

Wireless-G Broadband Router with SpeedBooster

6. You may see the login status display as Connecting. Press the F5 key to refresh the screen, until you see the login status display as Connected.
- Click the **Save Settings** button to continue.
 - If the connection is lost again, follow steps 1- 6 to re-establish connection.

17. I can't access my e-mail, web or I am getting corrupted data from the Internet.

The Maximum Transmission Unit (MTU) setting may need to be adjusted. By default, the MTU is set at 1500. For most DSL users, it is strongly recommended to use MTU 1492.

- If you are having some difficulties, perform the following steps:
 1. To connect to the Router, go to the web browser, and enter `http://192.168.1.1` or the IP address of the Router.
 2. Enter the password, if asked. (The default password is admin.)
 3. Look for the MTU option, and select **Manual**. In the Size field, enter 1492.
 4. Click the **Save Settings** button to continue.
- If your difficulties continue, change the Size to different values. Try this list of values, one value at a time, in this order, until your problem is solved:
 - 1462
 - 1400
 - 1362
 - 1300

18. When I enter a URL or IP address, I get a time-out error or am prompted to retry.

- Check if other PCs work. If they do, ensure that your workstation's IP settings are correct (IP Address, Subnet Mask, Default Gateway, and DNS). Restart the computer that is having a problem.
- If the PCs are configured correctly, but still not working, check the Router. Ensure that it is connected and powered on. Connect to it and check its settings. (If you cannot connect to it, check the LAN and power connections.)
- If the Router is configured correctly, check your Internet connection (DSL/cable modem, etc.) to see if it is working correctly. You can remove the Router to verify a direct connection.
- Manually configure the TCP/IP settings with a DNS address provided by your ISP.
- Make sure that your browser is set to connect directly and that any dial-up is disabled. For Internet Explorer, click **Tools, Internet Options**, and then the **Connection** tab. Make sure that Internet Explorer is set to **Never dial a connection**. For Netscape Navigator, click **Edit, Preferences, Advanced**, and **Proxy**. Make sure that Netscape Navigator is set to **Direct connection to the Internet**.

19. I cannot connect to the Internet.

- For Cable users - Click on the Status tab and make sure you have the Internet IP address is not 0.0.0.0. If it is, click the DHCP Renew button, and wait a few minutes for the router to try and contact your service provider. After the router successfully obtains an IP address, restart your computer.

Wireless-G Broadband Router with SpeedBooster

- For DSL users - 1) Make sure you have typed in your user name and password correctly. Some service providers use your full email address as the user name. If you are sure you have enter the right user name, try using username@[isp.com], where isp.com is the name of your service provider. 2) Power down your DSL Modem, your PC, and your router. Then power on your DSL Modem, wait for the LEDs on the DSL modem to stop flashing. Power on your router and wait for the power LED to stop flashing. Finally, power on your PC.

20. My wireless-G speed seems to be slow.

- Reposition the antenna.
- Reposition the router so that it's higher up, above your other networking gear.
- Change CTS Protection to Disable under advanced wireless settings.

21. I do not see a speed improvement while surfing wirelessly with my SpeedBooster equipment.

- Your Internet connection is usually much slower than your wireless network with SpeedBooster equipment. This equipment will not affect the speed of your Internet connection.
- You will see the most improvements in transferring or streaming files from one computer to another in your network.
- Your network speed will slow down if you have mixed 802.11g and SpeedBooster clients. For maximum performance, use all SpeedBooster devices on your network.

22. How do I turn on SpeedBooster on my router?

SpeedBooster is automatically turned on in Mixed, G-Only and SpeedBooster mode. There's nothing you need to do to utilize this feature.

Frequently Asked Questions

What is the maximum number of IP addresses that the Router will support?

The Router will support up to 253 IP addresses.

Is IPSec Pass-Through supported by the Router?

Yes, it is a built-in feature that the Router automatically enables.

Where is the Router installed on the network?

In a typical environment, the Router is installed between the cable/DSL modem and the LAN. Plug the Router into the cable/DSL modem's Ethernet port.

Does the Router support IPX or AppleTalk?

No. TCP/IP is the only protocol standard for the Internet and has become the global standard for communications. IPX, a NetWare communications protocol used only to route messages from one node to another, and AppleTalk, a communications protocol used on Apple and Macintosh networks, can be used for LAN to LAN connections, but those protocols cannot connect from the Internet to a LAN.

Does the Internet connection of the Router support 100Mbps Ethernet?

The Router's current hardware design supports up to 100Mbps Ethernet on its Internet port; however, the Internet connection speed will vary depending on the speed of your broadband connection. The Router also supports 100Mbps over the auto-sensing Fast Ethernet 10/100 switch on the LAN side of the Router.

What is Network Address Translation and what is it used for?

Network Address Translation (NAT) translates multiple IP addresses on the private LAN to one public address that is sent out to the Internet. This adds a level of security since the address of a PC connected to the private LAN is never transmitted on the Internet. Furthermore, NAT allows the Router to be used with low cost Internet accounts, such as DSL or cable modems, when only one TCP/IP address is provided by the ISP. The user may have many private addresses behind this single address provided by the ISP.

Does the Router support any operating system other than Windows 98SE, Windows Millennium, Windows 2000, or Windows XP?

Yes, but Linksys does not, at this time, provide technical support for setup, configuration or troubleshooting of any non-Windows operating systems.

Does the Router support ICQ send file?

Yes, with the following fix: click ICQ menu -> preference -> connections tab->, and check I am behind a firewall or proxy. Then set the firewall time-out to 80 seconds in the firewall setting. The Internet user can then send a file to a user behind the Router.

Wireless-G Broadband Router with SpeedBooster

I set up an Unreal Tournament Server, but others on the LAN cannot join. What do I need to do?

If you have a dedicated Unreal Tournament server running, you need to create a static IP for each of the LAN computers and forward ports 7777, 7778, 7779, 7780, 7781, and 27900 to the IP address of the server. You can also use a port forwarding range of 7777 ~ 27900. If you want to use the UT Server Admin, forward another port. (Port 8080 usually works well but is used for remote admin. You may have to disable this.) Then in the [UWeb.WebServer] section of the server.ini file, set the ListenPort to 8080 (to match the mapped port above) and ServerName to the IP assigned to the Router from your ISP.

Can multiple gamers on the LAN get on one game server and play simultaneously with just one public IP address?

It depends on which network game or what kind of game server you are using. For example, Unreal Tournament supports multi-login with one public IP.

How do I get Half-Life: Team Fortress to work with the Router?

The default client port for Half-Life is 27005. The computers on your LAN need to have "+clientport 2700x" added to the HL shortcut command line; the x would be 6, 7, 8, and on up. This lets multiple computers connect to the same server. One problem: Version 1.0.1.6 won't let multiple computers with the same CD key connect at the same time, even if on the same LAN (not a problem with 1.0.1.3). As far as hosting games, the HL server does not need to be in the DMZ. Just forward port 27015 to the local IP address of the server computer.

How can I block corrupted FTP downloads?

If you are experiencing corrupted files when you download a file with your FTP client, try using another FTP program.

The web page hangs; downloads are corrupt, or nothing but junk characters are being displayed on the screen. What do I need to do?

Force your Ethernet adapter to 10Mbps or half duplex mode, and turn off the "Auto-negotiate" feature of your Ethernet adapter as a temporary measure. (Please look at the Network Control Panel in your Ethernet adapter's Advanced Properties tab.) Make sure that your proxy setting is disabled in the browser. Check our website at www.linksys.com for more information.

If all else fails in the installation, what can I do?

Reset the Router by holding down the reset button until the Power LED fully turns on and off. Reset your cable or DSL modem by powering the unit off and then on. Obtain and flash the latest firmware release that is readily available on the Linksys website, www.linksys.com.

How will I be notified of new Router firmware upgrades?

All Linksys firmware upgrades are posted on the Linksys website at www.linksys.com, where they can be downloaded for free. To upgrade the Router's firmware, use the System tab of the Router's web-based utility. If the Router's Internet connection is working well, there is no need to download a newer firmware version, unless

Wireless-G Broadband Router with SpeedBooster

that version contains new features that you would like to use. Downloading a more current version of Router firmware will not enhance the quality or speed of your Internet connection, and may disrupt your current connection stability.

Will the Router function in a Macintosh environment?

Yes, but the Router's setup pages are accessible only through Internet Explorer 4.0 or Netscape Navigator 4.0 or higher for Macintosh.

I am not able to get the web configuration screen for the Router. What can I do?

You may have to remove the proxy settings on your Internet browser, e.g., Netscape Navigator or Internet Explorer. Or remove the dial-up settings on your browser. Check with your browser documentation, and make sure that your browser is set to connect directly and that any dial-up is disabled. Make sure that your browser is set to connect directly and that any dial-up is disabled. For Internet Explorer, click Tools, Internet Options, and then the Connection tab. Make sure that Internet Explorer is set to Never dial a connection. For Netscape Navigator, click Edit, Preferences, Advanced, and Proxy. Make sure that Netscape Navigator is set to Direct connection to the Internet.

What is DMZ Hosting?

Demilitarized Zone (DMZ) allows one IP address (computer) to be exposed to the Internet. Some applications require multiple TCP/IP ports to be open. It is recommended that you set your computer with a static IP if you want to use DMZ Hosting. To get the LAN IP address, see "Appendix E: Finding the MAC Address and IP Address for Your Ethernet Adapter."

If DMZ Hosting is used, does the exposed user share the public IP with the Router?

No.

Does the Router pass PPTP packets or actively route PPTP sessions?

The Router allows PPTP packets to pass through.

Is the Router cross-platform compatible?

Any platform that supports Ethernet and TCP/IP is compatible with the Router.

How many ports can be simultaneously forwarded?

Theoretically, the Router can establish 520 sessions at the same time, but you can only forward 10 ranges of ports.

What are the advanced features of the Router?

The Router's advanced features include Advanced Wireless settings, Filters, Port Forwarding, Routing, and DDNS.

How do I get mIRC to work with the Router?

Under the Port Forwarding tab, set port forwarding to 113 for the PC on which you are using mIRC.

Can the Router act as my DHCP server?

Yes. The Router has DHCP server software built-in.

Can I run an application from a remote computer over the wireless network?

This will depend on whether or not the application is designed to be used over a network. Consult the application's documentation to determine if it supports operation over a network.

What is the IEEE 802.11g standard?

It is one of the IEEE standards for wireless networks. The 802.11g standard allows wireless networking hardware from different manufacturers to communicate, provided that the hardware complies with the 802.11g standard. The 802.11g standard states a maximum data transfer rate of 54Mbps and an operating frequency of 2.4GHz.

What IEEE 802.11b features are supported?

The product supports the following IEEE 802.11b functions:

- CSMA/CA plus Acknowledge protocol
- Multi-Channel Roaming
- Automatic Rate Selection
- RTS/CTS feature
- Fragmentation
- Power Management

What is ad-hoc mode?

When a wireless network is set to ad-hoc mode, the wireless-equipped computers are configured to communicate directly with each other. The ad-hoc wireless network will not communicate with any wired network.

What is infrastructure mode?

When a wireless network is set to infrastructure mode, the wireless network is configured to communicate with a wired network through a wireless access point.

What is roaming?

Roaming is the ability of a portable computer user to communicate continuously while moving freely throughout an area greater than that covered by a single access point. Before using the roaming function, the workstation must make sure that it is the same channel number with the access point of dedicated coverage area.

To achieve true seamless connectivity, the wireless LAN must incorporate a number of different functions. Each node and access point, for example, must always acknowledge receipt of each message. Each node must

Wireless-G Broadband Router with SpeedBooster

maintain contact with the wireless network even when not actually transmitting data. Achieving these functions simultaneously requires a dynamic RF networking technology that links access points and nodes. In such a system, the user's end node undertakes a search for the best possible access to the system. First, it evaluates such factors as signal strength and quality, as well as the message load currently being carried by each access point and the distance of each access point to the wired backbone. Based on that information, the node next selects the right access point and registers its address. Communications between end node and host computer can then be transmitted up and down the backbone.

As the user moves on, the end node's RF transmitter regularly checks the system to determine whether it is in touch with the original access point or whether it should seek a new one. When a node no longer receives acknowledgment from its original access point, it undertakes a new search. Upon finding a new access point, it then re-registers, and the communication process continues.

What is ISM band?

The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available worldwide. This presents a truly revolutionary opportunity to place convenient high-speed wireless capabilities in the hands of users around the globe.

What is Spread Spectrum?

Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communications systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade-off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. If a receiver is not tuned to the right frequency, a spread-spectrum signal looks like background noise. There are two main alternatives, Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS).

What is DSSS? What is FHSS? And what are their differences?

Frequency-Hopping Spread-Spectrum (FHSS) uses a narrowband carrier that changes frequency in a pattern that is known to both transmitter and receiver. Properly synchronized, the net effect is to maintain a single logical channel. To an unintended receiver, FHSS appears to be short-duration impulse noise. Direct-Sequence Spread-Spectrum (DSSS) generates a redundant bit pattern for each bit to be transmitted. This bit pattern is called a chip (or chipping code). The longer the chip, the greater the probability that the original data can be recovered. Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the radio can recover the original data without the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers.

What is WEP?

WEP is Wired Equivalent Privacy, a data privacy mechanism based on a 64-bit or 128-bit shared key algorithm, as described in the IEEE 802.11 standard.

What is a MAC Address?

The Media Access Control (MAC) address is a unique number assigned by the manufacturer to any Ethernet networking device, such as a network adapter, that allows the network to identify it at the hardware level. For all practical purposes, this number is usually permanent. Unlike IP addresses, which can change every time a computer logs onto the network, the MAC address of a device stays the same, making it a valuable identifier for the network.

How do I reset the Router?

Press the Reset button on the back panel for about five seconds. This will reset the Router to its default settings.

How do I resolve issues with signal loss?

There is no way to know the exact range of your wireless network without testing. Every obstacle placed between the Router and a wireless PC will create signal loss. Lead glass, metal, concrete floors, water and walls will inhibit the signal and reduce range. Start with the Router and your wireless PC in the same room and move it away in small increments to determine the maximum range in your environment.

You may also try using different channels, as this may eliminate interference affecting only one channel.

I have excellent signal strength, but I cannot see my network.

WEP is probably enabled on the Router, but not on your wireless adapter (or vice versa). Verify that the same WEP keys and levels (64 or 128) are being used on all nodes of your wireless network.

How many channels/frequencies are available with the Router?

There are eleven available channels, ranging from 1 to 11 (in North America).

If your questions are not addressed here, refer to the Linksys website, www.linksys.com.

Appendix B: Wireless Security

Linksys wants to make wireless networking as safe and easy for you as possible. The current generation of Linksys products provide several network security features, but they require specific action on your part for implementation. So, keep the following in mind whenever you are setting up or using your wireless network.

Security Precautions

The following is a complete list of security precautions to take (at least steps 1 through 5 should be followed):

1. Change the default SSID.
2. Disable SSID Broadcast.
3. Change the default password for the Administrator account.
4. Enable MAC Address Filtering.
5. Change the SSID periodically.
6. Use the highest encryption algorithm possible. Use WPA if it is available. Please note that this may reduce your network performance.
7. Change the WEP encryption keys periodically.

For information on implementing these security features, refer to “Chapter 6: Configuring the Wireless-G Broadband Router.”

Security Threats Facing Wireless Networks

Wireless networks are easy to find. Hackers know that in order to join a wireless network, wireless networking products first listen for “beacon messages”. These messages can be easily decrypted and contain much of the network’s information, such as the network’s SSID (Service Set Identifier). Here are the steps you can take:

Change the administrator’s password regularly. With every wireless networking device you use, keep in mind that network settings (SSID, WEP keys, etc.) are stored in its firmware. Your network administrator is the only person who can change network settings. If a hacker gets a hold of the administrator’s password, he, too, can change those settings. So, make it harder for a hacker to get that information. Change the administrator’s password regularly.



Note: Some of these security features are available only through the network router or access point. Refer to the router or access point’s documentation for more information.

Wireless-G Broadband Router with SpeedBooster

SSID. There are several things to keep in mind about the SSID:

1. Disable Broadcast
2. Make it unique
3. Change it often

Most wireless networking devices will give you the option of broadcasting the SSID. While this option may be more convenient, it allows anyone to log into your wireless network. This includes hackers. So, don't broadcast the SSID.

Wireless networking products come with a default SSID set by the factory. (The Linksys default SSID is "linksys".) Hackers know these defaults and can check these against your network. Change your SSID to something unique and not something related to your company or the networking products you use.

Change your SSID regularly so that any hackers who have gained access to your wireless network will have to start from the beginning in trying to break in.

MAC Addresses. Enable MAC Address filtering. MAC Address filtering will allow you to provide access to only those wireless nodes with certain MAC Addresses. This makes it harder for a hacker to access your network with a random MAC Address.

WEP Encryption. Wired Equivalent Privacy (WEP) is often looked upon as a cure-all for wireless security concerns. This is overstating WEP's ability. Again, this can only provide enough security to make a hacker's job more difficult.

There are several ways that WEP can be maximized:

1. Use the highest level of encryption possible
2. Use "Shared Key" authentication
3. Change your WEP key regularly

WPA. Wi-Fi Protected Access (WPA) is the newest and best available standard in Wi-Fi security. Two modes are available: Pre-Shared Key and RADIUS. Pre-Shared Key gives you a choice of two encryption methods: TKIP (Temporal Key Integrity Protocol), which utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers, and AES (Advanced Encryption System), which utilizes a symmetric 128-Bit block data encryption. RADIUS (Remote Authentication Dial-In User Service) utilizes a RADIUS server for authentication and the use of dynamic TKIP, AES, or WEP.



Important: Always remember that each device in your wireless network **MUST** use the same encryption method and encryption key or your wireless network will not function properly.

Wireless-G Broadband Router with SpeedBooster

WPA Pre-Shared Key. If you do not have a RADIUS server, Select the type of algorithm, TKIP or AES, enter a password in the Pre-Shared key field of 8-64 characters, and enter a Group Key Renewal period time between 0 and 99,999 seconds, which instructs the Router or other device how often it should change the encryption keys.

WPA RADIUS. WPA used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router or other device.) First, select the type of WPA algorithm, **TKIP** or **AES**. Enter the RADIUS server's IP Address and port number, along with a key shared between the device and the server. Last, enter a Group Key Renewal period, which instructs the device how often it should change the encryption keys.

RADIUS. WEP used in coordination with a RADIUS server. (This should only be used when a RADIUS server is connected to the Router or other device.) First, enter the RADIUS server's IP Address and port number, along with a key shared between the device and the server. Then, select a WEP key and a level of WEP encryption, and either generate a WEP key through the Passphrase or enter the WEP key manually.

Implementing encryption may have a negative impact on your network's performance, but if you are transmitting sensitive data over your network, encryption should be used.

These security recommendations should help keep your mind at ease while you are enjoying the most flexible and convenient technology Linksys has to offer.

Appendix C: Upgrading Firmware

The Broadband Router's firmware is upgraded through the Web-based Utility's Administration tab. Follow these instructions:

1. Download the firmware from Linksys's website at www.linksys.com.
2. Click **Firmware Upgrade** from the Web-Utility's Administration tab, and the *Upgrade Firmware* screen, will appear.
3. Enter the location of the firmware's file or click the **Browse** button to find the file.
4. Then, click the **Upgrade** button to upgrade the firmware.



Figure C-1: Upgrade Firmware

Appendix D: Windows Help

All Linksys wireless products require Microsoft Windows. Windows is the most used operating system in the world and comes with many features that help make networking easier. These features can be accessed through Windows Help and are described in this appendix.

TCP/IP

Before a computer can communicate with the Broadband Router, TCP/IP must be enabled. TCP/IP is a set of instructions, or protocol, all PCs follow to communicate over a network. This is true for wireless networks as well. Your PCs will not be able to utilize wireless networking without having TCP/IP enabled. Windows Help provides complete instructions on enabling TCP/IP.

Shared Resources

If you wish to share printers, folder, or files over your network, Windows Help provides complete instructions on utilizing shared resources.

Network Neighborhood/My Network Places

Other PCs on your network will appear under Network Neighborhood or My Network Places (depending upon the version of Windows you're running). Windows Help provides complete instructions on adding PCs to your network.

Appendix E: Finding the MAC Address and IP Address for Your Ethernet Adapter

This section 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. You can also find the IP address of your computer's Ethernet adapter. This IP address is used for the Router's filtering, forwarding, and/or DMZ features. Follow the steps in this appendix to find the adapter's MAC or IP address in Windows 98, Me, 2000, or XP.

Windows 98SE or Me Instructions

1. Click **Start** and **Run**. In the *Open* field, enter `winipcfg`. Then press the **Enter** key or the **OK** button.
2. When the *IP Configuration* screen appears, select the Ethernet adapter you have connected to the Router via a CAT 5 Ethernet network cable.
3. Write down the Adapter Address as shown on your computer screen. This is the MAC address for your Ethernet adapter and is shown as a series of numbers and letters.

The MAC address/Adapter Address is what you will use for MAC address cloning or MAC filtering.

Another screen will show the Ethernet adapter's IP address. (Shown in the example as 192.168.1.100.) Your computer may show something different.

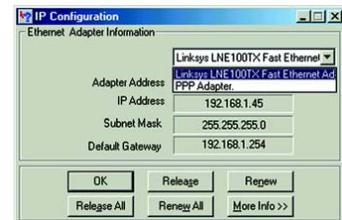


Figure E-1: IP Configuration Screen

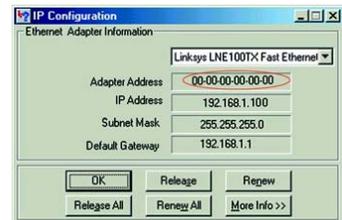


Figure E-2: MAC Address/Adapter Address



Note: The MAC address is also called the Adapter Address.

Windows 2000 or XP Instructions

1. Click **Start** and **Run**. In the *Open* field, enter `cmd`. Press the **Enter** key or click the **OK** button.
2. At the command prompt, enter `ipconfig /all`. Then press the **Enter** key.

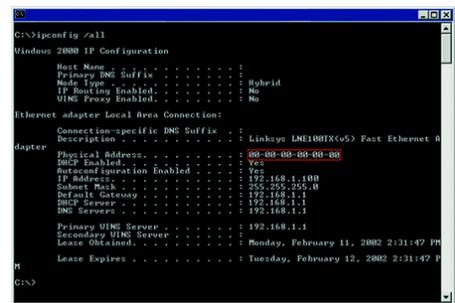


Figure E-3: MAC Address/Physical Address

Wireless-G Broadband Router with SpeedBooster

3. Write down the Physical Address as shown on your computer screen; it is the MAC address for your Ethernet adapter. This appears as a series of numbers and letters.

The MAC address/Physical Address is what you will use for MAC address cloning or MAC filtering.



Note: The MAC address is also called the Physical Address.

Another screen will show the Ethernet adapter's IP address. (Shown in the example as 192.168.1.100.) Your computer may show something different.

For the Router's Web-based Utility

For MAC filtering, enter the 12-digit MAC address in this format, XXXXXXXXXXXX, WITHOUT the hyphens.

For MAC address cloning, enter the 12-digit MAC address in the *MAC Address* fields provided, two digits per field.

Figure E-4: MAC Address Filter List

Figure E-5: MAC Address Clone

Appendix F: Glossary

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.

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.

Adapter - A device that adds network functionality to your PC.

Ad-hoc - A group of wireless devices communicating directly with each other (peer-to-peer) without the use of an access point.

AES (Advanced Encryption Standard) - A method that uses up to 256-bit key encryption to secure data.

Backbone - The part of a network that connects most of the systems and networks together, and handles the most data.

Bandwidth - The transmission capacity of a given device or network.

Beacon Interval - Data transmitted on your wireless network that keeps the network synchronized.

Bit - A binary digit.

Boot - To start a device and cause it to start executing instructions.

Broadband - An always-on, fast Internet connection.

Browser - An application program that provides a way to look at and interact with all the information on the World Wide Web.

Cable Modem - A device that connects a computer to the cable television network, which in turn connects to the Internet.

CSMA/CA (Carrier Sense Multiple Access/Collision Avoidance) - A method of data transfer that is used to prevent data collisions.

Wireless-G Broadband Router with SpeedBooster

CTS (Clear To Send) - A signal sent by a wireless device, signifying that it is ready to receive data.

Database - A collection of data that is organized so that its contents can easily be accessed, managed, and updated.

DDNS (Dynamic Domain Name System) - Allows the hosting of a website, FTP server, or e-mail server with a fixed domain name (e.g., www.xyz.com) and a dynamic IP address.

Default Gateway - A device that forwards Internet traffic from your local area network.

DHCP (Dynamic Host Configuration Protocol) - A networking protocol that allows administrators to assign temporary IP addresses to network computers by "leasing" an IP address to a user for a limited amount of time, instead of assigning permanent IP addresses.

DMZ (Demilitarized Zone) - Removes the Router's firewall protection from one PC, allowing it to be "seen" from the Internet.

DNS (Domain Name Server) - The IP address of your ISP's server, which translates the names of websites into IP addresses.

Domain - A specific name for a network of computers.

Download - To receive a file transmitted over a network.

DSL (Digital Subscriber Line) - An always-on broadband connection over traditional phone lines.

DSSS (Direct-Sequence Spread-Spectrum) - Frequency transmission with a redundant bit pattern resulting in a lower probability of information being lost in transit.

DTIM (Delivery Traffic Indication Message) - A message included in data packets that can increase wireless efficiency.

Dynamic IP Address - A temporary IP address assigned by a DHCP server.

Encryption - Encoding data transmitted in a network.

ESS (Extended Service Set) - More than one BSS in a network.

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

Wireless-G Broadband Router with SpeedBooster

Firewall - A set of related programs located at a network gateway server that protects the resources of a network from users from other networks.

Firmware - The programming code that runs a networking device.

Fragmentation - Breaking a packet into smaller units when transmitting over a network medium that cannot support the original size of the packet.

FTP (File Transfer Protocol) - A protocol used to transfer files over a TCP/IP network.

Gateway - A device that interconnects networks with different, incompatible communications protocols.

Half Duplex - Data transmission that can occur in two directions over a single line, but only one direction at a time.

Hardware - The physical aspect of computers, telecommunications, and other information technology devices.

HTTP (HyperText Transport Protocol) - The communications protocol used to connect to servers on the World Wide Web.

IEEE (The Institute of Electrical and Electronics Engineers) - An independent institute that develops networking standards.

Infrastructure - A wireless network that is bridged to a wired network via an access point.

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.

IPCONFIG - A Windows 2000 and XP utility that displays the IP address for a particular networking device.

IPSec (Internet Protocol Security) - A VPN protocol used to implement secure exchange of packets at the IP layer.

ISM band - Radio bandwidth utilized in wireless transmissions.

ISP (Internet Service Provider) - A company that provides access to the Internet.

LAN - The computers and networking products that make up your local network.

MAC (Media Access Control) Address - The unique address that a manufacturer assigns to each networking device.

Wireless-G Broadband Router with SpeedBooster

Mbps (MegaBits Per Second) - One million bits per second; a unit of measurement for data transmission.

mIRC - An Internet Relay Chat program that runs under Windows.

NAT (Network Address Translation) - NAT technology translates IP addresses of a local area network to a different IP address for the Internet.

Network - A series of computers or devices connected for the purpose of data sharing, storage, and/or transmission between users.

Node - A network junction or connection point, typically a computer or work station.

Packet - A unit of data sent over a network.

Passphrase - Used much like a password, a passphrase simplifies the WEP encryption process by automatically generating the WEP encryption keys for Linksys products.

Ping (Packet Internet Groper) - An Internet utility used to determine whether a particular IP address is online.

POP3 (Post Office Protocol 3) - A standard mail server commonly used on the Internet.

Port - The connection point on a computer or networking device used for plugging in cables or adapters.

PPPoE (Point to Point Protocol over Ethernet) - A type of broadband connection that provides authentication (username and password) in addition to data transport.

PPTP (Point-to-Point Tunneling Protocol) - A VPN protocol that allows the Point to Point Protocol (PPP) to be tunneled through an IP network. This protocol is also used as a type of broadband connection in Europe.

RADIUS (Remote Authentication Dial-In User Service) - A protocol that uses an authentication server to control network access.

Roaming - The ability to take a wireless device from one access point's range to another without losing the connection.

Router - A networking device that connects multiple networks together.

RTS (Request To Send) - A networking method of coordinating large packets through the RTS Threshold setting.

Server - Any computer whose function in a network is to provide user access to files, printing, communications, and other services.

Wireless-G Broadband Router with SpeedBooster

SMTP (Simple Mail Transfer Protocol) - The standard e-mail protocol on the Internet.

Software - Instructions for the computer. A series of instructions that performs a particular task is called a "program".

SPI (Stateful Packet Inspection) Firewall - A technology that inspects every incoming packet of information before allowing it to enter the network.

Spread Spectrum - Wideband radio frequency technique used for more reliable and secure data transmission.

SSID (Service Set Identifier) - Your wireless network's name.

Static IP Address - A fixed address assigned to a computer or device that is connected to a network.

Static Routing - Forwarding data in a network via a fixed path.

Subnet Mask - An address code that determines the size of the network.

Switch - 1. A data switch that connects computing devices to host computers, allowing a large number of devices to share a limited number of ports. 2. A device for making, breaking, or changing the connections in an electrical circuit.

TCP (Transmission Control Protocol) - A network protocol for transmitting data that requires acknowledgement from the recipient of data sent.

TCP/IP (Transmission Control Protocol/Internet Protocol) - A set of instructions PCs use to communicate over a network.

Telnet - A user command and TCP/IP protocol used for accessing remote PCs.

TFTP (Trivial File Transfer Protocol) - A version of the TCP/IP FTP protocol that has no directory or password capability.

TKIP (Temporal Key Integrity Protocol) - a wireless encryption protocol that provides dynamic encryption keys for each packet transmitted.

Topology - The physical layout of a network.

UDP (User Datagram Protocol) - A network protocol for transmitting data that does not require acknowledgement from the recipient of the data that is sent.

Upgrade - To replace existing software or firmware with a newer version.

Wireless-G Broadband Router with SpeedBooster

URL (Uniform Resource Locator) - The address of a file located on the Internet.

VPN (Virtual Private Network) - A security measure to protect data as it leaves one network and goes to another over the Internet.

WAN (Wide Area Network)- The Internet.

WEP (Wired Equivalent Privacy) - A method of encrypting network data transmitted on a wireless network for greater security.

WINIPCFG - A Windows 98 and Me utility that displays the IP address for a particular networking device.

WLAN (Wireless Local Area Network) - A group of computers and associated devices that communicate with each other wirelessly.

WPA (Wi-Fi Protected Access) - a wireless security protocol using TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.

Appendix G: Specifications

Model	WRT54GS
Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.11g, IEEE 802.11b
Channels	11 Channels (US, Canada) 13 Channels (Europe)
Ports/Buttons	Internet: One 10/100 RJ-45 Port LAN: Four 10/100 RJ-45 Switched Ports One Power Port One Reset Button
Cabling Type	UTP CAT 5
LEDs	Power, DMZ, WLAN, LAN (1, 2, 3, 4), Internet
RF Power Output	18 dBm
UPnP able/cert	Able
Security features	Stateful Packet Inspection (SPI) Firewall, Internet Policy
Wireless Security	WEP, Wireless MAC Filtering
Dimensions (W x H x D)	7.32" x 1.89" x 7.87" (186 mm x 48 mm x 200 mm)
Unit Weight	17 oz. (0.48 kg)

Wireless-G Broadband Router with SpeedBooster

Power	External, 12V DC, 1.0A
Certification	FCC, IC-03, CE
Operating Temp.	0° C to 40° C (32° F to 104° F)
Storage Temp.	-20° C to 70° C (-4° F to 158° F)
Operating Humidity	10% to 85% Non-Condensing
Storage Humidity	5% to 90% Non-Condensing
Warranty	3-Years Limited

Appendix H: Warranty Information

LIMITED WARRANTY

Linksys warrants to You that, for a period of three years (the "Warranty Period"), your Linksys Product will be substantially free of defects in materials and workmanship under normal use. Your exclusive remedy and Linksys' entire liability under this warranty will be for Linksys at its option to repair or replace the Product or refund Your purchase price less any rebates. This limited warranty extends only to the original purchaser.

If the Product proves defective during the Warranty Period call Linksys Technical Support in order to obtain a Return Authorization Number, if applicable. BE SURE TO HAVE YOUR PROOF OF PURCHASE ON HAND WHEN CALLING. If You are requested to return the Product, mark the Return Authorization Number clearly on the outside of the package and include a copy of your original proof of purchase. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE. You are responsible for shipping defective Products to Linksys. Linksys pays for UPS Ground shipping from Linksys back to You only. Customers located outside of the United States of America and Canada are responsible for all shipping and handling charges.

ALL IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE WARRANTY PERIOD. ALL OTHER EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF NON-INFRINGEMENT, ARE DISCLAIMED. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to You. This warranty gives You specific legal rights, and You may also have other rights which vary by jurisdiction.

This warranty does not apply if the Product (a) has been altered, except by Linksys, (b) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Linksys, or (c) has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident. In addition, due to the continual development of new techniques for intruding upon and attacking networks, Linksys does not warrant that the Product will be free of vulnerability to intrusion or attack.

TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL LINKSYS BE LIABLE FOR ANY LOST DATA, REVENUE OR PROFIT, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, REGARDLESS OF THE THEORY OF LIABILITY (INCLUDING NEGLIGENCE), ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE THE PRODUCT (INCLUDING ANY SOFTWARE), EVEN IF LINKSYS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL LINKSYS' LIABILITY EXCEED THE AMOUNT PAID BY YOU FOR THE PRODUCT. The foregoing limitations will apply even if any warranty or remedy provided under this Agreement fails of its essential purpose. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to You.

Please direct all inquiries to: Linksys, P.O. Box 18558, Irvine, CA 92623 USA.

Appendix I: Regulatory Information

FCC STATEMENT

This product has been tested and complies with the specifications 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 according to 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 is found 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 or devices

Connect the equipment to an outlet other than the receiver's

Consult a dealer or an experienced radio/TV technician for assistance

FCC Radiation Exposure Statement

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

INDUSTRY CANADA (CANADA)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

The use of this device in a system operating either partially or completely outdoors may require the user to obtain a license for the system according to the Canadian regulations.

EC DECLARATION OF CONFORMITY (EUROPE)

Linksys declares that the Wireless-G Broadband Router conforms to the specifications listed below, following the provisions of the European R&TTE directive 1999/5/EC:

EN 301 489-1, 301 489-17 General EMC requirements for Radio equipment.

EN 609 50 Safety

Wireless-G Broadband Router with SpeedBooster

EN 300-328-1, EN 300-328-2 Technical requirements for Radio equipment.

Caution: This equipment is intended to be used in all EU and EFTA countries. Outdoor use may be restricted to certain frequencies and/or may require a license for operation. Contact local Authority for procedure to follow.

Note: Combinations of power levels and antennas resulting in a radiated power level of above 100 mW equivalent isotropic radiated power (EIRP) are considered as not compliant with the above mentioned directive and are not allowed for use within the European community and countries that have adopted the European R&TTE directive 1999/5/EC.

For more details on legal combinations of power levels and antennas, contact Linksys Corporate Compliance.

Linksys vakuuttaa täten että Wireless-G Broadband Router tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien näiden direktiivien muiden ehtojen mukainen.

Linksys déclare la Wireless-G Broadband Router est conforme aux conditions essentielles et aux dispositions relatives à la directive 1999/5/EC.

Belgique:

Dans le cas d'une utilisation privée, à l'extérieur d'un bâtiment, au-dessus d'un espace public, aucun enregistrement n'est nécessaire pour une distance de moins de 300m. Pour une distance supérieure à 300m un enregistrement auprès de l'IBPT est requise. Pour une utilisation publique à l'extérieur de bâtiments, une licence de l'IBPT est requise. Pour les enregistrements et licences, veuillez contacter l'IBPT.

France:

2.4 GHz Bande : les canaux 10, 11, 12, 13 (2457, 2462, 2467, et 2472 MHz respectivement) sont complètement libres d'utilisation en France (en utilisation intérieur). Pour ce qui est des autres canaux, ils peuvent être soumis à autorisation selon le département. L'utilisation en extérieur est soumis à autorisation préalable et très restreint.

Vous pouvez contacter l'Autorité de Régulation des Télécommunications (<http://www.art-telecom.fr>) pour de plus amples renseignements.

Appendix J: Contact Information

Need to contact Linksys?

Visit us online for information on the latest products and updates to your existing products at:

<http://www.linksys.com> or
[ftp.linksys.com](ftp://ftp.linksys.com)

Can't find information about a product you want to buy on the web? Do you want to know more about networking with Linksys products? Give our advice line a call at:
Or fax your request in to:

800-546-5797 (LINKSYS)
949-823-3002

If you experience problems with any Linksys product, you can call us at:

800-326-7114
support@linksys.com

Don't wish to call? You can e-mail us at:

If any Linksys product proves defective during its warranty period, you can call the Linksys Return Merchandise Authorization department for obtaining a Return Authorization Number at:
(Details on Warranty and RMA issues can be found in the Warranty Information section in this Guide.)

949-823-3000