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Manual abstract:

and/or its affiliates in the U.S. and certain other countries. Copyright © 2005 Cisco Systems, Inc. All rights reserved. @@@@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 Compact Wireless-G Broadband Router. This exclamation point means there is a caution or warning and is something that could damage your property or the Compact Wireless-G Broadband Router. This question mark provides you with a reminder about something you might need to do while using the Compact 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".

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



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But what does all of this mean? Networks are useful tools for sharing computer resources.

You can access one printer from different computers and access data located on another computer's hard drive. Networks are even used for playing multiplayer video games. So, networks are not only useful in homes and offices, they can also be fun. PCs on a wired network create a LAN, or Local Area Network. They are connected with Ethernet cables, which is why the network is called "wired". PCs equipped with wireless cards or adapters can communicate without cumbersome cables. By sharing the same wireless settings, within their transmission radius, they form a wireless network. This is sometimes called a WLAN, or Wireless Local Area Network. The Compact Wireless-G Broadband Router bridges wireless networks of 802.11a, 802.

11b, and 802.11g standards and wired networks, allowing them to communicate with each other. With your wired and wireless networks connected to each other and the Internet, you can now share files and Internet access--and even play games. All the while, the Compact Wireless-G Broadband Router protects your networks from unauthorized and unwelcome users. Linksys recommends using the Setup CD-ROM for first-time installation of the Router. If you do not wish to run the Setup Wizard on the Setup CD-ROM, then use the instructions in this Guide to help you connect the Compact Wireless-G Broadband Router, set it up, and configure it to bridge your different networks. These instructions should be all you need to get the most out of the Compact Wireless-G Broadband Router. nat (network address translation): NAT technology translated IP addresses of a local area network to a different IP address for the Internet. mbps: one million bits per second; a unit of measurement for data transmission. browser: an application program that provides a way to look at and interact with all the information on the World Wide Web.

lan (local area network): the computers and networking products that make up the network in your home or office. ethernet: an IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium. 802.11b: 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. Chapter 1: Introduction Welcome 1 Compact Wireless-G Broadband Router What's in this Guide? This user guide covers the steps for setting up and using the Compact Wireless-G Broadband Router.

· Chapter 1: Introduction This chapter describes the Router's applications and this User Guide. · Chapter 2: Planning Your Wireless Network This chapter describes the basics of wireless networking. · Chapter 3: Getting to Know the Compact Wireless-G Broadband Router This chapter describes the physical features of the Router. · Chapter 4: Connecting the Compact Wireless-G Broadband Router This chapter instructs you on how to connect the Router to your network. · Chapter 5: Configuring the Compact Wireless-G Broadband Router This chapter explains how to use the Web-Based Utility to configure the settings on the Compact Wireless-G Broadband Router. · Appendix A: Troubleshooting This appendix describes some problems and solutions, as well as frequently asked questions, regarding installation and use of the Compact 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 firmware on the Router should you need to do so. · Appendix D: Windows Help This appendix describes how you can use Windows Help for instructions about networking, such as installing the TCP/IP protocol. · Appendix E: Finding the MAC Address and IP Address for your Ethernet Adapter.

This appendix describes how to find the MAC address for your computer's Ethernet adapter so you can use the MAC filtering and/or MAC address cloning feature of the Router. · Appendix F: Glossary This appendix gives a brief glossary of terms frequently used in networking. Chapter 1: Introduction What's in this Guide? 2 Compact Wireless-G Broadband Router · Appendix G: Specifications This appendix provides the technical specifications for the Router. · Appendix H: Warranty Information This appendix supplies the warranty information for the Router. · Appendix I: Regulatory Information This appendix supplies the regulatory information regarding the Router. · Appendix J: Contact Information This appendix provides contact information for a variety of Linksys resources, including Technical Support. Chapter 1: Introduction What's in this Guide? 3 Compact Wireless-G Broadband Router Chapter 2: Planning Your Wireless Network Network Topology A wireless local area network (WLAN) 55W 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 Compact Wireless-G Broadband Router. Chapter 2: Planning Your Wireless Network Network

Layout 5 Compact Wireless-G Broadband Router Chapter 3: Getting to Know the Compact Wireless-G Broadband Router The Back Panel The Router's ports and Reset button are located on the back panel of the Router. Figure 3-1: The Router's Back Panel Ethernet 1, 2, 3, 4 These ports (1, 2, 3, 4) connect the Router to your networked PCs and other Ethernet network devices. Internet POWER The Internet port is where you will connect your broadband Internet connection. The POWER port is where you will connect the power adapter.

port: the connection point on a computer or networking device used for plugging in cables or adapters. broadband: an always-on, fast Internet connection. Chapter 3: Getting to Know the Compact Wireless-G Broadband Router The Back Panel 6 Compact Wireless-G Broadband Router The Front Panel The Router's LEDs, which indicate the status of the Router and network activities, are located on the front panel. Figure 3-2: The Router's Front Panel Wireless Green. The WLAN LED flashes when there is a successful wireless connection.

Ethernet 1, 2, 3, 4 Green. These numbered LEDs, corresponding with the numbered ports on the Router's back panel, serve two purposes. If the LED is continuously lit, the Router is successfully connected to a device through that port. A flashing LED indicates network activity over that port. Internet Green. The Internet LED lights up when there is a connection made through the Internet port. Green. The Power LED lights up and will stay on while the Router is powered on.



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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.

Power Chapter 3: Getting to Know the Compact Wireless-G Broadband Router The Front Panel 7 Compact Wireless-G Broadband Router The Bottom Panel The Router's Reset button is located on the bottom panel. To access the button, turn the stand perpendicular to the Router. Use a sharp object like a pencil to push in the button. **STAND IMPORTANT:** If you reset the Router, all of your settings, including Internet connection, wireless, and security, will be deleted and replaced with the factory defaults. Do not reset the Router if you want to retain these settings. **RESET BUTTON** Figure 3-3: The Router's Bottom Panel **RESET Button** There are two ways to reset the Router's factory defaults. Either press the **RESET** button, for approximately eight seconds, or restore the defaults from the Administration tab Factory Defaults in the Router's Web-based Utility. Chapter 3: Getting to Know the Compact Wireless-G Broadband Router The Bottom Panel 8 Compact Wireless-G Broadband Router The Top Panel The Router comes with a built-in antenna, but there is an optional high gain antenna, model number HGA7S, that is available for longer range. The Router's SMA Port (connector) for the optional antenna is located on the top panel. To access the SMA Port, flip open the tab.

To attach the antenna, insert the base of the antenna into the SMA port and tighten it clockwise by hand. **OPTIONAL LINKSYS LONGER RANGE ANTENNA (HGA7S) TAB ANTENNA BASE SMA Port** Figure 3-4: The Router's Top Panel Chapter 3: Getting to Know the Compact Wireless-G Broadband Router The Top Panel 9 Compact Wireless-G Broadband Router Chapter 4: Connecting the Compact Wireless-G Broadband Router Overview Linksys recommends using the Setup Wizard on the Setup CD-ROM for first-time installation of the Router. For advanced users, you may follow the instructions in this chapter, and then configure the Router through its Webbased Utility (refer to "Chapter 5: Configuring the Compact Wireless-G Broadband Router"). This chapter includes two sets of instructions. If the Compact Wireless-G Broadband Router will be the only router in your network, follow the instructions in "Hardware Installation for Connection to Your Broadband Modem.

" If you want to install the Compact Wireless-G Broadband Router behind another router in your network, then follow the instructions in "Hardware Installation for Connection to Another Router." **NOTE:** For first-time installation of the Router, Linksys recommends using the Setup Wizard on the Setup CD-ROM. **Hardware Installation for Connection to your Broadband Modem** 1. Power down your network devices. 2.

Locate an optimum location for the Router. The best place for the Router is usually at the center of your wireless network, with line of sight to all of your wireless devices. If you are using the optional external antenna, adjust it now for optimum performance. Normally, the higher you place the antenna, the better the performance will be. 3. Connect a standard Ethernet network cable from the Router's Internet port to your broadband modem. Figure 4-1: Connecting your Broadband Modem Chapter 4: Connecting the Compact Wireless-G Broadband Router Overview 10 Compact Wireless-G Broadband Router 4. Connect a standard Ethernet network cable from one of the Router's numbered ports to your network PC or Ethernet device. Figure 4-2: Connecting Your Network Devices 5. Connect the AC power adapter to the Router's Power port.

Then connect the other end to an electrical outlet. Only use the power adapter supplied with the Router. Use of a different adapter can cause 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 Compact Wireless-G Broadband Router." Chapter 4: Connecting the Compact Wireless-G Broadband Router Hardware Installation for Connection to your Broadband Modem 11 Compact Wireless-G Broadband Router Hardware Installation for Connection to Another Router Before you install the Router, you must change the default IP address of the other router. This is mandatory because both routers may be set to the same IP address by default. If you do not change the other router's default IP address, then you may not be able to set up the Router. First, make sure the Router is **NOT** connected to your network.

Then follow these instructions: 1. To access the other router's Web-based Utility, launch Internet Explorer or Netscape Navigator, and enter the other router's default IP address, 192.168.1.1, in the Address field.

Then press Enter. 2. A password request page will appear. Leave the User Name field blank. In the Password field, enter the password you have set (the default password is admin).

Then click the OK button. Internet 3. The first screen that appears will display the Setup tab. In the Network Setup section, there is a setting called Local IP Address (also called Router IP), which is set to 192.168.1.1. Change this to 192.168.2.

1. 4. Click the Save Settings button to save your change, and then exit the Web-based Utility. 5. Power down your network devices. Now you will begin the hardware installation of the Router. 6. Locate an optimum location for the Router. The best place for the Router is usually at the center of your wireless network, with line of sight to all of your wireless devices. 7.

If you are using the optional external antenna, adjust it now for optimum performance. Normally, the higher you place the antenna, the better the performance will be. 8. Connect a standard Ethernet network cable to the Router's Internet port. Then, connect the other end of the Ethernet cable to one of the numbered Ethernet ports on your other router.

Compact Wireless-G Broadband Router Multiple PCs Figure 4-4: Diagram for Connection to Another Router Router **NOTE:** Steps 1-4 are instructions for a typical Linksys router; however, if you are using a nonLinksys router, refer to the other router's documentation for instructions on how to change its local IP address to 192.168.2.1. Broadband Modem Figure 4-5: Connecting Another Router Chapter 4: Connecting the Compact Wireless-G Broadband Router Hardware Installation for Connection to Another Router 12 Compact Wireless-G Broadband Router 9.

Decide which network computers or Ethernet devices you want to connect to the Router. Disconnect the selected computers or devices from the other router, and then connect them to the Router's numbered ports using standard Ethernet network cabling. Figure 4-6: Connecting Your Network Devices 10. Connect the AC power adapter to the Router's Power port and the other end into an electrical outlet.



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Only use the power adapter supplied with the Router. Use of a different adapter may result in product damage. **IMPORTANT:** Make sure you use the power adapter that is supplied with the Router. Use of a different power adapter could damage the Router. Figure 4-7: Connecting the Power Now that the hardware installation is complete, proceed to "Chapter 5: Configuring the Compact Wireless-G Broadband Router." Chapter 4: Connecting the Compact Wireless-G Broadband Router Hardware Installation for Connection to Another Router 13 Compact Wireless-G Broadband Router Chapter 5: Configuring the Compact Wireless-G Broadband Router Overview Linksys recommends using the Setup Wizard on the Setup CD-ROM for first-time installation of the Router.

For advanced users, you may follow the instructions in the previous chapter, "Chapter 4: Connecting the Compact Wireless-G Broadband Router", and then configure the Router through its 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. Make the necessary changes through the Web-based Utility. On each screen, click the Save Settings button to apply your changes or Cancel Changes to cancel your changes. Help information is shown on the right-hand side of the screen.

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

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. Chapter 5: Configuring the Compact Wireless-G Broadband Router Overview 14 Compact Wireless-G Broadband Router How to Access the Web-based Utility To access the Web-based Utility, launch Internet Explorer or Netscape Navigator, and enter the Router's default IP address, 192.168.1.

1, in the Address field. Then press Enter. A password request page will appear. Leave the User Name field blank. The first time you open the Web-based Utility, use the default password admin. (You can set a new password from the Administration tab's Management screen.) Then click the OK button. Figure 5-1: Router's IP Address The Setup Tab - Basic Setup The first screen that appears displays the Setup tab. This allows you to change the Router's general settings. Figure 5-2: Router Login Screen ip (internet protocol): a protocol used to send data over a network.

ip address: the address used to identify a computer or device on a network. Internet Setup The Internet Setup section configures the Router to your Internet connection. Most of this information can be obtained from your ISP. Internet Connection Type Choose the type of Internet connection your ISP provides from the drop-down menu. · Automatic Configuration - DHCP. By default, the Router's Internet Connection Type is set to Automatic Configuration - DHCP, which should be kept only if your ISP supports DHCP or you are connecting through a dynamic IP address. Figure 5-3: Setup Tab - Basic Setup Chapter 5: Configuring the Compact Wireless-G Broadband Router How to Access the Web-based Utility 15 Compact Wireless-G Broadband Router · Static IP. If you are required to use a permanent IP address to connect to the Internet, select Static IP. Internet IP Address. This is the Router's IP address, when seen from the Internet.

Your ISP will provide you with the IP Address you need to specify here. Subnet Mask. This is the Router's Subnet Mask, as seen by users on the Internet (including your ISP). Your ISP will provide you with the Subnet Mask. Default Gateway.

Your ISP will provide you with the Gateway Address, which is the ISP server's IP address. DNS (1-3). Your ISP will provide you with at least one DNS (Domain Name System) Server IP Address. · PPPoE. Some DSL-based ISPs use PPPoE (Point-to-Point Protocol over Ethernet) to establish Internet connections.

If you are connected to the Internet through a DSL line, check with your ISP to see if they use PPPoE. If they do, you will have to enable PPPoE. User Name and Password. Enter the User Name and Password provided by your ISP. Connect on Demand: Max Idle Time. You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. If you wish to activate Connect on Demand, click the radio button. In the Max Idle Time field, enter the number of minutes you want to have elapsed before your Internet connection terminates. Keep Alive Option: Redial Period.

If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, click the radio button next to Keep Alive. In the Redial Period field, you specify how often you want the Router to check the Internet connection. The default Redial Period is 30 seconds. · 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. packet: a unit of data sent over a network 16 Figure 5-5: PPPoE Connection Type pppoe: a type of broadband connection that provides authentication (username and password) in addition to data transport Figure 5-4: Static IP Connection Type static ip address: a fixed address assigned to a computer or device connected to a network. subnet mask: an address code that determines the size of the network. default gateway: a device that forwards Internet traffic from your local area network.

Chapter 5: Configuring the Compact Wireless-G Broadband Router The Setup Tab - Basic Setup Compact Wireless-G Broadband Router Connect on Demand: Max Idle Time.



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You can configure the Router to cut the Internet connection after it has been inactive for a specified period of time (Max Idle Time). If your Internet connection has been terminated due to inactivity, Connect on Demand enables the Router to automatically re-establish your connection as soon as you attempt to access the Internet again. If you wish to activate Connect on Demand, click the radio button. In the Max Idle Time field, enter the number of minutes you want to have elapsed before your Internet connection terminates. Keep Alive Option: Redial Period. If you select this option, the Router will periodically check your Internet connection. If you are disconnected, then the Router will automatically re-establish your connection. To use this option, click the radio button next to Keep Alive. In the Redial Period field, you specify how often you want the Router to check the Internet connection.

The default Redial Period is 30 seconds. Optional Settings Some of these settings may be required by your ISP. Verify with your ISP before making any changes. Host Name and Domain Name. These fields allow you to supply a host and domain name for the Router. Some ISPs, usually cable ISPs, require these names as identification. You may have to check with your ISP to see if your broadband Internet service has been configured with a host and domain name. In most cases, leaving these fields blank will work. MTU. MTU is the Maximum Transmission Unit.

It specifies the largest packet size permitted for Internet transmission. Select Manual if you want to manually enter the largest packet size that will be transmitted. The recommended size, entered in the Size field, is 1500. You should leave this value in the 1200 to 1500 range. To have the Router select the best MTU for your Internet connection, keep the default setting, Auto.

Figure 5-6: PPTP Connection Type Network Setup The Network Setup section changes the Router's local network settings. Changes to the Router's wireless network settings are performed through the Wireless tab. Router IP IP Address and Subnet Mask. This shows both the Router's IP Address and Subnet Mask, as seen by your network. The default IP Address is 192.

168.1.1, and the default Subnet Mask is 255.255.255.0. In most cases, keeping the default values will work. Chapter 5: Configuring the Compact Wireless-G Broadband Router The Setup Tab - Basic Setup 17 Compact Wireless-G Broadband Router DHCP Server Settings The settings allow you to configure the Router's Dynamic Host Configuration Protocol (DHCP) server function. The Router can be used as a DHCP server for your network. A DHCP server automatically assigns an IP address to each computer on your network.

If you choose to enable the Router's DHCP server option, you must make sure there is no other DHCP server on your network. DHCP Server. DHCP is enabled by factory default. If you already have a DHCP server on your network, or you don't want a DHCP server, then select Disabled (no other DHCP features will be available). Assign Static DHCP. Every time a PC reboots, it is assigned a new local IP address by the Router. If you want a PC to be assigned the same IP address every time it reboots, then click the Assign Static IP button. On the Static DHCP Client List screen, enter a client name, then enter the static local IP address in the Assign this IP field, and enter the MAC address of the PC in the To this MAC field. Then click the Enabled checkbox. When you have finished your entries, click the Save Settings button to save your changes.

Click the Cancel Changes button to cancel your changes. To exit this screen, click the Close button. If you want to see a list of DHCP clients, click the DHCP Client Table button. On the DHCP Client Table screen, you will see a list of DHCP clients with the following information: Client Names, Interfaces, IP Addresses, and MAC Addresses. From the To Sort by drop-down menu, you can sort the table by Client Name, Interface, IP Address, or MAC Address. To view the most up-to-date information, click the Refresh button. To exit this screen, click the Close button. Start IP Address. Enter a value for the DHCP server to start with when issuing IP addresses. Because the Router's default IP address is 192.

168.1.1, the Starting IP Address must be 192.168.1.2 or greater, but smaller than 192.168.1.254. The default Starting IP Address is 192.

168.1.100. Maximum Number of Users. Enter the maximum number of PCs that you want the DHCP server to assign IP addresses to. This number cannot be greater than 253. The default is 50. IP Address Range. The range of DHCP addresses is displayed here. Client Lease Time.

The Client Lease Time is the amount of time a network user will be allowed connection to the Router with their current dynamic IP address. Enter the amount of time, in minutes, that the user will be "leased" this dynamic IP address. After the time is up, the user will be automatically assigned a new dynamic IP address. The default is 0 minutes, which means one day. 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. Figure 5-8: DHCP Client Table Chapter 5: Configuring the Compact Wireless-G Broadband Router The Setup Tab - Basic Setup Figure 5-7: Static DHCP Client List 18 Compact Wireless-G Broadband Router Time Settings Change the time zone in which your network functions from this pull-down menu. Click the checkbox if you want the Router to automatically adjust for daylight savings time.

Change these settings as described here and click the Save Settings button to apply your changes or Cancel Changes to cancel your changes. Help information is shown on the right-hand side of the screen. 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 one of two DDNS service providers, DynDNS.org or TZO.com. If you do not want to use this feature, keep the default setting, Disable. dynamic ip address: a temporary IP address assigned by a DHCP server.

DDNS DDNS Service. If your DDNS service is provided by DynDNS.org, then select DynDNS.org from the drop-down menu. If your DDNS service is provided by TZO, then select TZO.com. The features available on the DDNS screen will vary, depending on which DDNS service provider you use.

DynDNS.org User Name, Password, and Host Name. Enter the User Name, Password, and Host Name of the account you set up with DynDNS.org. Internet IP Address. The Router's current Internet IP Address is displayed here. Because it is dynamic, it will change. Figure 5-9: DynDNS.org Status. The status of the DDNS service connection is displayed here. Chapter 5: Configuring the Compact Wireless-G Broadband Router The Setup Tab - DDNS 19 Compact Wireless-G Broadband Router TZO.



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com E-mail Address, Password, and Domain Name. Enter the Email Address, Password, and Domain Name of the service you set up with TZO. Internet IP Address. The Router's current Internet IP Address is displayed here. Because it is dynamic, this will change. Status. The status of the DDNS service connection is displayed here. When you have finished making changes to this screen, click the Save Settings button to apply your changes or Cancel Changes to cancel your changes. Help information is shown on the right-hand side of the screen. Figure 5-10: TZO.com The Setup Tab - MAC Address Clone A MAC address is a 12-digit code assigned to a unique piece of hardware for identification. Some ISPs will require you to register a MAC address in order to access the Internet.

If you do not wish to re-register the MAC address with your ISP, you may assign the MAC address you have currently registered with your ISP to the Router with the MAC Address Clone feature. MAC Address Clone Enabled/Disabled. To have the MAC Address cloned, select Enabled from the drop-down menu. MAC Address. Enter the MAC Address registered with your ISP here. Clone My PC's MAC. Clicking this button will clone the MAC address of the PC you are currently using. Change these settings as described here and click the Save Settings button to apply your changes or Cancel Changes to cancel your changes.

Help information is shown on the right-hand side of the screen. mac address: the unique address that a manufacturer assigns to each networking device. Figure 5-11: Setup Tab - MAC Address Clone Chapter 5: Configuring the Compact Wireless-G Broadband Router The Setup Tab - MAC Address Clone 20 Compact Wireless-G Broadband Router 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. Figure 5-12: Setup Tab - Advanced Routing (Gateway) 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 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.

Chapter 5: Configuring the Compact Wireless-G Broadband Router The Setup Tab - Advanced Routing Figure 5-13: Setup Tab - Advanced Routing (Router) 21 Compact Wireless-G Broadband Router The Wireless Tab - Basic Wireless Settings The basic settings for wireless networking are set on this screen. Wireless Network Wireless-G Settings Mode.

From this drop-down menu, you can select the wireless standards running on your network. If you have both 802.11g and 802.11b devices in your network, keep the default setting, Mixed. If you have only 802.11g devices, select G Only. If you have only 802.11b devices, select B Only. Network Name (SSID). The SSID is the network name shared by all devices in a wireless network. The SSID must be identical for all devices in the wireless network. It is case-sensitive and must not exceed 32 keyboard characters in length. Make sure this setting is the same for all devices in your wireless network. For added security, you should change the default SSID (linksys) to a unique name. Channel.

Select the appropriate channel from the list provided to correspond with your network settings. All devices in your wireless network must broadcast on the same channel in order to communicate. SSID Broadcast. When wireless clients survey the local area for wireless networks to associate with, they will detect the SSID broadcast by the Router. To broadcast the Router's SSID, keep the default setting, Enabled. If you do not want to broadcast the Router's SSID, then select Disabled. Change these settings as described here and click the Save Settings button to apply your changes or Cancel Changes to cancel your changes.

Help information is shown on the right-hand side of the screen. Figure 5-14: Wireless Tab - Basic Wireless Settings Chapter 5: Configuring the Compact Wireless-G Broadband Router The Wireless Tab - Basic Wireless Settings 22 Compact Wireless-G Broadband Router The Wireless Tab - Wireless Security The Wireless Security settings configure the security of your wireless network. There are three wireless security mode options supported by the Router: WPA Personal, WPA2 Personal, WPA2 Mixed Mode and WEP.

(WEP stands for Wired Equivalent Privacy). These four are briefly discussed here. For detailed instructions on configuring wireless security for the Router, turn to "Appendix B: Wireless Security." IMPORTANT: If you are using encryption, always remember that each device in your wireless network MUST use the same encryption method and encryption key, or else your wireless network will not function properly. Wireless Security WEP.



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WEP is a basic encryption method. Select a level of WEP encryption, 64-bit or 128-bit. If you want to use a Passphrase, then enter it in the Passphrase field and click the Generate button. If you want to enter the WEP key manually, then enter it in the WEP Key 1-4 field(s). To indicate which WEP key to use, select the appropriate TX Key number.

Figure 5-15: Wireless Tab - Wireless Security (WEP) wep (wired equivalent privacy): a method of encrypting network data transmitted on a wireless network for greater security. WPA Personal. This method offers two encryption methods, TKIP and AES, with dynamic encryption keys. Select the type of encryption method you want to use, TKIP or AES. Enter the Passphrase, which can have 8 to 63 characters. Then enter the Key Renewal period, which instructs the Router how often it should change the encryption keys. Figure 5-16: Wireless Tab - Wireless Security (WPA Personal) Chapter 5: Configuring the Compact Wireless-G Broadband Router The Wireless Tab - Wireless Security 23 Compact Wireless-G Broadband Router WPA2 Personal. WPA2 gives you one encryption method, AES, with dynamic encryption keys. Enter a Passphrase of 8-63 characters. Then enter a Group Key Renewal period, which instructs the Router how often it should change the encryption keys.

Figure 5-17: Wireless Tab - Wireless Security (WPA2 Personal) WPA2 Mixed Mode. WPA2 gives you TKIP+AES encryption. Enter a Passphrase of 8-63 characters. Then enter a Group Key Renewal period, which instructs the Router how often it should change the encryption keys. Figure 5-18: Wireless Tab - Wireless Security (WPA2 Mixed Mode) Chapter 5: Configuring the Compact Wireless-G Broadband Router The Wireless Tab - Wireless Security 24 Compact Wireless-G Broadband Router The Wireless Tab - Wireless MAC Filter Wireless access can be filtered by using the MAC addresses of the wireless devices transmitting within your network's radius. Wireless MAC Filter Access Restrictions To filter wireless users by MAC Address, either permitting or blocking access, click Enabled. If you do not wish to filter users by MAC Address, select Disabled. Prevent PCs listed below from accessing the wireless network.

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

Clicking this radio button will allow wireless access by MAC Address. Wireless Client List Wireless Client List. Click the Wireless Client MAC List button to display a list of network users by MAC Address. From the To Sort by drop-down menu, you can sort the table by Client Name, IP Address, or MAC Address.

To view the most up-to-date information, click the Refresh button.

To exit this screen, click the Close button. List users, by MAC Address, whose wireless access you want to control. Change these settings as described here and click the Save Settings button to apply your changes or Cancel Changes to cancel your changes. Help information is shown on the right-hand side of the screen. Figure 5-19: Wireless Tab - Wireless MAC Filter Figure 5-20: Wireless Tab - Wireless Client List Chapter 5: Configuring the Compact Wireless-G Broadband Router The Wireless Tab - Wireless MAC Filter 25 Compact Wireless-G Broadband Router The Wireless Tab - Advanced Wireless Settings This tab is used to set up the Router's advanced wireless functions.

These settings should only be adjusted by an expert administrator as incorrect settings can reduce wireless performance. Advanced Wireless Wireless-G Settings Authentication Type. The default is set to Auto (Default), allows either Open System or Shared Key authentication to be used. With Open System authentication, the sender and the recipient do NOT use a WEP key for authentication. With Shared Key authentication, the sender and recipient use a WEP key for authentication. Transmission Rate. The rate of data transmission should be set depending on the speed of your wireless network. You can select from a range of transmission speeds, or you can select Auto (Default) to have the Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client. The default value is Auto (Default).

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.

CTS Protection Mode.

CTS (Clear-To-Send) Protection Mode should be set to Auto (Default). The Router will automatically use CTS Protection Mode when your Wireless-G products are experiencing severe problems and are not able to transmit to the Router in an environment with heavy 802.11b traffic. This function boosts the Router's ability to catch all Wireless-G transmissions but will severely decrease performance. DTIM Interval.

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

Figure 5-21: Wireless Tab - Advanced Wireless Settings cts (clear to send): a signal sent by a wireless device, signifying that it is ready to receive data. dim: a message included in data packets that can increase wireless efficiency. Chapter 5: Configuring the Compact Wireless-G Broadband Router The Wireless Tab - Advanced Wireless Settings 26 Compact Wireless-G Broadband Router 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.



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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. Beacon Interval. The default value is 100. The Beacon Interval value indicates the frequency interval of the beacon. A beacon is a packet broadcast by the Router to synchronize the wireless network. Change these settings as described here and click the Save Settings button to apply your changes or Cancel Changes to cancel your changes. Help information is shown on the right-hand side of the screen.

fragmentation: breaking a packet into smaller units when transmitting over a network medium that cannot support the original size of the packet. beacon interval: data transmitted on your wireless network that keeps the network synchronized. Chapter 5: Configuring the Compact Wireless-G Broadband Router The Wireless Tab - Advanced Wireless Settings 27 Compact Wireless-G Broadband Router The Security Tab - Firewall The Firewall screen offers Filters and the option to Block WAN Requests. Filters block specific Internet data types and block anonymous Internet requests. To enable a feature, select Enabled from the drop-down menu.

To disable a feature, select Disabled from the drop-down menu. Firewall · SPI Firewall Protection. Enable this feature to employ Stateful Packet Inspection (SPI) for more detailed review of data packets entering your network environment. · Block Anonymous Internet Requests. When enabled, this feature keeps your network from being "pinged," or detected, by other Internet users.

It also reinforces your network security by hiding your network ports. Both functions of this feature make it more difficult for outside users to work their way into your network. This feature is enabled by default. Select Disabled to allow anonymous Internet requests. · Filter Multicast. Multicasting allows for multiple transmissions to specific recipients at the same time. If multicasting is permitted, then the Router will allow IP multicast packets to be forwarded to the appropriate computers. Select Enable to filter multicasting, or Disable to disable this feature. · Filter Internet NAT Redirection. This feature uses port forwarding to block access to local servers from local networked computers.

Check the box to enable filter Internet NAT redirection, or uncheck the box to disable this feature. · Web Filters Proxy. Use of WAN proxy servers may compromise the Gateway's security. Denying Filter Proxy will disable access to any WAN proxy servers. To enable proxy filtering, click the checkbox. Java. Java is a programming language for websites. If you deny Java, you run the risk of not having access to Internet sites created using this programming language. To enable Java filtering, click the checkbox. ActiveX.

ActiveX is a programming language for websites. If you deny ActiveX, you run the risk of not having access to Internet sites created using this programming language. To enable ActiveX filtering, click the checkbox. Cookies. A cookie is data stored on your computer and used by Internet sites when you interact with them.

To enable cookie filtering, click the checkbox. Change these settings as described here and click the Save Settings button to apply your changes or Cancel Changes to cancel your changes. Help information is shown on the right-hand side of the screen. Chapter 5: Configuring the Compact Wireless-G Broadband Router The Security Tab - Firewall Figure 5-22: Security Tab - Firewall 28 Compact Wireless-G Broadband Router The Security Tab - VPN Passthrough Use the settings on this tab to allow VPN tunnels using IPSec, L2TP, or PPTP protocols to pass through the Router's firewall. VPN Passthrough IPSec Passthrough.

Internet Protocol Security (IPSec) is a suite of protocols used to implement secure exchange of packets at the IP layer. IPSec Pass-Through is enabled by default. To disable IPSec Passthrough, select Disabled. L2TP Passthrough. Layer 2 Tunneling Protocol is the method used to enable Point-to-Point sessions via the Internet on the Layer 2 level. L2TP Pass-Through is enabled by default. To disable L2TP Passthrough, select Disabled. PPTP Passthrough. Point-to-Point Tunneling Protocol (PPTP) allows the Point-to-Point Protocol (PPP) to be tunneled through an IP network. PPTP Pass-Through is enabled by default.

To disable PPTP Passthrough, select Disabled. Change these settings as described here and click the Save Settings button to apply your changes or Cancel Changes to cancel your changes. Help information is shown on the right-hand side of the screen. Figure 5-23: Security Tab - VPN Passthrough 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 - Internet Access Policy The Internet Access Policy screen allows you to block or allow specific kinds of Internet usage and traffic, such as Internet access, designated applications, websites, and inbound traffic during specific days and times. Internet Access Policy 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 This Policy button. To view all the policies, click the Summary button. On the Summary screen, the policies are listed with the following information: No., Policy Name, Access, Days, Time, and status (Enabled).

You can change the type of access, days, and times of a policy. To activate a policy, click the Enabled checkbox. To delete a policy, click its Delete button. Click the Save Settings button to save your changes, or click the Cancel Changes button to cancel your changes. To return to the Internet Access Policy tab, click the Close button.

To view the list of PCs for a specific policy, click the PCs List button. Figure 5-24: Access Restrictions Tab - Internet Access Policy Chapter 5: Configuring the Compact Wireless-G Broadband Router The Security Tab - VPN Passthrough 29 Compact Wireless-G Broadband Router On the Internet Access PCs List screen, 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. Click the Close button to exit this screen. To create an Internet Access policy: 1. Select a number from the Access Policy drop-down menu. 2. Enter a Policy Name in the field provided.



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To enable this policy, select *Enable* from the *Status* drop-down menu. 4. Click the *Edit List* button to select which PCs will be affected by the policy. The *Internet Access PCs List* 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*. 7.

You can filter access to various applications accessed over the Internet, such as *FTP* or *telnet*, by selecting up to three applications from the drop-down menus next to *Blocked Application Port*. The *Block Services* menu offers a choice of ten preset applications. For the preset applications you select, the appropriate range of ports will automatically be displayed. Click the *>>* button to add to the *Blocked Services* list. If the application you want to block is not listed or you want to edit an application's settings, then create a new one by entering a *Service Name*, *Protocol*, and *Port Range*.

Then, click *Add*. 8. You can also block access by *URL* address by entering it in the *Website Blocking by URL Address* field or by *Keyword* by entering it in the *Website Blocking by Keyword* field. Figure 5-26: *Access Restrictions Tab - Internet Access PCs List* 30 Figure 5-25: *Access Restrictions Tab - Summary* 9.

Click the *Save Settings* button to save the policy's settings. To cancel the policy's settings, click the *Cancel Changes* button. Chapter 5: *Configuring the Compact Wireless-G Broadband Router The Access Restrictions Tab - Internet Access Policy Compact Wireless-G Broadband Router The Applications and Gaming Tab - Port Range Forwarding* The *Port Range Forwarding* screen 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.) Before using forwarding, you should assign static IP addresses to the designated PCs.

Port Range Forwarding To forward a port, enter the information on each line for the criteria required. Descriptions of each criteria are described here. *Application Name*. Each drop-down menu offers a choice of ten preset applications (select *None* if you do not want to use any of the preset applications). Select up to five preset applications. For custom applications, enter the name of your application in one of the available fields. The preset applications are among the most widely used Internet applications. They include the following: *DNS (Domain Name System)*. The way that Internet domain names are located and translated into IP addresses. A domain name is a meaningful and easy-to-remember "handle" for an Internet address.

Finger. A UNIX command widely used on the Internet to find out information about a particular user, such as a telephone number, whether the user is currently logged on, and the last time the user was logged on. The person being "fingered" must have placed his or her profile on the system in order for the information to be available. *Fingering* requires entering the full *user@domain* address. *FTP (File Transfer Protocol)*.

A protocol used to transfer files over a *TCP/IP* network (Internet, UNIX, etc.). For example, after developing the *HTML* pages for a website on a local machine, they are typically uploaded to the web server using *FTP*. *POP3 (Post Office Protocol 3)*. A standard mail server commonly used on the Internet.

It provides a message store that holds incoming e-mail until users log on and download it. *POP3* is a simple system with little selectivity. All pending messages and attachments are downloaded at the same time. *POP3* uses the *SMTP* messaging protocol. *SMTP (Simple Mail Transfer Protocol)*. The standard e-mail protocol on the Internet. It is a *TCP/IP* protocol that defines the message format and the message transfer agent (*MTA*), which stores and forwards the mail. Figure 5-27: *Applications and Gaming Tab - Port Range Forwarding 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.*

Chapter 5: *Configuring the Compact Wireless-G Broadband Router The Applications and Gaming Tab - Port Range Forwarding* 31 *Compact Wireless-G Broadband Router SNMP (Simple Network Management Protocol)*.

A widely used network monitoring and control protocol. Data is passed from *SNMP* agents, which are hardware and/or software processes reporting activity in each network device (hub, router, bridge, etc.) to the workstation console used to oversee the network. The agents return information contained in a *MIB (Management Information Base)*, which is a data structure that defines what is obtainable from the device and what can be controlled (turned off, on, etc.).

Telnet. A terminal emulation protocol commonly used on Internet and *TCP/IP*-based networks. It allows a user at a terminal or computer to log onto a remote device and run a program. *TFTP (Trivial File Transfer Protocol)*. A version of the *TCP/IP* *FTP* protocol that has no directory or password capability.

Web. The Internet. *Start/End*. This is the port range. Enter the port number or range of external ports used by the server or Internet application.

Check with the software documentation of the Internet application for more information. *Protocol*. Select the protocol(s) used for this application, *TCP* and/or *UDP*. To *IP Address*. For each application, enter the IP address of the PC running the specific application.

Enabled. Click the *Enabled* 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. Help information is shown on the right-hand side of the screen. Chapter 5: *Configuring the Compact Wireless-G Broadband Router The Applications and Gaming Tab - Port Range Forwarding* 32 *Compact Wireless-G Broadband Router The Applications & Gaming Tab - Port Range Triggering* The *Port Range Triggering* screen allows the Router to watch outgoing data for specific port numbers. The IP address of the computer that sends the matching data is remembered by the Router, so that when the requested data returns through the Router, the data is pulled back to the proper computer by way of IP address and port mapping rules.



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