

Instant Wireless® Series

Wireless Ethernet Bridge



Use this guide to install:

WET11

User Guide

 **LINKSYS**®

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.

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Linksys Group declares that the Instant Wireless Series products included in the Instant Wireless Series conform to the specifications listed below, following the provisions of the EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC:

- ETS 300-826, 301 489-1 General EMC requirements for Radio equipment.
- EN 609 50 Safety
- ETS 300-328-2 Technical requirements for Radio equipment.

Note: 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. For more details, contact Linksys Corporate Compliance.

Note: Combinations of power levels and antennas resulting in a radiated power level of above 100 mW 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 and/or the CEPT recommendation Rec 70.03. For more details on legal combinations of power levels and antennas, contact Linksys Corporate Compliance.

- Linksys Group vakuuttaa täten että Instant Wireless IEEE 802.11 PC Card tyyppinen laite on direktiivin 1999/5/EY, direktiivin 89/336/EEC ja direktiivin 73/23/EEC oleellisten vaatimusten ja sitä koskevien näiden direktiivien muiden ehtojen mukainen.
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- Belgique B L'utilisation en extérieur est autorisé sur le canal 11 (2462 MHz), 12 (2467 MHz), et 13 (2472 MHz).
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LIMITED WARRANTY

Linksys guarantees that every Wireless Ethernet Bridge will be free from physical defects in material and workmanship for one year from the date of purchase, when used within the limits set forth in the Specifications section of this User Guide. If the product proves defective during this warranty period, call Linksys Technical Support in order to obtain a Return Authorization Number. **BE SURE TO HAVE YOUR PROOF OF PURCHASE AND A BARCODE FROM THE PRODUCT'S PACKAGING ON HAND WHEN CALLING. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE.** When returning a product, mark the Return Authorization Number clearly on the outside of the package and include a copy of your original proof of purchase. All customers located outside of the United States of America and Canada shall be held responsible for shipping and handling charges.

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Linksys P.O. Box 18558, Irvine, CA 92623.

FCC STATEMENT

This Wireless Ethernet Bridge 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.

UG-WET11-110502D JL

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Chapter 1: Introduction

The Wireless Ethernet Bridge

The versatile Wireless Ethernet Bridge can make any wired Ethernet-equipped device a part of your wireless network. At home, use the Wireless Ethernet Bridge to connect to game consoles, set-top boxes, or computers into your wireless network to share your high-speed network connection. In the office, convert your Ethernet-wired printer, scanner, camera, notebook, or desktop into a wireless networked device.

It's completely driver-free, so it works on any platform and under any operating system! Since there are no drivers to load, setup is a snap—just plug it into your device and configure the network settings through your web browser.

You can also use the Wireless Ethernet Bridge as a kind of “cable-less cable” to connect remote areas together. Maybe Shipping is all the way across the warehouse from Receiving. Or maybe you want to set up a home office in your detached garage. With a Wireless Ethernet Bridge in the garage, and another one (or a Wireless Access Point) in the house, you're connected—with no cabling hassle.

Features

- An All-in-One Wireless Solution for Any Ethernet-Ready Network Device
- Interoperable with 802.11b (DSSS) 2.4GHz-Compliant Equipment
- No Additional Drivers Are Needed
- Up to 11 Mbps High-Speed Transfer Rate
- Dynamically Shifts between 11, 5.5, 2, and 1Mbps for Maximum Adaptability
- Supports up to 50 Remote Clients
- Assurance of Constant Connection via Direct Sequence Spread Spectrum (DSSS)
- Conveniently Eliminates Cables and Network Wires Used by Network Devices
- Equipped with One Standard 10Base-T Interface for Connection with Any Ethernet-Ready Networked Resource
- Capable of up to 128-Bit WEP Encryption
- Setup Wizard for Easy Installation
- Free Technical Support—24 Hours a Day, 7 Days a Week, Toll-Free US Calls
- 1-Year Limited Warranty

Chapter 2: Getting to Know the Wireless Ethernet Bridge

The Wireless Ethernet Bridge's Back Panel



Figure 2-1

- Reset** The Reset button resets the Bridge to its factory default settings.
- X-II** The X-II selection switch offers a choice between two settings. Use the X setting if you are connecting the Bridge to a network card or other Ethernet device. Use the II setting if you are connecting the Bridge to a hub or switch.
- LAN** The LAN port is where you will connect your Ethernet network cable.
- Power** The Power port is where you will connect your power.

The Wireless Ethernet Bridge's Front Panel LEDs

- PWR** *Green.* The PWR LED will light up when the Bridge is powered on.
- DIAG** *Green.* The DIAG LED will light up when there is a connection error. Re-establish the connection to eliminate the error.
- LAN** *Green.* The LAN LED will be lit steadily when the Bridge is connected to the LAN. The LED will blink when there is LAN traffic.
- WLAN** *Green.* The WLAN LED indicates the status of the link to the wireless local area network (WLAN). The WLAN LED will be lit steadily when the Bridge is connected to the WLAN. The LED will blink when there is WLAN traffic.



Figure 2-2

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

Chapter 3: Planning Your Wireless Network

Network Topology

A wireless LAN is exactly like a regular LAN, except that each network device in the LAN uses a Wireless Ethernet Bridge to connect to the network without using wires. Computers in a wireless LAN must be configured to share the same radio channel.

The Wireless Ethernet Bridge provides LAN access for wireless network devices. An integrated wireless and wired LAN is called an Infrastructure configuration. A group of Wireless Ethernet Bridge users and an access point compose a Basic Service Set (BSS). Each PC equipped with a Wireless Ethernet Bridge in a BSS can talk to any computer in a wired LAN infrastructure via the Bridge.

An infrastructure configuration extends the accessibility of a Wireless Ethernet Bridge to a wired LAN, and doubles the effective wireless transmission range for two Wireless Ethernet Bridge PCs. Since the access point is able to forward data within its BSS, the effective transmission range in an infrastructure LAN is doubled.

The use of a unique ID in a Basic Service Set is essential.

The Wireless LAN infrastructure configuration is appropriate for enterprise-scale wireless access to a central database, or as a wireless application for mobile users.

Roaming

Infrastructure mode also supports roaming capabilities for mobile users. More than one BSS can be configured as an Extended Service Set (ESS). This continuous network allows users to roam freely within an ESS. All Wireless Ethernet Bridge PCs within one Extended Service Set must be configured with the same SSID.

Selecting a feasible radio channel and optimum access point position is recommended. Proper access point positioning combined with a clear radio signal will greatly enhance performance.

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**. 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 the **Infrastructure** mode. The basis of Infrastructure mode centers around an **access point**, which serves as the main point of communications in a wireless network (see Figure 3-1). Access points transmit data to PCs equipped with wireless network card, which can **roam** within a certain radial range of the access point. Multiple access points can be arranged to work in succession to extend the roaming range, and can be set up to communicate with your Ethernet hardware as well.

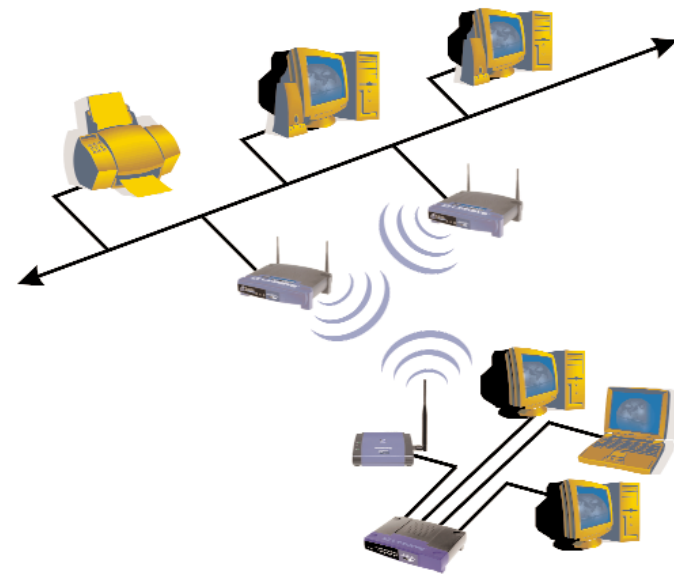


Figure 3-1

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 an 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.

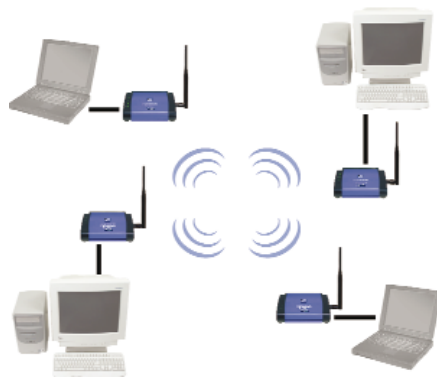


Figure 3-2

Figure 3-2 shows a typical scenario of four Wireless Ethernet Bridges in ad-hoc mode. Figure 3-3 shows a typical wireless bridging scenario using two Wireless Ethernet Bridges. Each wireless network is connected to a Wireless Ethernet Bridge through a switch. A separate notebook computer is equipped with a wireless PC card and can communicate with both wireless networks as long as it has the same SSID and channel as both wireless networks.



Figure 3-3

Chapter 4: Connecting the Wireless Ethernet Bridge

1. Plug the included Ethernet network cable into the LAN port on the back panel of the Bridge.



Figure 4-1

2. The X-II selection switch offers a choice between two settings. Slide the X-II selection switch to the X position if you are connecting the Bridge to a network card or other Ethernet device. Slide the X-II selection switch to the II position if you are connecting the Bridge to a hub or switch.
3. Plug the other end of the Ethernet network cable into the RJ-45 port on the PC you wish to use to configure the Bridge.
4. Plug the supplied power cable into the Power port on the back panel of the Bridge. Then plug the other end into an electrical outlet.
5. Proceed to the next section, “Chapter 5: Setting Up the Wireless Ethernet Bridge.”
6. After configuration, unplug the Ethernet network cable from the PC, and plug it into the RJ-45 port on the Ethernet-ready network device you wish to add to the wireless network.

The hardware installation is complete.

Chapter 5: Setting Up the Wireless Ethernet Bridge

Now that you've connected the Wireless Ethernet Bridge to your wired network, you are ready to set it up. The Setup Wizard will guide you through all the steps necessary.

1. Insert the **Setup Wizard CD-ROM** into your PC's CD-ROM drive. The Setup Utility should run automatically, and the screen in Figure 5-1 should appear. If it does not, click the **Start** button and choose **Run**. In the field that appears, enter **D:\setup.exe** (if "D" is the letter of your CD-ROM drive).



Figure 5-1

Click the **Setup** button to continue using the Setup Wizard. Click the **User Guide** button to open the pdf version of this User Guide. Click the **Linksys Web** button to access the Linksys website using an active Internet connection. Click the **Exit** button to exit the Setup Wizard.

2. The screen shown in Figure 5-2 shows the two ways to configure the Bridge using this Setup Wizard. Optimally, you should perform this setup through a PC on your wired network. You can also set up the Bridge through one of the PCs on your wireless network. Click the **Next** button to continue or the **Exit** button to exit the Setup Wizard.

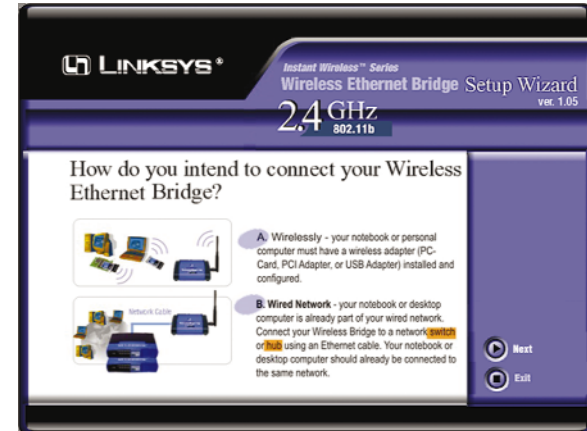


Figure 5-2

3. The screen shown in Figure 5-3 displays a list of Wireless Ethernet Bridges on your network, along with the status information for each Bridge. (If you have only one Bridge on your network, it will be the only one displayed.) Select the Bridge you are currently installing by clicking its name in the Selection box. Write down the IP address of the Wireless Ethernet Bridge, so you can use it to access the Web-based Utility later. Click the **Yes** button to continue or the **Exit** button to exit the Setup Wizard.



Figure 5-3

- For security purposes, you will be asked for your user name and password in order to access the Bridge. In lowercase letters, enter **admin** in the *Password* field (later you can change the password through the Web-based Utility). Click the **Yes** button to continue or the **No** button to return to the previous screen.



Figure 5-4

- The screen shown in Figure 5-5 shows a choice of two wireless modes. Click the **Infrastructure Mode** radio button if you want your wireless computers to network with computers on your wired network using a wireless access point. Click the **Ad-Hoc Mode** radio button if you want multiple wireless computers to network directly with each other. Do not use the Ad-Hoc mode if you want to network your wireless computers with computers on your wired network. Click the **Next** button to continue or the **Back** button to return to the previous screen.



Figure 5-5

- The *Basic Settings* screen will now appear. Enter your wireless network's SSID, and select the Channel at which the network broadcasts its wireless signal. Enter a unique Bridge Name for the Bridge. Then click the **Next** button to continue or the **Back** button to return to the previous screen.

- SSID** - The SSID is the unique name shared among all points in a wireless network. The SSID must be identical for all points in the wireless network. It is case-sensitive and must not exceed 32 alphanumeric characters, which may be any keyboard character (do not use any spaces). Make sure this setting is the same for all points in your wireless network.
- Channel** - Select the appropriate channel from the list provided to correspond with your network settings, between 1 and 11 (in North America). All points in your wireless network must use the same channel in order to function correctly.
- Bridge Name** - You may assign any name to the Bridge. Unique, memorable names are helpful, especially if you are using multiple bridges on the same network.

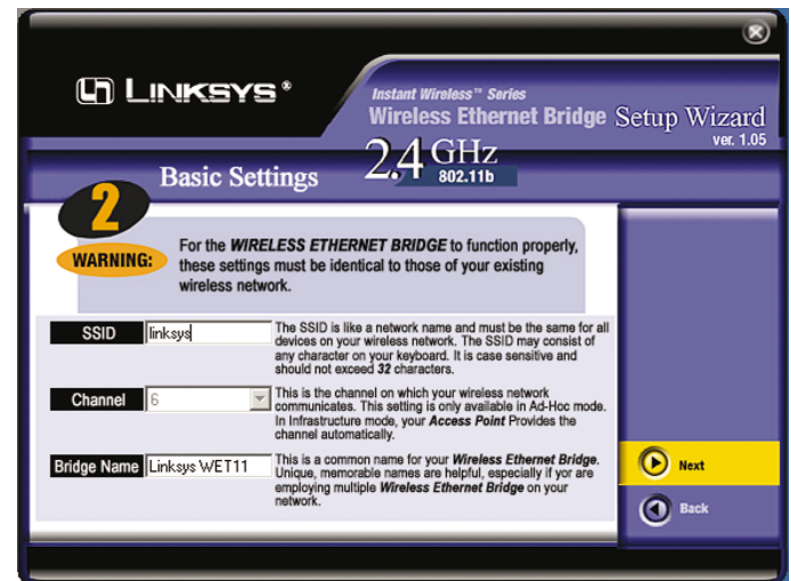


Figure 5-6

7. The *IP Settings* screen will appear next, shown in Figure 5-7. If your network has a DHCP server, click the radio button next to **Automatically obtain an IP address (DHCP)**. Click the **Next** button to continue or the **Back** button to return to the previous screen. Then proceed to step 8.

If your network does not have a DHCP server, click the radio button beside **Set IP configuration manually** to select this option. Enter an IP Address, IP Mask, and Gateway appropriate to your network. You must specify an IP address on this screen. If you are unsure about the IP Mask and Gateway, it is better to leave these two fields blank. Click the **Next** button to continue or the **Back** button to return to the previous screen. Then proceed to step 8.

- **IP Address** - This IP address must be unique to your network. Because this is a private IP address, there is no need to purchase a separate IP address from your Internet Service Provider (ISP).
- **IP Mask** - The Bridge's IP Mask (also known as Subnet Mask) must be the same as your Ethernet (wired) network.
- **Gateway** - Enter the IP address of your network's Gateway here.

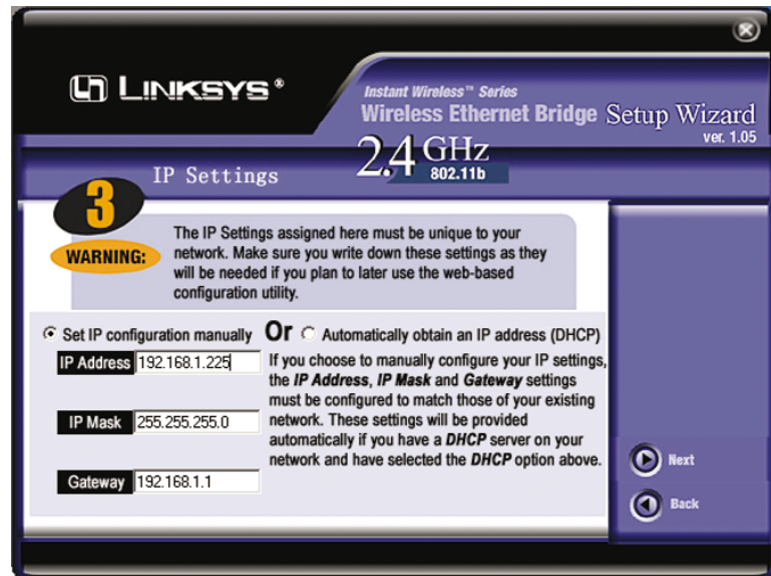


Figure 5-7

8. The *Security Settings* screen, shown in Figure 5-8, appears next. Set the Wired Equivalent Privacy (WEP) encryption for your wireless network by selecting a WEP configuration method.

- **WEP (Disabled/64-bit WEP/128-bit WEP)** - In order to utilize WEP encryption, select **64-bit** or **128-bit WEP** from the drop-down menu. If you do not want to use WEP encryption, keep the default setting, **Disabled**. The Bridge's WEP encryption is unique to Linksys and may conflict with other manufacturers' WEP encryption.

If you select 64-bit or 128-bit WEP, you can create a WEP key automatically or manually. Go to step 9a to generate a WEP key automatically. Go to step 9b to create a WEP key manually.



Figure 5-8

- 9a. Enter a passphrase.

- **Passphrase** - This is the code used when logging a wireless device onto the wireless network. The passphrase is case-sensitive and should not be longer than 16 alphanumeric characters. Based upon the passphrase created by you, WEP key settings are automatically generated. This passphrase is only compatible with other Linksys wireless products.

Click the **Next** button to continue or the **Back** button to return to the previous screen. Then on the *WEP Key Settings* screen, you will see the automatically generated WEP key. Click the **Next** button, and proceed to step 10.

- 9b. Leave the *Passphrase* field blank, and click the **Next** button to continue or the **Back** button to return to the previous screen.

If you selected 64-bit WEP, you will see Figure 5-9 (you will see a similar screen if you choose 128-bit WEP). Enter a WEP key. If you are using 64-bit WEP encryption, then the key must consist of exactly 10 hexadecimal characters in length. If you are using 128-bit WEP encryption, then the key must consist of exactly 26 hexadecimal characters in length. Valid hexadecimal characters are “0”-“9” and “A”-“F”. Then click the **Next** button, and proceed to step 10.

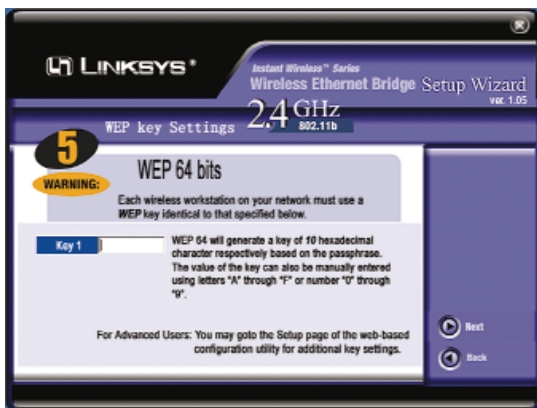


Figure 5-9

10. Review your settings. Write down the Bridge’s IP Address if you want to configure advanced settings through the Bridge’s Web-based Utility. Click the **Yes** button to save these settings. Click the **Back** button to make changes. Click the **Exit** button to exit the Setup Wizard.



Figure 5-10

11. The configuration using the Setup Wizard is complete. To configure any other Bridges on your network, run this Setup Wizard again. To exit the Setup Wizard, click the **Exit** button.



Figure 5-11



Important: To activate the new settings, reset the Bridge. Turn off the Bridge, and wait a few seconds. Then power on the Bridge.

The Wireless Ethernet Bridge is now successfully set up for your network.

After you have reset the Bridge, unplug the Ethernet network cable from the PC, and plug it into the RJ-45 port of the Ethernet-ready network device you wish to add to the wireless network.

For more advanced configuration, keep the Bridge plugged into the PC, and proceed to “Chapter 6: Using the Wireless Ethernet Bridge Web-based Utility.”

Chapter 6: Using the Wireless Ethernet Bridge Web-based Utility

Overview

The Bridge is designed to function properly after configuration using the Setup Wizard. However, if you would like to change these settings or make more advanced configuration changes, use your web browser and the Wireless Ethernet Bridge Web-based Utility. This chapter explains how to use the Utility.

Starting the Web-based Utility

1. Open your web browser, and enter the IP address of the Wireless Ethernet Bridge (the default is **192.168.1.225**). Press the **Enter** key, and the screen shown in Figure 6-1 will appear. In lowercase letters, enter **admin** in the *Password* field (the default password is **admin**). Click the **OK** button. You can set a new password on the *Password* screen later.



Figure 6-1

Wireless Ethernet Bridge

2. The *Setup* screen of the Bridge's Utility will appear.

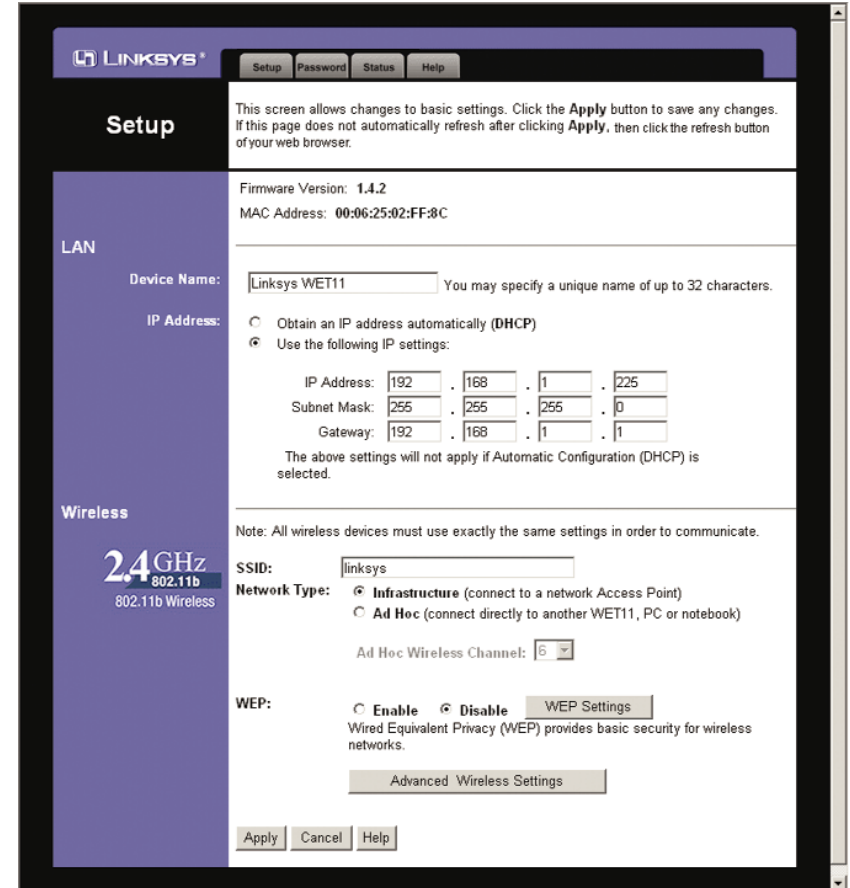


Figure 6-2

The Utility provides a convenient, web browser-based way to alter the Bridge's settings. It offers four main tabs:

- **Setup** - This screen enables you to configure the IP address and wireless settings.
- **Password** - Use this tab to change the password or reset all settings to factory defaults.
- **Status** - This screen displays the Bridge's current settings.
- **Help** - This screen provides explanations of various configuration settings and links to online technical support resources.

Setup

The *Setup* screen lets you configure the wired and wireless network settings for the Bridge.

The screenshot shows the Linksys Setup interface. At the top, there are tabs for Setup, Password, Status, and Help. The main content area is titled 'Setup' and contains the following information:

- LAN Section:**
 - Firmware Version: 1.4.2
 - MAC Address: 00:06:25:02:FF:8C
 - Device Name: Linksys WET11 (with a note: "You may specify a unique name of up to 32 characters.")
 - IP Address:
 - Radio buttons for "Obtain an IP address automatically (DHCP)" and "Use the following IP settings:" (selected).
 - IP Address fields: 192, 168, 1, 225
 - Subnet Mask fields: 255, 255, 255, 0
 - Gateway fields: 192, 168, 1, 1
 - Note: "The above settings will not apply if Automatic Configuration (DHCP) is selected."
- Wireless Section:**
 - Note: "All wireless devices must use exactly the same settings in order to communicate."
 - SSID: linksys
 - Network Type:
 - Radio buttons for "Infrastructure (connect to a network Access Point)" (selected) and "Ad Hoc (connect directly to another WET11, PC or notebook)".
 - Ad Hoc Wireless Channel: 6 (dropdown menu)
 - WEP:
 - Radio buttons for "Enable" and "Disable" (selected).
 - WEP Settings button.
 - Note: "Wired Equivalent Privacy (WEP) provides basic security for wireless networks."
 - Advanced Wireless Settings button.

At the bottom of the screen are buttons for Apply, Cancel, and Help.

Figure 6-3



Note: You may have to refresh this page to see any new settings.

- **Firmware Version** - The version number of the Bridge's firmware is displayed here. Firmware should be upgraded from the *Help* screen **ONLY** if you experience problems with the Bridge.

Wireless Ethernet Bridge

- **MAC Address** - The MAC Address of the Bridge is displayed here.

LAN

- **Device Name** - You may assign any name to the Bridge. Unique, memorable names are helpful, especially if you are using multiple bridges on the same wireless network.
- **IP Address** - If the Bridge will obtain an IP address automatically from a DHCP server, such as a router, then select **Obtain an IP address automatically (DHCP)**. If you are assigning the Bridge a static IP address, then select **Use the following IP settings**, and enter an IP Address, Subnet Mask, and Gateway address in the *IP Address*, *Subnet Mask*, and *Gateway* fields.

Wireless

- **SSID** - The SSID is the network name shared among 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 alphanumeric characters, which may be any keyboard character (do not use any spaces). Make sure this setting is the same for all devices in your wireless network. For added security, Linksys recommends that you change the default SSID (**linksys**) to a name of your choice.
- **Network Type** - Choose a wireless operating mode for the Bridge. Click the **Infrastructure** radio button if you want your wireless-equipped device to communicate with computers and other devices on your wired network using a wireless access point. Click the **Ad Hoc** radio button if you want multiple wireless-equipped devices to communicate directly with each other.

If you chose Ad Hoc mode, then select the correct operating channel for your network using the *Ad Hoc Wireless Channel* drop-down menu. The channel you choose should match the channel set on the other devices in your wireless network.

- **WEP** - To enable WEP encryption, click the **Enable** radio button. To increase wireless network security, using WEP encryption is strongly recommended. Then click the **WEP Settings** button to configure the WEP settings. To disable WEP encryption, keep the default setting, **Disable**.

An acronym for Wired Equivalent Privacy, WEP is an encryption method used to protect your wireless data communications. WEP uses 64-bit or 128-bit keys to provide access control to your network and encryption security for every data transmission. To decode a data transmission, each device in a network must use an identical WEP key. Higher encryption levels offer higher levels of security, but due to the complexity of the encryption, they may decrease network performance.

- **Advanced Wireless Settings** - To configure advanced wireless settings, such as Transmit Rate, AP Density, and Encryption Filter, click the **Advanced Wireless Settings** button.

Click the **Apply** button to save your changes. If your page doesn't automatically refresh itself, then click the **Refresh** button of your web browser. Click the **Cancel** button to cancel your changes. Click the **Help** button for additional on-screen information.

WEP Settings

Use the *WEP Settings* screen to configure the Passphrase or WEP key settings for your device, as well as the Authentication Type.

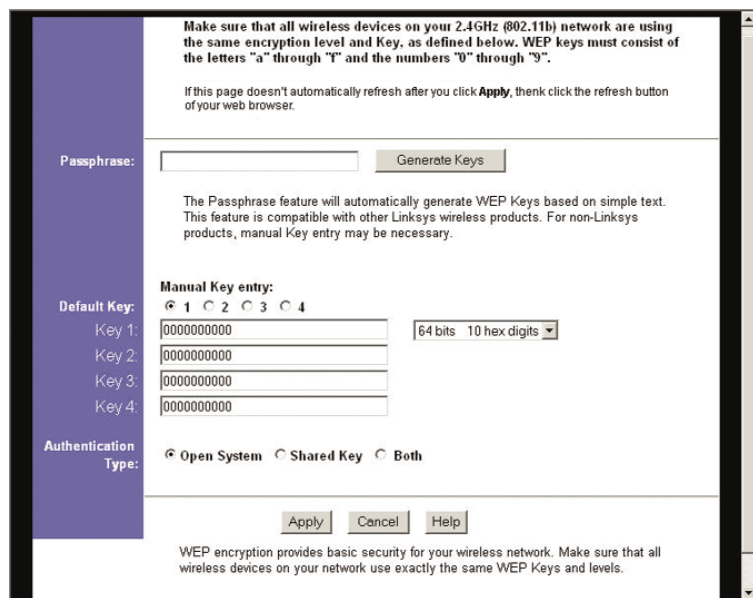


Figure 6-4



Note: You may have to refresh this page to see any new settings.

- **Passphrase** - Instead of manually entering WEP keys, you can enter a Passphrase. This Passphrase is used to generate one or more WEP keys. It is case-sensitive and should not be longer than 16 alphanumeric characters. (The Passphrase function is compatible with Linksys wireless products only. If you want to communicate with non-Linksys wireless products, you will need to enter your WEP key(s) manually on the non-Linksys wireless products.) After you enter the Passphrase, click the **Generate Keys** button to create WEP key(s).
- **Default Key** - Select which WEP key (1-4) will be used when the Bridge sends data. Make sure the other wireless-equipped devices are using the same key.
- **Keys 1-4** - If you are not using a Passphrase, then you can enter one or more WEP keys manually.

Next to the *Key 1* field, select the type of WEP encryption you wish to use from the drop-down menu. If you want to use 64-bit WEP encryption, then select **64 bits 10 hex digits**. If you want to use 128-bit WEP encryption, then select **128 bits 26 hex digits**.

In each key field, manually enter a set of values. (Do not leave a key field blank, and do not enter all zeroes. These are not valid key values.) If you are using 64-bit WEP encryption, then each key must consist of exactly 10 hexadecimal characters in length. If you are using 128-bit WEP encryption, then each key must consist of exactly 26 hexadecimal characters in length. Valid hexadecimal characters are “0”-“9” and “A”-“F”.

- **Authentication Type** - To use Open System authentication, keep the default setting, **Open System**. To use Shared Key authentication, select the **Shared Key radio** button. If you want the Bridge to use both authentication types, select the **Both** radio button. For Open System authentication, the sender and the recipient do NOT use a WEP key for authentication. For Shared Key authentication, the sender and recipient use a WEP key for authentication.

Click the **Apply** button to save your changes. If your page doesn't automatically refresh itself, then click the **Refresh** button of your web browser. Click the **Cancel** button to cancel your changes. Click the **Help** button for additional on-screen information.

Advanced Wireless Settings

Use the *Advanced Wireless Settings* screen to configure the Transmit Rate, AP Density, and Encryption Filter settings.

Use this page to configure the advanced settings for your 2.4Ghz (802.11b) wireless network. Click the **Apply** button at the bottom of the page to save your changes. These settings should only be modified by those with superior knowledge of wireless networking.

2.4GHz
802.11b Wireless

Regulatory Domain: **FCC - United States**

Transmit Rate: **Automatic** Mbps

AP Density: **High** This setting applies to Infrastructure mode only.

Encryption Filter: **Enabled** **Disabled**

When enabled, this device will discard any unencrypted data. If you enable this feature, you must also configure and enable WEP encryption. All wireless devices on your network must use exactly the same WEP encryption settings.

Note: If this page doesn't automatically refresh after you click **Apply**, then click the refresh button of your web browser.

Apply **Cancel** **Help**

Figure 6-5



Note: You may have to refresh this page to see any new settings.

- **Regulatory Domain** - The Bridge's Regulatory Domain is displayed here.
- **Transmit Rate** - The rate of data transmission should be set depending on the speed of your wireless network. You can select a specific transmission speed (1, 2, 1 or 2, 5.5, or 11Mbps), or keep the default setting, **Automatic**, to have the Bridge automatically adjust the transfer speed for optimal performance and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Bridge and another wireless-equipped device.

- **AP Density** - This enables you to specify how many access points are near the Bridge. Use this feature to reduce channel overlap and interference. (This setting is available only for a Bridge set to infrastructure mode.)

Low: 1-2 nearby access points

Medium: 3-4 nearby access points

High: 5 or more nearby access points

- **Encryption Filter** - If you want the Bridge to ignore unencrypted data transmissions, click the **Enabled** radio button. If you want the Bridge to accept unencrypted data transmissions, keep the default setting, **Disabled**.



Note: If you enable the Encryption Filter, you must also configure and enable WEP encryption.

Click the **Apply** button to save your changes. If your page doesn't automatically refresh itself, then click the **Refresh** button of your web browser. Click the **Cancel** button to cancel your changes. Click the **Help** button for additional on-screen information.

Password

The *Password* screen lets you change the Bridge's Password and restore the factory default settings.

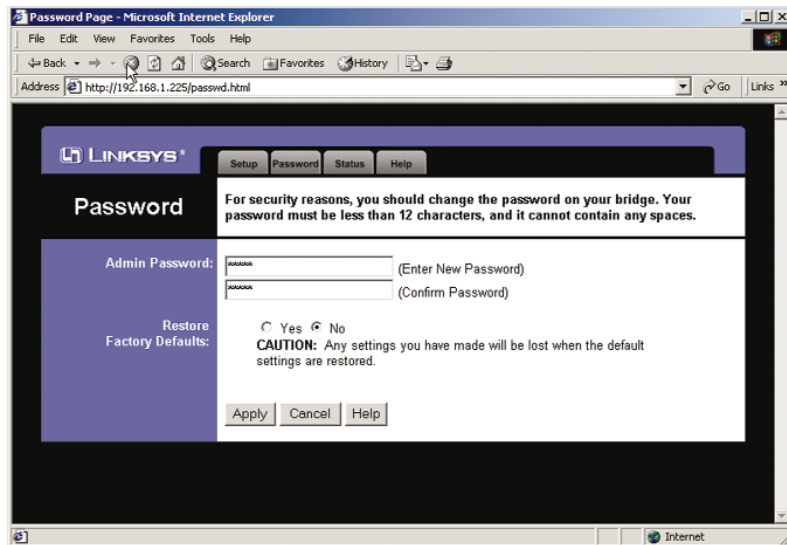


Figure 6-6

- **Admin Password** - It is strongly recommended that you change the factory default password of the Bridge, which is **admin**. All users who try to access the Bridge's Web-based Utility will be prompted for the Bridge's Password. The new Password must not exceed 12 characters in length and must not include any spaces. Enter the new Password a second time to confirm it.
- **Restore Factory Defaults** - Click the Yes radio button to reset all configuration settings to their default values. If you do not want to restore the factory defaults, then keep the default setting, No.



Note: Any settings you have saved will be lost when the default settings are restored.

To save your changes, click the **Apply** button. Click the **Cancel** button to cancel your changes. Click the **Help** button for additional on-screen information.

Status

The *Status* screen displays the Bridge's current status and settings. All information is read-only.

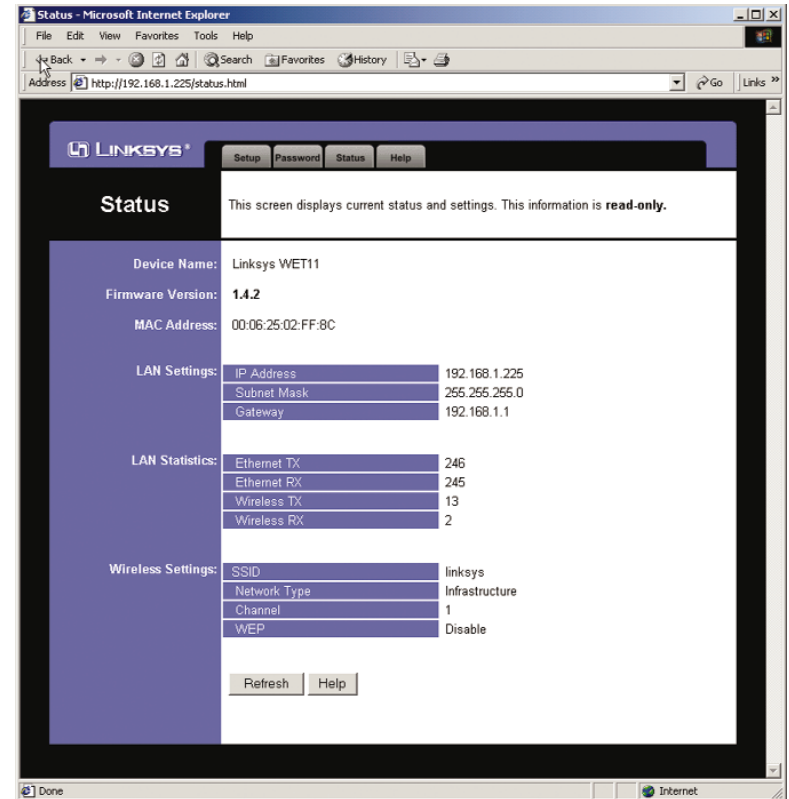


Figure 6-7

- **Device Name** - The name you have assigned to the Bridge is displayed here.
- **Firmware Version** - The version number of the Bridge's firmware is displayed here. Firmware should only be upgraded from the Help screen if you experience problems with the Bridge.
- **MAC Address** - The MAC Address of the Bridge is displayed here.

LAN Settings

- **IP Address** - The Bridge's IP Address is displayed here.
- **Subnet Mask** - The Bridge's Subnet Mask is displayed here.
- **Gateway** - The Gateway address for the Bridge is displayed here.

LAN Statistics

- **Ethernet TX** - The number of packets transmitted to the Ethernet network is displayed here.
- **Ethernet RX** - The number of packets received from the Ethernet network is displayed here.
- **Wireless TX** - The number of packets transmitted to the wireless network is displayed here.
- **Wireless RX** - The number of packets received from the wireless network is displayed here.

Wireless Settings

- **SSID** - The Bridge's SSID is displayed here.
- **Network Type** - The Bridge's mode is displayed here.
- **Channel** - The Bridge's channel setting is displayed here.
- **WEP** - The status of the Bridge's WEP encryption is displayed here.

Click the **Refresh** button to obtain the most up-to-date settings and statistics. Click the **Help** button for additional on-screen information.

Help

The *Help* screen offers links to all of the help information for the Web-based Utility's screens and the Bridge's online technical support resources. All information is read-only.

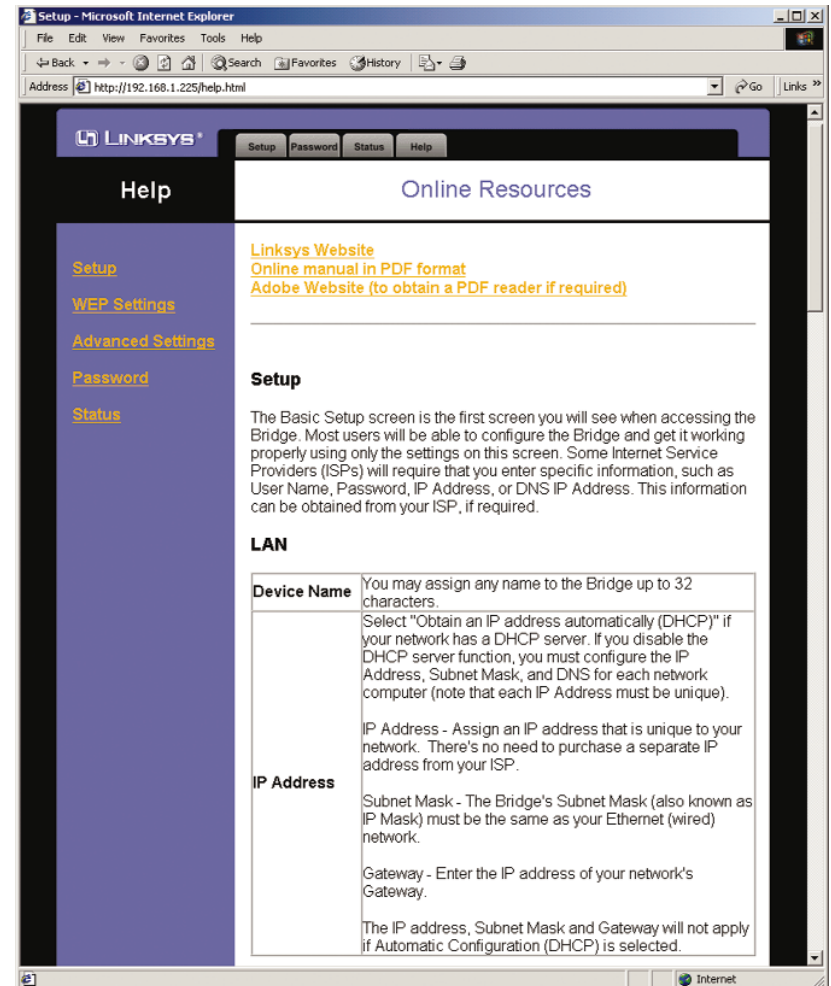


Figure 6-8

- **Linksys Website** - Click the **Linksys Website** link to visit Linksys's website, www.linksys.com (available if you have an active Internet connection).

- **Online Manual in PDF Format** - Click the **Online manual in PDF format** to view this User Guide on-screen. It is in Adobe Acrobat Portable Document File (.pdf) format, so you will need the free Adobe Acrobat Reader to view the pdf. If you do not have the Reader, click the Adobe Website link to download it.
- **Adobe Website (to obtain a PDF reader if required)** - If you need to download the Adobe Acrobat Reader to view the User Guide pdf, then click the **Adobe Website** link.

Appendix A: Troubleshooting

Common Problems and Solutions

This section provides solutions to potential problems regarding the installation and operation of the Wireless Ethernet Bridge. If you can't find an answer here, check the Linksys website at www.linksys.com.

1. I can't connect to the access point.
Open the Web-based Utility. On the **Setup** tab, perform the following steps:
 - Verify that the operating mode is set to Infrastructure mode.
 - Make sure that the SSID is the same as the SSID of the access point.
 - On the *WEP Settings* screen, make sure that all of the WEP settings are the same as the WEP settings of the access point.
2. I don't know how to change the Bridge's IP address.
You have two ways to change the Bridge's IP address.
 - Open the Web-based Utility. On the *Setup* screen, click the **Use the following IP settings** radio button, and change the IP address there.
 - If you encounter problems, power the Bridge off and on again, or push the Reset button. Then try to change the IP address again.
3. The Bridge-enabled PC won't communicate with a wireless-enabled PC or printer.
Perform the following steps:
 - Check that the wireless-enabled PC or printer is on the same wireless network as the PC using the Bridge.
 - Make sure that the SSID and operating mode are the same for all devices connected to the same wireless network.
 - If the wireless LAN settings are okay, make sure that all the devices are on the same IP network.
4. The Web-based Utility doesn't detect the Bridge.
Make sure that the Ethernet cable is properly connected and that the LAN LED is lit. If the LED is not lit, change the position of the X-II selection switch on the Bridge's rear panel. Use the X setting if you are connecting the Bridge to a network card or other Ethernet device. Use the II setting if you are connecting the Bridge to a hub or switch.

5. The Web-based Utility won't open.
Make sure that you have a LAN card (also known as a network adapter) installed on the PC so you can use the Web-based Utility.
6. The Web-based Utility does not recognize my password.
The password is case-sensitive. Make sure you are using the correct case(s) when entering the password.

If you forget your password, you can push the Bridge's Reset button. This will reset the password to the default setting; however, all other Bridge settings will be reset to the factory defaults as well. To use the default settings, leave the *User Name* field blank, and enter **admin** in the *Password* field.
7. After I make changes through the Web-based Utility, the new settings aren't displayed on-screen.
Click the **Refresh** button of your web browser. If the new settings aren't displayed, then unplug the power adapter from the Bridge. Plug the power adapter back in, and then click the **Refresh** button again.

Frequently Asked Questions

What is the IEEE 802.11b standard?

It is one of the IEEE standards for wireless networks. The 802.11b standard allows wireless networking hardware from different manufacturers to communicate, provided that the hardware complies with the 802.11b standard. The 802.11b standard states a maximum data transfer rate of 11Mbps and an operating frequency of 2.4GHz.

What IEEE 802.11b features are supported?

The product supports the following IEEE 802.11 functions:

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

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 user guide to determine if it supports operation over a network.

Can I play multiplayer games with other users of the wireless network?

Yes, as long as the game supports multiple players over a LAN. Refer to the game's user guide for more information.

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 wireless network access point. Before using the roaming function, the workstation must make sure that it is the same channel number as the wireless network access point of the dedicated coverage area.

To achieve true seamless connectivity, the wireless LAN must incorporate a number of different functions. Each node and wireless network access point, for example, must always acknowledge receipt of each message. Each node must maintain contact with the wireless network even when not actually transmitting data. Achieving these functions simultaneously requires a dynamic RF networking technology that links wireless network 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 wireless network access point and the distance of each wireless network access point to the wired backbone. Based on that information, the node next selects the right wireless network 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 wireless network access point or whether it should seek a new one. When a node no longer receives acknowledgment from its original wireless network access point, it undertakes a new search. Upon finding a new wireless network 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.

Would the information be intercepted while transmitting on air?

Instant Wireless products feature two-fold protection in security. On the hardware side, as with Direct Sequence Spread Spectrum technology, it has the inherent security feature of scrambling. On the software side, Instant Wireless products offer the encryption function (WEP) to enhance security and access control. Users can set it up depending upon their needs.

What is WEP?

WEP is Wired Equivalent Privacy, a data privacy mechanism based on a 40/64 bit shared key algorithm, as described in the IEEE 802.11 standard.

Can Instant Wireless products support file and printer sharing?

Instant Wireless products perform the same function as LAN products. Therefore, Instant Wireless products can work with NetWare, Windows NT/2000, or other LAN operating systems to support printer or file sharing.

Appendix B: Glossary

802.11b - One of the IEEE standards for wireless networking hardware. Products that adhere to a specific IEEE standard will work with each other, even if they are manufactured by different companies. The 802.11b standard specifies a maximum data transfer rate of 11Mbps, an operating frequency of 2.4GHz, and WEP encryption for security. 802.11b networks are also referred to as Wi-Fi networks.

Ad-hoc Network - An ad-hoc network is a group of computers, each with a wireless adapter, connected as an independent 802.11 wireless LAN. Ad-hoc wireless computers operate on a peer-to-peer basis, communicating directly with each other without the use of an access point. Ad-hoc mode is also referred to as an Independent Basic Service Set (IBSS) or as peer-to-peer mode, and is useful at a departmental scale or SOHO operation.

Default Gateway - The router used to forward all traffic that is not addressed to a station within the local subnet.

DHCP (Dynamic Host Configuration Protocol) - A protocol that lets network administrators centrally manage and automate the assignment of Internet Protocol (IP) addresses in an organization's network. Using the Internet's set of protocol (TCP/IP), each machine that can connect to the Internet needs a unique IP address. When an organization sets up its computer users with a connection to the Internet, an IP address must be assigned to each machine. Without DHCP, the IP address must be entered manually at each computer and, if computers move to another location in another part of the network, a new IP address must be entered. DHCP lets a network administrator supervise and distribute IP addresses from a central point and automatically sends a new IP address when a computer is plugged into a different place in the network.

DHCP uses the concept of a “lease” or amount of time that a given IP address will be valid for a computer. The lease time can vary depending on how long a user is likely to require the Internet connection at a particular location. It's especially useful in education and other environments where users change frequently. Using very short leases, DHCP can dynamically reconfigure networks in which there are more computers than there are available IP addresses.

DHCP supports static addresses for computers containing Web servers that need a permanent IP address.

DNS - The Domain Name System (DNS) is the way that Internet domain names are located and translated into Internet Protocol (IP) addresses. A domain name is a meaningful and easy-to-remember “handle” for an Internet address.

DSSS (Direct-Sequence Spread Spectrum) - DSSS generates a redundant bit pattern for all transmitted data. This bit pattern is called a chip (or chipping code). Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the receiver 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. However, to an intended receiver (i.e. another wireless LAN endpoint), the DSSS signal is recognized as the only valid signal, and interference is inherently rejected (ignored).

Dynamic IP Address - An IP address that is automatically assigned to a client station in a TCP/IP network, typically by a DHCP server. Network devices that serve multiple users, such as servers and printers, are usually assigned static IP addresses.

ESS (Extended Service Set) - A set of more than two or more BSSs (multiple access points) forming a single network.

FHSS (Frequency Hopping Spread Spectrum) - FHSS continuously changes (hops) the carrier frequency of a conventional carrier several times per second according to a pseudo-random set of channels. Because a fixed frequency is not used, and only the transmitter and receiver know the hop patterns, interception of FHSS is extremely difficult.

Firmware - Code that is written onto read-only memory (ROM) or programmable read-only memory (PROM). Once firmware has been written onto the ROM or PROM, it is retained even when the device is turned off.

IEEE - The Institute of Electrical and Electronics Engineers. The IEEE describes itself as “the world's largest technical professional society—promoting the development and application of electrotechnology and allied sciences for the benefit of humanity, the advancement of the profession, and the well-being of our members.”

The IEEE fosters the development of standards that often become national and international standards. The organization publishes a number of journals, has many local chapters, and has several large societies in special areas, such as the IEEE Computer Society.

IEEE 802.11b - One of the IEEE standards for wireless networks. The 802.11b standard allows wireless networking hardware from different manufacturers to communicate, provided that the hardware complies with the 802.11b standard. The 802.11b standard states a maximum data transfer rate of 11Mbps and an operating frequency of 2.4GHz.

Infrastructure Network - An infrastructure network is a group of computers or other devices, each with a wireless adapter, connected as an 802.11 wireless LAN. In infrastructure mode, the wireless devices communicate with each other and to a wired network by first going through an access point. An infrastructure wireless network connected to a wired network is referred to as a Basic Service Set (BSS). A set of two or more BSS in a single network is referred to as an Extended Service Set (ESS). Infrastructure mode is useful at a corporation scale, or when it is necessary to connect the wired and wireless networks.

IP Address - In the most widely installed level of the Internet Protocol (IP) today, an IP address is a 32-bit binary number that identifies each sender or receiver of information that is sent in packets across the Internet. When you request an HTML page or send e-mail, the Internet Protocol part of TCP/IP includes your IP address in the message (actually, in each of the packets if more than one is required) and sends it to the IP address that is obtained by looking up the domain name in the Uniform Resource Locator you requested or in the e-mail address you're sending a note to. At the other end, the recipient can see the IP address of the Web page requester or the e-mail sender and can respond by sending another message using the IP address it received.

IPCONFIG - A utility that provides for querying, defining and managing IP addresses within a network. A commonly used utility, under Windows NT and 2000, for configuring networks with static IP addresses.

ISP - An ISP (Internet service provider) is a company that provides individuals and companies access to the Internet and other related services such as website building and virtual hosting.

LAN - A local area network (LAN) is a group of computers and associated devices that share a common communications line and typically share the resources of a single processor or server within a small geographic area (for example, within an office building).

MAC Address - The MAC (Media Access Control) 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.

mIRC - mIRC runs under Windows and provides a graphical interface for logging onto IRC servers and listing, joining, and leaving channels.

Network Mask - Also known as the "Subnet Mask."

PCMCIA - The PCMCIA (Personal Computer Memory Card International Association) is an industry group organized in 1989 to promote standards for a credit card-size memory or I/O device that would fit into a personal computer, usually a notebook or laptop computer.

Ping (Packet INternet Groper) - An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.

RJ-45 - A connector similar to a telephone connector that holds up to eight wires, used for connecting Ethernet devices.

Roaming - In an infrastructure mode wireless network, this refers to the ability to move out of one access point's range and into another and transparently reassociate and reauthenticate to the new access point. This reassociation and reauthentication should occur without user intervention and ideally without interruption to network connectivity. A typical scenario would be a location with multiple access points, where users can physically relocate from one area to another and easily maintain connectivity.

SOHO (Small Office/Home Office) - Refers to any small office or home office environment.

Static IP Address - A permanent IP address that is assigned to a node in a TCP/IP network.

Subnet Mask - The method used for splitting IP networks into a series of subgroups, or subnets. The mask is a binary pattern that is matched up with the IP address to turn part of the host ID address field into a field for subnets.

TCP (Transmission Control Protocol) - A method (protocol) used along with the IP (Internet Protocol) to send data in the form of message units (datagram) between network devices over a LAN or WAN. While IP takes care of handling the actual delivery of the data (routing), TCP takes care of keeping track of the individual units of data (called packets) that a message is divided into for efficient delivery over the network. TCP is known as a "connection oriented" protocol due to requiring the receiver of a packet to return an acknowledgment of receipt to the sender of the packet resulting in transmission control.

TCP/IP (Transmission Control Protocol/Internet Protocol) - The basic communication language or set of protocols for communications over a network (developed specifically for the Internet). TCP/IP defines a suite or group of protocols and not only TCP and IP.

UDP (User Datagram Protocol) - A method (protocol) used along with the IP (Internet Protocol) to send data in the form of message units (datagram) between network devices over a LAN or WAN. While IP takes care of handling the actual delivery of the data (routing), UDP takes care of keeping track of the individual units of data (called packets) that a message is divided into for efficient delivery over the network. UDP is known as a "connection-less" protocol due to NOT requiring the receiver of a packet to return an acknowledgment of receipt to the sender of the packet (as opposed to TCP).

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

WINIPCFG - Configuration utility based on the Win32 API for querying, defining, and managing IP addresses within a network. A commonly used utility, under Windows 95, 98, and Millennium, for configuring networks with static IP addresses.

WLAN - A group of computers and associated devices that communicate with each other wirelessly. If set to infrastructure mode, the WLAN can communicate with a wired network through a wireless network access point.

Appendix C: Specifications

Standard	IEEE 802.11b, IEEE 802.3
Channels	11 Channels (US, Canada) 13 Channels (Europe)
Ports	One RJ-45 (10BaseT) One Reverse SMA Antenna
Transmit	19 dBm
Receive Sensitivity	-83 dBm (typical)
Modulation	DSS, BPSK, QPSK, CCK
LEDs	Power, LAN, WLAN, Diag
Network Protocol	TCP/IP

Environmental

Dimensions	4.94" x 3.70" x 1.22" (125.5 mm x 94 mm x 31 mm)
Unit Weight	7.1 oz. (0.2 kg)
Power	5V DC
Certifications	FCC Class B, CE Mark
Operating Temp.	32°F to 122°F (0°C to 50°C)
Storage Temp.	-13°F to 158°F (-25°C to 70°C)
Operating Humidity	10% to 90%, Non-Condensing
Storage Humidity	10% to 90%, Non-Condensing

Appendix D: Warranty Information

BE SURE TO HAVE YOUR PROOF OF PURCHASE AND A BARCODE FROM THE PRODUCT'S PACKAGING ON HAND WHEN CALLING. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE.

IN NO EVENT SHALL LINKSYS'S LIABILITY EXCEED THE PRICE PAID FOR THE PRODUCT FROM DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT, ITS ACCOMPANYING SOFTWARE, OR ITS DOCUMENTATION. LINKSYS DOES NOT OFFER REFUNDS FOR ANY PRODUCT.

LINKSYS OFFERS CROSS SHIPMENTS, A FASTER PROCESS FOR PROCESSING AND RECEIVING YOUR REPLACEMENT. LINKSYS PAYS FOR UPS GROUND ONLY. ALL CUSTOMERS LOCATED OUTSIDE OF THE UNITED STATES OF AMERICA AND CANADA SHALL BE HELD RESPONSIBLE FOR SHIPPING AND HANDLING CHARGES. PLEASE CALL LINKSYS FOR MORE DETAILS.

Appendix E: Contact Information

For help with the installation or operation of this product, contact Linksys Technical Support at one of the phone numbers or Internet addresses below.

Sales Information	800-546-5797 (LINKSYS)
Technical Support	800-326-7114
RMA Issues	949-271-5461
Fax	949-265-6655
E-mail	support@linksys.com
Web	http://www.linksys.com
FTP Site	ftp.linksys.com



<http://www.linksys.com>

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