Instant Wireless® Series

Dual-Band Wireless A + G Access Point

Use this guide to install: WAP55AG

User Guide

LINKSYS®

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SAFETY AND REGULATORY NOTICES

FCC STATEMENT

The Instant Wireless Dual-Band Wireless A + G Access Point has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

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 Caution: Any change or modification to the product not expressly approved by Linksys could void the user's authority to operate the device.

FCC Caution: Operation within the 5150 to 5250GHz band is restricted to indoor use only.

FCC RF Radiation Exposure Statement

To comply with the FCC and ANSI C95.1 RF exposure limits, the antenna(s) for this device must comply with the following:

- Access points with 2.4 GHz or 5 GHz integrated antenna must operate with a separation distance of at least 20 cm from all persons using the cable provided and must not be co-located or operating in conjunction with any other antenna or transmitter.

End-users must be provided with specific operations for satisfying RF exposure compliance.

Note: Dual antennas used for diversity operation are not considered co-located.

Canadian Department of Communications Industry Canada (IC) Notice

This Class B digital apparatus complies with Canadian ICES-003 and RSS-210.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 et CNR-210 du Canada.

"To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing."

" Pour empêcher que cet appareil cause du brouillage au service faisant l'objet d'une licence, il doit être utilisé à l'intérieur et devrait être placé loin des fenêtres afin de fournir un écran de blindage maximal. Si le matériel (ou son antenne d'émission) est installé à l'extérieur, il doit faire l'objet d'une licence. "

EC DECLARATION OF CONFORMITY (EUROPE)

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 European R&TTE directive 1999/5/EC, EMC directive 89/336/EEC, and Low Voltage directive 73/23/EEC:

For 11Mbps, 2.4 GHz access points with 100 mW radios, the following standards were applied:

- 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.

For 54 Mbps, 5 GHz access points with 40 mW radios, the following standards were applied:

- ETS 301 489-1, 301 489-17 General EMC requirements for Radio equipment.
- EN 609 50 Safety
- ETS 301-893 Technical requirements for Radio equipment.

Caution: The frequencies used by 802.11a wireless LAN devices are not yet harmonized within the European community, 802.11a products are designed for use only in specific countries, and are not allowed to be operated in countries other than those of designated use. Contact local Authority for procedure to follow.

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

Note: Combinations of power levels and antennas resulting in a radiated power level of above 100 mW equivalent isotropic radiated power (EIRP) are considered as not compliant with the above mentioned directive and are not allowed for use within the European community and countries that have adopted the European R&TTE directive 1999/5/EC 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 Dual-Band Wireless A + G Access Point 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.
- Linksys Group déclare que la Instant Wireless Dual-Band Wireless A + G Access Point est conforme aux conditions essentielles et aux dispositions relatives à la directive 1999/5/EC, la directive 89/336/EEC, et à la directive 73/23/EEC.
- Belgique B L'utilisation en extérieur est autorisé sur le canal 11 (2462 MHz), 12 (2467 MHz), et 13 (2472 MHz). Dans le cas d'une utilisation privée, à l'extérieur d'un bâtiment, au-dessus d'un espace public, aucun enregistrement n'est nécessaire pour une distance de moins de 300m. Pour une distance supérieure à 300m un enregistrement auprès de l'IBPT est requise. Pour une utilisation publique à l'extérieur de bâtiments, une licence de l'IBPT est requise. Pour les enregistrements et licences, veuillez contacter l'IBPT.
- France F:
  2.4 GHz Bande : les canaux 10, 11, 12, 13 (2457, 2462, 2467, et 2472 MHz respectivement) sont complétement libres d'utilisation en France (en utilisation intérieur). Pour ce qui est des autres canaux, ils peuvent être soumis à autorisation selon le départment. L'utilisation en extérieur est soumis à autorisation préalable et très restreint.
  5 GHz Bande: Conformément aux décisions de la CEPT, l'utilisation des fréquences de la bande 5150 MHz - 5350 MHz est autorisée à l'intérieur des bâtiments avec une puissance maximale de 200 mW, et interdite en extérieur. La bande 5470 MHz - 5725 MHz n'est pas ouverte aujourd'hui.
  Vous pouvez contacter l'Autorité de Régulation des Télécommunications (http://www.art-telecom.fr) pour de plus amples renseignements.
  2.4 GHz Band: only channels 10, 11, 12, 13 (2457, 2462, 2467, and 2472 MHz respectively) may be used freely in France for indoor use. License required for outdoor installations.
  5 GHz Band: frequencies in the 5150 MHz - 5350 MHz band may be used indoor with maximum power of 200 mW. Their use is forbidden outdoors. The 5470 MHz - 5725 MHz band is not currently open.
  Please contact ART (http://www.art-telecom.fr) for procedure to follow.
- Deutschland D: Anmeldung im Outdoor-Bereich notwending, aber nicht genehmigungspflichtig. Bitte mit Händler die Vorgehensweise abstimmen.
- Germany D: License required for outdoor installations. Check with reseller for procedure to follow.
- Italia I: E' necessaria la concessione ministeriale anche per l'uso interno. Verificare con i rivenditori la procedura da seguire. L'uso per installazione in esterni non e' permessa.
- Italy I: License required for indoor use. Use with outdoor installations not allowed.
- The Netherlands NL License required for outdoor installations. Check with reseller for procedure to follow.
- Nederlands NL Licentie verplicht voor gebruik met buitenantennes. Neem contact op met verkoper voor juiste procedure.

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Chapter 1: Introduction

The Instant Wireless Dual-Band Wireless A + G Access Point

The Linksys Dual-Band Wireless A+G Access Point gives you universal wireless connectivity. It's the best way to add wireless capability to your existing wired network, or to add bandwidth to your wireless installation.

The Dual-Band Wireless A+G Access Point actually contains two separate wireless connectivity radio transceivers, which support all three popular wireless networking specifications. The first transceiver uses the 2.4GHz radio band, supporting both the widely-used and inexpensive Wireless-B (802.11b) standard at 11Mbps, and the new, almost five times faster, Wireless-G (draft 802.11g) at 54Mbps. The second radio operates in the 5GHz band, and supports Wireless-A (802.11a) networking, also at 54Mbps. Since the two radios operate in different bands, they can work simultaneously, blanketing your wireless zone with high-speed bandwidth.

To protect your data and privacy, the A+G Access Point can encrypt all wireless transmissions. The MAC Address filter lets you decide exactly who has access to your wireless network while Dynamic Frequency Selection (DFS) puts your network on the cleanest channel in your location. Configuration is a snap with the web browser-based configuration utility.

With the Linksys Dual-Band Wireless A+G Access Point, you'll have the best of all worlds -- Wireless-B for legacy compatibility, and both Wireless-G and Wireless-A for high-speed access.

Features

- Dual-band, tri-standard Access Point communicates with Wireless-A (802.11a), Wireless-B (802.11b), and Wireless-G (draft 802.11g) wireless networks
- Protect your wireless investment while preparing your infrastructure for the future
- Advanced features: SNMP manageability, and Dynamic Frequency Selection (DFS)
- Powerful security: Up to 152-bit wireless data encryption (WEP), and wireless MAC address filter
- Performance Investment Protection: Compatibility with Wireless-A (802.11a), Wireless-B (802.11b) and Wireless-G (draft 802.11g) Standards
- Ideal Wireless Solution for Enterprise customers
- MAC Address Filtering and up to 152-bit WEP Encryption
- Built in Web UI for easy configuration from any Web Browser
- Firmware upgradeable through Web-browser
- Quick Setup and Easy for Deployment
- Free Technical Support - 24 Hours a Day, 7 Days a Week, Toll-Free U.S. Calls
- 1-Year Limited Warranty

Chapter 2: Planning Your Wireless Network

Network Topology

A wireless LAN is a group of computers, each equipped with one Instant Wireless Series adapter. Computers in a wireless LAN must be configured to share the same radio channel.

The Instant Wireless Series adapters provide access to a wired LAN for wireless workstations. An integrated wireless and wired LAN is called an infrastructure configuration. A group of Instant Wireless Series adapter users and an Access Point compose a Basic Service Set (BSS). Each Instant Wireless Series adapter PC in a BSS can talk to any computer in a wired LAN infrastructure via the Access Point.

An infrastructure configuration extends the accessibility of an Instant Wireless Series adapter PC to a wired LAN, and doubles the effective wireless transmission range for two Instant Wireless Series adapter PCs. Since the Access Point is able to forward data within its BSS, the effective transmission range in an infrastructure LAN is doubled.

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 PCs equipped with an Instant Wireless Series adapter within one ESS must be configured with the same ESS ID and use the same radio channel.

Before enabling an ESS with roaming capability, choosing 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.

Chapter 3: Getting to Know the Dual-Band Wireless A + G Access Point

The Access Point's Back Panel

The Access Point's ports, where a network cable is connected, are located on the Access Point's back panel, shown in Figure 3-1.

Figure 3-1

LAN This **LAN** (Local Area Network) port connects to Ethernet network devices, such as a hub, switch, or router.

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

Reset Button There are two ways to Reset the Access Point's factory defaults. Either press the Reset Button, for approximately ten seconds, or restore the defaults from the password tab in the Access Point's Web-Based Utility.

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

The Access Point's Front Panel

The LEDs on the Access Point's front panel, shown in Figure 3-2, display network activity.

Figure 3-2

Power *Green*. The **Power** LED lights up when the Access Point is powered on.

Diag *Red*. The **Diag** LED indicates the Access Point's self-diagnosis mode during boot-up and restart. It will turn off upon completing the diagnosis. If this LED stays on for an abnormally long period of time, refer to the Troubleshooting Appendix.

WLAN Act *Green*. If the WLAN's **Act** LED is flickering, the Access Point is actively sending or receiving data to or from one of the devices on the network.

WLAN Link *Green*. The WLAN's **Link** LED lights whenever there is a successful wireless connection.

LAN Act/Link *Green*. The LAN's **LINK** LED serves two purposes. If the LED is continuously lit, the Access Point is successfully connected to a device through the LAN port. If the LED is flickering, it is an indication of any network activity.

LAN Full/Col *Green*. The LAN's **Full/Col** LED also serves two purposes. When this LED is continuously lit, the connection made through the corresponding port is running in Full Duplex mode. A flickering LED indicates that the connection is experiencing collisions. Infrequent collisions are normal. If this LED blinks too often, there may be a problem with your connection. Refer to the Troubleshooting Appendix if you think there is a problem.

LAN 100 *Orange*. The LAN's **100** LED indicates when a successful 100Mbps connection is made through the LAN port.

Chapter 4: Connecting the Dual-Band Wireless A + G Access Point

1. **Locate an optimum location for the Access Point.** The best place for the Access Point is usually at the center of your wireless network, with line of sight to all of your mobile stations.

2. **Fix the direction of the antenna.** Try to place it in a position which can best cover your wireless network. Normally, the higher you place the antenna, the better the performance will be. The antenna's position enhances the receiving sensitivity.

3. **Connect a standard Ethernet network cable to the Access Point.** Then, connect the other end to a PC or to your wired network.

4. **Connect the AC Power Adapter to the Access Point's Power Socket.** Only use the power adapter supplied with the Access Point. Use of a different adapter may result in product damage.

Now that the hardware installation is complete, proceed to **Chapter 5: Setting Up the Dual-Band Wireless A + G Access Point** for directions on how to set up the Access Point.

Note: In order for all other wireless devices to communicate with the Access Point, those devices must be operating in the **Infrastructure Mode**. If any wireless devices are configured in the **Ad Hoc Mode**, they *will not* be recognized by the Access Point.

Chapter 5: Setting Up the Dual-Band Wireless A + G Access Point

Have You: Connected the Access Point to a PC or available port on your wired network as described in Chapter 4: Connecting the Dual-Band Wireless A + G Access Point?

Now that you've connected the Access Point to your wired network, you are ready to begin setting it up. This Setup Wizard will take you through all the steps necessary to configure the Access Point.

Note: While the Access Point has been designed to work correctly right out of the box, setting it up on a wireless computer will require you to use the Linksys default settings. These settings can then be changed with the Setup Wizard or Web-based Browser Utility.

1. Insert the Setup Wizard CD into your PC's CD-ROM drive. Your PC must be on your wired network to set up the Access Point.

2. The screen in Figure 5-1 should appear on your monitor. If it does not, this means the autorun is not functioning. Start the Setup Wizard manually by clicking the **Start** button, selecting **Run**, and typing **d:\setup.exe** (where "D" is your PC's CD-ROM drive). Click the **Setup** button to continue this Setup Wizard. Clicking the **User Guide** button opened this User Guide. To access the Linksys web site on an active Internet connection, click the **Linksys Web** button or to exit this Setup Wizard, click the **Exit** button.

Figure 5-1

3. The following screen, shown in Figure 5-2, displays how to connect the Access Point. You can also configure the Access Point through one of your PC's ethernet ports. Click the **Next** button to continue.

Figure 5-2

4. The next screen to appear, shown in Figure 5-3, will display a list of access points on your network along with the status information for each access point. Choose this Access Point for configuration and click the **Yes** button to continue.

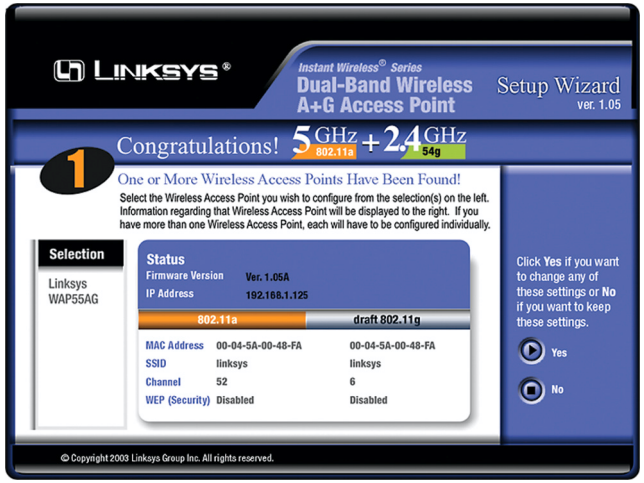

Figure 5-3

5. You will be asked to sign onto the Access Point you've selected, as shown in Figure 5-4. Enter the default password: **admin**. Then, click the **OK** button. (This password should be changed from the Web-based Utility's *Password* tab for greater security.)

Figure 5-4

6. As shown in Figure 5-5, the *IP Settings* screen will appear next. Enter an IP Address, Subnet Mask, and enter a unique access point name for the Access Point appropriate to your network. Then, click the **Next** button to continue.

IP Address. This IP address must be unique to your network. (The default IP address is 192.168.1.246.)

Subnet Mask. The Access Point's Subnet Mask must be the same as your Ethernet network.

Access Point Name. Assign a name to the Access Point. Unique, memorable names are helpful, especially if you are employing multiple access points on the same network.

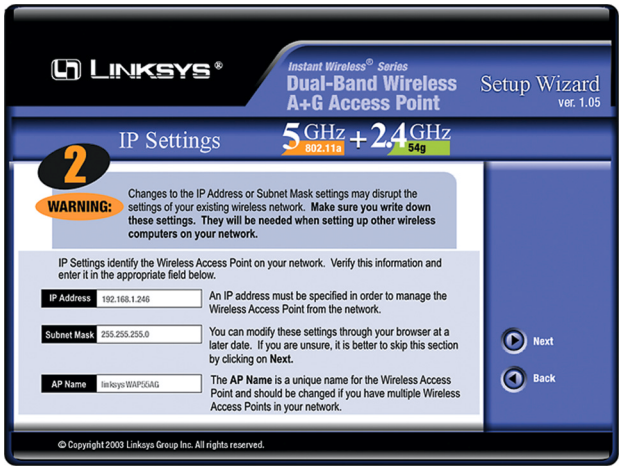

Figure 5-5

7. As shown in Figure 5-6, the *Basic Settings* screen for your 5 GHz/802.11a wireless products will appear. Enter your wireless network's SSID and select the channel at which the network broadcasts its wireless signal. Then, click the **Next** button to continue.

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 characters, which may be any keyboard character. The default SSID, **linksys-a**, should be changed for greater security. 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 36 and 64. All points in your wireless network must use the same channel in order to function correctly.

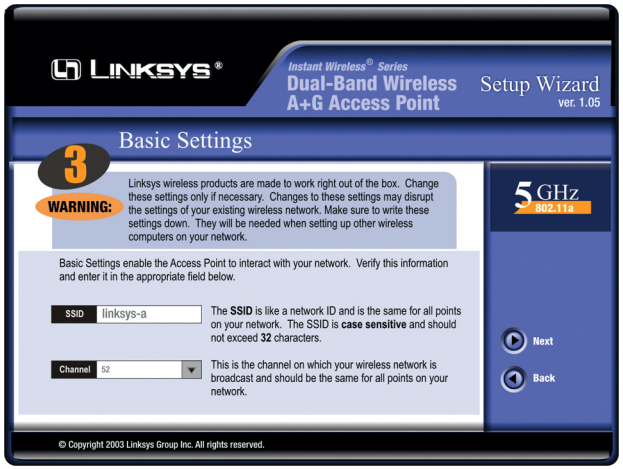

Figure 5-6

8. The *Security Settings* screen (Figure 5-7) for your 5 GHz/802.11a wireless products will appear next. From this screen, you will set the Wired Equivalent Privacy (WEP) encryption, 64-bit/128-bit/152-bit, for your wireless network. Select a WEP configuration method and a WEP key.

The WEP key can consist of the letters "A" through "F" and the numbers "0" through "9" and should be 10 characters in length for 64-bit encryption, 26 characters in length for 128-bit encryption, or 32 characters in length for 152-bit encryption. All points in your wireless network must use the same WEP key to utilize WEP encryption.

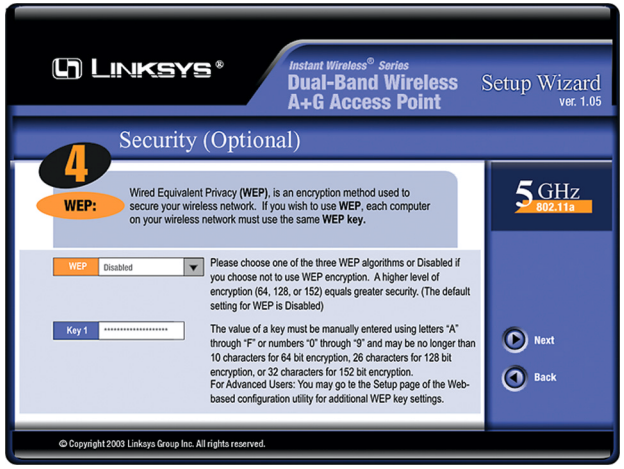

Figure 5-7

Click the **Next** button to continue.

9. As shown in Figure 5-8, the *Basic Settings* screen for your 2.4 GHz/802.11g wireless products will appear. Enter your wireless network's SSID and select the channel at which the network broadcasts its wireless signal. Then, click the **Next** button to continue.

Network Mode. Since 802.11g-draft products are backwards compatible with 802.11b products, this mode is provided in the event you wish to incorporate 802.11b products into you 802.11g-draft wireless network. If you are using both 802.11g-draft and 802.11b products in your network, select **Mixed** mode. You may experience reduced networking speeds in Mixed mode, as the speed must compensate for both types. If you are only using 802.11g-draft products in your network, select **G-Only** mode.

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 characters, which may be any keyboard character. The default SSID, **linksys-g**, should be changed for greater security. 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.

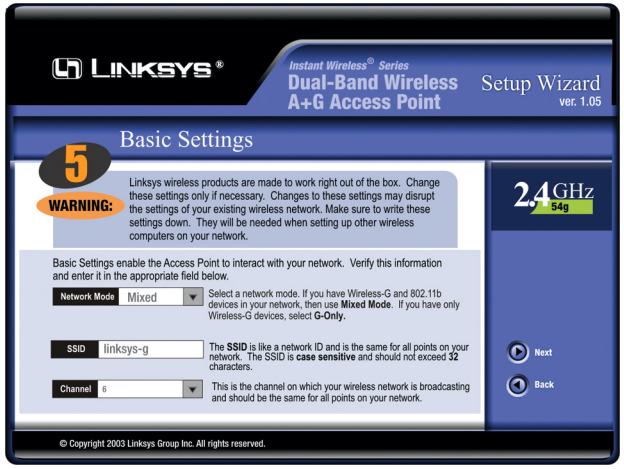

Figure 5-8

Note: WEP encryption should be used whenever networking wirelessly. WEP encryption helps increase security and make your wireless network safer to use.

10. The *Security Settings* screen (Figure 5-9) for your 2.4 GHz/802.11g-draft wireless products will appear next. From this screen, you will set the Wired Equivalent Privacy (WEP) encryption, 64-bit/128-bit, for your wireless network. Select a WEP configuration method and a WEP passphrase.

WEP (Disable/64-bit WEP/128-bit WEP). In order to utilize WEP encryption, select the WEP setting from the pull-down menu. If you do not wish to utilize WEP encryption, make sure **Disable** is selected.

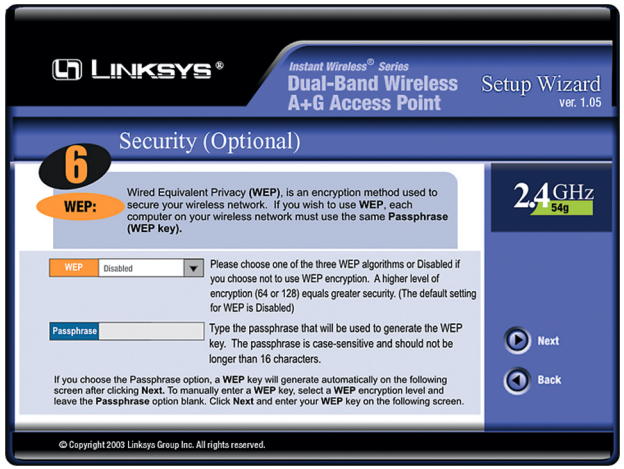

Figure 5-9

Passphrase. This is a text string with a maximum of 16 alphanumeric characters used for generating a WEP Key. Type the passphrase here. This passphrase may not work with non-Linksys products due to possible incompatibility with other vendors' passphrase generators. If you'd rather not use a passphrase and would rather enter the WEP Key manually, click the **Next** button.

Click the **Next** button to continue.

Note: The Access Point's passphrase function when mixing products from other manufacturers into your wireless network. Linksys products should always be used for optimum functionality. If another company's wireless product is used, however, the WEP key should be set manually.

11. The following Security screen, shown in Figure 5-7, will allow you to enter your WEP key if a passphrase was not entered on the previous screen. If a passphrase was used, the new WEP key will appear on this screen. Each point in your wireless network must use the same WEP key for the network to function properly. Verify that the appropriate key is entered and click the **Next** button to continue.

    The WEP key can consist of the letters "A" through "F" and the numbers "0" through "9" and should be 10 characters in length for 64-bit encryption or 26 characters in length for 128-bit encryption. All points in your wireless network must use the same WEP key to utilize WEP encryption.

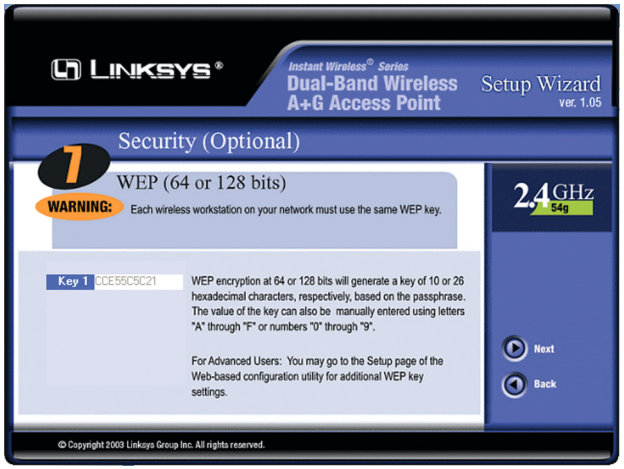

Figure 5-10

12. You should now review the settings you've chosen, as shown in Figure 5-11. If these settings are correct, click the **Yes** button to save these settings. If you wish to change any of the settings, click the **No** button. You will exit the Setup Wizard and can start it again to revise your settings.

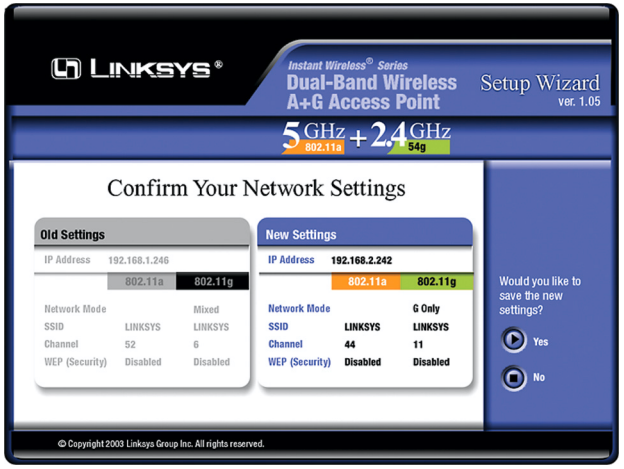

Figure 5-11

13. At this point, the configuration performed with the Setup Wizard is complete, as shown in Figure 5-12. To configure any other Access Points in your network, you can run this Setup Wizard again. Click the **Exit** button to exit the Setup Wizard.

Figure 5-12