# Dual-Band Wireless A+G Notebook Adapter


Use this guide to install:

WPC55AG

Cisco Compatible

**User Guide**

COPYRIGHT & TRADEMARKS



LIMITED WARRANTY

Linksys warrants to the original end user purchaser ("You") that, for a period of three years. Your Linksys product will be free of defects in materials and workmanship under normal use. Your exclusive remedy and Linksys's entire liability under this warranty will be for Linksys at its option to repair or replace the product or refund Your purchase price less any rebates.

If the product proves defective during the Warranty Period call Linksys Technical Support in order to obtain a Return Authorization Number. BE SURE TO HAVE YOUR PROOF OF PURCHASE ON HAND WHEN CALLING. 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. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE. You are responsible for shipping defective products to Linksys. Linksys pays for UPS Ground shipping from Linksys back to You only. Customers located outside of the United States of America and Canada are responsible for all shipping and handling charges.

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

TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL LINKSYS BE LIABLE FOR ANY LOST DATA, REVENUE OR PROFIT, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, HOWEVER CAUSED REGARDLESS OF THE THEORY OF LIABILITY, ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE THE PRODUCT, EVEN IF LINKSYS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL LINKSYS' LIABILITY EXCEED THE AMOUNT PAID BY YOU FOR THE PRODUCT.

The foregoing limitations will apply even if any warranty or remedy provided under this Section fails of its essential purpose. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to You.

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

SAFETY AND REGULATORY NOTICES

FCC STATEMENT

The Dual-Band Wireless A+G Notebook Adapter has been tested and found to comply 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.

INDUSTRY CANADA (CANADA)

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

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

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

EC DECLARATION OF CONFORMITY (EUROPE)

Linksys Group declares that the products included 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 devices 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 54Mbps, 5 GHz devices 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 Dual-Band Wireless A+G Notebook Adapter 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 Dual-Band Wireless A+G Notebook Adapter 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 département. 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.



# Table of Contents

# Chapter 1: Introduction

## The Dual-Band Wireless A+G Notebook Adapter

The Linksys Dual-Band Wireless A+G Notebook Adapter lets your notebook communicate with all three wireless network standards. With one PC Card, you can connect to Wireless-A (802.11a), Wireless-G (draft 802.11g) and Wireless-B (802.11b) networks.

Wireless-B networks have a data rate of 11Mbps, and are commonly found in corporate environments and in homes for household Internet connectivity without the need for running cables. They're also popping up all over the country in coffee shops, airports, hotels, convention centers, and other public spaces offering "on the go" connectivity to mobile users.

In high speed or heavy usage environments, Wireless-B is quickly being replaced by a new standard, Wireless-G, which uses the same 2.4GHz radio band, but at 54Mbps, is almost five times faster. The third wireless network standard is Wireless-A, which also runs at 54Mbps, but operates in the less-crowded 5GHz radio band. Wireless-A is mostly used in corporate installations.

Whichever standard you encounter, the Dual-Band Wireless A+G Notebook Adapter is ready to connect. And it's simple to use. Just pop it into a PC Card slot and run the included Setup Wizard which will walk you through the configuration. All wireless communications can be protected by up to 152-bit encryption, so your data stays secure.

Join the wireless revolution. With the Linksys Dual-Band Wireless A+G Notebook Adapter, you'll be ready to connect to all three types of wireless networks, wherever you go, now and in the future.

## Features

- Connects to either 2.4Ghz (802.11b or draft 802.11g) or 5Ghz (802.11a) networks without changing adapters
- Advanced security features with LEAP and up to 152-Bit WEP encryption
- Easy-to-use Setup Wizard
- Detailed monitoring and performance utility
- 802.11a, 802.11b and draft 802.11g compliant
- 32-Bit CardBus Interface
- Cisco Compatible Extensions

# Chapter 2: Planning Your Wireless Network

## Network Topology

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

## Ad-Hoc versus Infrastructure Mode

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

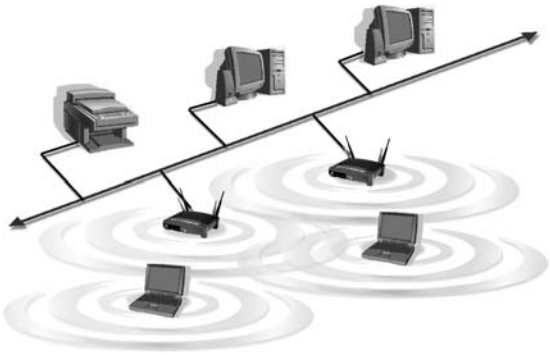

**Figure 2-1**

If the computers on the wireless network need to be accessed by a wired network or need to share a peripheral, such as a printer, with the wired network computers, the wireless network should be set up in **infrastructure** mode. (See Figure 2-1.) The basis of infrastructure mode centers around an *access point*, which serves as the main point of communications in a wireless network. Access points transmit data to PCs equipped with wireless network cards, 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 (wired) hardware as well.



If the wireless network is relatively small and needs to share resources only with the other computers on the wireless network, then the **ad-hoc** mode can be used. (See Figure 2-2.) 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 2-2**

# Chapter 3: The Dual-Band Wireless A+G Notebook Adapter's LEDs

The Adapter has two LEDs to let you know how the card is functioning. Here is a description of those LEDs:

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

**Link** *Green*. The Link LED lights up and stays solid when the Adapter is inserted correctly and a link is established with the notebook. The LED flashes when data is transmitted or received.



# Chapter 4: Installation and Configuration for Windows XP

**Important for Windows 98, Me, and 2000 users:** Go to "Chapter 5: Installation and Configuration for Windows 98, Me, and 2000."

## Overview

After installing the Dual-Band Wireless A+G Notebook Adapter in your computer, you will install the driver and configure the Adapter.

## Hardware Installation

1. Turn off your notebook PC.
2. Locate an available CardBus slot on your notebook PC.
3. With the Adapter's label facing up, as shown in Figure 4-1, slide it completely into the CardBus slot.
4. Restart your notebook PC.

**Figure 4-1**

5. Windows will begin copying the driver files to your computer. If Windows asks you for the original Windows CD-ROM, insert the CD-ROM, and direct Windows to its proper location (e.g., **D:**\).

**Proceed to the next section, "Driver Installation for Windows XP."**

## Driver Installation for Windows XP

1. Windows XP will automatically detect the Adapter. Click the radio button next to **Install the software automatically (Recommended)**. Insert the Setup Wizard CD-ROM into your computer's CD-ROM drive. Then click the **Next** button.


**Figure 4-3**

**Important for Windows XP users:** Do NOT run the Dual-Band Wireless A+G Notebook Adapter Setup Wizard. If the Setup Wizard runs automatically after the Setup Wizard CD-ROM has been inserted, click the **Exit** tab.

2. After Windows has finished installing the driver, click the **Finish** button.


**Figure 4-4**

**You have now completed the driver installation for the Dual-Band Wireless A+G Notebook Adapter. To configure the Adapter, proceed to the next section, "Windows XP Wireless Zero Configuration."**



## Windows XP Wireless Zero Configuration

**Important for Windows XP users:** Windows XP has a built-in configuration tool. Use the Windows XP Wireless Zero Configuration (in the system tray at the bottom of your screen) to configure the Adapter.

1. After installing the Adapter, the Windows XP Wireless Zero Configuration icon will appear in your computer's system tray. Double-click the icon.


**Figure 4-5**

**Note:** These instructions are for Windows XP with Service Pack 1 installed.

If you have not installed Service Pack 1, select the network you want, and click the **Connect** button. If the network has WEP encryption enabled, enter the WEP key in the *Network key* field, and then click the **Connect** button.

2. The screen that appears will show any available wireless network. Select the network you want.

If this network has WEP encryption disabled, go to Step 3.

If this network does not have WEP encryption enabled, then Figure 4-6 will appear. Make sure the box next to *Allow me to connect to the selected wireless network, even though it is not secure* is checked. Then click the **Connect** button, and go to Step 4.

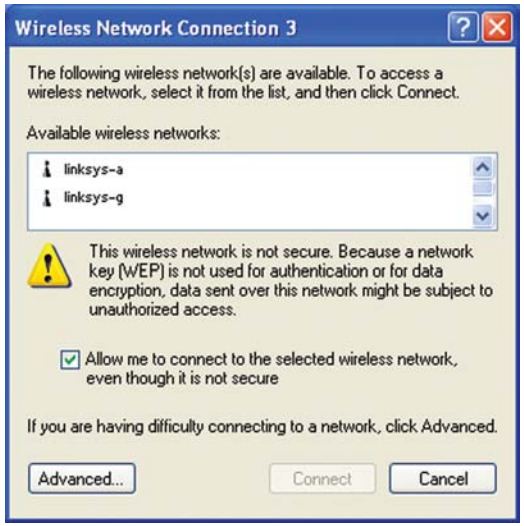


**Figure 4-6**

3. If WEP is enabled, the screen in Figure 4-7 will appear. Enter the WEP key of your wireless network in the *Network key* field, and re-enter it in the *Confirm network key* field. Then click **Connect**, and go to Step 4.

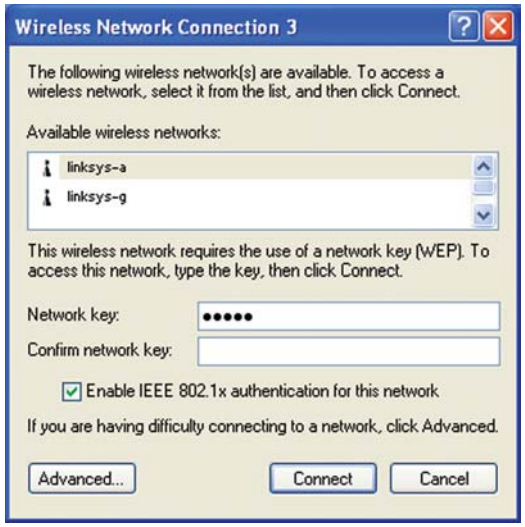


**Figure 4-7**

4. The screen in Figure 4-8 will appear if your connection is active.

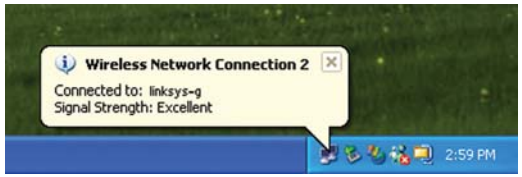


**Figure 4-8**

For more information about wireless networking on a Windows XP computer, click **Start** and then **Help and Support**. Enter the keyword **wireless** in the field provided, and press the **Enter** key.

**Congratulations! The installation of the Dual-Band Wireless A+G Notebook Adapter is complete.**



# Chapter 5: Installation and Configuration for Windows 98, Me, and 2000

**Important for Windows XP users:** Go to "Chapter 4: Installation and Configuration for Windows XP."

## Overview

The Dual-Band Wireless A+G Notebook Adapter Setup Wizard will guide you through the installation and configuration procedure for Windows 98, Me, and 2000. Then you will install the Adapter in your computer.

## Software Installation for Windows 98, Me, and 2000

1. Insert the **Setup Wizard CD-ROM** into your CD-ROM drive. The Setup Wizard should run automatically, and 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** (where "D" is the letter of your CD-ROM drive).


**Figure 5-1**

- **Install** - Click the **Install** button to begin the software installation process.
- **User Guide** - Clicking the **User Guide** button opened this PDF file of this User Guide.
- **Exit** - Click the **Exit** button to exit the Setup Wizard.

2. To install the Adapter, click the **Install** button on the *Welcome* screen.

3. After reading the Warranty Policy, shown in Figure 5-2, click the **Next** button if you agree, or click the **Cancel** button to end the installation.


**Figure 5-2**

4. Next you will choose your type of wireless network. If you will connect to both 802.11a and 54g networks, select **5GHz + 2.4GHz**. If you will connect to only 802.11a, select **5GHz**. If you will connect to only 54g, select **2.4GHz**. Click the **Next** button to continue.


**Figure 5-3**

5. Choose a wireless mode for your network. Click the **Infrastructure Mode** radio button if you want your wireless computers to network with computers on your wired network using an access point. Click the **Ad-Hoc Mode** radio button if you want multiple wireless computers to network directly with each other.

In the *SSID* field, enter the **SSID** of your wireless network. The SSID must be identical for all devices in the network. The default setting is **linksys** (all lowercase). Click the **Next** button.


**Figure 5-4**

6. If you chose *Infrastructure Mode*, go to Step 7 now. If you chose *Ad-Hoc Mode*, the *Ad-Hoc Mode Setting* screen will appear for the type of network you're using (see Figures 5-5 and 5-6).

**Note:** If you chose *5GHz + 2.4GHz* in Step 4 for connection to both 802.11a and 54g networks, then go to Step 6. The Adapter will automatically select the best channel for you.

For the *Channel* setting, the channel you choose should match the channel set on the other devices in your wireless network. Select the channel you plan to use for your 802.11a or 54g network from the appropriate drop-down screen that appears. If you want the network to automatically choose a channel for you, then select **Auto**.


**Figure 5-5**

The *Network Mode* setting is available only for 54g networks. If you have Wireless-G (draft 802.11g) and Wireless-B (802.11b) devices in your network, then keep the default *Network Mode* setting, **Mixed Mode**. If you have only Wireless-G devices, select **G-Only Mode**.


**Figure 5-6**

Click the **Next** button.

7. Review your settings on the *Finalize Settings* screen, shown in Figure 5-7, before the Setup Wizard starts to copy your files. Click the **Next** button to continue.


**Figure 5-7**

8. After the files have been successfully copied, the screen in Figure 5-8 will appear. Click the **Exit** button.


**Figure 5-8**

**Proceed to the next section, "Hardware Installation."**

## Hardware Installation

1. Turn off your notebook PC.

2. Locate an available CardBus slot on your notebook PC.

3. With the Adapter's label facing up, as shown in Figure 5-9, slide it completely into the CardBus slot.

4. Restart your notebook PC.

**Figure 5-9**

5. Windows will begin copying the driver files to your computer. If Windows asks you for the original Windows CD-ROM, insert the CD-ROM, and direct Windows to its proper location (e.g., **D:**\).

**Congratulations! The installation of the Dual-Band Wireless A+G Notebook Adapter is complete.**

**If you want to check the link information, search for available wireless networks, or make additional configuration changes, proceed to "Chapter 6: Using the WLAN Monitor for Windows 98, Me, and 2000."**



# Chapter 6: Using the WLAN Monitor for Windows 98, Me, and 2000

## Overview

Use the WLAN Monitor to check the link information, search for available wireless networks, or make additional configuration changes.

**Important for Windows XP users:** Windows XP has a built-in configuration tool. Use the Windows XP Wireless Zero Configuration (in the system tray at the bottom of your screen) to configure the Adapter. See "Chapter 4: Installation and Configuration for Windows XP."

## Starting the WLAN Monitor

After installing the Adapter, the Dual-Band Wireless A+G Notebook Adapter WLAN Monitor icon (see Figure 6-1) will appear in the system tray, which is located at the bottom right-hand corner of your screen. The top left-hand corner of the icon will light up blue if the Adapter is installed and active. Its bottom right-hand corner will light up yellow if the Adapter is connected to a wireless screen. The icon will remain dim if the Adapter is not installed or is disabled.

**Figure 6-1**

Double-click the WLAN Monitor icon, and the *Link Information* screen will appear. From this screen, you can find out how strong the Adapter's wireless signal is and how good the connection's quality is. Click the **More Information** button to view additional status information about the current wireless connection. To search for available wireless networks, click the **Site Survey** tab. To perform configuration changes, click the **Profiles** tab.

## Link Information

The *Link Information* screen, shown in Figure 6-2, displays the Adapter's signal strength and link quality information. Click the *More information* button for further information about your wireless connection (see Figure 6-3).


**Figure 6-2**

**Ad-Hoc Mode** or **Infrastructure Mode** - The screen indicates whether the Adapter is currently working in ad-hoc or infrastructure mode.

**Signal Strength** - The Signal Strength bar indicates the strength of the Adapter's signal.

**Link Quality** - The Link Quality bar indicates the quality of the wireless network connection.

Click the **More Information** button to view more information about the wireless network connection.

Click the **X** (Close) button in the upper right corner to exit the WLAN Monitor.



**Wireless Network Status**


**Figure 6-3**

**Status**- The status of the wireless network connection.
**SSID** - The SSID of the wireless network.
**Network Mode** - The wireless mode currently in use, ad-hoc or infrastructure.
**Transfer Rate** - The data transfer rate of the current connection.
**Channel** - The channel to which the wireless network devices are set.
**WEP** - The status of the WEP encryption security feature.
**MAC** - The MAC address of the wireless network's access point.

**TCP/IP Setting**

**IP Address** - The IP Address of the Adapter.
**Subnet Mask** - The Subnet Mask of the Adapter.
**Default Gateway** - The Default Gateway address of the Adapter.
**DNS** - The DNS address of the Adapter.
**DHCP** - The status of the DHCP client.

Click the **Save to Profile** button to save the current settings in a profile. Enter a name for the profile (see Figure 6-4), and then click the **OK** button.


**Figure 6-4**

**Signal Strength** - This indicates the strength of the Adapter's signal.

**Link Quality** - This indicates the quality of the wireless network connection.

Click the **Back** button to return to the initial *Link Information* screen.

Click the **X** (Close) button in the upper right corner to exit the WLAN Monitor.

## Site Survey

The *Site Survey* screen, shown in Figure 6-5, displays a list of infrastructure and ad-hoc networks available for connection.


**Figure 6-5**

**SSID** - The SSID of the wireless network.
**Signal** - The quality of signal strength: Poor, Fair, Good, or Excellent.

**Site Information**
**Network Type** - The wireless mode currently in use.
**Channel** - The channel to which the wireless network devices are set.
**WEP** - The status of the WEP encryption security feature.
**MAC** - The MAC address of the wireless network's access point.
**Surveyed at** - The time at which the wireless network was scanned.

**Refresh** - Click the **Refresh** button to perform a new search for wireless devices.

**Connect** - To connect to one of the networks on the list, select the wireless network**,** and click the **Connect** button.

Once you are connected, the Security Settings screen will appear, shown in Figure 6-6. Select the security method your wireless network employs in the drop-down menu.



If the wireless network has WEP encryption enabled for security, you will see the screen shown in Figure 6-6. If the wireless network has LEAP authentication enabled for security, you will see the screen shown in Figure 6-7. If the wireless network employs an Externally Managed 802.1x type of security, choose this selection. The Adapter will detect the settings and forward you to the next Profile screen, shown in Figure 6-9.


**Figure 6-6**

**WEP**

When the WEP settings screen opens, shown in Figure 6-7, first select the level of WEP encryption you wish to employ: 64-bit, 128-bit, or 152-bit.


**Figure 6-7**

Next, select the type of Authentication your network employs. You may choose between **Auto**, **Open System** or **Shared Key**. With the **Shared Key** setting, all wireless devices must have the same WEP keys so that they can authenticate each other and start transmitting data. With the **Open System** setting, the Adapter can join a network without performing a security check. The default setting is to **Auto**, which means that the Adapter will automatically detect the network's settings and transmit data appropriately.

Next, choose a Transmit Key, 1-4. This will be one of the encryption keys in the four fields, entered manually or generated through the use of a Passphrase.

When manually, the encryption key must 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.

If you wish to have the encryption key generated through a Passphrase, it can be a maximum of 16 alphanumeric characters. Type this in the *Passphrase* field and a key will be automatically generated. This passphrase may not work with non-Linksys products due to possible incompatibility with other vendors' passphrase generators.

Click the **Next** button to continue or **Back** to chose a different security method.

***LEAP Authentication***

From the LEAP screen, shown in Figure 6-8, complete the *User Name* and *Password* fields, making sure to confirm the password in the *Confirm* field. If you do not know this information, contact your network administrator.


**Figure 6-8**

Click the **Next** button to complete the connection or **Back** to chose a different security method. Click the **X** (Close) button in the upper right corner to exit the WLAN Monitor.



## Profiles

The *Profiles* screen, shown in Figure 6-9, lets you save different configuration profiles for different network setups. You can also import or export profiles. The default profile holds the configuration saved when you installed the Adapter.


**Figure 6-9**

**Profile Name** - The name of the profile.
**SSID** - The SSID of the wireless network.
Type - This letter signifies the type of network assigned to this profile. The letter **A** signifies an 802.11a network, **B** signifies 802.11b, and **G** signifies 802.11g.

**Profile Information**
**Network Type** - The network mode: Ad-Hoc or Infrastructure.
**Transfer Rate** - The Adapter is set to Auto mode, so it will dynamically shift to the fastest data transfer rate possible at any given time.
**Channel** - The channel to which the wireless network devices are set.
**WEP** - The status of the WEP encryption security feature.

**Connect** - To connect to a wireless network using a specific profile, select the profile's SSID**,** and click the **Connect** button.
**Edit** - Select the profile's name, and click the **Edit** button to change an existing profile.
**New** - Click the **New** button to create a new profile. See the next section, "Creating a New Profile."

**Import** - Click the **Import** button to import a profile that has been saved in another location. Select the appropriate file, as shown in Figure 6-10, and click the **Open** button.

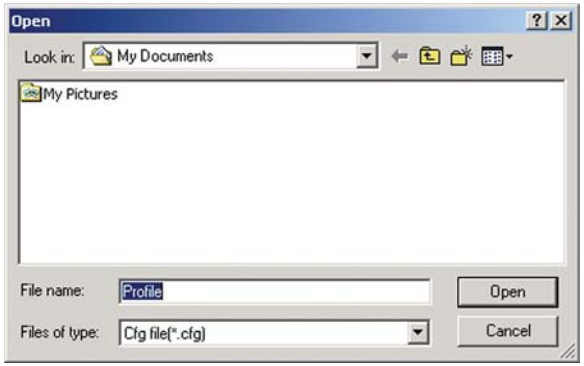


**Figure 6-10**

**Export** - Select the profile you want to save in a different location, and click the **Export** button. Select the appropriate folder, as shown in Figure 6-11, and click the **Save** button.

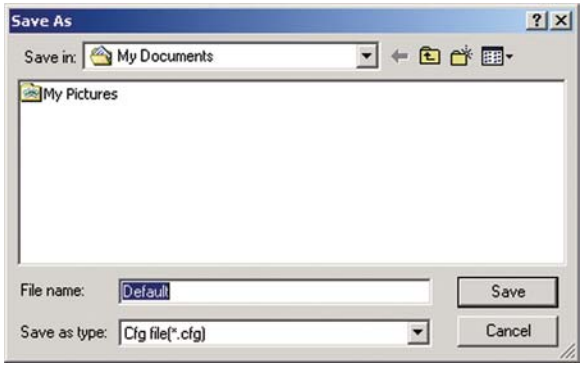


**Figure 6-11**

**Note:** If you want to export more than one profile, you have to export them one at a time.

**Delete** - Select a profile, then click the **Delete** button to delete a profile.

Click the **X** (Close) button in the upper right corner to exit the WLAN Monitor.



## Creating a New Profile

1. On the *Profiles* screen, shown in Figure 6-12, click the **New** button to create a new profile.


**Figure 6-12**

2. On the *Create connection profile* screen, shown in Figure 6-13, enter the Profile's name. Then click the **OK** button.


**Figure 6-13**

3. The *Profile Wizard* screen (Figure 6-14) appears next. Select one of three wireless network types. Select the **2.4GHz + 5 GHz** if you will connect to both 802.11a and 54g networks. Select **5GHz** if you will only connect to 802.11a networks. Select the **2.4 GHz** if you will only connect to 54g networks. Then click the **Next** button.


**Figure 6-14**

4. The *Network Settings* screen, shown in Figure 6-15, will appear.

   If your network has a DHCP server, click the radio button next to **Obtain an IP address automatically (DHCP)**. Click the **Next** button to continue, and go to step 4.

   If your network does not have a DHCP server, click the radio button next to **Specify the IP address**. Enter an **IP Address**, **Subnet Mask**, **Default Gateway**, and **DNS** appropriate for your network. You must specify the IP Address and Subnet Mask on this screen. If you are unsure about the Default Gateway and DNS addresses, then leave these fields alone.

   Click the **Next** button to continue, and go to Step 4.

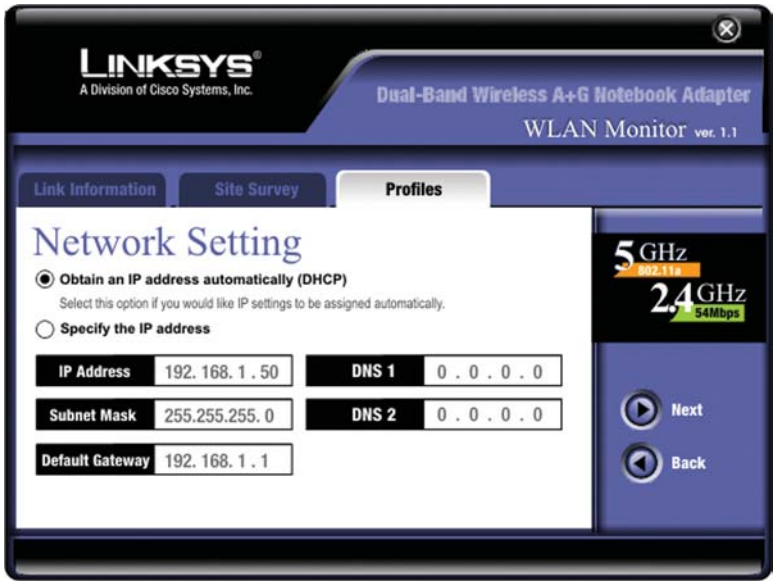


**Figure 6-15**

**IP Address** - This IP Address must be unique to your network.
**Subnet Mask** - The Adapter's Subnet Mask must be the same as your wired network's Subnet Mask.
**Default Gateway** - Enter the IP address of your network's Gateway.
**DNS** - Enter the DNS server addresses used by your ISP.



5. The *Choose a network type* screen (Figure 6-16) shows a choice of two network modes. Click the **Infrastructure Mode** radio button if you want your wireless computers to communicate with computers on your wired network via an access point. Click the **Ad-Hoc Mode** radio button if you want multiple wireless computers to communicate directly with each other. Then, enter the SSID for your wireless network in the *SSID 1* field. Enter alternative SSIDs in the *SSID 2* and *SSID 3* fields. Click the **Next** button.

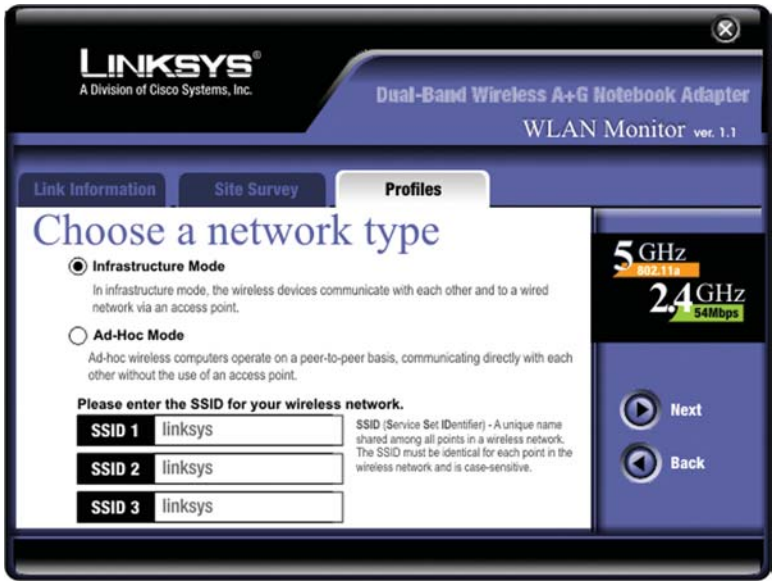


**Figure 6-16**

**Infrastructure Mode** - This mode allows wireless and wired networks to communicate through an access point.

**Ad-Hoc Mode** - This mode allows wireless-equipped computers to communicate directly with each other. No access point is used.

**SSID** - The SSID is the unique 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 characters (use any of the characters on the keyboard). Make sure this setting is the same for all devices in your wireless network.

When attempting a connection, the Adapter will try SSID 1. If unsuccessful, the Adapter will then try SSID 2 and SSID 3 until a connection is made.

6. If you chose Infrastructure mode, proceed to Step 6. Depending upon the Ad-Hoc mode you chose, one or both *Ad-Hoc Mode Setting* screens, shown in Figure 6-17 and 6-18, will appear.

**Note:** If you chose *5GHz + 2.4GHz* in Step 2 for connection to both 802.11a and 54g networks, then go to Step 6. The Adapter will automatically select the best channel for you.

From the drop-down menu, select the channel you plan to use for your network. If you want the network to automatically choose a channel for you, then select **Auto**.

The *Network Mode* setting is available only for 54g networks. If you have Wireless-G (draft 802.11g) and Wireless-B (802.11b) devices in your network, then keep the default *Network Mode* setting, **Mixed Mode**. If you have only Wireless-G devices, select **G-Only Mode**.

Click the **Next** button to continue.


**Figure 6-17**


**Figure 6-18**

7. The Security Settings screen will appear next, as shown in Figure 6-19. Select the security method your wireless network employs in the drop-down menu.

If the wireless network has WEP encryption enabled for security, you will see the screen shown in Figure 6-20. If the wireless network has LEAP authentication enabled for security, you will see the screen shown in Figure 6-21. If the wireless network employs an Externally Managed 802.1x type of security, choose this selection. The Adapter will detect the settings and forward you to the next Profile screen, shown in Figure 6-22.


**Figure 6-19**

**WEP**

When the WEP settings screen opens, shown in Figure 6-20, first select the level of WEP encryption you wish to employ: 64-bit, 128-bit, or 152-bit.

Next, select the type of Authentication your network employs. You may choose between **Auto**, **Open System** or **Shared Key**. With the **Shared Key** setting, all wireless devices must have the same WEP keys so that they can authenticate each other and start transmitting data. With the **Open System** setting, the Adapter can join a network without performing a security check. The default setting is to **Auto**, which means that the Adapter will automatically detect the network's settings and transmit data appropriately.


**Figure 6-20**

Next, choose a Transmit Key, 1-4. This will be one of the encryption keys in the four fields, entered manually or generated through the use of a Passphrase.

When manually, the encryption key must 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.

If you wish to have the encryption key generated through a Passphrase, it can be a maximum of 16 alphanumeric characters. Type this in the *Passphrase* field and a key will be automatically generated. This passphrase may not work with non-Linksys products due to possible incompatibility with other vendors' passphrase generators.

Click the **Next** button to continue or **Back** to chose a different security method.

**Note:** 152-bit encryption is available only for 802.11a networking.

**LEAP Authentication**

From the LEAP screen, shown in Figure 6-21, complete the *User Name* and *Password* fields, making sure to confirm the password in the *Confirm* field. If you do not know this information, contact your network administrator.


**Figure 6-21**

Click the **Next** button to complete the connection or **Back** to chose a different security method. Click the **X** (Close) button in the upper right corner to exit the WLAN Monitor.



8. The *Confirm New Settings* screen will appear. To save the new settings, click the **Save** button. To cancel the settings and return to the *Profiles* screen without saving your changes, click the **Cancel** button. To edit the new settings, click the **Back** button.


**Figure 6-22**

9. The *Congratulations* screen will appear next. Click **Activate new settings now** to implement the new settings immediately and return to the *Link Information* screen. Click **Activate new settings later** to keep the current settings active and return to the *Profiles* screen.


**Figure 6-23**

**You have successfully created a connection profile. Click the X (Close) button in the upper right corner to exit the WLAN Monitor.**

# Appendix A: Troubleshooting

This chapter provides solutions to problems that may occur during the installation and operation of the Dual-Band Wireless A+G Notebook Adapter. Read the descriptions below to solve your problems. If you can't find an answer here, check the Linksys website at *www.linksys.com.*

## Common Problems and Solutions

1. My computer does not recognize the Adapter.
   Make sure that the Adapter is properly inserted into the PCMCIA slot. Note that the card can be inserted either way, but is correct only when it is inserted with the arrow on the front of the card up. If in doubt, try inserting the card both ways. The card will slide in further when it is correct.

2. The Adapter does not work properly.
- Reinsert the Adapter into your notebook's PCMCIA slot. A beep should be heard if the card is properly inserted.
- For non-Windows environments, make sure that a PCMCIA card service driver is installed on your PC.
- Open the **Control Panel** and click on the **PC Card**. Check whether it has a PCMCIA card in one of the sockets or not. If you find the Adapter in one of the sockets, it means the card has been detected properly. If you see a yellow question mark, the resources are conflicting.
- Right-click on **My Computer** and select **Properties**. Select the device manager and click the **Adapter**. You will find the Adapter if it is installed successfully. If you see the yellow exclamation mark, the resources are conflicting. Click **PCMCIA card** and then click **PCMCIA card service**. You will see the status of the Adapter. If there is a yellow question mark, please check the following:
  - Make sure that your notebook has a free IRQ.
  - Make sure that you have inserted the right card and installed the proper driver.

  If the Adapter does not function after attempting the above steps, remove the card and do the following:
  - Uninstall the driver software from your PC.
  - Restart your PC and repeat the hardware and software installation as specified in this User Guide.

3. I cannot communicate with the other computers linked via the Ethernet in the Infrastructure configuration.
- Make sure that the notebook PC to which the Adapter is associated is powered on.
- Make sure that your Adapter is configured on the same channel and with the same security options as the other computers in the Infrastructure configuration.

## Frequently Asked Questions

**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 computer games with other members of the wireless network?**
Yes, as long as the game supports multiple players over a LAN (local area network). Refer to the game's user guide for more information.

**What is the IEEE 802.11a standard?**
It is one of the IEEE standards for wireless networks. The 802.11a standard allows wireless networking hardware from different manufacturers to communicate, provided that the hardware complies with the 802.11a standard. The 802.11a standard states a maximum data transfer rate of 54Mbps and an operating frequency of 5GHz.

**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 802.11a features are supported?**
The product supports the following IEEE 802.11a functions:
- OFDM protocol
- Multi-Channel Roaming
- Automatic Rate Selection
- RTS/CTS feature
- Fragmentation

### What IEEE 802.11b features are supported?

The product supports the following IEEE 802.11b functions:

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

### What is ad-hoc mode?

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

### What is infrastructure mode?

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

### What is 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?

WLAN features 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, WLAN offers the encryption function (WEP) to enhance security and access control.

### Can Linksys wireless products support printer sharing?

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

### 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.

# Appendix B: Glossary

**802.11a** - 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. It specifies a maximum data transfer rate of 54Mbps and an operating frequency of 5GHz. The 802.11a standard uses the Orthogonal Frequency Division Multiplexing (OFDM) transmission method. Additionally, the 802.11a standard supports 802.11 features such as WEP encryption for security.

**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.

**802.11g** - A proposed, but as yet unratified extension of the IEEE 802.11 standard for wireless networking hardware. The draft 802.11g specifications used by Linksys specify a maximum data transfer rate of 54Mbps using OFDM modulation, an operating frequency of 2.4GHz, backward compatibility with IEEE 802.11b devices, and WEP encryption for security.

**Adapter** - Printed circuit board that plugs into a PC to add to capabilities or connectivity to a PC. In a networked environment, a network interface card is the typical adapter that allows the PC or server to connect to the intranet and/or Internet.

**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.

**Bandwidth** - The transmission capacity of a given facility, in terms of how much data the facility can transmit in a fixed amount of time; expressed in bits per second (bps).

**Bit** - A binary digit. The value—0 or 1—used in the binary numbering system. Also, the smallest form of data.



**Cardbus** - A high-speed peripherals interface for notebook PCs that delivers 32-bit performance based on PCI bus architecture.

**CSMA/CA** (**C**arrier **S**ense **M**ultiple **A**ccess/**C**ollision **A**voidance) - In local area networking, this is the CSMA technique that combines slotted time-division multiplexing with carrier sense multiple access/collision detection (CSMA/CD) to avoid having collisions occur a second time.

**CTS** (**C**lear **T**o **S**end) - An RS-232 signal sent from the receiving station to the transmitting station that indicates it is ready to accept data.

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

**DHCP** (**D**ynamic **H**ost **C**onfiguration **P**rotocol) - A protocol that lets network administrators manage centrally 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 name are located and translated into Internet Protocol (IP) addresses. A domain name is a meaningful and easy-to-remember “handle” for an Internet address.

**Domain** - A subnetwork comprised of a group of clients and servers under the control of one security database. Dividing LANs into domains improves performance and security.

**Driver** - A workstation or server software module that provides an interface between a network interface card and the protocol software running in the computer; it is designed for a specific device, and is installed during the initial installation of a network-compatible client or server operating system.

**DSSS** (**D**irect-**S**equence **S**pread **S**pectrum) - DSSS generates a redundant bit pattern for all data transmitted. 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).

**EAP** (**E**xtensible **A**uthentication **P**rotocol) - An IETF standard that establishes an authentication protocol for network access. Many authentication methods, including passwords, certificates, and smart cards, work within this framework.

**Encryption** - A security method that applies a specific algorithm to data in order to alter the data's appearance and prevent other devices from reading the information.

**Ethernet** - IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium. Has a transfer rate of 10 Mbps. Forms the underlying transport vehicle used by several upper-level protocols, including TCP/IP and XNS.

**FHSS** (**F**requency **H**opping **S**pread **S**pectrum) - 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.

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



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

**Hardware** - Hardware is the physical aspect of computers, telecommunications, and other information technology devices. The term arose as a way to distinguish the “box” and the electronic circuitry and components of a computer from the program you put in it to make it do things. The program came to be known as the software.

**Hop** - The link between two network nodes.

**IEEE** (The **I**nstitute of **E**lectrical and **E**lectronics **E**ngineers) - 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 several large societies in special areas, such as the IEEE Computer Society.

**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. A set of two or more BSS in a single network is referred to as an Extended Service Set. Infrastructure mode is useful at a corporation scale, or when it is necessary to connect the wired and wireless networks.

**IP** (**I**nternet **P**rotocol) - The method or protocol by which data is sent from one computer to another on the Internet. It is a standard set of rules, procedures, or conventions relating to the format and timing of data transmission between two computers that they must accept and use to be able to understand each other.

**IP Address** - In the most widely installed level of the Internet Protocol (IP) today, an IP address is a 32-binary digit number that identifies each sender or receiver of information that is sent 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 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 requestor or the e-mail sender and can respond by sending another message using the IP address it received.

**IRQ** (**I**nterrupt **R**eQuest) - A hardware interrupt on a PC. There are 16 IRQ lines used to signal the CPU that a peripheral event has started or terminated. Except for PCI devices, two devices cannot use the same line.

**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.

**ISP** (**I**nternet **S**ervice **P**rovider) - A company that provides individuals and companies access to the Internet and other related services such as Web site building and virtual hosting.

**LAN** (**L**ocal **A**rea **N**etwork) - 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).

**LEAP** (**L**ightweight **E**xtensible **A**uthentication **P**rotocol) - Cisco's proprietary, mutual authentication method using the Extensible Authentication Protocol (EAP) and a username and password system. LEAP authentication supports dynamic WEP key management for wireless networking using 802.1x.

**MAC** (**M**edia **A**ccess **C**ontrol) **Address** - 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.

**Mbps** (**M**ega**b**its **p**er **s**econd) - One million bits per second; unit of measurement for data transmission.

**Network** - A system that transmits any combination of voice, video and/or data between users.

**Notebook** (PC) - A notebook computer is a battery-powered personal computer generally smaller than a briefcase that can easily be transported and conveniently used in temporary spaces such as on airplanes, in libraries, temporary offices, and at meetings. A notebook computer, sometimes called a laptop computer, typically weighs less than five pounds and is three inches or less in thickness.

**OFDM** - Developed for wireless applications, Orthogonal Frequency Division Multiplexing (OFDM) technology offers superior performance-increased data rates and more reliable transmissions-than previous technologies, such as DSSS. OFDM is a scheme in which numerous signals of different frequencies are combined to form a single signal for transmission on the medium.

OFDM works by breaking one high-speed data stream into a number of lower-speed data streams, which are then transmitted in parallel. Each lower speed stream is used to modulate a subcarrier. Essentially, this creates a multi-carrier transmission by dividing a wide frequency band or channel into a number of narrower frequency bands or sub-channels. OFDM is also used for other applications, including powerline networking.

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

**PC Card** - A credit-card sized removable module that contains memory, I/O, or a hard disk.

**PCI** (**P**eripheral **C**omponent **I**nterconnect) - A peripheral bus commonly used in PCs, Macintoshes and workstations. It was designed primarily by Intel and first appeared on PCs in late 1993. PCI provides a high-speed data path between the CPU and peripheral devices (video, disk, network, etc.). There are typically three or four PCI slots on the motherboard. In a Pentium PC, there is generally a mix of PCI and ISA slots or PCI and EISA slots. Early on, the PCI bus was known as a "local bus."

PCI provides "plug and play" capability, automatically configuring the PCI cards at startup. When PCI is used with the ISA bus, the only thing that is generally required is to indicate in the CMOS memory which IRQs are already in use by ISA cards. PCI takes care of the rest.

PCI allows IRQs to be shared, which helps to solve the problem of limited IRQs available on a PC. For example, if there were only one IRQ left over after ISA devices were given their required IRQs, all PCI devices could share it. In a PCI-only machine, there cannot be insufficient IRQs, as all can be shared.

**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.

**RTS** (**R**equest **T**o **S**end) - An RS-232 signal sent from the transmitting station to the receiving station requesting permission to transmit.
**Server** - Any computer whose function in a network is to provide user access to files, printing, communications, and other services.

**Software** - Instructions for the computer. A series of instructions that performs a particular task is called a "program." The two major categories of software are "system software" and "application software." System software is made up of control programs such as the operating system and database management system (DBMS). Application software is any program that processes data for the user.

A common misconception is that software is data. It is not. Software tells the hardware how to process the data.

**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).

**SSID** (**S**ervice **S**et **ID**entifier) - A unique name shared among all points in a wireless network. The SSID must be identical for each point in the wireless network and is case-sensitive.

**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** (**T**ransmission **C**ontrol **P**rotocol) - 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** (**T**ransmission **C**ontrol **P**rotocol/**I**nternet **P**rotocol) - 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.

**Topology** - A network's topology is a logical characterization of how the devices on the network are connected and the distances between them. The most common network devices include hubs, switches, routers, and gateways. Most large networks contain several levels of interconnection, the most important of which include edge connections, backbone connections, and wide-area connections.

**WAN** (**W**ide **A**rea **N**etwork)- A communications network that covers a relatively large geographic area, consisting of two or more LANs. Broadband communication over the WAN is often through public networks such as the telephone (DSL) or cable systems, or through leased lines or satellites. In its most basic definition, the Internet could be considered a WAN.

**WEP** (**W**ired **E**quivalent **P**rivacy) - A data privacy mechanism based on a 64-bit or 128-bit shared key algorithm, as described in the IEEE 802.11 standard.

**WLAN** (**W**ireless **L**ocal **A**rea **N**etwork) - A group of computers and associated devices that communicate with each other wirelessly.

# Appendix C: Specifications

| | |
|---|---|
| **Standards** | IEEE 802.11a, 802.11b, draft 802.11g |
| **Interface** | CardBus |
| **LEDs** | Power, Link |
| **Transmit Power** | 11 dBm to 17 dBm |
| **Modulation** | 802.11a and draft 802.11g: OFDM;<br>802.11b: CCK, DQPSK, DBPSK |
| **Security Features** | WEP, LEAP, CKIP |
| **WEP Key Bits** | 64, 128, 152 Bits |
| **Protocol** | TCP/IP |



**Environmental**

| | |
|---|---|
| **Dimensions** | 4.72" x 0.51" x 2.13"<br>(120 mm x 13 mm x 54 mm) |
| **Unit Weight** | 1.48 oz. (0.04 kg) |
| **Power** | 3.3V Bus Powered |
| **Certifications** | FCC, CE, IC-03, Wi-Fi (802.11a, 802.11b), CCX<br>WHQL: XP, 2000, Me |
| **Operating Temp.** | 0°C to 55°C |
| **Storage Temp.** | -20°C to 85°C |
| **Operating Humidity** | 10% to 85%, Non-Condensing |
| **Storage Humidity** | 5% 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' 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 the Dual-Band Wireless A+G Notebook Adapter, 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 (Return Merchandise Authorization) Issues** | www.linksys.com (or call 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**