

Instant Wireless™ Series

Wireless PCI Card



Use this guide to install:

WMP11 ver. 2.7

User Guide

 **LINKSYS**®

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FCC STATEMENT

This Instant Wireless™ Wireless PCI Card has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or devices
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with 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.

FCC RF Radiation Exposure Statement

This device and its antenna(s) must operate with a separation distance of at least 20 cm from all persons 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.

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 EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC:

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

Note: This equipment is intended to be used in all EU and EFTA countries. Outdoor use may be restricted to certain frequencies and/or may require a license for operation. For more details, contact Linksys Corporate Compliance.

Note: Combinations of power levels and antennas resulting in a radiated power level of above 100 mW are considered as not compliant with the above mentioned directive and are not allowed for use within the European community and countries that have adopted the European R&TTE directive 1999/5/EC and/or the CEPT recommendation Rec 70.03. For more details on legal combinations of power levels and antennas, contact Linksys Corporate Compliance.

- Linksys Group™ vakuuttaa täten että Instant Wireless IEEE 802.11 PC Card tyyppinen laite on direktiivin 1999/5/EY, direktiivin 89/336/EEC ja direktiivin 73/23/EEC oleellisten vaatimusten ja sitä koskevien näiden direktiivien muiden ehtojen mukainen.
- Linksys Group™ déclare que la carte PC Instant Wireless IEEE 802.11 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.
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- France F: Restricted frequency band: only channels 10, 11, 12, 13 (2457, 2462, 2467, and 2472 MHz respectively) may be used in France. License required for every indoor and outdoor installations. Please contact ART for procedure to follow.
- Deutschland D: Anmeldung im Outdoor-Bereich notwendig, 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 Wireless PCI Card

The Wireless PCI Card gives you the freedom to work from wherever you want to be. Whether you're at your desk or in the boardroom, the Card lets your PC share high-speed Internet access, files, and printers through the network, so you increase your productivity and stay connected—without wires.

Transfer data at speeds of up to 11Mbps. Advanced signal processing combined with improved error correction and excellent receiver sensitivity enable the Card to operate at higher transmission rates for longer distances. With the Wireless PCI Card, take advantage of wireless networking—the easy way.

Features

- Up to 11Mbps, High-Speed Data Transfer Rate with Automatic Fallback
- Compliant with 802.11b, DSSS, 2.4GHz Standard
- Plug-and-Play Operation Provides Easy Setup
- Supports up to 128-Bit WEP Encryption
- Compatible with Virtually All Major Network Operating Systems
- Uses Direct Sequence Spread Spectrum (DSSS) to Maintain Connectivity
- Clear Channel Assessment Increases Network Throughput
- Hardware Buffer Chaining Provides High Performance While Reading and Writing Buffers
- Free Technical Support—24 Hours a Day, 7 Days a Week, Toll-Free US Calls
- 1-Year Limited Warranty

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Package Contents



Figure 1-1

- One Wireless PCI Card
- One Setup Wizard CD-ROM with User Guide
- One Quick Installation guide
- One Registration Card

System Requirements

- One PC with the following:
- 200MHz or Higher CPU
 - 64MB RAM
 - Windows 98, Millennium, 2000, or XP
 - Available PCI Slot
 - CD-ROM Drive

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.

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

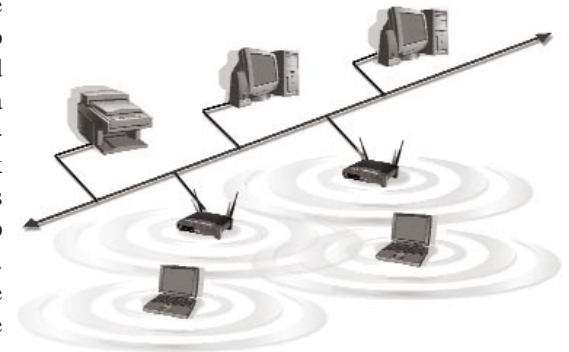


Figure 2-1

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: Getting to Know the Wireless PCI Card

The Wireless PCI Card's Port and LEDs



Figure 3-1

Port

Antenna The Antenna port is where you will connect the Card's external antenna.

LED Indicators

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

Link *Green.* The **Link** LED blinks when the Card is functioning in ad-hoc mode. It is solidly lit when the Card is functioning in infrastructure mode.

Chapter 4: Software Installation and Configuration for Windows 98, Me, and 2000

Overview

The Wireless PCI Card Setup Wizard will guide you through the installation procedure for Windows 98, Me, and 2000. The Setup Wizard will install the WLAN Monitor and Device Driver, as well as configure the Card.



Important for Windows XP users: Do NOT run the Wireless PCI Card Setup Wizard. Proceed directly to “Chapter 5: Hardware Installation.”



Important for Windows 98, Me, and 2000 users: You must run the Setup Wizard to install the software before installing the hardware.

Insert the **Setup Wizard CD-ROM** into your CD-ROM drive. The Setup Wizard should run automatically, and Figure 4-1 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 4-1

Wireless PCI Card

- **Install** - Click the **Install** button to begin the software installation process.
- **User Guide** - Click the **User Guide** button to open the PDF file of this User Guide.
- **LINKSYS Web** - Click the **LINKSYS Web** button to access the Linksys website through an active Internet connection.
- **Exit** - Click the **Exit** button to exit the Setup Wizard.

Instructions for Windows 98, Me, and 2000

1. To install the Card, click the **Install** button on the *Welcome* screen.
2. After reading the Warranty Policy, click the **Next** button if you agree, or click the **Cancel** button to end the installation.



Figure 4-2

3. The Setup Wizard will ask you to choose a wireless mode. Click the **Infrastructure Mode** radio button if you want your wireless computers to network with computers on your wired network using a wireless access point. Click the **Ad-Hoc Mode** radio button if you want multiple wireless computers to network directly with each other. Do not use the Ad-Hoc mode if you want your wireless computers to communicate with computers on your wired network.

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.

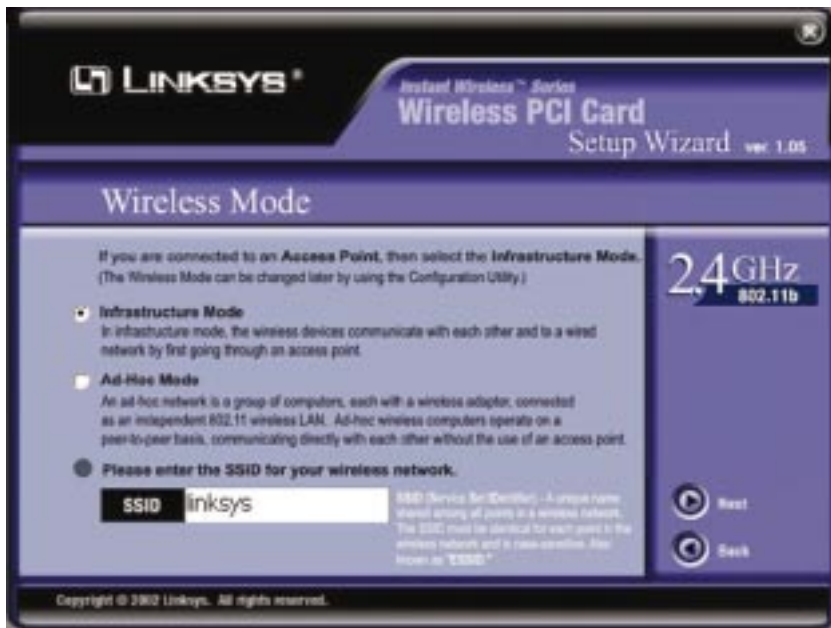


Figure 4-3

4. If you chose **Infrastructure Mode**, go to **Step 5** now. If you chose **Ad-Hoc Mode**, select the correct operating channel for your network. The channel you choose should match the channel set on the other devices in your wireless network. Click the **Next** button, and go to **Step 5**.



Figure 4-4

5. The Setup Wizard will ask you to review your settings before it starts to copy files. Click the **Next** button to save these settings, or click the **Back** button to change any settings.

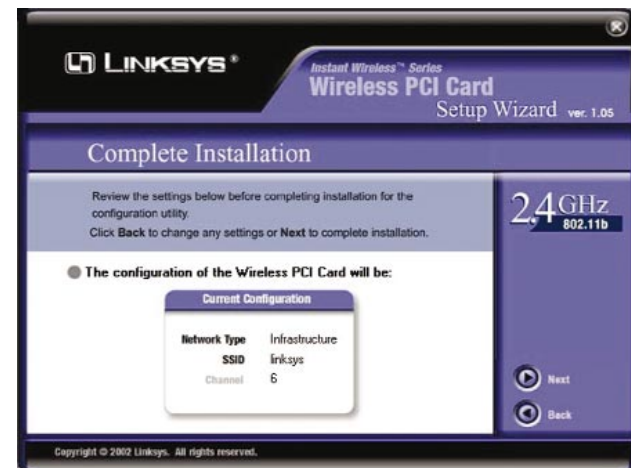


Figure 4-5

5. After the files have been successfully copied, the screen in Figure 4-6 will appear. Click the **Finish** button.



Figure 4-6

Proceed to “Chapter 5: Hardware Installation.”

Chapter 5: Hardware Installation



Important for Windows 98, Me, and 2000 users: You must run the Setup Wizard to install the software before installing the hardware.



Important for Windows XP users: You must install the Card's hardware before installing the software.

1. Remove any CDs or disks from their drives, and turn off your desktop PC.
2. Open your PC's case, and locate an available PCI slot on the motherboard. Check with your computer manufacturer for instructions.
3. Slide the Card into the PCI slot. Make sure that all of its pins are touching the slot's contacts. You may have to apply a bit of pressure to slide the Card all the way in.



Figure 5-1

4. After the Card is set firmly in place, secure its fastening tab to your PC's chassis with a mounting screw. Then close your PC's case.

5. Attach the external antenna to the Card's antenna port.



Figure 5-2



Important: Make sure the antenna is positioned straight up into the air, at a 90° angle from the Card (see Figure 5-2). This will ensure optimum wireless operating range and performance.

6. Power on your desktop PC.

If your PC is running Windows 98SE, Me, or 2000, proceed to the next section, “Hardware Detection for Windows 98SE, Me, and 2000.”

If your PC is running Windows XP, proceed to “Chapter 6: Driver Installation and Configuration for Windows XP.”

Hardware Detection for Windows 98SE, Me, and 2000

After the Card has been physically connected to your computer, Windows will detect the new hardware.

Windows will begin installing the driver files in your operating system. If Windows asks you for the original Windows CD-ROM, insert the CD-ROM, and direct Windows to the proper location for the CD-ROM (e.g., D:).

Congratulations! The installation of the Wireless PCI Card is complete.

If you want to check the link information, search for available wireless networks, or make additional configuration changes, proceed to “Chapter 7: Using the WLAN Monitor for Windows 98, Me, and 2000.”

Chapter 6: Driver Installation and Configuration for Windows XP

Overview

After connecting the Wireless PCI Card to your computer, you will install the driver and configure the Card.



Important for Windows XP users: Do NOT run the Wireless PCI Card Setup Wizard. If the Setup Wizard runs automatically after the Setup Wizard CD-ROM has been inserted, click the **Exit** tab.

Driver Installation for Windows XP

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



Figure 6-1

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



Figure 6-2

You have now completed the driver installation for the Wireless PCI Card. To configure the Card, 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 Card.

- After installing the Card, the Windows XP Wireless Zero Configuration icon will appear in your computer's system tray (see Figure 6-3). Double-click the icon.



Figure 6-3

- The screen that appears will show any available wireless network. Select a network, and then click the **Connect** button.

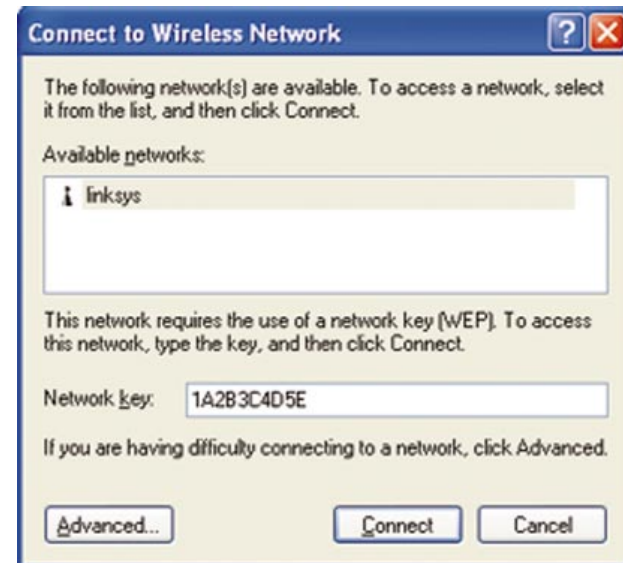


Figure 6-4

3. If your access point has WEP encryption enabled, the screen in Figure 6-5 will appear. Enter the WEP key of your wireless network in the *Network key* field. Click the **Connect** button.



Note: Windows XP does not support the use of a passphrase. Enter the exact WEP key used by your access point.

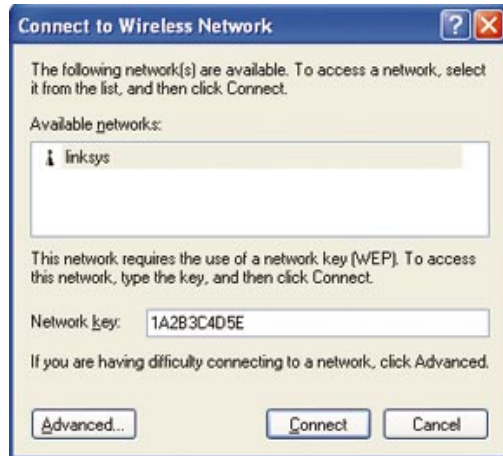


Figure 6-5

To find the WEP encryption key settings of the other wireless devices in your network, such as the WAP11 Wireless Access Point, you may use any device's web-based utility to check the WEP encryption screen for the correct key entries. If you are using other manufacturers' access points, refer to their documentation for more information about WEP encryption.

4. The screen in Figure 6-6 will appear if your connection is active.



Figure 6-6

For more information about WEP, refer to your access point's user guide, or visit www.linksys.com.

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 Wireless PCI Card is complete.

Chapter 7: 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 Card. See “Chapter 6: Driver Installation and Configuration for Windows XP.”

Starting the WLAN Monitor

After installing the Card, the Wireless PCI Card WLAN Monitor icon will appear in your system tray. Double-click the icon (see Figure 7-1).



Figure 7-1

The *Link Information* screen will appear, displaying the settings for your current wireless connection. To search for available wireless networks, click the **Site Survey** tab. To perform configuration changes, click the **Profiles** tab.

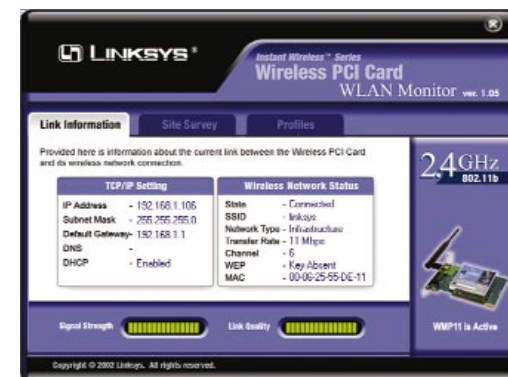


Figure 7-2

Link Information

The *Link Information* screen shows you the settings of your current connection.

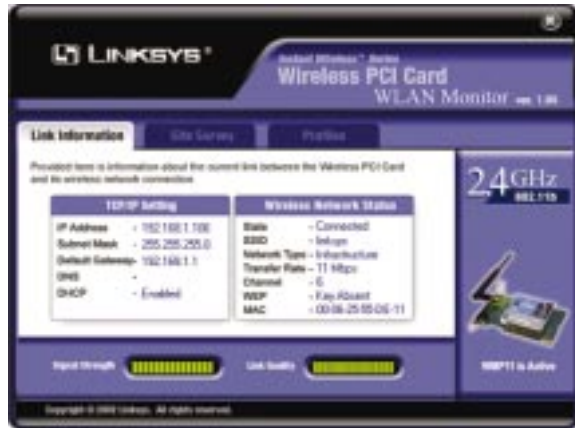


Figure 7-3

TCP/IP Setting

IP Address - The IP Address of the Card.

Subnet Mask - The Subnet Mask of the Card.

Default Gateway - The Default Gateway address of the Card.

DNS - The DNS address of the Card.

DHCP - The status of the DHCP client.

Wireless Network Status

State - The status of the wireless network connection.

SSID - The SSID of the wireless network.

Network Type - The wireless mode currently in use.

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.

Signal Strength - The Signal Strength bar indicates signal strength, from 0 to 100%.

Link Quality - The Link Quality bar indicates the quality of the wireless network connection, from 0 to 100%.

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

Site Survey

The *Site Survey* screen displays a list of infrastructure and ad-hoc networks available for connection.

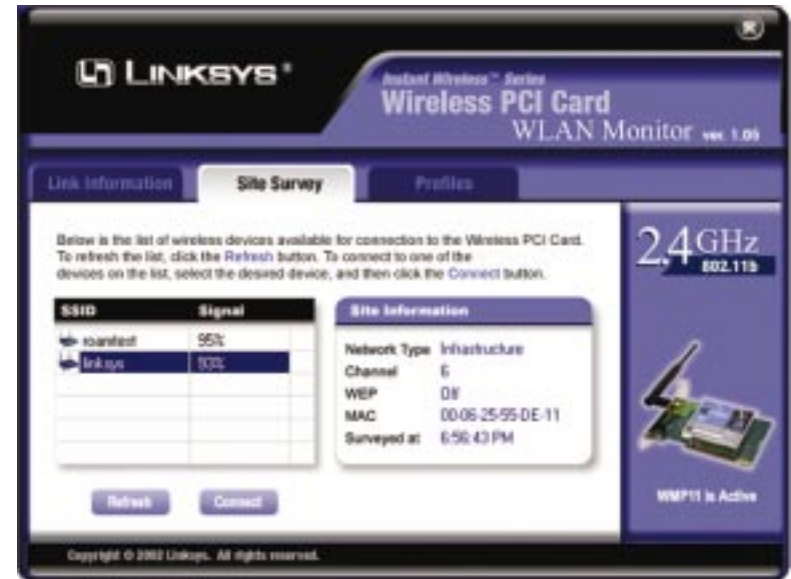


Figure 7-4

SSID - The SSID of the wireless network.

Signal - The percentage of signal strength, from 0 to 100%.

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 to connect. If the wireless network has WEP encryption enabled, you will see the screen shown in Figure 7-5.

Security Settings (Optional)

Wired Equivalent Privacy (WEP) is an encryption method used to secure your wireless network. A higher level of encryption is more secure. To use WEP, you must use the same WEP Key or Passphrase that your wireless network uses.

WEP Disabled

If your wireless network uses a passphrase, enter the passphrase here. Note that the passphrase is case-sensitive and should not be longer than 16 alphanumeric characters.

Passphrase

OR

If your wireless network uses a WEP key, enter the same WEP key here.

Key 1

OK Cancel

Figure 7-5

In the *WEP* drop-down box, select the type of WEP encryption used by the wireless network: **64-bit** or **128-bit WEP**.

If the wireless network uses a passphrase, enter the passphrase in the *Passphrase* field. If the wireless network uses a WEP key, enter the WEP key in the *Key 1* field.

Click the **OK** button to complete the network connection and return to the *Site Survey* screen, or click the **Cancel** button to cancel the network connection and return to the *Site Survey* screen.

On the *Site Survey* screen, click the **X** (Close) button in the upper right corner to exit the WLAN Monitor.

Profiles

The *Profiles* screen lets you save different configuration profiles for different network setups. You can also import or export profiles. The default profile holds the initial configuration saved when you installed the Card.

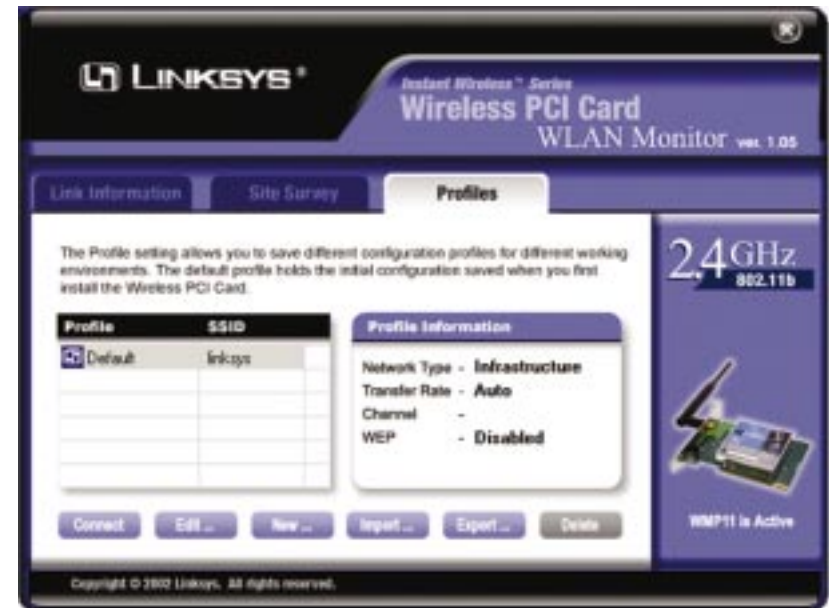


Figure 7-6

Profile - Name of the connection profile.

SSID - The wireless network's SSID, as set in the connection profile.

Profile Information

Network Type - The wireless mode currently in use.

Transfer Rate - The data transfer rate of the current connection: *1Mbps*, *2Mbps*, *1 or 2Mbps*, *5.5Mbps*, *11Mbps*, or *Auto* (in *Auto* mode, the Card dynamically shifts 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, and click the **Connect** button. If the wireless network has WEP encryption enabled, you will see the screen shown in Figure 7-7.

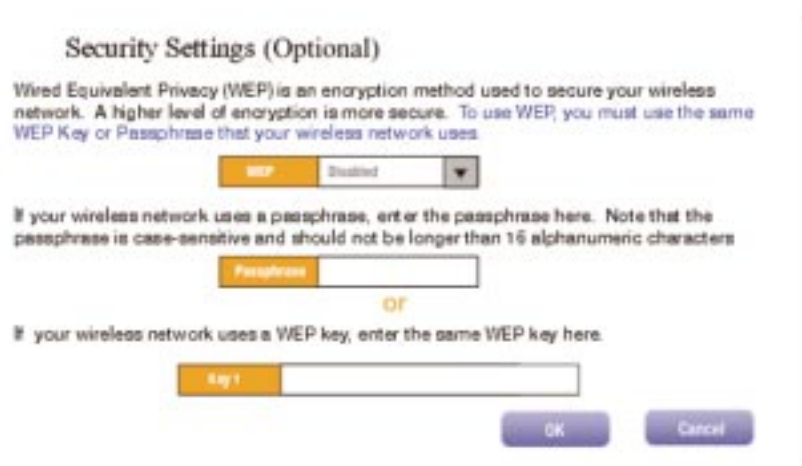


Figure 7-7

In the *WEP* drop-down box, select the type of WEP encryption used by the wireless network: **64-bit** or **128-bit WEP**.

If the wireless network uses a passphrase, enter the passphrase in the *Passphrase* field. If the wireless network uses a WEP key, enter the WEP key in the *Key 1* field.

Click the **OK** button to complete the network connection and return to the *Profiles* screen, or click the **Cancel** button to cancel the network connection and return to the *Profiles* screen.

Edit - Select a profile, 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, and click the **Open** button.

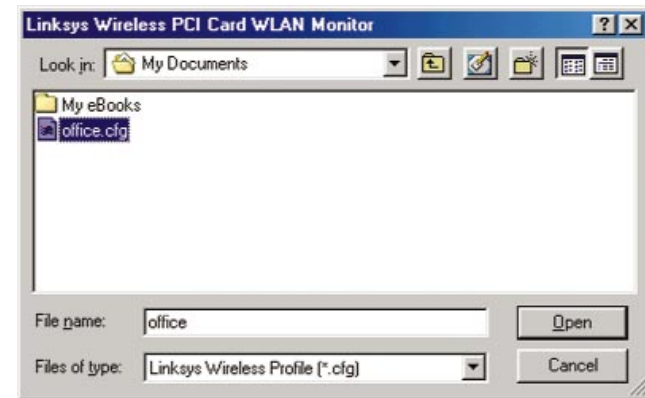


Figure 7-8

- **Export** - Select the profile you want to save in a different location, and click the **Export** button. Direct Windows to the appropriate folder, and click the **OK** button.

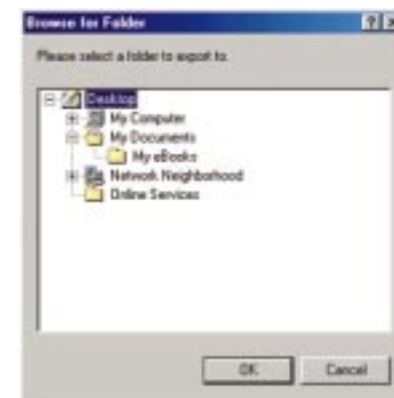


Figure 7-9



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

- **Delete** - 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

There are two ways to create a new profile. You will be asked if you want to use the Profile Wizard or Expert Mode. If you want to be guided through all the steps, choose the **Profile Wizard**, and proceed to *step 1*. If you are an advanced user knowledgeable about wireless networking, choose **Expert Mode**, and proceed to the next section, “Using Expert Mode.”

1. On the *Profiles* screen, click the **New** button to create a new profile.
2. Enter a name for the new profile.



Figure 7-10

3. Select **Profile Wizard**, and click the **Next** button.

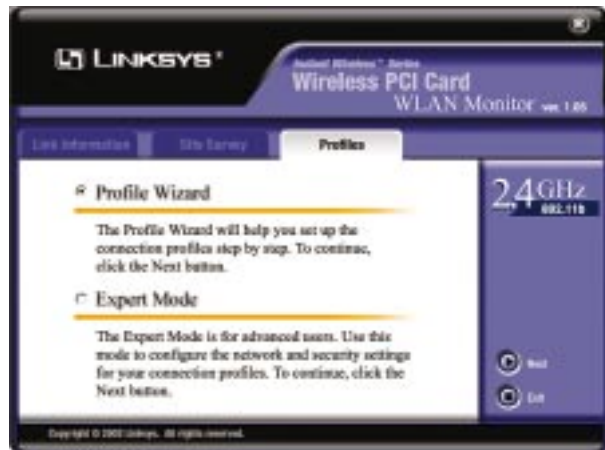


Figure 7-11

4. The *Choose a network type* screen shows a choice of two wireless modes. Click the **Infrastructure Mode** radio button if you want your wireless computers to communicate with computers on your wired network via a wireless access point. Click the **Ad-Hoc Mode** radio button if you want multiple wireless computers to communicate directly with each other. Click the **Next** button to continue or the **Back** button to return to the previous screen.

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.

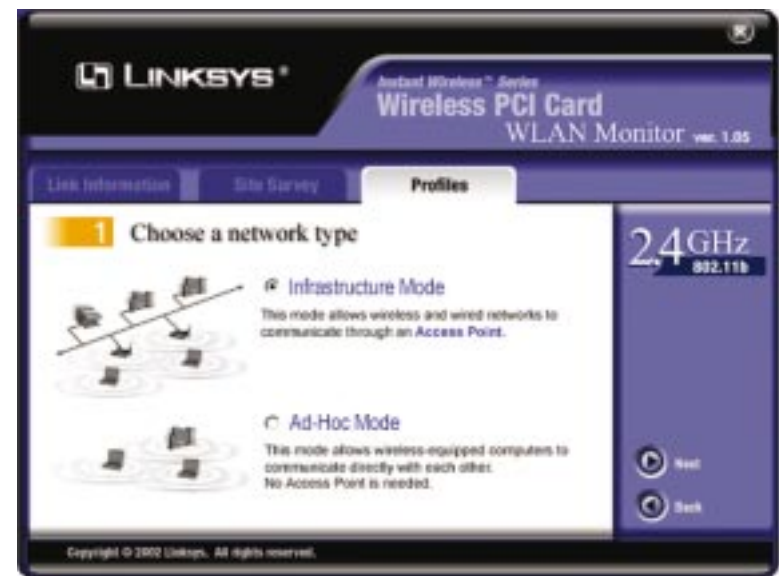


Figure 7-12

- The *Basic Settings* screen will now appear. Enter your wireless network's **SSID**. Select the **Transfer Rate** to determine the speed(s) at which the Card will send and receive data. Select the **Channel** at which the network broadcasts its wireless signal (available only for Ad-Hoc Mode). Then click the **Next** button to continue or the **Back** button to return to the previous screen.

SSID - The SSID is the unique name shared 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.

Transfer Rate - Select the data transfer rate for your wireless connection. Choose from **1Mbps**, **2Mbps**, **1 or 2Mbps**, **5.5Mbps**, **11Mbps**, or **Auto**. When you select *Auto*, the Card dynamically shifts to the fastest data transfer rate possible at any given time.

Channel - From the drop-down box, select the appropriate channel that corresponds with your network settings. All devices in your wireless network must use the same channel in order to function correctly.

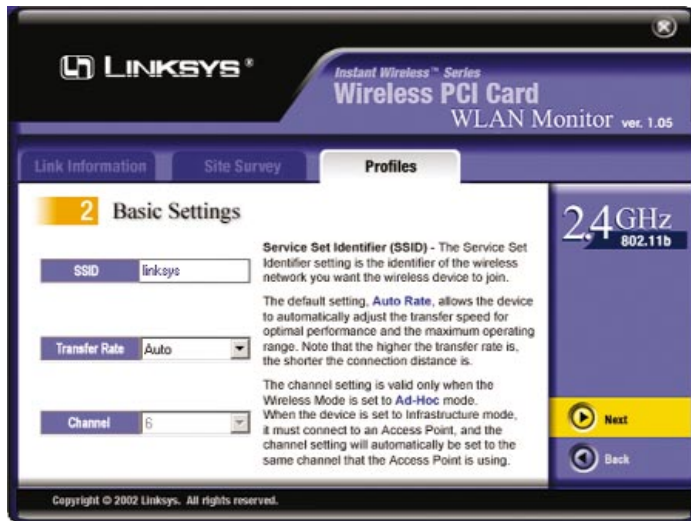


Figure 7-13

- The *Network Setting* screen will appear next. 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 or the **Back** button to return to the previous screen. Then go to *step 8*.

If your network does not have a DHCP server, click the radio button next to **Specify the IP address**. Click the **Next** button to continue or the **Back** button to return to the previous screen. Then go to *step 7*.

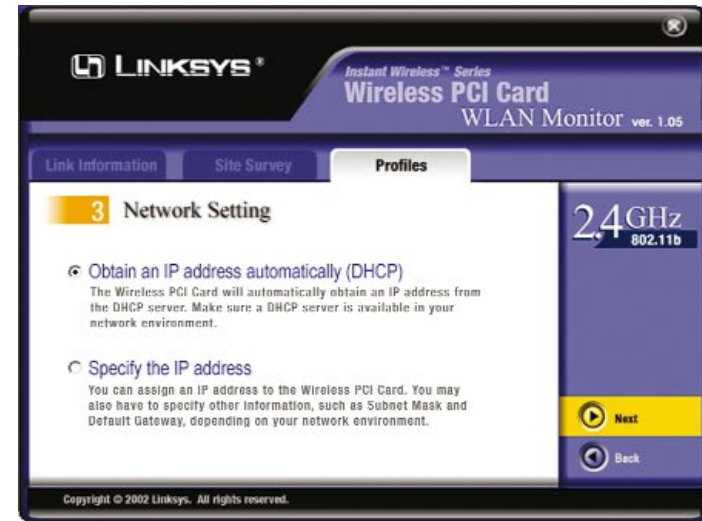


Figure 7-14

7. The *Network Setting - Specify IP address* screen will appear next. 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 address, then leave these fields alone. Click the **Next** button to continue or the **Back** button to return to the previous screen.

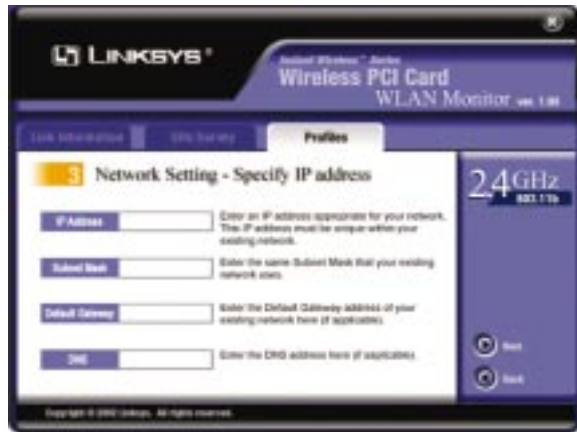


Figure 7-15

IP Address - This IP Address must be unique to your network. Enter the IP Address in this format: **xxx.xxx.xxx.xxx** (the x's represent your actual IP Address).

Subnet Mask - The Adapter's Subnet Mask must be the same as your wired network's Subnet Mask. Enter the Subnet Mask in this format: **xxx.xxx.xxx.xxx** (the x's represent your actual Subnet Mask).

Default Gateway - Enter the IP address of your network's Gateway here. Enter the Default Gateway in this format: **xxx.xxx.xxx.xxx** (the x's represent your actual Default Gateway).

DNS - Enter the DNS address of your Ethernet (wired) network here. Enter the DNS address in this format: **xxx.xxx.xxx.xxx** (the x's represent your actual DNS address).

8. The *Security Settings* screen will appear next. Set the Wired Equivalent Privacy (WEP) encryption for your wireless network by selecting a WEP configuration method.



Figure 7-16

WEP (Disabled/64-bit WEP/128-bit WEP) - If you do not want to use WEP encryption, choose **Disabled**. Then click the **Next** button to continue or the **Back** button to return to the previous screen.

To use WEP encryption, select **64-bit** or **128-bit WEP** from the drop-down menu (recommended).

If you select 64-bit or 128-bit WEP, you have two choices. Enter the passphrase of your wireless network in the *Passphrase* field, or enter the WEP key of your wireless network in the *Key 1* field. Click the **Next** button to continue or the **Back** button to return to the previous screen.

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

Key 1 - This WEP key must match the WEP key of your wireless network. If you are using 64-bit WEP encryption, then the key must consist of exactly **10** hexadecimal characters in length. If you are using 128-bit WEP encryption, then the key must consist of exactly **26** hexadecimal characters in length. Valid hexadecimal characters are "0" to "9" and "A" to "F".

9. The *Confirm New Settings* screen will appear next. The former and new settings are shown. To save the new settings, click the **Yes** button. To cancel the settings and return to the *Profiles* screen, click the **No** button. To edit the new settings, click the **Back** button.



Figure 7-17

10. 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 7-18

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

Using the Expert Mode

1. On the *Profiles* screen, click the **New** button to create a new profile.
2. Enter a name for the new profile.



Figure 7-19

2. Choose **Expert Mode**. Then click the **Next** button.

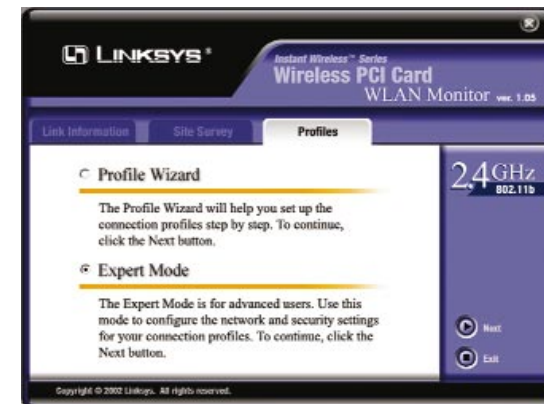


Figure 7-20

3. The *Profile - Basic Setting* screen will appear. Configure the basic network type and wireless connection setting on this screen.

Network Type

Infrastructure Mode - Click the **Infrastructure Mode** radio button if you want your wireless computers to communicate with computers on your wired network using a wireless access point. Click the **Power-Saving Mode** button if you want the Card to enter sleep mode when the wireless connection is inactive.

Ad-Hoc Mode - Click the **Ad-Hoc Mode** radio button if you want multiple wireless computers to communicate directly with each other.

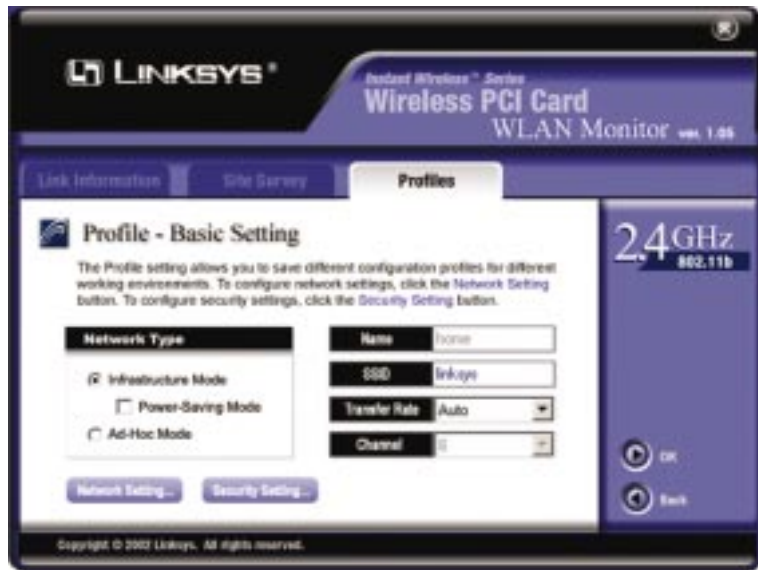


Figure 7-21

Name - The profile's Name is automatically displayed.

SSID - Enter your wireless network's SSID.

Transfer Rate - Select the **Transfer Rate** for your wireless connection. Choose from **1Mbps**, **2Mbps**, **1 or 2Mbps**, **5.5Mbps**, **11Mbps**, or **Auto**. When you select *Auto*, the Adapter dynamically shifts to the fastest data transfer rate possible.

Channel - Select the **Channel** at which the network broadcasts its wireless signal (available only for Ad-Hoc Mode).

Network Setting - Click the **Network Setting** button to configure network settings.

Security Setting - Click the **Security Setting** button to configure security settings.

Click the **OK** button to save the profile you have configured. Click the **Back** button to return to the *Profiles* screen.

- Click the **Network Setting** button, and the *Profile - Network Setting* screen will appear. Select the appropriate settings for the Card's network.

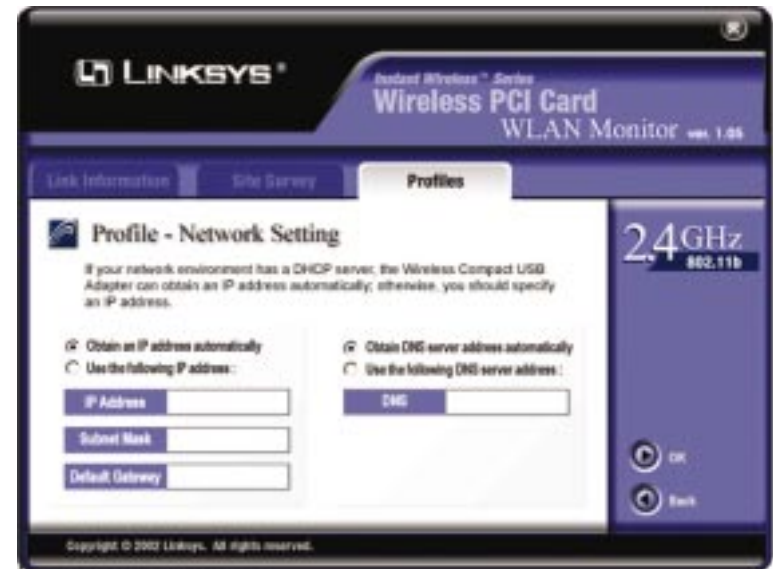


Figure 7-22

Obtain an IP address automatically - If your network has a DHCP server, click the radio button next to **Obtain an IP address automatically (DHCP)**.

Use the following IP address - If your network does not have a DHCP server, click the radio button next to **Use the following IP address**. Enter the **IP Address**, **Subnet Mask**, and **Default Gateway** appropriate for your network.

Obtain DNS server address automatically - Select this feature if you want the Card to automatically get a DNS server address.

Use the following DNS server address - Select this feature if you want to specify a DNS server address. Enter the DNS server address in the field provided.

Click the **OK** button to save the settings and return to the *Profile - Basic Setting* screen. Click the **Back** button to cancel the settings and return to the *Profile - Basic Setting* screen.

- Click the **Security Setting** button, and the *Profile - Security Setting* screen will appear. Set the Wired Equivalent Privacy (WEP) encryption for your wireless network by selecting a WEP encryption method.

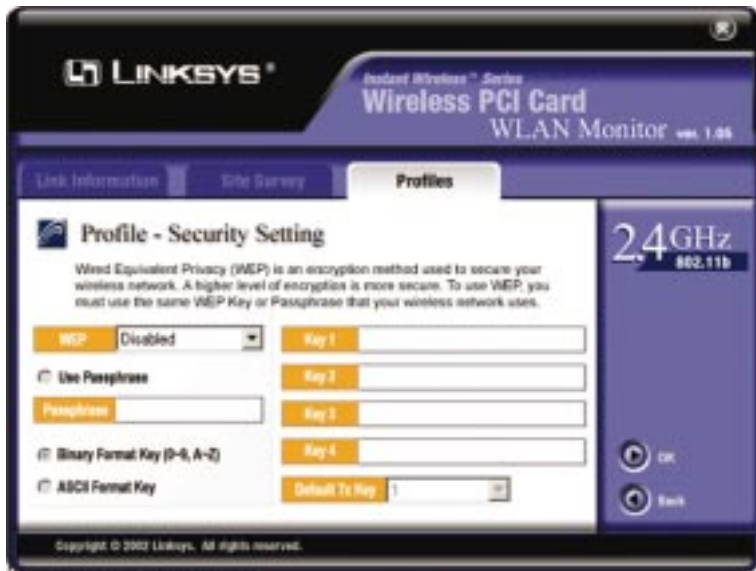


Figure 7-23

WEP (Disabled/64-bit WEP/128-bit WEP) - If you do not want to use WEP encryption, choose **Disabled**.

To use WEP encryption, select **64-bit** or **128-bit WEP** from the drop-down menu. The Card's WEP encryption is unique to Linksys and may conflict with other manufacturers' WEP encryption.

If you select 64-bit or 128-bit WEP, you have two ways to generate WEP key(s), entering a passphrase or entering manual WEP key(s).

Passphrase - Click **Use Passphrase**, and enter the passphrase of your wireless network in the *Passphrase* field. The WEP key(s) will be automatically generated.

Key 1-4 - Enter the WEP key(s) of your wireless network in the *Key* fields. Specify the format of your WEP key(s) by selecting **Binary Format Key** or **ASCII Format Key**.

Default Tx Key - In the drop-down box provided, select the WEP key you want to use as the default.

Click the **OK** button to save the settings and return to the *Profile - Basic Setting* screen. Click the **Back** button to cancel the settings and return to the *Profile - Basic Setting* screen.

- On the *Profile - Basic Setting* screen, click the **OK** button to save the profile you have configured.
- The *Confirm New Settings* screen will appear next and display the old and new settings. To save the new settings, click the **Yes** button. To cancel the new settings, click the **No** button and return to the *Profiles* screen. To edit the new settings, click the **Back** button to return to the previous screen.



Figure 7-24

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



Figure 7-25

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

Common Problems and Solutions

This chapter provides solutions to problems that may occur during the installation and operation of the Wireless PCI Card. Read the descriptions below to solve your problems. If you can't find an answer here, check the Linksys website at www.linksys.com.

1. The Wireless PCI Card does not work properly.
 - Reinsert the Card into the PC's PCI slot.
 - For Windows 98 or Me, right-click **My Computer**, and select **Properties**. Select the **Device Manager** tab, and select the Card. You will find the Card if it has been installed successfully. If you see a yellow exclamation mark, the resources may be in conflict, and you must follow the steps below:
 - Uninstall the driver software from your PC.
 - Restart your PC and repeat the hardware and software installation as specified in this User Guide.
2. I cannot communicate with a wired computer linked via an access point in the infrastructure configuration.
 - Make sure that the notebook or desktop PC is powered on.
 - Make sure that the Wireless PCI Card is configured with the same channel, SSID, and WEP encryption as the other computers in the infrastructure LAN.

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 802.11b standard?
It is one of the IEEE standards for wireless networks. The 802.11b standard allows wireless networking hardware from different manufacturers to communicate, provided that the hardware complies with the 802.11b standard. The

802.11b standard states a maximum data transfer rate of 11Mbps and an operating frequency of 2.4GHz.

What IEEE 802.11b features are supported?

The product supports the following IEEE 802.11b functions:

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

What is ad-hoc mode?

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

What is infrastructure mode?

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

What is roaming?

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

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

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

What is ISM band?

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

What is Spread Spectrum?

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

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

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

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 fea-

ture of scrambling. On the software side, WLAN offers the encryption function (WEP) to enhance security and access control.

Can Instant Wireless products support printer sharing?

Instant Wireless products perform the same function as LAN products. Therefore, Instant Wireless products can work with NetWare, Windows NT/2000, or other 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

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

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

CTS (Clear To Send) - An RS-232 signal sent from the receiving station to the transmitting station that indicates it is ready to accept data.

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

DHCP (Dynamic Host Configuration Protocol) - A protocol that lets network administrators 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 names are located and translated into Internet Protocol (IP) addresses. A domain name is a meaningful and easy-to-remember “handle” for an Internet address.

DSSS (Direct-Sequence Spread Spectrum) - DSSS generates a redundant bit pattern for all transmitted data. This bit pattern is called a chip (or chipping code). Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the receiver can recover the original data without the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers. However, to an intended receiver (i.e. another wireless LAN endpoint), the DSSS signal is recognized as the only valid signal, and interference is inherently rejected (ignored).

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

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

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

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

The IEEE fosters the development of standards that often become national and international standards. The organization publishes a number of journals, has many local chapters, and 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 (BSS). A set of two or more BSS in a single network is referred to as an Extended Service Set (ESS). Infrastructure mode is useful at a corporation scale, or when it is necessary to connect the wired and wireless networks.

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

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

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

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

MAC Address - The MAC (Media Access Control) address is your computer’s unique hardware number.

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

Network Mask - also known as the “Subnet Mask.”

Plug-and-Play - The ability of a computer system to configure expansion boards and other devices automatically without requiring the user to turn off the system during installation.

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.

SSID (Service Set Identifier) - An identification name that wireless devices use to make connections. In order for wireless devices to communicate, they must all be set to the same channel and they all must use the same SSID. For instance, if you are using an access point to connect two computers using wireless devices, the access point and each of the wireless devices must use the same SSID. Even if they are set to the same channel, they cannot communicate unless the SSID is the same.

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

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

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

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

UDP (User Datagram Protocol) - A method (protocol) used along with the IP (Internet Protocol) to send data in the form of message units (datagram) between network devices over a LAN or WAN. While IP takes care of handling the actual delivery of the data (routing), UDP takes care of keeping track of the individual units of data (called packets) that a message is divided into for effi-

cient delivery over the network. UDP is known as a "connection-less" protocol due to NOT requiring the receiver of a packet to return an acknowledgment of receipt to the sender of the packet (as opposed to TCP).

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

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

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

Appendix C: Specifications

Model Number	WMP11 ver. 2.7
Standards	IEEE 802.11b
Channels	11 Channels (USA) 13 Channels (Europe) 14 Channels (Japan)
Port	One Antenna
Transmit	15 dBm
Receive Sensitivity	-82 dBm
Modulation	BPSK, QPSK, CCK
Network Protocols	IPX/SPX, TCP/IP, NetBEUI
LEDs	Power, Link

Environmental

Dimensions	5.25" x 4.76" x 0.75" (133 mm x 121 mm x 19 mm)
Unit Weight	3.2 oz. (0.09 kg)
Power	3.3 or 5V DC
Certifications	FCC Class B, Wi-Fi, CE
Operating Temp.	32°F to 131°F (0°C to 55°C)
Storage Temp.	-4°F to 158°F (-20°C to 70°C)
Operating Humidity	0% to 90%, Non-Condensing
Storage Humidity	0% to 95%, 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 Wireless PCI Card, contact Linksys Technical Support at one of the phone numbers or Internet addresses below.

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



<http://www.linksys.com>

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