

11Mbps Wireless LAN Card

User's Manual

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About This Manual

This manual was written for the following types of wireless adapter:

- Mini PCI Wireless LAN Card
- PCMCIA Wireless LAN Card

For brevity, throughout this manual **Wireless LAN Card** is used to indicate the **11Mbps Mini PCI Wireless LAN Card/ PCMCIA Wireless LAN Card**. Also, the following terms/abbreviations are used interchangeably:

- Base Station – Access Point – AP
- Peer-to-Peer – Ad Hoc
- Wireless LAN – WLAN
- Ethernet network – LAN – network

This User's Manual contains information on how to install and configure your Wireless LAN Card. From now on, we will guide you through the correct configuration steps to get your device up and run.

Chapter 1 Introduction

This Wireless LAN Card is an IEEE 802.11b wireless LAN adapter. It allows your computer to connect to a wireless network and to share resources, such as files or printers without being bound to the network wires. Operating in 2.4GHz Direct Sequence Spread Spectrum (DSSS) radio transmission, the Wireless LAN Card transfers data at speeds up to 11Mbps. Both Peer-to-Peer Group (also referred to as Ad-Hoc mode) and Base Station connection (also referred to as Infrastructure mode) are supported. For network security concern, 64/128-bit Wired Equivalent Protection (WEP) algorithm is used. In addition, its standard compliance ensures that it can communicate with any 802.11b networks.

Wireless LAN Basics

This section conations some Wireless LAN basics to help you better understand how the product work together to create a wireless network.

Local Area Network (LAN)

Simply put, a LAN is a network that exists in a relatively limited area. A network is two or more computers connected together sharing files and peripheral devices such as printers.

The Wireless LAN Card allows you to interact with other computers without having to run cables normally associated with networks. This lets you move your computer around while staying connected to your network.

There are two ways to use the Wireless LAN Card. One way is to connect directly to one or more Wireless LAN Card equipped computers, forming a Peer-to-Peer (Ad-Hoc) wireless network. The second way is to connect to a Base Station (Access Point) that gives you access to an existing wired LAN, forming an Infrastructure wireless network.

Ad-Hoc Mode

Ad-Hoc mode offers peer-to-peer connections between workstations, allowing communication between computers within range that have an 802.11b DSSS compatible PC card installed. A wireless Peer-to-Peer Group can also access a wired LAN's TCP/IP service (such as e-mail and the Internet) by using a TCP/IP software router on an Ethernet equipped PowerBook or notebook.

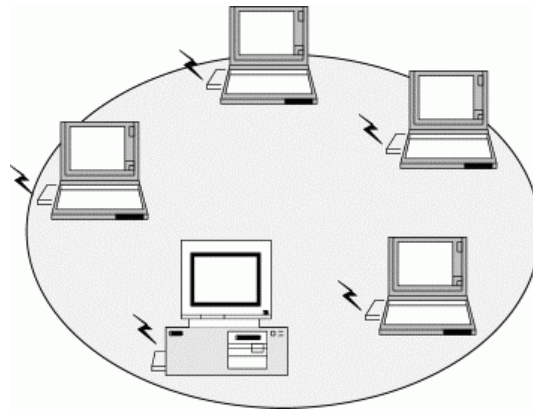


Figure 1-1 Ad-Hoc Mode

Infrastructure Mode

The Infrastructure network uses a Base Station (access point) or several Base Stations as a gateway, linking the wireless network to a wired LAN. As a result, portable workstations or desktops on your wireless network have access to all of the features of your wired LAN including e-mail, Internet access, network printers and files server.

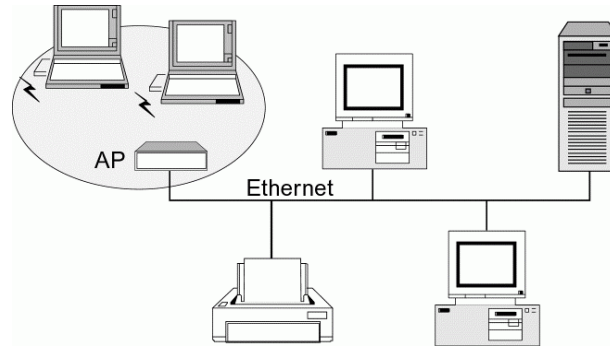


Figure 1-2 Infrastructure Mode

Roaming

Multiple Base Stations (Access Points) can be installed to extend the wireless service coverage area for seamless wireless access. Within an extended service area, all Base Stations and wireless clients must have the same Service Set Identity (SSID). Roaming among different Access Points is controlled automatically to maintain the wireless connectivity at all times.

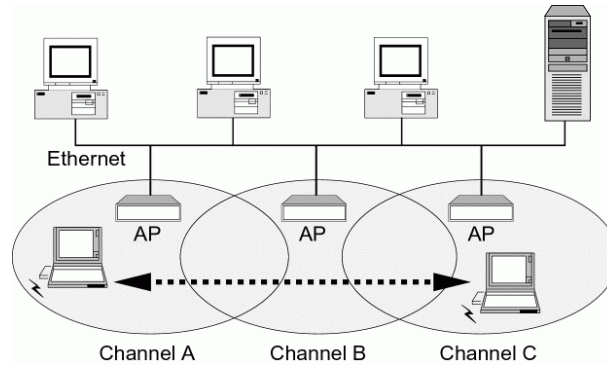


Figure 1-3 Roaming Across Multiple Access Points

Chapter 2 Installing the Wireless LAN Card

This chapter describes the installation process for the driver and software for the Wireless LAN Card. Proper driver installation is to allow the device to operate on your host computer while the utility software, **Wireless LAN Monitor Utility**, is to help you configure and monitor your Wireless LAN Card.

After completing the steps listed above, if you need to set up the TCP/IP protocol for the Wireless LAN Card to communicate with your network, refer to “

Appendix C Setting Up TCP/IP” for details.

System Requirements

To use the Wireless LAN Card, your computer must meet the following minimum requirements:

- Pentium-class PC, 300MHz or better recommended
- 64 Mbytes recommended
- Hard disk space at least 30 Mbytes
- PCMCIA slot (for PCMCIA type Wireless LAN Card)
- UL listed I.T.E. computers

Installing Wireless LAN Card Driver and Software

Follow these steps to install the Wireless LAN Card driver and software.

Notes:

For Mini PCI Wireless LAN Card:

a. Your notebook is probably shipped with Wireless LAN Card and its driver and software properly installed. If this is the case, ignore this chapter and proceed with the configuration steps in the next chapter.

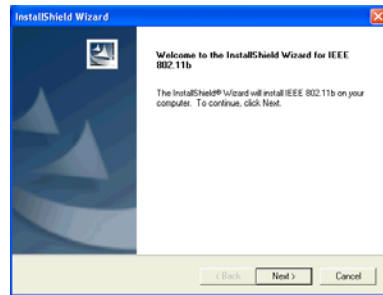
b. If your system has not been installed with the driver, the Windows PnP function will detect the wireless adapter and issue a dialog box requesting for its driver. Click **Cancel** to quit the wizard at this point.

For PCMCIA Wireless LAN Card:

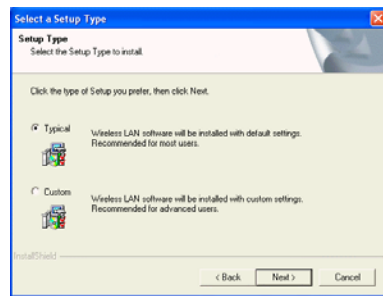
Do not insert the Wireless LAN Card device to your laptop's PCMCIA slot before installing its driver. If this happens, the Windows PnP function will detect the PCMCIA device and issue a dialog box requesting for its driver. Click **Cancel** to quit the wizard and remove the Wireless LAN Card.

1. Close all Windows programs that are running.

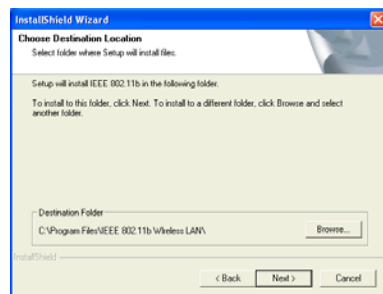
2. Insert the provided Software Utility CD into your CD-ROM drive and select **Utility&Driver**. Or, run **Setup.exe** from **D:\Utility&Driver** folder of the Software Utility CD where **D** is the drive letter. When the welcome screen pops up, click **Next**.



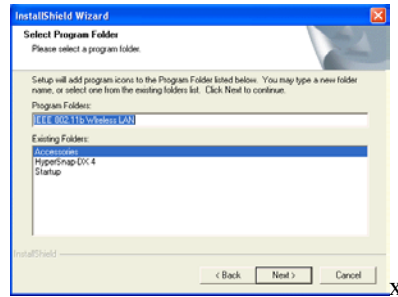
3. For quick installation, select **Typical** and click **Next**. Then skip to step 10. For custom installation (to select the parameters that you would like to use), select **Custom** and click **Next** to go to next step.



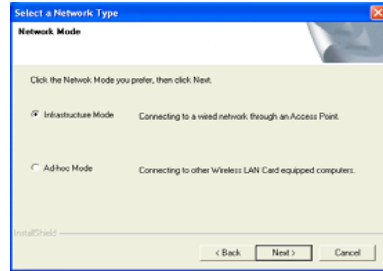
4. To install the software to the default destination folder, click **Next**. If you are to install the software to a different folder, click **Browse** to select another folder, and then click **Next**.



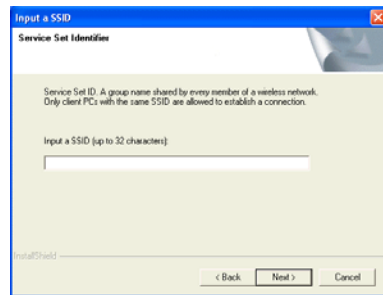
5. If required, you may type a new folder name for the program icons to be added to the Program Folder. Then click **Next** to continue.



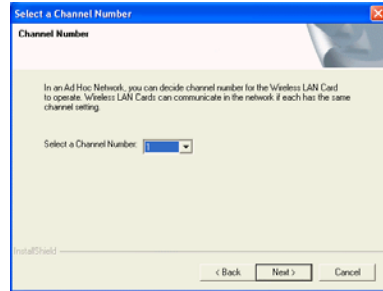
6. Select the network type you prefer and then click **Next**.



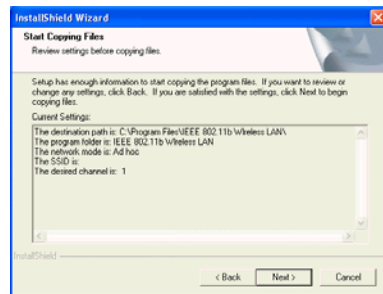
7. Enter the SSID of the wireless network you wish to connect to. Then click **Next**.



8. This step is for Ad Hoc network type only. For Ad Hoc mode network, specify a channel number for the Wireless LAN Card.



9. If the settings listed are correct, click **Next**. Otherwise, click **Back** to modify your settings.



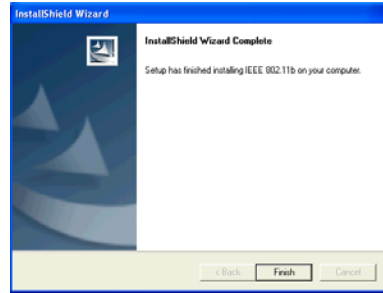
10. For PCMCIA wireless adapter only, the following screen will pop up asking you to insert your wireless adapter into the PCMCIA slot of your computer. Please do as the dialog request.



For Windows 98(SE)

The system will find the Wireless LAN Card and you will be prompted for Windows 98 CD. Click **OK**. Then enter the path to your Windows 98(SE) CD files (if Windows 98 CD files are not in your host computer, remove the Software Utility CD and insert the Windows 98 CD into your CD-ROM at this step) and click **OK**.

11. Click **Finish**.



For PCMCIA adapter users, the installation is complete.

For Mini PCI adapter users, just follow the instructions below to complete the installation process.

For Windows XP and 2000 users, the installation is complete.

For Windows 98(SE) and Windows ME users, the system will reboot after you click **Finish** at step 11. Just follow the on-screen instructions as described below to complete the installation.

Windows 98(SE)

1. After reboot, the system will find the Wireless LAN Card and you will be prompted for Windows 98 CD. Click **OK**. Then enter the path to your Windows 98(SE) CD files (if Windows 98 CD files are not in your host computer, remove the Software Utility CD and insert the Windows 98 CD into your CD-ROM at this step) and click **OK**.
2. You will be prompted to restart your computer, click **Yes**.

Windows ME

After reboot, Windows will continue the installation process and you will be prompted to restart your computer again, click **Yes**.

Note: If you need to set up the TCP/IP address or the subnet mask, refer to “

Appendix C "Setting Up TCP/IP" for details.

Now you are done with the installation procedure. You should be able to see the **Wireless LAN Monitor** icon appearing on the right side of the taskbar. Proceed to next chapter to configure or fine-tune your Wireless LAN Card settings.

Chapter 3 Wireless LAN Monitor Utility

The configuration of the Wireless LAN Card is done through the **Wireless LAN Monitor Utility**. This utility also includes a number of tools to display current statistics and status information pertaining to your Wireless LAN Card and to perform link test. See the appropriate subsection as required.

Accessing the Wireless LAN Monitor Utility

The **Wireless LAN Monitor Utility** is launched automatically with its monitor icon located on the system tray. If the utility is not launched, manually start it by selecting **Start > Programs > IEEE 802.11b Wireless LAN > IEEE 802.11b Wireless LAN Utility**.

To access the **Wireless LAN Monitor Utility**, you can take any of the following methods:

- Double-click the **Wireless LAN Monitor** icon on the system tray



- Right-click the tray icon and select the desired tab from the context menu.

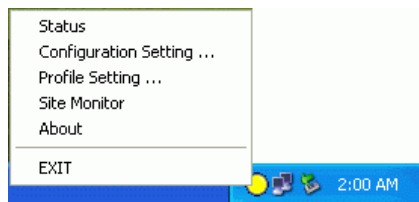


Figure 3-1 Wireless LAN Monitor Tray Icon Menu

When the **Wireless LAN Monitor Utility** screen pops up, it displays the current active configuration profile and its connection status.

In addition, you can find the following buttons in any tab which perform the self-explanatory tasks:

- **Radio Enable/Disable:** Allows to enable/disable the RF signal.
- **Exit:** Hide the **Wireless LAN Monitor Utility** user interface.

Note to Windows XP Users

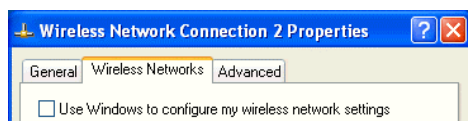
Under Windows XP, if you are launching the **Wireless LAN Monitor Utility** for the first time, you will find that you are only allowed to view the **Status** and **About** tabs. This is because the Windows XP built-in **Wireless Zero Configuration Utility** overrides the management of your Wireless LAN Card.

If you want to disable the Windows XP **Wireless Zero Configuration Utility** and have your device managed by the **Wireless LAN Monitor Utility**, proceed as follows:

1. Double-click the Windows XP wireless tray icon and then click **Advanced (or Properties) > Wireless Networks**.



2. On the **Wireless Networks** tab, uncheck the **Use Windows to configure my wireless network settings** box and click **OK**.



If you need to revert back to using Windows XP **Wireless Zero Configuration Utility**, just go to the **Wireless Networks** tab and check the **Use Windows to configure my wireless network settings** box and click **OK**.

Status Tab

The **Status** tab contains general information about the connection and activity of your current connection. The following table describes the items found on the **Status** screen.

Screen Item	Description
Current Profile	Name of your current settings.
SSID	Displays the name of the wireless network your station is currently connected to.
Network Mode	Infrastructure or Ad-Hoc (peer-to-peer).
Channel	Shows which channel is current in use.
Tx Rate	Transmission rate at which data is transferred.
Privacy	WEP enabled or disabled.
Power Saving	Displays whether power consumption is enabled by the Wireless LAN Card to extend the battery life of your notebook.
Send	Number of packets sent.
Received	Number of packets received.
Link Status	Displays whether your Wireless LAN Card is connected or disconnected.
Signal Strength	Displays the signal strength in dbm and in graphic (only in infrastructure mode).

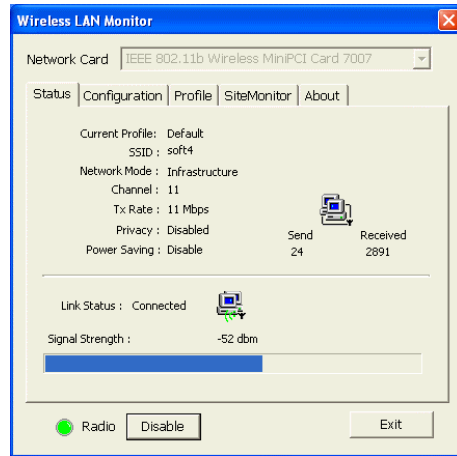


Figure 3-2 Wireless LAN Monitor Utility – Status

Configuration Tab

The **Configuration** tab allows you to configure the parameters for the current connection or the new one that you wish to connect to.

Screen Item	Description
Network Name	<p>Enter the name of the WLAN group you want to participate in.</p> <p>For Ad Hoc mode: A network name is mandatory. The SSID for all stations in a single Ad Hoc network must be same.</p> <p>For Infrastructure mode: Enter the Network Name you wish to join in. If the this field is left blank, your Wireless LAN Card will connect to the first compatible and “open” AP with the best signal strength within the connection range. It allows your Wireless LAN Card to wander across networks with different SSID (Network Name).</p>
Operating Mode	Select your operation mode as Infrastructure or Ad-Hoc (peer-to-peer).
Transmit Rate	Select the speed of the data transmission. The default setting (AUTO) allows the wireless adapter adaptively adjust its data rate as the signal strength warrants.
Channel	<p>Select the channel for your wireless network (Ad-Hoc mode ONLY). The available (legal) channels is restricted by your regulatory domain. If required, you will need to click Advanced to change your domain setting first. See Advanced section for more information.</p> <p>If you are using Infrastructure mode, your Wireless LAN Card will automatically use the channel specified by the AP. You don't need to set up this item.</p>
Power Saving	Enable or disable power consumption by the Wireless LAN Card to extend the battery life of your notebook.

Encryption

Encryption technology is used to enhance wireless media security. Your encryption settings must match those used by the Access Points or wireless stations (Ad-hoc mode) in your network, or your computer will be unable to communicate with others through the network.

If you are not going to use encryption, just select **Disable** in the **Encryption** field from the **Profile** tab. Yet, if you need to enable encryption, please do the following:

1. In the Encryption field, select **64 Bit** or **128 Bit** as your encryption type.
2. For flexibility, you can enter the WEP keys in either **HEX** or **ASCII** format. Enable the preferred format and then enter up to four keys in the **Key #1-4** fields.

Note that when using **HEX** format, only digits 0-9 and letters A-F, a-f are allowed. Valid key length for each encryption type is as below:

	HEX Format	ASCII Format
64 Bit	10 hexadecimal digits	5 ASCII characters
128 Bit	26 hexadecimal digits	13 ASCII characters

3. From the **Default Key** drop-down menu, select one of the entered keys to encrypt the data you are going to transmit.
4. From the **Type** drop-down menu, select **Auto**, **Open System** or **Shared System**.
 - **Open System:** If your targeted wireless network uses **Open System**, your authentication request will be always accepted.
 - **Shared System:** If your targeted wireless network uses **Shared System**, your wireless adapter must be set to use correct WEP keys to pass the authentication. If selected, your wireless adapter must use identical WEP keys as the targeted wireless network.
 - **Auto:** Selects automatically between the two authentication types above mentioned.

Note: To use data encryption, all the wireless stations and/or Access Points must use the same encryption key values. For example, if you use Key #1 on your Wireless LAN Card and a value is assigned, then the same value must be assigned to Key 1 for all other client stations.

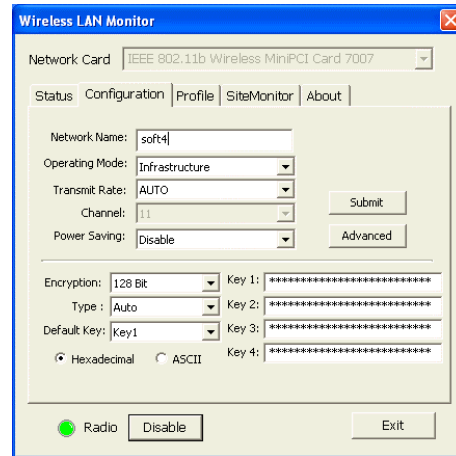


Figure 3-3 Wireless LAN Monitor Utility – Configuration

Advanced

This section allows you to select the range of channels to be used by the Wireless LAN Card. The available channels are different according to your geographic location. Make sure to select the legal frequency channels allowed in your regulatory domain.

- 1~11 channels for US, Canada (FCC)
- 1~14 channels for Japan (MKK1)
- 1~13 channels for Europe (ETSI)

To change your domain, from the **Domain select** drop-down menu, select the range of channel allowed in your location and click **OK**. You will return to the previous **Configuration** tab and find that the available channels in the **Channel** drop-down menu have been changed.

Caution: If you are using the Wireless LAN Card in France, although ETSI is the applicable option, yet only 10-13 channels are the legal channels. In this case, you should not select the channels beyond scope 10-13 when configuring your Wireless LAN Card.

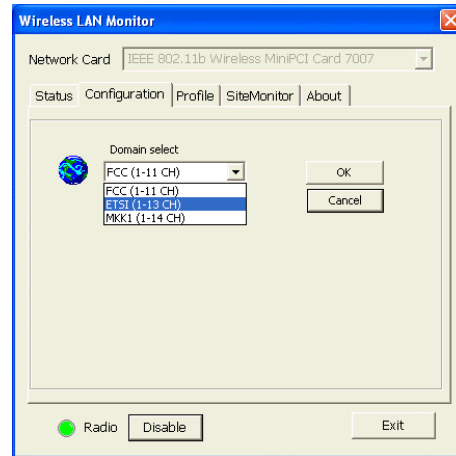


Figure 3-4 Wireless LAN Monitor Utility – Domain selection

Profile Tab

The **Profile** feature allows you to create multiple profiles to reflect specific WLAN settings for each place you may roam. Selecting a profile from the **Existing Profile** list can display the corresponding parameters on the bottom of this tab.

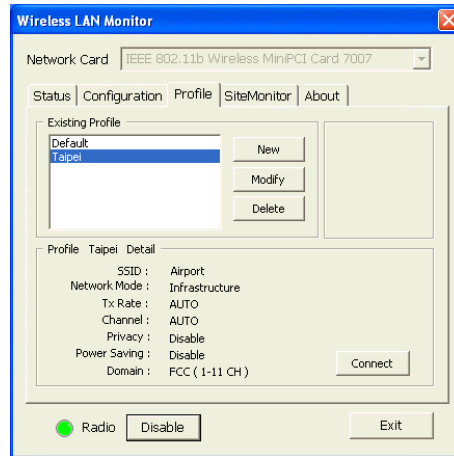
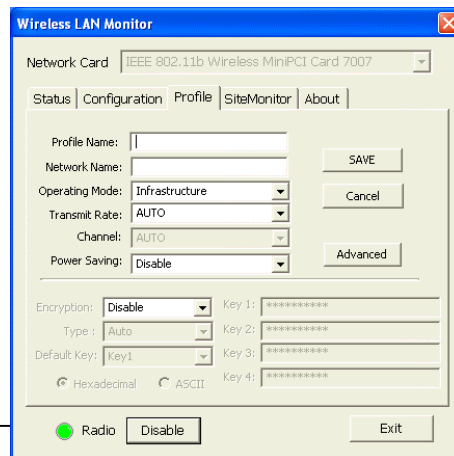


Figure 3-5 Wireless LAN Monitor Utility – Profile

To create a new profile, click the **New** button. If you need to customize the settings for certain profile, you must highlight the profile from the **Existing Profile** list box and click the **Modify** button. In both cases the following screen will appear. If you are creating a new profile, enter an appropriate name for the new profile in the **Profile Name** field.



For instructions on configuration, please consult the previous section describing the Configuration tab.

Activating a Desired Profile

There are two ways to activate any profile under **Existing Profile** list box:

- Double-click on the profile name.
- Select the profile name and click on the **Connect** button.

In both cases the utility will take you back to the **Status** tab showing the parameters of the connection newly established.

Deleting a Profile

If you wish to delete an existing profile, do the following:

1. Make sure the profile is not currently in use. If it is in use, the **Delete** button will not be accessible.
2. In the **Existing Profile** list box, highlight the profile name and click the **Delete** button.

Site Monitor Tab

Site Monitor scans the wireless network searching for available Access Points and wireless stations (Ad-hoc mode) within the range of the card. Available stations are listed with the following information provided:

Network Name: Service Set ID. Displays the current SSID of the Access Point or Ad Hoc network.

Network Mode: Indicates whether the operating mode is Infrastructure or Ad-Hoc.

Ch: The operating radio channel number.

WEP: Displays if encryption is enabled or disabled on the Access Point/wireless station.

dbm: Shows the signal strength ratio. The higher the ration, the more powerful the signal received by your Wireless LAN Card. It helps you optimize the placement of your wireless station when roaming throughout the wireless network environment

Network Address: For an Infrastructure network, it shows the MAC address of the AP. For Ad-Hoc network, a MAC address randomly generated will be displayed.

Scan: This button allows you to update the monitor list.

Connecting to Desired Site by Site Monitor Utility

If you want to connect to any of the Access Point(s) and Ad-Hoc Station(s) listed, double-click on the selected network. The utility will take you back to the **Status** tab showing the parameters of the connection newly established.

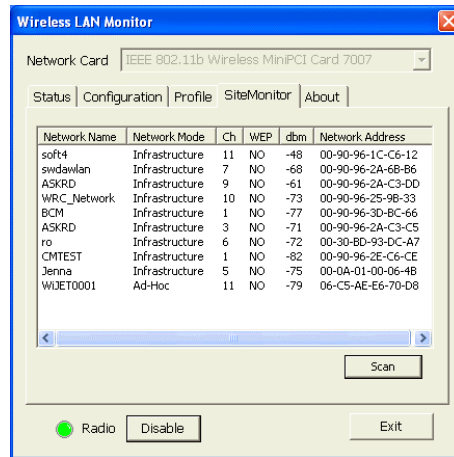


Figure 3-6 Wireless LAN Monitor Utility – Site Monitor

About Tab

The **About** tab displays the basic information about the device, including the Driver, Firmware, Application version and the MAC address of your Wireless LAN Card. Click **Exit** button if you wish to exit the utility.

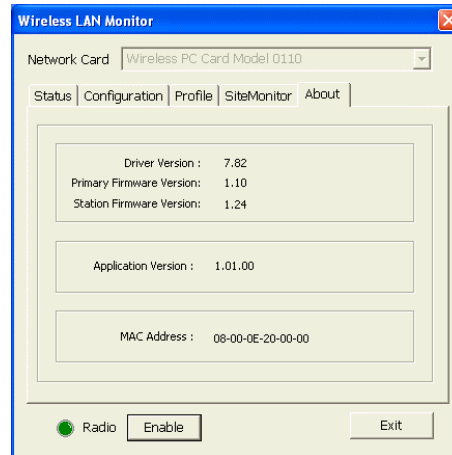


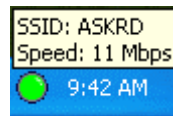
Figure 3-7 Wireless LAN Monitor Utility – About

Chapter 4 Using Wireless Tray Icon Functions

Viewing Signal Strength and Speed





Whenever you start Windows, you should be able to find the wireless monitor icon loaded in the system tray, located near the clock on the task bar.

While connected, you can place your cursor over the icon to see the pop-up text that gives link information about the SSID and the speed.



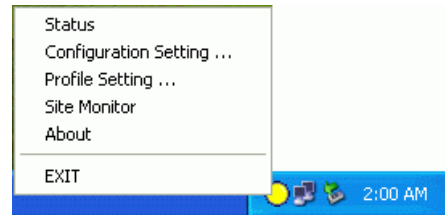
Tray Icon Color Indication

The graphic of the wireless icon changes to indicate your wireless connection quality. Possible radio connection quality and procedures to take are described in the table below:

Color	Description
	Excellent signal strength. Your Wireless LAN Card has an excellent radio connection with the network.
	Low signal strength. The radio signal is very weak. Save your profiles and move closer to the target Access Point.
	Your Wireless LAN Card has been set to operate in Ad Hoc mode.
	Disconnect. No connection

Other Functions

Right-click the icon displays the menu as shown below:



Each item on the context menu is described as below:

Status/Configuration Setting/Profile Setting/Site Monitor/About: Pops up the **Wireless LAN Utility** in its respective tab.

Exit: Shuts down the **Wireless LAN Utility**.

Chapter 5 Windows XP Wireless Zero Configuration Utility

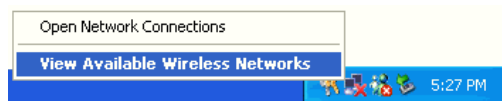
Windows XP provides built-in **Wireless Zero Configuration** utility for wireless configuration and monitoring. You can choose to configure your wireless network via either the **Wireless LAN Utility** as described in preceding section, or to use the Windows XP **Wireless Zero Configuration** utility.

This section only provides the essential instructions on using Windows XP wireless utility to get your wireless network established. For more information please refer to Windows XP on-line help.

Connecting to an Access Point or Wireless LAN Card

To connect to an existing Access Point/Wireless LAN Card, take out the following steps:

1. Right-click the **Wireless Connection** icon on the system tray and select **View Available Wireless Networks** from the context menu.



Note: Depending on whether your wireless network is established, the context menu may come with different items.

2. When the **Connect to Wireless Network** window pops up, you will see all the Access Points or Wireless LAN Cards that are available in the air. Select the wireless network you want to connect to.

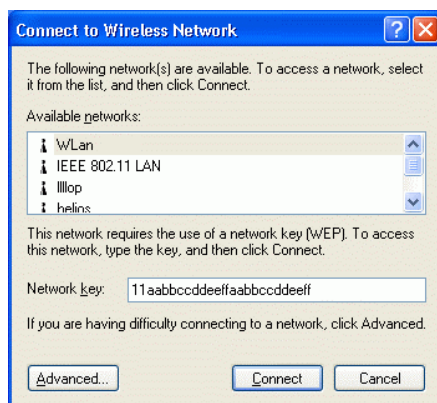
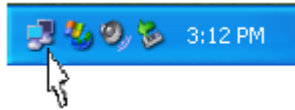


Figure 4-1 Windows XP Configuration Utility-Connect to Wireless Network

3. If the target Access Point/Wireless LAN Card has been set with WEP key, you must enter the same WEP key in the **Network key** field. Otherwise, leave it blank.

- Click **Connect**, then you will join the target network and this dialog window will disappear. When your wireless connection is established, the connection icon appears as below:



Note: If the wireless connection can't be established, double-click the connection icon and then click **Properties**. Go to **Authentication** tab first to make sure that you use the correct authentication type for the Wireless LAN Card. For more information, refer to "Authentication" on page 36.

Viewing Wireless Connection Status

After you successfully connect to the Access Point or Wireless LAN Card, double-click the icon in the system tray again. This will open the **Wireless Network Connection Status** window where you can see the general data of the Wireless LAN Card, such as Status, Duration, Speed, Signal Strength, etc.

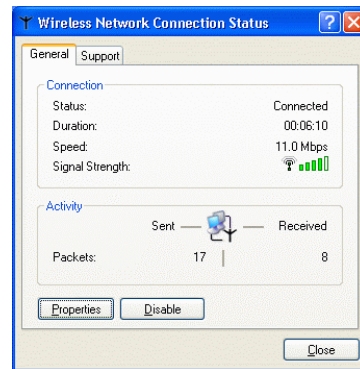


Figure 4-2 Windows XP- Connection Status

Configuring Your Wireless Properties

To configure your wireless properties, open the **Wireless Network Connection Status** window as described above, and then click the **Properties** button. This will open the **Wireless Network Connection Properties** window that allows you to configure more detailed items of the Wireless LAN Card. The following describes each tab of the properties window to help you do more settings of the Wireless LAN Card.

General

This tab allows you to specify the network methods to be used with your Wireless LAN Card. The network policy depends on your wireless network. For TCP/IP protocol, you should configure its properties as instructed by your network administrator. For more information on TCP/IP setting, please refer to “

Appendix C Setting Up TCP/IP” on page 51.

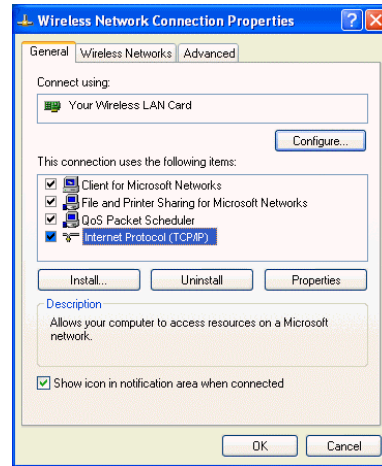


Figure 4-3 Windows XP Connection Properties -General

Wireless Networks

This tab contains two sections: **Available networks** and **Preferred networks** described as below.

Under **Available networks** section, you can also see all the Access Points and Wireless LAN Cards available in the air. Clicking **Refresh** will update the list of Access Points and Wireless LAN Cards.

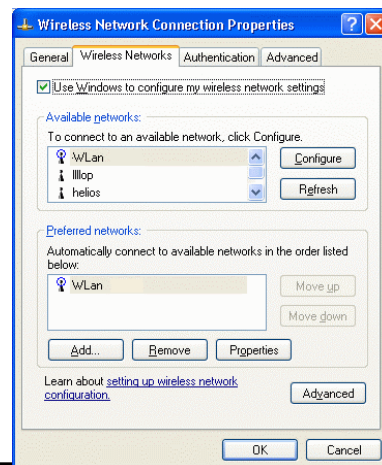


Figure 4-4 Windows XP Connection Properties-Wireless Networks

Under **Preferred networks** section, you can add any wireless networks that you wish to connect to. To do this, just click **Add** to add more Access Points or Wireless LAN Cards to the list.

After you click the **Add** button, the **Wireless Network Properties** window pops up. Type your network name (SSID) and, if needed, the wireless network WEP settings. Once the Access Point or Wireless LAN Card that you want to connect to has been set with WEP key, you must type the same WEP key as the Access Point's or Wireless LAN Card's.

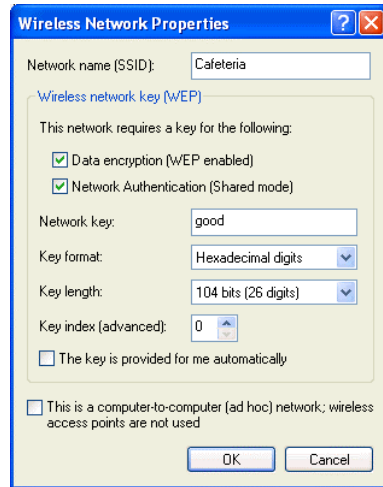


Figure 4-5 Windows XP-Add Preferred Networks

After you add several profiles into **Preferred networks**, you can change the order in which connection attempts to preferred networks are made. Just select the target wireless network and click **Move up** or **Move down** to move it to a desired position.

To Access Certain Wireless Network Only

If you just want to access certain wireless network type, click the **Advanced** button on the Wireless Networks tab (Figure 3-12) to open the **Advanced** window. You can choose to connect to the following networks:

- Any available network (access point preferred)
- Access point (infrastructure)
- Computer-to-computer (Peer-to-Peer Group)

The default network type is **Any available network (access point preferred)**. In this network type, your device will connect to any Access Points or Wireless LAN Cards available in the air but Access Point always demands higher connection attempt priority.

Once you finish the advanced setting, your wireless station will then connect to your desired network and the connected network will be listed under **Available networks**.

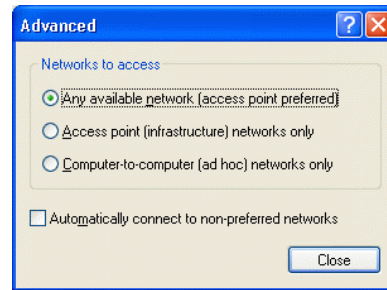
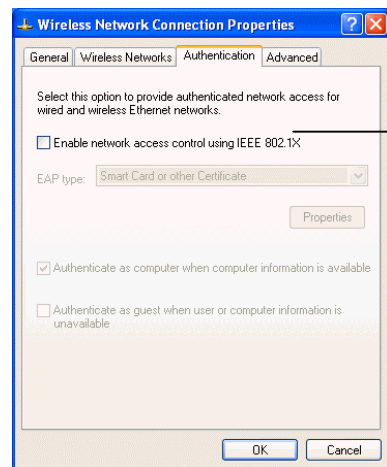


Figure 4-6 Windows XP Configuration Utility-Set up Network to Access

Authentication

This tab allows you to configure the authentication settings of your Wireless LAN Card. The most important setting for the Wireless LAN Card is to disable **Enable network access control using IEEE802.1X** to ensure successful connection between the Wireless LAN Cards and Access Points or other Wireless LAN Cards. You must disable this function for any reason. Otherwise, there may be some problems happening during connection. For other settings, we recommend you keep the default settings to minimize the problems during connection.



Make sure to clear the **Enable network access control using IEEE802.1X** check box to ensure successful connection.

Figure 4-7 Windows XP Connection Properties -Authentication

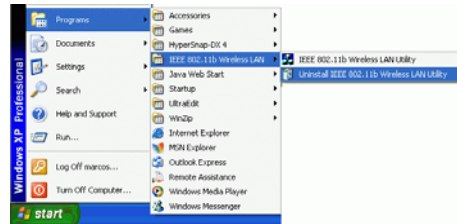
Chapter 6 Uninstalling the Wireless LAN Card

Should you need to uninstall the Wireless LAN Card and application software for any reason,, you should uninstall the associated software first and then remove the hardware from your computer. Please proceed as follows.

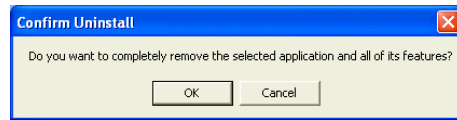
Uninstalling the Wireless LAN Card Software

Note: Before uninstalling the Wireless LAN Card software, please disable the utility by right-clicking the utility tray icon and select **Exit** from the context menu. The icon will disappear to indicate that the utility is not in operation.

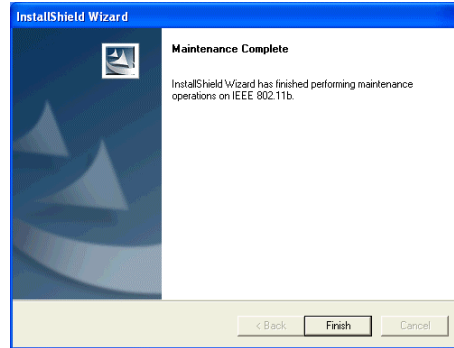
1. Close all programs that are currently running.
2. Click the Windows **Start** > **Programs** > **IEEE 802.11b Wireless LAN** > **Uninstall IEEE 802.11b Wireless LAN Utility**.



3. Click **OK** to proceed with the software removal procedure.



4. Click **Finish**. According to your wireless adapter the Windows OS may reboot to enable the changes.



Removing the Wireless LAN Card (For PCMCIA Adapter)

To permanently remove the PCMCIA adapter from your computer, make sure that you have removed the software before you proceed to remove the hardware.

The Wireless LAN Card complies with the PCMCIA standard that allows devices to be inserted into and removed from the computer's PCMCIA slot when the computer is powered on. For a PCMCIA device, it is recommended that you follow the standard Windows procedure for disconnecting a PCMCIA device from your computer. The following steps assume a Windows 98 environment:

1. On the system tray, right-click the PCMCIA icon, and then click **Adjust PC Card Properties**.
2. Select the Wireless LAN Card that you want to remove, click **Stop**.
3. When the message appears that tells you it is safe to remove device, click **OK** and remove the Wireless LAN Card from the computer.
4. Click **OK** to exit the **PC Card (PCMCIA) Properties** window.

Chapter 7 Updating the Device Driver and Software

Periodically, you may need to upgrade the Wireless LAN Card's driver when a newer version is available. Check our website for information about the latest driver upgrades. When you have finished the download procedure, please follow as below to update the device driver.

1. Uninstall the Wireless LAN Card as described in Chapter 5. Follow the steps to remove the Wireless LAN Card and then uninstall the software.
2. Install the new driver you have downloaded. Refer to Chapter 2 for detailed instructions.

Once you finish installing the new driver, the updating is complete.

Chapter 8 Troubleshooting

Radio Interference

You may be able to eliminate any interference by trying the following:

- Reseat the Wireless LAN Card.
- Increase the distance between the wireless computers and the device causing the radio interference.
- Plug the computer equipped with the Wireless LAN Card into an outlet on a different branch circuit from that used by the affecting device.
- Consult the dealer or an experienced radio technician for help.
- Keep the computer with the Wireless LAN Card away from the microwave oven and large metal objects.

Card Not Detected

If Windows does not detect the Wireless LAN Card, try the following:

- Make sure the Wireless LAN Card is properly inserted in the computer.
- For PCMCIA wireless adapter, make sure you are using 16-bit PCMCIA expansion slot and the slot is working.
- Contact your dealer for additional testing if there is a hardware problem with the Wireless LAN Card.

Cannot Connect to Another Wireless LAN Card

If you cannot make a connection to another Wireless LAN Card from your computer, it could be due to one of the following reasons:

- Incorrect SSID. Make sure the SSID is the same for all computers that have a Wireless LAN Card.
- Your computer is not recognizing changes. Restart your computer.
- If in Peer-to-Peer Group, make sure the **Log on to Windows NT domain** check box is not selected in the **Client for Microsoft Networks Properties** dialog box in the **Network Configuration** tab.
- Incorrect IP address or subnet mask. Check these settings in the **TCP/IP Properties** dialog box in the **Network Configuration** tab.

Poor Link Quality

If the Link Quality display stays in the poor range, it could be due to one of the following reasons:

- Radio interference.
- Distance between Wireless LAN Card and Access Point is too far. Decrease the distance between the Wireless LAN Card and Access Point (or another card).

Cannot Connect to Access Point

If you cannot make a connection to the Access Point, it could be due to one of the following reasons:

- Make sure the Access Point have no physical connection problems.
- Make sure the SSID for the Wireless LAN Card is the same as the Access Point.
- Make sure the privacy type is the same as that of Access Point.

Appendix A Limited Warranty

Wireless LAN Hardware

The seller warrants to the end user (“Customer”) that this hardware product will be free from defects in workmanship and materials, under normal use and service, for 1 year from the date of purchase from the seller or its authorized reseller. The seller’s sole obligation under this express warranty shall be, at the seller’s option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, The seller may, in its sole discretion, refund to the Customer the purchase price paid for the defective product. All products that are replaced will become the property of the seller. Replacement products may be new or reconditioned.

Wireless LAN Software

The seller warrants to Customer that each software program licensed from it , except as noted below, will perform in substantial conformance to its program specifications, for a period of 1 year from the date of purchase from the seller or its authorized reseller. The seller warrants the media containing software against failure during the warranty period. No updates are provided. The seller's sole obligation under this express warranty shall be, at the seller's option and expense, to refund the purchase price paid by Customer for any defective software product, or to replace any defective media with software which substantially conforms to applicable seller published specifications. Customer assumes responsibility for the selection of the appropriate application programs and associated reference materials. The seller makes no warranty or representation that its software products will meet Customer's requirements or work in combination with any hardware or software applications products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third party products listed in the seller software product documentation or specifications as being compatible, the seller will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a defect in the third party's product or from use of the software product not in accordance with the seller's published specifications or user manual.

Appendix B Regulatory Compliance

FCC Part 15 Declaration of Conformity (DoC)

The following equipment:

Product Name: Wireless LAN Card

is herewith confirmed to comply with the requirements of FCC Part 15 rules. The 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 Rules and Regulations - Part 15

Warning: This device has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the Federal Communications Commissions Rules and Regulation. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, 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 can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Relocate your WLAN equipped laptop computer.
- Increase the separation between the WLAN equipped laptop computer and other electronics.
- Connect the WLAN equipped laptop computer into an outlet on a circuit different from that of other electronics.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm between the radiator & your body.

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

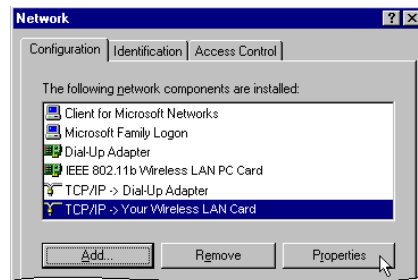
FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Appendix C Setting Up TCP/IP

This section contains instructions for configuring the TCP/IP protocol of the Wireless LAN PCMCIA Card. The IP address policy depends on your wireless network. You should configure your TCP/IP protocol as instructed by your network administrator.

For Windows 98/ME

1. Double-click the **Network** icon on the **Control Panel**.
2. Click the **Configuration** tab of the **Network** dialog box.
3. In the network components list, select the TCP/IP protocol of your Wireless LAN Card, e.g., **TCP/IP ->Wireless PC Card Model xxxx** and then click **Properties**.



4. On the **IP Address** tab, choose one of the methods as required:

Option A: Click Specify an IP address.

In the **IP Address** box, enter a valid four-component IP address, either a public or private one as required.

In the **Subnet Mask** box, enter a valid four-component IP address.

Then select the **Gateway** tab and enter your gateway information.

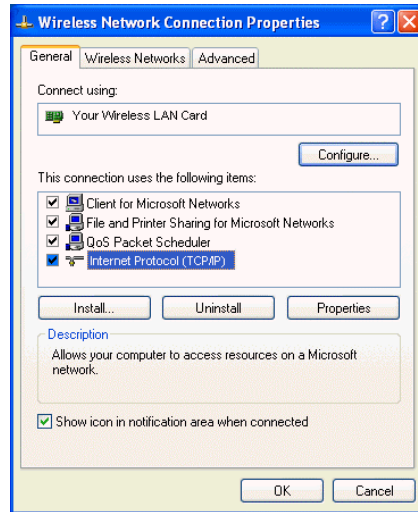
Option B: Select Obtain an IP address automatically.

Then an IP address will be automatically assigned to your computer.

5. Click **OK** to return to **Network** dialog box and click **OK** again to finish configuration. If your TCP/IP properties have been modified, you will be prompted to restart your computer. Click **Yes** to have new settings take effect.

For Windows 2000/XP

1. Double-click **Network Dial-up Connections** (Windows 2000) or **Network Connections** (Windows XP) on **Control Panel**.
2. Right-click the **Local Area Connection** icon corresponding to your wireless adapter (e.g., Wireless PC Card Model xxxx) and click **Properties**.



3. On the **General** tab, highlight **Internet Protocol (TCP/IP)** and then click **Properties**.

Option A: Use fixed IP address.

Enable the **Use the following IP Address** option. Enter the **IP address**, **Subnet Mask** and **Default gateway**. Then click **OK**.

Option B: Use dynamic IP address

Select **Obtain an IP address automatically**.

4. Close the **Local Area Connection Properties** window. For Windows 2000, if prompted, click **Yes** to restart your computer.

Appendix D Specifications

* Specifications are subject to change with notice.

Operation Mode	<ul style="list-style-type: none">● Ad-hoc mode● Infrastructure mode
Interface	<ul style="list-style-type: none">● PCMCIA:<ul style="list-style-type: none">– <i>PCMCIA V2.1 standard</i>– <i>16-bit Type II PC Card</i>– <i>Plug and Play</i>● Mini PCI:<ul style="list-style-type: none">– <i>Mini PCI type IIIB</i>– <i>Mini PCI V1.0 Interface</i>
Security	<ul style="list-style-type: none">● Support SSID network identification for security● Support 64-bit and 128-bit WEP Data Encryption and Decryption<ul style="list-style-type: none">– <i>40-bit key plus 24-bit Initialization Vector</i>– <i>104-bit key plus 24-bit Initialization Vector</i>

RF Specification

- Transmit Power : 13-17dBm
 - Receive sensitivity
 - PCMCIA : -80dBm at 11Mbps with FER <8%
 - Mini PCI : -84dBm at 11Mbps with FER <8%
 - Frequency range:
 - PCMCIA : 2400MHz to 2484MHz
 - Mini PCI : 2412MHz to 2484MHz
 - Frequency stability: within 25KHz of nominal value
 - Nominal antenna port impedance: 50Ω
 - Media Access Protocol: CSMA /CA with ACK
 - Modulation technique: DSSS (Direct Sequence Spread Spectrum)
 - CCK (11 Mbps and 5.5 Mbps)
 - DQPSK (2 Mbps)
 - DBPSK (1 Mbps)
 - Spreading: 11-chip Barker sequence
 - International Channel Frequencies:
 - 1-11 Channels (US, Canada / FCC)
 - 1-13 Channels (Europe / ETSI)
 - 1-14 Channels (Japan)
-

General Specification	<ul style="list-style-type: none"> ● Operation Voltage <ul style="list-style-type: none"> – PCMCIA: 5V – Mini PCI: 3.3V ● Power Consumption <ul style="list-style-type: none"> – PCMCIA <ul style="list-style-type: none"> – Transmit mode :210mA – Received mode :160mA – Mini PCI <ul style="list-style-type: none"> – Transmit mode: Max 290mA – Received mode: Max 215mA – Doze mode: 45mA ● Environment parameter <ul style="list-style-type: none"> – PCMCIA <ul style="list-style-type: none"> – Operating temperature: 32 °~131 °F (0 °~55 °C) – Storage temperature: -40 °~158 °F (-40 °~70 °C) – Operating Humidity: 10%~ 80% (at 104 °F / 40 °C) – Mini PCI <ul style="list-style-type: none"> – Operating temperature: 32 °to 131 °F (0 °to 55 °C) – Storage temperature: -4 °to 167 °F (-20 °to 75 °C)
Certifications	<ul style="list-style-type: none"> ● FCC part 15 ● CE-EMC ● CE-LVD ● JATE ● VCCI class 2
Operating OS	<ul style="list-style-type: none"> ● Windows 98(SE), Windows ME, Windows 2000 and Windows XP.
Outside description	<ul style="list-style-type: none"> ● For PCMCIA <ul style="list-style-type: none"> – LED 1 (Green):System ready – LED 2 (Green):Link success
System Requirements	<ul style="list-style-type: none"> ● Pentium-class PC, 300MHz or better recommended ● 64 Mbytes recommended ● Hard disk space at least 30 Mbytes ● PCMCIA slot (for PCMCIA type)

Glossary

- Access Point** An internetworking device that seamlessly connects wired and wireless networks. Access Points combined with a distributed system support the creation of multiple radio cells that enable roaming throughout a facility.
- Ad-Hoc (Peer-to-Peer Group)** A network composed solely of stations within mutual communication range of each other (no Access Point connected).
- BSS** *Basic Service Set.* A set of stations controlled by a single coordination function.
- Channel** A medium used to pass protocol data units that can be used simultaneously in the same volume of space by other channels of the same physical layer, with an acceptably low frame error ratio due to mutual interference.
- ESS** *Extended Service Set.* A set of one or more interconnected Basic Service Sets (BSSs) and integrated Local Area Networks (LANs) can be configured as an Extended Service Set.
- Ethernet** The most widely used medium access method, which is defined by the IEEE 802.3 standard. Ethernet is normally a shared media LAN; i.e., all the devices on the network segment share total bandwidth. Ethernet networks operate at 10Mbps using CSMA/CD to run over 10BaseT cables.
- Gateway** A network component that acts as an entrance to another network.
- IEEE 802.11** The IEEE 802.xx is a set of specifications for LANs from the Institute of Electrical and Electronic Engineers (IEEE). Most wired networks conform to 802.3, the specification for CSMA/CD-based Ethernet networks or 802.5, the specification for token ring networks. 802.11 defines the standard for wireless LANs encompassing three incompatible (non-interoperable) technologies: Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum (DSSS), and Infrared. IEEE standards ensure interoperability between systems of the same type.
- Infrastructure** A wireless network centered about an Access Point. In this environment, the Access Point not only provides communication with the wired network but also mediates wireless network traffic in the immediate neighborhood.
- IP** *Internet Protocol.* The standard protocol within TCP/IP that defines the basic unit of information passed across an Internet connection by breaking down data messages into packets, routing and transporting the packets over network connections, then reassembling the packets at their destination. IP corresponds to the network layer in the ISO/OSI model.

- IP Address** An IP address is a 32-bit number that identifies each sender or receiver of information sent across the Internet. An IP address has two parts: the identifier of a particular network on the Internet and an identifier of the particular device (which can be a server or a workstation) within that network.
- ISP** *Internet Service Provider*. An organization that provides access to the Internet. Small ISPs provide service via modem and ISDN while the larger ones also offer private line hookups (T1, fractional T1, etc.).
- LAN** *Local Area Network*. A communications network that serves users within a defined geographical area. The benefits include the sharing of Internet access, files, and equipment, such as printers and storage devices. Special network cabling (10BaseT) is often used to connect the PCs together.
- Radio Frequency** *RF*, Terms: GHz, MHz, Hz —The international unit for measuring frequency is Hertz (Hz), equivalent to the older unit of cycles per second. One megahertz (MHz) is one Million-Hertz. One giga hertz (GHz) is one Billion-Hertz. The standard U.S. electrical power frequency is 60 Hz, the AM broadcast radio frequency band is 0.55–1.6 MHz, the FM broadcast radio frequency band is 88–108 MHz, and wireless 802.11 LANs operate at 2.4GHz.
- SSID** *Service Set ID*. A group name shared by every member of a wireless network. Only client PCs with the same SSID are allowed to establish a connection.
- Subnet Mask** A value that defines whether your computer communicates only within your LAN or communicates outside of your LAN, where it is routed out to the rest of the Internet. A Subnet Mask that has the same first three components (for example, 255.255.255.0) is the routing pattern for a Class C address.
- TCP** *Transmission Control Protocol*. The standard transport level protocol that provides the full duplex, stream service on which many applications' protocols depend. TCP allows a process on one machine to send a stream of data to a process on another. Software implementing TCP usually resides in the operating system and uses the IP to transmit information across the network.

WEP *Wired Equivalent Privacy*. The optional cryptographic confidentiality algorithm specified by 802.11. The algorithm is being used to provide data confidentiality that is subjectively equivalent to the confidentiality of a wired LAN medium that does not employ cryptographic techniques to enhance privacy..