802.11 b/g Wireless LAN Card

User's Manual

Rev: 1.0
Mini-PCI:
MAC: 009096-522627
Driver: 2.4.0.71
Utility: 1.03.00

CardBus:
MAC: FFFFFF-FFFFFF
Driver: 2.4.1.30
Utility: 1.03.00
September 24, 2003

Contents

List of Figures

About This Manual

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

- 32-bit CardBus Adapter
- Mini-PCI Adapter

For brevity, throughout this manual **Wireless LAN Card** is used to indicate both adapters. Also, the following terms/abbreviations are used interchangeably:

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

Note and **Caution** in this manual are highlighted with graphics as below to indicate important information.

Contains related information text that corresponds to a topic.

Note

Represents essential steps, actions, or messages that should not be ignored.

Caution

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 enables your computer to access the Internet, share resources, such as files or printers without being bound to the network wires. This card is fully compatible with IEEE 802.11 standards, which means it can interoperate with devices from other vendors that also follow this standard.

The 802.11b/g Wireless LAN Card can transmit data up to 54 Mbps. The 802.11b/g products are backward compatible with 802.11b devices. Since the 802.11b standard has been widely adopted in many devices and hotspots, you will still be able to be connected wherever you go.

Wireless LAN Basics

This section contains some wireless network 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 an Ad-Hoc (Peer-to-Peer) wireless network. The second way is to connect to an 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 compatible wireless adapters installed. This mode is typically used in a relatively small network. A typical Ad-Hoc network may look like Figure 1-1 where all the wireless stations use the same Service Set Identity (SSID), channel, WEP settings (if enabled).
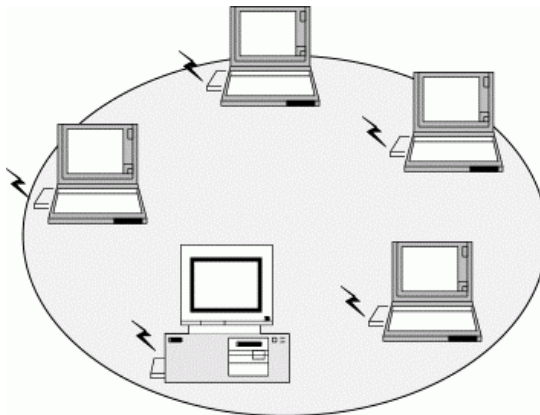
Figure 1-1   Ad-Hoc Mode

Interoperability between Wireless Stations

When set to use Ad-Hoc mode, your Wireless LAN Card can connect to another standard-compatible Ad-Hoc peer. The interoperability between wireless stations is summarized as follows:

- When operating in 802.11g mode, your target peer can be 802.11b or 802.11g compatible wireless stations.
- An 802.11b/g device cannot communicate with 802.11a devices.

Infrastructure Mode

An Infrastructure network uses an Access Point or several Access Points 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.

To successfully associate with an Access Point, the wireless station must be set to use Infrastructure mode and use the same Service Set Identity (SSID) and security settings (if enabled) with the AP. It does not need to configure a channel since it will automatically receive the channel assignment from the AP.

Note the following compatibility if your Wireless LAN Card is set to use Infrastructure mode:

● Your 802.11b/g card cannot connect to an 802.11a Access Point since 802.11a devices are not compatible with 802.11b/g devices.

● Operating in 802.11b/g mode, you can connect to 802.11b or 802.11g compatible Access Point.
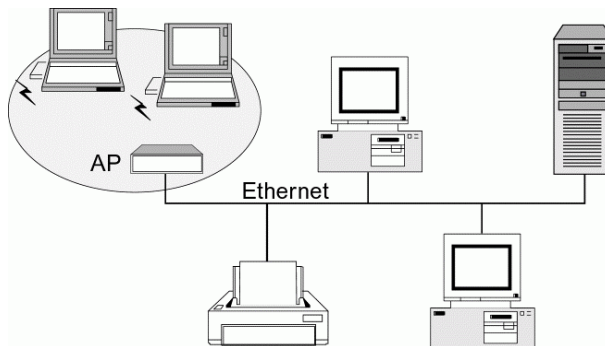
Figure 1-2   Infrastructure Mode

Roaming

Multiple Access Points can be installed to extend the wireless service coverage area for seamless wireless access. Within an extended service area, all Access Points 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.
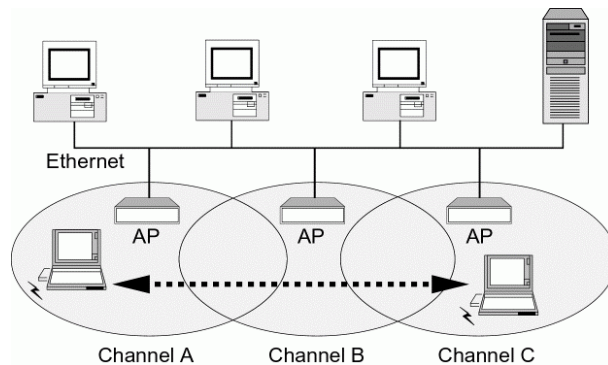
Figure 1-3   Roaming Across Multiple Access Points

802.11b and 802.11g

802.11b and 802.11g networks have their own features. Getting familiar with some of theses features will help you better understand your device.

802.11b: This most widely adopted wireless standard operates in the 2.4GHz band. It supports data rates of 1, 2, 5.5, and 11 Mbps. This standard employs Direct Sequence Spread Spectrum (DSSS) technologies.

802.11g: This standard is a new emerged wireless networking standard. It provides data transfer of up to 54 Mbps, up to 5 times faster than 802.11b.Since 802.11g operates on the same frequency of 2.4 GHz as 802.11b, it is backwards compatible with existing 802.11b devices. The benefit is that you can preserve the existing 802.11b infrastructure while migrating to the new screaming fast 802.11g standard.

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
- UL listed I.T.E. computers
- CardBus slot (for 32-bit CardBus Adapter)

Installing Wireless LAN Card Driver and Software

This section describes how to install the wireless adapter's driver and software. The following only describes the overall installation procedures. In OS-specific situations, you should follow the on-screen instructions to proceed. You can refer to the general guidelines provided in next section for further information.

For Mini PCI adapter.
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.

Caution

For CardBus adapter.
Do not insert the wireless adapter to your computer before installing its driver. If this happens, the Windows PnP function will detect the wireless adapter and issue a dialog box requesting for its driver. Click **Cancel** to quit the wizard and remove the Wireless LAN Card from your computer.

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

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**.
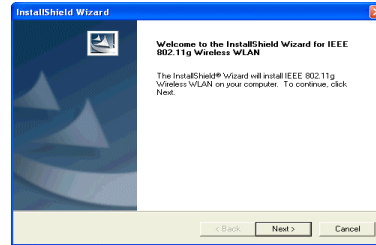
3.   For quick installation, select **Typical** and click **Next**. Then skip to step 10.
      For custom installation (to select the parameters that you would like to use), select
      Custom and click **Next** to go to next step.
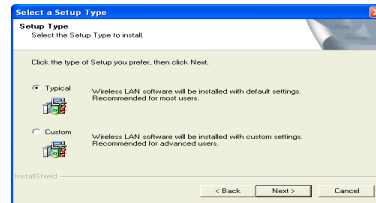
4. To install the software to the default destination folder, click **Next**. If you are to install the software to a different folder, click **Browse** to select another folder, and then click **Next**.
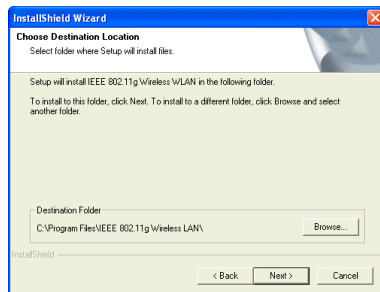
5. If required, you may type a new folder name for the program icons to be added to the Program Folder. Then click **Next** to continue.
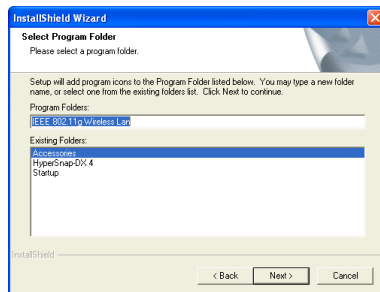
6.   Select the network type you prefer and then click **Next**.
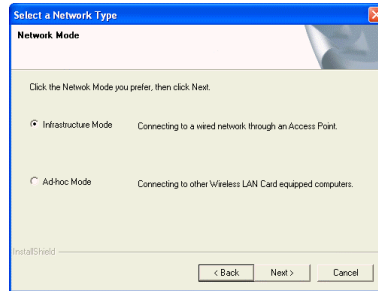
7.   Enter the SSID of the wireless network you wish to connect to. Then click **Next**.
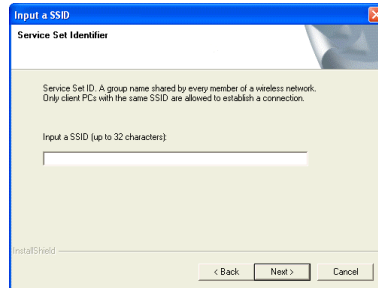
8. This step is for Ad Hoc network type only. For Ad Hoc mode network, specify a channel (1 ~ 11) for the Wireless LAN Card.
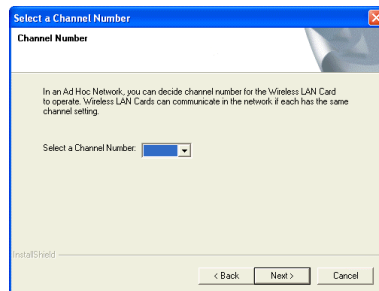
9. If the settings listed are correct, click **Next**. Otherwise, click **Back** to modify your settings.
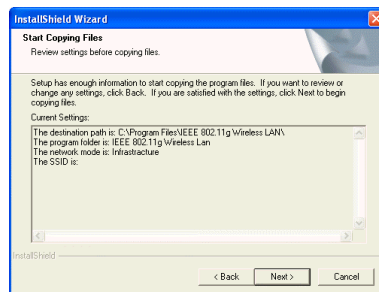
10. For CardBus adapter only. The following screen will pop up asking you to insert your wireless adapter into the PCMCIA slot of your computer. Please do as the dialog request.
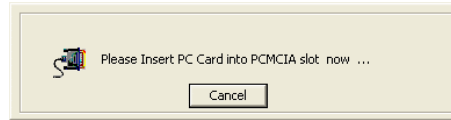
11. When the following screen appears, click **Finish**.
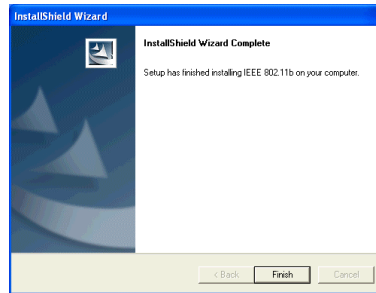
General Guidelines for OS-Specific Situations

Subject to your Windows OS and Wireless LAN Card, different situations will occur **during** or **after** the software installation. Follow these instructions to complete the installation.

For Windows 98(SE)

- When prompted for Windows 98(SE) CD-ROM, click **OK**. Then enter the path to your Windows 98(SE) original files, and click **OK**.

  If Windows 98(SE) original files are not on your computer, you will need to remove the Software Installation CD and then insert your Windows 98(SE) installation CD. Otherwise just locate the Windows 98 CAB files on your computer.

- When prompted to restart your computer click **Yes**.

For Windows Me

- If prompted to restart your PC, click **Yes**.

For Windows 2000

- If you are prompted with the **Digital Signature not Found** alarm message, click **Yes**.

For Windows XP

● If Windows logo compatibility message appears, click **Continue Anyway**.

● If Windows OS pops up a dialog box requesting for driver, select **Install the software automatically** and click **Next**.

If you need to set up the TCP/IP address or the subnet mask, refer to "Appendix C Setting Up TCP/IP" for details.

Note

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 802.11g Wireless LAN** > **IEEE 802.11g 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.
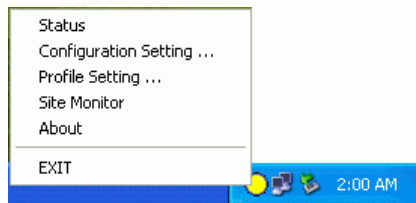
Figure 3-1　Wireless LAN Monitor Tray Icon Menu

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:** Hides 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**.

    Windows XP wireless icon ⎯⎯⎯⎯⎯   ⎯⎯⎯⎯⎯ Vendor-provided wireless utility tray icon

2. On the **Wireless Networks** tab, uncheck the **Use Windows to configure my wireless network settings** box and click **OK**.
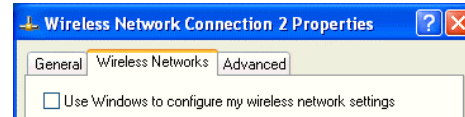
If you need to revert back to using Windows XP **Wireless Zero Configuration Utility**, just go to the **Wireless Networks** tab and check the **Use Windows to configure my wireless network settings** box and click **OK**. For information on using Windows XP **Wireless Zero Configuration Utility**, refer to Chapter 5   Windows XP Wireless Zero Configuration Utility.

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 currently 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.
Sent	Number of packets sent.

Screen Item	Description
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).
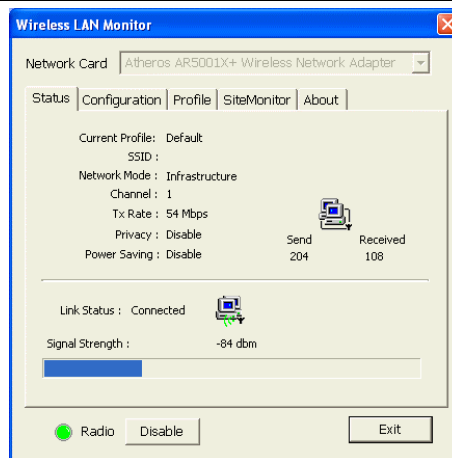
Figure 3-2   Status Tab

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	Enter the name of the WLAN group you want to participate in.
	For Ad Hoc mode: A network name is **mandatory**. The SSID for all stations in a single Ad Hoc network must be same.
	For Infrastructure mode: Enter the Network Name you wish to join in. If this field is left blank or using the special SSID "any", 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).
Operating Mode	Select your operation mode as Infrastructure or Ad-Hoc (peer-to-peer).
Transmit Rate	The default setting (**AUTO**) allows the wireless adapter to adjust its data rate as the signal strength warrants.

Screen Item	Description
Channel	Select the channel (1 ~ 11) for your wireless network (Ad-Hoc mode ONLY). 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.
Power Saving	Specifies the power save mode to be used in order to extend the battery life of your notebook. ● Disabled – The wireless adapter receives full power from the PC. The Power Save function is disabled. ● Normal – The driver turns off power to the wireless adapter for short periods over briefly short time intervals. ● Maximum – The driver turns off power to the wireless adapter for longer periods over more long spaced time intervals.

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.

When configuring WEP settings, please note the following:

- Your authentication type and WEP key table must be identical to those used by your target wireless network.
- When selecting a key to transmit your outgoing data, you may optionally use a key different from the target AP's or wireless client. But it must be one of the defined keys.

Figure 3-3   Configuration Tab

Advanced

The configuration items on the **Advanced** tab are described as below.

Transmit Power Level: Specifies the transmit power to be used. Reducing the transmit power level conserves battery power but decreases radio range.

802.11b Preamble: The preamble is part of the IEEE 802.11b physical layer specification. All 802.11b devices are mandatory to support the long preamble format, but may optionally support the short preamble. This Wireless LAN Card supports the short preamble. The default **Short & Long** option allows communication with other 802.11b devices that support short preamble to boost the throughput. If your device is having trouble to communicate with other 802.11b devices, you may try to select the **Long Only** option.

Wireless Mode: Specifies the wireless operation mode. The Wireless LAN Card will scan the radio signals only in the base band you specified. You can check all for your convenience.

● **2.4 GHz 11 Mbps:** Specifies whether to use 11 Mbps mode for 802.11b radio space.
● **2.4 GHz 54 Mbps:** Specifies whether to use 54 Mbps mode for 802.11g radio space.

Wireless Mode When Starting Ad Hoc Network: Disabled in Infrastructure mode. Set up the operational mode of your Ad Hoc Network.

- **2.4 GHz 11 Mbps:** Specifies whether to use 11 Mbps mode for 802.11b radio space.
- **2.4 GHz 54 Mbps:** Specifies whether to use 54 Mbps mode for 802.11g radio space.

Note

Subject to the wireless adapter type some radio space option will not be available.

Once the options on the **Advanced** page has been defined, click the **OK** button to save the settings. The Wireless LAN Monitor will take you back to the **Configuration** tab.
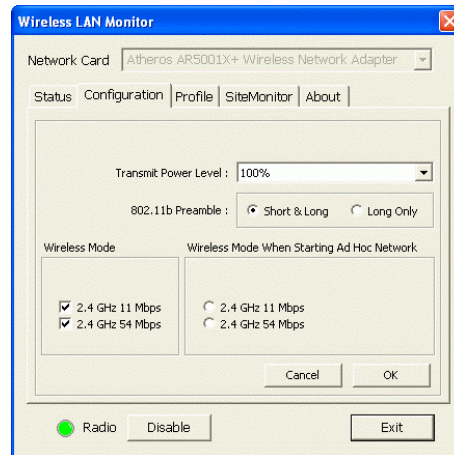
Figure 3-4   Advanced section under Configuration Tab

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.
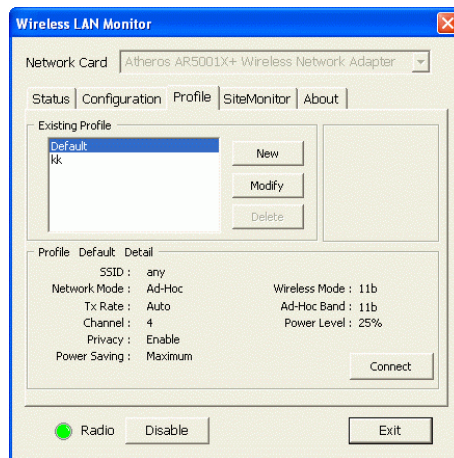
Figure 3-5   Profile Tab

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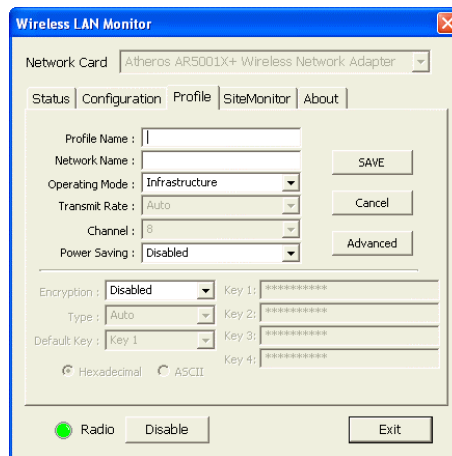
For instructions on configuration, please consult the previous section describing the Configuration tab.

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:

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.

Encryption: 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.

_[_802.11b/g Wireless LAN Card User's Manual_
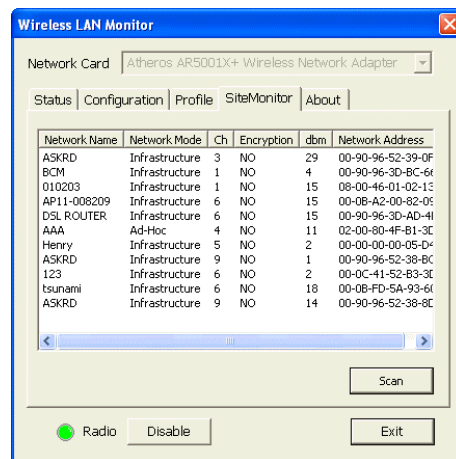
Figure 3-6　Site Monitor Tab

42

About Tab

The **About** tab displays the basic information about the device, including the Driver, Application version and the MAC address of your Wireless LAN Card. Click **Exit** button if you wish to exit the utility.
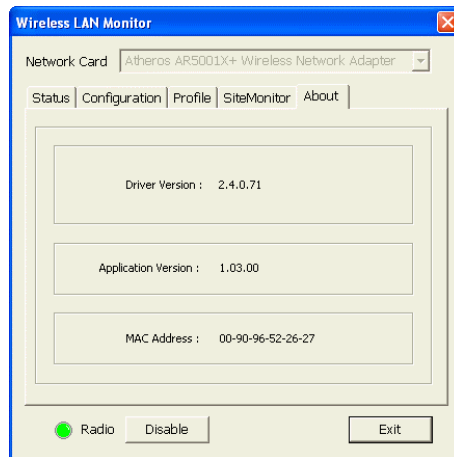
Figure 3-7   About Tab

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.
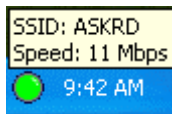
Tray Icon Color Indication

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 or it indicates good signal strength in Infrastructure mode.
🟢	Disconnect. No connection

Other Functions

Right-click the icon displays the menu as shown below:
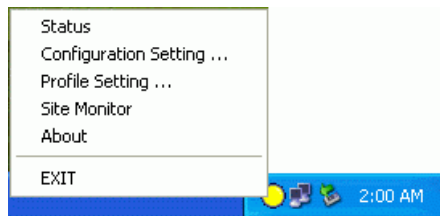
Each item on the context menu is described as below:

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

EXIT: Shuts down the **Wireless LAN Monitor 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 **ireless 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.
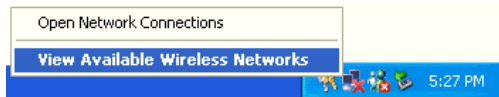
| | Depending on whether your wireless network is established, the context menu may come with different items. |

Note

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.
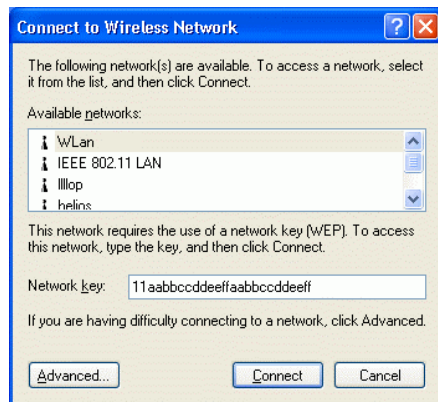
Figure 5-1   Windows XP Configuration Utility-Connect to Wireless Network

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.

4.   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 57.

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.
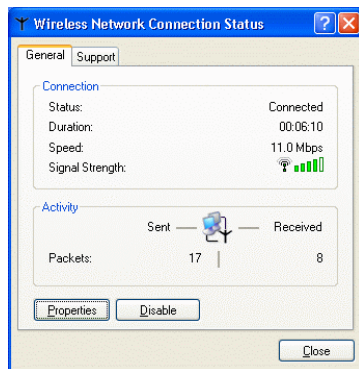
Figure 5-2   Windows XP- Connection Status

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 77.
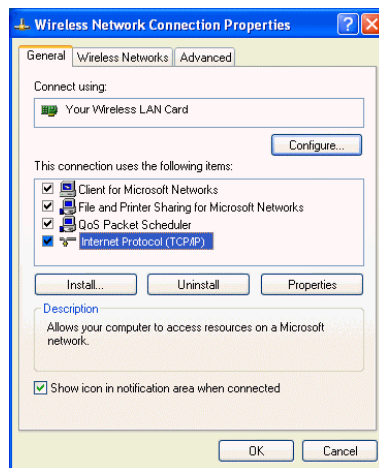
Figure 5-3   Windows XP Connection Properties -General

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.
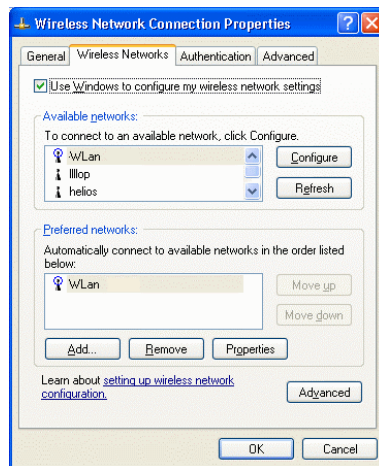
Figure 5-4   Windows XP Connection Properties-Wireless Networks

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.
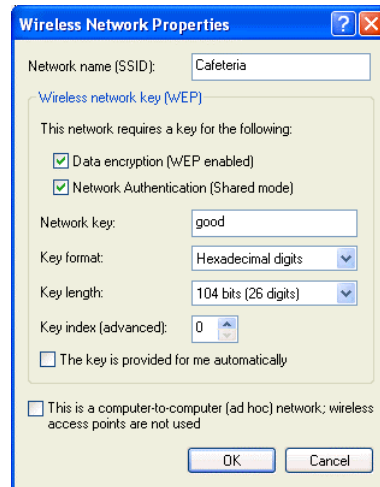
Figure 5-5   Windows XP-Add Preferred Networks

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**.
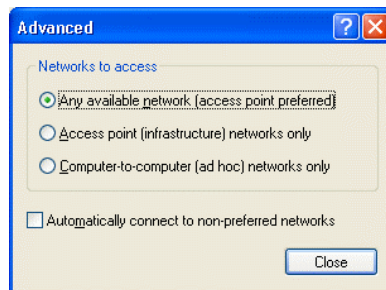
Figure 5-6   Windows XP Configuration Utility-Set up Network to Aceess

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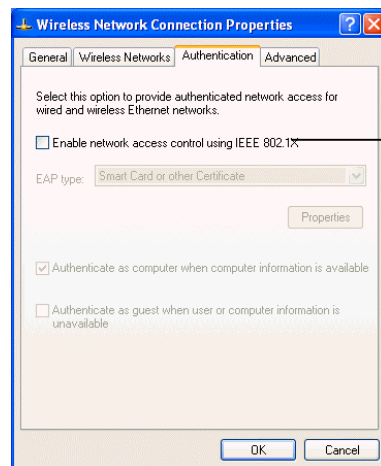
Make sure to clear the **Enable network access control using IEEE802.1X** check box to ensure successful connection.

Figure 5-7   Windows XP Connection Properties -Authentication

Chapter 6   Disabling / Uninstalling the Wireless LAN Card

As the Mini PCI Wireless LAN Card is an embedded wireless solution, it does not make sense to uninstall the Wireless LAN Card since the physical device is still present in your laptop. Even wireless software removal is performed, Windows PnP capability still detects the wireless adapter and requests for its driver.

Therefore, if you want to stop the device from working, you should disable the device instead of uninstalling it. The removal procedure is used in the occasion when a newer version driver is available and you want to upgrade the driver.

Disabling the Wireless LAN Card

For Windows 98/Me

1.   Under **Control Panel**, click **System** > **Device Manger**.

2.   In **Device Manager** window, double-click **Network adapters** to display the wireless adapter.

3.   Right-click the target wireless adapter and select **Properties**.

4.   On the **Device usage** section on the **General** tab, check the **Disable in this hardware profile** box. Click **OK**. A red X is appended to the adapter icon to indicate that the device has been disabled.

For Windows 2000/XP

1.   Under **Control Panel**, click **System** > **Hardware** > **Device Manager**.

2.   In **Device Manager** window, double-click **Network adapters** to display the target wireless adapter.

3.   Right-click the target wireless adapter and select **Disable**. A red X is appended to the adapter icon to indicate that the device has been disabled.

Uninstalling the Wireless LAN Card Software

In case you want to update the Wireless LAN Card software, you can follow the steps described in this section to remove your old driver first.

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 802.11g Wireless LAN > Uninstall IEEE 802.11g Wireless LAN**.
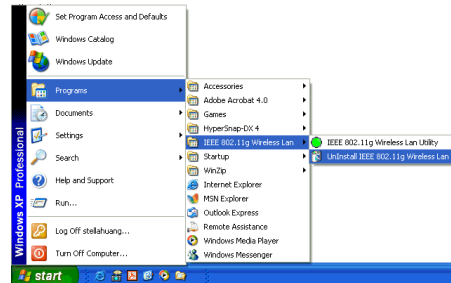
3.   Click **OK** to proceed with the software removal procedure.
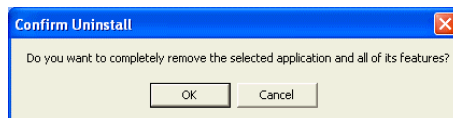
4.   Click **Finish**. Subject to your Wireless LAN adapter, the Windows OS may reboot to enable the changes.
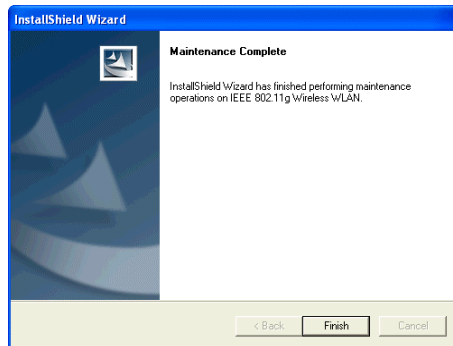
Chapter 7   Updating the Device Driver and Software

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 6. 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

To verify the Wireless LAN Card is functioning properly.

After installation you can verify whether you wireless adapter is properly installed and functioning by take out these steps:

1. Launch the **Device Manager** as below:

   - For Windows 98/Me: Under **Control Panel**, click **System** > **Device Manager**.

   - For Windows 2000/XP: Under **Control Panel**, click **System** > **Hardware** > **Device Manager**.

2. In the **Device Manager** window, double-click **Network adapters** to display your wireless adapter.

3. Without an exclamation mark next to the wireless adapter, your wireless device is working properly; otherwise you will need to remove and re-install the wireless adapter.

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 when operating in 802.11b/g networks.

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.

- 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 using Ad-Hoc mode, 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.

- Ensure you are not trying to connect to an 802.11a wireless adapter. 802.11a and 802.11b/g standards are not interoperable.

Poor Link Quality

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

- Radio/object interference. To minimize this problem, move the devices within the line of sight.

- Distance between two wireless devices is too far. Decrease the distance between the wireless adapter and Access Point (or another wireless adapter).

- When operating in Ad-Hoc mode, change the utilizing channel if it already been used by another Access Point or another Ad-Hoc mode wireless network nearby. This helps to prevent the turbulence on the same channel.

Cannot Connect to an 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.

- Make sure your wireless LAN card operation mode is set to Infrastructure.

- Make sure you are not trying to connect to an 802.11a Access Point. 802.11a and 802.11b/g standards are not interoperable.

- The Access Point has reached its maximum number of supported clients.

- If MAC address access control is enabled on the Access Point, make sure the MAC address of your Wireless LAN Card is not among the deny access list.

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

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

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

Information to User:

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the 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**.
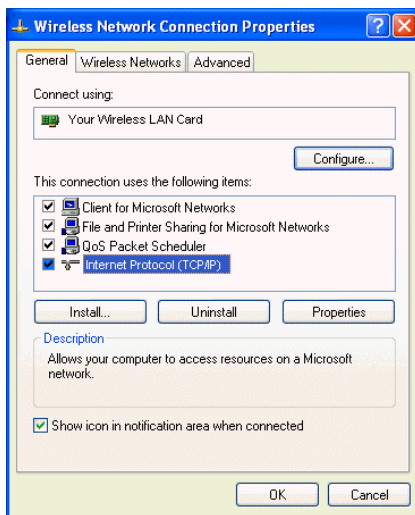
3. On the **General** tab, highlight **Internet Protocol (TCP/IP)** and then click **Properties**.

    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 without notice.

General Specification

Host Interface	• 32bit CardBus • Mini-PCI spec V1.0
Form Factor	• CardBus type • Mini PCI type IIIB
Chipset	• CardBus: Atheros AR5212 , AR5112 • Mini-PCI: Atheros AR5212, AR2112
Network Standard	IEEE 802.11b, 802.11g
Security Encryption **	• Encryption: AES, TKIP, WEP • Authentication: 802.1x
Network Architectures	Ad hoc and Infrastructure

Modulation Techniques	BPSK, QPSK, 16QAM, 64QAM
Modulation Technology	OFDM, CCK, DSSS
Media Access Technique	CSMA/CA
Supported Data Rates	IEEE 802.11b/g Standard Mode: 1 – 54Mbps
Antenna type	● Mini-PCI: Internal diversity with connectors ● CardBus: Two internal diversity antennas
OS Compatibility	Windows 98se, Me, 2000, XP

** The current driver/utility versions only support WEP encryption.

Glossary

802.11 802.11 refers to a family of specifications developed by the IEEE for wireless LAN technology. 802.11 specifies an over-the-air interface between a wireless client and a base station or between two wireless clients.

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) An 802.11 networking framework in which devices or stations communicate directly with each other, without the use of an Access Point (AP). Ad-hoc mode is useful for establishing a network where wireless infrastructure does not exist or where wired network services are not required. Ad-hoc mode is also referred to as peer-to-peer mode or an Independent Basic Service Set (IBSS).

Bit A bit (short for binary digit) is the smallest unit of data in a computer. A bit has a single binary, either 0 or 1.

Bluetooth Bluetooth is a computing and telecommunications industry specification that describes how mobile phones, computers, and personal digital assistants (PDAs) can easily interconnect with each other and with home and business phones and computers using a

short-range wireless connection.

BSS	Basic Service Set. In a network where an AP is connected to wired network and is associates with a set of wireless stations, it is referred to as a BSS.
ESS	Extended Service Set. An Extended Service Set (ESS) is a set of two or more BSSs that form a single network. It's basically a roaming wireless network.
Default Gateway	The address used to forward all traffic that is not addressed to a station within a local subnet.
Encryption	The translation of data into a secret code. Encryption is the most effective way to achieve data security. To read an encrypted file, you must have access to a secret key or password that enables you to decrypt it.
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 interconnects networks with different, incompatible communications protocols.
IEEE	Abbreviation of Institute of Electrical and Electronics Engineers, pronounced I-triple-E. Founded in 1884 as the AIEE, the IEEE was formed in 1963 when AIEE merged with IRE. IEEE is an organization composed of engineers, scientists, and students. The IEEE is best known for developing standards for the computer and electronics industry.
Infrastructure	An 802.11 networking framework in which devices communicate with each other by first going through an Access Point (AP). In Infrastructure mode, wireless devices can

communicate with each other or can communicate with a wired network.

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.

LAN Local Area Network. A communication 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 (such as 10BaseT) is often used to connect the PCs together.

MAC Address The MAC (Media Access Control) Address is a 12 digit Hexadecimal number that uniquely identify your network adapter on the network.

Media The materials used to connect network devices, such as twisted-pair wire, coaxial cables, or fiber optic cables. Some networks do not use physical connecting media; communications are achieved via radio waves instead.

Mbps Stands for millions of bits per second or megabits per second and is a measurement for data transmission.

Protocol The rules and encoding specifications for sending data.

RF	Radio Frequency, any frequency within the electromagnetic spectrum associated with radio wave propagation. When an RF current is supplied to an antenna, an electromagnetic field is created that then is able to propagate through space.
Roaming	In an Infrastructure mode wireless network, roaming refers to the ability to move from one AP coverage area to another without interruption in service or loss in connectivity.
SSID	Service Set Identifier, up to 32-character unique identifier attached to the header of packets sent over a WLAN that acts as a password when a mobile device tries to connect to the BSS. The SSID differentiates one WLAN from another; so all access points and all devices attempting to connect to a specific WLAN must use the same SSID. A device will not be permitted to join the BSS unless it can provide the unique SSID. An SSID is also referred to as a Network Name because essentially it is a name that identifies a wireless network.
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.
Topology	The geometric arrangement of devices on a network. For example, devices can be arranged in a ring, bus or star.

WEP   Wired Equivalent Privacy, a security protocol for wireless local area networks defined in the 802.11b standard. WEP is designed to provide the same level of security as that of a wired LAN. LANs are more secure than WLANs because LANs are somewhat physically protected by their structure, having some or all part of the network inside a building protected from unauthorized access. WLANs, which are over radio waves, do not have the same physical structure and therefore are more vulnerable to tampering. WEP aims to provide security by encrypting data over radio waves so that it is protected as it is transmitted from one end point to another.

WLAN   Wireless Local Area Network. A group of computers and devices that communicates with each other wirelessly.