54Mbps Wireless LAN Card

User's Manual

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About This Manual

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

- 32-bit CardBus Adapter
- PCI Adapter
- Mini-PCI Adapter

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

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

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.

Contents

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Chapter 1   Introduction

This Wireless LAN Card is an IEEE 802.11g wireless LAN adapter. 802.11g is the latest in the series of 802.11 specifications for wireless local area networks (WLANs) and provides data transfer of up to 54 Mbps. Since 802.11g standard operates on the same frequency of 2.4 GHz as 802.11b, so it is backwards compatible with existing Wi-Fi devices!

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 54Mbps. Both Ad hoc and Infrastructure mode are supported. For network security concern, 64/128-bits Wired Equivalent Privacy (WEP) encryption is used. In addition, its standard compliance ensures that it can communicate with any 802.11b/g networks.

Wireless LAN Basics

This section contains 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 an Ad hoc 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

The Ad hoc group offers peer-to-peer connections between workstations, allowing communication between computers within range that have a Wireless LAN Card installed. A wireless Ad hoc network 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.

Note: Using the 802.11g card in Ad hoc mode, your target peer can be 802.11b or 802.11g compatible wireless station. But you cannot connect to an 802.11a wireless station since 802.11a devices are not compatible with 802.11b/g devices.
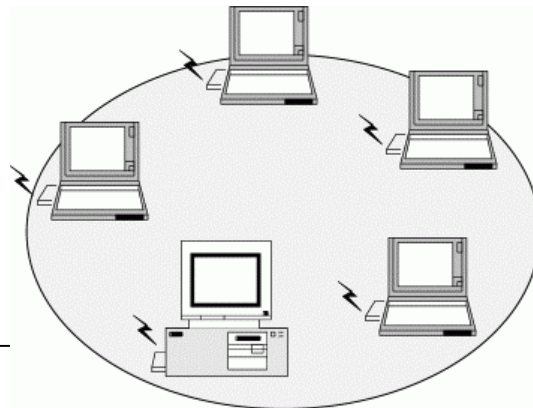
Figure 1-1   Ad Hoc Mode

Infrastructure Mode

The Infrastructure network uses an AP or several APs 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 file server.

Note: Using 802.11g card, you can connect to 802.11b or 802.11g compatible Access Point. But you cannot connect to an 802.11a Access Point since 802.11a devices are not compatible with 802.11b/g devices.
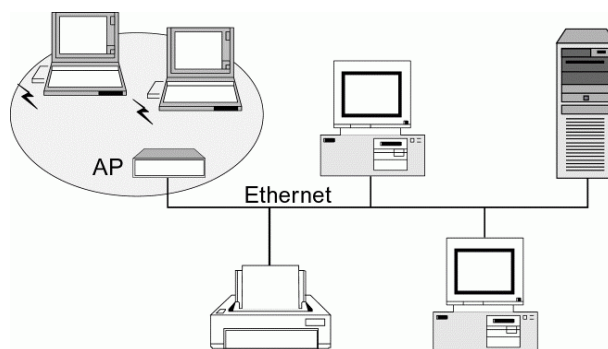
Figure 1-2   Infrastructure Mode

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.
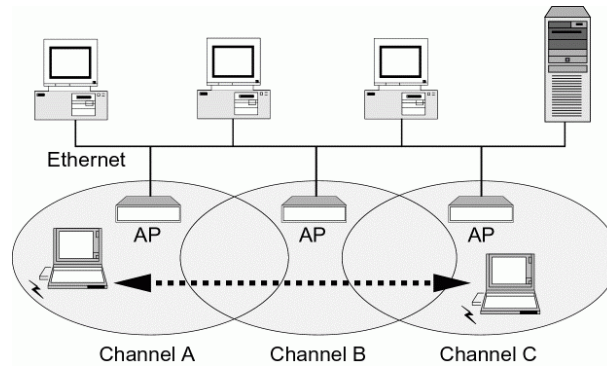
Figure 1-3   Roaming Across Multiple Access Points

Chapter 2   Installing the Wireless LAN Card

This chapter describes the installation process of 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 Utility, is to help you configure and monitor your Wireless LAN Card.

If you are using an embedded wireless solution, such as the Mini PCI wireless adapter, your notebook is probably shipped with its driver and software properly installed. If this is the case, just ignore this chapter and proceed with the configuration steps in next chapter.

In case you need to install the driver and software for any reason, follow the instructions described in this chapter.

System Requirements

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

- Pentium-class PC, 300MHz or better recommended
- 64 MB of RAM, additional memory recommended
- Hard disk space at least 30 Mbytes
- Windows© 98(SE)/Me/2000/XP
- UL listed I.T.E. computers
- For CardBus wireless adapter: 32-bit CardBus expansion slot
- For PCI wireless adapter: One available PCI slot *

*WARNING: THE OPERATING VOLTAGE OF PCI ADAPTER IS 3.3V. IF YOU INSTALL THE PCI ADAPTER IN MOTHERBOARDS THAT SUPPORT ONLY 5V PCI ADPTER, YOUR COMPUTER WILL NOT WORK PROPERLY.

Installing Wireless LAN Driver and Software

This section describes how to install the Wireless LAN Card driver and software.

Basic Installation Procedures

Windows 98, Me, 2000 and XP use the same setup program; however, operation system-specific situation may occur during or after the installation process. 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.

Cautions:
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.
For PCI/MiniPCI adapter: 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.

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** of the Software Utility CD where **D** is the drive letter.

3. When the welcome screen pops up, click **Next**.
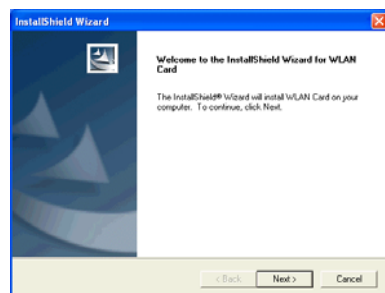
4. When the **License Agreement** screen appears, click **Yes**.
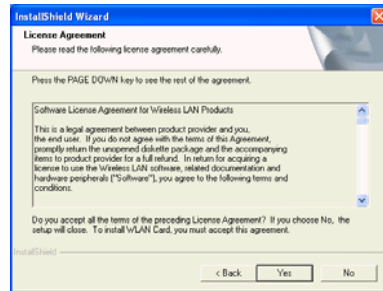
5.   To install the software to the default destination folder, click **Next**. If you are to install the software to a different folder, click **Browse** to select another folder, and then click **Next**.
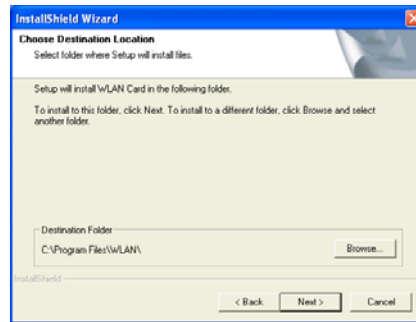
6.   For CardBus/Mini-PCI wireless adapter only. For CardBus user, insert your wireless adapter into the PCMCIA slot of your computer when the following screen appears. For Mini-PCI users, do as the dialog request.

For Mini-PCI user. If prompted with this screen, click **Cancel**.
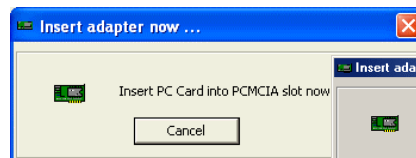
For Mini-PCI user. If prompted with this screen, click **Next**.
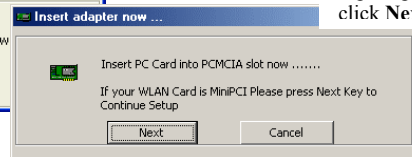
8.   Click **Finish** when the following screen appears. Subject to the type of your Wireless LAN Card, the Windows may reboot.
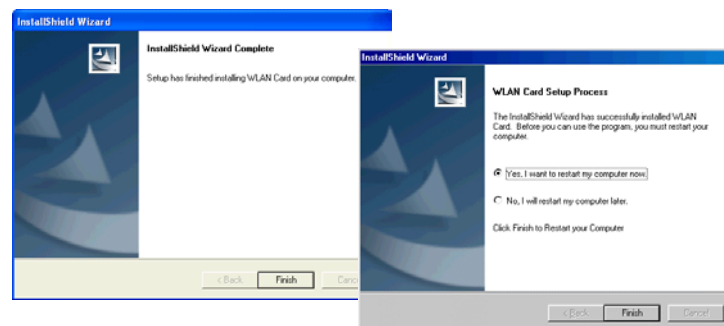
General Guidelines for OS-Specific Situations

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

Now you are done with the installation procedure. After software installation, you should be able to find the wireless monitor icon located on the system tray. Your Wireless LAN Card is ready to use. Proceed to next chapter to configure or fine-tune your Wireless LAN Card settings.

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.

Chapter 3   Using Wireless LAN Utility

Once your wireless adapter software is properly installed, the provided Wireless LAN Utility is ready for use. The utility comes with five tabs. The **Link Status** tab displays the current link status. The **Configuration** tab allows configuring your wireless connection. The **Encryption** tab allows securing wireless transmission. The **Site Monitor** tab allows to monitor available networks and the **About** tab displays utility information. See the ensuing subsections for instructions to launch the utility and descriptions of each tab.

Accessing Vendor's Wireless LAN Utility

You can access the vendor-provided Wireless LAN Utility by any of the following methods:

● Double-click the wireless tray icon on the system tray.

● Right-click the wireless tray icon and select one of the five tab's name from the context menu.

Tabs inside Wireless LAN Utility
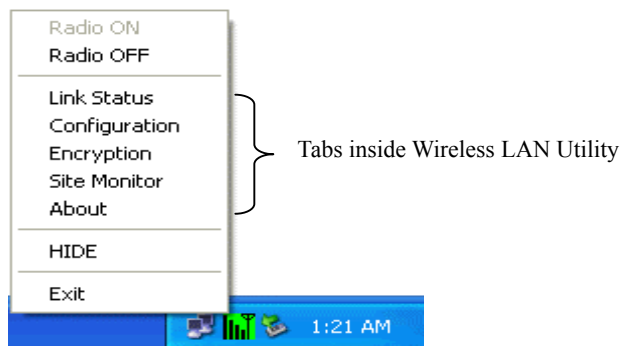
Note: If the wireless tray icon is not launched, you can manually start the Wireless LAN Utility by selecting **Start** > **Programs** > **WLAN Utility**>
WLAN Utility.

The Wireless LAN Utility screen pops up with five available tabs: **Link Status**, **Configuration, Encryption, Site Monitor** and **About**. See appropriate
section, which describes each tab item.

Notice When Assessing Wireless LAN Utility under Windows XP

Aside from using the vendor's WLAN utility for configuration, Windows XP includes a **Wireless Zero Configuration Utility** for you to configure
your wireless adapter. You can optionally choose to configure your wireless adapter via either the vendor's Wireless LAN Utility or Windows
XP-included wireless utility.

By default, your wireless adapter is managed by the vendor-provided wireless utility. If you want to enable the Windows XP-included wireless utility,
refer to next section for instructions. For information on using Windows XP **Wireless Zero Configuration Utility**, please refer to Chapter 5
Windows XP Wireless Zero Configuration Utility

Using Windows XP's Wireless LAN Utility

To use Windows XP WLAN utility for configuration purposes, you should take these steps:

1. Double-click the Windows XP wireless tray icon (not the vendor's WLAN utility icon) and then click **Properties** (or **Advanced**). Then select **Wireless Networks** tab.

Windows XP wireless icon   Vendor's wireless icon

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

    To revert back to vendor-provided wireless utility, just return to this screen and uncheck this check box.

If your wireless adapter is managed by Windows XP-included wireless utility, in vendor-provided wireless utility, you can only access the **Link Status**, **Statistics** and **About** screens. The **Configuration** and the **Encryption** screens are not accessible.
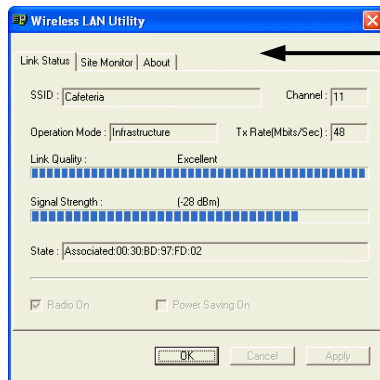
Configuration/Encryption tab is not visible when Windows XP overrides the management of your wireless adapter.

You can choose to configure your Wireless LAN Card via either the vendor's wireless LAN utility or Windows XP-included wireless utility.

Link Status Tab

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

Screen Item	Description
SSID	Displays the name of the wireless network your station is currently connected to.
Operation Mode	Displays the current connection mode: Infrastructure or Ad Hoc.
Channel	Shows which channel is current in use.
TxRate (Mbits/Sec)	Transmission rate at which data is transferred.
Link Quality	Measures quality of the link.
Signal Strength	Displays the signal strength in dBm and by graphic.
State	Displays current status such as scanning or successful association.

In addition, you can find two checkboxes at the button on this tab which perform the self-explanatory tasks:

- **Radio On**: Uncheck it if you wish to turn off the RF signal.
- **Power Saving On**: Check it if you with to reduce the power consumption by the Wireless LAN Card to extend the battery life of your laptop.
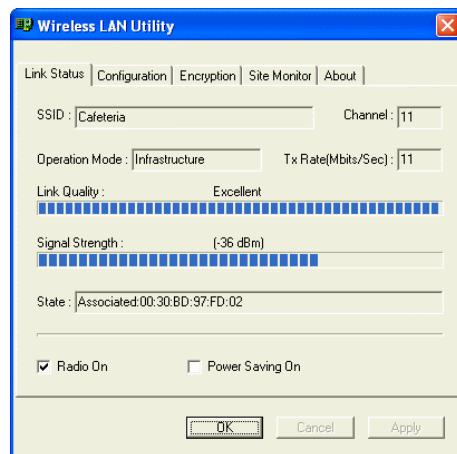
Figure 3-1   Link Status Tab

Configuration Tab

This section allows you to add a new profile or edit an existing profile. If you wish to add a new profile click on the **New** button. To delete an existing profile, from the **Profile Name** drop-down menu select the target profile and click the **Delete** button. The **Defaults** button sets *Default* profile to connect with any compatible and "open" AP.

The items on the **Configuration** tab are described in the table below:

Screen Item	Description
Profile Name	Name of your current settings.
Operating Mode	Infrastructure or Ad Hoc (peer-to-peer).
Network Name	Specifies 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:** If using the special SSID "**ANY**"(case sensitive), your Wireless LAN Card will connect to the first compatible and "open" AP with the best signal strength within the connection range.

Screen Item	Description
Peer-to-Peer Channel	Select the channel for your wireless network (Ad Hoc mode ONLY).
	Note that 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 (TELEC)
	• 1-13 channels for Europe (ETSI)
	• 10-13 channels for France
Transmit Rate	Decides the speed of the data transmission. The default setting (**Fully Automatic**) allows the wireless adapter adaptively adjust its data rate as the signal strength warrants. Note that the available rates vary according to the supported rates of the associated AP or wireless client:
	For 802.11b AP or wireless client: 1, 2, 5.5 and 11 Mbps are supported.
	For 802.11g AP or wireless client: 1, 2, 5.5, 6, 9,11, 12, 18, 24, 36, 48 and 54Mbps are supported.
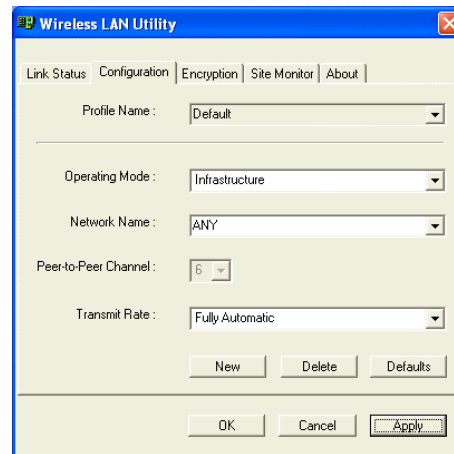
Figure 3-2   Configuration Tab

Once the configuration you made is complete, click the **Apply** button. The Wireless LAN Utility will switch to the **Link Status** to display whether the connection has been established or not.

Encryption Tab

This section allows you to enable secure data transmission by using WEP (Wired Equivalent Privacy). If encryption is not necessary, just select **Disable** from the **Encryption (WEP security)** drop down menu. If your target network is WEP protected, you also have to enable WEP and enter the correct keys in order to establish the connection. To enable WEP, take the steps below:

1. Select **64 bits** or **128 bits** as the WEP key length from the **Encryption (WEP security)** drop-down menu.

2. From the **Type** list, select the required authentication type. (You should use the same authentication method as used by your target wireless network.)

   - **Open System**: If your target wireless network uses **Open System**, your authentication request will be always accepted.

   - **Shared Key:** If your target wireless network uses **Shared Key**, your wireless adapter must be set to use correct WEP to pass the authentication. If selected, your wireless adapter must use identical WEP keys as the target wireless network.

3. Choose **Alphanumeric** or **Hexadecimal** as the key format and then enter up to four keys in the provide fields. When using **Hexadecimal** format, only digits 0-9 and letters a-f, A-F are allowed. Make sure to enter the character matching the required key format and length as below:

	ASCII characters	Hexadecimal digits
64 bits	5 alphanumeric characters	10 hexadecimal digits
128 bits	13 alphanumeric characters	26 hexadecimal digits
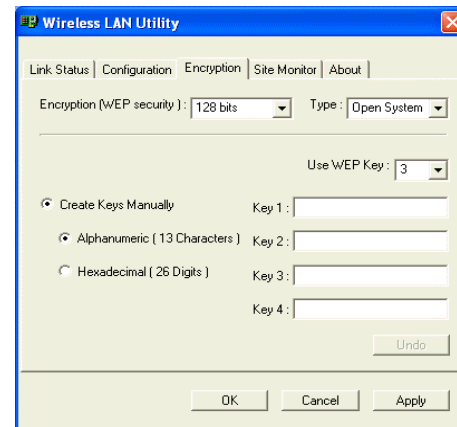
Figure 3-3   Encryption Tab

4. From the **Use WEP Key** list select which key you want to use to encrypt your transmitting data.

5.   After you finished all the encryption settings, click **Apply** to activate the changes.

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.

Site Monitor Tab

The **Site Monitor** tab displays the general information of the wireless networks available in the air and you can select the network you want to connect with by double-clicking on the network's name. In addition, you can use the **Site Monitor** feature to display the communications quality of your computer with multiple APs or clients in its vicinity. The **Site Monitor** allows you to:

● Connect to a wireless network by double-clicking on it.

● Determine the overall wireless coverage of your wireless network.

● Optimize placement of the Access Point(s), to provide seamless connectivity to mobile stations.

● Roam throughout the wireless network environment with your station, you will be able to identify areas that may not have adequate coverage, or that suffer from interference by other (wireless) equipment such as microwave ovens.

The list will update automatically to display all visible networks. Click **Freeze** table checkbox to freeze the list box so that you can calmly read the information inside it. In addition, it will stop the search for available network. To display only the Ad hoc network, enable the **Ad hoc networks only** checkbox.

For each network, the following information will be displayed:

Field	Description
Network Name	Displays the name of the wireless network.
Channel	The channel used by the AP or wireless station.
WEP	Displays whether WEP is ON or OFF.
Signal (dBm)	Displays the signal strength in dBm.
Link Quality	Measures the signal level.
Network Address	The MAC address of the AP or wireless client.
Network Type	Displays whether the AP or wireless client supports 802.11b & 11g or only 802.11b.
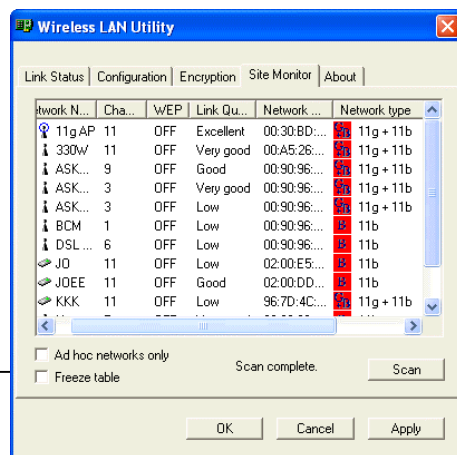
Figure 3-5   Site Monitor Tab

If you are unsure whether the target network is Ad hoc or Infrastructure, check the table below.

Icon	Description
	Access Point (Infrastructure mode).
	Wireless station (Ad hoc mode).

About Tab

The **About** tab displays information about the device, including the Utility, Driver and Firmware details.
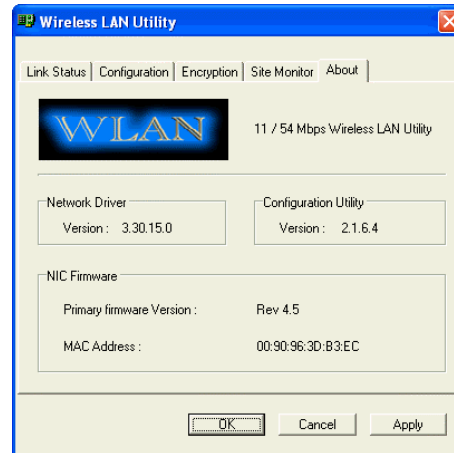
Figure 3-6   About Tab

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 connection and signal strength.
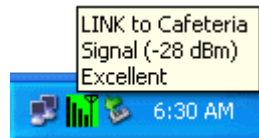
Tray Icon Graphic Indication

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:

Graphic	Radio Connection Quality
	Very good. Your Wireless LAN Card has an excellent radio connection with the network, allowing excellent network communication at the highest transmit rate.
	Good radio connection Your Wireless LAN Card has a good radio connection with the network, allowing normal network communication.
	Low radio connection The radio signal is low. You can move your device closer to your target Access Point or wireless station for better signal strength.
	Poor radio connection. The radio signal is very weak. You can move your device closer to your target Access Point or wireless station for better signal strength.

Graphic	Radio Connection Quality
	No signal. It may due to you are out of range of the wireless network or configuration errors (such as the SSID or WEP encryption doesn't match your target AP/wireless station). Move your device closer to your target Access Point/wireless station or verify your SSID or WEP settings.
	Radio if OFF. You manually disable the RF signal.
	Disconnect. Wireless connection unavailable

Other Functions

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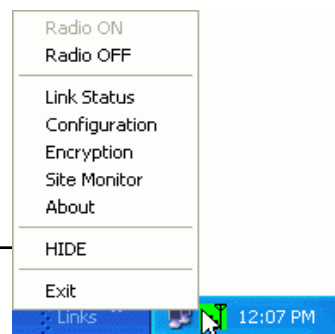
Each item on the context menu is described as below:

Radio ON/Radio OFF: Enable or disable the RF signal

Link Status/Configuration/Encryption/Site Monitor/About: Pop up the Wireless LAN Utility.

HIDE: Close the menu.

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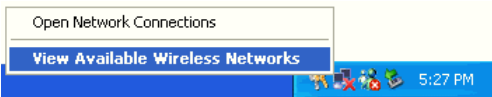
Note: Depending on whether your wireless network is established, the context menu may come with different items.

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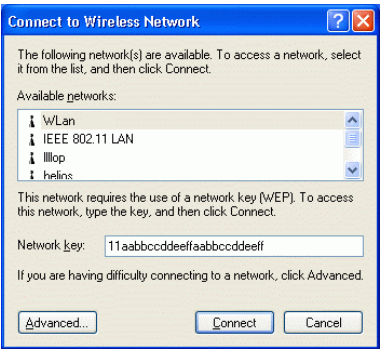
Figure 5-1   Windows XP Configuration Utility-Connect to Wireless Network

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 35.

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.
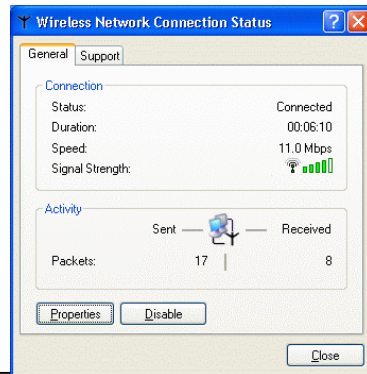
Figure 5-2   Windows XP- Connection Status

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 which 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 49.
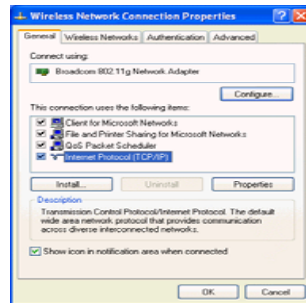
Figure 5-3   Windows XP Connection Properties -General

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. Click **Refresh** to update the list of Access Points and Wireless LAN Cards.
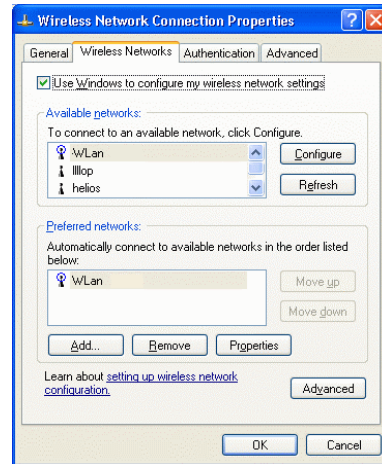
Figure 5-4　Windows XP Connection Properties-Wireless Networks

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.
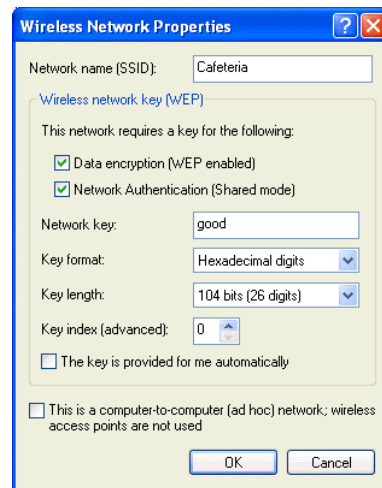
Figure 5-5　Windows XP-Add Preferred Networks

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 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**.
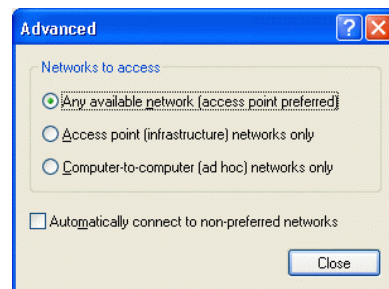
Figure 5-6   Windows XP Configuration Utility-Defining Network Mode

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 disable **Enable network access control using IEEE 802.1X**.
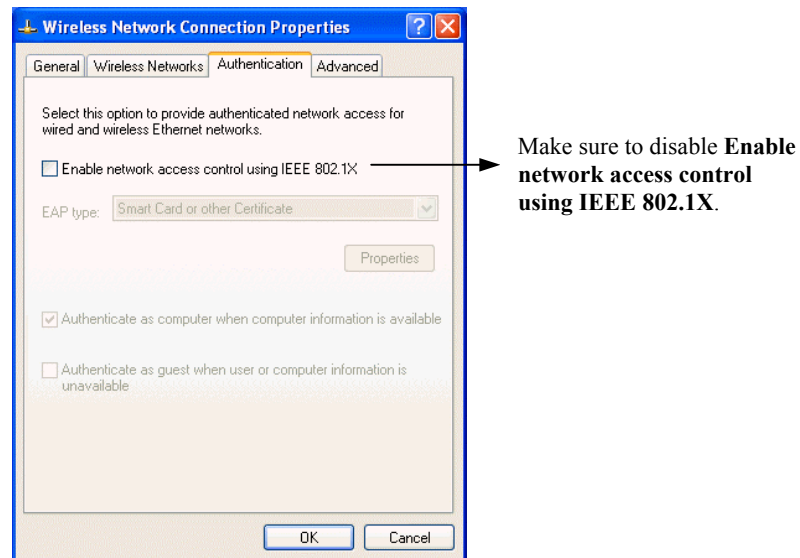
Figure 5-7　Windows XP Connection Properties – Authentication

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 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** button, point to **Programs**, **WLAN Utility** and then click **Uninstall Utility**.
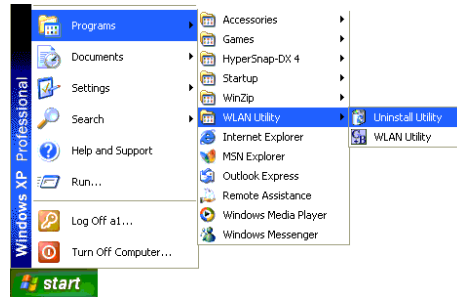
3.   Click **OK** to proceed with the software removal procedure.
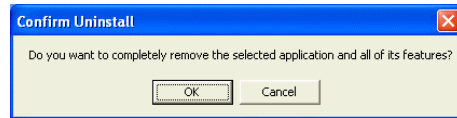
4.   Click **Finish** to complete the software uninstallation. Subject to your Wireless LAN Card, the Windows OS may reboot to enable the changes.
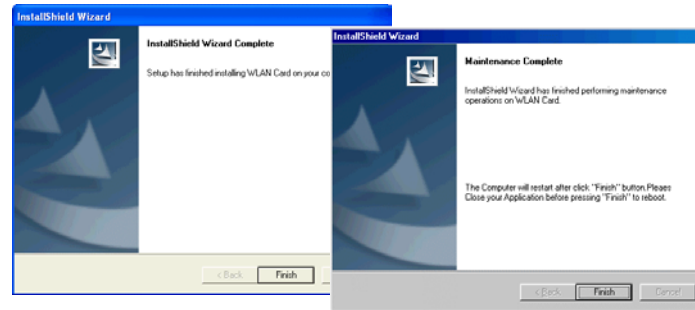
Removing the Wireless LAN Card (For CardBus Adapter)

To permanently remove the CardBus 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   Troubleshooting

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 WLAN card's software.

Cannot Install under Windows 2000

When I installing the software under Windows 2000, I received the error message: "1608: Unable to create InstallDriver instance" and the program stopped installing.

This error occurs when the **Microsoft Network Client** is not installed under Windows 2000. To install this network component:

1. Go to **Control Panel** and double-click the **Network and Dial-up Connections** icon. Right-click on the **Local Area Connection**, then select **Properties**.

2. Click **Install** > **Client** > **Add** > **Client for Microsoft Networks** > **OK**.

3. The **Microsoft Network Client** is now installed. Manually restart your computer to enable the changes.

4. Then re-try to install the software as described in this manual.

Radio Interference

You may be able to attenuate 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 / Computer does not Boot Correctly

If the Wireless LAN Card is not detected by Windows, try the following:

- Make sure the Wireless LAN Card is properly inserted in the computer.
- For CardBus wireless adapter, make sure you are using 32-bit CardBus expansion slot and the slot is working.
- Contact your dealer for additional testing if there is a hardware problem with the Wireless LAN Card.
- For PCI wireless adapter. The operating voltage of the WLAN card is 3.3V, if your motherboard's PCI slots only support 5V, your computer will not work properly.

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 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.
- Make sure you are not trying to connect to an 802.11a wireless adapter. 802.11a and 802.11b/g standards are not interoperable.
- If more than one wireless adapter is installed in the same computer, this could cause the driver conflict and thus the wireless adapter cannot function properly. In this situation, the client should remove all the drivers and re-install the dedicated wireless adapter.

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 Wireless LAN Card and the target Access Point or wireless client   is too far. Decrease the distance between the Wireless LAN Card and Access Point or wireless client.
- When operating in Ad hoc mode, change the utilizing channel if it is 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 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 security settings are 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 device complies with FCC RF Exposure limits set forth for an uncontrolled environment, under 47 CFR 2.1093 paragraph (d)(2)

SAR compliance has been achieved and applies to laptops with double PCMCIA slots which located at left side of laptop PC.

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

Broadxent Pte Ltd. declare that CW2220-1 (Wireless 54Mbps Notebook Adapter) is limited in CH1~CH11 by specified firmware controlled in USA.

Appendix C   Setting Up TCP/IP

This section contains instructions for configuring the TCP/IP protocol of the Wireless LAN 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 ->Your Wireless LAN Card** and then click **Properties**.
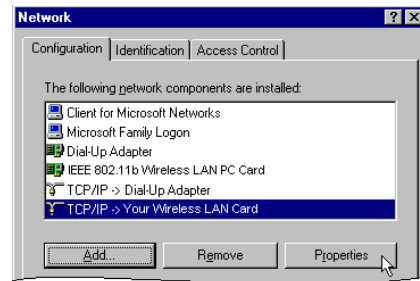
4. On the **IP Address** tab, choose one of the methods as required:

    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,** then **Network Connections**.

2. Right-click the **Local Area Connection** icon corresponding to your wireless adapter and click **Properties**.
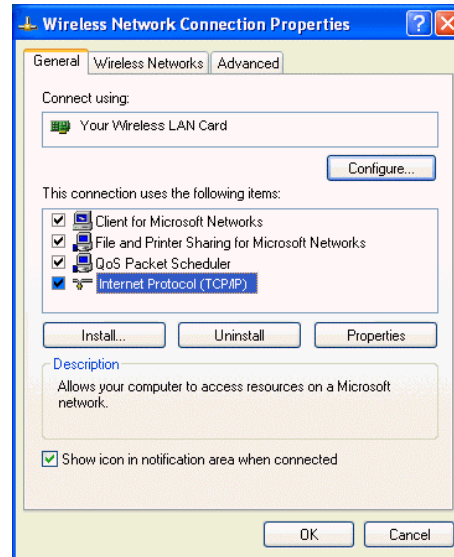
3. On the **General** tab, highlight **Internet Protocol (TCP/IP)** and then click **Properties**.

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

Host Interfaces	Mini PCI / CardBus / PCI Spec. V2.2
Form factor	Type III B / 32bit CardBus / Low profile PCI
Chipset	Broadcom BCM 4306 & BCM 2050
Operation Voltage *	3.3VDC
Network Standards	IEEE 802.11b (Wi-Fi™) standard and IEEE 802.11g standard
Modulation Techniques	DBPSK,DQPSK,CCK,16QAM,64QAM
Modulation Technology	OFDM, DSSS
Data Rate	802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps
Network Architectures	Infrastructure and Ad hoc
Operating Frequencies	2.4-2.497 GHz
Operating Channels	802.11b: 11 for North America, 14 for Japan, 13 for Europe (ETSI) 802.11g: 13 for North America, 13 for Europe (ETSI), 13 for Japan
RF Output Power	15 dBm maximum output power (14 dBm nominal ± 1 dBm over operating temperature
Receiver sensitivity **(PER <10%)**	-80dBm @ 6Mbps
Antenna Type	Hardware diversity support: transmit and receive on Main and Auxiliary antenna connectors.
Range	802.11b: 11 Mbps up to 180m LOS, 60m indoors; 1 Mbps up to 570m LOS, 125m indoors

	802.11g: 54 Mbps up to 50m LOS, 20m indoors; 18 Mbps up to 150m LOS, 75m indoors
Power Consumption	Tx peak: 550 ma @ 3.3VDC; Rx peak: 350 ma @ 3.3VDC; Idle: 225mA @ 3.3VDC
Security **	Hardware 64/128-bit WEP engine; WEP weak-key avoidance, TKIP, hardware AES engine supporting CCM and OCB, 802.1x, SSN
Delay Tolerance	802.11b: Multipath R.M.S Delay Spread @ 1% FER: 11 Mbps > 250 nsec; 5.5 Mbps > 300 nsec
Client Utility	Automatic location profile, site monitor, current link status, and diagnostics
Software Support	Microsoft WHQL certified for Windows XP.
LED Indicators	WLAN Activity Monitor, WLAN Radio Status Indicators
Switch	Manual radio on/off disables transmit and receive to comply with aviation in-flight restrictions
Temperatures	Operates from 0 to 70 ℃ Storage from -40 to 90 ℃
Humidity (non-condensing)	5 to 95%
Certifications	FCC Part 15 CE TELEC JATE

* For PCI adapter user, if you install the PCI adapter in motherboards that support only 5V PCI adpter, your computer will not work properly. The operating voltage of Mini-PCI, CardBus, and PCI model is 3.3V.

** The current sofware version only supports 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.
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.