

Wireless LAN Card

User's Manual

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Chapter 1 Introduction

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

This User's Manual contains information on how to install and configure your Wireless LAN Card. Your Wireless LAN Card will allow you to connect your computer to other Wireless LAN Card equipped computers.

Wireless LAN Basics

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

Local Area Network (LAN)

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

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

There are two ways to use the Wireless LAN Card. One way is to connect directly to one or more Wireless LAN Card equipped computers, forming 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 Network

The Ad Hoc network offers peer to peer connections between workstations, allowing communication between computers within range that have an 802.11b DSSS compatible PC

card installed. A wireless 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.

Infrastructure Network

The 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.

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.

Chapter 2 Installing the Wireless LAN Card

This chapter describes the system requirement and Wireless LAN Card status LEDs. In addition, we will guide you through the Wireless LAN Card installation as outlined below:

For Windows 98(SE)/Me/2000/NT

1. Installing the software utility using the provided Software Utility CD.
2. Installing the hardware and then driver installation will be auto-processed.

For Windows NT4.0 (for PCMCIA card only)

1. Installing the software utility using the provided Software Utility CD.
2. Manually install the driver and the hardware.

For Windows XP

Installing the hardware and then manually install the driver upon hardware detection.

Note: When connecting the hardware, note that this Wireless LAN Card is for use with UL listed I.T.E. computers.

After completing the steps above, if you need to set up the TCP/IP protocol to communicate with your network, refer to “Appendix C Setting Up TCP/IP” on page 63 for details.

System Requirements

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

- Windows 98(SE)/Me/2000/XP/NT4.0 (for Wireless LAN PCMCIA Card)
- Windows 98(SE)/Me/2000/XP (for Wireless LAN USB Card)
- 32 MB of RAM, additional memory recommended
- Standard **PCMCIA** slot/**USB** port

Wireless LAN Card Status LEDs

The two LEDs on the Wireless LAN Card indicate connection status and data transfer operation status, as described below:

LED	Color	State	Description
Power	Red	On	The adapter is plugged into the PCMCIA slot/ USB port of your computer.
Activity	Green	Blinking	Transmission mode. The faster the LED blinks, the higher the data exchange rate.

The Antenna on the Wireless LAN Card (Only for Wireless LAN USB Card)

The USB adapter comes with one powerful antenna. You can rotate the antenna from 0 to 180 degrees to adjust its range and the connection quality.

Note: Do not rotate the antenna more than 180 degrees, otherwise permanent damage may be caused.

Installing the Wireless LAN Card Software

Note: If you are using Windows XP, the operation system is already equipped with Wireless LAN Card Software, so you don't have to install extra software but only need to install the driver to activate the Wireless LAN Card. Please skip this step and go to next section "Installing the Hardware".



Caution: Do not connect the Wireless LAN Card device to your computer before installing its software. If this happens, the Windows PnP function will detect the **PCMCIA/USB** device and issue a dialog box requesting its driver. Click **Cancel** to quit the wizard.

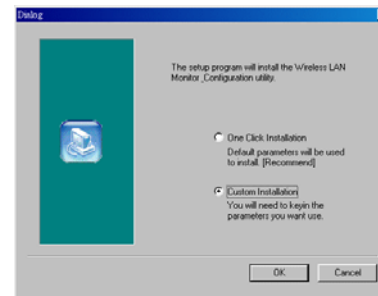
Follow these steps to install the Wireless LAN Card software:

1. Close all Windows programs that are running.

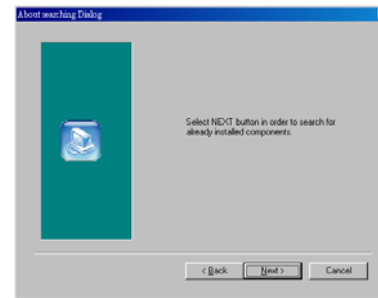
2. Insert the provided Software Utility CD into your CD-ROM drive and select **Install Driver and Utility**. Or, run **Setup.exe** from the **D:\Utility** folder of the Software Utility CD where **D** is the drive letter. When the welcome screen pops up, click **Next**.



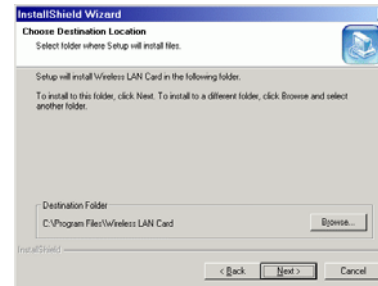
3. For quick installation, select **One Click Installation** and Click **OK** to jump to step 10. For custom installation (to select the parameters that you would like to use), select **Custom Installation** and click **OK** to go to next step.



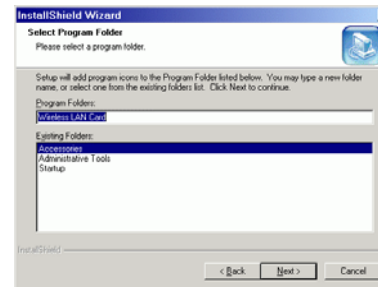
4. Click **Next** to continue.



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

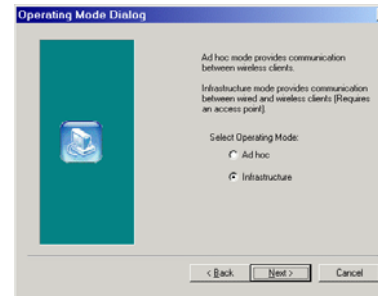


6. Click **Next** to continue.



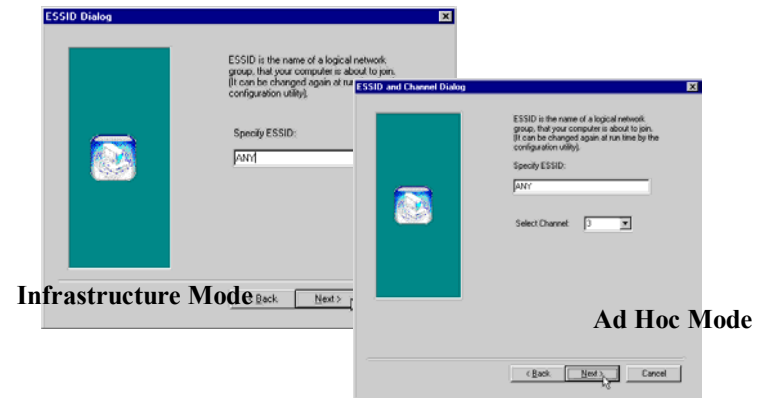
You can change your Operating Mode later by the Wireless LAN Cards Monitor Utility. See “Chapter 3 Wireless LAN Cards Monitor Utility” on page 23 for details.

7. Select the Operating Mode (**Ad Hoc** or **Infrastructure**) in which your wireless client will operate, and then click **Next**.

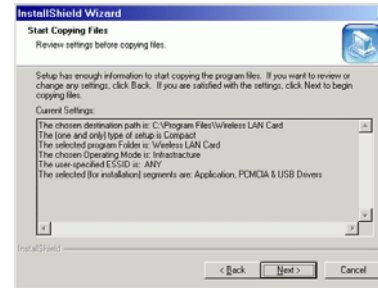


8. Depending on the Operating Mode you specified on Step 7, different **ESSID Dialog** box appears. In the **Specify ESSID** box, enter the Service Set ID name. For Ad hoc mode only, in **Select Channel** box, select a channel number as your operation radio channel. Then click **Next**.

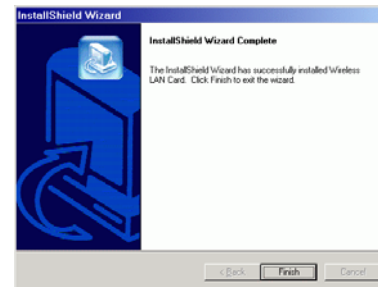
You can change your settings later by the Wireless LAN Cards Monitor Utility. See “Chapter 3 Wireless LAN Cards Monitor Utility” on page 23 for details.



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



10. After Windows OS copies the Setup files from the Wireless LAN Card Software Utility CD, click **Finish**.



Installing the Hardware and Driver

Windows 98(SE)/Me/2000

The red LED on the Wireless LAN Card will light when the Wireless LAN Card is connected to your computer.

For Windows 2000, you will not see **Digital Signature Not Found** message with the setting below:

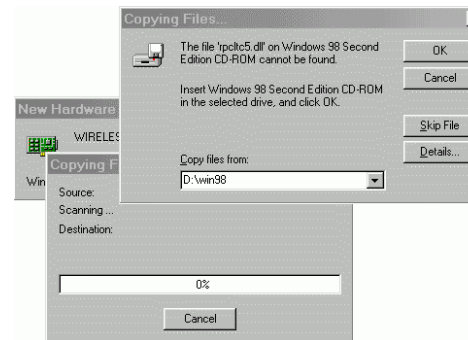
Control Panel > System > Hardware > Driver Signing > Ignore- Install the software anyway....

After installing the Wireless LAN Card Software, plug the Wireless LAN Card into your computer's **PCMCIA** slot/**USB** port. The Wireless LAN Card is powered on; no external power is required.

Upon hardware detection, Windows OS will install the driver for the card automatically.

Note:

1. For Windows 2000: If you are prompted with the **Digital Signature not Found** alarm message, just click **Yes** to ignore it and continue with the auto-installation.
2. For Windows 98(SE): If prompted, you need to insert your Windows 98(SE) installation CD to complete the driver installation.



Note: If you need to set up the TCP/IP address or the subnet mask, refer to “Appendix C Setting Up TCP/IP” on page 63 for details.

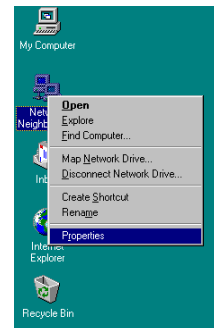
Now you are done with the installation procedure. Select **Start > Programs > Wireless LAN Card > Configuration & Monitor Utility**. You should be able to see the **Wireless LAN Cards Monitor Utility** icon appearing on the right side of the taskbar. Proceed to next chapter to configure or fine-tune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

Windows NT4.0 (For Wireless LAN PCMCIA Card Only)

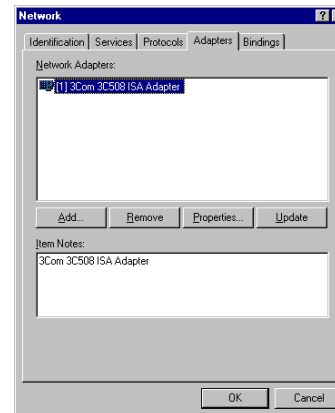
After installing the Wireless LAN Card Software, you should manually install the driver for the Wireless LAN PCMCIA Card first before you insert the PCMCIA card. Windows NT will not install the drivers for the card automatically. Follow the steps below to install the driver and then the hardware:

Note: You must install **Windows NT Service Pack 5 or above** before installing the Wireless LAN PCMCIA Card driver.

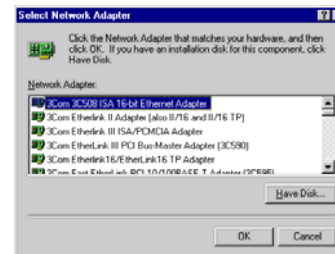
1. On your desktop, right-click the **Network Neighborhood** icon and then click **Properties** to open the network setting window.



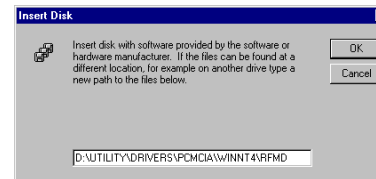
2. Select the **Adapter** tab, and click **Add** to install the Wireless LAN PCMCIA Card.



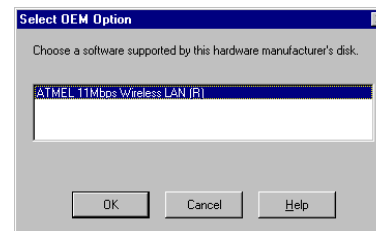
3. Click **Have Disk** to continue.



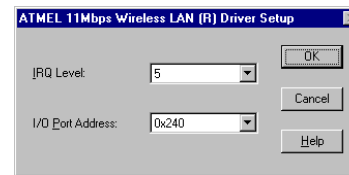
4. Type the directory in which the Wireless LAN PCMCIA Card driver is located.



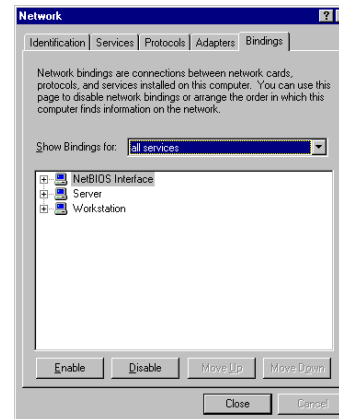
5. When the Wireless LAN PCMCIA Card driver is found, it will show the type of the Wireless LAN Card. Click **OK** to continue.



6. Then be sure to prevent the **IRQ Level** and **I/O Port Address** from colliding with other hardware.



7. Finally, you must click the **Bindings** tab to bind network protocols to the Wireless LAN PCMCIA Card . Click **Close** and Windows NT will ask you to restart the computer . Insert the Wireless LAN PCMCIA Card into PCMCIA slot and then restart the computer.



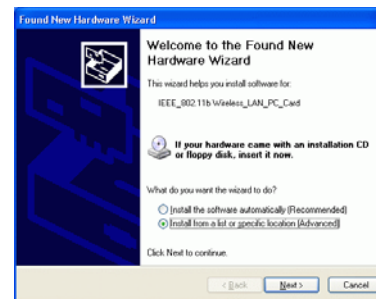
Windows XP

The red LED on the Wireless LAN Card will light when the Wireless LAN Card is connected to your computer.

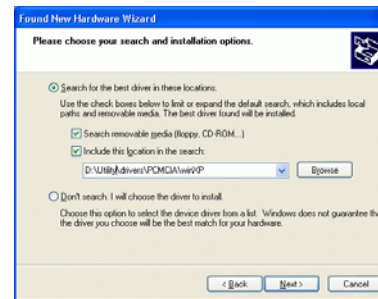
After installing the Wireless LAN Card Software, plug the Wireless LAN Card into your computer's **PCMCIA slot/USB** port. The Wireless LAN Card is powered; no external power is required.

Note: Windows XP will not install the drivers for the card automatically, so users must follow the steps to install the driver as below:

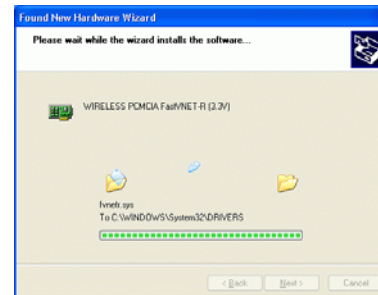
1. When you insert the Wireless LAN Card into **PCMCIA slot/USB** port, the system will display an unknown hardware message. Select **Install from a list or specific location[Advanced]** and click **Next** to continue.



2. Point the directory to the Software Utility CD, for example, **D:\Utility\drivers\PCMCIA(USB)\winXP**. Click **Next** to continue.



3. The Windows now will copy the drivers form the Software Utility CD.



4. After Windows XP copied the drivers from the Software Utility CD, click **Finish**.



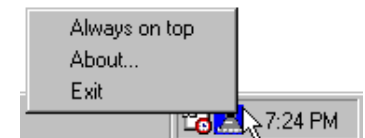
Chapter 3 Wireless LAN Cards Monitor Utility

PART I. Wireless LAN Card Monitor Utility for Win98\98SE\Me\2000\NT

Wireless LAN Cards Monitor

If the utility is not launched, manually start the monitor by selecting **Start > Programs > Wireless LAN Card, > Configuration & Monitor Utility**.

The Wireless LAN Card uses the **Wireless LAN cards Monitor Utility** for both configuration and monitoring. The utility is launched automatically with its icon located on the right side of the taskbar. Right-clicking the icon displays the context menu as shown opposite:



By the color of the monitor icon, you can determine the connection status as below:

Red	Not Linked	Computer is not connected to Access Point
Blue	Linked	Computer joined to an Access Point.

Note: In Ad-Hoc mode, the **Wireless LAN Cards Monitor** icon is always in blue color no matter the wireless lan card(Ad-Hoc mode) connects to other wireless lan card(Ad-Hoc mode) or not.

Wireless LAN Cards Monitor Utility

To start the utility program, double-click the icon or select **About...** from its context menu. The **Wireless LAN Cards Monitor Utility** screen pops up with six tabs: **Status**, **Statistics**, **Site Survey**, **Encryption**, **Advance** and **Version**. Please see the appropriate section which describes each tab item.

Status

Status function allows you to re-configure the Wireless LAN Card setting. Even though you have configured the settings during driver and utility installation, it is possible that you want to change your operating mode between Infrastructure or Ad-Hoc mode and fine-tune other settings.

You can connect your computer to a network in one of the following two ways. Refer to sequential sections for configuration:

Ad Hoc Connecting to other Wireless LAN Card equipped computers, forming a wireless network.

Infrastructure Connecting to a wired/wireless network through an Access Point.

Connecting to Other Wireless LAN Cards (Ad-Hoc Mode)

1. In the taskbar, double-click the **Wireless LAN Cards Monitor** icon to display the **Wireless LAN Cards Monitor Utility** dialog box.
2. Click the **Status** tab.
3. In the **Operating Mode** list, select **Ad-Hoc**.
4. In the **Channel** list, select the Channel Number which you want to use.
5. In the **SSID** list, type the Service Set ID (SSID) of the Wireless LAN group. All wireless clients must use the same SSID in order to communicate with each other.
6. Click **Submit**.
7. Click **Exit** if you wish to exit the utility.

Note: The MAC Address indicates the MAC address of your computer.

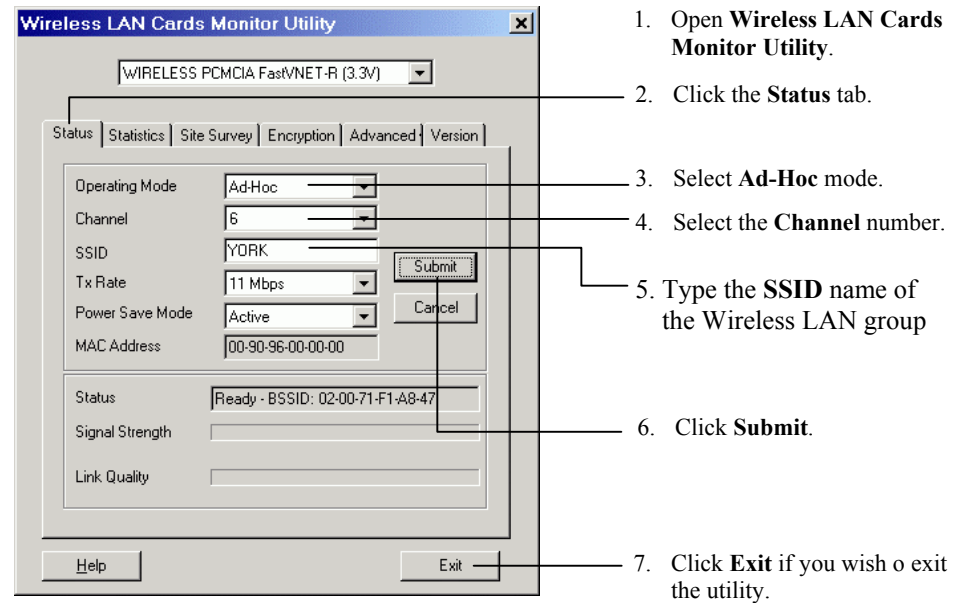


Figure 3-1 Ad-Hoc Configuration

Connecting to Access Points (Infrastructure Mode)

1. In the taskbar, double-click the **Wireless LAN Cards Monitor** icon to display the **Wireless LAN Cards Monitor Utility** dialog box.
2. Click the **Status** tab.
3. In the **Operating Mode** list, click **Infrastructure**.
4. In the **SSID** list, type SSID name of the Access Point. The wireless client must use the same SSID as the Access Point in order to communicate with other computers via the Access Point.
5. Click **Submit**. If the connection is successful, you should be able to find your computer on the Network Neighborhood in Windows Explorer.
6. Click **Exit** if you wish to exit the utility.

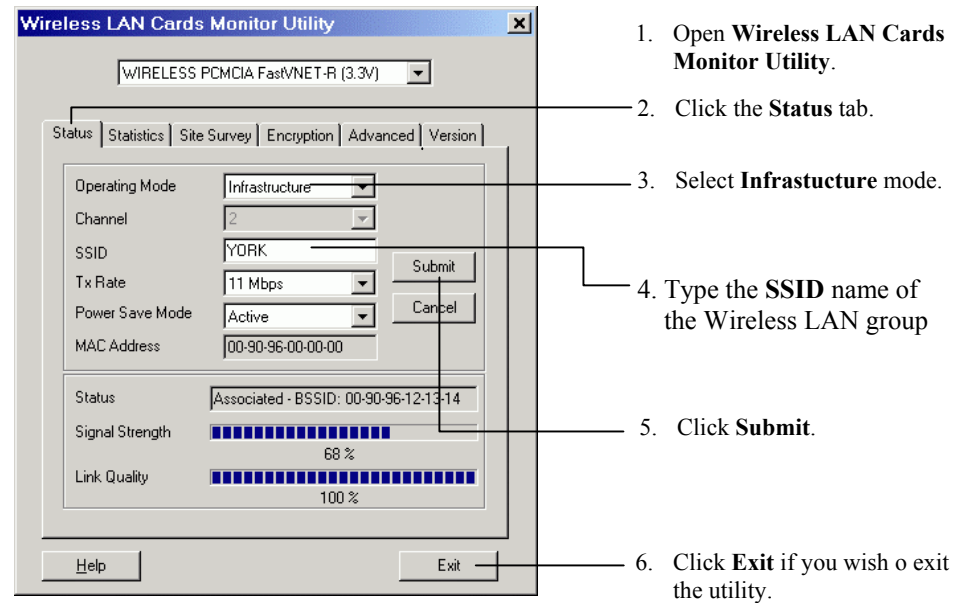


Figure 3-2 Infrastructure Mode Configuration

Checking Link Quality (Infrastructure Mode Only)

If you are in Ad-Hoc mode, the **Signal Strength** and **Link Quality** fields are grayed-out.

To check the link quality of the connection when in Infrastructure mode,, double-click the **Wireless LAN Cards Monitor** icon on the taskbar to display the **Wireless LAN Cards Monitor Utility** dialog box. Then click the **Status** tab. The status is displayed at the lower part of the panel.

Status: Indicates the Access Point your Wireless LAN Card associated with. If no Access Point is connected, current status, such as scanning, authenticating, is displayed.

Signal Strength: Displayed as percentages using active progress indicators that change as the network radio signal fluctuates.

Link Quality: Link Quality categories are defined as follows:

Link Quality	Range (%)
Poor	0-29
Fair	30-59
Good	60-89
Excellent	90-100

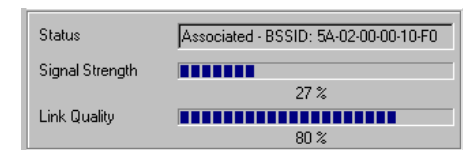


Figure 3-3 Infrastructure Mode Link Status

Statistics

Statistics feature allows you to view the available statistic information (Data packets). **Tx** indicates data is being transmitted whereas **Rx** indicates data is being received. To renew or update the statistics, click the **Reset** button.

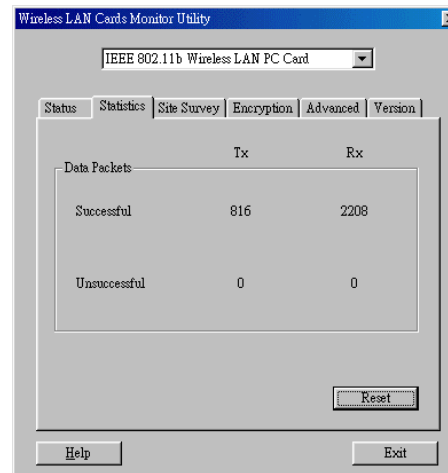


Figure 3-4 Wireless LAN Cards Monitor Utility – Statistics

Site Survey

Site Survey function 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:

BSSID: Basic Service Set ID. It is actually the MAC address of the Access Point/wireless station (Ad-hoc mode). It can be used to identify the stations when they have the same SSID.

SSID: Service Set ID. Displays the current SSID of the Access Point/wireless station (Ad-hoc mode).

Signal: Shows the signal strength ratio. The higher the ration is, the more powerful the signal received by your Wireless LAN Card. It helps you identify the quality network operation.

Channel: The operating radio channel number.

Encryption: Displays if encryption is enabled or disabled on the Access Point/wireless station (Ad-hoc mode).

BSS: Basic Service Set. Indicates whether the operating mode is Infrastructure (Access Point) or Ad-Hoc (wireless station).

Re-Scan: This button allows you to update the list.

Connecting to Desired Site By Site Survey Utility

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

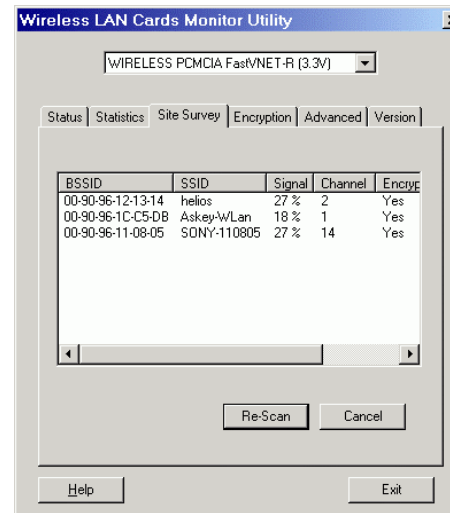


Figure 3-5 Wireless LAN Cards Monitor Utility – Site Survey

Encryption

Encryption technology is used to enhance wireless media security. Your encryption settings must match the 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 of your network.

To enable encryption, do the following:

1. Select the **Encryption** tab from the **Wireless LAN Cards Monitor Utility**.
2. Select your encryption type from **64 Bit** or **128 Bit**.
3. In the **Key #1-4** fields, enter the encryption keys. Note that the key must be in the form of Hex format; only digits 0-9 and letters A-F are valid. The four keys, including the one selected as **Default Key**, are used to decrypt the data you receive.
4. In the **Default Key** box, select one of the four keys to encrypt the data you are going to transmit.
5. Select encryption **Mode** from **Mandatory** and **Optional**.

Mandatory: WEP encryption is required to establish connection with other wireless stations. Both your computer and other stations need to use WEP encryption to establish a communication. This requirement is in line with the IEEE 802.11b standard.

Optional: Your station can communicate with every other station regardless if WEP is enabled or disabled in the other station.

6. Select the **Authentication Type** from **Open System** and **Shared Key**.
Your authentication type must be the same as those on the Access Point/wireless client (Ad-Hoc mode) with which you want to associate.
7. To have the new settings take effect, click the **Submit**. Then click **Exit** to exit the utility.

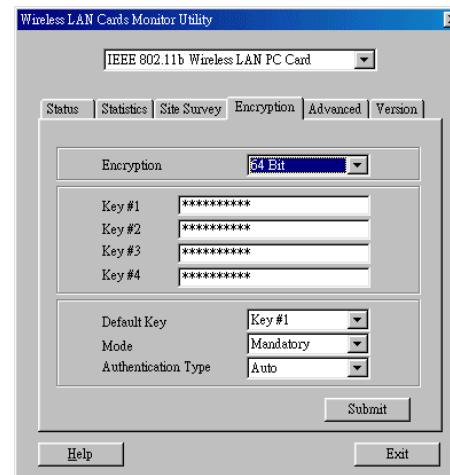


Figure 3-6 Wireless LAN Cards Monitor Utility – Encryption

Advanced

Advanced features allows you to change advanced configuration settings: **Fragmentation Threshold** and **RTS Threshold**.

Fragmentation Threshold: The fragmentation threshold, which is specified in bytes, determines whether packets will be fragmented and at what size. On an 802.11 wireless LAN, packets exceed the fragmentation threshold are fragmented, i.e., split into, smaller units suitable for the circuit size. Packets smaller than the specified fragmentation threshold value are not fragmented.

RTS Threshold: When set (in bytes), it specifies the packet size beyond which the Wireless LAN Card invokes its RTS/CTS mechanism. Packets that exceed the specified RTS threshold trigger the RTS/CTS mechanism. The NIC transmits smaller packets without using RTS/CTS.

Changing the Fragmentation/RTS Threshold

By default, the Fragmentation and RTS Threshold are disabled. To change the **Fragmentation/RTS Threshold** parameters, move the slide bar with your mouse and then use the right and left arrow keys of your keyboard to select an exact number in bytes.

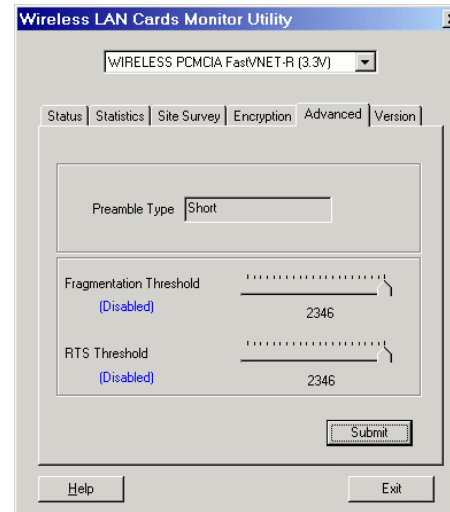


Figure 3-7 Wireless LAN Cards Monitor Utility – Advanced

Version

Version tab displays the basic information about the device, including the Driver, Firmware and Application Version. Use the **Exit** button if you wish to exit the application.

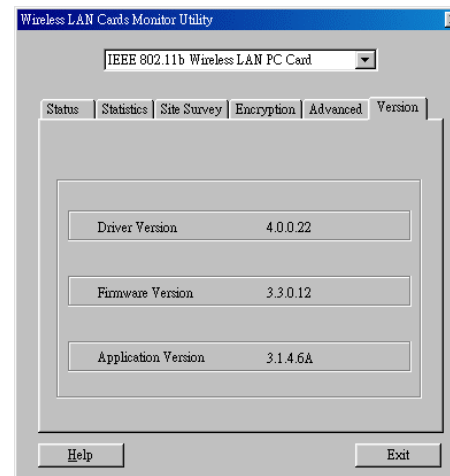
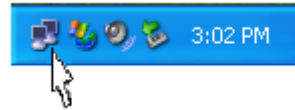


Figure 3-8 Wireless LAN Cards Monitor Utility – Version

PART 2. Configuration Utility for Windows XP

Under Windows XP, the Wireless LAN Card uses the **Wireless Network Connection** utility for both configuration and monitoring. The utility can be quickly accessed via the network connection icon on the system tray. If your computer is not connected to any Access Point/Wireless LAN Card yet, the icon should appear as below:



Connecting to an Access Point or Wireless LAN Card

To connect to an existing Access Point/Wireless LAN Card (Ad-Hoc mode), do the following:

1. Double-click the network connection icon on the system tray.
2. When the **Connect to Wireless Network** window pops up, you will see all the Access Points or Wireless LAN Cards (Ad-Hoc mode) that are available in the air. Select the wireless network you want to connect to .

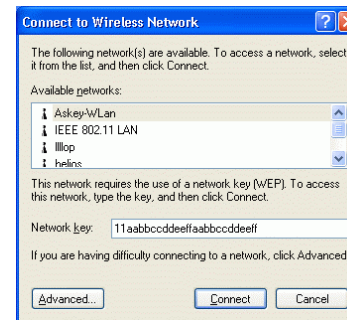


Figure 3-9 Windows XP Configuration Utility-Connect to Wireless Network

3. If the target Access Point/Wireless LAN Card (Ad-Hoc mode) 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 44.

Viewing Wireless Connection Status

After you successfully connect to the Access Point or Wireless LAN Card (Ad-Hoc mode), 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.

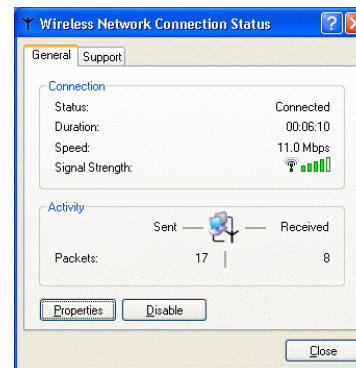


Figure 3-10 Windows XP- Connection Status

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 **PCMCIA/USB** 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 63.

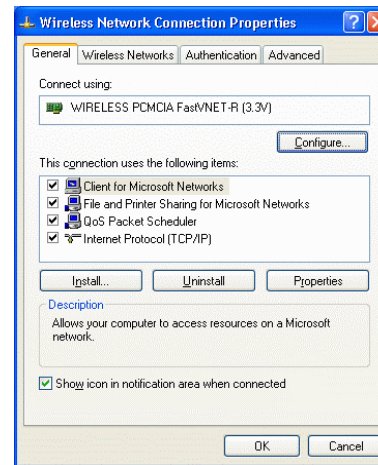


Figure 3-11 Windows XP Connection Properties -General

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 (Ad-Hoc mode) available in the air. Clicking **Refresh** will update the list of Access Points and Wireless LAN Cards (Ad-Hoc mode).

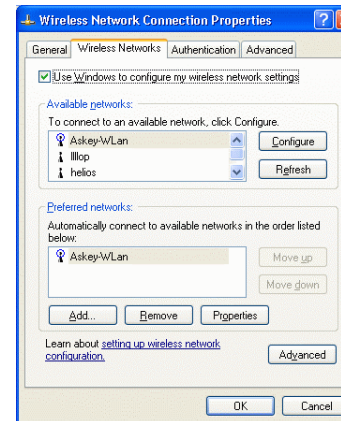


Figure 3-12 Windows XP Connection Properties-Wireless Networks

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 (Ad-Hoc mode) 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 (Ad-Hoc mode) 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.

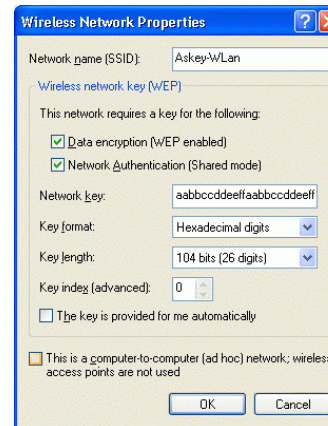


Figure 3-13 Windows XP-Add Preferred Networks

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 (ad hoc)

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 (Ad-Hoc mode) 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**.

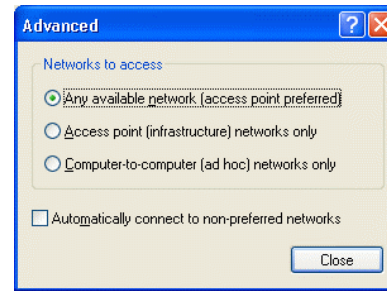
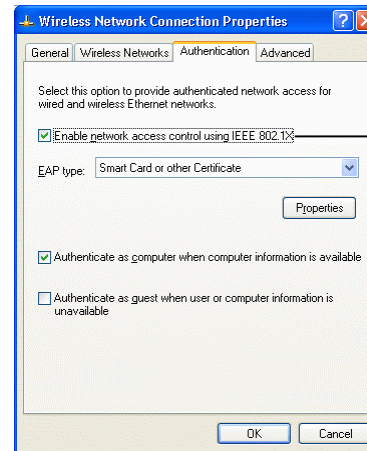


Figure 3-14 Windows XP Configuration Utility-Set up Network to Access

Authentication

This tab allows you to configure the authentication settings of your Wireless LAN Card. The most important setting for the Wireless LAN Card is to disable **Enable network access control using IEEE802.1X** to ensure successful connection between the Wireless LAN Cards and Access Points or other Wireless LAN Card (Ad-Hoc mode). 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 3-15 Windows XP Connection Properties -Authentication

Chapter 4 Uninstalling the Wireless LAN Card

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

Removing the Wireless LAN Card

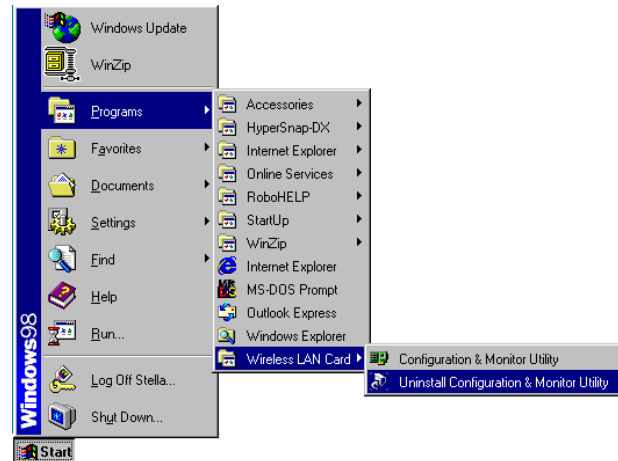
The Wireless LAN Card complies with the **PCMCIA/USB** standard that allows devices to be inserted into and removed from the computer's **PCMCIA** slot/**USB** port when the computer is power on. For **USB** Wireless LAN Card, just remove the card from your PC's USB port. For **PCMCIA** device, it is recommended that you follow the standard Windows procedure for disconnecting a PCMCIA device from your computer.

1. On the system tray, click the PCMCIA icon, and then click **Adjust PC Card Properties**.
2. Select the Wireless LAN Card which you want to remove, click **Stop** and then click **OK**.
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.

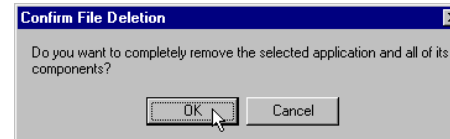
Uninstalling the Wireless LAN Card Software

Make sure that you have removed the hardware before you proceed.

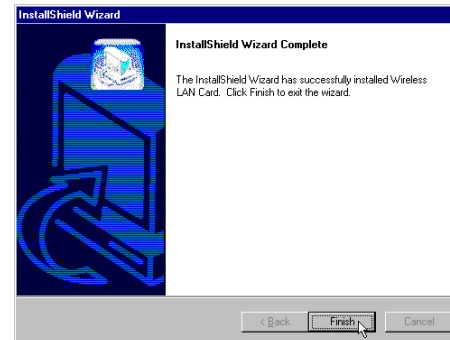
1. Close all programs that are currently running.
2. Click the Windows **Start** button, point to **Programs**, **Wireless LAN Card** and then click **Uninstall Configuration & Monitor Utility**.



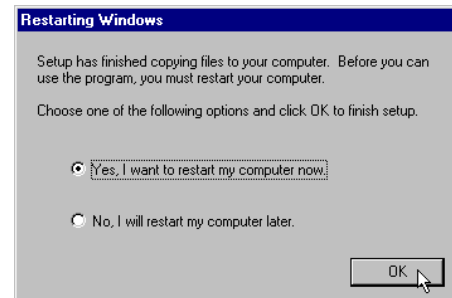
3. Click **OK** to proceed with the software removal procedure.



4. Click **Finish** to exit the wizard.



5. When prompted, click **OK** to restart your computer to complete the uninstallation.



Chapter 5 Updating the Device Driver

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 4. 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 6 Troubleshooting

Radio Interference

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

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

Card Not Detected

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

- Make sure the Wireless LAN Card is properly inserted in the **PCMCIA** slot/**USB** port.
- Make sure the **PCMCIA** slot/**USB** port in your computer is working.
- Contact your dealer for additional testing if there is a hardware problem with the Wireless LAN Card.

Cannot Connect to Another Wireless LAN Card

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

- Incorrect SSID. Make sure the SSID is the same for all computers that have a Wireless LAN Card.
- Changes are not being recognized by your computer. 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.

Poor Link Quality

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

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

Cannot Connect to Access Point

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

- Make sure the Wireless LAN Card and Access Point have no physical connection problems.
- Make sure the SSID for the Wireless LAN Card is set to “null” or is the same as the Access Point.
- Make sure the privacy type is the same as that of Access Point. Also, make sure the Default Key is the same for both computers.

Appendix A Limited Warranty

Wireless LAN Hardware

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

Wireless LAN Software

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

Appendix B Regulatory Compliance

FCC Part 15 Declaration of Conformity (DoC)

The following equipment:

Product Name: Wireless LAN Card

is herewith confirmed to comply with the requirements of FCC Part 15 rules. The operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Rules and Regulations - Part 15

Warning: This device has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the Federal Communications Commissions Rules and Regulation. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

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

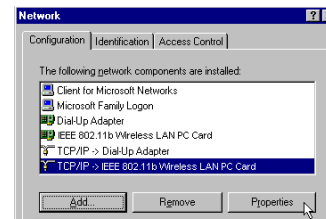
FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 2.5cm between the radiator & your body.

Appendix C Setting Up TCP/IP

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

1. On the taskbar, select **Start > Settings > Control Panel**, double-click the **Network** icon.
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 ->IEEE 802.11b Wireless LAN PC Card**, and then click **Properties**.



For correct IP address information for your wireless LAN installation, contact your network administrator.

For more information on IP addresses, see the Network Working Group Specification RFC 1918 on the Internet.

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

Option A: Click Specify an IP address.

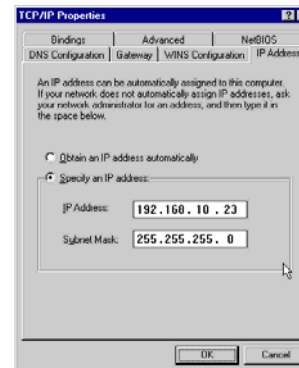
In the **IP Address** box, enter a valid four-component IP address, either a public or private one as required. If private IP address is used, the following three blocks of IP addresses are available for private networks:

10. 0 . 0 . 0 — 10.255.255.255

172. 16. 0 . 0 — 172. 31.255.255

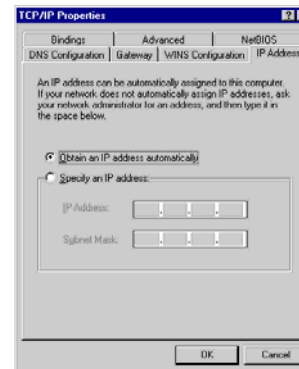
192.168. 0 . 0 — 192.168.255.255

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



Option B: Select Obtain an IP address automatically.

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.

Appendix D Specification

* Specifications are subject to change with notice.

Software

Standards Compliance	<ul style="list-style-type: none">● IEEE 802.11 / 802.11b Standard● PCMCIA v2.1 Standard (WLAN PCMCIA Card)● USB 1.1 Compliant (WLAN USB Card)
Operation Modes	<ul style="list-style-type: none">● Ad-hoc mode● Infrastructure mode
Security Features	<ul style="list-style-type: none">● Support SSID network identification for security● Support 64-bit and 128-bit WEP Data Encryption and Decryption● Support Authentication: Open System, Shared Key

-
- | | |
|----------------------------------|--|
| Monitor and Configuration | <ul style="list-style-type: none">● Reliable and robust monitor and configuration utilities● Dynamic configuration● Network traffic statistics gathering● Clear LED Indicators for real time monitor current network status |
|----------------------------------|--|
-

- | | |
|--|---|
| Device Driver and Configuration Utility | <ul style="list-style-type: none">● A PCMCIA NDIS 5.0 mini-port driver running on Windows 98(SE)/ME/2000/XP/NT4.0 platforms(WLAN PCMCIA Card)● A USB NDIS 5.0 mini-port driver running on Windows 98(SE)/ME/2000/XP platforms(WLAN USB Card)● A monitor and configuration utility running on Windows 98(SE)/ME/2000/NT4.0 platforms <p>PS: Under Windows XP, use XP built-in monitor and configuration utility.</p> |
|--|---|
-

Hardware

Interface	<ul style="list-style-type: none">● One 2.4GHz RF interface for Wireless LAN connection● Interface: WLAN PCMCIA Card: One PCMCIA interface WLAN USB Card: One USB connector
Radio Characteristics	<ul style="list-style-type: none">● Frequency Band: 2.400 ~ 2.4835 GHz ISM Band (subject to local regulations)● Spreading: Direct Sequence Spread Spectrum● Modulation<ul style="list-style-type: none">➤ <i>CCK: 11Mbps and 5.5Mbps</i>➤ <i>DQPSK: 2Mbps</i>➤ <i>DBPSK: 1Mbps</i>● Number of Channels<ul style="list-style-type: none">➤ <i>11 Channels (US, Canada)</i>➤ <i>13 Channels (Europe)</i>➤ <i>14 Channels (Japan)</i>● Channel Spacing: 5MHz● Data Rate: 11Mbps / 5.5Mbps / 2Mbps / 1Mbps

Radio Characteristics

- Antenna:
Two Internal Antennas (WLAN PCMCIA Card)
One external antenna (WLAN USB Card)
 - Transmit Power:
17dBm (typical) (WLAN PCMCIA Card)
17dBm (typical) (WLAN USB Card (R))
12dBm (typical) (WLAN USB Card (I))
 - Receiver Sensitivity:
-82dBm @ FER < 8% (WLAN PCMCIA Card)
-80dBm @ FER < 8% (WLAN USB Card (R))
-80dBm @ FER < 8% (WLAN USB Card (I))
-

**Power Requirement and
Operation Environment
Requirement**

- Temperature
 - WLAN PCMCIA Card
 - *Operating Temperature: 0°C to 55°C (32°F to 131°F)*
 - *Storage Temperature: -10°C to 65°C*
 - WLAN USB Card (R)
 - *Operating Temperature: 0°C to 55°C (32°F to 131°F)*
 - *Storage Temperature: -10°C to 80°C*
 - WLAN USB Card (I)
 - *Operating Temperature: 0°C to 55°C (32°F to 131°F)*
 - *Storage Temperature: -20°C to 80°C*
 - Humidity:
 - 5% to 80% (non-condensing) (WLAN PCMCIA Card)
 - 5% to 80% (non-condensing) (WLAN USB Card (R))
 - 5% to 95% (non-condensing) (WLAN USB Card (I))
 - Power Consumption
 - WLAN PCMCIA Card
 - *Receive mode: 220mA*
 - *Transmit mode: 440 mA*
 - *Doze mode: TBD*
-

WLAN USB Card (R)

- *Receive mode: 250mA*
- *Transmit mode: 420 mA*
- *Doze mode: TBD*

WLAN USB Card (I)

- *Receive mode: 322mA*
- *Transmit mode: 382 mA*
- *Standby mode: TBD*
- *Sleep mode: TBD*

LED Indicators (from left to right in front panel)

- Activity (Green)
- Power (Red)

**PCMCIA Specification
-WLAN PCMCIA Card**

- PCMCIA v2.1 Standard
 - Plug and Play
 - Hot Swapping
-

USB Specification	<ul style="list-style-type: none"> ● USB 1.1 Compliant
-WLAN USB Card	<ul style="list-style-type: none"> ● USB Slave ● Plug and Play ● Hot Swapping
<hr/>	
Physical	<ul style="list-style-type: none"> ● Form Factor: PCMCIA (16-bit) Type II PC Card
-WLAN PCMCIA Card	<ul style="list-style-type: none"> ● PCB Dimensions: 118.20mm (L)×54.00mm (W)×0.76mm (H) ● PCB Weight: 46g
<hr/>	
Physical	<ul style="list-style-type: none"> ● Dimensions: 79.52mm (L)×48.00mm (W)×0.80mm (H)
-WLAN USB Card (R)	
-WLAN USB Card (I)	
<hr/>	
Safety and Regulatory Approvals	<ul style="list-style-type: none"> ● FCC ● VCCI ● CE ● TELEC & JATE

Glossary

10BaseT	An IEEE standard (802.3) for operating 10 Mbps Ethernet networks (LANs) with twisted pair cabling and a wiring hub.
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	A network composed solely of stations within mutual communication range of each other (no Access Point connected).
BSS	<i>Basic Service Set.</i> A set of stations controlled by a single coordination function.
Channel	A medium used to pass protocol data units that can be used simultaneously in the same volume of space by other channels of the same physical layer, with an acceptably low frame error ratio due to mutual interference.
Encapsulated	An Ethernet address mode that treats the entire Ethernet packet as a whole and places it inside an 802.11 frame along with a new header.

- ESS** *Extended Service Set.* A set of one or more interconnected Basic Service Sets (BSSs) and integrated Local Area Networks (LANs) can be configured as an Extended Service Set.
- Ethernet** The most widely used medium access method, which is defined by the IEEE 802.3 standard. Ethernet is normally a shared media LAN; i.e., all the devices on the network segment share total bandwidth. Ethernet networks operate at 10Mbps using CSMA/CD to run over 10BaseT cables.
- Gateway** A network component that acts as an entrance to another network.
- IEEE 802.11** The IEEE 802.xx is a set of specifications for LANs from the Institute of Electrical and Electronic Engineers (IEEE). Most wired networks conform to 802.3, the specification for CSMA/CD-based Ethernet networks or 802.5, the specification for token ring networks. 802.11 defines the standard for wireless LANs encompassing three incompatible (non-interoperable) technologies: Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum (DSSS), and Infrared. IEEE standards ensure interoperability between systems of the same type.
- Infrastructure** A wireless network centered about an Access Point. In this environment, the Access Point not only provides communication with the wired network but also mediates wireless network traffic in the immediate neighborhood.
- IP** *Internet Protocol.* The standard protocol within TCP/IP that defines the basic unit of information passed across an Internet connection by breaking down data messages into packets, routing and transporting the packets over network connections, then reassembling the packets at their destination. IP corresponds to the network layer in the ISO/OSI model.
- IP Address** An IP address is a 32-bit number that identifies each sender or receiver of information sent across the Internet. An IP address has two parts: the identifier of a particular network on the

Internet and an identifier of the particular device (which can be a server or a workstation) within that network.

- ISP** *Internet Service Provider.* An organization that provides access to the Internet. Small ISPs provide service via modem and ISDN while the larger ones also offer private line hookups (T1, fractional T1, etc.).
- LAN** *Local Area Network.* A communications network that serves users within a defined geographical area. The benefits include the sharing of Internet access, files, and equipment, such as printers and storage devices. Special network cabling (10BaseT) is often used to connect the PCs together.
- NAT** *Network Address Translation.* The translation of an Internet Protocol address (IP address) used within one network to a different IP address known within another network. One network is designated the internal network and the other is the external. The internal network then appears as one entity to the outside world.

- Radio Frequency** *RF*, Terms: GHz, MHz, Hz —The international unit for measuring frequency is Hertz (Hz), equivalent to the older unit of cycles per second. One megahertz (MHz) is one Million-Hertz. One giga hertz (GHz) is one Billion-Hertz. The standard U.S. electrical power frequency is 60 Hz, the AM broadcast radio frequency band is 0.55–1.6 MHz, the FM broadcast radio frequency band is 88–108 MHz, and wireless 802.11 LANs operate at 2.4GHz.
- SSID** *Service Set ID*. A group name shared by every member of a wireless network. Only client PCs with the same SSID are allowed to establish a connection.
- Subnet Mask** A value that defines whether your computer communicates only within your LAN or communicates outside of your LAN, where it is routed out to the rest of the Internet. A Subnet Mask that has the same first three components (for example, 255.255.255.0) is the routing pattern for a Class C address.
- TCP** *Transmission Control Protocol*. The standard transport level protocol that provides the full duplex, stream service on which many applications' protocols depend. TCP allows a process on one machine to send a stream of data to a process on another. Software implementing TCP usually resides in the operating system and uses the IP to transmit information across the network.
- WEP** *Wired Equivalent Privacy*. The optional cryptographic confidentiality algorithm specified by 802.11. The algorithm is being used to provide data confidentiality that is subjectively equivalent to the confidentiality of a wired LAN medium that does not employ cryptographic techniques to enhance privacy..