IEEE802.11b WLAN PCI Card

User's Manual

Rev 1.0

Regulatory compliance

FCC Warning

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

IMPORTANT NOTE:

Federal Communications Commission (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 20cm between the radiator & your body.

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

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

About this manual

This User's Manual describes how to install and operate your IEEE802.11b WLAN PCI Card. Please read this manual before you install the product.

This manual includes the following topics:

- Product description and features.
- Hardware installation procedure.
- Software installation procedure.
- FAQ

Table of Contents

Chapter 1 - Introduction

Thank you for purchasing the IEEE802.11b WLAN PCI Card. This high-speed IEEE802.11b WLAN PCI Card provides you with an innovative wireless networking solution. The Card is easy to set up and use. With this innovative wireless technology, you can share files and printers on the network—without inconvenient wires!

The Card is a network Adapter with a rate of 1, 2, 5.5, and 11 Mbps operating in the ISM band using Direct Sequence Spread Spectrum (DSSS) transmission implementing the IEEE 802.11b standard. This Adapter provides Device Drivers for Windows Operating Systems. It also provides tools for the configuration of the Card. The tool, as well as the installation steps of the plug-and-play procedure for the Windows operating systems, is described in this document.

Features

The IEEE802.11b WLAN PCI Card offers compliance with the IEEE 802.11b specification. This feature allows them to communicate with other wireless devices that support the standard. Features of the Card are:

- **Uses 2.4GHz frequency band, which complies with worldwide requirement**
- **Wireless interface following the IEEE 802.11b standard**
- **Using PCI interface**
- **Enciphering/deciphering of wireless data by the implementation of the WEP algorithm**
- **Wire-free access to networked resources from anywhere beyond the desktop**
- **Allows users move between Access Points without resetting their connection reconfiguration**
- **Delivers data rate up to 11 Mbps**
- **Supports 11, 5.5, 2, and 1 Mbps rates**
- **Provide IEEE802.11b WLAN PCI Card Configuration utility**
- **The Card uses external Antenna with LEDs indicating Power and Link**
- **Supports most popular operating systems**

What is Wireless LAN?

Wireless Local Area Network (WLAN) systems offer a great number of advantages over traditional wired systems. WLAN is flexible and easy to setup and manage. They are also more economical than wired LAN systems.

Using radio frequency (RF) technology, WLAN transmit and receive data through the air. WLAN combine data connectivity with user mobility. For example, users can roam from a conference room to their office without being disconnected from the LAN.

Using WLAN, users can conveniently access-shared information, and network administrators can configure and augment networks without installing or moving network cables.

WLAN technology provides users with many convenient and cost saving features:

- **Mobility:** WLAN provide LAN users with access to real-time information anywhere in their organization, providing service opportunities that are impossible with wired networks.
- **Ease of Installation:** Installing is easy for novice and expert users alike, eliminating the need to install network cables in walls and ceilings.
- **Scalability**: WLAN can be configured in a variety of topologies to adapt to specific applications and installations. Configurations are easily changed and range from peer-to-peer networks suitable for a small number of users to full infrastructure networks of thousands of users roaming over a broad area.

Wireless LAN Modes

Wireless LANs can be configured in one of two ways:

Ad-hoc Networking	Also known as a peer-to-peer network, an ad-hoc network is one that allows all workstations and computers in the network to act as servers to all other users on the network. Users on the network can share files, print to a shared printer, and access the Internet with a shared modem. However, with ad-hoc networking, users can only communicate with other wireless LAN computers that are in the wireless LAN workgroup, and are within range.
Infrastructure Networking	Infrastructure networking differs from ad-hoc networking in that it includes an access point. Unlike the ad-hoc structure where users on the LAN contend the shared bandwidth, on an infrastructure network the access point can manage the bandwidth to maximize

	bandwidth utilization. Additionally, the access point enables users on a wireless LAN to access an existing wired network, allowing wireless users to take advantage of the wired networks resources, such as Internet, email, file transfer, and printer sharing. Infrastructure networking has the following advantages over ad-hoc networking: • **Extended range:** each wireless LAN computer within the range of the access point can communicate with other wireless LAN computers within range of the access point. • **Roaming:** the access point enables a wireless LAN computer to move through a building and still be connected to the LAN. • **Wired to wireless LAN connectivity:** the access point bridges the gap between wireless LANs and their wired counterparts.

Notes on Wireless LAN Configuration

When configuring a wireless LAN (WLAN), be sure to note the following points:

- Optimize the performance of the WLAN by ensuring that the distance between access points is not too far. In most buildings, WLAN Adapters operate within a range of 100 ~ 300 feet, depending on the thickness and structure of the walls.
- Radio waves can pass through walls and glass but not metal. If there is interference in transmitting through a wall, it may be that the wall has reinforcing metal in its structure. Install another access point to circumvent this problem.
- Floors usually have metal girders and metal reinforcing struts that interfere with WLAN transmission.

This concludes the first chapter. The next chapter deals with the hardware installation of the Card.

Chapter 2 - Hardware Installation

This chapter covers connecting your IEEE802.11b WLAN PCI Card to PCI slot of desktop PC.

Package Contents

Please make sure that items below are included on package.

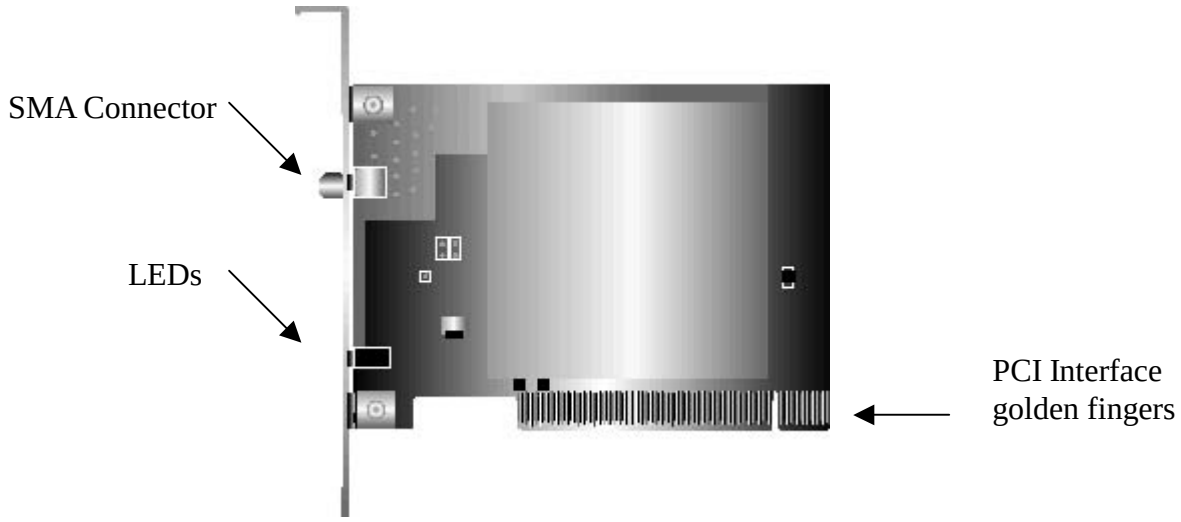
- ✓ One IEEE802.11b WLAN PCI Card
- ✓ One Driver / Utility CD-ROM (this user's manual included)
- ✓ One Quick Installation Guide
- ✓ One external antenna

System Requirements for the Card

- Operating System: Microsoft Windows 95/98/ME/2000/NT4.0/XP
- Desktop PC with CD-ROM drive
- One free PCI slot
- Pentium-Class 90MHz or higher

Install the PCI Adapter

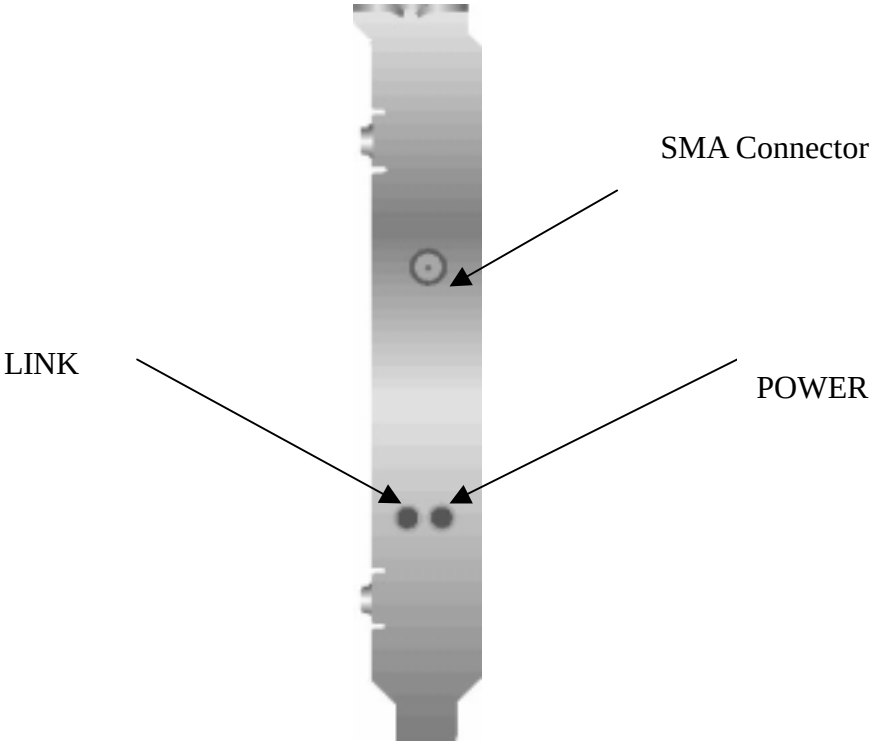
NOTE: These instructions apply to most desktop computers. For detailed information on inserting PCI Adapter into your desktop PC, consult the desktop PC User's Manual.



The IEEE802.11b WLAN PCI Card

1. ***Turn off the computer, unplug the power cord and remove the computer's cover.***
2. ***Pick a free PCI expansion slot and remover the protective bracket.***
3. ***Insert the Card into the slot until it is fully seated.***
4. ***Secure the Card bracket with the screw from step 2.***
5. ***Replace the computer's cover.***
6. ***Reconnect the power cord and turn on the computer.***

LED Indicators



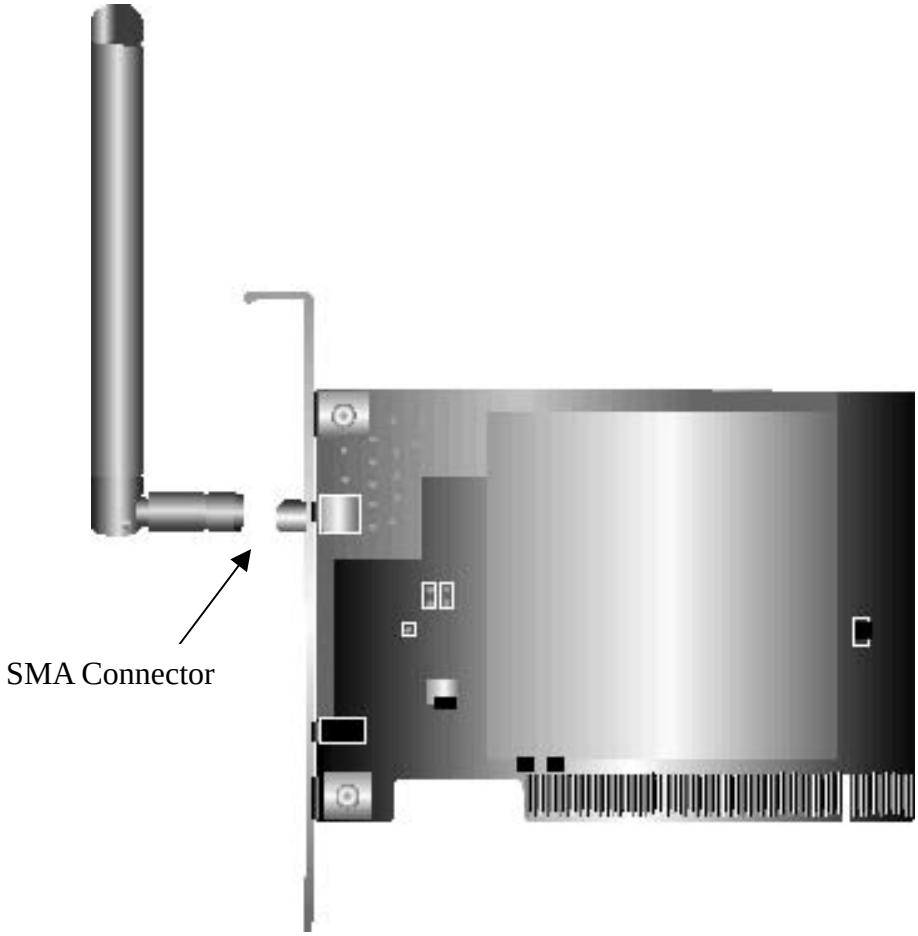
Side view of the PCI Card from bracket.

The following table describes the meaning of LED indicators:

LED	MEANING
POWER	Indicates that the Card is powered on (solid green).
LINK	Indicates link status. The LED lights up (solid green) while the wireless connection is linked. The LED is blinking green while wireless data transmitting / receiving.

Connecting the adjustable Antenna to the Card

After installing the Card on computer, connect external Antenna to the Card from the SMA connector. Hold the antenna in the desired orientation and then turn the lock nut clockwise until snug (do not over tighten the nut). To adjust the antenna direction, turn the nut counter clockwise one full turn, adjust the antenna and then tighten the nut.



After hardware installation is completed, please go to Chapter 3 to install driver on different Operating System.

Chapter 3 – Driver Installation for Windows

The following sections cover IEEE802.11b WLAN PCI Card driver installation in the Windows Operating Systems.

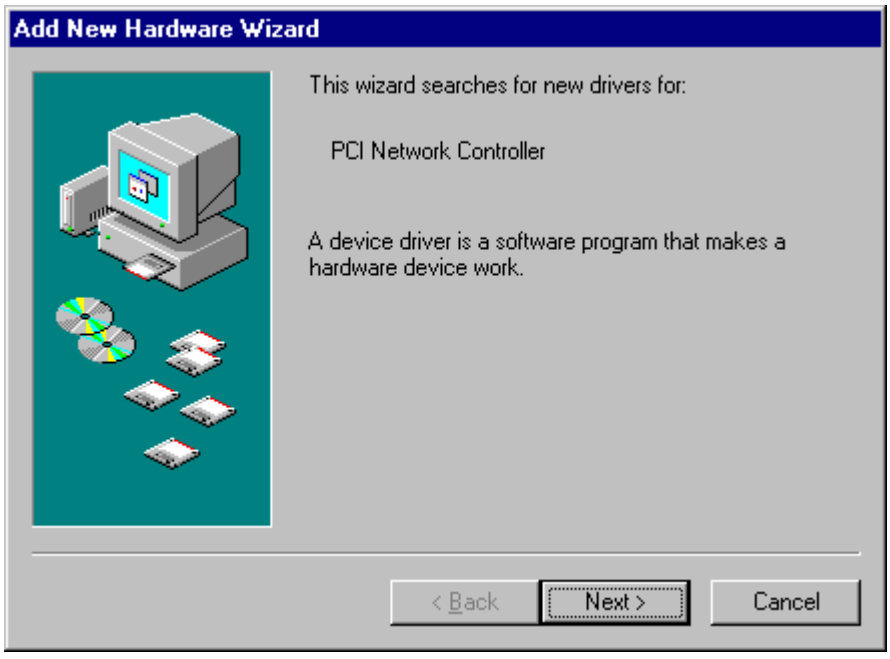
Note: You have to install your hardware first before you begin to install the drivers.

Driver installation for Windows 98

Follow the steps below to install the IEEE802.11b WLAN PCI Card drivers for Windows 98.

1. Insert the IEEE802.11b WLAN PCI Card to PCI slot of desktop PC first. (Refer to Chapter 2 – Hardware installation.)

2. After Windows 98 detects the IEEE802.11b WLAN PCI Card, the *Add New Hardware Wizard* window appears. Clicks **Nex**t to continue the installation.

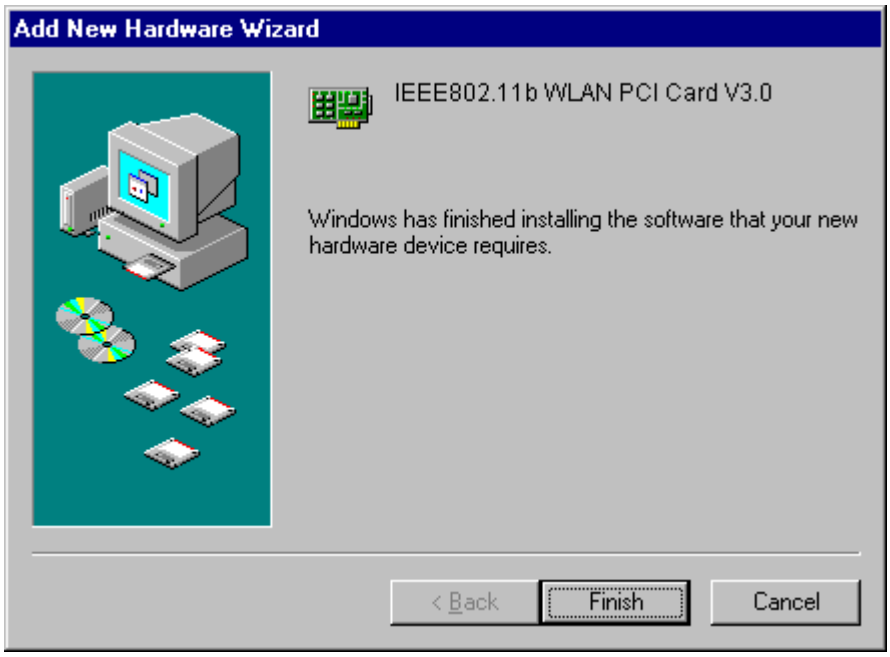


3. A screen appears prompting you to select an installation method. Select **Search for the best driver for your device. (Recommended)** and click **Next** to continue.

4. Ensure that the **CD-ROM drive** is selected. Inserts the driver CD-ROM into your CD-ROM drive and clicks **Next** to continue.

5. The following screen appears showing the driver search result. Click **Next** to continue the installation.

6. Windows 98 copies files to your hard disk. The following screen will appear to inform you when the software installation has finished. Click **Finish** to finish the installation.



7. The following screen will ask you to restart your computer to finish the installation. Click **Yes** to reboot the system. After system reboot, the Wireless LAN Utility will be installed automatically. Please go to Chapter 4 to install the utility.

*NOTE: In most cases, Windows will automatically copy all of the files needed for networking. If Windows asks you for the files and prompts you to input the path to the files. Follow the instructions on your screen, and then click **OK** to continue.*

Driver installation for Windows 2000

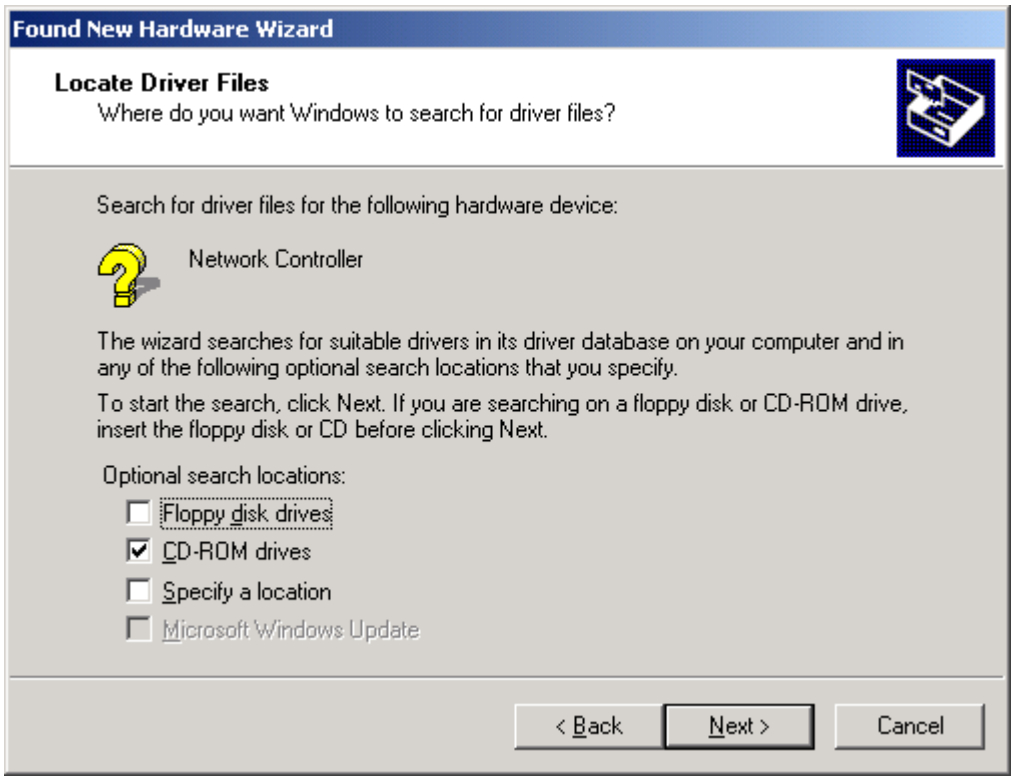
Follow the steps below to install the IEEE802.11b WLAN PCI Card drivers for Windows 2000.

1. Insert the IEEE802.11b WLAN PCI Card to PCI slot of desktop PC first. (Refer to Chapter 2 – Hardware installation.)

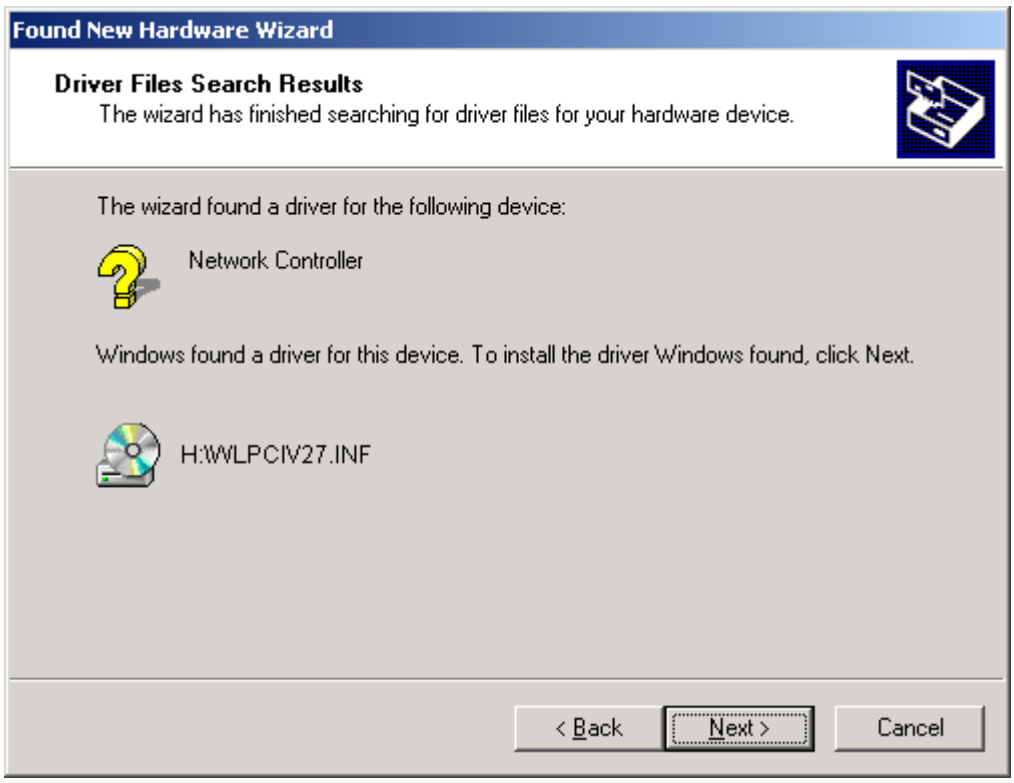
2. After Windows 2000 detects the IEEE802.11b WLAN PCI Card, the *Found New Hardware Wizard* window appears. Click **Next** to start the installation.

3. A screen appears prompting you to select an installation method. Select **Search for a suitable driver for my device (recommended)** and click **Next** to continue.

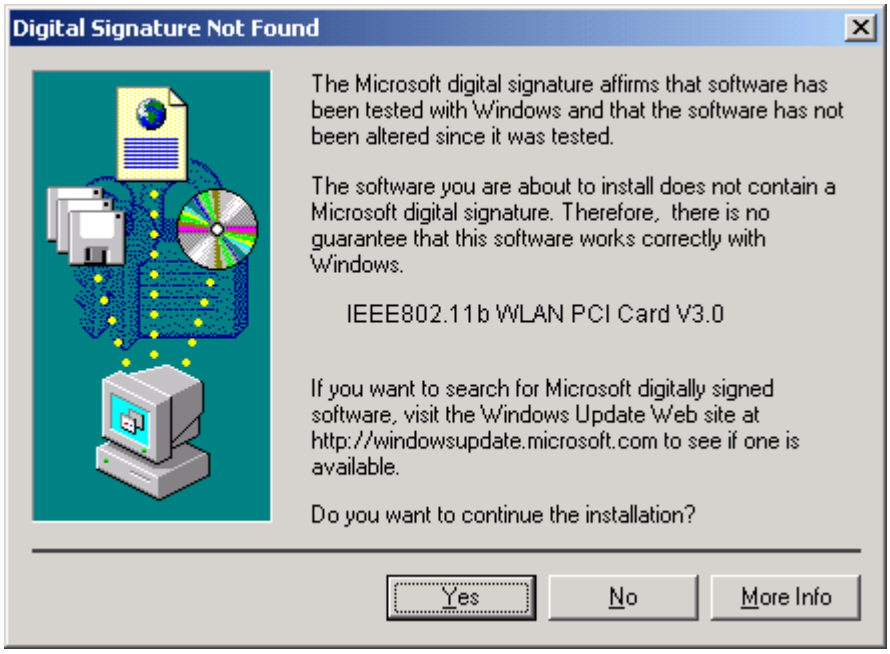
4. Ensure that the **CD-ROM driver** is selected and insert the driver CD-ROM into your CD-ROM drive and click **Next** to continue.



5. The following screen appears showing the driver search result. Click **Next** to continue the installation.



6. The following screen appears. Click **Yes** to continue



7. The Windows has finished installing software for the device. Click **Finish** to finish the installation.

Then system will start to install Wireless LAN Utility. Please refer to procedures at Chapter 4.

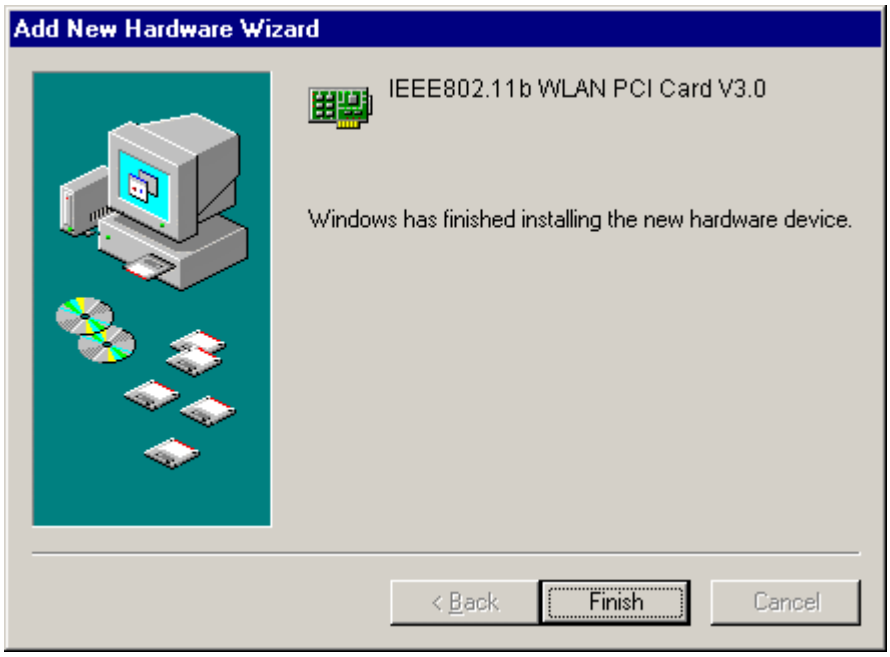
Driver installation for Windows ME

Follow the steps below to install the IEEE802.11b WLAN PCI Card drivers for Windows ME.

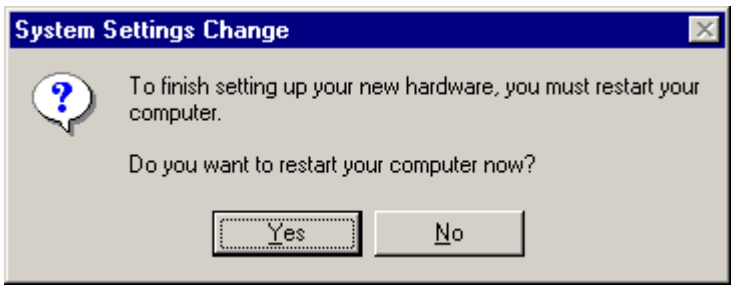
1. Insert the IEEE802.11b WLAN PCI Card to PCI slot of desktop PC first. (Refer to Chapter 2 – Hardware installation.)

2. After Windows ME detects the IEEE802.11b WLAN PCI Card, the *Add New Hardware Wizard* window appears. Select **Automatic search for a better driver (Recommended)** and insert the driver CD-ROM into CD-ROM drive and click **Next** to continue.

3. The system will find the setup files and follow the instruction to copy files to your hard disk. The following screen will appear when the software installation has finished. Click **Finish** to finish the installation.



4. The following screen will ask you to restart your computer to finish the hardware setting up. Click **Yes** to reboot the system. After system reboot, the Wireless LAN Utility will be installed automatically. Please go to Chapter 4 to install the utility.



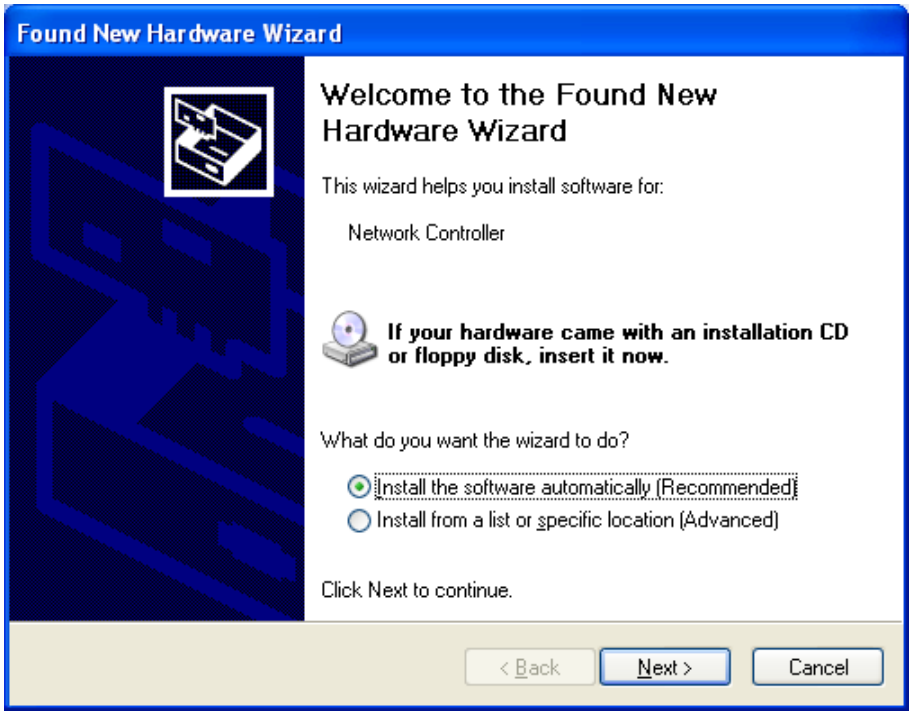
NOTE: In most cases, Windows will automatically copy all of the files needed for networking. If Windows asks you for the files and prompts you to input the path to the files. Follow the instructions on your screen, and then click ***OK*** *to continue.*

Driver installation for Windows XP

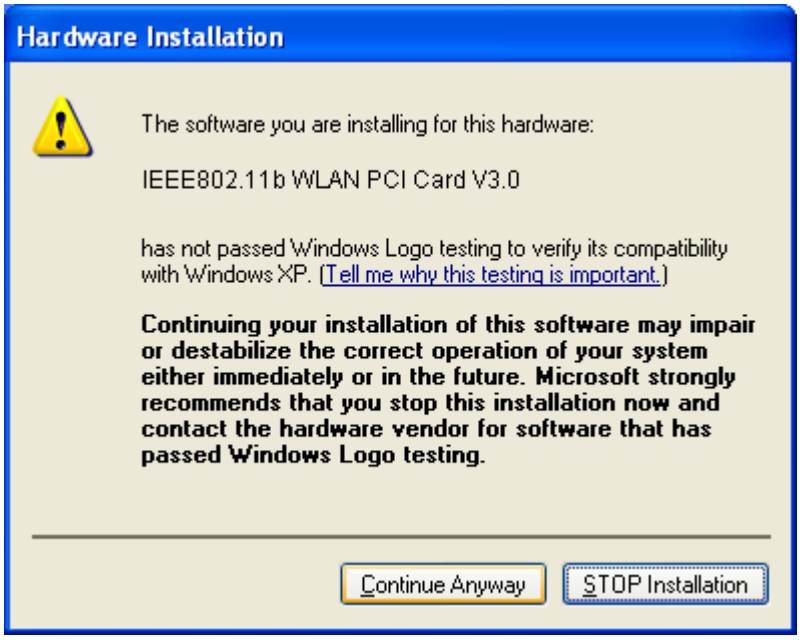
Follow the steps below to install the IEEE802.11b WLAN PCI Card drivers for Windows XP.

1. Insert the IEEE802.11b WLAN PCI Card to PCI slot of desktop PC first. (Refer to Chapter 2 – Hardware installation.)

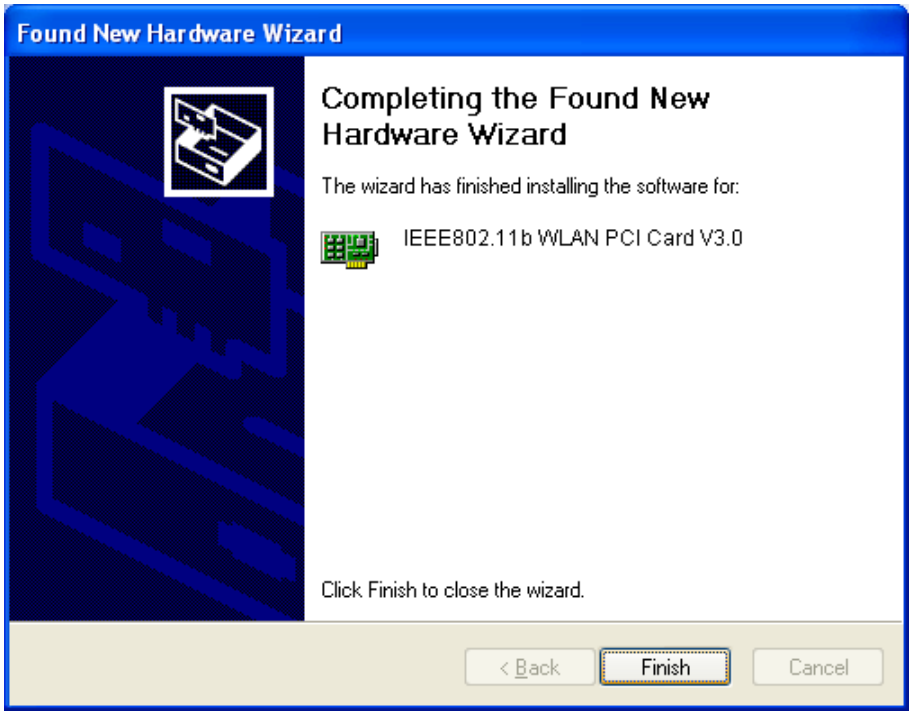
2. After Windows XP detects the IEEE802.11b WLAN PCI Card, the *Found New Hardware Wizard* window appears. Select **Install the software automatically [Recommended]** and insert the driver CD-ROM into CD-ROM drive and click **Next** to continue.



3. Click **Continue Anyway** to continue the installation.



4. The Windows has finished installing software for the device. Click **Finish** to finish the installation



Then system will start to install Wireless LAN Utility. Please refer to procedures at Chapter 4.

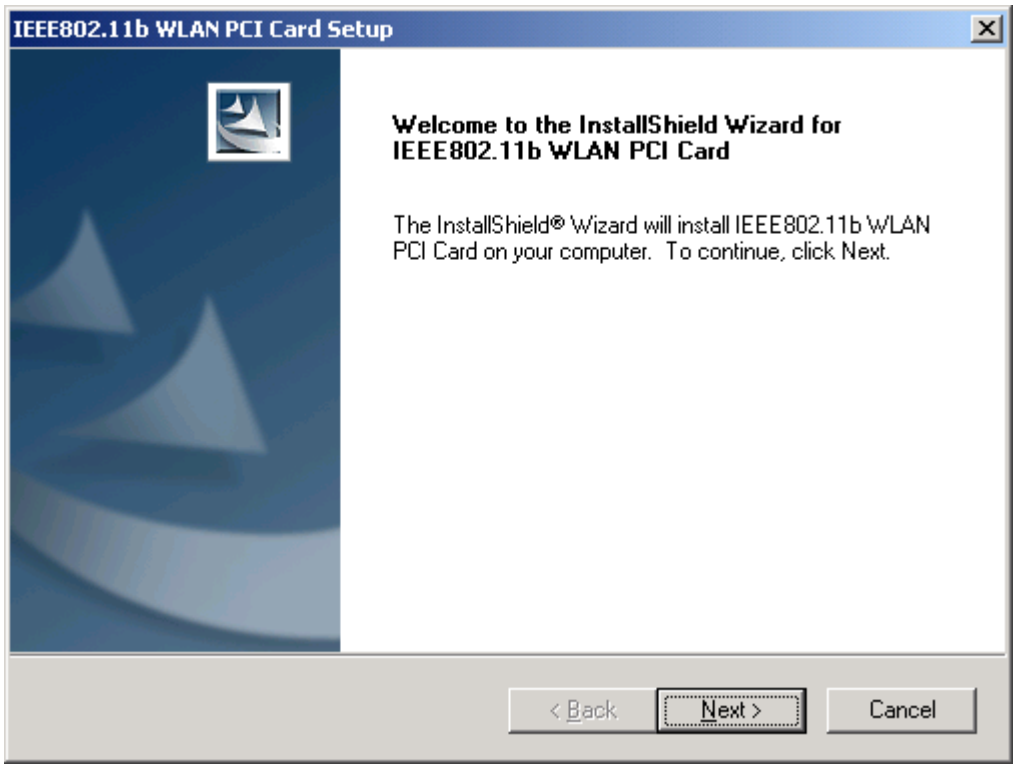
Chapter 4 – Installing and Using the Wireless Utility

The following sections cover the IEEE802.11b WLAN PCI Card utility installation and configuration.

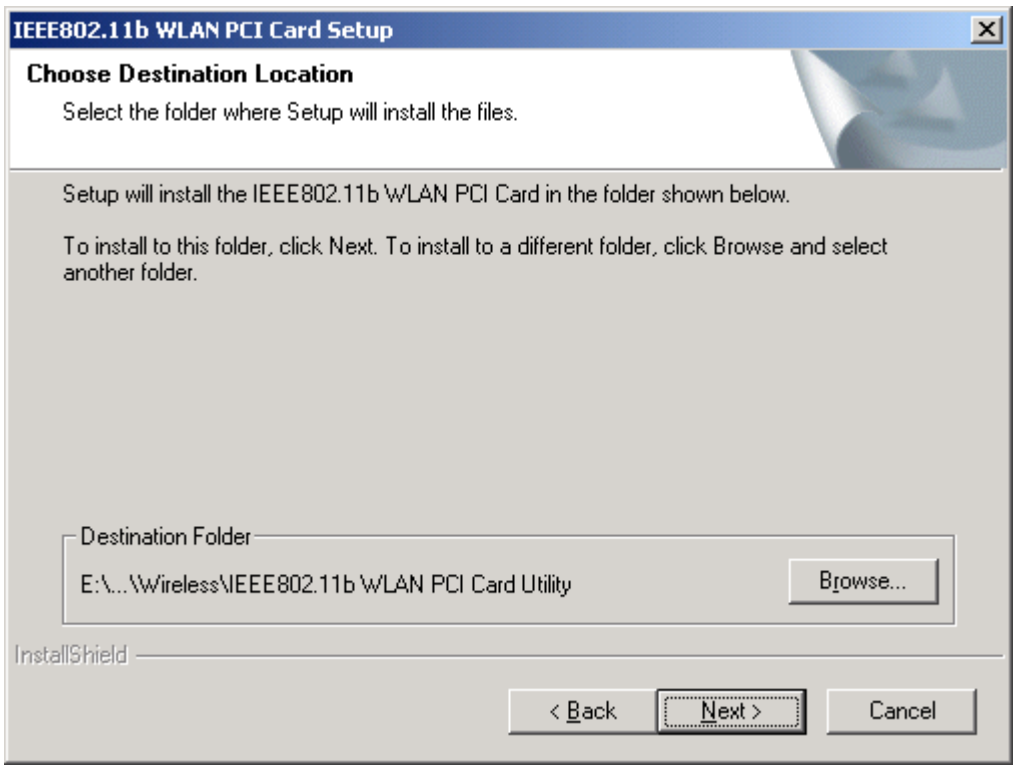
Installation in Windows

After you have installed driver, system will start to install Wireless LAN Utility. Please follow the steps below to install the utility.

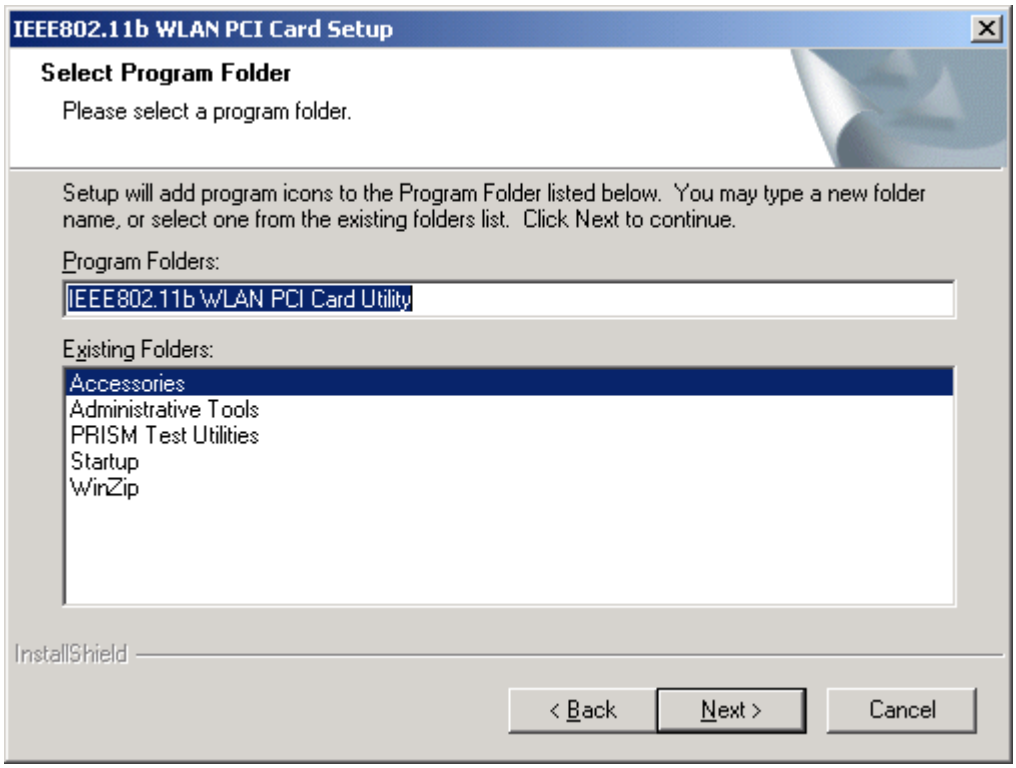
1. Once you see the following screen, click **Next** to continue.



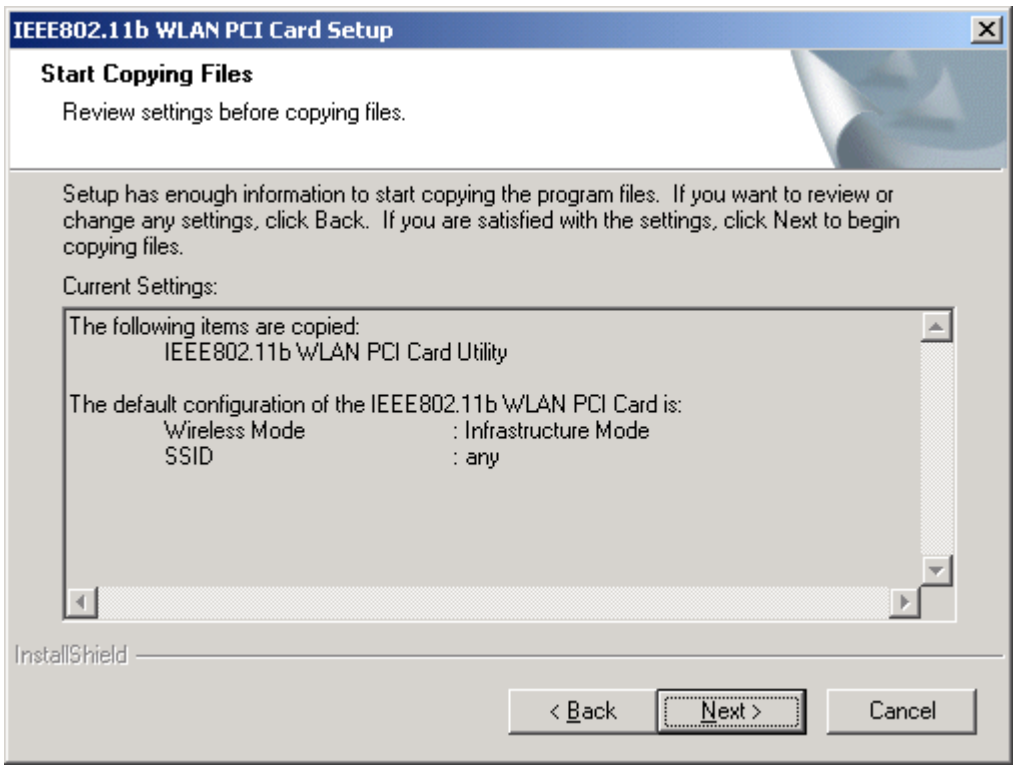
2. The screen will show you the default destination chosen by the utility. Click **Next** to continue or click the **Browse** button to select an alternate destination.



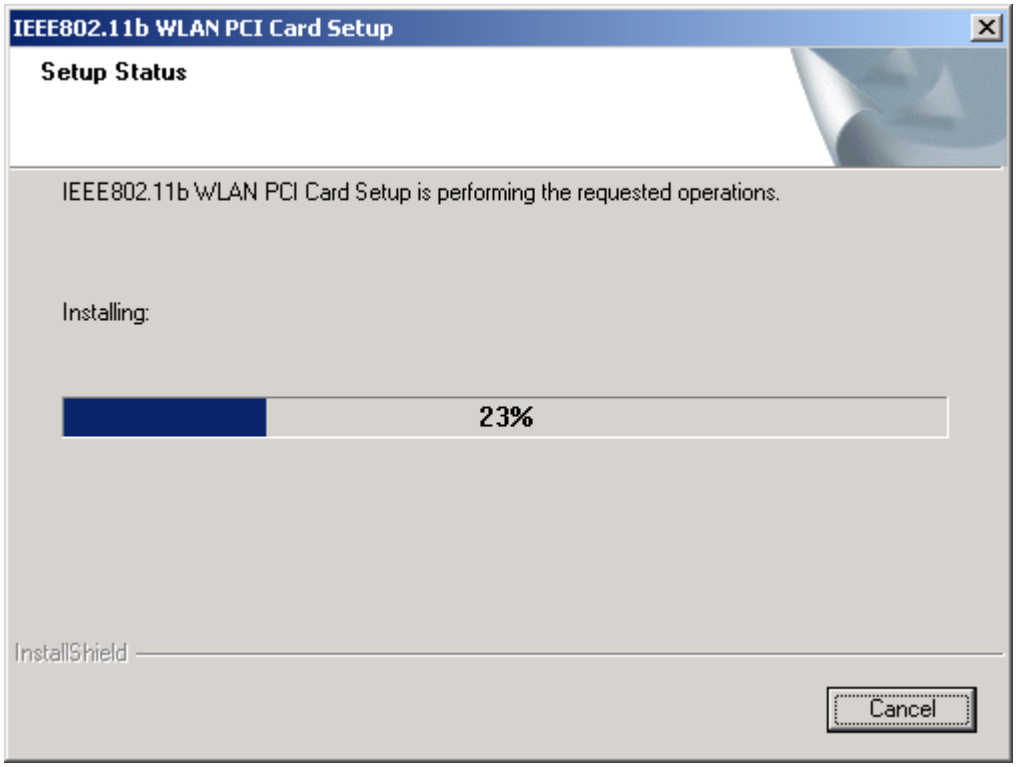
3. The following screen will add program icons to the Program Folder. You may type a new folder name or select one from the existing folders list. Click **Next** to continue or click **Back** to review or change any settings.



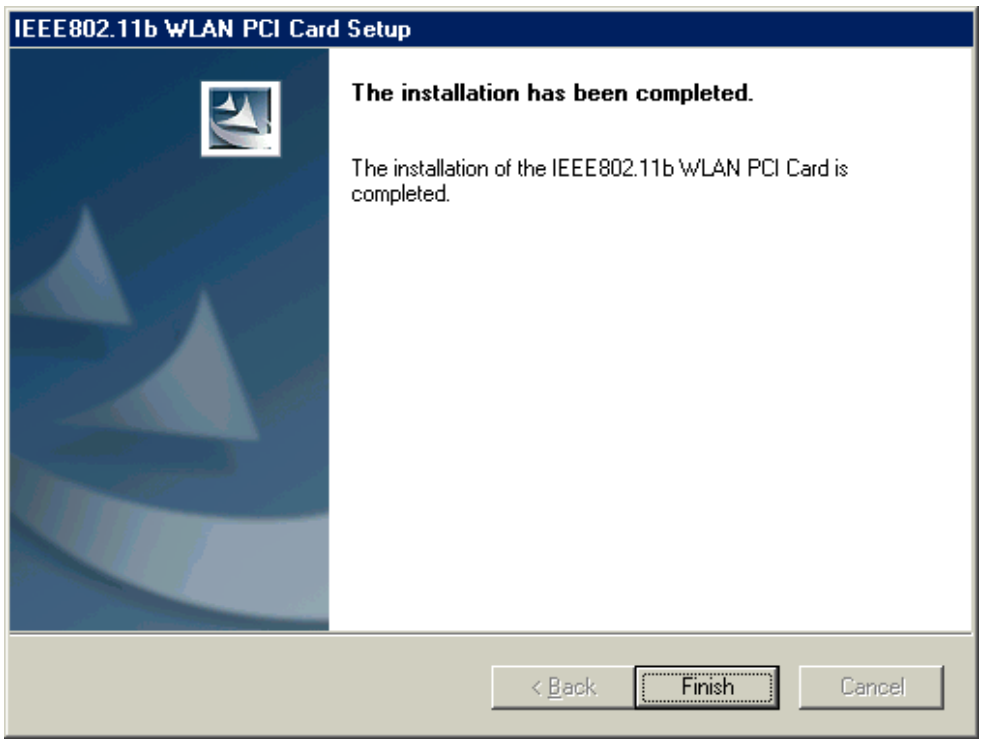
4. The following screen shows the current settings, click **Next** to continue or click **Back** to change the **Destination Folder** in step 3.



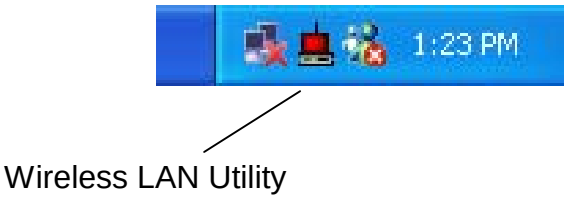
5. The following screen shows you the Setup status by percentage.



6. The Windows has finished installing Wireless LAN Utility. Click **Finish** to finish the installation.



Using Wireless Utility In Windows XP



There are two ways to configure IEEE802.11b WLAN PCI Card. One is Wireless LAN Utility; the other one is Windows Wireless Network Configuration.

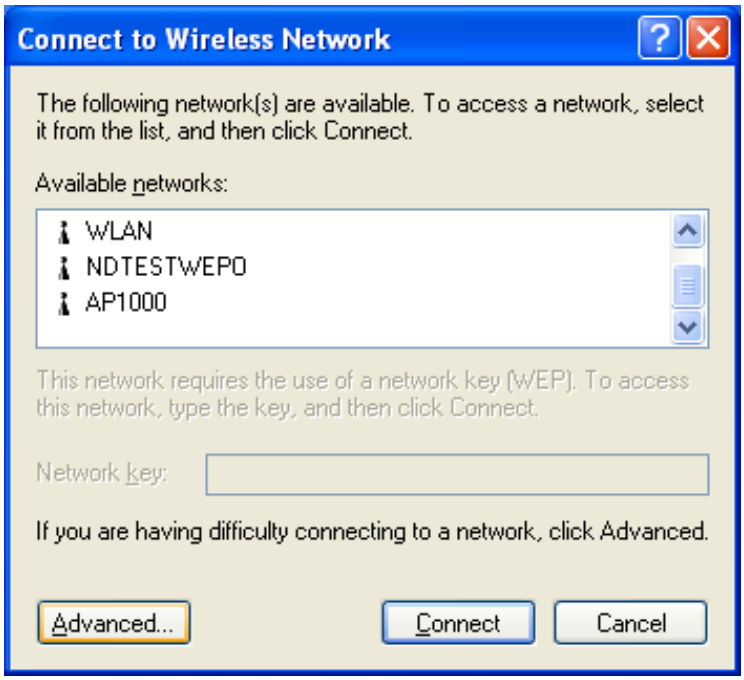
Use Windows Wireless Network Configuration

1. Click the right key of the mouse and **Exit** Wireless LAN Utility.

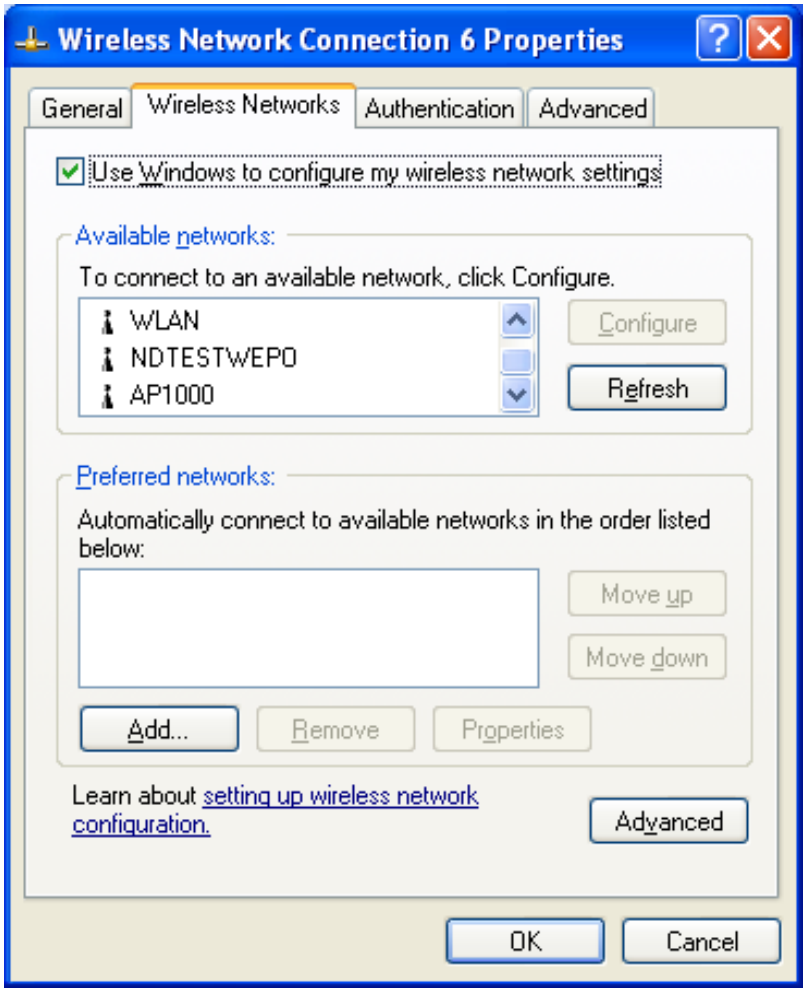
2. Click the Windows Wireless Network Configuration icon.

Windows Wireless Network Configuration

3. The Connect to Wireless Network window pop up as following, the click the **Advanced** button.



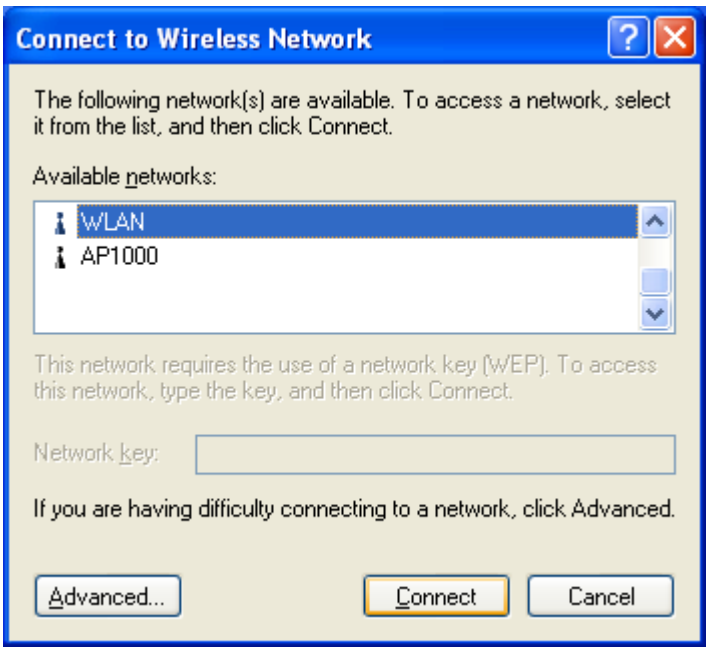
4. Make sure "**Use Windows to configure my wireless network settings"** has been selected, and then click **OK** button.



5. Click the Windows Wireless Network Configuration icon again to open the Connect to Wireless Network window.

Windows Wireless Network Configuration

6. Select an available network and click **Connect** button.



7. The Windows Wireless Network Configuration has been enabled.

Windows Wireless Network Configuration is enabled

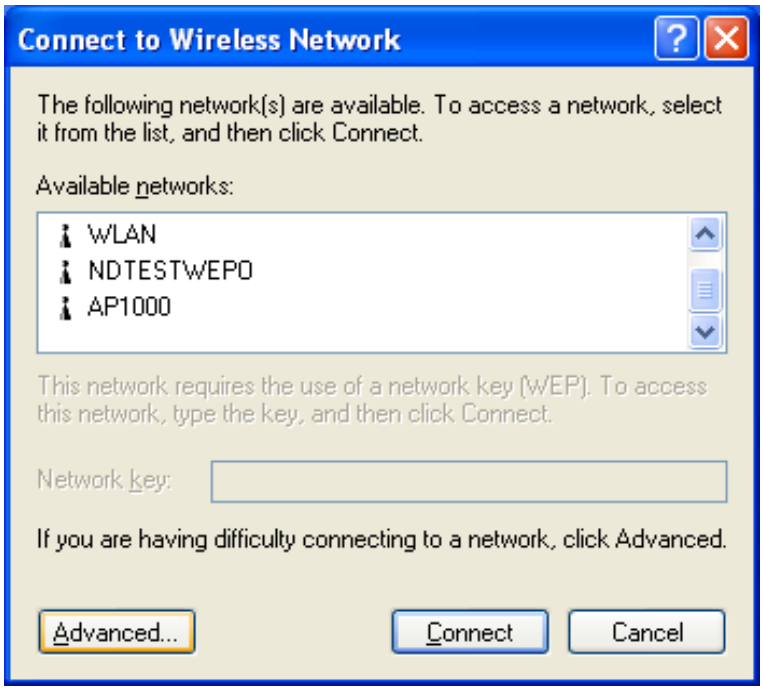
Use Wireless LAN Utility

1. **Exit** the Wireless LAN Utility.

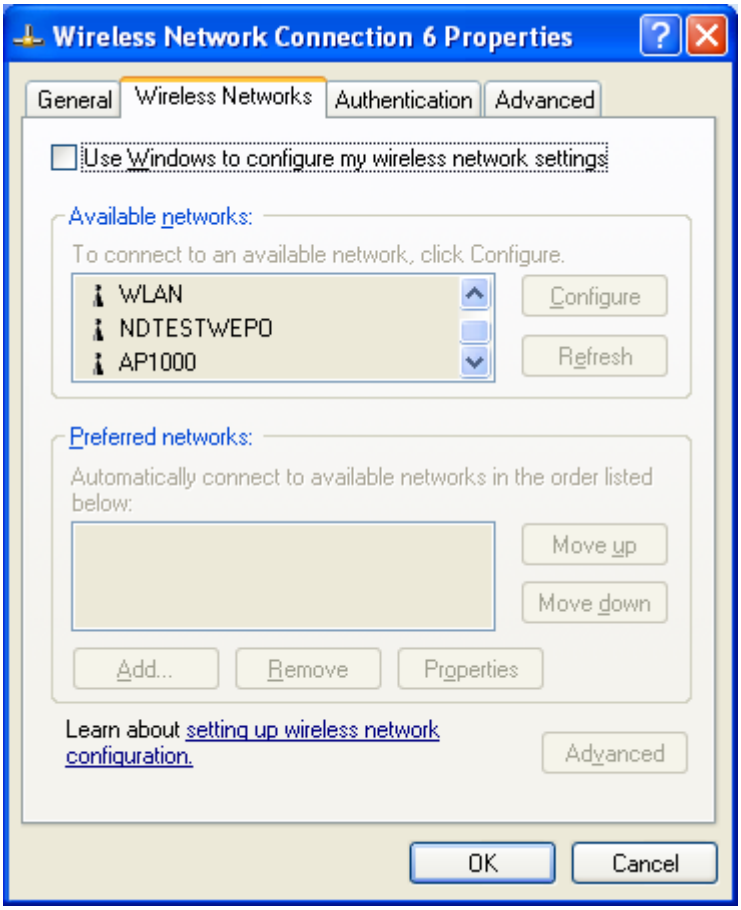
2. Double click Windows Wireless Network Configuration icon.

Windows Wireless Network Configuration

3. Click **Advanced** button.

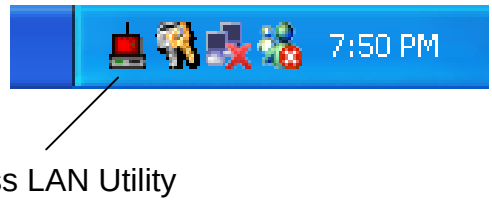


4. Disable "**Use Windows to configure my wireless network settings**" and click **OK** button.



5. Select **Start -> All Programs -> IEEE802.11b WLAN PCI Card** then click **IEEE802.11b WLAN PCI Card Utility** to start the Wireless LAN Utility.

6. The Wireless LAN Utility will be enabled.



Use Wireless LAN Utility In Windows 98, 2000 and ME

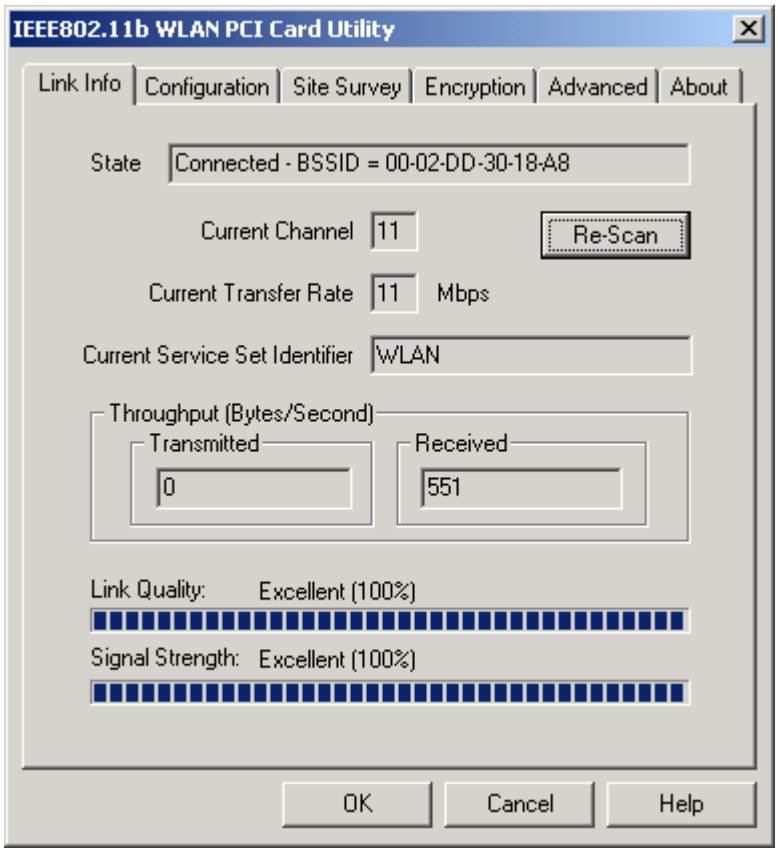
Wireless LAN Utility icon

Icon	Meaning
	Green: indicates a connection is linked to a wireless network.
	Red: indicates that the wireless LAN card is looking for an available access point.

Double-click the icon to open the Wireless LAN Utility.

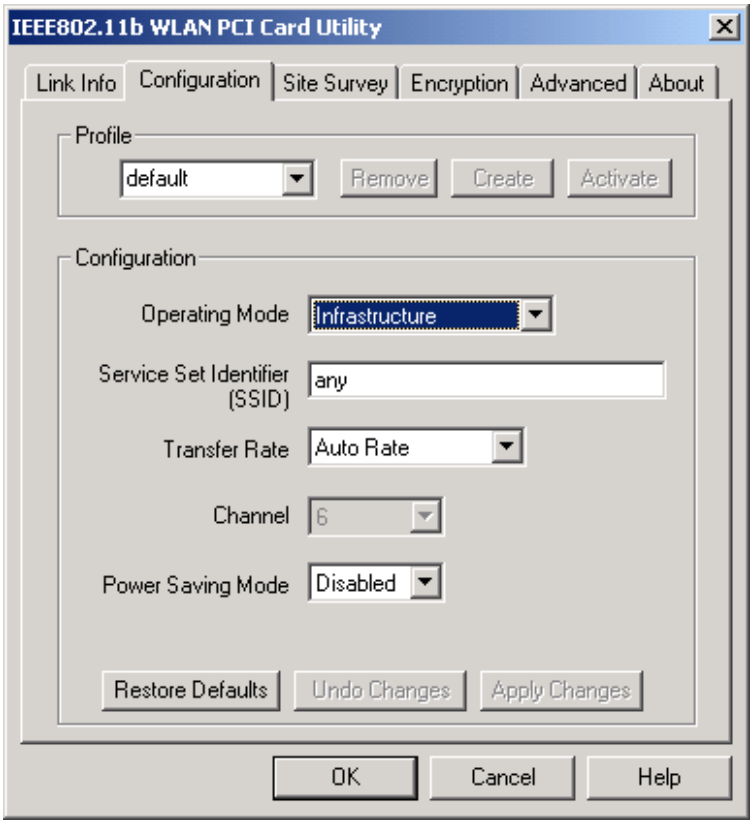
Configuring the IEEE802.11b WLAN PCI Card

1. This screen shows you the status of your current connection. Click **Re-Scan** to search for wireless connection (the Card will search for the connection automatically when it is activated).

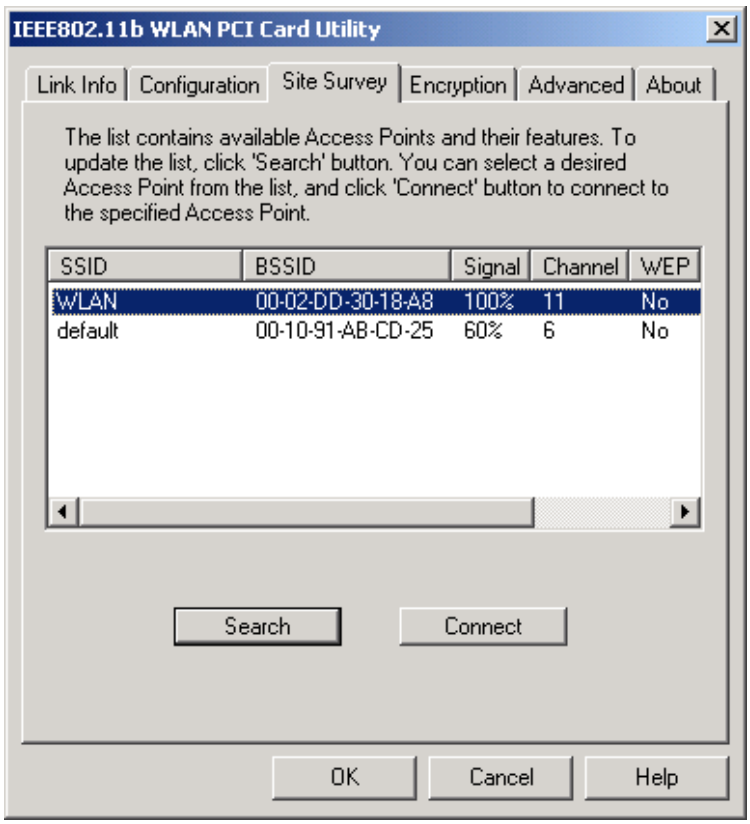


2. Select the "**Configuration"** tab. The **profile** setting allows you to save

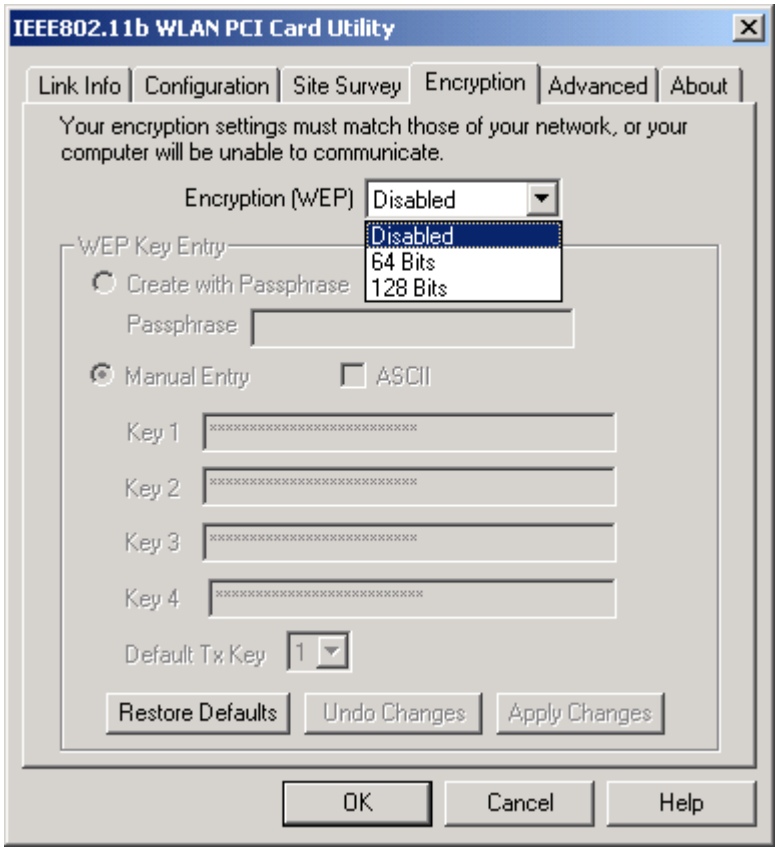
configurations in different profiles for different working environments. The default profile will contain the initial configuration setting when you install the Card. Under the **Operating Mode** drop-box, you may choose either Infrastructure or Ad-Hoc. The Infrastructure mode allows a wireless adapter to communicate with a wired network employing an Access Point, while the Ad-Hoc mode allows wireless-to-wireless, peer-to-peer communication. If you choose Infrastructure, the **SSID** should have the same name as the Access Point. If you choose **Ad-Hoc**, all clients should share the same **SSID** name. You may also select which **Transfer Rate** you wish to use: **1, 2, 5.5, 11Mbps** or **Auto Rate**. Under **Power Saving Mode**, you can select **Enabled** to allow your adapter to go to sleep mode while the Card doesn't proceed the data transmission. Or select **Disabled** to make the Card never go to sleep mode. Click **Apply** to save the settings.



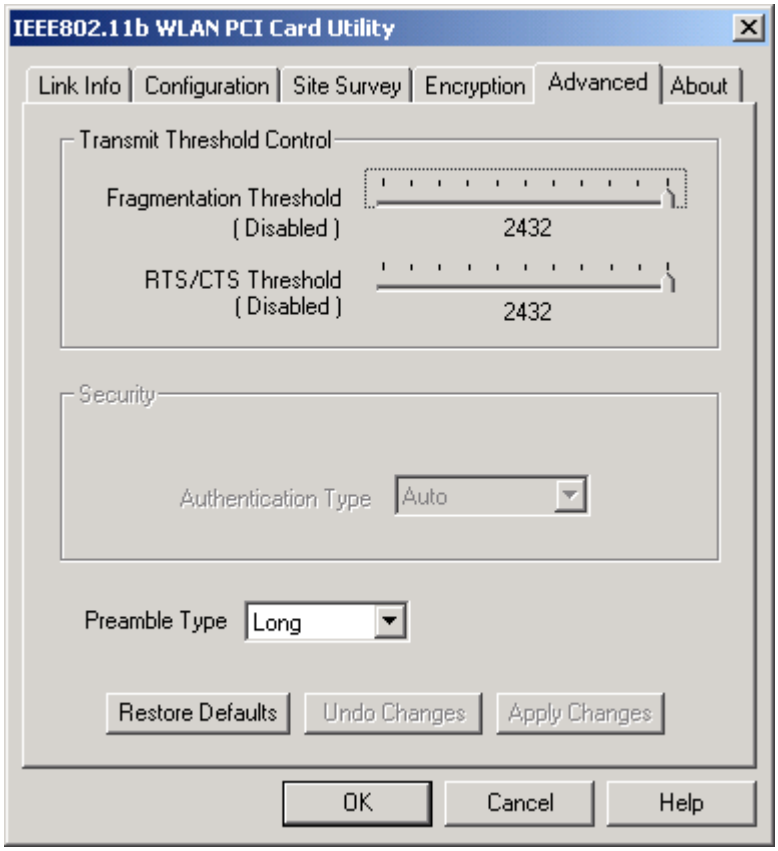
3. Select the "**Site Survey"** tab. The list on the adjacent screen shows you available Access Points and their features. Click on the desired Access Point, then click **Connect** to connect or **Search** to search for more Access Points. Click **OK** when you are finished.



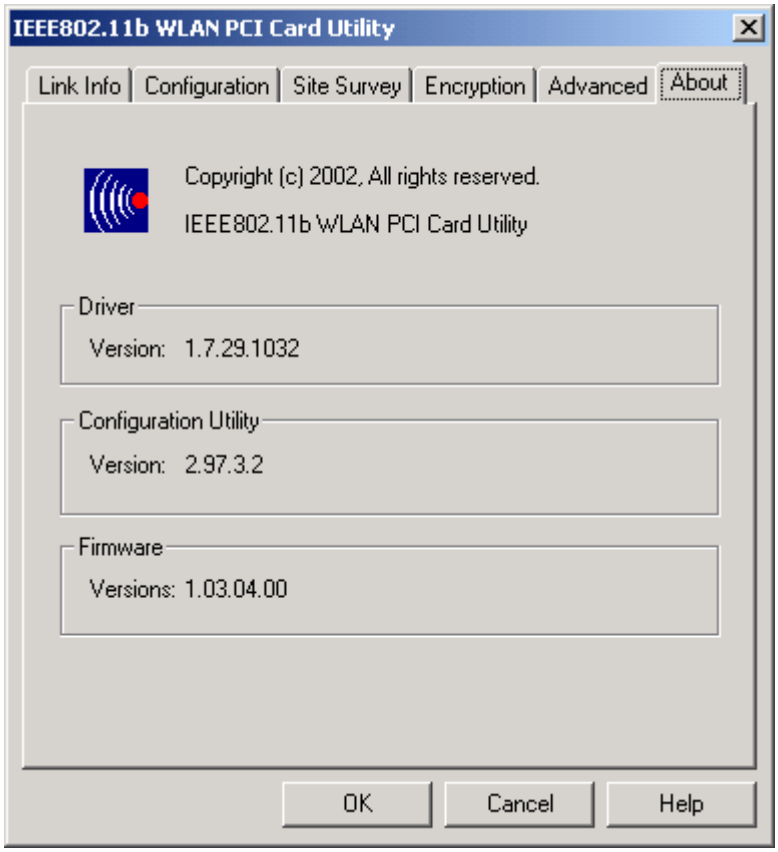
4. Click on the "**Encryption"** tab. Under the drop-box, you can choose to have WEP encryption **Disabled, 64-Bit, or 128-Bit.** Wired Equivalent Privacy (WEP) is an encryption scheme used to protect wireless data communication. The Disabled setting prevents the sharing of data with other computers on the WEP network. For data sharing to be enabled, select the level of encryption desired, either 64 or 128-bit.



5. Select the "**Advanced**" tab. You can choose the **fragmentation threshold** to define the maximum data frame size your adapter will transmit. When the packet error rate is high, you may set the threshold value to transmit shorter frames. You may select **RTS/CTS threshold** to define when will your adapter send out RTS/CTS frames to reserve bandwidth for transmission. By using the RTS/CTS function, you may request bandwidth from AP to allow you have better chance to send out your data. For the **Security, i**t's only applicable while WEP is enabled. For the **Authentication Type,** the current supported algorithms are Open System, Shared Key, and Auto. The algorithm will be invoked when associated to Access Point. To associate to the desired Access Point you must set the same algorithm as the one of the desired Access Point. When select Auto mode, the driver can auto detect the Authentication Type of the Access Point you are going to associate. You can also select **Preamble Type**, which is for framing synchronization. The possible settings are Long and Short. The setting must be the same as the setting of the Access Point you are going to associate.



6. The **"About"** tab shows you copyright and version information about the driver, the configuration utility, and the firmware. Click **OK** to complete the configuration.



Chapter 5 – Installing Network Protocols

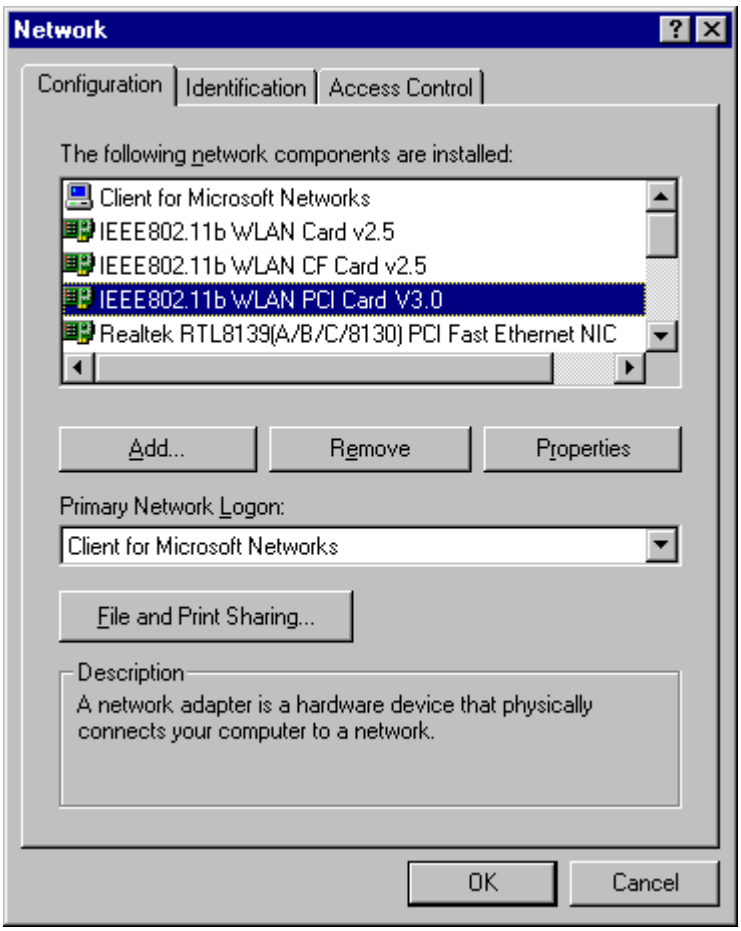
Protocols are necessary for computers to be recognized on your network. Windows 2000 users need to check their Windows User Guides for protocol installation.

Installing the Network Protocols for Windows 98 and Millennium

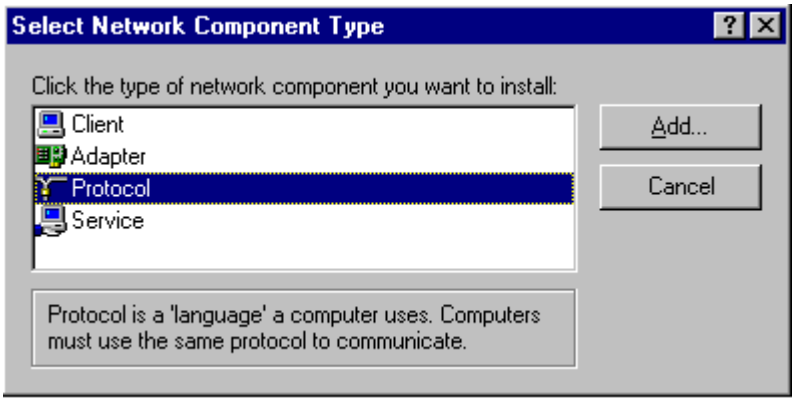
1. From the **Start** Menu, select **Settings** and bring up the **Control Panel**. From the Control Panel, double-click on the **Network** icon.

Note: Before adding any network protocols, verify that the protocol is not already installed. Never install duplicate protocols.

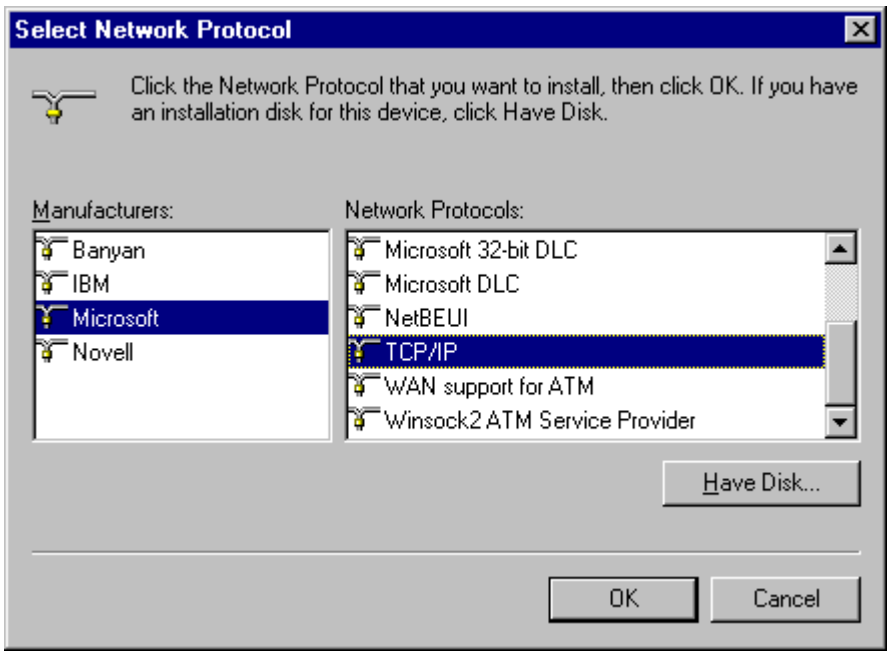
2. Select ***IEEE802.11b WLAN PCI Card*** from the list and click the **Add** button.



3. Highlight **Protocol** and click the **Add** button.



4. Select **Microsoft** from the list of "Manufacturers" and **TCP/IP** from the list of "Network" Protocols" and click the **OK** button to finish the installation.


Select Network Protocol
Click the Network Protocol that you want to install, then click OK. If you have an installation disk for this device, click Have Disk.
Manufacturers:
Banyan
IBM
Microsoft
Novell
Network Protocols:
Microsoft 32-bit DLC
Microsoft DLC
NetBEUI
TCP/IP
WAN support for ATM
Winsock2 ATM Service Provider
Have Disk...
OK
Cancel

Appendix A – FAQ

1. What is IEEE 802.11 standard?

- The IEEE 802.11 is a wireless LAN industry standard, and the objective of IEEE 802.11 is to make sure that different manufactures' wireless LAN devices can communicate to each other.

2. What is WEP?

- As described in the IEEE 802.11 standard, WEP (Wired Equivalent Privacy) is a data privacy mechanism based on a 40 bit shared key algorithm.

3. My desktop PC cannot recognize the Wireless Network PCI Adapter.

- Please make sure that the Card is inserted into the PCI slot of your desktop PC properly (check this when the PC is powered off).
- And also make sure that the PCI controller is enabled in the BIOS of your desktop PC.
- Try installing the card in a different PCI slot.

4. In Infrastructure mode, my desktop PC cannot communicate with the others PCs on the network.

- First, make sure that the SSID is same as the others PC.
- Check if the WEP is enabled on the Access Point, if it is, set your Adapter's WEP the same as the Access Point.
- Also check the Access Point's Authentication Type and Preamble Type and match those settings.

5. In ad-hoc mode, my desktop PC cannot communicate with the others PCs on the network.

- Make sure the SSID and the Channel number are the same as other wireless stations.
- Check if WEP settings are the same in all wireless stations.
- Check the **Network Properties,** make sure proper protocol is installed and **File and Printer Sharing** is enabled.

Appendix B – Specifications

Standards:	IEEE 802.11b PCI Local Bus 2.1 Compliance
Channels:	11 Channels (US, Canada) 13 Channels (Europe) 14 Channels (Japan)
Antenna:	Dipole antenna with reversed SMA Connector
Frequency:	2.4 to 2.4835GHz (Industrial Scientific Medical Band)
Data Rate:	up to 11Mbps
Operating Ranges:	Indoor (varies depends on the environment): Up to 50M @ 11Mbps Up to 80M @ 5.5Mbps Outdoor (varies depends on the environment): Up to 150M @ 11Mbps Up to 300M @ 5.5Mbps
Temperature:	Operating: 0° ~ 55° C Storage: -25° ~ 70° C
Humidity:	10% to 90% (non-condensing)