User Guide

P120

11Mbps Wireless LAN PCI Adapter

INFORMATION TO USER

Federal Communications Commission Statement
This product has been tested and complies with the specifications 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. The antenna used for this transmitter must be installed to provide a separation distance of least 20 centimeters from all persons and must not be operating in conjunction with other antenna or transmitters. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to 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 is found 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 or device.
Connect the equipment to an outlet other than receiver   .
Consult a dealer or an experienced radio/TV technician for assistance

Notice: The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency. Any change or modification not expressly approved by the party responsible could void the user authority to operate the device.

Regulatory
The wireless LAN PCI Adapter must be installed and used in strict accordance with the manufacturer instructions. This device complies with the following radio frequency and safety standards.

USA - Federal Communications Commission (FCC)
This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference that may cause undesired operation.

Europe - R&TTE Directive
This device complies with the specifications listed below:
ETS 301-489 General EMC requirements for Radio equipment.
ETS 300-328 Technical requirements for Radio equipment.
EN60950 Safety requirements for Radio equipment.

EU Countries not intend for use
The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France (with Frequency channel restrictions). Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.

The ETSI version of this device is also authorized for use in EFTA member states Iceland, Liechtenstein, Norway and Switzerland.

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1   Introduction

1.1   The 11Mbps Wireless LAN PCI Adapter

The 11Mbps Wireless LAN PCI Adapter now has a new, higher-powered antenna that provides a greater range than ever. The increased sensitivity helps filter out interference and notice to keep your signal clear. Improved error correction in the chipset keeps you operating at higher transmission rates for longer distances. And since you only need one PCI slot, you're free to use your other slots for additional accessories.

Plug-and-Play device, Windows 98/ME/2000/XP will automatically recognize the wireless LAN card and initiate the installation process. Upon successful installation, the wireless LAN card will communicate seamlessly with other wireless home and office networking products.

Using radio frequency (RF) technology, WLANs transmit and receive data over the air, minimizing the need for wired connections. Thus, WLANs combine data connectivity with user mobility, and through simplified configuration, enable movable LANs. This wireless networking solution has been designed for both large and small businesses, and it is scalable so that you can easily add more users and new network features as your business grows.

This manual will assist you in the installing WLAN PCI Adapter

1.2   Feature
IEEE 802.11b Direct Sequence Spread Spectrum(DSSS) high rate compatible.
High data rate 11/5.5/2/1 Mbps.
Support 32bit PCI interface
Auto Rate fallback for optimizing communication possibility in worse channel conditions and over larger distances.
Support 64/128bit WEP data encryption security
Compliant with Windows 98/200/ME/XP
Power save in infrastructure mode.
Detachable and reversible dipole antenna
Plug-and-Play and easy setup
Easy-to-Use Graphical Configuration utility saves detailed connectivity profiles for frequently accessed networks

1.3   Package Contents
One 11Mbps Wireless LAN PCI Adapter (with 3dBi dipole antenna).
One setup Utility CD-ROM (User Guide on CD).
Quick Installation Guide.
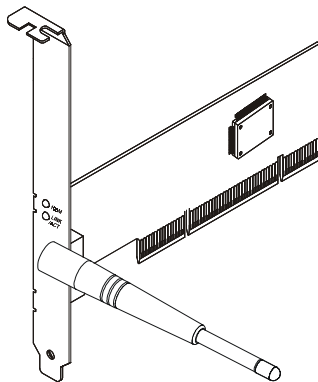
11Mbps Wireless LAN PCI Card
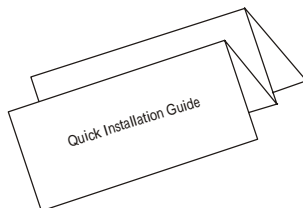
Quick Installation Guide   Utility CD-ROM

1.4   System Requirements

Desktop computer with an available 32bit PCI slot
Operating System: Windows 98, ME, NT, 2000, XP.
2M bytes free disk space for utility and driver installation.

2　Network Configuration and Planning

2.1　Wireless LAN Basic
The WLANs supports legacy Ethernet LAN network configuration options as defined by the IEEE 802.11b standards committee.

The wireless LAN PCI Adapter can be configured as:
    Ad-Hoc for departmental or SOHO LANs.
    Infrastructure for enterprise LANs.
    LAN-Interconnection for point-to-point link as campus backbone.

2.2　Network Topology

Ad-Hoc Wireless LAN

An Ad-Hoc wireless LAN is a group of computers, each equipped with one WLAN adapter, connected as an independent wireless LAN. Computers in a specific Ad-Hoc wireless LAN must be configured to share the same radio channel.

Infrastructure Wireless LAN
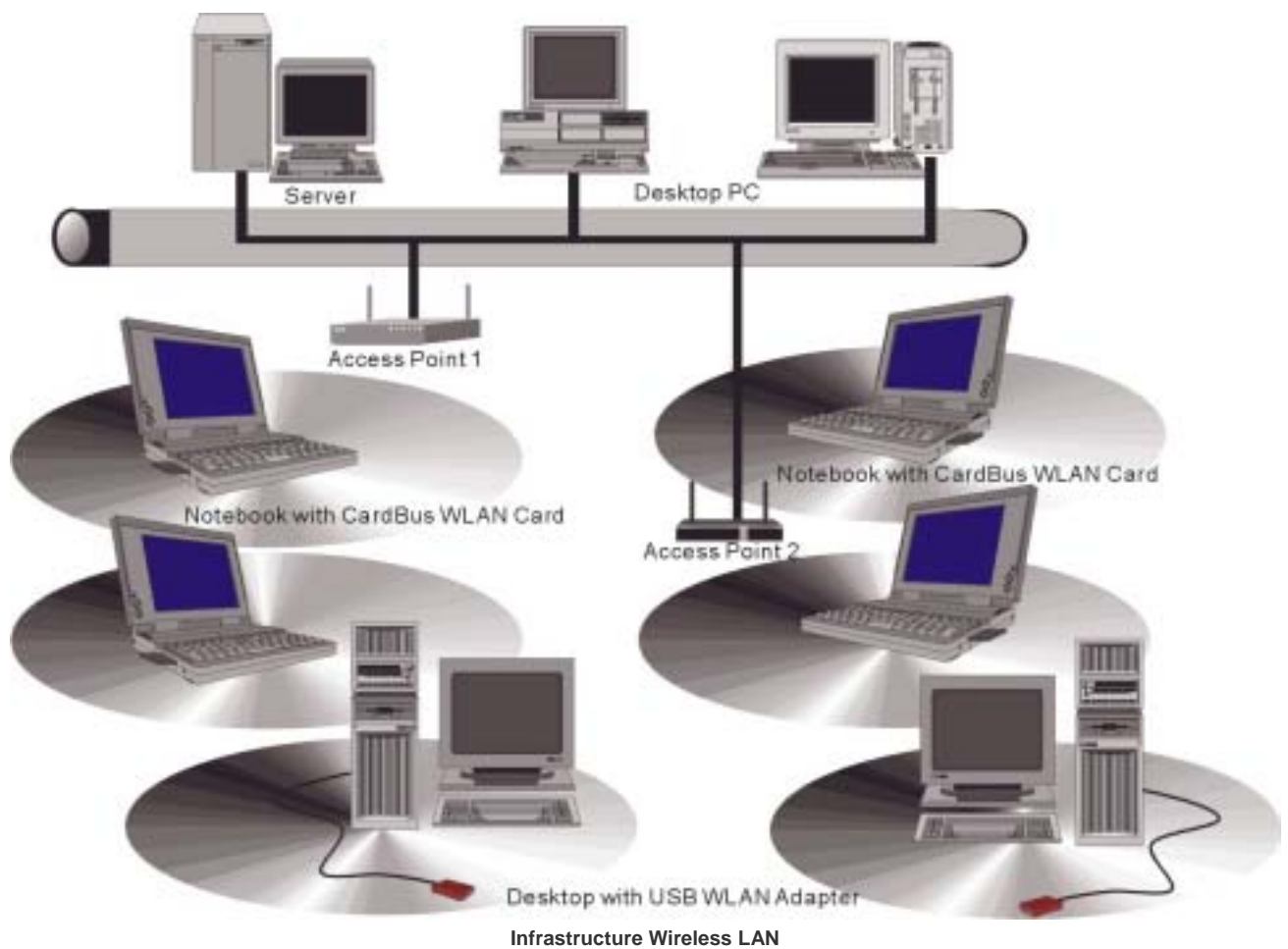
The adapter provides access to a wired LAN for wireless workstations. An integrated wireless and wired LAN is called an infrastructure configuration. A group of WLAN PC users and an Access Point compose a Basic Service Set (BSS). Each WLAN PC in a BSS can talk to any computer in the wired LAN infrastructure via the Access Point.

An infrastructure configuration extends the accessibility of a WLAN equipped PC to a wired LAN, and doubles the effective wireless transmission range for 2 WLANs PCs. Since the Access Point is able to forward data within its BSS, the effective transmission range in an infrastructure LAN is double.
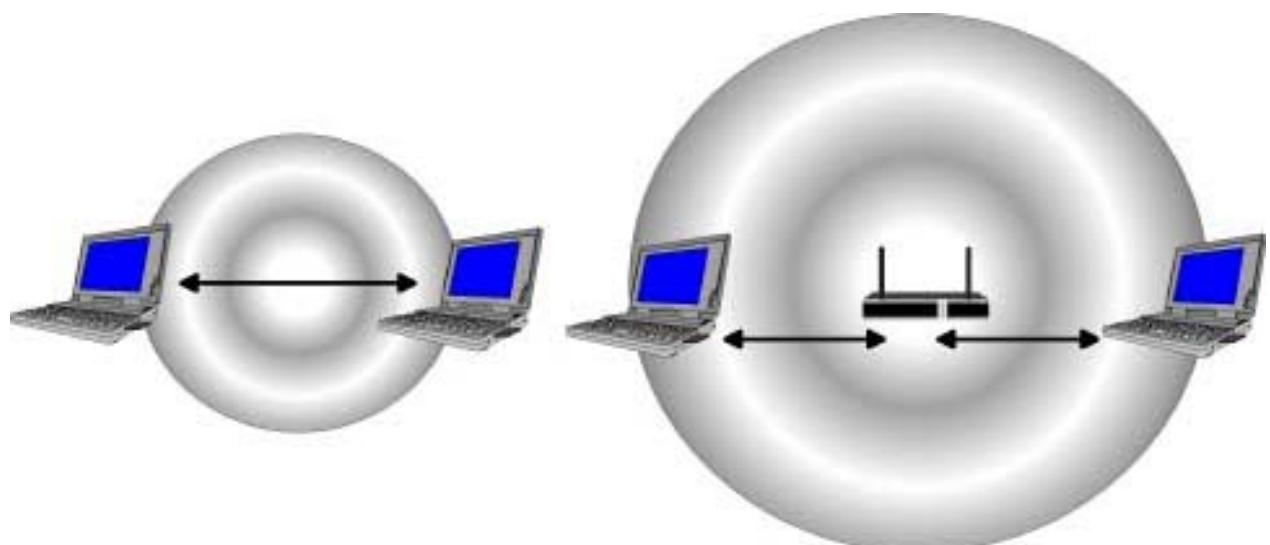

The effective transmission range

The use of a unique ID in a BSS is essential. All WLAN equipped PCs configured without roaming options in independent BSS must be configured with a BSS ID corresponding to the Access Point used in the BSS. Check your Access Point for its BSS ID or use the Access Point Browser Utility program to determine the BSS ID.

The infrastructure wireless LAN configuration is appropriate for enterprise-scale wireless access to a central database, or as a wireless application for mobile users.

2.3   Roaming
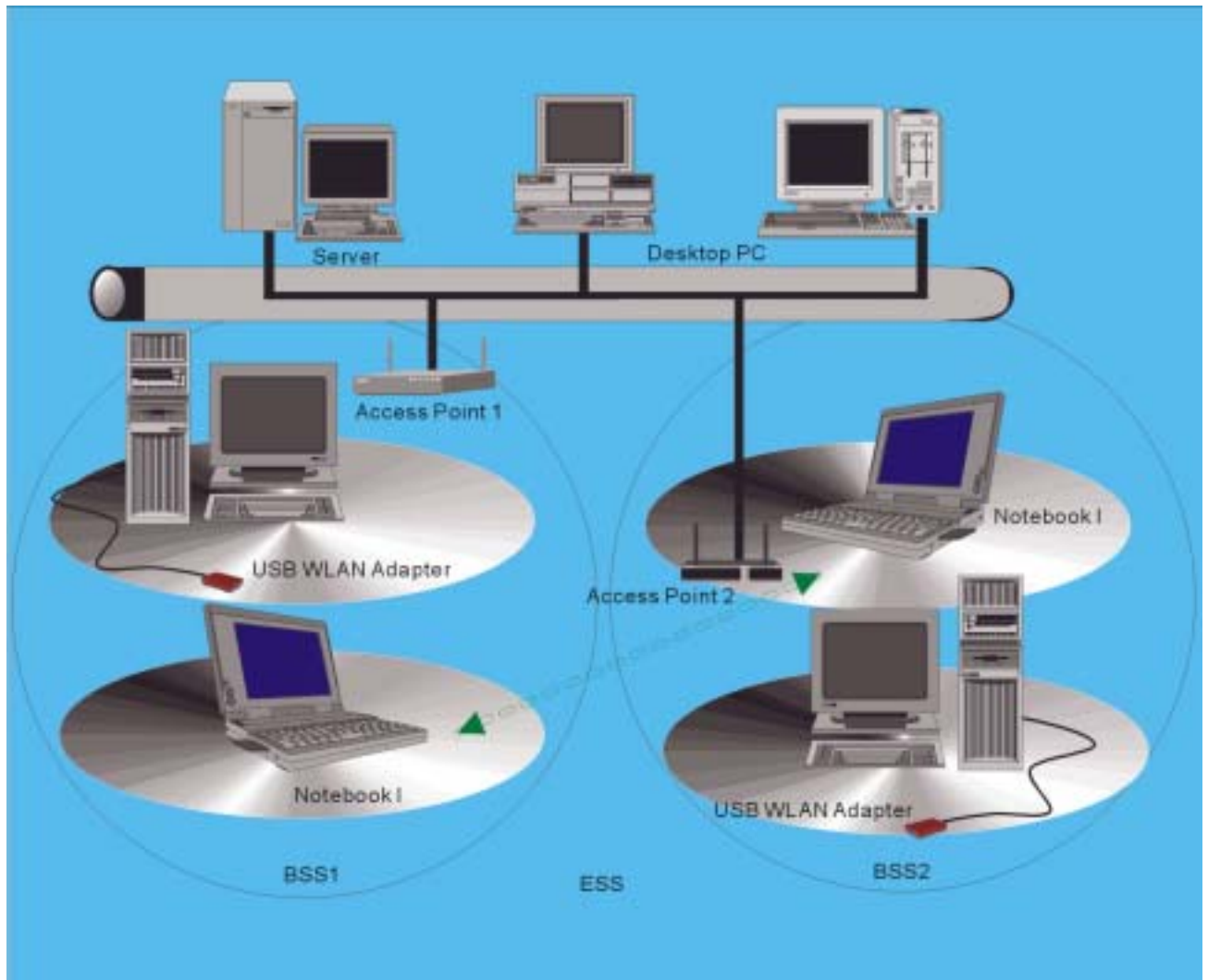
Roaming in an Extended Service Set (ESS)

Infrastructure mode also supports roaming capabilities for mobile users. More than one BSS can be configured as an Extended Service Set (ESS). The continuous network allows users to roam freely within an ESS. All WLAN PCs and Access Point within one ESS must be configured with the same ESS ID.

Before enabling an ESS with roaming capability, it is recommended to select a feasible radio channel and optimum Access Point position. Proper Access Point positioning combined with a clear radio signal will greatly enhance performance.

3   Installing and Un-installing the Drivers and Configuration Utility

3.1   Running the Auto Driver/Utility Installation

Before insert your card, please install the Auto-Install CD into your CD-ROM driver first. Unless you have deactivated the auto-run feature of Windows, the screen shown below should appear automatically.


Autorun feature of Windows

If this screen doesn't appear automatically, you can access the installation by clicking the Start button and choosing **Run**. In the drop-down box provided type **D:\Setup.exe** (where D: is the letter of your CD-ROM drive). Alternately, double-click My Computer and double-click the Setup.exe icon in the folder that appears. **Click "install 802.11b WLAN Driver and Utility", please**
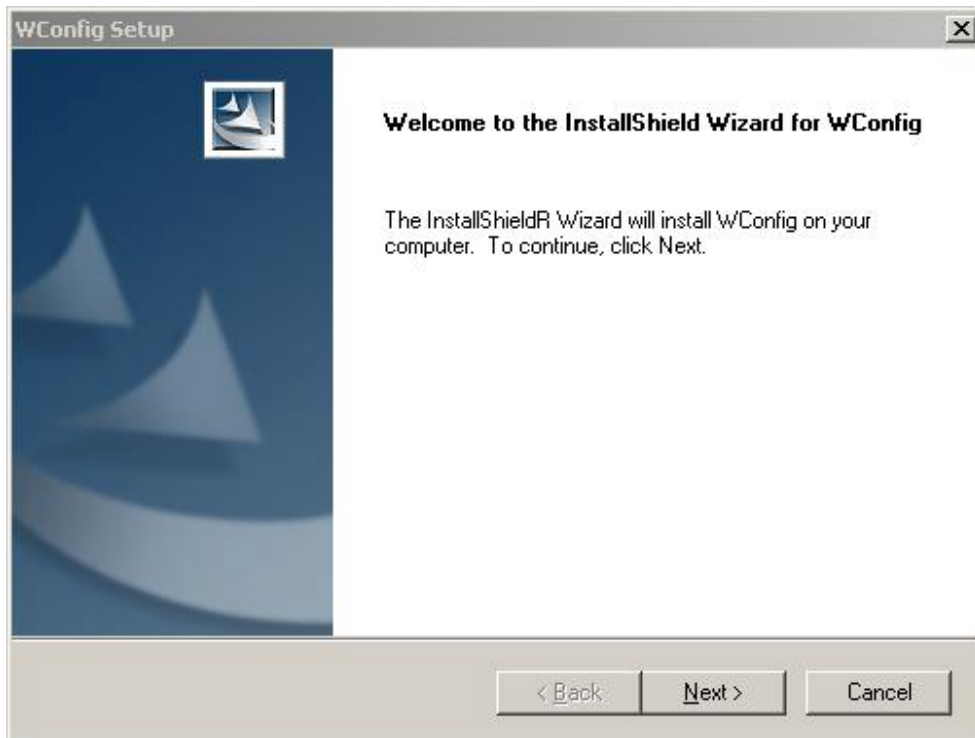
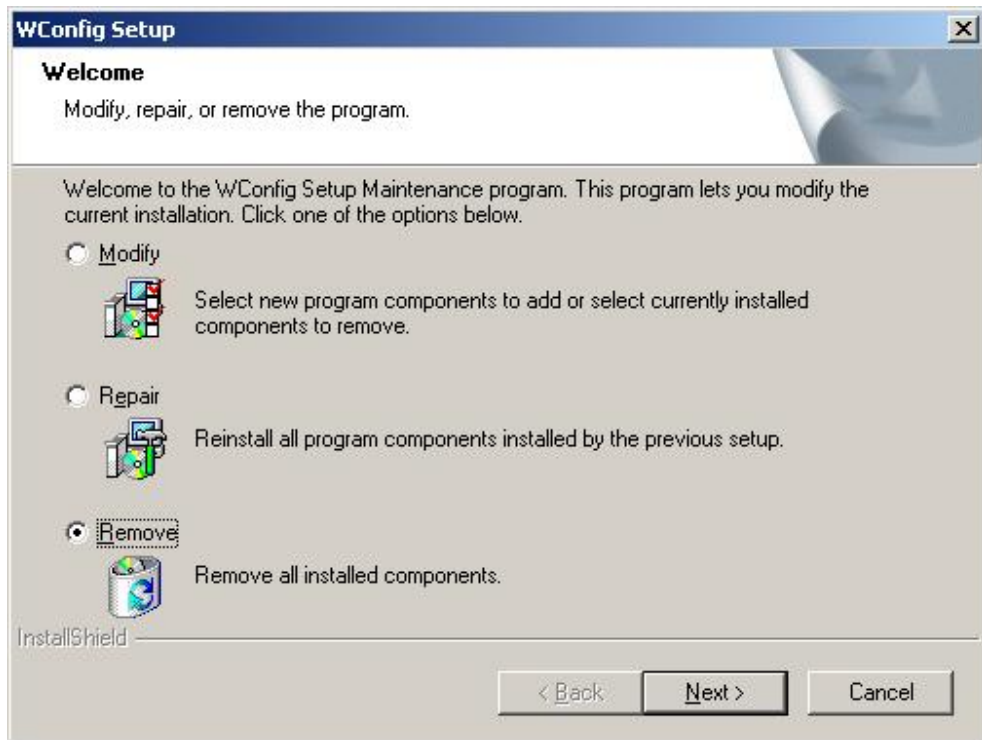The screen below will appear next, please click **Next** button.
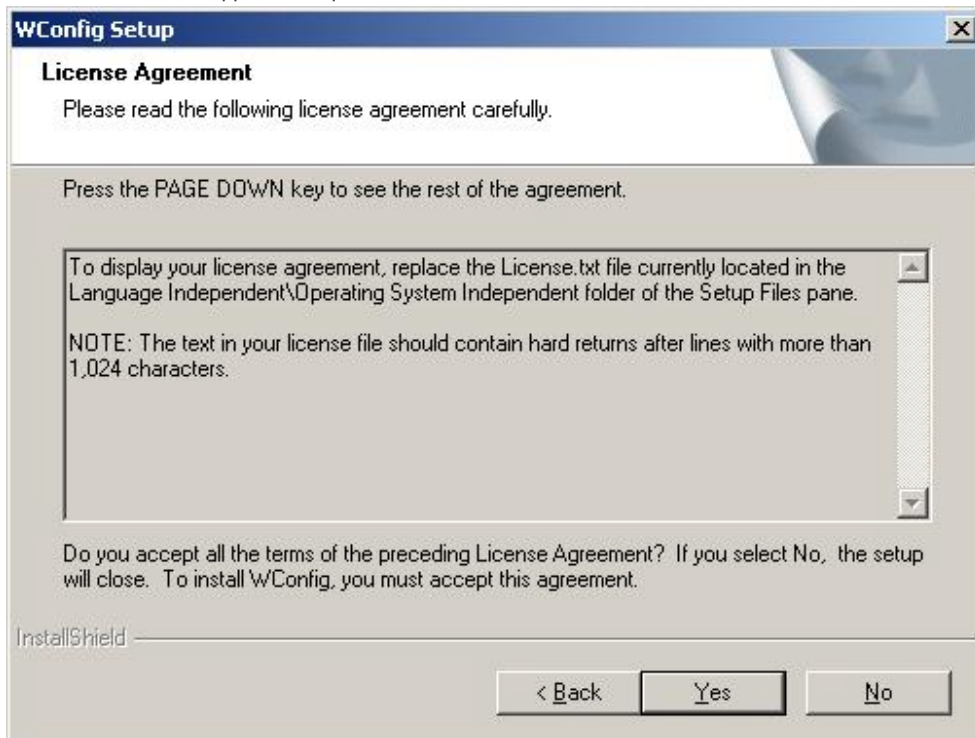
Click **Yes** button for installing configuration utility. Otherwise click **NO** to skip or **Back** to the previous screen. After Windows has finished copying the necessary files, a screen similar to that shown below will appear.
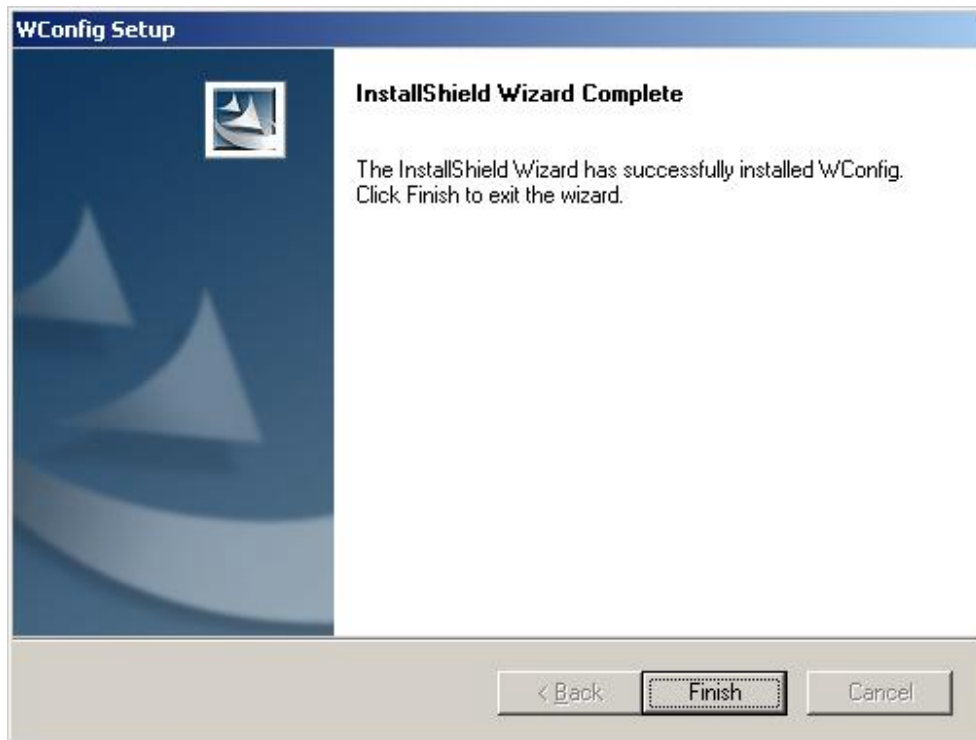
3.2 Uninstalling the Driver and Utilty

Previous installations or interrupted installation attempts sometimes leave problems that affect card operation. If the installation is

unsuccessful, your best course may be to completely uninstall the card and repeat the installation procedure.
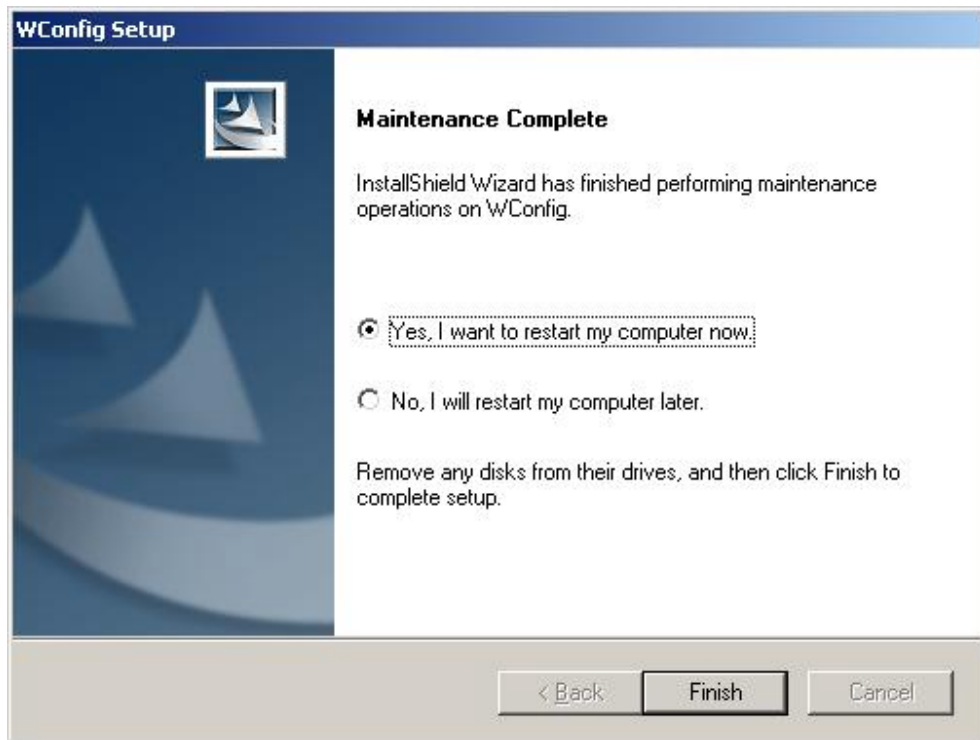
please run the Auto-Install again, **Click "install 802.11b WLAN Driver and Utility"**. The screen shown below should appear automatically. Select "Remove"

The screen below will appear next, please click **Yes** button.
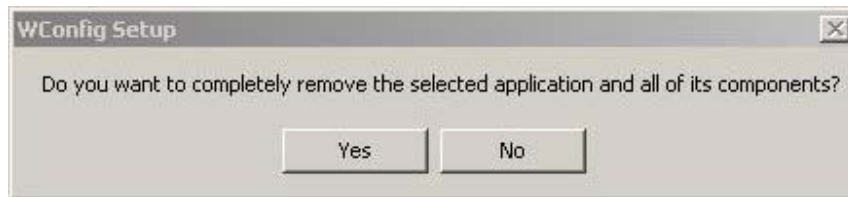
After Windows has finished removing all installed components, a screen similar to that shown below will appear.

Click **Finish** . The operating system will restart the computer automatically.

3.3   Inserting the adapter

You had better install the setup program previously.
To insert the wireless LAN PCI adapter into a computer, do the following:
Power off the computer before installing the adapter. And remove the computer cover.
Locate an available PCI slot in the computer. And align the adapter with the slot and insert firmly.
Verify that the antenna connectors on the back of the PC are exposed. And replace the computer cover finally.

4   Configuration Utility

The **Configuration Utility** is provided to allow you further customization of the WLAN LAN PCI adapter and your wireless network.

4.1   Using the configuration Utility

After the Configuration Utility has been installed, an icon will placed in the system tray when the WLAN PCI Adapter is inserted.
The utility is divided into five parts: **Profile , Link State, Site Survey, Statistics, and about.** *You should change all your configuration settings for your WLAN PCI Adapter using this utility and not with the Network Properties section in your Control Panel.*
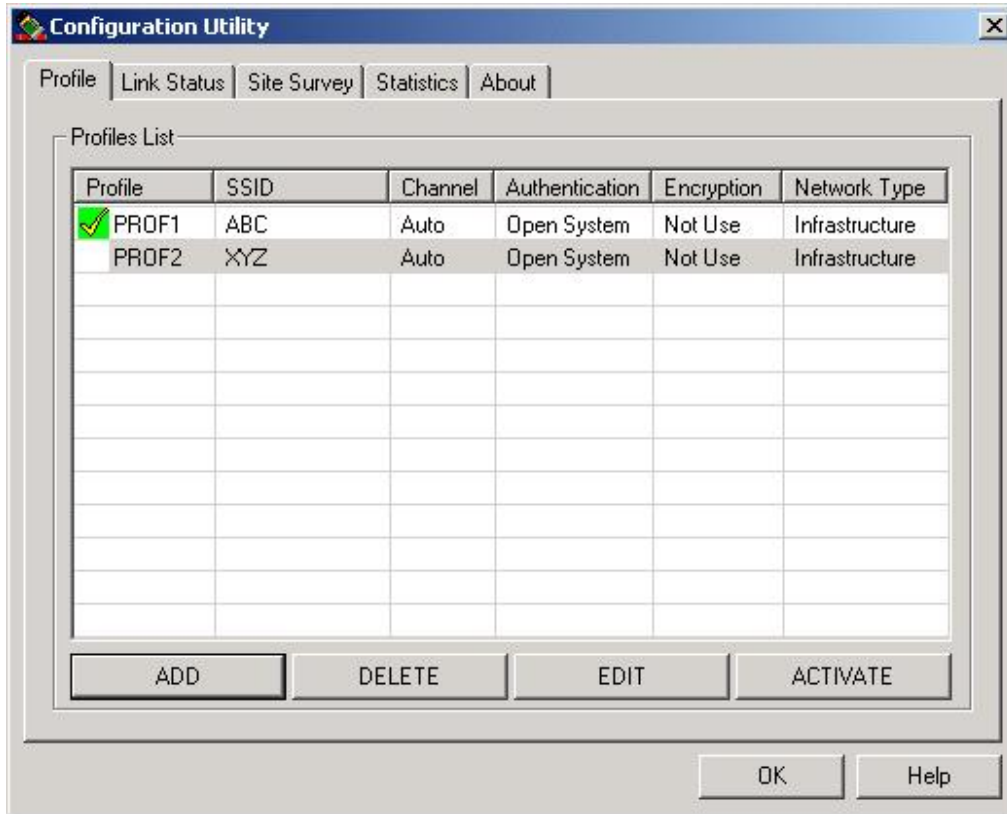
Click **ACTIVATE** to excuse the profile.
To add a new location profile name or to rename, delete, or select an existing profile, click **Edit**. The Edit Configurations screen appears

4.1.1 Profile

Specifies different network profile settings used in various locations, such as your office, your home, the factory, or the airport. In each profile, you can specify a network type, network name, WEP and security setting parameters required for that operating location.

4.1.1.1   System Configuration

Edit profile
Network Type:

   Ad Hoc: An Ad-Hoc wireless LAN is a group of computers each with wireless adapters, connected as an independent wireless LAN.
   Infrastructure: An integrated wireless and wired LAN is called an infrastructure configuration.
SSID: All wireless devices within the ESS or extended wireless LAN use the SSID. This can be any alphanumeric value of up to 32 long. Use this to prevent cross communication between two or more WLAN in one area. The SSID should be changed in order to provide some minimum security.
Fragment Threshold: Fragment Threshold defines a threshold above, which the wireless packet will be split up, or fragmented. For a fragmented packet, if transmission of part of it were to be interfered with, only the portion that was successfully transmitted would need to be resent. Throughput will generally be lower for fragmented packets, since the fixed packet overhead consumes a higher portion of the RF bandwidth.
RTS Threshold: The RTS Threshold sets an upper threshold at which point the device will issue an RTS packet. The RTS (Request To Send) packet is used for the purpose of avoiding data collisions on the wireless LAN. There are several trade offs to consider when setting this parameter. Setting this parameter to a small value causes RTS packets to be sent more often, consuming more of the available bandwidth, therefore reducing the apparent throughput of other network packets. However, the more often RTS packets are sent, the quicker the system can recover from interference or collisions. Refer to the IEEE 802.11 Standard for more information on the RTS/CTS mechanism.
Power Save Mode:

CAM: (Constant Awake Mode) CAM is the normal mode for desktop machines or other machines where power consumption is not an issue. It keeps the radio powered up continuously, so there is little latency for responding to messages.

Max_PSP: Maximum Power Save.

Fast_PSP: Fast Awake.

Use Short Preamble: Preamble is the first sub-field of PPDU, which is the appropriate frame format for transmission to PHY (Physical layer). There are two options, Short Preamble and Long Preamble. The Short Preamble option improves throughput performance.

Transmit rate: By default, the unit adaptively selects the highest possible rate for transmission. Select the basic rates to be used among the following options: Auto, 1, 2, 5.5, or 11 Mbps. For most networks the default setting, Auto will be the best choice. When Auto (Rate Fall Back) is enabled the transmission rate will select the optimum rate. If obstacles or interference are present, the system will automatically fall back to a lower rate.

Encryption : A way of coding the information in a file or e-mail message so that if it is intercepted by a third party as it travels over a network it cannot be read. Only the person or persons that have the right type of decoding software can unscramble the message.

WEP : WEP (Wired Equivalent Privacy) is an optional feature of the IEEE 802.11 standard that is used to provide data confidentiality and is equivalent to that of a wired LAN that does not use crypto techniques to improve security.

4.1.1.2   Authentication & Security

No Encryption: No any encryption for security.

Encryption:

  WEP Key length: The 64 or 128-bits Wired Equivalent Privacy Algorithm. Use this enable 64-bit or 128-bit encryption. WEP is disabled by default. WEP use a Hexadecimal format as key type.   The 64/128-bit key length minus the 24-bit IV actually gives an effective 40/104-bit key length,

  Open System: With this setting any station in the Wireless LAN can associate with an Access Point to receive and to transmit data.

Key 1 - Key 4: These four fields can be used to manually enter the encryption keys. This may be necessary if you wish this node to

match keys in a different vendor's product.

Edit Profile

Profile Name PROF1   SSID ABC

System Configuration | Authentication & Security

Authentication Setting

    Authentication Type   Open System

☐ Encryption

    WEP Key Type   Hexadecimal

    WEP Key Length   64 Bits

    WEP Key

        ● Key#1

        ○ Key#2

        ○ Key#3

        ○ Key#4

        OK   CANCEL

No Data Encryption.
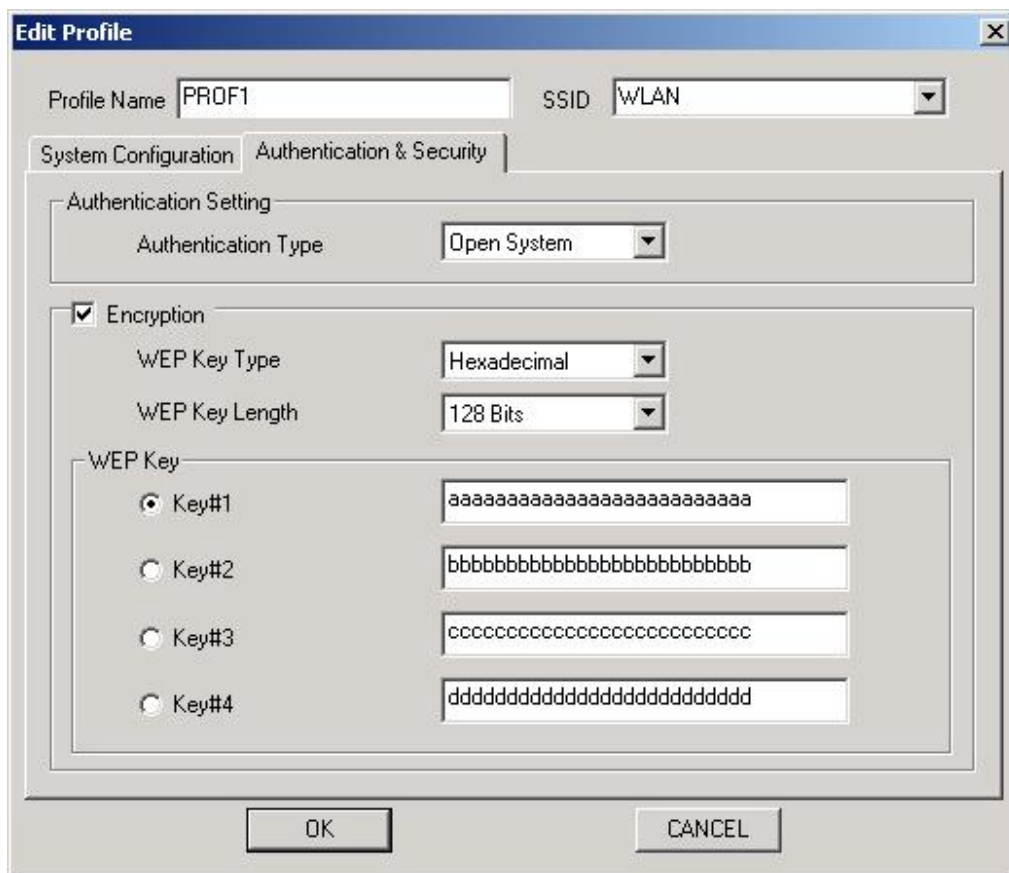
4.1.2 Link State
You can see the below status:
Status, Current Channel, Current TX Rate, througput(Kbit/sec), Link Quality, Signal Strength,.
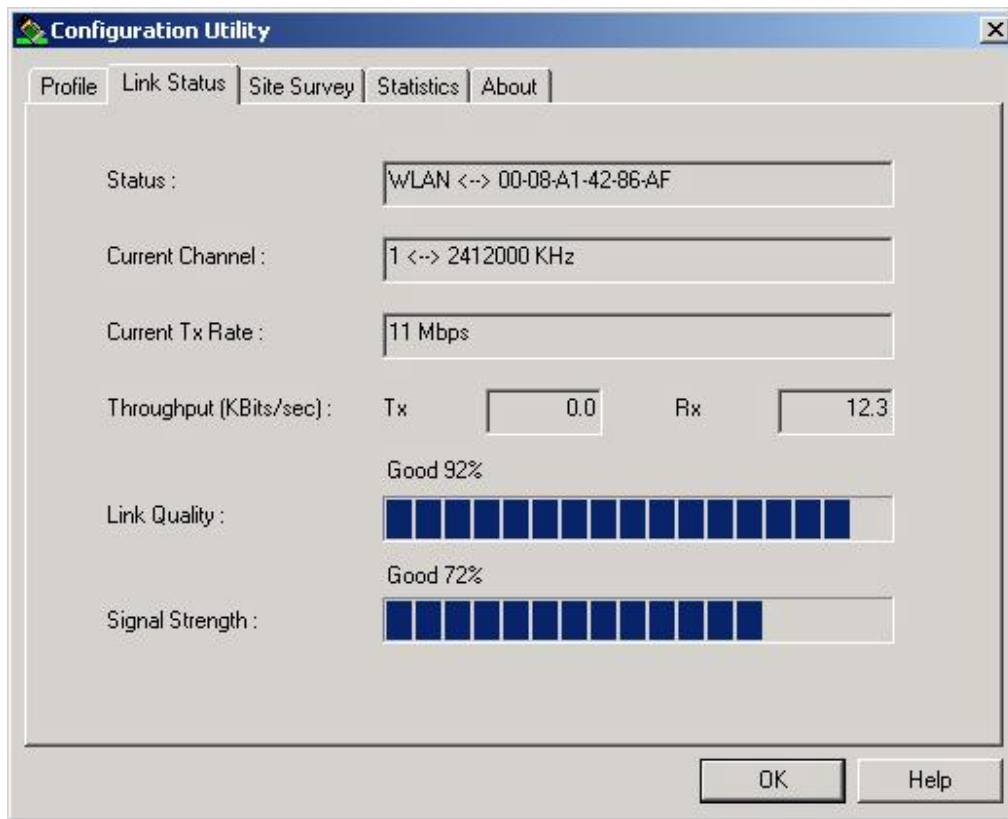
4.1.3 Site Survey:

When you select AP Client, you can find that the Site Survey and Link Quality are enabled. Click the Site Survey, and then you can choose which AP you want to click and click Close button to close the screen. The AP's MAC address will be displayed at the Preferred BSSID field. You can click the Link Quality also to see the link quality of AP you select.

4.1.4   Statistics

You can see the information of transmit statistics and receive statistics in this screen :
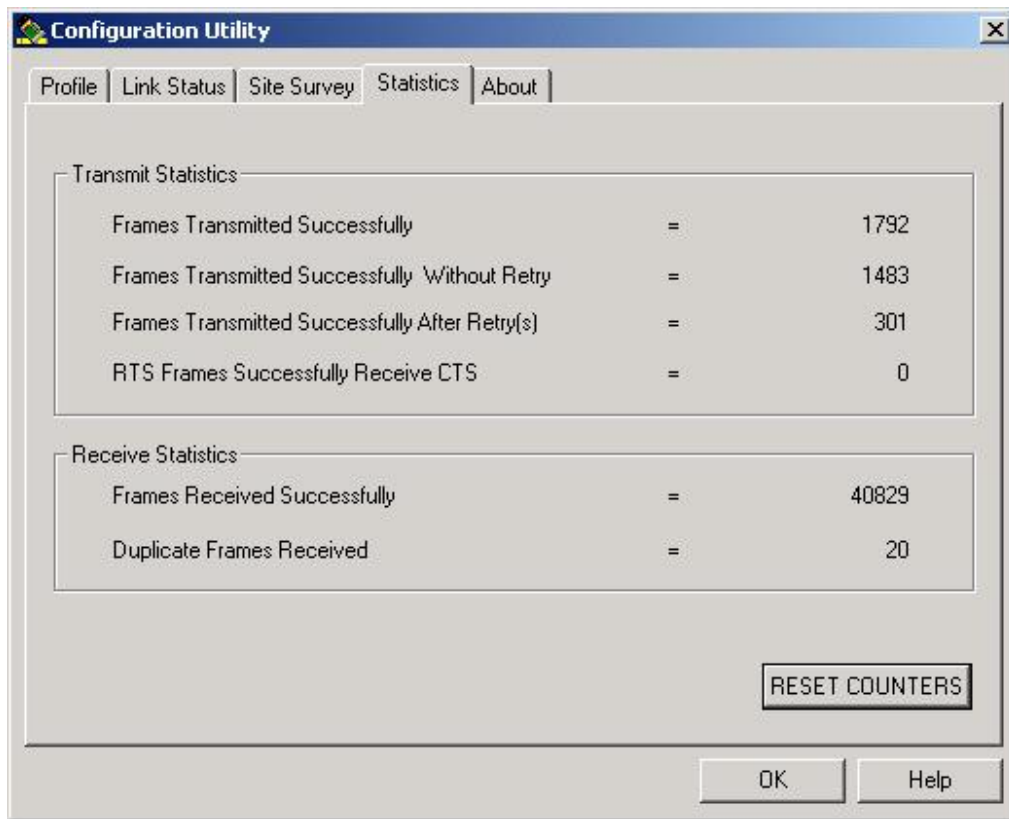
4.1.5 About

You can see the driver & utility information as below, including owner, version and phy_address.
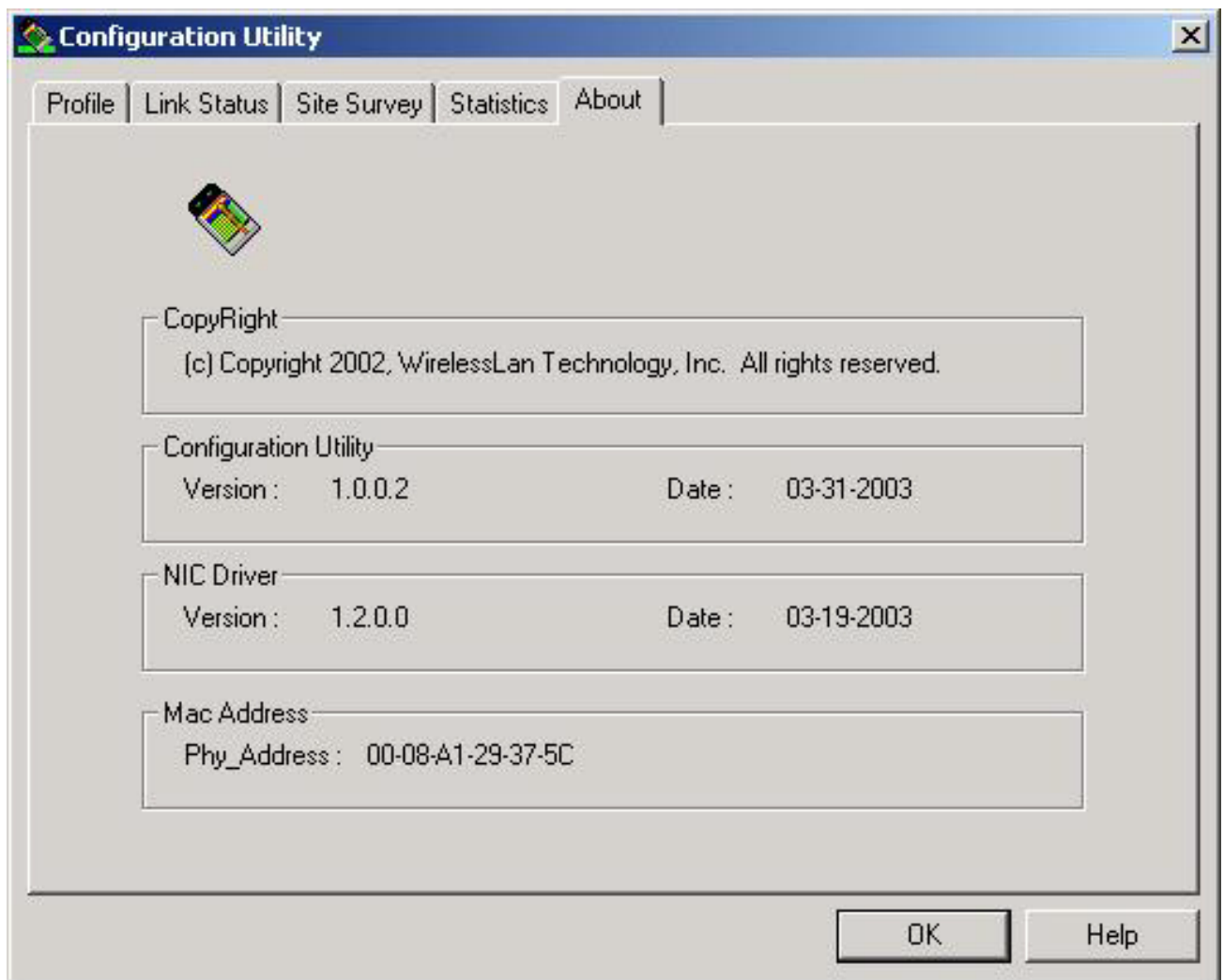
5   Glossary

Access Point - An internetworking device that seamlessly connects wired and wireless networks together.

Ad-Hoc - An Ad-Hoc wireless LAN is a group of computers each with wireless adapters, connected as an independent wireless LAN.

Bit - A binary digit. The value - 0 or 1 used in the binary numbering system. Also, the smallest form of data.

Backbone - The core infrastructure of a network, the portion of the network that transports information from one central location to another central location. The information in then off-loaded onto a local system.

BSS - Stands for Basic Service Set. An Access Point associated with several stations.

Domain - A subnetwork comprised of a group of clients and servers under the control of one security database. Dividing LANs into domains improves performance and security.

DSSS - Direct Sequence Spread Spectrum is very widely known and the most used of the spread spectrum types, owing most of its popularity to its ease of implementation and high data rates.

Encryption - A security method that applies a specific algorithm to data in order to alter the data's appearance and prevent other devices from reading the information

ESS - Stands for Extended Service Set. More than one BSS can be configured as an Extended Service Set. An ESS is basically a roaming domain.

Ethernet - A popular local area data communications network, originally developed by Xerox Corp., which accepts transmission from computers and terminals.
Ethernet operates on 10 Mbps baseband transmission over shielded coaxial cable or over shielded twisted pair telephone wire.

Fragmentation - Breaking a packet into smaller units when transmitting over a network medium that cannot support the original size of the packet.

Infrastructure - An integrated wireless and wired LAN is called an infrastructure configuration.

IRQ - Interrupt ReQuest, A hardware interrupt on a PC. There are 16 IRQ lines used to signal the CPU that peripheral event has started or terminated. In most cases, two devices cannot use the same line.

Roaming - A function that allow one to travel with a mobile end system (wireless LAN mobile station, for example) through the territory of domain (an ESS, for example) while continuously connecting to the infrastructure.

RTS - Request to Send, An RS-232 signal sent from the transmitting station to the receiving station requesting permission to transmit.

Throughput - The amount of data moved successfully from one place to another in a given time period.

Tx Rate - Transmission Rate.

WEP - Wired Equivalent Privacy, A data privacy mechanism based on a 64-bit or 128-bit shared key algorithm, as described in IEEE 802.11 standard.

6   Specifications

Model	11Mbps Wireless LAN PCI Adapter
Radio	Complies with IEEE 802.11b
Frequency Band	2400 ~ 2483.5MHz (for US, Canada, and ETSI) 2400 ~ 2497MHz (for Japan)
Modulation TYPE	CCK, BPSK, QPSK
Operating Channels	IEEE 802.11b compliant 11 channels (US, Canada) 13 channels (ETSI) 14 channels (Japan)
Radio Technology	Direct Sequence Spread Spectrum
Data Rate	1 / 2 / 5.5 / 11 Mbps
Output Power	> +15dBm, 10mW/MHz for Japan
Receive sensitivity	Min. -80dBm for 11Mbps (@BER $10E^{-5}$) Min. -82dBm for 5.5/2/1 Mbps (@BER $10E^{-5}$)
Antenna Type	Detachable and reversible dipole antenna
Current Consumption	Universal Bus, Tx mode 350 mA (Max.) Rx mode 150 mA (Max.)
Certification	Radio: EU: ETS 300 328; USA: FCC Part 15C Taiwan: DGT EMC: EU ETS 301 489; USA: FCC Part 15B Safety: EN60950
Driver	Windows 98SE/ME/2000/XP

FCC WARNING

This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules, which are designed to provide reasonable protection against electromagnetic interference in a commercial environment.

Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CE MARK WARNING

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