TRENDNET

User's Guide

TEW-423PI

Regulatory notes and statements

Wireless LAN, Health and Authorization for use

Radio frequency electromagnetic energy is emitted from Wireless LAN devices. The energy levels of these emissions however are far much less than the electromagnetic energy emissions from wireless devices like for example mobile phones. Wireless LAN devices are safe for use frequency safety standards and recommendations. The use of Wireless LAN devices may be restricted in some situations or environments for example:

·On board of airplanes, or

·In an explosive environment, or

·In case the interference risk to other devices or services is perceived or identified as harmful

In case the policy regarding the use of Wireless LAN devices in specific organizations or environments (e.g. airports, hospitals, chemical/oil/gas industrial plants, private buildings etc.) is not clear, please ask for authorization to use these devices prior to operating the equipment.

Regulatory Information/disclaimers

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The Manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, of the substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

USA-FCC (Federal Communications Commission) statement

This device complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:

1. This device may not cause interference, and

2. This device must accept any interference, including interference that may cause undesired operation of this device.

FCC Radio Frequency Exposure statement

This Wireless LAN radio device has been evaluated under FCC Bulletin OET 65 and found compliant to the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices.

The radiated output power of this Wireless LAN device is far below the FCC radio frequency exposure limits. Nevertheless, this device shall be used in such a manner that the potential for human contact during normal operation is minimized.

When nearby persons has to be kept to ensure RF exposure compliance, in order to comply with RF exposure limits established in the ANSI C95.1 standards, the distance between the antennas and the user should not be less than 20 cm.

FCC Interference Statement

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. If not installed and used in accordance with the instructions, it 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:

1. Reorient or relocate the receiving antenna.

2. Increase the distance between the equipment and the receiver.

3. Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

4. Consult the dealer or an experienced radio/TV technician for help.

Export restrictions

This product or software contains encryption code that may not be exported or transferred from the US of Canada without an approved US Department of Commerce export license.

Safety Information

Your device contains a low power transmitter. When device is transmitted it sends out radio frequency (RF) signal.

CAUTION: To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use on the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

Protection requirements for health and safety – Article 3.1a

Testing for electric safety according to EN 60950 has been conducted. These are considered relevant and sufficient.

Protection requirements for electromagnetic compatibility – Article 3.1b

Testing for electromagnetic compatibility according to EN 301 489-1, EN 301 489-17 and EN 55024 has been conducted. These are considered relevant and sufficient.

Effective use of the radio spectrum – Article 3.2

Testing for radio test suites according to EN 300 328-2 has been conducted. These are considered relevant and sufficient.

CE in which Countries where the product may be used freely:

Germany, UK, Italy, Spain, Belgium, Netherlands, Portugal, Greece, Ireland, Denmark, Luxembourg, Austria, Finland, Sweden, Norway and Iceland.

France: except the channel 10 through 13, law prohibits the use of other channels.

TABLE OF CONTENT

INTRODUCTION

Congratulations on your purchase of this IEEE 802.11g Wireless PCI Adapter.

This manual helps to get familiar with the Wireless PCI Adapter. This manual contains detailed instructions in operation of this product. Please keep this manual for future reference.

With a Wireless (IEEE 802.11g) PCI Adapter, a computer or a station can communicate with another computer in a wireless way. Easy-to-use utilities are bundled with Wireless PCI Adapter for configuration, monitoring, and diagnosis purposes.

Wireless PCI Adapter can wirelessly transmit and receive data, minimizing the need for wired connections, at a speed of up to fifty-four megabit per second. With Wireless PCI Adapter, you can locate your PC or station wherever you want without wires and cables.

Wireless PCI Adapter provides users with an access to real-time information anywhere in their organization. The mobility provides productivity and service, which are not available under wired networks. The Wireless PCI Adapter configuration is easy to change from peer-to-peer networks, suitable for a small number of users, to full infrastructure networks of thousands of users that allow roaming around a broad area.

Overview of this User's Guide

Introduction. Describes the IEEE 802.11g Wireless PCI Adapter and its features.

Unpacking and Setup. Helps you get started with the basic installation of the IEEE 802.11g Wireless PCI Adapter.

Identifying External Components. Describes the LED indicators on the Adapter.

Software Installation. Describes how to setup the driver and the utility setting.

Technical Specifications. Lists the technical (general, physical and environmental) specifications of the IEEE 802.11g Wireless PCI Adapter.

UNPACKING AND SETUP

This chapter provides unpacking and setup information for the IEEE 802.11g Wireless PCI Adapter.

Unpacking

Open the box of the IEEE 802.11g Wireless PCI Adapter and carefully unpack it. The box should contain the following items:

- One IEEE 802.11g Wireless PCI Adapter
- One Driver & Utility CD-ROM
- Quick Installation Guide
- One 2dbi Antenna

If any item is found missing or damaged, please contact your local reseller for replacement.

Setup

The setup of the IEEE 802.11g Wireless PCI Adapter can be performed using the following steps:

- Visually inspect the PCI Adapter and make sure that it is fully plugged in to the PCI slot.
- Make sure that there is a well environment that there is no much intrusion to have a better connection.

IDENTIFYING EXTERNAL COMPONENTS

LED Indicator

LNK (LINK)

The LNK indicator will blinks green when the Wireless PCI Adapter is connecting to the wireless network. It will light green when the Wireless PCI Adapter is connected to the networking, otherwise, it is off.

ACT (Activity)

The ACT indicator blinks green when the Wireless PCI Adapter is connected to a network successfully and transmitting data. Otherwise the LNK indicator is off whiles the Wireless LAN is stand by.

SOFTWARE INSTALLATION

This section describes how to install the driver and utility for the IEEE 802.11g Wireless PCI Adapter.

Windows 98SE/ME/2000/XP Installation

1) Insert the Utility and Driver CD-ROM into your computer's CD-ROM Drive and then click **Install Utility**.
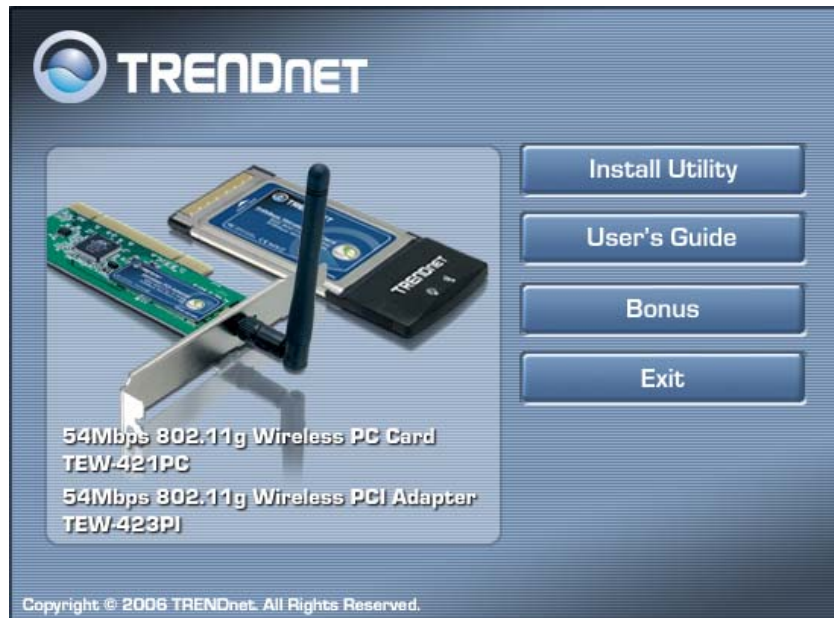
2) Follow the InstallShield Wizard Instructions

3) Click **Finish**.
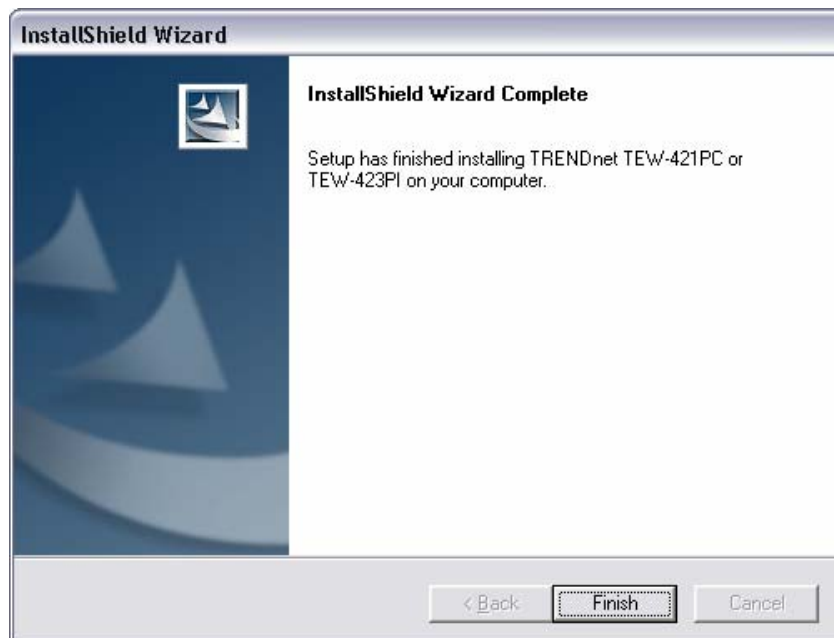
4) Select the appropriate country domain and then click ok.
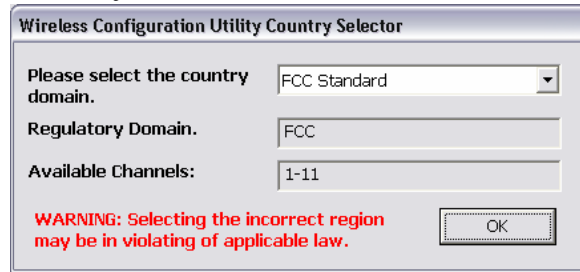
Warning: *Selecting the incorrect country domain may result in a violation of applicable law.*
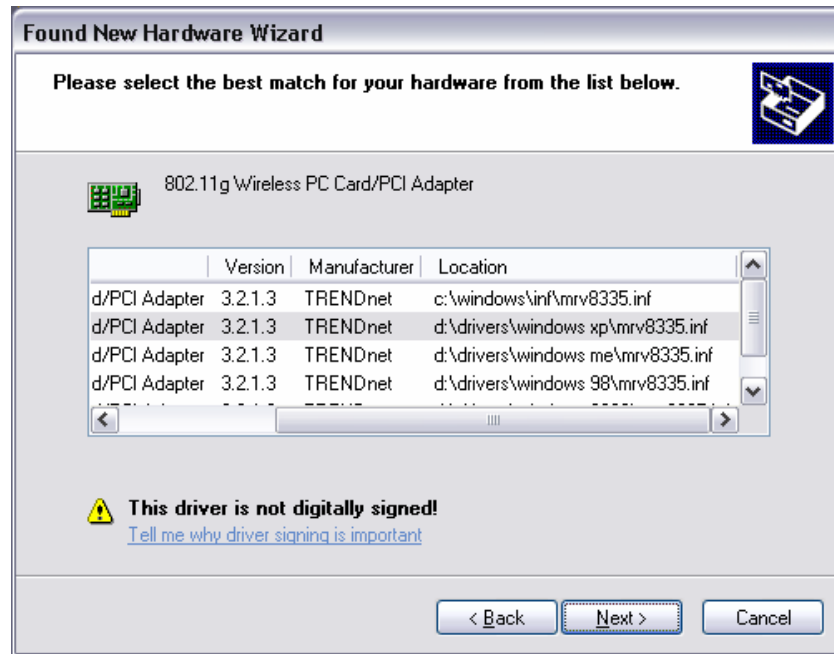
5) Shutdown your computer.

6) Insert PCI Card firmly into an available PCI slot of PC, attach the antenna and then turn ON the computer and wait until the Windows desktop appears.

   <u>Windows XP</u>

7) Click **Install the software automatically (Recommended)**, and then click **Next**.
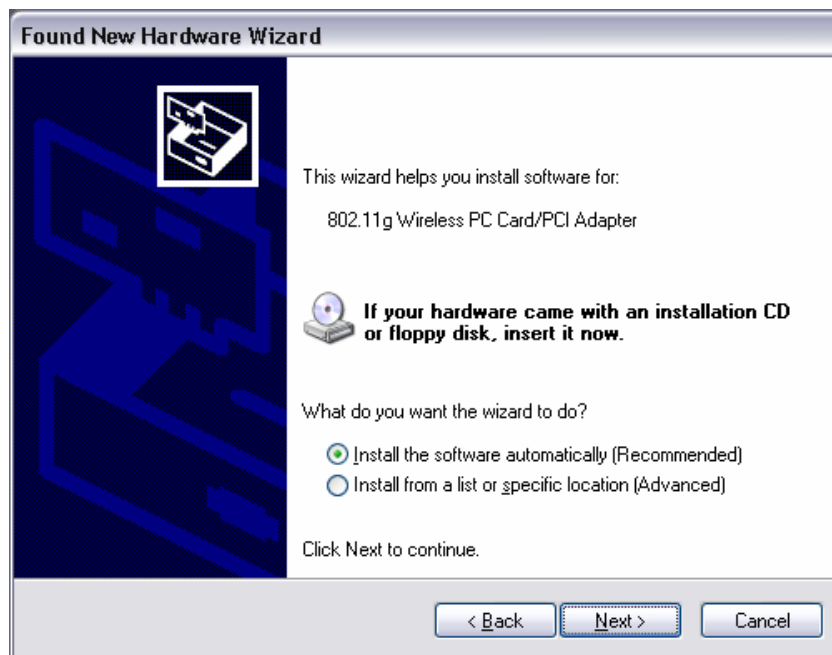
8) Select the Windows XP drivers and then click **Next**.

9) Click **Finish**.
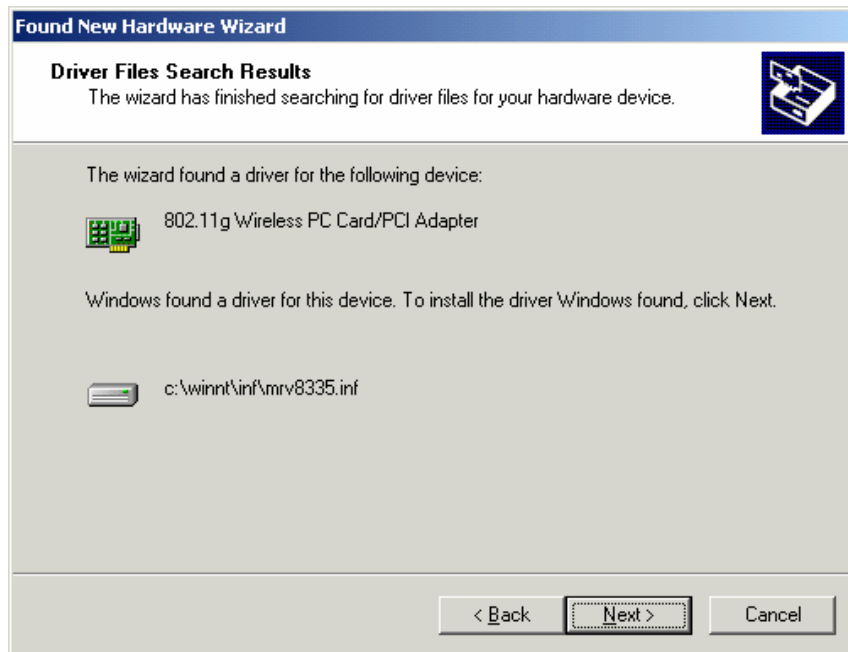
Windows 2000

10) Click **Next**.

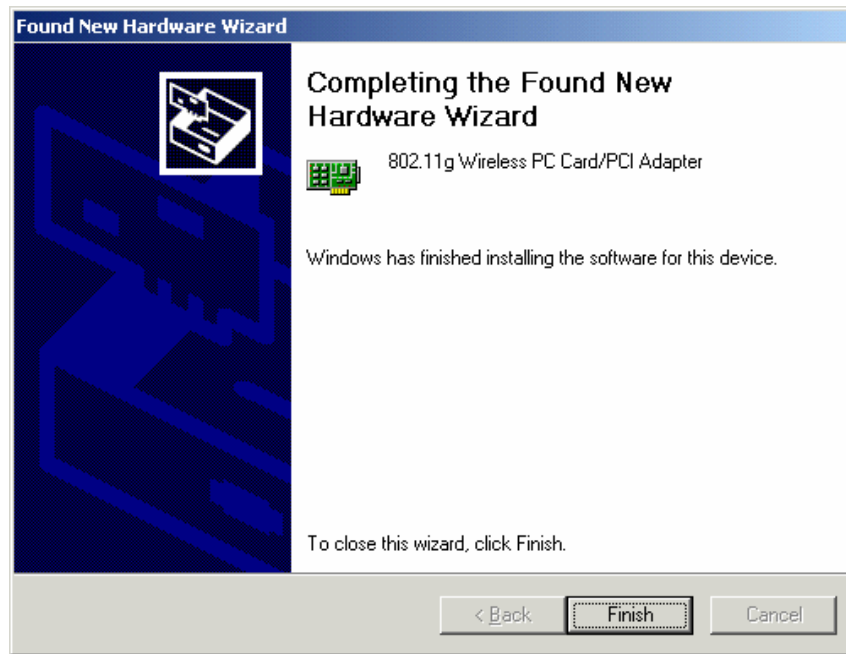11) Select **Search for a suitable driver for my device (recommended)** and then click **Next**.

12) Click **Next**.

13) Click **Next**.
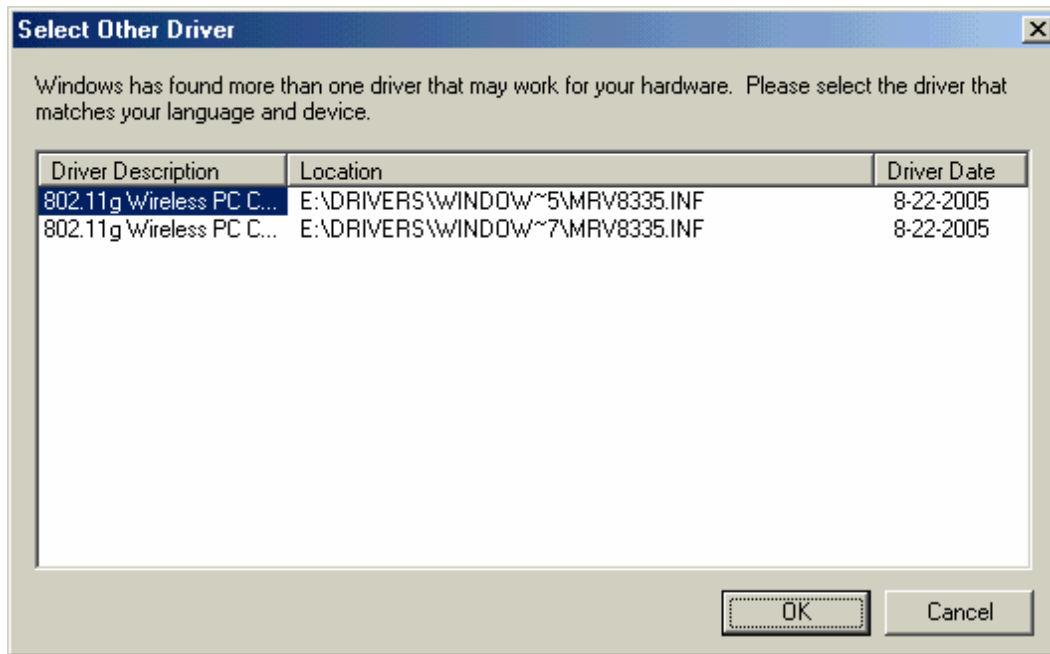
14) Click **Finish**.

Windows ME

15) Select **Automatic search for a better driver (Recommended)** and then click **Next**.
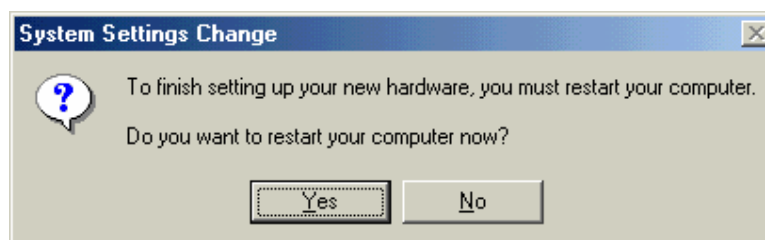
16) Click **OK**.

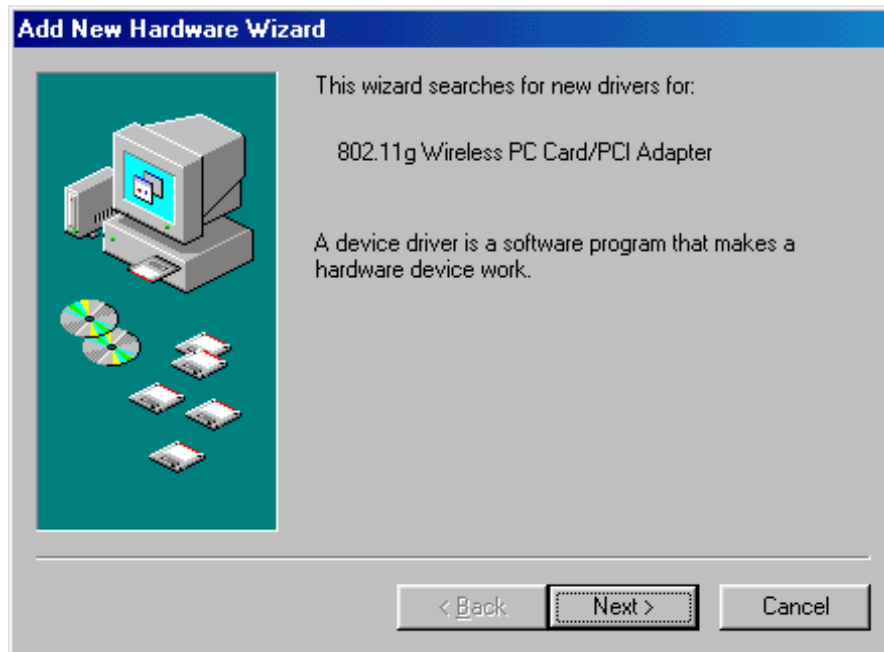17) Click **Finish**.

18) Click **Yes**.

<u>Windows 98SE</u>

a) Click **Next**

19) Select **Search for the best driver for your device(Recommended)** and then click next.
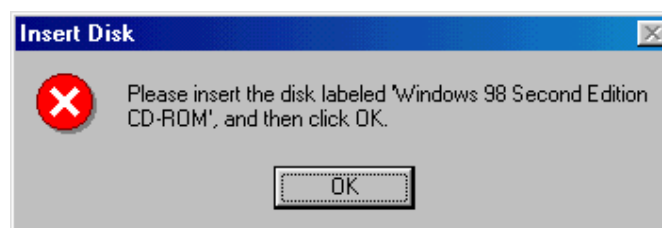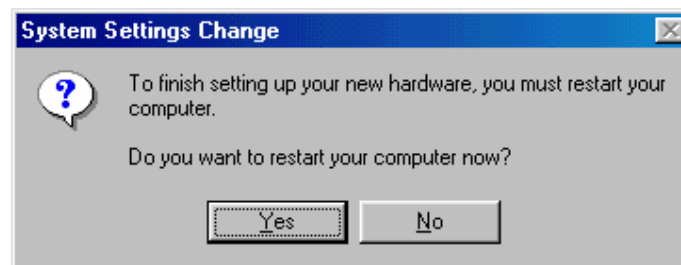
20) Click **Next**.

21) Click **Next**.

22) Put in your Windows 98SE CD-ROM drive into your CD-ROM drive, and then click **OK**.
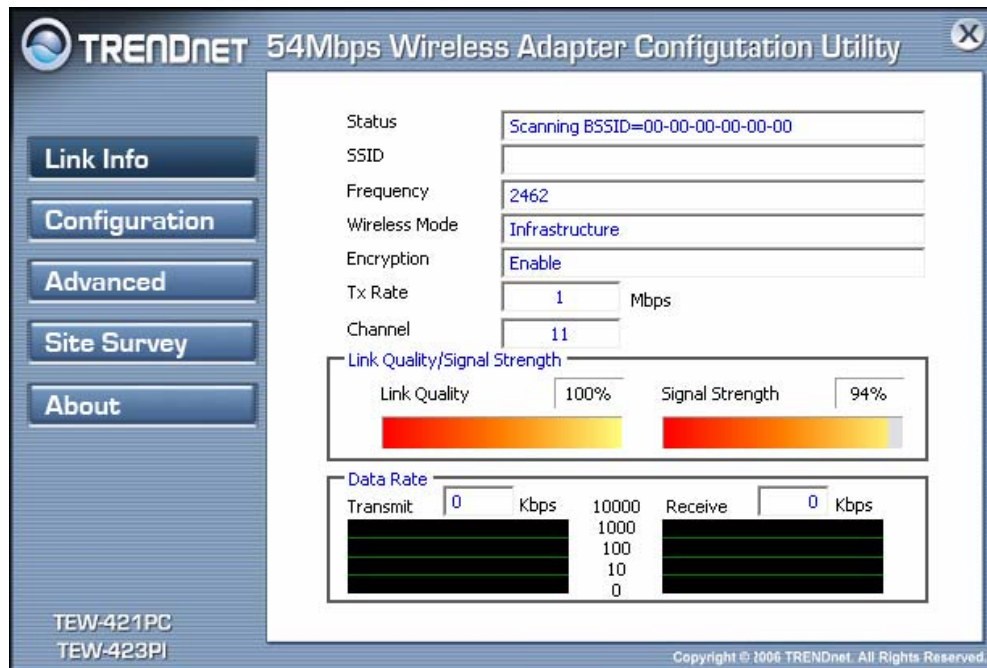
23) Click **Finish**.

24) Click **Yes**.

Wireless Utility Setting

I. Link Information

Status: Shows the BSSID associated, which can be used to identify the wireless network.

SSID: Shows current SSID, which must be the same for the wireless client and AP in order for communication to be established.

Frequency: Shows the current frequency used for wireless network.

Wireless Mode: Shows the current wireless mode used for wireless communication.

Encryption: Shows the current encryption mode used for wireless network.

TxRate: Shows the current data rate used for transmitting.

Channel: Shows the current channel for communication.

Link Quality: Shows the link quality of the 54Mbps wireless LAN PCI card with the Access Point when operating under Infrastructure mode.

Signal Strength: Shows the wireless signal strength of the connection between the 54Mbps wireless LAN PCI card with the Access Point.

Data Rate: Shows the statistics of data transfer, and the calculation is based on the number of packets transmitted and received.

II. Configuration

This is the page where changes the basic settings of the PCI card with the minimum amount of effort to implement a secure wireless network environment.

SSID: Service Set Identifier, which is a unique name shared among all clients and nodes in a wireless network. The SSID must be identical for each clients and nodes in the wireless network.

Wireless Mode: There are two types available for selection
●Infrastructure – to establish wireless communication with LAN and other wireless clients through the use the Access Points.
●Ad-Hoc – to establish point-to-point wireless communication directly with other wireless client devices such as wireless network PCI Adapter.

AdHoc Band: There are two bands available for selection- 11B and 11G

Channel: The value of channel that AP will operate in. User can select the channel range of 1 to 11 for North America (FCC) domain and 1 to 13 for European (ETSI) domain.

Power Mode: There are 3 modes to choose.
●Continuous Access Mode (default) – the PCI card is constantly operating with full power and it consumes the most power.
●Maximum Power Save – the PCI card consumes the least power and only operates when there is wireless network activity.
●Power Save – the PCI card consumes the moderate level of power.
Preamble: Select Long or Short Preamble type. Preamble is a sequence of bits transmitted at 1Mbps that allows the PHY circuitry to reach steady-state

demodulation and synchronization of bit clock and frame start. Two different preambles and headers are defined: the mandatory supported Long Preamble and header, which interoperate with the 1 Mbit/s and 2 Mbit/s DSSS specification (as described in IEEE Std 802.11), and an optional Short Preamble and header (as described in IEEE Std 802.11b). At the receiver, the Preamble and header are processed to aid in demodulation and delivery of the PSDU. The Short Preamble and header may be used to minimize overhead and, thus, maximize the network data throughput. However, the Short Preamble is supported only from the IEEE 802.11b (High- Rate) standard and not from the original IEEE 802.11. That means that stations using Short-Preamble cannot communicate with stations implementing the original version of the protocol. Click "Apply" for the changes to take effect.

Support Band: There are three functions for users select, including 11B, 11G and Extended Range. The default setting is 11B, 11G and Extended Range enable, which is interoperable with both 11B and 11G devices, and provide more than 500m connection ability.

Note: user must select at least one support band option, otherwise the wireless connection will not function.

III. Advanced
This is the page to configure Security settings of 54Mbps wireless LAN PCI card.

Encryption: 4 options are available: **Shared Key, Auto**, **WPA/WPA2** and **WPA-PSK/WPA2-PSK**. Select **Shared Key** or **Auto** for WEP data encryption feature.
Shared Key – the sender and receiver shares the common key for data communication, and the key is used for extended length of time.

Auto – depend on the communication to establish, and automatically use the proper authentication mode.

The following will only be activated to allow for configuration when **Encryption** is enabled.
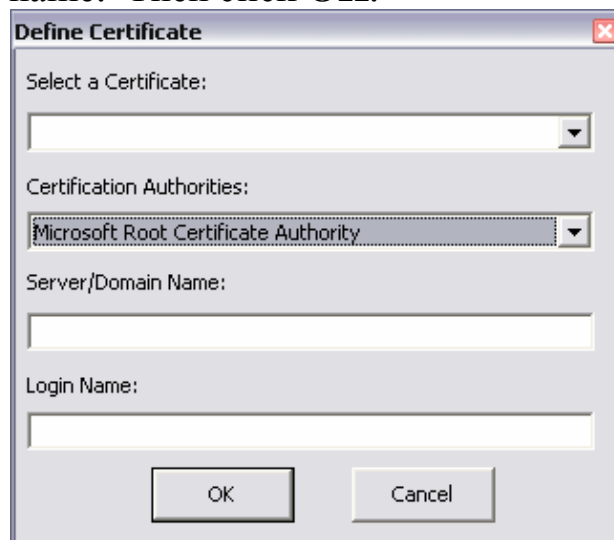
Network Key: enter the password in the blank space.
Key Length: select 64- or 128-bits as the length of the key.
Default Key: select one of the 4 keys to use.
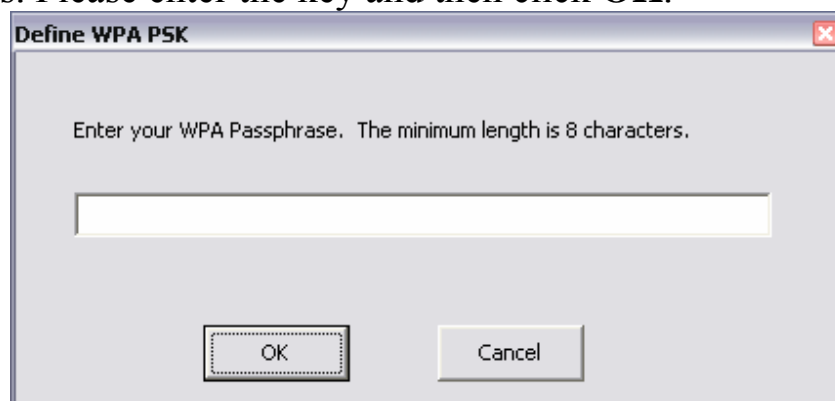**Key Format:** ASCII or HEX.

If **WPA/WPA2** is selected, configuration is enabled. Click "**configuration**". The below window appears. Select the certificate that the user wants to use and enter the server name and login name. Then click **OK**.

If **WPA-PSK/WPA2-PSK** is selected, click the configuration button. The below window appears. Please enter the key and then click **OK**.

IV. Site Survey
This page allows user to enable the Site Survey function to scan for the available wireless network (wireless clients and Access Points) and establish wireless communications with one.

Available Network – displays the wireless networks (wireless clients and Access Points) that are in signal range.
Select any one of them to establish communications by simply mouse **double-click** or click on the "**Connect**" button.
Click "**Refresh**" button to start scanning for available network again.
Profile – User can create and manage the created profiles for Home, offices or public areas. By double-clicking on one of the created profile, the setting will adapt to the configuration such as SSID, channel, and WEP settings saved by that particular profile.
Remove: To remove the selected the profile
Properties: To view and change its settings of the profile.

Add: To add a profile. Then, the following screen would appear. User can enter the necessary information required for accessing Access Points or Wireless Router.

V. About

This page displays some information about the 54Mpbs wireless LAN PCI card utility, which includes the version numbers for Driver, Firmware and Utility. When there is new version of software available for upgrade, users will be able to identify by version numbers.

APPENDIX A

This appendix lists the IEEE 802.11g channels supported by the world's regulatory domains.

Regulatory Domains

Channel Identifier	802.11b Frequency	Regulatory Domains				
		FCC (North America)	ETSI (Europe)	France	Israel	MKK (Japan)
1	2412	X	X			X
2	2417	X	X			X
3	2422	X	X		X	X
4	2427	X	X		X	X
5	2432	X	X		X	X
6	2437	X	X		X	X
7	2442	X	X		X	X
8	2447	X	X		X	X
9	2452	X	X		X	X
10	2457	X	X	X		X
11	2462	X	X	X		X
12	2467		X	X		X
13	2472		X	X		X
14	2484					X

Some European countries may have their own domain; users are responsible for ensuring that the channel set configuration is in compliance with the regulatory standards of these countries.

TECHNICAL SPECIFICATIONS

General	
Radio Technology	IEEE 802.11b Direct Sequence Spread Spectrum (DSSS) IEEE 802.11g Orthogonal Frequency Division Multiplexing (OFDM)
Interface	32-bit PCI 2.1, 2.2. Bus Master
Data Transfer Rate	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54Mbps (auto sense)
Receiver Sensitivity	54Mbps: Typical -73dBm @ 10% PER (Packet Error Rate) 11Mbps: Typical -85dBm @ 8% PER (Packet Error Rate)
Transmit Rate	802.11g: 12dBm typically 802.11b: 15dBm typically
Frequency Range	2412 ~ 2484 MHz ISM band
Modulation Schemes	DBPSK/DQPSK/CCK/OFDM
Channels	1~13 Channels (Universal Domain Support)
Media Access Protocol	CSMA/CA with ACK
Security	64/128-bit WEP Encryption, WPA, WPA2
Diagnostic LED	LNK (Link status)
Antenna	2 dBi Dipole Antenna
Physical and Environmental	
Driver Support	Windows 98SE/ME/2000/XP
Continuous Current Consumption	240mA typ. for receive mode 530mA typ. for transmit mode
Temperature	Operating: 0° ~ 40° C, Storage: -10° ~ 70° C
Humidity	10% ~ 95% RH, no condensation
Dimensions	133 x 121 x 21.6 mm (without antenna)
Certifications	FCC Part 15.247 for US, ETS 300 328 for Europe,

Limited Warranty

TRENDnet warrants its products against defects in material and workmanship, under normal use and service, for the following lengths of time from the date of purchase.

Wireless	Three years

If a product does not operate as warranted above during the applicable warranty period, TRENDnet shall, at its option and expense, repair the defective product or deliver to customer an equivalent product to replace the defective item. All products that are replaced will become the property of TRENDnet. Replacement products may be new or reconditioned.

TRENDnet shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to TRENDnet pursuant to any warranty.

There are no user serviceable parts inside the product. Do not remove or attempt to service the product through any unauthorized service center. This warranty is voided if (i) the product has been modified or repaired by any unauthorized service center, (ii) the product was subject to accident, abuse, or improper use (iii) the product was subject to conditions more severe than those specified in the manual.

Warranty service may be obtained by contacting TRENDnet office within the applicable warranty period for a Return Material Authorization (RMA) number, accompanied by a copy of the dated proof of the purchase. Products returned to TRENDnet must be pre-authorized by TRENDnet with RMA number marked on the outside of the package, and sent prepaid, insured and packaged appropriately for safe shipment.

WARRANTIES EXCLUSIVE: IF THE TRENDNET PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, THE CUSTOMER'S SOLE REMEDY SHALL BE, AT TRENDNET'S OPTION, REPAIR OR REPLACEMENT. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. TRENDNET NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF TRENDNET'S PRODUCTS.

TRENDNET SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR OR MODIFY, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, OR OTHER HAZARD.

LIMITATION OF LIABILITY: TO THE FULL EXTENT ALLOWED BY LAW TRENDNET ALSO EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATE, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT TRENDNET'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

Governing Law: This Limited Warranty shall be governed by the laws of the state of California.

Note: AC/DC Power Adapter, Cooling Fan, and Power Supply carry 1-Year Warranty

TRENDNet

TRENDnet Technical Support

US • Canada

Toll Free Telephone: 1(866) 845-3673

24/7 Tech Support

Europe (Germany • France • Italy • Spain • Switzerland • UK)

Toll Free Telephone: +00800 60 76 76 67

English/Espanol - 24/7
Francais/Deutsch - 11am-8pm, Monday - Friday MET

Worldwide

Telephone: +(31) (0) 20 504 05 35

English/Espanol - 24/7
Francais/Deutsch - 11am-8pm, Monday - Friday MET

Product Warranty Registration

Please take a moment to register your product online.
Go to TRENDnet's website at http://www.trendnet.com

TRENDNet
3135 Kashiwa Street
Torrance, CA 90505
USA