

**MIMO Wireless LAN Card
User's Manual
(For SOHO Users)**

May, 2006

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 communication. 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
- Consult the dealer or an experienced radio/TV technician for help. the receiver is connected.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. 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.

IMPORTANT NOTE:

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 a minimum distance of about eight inches (20cm) between the radiator and your body.

This transmitter must not be co-located or operated 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.

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Trademarks:

All trade names and trademarks are the properties of their respective companies.

Revision History

Revision

History

V1.0

First release

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1. Install Driver & Utility

Note: If you have installed the Wireless PCI Card driver & utility before, please uninstall the old version first.

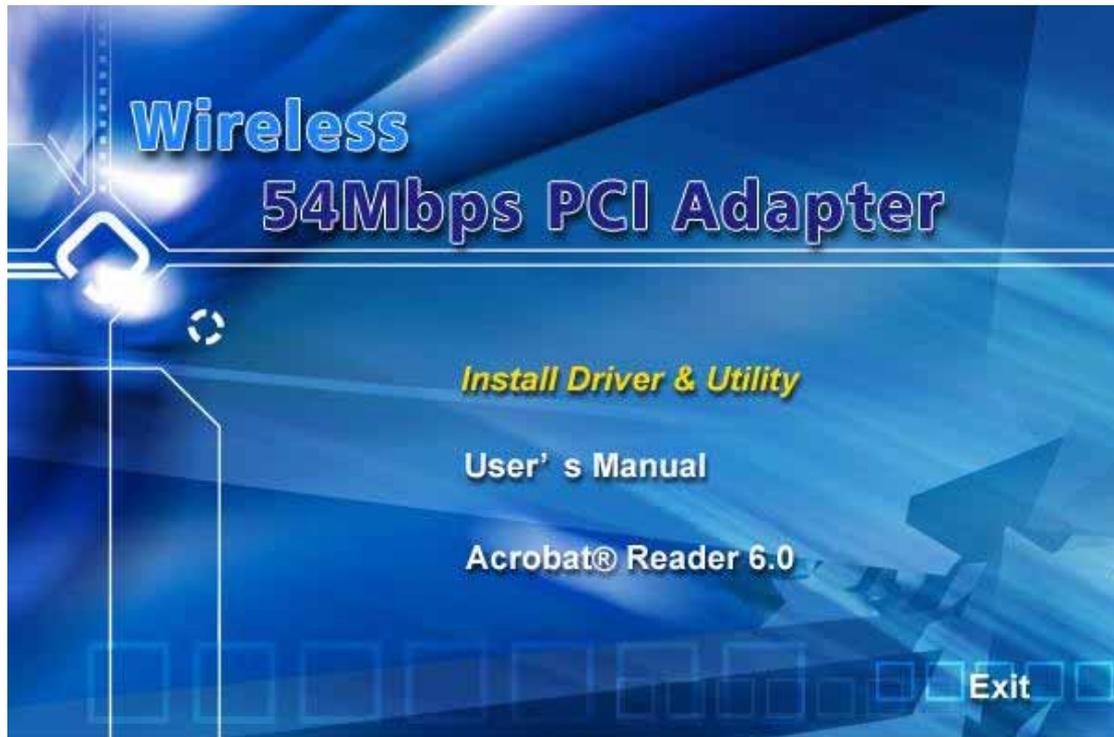
Note: The following installation was operated under Windows XP. (Procedures will be same for Windows 2000 / Windows ME / Windows 98SE)

Step1: Turn off your PC.

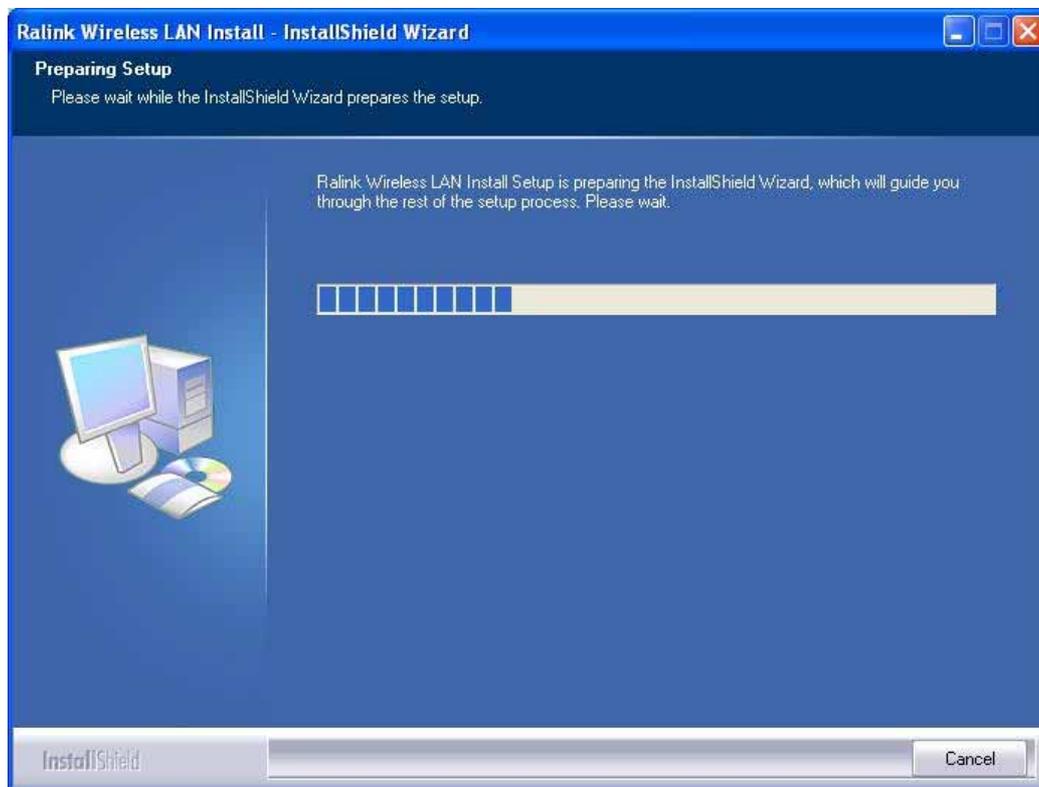
Step2: Insert the Wireless PCI card into the PCI slot of your computer, and turn on your PC again. The system will automatically find the device and search for its driver. Please click **Cancel** to continue.



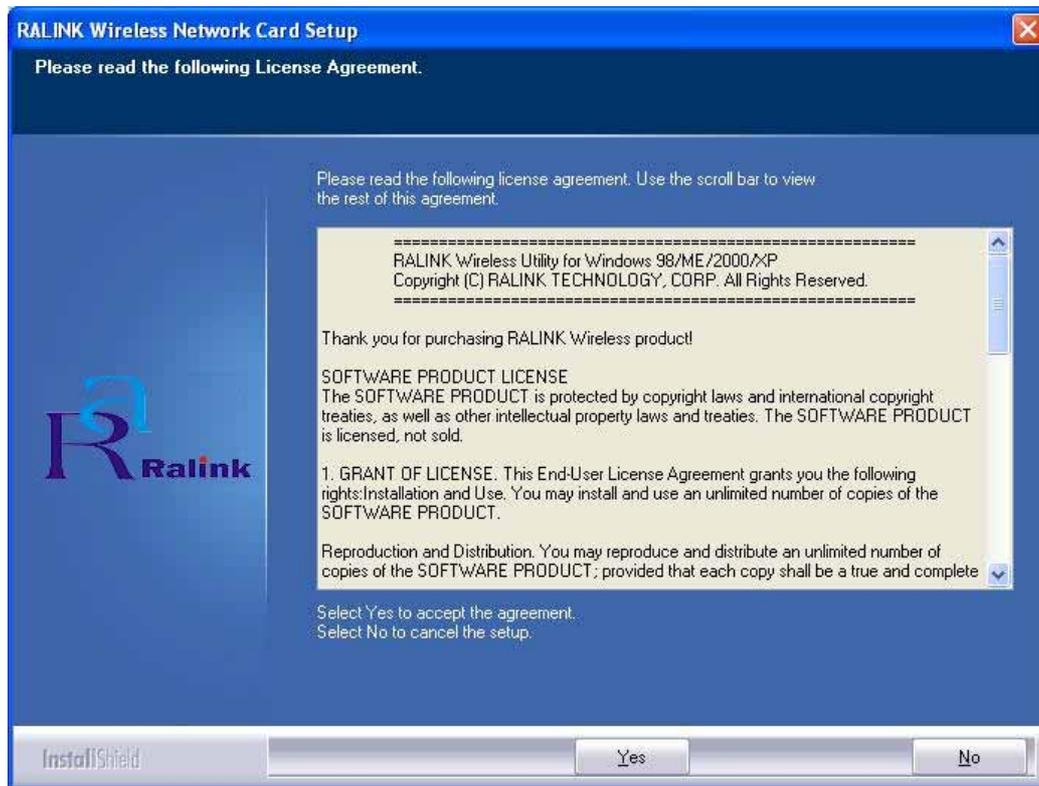
Step3: Insert Wireless PCI LAN Card Installation CD into CD-ROM drive then windows below will appear. Click **Install Driver & Utility** to begin device driver installation.



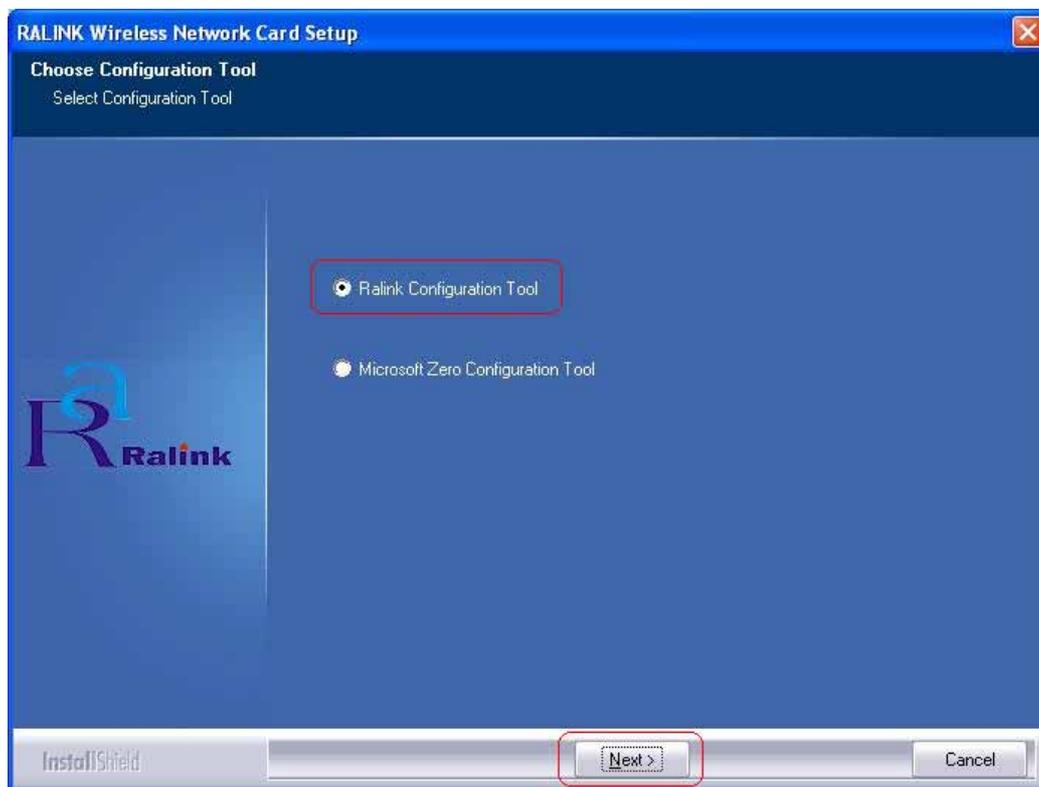
Step4: Please wait for a while during the Setup Wizard is preparing the setup.



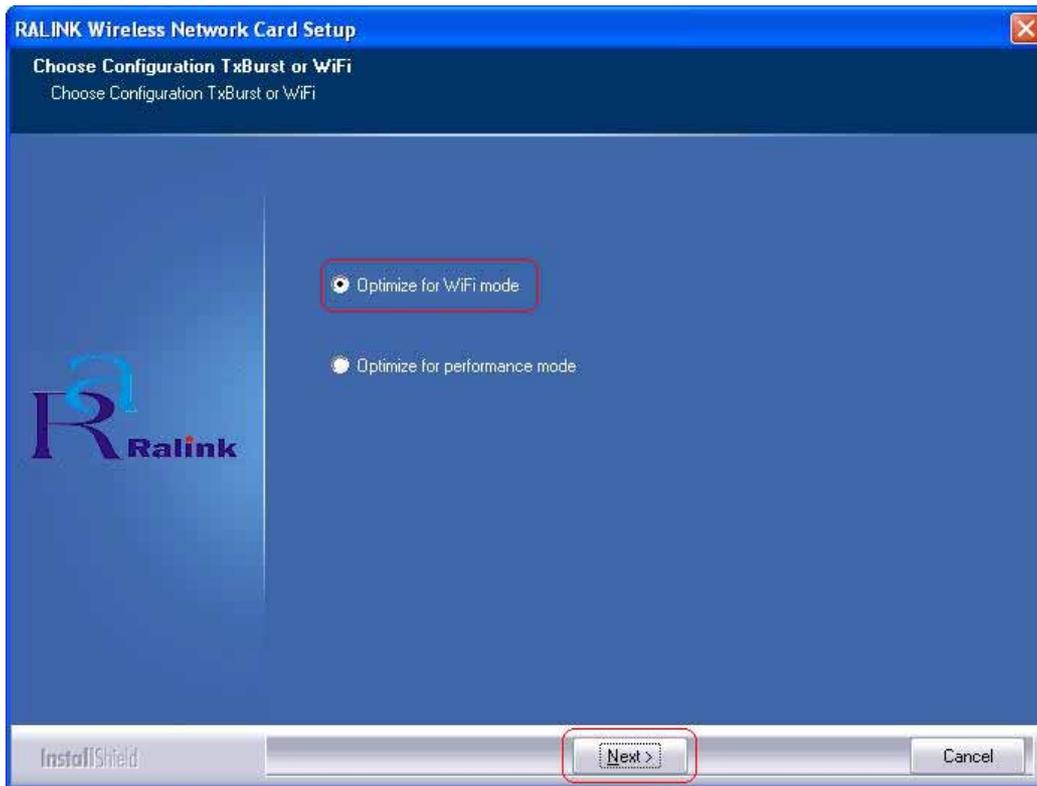
Step5: Please read the following license agreement. Use the scroll bear to view the rest of this agreement. Select **Yes** to accept the agreement.



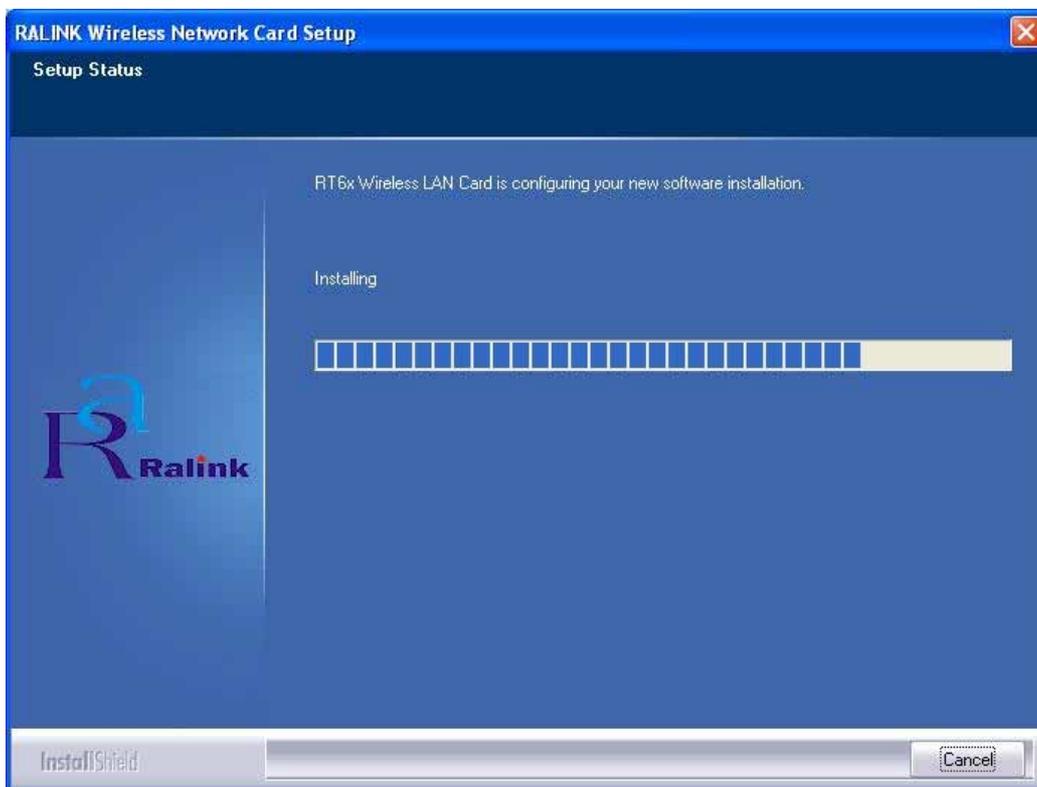
Step6: Choose Configuration Tool, **Ralink Configuration Tool**, and click **Next** to continue.



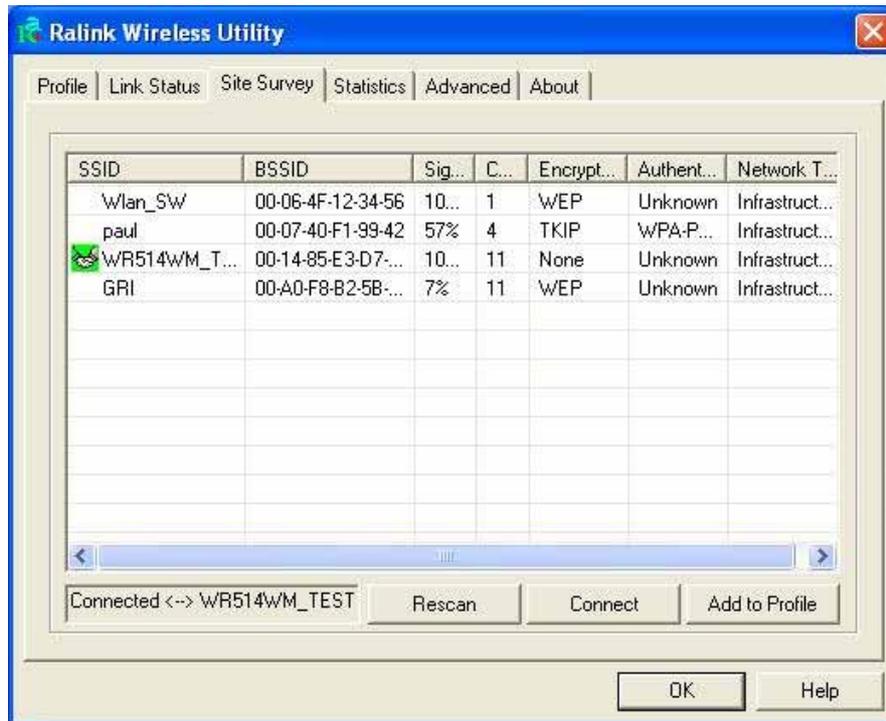
Step7: Choose Optimize Mode Configuration of **TxBurst** or **WiFi** and click **Next**.



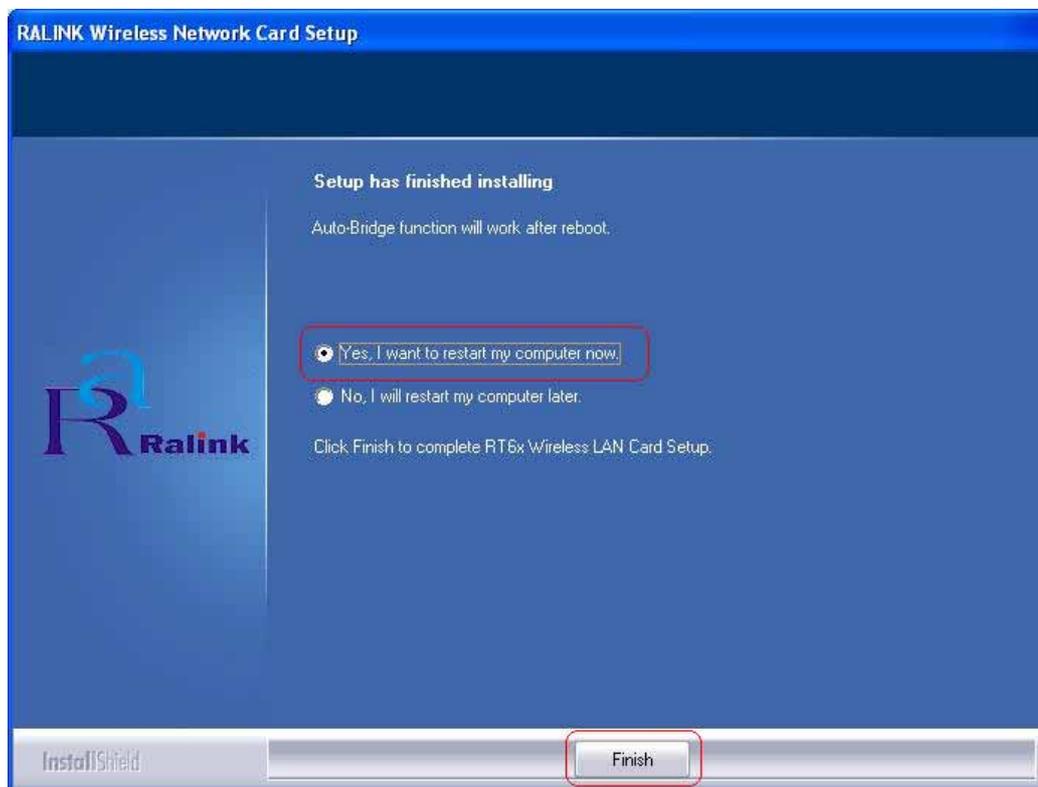
Step8: Please wait for a while during the Wireless LAN Card is configuring your new software installation.



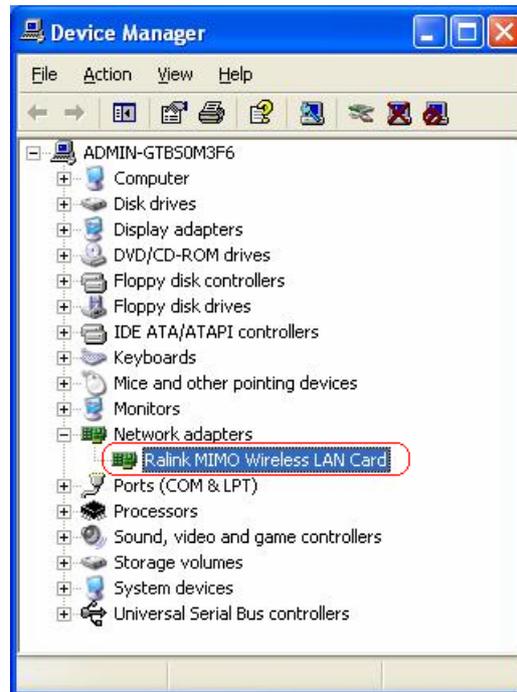
Step9: When Utility setup is completed, the Wireless LAN Card utility's main page will automatically show up on your screen.



Step10: Please restart your computer after the setup has finished installing. Choose **Yes, I want to restart my computer** and click **Finish** button.



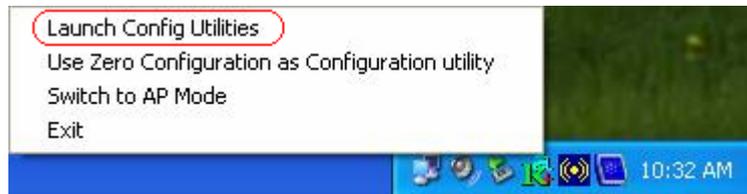
To check if Wireless PCI card is properly installed, you can right-click **My Computer** → choose **Properties** → click **Device Manager**.



To enable the Wireless LAN Card Configuration Utility, you can right-click the icon →

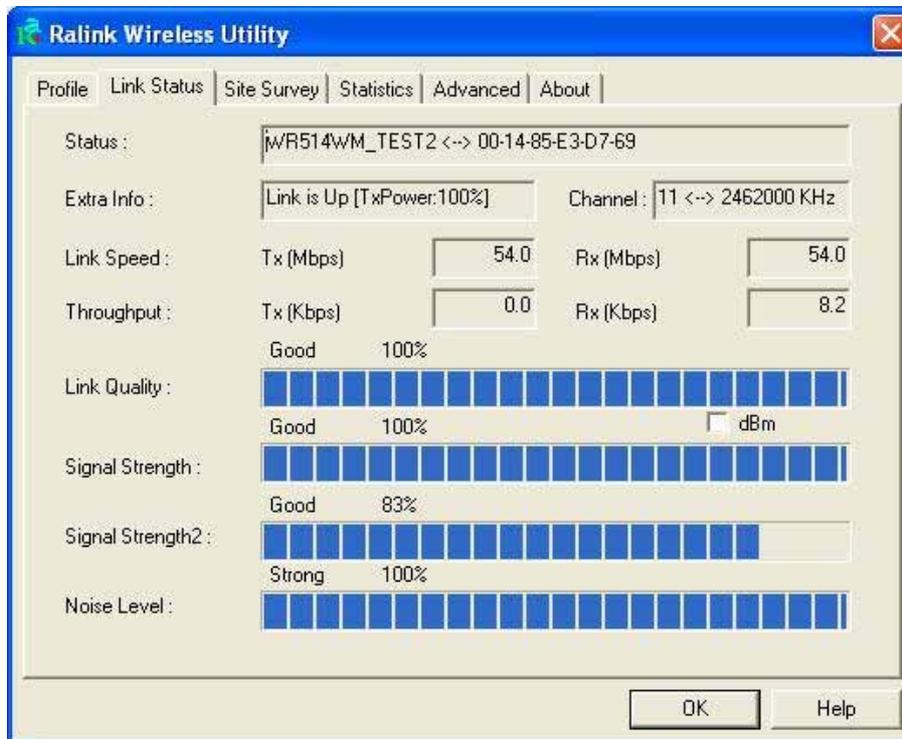


on the desktop system tray and choose "**Launch Config Utilities**" to open the utility.



2.2 Link Status

In this section, you can immediately monitor the current connected link status, such as Link Speed, Throughput, Link Quality, Signal Strength, Noise Level ...etc.

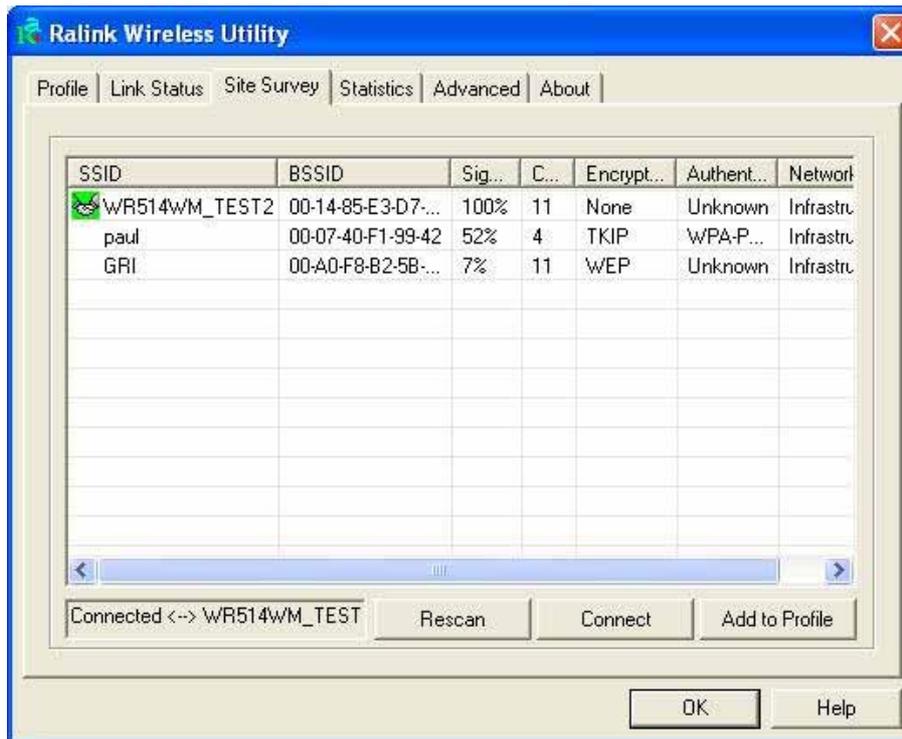


2.3 Site Survey

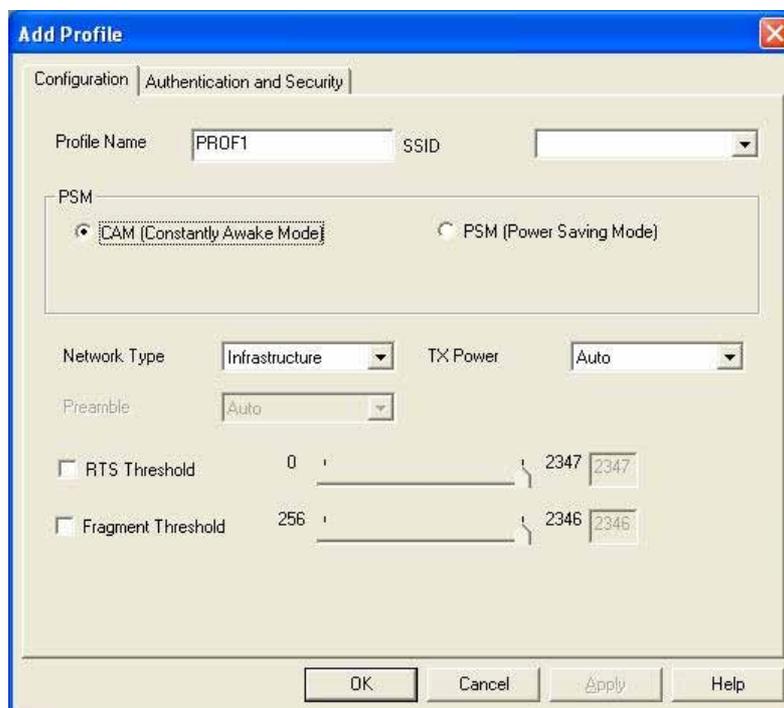
The "Site Survey" shows all Access Points, Routers or Adapters nearby when operating in Ad-Hoc Mode.

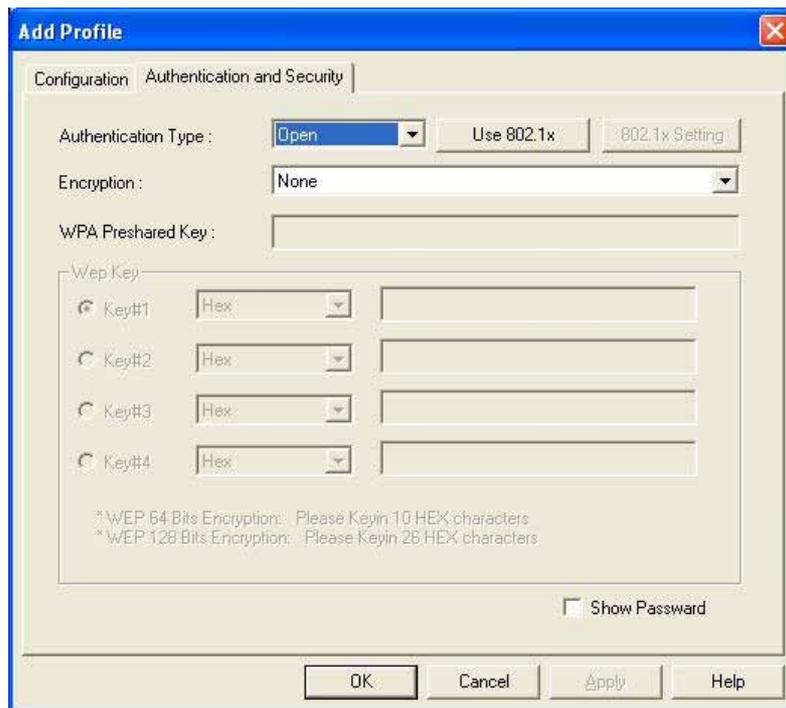
Click "Rescan" button to collect the SSID and Channel information of all the wireless devices nearby. If you want to connect to any device on the list, double-click the item on the list, and the card will automatically connect to the selected device.

When you want to connect different AP, just select the SSID and click "Connect" button, and then you can switch to another one.



If you want to add one Access Point to the profile, click **"Add to Profile"** button. The **Add Profile** windows will display. You can configure your Wireless Network Security for the card.





[Authentication Type]

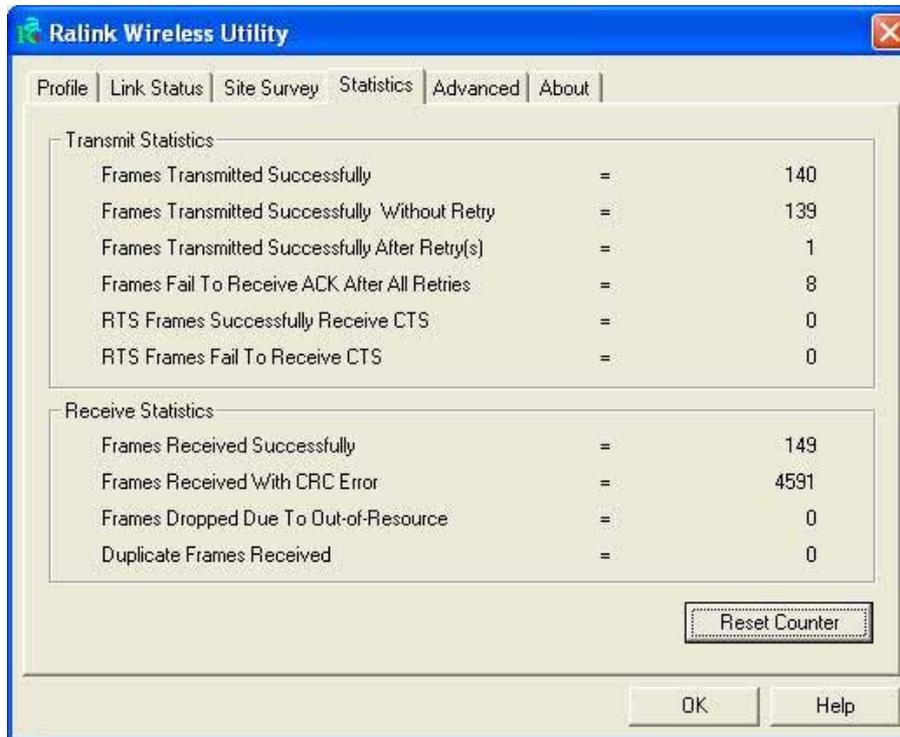
- **Open**: No authentication is needed among the wireless devices.
- **Shared**: Only Wireless device using a shared key (WEP Key identified) is allowed to connecting each other. Setup the same key as the wireless device which the card intends to connect.
- **WPA-PSK**: It is a special modem of WPA for home users without an enterprise authentication server and provides the same strong encryption protection.
- **WPA2-PSK (for WPA2 Personal)**: This option will be present only if the wireless network adapter and its driver support WPA2.
- **WPA 802.1X**: 802.1x authentication is required in WPA. In the 802.11 standard, 802.1x authentication was optional.
- **WPA2 802.1X**: WPA2 is the next-generation Wi-Fi security standard, combining the most powerful authentication and encryption techniques to protect wireless networks from unauthorized use. Based upon the recently-ratified IEEE 802.11i standard, WPA2 adds the Advanced Encryption Standard (AES) to the original WPA specification to provide the greatest levels of network security available. The National Institute of Standards and Technology (NIST) advocates the use of AES security to protect sensitive digital information on government networks.

[Encryption]

- **None**: Disable the WEP Data Encryption.
- **WEP**: Enabled the WEP Data Encryption. When the item is selected, you have to continue setting the WEP Key Length & the key Index.

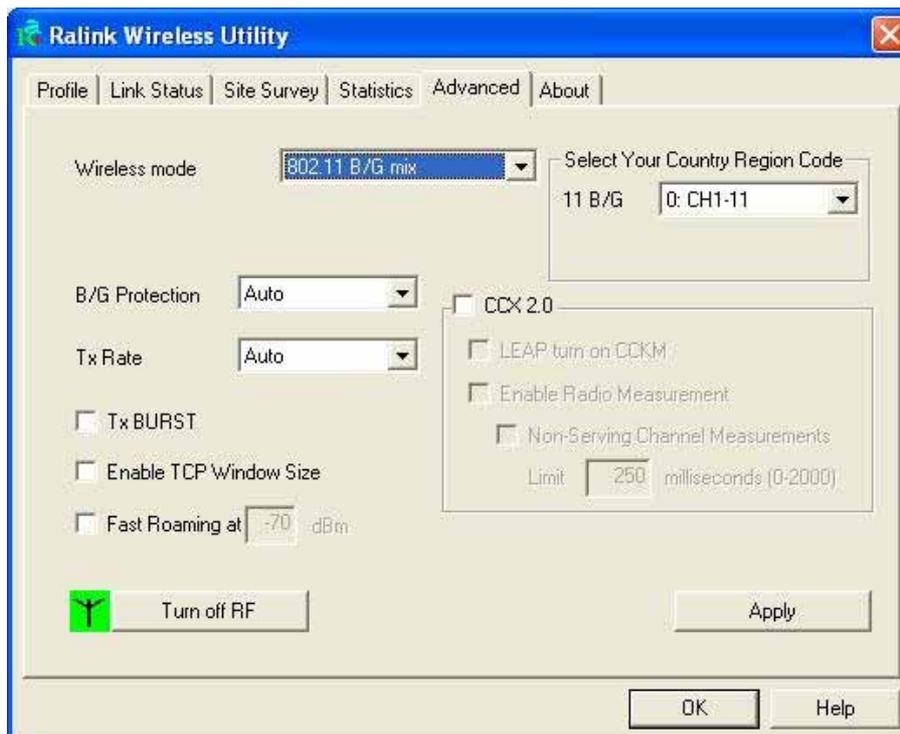
2.4 Statistics

In the “**Statistics**”, you can get the real time information about the packet transmission and receiving status.



2.5 Advanced

In the “**Advanced**”, you can configure Wireless LAN Card’s Wireless Mode, B/G Protection, Tx Rate, Country Region Code...etc.



2.6 About

In the "About", you can see current RaConfig Version, Driver Version, EEPROM Version, IP Address, Sub Mask, and Default Gateway.



3. Glossary

IEEE 802.11 Standard

The IEEE 802.11 Wireless LAN Standards subcommittee, which is formulating a standard for the industry.

Access Point

An internetworking device that seamlessly connects the wired & wireless networks together.

Ad Hoc

An Ad Hoc wireless LAN is a group of computers, each with a WLAN adapter connected as an independent wireless LAN. Ad Hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

BSSID

A specific Ad Hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSSID.

DHCP

Dynamic Host Configuration Protocol – a method in which IP addresses are assigned by server dynamically to clients on the network. DHCP is used for Dynamic IP Addressing and requires a dedicated DHCP server on the network.

Direct Sequence Spread Spectrum

This is the method the wireless cards use to transmit data over the frequency spectrum. The other method is frequency hopping. Direct sequence spreads the data over one frequency range (channel) while frequency hopping jumps from one narrow frequency band to another many times per seconds.

ESSID

An Infrastructure configuration could also support roaming capability for mobile workers. More than one BSS can be configured as an Extended Service Set (ESS). Users within an ESS could roam freely between BSS s while served as continuous connection to the network wireless stations and Access Points within an ESS must be configured with the same ESSID and the same radio channel.

Ethernet

Ethernet is a 10/100Mbps network that runs over dedicated home/office wiring. Users must be wired to the network at all times to gain access.

Gateway

A gateway is a hardware and software device that connects two dissimilar systems, such as a LAN and a mainframe. In Internet terminology, a gateway is another name for a router. Generally a gateway is used as a funnel for all traffic to the Internet.

IEEE

Institute of Electrical and Electronics Engineers.

Infrastructure

An integrated wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

Network

A network is a system of computers that is connected. Data, files, and messages can be transmitted over this network. Networks may be local or wide area networks.

ISM Band

The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the so –called ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available worldwide. This presents a truly revolutionary opportunity to place convenient high-speed wireless capabilities in the hands of users around the globe.

Local Area Network (LAN)

A LAN is a group of computers, each equipped with the appropriate network adapter card connected by cable/air, that share applications, data, and peripherals. All connections are made via cable or wireless media, but a LAN does not use telephone services. It typically spans a single building or campus.

PCMCIA

Personal Computer Memory Card International Association. Also a PCMCIA card is also referred to Cardbus Adapter.

Protocol

A protocol is a standardized set of rules that specify how a conversation is to take place, including the format, timing, sequencing and/or error checking.

SSID

A Network ID unique to a network. Only clients and Access Points that share the same SSID are able to communicate with each other. This string is case-sensitive.

Simple Network Management Protocol (SNMP)

Simple Network Management Protocol is the network management protocol of TCP/IP. In SNMP, agents-which can be hardware as well as software-monitor the activity in the various devices on the network and report to the network console workstation. Control information about each device is maintained in a structure known as a management information block.

Static IP Addressing

A method of assigning IP addresses to clients on the network. In networks with Static IP address, the network administrator manually assigns an IP address to each computer. Once a Static IP address is assigned, a computer uses the same IP address every time it reboots and logs on to the network, unless it is manually changed.

Transmission Control Protocol / Internet Protocol (TCP/IP)

TCP/IP is the protocol suite developed by the Advance Research Project Agency (ARPA). It is widely used in corporate Internet works, because of its superior design for WANs. TCP governs how packer is sequenced for transmission the network. The term "TCP/IP" is often used generically to refer to the entire suite of related protocols.

Transmit/ Receive

The wireless throughput in Bytes per second averaged over two seconds.

Wide Area Network (WAN)

A WAN consists of multiple LANs that are tied together via telephone services and/or fiber optic cabling. WANs may span a city, a state, a country, or even the world.

WPA/WPA2

Wi-Fi Protected Access (WPA/WPA2) is a security enhancement that strongly increases the level of data protection and access control to a wireless network. WPA enforces 802.1x authentication and key-exchange and only works with dynamic encryption keys. To strengthen data encryption, WPA utilizes its Temporal Key Integrity Protocol (TKIP). TKIP provides important data encryption enhancements that include a per-packet key mixing function, a message integrity check (MIC) named Michael an extended initialization vector (IV) with sequencing rules, and a also re-keying mechanism. Using these improvement enhancements, TKIP protects against WEP's known weaknesses.

The second generation of WPA that complies with the IEEE TG1 specification is known as WPA2.

WPA/WPA2 – Enterprise provides this level of security on enterprise networks with a 802.1x RADIUS server. An Authentication Type is selected to match the authentication protocol of the 802.1x server.

WPA/WPA2 - Personal provides this level of security in the small network or home environment. It uses a password also called a pre-shared key (PSK). The longer this password the stronger the security of the wireless network. If your Wireless Access Point or Router supports WPA/WPA2 Personal (WPA-PSK) then you should enable it on the access point and provide a long, strong password. The same password entered into access point needs to be used on this computer and all other wireless devices that access the wireless network.