

IEEE 802.11n
Wireless PCI Card

WP72RL1

User's Manual

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.

FCC Caution:

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.

Revision History

Revision	History
V1.	1st release

All brand and product names mentioned in this manual are trademarks and/or registered trademarks of their respective holders.

CE 0984 Ⓢ

$E=9.67977$ V/m is the maximum E-Field strength when safety distance between the EUT and human body is maintained at least 20cm, which is below 61V/m as required in Annex III table 2 of EC Council Recommendation (1999/519/EC). This proves that the unit complies with the EN 62311 for RF exposure requirement.

Is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility (2004/108/EC), Low-voltage Directive (2006/95/EC), the procedures given in European Council Directive 99/5/EC and 2004/104/EC.

The equipment was passed. The test was performed according to the following European standards:

- EN 300 328 V.1.7.1
- EN 301 489-1 V.1.8.1 / EN 301 489-17 V.2.1.1
- EN 62311
- EN 60950-1

Regulatory statement (R&TTE)

- European standards dictate maximum radiated transmit power of 100mW EIRP and frequency range 2.400-2.4835GHz;
- In France, the equipment must be restricted to the 2.4465-2.4835GHz frequency range and must be restricted to indoor use.

Operation of this device is subjected to the following National regulations and may be prohibited to use if certain restriction should be applied.

$D=0.020$ m is the minimum safety distance between the EUT and human body when the E-Field strength is 61V/m.

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1. Introduction

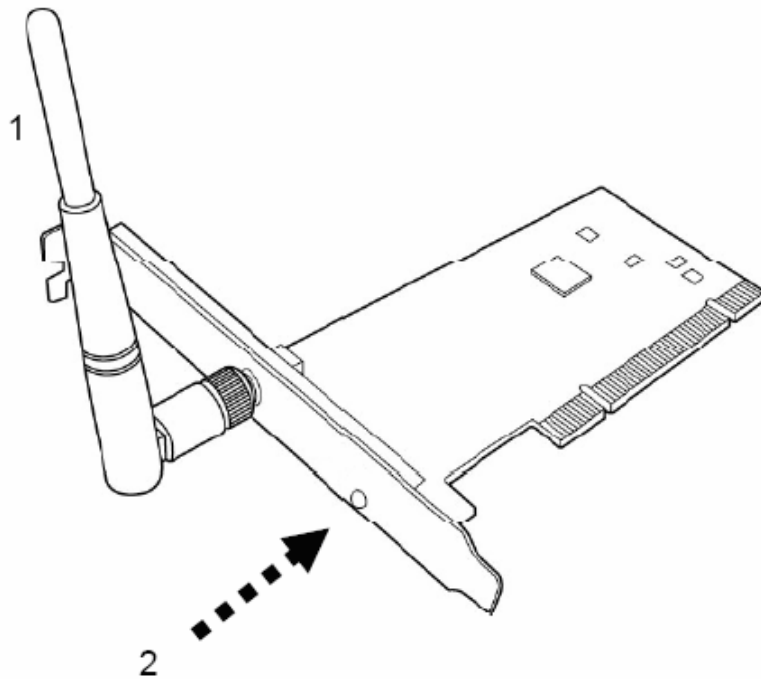
Thank you for purchasing this high-speed wireless network card! Excepting common wireless standards 802.11b/g, this wireless network card is also able to access 802.11n wireless networks - data transfer rate is 150Mbps, and that's three times faster than 802.11g wireless network! With easy-to-install PCI interface - a very common expansion port of computers - plug this wireless network card into any empty PCI slot of your computer, just that simple!

This product is made in ISO9001 approved factory and complies with FCC part 15 regulations and CE approval.

1.1 Features

- High-efficiency antenna expands the scope of your wireless network.
- High-speed data transfer rate - Up to 150Mbps.
- WMM function: control the bandwidth required for different applications.
- Work with IEEE 802.11b/g/n wireless devices.
- Supports major encryption methods like WEP, WPA, and WPA2 encryption.
- WPS configuration - You don't need an experienced computer technician to help you to get connected. Utilizing the software program of the card, you can get your computer connected by pushing a button or entering an 8-digit code. Pressing the button on the network card, the WPS connection can be activated as well.
- PCI interface - you can get it installed on your computer in just few seconds!

1.2 Familiar with your new wireless network card



1. Antennas

One 2dBi dipole antenna is enclosed with the PCI card. Please secure the antenna to Reverse SMA connector of the card.

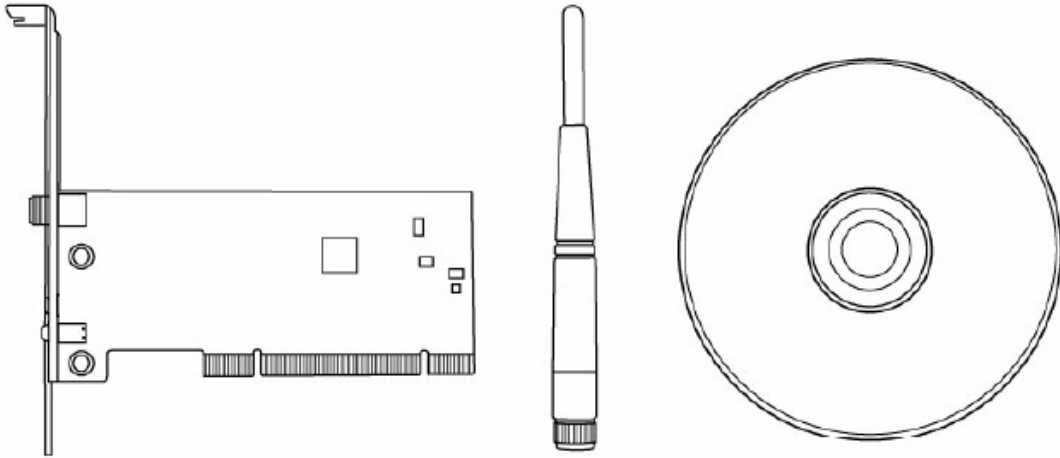
2. Link & Active LED Definitions

LED	Light Status	Description
Link	On	Link to a wireless access point
	Off	Radio is switched to off
Active	Blinking	Transferring / receiving data
	Off	No wireless activity

1.3 Package Contents

Before you starting to use this wireless network card, please check if there's anything missing in the package, and contact your dealer of purchase to claim for missing items:

- One PCI Wireless Network Card
- One 2dBi Dipole Antennas
- One CD-ROM (Drivers / Utility/User Manual)



1.4 Before you start

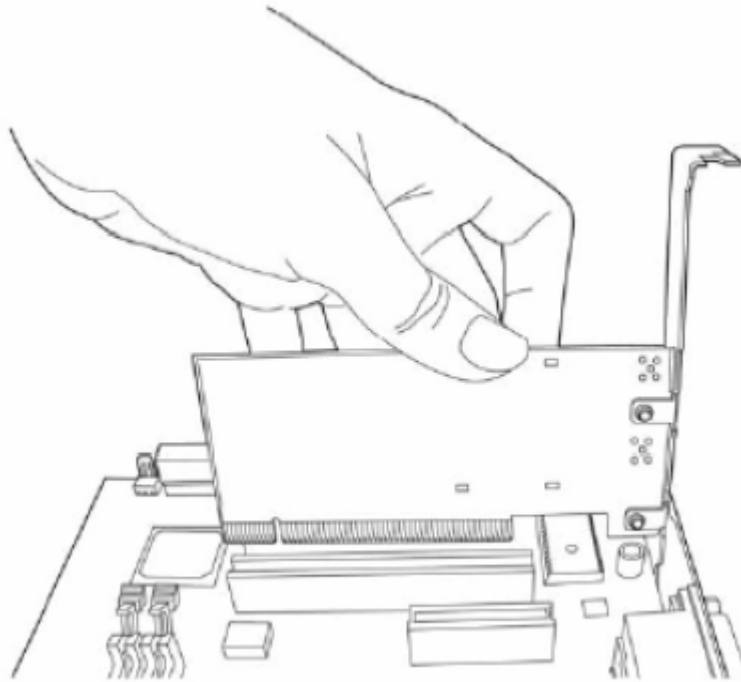
You must have the requirements as follow,

- A computer with an available PCI slot
- At least a 300MHz processor and 32MB memory
- Windows 2000/XP/Vista or Windows 7 operation system
- A CD-ROM drive
- At least 100MB of available disk space.
- Wireless PCI Adapter properly installed

1.5 Hardware Installation

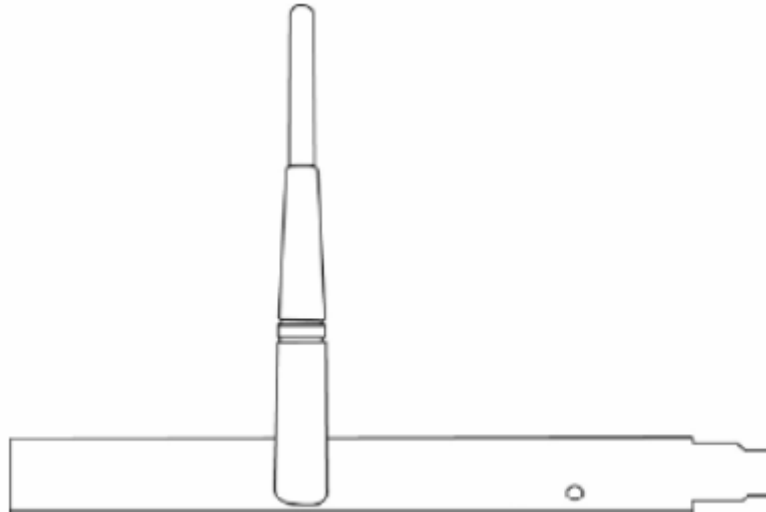
STEP1: Turn off your computer and remove its cover

STEP2: Insert the PCI wireless network card into an available PCI slot firmly. Please refer to the illustration below:



STEP3: Secure this card to the rear of the computer chassis and replace the cover.

STEP4: Install the antenna on the wireless network card, and make sure the antenna is securely installed. To improve radio reception, please adjust antenna to the proper position.



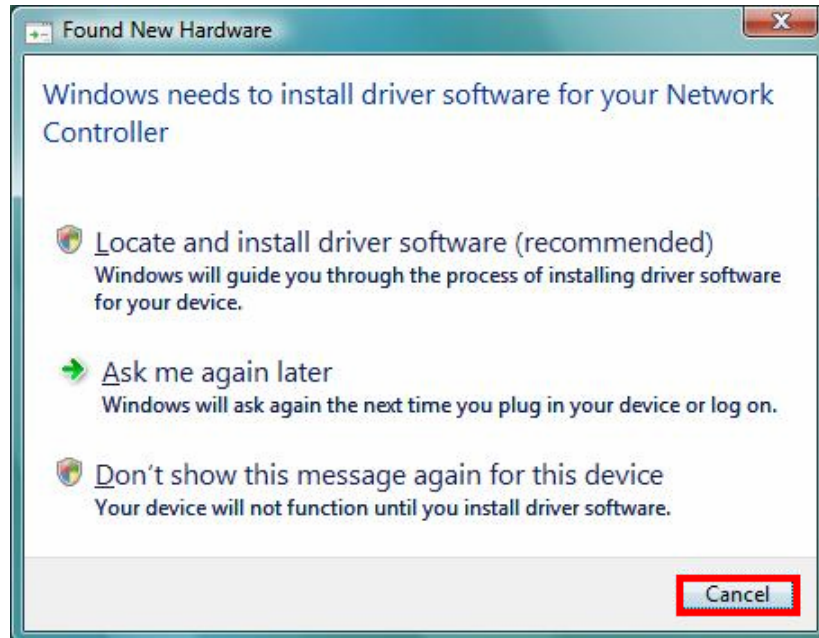
STEP5: Turn on the computer.

2. Installation Procedure

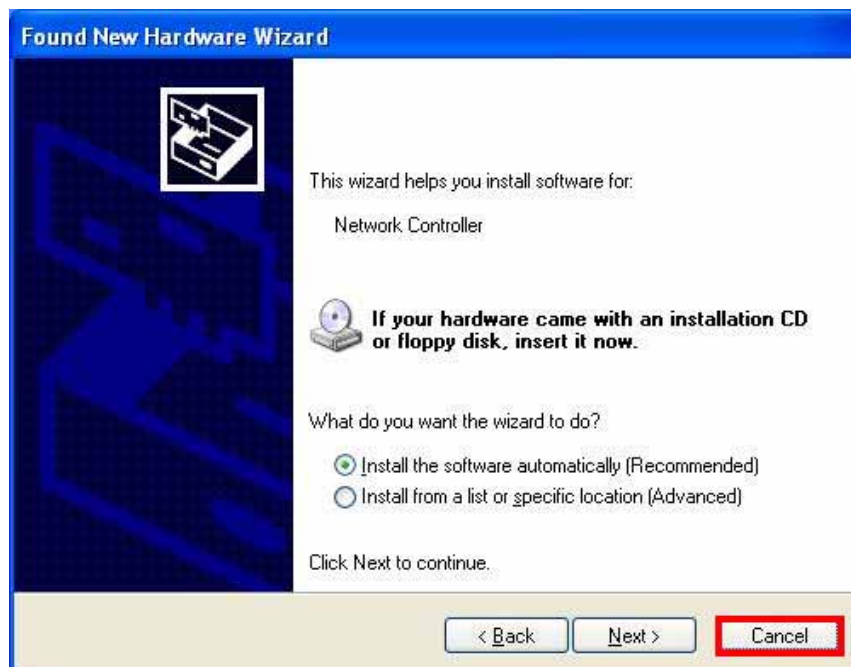
Note: *If you have installed the Wireless Adapter driver & utility before,*

please uninstall the old version first.

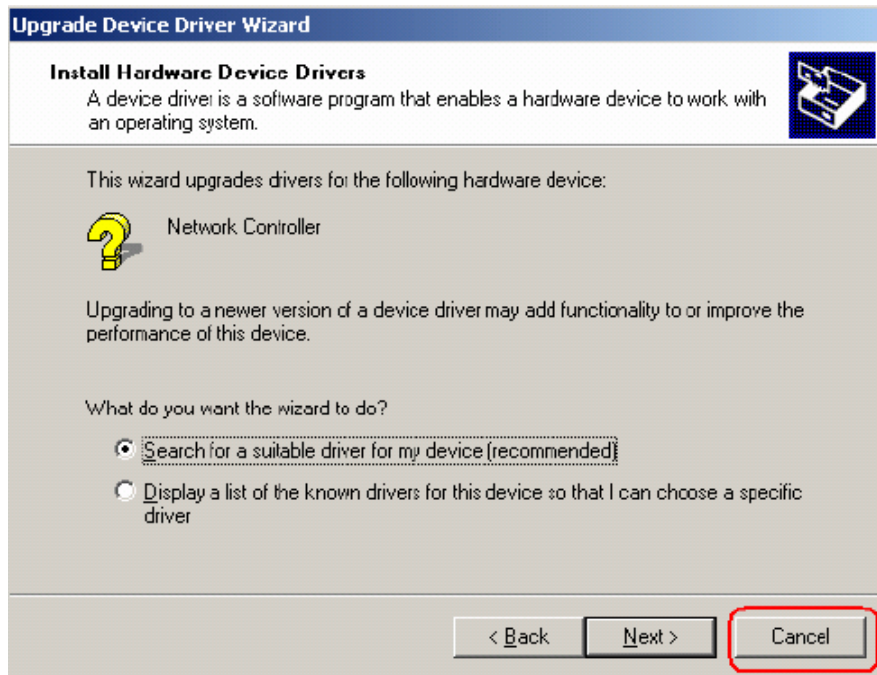
STEP1: The **Found New Hardware Wizard** below will appear after the WLAN adapter is installed. Please click **Cancel** to continue.



(For Windows Vista)



(For Windows XP)

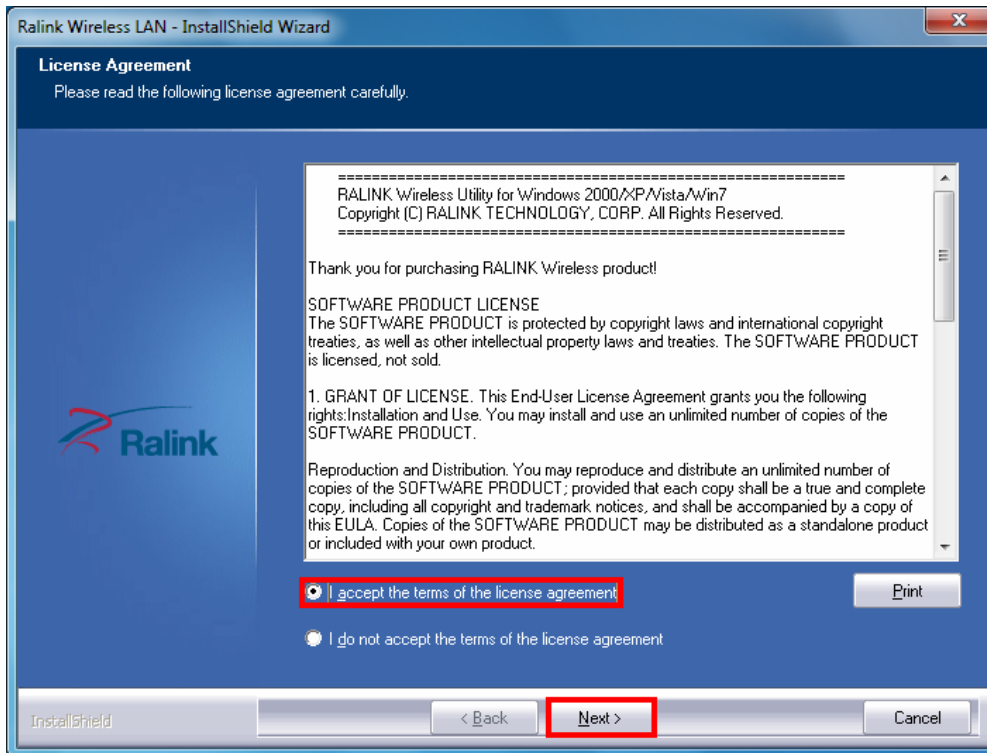


(For Windows 2000)

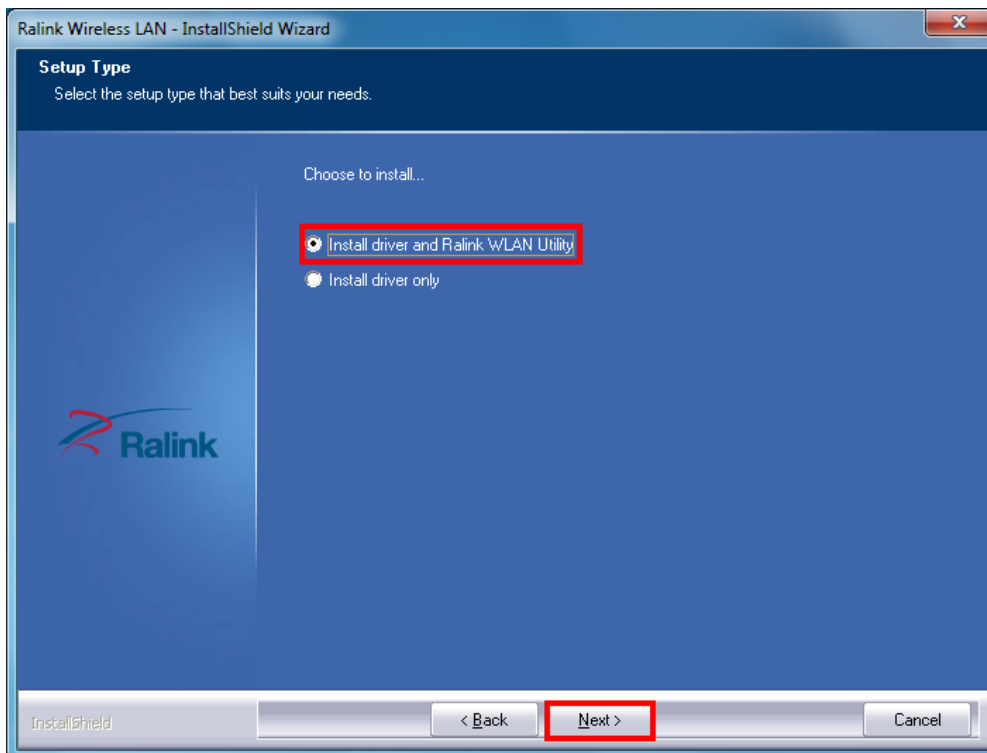
STEP2: Insert Installation CD into CD-ROM drive, windows below will appear. Click **Install Driver & Utility** to begin device driver installation.



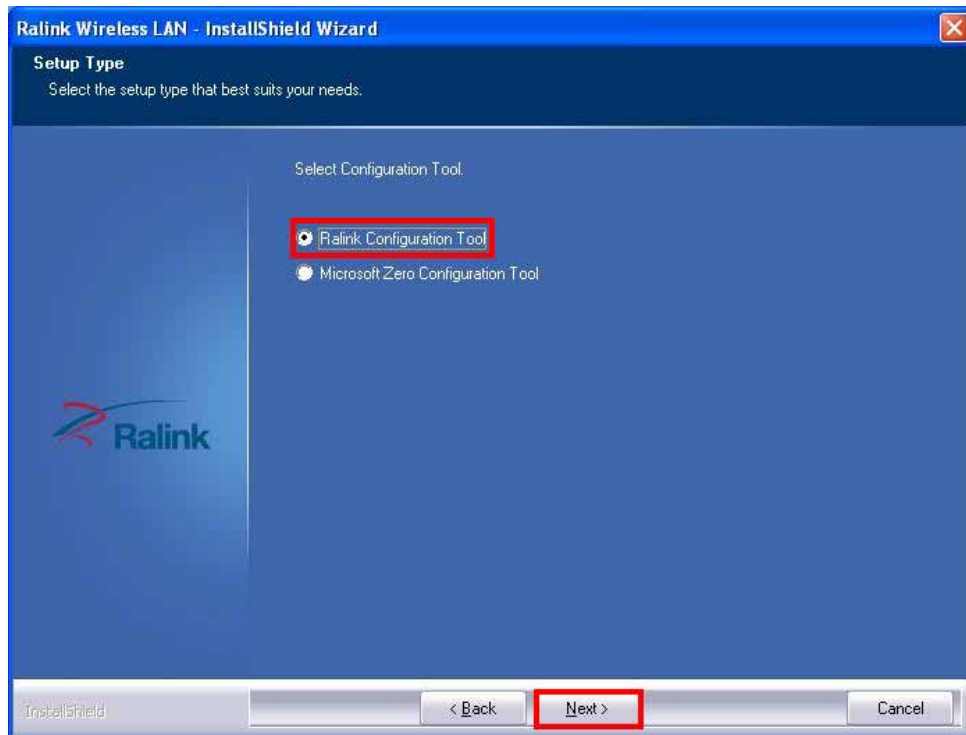
STEP3: Please read the following license agreement. Use the scroll bar to view the rest of this agreement. Select **I accept the terms of the license agreement** and click **Next** to continue.



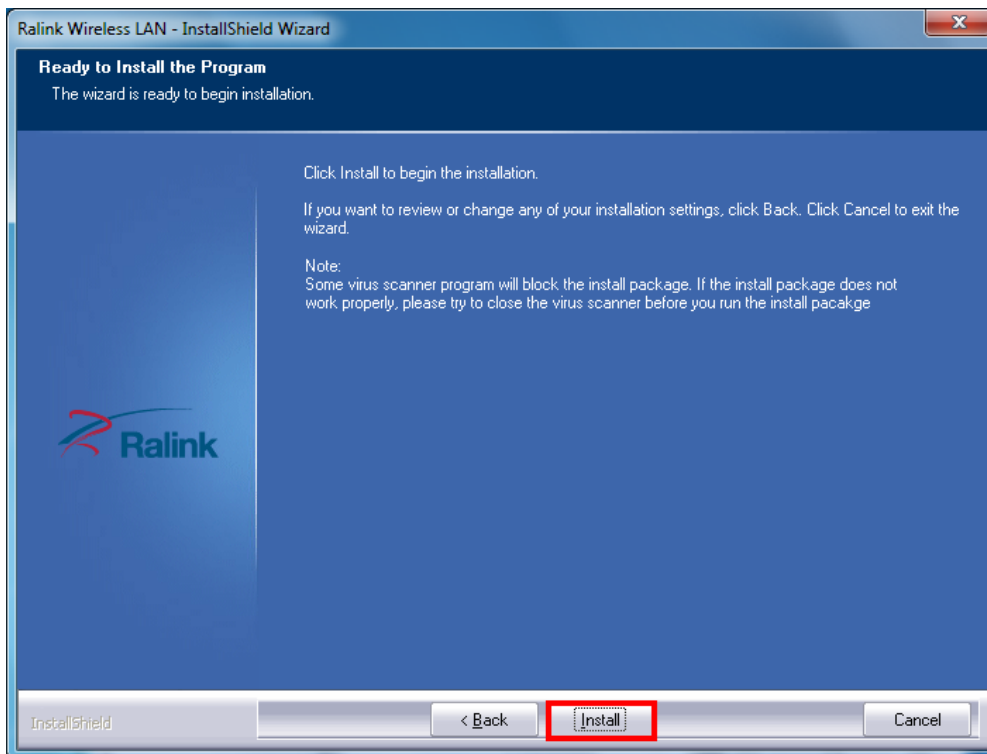
STEP4: Choose **Install driver and Ralink WLAN Utility** and click **Next** to continue.



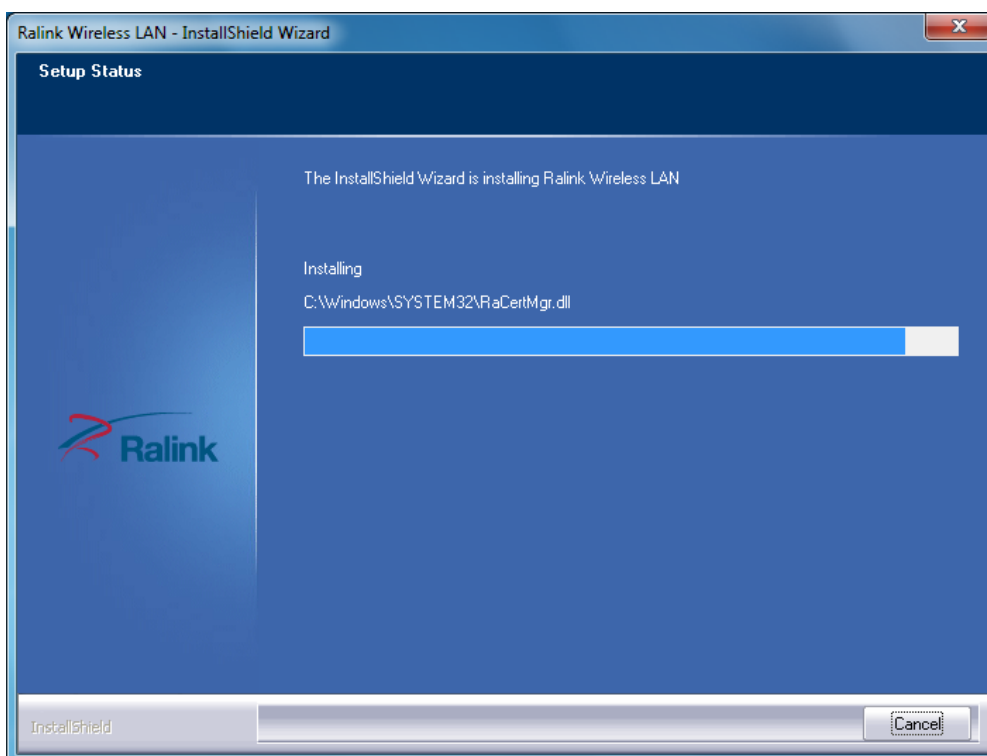
STEP5: In Windows XP, there is a **Windows Zero Configuration Tool** for you to setup wireless adapter. You can choose to configure the adapter through the **Microsoft Zero Configuration Tool** or the **Ralink Configuration Tool**. It is recommended to choose the **Ralink Configuration Tool** for the adapter. Click **Next** to continue.



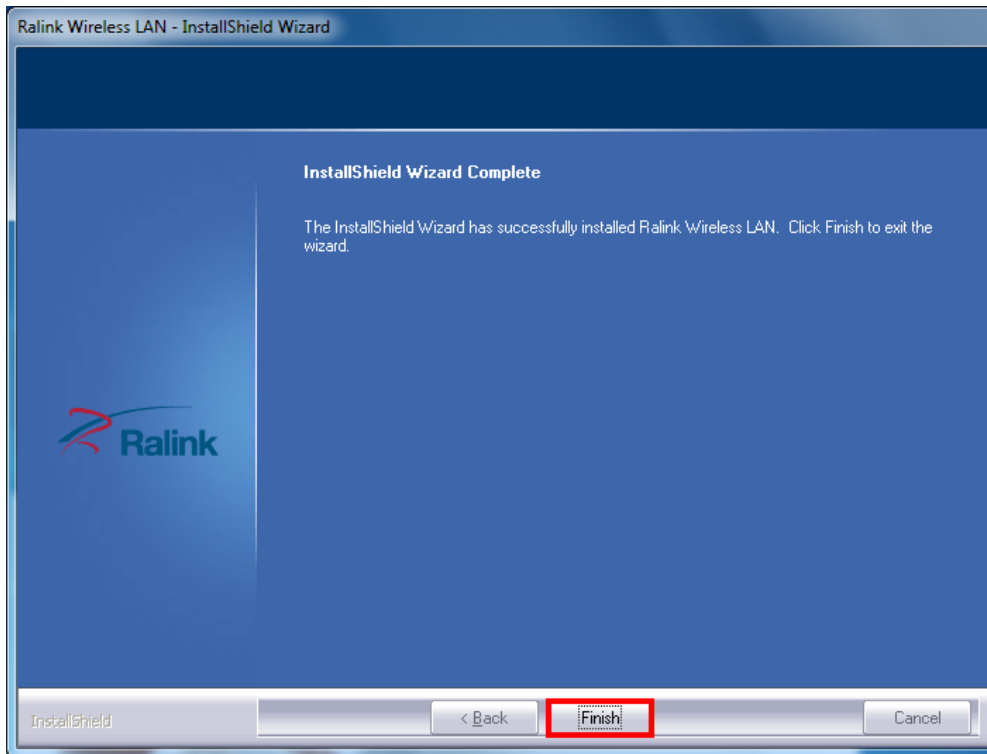
STEP6: Click **Install** to begin the installation.




STEP7: Please wait for a while during the Wireless LAN adapter is configuring your new software installation.



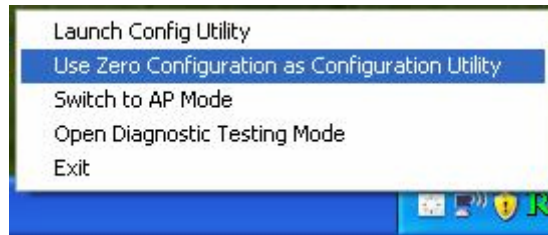
STEP8: After the setup wizard has successfully installed wireless LAN, click **Finish** to exit the wizard.



The Configuration Utility appears as an icon on the system tray of Windows while the adapter is running. You can open the utility by double-click on the icon. 

Right-click the icon, there are some items for you to operate the configuration utility,

- **Launch Config Utilities** → Select this option to open the Configuration Utility tool.
- **Use Zero Configuration as Configuration utility** ([Available on Windows XP only](#)) → Select this option to use Windows XP built-in wireless configuration utility (Windows Zero Configuration) to configure to card.
- **Switch to STA+AP Mode** ([Available on Windows 7](#)) → Select this option to change to AP mode.
- **Switch to AP Mode** ([Available on Windows Vista/XP/2000 only](#)) → Select this option to change to AP mode.
- **Open Diagnostic Testing Mode** ([Available on Windows Vista/XP/2000 only](#)) → To check network connection status.
- **Exit** → Select **Exit** to close the Configuration Utility tool.



3. Wireless Network Configuration Utility

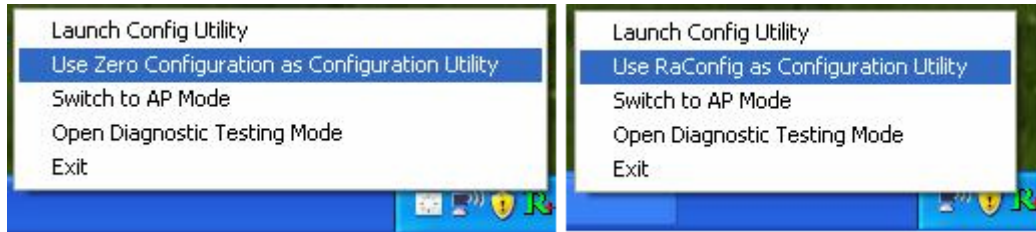
3.1 RaUI Wireless Utility & Windows Zero Configuration (WZC)

The Configuration Utility is a powerful application that helps you to configure the Wireless LAN adapter and monitor the link status and statistics during the communication process.

When the adapter is installed, the configuration utility will be displayed automatically. This adapter will auto connect to wireless device which has better signal strength and no wireless security setting.

In **Windows XP**, it provides wireless configuration utility named "Windows Zero configuration" which provides basic configuration function for Ralink Wireless NIC, Ralink's Utility (RaUI) provides WPA supplicant functionality. To make it easier for user to select the correct utility, RaUI will let user make the selection when it first runs after windows XP boots.

RaUI can co-exist with **WZC (Windows Zero Configuration)**. When coexisting with WZC, RaUI only provides monitoring function, such as link status, network status, statistic counters, advance feature status, WMM status and WPS status. It won't interfere with WZC's configuration or profile functions. Please see below picture: To select WZC or RaUI



If **“Use Zero Configurations as Configuration utility”** is selected, please continue on the section. Below picture shows that the RaUI status when WZC is active as main control utility.

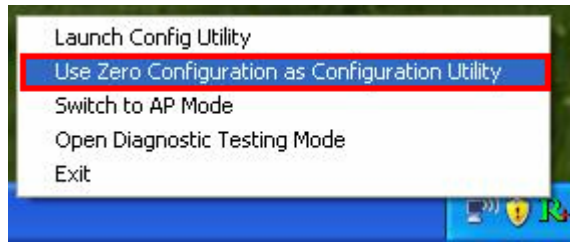


When activating WZC, there are couple different on RaUI status compare to the without WZC running:

- (1) **Profile** button will be gray, profile function is removed since the NIC is controlled by WZC.
- (2) The **connect** and **add profile** function will be gray. The reason is same as the first difference.

[Use WZC to configure wireless NIC]

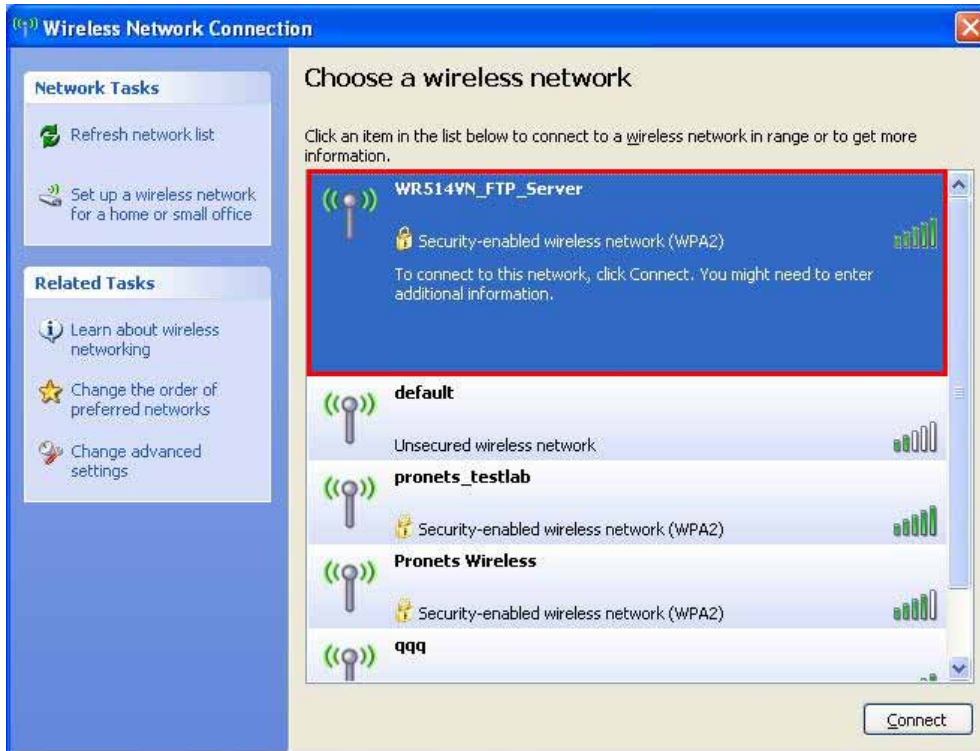
STEP1: Right-click Ralink configuration utility icon and select “Use Zero Configuration as Configuration Utility”.



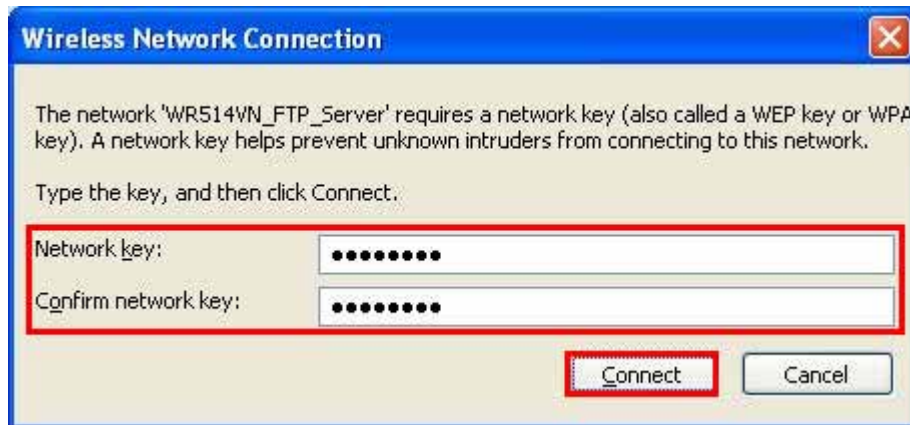
STEP2: Right-click the network connection icon in the task bar.



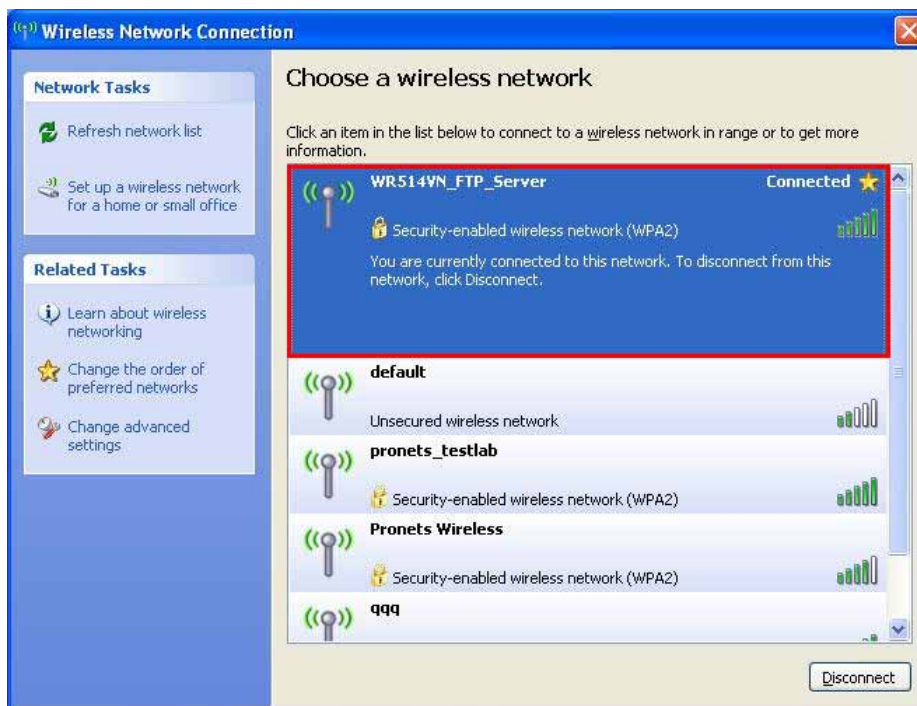
STEP3: All wireless access point in proximity will be display here. If the access point you want to use is not display here, please try to move your computer closer to the access point, or you can click “Refresh Network List” to rescan access points. Click the access point you wan to use if it’s shown, then click “Connect”.



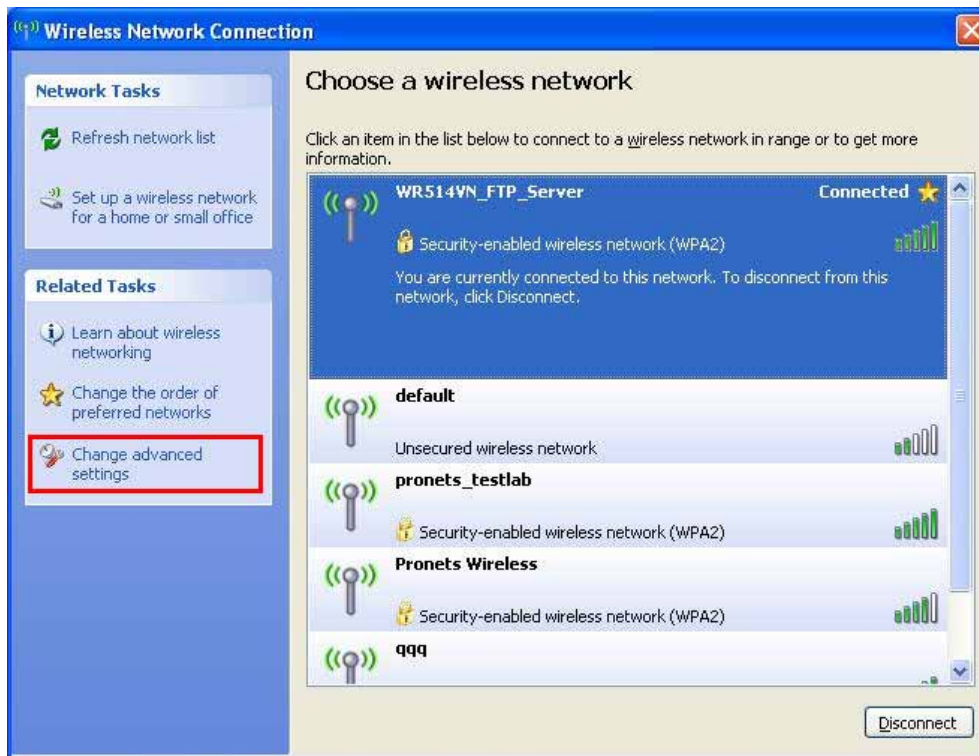
STEP4: If the access point is protected by encryption, you have to input its security key or passphrase here. It must match the encryption setting on the access point.



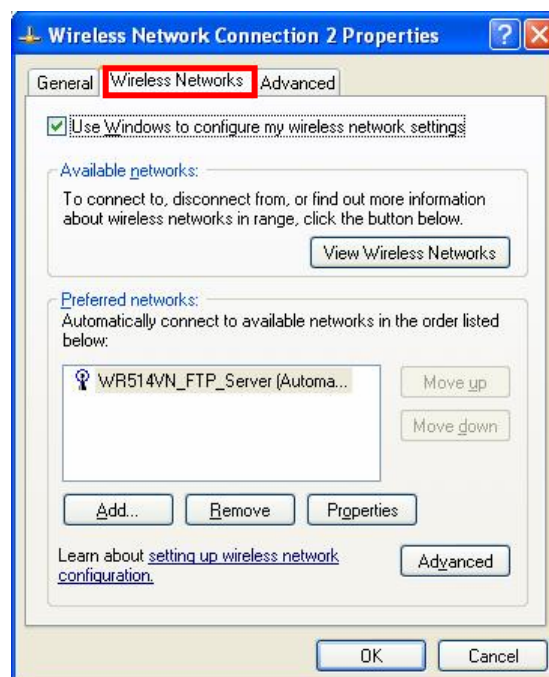
STEP5: When you see the “**Connected**” message, the connection between your computer and wireless access point is successfully established.



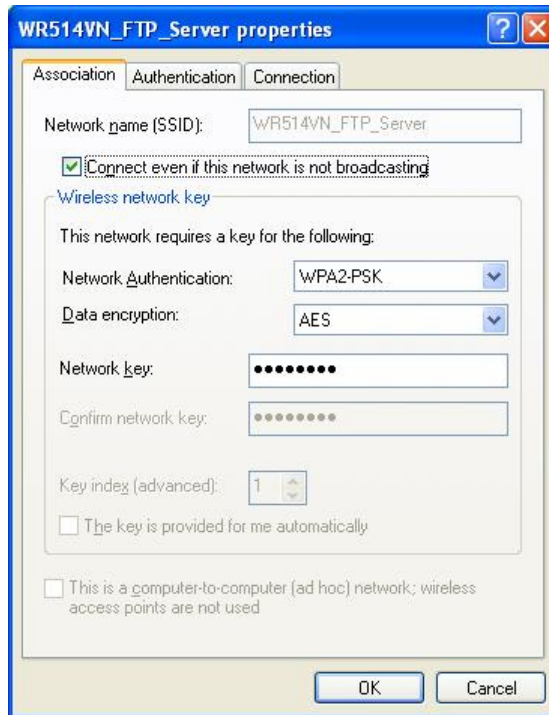
STEP6: If you want to modify information about AP, click “**Change advanced settings**”



STEP7: Choose “Wireless Networks” tab.



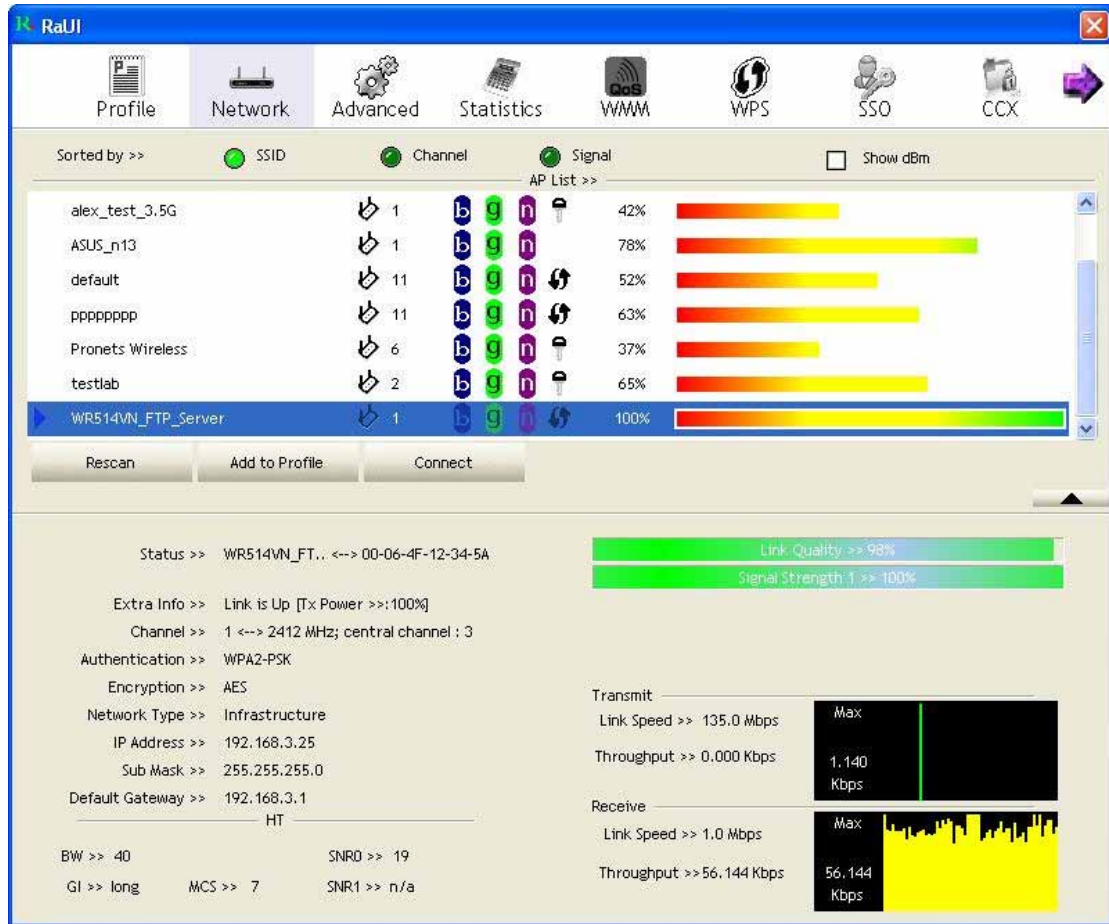
STEP8: Click “Properties” and then click “OK” button.



STEP9: After filling appropriate value, click “OK” button. And the status will prompt up as below.



STEP10: Click the Ralink’s icon will bring up RaUI main window. User can find the surrounding APs in the list. The current connected AP will also show with the green icon indicated as below screen. User may use the available tab to configure more advanced features provided by Ralink’s wireless NIC.



3.2 Start RaUI Utility

When starting RaUI, system will connect to the AP with best signal strength without setting profile or matching profile setting. It will issue a scan command to wireless NIC. After two seconds, the AP list will updated with the result of BSS list scan. The AP list include most used fields, such as SSID, network type, channel used, wireless mode, security status and signal percentage. The arrow icon indicates the connected BSS or IBSS network.



There are three sections in RaUI. These sections are briefly described as below.

- **Button Section:** Include Profile page, Network page, Advanced page, Statistics page, WMM page, WPS page, SSO page, CCX Page, About button, Radio On/Off button and Help button.

➔ **Button Section**



➔ **Move to the Left**

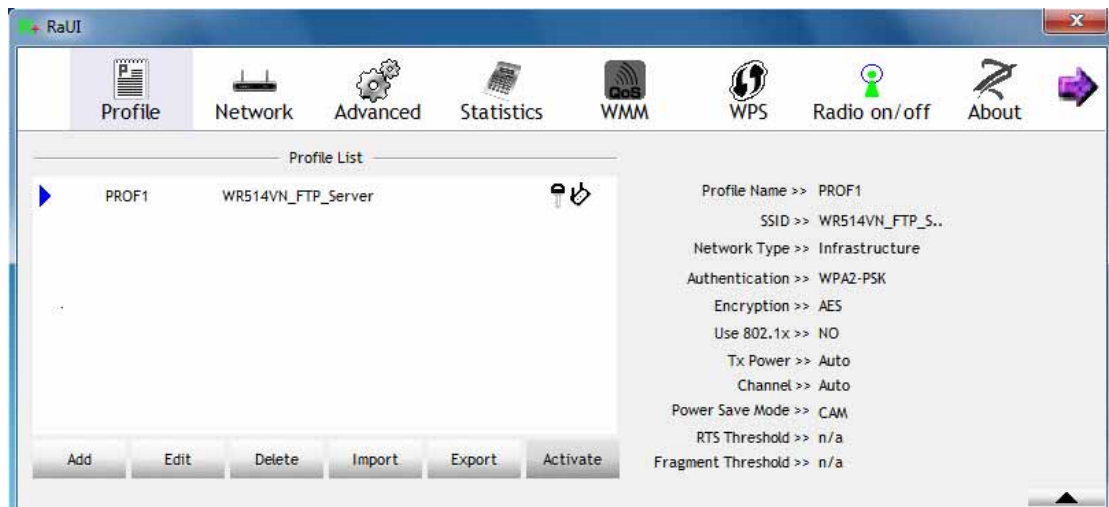


➔ **Move to the Right**

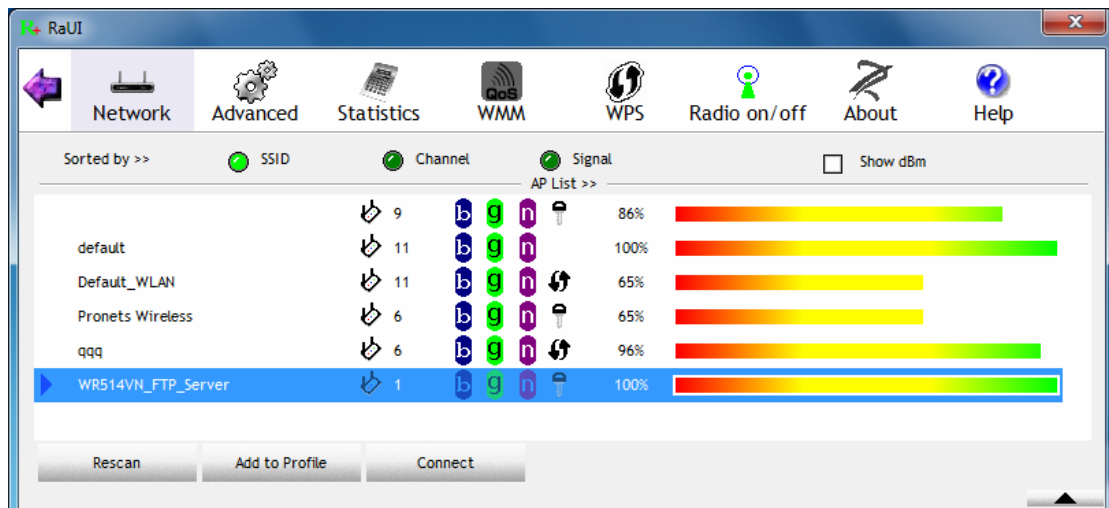


■ **Function Section:** Corresponding button

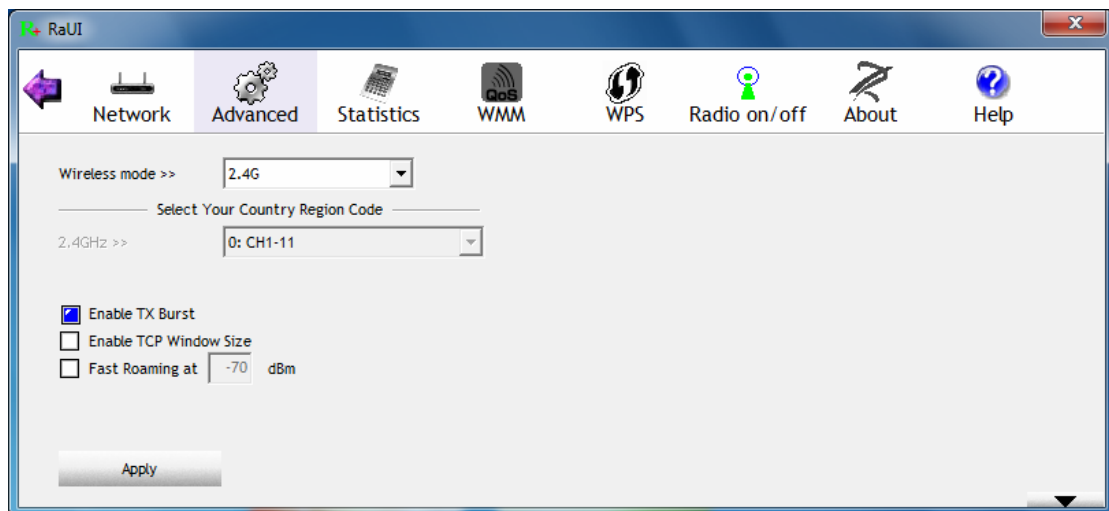
➔ Profile Page



➔ Network Page



➔ Advanced Page



→ Statistics Page

Network Advanced **Statistics** WMM WPS Radio on/off About Help

Transmit Receive

Frames Transmitted Successfully = 2610
 Frames Retransmitted Successfully = 2188
 Frames Fail To Receive ACK After All Retries = 65

Reset Counter

→ WMM Page

Network Advanced Statistics **WMM** WPS Radio on/off About Help

WMM Setup Status
 WMM >> Enabled Power Save >> Disabled Direct Link >> Disabled

WMM Enable
 WMM - Power Save Enable
 AC_BK AC_BE AC_VI AC_VO
 Direct Link Setup Enable
 MAC Address >> [][][][][][] Timeout Value >> 60 sec

Apply
Tear Down

→ WPS Page

Network Advanced Statistics WMM **WPS** Radio on/off About Help

WPS AP List

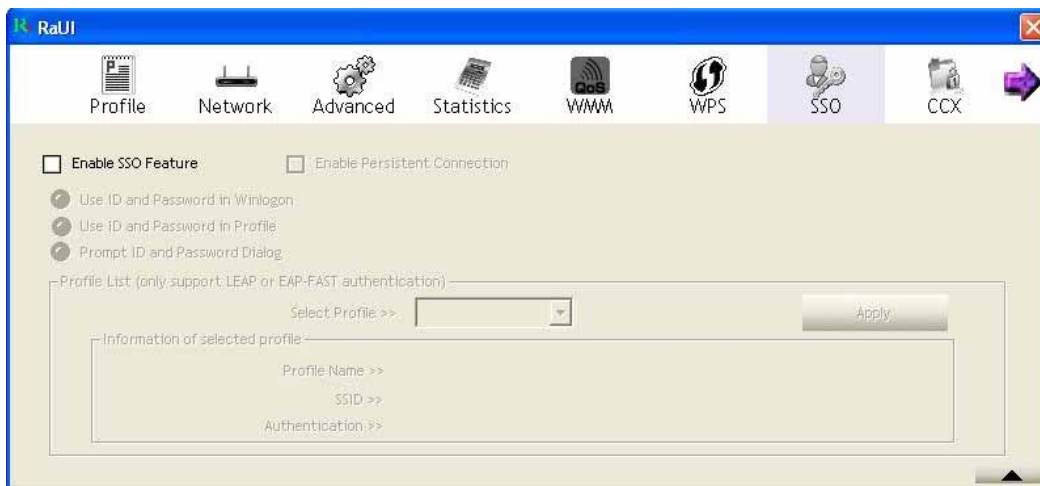
ID :	qqq	00-06-4F-6F-8E-E8	6	
ID :	Default_WLAN	00-E0-4C-86-70-01	11	

WPS Profile List

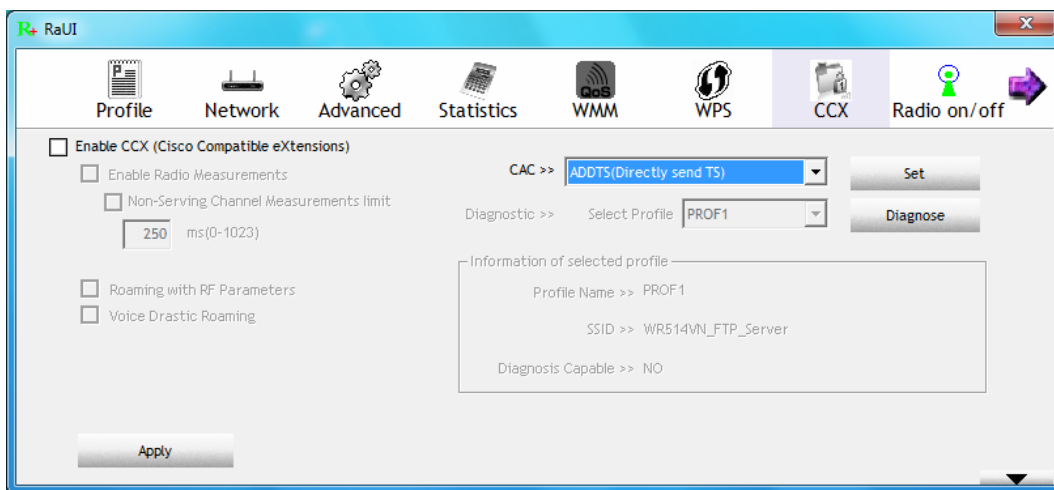
Rescan
Information
Pin Code
00762915 Renew
Config Mode
Enrollee
Detail
Connect
Rotate
Disconnect
Export Profile
Delete

PIN
PBC
Progress >> 0%

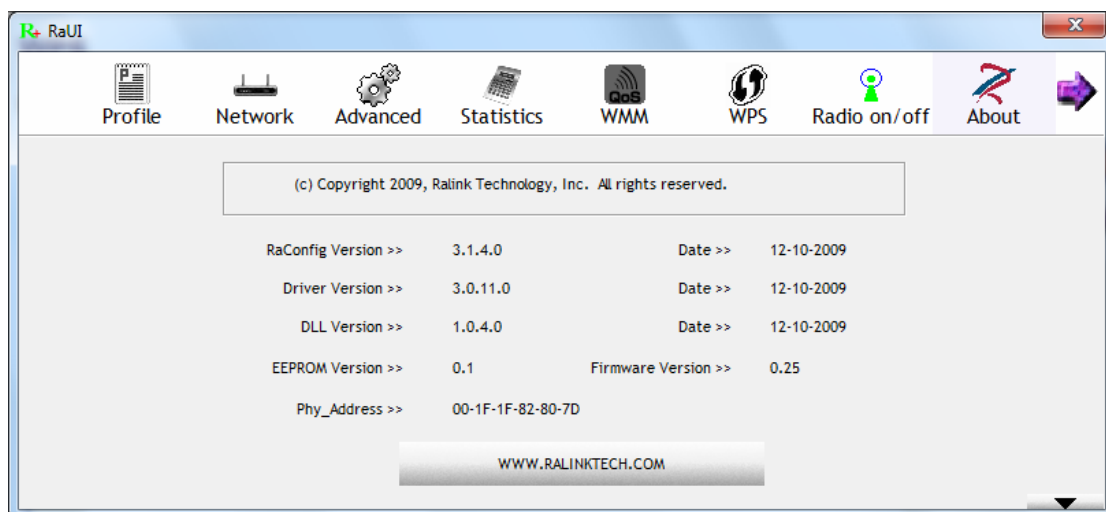
→ SSO Page (available on Windows XP & 2000 OS)



→ CCX Page (available on Windows Vista, XP & 2000 OS)



→ About Page



- **Status Section:** Include Link Status, Authentication Status, AP's information, Configuration and retrying the connection when authentication is failed.

➔ Link Status

Status >> WR514VN_FT.. <-> 00-06-4F-12-34-5A

Link Quality >> 95%

Signal Strength 1 >> 100%

Extra Info >> Link is Up [Tx Power >>100%]
 Channel >> 1 <-> 2412 MHz; central channel : 3

Authentication >> WPA2-PSK
 Encryption >> AES

Network Type >> Infrastructure
 IP Address >> 192.168.3.39
 Sub Mask >> 255.255.255.0
 Default Gateway >> 192.168.3.1

HT

BW >> 40 SNR0 >> 21
 GI >> long MCS >> 7 SNR1 >> n/a

Transmit
 Link Speed >> 135.0 Mbps
 Throughput >> 0.000 Kbps

Receive
 Link Speed >> 1.0 Mbps
 Throughput >> 55.612 Kbps

➔ Authentication Status

Authentication Status

Card Name >> Ralink 802.11n Wireless LAN Card
 Connected by manual...

16:37:25.062 Starting network connection...
 16:37:25.171 Network is connecting...
 16:37:25.281 PEAP Authenticating...
 16:37:28.375 Wireless client is authenticated.

Cancel

➔ AP's Information

General WPS 802.11n

SSID >> WR514VN_FTP_Server
 MAC Address >> 00-06-4F-12-34-5A

Authentication Type >> WPA-PSK+WPA2-PSK
 Encryption Type >> TKIP+AES

Channel >> 1 <-> 2412 MHz
 Network Type >> Infrastructure
 Beacon Interval >> 100

Signal Strength >> 100%

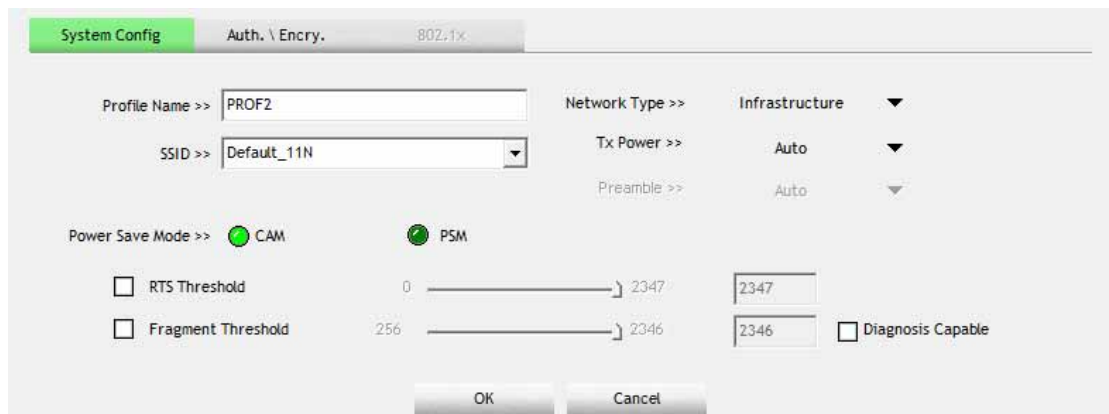
Legacy Supported Rates (Mbps): 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54
 802.11n Max. Supported Rates (Mbps): 72.2

Close

→ Retry the Connection



→ Configuration



- At the mean time of starting RaUI, there is also a small Ralink icon appears within windows taskbar as below. You may double click it to bring up the main menu if you selected to close RaUI menu earlier. You may also use mouse;s right button to close RaUI utility.



→→ Ralink icon in system tray.

- Besides, the small icon will change color to reflect current wireless network connection status. The status indicates as follow:
 - **R+** -- indicate Connected and Signal Strength is Good.
 - **R** -- indicate Connected and Signal Strength is Normal
 - **R-** -- indicate Wireless NIC is not connected yet
 - **Rx** -- indicate Wireless NIC is not detected
 - **R** -- indicate Connected and Signal Strength is Weak

3.3 Profile

Profile can book keeping your favorite wireless setting among your home, office, and other public hot-spot. You may save multiple profiles, and activate the correct one at your preference.



[Definition of each field]

Profile Name: Name of profile, preset to PROF* (* indicate 1,2,3,...)

SSID: AP or Ad-Hoc name

Network Type: Network's type, including infrastructure and Ad-Hoc.

Authentication: Authentication mode

Encryption: Encryption Type

Use 802.1x: Whether or not use 802.1x feature

Tx Power: Transmit power, the amount of power used by a radio transceiver to send the signal out.

Channel: channel in use for Ad-Hoc mode

Power Save Mode: Choose from CAM (Constantly Awake Mode) or Power Saving Mode.


RTS Threshold: User can adjust the RTS threshold number by sliding the bar or key in the value directly.

Fragment Threshold: User can adjust the Fragment threshold number by sliding the bar or key in the value directly.

[Icons and buttons]


 → indicate connection is successful on currently activated profile



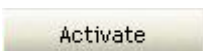


 → indicate connection is failed on currently activate profile

 → indicate network type is infrastructure mode

 → indicate network type is Ad-Hoc

 → indicate security-enabled wireless network

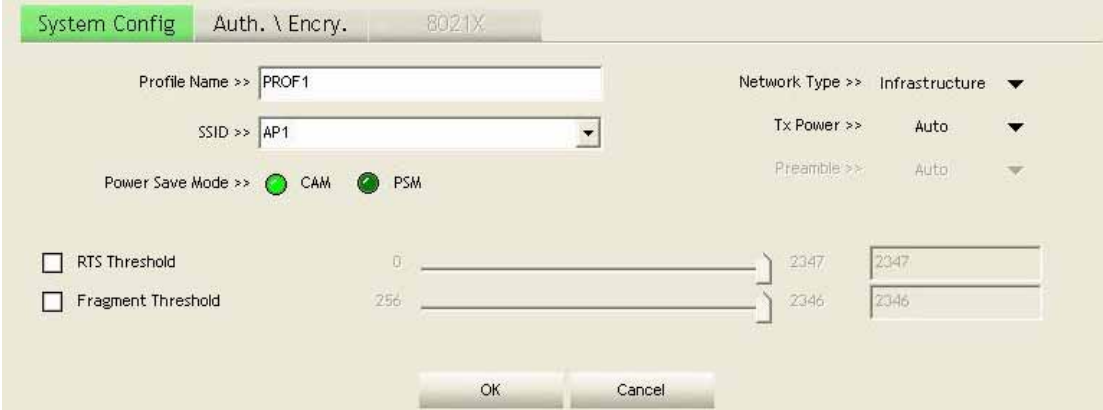
 → Add a new profile

-  → Edit an existing profile
-  → Delete an existing profile
-  → Activate selected profile
-  → Show the information of Status Section
-  → Hide the information of Status Section

3.3.1 Add/Edit Profile

There are 3 methods to open Profile Editor form:

- You can open it from “Add to Profile” button in Site Survey function
- You can open it form “Add” button in Profile function
- You can open it from “Edit” button in Profile function




Profile Name: User can chose name for this profile, or use default name defined by system.

SSID: User can key in the intended SSID name or use pull down menu to select from available APs.

Power Save Mode: Choose from CAM [Constantly Awake Mode] or Power Saving Mode.