IEEE 802.11n
Wireless PCI Express Adapter

WPE71RL

User's Manual

February 2010

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: 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.

Revision History

Revision	History
V1.	1st release

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

Contents

1. Introduction

This is a wireless PCI Express adapter that delivers unrivaled wireless performance for your Desktop PC. It complies with IEEE 802.11n draft standard and backward compatible with IEEE 802.11b/g. With this adapter, you can easily upgrade your Desktop PC wireless connectivity. Once connected, access the network with high-speed Internet connection while sharing photos, files, music, video, printers, and storage. Get a better Internet experience with a faster wireless connection so you can enjoy smooth digital phone calls, gaming, downloading, and video streaming. This wireless adapter also provides peer-to-peer communication among any compatible wireless users and no Access Point required.

This wireless PCI Express adapter provides maximum transfer rate up to 150Mbps and supports WEP, WPA, WPA2, WPS 802.1x high-level WLAN security features that guarantee the best security for users.

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

1.1 Features

- Complies with draft IEEE 802.11n standard
- Up to 150Mbps data transfer rates in 802.11n mode
- Backward compatible with IEEE 802.11b/g
- Legacy and High Throughput Modes
- Supports 64/128-bit WEP Data Encryption
- Supports WPA, WPA2 (802.11i), WPS, 802.1x advanced security
- Supports both Infrastructure and Ad-Hoc Networking Modes
- Supports Quality of Service (QoS) - WMM, WMM-PS
- Supports Multiple BSSID
- Supports Windows 2000/XP/Vista/Windows 7
- Simple user setup and diagnostics utilities

1.2 LED Indicator

LED	Light Status	Description
ACT	Blinking	Data is being transmitted or received.

1.3 Package Contents

- One Wireless PCI Express Adapter
- Three External Antennas
- One CD-ROM (Drivers / Utility, User's Manual)

If any of the above items is missing, contact your dealer immediately.

1.4 Before you start

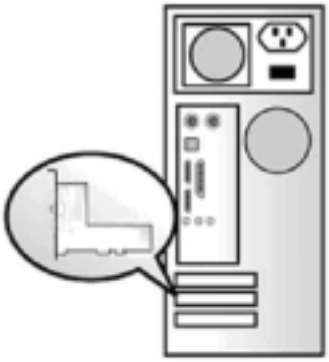
You must have the requirements as follow,

- A computer with an available PCI Express slot
- At least a 300MHz processor and 32MB memory
- Windows 2000/XP/Vista/Windows 7 support
- A CD-ROM drive
- Wireless PCI Express Adapter properly installed

1.5 Hardware Installation

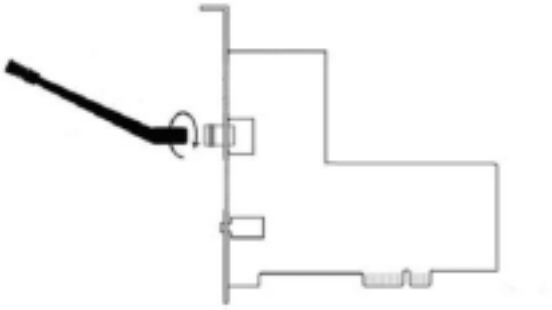
STEP1: Turn off your computer and remove its cover

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



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

STEP4: Secure the antenna to antenna connector of the card. Please refer to the illustration below:



STEP5: Turn on the computer.

[Guidelines for the Hardware Installation]

Please observe the following guidelines when you are installing the wireless PCI Express adapter to the Desktop PC:

- **Avoid placing the PC close to obstacles**

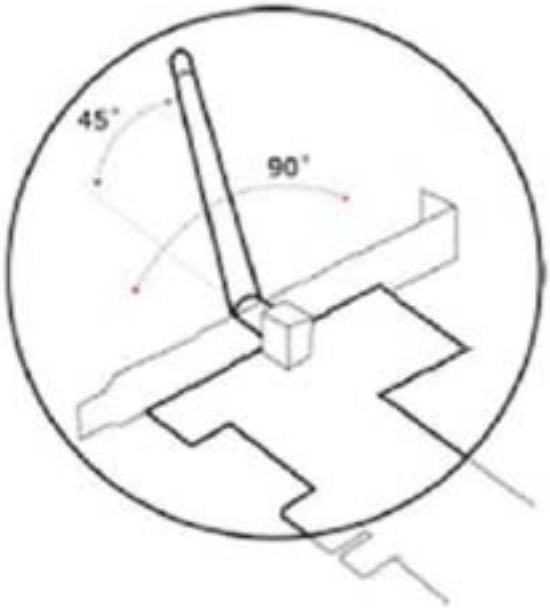
  Obstructions such as concrete and thick walls limit radio signal penetration and reduce the throughput and the coverage range of the wireless PCI Express adapter.

- **Place the PC as high as possible**

  The higher the PC is placed, the better the performance.

- **Adjust the antenna position**

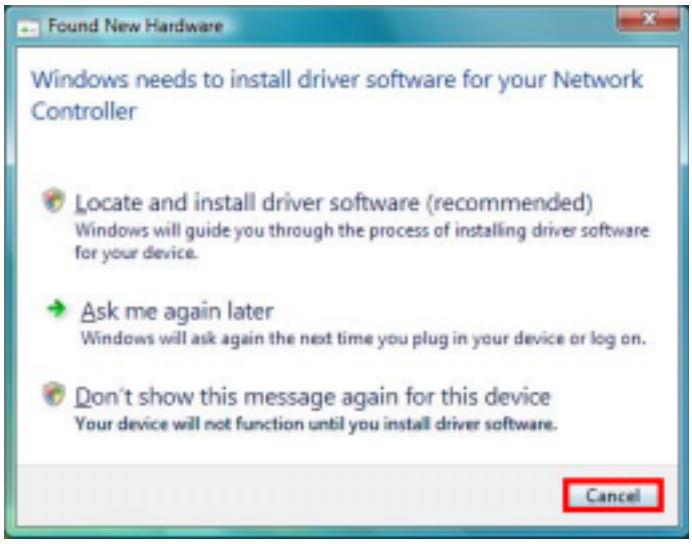
  Please refer to the illustration below:



2. Installation Procedure

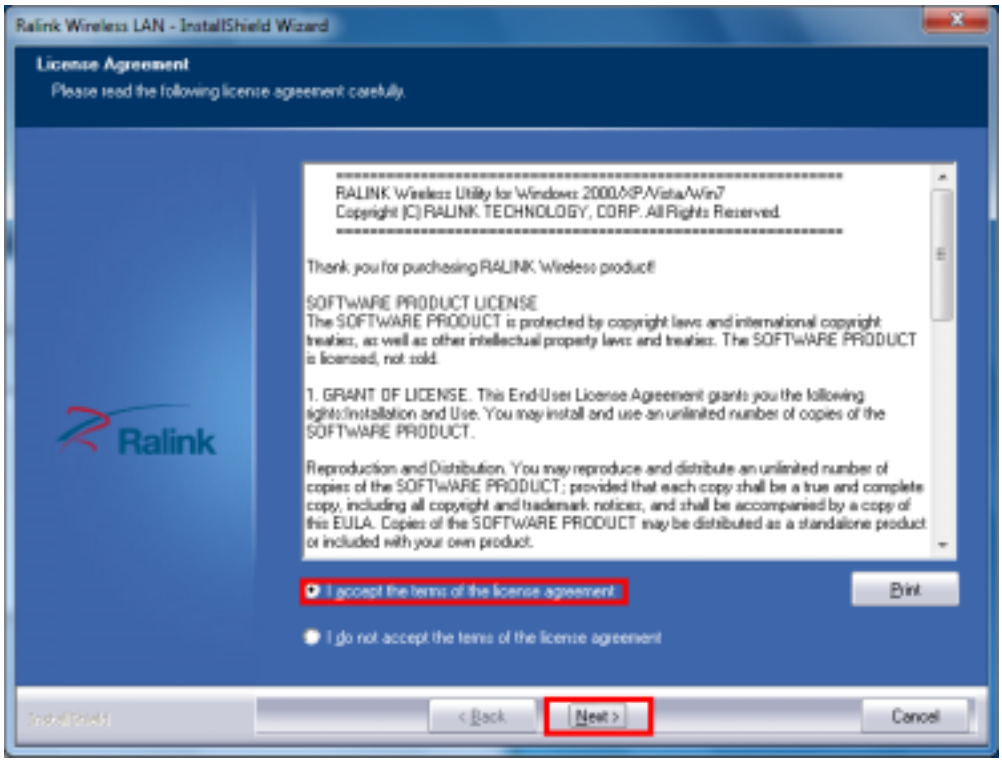
***Note:* If you have installed the Wireless Adapter driver & utility before, please uninstall the old version first.**

STEP1: Found New Hardware Wizard is displayed after the adapter is installed and the computer is restarted. Please click **Cancel** to continue.

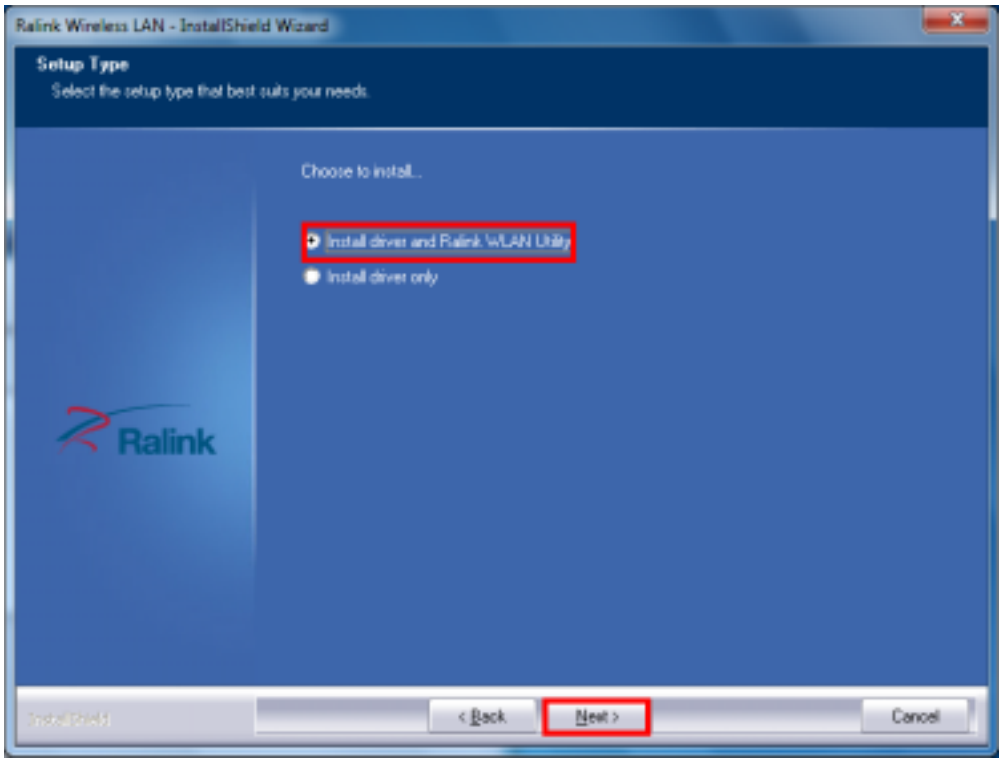


STEP2: Insert Installation CD into CD-ROM drive then windows below will appear. Click **Install Driver** to begin device driver installation.

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.

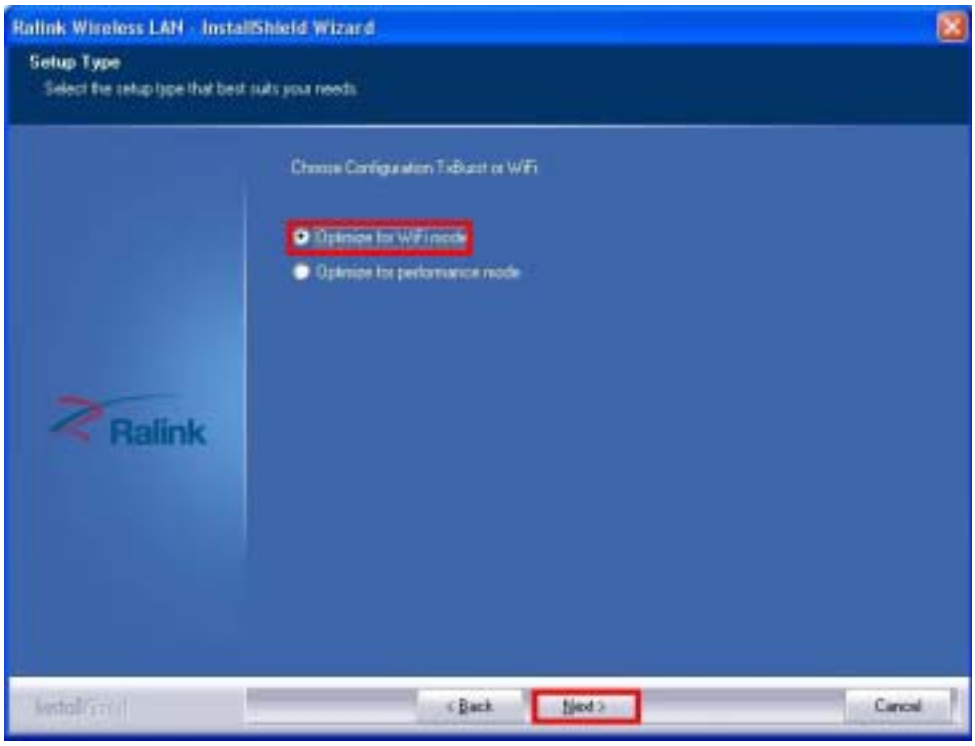


STEP4: Select the setup type that best suits your needs. Click **Next** to continue.

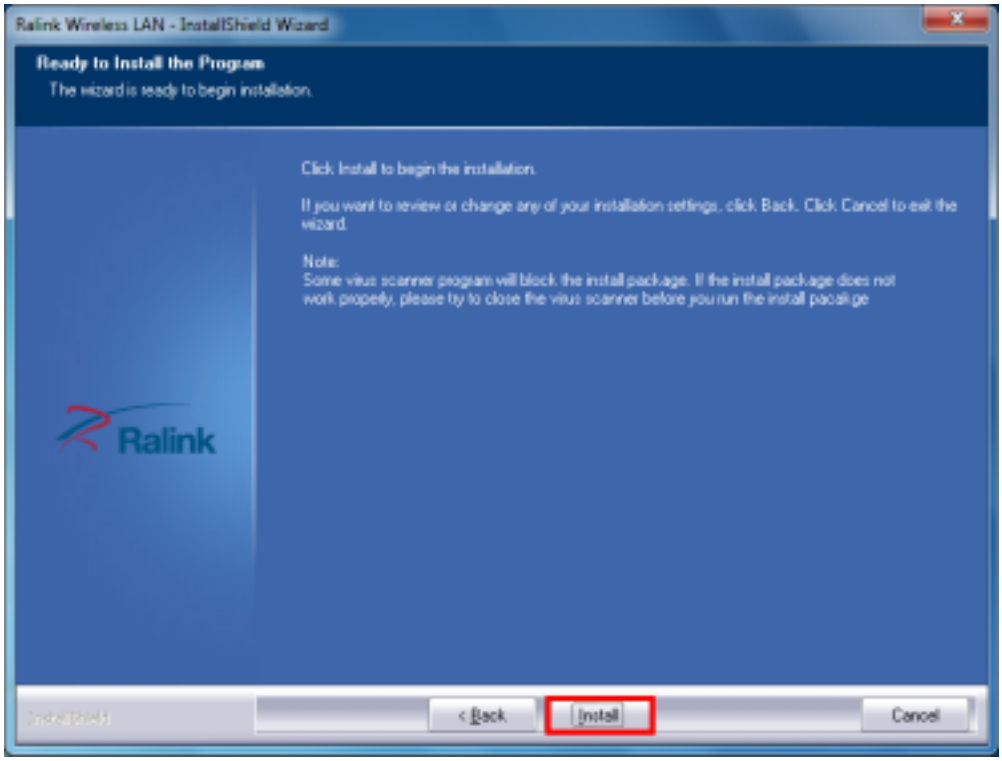


In **Windows XP**, there is a **Windows Zero Configuration Tool** for you to setup wireless adapter. You can choose to configure the adapter through the **Microsoft Zero Configuration Tool** or the **Ralink Configuration Tool**. It is recommended to choose the **Ralink Configuration Tool** for the adapter.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

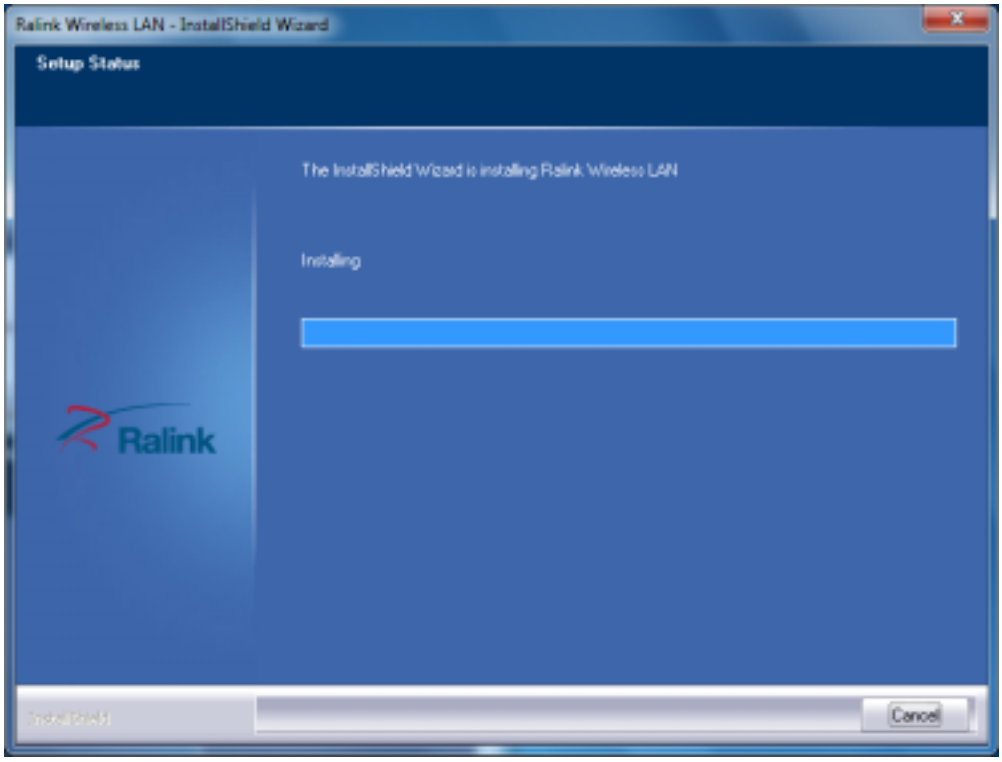
If you need the adapter to operate with better performance, please choose **Optimize for performance mode** to enable the **Tx Burst mode**. Or you can choose **Optimize for WiFi mode** to run in standard wireless network.



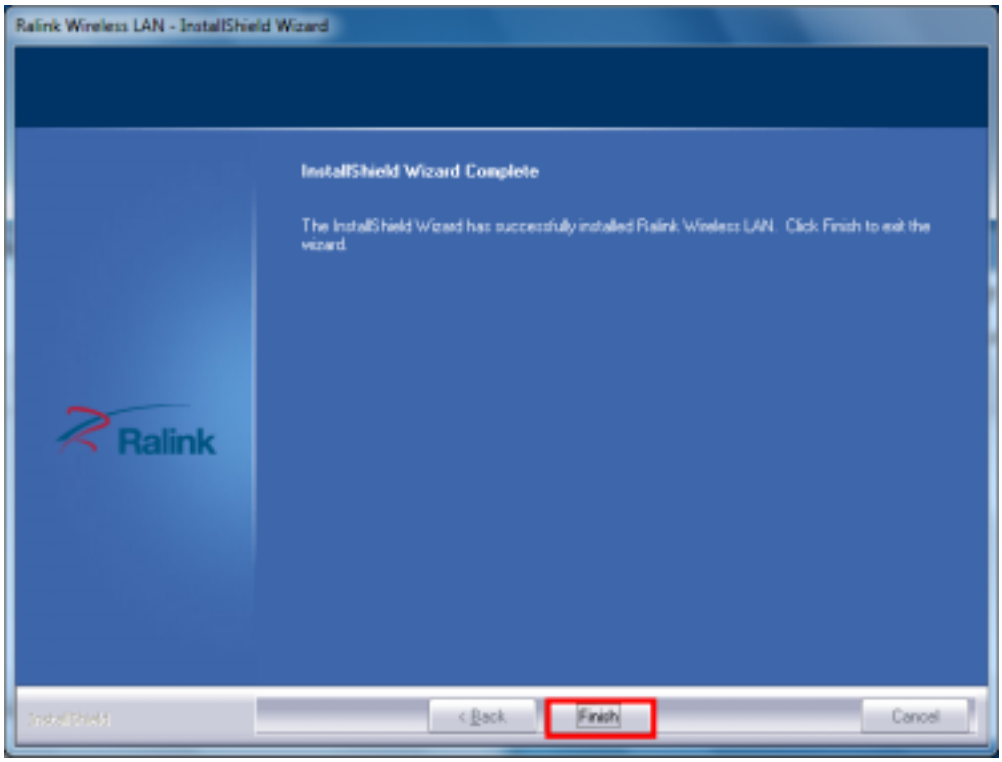
STEP5: Click **Install** to begin the installation.



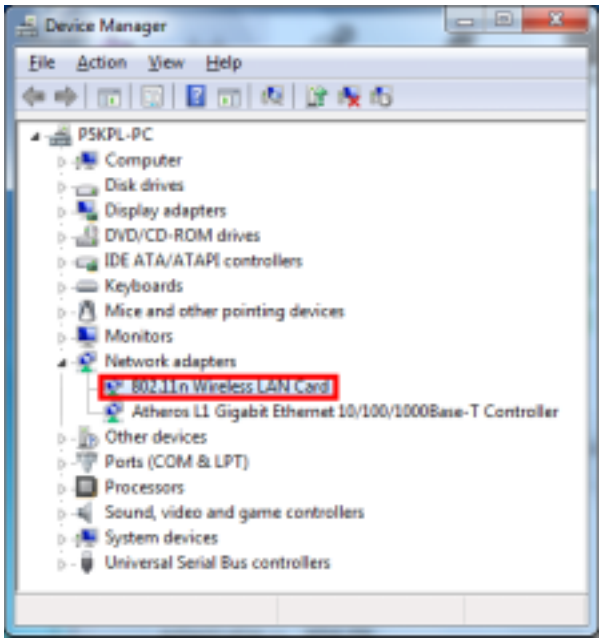
STEP6: Please wait for a while during the adapter is configuring your new software installation.



STEP7: After the setup wizard has successfully installed wireless LAN, click **Finish** to exit the wizard.



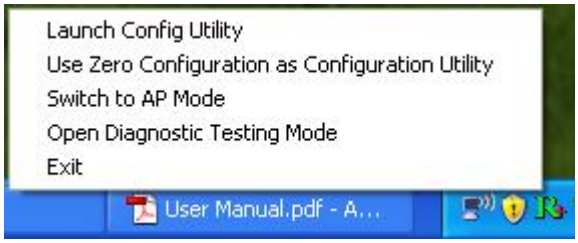
To check if the adapter is properly installed, you can right-click **Computer** → choose **Properties** → click **Device Manager**.



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** → Select this option to use Windows XP built-in wireless configuration utility (Windows Zero Configuration) to configure to card.
- **Switch to AP Mode** → Select this option to change to AP mode.
- **Exit** → Select **Exit** to close the Configuration Utility tool.



3. Wireless Network Configuration Utility

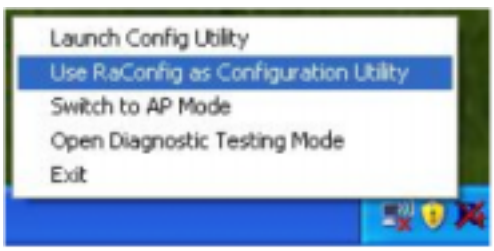
3.1 Wireless Utility (RaUI) & Windows Zero Configuration (WZC)

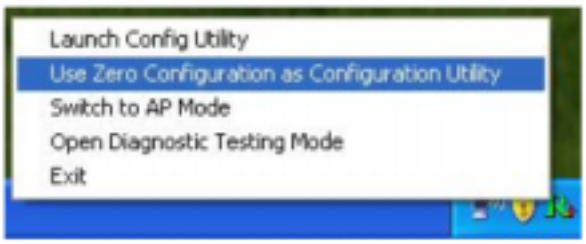
The Configuration Utility is a powerful application that helps you to configure the Wireless LAN adapter and monitor the link status and statistics during the communication process.

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.

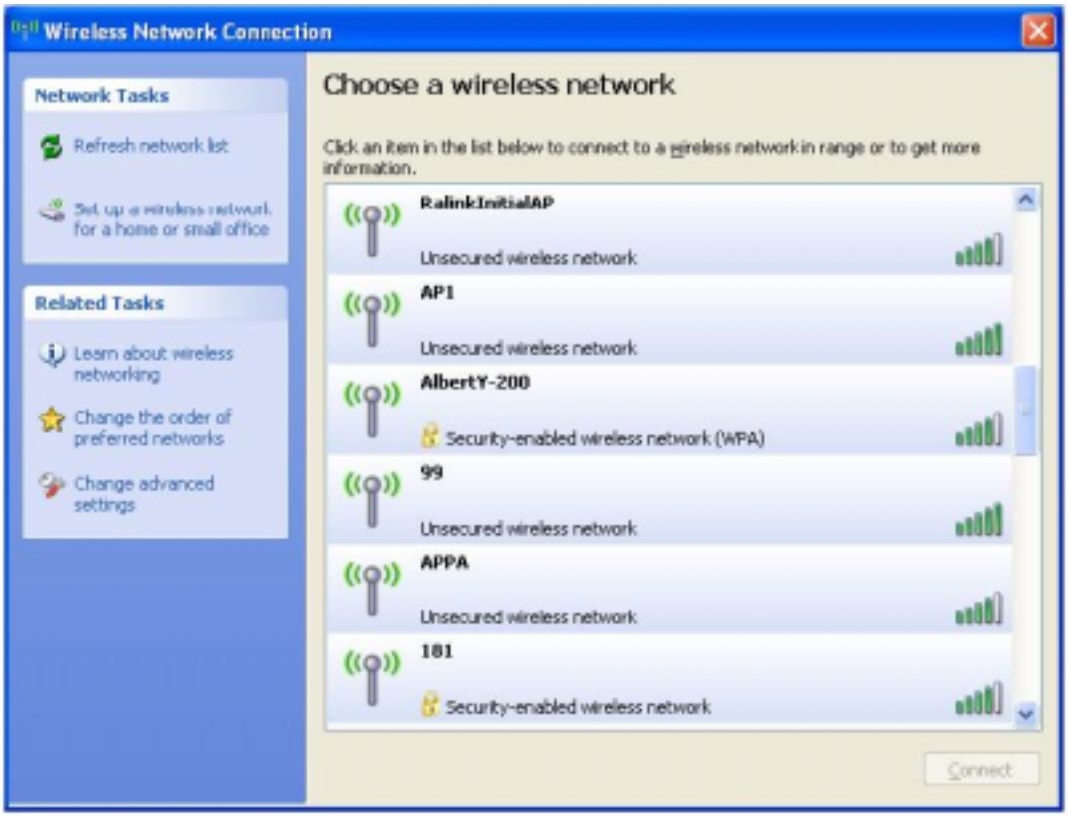
(2) The **connect** and **add profile** function will be gray. The reason is same as the first difference.

3.2 Use WZC to configure wireless adapter

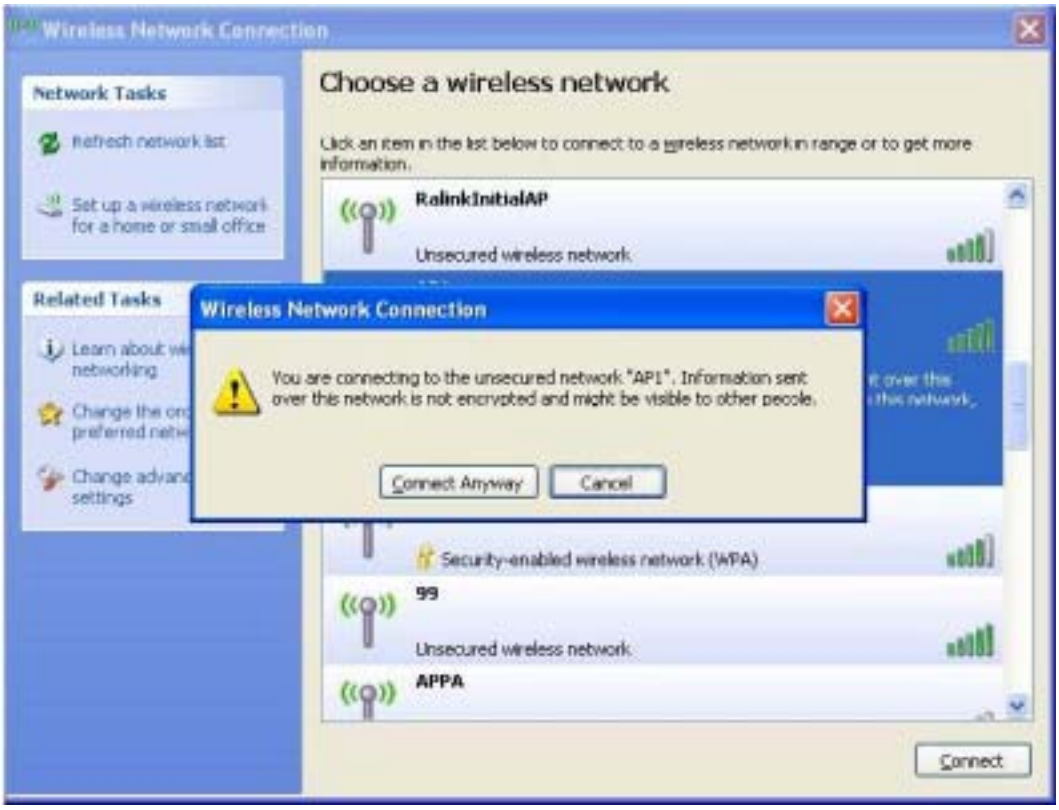
STEP1: If connection is lost or not connected, the status prompt as below will pop up.

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

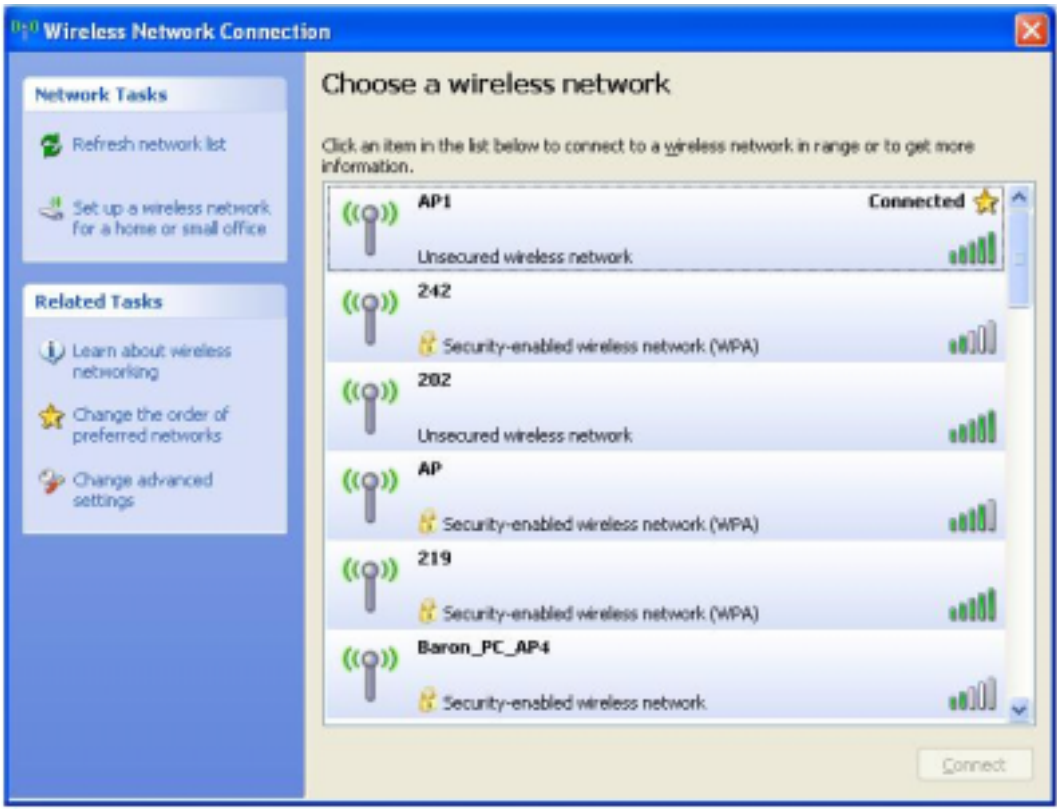
STEP3: Select "**View Available Wireless Networks**" will pop up the dialog shown as below.



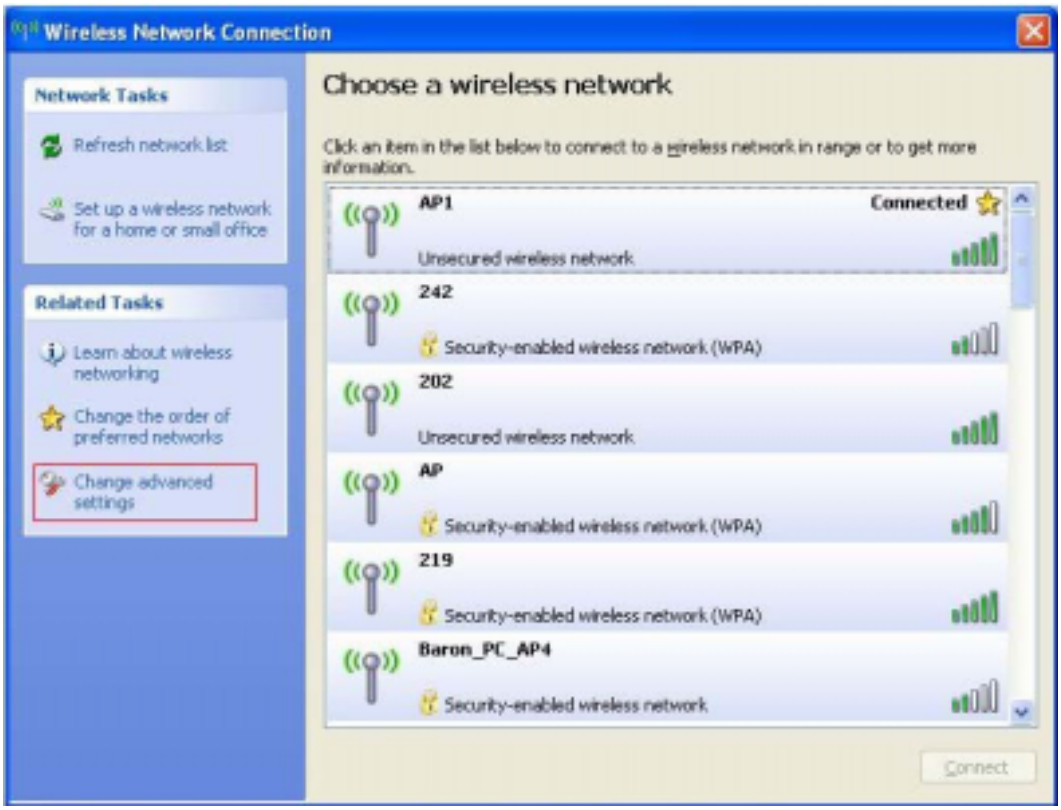
STEP4: Select intended AP and click "**Connect**" shown as below, then click "**Connect Anyway**".



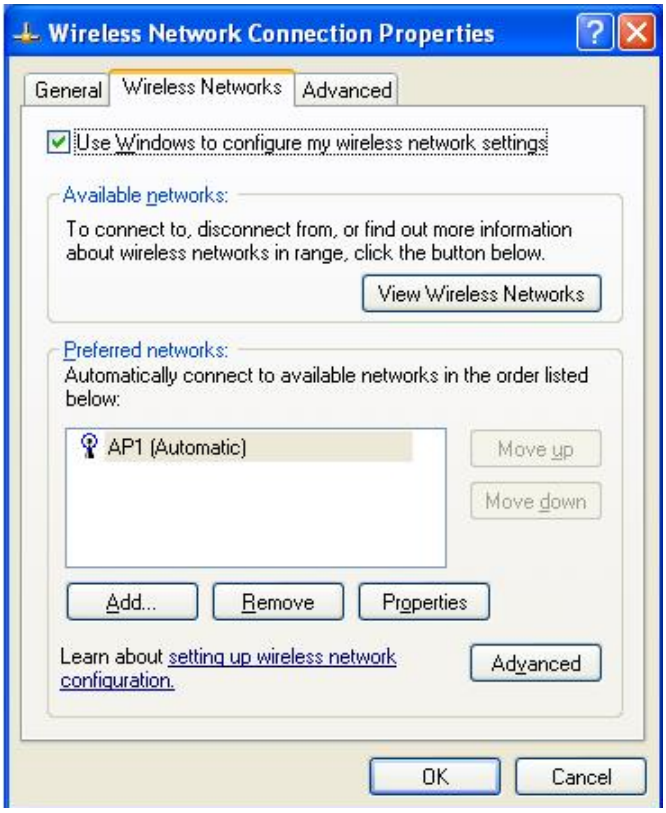
STEP5: AP1 is successful connected.



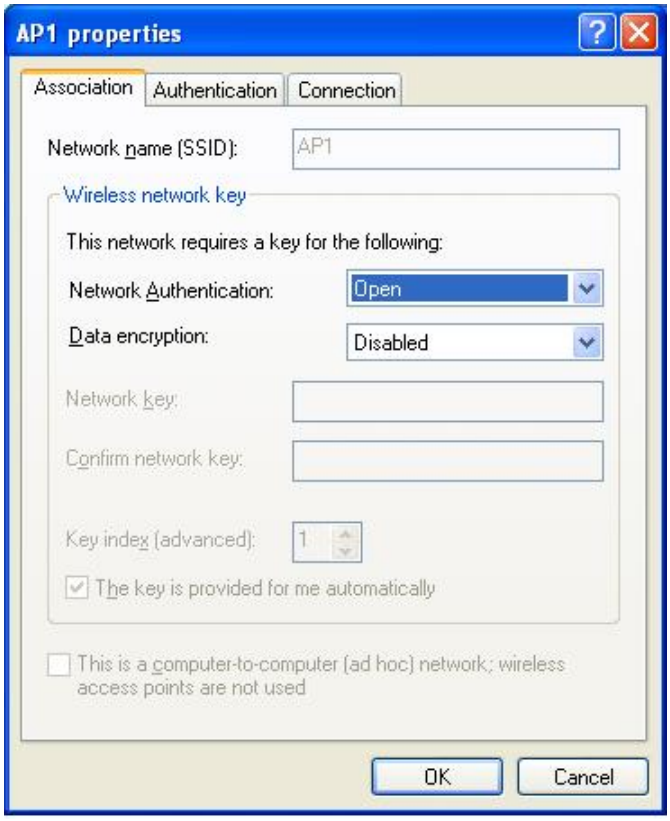
STEP6: If you want to modify information about AP, click "C**hange advanced settings**"



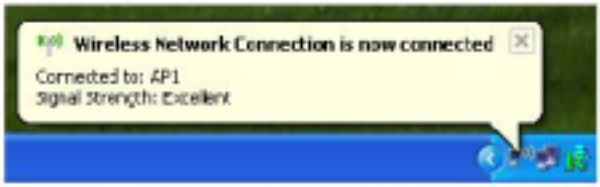
STEP7: Choose "**Wireless Networks**" tab.



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 shown with the green icon indicated as below screen. User may user the available tab to configure more advanced features provided by Ralink's wireless NIC.

3.3 Wireless Utility - RaUI

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, 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

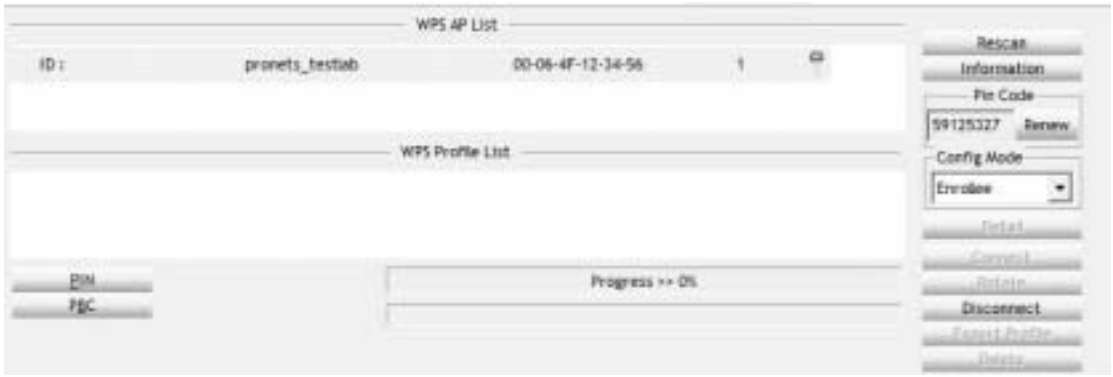
➔ Network Page

➔ Advanced Page

➔ Statistics Page

➔ WMM Page

➔ WPS Page



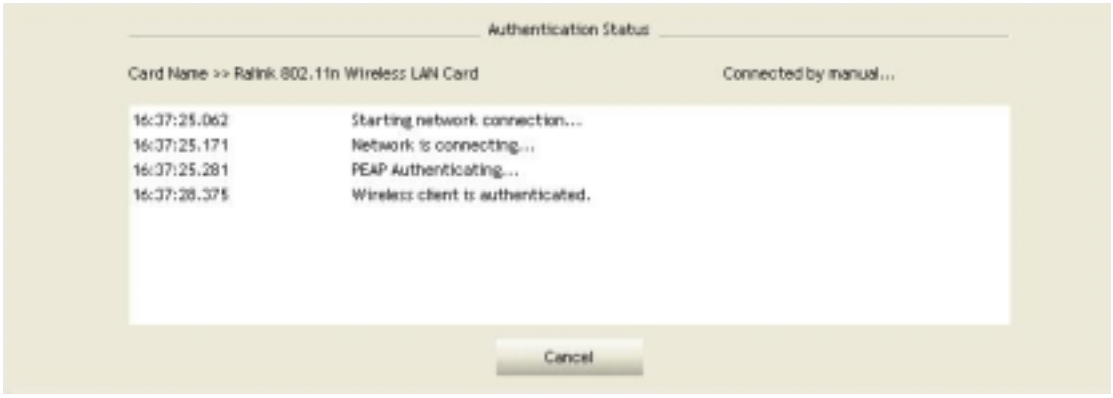
➔ CCX Page

➔ About Page

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

➔ Link Status

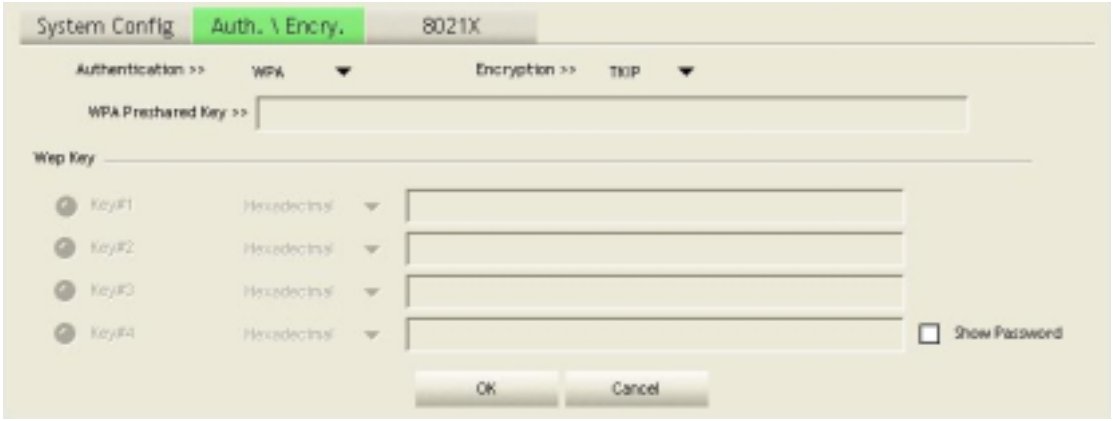
➔ Authentication Status



➔ AP's Information

➔ 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:

➔  -- indicate Connected and Signal Strength is Good.

➔  -- indicate Connected and Signal Strength is Normal

➔  -- indicate Wireless NIC is not connected yet

➔  -- indicate Wireless NIC is not detected

➔  -- indicate Connected and Signal Strength is Weak

3.3.1 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

Channel: channel in use for Ad-Hoc mode

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

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

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 ➔ Add a new profile

Edit ➔ Edit an existing profile

Delete ➔ Delete an existing profile

Import ➔ Import an existing profile

Export ➔ Export the profile

Activate ➔ Activate selected profile

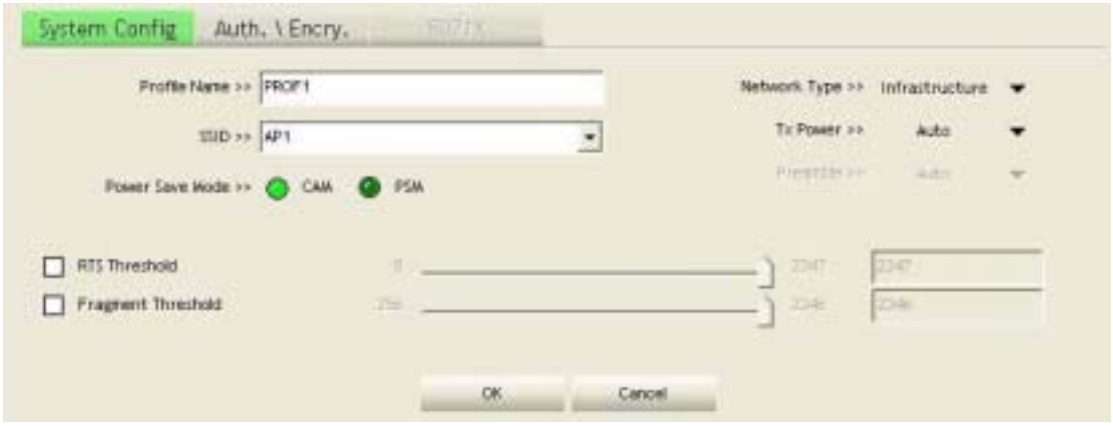
3.3.1.1 Add/Edit Profile

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.

Network Type: There are two types, infrastructure and 802.11 Ad-Hoc mode. Under Ad-Hoc mode, user can also choose the preamble type, the available preamble type includes auto and long. In addition to that the channel field will be available for setup in Ad-Hoc mode.

RTS Threshold: User can adjust the RTS threshold number by sliding the bar or key in the value directly. The default value is 2347.

Fragment Threshold: User can adjust the Fragment threshold number by sliding the bar or key in the value directly. The default value is 2346.

Channel: Only available for setting under Ad-Hoc mode. User can choose the channel frequency to start their Ad-Hoc network.

Authentication Type: There are 7 type of authentication modes supported by RaUI. They are Open, Shared, LEAP, WPA, WPA-PSK, WPA2, WPA2-PSK.

Encryption Type: For open and shared authentication mode, the selection of encryption type are None and WEP. For WPA, WPA2, WPA-PSK and WPA2-PSK authentication mode, the encryption type supports both TKIP and AES.

802.1x Setting: It is an authentication for WPA and WPA2 certificate to server.

WPA Pre-Shared Key: This is the shared secret between AP and STA. For WPA-PSK and WPA2-PSK authentication mode, this field must be filled with character longer than 8 and less than 32 lengths.

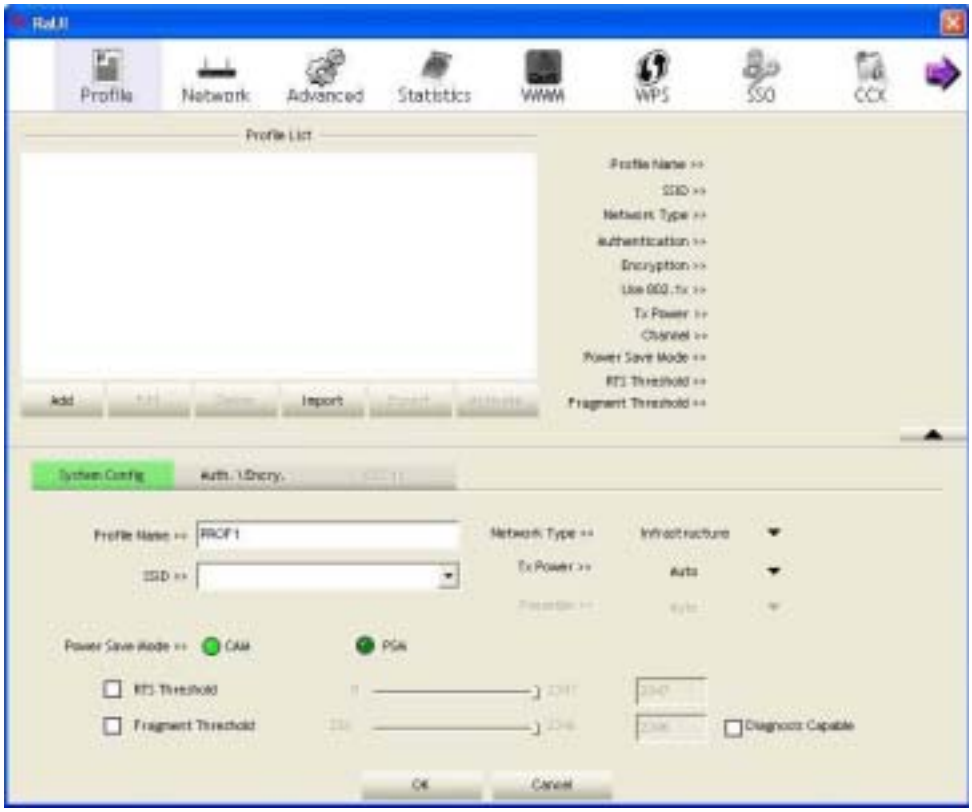
WEP Key: Only valid when using WEP encryption algorithm. The key must matched AP's key. There are several formats to enter the keys:

- ➔ Hexadecimal – 40bits: 10 Hex characters
- ➔ Hexadecimal – 128bits: 26 Hex characters.
- ➔ ASCII – 40bits: 5 ASCII characters
- ➔ ASCII – 128bits: 13 ASCII characters

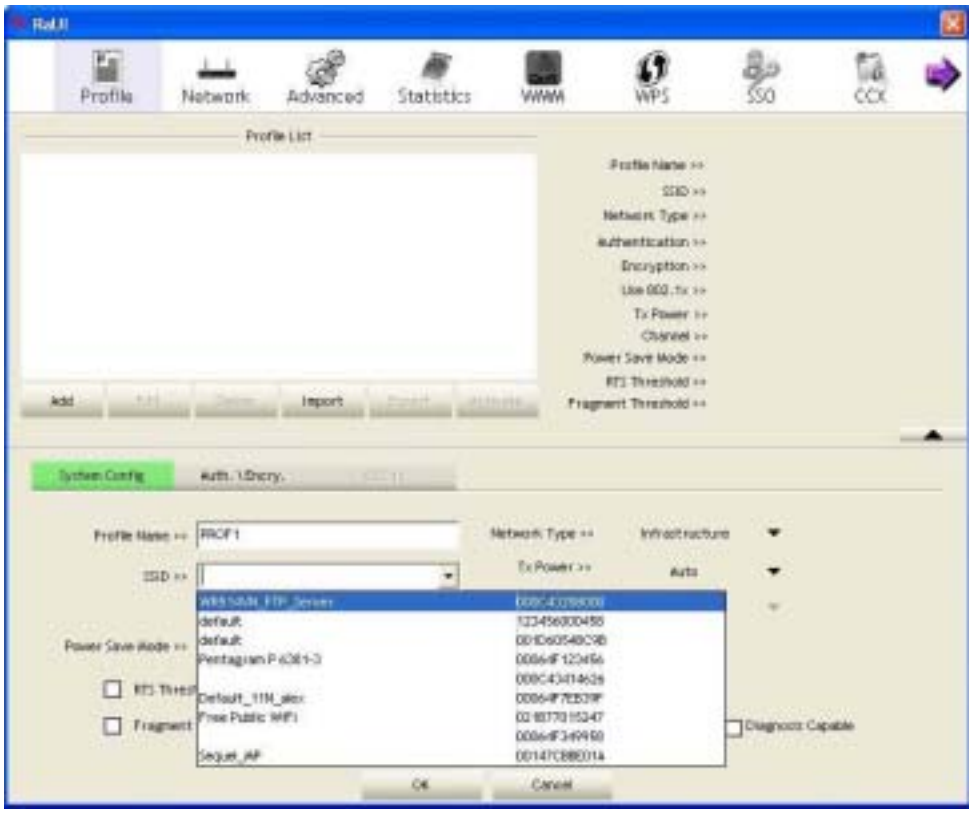
3.3.1.2 Example to Add Profile in Profile

Step 1: Click **Add** in Profile function

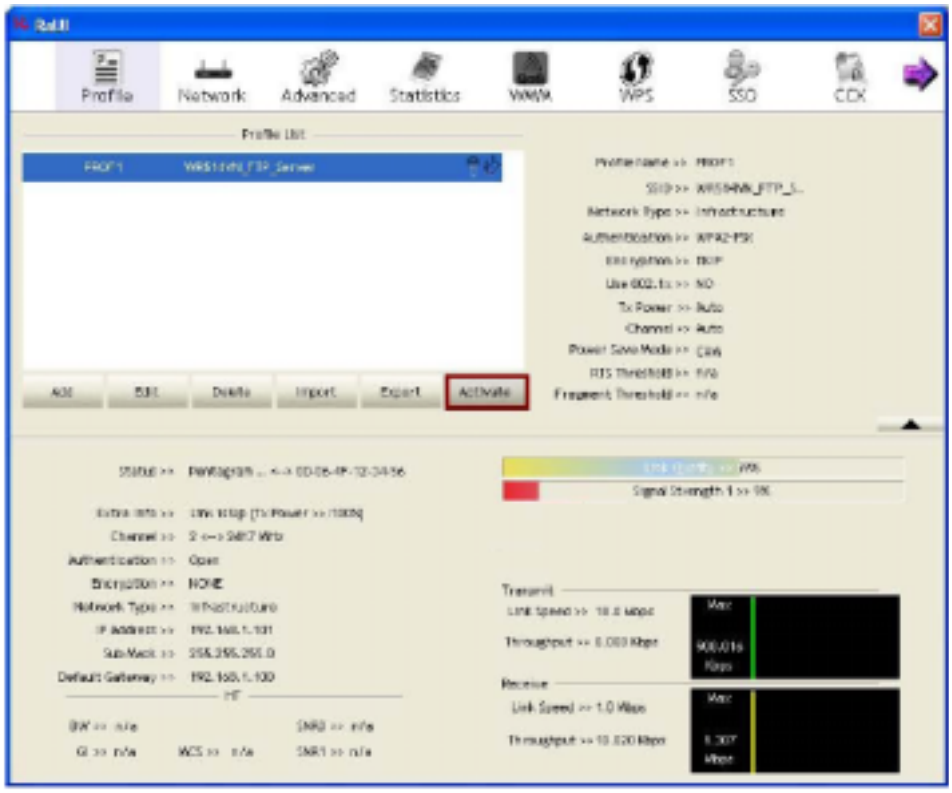
Step 2: **Add Profile** page will pop up.



Step 3: Change profile name to what you want to connect. Pull down the SSID and select one intended AP. The AP list is the result of last Network.



Step 4: Then, you can see the profile which you set appear in the profile list. Click "**Activate**" to activate the profile setting.



3.3.2 Network

Under the Network function, system will display the information of surrounding APs from last scan result. List information includes SSID, BSSID, Signal, Channel, Encryption algorithm, Authentication and Network type as below:

[Definition of each field]

SSID: Name of BSS or IBSS network

Network Type: Network type in use, infrastructure for BBS, Ad-Hoc for IBSS network

Channel: Channel in use.

Wireless Mode: AP support wireless mode. IT may support 802.11b, 802.11g or 802.11n wireless mode.

Security-Enable: Whether AP provides security-enabled wireless network

Signal: Receive signal strength of specified network

[Icons & Buttons]

 ➔ Indicate connection is successful.

 ➔ Indicate network type is infrastructure mode.

 ➔ Indicate network type is Ad-Hoc mode.

 ➔ Indicate security-enabled wireless network.

 ➔ Indicate 802.11b wireless mode.

 ➔ Indicate 802.11n wireless mode.

➔ Indicate the AP lists are sorted by SSID, Channel, or Signal.

➔ Command to connect to the selected network.

➔ Issue a rescan command to wireless NIC to update information on surrounding wireless network.

➔ Add the selected AP to Profile setting. It will bring up profile page and save user's setting to a new profile.

[Connected Network]

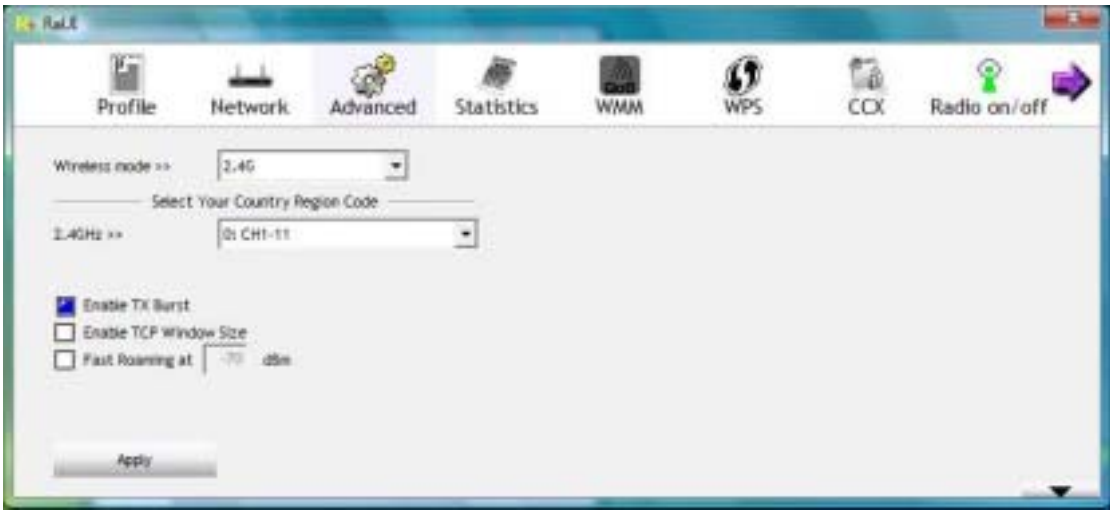
(1) When RaUI first ran, it will select the best AP to connect automatically.

(2) If user wants to connect to other AP, He can click "Connect: button for the intended AP to make connection.

(3) If the intended network has encryption other than "Not Use", RaUI will bring up the security page appropriate information to make the connection.

(4) When you double-click on the intended AP, you can see AP's detail information.

3.3.3 Advanced



Wireless Mode: Here support **2.4G** wireless mode

Enable Tx Burst: Check to enable this function. This function enables the adapter to deliver better throughput during a period of time, it only takes effect when connecting with the AP that

supports this function..

Enable TCP Windows Size: Check to increase the transmission quality. The large TCP Window size the better performance

Fast Roaming at: Fast to roaming, setup by transmit power.

Select your Country Region Code: The available channel differs from different countries. For example: USA (FCC) is channel 1-11, Europe (ETSI) is channel 1-13. The operating frequency channel will be restricted to the country user located before importing. If you are in different country, you have to adjust the channel setting to comply the regulation of the country. Supporting region code for this section has CH1-11, CH1-13, CH10-11, CH10-13, CH14, CH1-14, CH3-9, and CH5-13. Please refer to below Channel Classification and range, Country Channel list to select your Country Region Code:

Classification	Range
0:GFCC	CH1 ~ CH11
1:GIC (Canada)	CH1 ~ CH11
2:GETSI	CH1 ~ CH13
3:GSPAIN	CH10 ~ CH11
4:GFRANCE	CH10 ~ CH13
5:GMKK	CH14 ~ CH14
6:GMKKI (TELEC)	CH1 ~ CH14
7:GISRAEL	CH3 ~ CH9

Figure 1: Channel Classification and range

Country Name	Classification	Range
Argentina	0	CH1~11
Australia	1	CH1~13
Austria	1	CH1~13
Bahrain	1	CH1~13
Belarus	1	CH1~13
Belgium	1	CH1~13
Bolivia	1	CH1~13
Brazil	0	CH1~11
Bulgaria	1	CH1~13
Canada	0	CH1~11
Chile	1	CH1~13
China	1	CH1~13
Colombia	0	CH1~11
Costa Rica	1	CH1~13
Croatia	1	CH1~13
Cyprus	1	CH1~13
Czech Republic	1	CH1~13
Denmark	1	CH1~13
Ecuador	1	CH1~13
Egypt	1	CH1~13
Estonia	1	CH1~13
Finland	1	CH1~13
France	3	CH10~13
France2	1	CH1~13
Germany	1	CH1~13
Greece	1	CH1~13
Hong Kong	1	CH1~13
Hungary	1	CH1~13
Iceland	1	CH1~13
India	1	CH1~13
Indonesia	1	CH1~13
Ireland	1	CH1~13
Israel	6	CH3~9
Italy	1	CH1~13
Japan	5	CH1~14
Japan2	4	CH14~14
Japan3	1	CH1~13
Jordan	3	CH10~13
Kuwait	1	CH1~13
Latvia	1	CH1~13

Country Name	Classification	Range
Lebanon	1	CH1~13
Liechtenstein	1	CH1~13
Lithuania	1	CH1~13
Luxembourg	1	CH1~13
Macedonia	1	CH1~13
Malaysia	1	CH1~13
Mexico	0	CH1~11
Morocco	1	CH1~13
Netherlands	1	CH1~13
New Zealand	1	CH1~13
Nigeria	1	CH1~13
Norway	1	CH1~13
Panama	1	CH1~13
Paraguay	1	CH1~13
Peru	1	CH1~13
Philippines	1	CH1~13
Poland	1	CH1~13
Portugal	1	CH1~13
Puerto Rico	1	CH1~13
Romania	1	CH1~13
Russia	1	CH1~13
Saudi Arabia	1	CH1~13
Singapore	1	CH1~13
Slovakia	1	CH1~13
Slovenia	1	CH1~13
South Africa	1	CH1~13
South Korea	1	CH1~13
Spain	2	CH10~11
Sweden	1	CH1~13
Switzerland	1	CH1~13
Taiwan	0	CH1~11
Thailand	1	CH1~13
Turkey	1	CH1~13
United Arab Emirates	1	CH1~13
United Kingdom	1	CH1~13
United States of America	0	CH1~11
Uruguay	1	CH1~13
Venezuela	1	CH1~13
Yugoslavia	0	CH1~11

Figure 2: Country Channel list

3.3.4 Statistics

Statistics page displays the detail counter information based on 802.11 MIB counters. This page translates the MIB counters into a format easier for user to understand.

[Transmit Statistics]

Frames Transmitted Successfully: Frames successfully sent.

Frames Retransmitted Successfully: Successfully retransmitted frames numbers

Frames Fail To Receive ACK After All Retries: Frames failed transmit after hitting retry limit.

Reset Counter: Reset counters to zero

[Receive Statistics]

Frames Received Successfully: Frames received successfully.

Frames Received With CRC Error: Frames receive with CRC error.

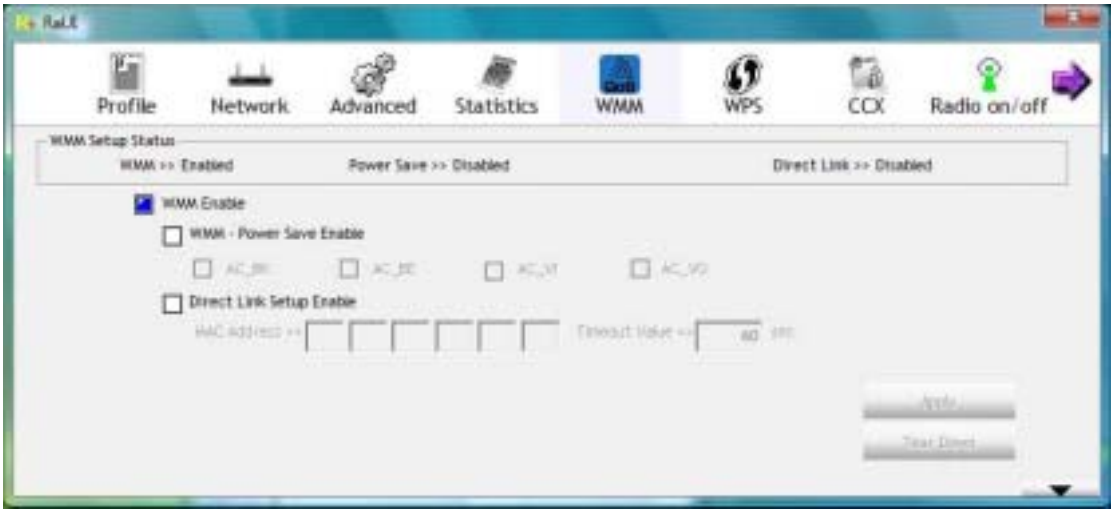
Frames Dropped Due To Out-Of-Resource: Frames dropped due to resource issue.

Duplicate Frames Received: Duplicate received frames.

Reset Counter: Reset counters to zero

3.3.5 WMM

WMM function involves "**WMM Enable**", "**WMM-Power Save Enable**" and "**DSL Setup**".



WMM Enable: Enabe Wi-Fi Multi-Media.

WMM-Power Save Enable: Enable WMM Power Save.

Direct Link Setup Enable: Enable DLS (direct Link Setup).

[WMM Enable – Enable Wi-Fi Multi-Media]

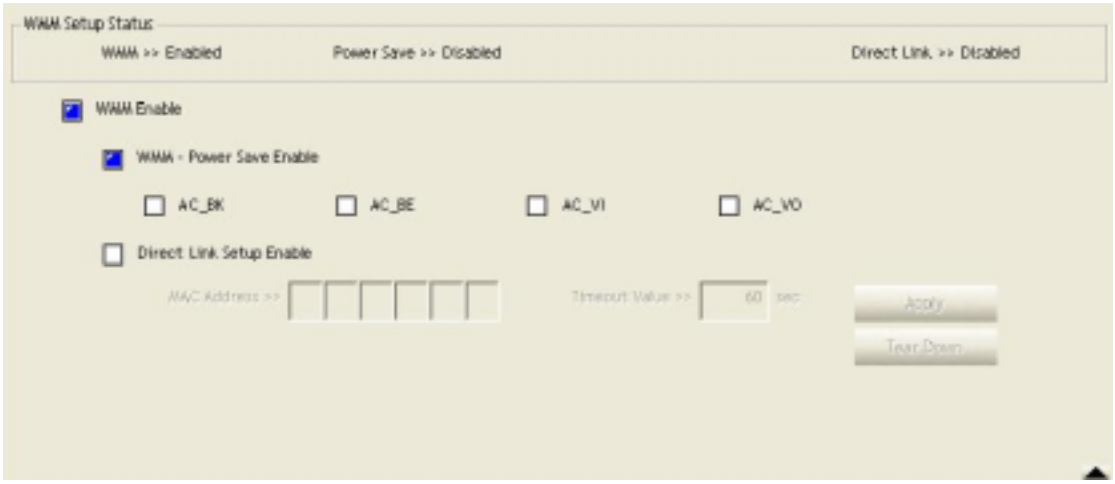
If you want to use “WMM-Power Save” or “Direct Link Setup” you must enable WMM. The setting methods of enabling WMM indicating as follow:

Step 1: Click “**WMM Enable**”

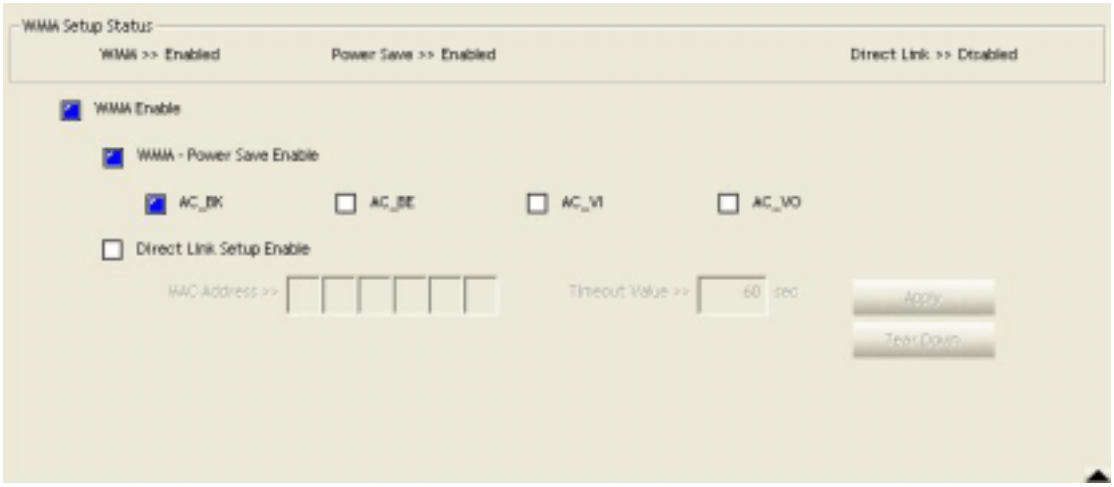
Step 2: Change to “**Network**” function. And add an AP that supports WMM features to a **Profile**. The result will look like the below figure in **Profile** page.

[WMM-Power Save Enable – Enable WMM Power Save]

Step 1: Click "**WMM-Power Save Enable**"

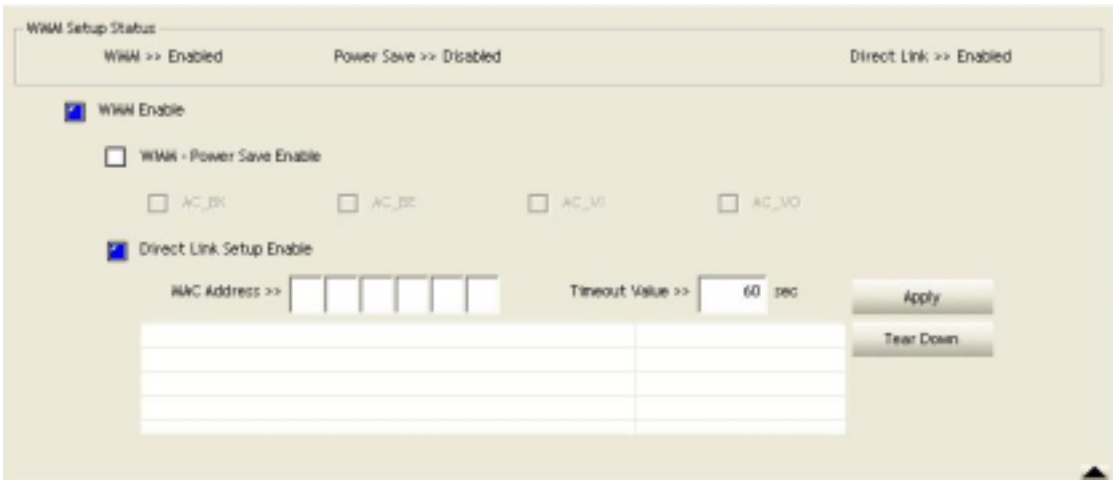


Step 2: Please select which ACs you want to enable. The setting of enabling WMM-Power Save is successfully.



[Direct Link Setup Enable – Enable DLS (Direct Link Setup)]

Step 1: Click "**Direct Link Setup Enable**"



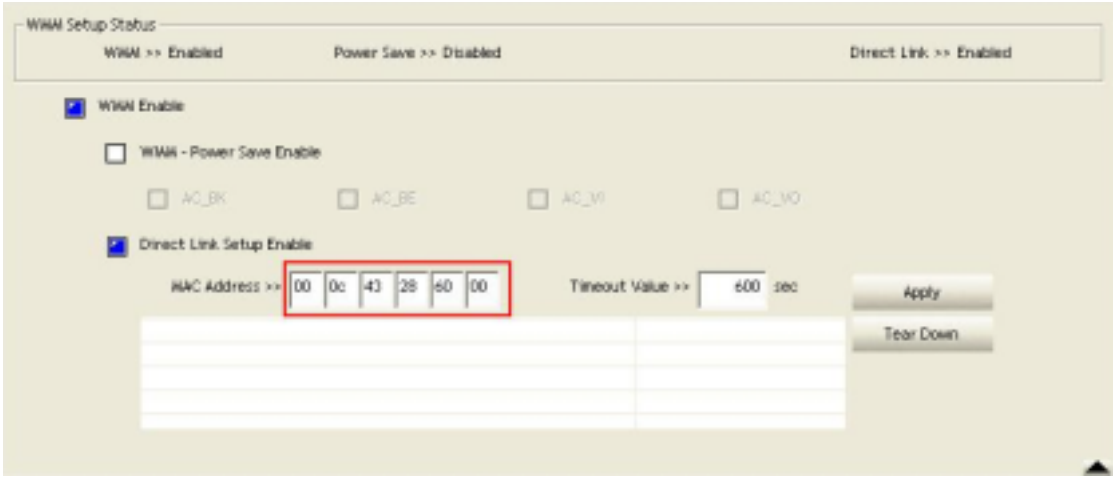
Step 2: Change to "**Network**" function. And add an AP that supports DLS features to a **Profile**. The result will look like the below figure in **Profile** page.

The Setting of DLS indicates as follow:

(1) Fill in the blanks of Direct Link with MAC address of STA. The STA must conform to 2 conditions as follow:

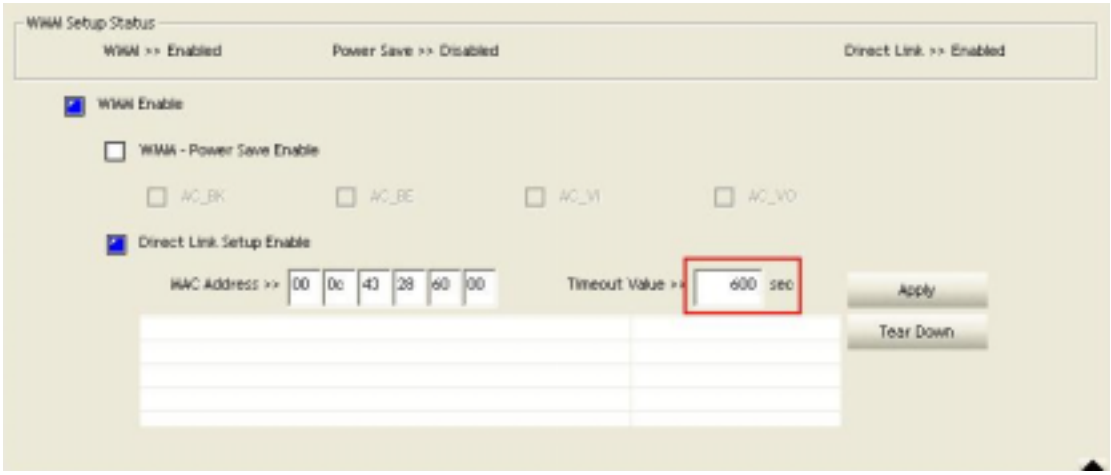
➔ Connect with the same AP that support DLS features.

➔ Have to enable DLS

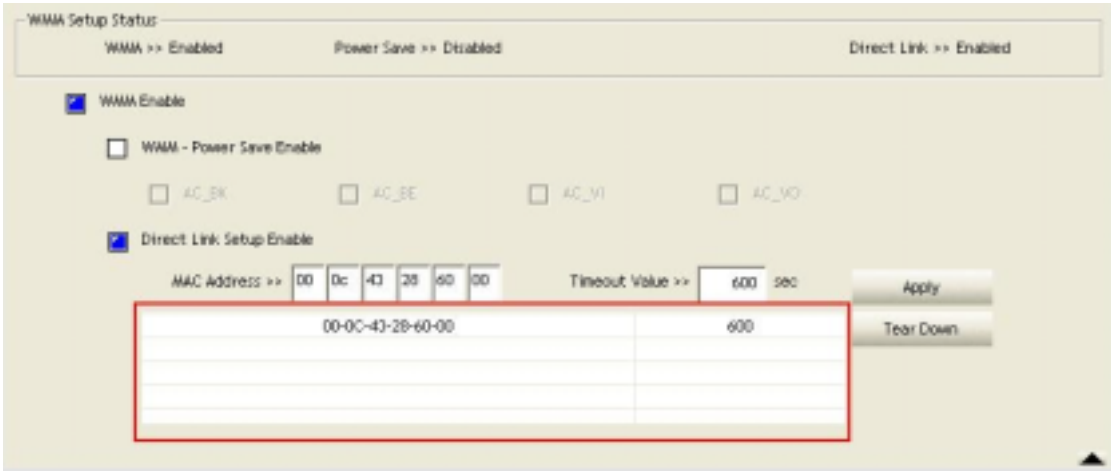


(2) Timeout Value represent that it disconnect automatically after some seconds. The value

is integer. The integer must be between 0~65535. It represents that it always connects if the value is zero. Default value of Timeout Value is 60 seconds.



(3) Click "**Apply"** button. The result will look like the below figure.

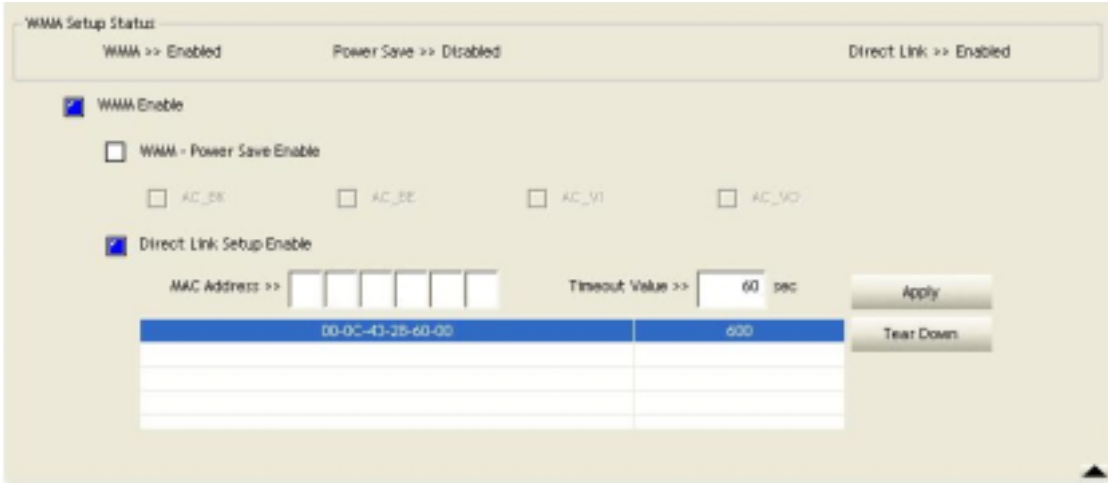


Describe "DLS Status" as follow:

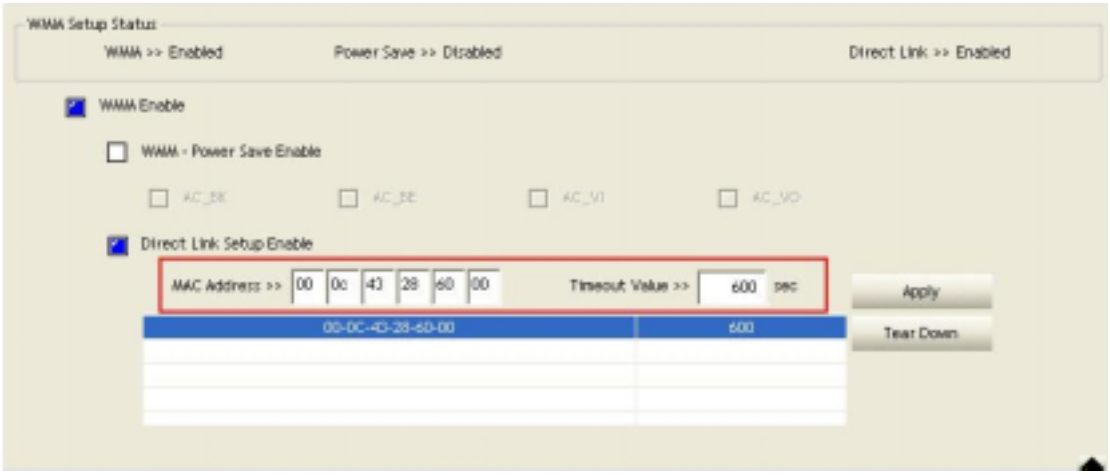
(1) As the up figure, after configuring DLS successfully, show MAC address of the opposite side and Timeout Value of setting in "**DLS Status**". In "**DLS Status**" of the opposite side, it shows MAC address of itself and Timeout Value of setting.

(2) Display the values of "**DLS Status**" to "**Direct Link Setup**" as follow:

Step 1: In "**DLS Status**", select a direct link STA what you want to show its values in "**Direct Link Setup**".

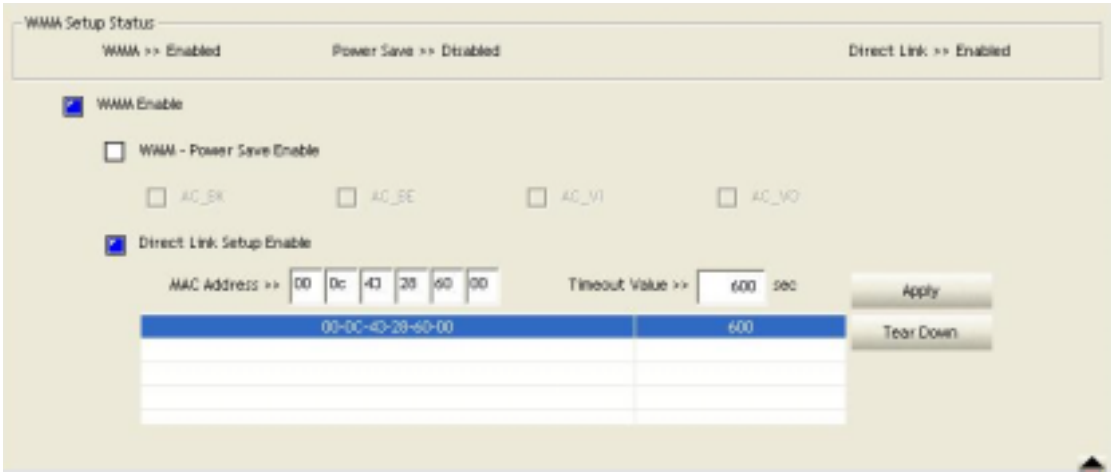


Step 2: Double-Click and the result will look like the below figure.



(3) Disconnect Direct Link Setup as follow:

Step 1: Select a direct link STA.



Step 2: Click "**Tear Down**" button. The result will look like the below figure.

3.3.6 WPS

WPS Configuration: The primary goal of Wi-Fi Protected Setup (Wi-Fi Simple Configuration) is to simply the security setup and management of Wi-Fi networks. Ralink STA as an Enrollee or external Registrar supports the configuration setup using PIN configuration method or PBC configuration setup using PIN configuration method or PBC configuration method through an internal or external Registrar.

WPS AP List: Display the information of surrounding APs with WPS IE from last scan result. List information includes SSID, BSSID, Channel, ID (Device Password ID), Security-Enabled.

Rescan: Issue a rescan command to wireless NIC to update information on surrounding wireless network.

Information: Display the information about WPS IE on the selected network. List Information includes Authentication Type, Encryption Type, Config Methods, Device Password ID, Selected Registrar, State, Version, AP Setup Locked, UUID-E and RF Bands.

PIN Code: 8-digit numbers. It is required to enter PIN Code into Registrar using PIN method. Each NIC Wireless has only one PIN Code of Enrollee.

Config Mode: Our station role-playing as an Enrollee or an external Registrar.

WPS Profile List: Display all of credentials got from the Registrar. List information includes SSID, MAC address, Authentication and Encryption Type. If STA Enrollee, credentials are created as soon as each WPS success. If STA Registrar, RaUI creates a new credential with WPA2-PSK/AES/64Hex-Key and doesn't change until next switching to STA Registrar.

Control items on WPS Profile List:

➔ Detail: Information about Security and Key in the credential

➔ Connect: Command to connect to the selected network inside credentials. The active selected credential is as like as the active selected Profile.

➔ Rotate: Command to rotate to connect to the next inside credentials

➔ Disconnect: Stop WPS action and disconnect this active link. And then select the last profile at the Profile Page of RaUI if exist. If there is an empty profile page, the driver will select any non-security AP.

➔ Delete: Delete an existing credential. And then select the next credential if exist. If there is an empty credential, the driver will select any non-security AP.

PIN: Start to add to Registrar using PIN configuration method. IF STA Registrar, remember that enter PIN Code read from you Enrollee before starting PIN.

PBC: Start to add to AP using PBC configuration method.

★ When you click PIN or PBC, please **don't do** any rescan within two-minute connection. If you want to abort this setup within the interval, restart PIN/PBC or press **Disconnect** to stop WPS connection.

WPS associate IE: Send the association request with WPS IE during WPS setup. It is optional for STA.

WPS probe IE: Send the probe request with WPS IE during WPS setup. IT is optional for STA.

Progress Bar: Display rate of progress from Start to Connected status.

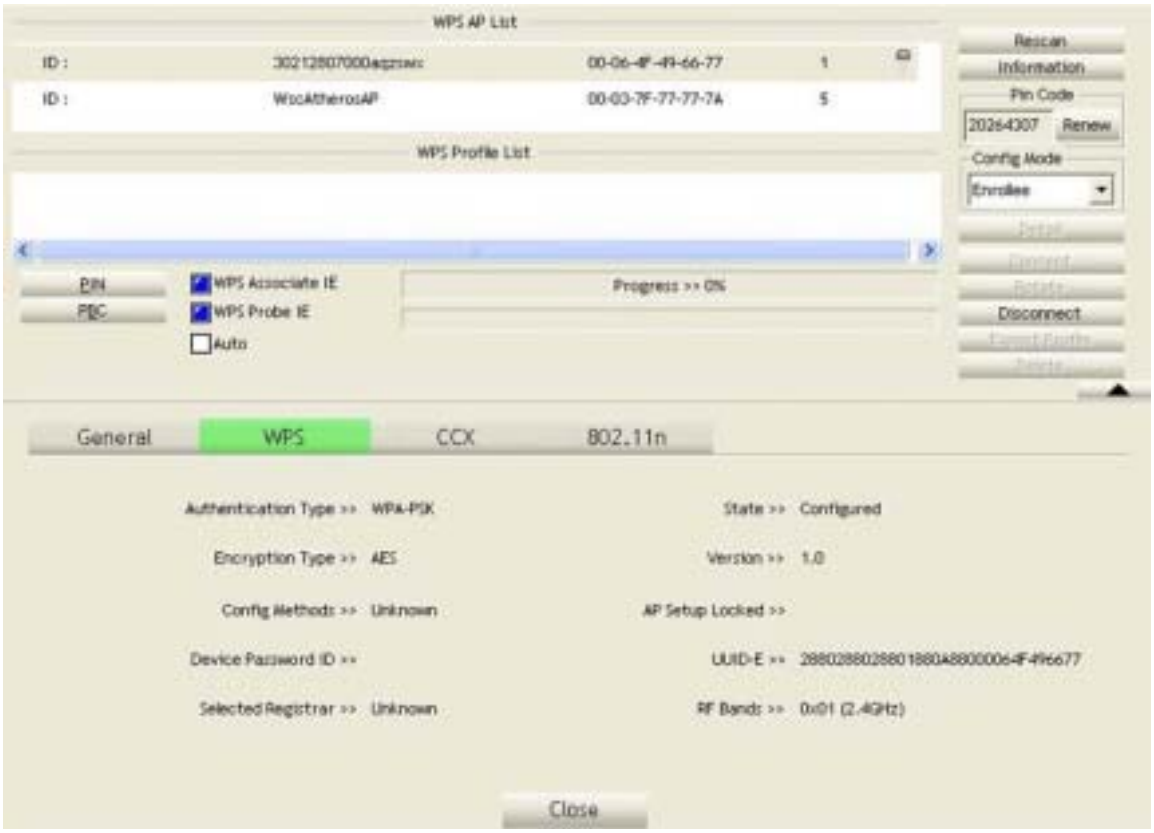
Status Bar: Display currently WPS Status.

[WPS Information on AP]

WPS information contain authentication type, encryption type, config methods, device password ID, selected registrar, state, version, AP setup locked, UUID-E and RF bands.

Authentication Type: There are three types of authentication modes supported by RaConfig. There are Open, Shared, WPA-PSK, and WPA system.

Encryption Type: For Open and shared authentication mode, the selection of encryption are None and WEP. For WPA, WPA2, WPA-PSK, and WPA2-PSK authentication mode, the encryption type supports both TKIP and AES.



Config Methods: Correspond to the methods the AP supports as an Enrollee for adding external Registrars. (A bitwise OR of values)

Value	Hardware Interface
0x0001	USBA (Flash Drive)
0x0002	Ethernet
0x0004	Label
0x0008	Display
0x0010	External NFC Token
0x0020	Integrated NFC Token
0x0040	NFC Interface
0x0080	Push Button
0x0100	Keypad

Device Password ID: Indicate the method or identifies the specific password that the selected Registrar intends to use. AP in PBC mode must indicate 0x0004 within two-minute Walk time.

Value	Description
0x0000	Default (PIN)
0x0001	User-specified
0x0002	Rekey
0x0003	Display
0x0004	PushButton (PBC)
0x0005	Registrar-specified
0x0006-0x000F	Reserved

Selected Registrar: Indicate if the user has recently activated a Registrar to add an Enrollee. The values are "TRUE" and "FALSE"

State: The current configuration state on AP. The value are "Unconfigured" and "Configured".

Version: WPS specified version.

AP Setup Locked: Indicate if AP has entered a setup locked state.

UUID-E: The universally unique identifier (UUID) element generated by the Enrollee. There is a value. It is 16 bytes.

RF-Bands: Indicate All RF bands available on the AP. A dual-band AP must provide it. The values are "2.4GHz" and "5GHz"

3.3.7 SSO

The SSO configuration page as shown in blow diagram:

(SSO funciton doesn't support Vista & Win 7 OS)

[Field Definitions]

Enable SSO Feature: Choose which SSO methods to log on.

Use ID and Password in Winlogon: Use the ID and password in Windows logon.

Use ID and Password in Profile: Use the ID and password in Raul profile settings.

Use ID and Password in Dialog: Use the ID and password in pop-in authentication dialog

Enable Persistent Connection: Use ID and Password in the previous activate Profile and not show any authentication dialog

Profile List (Only support LEAP or EAP-FAST authentication):

Select Profile: Select a profile containing LEAP or EAP-FAST authentication

Information of selected profile: Profile information, such as profile name, SSID, and Authentication.

3.3.8 CCX

The CCX (Cisco Compatible eXtensions) configuration page as shown in blow diagram: (CCX function doesn't support Windows 7 OS)

[Field Definitions]

Enable CCX (Cisco Compatible eXtensions): Click here to enable CCX function.

Enable Radio Measurements: Check to enable the Radio measurement function.

Non-Serving Channel Measurements Limit: User can set channel measurement every 0~1023 milliseconds. Default is set to 250 milliseconds.

Roaming with RF Parameters: Roaming by a set of RF parameters from AP.

Voice Drastic Roaming: Diagnose roaming function by voice traffic test.

CAC(Tolerance): Enable the call admission control.

Diagnostic: Select a profile which the user want to diagnose, then hit the Diagnose button to perform the diagnostic test.

Information of selected profile: Profile information, such as profile name, SSID, and Diagnosis Capable information.

3.3.9 About

About function display the wireless card and driver version information.

(1) Connect to Ralink's Website: WWW.RALINKTECH.COM

(2) Display Configuration Utility, Driver, and EEPROM version information

(3) Display Wireless NIC MAC Address.

3.3.10 Link Status

Link Status displays the detail information current connection

Status: Current connection status. If no connection, it will show Disconnected. Otherwise, the SSID and BSSID will show here.

Extra Info: Display link status in use.

Channel: Display current channel in use.

Authentication: Authentication mode in use.

Encryption: Encryption type in use.

Network Type: Network type in use.

IP Address: IP address about current connection.

Sub Mask: Sub Mast about current connection.

Default Gateway: Default gateway about current connection.

Link Speed: Show current transmit rate and receive rate.

Throughout: Display transmits and receive throughput in unit of Mbps.

Link Quality: Display Connection quality based on signal strength and Tx/Rx packet error rate.

Signal Strength 1: Receive signal strength 1, user can choose to display as percentage or dBm format.

Signal Strength 2: Receive signal strength 2, user can choose to display as percentage or dBm format.

Signal Strength 3: Receive signal strength 3, user can choose to display as percentage or dBm format.

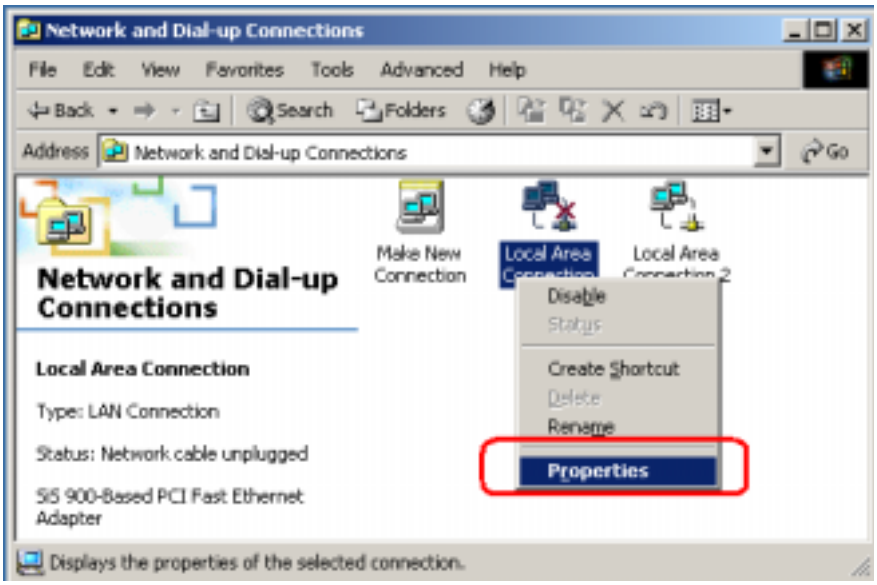
Noise Strength: Display noise signal strength.

HT: Display current HT Status in use, containing BW, GI, MCS, SNR0, and SNR1 value. (Show the information only for 802.11n wireless card)

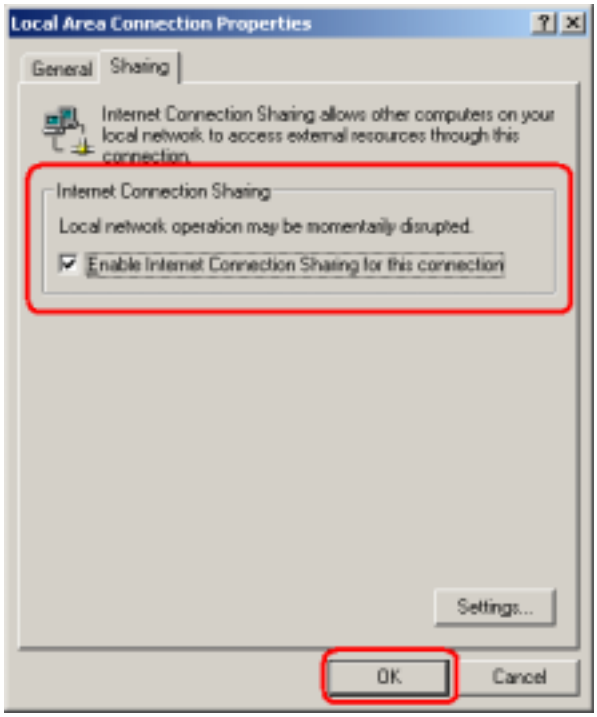
3.3.11 Enable AP Mode Feature in Windows 2000 OS

In Windows 2000 Operation System, the local network won't be automatically established while using Wireless PCI adapter's AP mode. Please follow the below steps to enable Internet Connection Sharing feature first before you switch Wireless PCI adapter's AP mode.

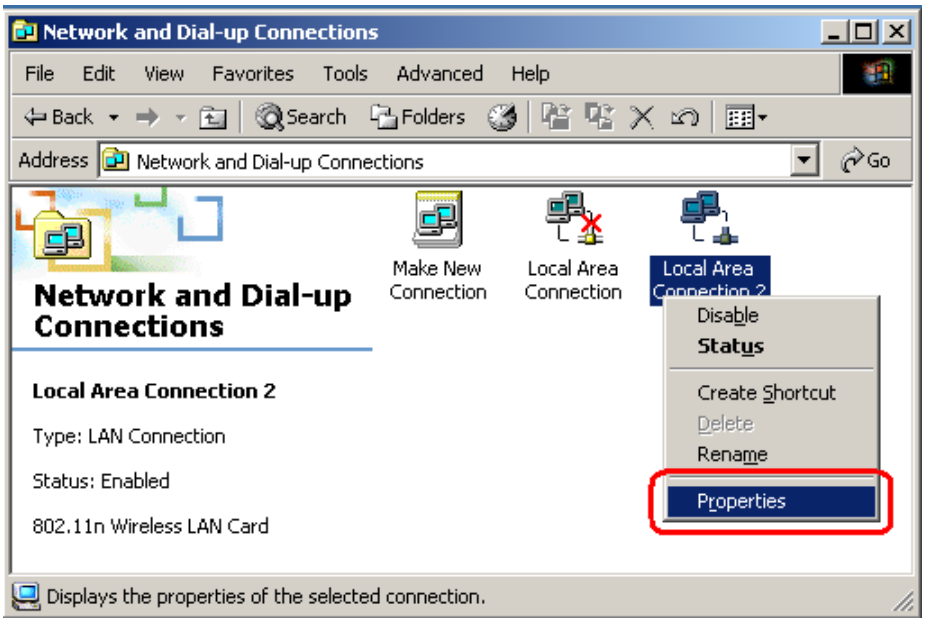
Step 1: After the Wireless PCI Adapter is installed properly in Windows 2000 Operation System, go to **Start ➔ Settings ➔ Control Panel ➔ Choose "Network and Dial-up Connections"** option. Right-Click your local area connection (such as another LAN Card in the same computer), and choose "**Properties**".



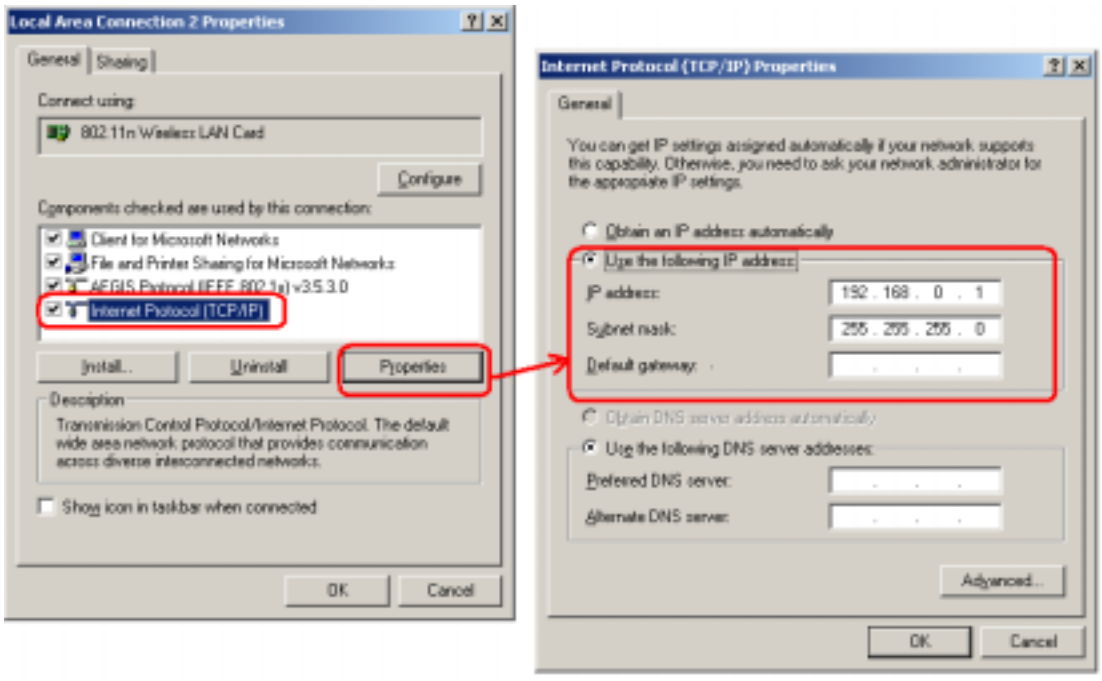
Step 2: In **Sharing** tab, enable **Internet Connection Sharing for this connection** and click "**OK**"



Step 3: Back to Network and Dial-up Connection screen, right-click "**Local Area Connection 2**" (for 802.11n Wireless LAN card) and choose "**Properties**".

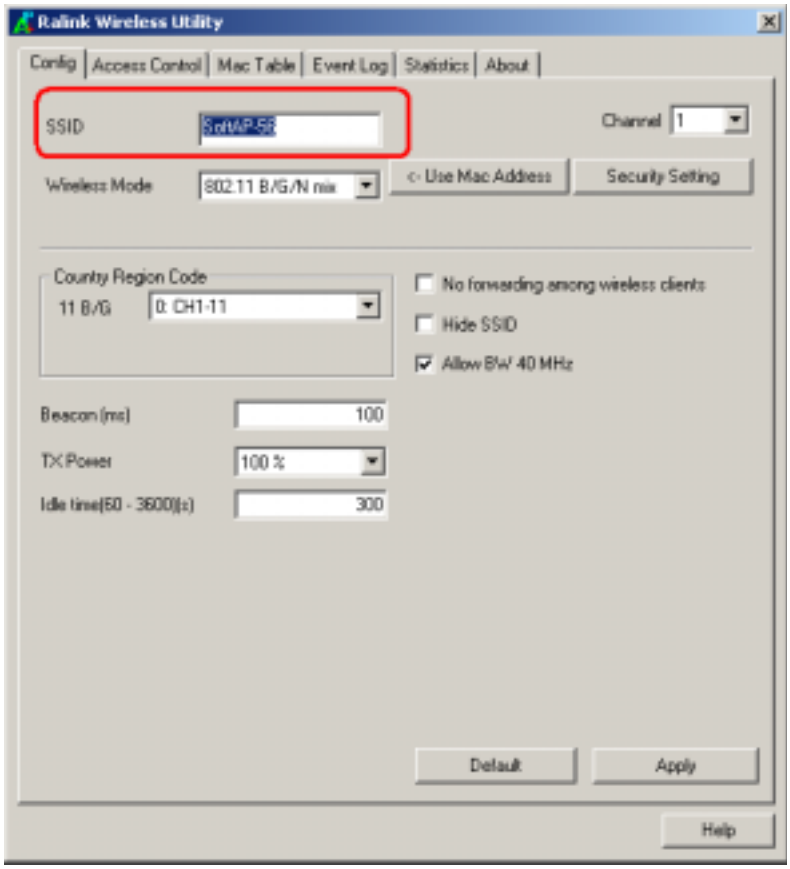


Step 4: Select "**Internet Protocol (TCP/IP)**" and click "**Properties**". You will see 802.11n Wireless PCI adapter will be automatically assigned an IP address as Access Point.

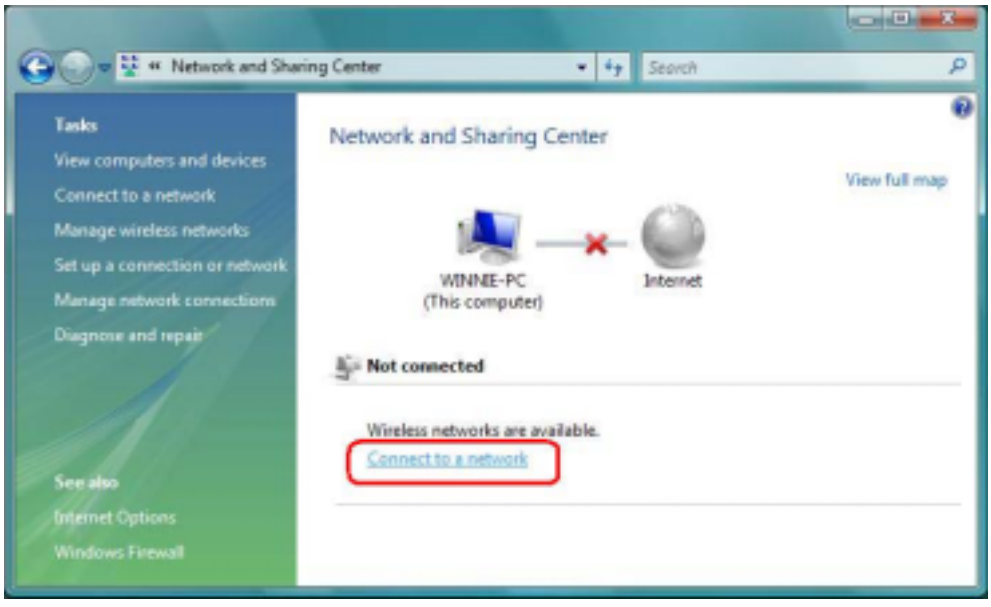


Step 5: In the System tray, now you can switch 802.11n Wireless PCI Adapter to AP Mode.

Step 6: After switch to AP mode, Ralink Wireless Utility will automatically pup-up. The Wireless Default SSID is assigned as "**SoftAP-56**".

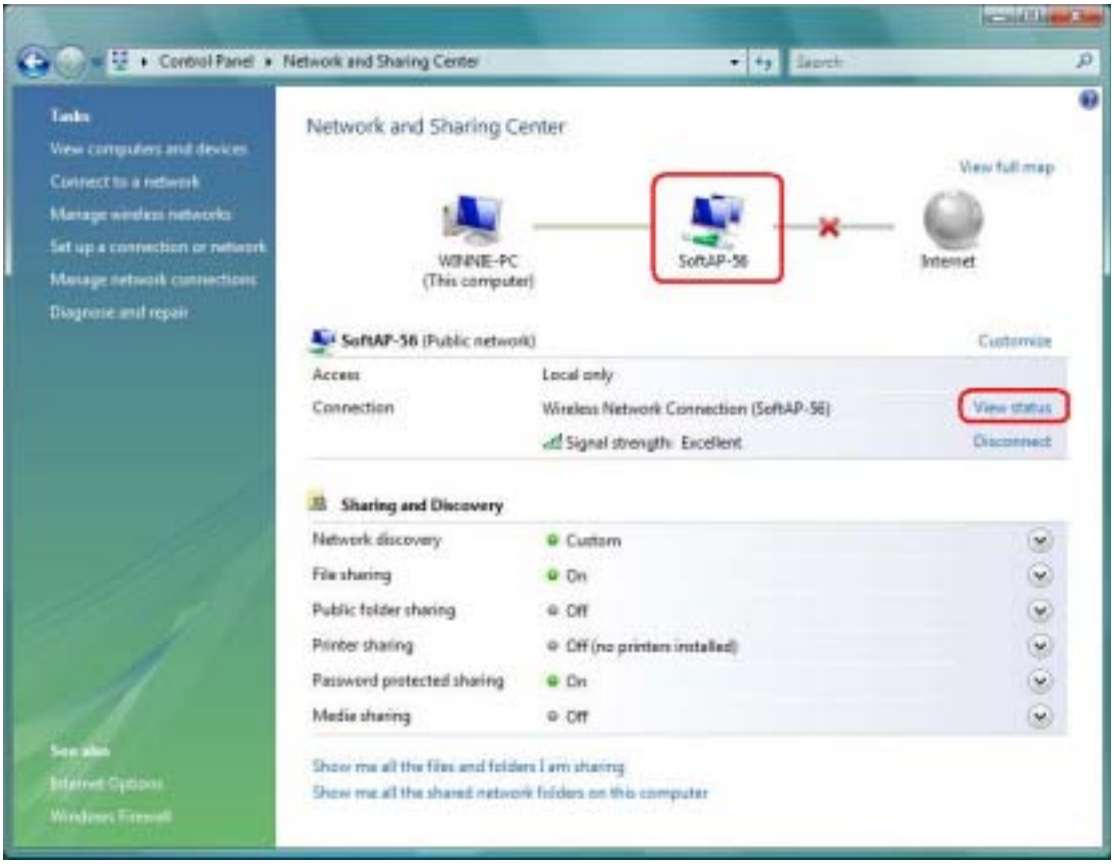


Step 7: To make sure your Soft AP is working properly, you need to use another computer which with Wireless LAN feature to access SoftAP-56 AP. In the below example, use another PC with Wireless feature in Vista Operation System. Go to **Start ➔ Control Panel ➔** Choose "**Network and Sharing Center**" option **➔** Click "**Connect to a network**" to search the available networks.

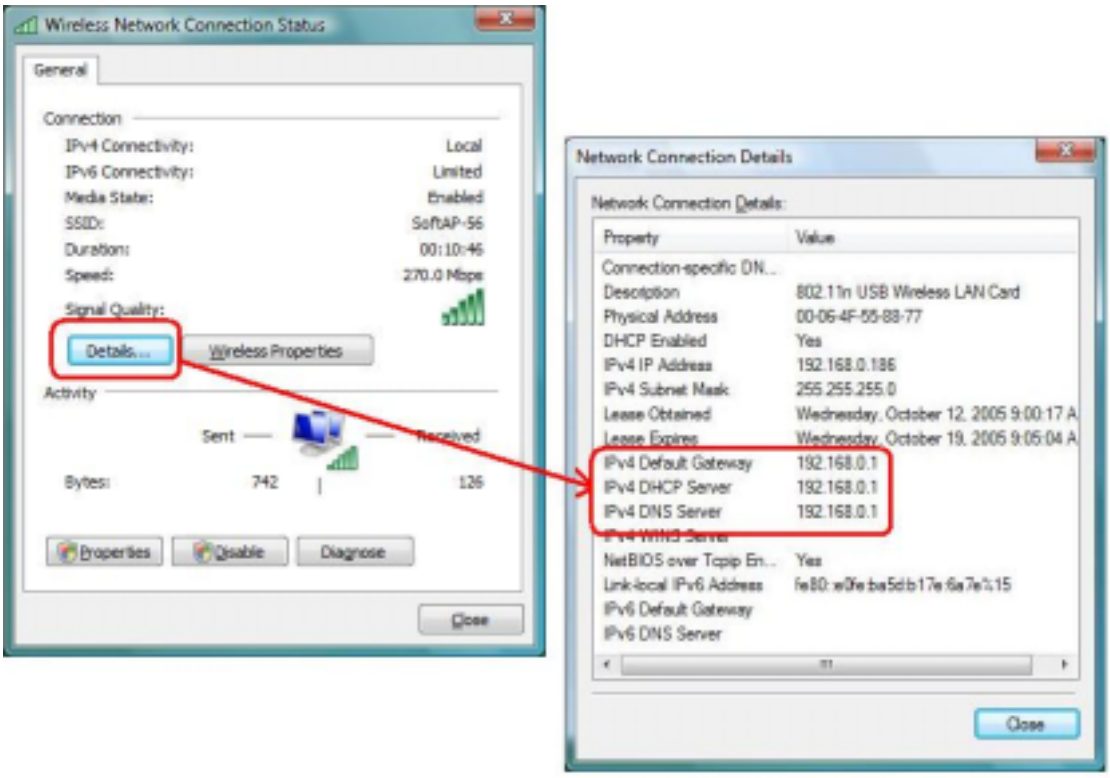


Step 8: Select the network "**SoftAP-56**" and click "**Connect**" to establish the connection.

Step 9: After the computer is successful connected to SoftAP-56, Network and Sharing Center screen will be shown as below. Click "**View Status**" to see the detail.



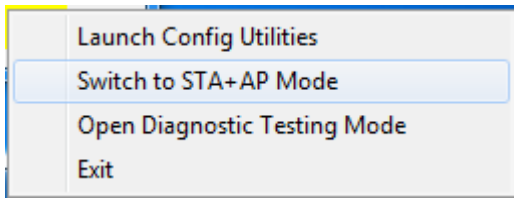
Step 10: In General tab, click "**Detail...**", and then you can see the current Network connection details. If this computer is successful connect to SoftAP-56 Access Point, the DHCP server will be assigned to same IP address.



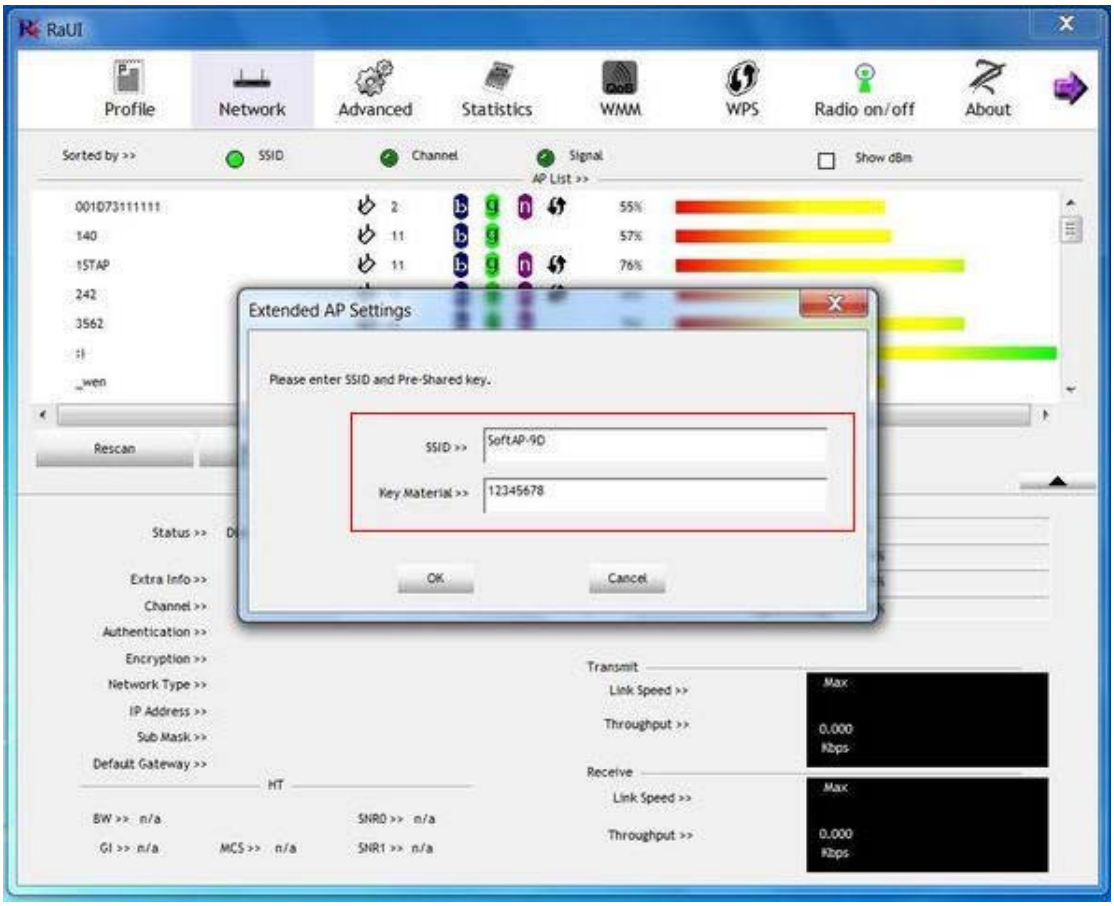
3.3.12 SoftAP (Only Windows 7 Support)

Windows 7 allows wireless device to be in both Station (STA) and AP Mode. According to following steps, you can open or close AP function.

Step 1: Click "**Switch to STA+AP mode**" item in RaUI system tray menu.



Step 2: Set SoftAP SSID and key

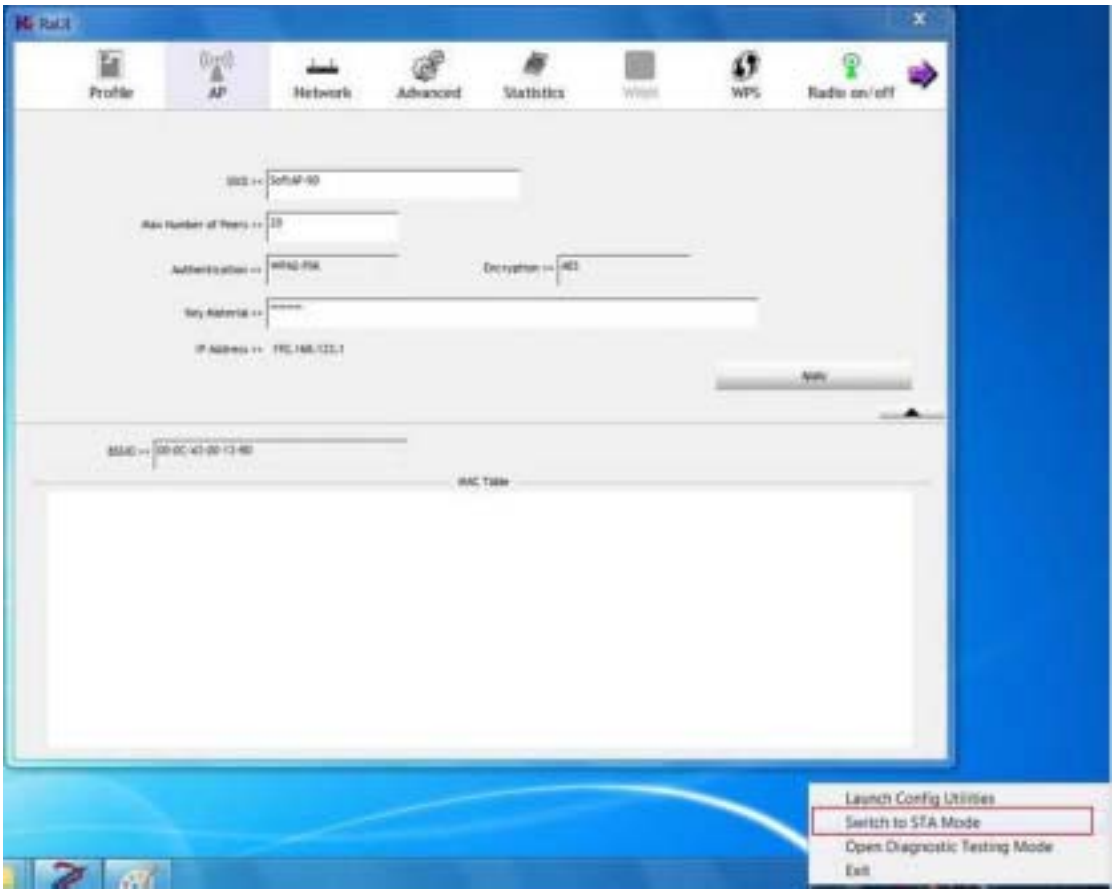


Step 3: Select WAN adapter

Step 4: Select SoftAP page to set SoftAP parameter

Step 5: Set SoftAP parameter in SoftAP page

Step 6: Click "**Switch to STA mode**" to close SoftAP function



Step 7: SoftAP function is closed

If you have any troubles to configure or setup this WLAN adapter, please feel free to contact us. Before contacting us, make sure collect following information. Submit complete detailed information of your problem will help us to provide you accurate answers.

Model Name:
Serial Number:
PC Settings:
Other: