Zonet®

ZEW1642

802.11n **Wireless** PCI Adapter

USER MANUAL

Table of Contents

Chapter 1 Introduction

1.1 Welcome

ZEW1642 connects you with IEEE802.11n(Draft 2.0) networks at receiving rate up to an incredible 300Mbps! By using the reflection signal, 802.11n's "Multiple In, Multiple Out" (MIMO) technology increases the range and reduces "dead spots" in the wireless coverage area. Unlike ordinary wireless networking of 802.11b/g standards that are confused by wireless reflections, MIMO can actually use these reflections to increase four times transmission range of 802.11g products. Besides, when both ends of the wireless link are 802.11n products, MIMO technology can utilize twice radio band to increase three times transmission speed of ordinary 802.11g standard products, and can comply with backwards 802.11b/802.11g standards.

Soft AP supported by ZEW1642 can help you establish wireless LAN networking with lowest cost. Besides, WPS (PBC and PIN) encryption method can free you from remembering the long passwords. Complete WMM function makes your voice and video more smooth.

1.2 Product Feature

- Complies with IEEE 802.11n (Draft 2.0), IEEE 802.11g, IEEE 802.11b standards
- Provides 32-bit PCI interface
- Provides 300Mbps receiving rate and 150Mbps sending rate
- Supports 20MHz/40MHz frequency width
- Auto-detects and changes the network transmission rate
- Provides two work modes: Infrastructure and Ad-Hoc
- Supports Soft AP to establish your wireless LAN networking with lowest cost
- Supports 64/128-bit WEP, WPA, WPA2 encryption methods and 802.1x security authentication standard
- Supports WPS (PBC and PIN) encryption method to free you from remembering long passwords
- Supports WMM to make your voice and video more smooth
- Supports Windows 2000 / XP / 2003 / Vista

1.3 Contents of Package

- One ZEW1642
- One Installation CD w/User Manual
- One Quick Installation Guide
- Two dipole antennas

Contact your local authorized reseller or the store purchased from for any items damaged and/or missing.

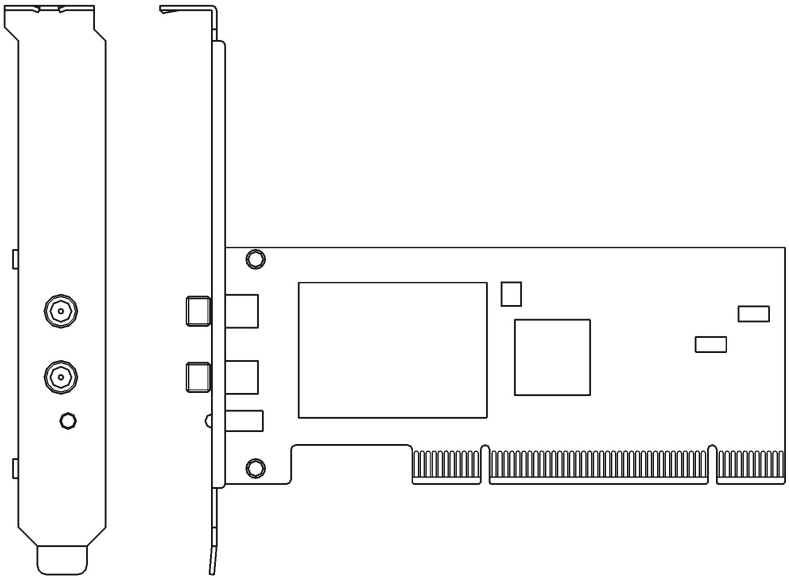
1.4 Before you begin

You must have the following:

- A desktop PC with an available 32-bit PCI slot
- Minimum 300MHz processor and 32MB memory
- Windows 2000, XP, 2003, Vista
- A CD-ROM Drive
- PCI controller properly installed and working in the desktop PC
- 802.11n or 802.11b/g Access Point (for infrastructure Mode) or another 802.11n or 802.11b/g wireless adapter (for Ad-Hoc; Peer-to-Peer networking mode.)

Chapter 2 Designing Your ZEW1642

ZEW1642 supports up to 300Mbps connections. It is fully compliant with the specifications defined in 802.11n (Draft 2.0) standard.



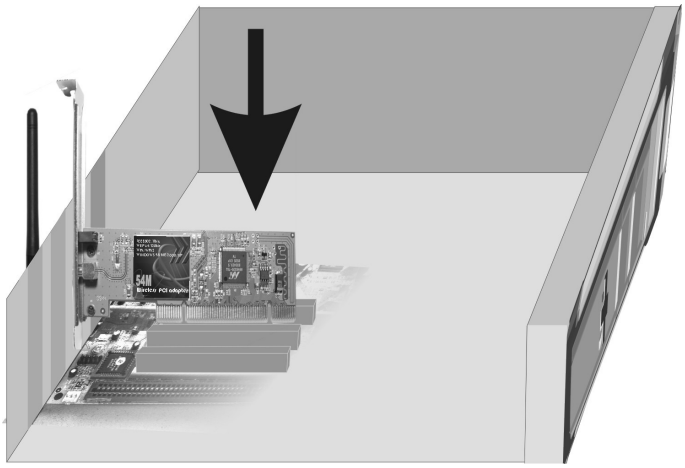
The status LED indicators of ZEW1642 are described in the following.

- Lnk/Act ON (Green): Indicates a valid connection
- Lnk/Act Flashing: Indicates the Adapter is transmitting or receiving data.

Chapter 3 Installation

3.1 Install Your ZEW1642

- Open your PC case and locate an available PCI on the motherboard.
- Slide ZEW1642 into the PCI slot. Make sure that all of its pins are touching the slot's contacts. You may have to apply a bit of pressure to slide ZEW1642 all the way in. after it is firmly in place, secure its fastening tab to your PC's chassis with a mounting screw. Then close your PC.
- Attach the external antennas to ZEW1642's antenna port.
- Power on the PC.



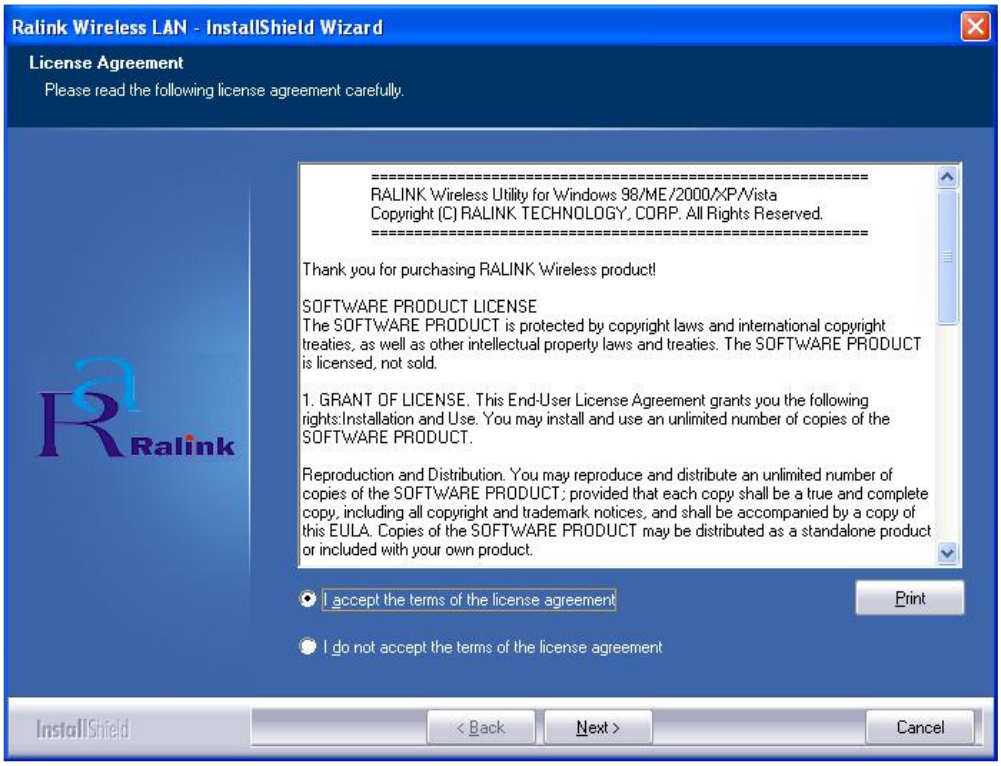
- Select ***Cancel*** when "Found New Hardware" window appears.

3.2 Install Driver and Utility

NOTE: *Snap-shot screens of the following installation procedure are based on Windows XP. Installation procedures will be similar for other windows operating systems.*

1. Insert Installation CD to your CD-ROM drive. Browse CD and double-click **setup.exe** in Driver folder to execute it. The wizard will run and install all necessary files to your computer automatically.

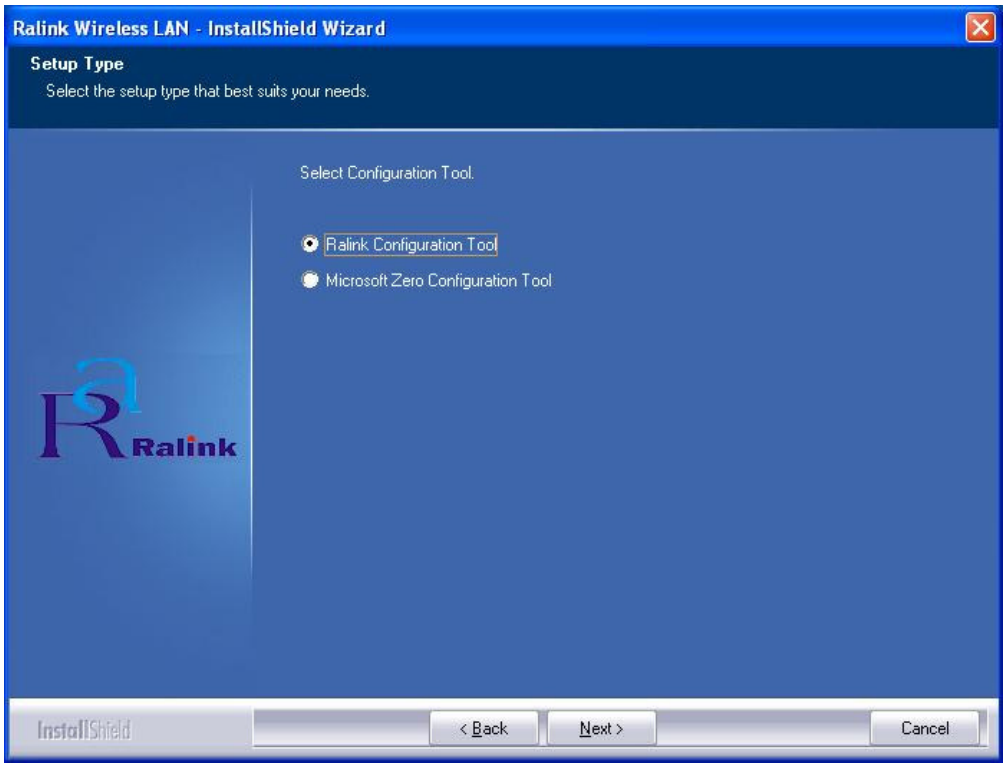
2. Click ***Next*** to accept the Agreement. Or click ***Cancel*** to cancel the installation.



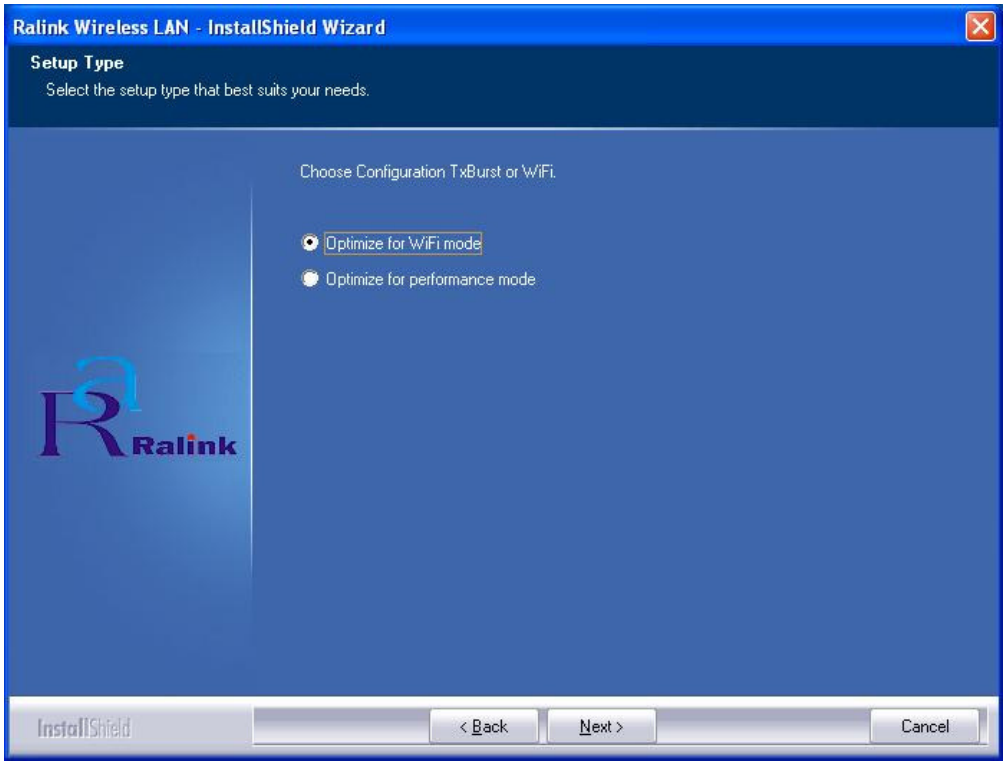
3. Select ***Ralink Configuration Tool*** or ***Microsoft Zero Configuration Tool*** then click ***Next***.

    a. It's recommended to select **Ralink Configuration Tool**, which provides fully access to all function of ZEW1642.

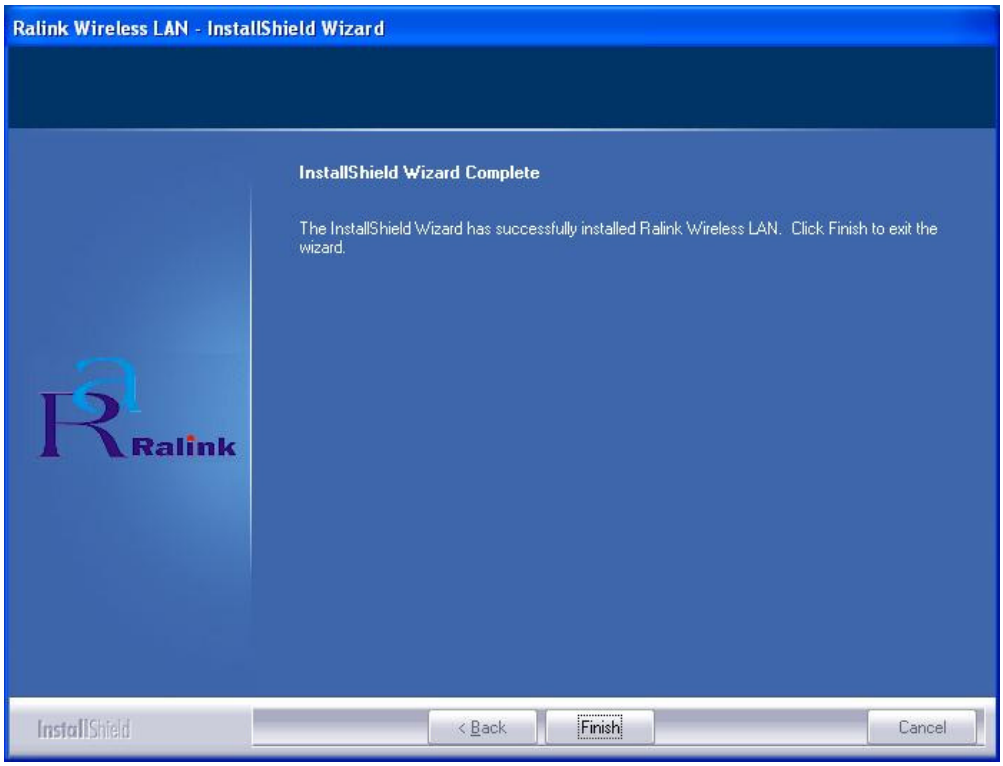
    b. If you prefer to use the wireless configuration tool provided by Windows XP or Vista, please select **Microsoft Zero Configuration Tool.**



4. Select **Optimize for WiFi mode** or **Optimize for performance mode** then click ***Next***.



5. Click ***Finish*** to complete the software installation.



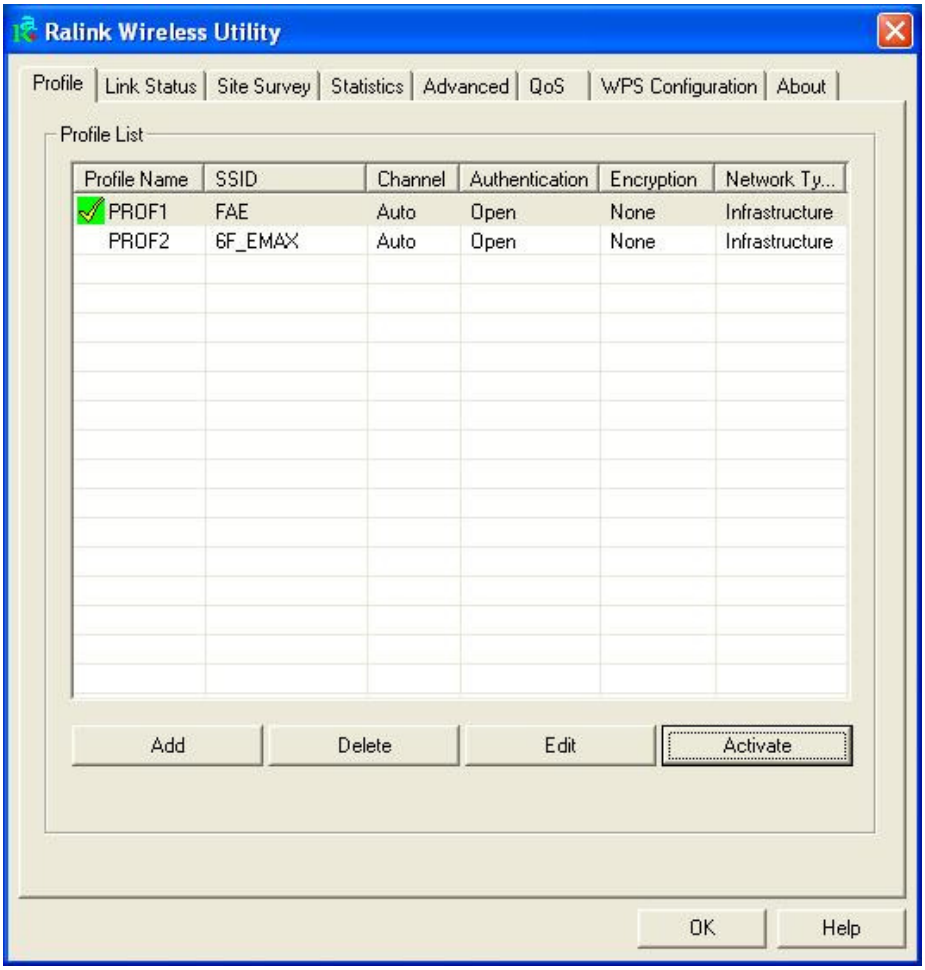
You will see a tray icon  appear in your system tray at the bottom of the screen after the software and hardware installation completed successfully.

Chapter 4 Configuration

Right-click the tray icon and then click ***Launch Config Utilities*** to use Ralink configuration utility.

4.1 Profile

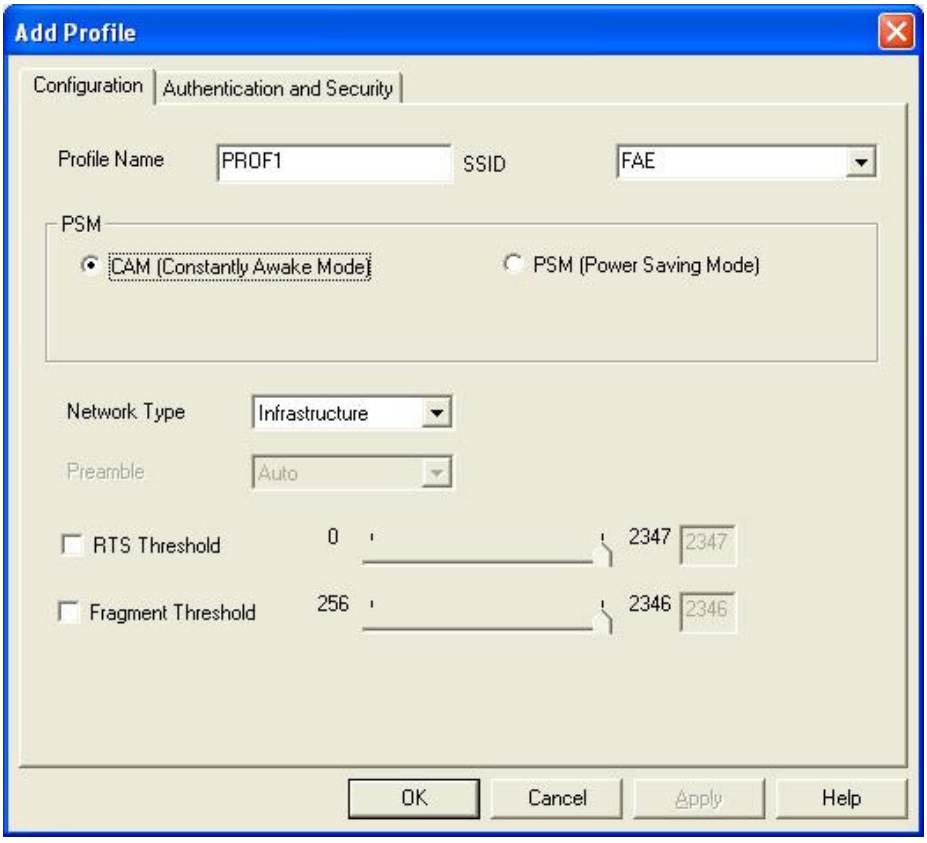
Profile can keep your favorite wireless setting among your home, office, and other public hotspot. You may save multiple profiles and activate the one at your preference.



1. **Definitions:**
   a. **Profile Name:** Name of the profile, preset to PROF* (* indicate 1, 2, 3,)
   b. **SSID:** The public name of a wireless network, Service Set IDentifier
   c. **Network Type:** Infrastructure and/or Ad-Hoc
   d. **Authentication:** Open, Shared, (Leap), WPA-PSK, WPA2-PSK, WPA and WPA2
   e. **Encryption:** WEP, TKIP, AES, and None
   f. **Channel:** Channel of the connected wireless network
2. **Add :** to create a new profile
3. **Edit :** to edit/modify/change parameter of an existing profile
4. **Delete :** to delete an existing profile
5. **Activate :** to make an existing profile become active and to connect

4.1.1 Add/Edit Profile

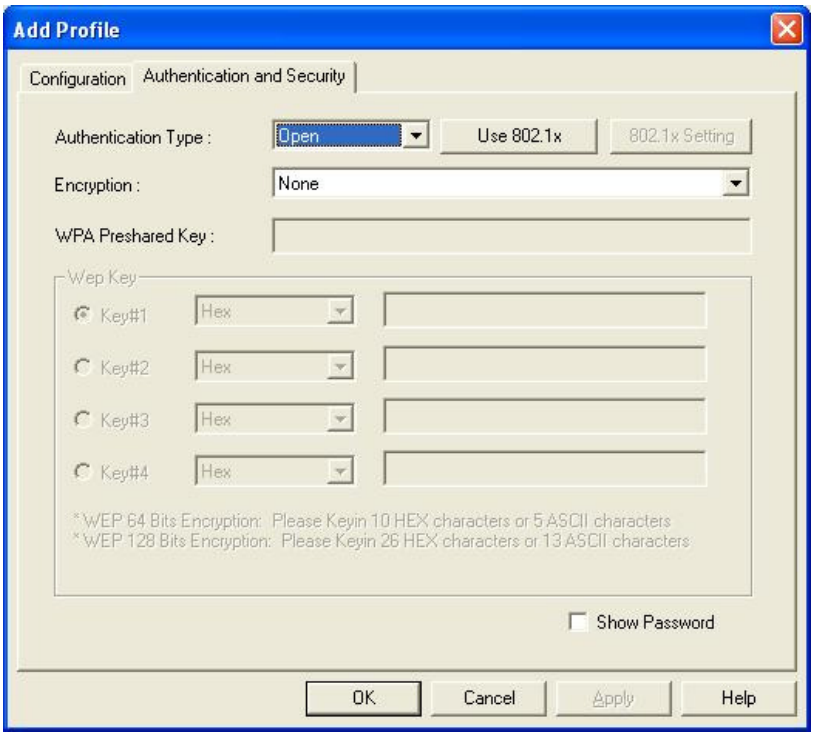
a. Configuration



1. **Profile Name:** Specify one name for the profile
2. **SSID:** Name of intended wireless network, User can key in the intended SSID name or use pull down menu to select from available Access Point.
3. **Network Type:** you can select one from Infrastructure and Ad-hoc modes
   Infrastructure: A wireless Router and/or Access Point is required.
   Ad-hoc: Peer-to-Peer network, no base station required.
4. Power Save Mode: Choose from CAM or PSM.
   CAM (Constantly Awake Mode): ZEW1642 will stay power-ON as long as the computer is connected to a power outlet.
   PSM (Power Saving Mode): ZEW1642 will hibernate when the computer is hibernating.

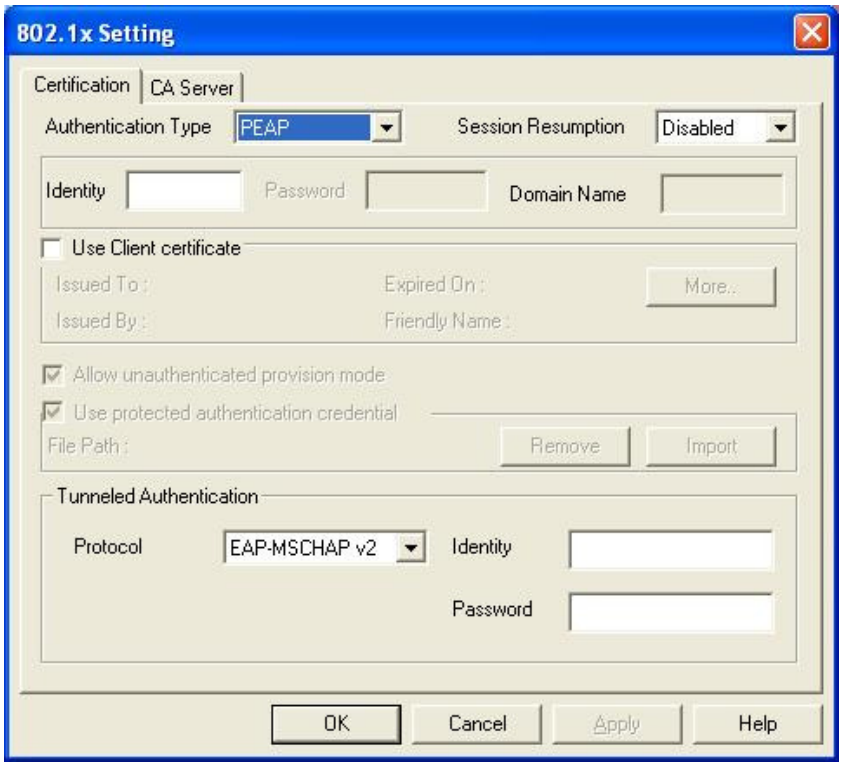
5. **RTS Threshold:** you can adjust the RTS threshold number by sliding the bar or key in the value directly. Default value = 2347
6. **Fragment Threshold:** you can adjust the Fragment threshold number by sliding the bar or key in the value directly. Default value = 2346

b. Authentication and Security



1. **Authentication:** Open, Shared, (Leap), WPA-PSK, WPA2-PSK, WPA and WPA2
2. **Encryption:** Algorithm used in BSS or IBSS, WEP, TKIP, AES, and None
3. **802.1x configuration:** It is an advanced encryption mode based on Radius server or authentication credentials.

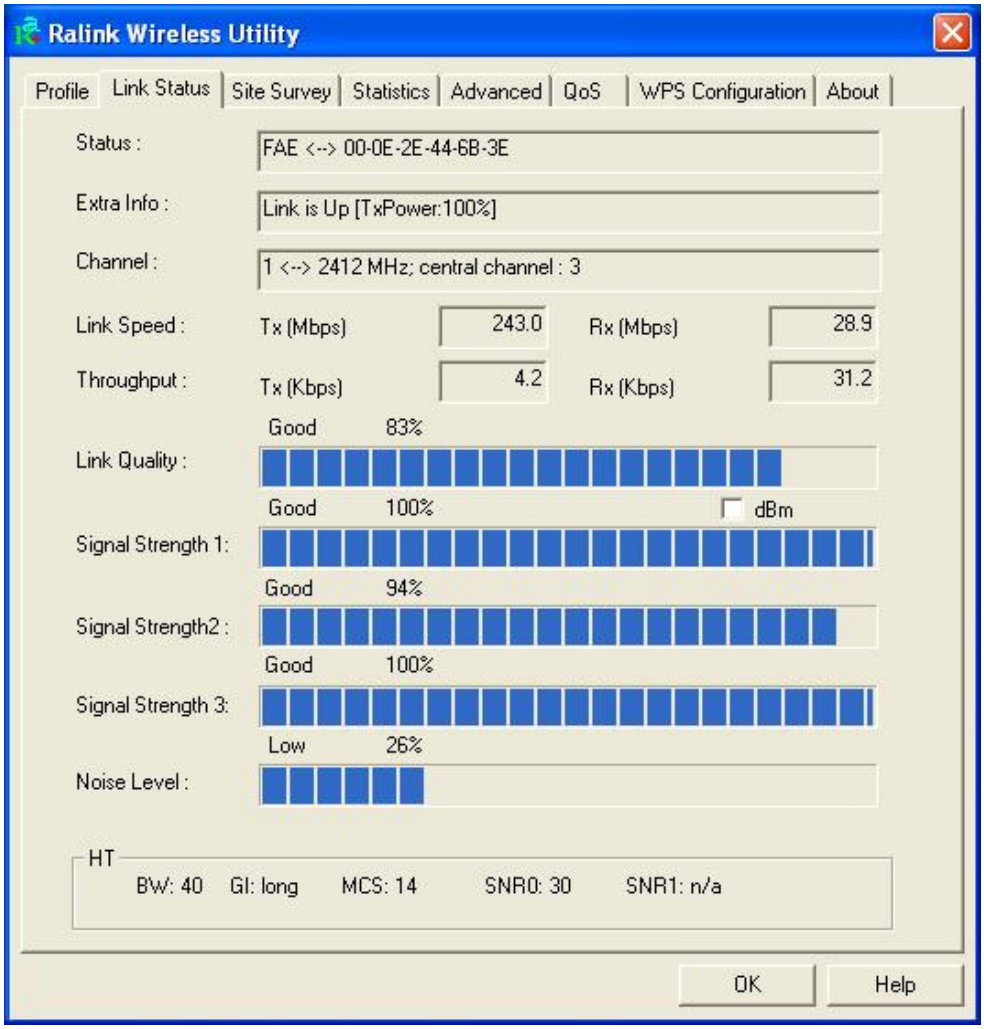
c. 802.1X



1. **Authentication Type:** The type selected here must be identical to the type of the 802.1x authentication type you're using.
2. **Session Resumption:** Enable or Disable.
3. **Domain Name:** Input the domain name of 802.1x authentication. This field will be grayed out when authentication type is not **EAP-FAST**.
4. **Use Client:** If the authentication type is using **PEAP** or **TTLS**, you can use the certificate stored on your computer. If the authentication type is using **TLS/Smart Card**, this box is always checked.
5. **Allow unauthenticated provision mode:** This box is always checked and can not be modified.
6. **Use protected authentication credential:** If the authentication type is using **EAP-FAST**, you can use protected authentication credential by check this box.
7. **Remove:** Remove the credential you imported previously.
8. **Import:** Import the authentication credential file (PAC or al file format), you'll be prompted to select a credential file from your computer.
9. **Protocol:** Select the protocol of tunneled authentication. This pull-down menu is only available when authentication type is using **PEAP** or **TTLS**. When using **EAP-FAST** as authentication type, the protocol setting is always **Generic Token Card** and can not be changed.
10. **Password Mode:** Select the password mode of **EAP-FAST** authentication mode. This setting is hidden when the authentication type is not **EAP-FAST**.

4.2 Link Status

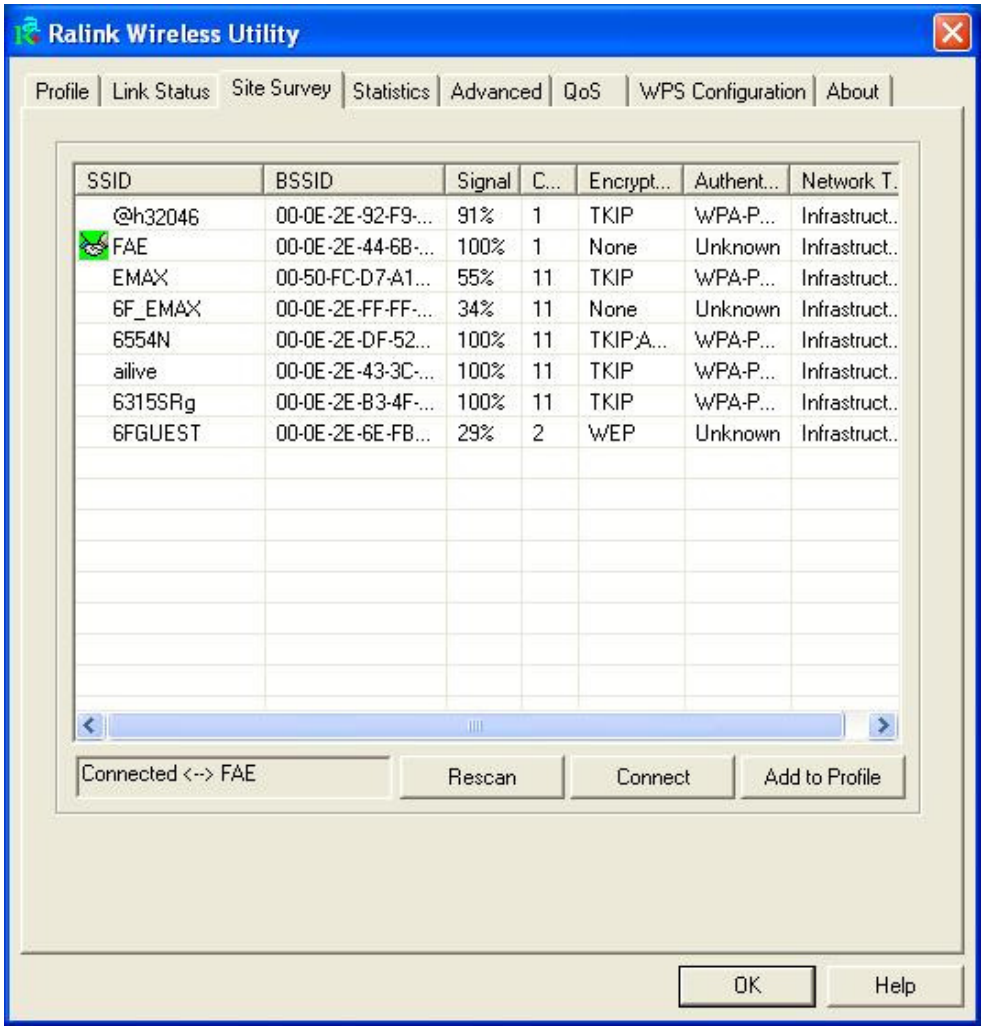
Link status page shows detail information about the current connection.



1. **Status:** Shows the current connected SSID / BSSID. If there's no active connection currently, "Disconnected" will be displayed.
2. **Extra Info:** Shows link status and its transmit power
3. **Channel:** Shows the current connected channel
4. **Link Quality:** Based on signal strength and TX/RX packet error rate (%)
5. **Signal Strength:** Shows in percentage (%) or dBm
6. **Noise Level:** Shows noise and signal strength ratio (%). If the value of this item is high, data transfer rate will drop.
7. **Transmit:**
   Link Speed: Shows current transmitting rate (Mbps)
   Throughput: Shows current transmitting throughput (Kbps)
8. **Receive:**
   Link Speed: Shows current receiving rate (Mbps)
   Throughput: Shows current receiving throughput (Kbps)

4.3 Site Survey

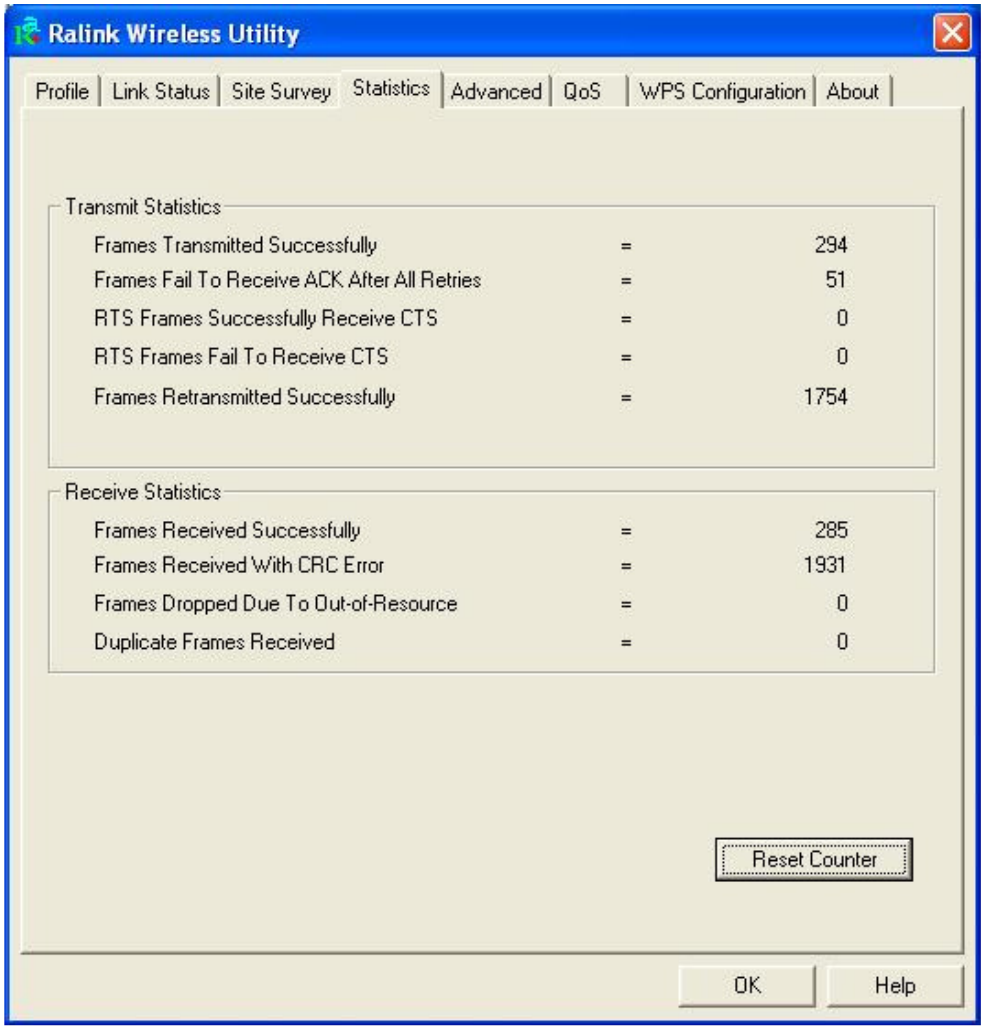
Under Site Survey tab, you will know information of all surrounding wireless networks from the last scan. Click ***Rescan*** to update and refresh. Or Select a SSID to add to your profile.



 Indicates your current connected network.

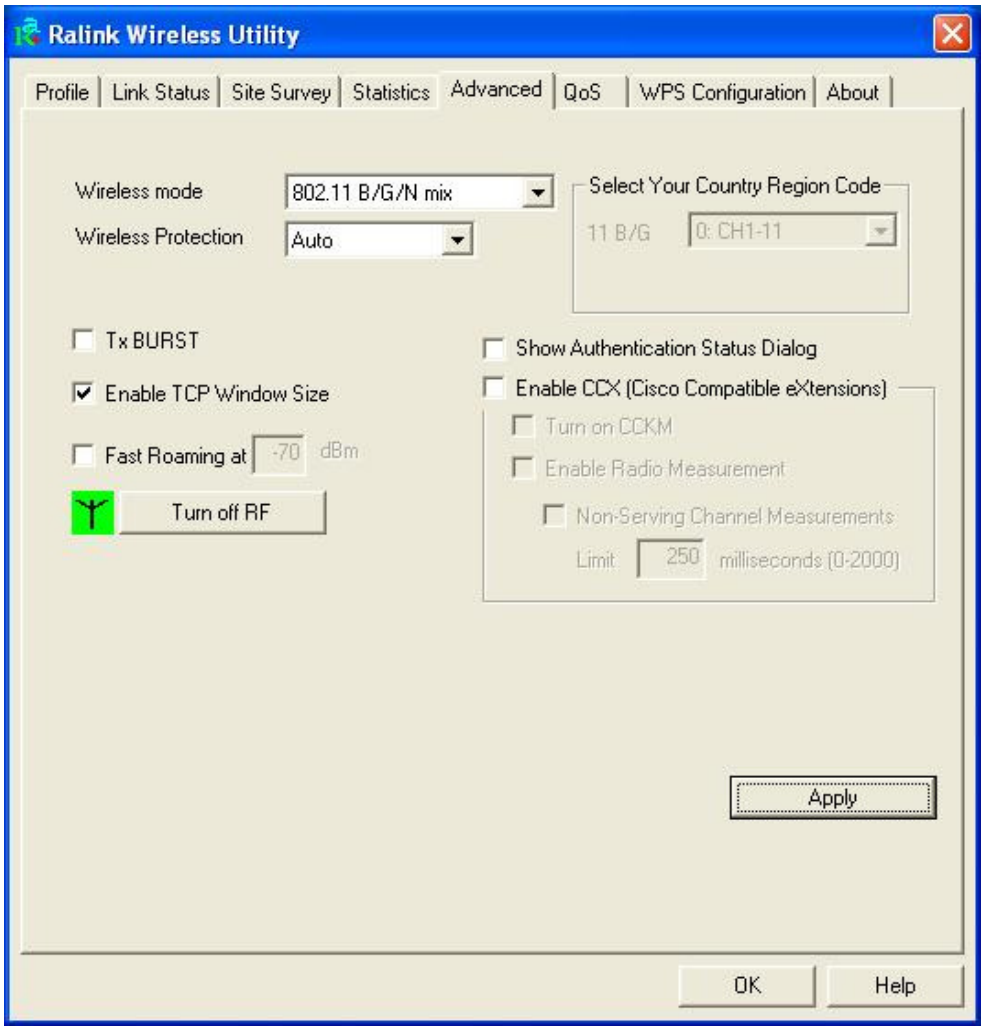
4.4 Statistics

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



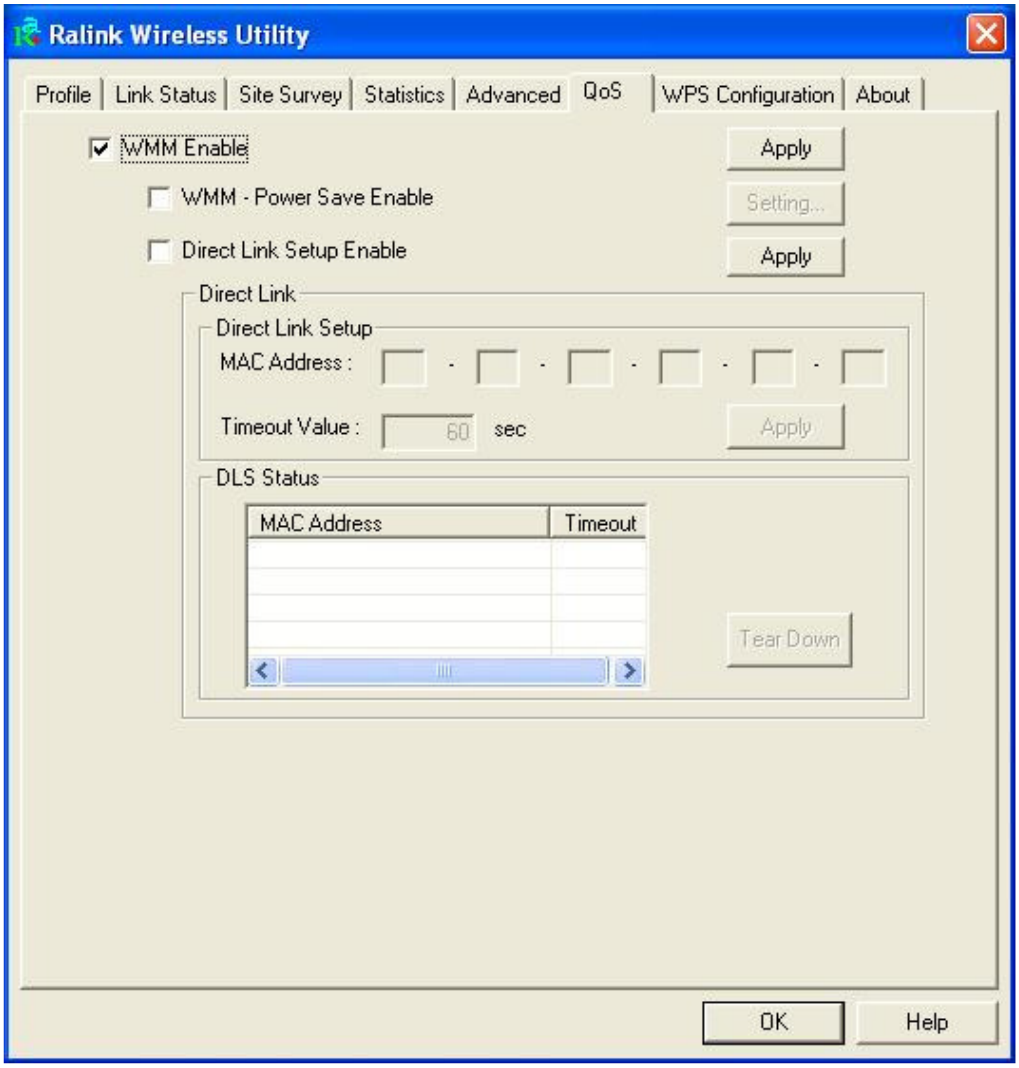
4.5 Advanced

The following figure shows Advance function of UI



1. **Wireless mode:** Select from 802.11B only, 802.11 B/G mixed, 802.11 B/G/N mixed, and 802.11G only
2. **Enable Tx BURST:** Ralink's proprietary frame burst mode. Suggest using with an Access Point that has the same technology.
3. **Enable TCP Window Size:** Check this box and the configuration utility will adjust TCP window size automatically to get better performance.
4. **Fast Roaming at:** Fast to roaming, setup by transmitting power
5. **Enable CCX(Cisco Compatible eXtensions):**
   a. **LEAP – Turn on CCKM**
   b. **Enable Radio Measurement:** channel measures every 0~2000 milliseconds

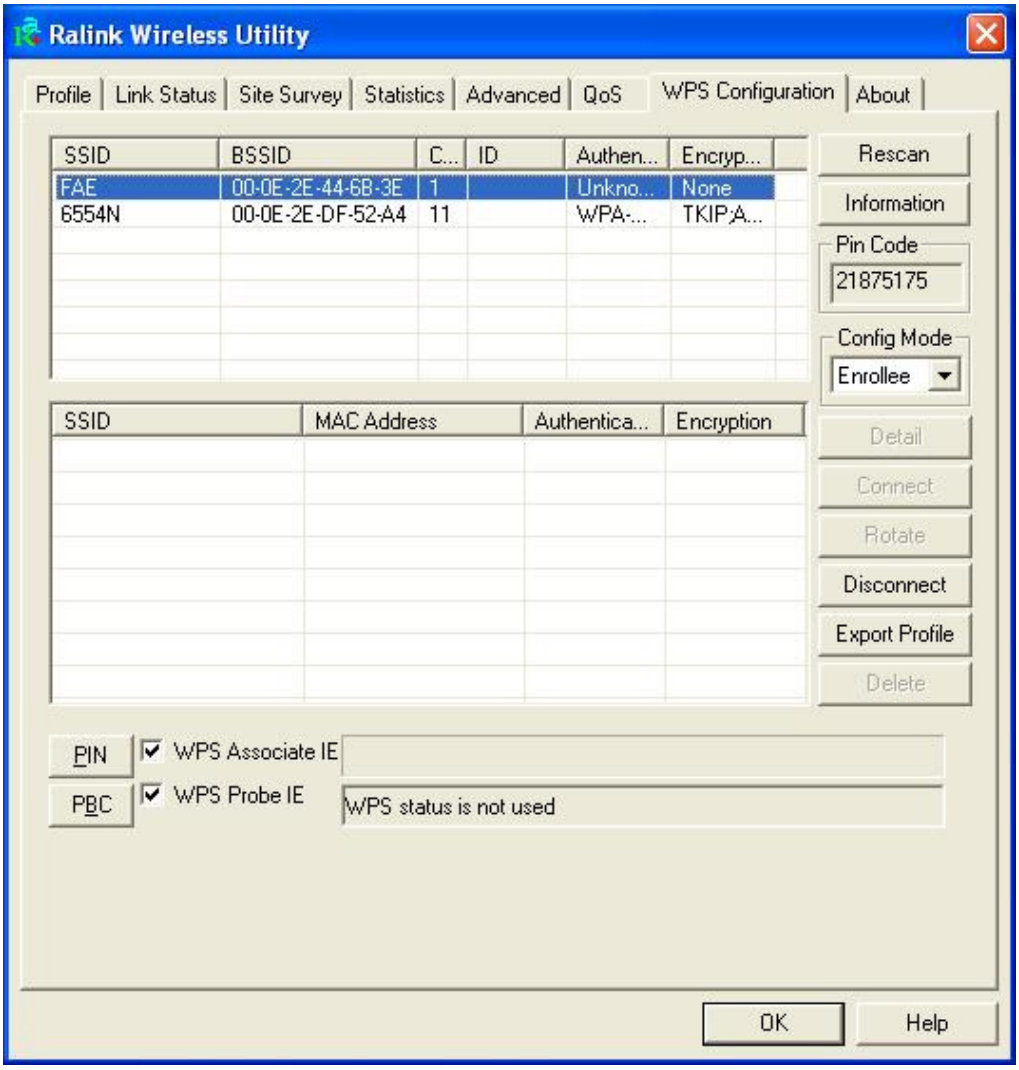
4.6 QoS



1. **WMM Enable:** Enable Wi-Fi Multi-Media
2. **WMM - Power Save Enable:** Enable WMM Power Save
3. **Direct Link Setup Enable:** Enable DLS (Direct Link Setup). This function will greatly improve the data transfer rate between WMM-enabled wireless devices.
   MAC Address: Input the MAC address of another WMM-enabled wireless device you wish to establish a direct link.
   Timeout Value: must be between 0~65535 in integer. If the value is zero represents it always connects. Default value of Timeout Value is 60 seconds.
   Tear Down: If you want to remove a specific wireless device from DLS table, select the device and click this button to remove it.

4.7 WPS Configuration

WPS page supports the configuration setup using PIN configuration method or PBC configuration method. WPS(Wi-Fi Protected Setup) is to simplify the security setup and management of Wi-Fi networks.



1. **WPS AP List:** Display the information of surrounding APs with WPS IE from last scan result, including SSID, BSSID, Channel, ID (Device Password ID), Security-Enabled.
2. **Rescan:** Update information on surrounding wireless network.
3. **Information:** Display the information about WPS IE on the selected network, list including Authentication Type, Encryption Type, Config Methods, Device Password ID, Selected Registrar, State, Version, AP Setup Locked, UUID-E and RF Bands
4. **PIN Code:** 8-digit numbers.
5. **Config Mode:** Enrollee or external Registrar
6. **Detail:** Information about Security and Key in the credential.
7. **Connect:** Connect to the selected network inside credentials.
8. **Rotate:** Connect to the next network inside credentials.
9. **Disconnect:** Stop WPS action and disconnect this active link.

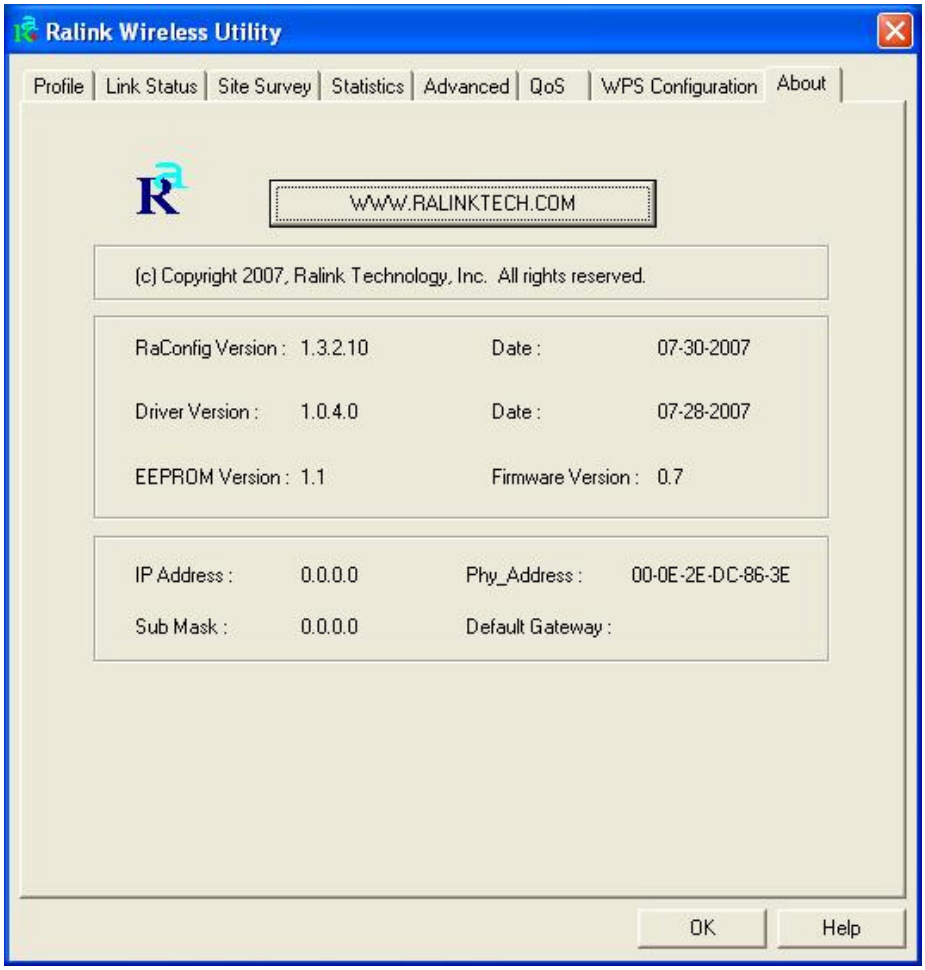
10. **Export Profile:** Export all credentials to Profile.
11. **Delete:** Delete an existing credential.
12. **PIN:** Start to add to AP using PIN configuration method
13. **PBC:** Start to add to AP using PBC configuration method

Note: *When clicking PIN or PBC button, please don't click* ***Rescan*** *within two-minute. If you want to abort this setup within the interval, restart PIN/PBC or press Disconnect to stop WPS.*

14. **WPS associate IE:** Send the association request with WPS IE during WPS setup.
15. **WPS probe IE:** Send the probe request with WPS IE during WPS setup.

4.8 About

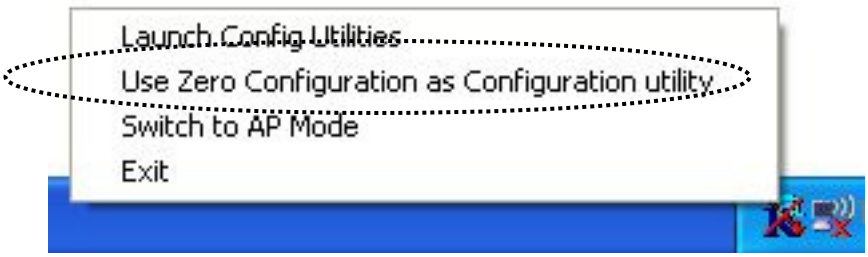
Display information about ZEW1642, such as Utility version/date, Driver version/date, EEPROM version and Firmware version.



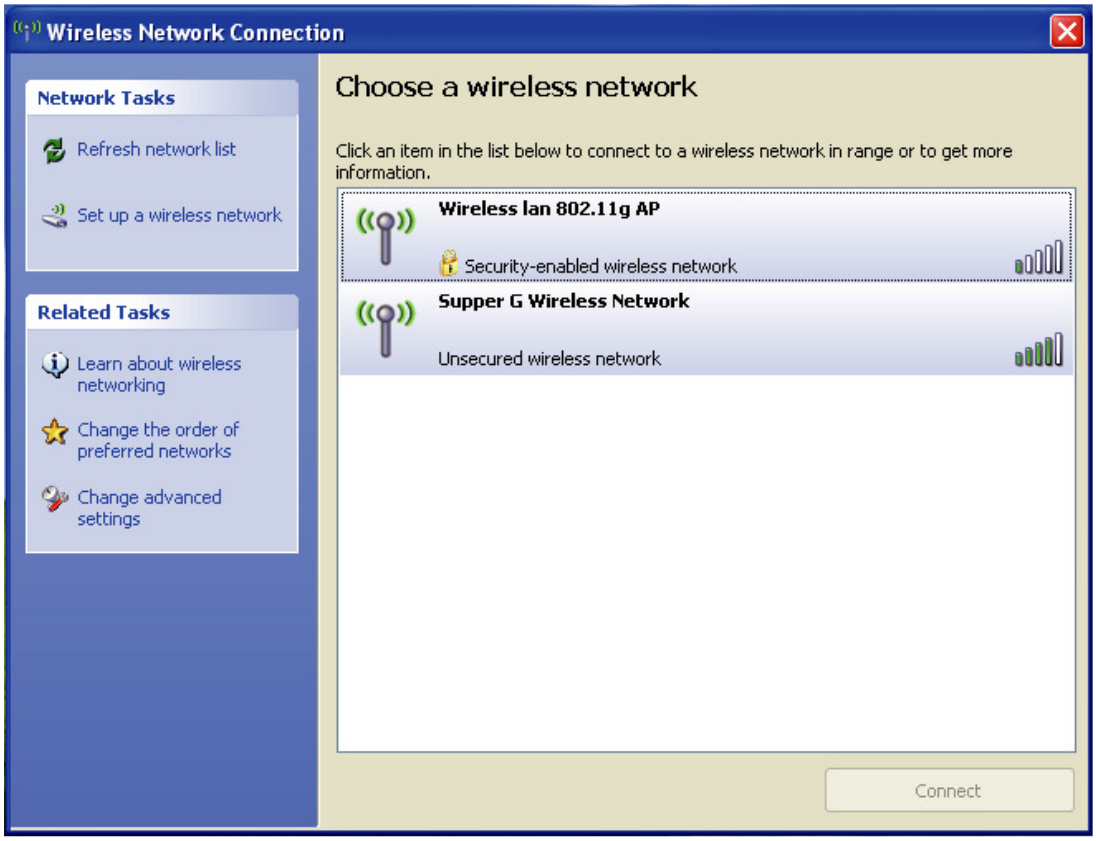
Chapter 5 Use Zero Configuration

Windows XP and Vista has a built-in wireless network configuration utility "Windows Zero Configuration" (WZC). It is a built in service to configure your wireless clients from Windows

1. Start using WZC, right click the tray utility  and select **Use Zero Configuration as Configuration utility**.

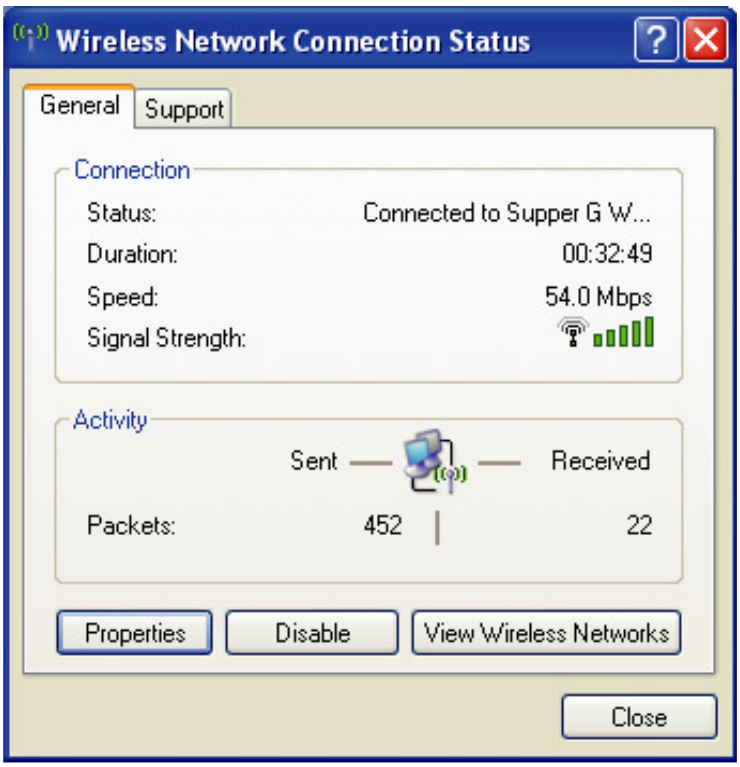


2. The windows wireless network connection will appear, double click the wireless network icon  on the system tray to check the wireless network, choose the network and click **Connect** to setup the association.

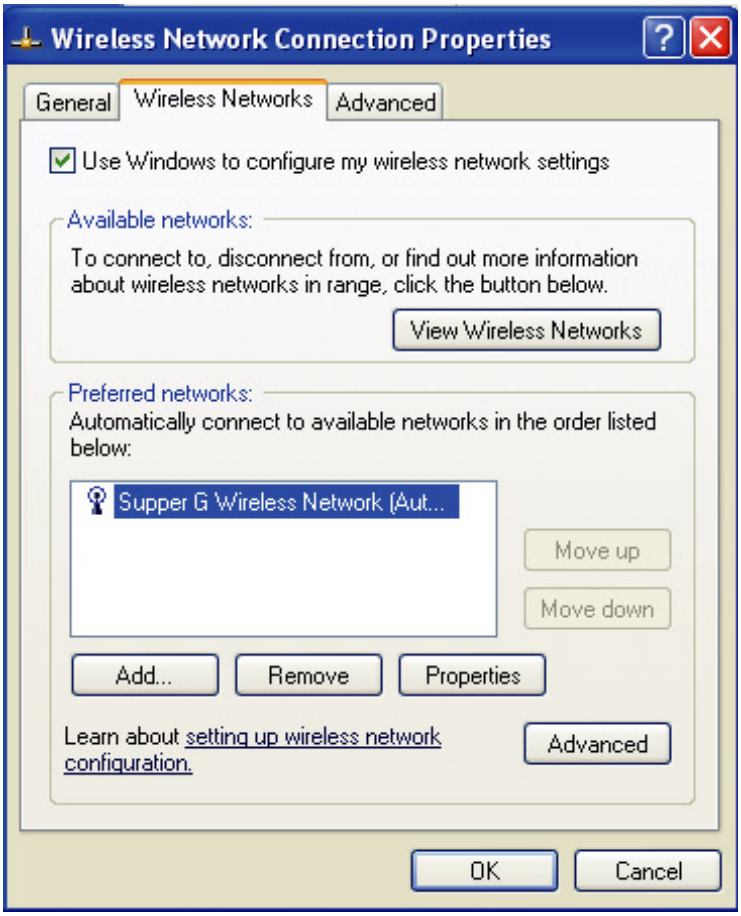


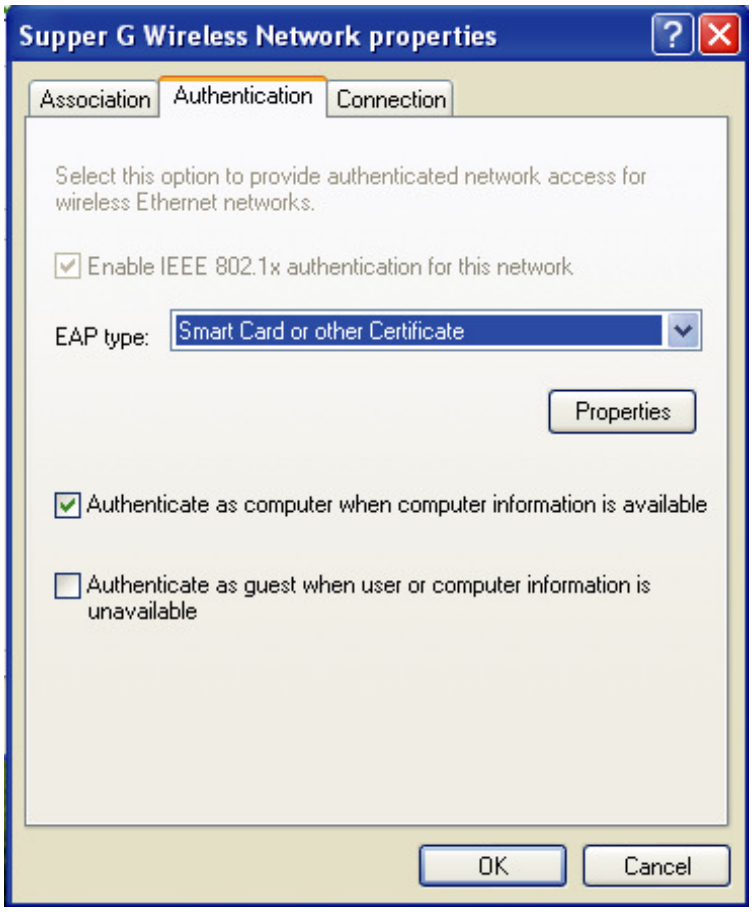
3. If your wireless router has been encrypted, there will be a window appeared for input the key. Please input the key and click **Connect**, then the connection connect.

4. To configure the wireless connect properties, please right click the wireless icon in the system tray and choose **Status** to open the page **Wireless Network Connection Status**.

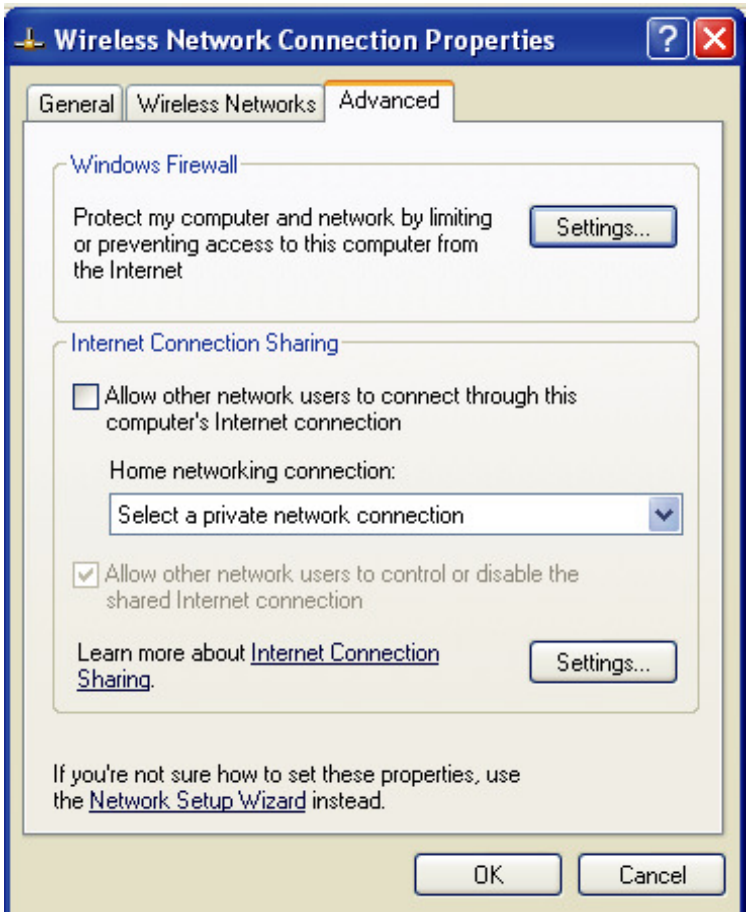


5. Click **Properties** button in **General** page and choose the tab **Wireless Networks** to add the **SSID** of available network by clicking **Add**, if there are several available networks, linking priority could be configured by the button **Move up** and **Move down**. The icon  shows the current linked AP. Click **Properties** to configure authentication of wireless connection.


Wireless Network Connection Properties
General
Wireless Networks
Advanced
Use Windows to configure my wireless network settings
Available networks:
To connect to, disconnect from, or find out more information about wireless networks in range, click the button below.
View Wireless Networks
Preferred networks:
Automatically connect to available networks in the order listed below:
Supper G Wireless Network (Aut...
Move up
Move down
Add...
Remove
Properties
Learn about setting up wireless network configuration.
Advanced
OK
Cancel


Supper G Wireless Network properties
Association
Authentication
Connection
Select this option to provide authenticated network access for wireless Ethernet networks.
Enable IEEE 802.1x authentication for this network
EAP type:
Smart Card or other Certificate
Properties
Authenticate as computer when computer information is available
Authenticate as guest when user or computer information is unavailable
OK
Cancel

6. **Advanced** page configures firewall and connection sharing.



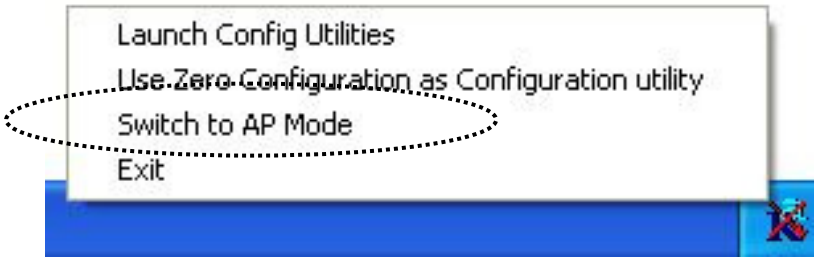
Chapter 6 Soft AP

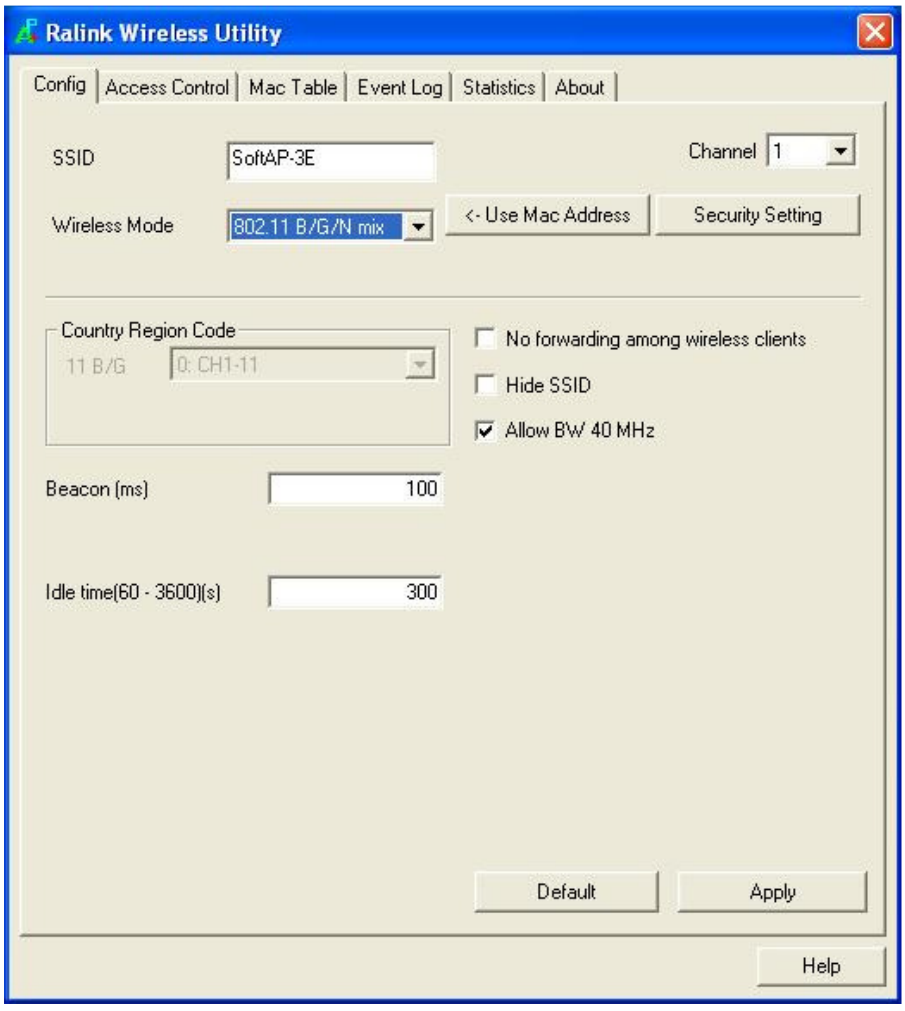
ZEW1642 has two modes: working station and Soft AP. After start Soft AP, ZEW1642 will be an AP to accept any wireless device access.

6.1 Start Soft AP

After starting ZEW1642 driver, you will see icon  in the system tray.

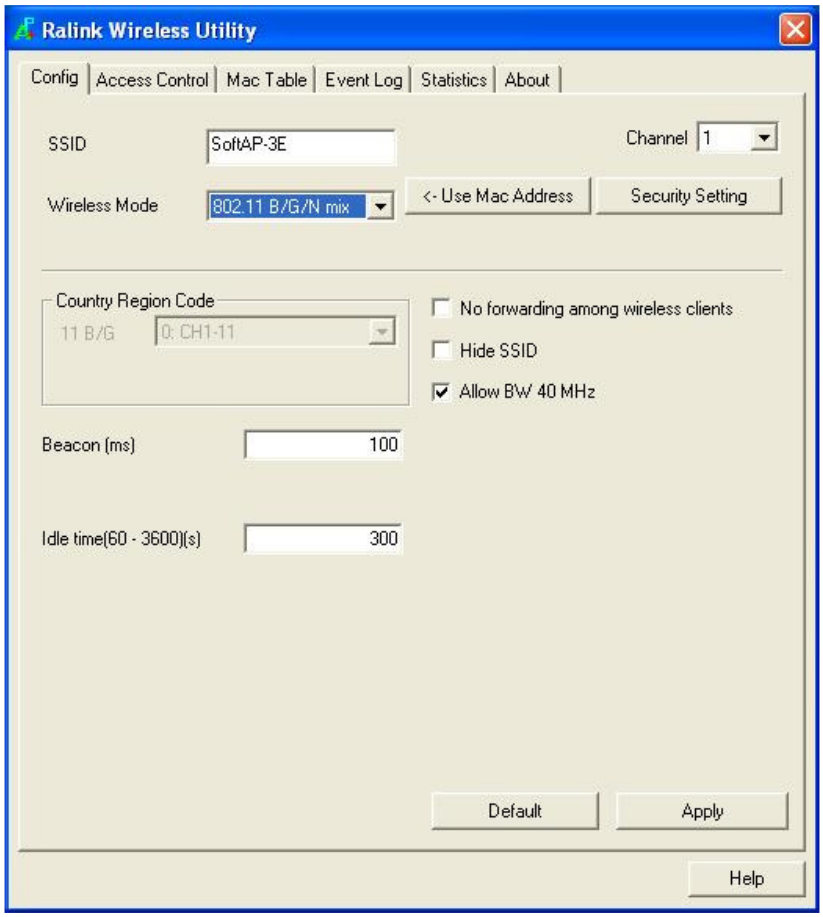
Right click the icon and choose **Switch to AP Mode**, the tray icon will change to  , and the soft AP configuration Utility window will appear as below.



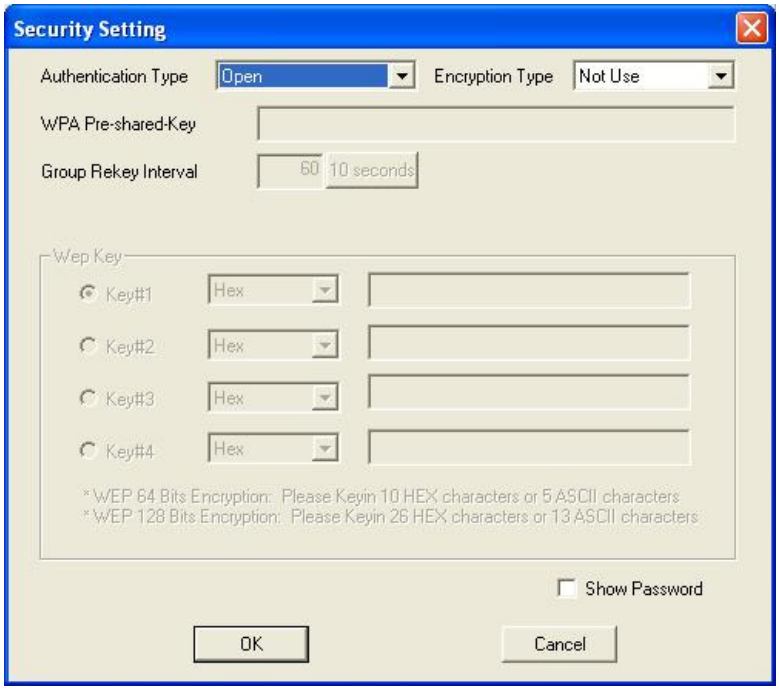


6.2 Configuration

In soft AP configuration Utility page, you can make some basic configurations, such as wireless network name, mode, channel and authentication.

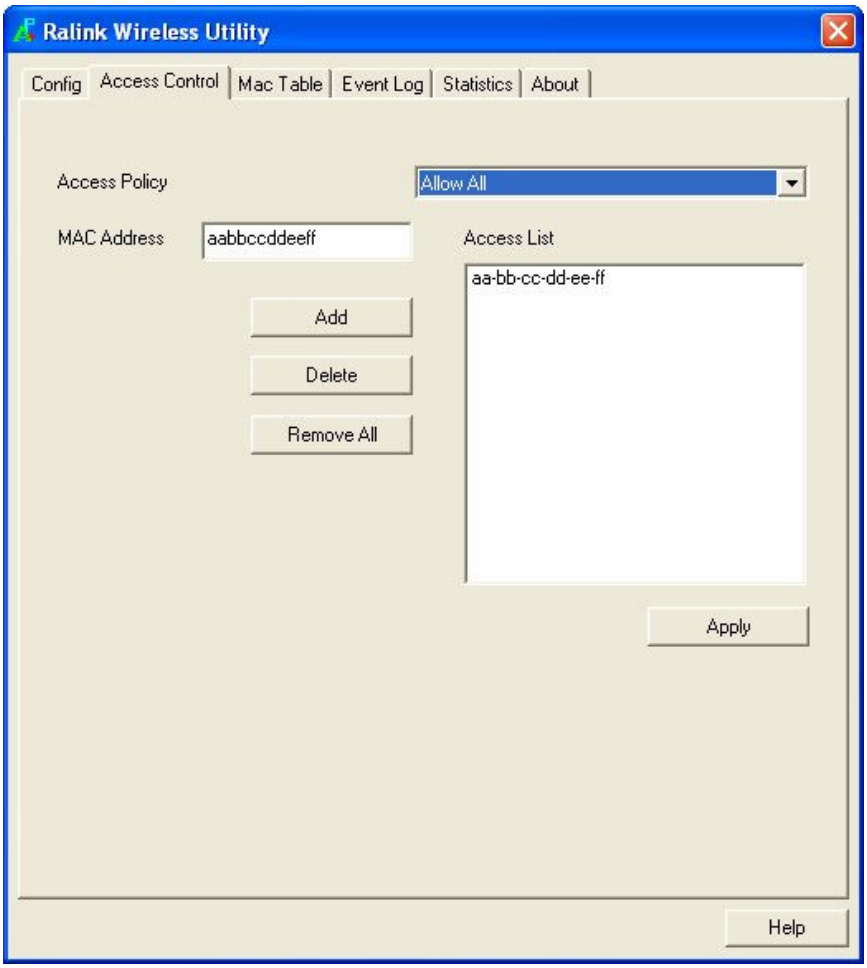


Click **Security Setting** button to make different security configurations of wireless communication, and you can choose the authentication type or encryption type.



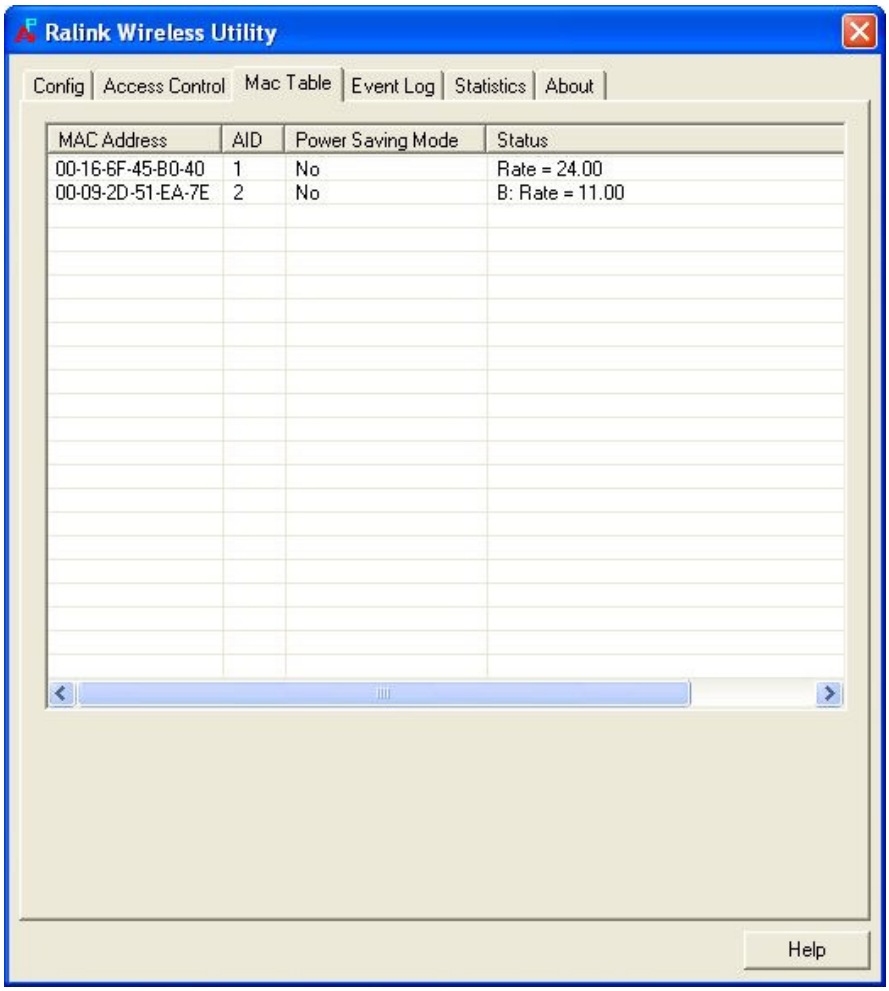
6.3 Access Control

Choose **Access Control** tab to start MAC control. Access control includes **Allow All** and **Reject All**. After editing the MAC address access list, only the MAC in the Allow All list could access the Soft AP.



6.4 MAC Table

MAC Table page shows the information of the wireless devices accessed to this soft AP.



6.5 Switch to Working Station mode

In the Soft AP mode, right-click the icon  in the system tray and choose **Switch to Station Mode**, then ZEW1642 is switching to working station mode with an interface of working station.

Chapter 7. Specifications

General Features	
Standards	IEEE 802.11n(Draft 2.0) IEEE 802.11g IEEE 802.11b
Interface	32-bit PCI
OS	Windows 2000/XP/Vista
User interface	Easy to use user configuration software
roaming	Support multipoint auto roaming and configuration; Support wireless network environments auto detect.
LED	Status / activity
Antenna type	External Dipole Antenna (Detachable)
RF and baseband Technical Features	
Frequency range	2.4~2.4835GHz
Radio data rate	11n: 150/130/117/104/78/52/39/26/13Mbps 65/58.5/52/39/26/19.5/13/6.5Mbps 11g: 54/48/36/24/18/12/9/6Mbps 11b: 11/5.5/2/1Mbps
Modulation	BPSK, QPSK, CCK and OFDM (BPSK/QPSK/16-QAM/64-QAM)
Spectrum Spread Technology	DSSS
Transmit output power	11n 20MHz/40MHz: -65dBm 54Mbps: -72dBm 11Mbps: -88dBm
Antenna Gain	2 x 1.8 dBi
Number of Selectable Channels	USA,Canada: 11 channels Europe: 13 channels
Media Access Protocol	WMM
Data security	WPA/WPA2; 64/128-bit WEP; TKIP/AES
Environmental and Physical	
Operation Temp.	0°C ~ 40°C
Storage Temp.	-20ºC ~ 70ºC
Operation Humidity	10% - 90% RH, Non-condensing

Chapter 8. TroubleShooting

This chapter provides solutions to problems that may occur during the installation and operation of ZEW1642. Read the descriptions below to solve your problems.

1. The ZEW1642 does not work properly.

Reinsert ZEW1642 into your PC's PCI slot.
Right click on My Computer and select Properties. Select the device manager and click on the Network Adapter. You will find ZEW1642 if it is installed successfully. If you see the yellow exclamation mark, the resources are conflicting. You will see the status of ZEW1642. If there is a yellow question mark, please check the following:
Make sure that your PC has a free IRQ (Interrupt ReQuest, a hardware interrupt on a PC.)
Make sure that you have inserted the right adapter and installed the proper driver. If ZEW1642 does not function after attempting the above steps, remove it and do the following:
Uninstall the driver software from your PC.
Restart your PC and repeat the hardware and software installation as specified in this User Guide.

2. I cannot communicate with the other computers linked via Ethernet in the Infrastructure configuration.

Make sure that the PC to which ZEW1642 is associated is powered on.
Make sure that ZEW1642 is configured on the same channel and with the same security options as with the other computers in the Infrastructure configuration.

3. What should I do when the computer with ZEW1642 installed is unable to connect to the wireless network and/or the Internet?

Check that the LED indicators for the broadband modem are indicating normal activity. If not, there may be a problem with the broadband connection.
Check that the LED indicators on the wireless router are functioning properly. If not, check that the AC power and Ethernet cables are firmly connected.
Check that the IP address, subnet mask, gateway, and DNS settings are correctly entered for the network.
In Infrastructure mode, make sure the same Service Set Identifier (SSID) is specified on the settings for the wireless clients and access points.
In Ad-Hoc mode, both wireless clients will need to have the same SSID. Please note that it might be necessary to set up one client to establish a BSS (Basic Service Set) and wait briefly before setting up other clients. This prevents several clients from trying to establish a BSS at the same time, which can result in multiple singular BSSs being established, rather than a single BSS with multiple clients associated to it.
Check that the Network Connection for the wireless client is configured properly.
If Security is enabled, make sure that the correct encryption keys are entered on both ZEW1642 and the access point.