

# IEEE 802.11n Wireless Series

## **Long-Range USB Adapter**

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Version: 2.0

Date: January 13, 2009

## Key Features

- Complies with IEEE 802.11n wireless standards
- 2.4GHz (AWUS036NH / AWUS036NEH) frequency
- 2.4GHz (AWUS051NH) frequency
- Complies with USB 2.0
- High speed transfer data rate up to 150 Mbps
- Supports auto-installation
- Supports wireless data encryption with 64/128-bit WEP, WPA, WPA2, TKIP, AES
- Supports QoS: WMM, WMM-PS
- Supports multiple BSSID
- Supports driver for Windows 2000, XP 32/64, Vista 32/64, Windows 7, Linux (2.4.x/2.6.x), and Mac (10.3.x/10.4.x/10.5.x/10.6.x) Power PC & PC

## Installation Guide

### Software Installation

**Note:**

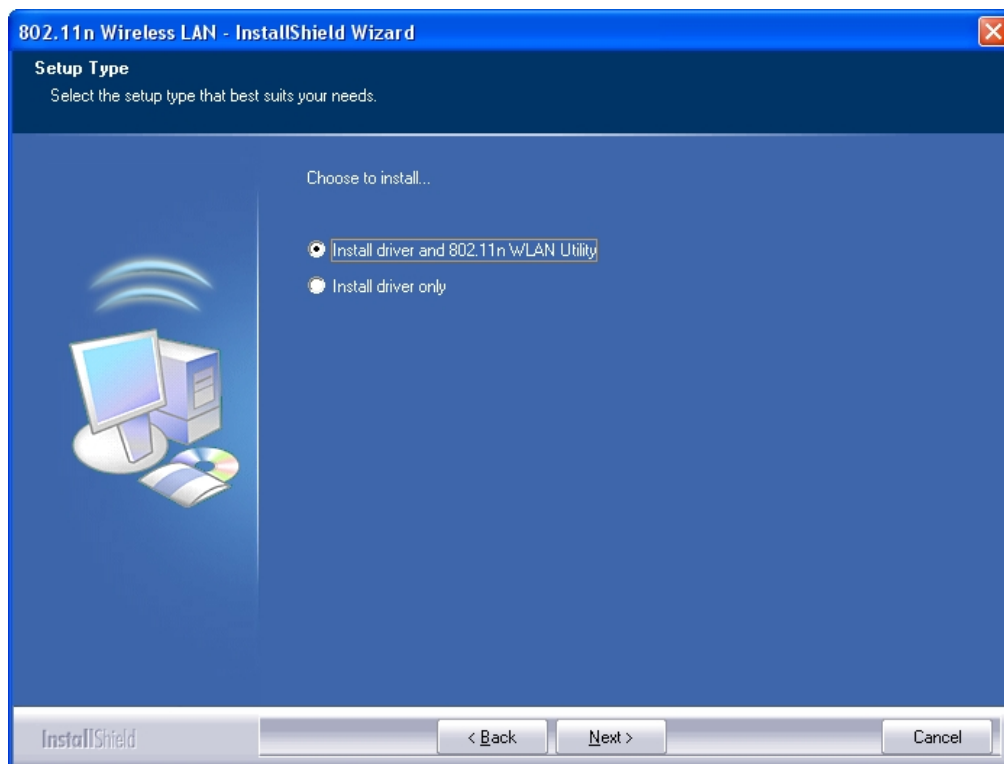
- For Linux or Mac driver installation guide, please refer to the instruction in [/Driver/Linux/README](#) or [/Driver/Mac/README](#) in the CD-Rom.
  - The following driver installation guide uses Windows XP as the presumed operation system. The procedures and screens in Windows 2000 and Vista are familiar with Windows XP.
1. The system finds the newly installed device automatically. Click **Cancel** to close this window.



2. Insert the CD-Rom that came with this product to your CD-Rom drive. The menu window pops up automatically. Please click the **Driver** button of this product.

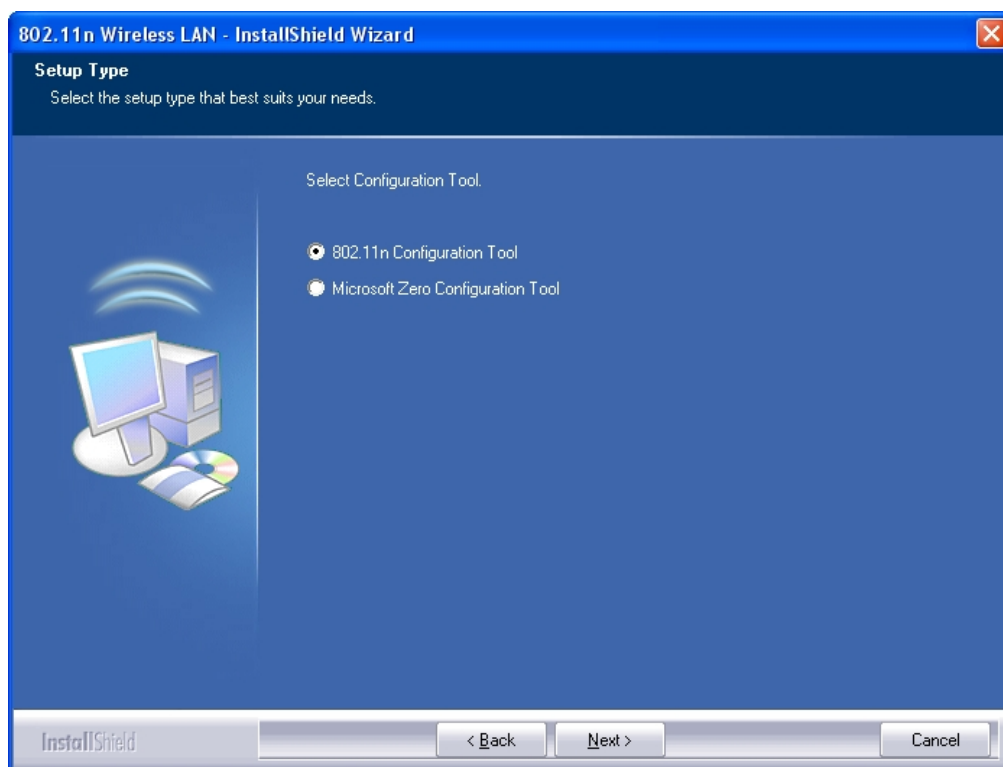
**Note:** If the CD-Rom fails to auto-run, please click on **My Computer > your CD-Rom drive > (folder of this product) > Driver** then double-click the **Setup** icon to start this menu.

3. Select if you are going to install the driver and wireless utility; or install the driver only.

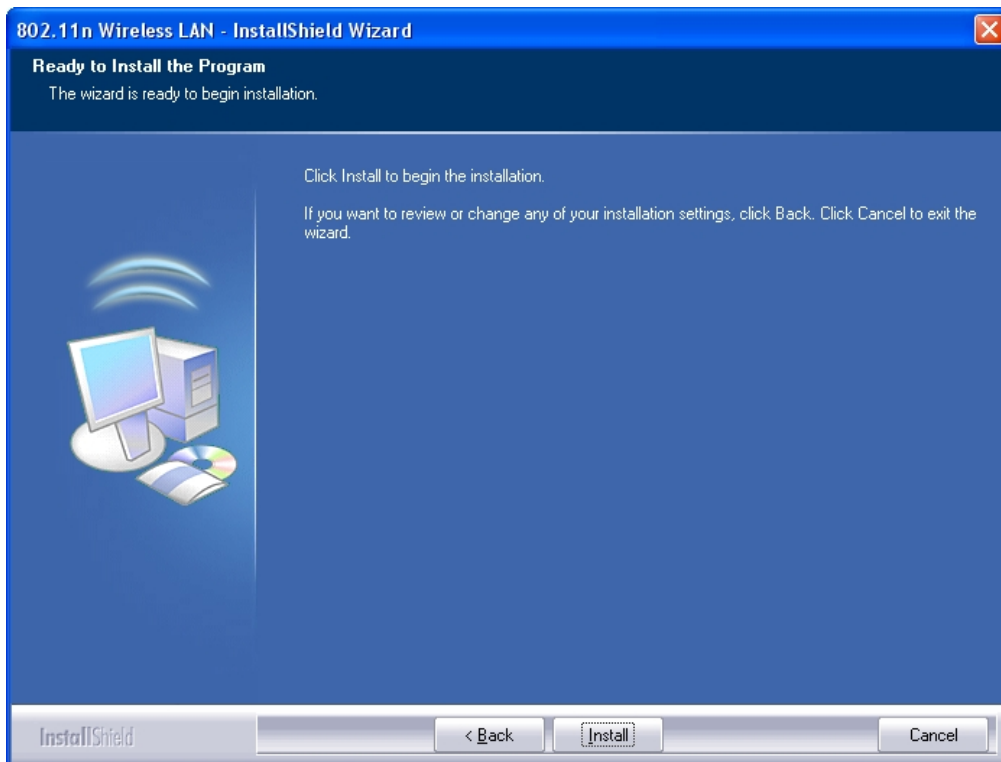


4. Select if you are going to configure your wireless network with this device or with Microsoft Zero Configuration tool.

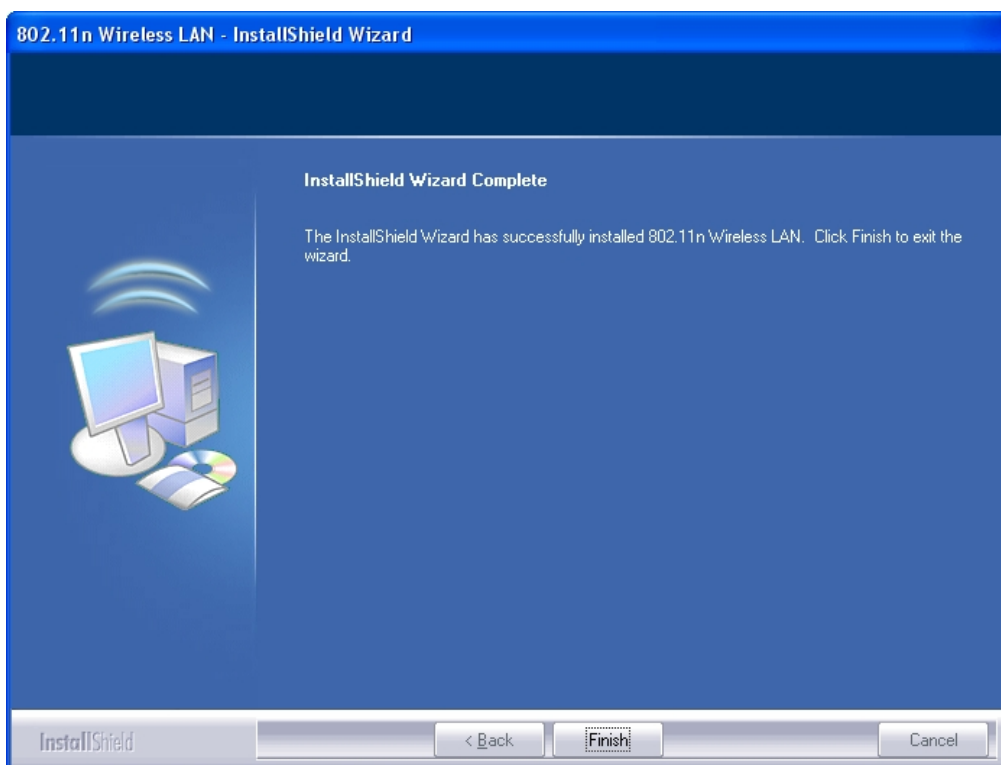
**Note:** This can be changed after installing this software.



5. Click the **Install** button to start installing.



6. Click the **Finish** button to complete installation.




# Management Guide

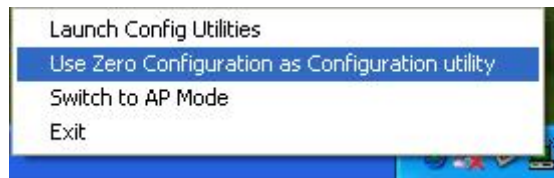
Read this chapter to understand the management interface of the device and how to manage the device.

## Making a Basic Network Connection


### Select a configuration tool

In the following instruction for making a network connection, we use the Utility we provide to configure your wireless network settings.

**Note:** You could use either the software we provide or Microsoft Zero Configuration tool to configure this adapter. To switch between the two configuration tools, please right click on the  icon on system tray to select.

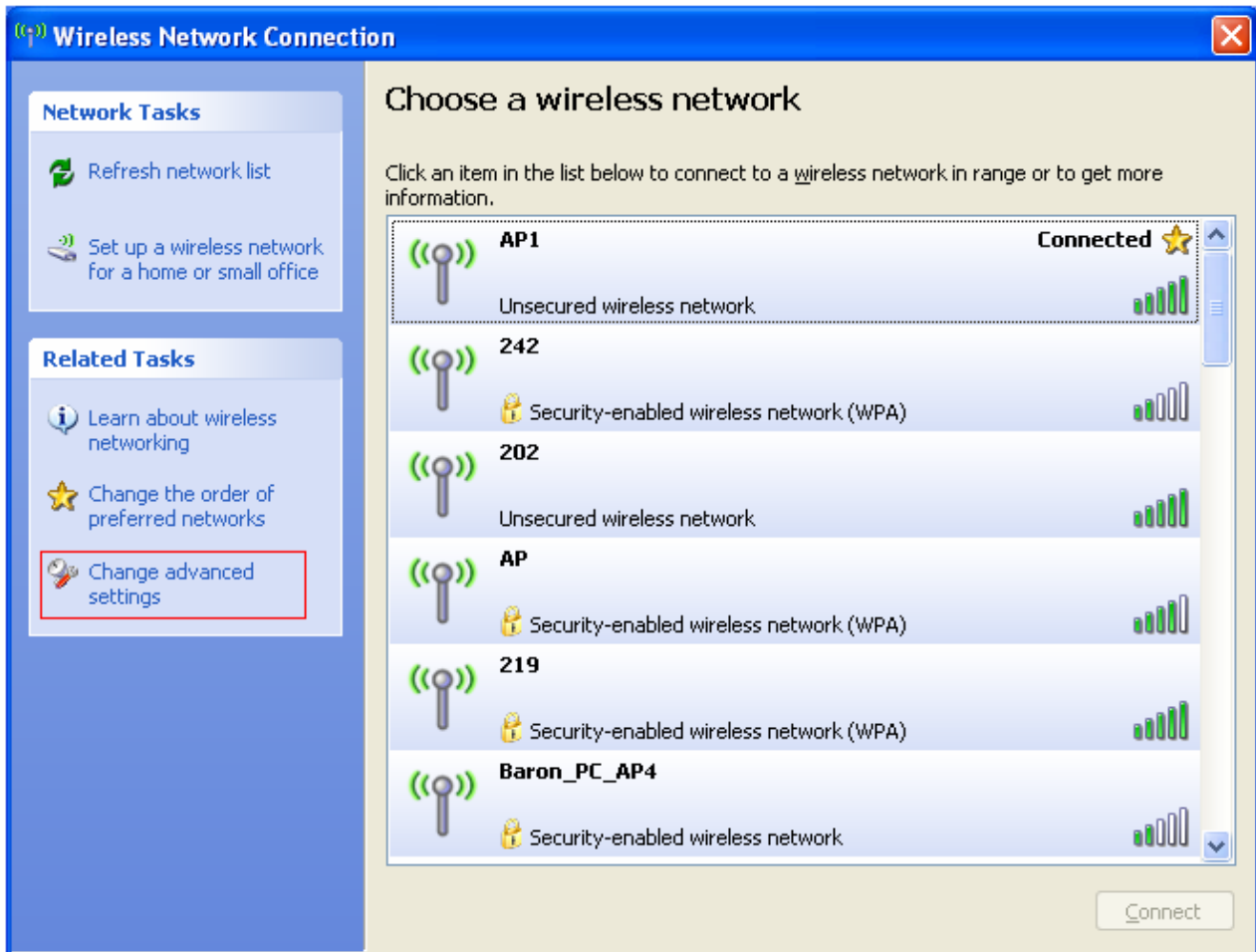


### To connect with Microsoft Zero Configuration tool


After specifying the Microsoft Zero Configuration tool to configure your wireless network, right click on the  icon on system tray. Select **View Available Wireless Networks** to specify your wireless network.

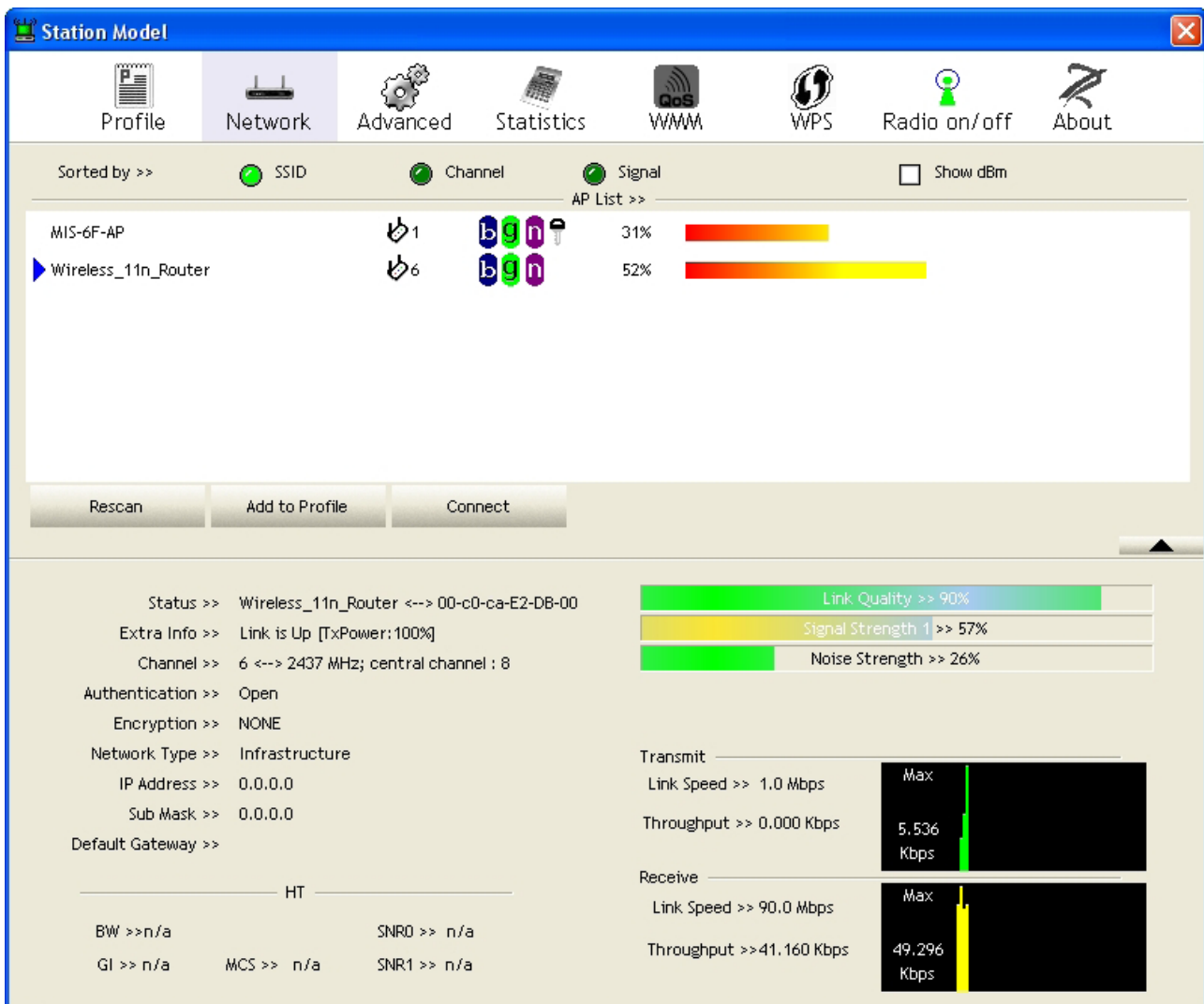


The tool shows the available wireless networks. Select your demanding network to connect with. To connect to a wireless network with more security settings, please click **Change advanced settings** to be compatible with your wireless network security settings.



## To connect with 802.11n Wireless LAN Utility

We provide this Utility for users to connect to a wireless network easily. It provides more information and configuration for this adapter. As default, the Utility is started automatically upon starting your computer and connects to a connectable wireless network with best signal strength and with no security setting. Right click on the  icon in the system tray and select **Launch Config utilities** if the Utility does not start. Please refer to the following chapters to get information regarding to the functions of this Utility.

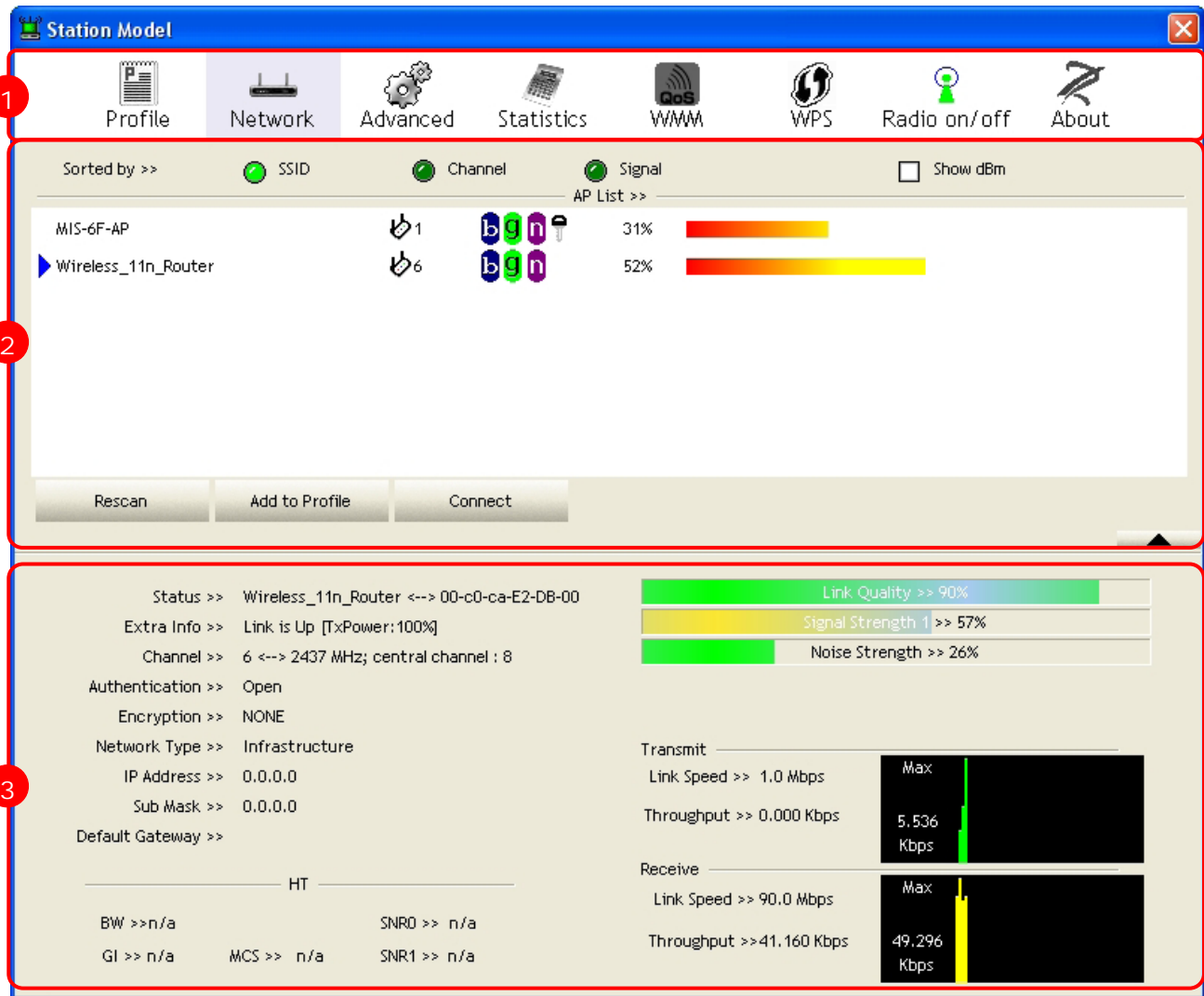


# Introduction to the 802.11n Wireless LAN Utility

**Note:** The Utility in Linux and Mac are different from the following.

## Interfaces

This Utility is basically consisted of three parts:



**1. Functional Buttons:** on top of the window. You can click each button to access each configuration window.

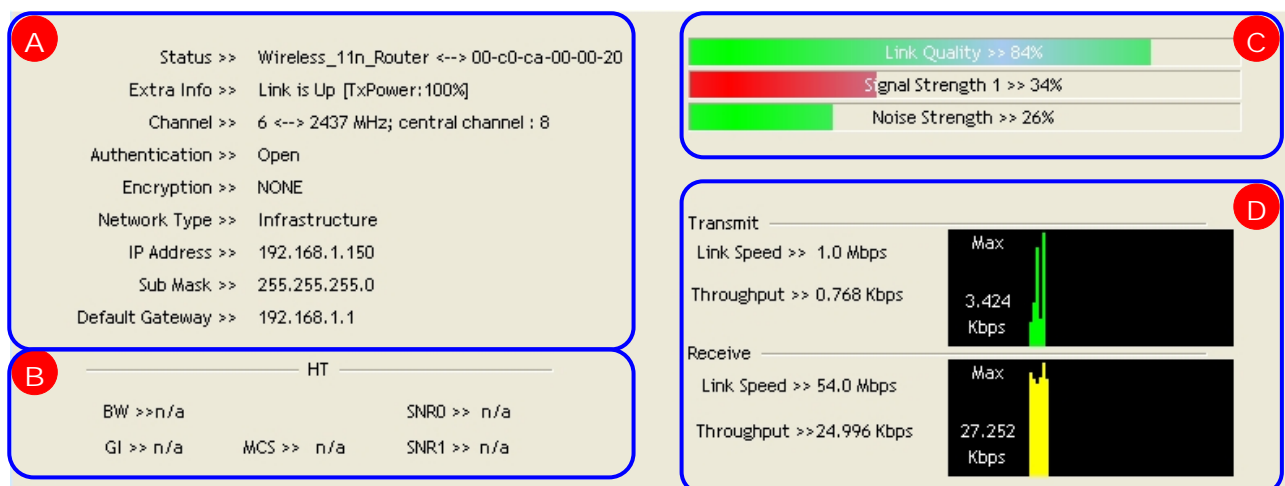
**Note:** Click  to enable/disable wireless connection status.

**2. Configuration Column:** Center of the Utility window. Make your changes for each function in this part.

**3. Link Status Information:** bottom of the utility window. Shows the connection status and system information.



## Link Status Information



### A. Network Information:

Items	Information
Status	Show the connecting status. Also shows the SSID while connecting to a valid network.
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 of current connection.
Sub Mask	Subnet mask of current connection.
Default Gateway	Default gateway of current connection.
Link Speed	Show current transmit rate and receive rate.
Throughput	Display transmit and receive throughput in Mbps.

**B. HT:** Display current HT status in use, containing BW, GI, MCS, SNR0, and SNR1 value.

### C. Link Quality and Strength Bar:

Items	Information
Link Quality	Display connection quality based on signal strength and TX/RX packet error rate.
Signal Strength 1	Receive signal strength 1.
Noise Strength	Display noise signal strength.

User can choose to display Signal and Noise Strength as percentage or dBm format by mark the dBm checkbox.

Profile
 Network
 Advanced
 Statistics
 WMM
 WPS
 Radio on/off
 About

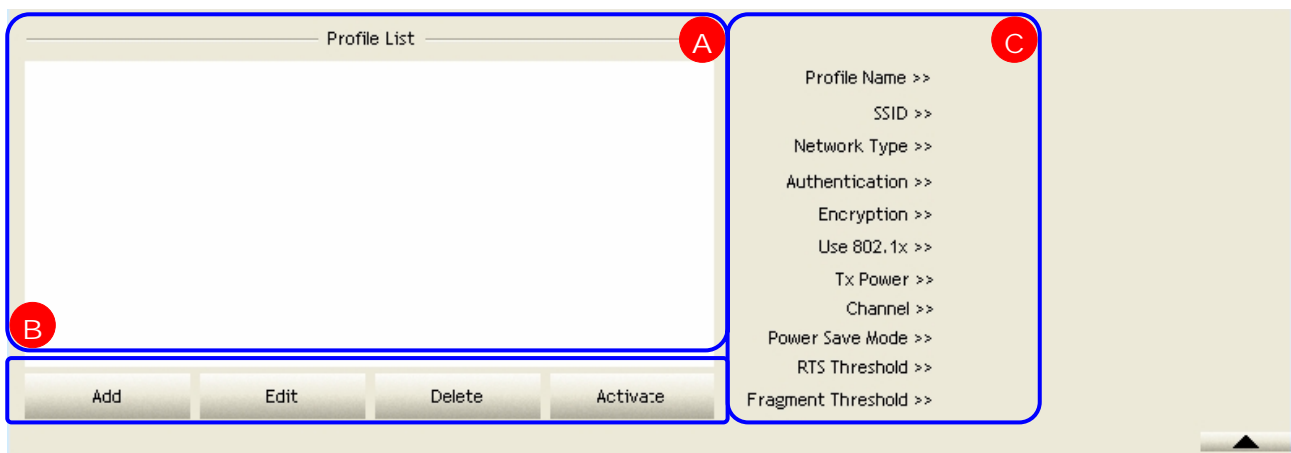
Sorted by >>
☒ SSID
☒ Channel
☒ Signal
☐ Show dBm

### D. Statistics:

Items	Information
Link Speed	Show current transmit rate and receive rate.
Throughput	Display transmit and receive throughput in Mbps.


## Profile

This profile page allows users to save different wireless settings, which helps users to get access to wireless networks at home, office or other wireless network environments quickly.



**A. Profile List:** The list shows all the profiles you have added before.

**B. Buttons:** You can click on these buttons to add a new profile, edit, delete or activate an old profile.

**Note:** For Vista user, there are extra  and  buttons in this feature. Click on these buttons to import or export the selected profile.

**C. Profile Information:** While you select a profile in the profile list, you can see the profile information shows on here.

Items	Information
<b>Profile Name</b>	The name of the selected profile.
<b>SSID</b>	The SSID of the wireless system.
<b>Network Type</b>	Shows Infrastructure / Ad-hoc to indicate the network type of the selected profile.
<b>Authentication</b>	Shows the authentication mode in use. There are total 8 modes: Open, Shared, LEAP, WPA, WPA-PSK, WPA2, WPA2-PSK and WPA-NONE.
<b>Encryption</b>	Shows the encryption mode in use. There are total 4 modes: None, WEP, TKIP and AES.
<b>Use 802.1x</b>	Shows Yes/No to indicate whether the selected profile use the 802.1x feature or not.
<b>Tx Power</b>	Shows the transmit power in use. There are total 7 types: Auto, 100%, 75%, 50%, 25%, 10% and Low.
<b>Channel</b>	Shows the channel in use (1~14) for Ad-Hoc mode.
<b>Power Save Mode</b>	Shows the power save mode in use. Two selections: CAM (Constantly Awake Mode) and PSM (Power Saving Mode).
<b>RTS Threshold</b>	Shows the RTS threshold value in use.
<b>Fragment Threshold</b>	Shows the fragment threshold in use.

To add a new profile:

1. Click the **Add** button. The add profile window pops up.

**Note:** you could also add a new profile quickly by selecting an available network in the **Network** function then click the **Add to Profile** button.

System Config    Auth. \Encry.    802.1x    ← Click on these tabs

Profile Name >> PROF1    Network Type >> Infrastructure ▼

SSID >> ▼    Tx Power >> Auto ▼

Power Save Mode >> ☒ CAM    ☒ PSM    Preamble >> Auto ▼

☐ RTS Threshold    0    2347    2347

☐ Fragment Threshold    255    2346    2346

OK    Cancel

2. There are three tabs on the window:

System Config

Settings for: Profile Name, SSID, Network Type, Tx Power, Preamble, Power Save Mode, RTS Threshold, and Fragment Threshold.

Auth. \Encry.

Settings for: Authentication, Encryption, Preshared Key, and WEP Key.

802.1x

Settings for: EAP Method, Tunnel Authentication, and Session Resumption. For different EAP Method, you also have to configure different require of ID/Password, Client Certificate, or Server Certificate.

Please follow the steps below to fill in the information gradually.

3. In **System Config** section, fill in information for this profile:

The screenshot shows the 'System Config' window for a network profile. The 'System Config' tab is selected. The 'Profile Name' is 'PROF1'. The 'SSID' is an empty dropdown menu. The 'Network Type' is 'Infrastructure'. The 'Tx Power' is 'Auto'. The 'Preamble' is 'Auto'. The 'Power Save Mode' has two radio buttons: 'CAM' (selected) and 'PSM' (selected). The 'RTS Threshold' is a slider from 0 to 2347, with a text box showing 2347. The 'Fragment Threshold' is a slider from 256 to 2346, with a text box showing 2346. The 'OK' and 'Cancel' buttons are at the bottom.

Items	Information
<b>Profile Name</b>	Choose a name for this profile, or use default name defined by system.
<b>SSID</b>	Fill in the intended SSID name or use the drop list to select from available APs.
<b>Network Type</b>	There are two types, infrastructure and 802.11 Ad-hoc modes. Under Ad-hoc mode, you could 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.
<b>Tx Power</b>	Transmit power, the amount of power used by a radio transceiver to send the signal out.
<b>Preamble</b>	Two selections: Auto, and Long Preamble. This can only be set up in Ad –hoc mode.
<b>Channel</b>	Channel in use for Ad-Hoc mode.
<b>Power Save Mode</b>	Choose from CAM (Constantly Awake Mode) or PSM (Power Saving Mode).
<b>RTS Threshold</b>	For adjusting the RTS threshold number by sliding the bar or key in the value directly. The default value is 2347.
<b>Fragment Threshold</b>	Adjust the Fragment threshold number by sliding the bar or key in the value directly. The default value is 2346.

4. In **Auth. \Encry.** section, select an encryption type and fill in the corresponding wireless network information:

Items	Information																						
<b>Authentication Type</b>	<p><b>For Windows 2000 User</b> There are 7 types supported: Open, Shared, LEAP, WPA, WPA-PSK, WPA2, WPA2-PSK, and WPA-NONE<sup>1</sup>. Please select a type from the drop down list.</p> <p><b>For Vista User</b> There are 7 types supported: Open, Shared, WPA, WPA-PSK, WPA2, WPA2-PSK, and CCKM. Please select a type from the drop down list.</p>																						
<b>Encryption Type</b>	<p><b>For Windows 2000 User</b> There are 4 types supported: None, WEP, TKIP and AES. The available encryption selection will differ from the authentication type you have chosen, the result is shown below:</p> <table border="1"> <thead> <tr> <th>Authentication</th><th>Available Encryption Selection</th></tr> </thead> <tbody> <tr> <td>Open</td><td>NONE, WEP</td></tr> <tr> <td>Shared</td><td>WEP</td></tr> <tr> <td>LEAP</td><td>(no selection)</td></tr> <tr> <td>WPA/WPA2/WPA-PSK WPA2-PSK/WPA-NONE</td><td>TKIP, AES</td></tr> </tbody> </table> <p><b>For Vista User</b> There are 6 types supported: None, WEP, TKIP, AES, TKIP (MFP) and AES (MFP). The available encryption selection will differ from the authentication type you have chosen, the result is shown below:</p> <table border="1"> <thead> <tr> <th>Authentication</th><th>Available Encryption Selection</th></tr> </thead> <tbody> <tr> <td>Open</td><td>NONE, WEP</td></tr> <tr> <td>Shared</td><td>WEP</td></tr> <tr> <td>WPA/ WPA-PSK/ WPA2-PSK</td><td>TKIP, AES</td></tr> <tr> <td>WPA2</td><td>TKIP, AES, TKIP(MFP), AES(MFP)</td></tr> <tr> <td>CCKM</td><td>WEP, TKIP, AES</td></tr> </tbody> </table>	Authentication	Available Encryption Selection	Open	NONE, WEP	Shared	WEP	LEAP	(no selection)	WPA/WPA2/WPA-PSK WPA2-PSK/WPA-NONE	TKIP, AES	Authentication	Available Encryption Selection	Open	NONE, WEP	Shared	WEP	WPA/ WPA-PSK/ WPA2-PSK	TKIP, AES	WPA2	TKIP, AES, TKIP(MFP), AES(MFP)	CCKM	WEP, TKIP, AES
Authentication	Available Encryption Selection																						
Open	NONE, WEP																						
Shared	WEP																						
LEAP	(no selection)																						
WPA/WPA2/WPA-PSK WPA2-PSK/WPA-NONE	TKIP, AES																						
Authentication	Available Encryption Selection																						
Open	NONE, WEP																						
Shared	WEP																						
WPA/ WPA-PSK/ WPA2-PSK	TKIP, AES																						
WPA2	TKIP, AES, TKIP(MFP), AES(MFP)																						
CCKM	WEP, TKIP, AES																						

<sup>1</sup> WPA-NONE is only available in Ad-hoc mode.

<b>Use 802.1x</b>	<p>This checkbox appears while the environment is set to an Open authentication with WEP encryption. Mark the checkbox to make the 802.1x section available. The 802.1x section is also available in WPA and WPA2 authentication types.</p>
<b>Preshared Key</b>	<p>This is the shared secret between AP and STA. For WPA-PSK, WPA2-PSK and WPA-NONE authentication mode, this field must be filled with characters longer than 8 and less than 32 lengths. The following dialog appears if you have input invalid values.</p> <p>Invalid WPA Pre-Shared key, WPA-PSK used field should use 8-63 ASCII characters or 64 Hex characters.</p>
<b>WEP Key</b>	<p>Only available when using WEP encryption algorithm. The key must match AP's key. Select Hex<sup>1</sup> or ASCII<sup>2</sup> to setup the key value. The following dialog appears if you have input invalid values.</p> <p>Invalid WEP Key 1 length, WEP Key should be 10 or 26 hex digits</p> <p>Invalid WEP Key 1 length, WEP Key should be 5 or 13 ascii characters</p>

<sup>1</sup> Hexadecimal digits consist of the numbers 0-9 and the letters A-F.

<sup>2</sup> ASCII (American Standard Code for Information Interchange) is a code for representing English letters as numbers from 0-127.

5. Specify the 802.1x information if you are using the 802.1X certification method.

Users that do not use this function or connecting to an open-wireless network please skip this part.

#### A. EAP Method:

**For Windows 2000 User:** There are total 5 modes: PEAP, TLS/Smart Card, TTLS, EAP-FAST, and MD5-Challenge.

**For Vista User:** There are total 4 modes: PEAP, TLS/Smart Card, EAP-FAST, and LEAP. Please select an EAP method from the drop down list.

Items	Information
<b>PEAP</b>	Protect Extensible Authentication Protocol. PEAP transport securely authenticates data by using tunneling between PEAP clients and an authentication server. PEAP can authenticate wireless LAN clients using only server-side certificates, thus simplifying the implementation and administration of a secure wireless LAN.
<b>TLS/Smart Card</b>	Transport Layer Security. Provides for certificate-based and mutual authentication of the client and the network. It relies on client-side and server-side certificates to perform authentication and can be used to dynamically generate user-based and session-based WEP keys to secure subsequent communications between the WLAN client and the access point.
<b>TTLS</b>	Tunneled Transport Layer Security. This security method provides for certificate-based, mutual authentication of the client and network through an encrypted channel. Unlike EAP-TLS, EAP-TTLS requires only server-side certificates.
<b>EAP-FAST</b>	Flexible Authentication via Secure Tunneling. It was developed by Cisco. Instead of using a certificate, mutual authentication is achieved by means of a PAC (Protected Access Credential) which can be managed dynamically by the authentication server. The PAC can be supplied (distributed one time) to the client either manually or automatically. Manually, it is delivered to the client via disk or a secured network distribution method. Automatically, it is supplied as an in-band, over the air, distribution. For tunnel authentication, only support "Generic Token Card" authentication.
<b>MD5-Challenge</b>	Message Digest Challenge. Challenge is an EAP authentication type that provides base-level EAP support. It provides for only one-way authentication - there is no mutual authentication of wireless client and the network.
<b>LEAP</b>	Light Extensible Authentication Protocol is an EAP authentication type used primarily by Cisco Aironet WLANs. It encrypts data transmissions using dynamically generated WEP keys, and supports mutual authentication.

**B. Tunnel Authentication:** The tunnel authentication will differ from the EAP method you have chosen, the result is shown below:

**For Windows 2000 User:**

EAP Method	Tunnel Authentication
PEAP	EAP-MSCHAP v2 , EAP-TLS/Smart Card, Generic Token Card
TLS/Smart Card	(no selection)
TTLS	CHP, MS-CHAP, MS-CHAP-V2, PAP, EAP-MD5
EAP-FAST	Generic Token Card
MD5-Challenge	(no selection)

**For Vista User:**

EAP Method	Tunnel Authentication
PEAP	EAP-MSCHAP v2 , EAP-TLS/Smart Card, Generic Token Card
TLS/Smart Card	(no selection)
EAP-FAST	(no selection)
LEAP	(no selection)

**C. Session Resumption:** Mark to enable this function or unmark it to disable.

After doing the above settings, please click on the tabs below. There are several tabs on the window, please fill in the information gradually.

- ID \ PASSWORD** Settings for: Authentication ID/Password, Tunnel ID/Password and Password Mode<sup>1</sup>.
- Client Certificate** Settings for using the Client Certificate function or not.
- Server Certificate** Settings for using the Server Certificate function or not.
- EAP-FAST** Setting for EAP-FAST method.
- SSO** Settings for Single Sign On. **Note:** This tab only appears in Vista system.

<sup>1</sup> Password mode is only available in EAP-FAST method.



## ID \ PASSWORD

Items	Information
<b>Authentication ID / Password</b>	The identity, password and domain name for server. Only "EAP-FAST" and "LEAP" authentication can be keyed in domain name. Blank space can be keyed in domain name.
<b>Tunnel ID / Password</b>	Identity and Password for server.
<b>Password Mode</b>	Select the power save mode.  <b>For Windows 2000 User</b> There are two selections: Soft Token and Static Password.  <b>For Vista User</b> There are four selections: Soft Token, Static Password, Windows Logon and Prompt User.

## Client Certificate

Items	Information
<b>Use Client certificate</b>	Client certificate for server authentication.
<b>Use my smart card</b>	Client certificate for server authentication.

## Server Certificate

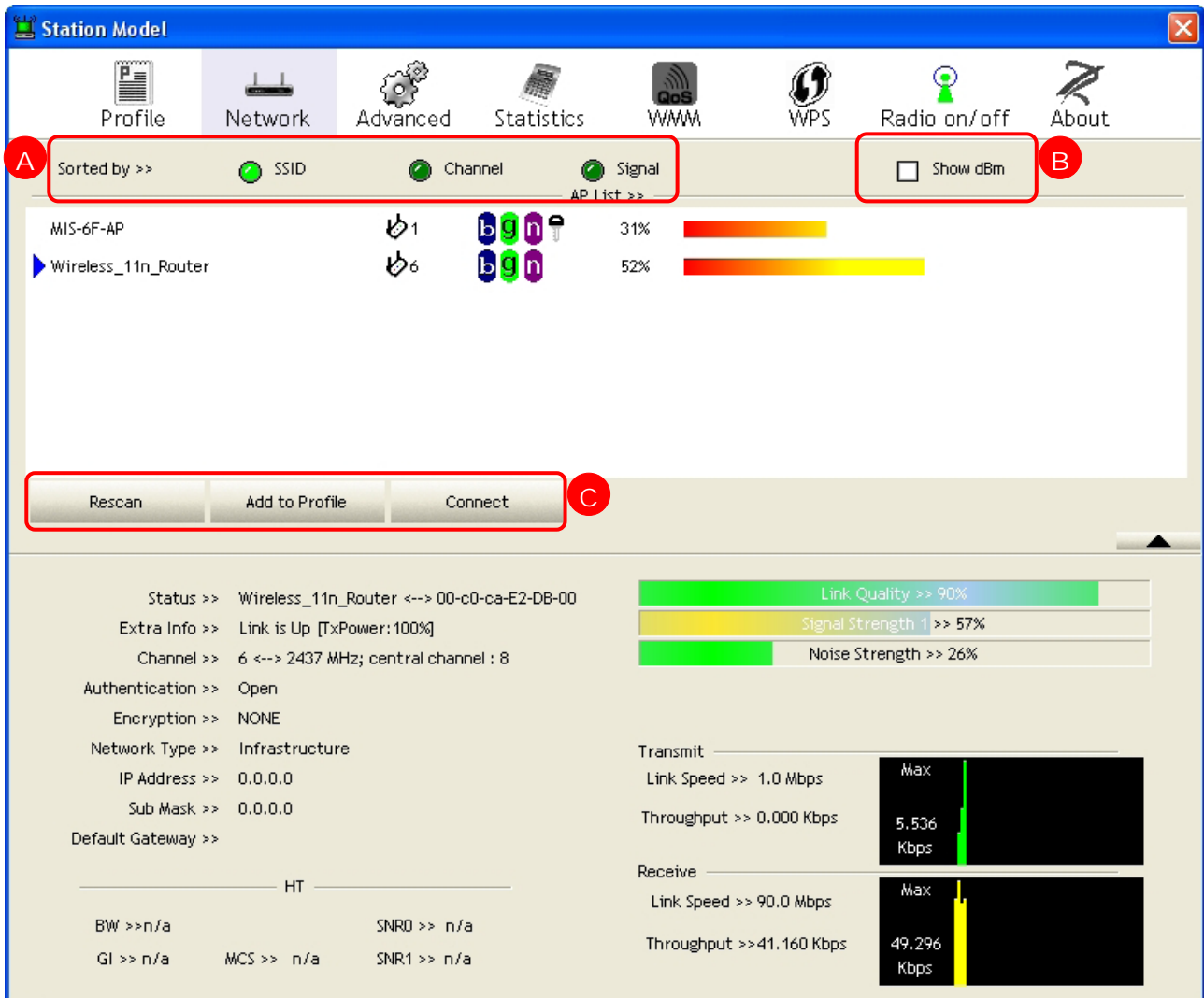
Items	Information
<b>Use Certificate chain</b>	Mark the checkbox to enable using certification chain.
<b>Allow intimidate certificates</b>	Mark to allow intimidates certification.
<b>Server name</b>	Enter an authentication sever root.

## EAP Fast

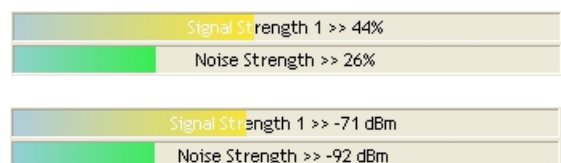
Items	Information
<b>Allow unauthenticated provision mode</b>	During the PAC can be provisioned (distributed one time) to the client automatically. It only supported "Allow unauthenticated provision mode" and use "EAP-MSCHAP v2" authentication to authenticate now. It causes to continue with the establishment of the inner tunnel even though it is made with an unknown server. Mark to enable unauthenticated provision mode.
<b>Use protected authentication credential</b>	Use protected authentication credential: Using PAC, the certificate can be provided to the client manually via disk or a secured network distribution method. Mark to use protected authentication credential.

## Network

This network lists the available wireless networks. The Utility connects to a wireless network with best signal strength automatically. You can change the connecting network by clicking on the network name and click the **Connect** button. To see detail information of each network, please double click on each item to pop up the information window.



- A. Sorted by:** Click each button to sort the listing networks by SSID, channel and Signal strength.
- B. Show dBm:** Mark the checkbox to show the signal and noise strength in dBm, unmark to show in percentage.
- C. Buttons:** You can click on these buttons to add a new profile, edit, delete or activate an old profile.



Items	Information
<b>Rescan</b>	To rescan available wireless networks.
<b>Connect</b>	To connect to a designated network.
<b>Add to Profile</b>	To add a network to profile after selecting a network.

## Advanced

This page provides advanced configurations to this adapter. Please refer to the following chart for definitions of each item.

Wireless mode >> 2.4G

☒ Enable CCX (Cisco Compatible eXtensions)

☒ Turn on CCKM

☒ Enable Radio Measurements

☒ Non-Serving Channel Measurements limit 250 ms(0-2000)

☒ Enable TX Burst

☐ Enable TCP Window Size

☐ Fast Roaming at -70 dBm

☐ Show Authentication Status Dialog

Select Your Country Region Code

11B/G >> 0: CH1-11

Apply

Items	Information
<b>Wireless mode</b>	Select wireless mode. 2.4G/5.8G is supported.
<b>Enable TX Burst</b>	Select to enable connecting to a TX Burst supported device.
<b>Enable TCP Window Size</b>	Mark the checkbox to enable TCP window size, which help enhance throughput.
<b>Fast Roaming at __ dBm</b>	Mark the checkbox to enable fast roaming. Specify the transmit power for fast roaming.
<b>Show Authentication Status Dialog</b>	Mark the checkbox to show "Authentication Status Dialog" while connecting to an AP with authentication. Authentication Status Dialog displays the process about 802.1 x authentications.
<b>Select Your Country Region Code</b>	Eight countries to choose. Channel list:  1 ~ 11 channels (North America) 1 ~ 13 channels (General Europe) 1 ~ 14 channels (Japan) IEEE802.11a 4 Channels (Japan) 19 Channels (Europe) 13 Channels (USA)
<b>Enable CCX (Cisco Compatible extensions)</b>	Select to enable CCX. This function can only be applied when connecting to a Cisco compatible device.
<b>Turn on CCKM</b>	Mark to enable CCKM.
<b>Enable Radio Measurements</b>	Mark to enable channel measurement every 0~2000 milliseconds.
<b>Non-Serving Channel Measurements limit</b>	Mark to revise the channel measurement.

**Note:** For Vista user, click on the CCX button to do more configuration. Please refer to [CCX](#) for more information.



## 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

Receive

Frames Transmitted Successfully

=

120

Frames Retransmitted Successfully

=

14

Frames Fail To Receive ACK After All Retries

=

0

RTS Frames Successfully Receive CTS

=

0

RTS Frames Fail To Receive CTS

=

0

Reset Counter

Items	Information
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.
RTS Frames Successfully Receive CTS	Successfully receive CTS after sending RTS frame.
RTS Frames Fail To Receive CTS	Failed to receive CTS after sending RTS.
Reset Counter	Reset counters to zero.

Transmit

Receive

Frames Received Successfully

=

11

Frames Received With CRC Error

=

333

Frames Dropped Due To Out-of-Resource

=

0

Duplicate Frames Received

=

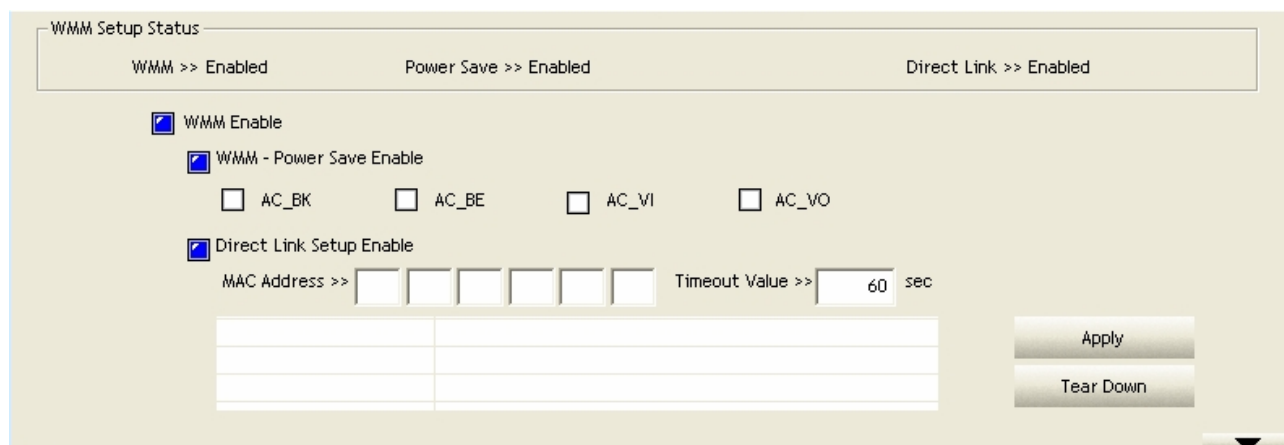
0

Reset Counter

Items	Information
Frames Received Successfully	Frames received successfully.
Frames Received With CRC Error	Frames received 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.

## WMM


This page allows users to activate the WMM function for this device. Please note that this function only works while connecting to a WMM compatible device.

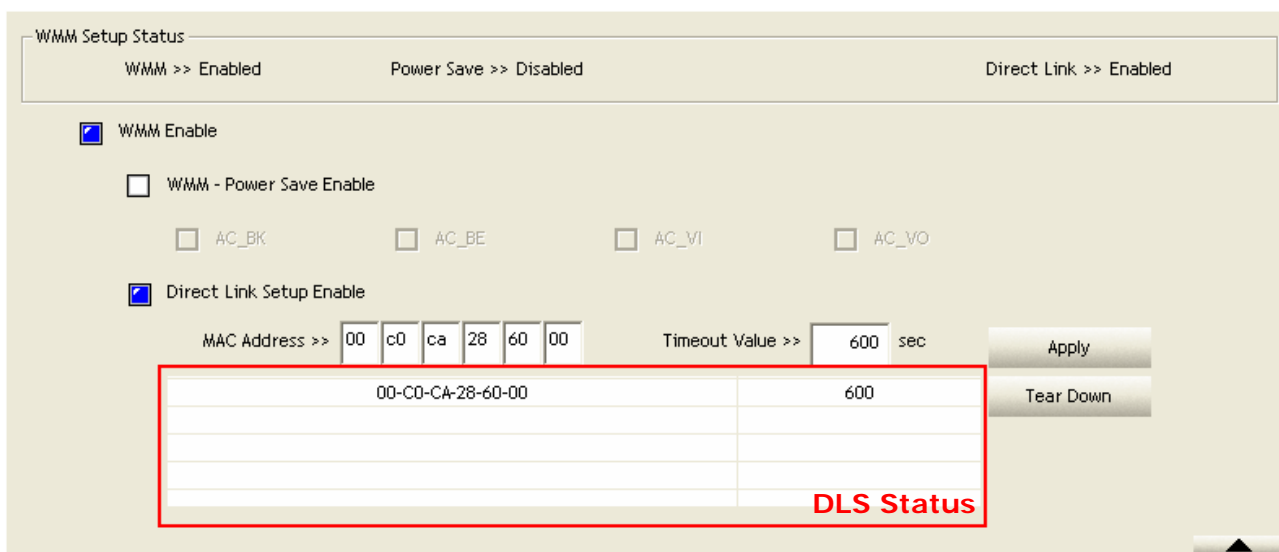


The image shows a web-based configuration page titled "WMM Setup Status". At the top, there is a status bar with three indicators: "WMM >> Enabled", "Power Save >> Enabled", and "Direct Link >> Enabled". Below this, there are three main sections. The first section, "WMM Enable", has a checked checkbox. The second section, "WMM - Power Save Enable", has a checked checkbox and four unchecked checkboxes labeled "AC\_BK", "AC\_BE", "AC\_VI", and "AC\_VO". The third section, "Direct Link Setup Enable", has a checked checkbox. Below this, there are two input fields: "MAC Address >>" followed by five empty boxes, and "Timeout Value >>" followed by a text box containing "60" and the unit "sec". At the bottom right, there are two buttons: "Apply" and "Tear Down".

Items	Information
<b>WMM Enable</b>	Enable Wi-Fi Multi-Media.
<b>WMM - Power Save Enable</b>	Enable WMM Power Save. Please enable WMM before configuring this function.
<b>Direct Link Setup Enable</b>	Enable DLS (Direct Link Setup). Please enable WMM before configuring this function.
<b>MAC Address</b>	Fill in the blanks of Direct Link with MAC Address of STA.
<b>Timeout Value</b>	Time of automatically disconnect 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.
<b>Apply / Tear Down</b>	After fill in the "MAC Address" and "Timeout Value", click "Apply" button to save your configuration. The result will appear in the following "DLS Status" blanks. To remove the configuration, please select the configuration in the blanks and then click "Tear Down" button.


### Steps to enable Direct Link Setup function:

1. Click the "Direct Link Setup Enable" checkbox.
2. Change to "Network" function. Add an AP that supports DLS features to the Profile.
3. Fill in the blanks of Direct Link with MAC Address of STA. The STA must conform to these two conditions:
  - Connect with an AP that supports DLS features.
  - Ensure that DLS is enabled
4. Fill in the Timeout Value and then click .
5. After configuring the DLS successfully, the MAC address and Timeout Value are displayed in the "DLS Status".



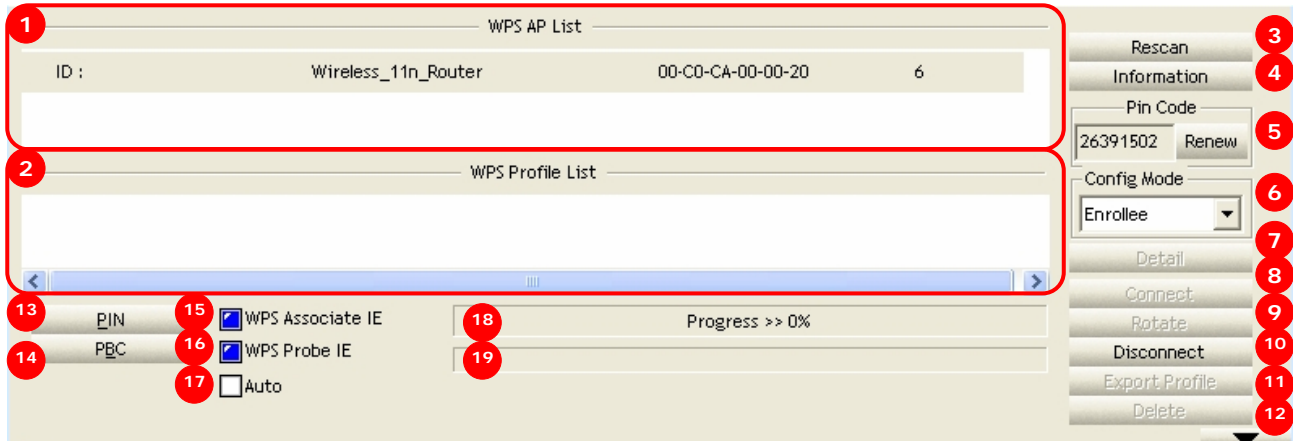
The image shows a "WMM Setup Status" window. At the top, it displays "WMM >> Enabled", "Power Save >> Disabled", and "Direct Link >> Enabled". Below this, there are checkboxes for "WMM Enable" (checked), "WMM - Power Save Enable" (unchecked), and "Direct Link Setup Enable" (checked). Under "WMM - Power Save Enable", there are four unchecked checkboxes: "AC\_BK", "AC\_BE", "AC\_VI", and "AC\_VO". Under "Direct Link Setup Enable", there are input fields for "MAC Address >>" (00 c0 ca 28 60 00) and "Timeout Value >>" (600 sec). Below these fields is a table with two columns. The first column contains the MAC address "00-C0-CA-28-60-00" and the second column contains the timeout value "600". The table is labeled "DLS Status" in red text. To the right of the table are two buttons: "Apply" and "Tear Down".

MAC Address	Timeout Value
00-C0-CA-28-60-00	600

6. If you want to disconnect Direct Link Setup, select the list in "DLS Status" and then click on the  button.

## WPS

The primary goal of Wi-Fi Protected Setup (Wi-Fi Simple Configuration) is to simplify the security setup and management of Wi-Fi networks. This adapter supports the configuration setup using PIN configuration method or PBC configuration method through an internal or external Registrar.



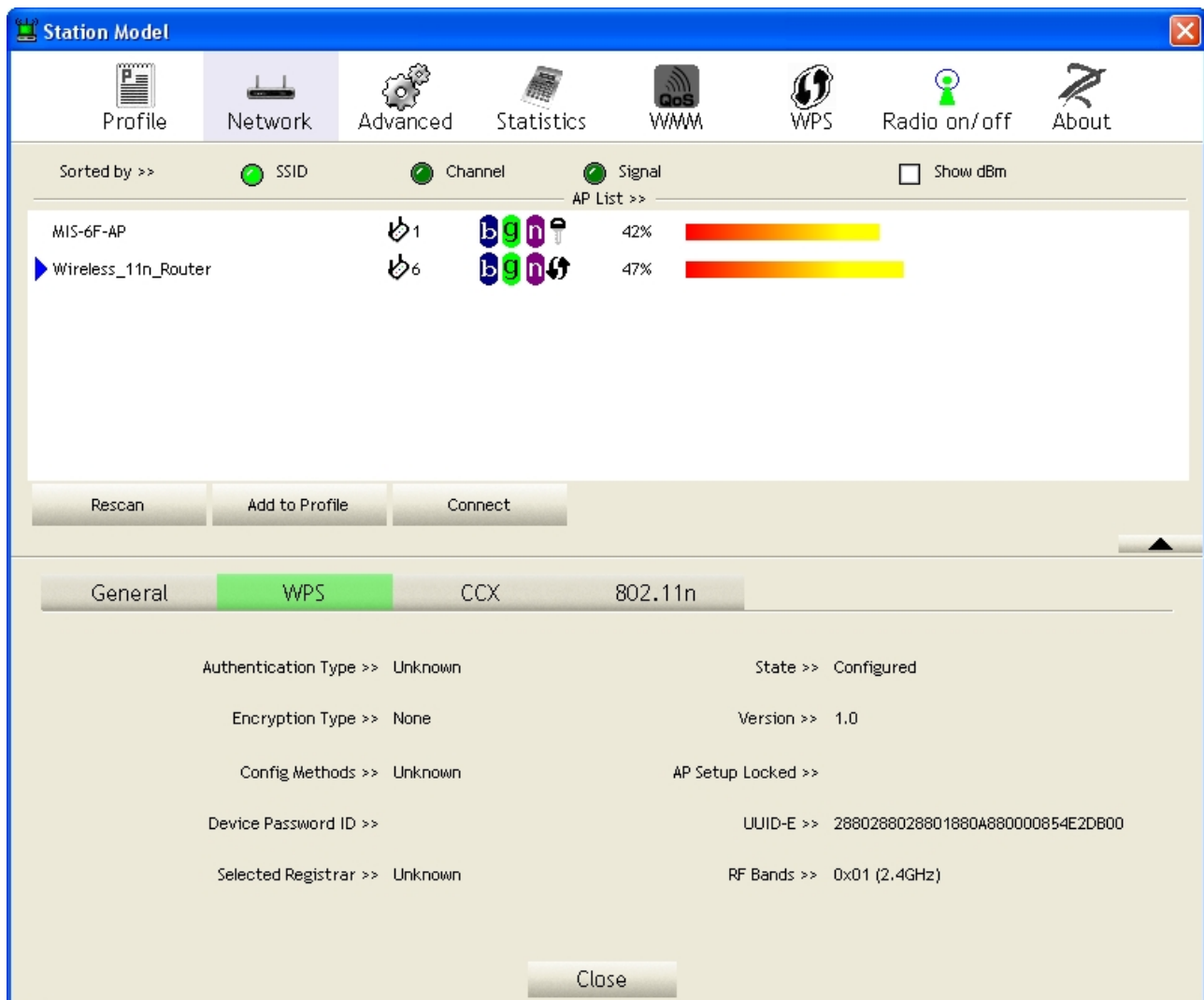
Items	Information
1. WPS AP List	Display the information of surrounding APs with WPS IE from last scan result. List information includes SSID, BSSID, Channel, ID (Device Password ID), and Security-Enabled.
2. WPS Profile List	Display all of credentials got from the Registrar. List information includes SSID, MAC Address, Authentication and Encryption Type. If STA Enrollee, credentials are created as soon as each WPS success. If STA Registrar, Utility creates a new credential with WPA2-PSK/AES/64Hex-Key and doesn't change until next switching to STA Registrar.
3. Rescan	Click to rescan the wireless networks.
4. 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.
5. Pin Code	8-digit numbers. It is required to enter PIN Code into Registrar using PIN method. Each Network card has only one PIN Code of Enrollee. Click on the Renew button to renew the PIN code.
6. Config Mode	Enrollee or an external Registrar.
7. Detail	Information about Security and Key in the credential.
8. Connect	Command to connect to the selected network inside credentials.
9. Rotate	Command to connect to the next network inside credentials.
10. Disconnect	Stop WPS action and disconnect this active link. And then select the last profile at the Profile Page of Utility if exists. If there is an empty profile page, the driver will select any non-security AP.
11. Export Profile	Click the "Export Profile" button will export the WPS profile.
12. 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.
13. PIN	Start to add to Registrar using PIN configuration method.
14. PBC	Start to add to AP using PBC configuration method.
15. WPS associate IE	Send the association request with WPS IE during WPS setup. It is optional for STA.
16. WPS probe IE	Send the probe request with WPS IE during WPS setup. It is optional for STA.
17. Auto	Select the AP automatically.
18. Progress Bar	Display rate of progress from Start to Connected status.
19. Status Bar	Display currently WPS Status.



The following description divides into four parts:

- A. WPS Information on AP**
- B. Example of Adding to Registrar Using PIN Method**
- C. Example of Adding to Registrar Using PIN Method**
- D. Example of Configuring a Network/AP Using PIN or PBC Method**

**A. WPS Information on AP:** On Network AP list, double click on the AP then you can see the information appears below.



Items	Information
<b>Authentication Type</b>	There are three authentication modes supported by this utility. They are open, Shared, WPA-PSK and WPA system.
<b>Encryption Type</b>	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.
<b>Config Methods</b>	Correspond to the methods the AP supports as an Enrollee for adding external Registrars. (a bitwise OR of values)
<b>Device Password ID</b>	Indicates the method or identifies the specific password that the selected Registrar intends to use. APs in PBC mode must indicate 0x0004 within two-minute Walk Time.
<b>Selected Registrar</b>	Indicates if the user has recently activated a Registrar to add an Enrollee. The values are "TRUE" and "FALSE".
<b>State</b>	The current configuration state on AP. The values are "Unconfigured" and "Configured".
<b>Version</b>	WPS specified version.
<b>AP Setup Locked</b>	Indicates if the AP has entered a setup locked state.
<b>UUID-E</b>	The universally unique identifier (UUID) element generated by the Enrollee. This is a 16 byte value.
<b>RF Bands</b>	Indicates all the RF bands available on the AP. A dual-band AP must provide it. The values are "2.4GHz".

## B. Example of Adding to Registrar Using PIN Method

The user obtains a device password (PIN Code) from the STA and enters the password into the Registrar. Both the Enrollee and the Registrar use PIN Config method for the configuration setup. Please follow the step below.

1. Select "Enrollee" from the Config Mode drop-down list.
2. Click "Rescan" to update available WPS APs.

WPS AP List

ID : Unknown	Sample	00-C0-CA-28-60-20	1	
ID : Unknown	AP1-WPS	00-C0-CA-90-2E-27	1	
ID : Unknown	AP	00-C0-CA-28-60-60	3	
ID : Unknown	default	00-C0-CA-4A-0A-6B	6	

WPS Profile List

Buttons: PIN, PBC, WPS Associate IE, WPS Probe IE, Automatically select the AP

Progress >> 0%

WPS status is disconnected

Buttons: Rescan, Information, Pin Code (64893945), Renew, Config Mode (Enrollee), Detail, Connect, Rotate, Disconnect, Export Profile, Delete

3. Select an AP (SSID/BSSID) that STA will join to.

WPS AP List

ID : Unknown	AP1-WPS	00-C0-CA-90-2E-27	1	
ID : Unknown	Sample	00-C0-CA-28-60-20	1	
ID : Unknown	AP	00-C0-CA-28-60-60	3	
ID : Unknown	default	00-C0-CA-4A-0A-6B	6	

WPS Profile List

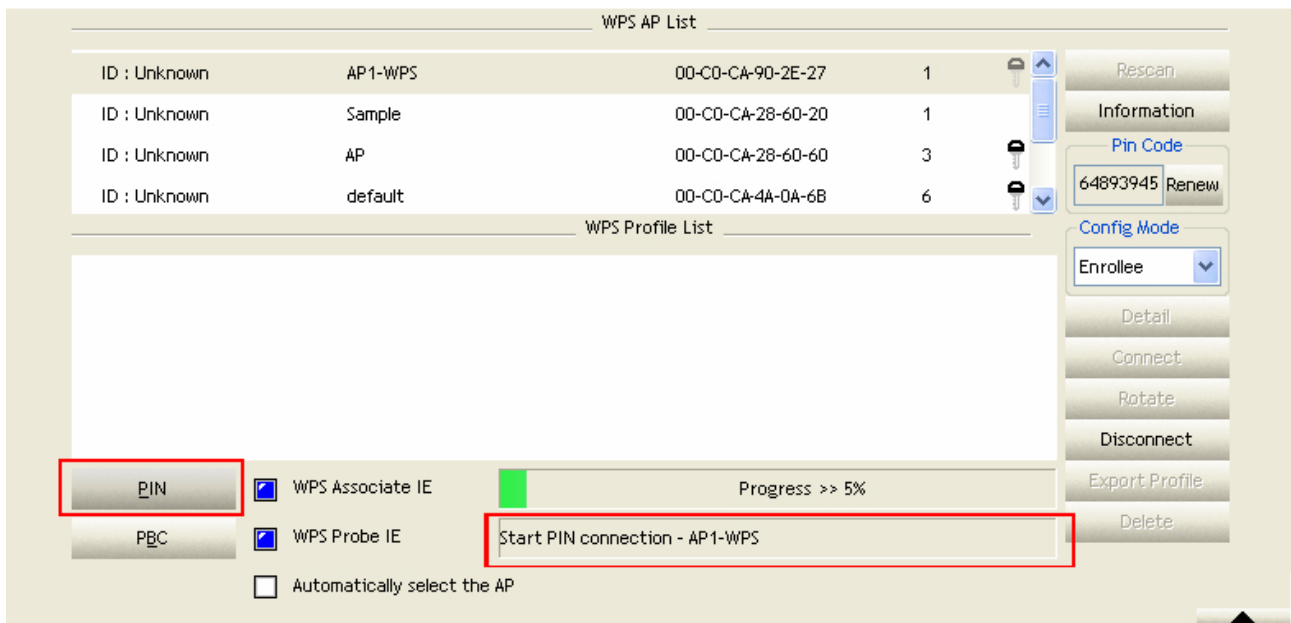
Buttons: PIN, PBC, WPS Associate IE, WPS Probe IE, Automatically select the AP

Progress >> 0%

WPS status is disconnected

Buttons: Rescan, Information, Pin Code (64893945), Renew, Config Mode (Enrollee), Detail, Connect, Rotate, Disconnect, Export Profile, Delete

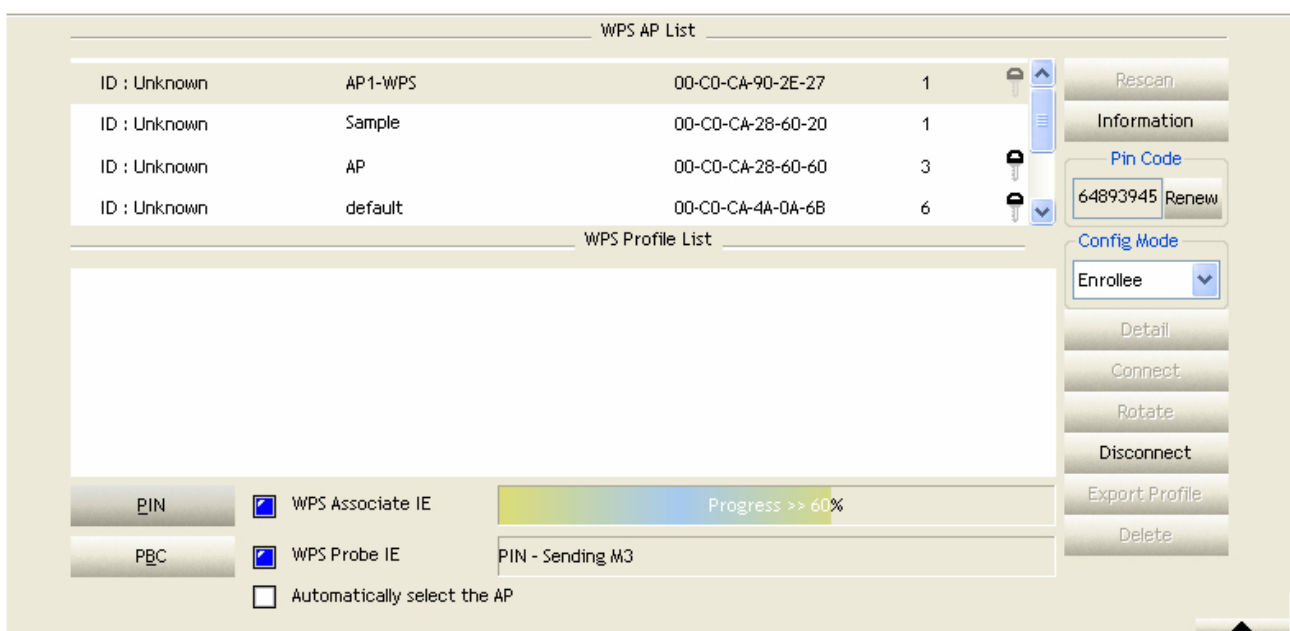
4. Click "PIN" to enter the PIN.
5. Enter the PIN Code of the STA into the Registrar when prompted by the Registrar.



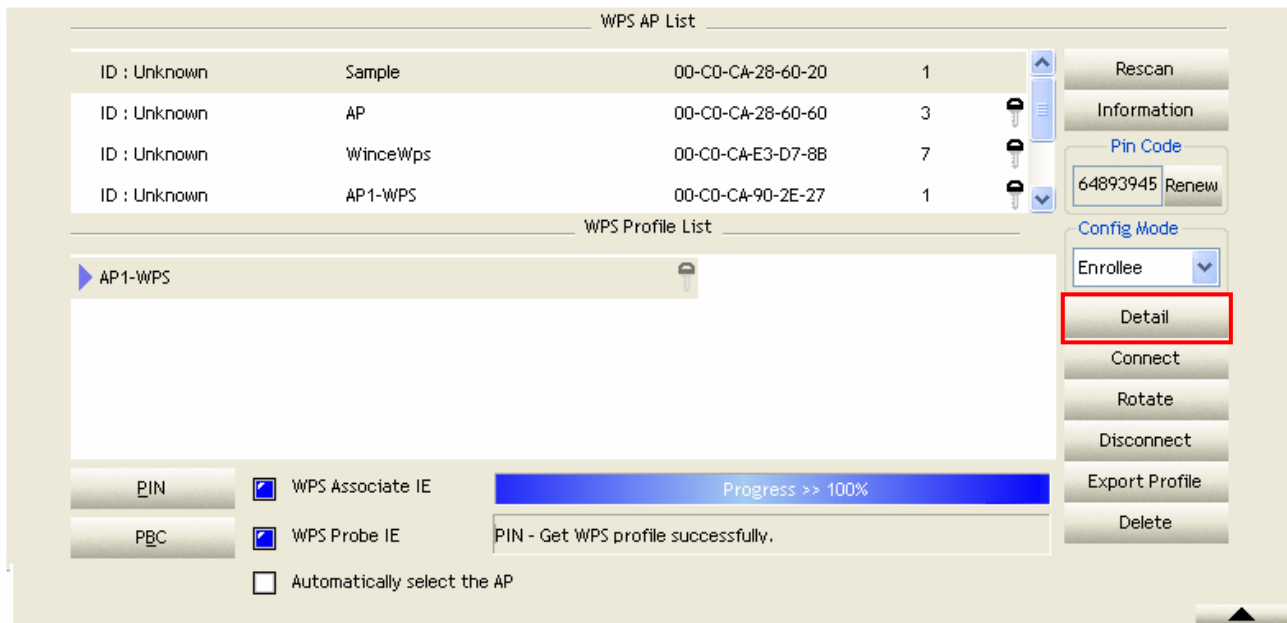
**Note:**

- Allow of an exchange between Step 4 and Step 5.
- If you use Microsoft Window Connection Now as an External Registrar, you must start PIN connection at STA first. After that, search out your WPS Device name and MAC address at Microsoft Registrar. Add a new device and enter PIN Code of STA at Microsoft Registrar when prompted.

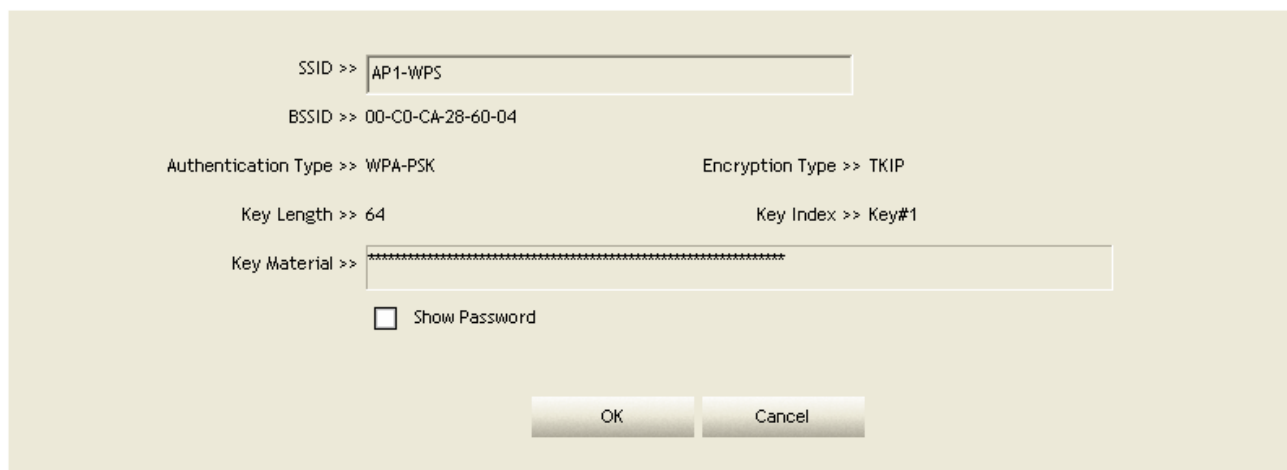
6. The result should appear as the image below.



7. Configure one or more credentials. Then connect successfully.



8. Click "Detail." You can see the figure below.



### C. Example of Adding to the Registrar Using the PBC Method

The PBC method requires the user to press a PBC button on both the Enrollee and the Registrar within a two-minute interval called the Walk Time. If there is only one Registrar in PBC mode, the PBC mode selected is obtained from ID 0x0004, and is found after a complete scan. The Enrollee can then immediately begin running the Registration Protocol.

If the Enrollee discovers more than one Registrar in PBC mode, it MUST abort its connection attempt at this scan and continue searching until the two-minute timeout.

**Note:** Before you press PBC on STA and candidate AP. Make sure all APs aren't PBC mode or APs using PBC mode have left their Walk Time. The user can configure WPS profiles with either PIN method or PBC method.

Please follow the steps below.

1. Select "Enrollee" from the Config Mode drop-down list.

The screenshot shows the WPS configuration interface. At the top, there is a 'WPS AP List' table with four rows of data. Below this is a 'WPS Profile List' section which is currently empty. On the right side, there is a vertical toolbar with buttons: 'Rescan', 'Information', 'Pin Code' (with a text input '64893945' and a 'Renew' button), 'Config Mode' (a dropdown menu currently showing 'Enrollee'), 'Detail', 'Connect', 'Rotate', 'Disconnect', 'Export Profile', and 'Delete'. At the bottom, there are two buttons: 'PIN' and 'PBC'. To their right are two checkboxes: 'WPS Associate IE' (checked) and 'WPS Probe IE' (checked). Further right is a 'Progress' bar showing 'Progress >> 0%' and a status box that says 'WPS status is disconnected'. At the very bottom, there is an unchecked checkbox labeled 'Automatically select the AP'.

ID	Sample	MAC Address	Count
ID : Unknown	Sample	00-C0-CA-28-60-20	1
ID : Unknown	AP1-WPS	00-C0-CA-90-2E-27	1
ID : Unknown	AP	00-C0-CA-28-60-60	3
ID : Unknown	default	00-C0-CA-4A-0A-6B	6

ID	Sample	MAC Address	Count
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2. Click PBC to start the PBC connection.
3. Push the PBC on AP.

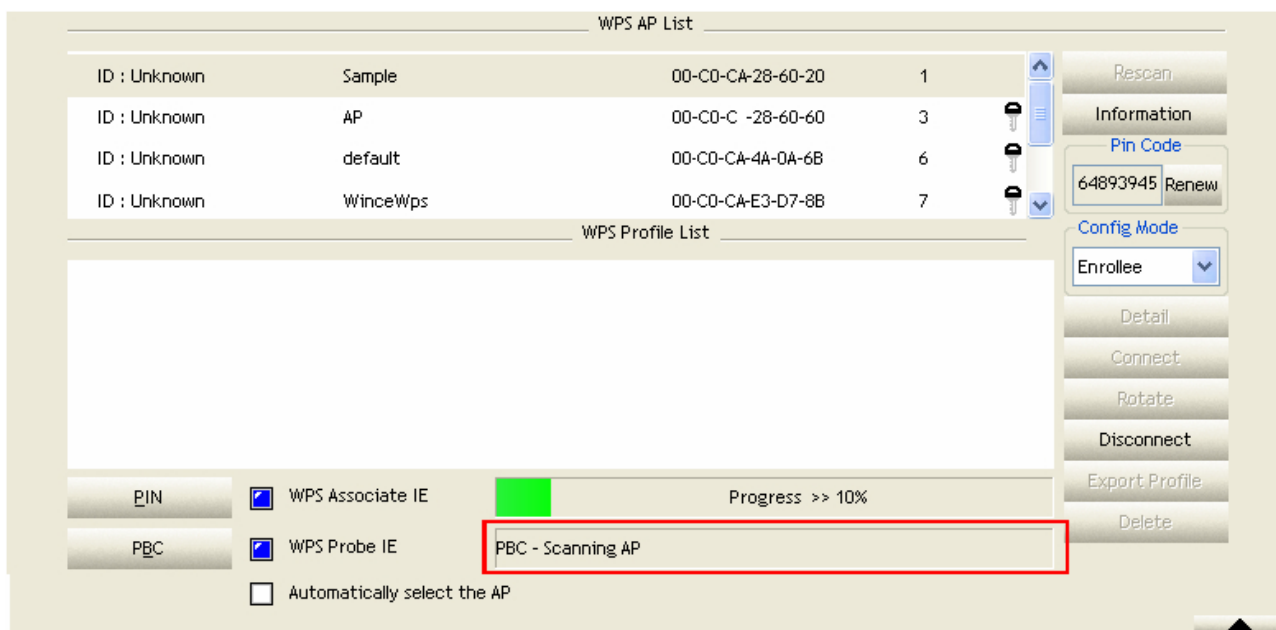
**Note:** Allow time for an exchange between Step 2 and Step 3.

This screenshot shows the same WPS configuration interface as the previous one, but after the 'PBC' button has been clicked. The 'PBC' button is now highlighted with a red box. The status box at the bottom right now displays 'Start PBC connection'. The 'Progress' bar still shows 'Progress >> 0%'. The 'Config Mode' dropdown remains set to 'Enrollee'. The 'WPS Associate IE' and 'WPS Probe IE' checkboxes are still checked. The 'Automatically select the AP' checkbox remains unchecked.

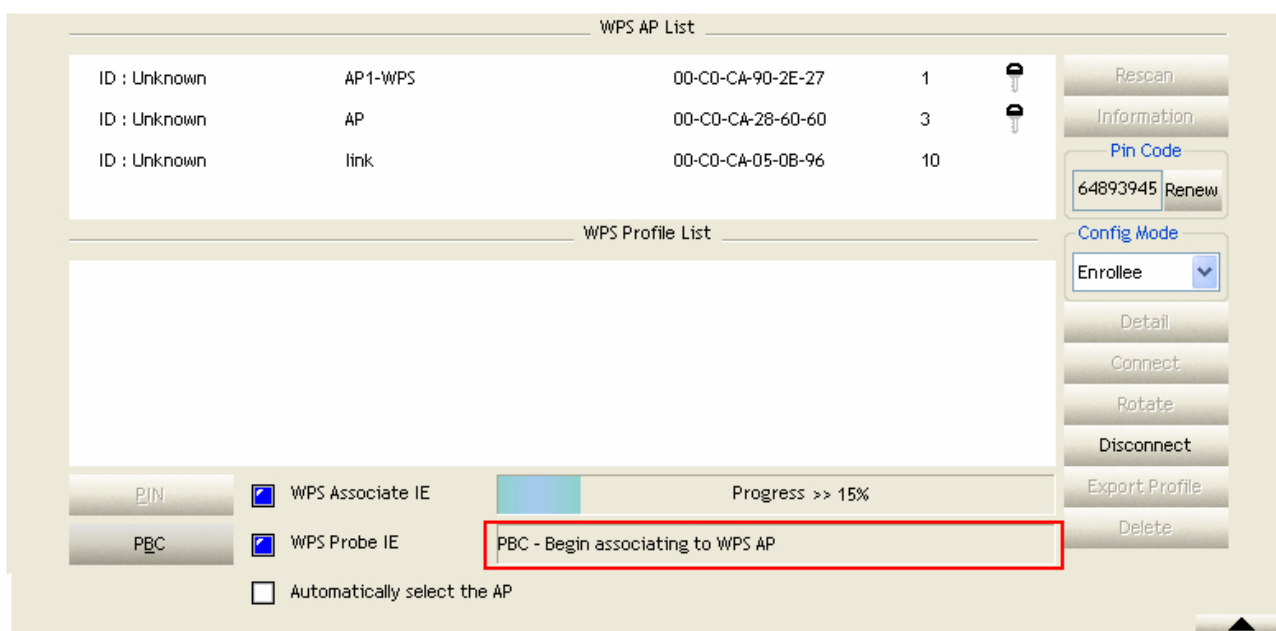
ID	Sample	MAC Address	Count
ID : Unknown	Sample	00-C0-CA-28-60-20	1
ID : 0x0004	AP1-WPS	00-C0-CA-90-2E-27	1
ID : Unknown	default	00-C0-CA-4A-0A-6B	6
ID : Unknown	WinceWps	00-C0-CA-E3-D7-8B	7

ID	Sample	MAC Address	Count
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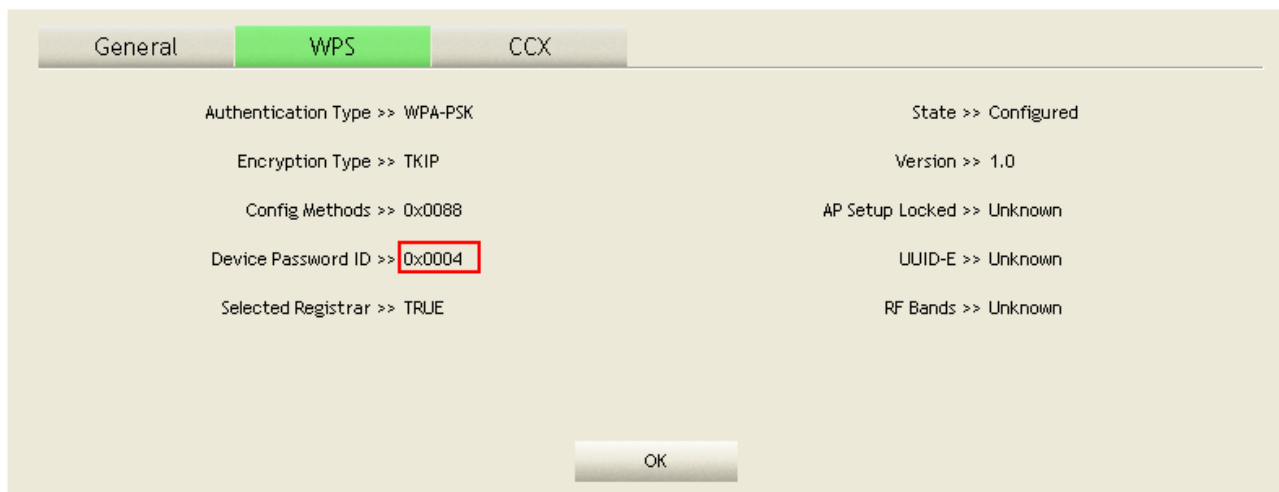
- The progress bar as shown in the figure below indicates that scanning progress.



- When one AP is found, join it.



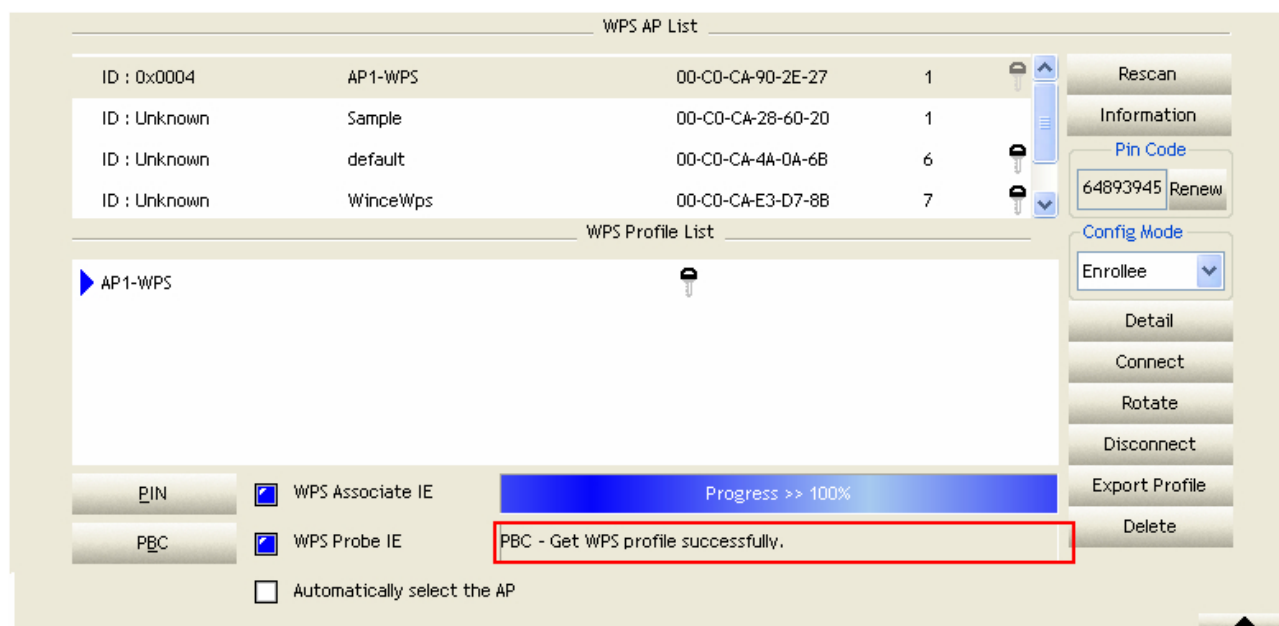
6. Check WPS Information on the available WPS APs.



The image shows a 'WPS' configuration window with tabs for 'General', 'WPS', and 'CCX'. The 'WPS' tab is active. It displays various configuration parameters in two columns. The 'Device Password ID' is highlighted with a red box and contains the value '0x0004'. An 'OK' button is at the bottom center.

Parameter	Value
Authentication Type	WPA-PSK
Encryption Type	TKIP
Config Methods	0x0088
Device Password ID	0x0004
Selected Registrar	TRUE
State	Configured
Version	1.0
AP Setup Locked	Unknown
UUID-E	Unknown
RF Bands	Unknown

7. Configure and receive one or more credential(s). Then connect successfully. The result will be displayed as it is in the figure below.



The image shows a 'WPS AP List' window. It contains a table of available WPS APs. Below the table is a 'WPS Profile List' section showing a profile for 'AP1-WPS'. At the bottom, there are checkboxes for 'WPS Associate IE' and 'WPS Probe IE', both of which are checked. A progress bar shows 'Progress >> 100%'. A red box highlights the message 'PBC - Get WPS profile successfully.'.

ID	AP Name	MAC Address	Signal Strength	Icon
ID : 0x0004	AP1-WPS	00-C0-CA-90-2E-27	1	Key icon
ID : Unknown	Sample	00-C0-CA-28-60-20	1	Key icon
ID : Unknown	default	00-C0-CA-4A-0A-6B	6	Key icon
ID : Unknown	WinceWps	00-C0-CA-E3-D7-8B	7	Key icon

WPS Profile List

AP1-WPS

PIN ☒ WPS Associate IE

PBC ☒ WPS Probe IE

☐ Automatically select the AP

Progress >> 100%

PBC - Get WPS profile successfully.



## D. Example of Configuring a Network/AP Using PIN or PBC Method

1. Select "Registrar" from the Config Mode drop-down list.

The screenshot shows a web-based configuration interface for WPS. It features a 'WPS AP List' table with columns for ID, AP name, MAC address, and a status icon. Below this is a 'WPS Profile List' section with a single entry 'ExRegNW286004'. To the right is a vertical sidebar with buttons: 'Rescan', 'Information', 'Pin Code' (with a text input '64893945' and a 'Renew' button), 'Config Mode' (highlighted with a red box and a dropdown menu showing 'Registrar'), 'Detail', 'Connect', 'Rotate', 'Disconnect', and 'Export Profile'. At the bottom, there are tabs for 'PIN' and 'PBC', checkboxes for 'WPS Associate IE' and 'WPS Probe IE', a 'Progress' bar at 0%, and a checkbox for 'Automatically select the AP'. The status 'WPS status is disconnected' is also displayed.

2. Enter the details of the credential and change configurations (SSID, Authentication, Encryption and Key) manually if needed.

The screenshot shows a configuration dialog box with the following fields and options:

- SSID >> ExRegNW286004
- BSSID >> 00-00-00-00-00-00
- Authentication Type >> WPA2-PSK (dropdown)
- Encryption Type >> AES (dropdown)
- Key Length >> 5 (dropdown)
- Key Index >> 1 (dropdown)
- Key Material >> A field containing asterisks for password input.
- A checkbox labeled 'Show Password' is currently unchecked.
- 'OK' and 'Cancel' buttons are at the bottom.

3. If the PIN configuration is setup, enter the PIN sent from the Enrollee.
4. Start PIN or PBC. The following procedures are as similar as section PIN Enrollee Setup or PBC Enrollee Setup.

5. If your AP Enrollee has been configured before the WPS process, the credential you set in advance will be updated to the AP itself. Otherwise, after a successful registration, the AP Enrollee will be re-configured with the new parameters, and the STA Registrar will connect to the AP Enrollee with these new parameters.

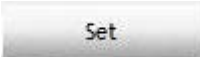
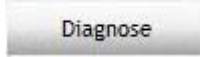
The screenshot displays a software interface for WPS (Wi-Fi Protected Setup) configuration. It is divided into several sections:

- WPS AP List:** A table showing discovered Access Points (APs).

ID :	Device Type	MAC Address	Count	Icon
	CAP	00-C0-CA-E3-D7-8B	1	
	AP	00-C0-CA-28-60-60	6	
- WPS Profile List:** A section showing a single profile named "ExRegNW286004".
- Configuration Options:** Located at the bottom left, including checkboxes for "WPS Associate IE", "WPS Probe IE", and "Automatically select the AP".
- Buttons and Progress:** A "PIN" button is visible. A progress bar indicates "Progress >> 100%". A status message reads "PIN - Get WPS profile successfully."
- Right Panel:** Contains a "Rescan" button, an "Information" button, a "Pin Code" field with the value "64893945" and a "Renew" button, a "Config Mode" dropdown menu currently set to "Registrar", and buttons for "Detail", "Connect", "Rotate", "Disconnect", and "Export Profile".

## CCX

This page is available for **Vista user only**. It provides CCX configurations to this adapter. Please refer to the following chart for definitions of each item.

Items	Information
<b>Enable CCX (Cisco Compatible extensions)</b>	Select to enable CCX. This function can only be applied when connecting to a Cisco compatible device.
<b>Turn on CCKM</b>	Mark to enable CCKM.
<b>Enable Radio Measurements</b>	Mark to enable channel measurement every 0~2000 milliseconds.
<b>Non-Serving Channel Measurements limit</b>	Mark to revise the channel measurement.
<b>Network EAP</b>	Enable the NetworkEAP authentication algorithm.
<b>Enable RF Roaming</b>	Enable RF roaming function
<b>Enable CAC (Tolerance)</b>	Enable the call admission control
<b>CAC</b>	There are four selections: ADDTS (Directly send TS), DELTS, and RESET. Select an item from the drop down list and then click on the  button.
<b>Diagnosis</b>	Select a profile which the user wants to diagnose, and then click on the Diagnose button to perform the test. 

## Radio On/Off


Click on the button to enable/disable wireless connection status.

**Connected:**  Radio On/Off

**Disconnected:**  Radio On/Off

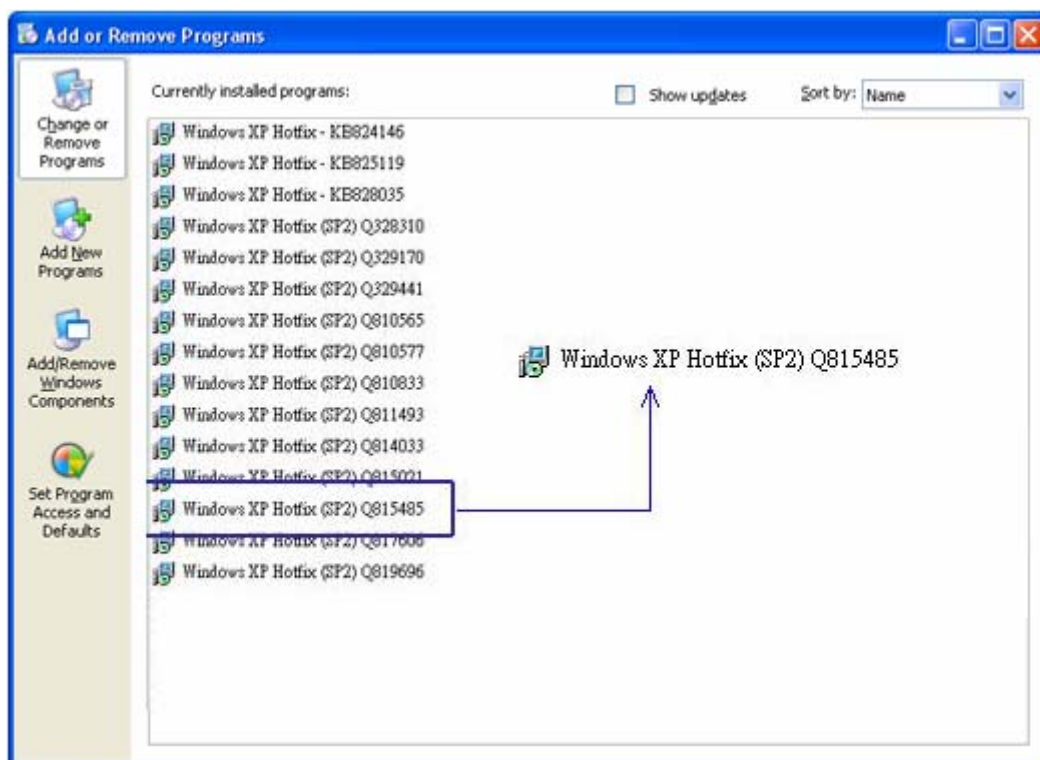
# AP mode management guide for Windows 2000/XP/Vista

If you wish to share the Internet access with the wireless stations in your environment, you can configure this wireless adapter as a software access point (Soft AP). In this mode, this wireless adapter becomes the wireless access point that provides local area network and Internet access for your wireless stations.

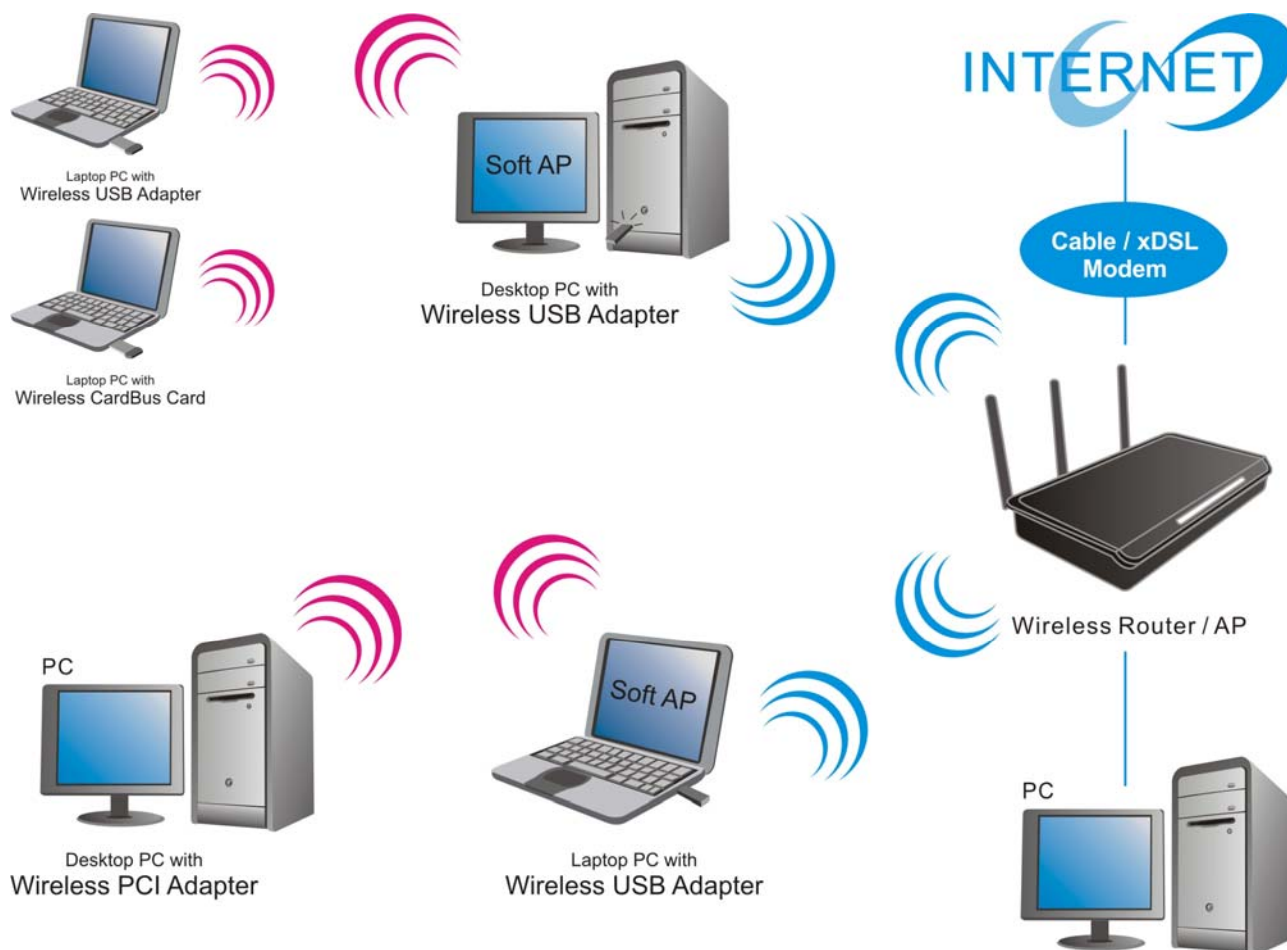
To use this adapter as an access point, please right click the  icon on system tray and select **Switch to AP mode**. Please refer to the following introduction and information about this AP-mode utility.



**Note:** In windows XP, it provides WPA support at hotfix Q815485. However; you have to make sure that hotfix Q815485 (require XP SP1 installed) has been installed in your system before you can start using WPA features. You can check the installation of hotfix in add/remove software page under control panel.



## Software Access Point (Soft AP) Application



## Config

This page provides overall configuration to this adapter. Please find the following items for identification to each field.

The screenshot shows a configuration window with the following elements:

- 1** SSID: Text box containing "SoftAP-00".
- 2** Wireless Mode: Dropdown menu showing "2.4G".
- 3** Country Region Code: Dropdown menu showing "11 B/G" and "0: CH1-11".
- 4** Beacon (ms): Text box containing "100".
- 5** TX Power: Dropdown menu showing "100 %".
- 6** Idle time(60 - 3600)(s): Text box containing "300".
- 7** Channel: Dropdown menu showing "1".
- 8** < Use Mac Address: Button.
- 9** Security Setting: Button.
- 10** No forwarding among wireless clients: Checkbox (unchecked).
- 11** Hide SSID: Checkbox (unchecked).
- 12** Allow B'W 40 MHz: Checkbox (checked).
- 13** Default: Button.
- 14** Cancel: Button.
- 15** Apply: Button.

1. **SSID:** AP name of user type. User also can select [Use Mac Address] to display it.
2. **Wireless Mode:** Select wireless mode. Only 2.4G is supported.

**3. Country Region Code:** eight countries to choose. Country channel list:

Classification	Range
0: FCC (Canada)	CH1 ~ CH11
1: ETSI	CH1 ~ CH13
2: SPAIN	CH10 ~ CH11
3: FRANCE	CH10 ~ CH13
4: MKK	CH14 ~ CH14
5: MKKI (TELEC)	CH1 ~ CH14
6: ISRAEL	CH3 ~ CH9
7: ISRAEL	CH5 ~ CH13

**Note:** Country Region code is not support for Vista.

- 4. Beacon (ms):** The time between two beacons. System default is 100 ms.
- 5. TX Power:** Manually force the AP transmits power. System default is 100%.
- 6. Idle Time:** Manually force the Idle Time using selected value. Default is 300.
- 7. Channel:** Manually force the AP using the channel. System default is channel 1.
- 8. Use Mac Address:** Use MAC address of used wireless card to be AP name. System default is APX (X is last number of Mac Address).
- 9. Security Setting:** Authentication mode and encryption algorithm used within the AP. System default is no authentication and encryption.
- 10. No forwarding among wireless clients:** If there is no beacon among the wireless clients, they can't share information with each other.
- 11. Hide SSID:** Prevent this AP from recognized in wireless network. This is disabled as default.
- 12. Allow BW40 MHz:** Allow BW40 MHz capability.
- 13. Default:** Use system default value.
- 14. Cancel:** Cancel the above changes.
- 15. Apply:** Apply the above changes.

## Security Setting

This page pops up after clicking the **Security Setting** button. Please follow the instructions below:

The screenshot shows a 'Security Setting' dialog box with the following fields and annotations:

- 1** Authentication Type: A dropdown menu currently set to 'Open'.
- 2** Encryption Type: A dropdown menu currently set to 'WEP'.
- 3** WPA Pre-shared-Key: A text input field.
- 4** Group Rekey Interval: A text input field with '60' and a unit dropdown set to '10 seconds'.
- 5** Wep Key: A section containing four radio buttons labeled 'Key#1', 'Key#2', 'Key#3', and 'Key#4'. Each radio button is followed by a 'Hex' dropdown menu and a text input field. Below these fields, there is a note: '\*WEP 64 Bits Encryption: Please Keyin 10 HEX characters or 5 ASCII characters \*' and 'WEP 128 Bits Encryption: Please Keyin 26 HEX characters or 13 ASCII characters'.

At the bottom of the dialog are 'OK' and 'Cancel' buttons.

- 1. Authentication Type:** Select to be open, shared, WPA-PSK, WPA2-PSK, or WPA PSK/WPA2-PSK system.
- 2. Encryption Type:** Select an encryption type from the drop list.
- 3. WPA Pre-shared Key:** A shared string between AP and STA. For WPA-PSK authentication mode, this field must be filled with character longer than 8 and less than 32 lengths.
- 4. Group Rekey Interval:** Only valid when using WPA-PSK encryption algorithm. The key will change compliance with seconds or beacon that user set.
- 5. WEP Key:** Only valid when using WEP encryption algorithm. The key must match the key on AP. There are several formats to enter the keys.
  - Hexadecimal (40bits): 10 Hex characters.
  - Hexadecimal (128bits): 32Hex characters.
  - ASCII (40bits): 5 ASCII characters.
  - ASCII (128bits): 13 ASCII characters.



## Access Control

This function filters users to use this device by designating MAC address. Please refer to the following chart for introduction.

The screenshot shows a web-based configuration interface for 'Access Control'. At the top, there is a navigation bar with tabs: 'Config', 'Access Control' (selected), 'Mac Table', 'Event Log', 'Statistics', and 'About'. The main area contains the following elements:

- 1 Access Policy:** A dropdown menu currently set to 'Disable'.
- 2 MAC Address:** A text input field for adding MAC addresses, with an 'Add' button below it.
- 3 Access List:** A large empty rectangular box for displaying the list of MAC addresses.
- 4 Delete:** A button to remove selected MAC addresses from the list.
- 5 Remove All:** A button to clear all MAC addresses from the list.
- 6 Apply:** A button at the bottom right to save the configuration changes.

- 1. Access Policy:** Choose a method to process access control from the drop list to determine the MAC addresses that you designated are allowed to access the AP or not.
- 2. MAC Address:** Add allowed (or denied) MAC addresses to the MAC address list.
- 3. Access List:** Display all Mac Addresses that you designated.
- 4. Delete:** Delete Mac addresses that you selected.
- 5. Remove All:** Remove all Mac address in [Access List].
- 6. Apply:** Apply changes.

## MAC Table

This page displays the station detail information of current connection.

[illegible]

Items	Information
MAC Address	The station MAC address of current connection.
AID	Raise value by current connection.
Power Saving Mode	Check if the connected station supports power saving.
Status	The connection status.

## Event Log

Record Soft AP all event time and message.

[illegible]

Items	Information
Event Time (yy/mm/dd-hh:mm:ss)	Record event time.
Message	All event messages.

## Statistics

Statistics page displays the detail counter information based on 802.11 MIB counters.

Transmit Statistics		
Frames Transmitted Successfully	=	779
Frames Fail To Receive ACK After All Retries	=	13
RTS Frames Successfully Receive CTS	=	0
RTS Frames Fail To Receive CTS	=	0
Frames Transmitted Successfully After Retry	=	779

Receive Statistics		
Frames Received Successfully	=	22
Frames Received With CRC Error	=	5091
Frames Dropped Due To Out-of-Resource	=	0
Duplicate Frames Received	=	0

**RESET COUNTERS**

### 1. Transmit Statistics

Items	Information
Frames Transmitted Successfully	Frames that successfully sent.
Frames Fail To Receive ACK After All Retries	Frames that failed to transmit after hitting retry limit.
RTS Frames Successfully Receive CTS	Counts of CTS that successfully received after sending RTS frame.
RTS Frames Fail To Receive CTS	Counts of CTS that fail to be received after sending RTS frame.
Frames Retransmitted Successfully	Successfully retransmitted frames numbers.

### 2. Receive Statistics

Items	Information
Frames Received Successfully	Frames received successfully.
Frames Received With CRC Error	Frames received with CRC error.
Frames Dropped Due To Out-of-Resource	Frames dropped due to resource issue.
Duplicate Frames Received	Duplicate received frames.

### 3. Reset Counters: Reset counters to zero.