



Quick Installation Guide  

Guide d'installation rapide 

Anleitung zur Schnellinstallation 

Guía de instalación rápida 

Руководство по быстрой установке 

**TEW-684UB**

1.01

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## **Federal Communication Commission Interference Statement**

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 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.

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:**

### **Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with FCC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operated in conjunction with any other antenna or transmitter

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

## **CE Mark Warning**

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

This transmitter must not be co-located or operation in conjunction with any other antenna or transmitter.

## Introduction

TRENDnet's compact 450Mbps Dual Band Wireless N USB Adapter, model TEW-684UB, connects a laptop or desktop computer to an ultra-high performance 450Mbps dual band wireless network.

Quickly connect to a 450Mbps 2.4GHz or 5GHz wireless network at the touch of a button with the convenience of one-touch Wi-Fi Protected Setup (WPS). Seamlessly stream HD video over the less congested 5GHz band.

Place the adapter in the most ergonomic location with the included USB extension cable. Advanced Multiple Input Multiple Output (MIMO) antenna technology with three spatial streams per antenna generates a maximum theoretical wireless throughput of 450Mbps. WMM® Quality of Service (QoS) technology prioritizes gaming, Internet calls, and video streams. LEDs on the front of the adapter convey device status. Upgrade your computer's wireless connection to experience the speed of a 450Mbps network.

## Features

- 1 x USB 2.0 connector
- Wi-Fi compliant with IEEE 802.11n/g/b/a standards
- One-touch wireless connection with external Wi-Fi Protected Setup (WPS) button
- Multiple Input Multiple Output (MIMO) technology
- Maximum reliability, throughput, and connectivity with automatic data rate switching
- Supports 64/128-bit WEP, WPA/WPA2-RADIUS, and WPA-PSK/WPA2-PSK
- Wi-Fi Multimedia (WMM) Quality of Service (QoS) data prioritization
- Easy user setup and intuitive diagnostic utility
- Coverage of up to 50 meters indoor (164 feet) and 100 meters outdoor (320 feet)\*
- 3-year limited warranty

## Package Content

- TEW-684UB
- CD-ROM (Utility and Driver)
- Multi-Language Quick Installation Guide
- USB cable 100cm (39.3 in)

## System Requirement

- Pentium class notebook computers with at least one available USB slot
- Microsoft Windows 7, Vista, XP and 2K
- CD-ROM drive

## Wireless Performance Considerations

There are a number of factors that can impact the range of wireless devices.

1. Adjust your wireless devices so that the signal is traveling in a straight path, rather than at an angle. The more material the signal has to pass through the more signal you will lose.
2. Keep the number of obstructions to a minimum. Each obstruction can reduce the range of a wireless device. Position the wireless devices in a manner that will minimize the amount of obstructions between them.
3. Building materials can have a large impact on your wireless signal. In an indoor environment, try to position the wireless devices so that the signal passes through less dense material such as dry wall. Dense materials like metal, solid wood, glass or even furniture may block or degrade the signal.
4. Antenna orientation can also have a large impact on your wireless signal. Use the wireless adapter's site survey tool to determine the best antenna orientation for your wireless devices.
5. Interference from devices that produce RF (radio frequency) noise can also impact your signal. Position your wireless devices away from anything that generates RF noise, such as microwaves, radios and baby monitors.
6. Any device operating on the 2.4GHz frequency will cause interference. Devices such as 2.4GHz cordless phones or other wireless remotes operating on the 2.4GHz frequency can potentially drop the wireless signal. Although the phone may not be in use, the base can still transmit wireless signal. Move the phone's base station as far away as possible from your wireless devices.

If you are still experiencing low or no signal consider repositioning the wireless devices or installing additional access points. The use of higher gain antennas may also provide the necessary coverage depending on the environment.

# Installation

**Important! DO NOT install the TEW-684UB in the computer until instructed to do so.**

Follow the instructions below to install the USB Adapter and Utility.

## STEP 1

Insert the Driver and Utility CD into CD drive

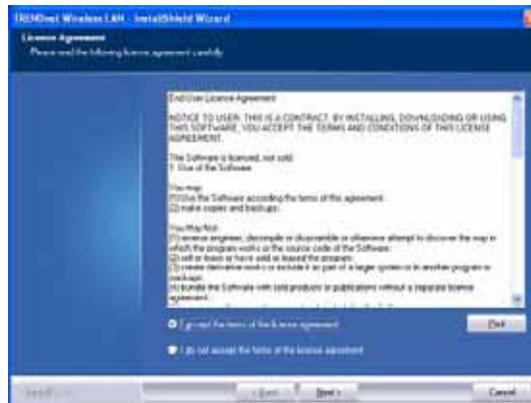
## STEP 2

Click "Install Utility" button. If your CD Autorun is enabled, the installation procedures will be started. (Otherwise open your CD folder and double-click on the "setup.exe" file)



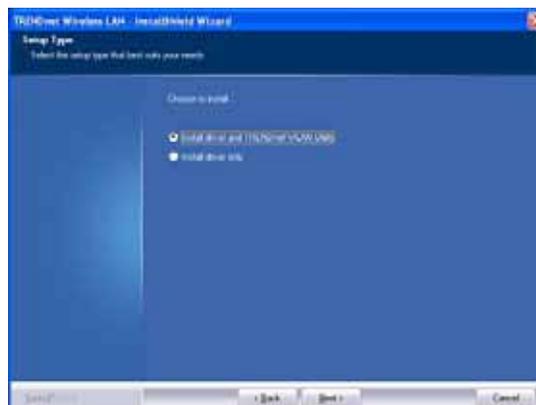
## STEP 3

Select **I accept the terms and of the license agreement** and click **Next**.



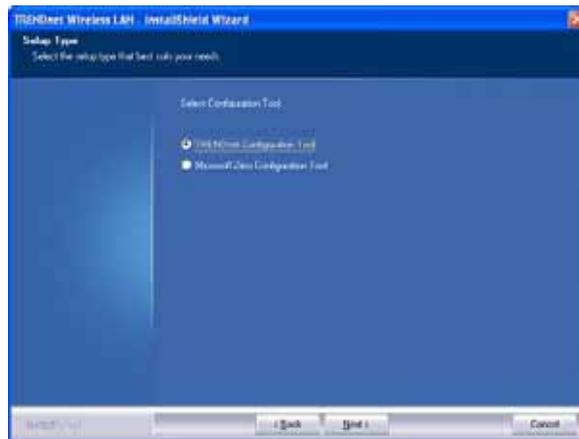
## STEP 4

Select **Install driver and TRENDnet WLAN utility** and click **Next**.



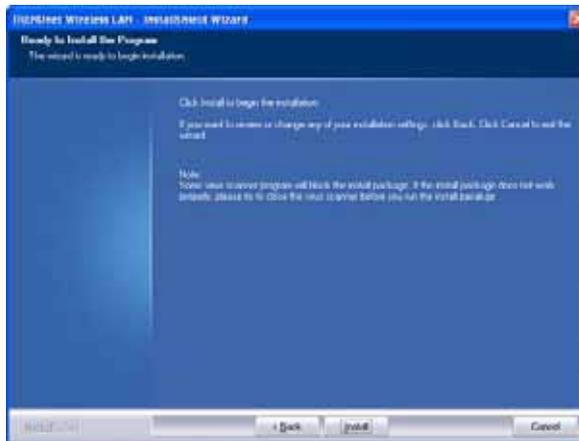
**STEP 5**

Select **TRENDnet Configuration Tool** and click **Next**.



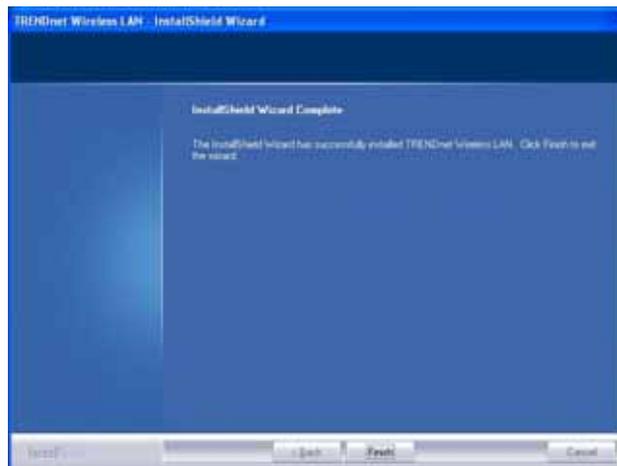
**STEP 6**

Click **Install** on it.



**STEP 7**

Click **Finish** to complete the client utility installation.

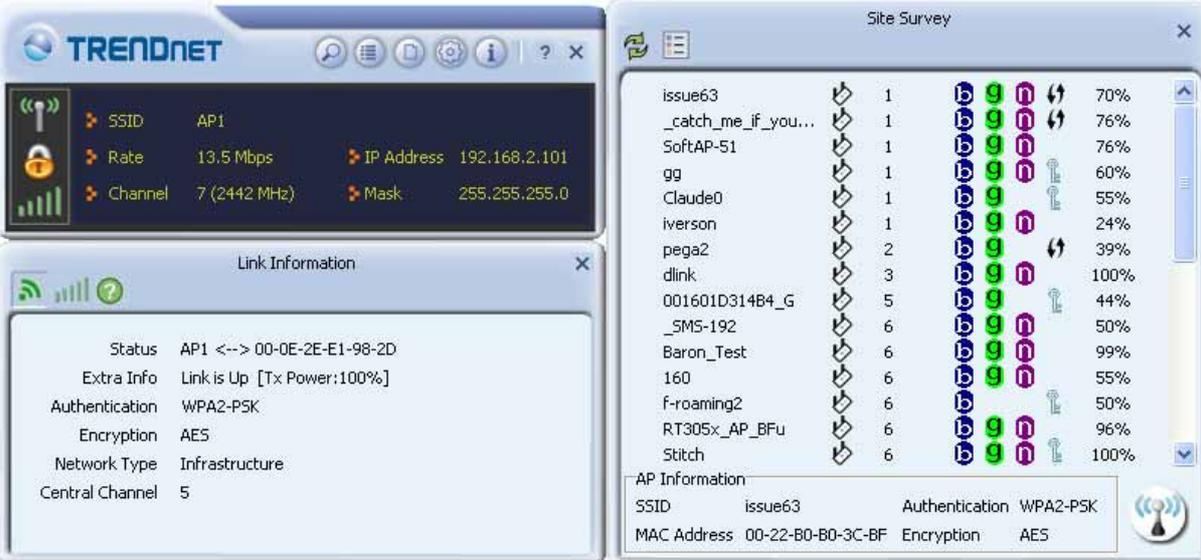


# Using the Utility

When starting the utility, a small TRENDnet wireless icon appears in the notifications area of the taskbar. You can double click it to maximize the dialog box if you selected to close it earlier. You may also use the mouse's right button to close the utility.

Additionally, the small icon will change color to reflect current wireless network connection status. The status is shown as follows:

-  : Indicates the connected and signal strength is good.
-  : Indicates the connected and signal strength is normal.
-  : Indicates that it is not yet connected.
-  : Indicates that a wireless NIC can not be detected.
-  : Indicates that the connection and signal strength is weak.



The screenshot shows the TRENDnet utility interface. The main window displays connection details for AP1:

- SSID: AP1
- Rate: 13.5 Mbps
- Channel: 7 (2442 MHz)
- IP Address: 192.168.2.101
- Mask: 255.255.255.0

The 'Link Information' window shows:

- Status: AP1 <--> 00-0E-2E-E1-98-2D
- Extra Info: Link is Up [Tx Power:100%]
- Authentication: WPA2-PSK
- Encryption: AES
- Network Type: Infrastructure
- Central Channel: 5

The 'Site Survey' window displays a list of detected APs with their signal strength and connection status:

AP Name	Channel	Signal Strength	Connection Status	Percentage
issue63	1	Good	Connected	70%
_catch_me_if_you...	1	Normal	Connected	76%
SoftAP-51	1	Normal	Connected	76%
gg	1	Weak	Not Connected	60%
Claude0	1	Normal	Not Connected	55%
iverson	1	Weak	Not Connected	24%
pega2	2	Normal	Connected	39%
dlink	3	Good	Connected	100%
001601D314B4_G	5	Normal	Not Connected	44%
_SMS-192	6	Normal	Not Connected	50%
Baron_Test	6	Good	Not Connected	99%
160	6	Normal	Not Connected	55%
F-roaming2	6	Normal	Not Connected	50%
RT305x_AP_BFu	6	Good	Not Connected	96%
Stitch	6	Good	Not Connected	100%

The 'AP Information' window for 'issue63' shows:

- SSID: issue63
- MAC Address: 00-22-B0-B0-3C-BF
- Authentication: WPA2-PSK
- Encryption: AES

# Profile

The Profile List keeps a record of your favorite wireless settings at home, office, and other public hot-spots. You can save multiple profiles, and activate the correct one at your preference.



## Icons and buttons:

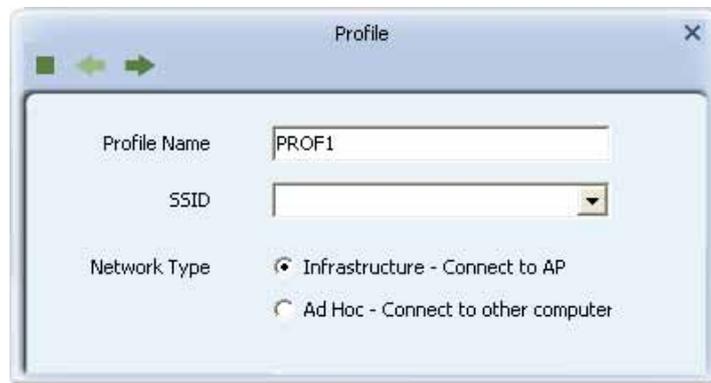
-  Indicates if a connection made from the currently activated profile.
-  Indicates if the connection has failed on a currently activated profile.
-  Indicates the network type is infrastructure mode.
-  Indicates the network type is in Ad-hoc mode.
-  Indicates if the network is security-enabled.
-  Click to add a new profile.
-  Click to edit an existing profile.
-  Deletes an existing profile.
-  Import an existing profile.
-  Export an existing profile.
-  Activates the selected profile.

## Adding a Profile:

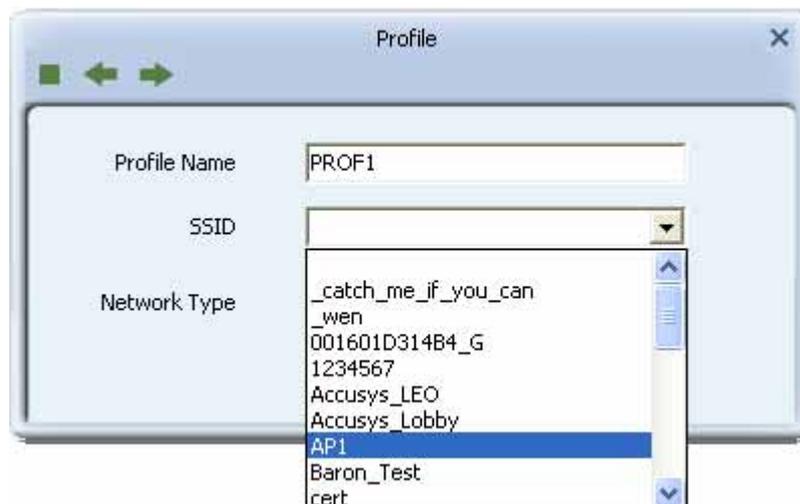
Click "Add" below the Profile List.



The "Add Profile" window will appear.



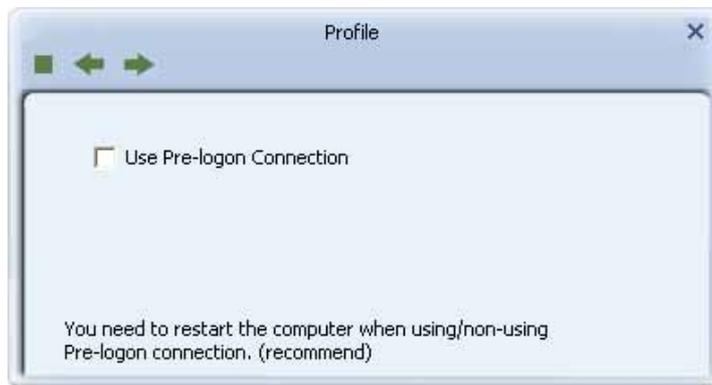
Enter or specify a profile name. Select an AP from the SSID drop-down list.



Now the profile which the user set appears in the profile list. Click "Activate" icon to activate the connection.



## Pre-logon Connect



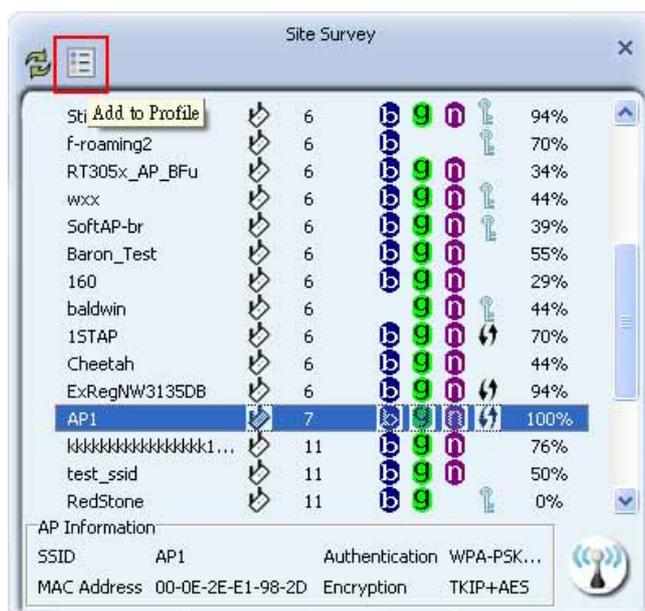
Field definitions:

Pre-logon Connect: Use ID and Password in Profile.

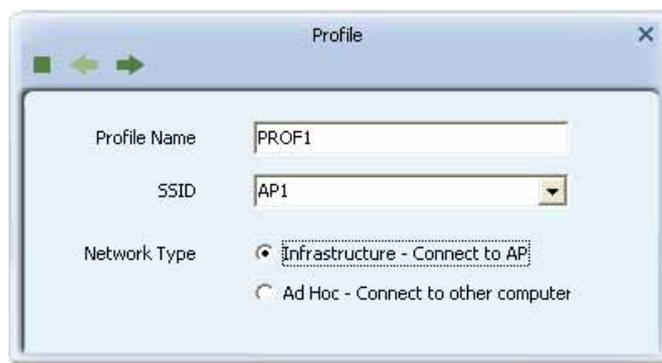
\*\* Recommend: You need to restart the computer when using/non-using Pre-logon connect

## Adding a Profile to the Network using site survey

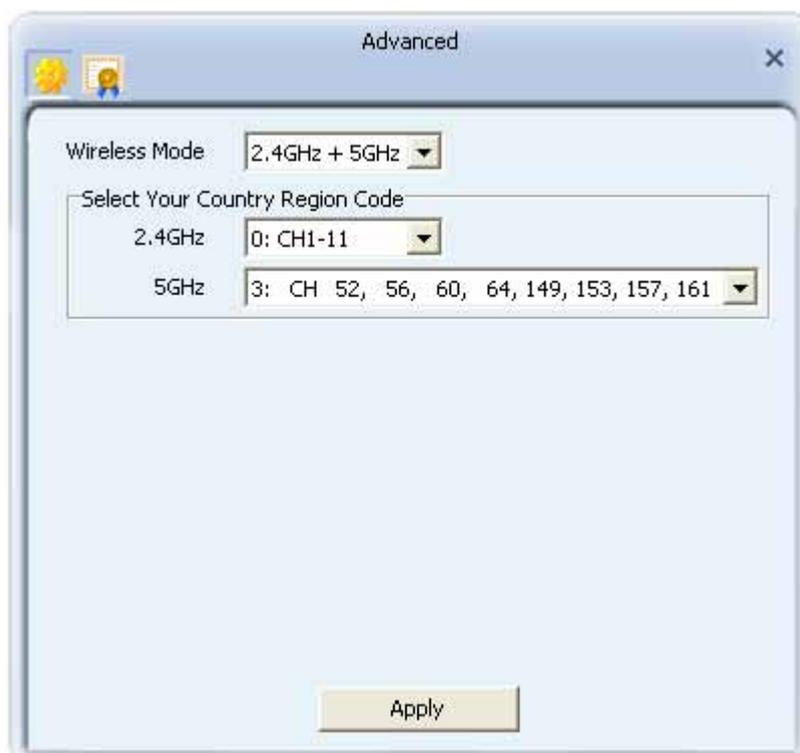
Select the AP from the list on the Network tab and click the "Add to Profile" button.



Verify the new profile in the profile list and click “Activate”.



## Advanced



1. Wireless mode: Select wireless mode. 2.4GHz, 5GHz and 2.4GHz+5GHz are supported.

2. Wireless Protection: Users can choose from Auto, On, and Off. (This is not supported by 802.11n adapters.)

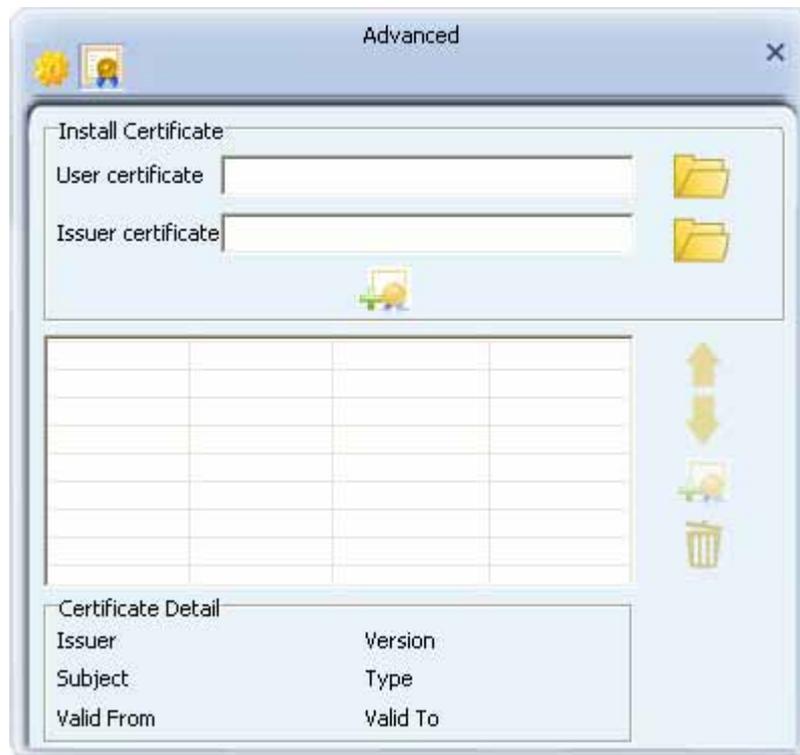
- Auto: STA will dynamically change as AP announcement.
- On: The frames are always sent with protection.
- Off: The frames are always sent without protection.

3. TX Rate: Manually select the transfer rate. The default setting is auto. (802.11n wireless cards do not allow the user to select the TX Rate.)

4. Select Your Country Region Code: There are eight countries to choose from in the country channel list. (11A ListBox only shows for 5G adapter.)

5. Apply the above changes.

## Certificate Management



Install Certificate :

1. Need to install user certificate and issuer certificate for the authentication.
2. Icons and buttons :



Indicates to browser the file.



Indicates to install the certificate.

Certificate List :

1. Show all installed certificates. There are ordered property.
2. Icons and buttons :



Move up the selected certificate.



Move down the selected certificate.



Install AS certificate for the selected certificate.



Delete the selected certificate.

# Wi-Fi Direct

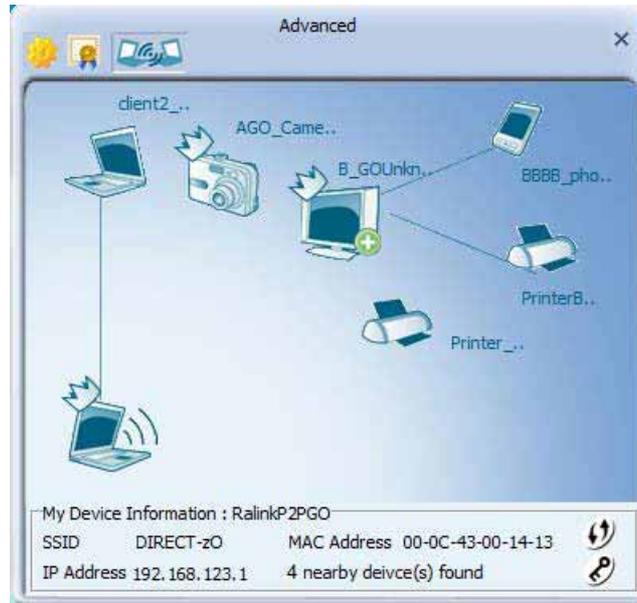


## Enable Wi-Fi Direct :

1. Need to double-click the notebook icon.
2. Specify the name of Wi-Fi Direct Device :



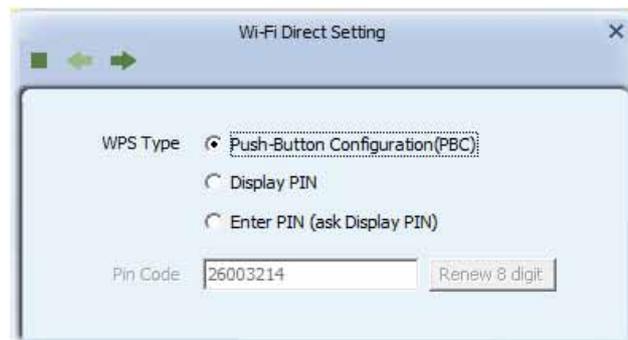
TRENDnet utility is able to discover other WiFi Direct topologies nearby



-  : GO : AP- like.
-  : GO with clients in the same group.
-  : configure WPS for GO
-  : Set WPA2PSK AES key

### Connect to P2P device :

1. Double click the device icon to specify the connection.
2. Select the WPS connection type :



- PBC: Start the WPS progress using PBC configuration method.
  - Display PIN : Start the WPS progress using display configuration method.
  - Enter PIN : Start to WPS progres using keypad configuration method. Remember that enter PIN Code shown from the P2P device.
  - PIN Code: The user is required to enter an 8-digit PIN Code into Registrar in the pop-up windows with Enter PIN.
3. Select the preferred operating channel and whether save profile :



### Accept one P2P device's connection request :

1. Once someone wants to connect to me, TRENDnet Utility would show a bubble message and pop up the corresponding setting page as follows

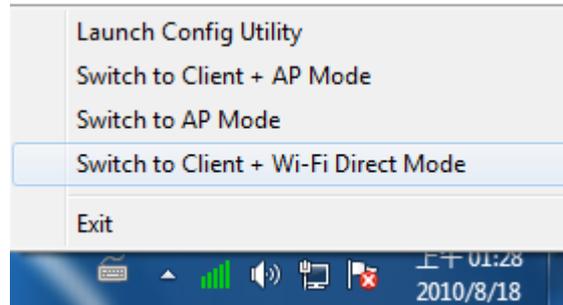


2. Press  to select the preferred operating channel and whether save profile :



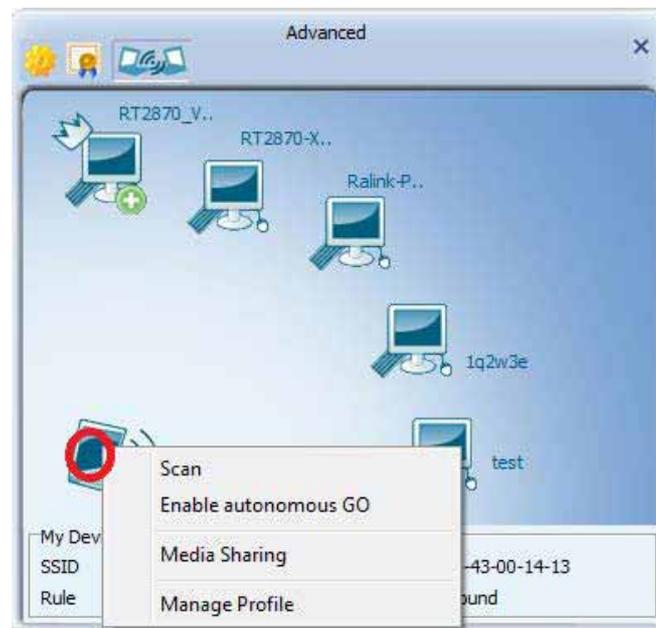
## Switch to Wi-Fi Direct concurrent mode:

Switch to Concurrent mode ( legacy Client + WiFi Direct GO ) by right-click TRENDnet utility tray icon



## Wi-Fi Direct function:

Click mouse right button on My Device.



1. Scan : Choose "Scan" to update discovery topology.
2. Enable autonomous GO : Autonomous GO allow user to start a GO manually
  - 2.1 Choose "Enable autonomous GO" to open Wi-Fi Direct setting page for autonomous GO.



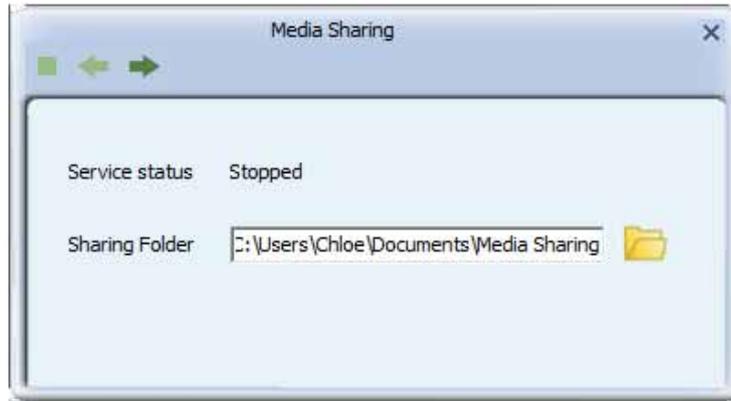
2.2 Enter the WPA2-PSK key for GO



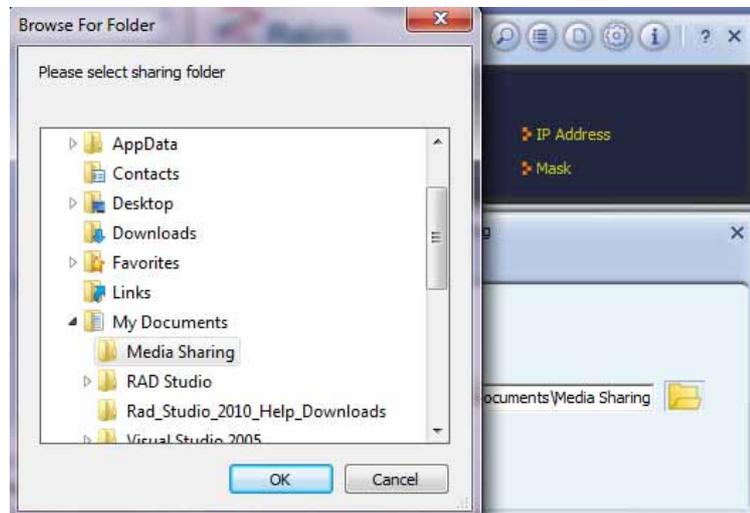
2.3 Select the preferred operating channel and whether save profile : the GO will send beacon on the channel.



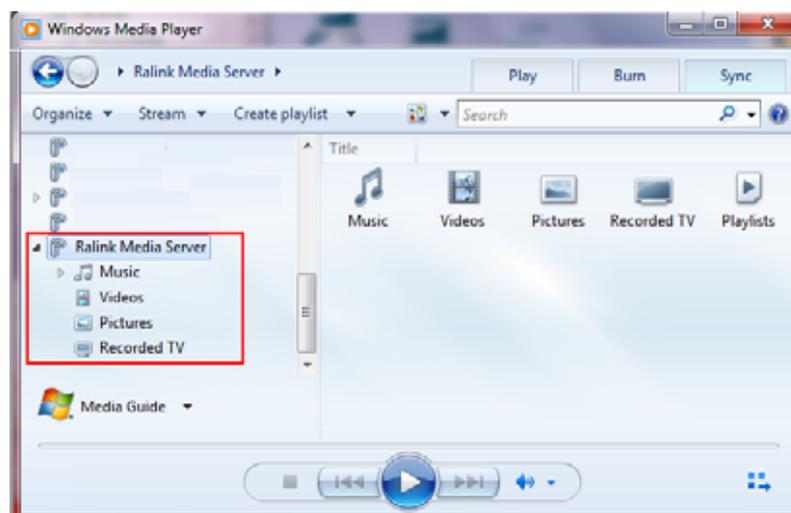
3. Media sharing: Media Sharing is disabled as default.



3.1 Select sharing folder. (utility would create "r;Media Sharing" in C:\User\xxx\Document as default)

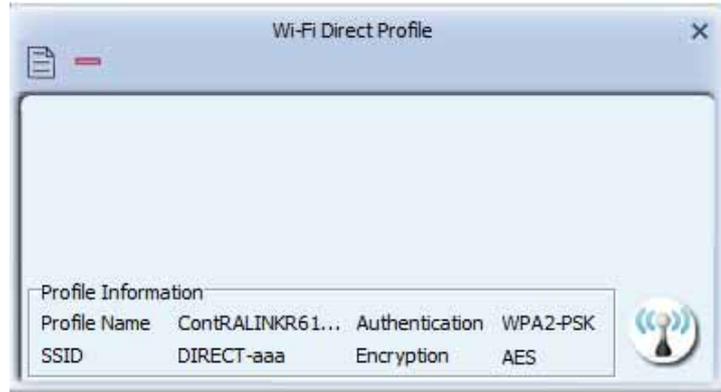


Press  to start sharing. After device connected, user can search the media server and play music/video by media player.



Press  to stop sharing

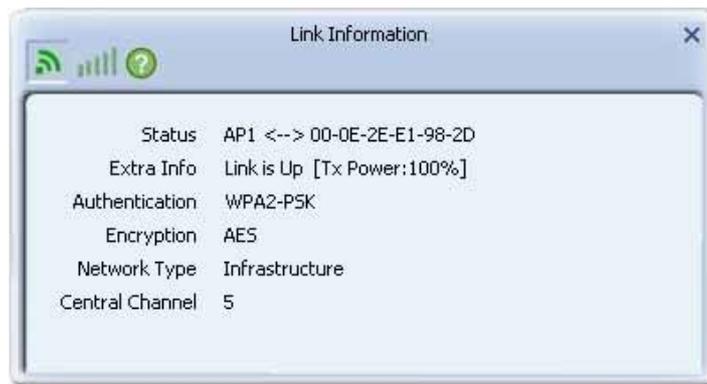
4. Manage profile : Choose "manage profile" to open profile page



## Link Information

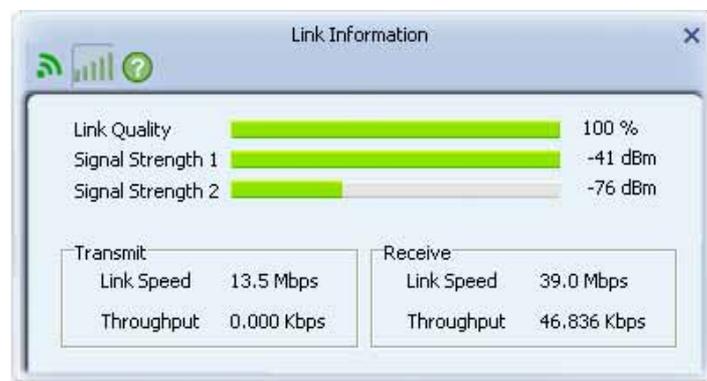
### Link Status

The link status page displays detailed information about the current connection as shown in.



## Throughput

The throughput page displays detailed information about the current connection as shown in.



## Statistics

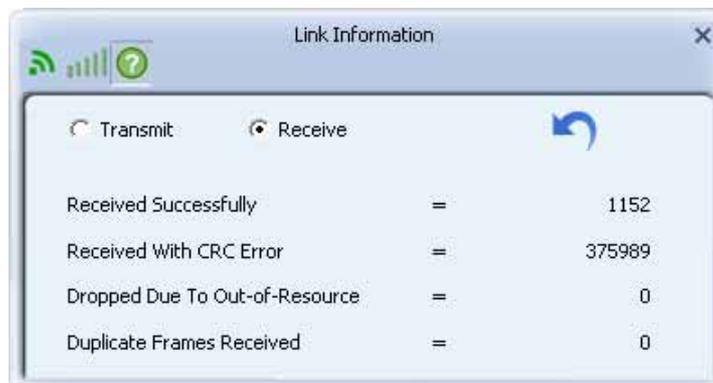
The Statistics page displays detailed counter information based on 802.11 MIB counters. This page translates that MIB counters into a format easier for the user to understand.  
Transmit Statistics:



The screenshot shows a window titled "Link Information" with a wireless signal icon and a help icon. It has two radio buttons: "Transmit" (selected) and "Receive". A refresh button is in the top right. The statistics are as follows:

Statistic	Value
Transmitted Successfully	2613
Retransmitted Successfully	260
Fail To Receive ACK After All Retries	735

Receive Statistics:



The screenshot shows the same "Link Information" window, but with the "Receive" radio button selected. The statistics are as follows:

Statistic	Value
Received Successfully	1152
Received With CRC Error	375989
Dropped Due To Out-of-Resource	0
Duplicate Frames Received	0

## About

Click "About" to display the wireless card and driver version information.



The screenshot shows a window titled "About" with the following information:

Version			
Utility	4.0.0.0	Date	2010-03-07
Driver	1.4.9.0	Date	2009-11-26
SDK	1.0.4.0	Date	2010-03-04
Firmware	0.22	EEPROM	1.1

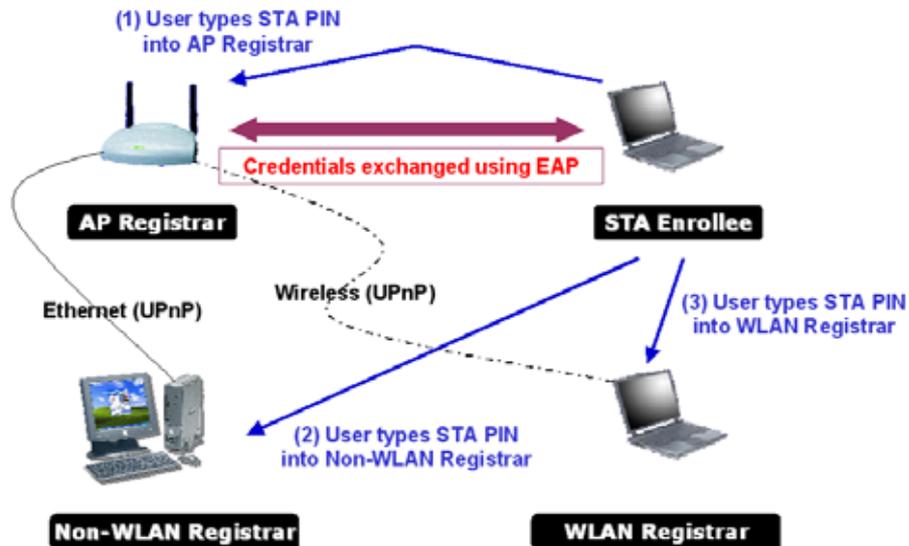
MAC Address: 00-1C-10-01-FE-1B

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All rights reserved.

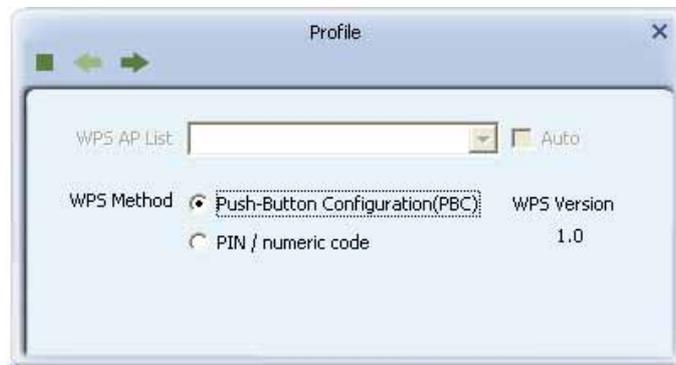
# WPS

## PIN Method

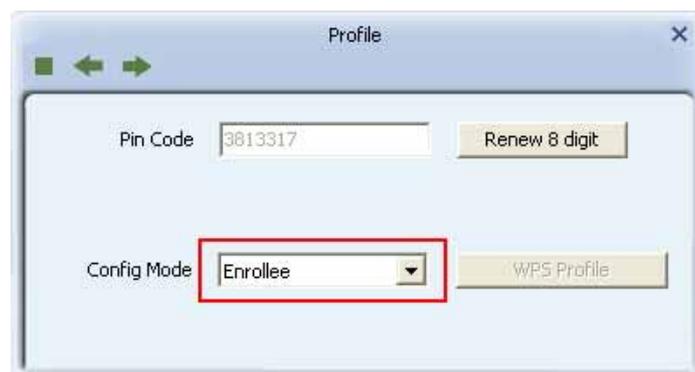
The user obtains a device password (PIN Code) from the STA and enters the password into the Registrar. Both the Enrollee and the Registrar use PIN Config method for the configuration setup. The following image outlines the process.



1. Select an AP (SSID/BSSID) that STA will join to and Select the "PIN/ numeric code" method.

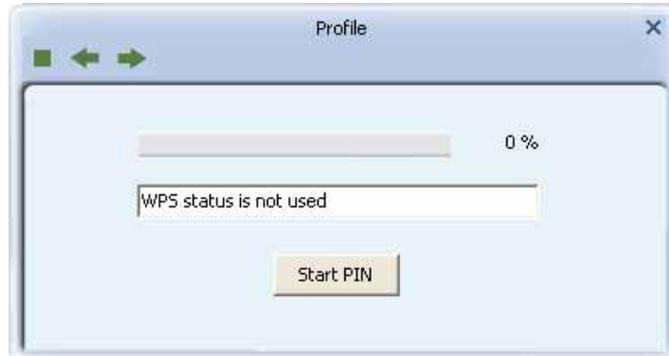


2. Select "Enrollee" from the Config Mode drop-down list.  
3. Enter the PIN Code of the STA into the Registrar when prompted by the Registrar.

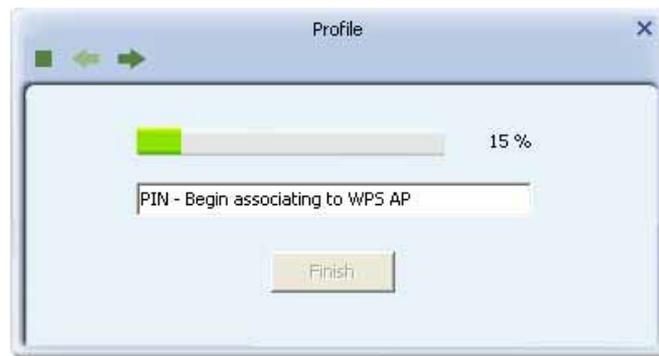


If you use Microsoft Window Connection Now as an External Registrar, you must start PIN connection at STA first. After that, search out your WPS Device name and MAC address at Microsoft Registrar. Add a new device and enter PIN Code of STA at Microsoft Registrar when prompted.

4. Click "PIN" to enter the PIN



5. The result should appear as the image below.



7. Configure one or more credentials

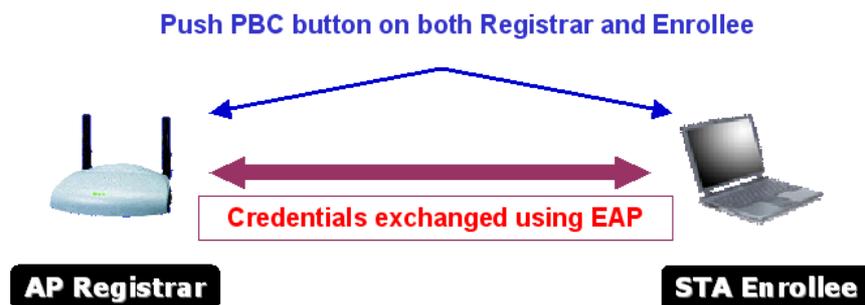


## PBC Method

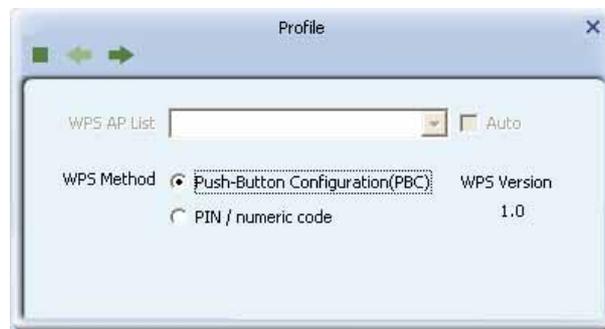
The PBC method requires the user to press a PBC button on both the Enrollee and the Registrar within a two-minute interval called the Walk Time. If there is only one Registrar in PBC mode, the PBC mode selected is obtained from ID 0x0004, and is found after a complete scan. The Enrollee can then immediately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

\*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.

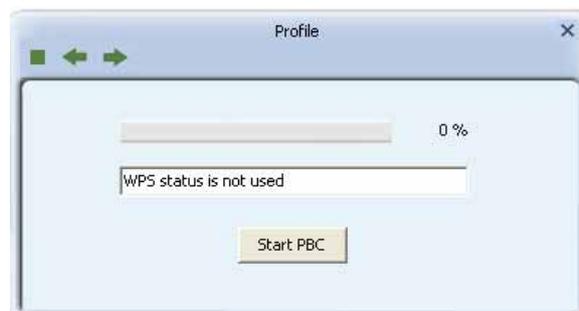


1. Select an AP (SSID/BSSID) that STA will join to and Select the "Push-button Configuration" method.

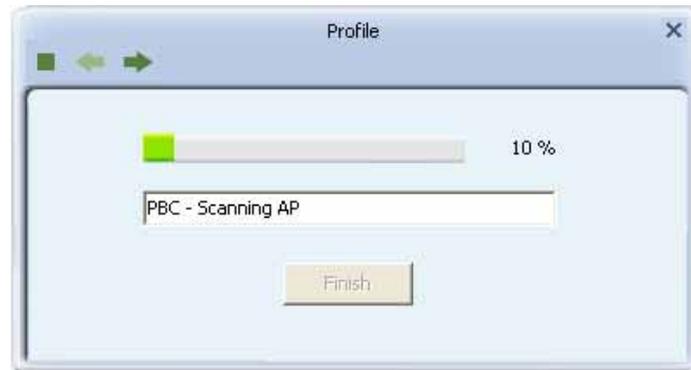


2. Click PBC to start the PBC connection.

3. Push the PBC on AP.

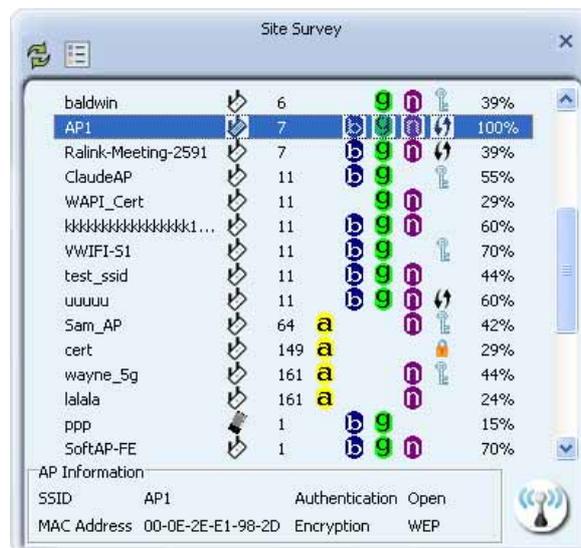


4. The progress bar as shown in the figure below indicates that scanning progress.



## Security WEP

1. Select an AP with WEP encryption and click "Connect".



2. The Authentication \ Encryption function will appear as below;

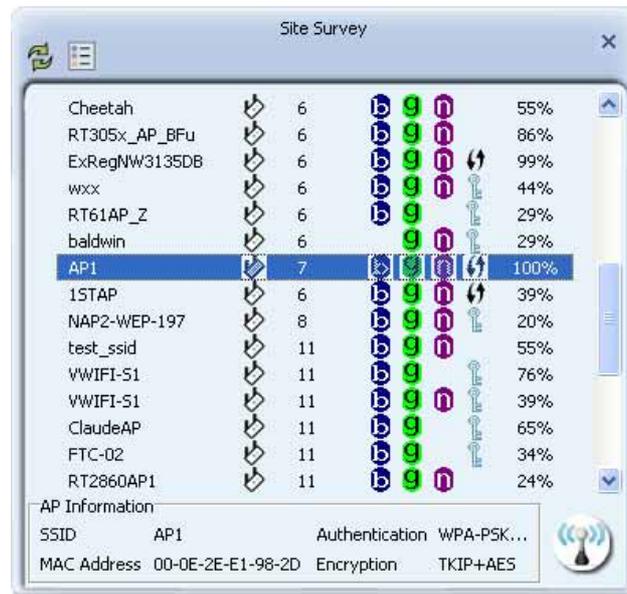


3. Enter in the assigned WEP key in the field. This value is same as our intended AP's setting.



# WPA-PSK

1. Select the AP with a WPA-PSK authentication mode and click "Connect".



2. Authentication \ Encryption function appears.



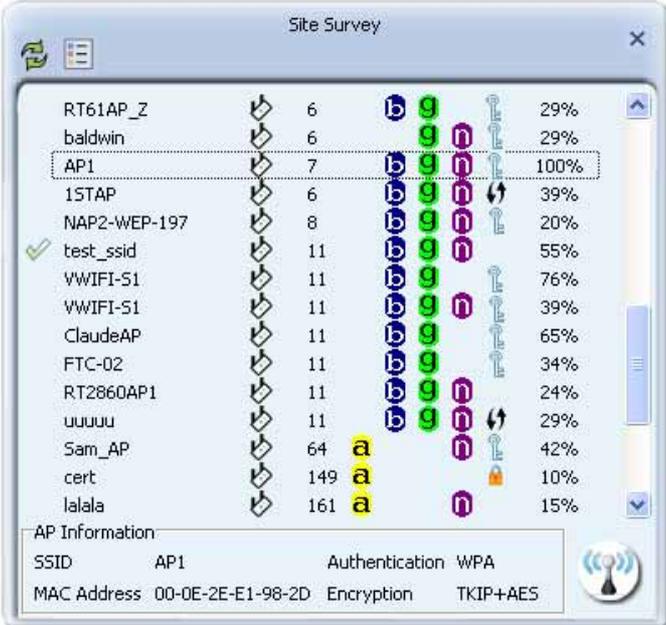
3. Select WPA-PSK as the Authentication Type. Select TKIP or AES encryption. Enter the WPA Pre-Shared Key as "12345678".



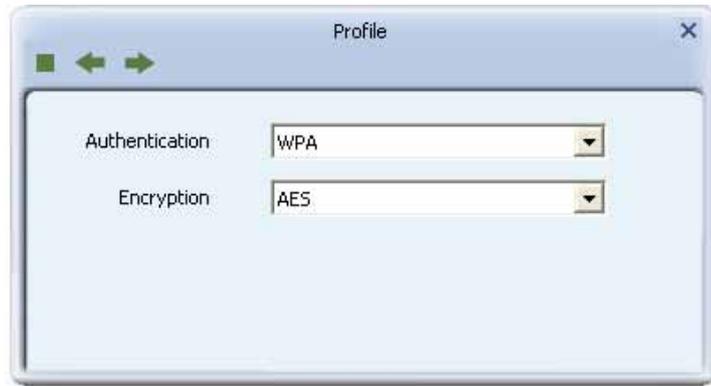
4. Click "OK". Be careful, if the WPA Pre-Shared Key entered is not correct, you won't be able to exchange any data frames, even though the AP can be connected.

### WPA

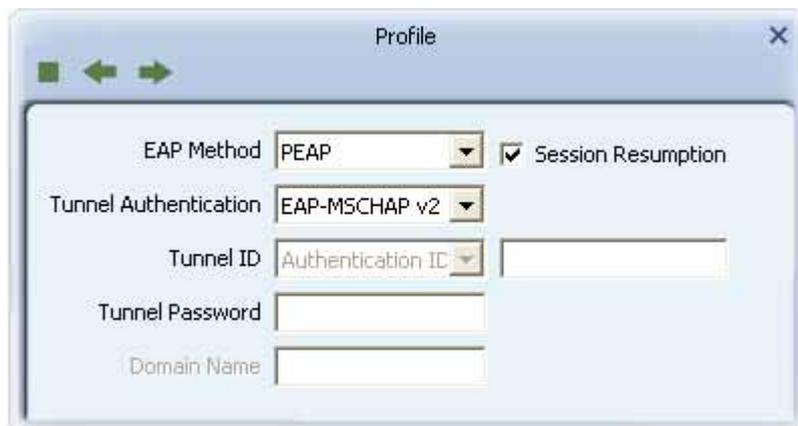
1. Select an AP with WPA authentication mode and click "Connect".



2. The Authentication \Encryption function window will pop up.



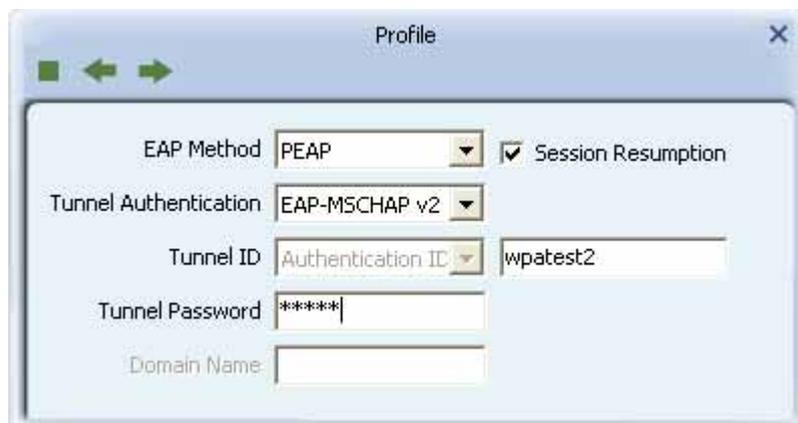
3. Click "8021X" and the setting page will appear.



4. Authentication type and setting method :

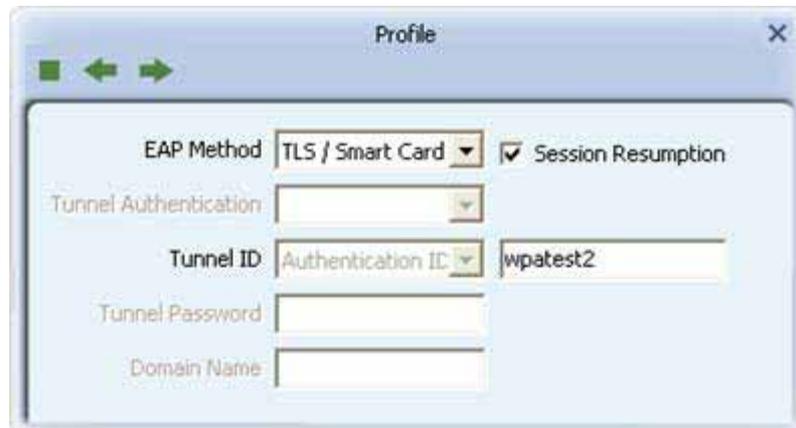
**PEAP:**

Select "PEAP" as the Authentication type from the drop-down list. Key-in "wpatest2" for the identity. "Select "EAP-MSCHAP v2" from the drop-down list for tunnel authentication and key-in the tunnel identity as "wpatest2" and the tunnel password as "test2". These settings are the same as our intended AP's setting.



## TLS / Smart Card :

"Select TLS / Smart Card" from the Authentication type drop-down list. TLS only requires the identification to be set as "wpatest2" for server authentication. TLS must use client certification. Click "Client Certification" and select a certification for server authentication.

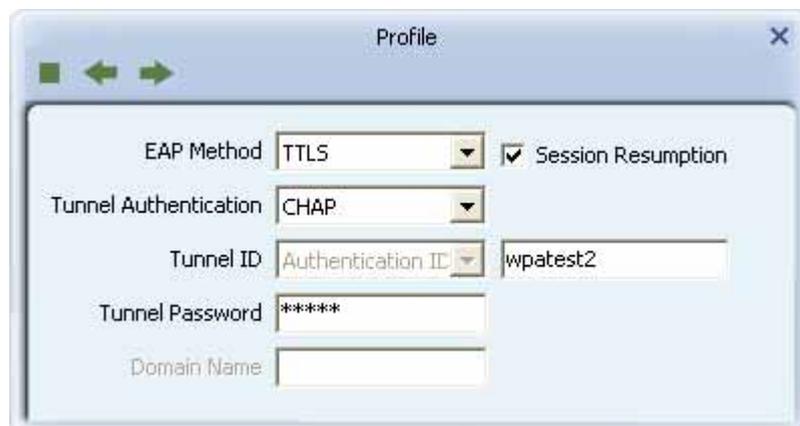


The screenshot shows a 'Profile' configuration window with the following settings:

- EAP Method: TLS / Smart Card
- Session Resumption:
- Tunnel Authentication: (empty dropdown)
- Tunnel ID: Authentication ID (dropdown) wpatest2
- Tunnel Password: (empty text box)
- Domain Name: (empty text box)

## TTLS :

Select TTLS from the Authentication type drop-down list. Key-in the identity as "wpatest2". Select CHAP for tunnel authentication, and key-in the identity as "wpatest2" and tunnel password as "test2". These settings are the same as our intended AP's setting.

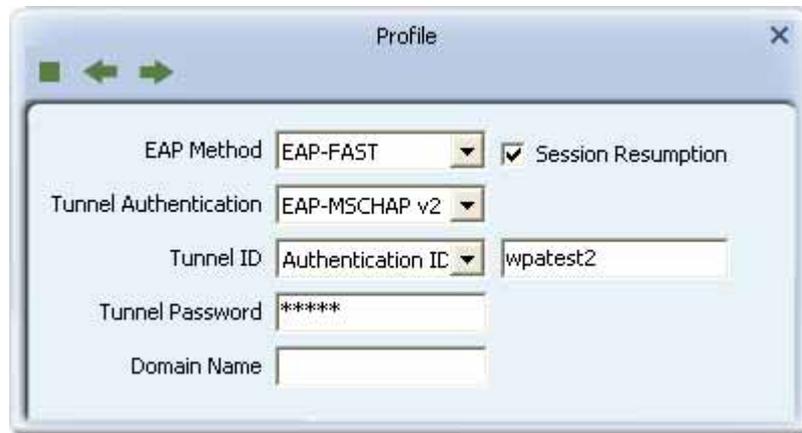


The screenshot shows a 'Profile' configuration window with the following settings:

- EAP Method: TTLS
- Session Resumption:
- Tunnel Authentication: CHAP
- Tunnel ID: Authentication ID (dropdown) wpatest2
- Tunnel Password: \*\*\*\*\*
- Domain Name: (empty text box)

## EAP-FAST:

Select EAP-FAST from the Authentication type drop-down list. Key-in the identity as "wpatest2" and a domain name into the blank field. The tunnel identity is "wpatest2" and password is "test2". These setting are the same as our intended AP's setting.



The image shows a screenshot of a configuration window titled "Profile". The window contains the following settings:

- EAP Method: EAP-FAST (selected in a dropdown menu)
- Session Resumption:  (checked)
- Tunnel Authentication: EAP-MSCHAP v2 (selected in a dropdown menu)
- Tunnel ID: Authentication ID (selected in a dropdown menu) with a text field containing "wpatest2"
- Tunnel Password: \*\*\*\*\* (masked text field)
- Domain Name: (empty text field)

# Appendix

## Glossary

For unfamiliar terms used below, look for entries elsewhere in the glossary.

### **AD-HOC (IBSS)**

Ad-hoc mode does not require an AP or a wired network. A network that transmits wireless from computer to computer without the use of a base station (access point).

Two or more wireless stations communicate directly to each other. An ad-hoc network may sometimes be referred to as an Independent Basic Service Set (IBSS).

### **CHANNEL**

A radio frequency used by a wireless device is called a channel.

### **EAP AUTHENTICATION**

EAP (Extensible Authentication Protocol) is an authentication protocol that runs on top of the IEEE802.1X transport mechanism in order to support multiple types of user authentication. By using EAP to interact with an EAP-compatible RADIUS server, an access point helps a wireless station and a RADIUS server perform authentication.

### **ENCRYPTION**

The reversible transformation of data from the original to a difficult-to-interpret format. Encryption is a mechanism for protecting confidentiality, integrity, and authenticity of data. It uses an encryption algorithm and one or more encryption keys.

### **FRAGMENTATION THRESHOLD**

This is the maximum data fragment size that can be sent before the packet is fragmented into smaller packets.

### **IEEE 802.1X**

The IEEE 802.1X standard outlines enhanced security methods for both the authentication of wireless stations and encryption key management. Authentication can be done using an external RADIUS server.

### **INFRASTRUCTURE (BSS)**

When a number of wireless stations are connected using a single AP, you have a Basic Service Set (BSS).

### **ROAMING**

In an infrastructure network, wireless stations are able to switch from one BSS to another as they move between the coverage areas. During this period, the wireless stations maintain uninterrupted connection to the network. This is roaming. As the wireless station moves from place to place, it is responsible for choosing the most appropriate AP depending on the signal strength, network utilization among other factors.

### **SSID**

The SSID (Service Set Identity) is a unique name shared among all wireless devices in a wireless network. Wireless devices must have the same SSID to communicate with each other.

### **TEMPORAL KEY INTEGRITY PROTOCOL (TKIP)**

Temporal Key Integrity Protocol (TKIP) uses 128-bit keys that are dynamically generated and distributed by the authentication server.

### **USER AUTHENTICATION**

WPA applies IEEE 802.1X and Extensible Authentication Protocol (EAP) to authenticate wireless clients using an external RADIUS database. If you do not have an external RADIUS server, use WPA-PSK/WPA2-PSK (WPA -Pre-Shared Key) that only requires a single (identical) password entered into each access point, wireless gateway and wireless client. As long as the passwords match, clients will be granted access to a WLAN.

### **WEP**

WEP (Wired Equivalent Privacy) encryption scrambles all data packets transmitted between the WCB-321A and the AP or other wireless stations to keep network communications private. Both the wireless stations and the access points must use the same WEP key for data encryption and decryption.

## Specification

<b>Hardware</b>	
<b>Interface</b>	USB 2.0
<b>Standards</b>	IEEE 802.11a, IEEE 802.11b, IEEE 802.11g and IEEE 802.11n
<b>Button</b>	WPS button: enables quick wireless connection with WPS function
<b>Power Consumption</b>	Receive mode: 406mA (max.) Transmit mode : 428mA (max)
<b>Supported OS</b>	Windows 7 (32/64-bit), Vista (32/64-bit), XP and 2000
<b>Dimensions (LxWxH)</b>	72 x 50 x 31 mm (2.8 x 2.0 x 1.2 in.)
<b>Weight</b>	40 g (1.41 oz)
<b>Temperature</b>	Operating: 0° ~ 40° C (32° ~ 104° F) Storage: -20° ~ 60° C (-4° ~ 140° F)
<b>Humidity</b>	Max. 85% (non-condensing)
<b>Certifications</b>	CE, FCC
<b>Wireless</b>	
<b>Modulation</b>	CCK/ OFDM - BPSK, QPSK, 16-QAM, 64-QAM, DBPSK, DQPSK
<b>Antenna</b>	3 Built-in on board antenna
<b>Frequency</b>	802.11b/g/n: 2.412 ~ 2.484 GHz 802.11a/n: 5.15 ~ 5.825GHz (FCC), 5.470 ~ 5.725GHz (ETSI)
<b>Data Rate (auto fallback)</b>	802.11a: up to 54Mbps 802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 450Mbps
<b>Output Power</b>	<b>802.11a: 13dBm (typical)</b> <b>802.11b: 18dBm (typical)</b> <b>802.11g: 15dBm (typical)</b> <b>802.11n/g: 14dBm (typical)</b> <b>802.11n/a: 12dBm (typical)</b>
<b>Receiving Sensitivity</b>	802.11b: -84dBm (typical) at 11mpbs 802.11g: -72dBm (typical) at 54Mbps 802.11n/g: -65dBm (typical) at 450Mbps 802.11n/a: -64dBm (typical) at 450Mbps
<b>Encryption</b>	64/128-bit WEP, WPA/WPA2-RADIUS, WPA-PSK/WPA2-PSK
<b>Channels</b>	802.11b/g/n: 1~11 (FCC), 1~13 (ETSI) 802.11a/n: 36, 40, 44, 48, 149, 153, 157, 161, 165 (FCC), 36, 40, 44, 48 (ETSI)

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