EUB-9701 EXT2

Wireless-N USB 2.0 Adapter

(802.11n draft, 802.11g & 802.11b)

User Manual

Version: 1.3

TABLE OF CONTENTS

Revision History

Version	Date	Notes
1.1	May 24, 2007	Created
1.2	June 4, 2007	Updated setup pages
1.3	June 9, 2007	Modified Config pages & Screenshots

1 Introduction

EnGenius Wireless-N USB Adapter (EUB-9701 EXT2) implements the latest 11n (Draft 2.0) technology which extremely improves wireless signal for your computer than existing wireless 802.11g technology. The incredible speed of Wireless-N USB adaptor makes heavy traffic networking activities more flexible and takes the wireless into practical road.

You could enjoy the racing speed of wireless connection, surf Internet without string of wires. Adding EnGenius Wireless-N to your Notebook or Computer, provides an excellent solution for media-centric activities such as streaming video, gaming, and enhances the QoS (WMM) without any performance penalty.

It extends network coverage by 3 times and boosts transmission throughput 6 times than existing 11g products. For more security-sensitive applications, EUB-9701 EXT2 supports Hardware-based IEEE 802.11i encryption/decryption engine, including 64-bit/128-bit WEP, TKIP, and AES. Also, it supports Wi-Fi alliance WPA and WPA2 encryption. Cisco CCX V1.0, V2.0 and V3.0

2 Features

Features	Advantages
High Speed Data Rate Up to 300Mbps*	Capable of handling heavy data payloads such as MPEG video streaming
IEEE 802.11b/g Compliant	Fully Interoperable with IEEE 802.11b / IEEE802.11g compliant devices with legacy protection
WPA/WPA2 (IEEE 802.11i), WEP 64/128 Support	Powerful & Robust data security.
Support 2Tx * 2Rx Radios	enables Intelligent Antenna
WMM (IEEE 802.11e) standard support	Wireless Multimedia Enhancements Quality of Service support (QoS) / enhanced power saving for Dynamic Networking.
2 Detachable Antenna design	Flexible with SMA connector design

* Theoretical wireless signal rate based on IEEE standard of 802.11a, b, g chipset used. Actual throughput may vary. Network conditions and environmental factors lower actual throughput rate.
** All specifications are subject to change without notice.

3 Package Contents

Open the package carefully, and make sure that none of the items listed below are missing. Do not discard the packing materials, in case of return; the unit must be shipped back in its original package.

- One Wireless-N USB Adaptor
- One USB cable (1.0m)
- One CD-ROM with User's Manual & Drivers
- Quick Installation Guide
- 2 Detachable antennas (Reverse SMA connector)

LED	Description
LINK	Blinks when active connection is available else remains switched OFF
PWR	Blinks rapidly when data communication in progress else remains switched OFF

4 System Requirements

To begin using the WLAN USB Adapter, your PC/Notebook must meet the following minimum requirements:

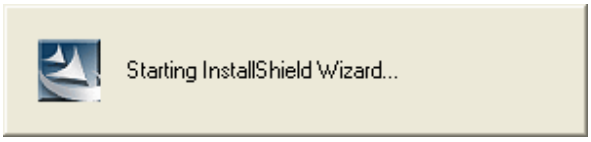
- Operating System – Microsoft Windows XP/2000
- USB 2.0 socket x 1 (free to use socket)
- 256MB system memory or larger
- 750MHz CPU or higher configuration

5 Installation

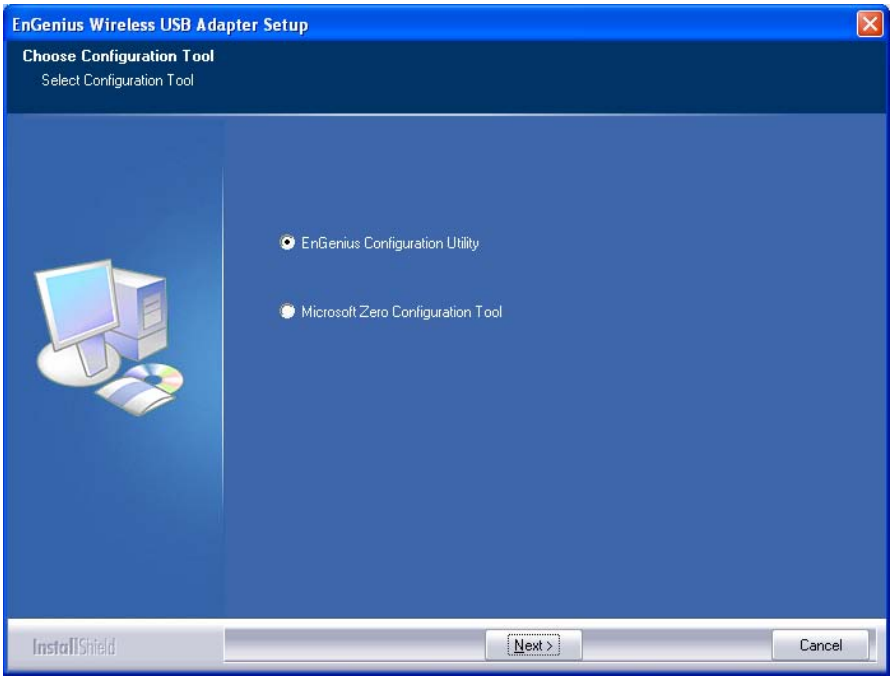
Important: Install the WLAN Adapter utilities before inserting the WLAN Adapter into your computer.

Insert the support CD into your optical drive. In the CD drive folder, you will see the following file.

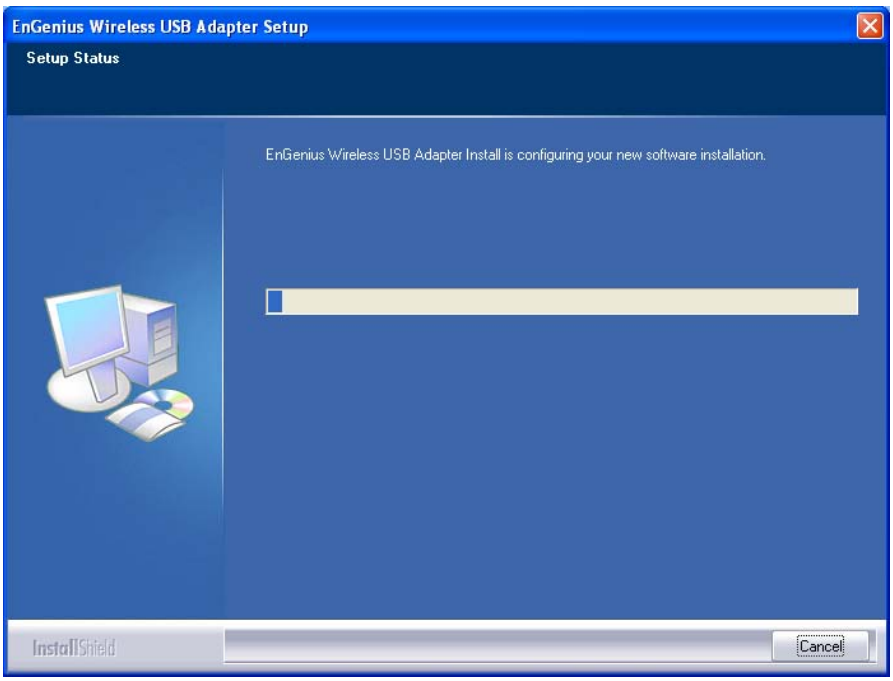
Open the file and you can briefly see the following…



Choose EnGenius configuration utility & click next

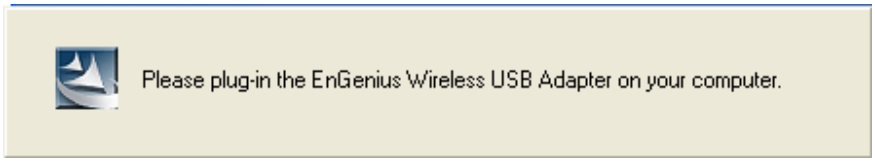


Await instructions as you see the setup progress as shown below...

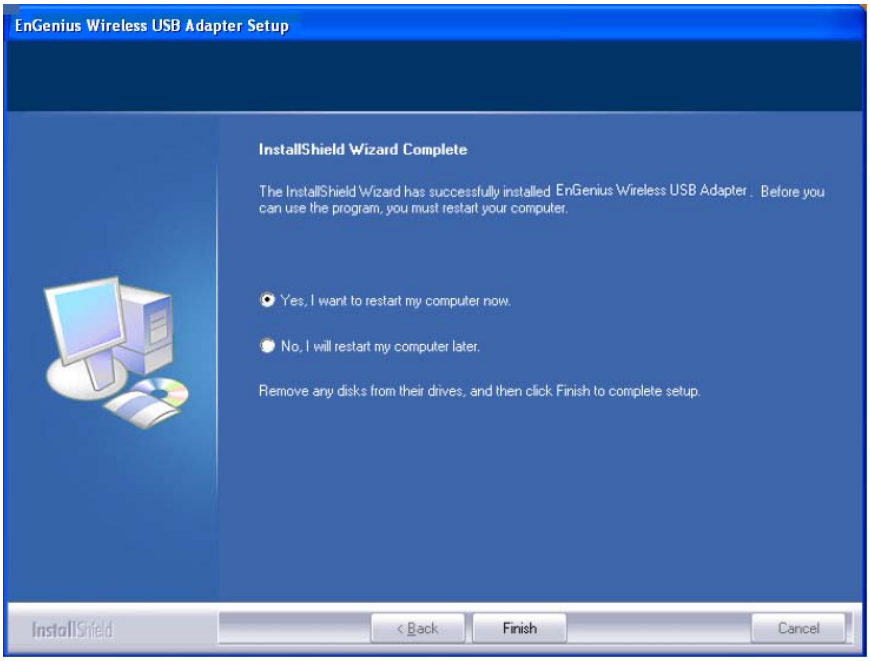


Click finish to restart PC/notebook.

Please insert EUB-9701 EXT2 Wireless Network Adapter with the USB cable in your notebook/PC's available USB 2.0 socket

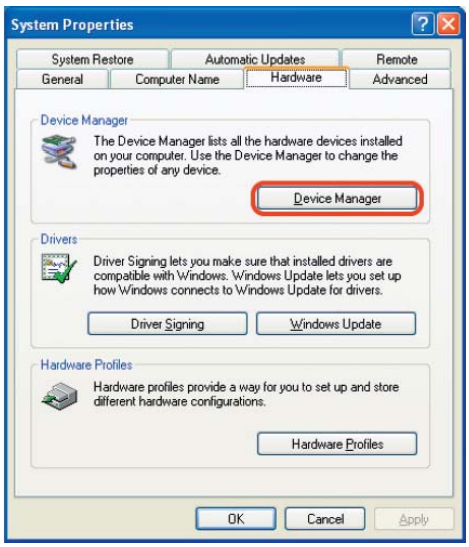


After a few seconds a notification that setup is complete will show up as follows. Click **Finish** to restart the PC/notebook.

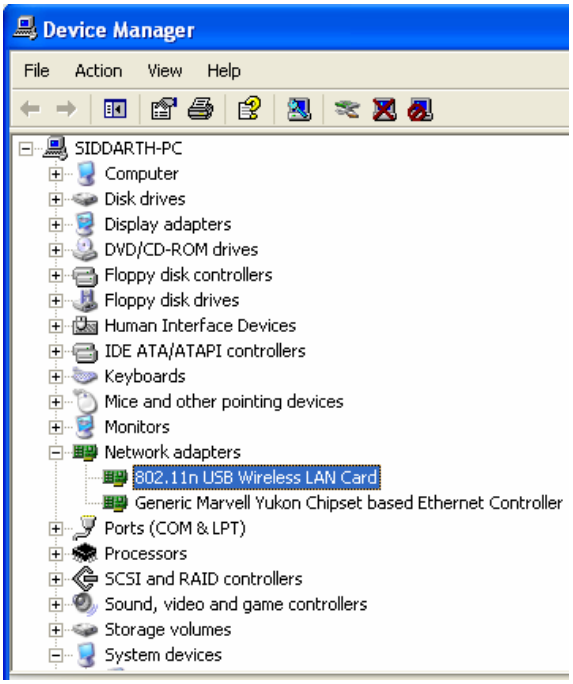


6 Verify installation

1. Open [Control Panel] =>Double-click [System].
2. Select [Hardware] tab=>Click [Device Manager].

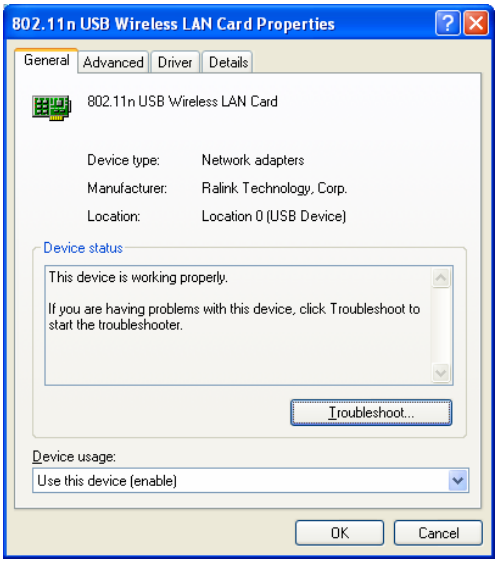


Select and double-click [802.11N USB wireless LAN card]



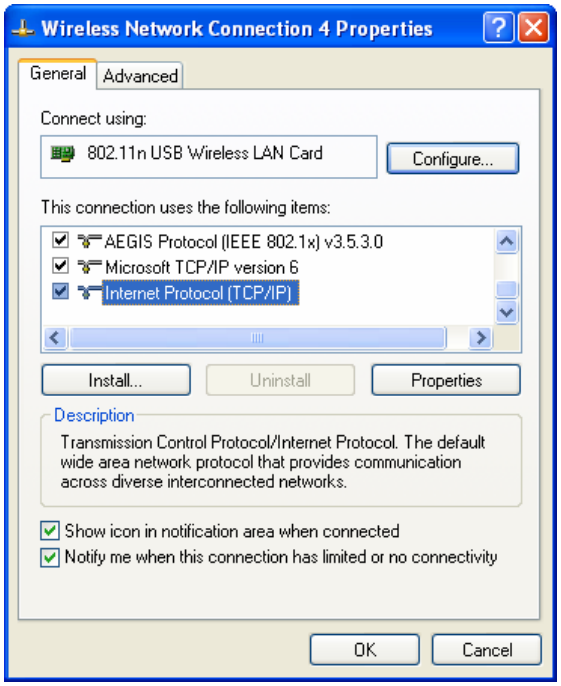
Verify that the device status of [802.11N USB wireless LAN card]

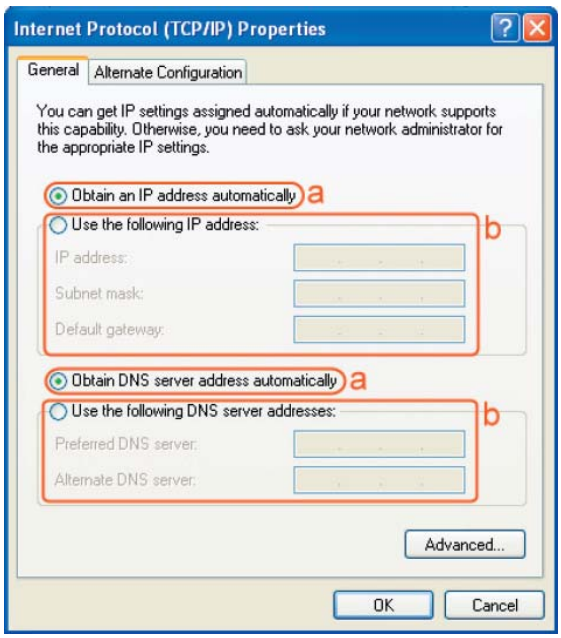
[This device is working properly]->Click [OK]



7 Setup Network Configuration (MS WinXP)

- Enter [Start Menu] =>select [Control panel] =>select [Network].
- Right-click [Wireless Network]
- Select [Local Area Connection]) icon=>select [properties]
- Select [Internet Protocol (TCP/IP)] =>Click [Properties].





- Select the [General] tab.

  a. If your Wireless Router supports [DHCP] function, please select both [Obtain an IP address automatically] and [Obtain DNS server address automatically].

  b. If the router does not support [DHCP] function, you have to configure the IP and DNS settings.

8 Setup WLAN (EnGenius Config-Utility)

Prerequisite:

1. **Your home/office environment should have a wireless LAN Access Point (AP) that is available for your use.**
2. **You should readily have the (security keys) to connect those Wireless LAN Access Points (AP)**

Configuration utility will first automatically link with the Wireless AP if there is no security key required. If the connection is successful, a message will appear on taskbar.

Following steps guides you to initially setup a wireless network connection.

Notice the EnGenius configuration utility on the taskbar

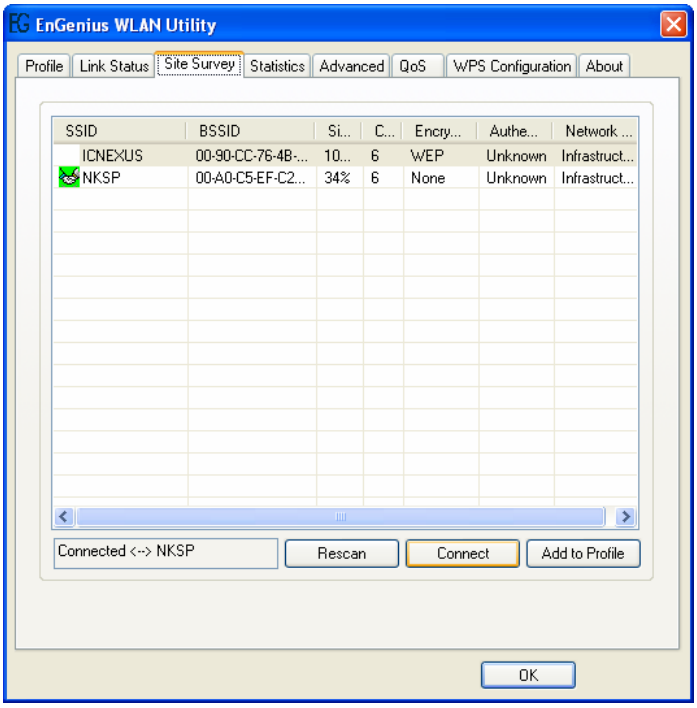
Hovering the mouse cursor briefly over "**EG**" icon will show status as follows…the current status indicates that **Config utility** has automatically connected to an **Access Point** named **NKSP**.

Right click on "**EG**" icon will open up a menu as shown below

Click on **Launch Config Utilities.** Notice it has many tabs for configuration

To make connection, select one AP/SSID (eg: NKSP) and click [Connect]. When the connection works, [Connected] will appear in the left button of this tab and the icon appears in front of the linked AP.

When the connection failed, [Disconnected] will appear. If the AP has set up the encryption, please setup the same before you click [OK].



Click on **Site Survey** tab. Press **Rescan**. You will see several AP listed under SSID

They denote individual access points. Click on the one you want to connect with. Notice that if there is no security key needed, you can see that in the **Encryption** status as "**None**".

If there is security key required, obtain it and click **connect**. If you need to input a security key, refer to chapter 9 to understand setting up WEP key.

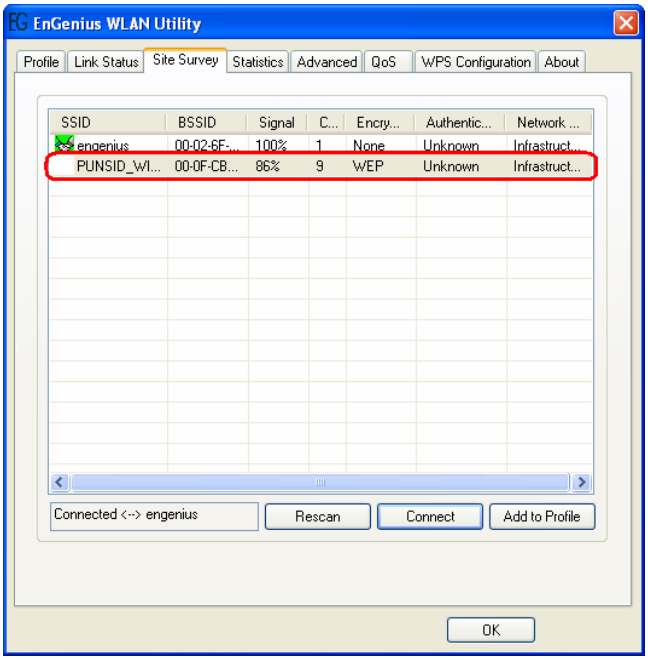
9 Setup Network security (WEP, WPA…)

If your AP/Router has network security key, your wireless adapter needs to have the same security setting. The details of network security setting are described below. Please open EnGenius Wireless Utility before you start to setup network security:

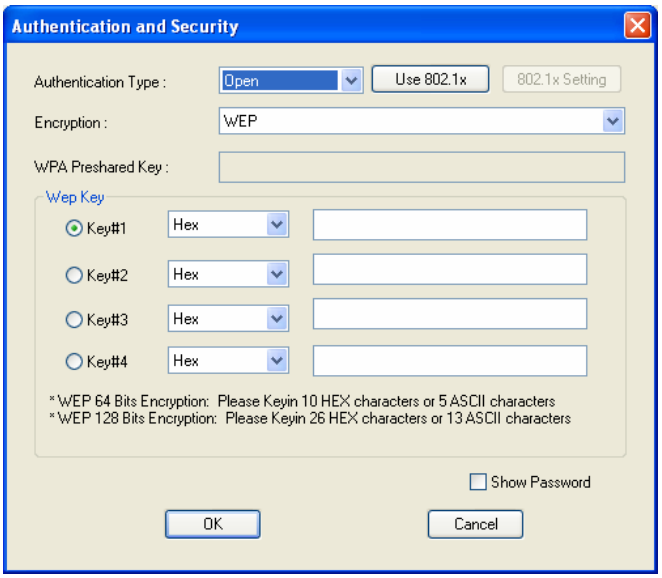
Please click [start] ->select [Programs] ->click [CG-WLUSB2GO] ->click [EnGenius Wireless Utility], and the wireless icon "**EG**" will appear on taskbar.

a. Setting WEP

If AP you want to connect to has [WEP] authentication, press [Connect].



Press **Connect**. You will see a window pop up as shown below.



Follow steps below:

a. [Authentication Type]: indicates the authentication type of the AP/Router. Please confirm the setting of the AP/Router.

∗ [Open]: WEP open system is based on request and grant. It is essentially no authentication.

∗ [Shared]: WEP shared key is based on request, challenge, challenge response, grant/deny.

b. Select [WEP] in [Encryption].

c. Key in AP encryption keys (64/128bits) in the box Key1~Key4. Please accept the auto selected setting of [Hex]/ [ASCII].

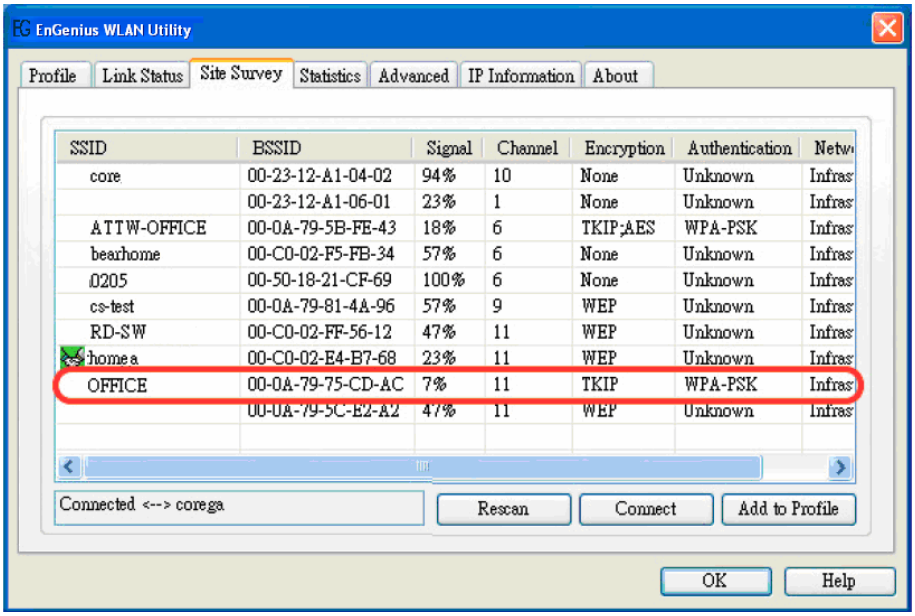
d. Select the current AP encryption keys from Key1~Key4.

e. Press [OK] to finish setting.

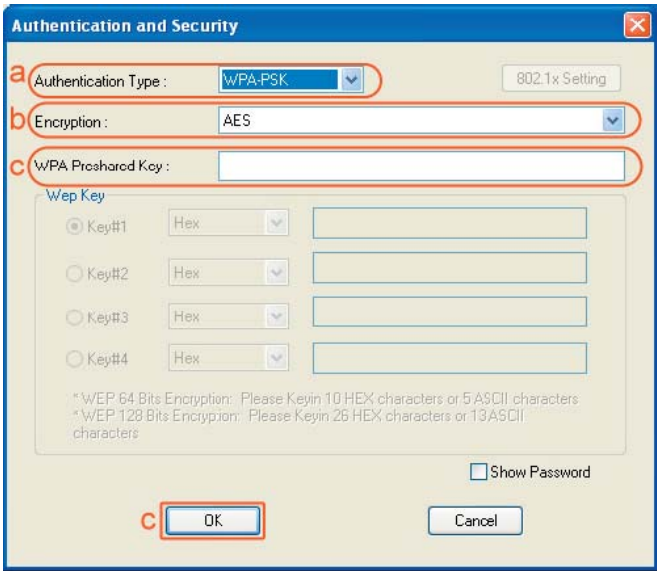
b. Setting WPA

WPA encryption type can be divided into WPA-PSK, WPA2-PSK, WPA (or called WPA-EAP), and WPA2 (or called WPA2-EAP). All settings should correspond with settings of the wireless AP you would want to connect with.

WPA-PSK and WPA2-PSK



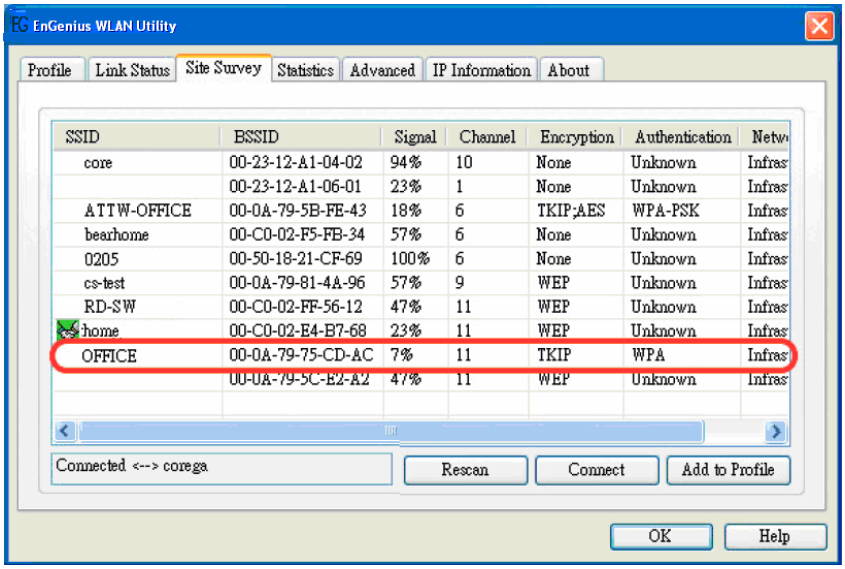
Setting the [Authentication and Security] Page:



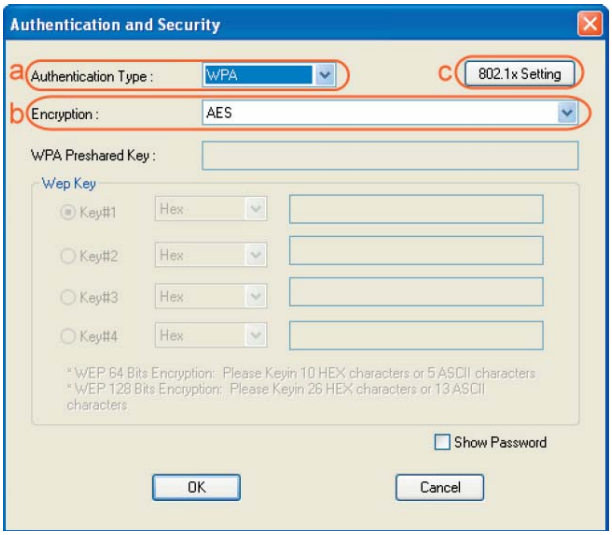
a. Authentication Type: Select [WPA-PSK] or [WPA2-PSK] (AP must support the function).
b. Encryption: Select [TKIP] or [AES].(Same as AP)
c. Enter the selected AP's password in [WAP Preshared Key] box and click [OK].

WPA and WPA2

1. Select an AP with [WPA] or [WPA2] authentication and press [Connect]. Here we use OFFICE for example; hence the following settings must correspond with your corresponding Wireless Access Point.



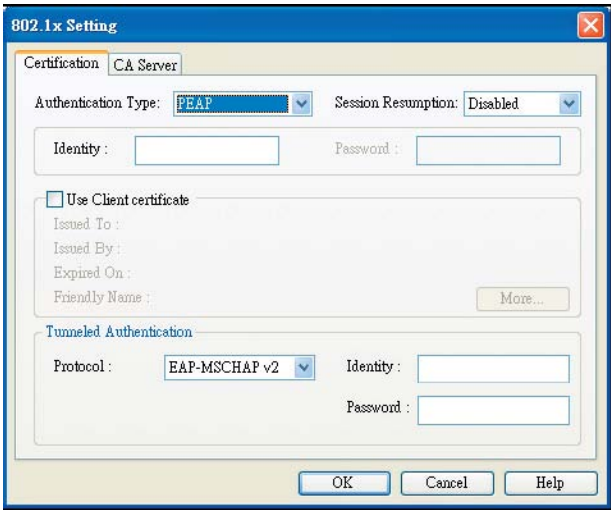
Setting the [Authentication and Security] Page:



a. Authentication Type: select [WPA] or [WPA2-PSK] (AP must support the function).

b. Encryption: select [TKIP] or [AES] (Same as AP)

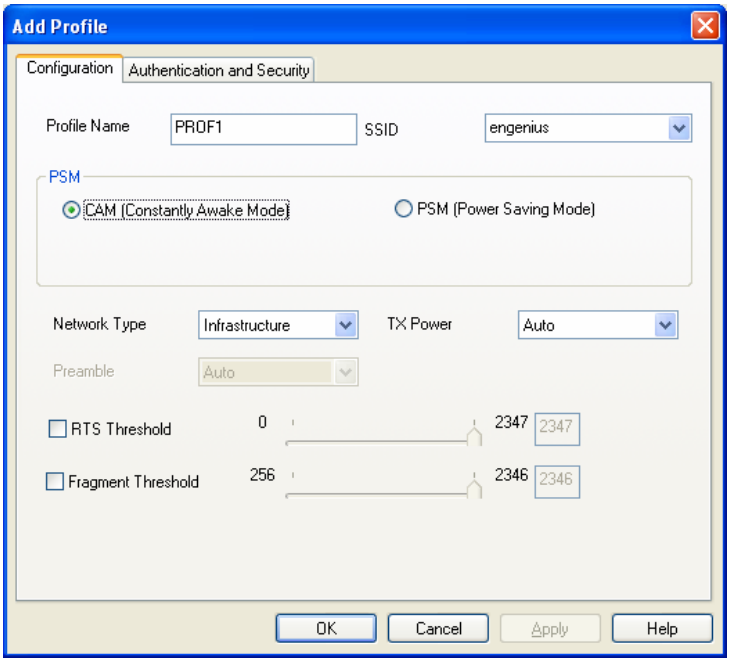
c. If the AP/router has [802.1x Setting] function, click it for advanced settings. Please consult your network administrator for details or check the user manual of the Wireless Access Point.



Click [OK] to finish setting.

10 Adding Profiles

1. Select one AP in the SSID column, eg: EnGenius=>Click [Add to Profile] and the page shown below will appear.



2. Setting items in the [configuration] tab:

• **Profile Name:** Enter the connected AP profile, eg: PROF1.

• **SSID**: Click the drop-down menu and select one AP. You can also enter the AP manually.

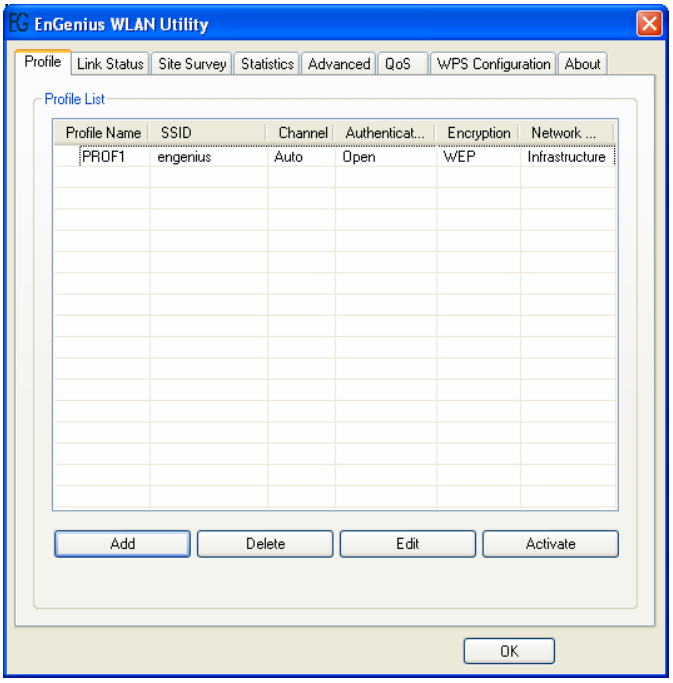
• **PSM**: When CAM is selected, indicates that the product is not in power saving status. When PSM is selected, the product is in power saving status. (Only select it under Infrastructure network type).

• **Network Type**: [Infrastructure] or [Ad Hoc] type. We recommend you to select [Infrastructure].

• **Transmit power**: the amount of power used by a radio transceiver to send the signal out. User can choose power value by sliding the bar.

• [**RTS Threshold**] and [**Fragment Threshold**]: We recommend you to use the default value 2312. User can adjust threshold numbers by sliding the bars or key in the values directly.

3. Click [**OK**] and the set AP will appear in the [Profile] tab.



• [Add]: Click [Add] to add a new profile.

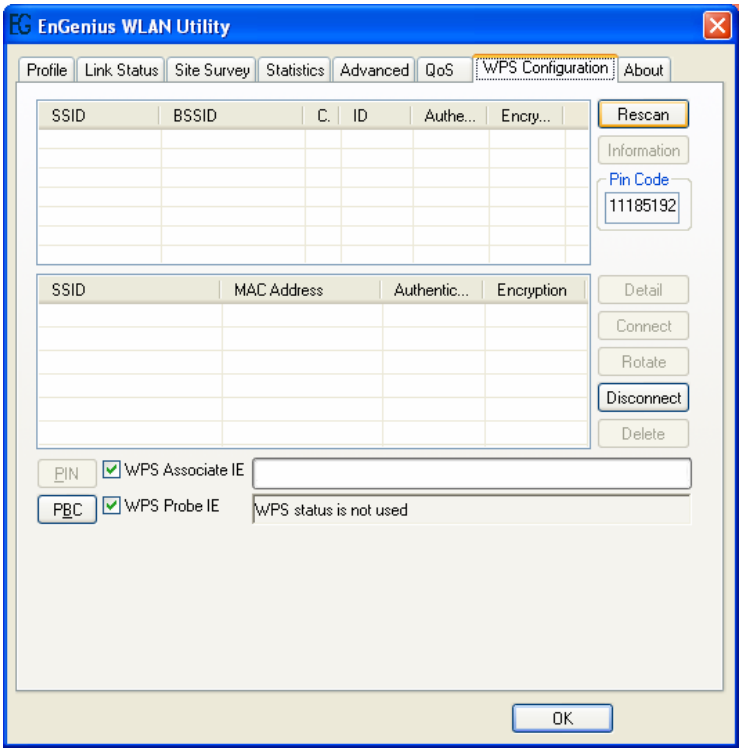
• [Delete]: to delete a profile, select one profile name and click [Delete].

• [Edit]: to edit the setting of a profile, select the profile and click [Edit].

• [Activate]: to activate the selected profile, select the profile and click [Activate].

11 WPS Configuration

Wi-Fi Protected Setup (WPS) configuration function - provides easy procedures to set up wireless security. Wi-Fi Protected Setup gives SOHO users a variety of setup options. It uses familiar methodologies such as typing in a Personal Identification Number /numeric code (PIN method), and pushing a button (Push-Button Configuration, or PBC) to enable users to automatically configure network names and strong WPA2 (Wi-Fi Protected Access 2TM) data encryption and authentication.

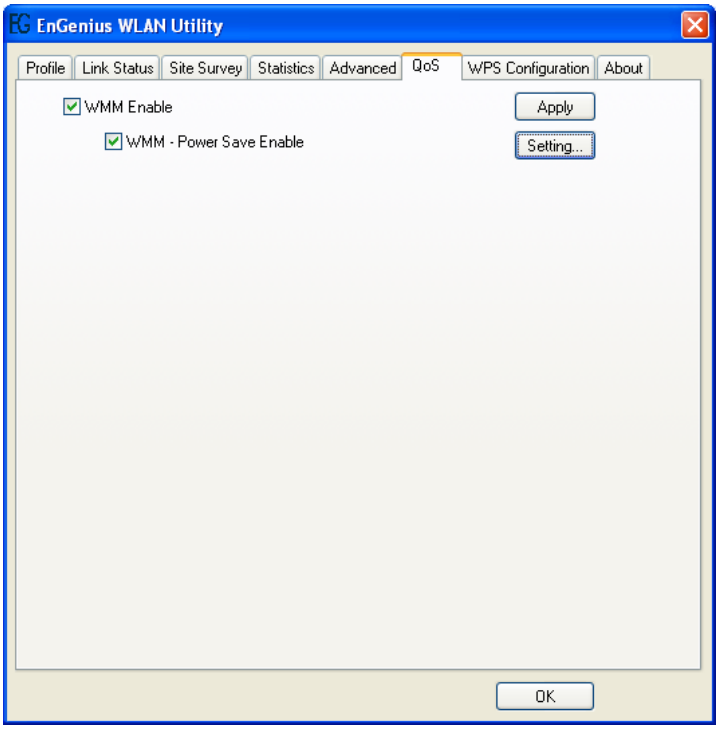


12 QoS

Wi-Fi CERTIFIED™ for WMM (Wi-Fi Multimedia) provides multimedia enhancements for Wi-Fi® networks that improve the user experience for audio, video, and voice applications. WMM is a profile of the IEEE 802.11e Quality of Service (QoS) extensions for 802.11 networks and started a certification program for WMM to satisfy the most urgent needs of the industry for a QoS solution for Wi-Fi networks. WMM provides prioritized media access and is based on the Enhanced Distributed Channel Access (EDCA) method.

Click **WMM Enable** to turn on the WMM capability.

Click **WMM – Power Save Enable** and this can improve the power savings by atleast 15% as far as the EUB-9701 EXT2 power consumption is concerned.



13 Advanced Settings

Wireless mode: Select wireless network mode (speed)

- 802.11b/g mixed: Automatically detect 11b or 11g
- 802.11b only: Frequency only 11b
- 802.11b/g/n mixed: Automatically detect 11b or 11g or 11n

In order to keep the connection stable, please select [Auto] to automatically confirm which mode the wireless network is working.

TX-Burst: Ralink's proprietary frame burst mode. When it is checked, transmission throughput will be improved. (Only works when AP supports this function)

Enable TCP Window Size :.(When checked, the reception speed will improve.)

Fast Roaming at ___ dBm: Will enter roaming mode when dBm reaches defined level.

CCX 2.0: Open CCX (supports Cisco Compatible Extensions function). Check it after making sure the Wireless AP supports it.

Turn on CCKM: Open CCKM function (Cisco Key Management).

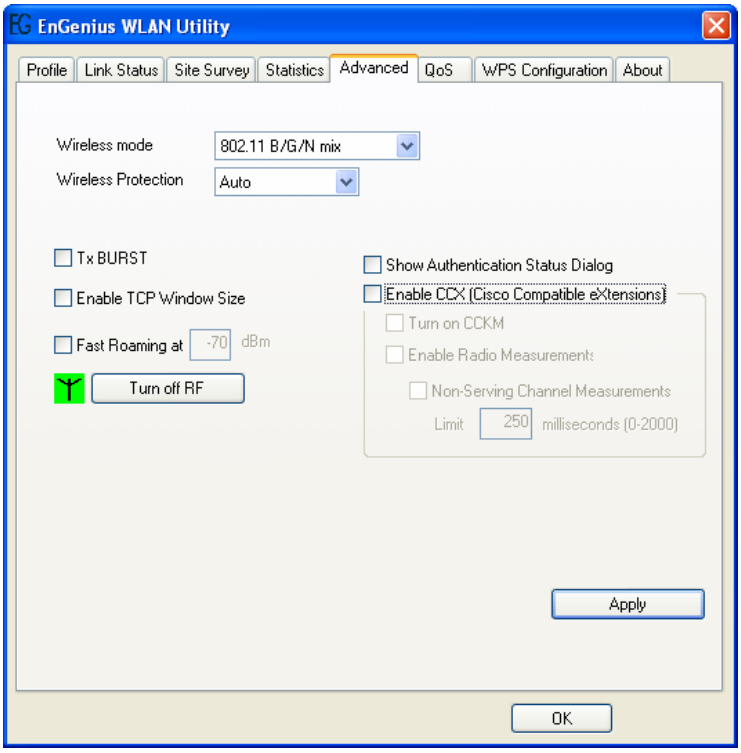
Enable Radio Measurements: Open the function of CCK Monitor AP Channel.

Non-Serving Channel Measurements: Select and start to monitor the channels on which the AP is not transmitting

Turn off RF: Disable wireless radio.

Turn on RF: Enables wireless radio.

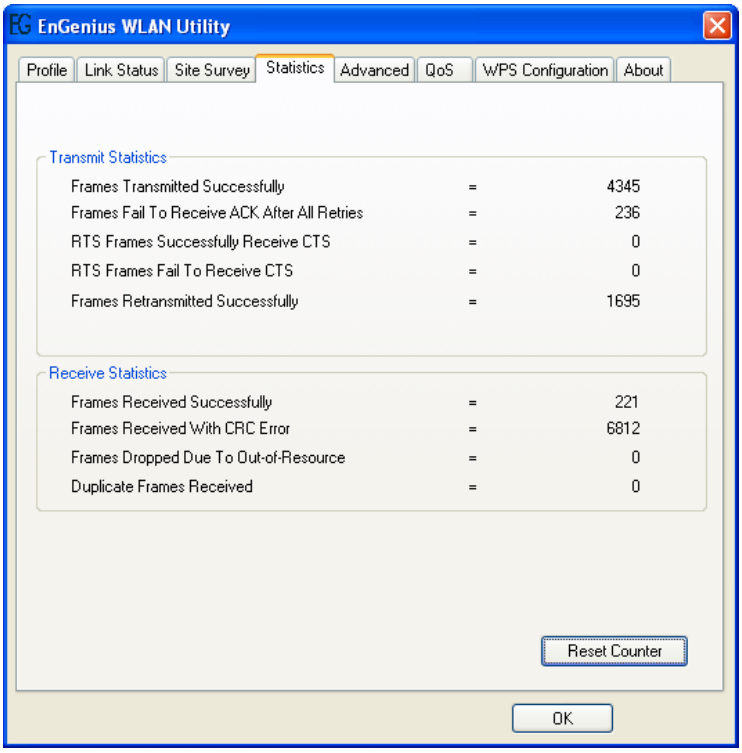
[Apply]: Click this when finish the settings.



14 Statistics

Statistics page displays the detail information about Wireless LAN TX/RX.

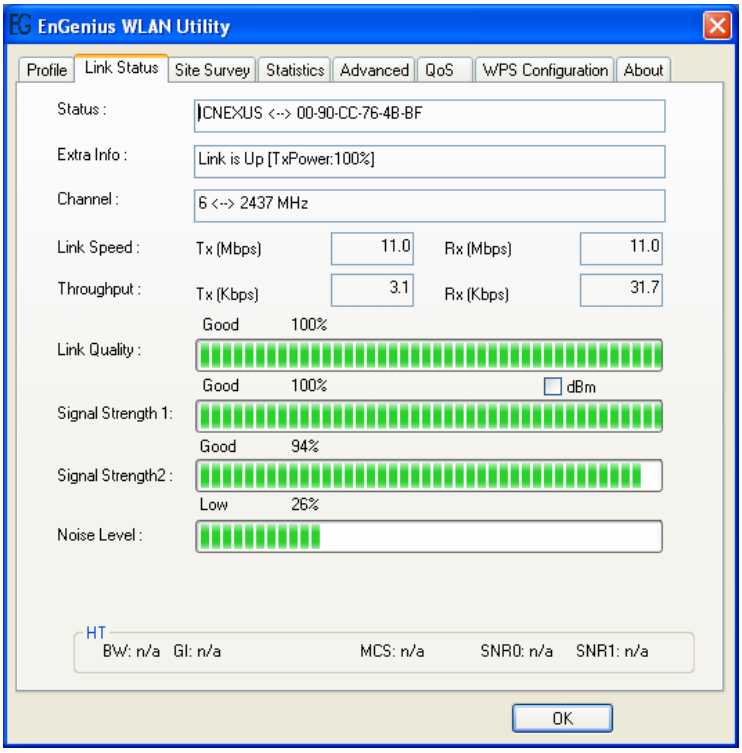
• **Transmit Statistics**: Statistic of transmitted frames.
• **Receive Statistics**: Statistic of received frames.
• [**Reset Counters**]: Click [Reset Counter] to zero the statistic numbers of transmitting and receiving data and start over.



15 Link Status

This tab displays the information of the Wireless connection status.

• **Status**: Displays the linked AP name and MAC address. When [Disconnect] appears in this box, the connection is failed.
• **Extra Info**: link status and strength.
• **Channe**l: Current channel in use.
• **Link Speed**: Show current transmit rate and receive rate.
• **Throughput:** Display transmit and receive throughput value.
• **Link Quality**: Display connection quality based on signal strength and TX/RX packet error rate.



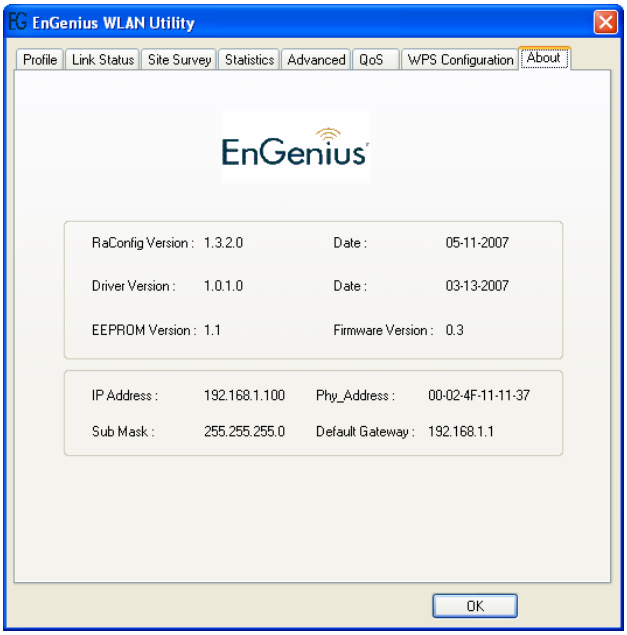
• **Signal Strength 1 & 2**: Receive signal strength, user can choose to display as percentage or dBm format

• **Noise Level**: Display noise signal strength.

16 About

The About tab displays version information of

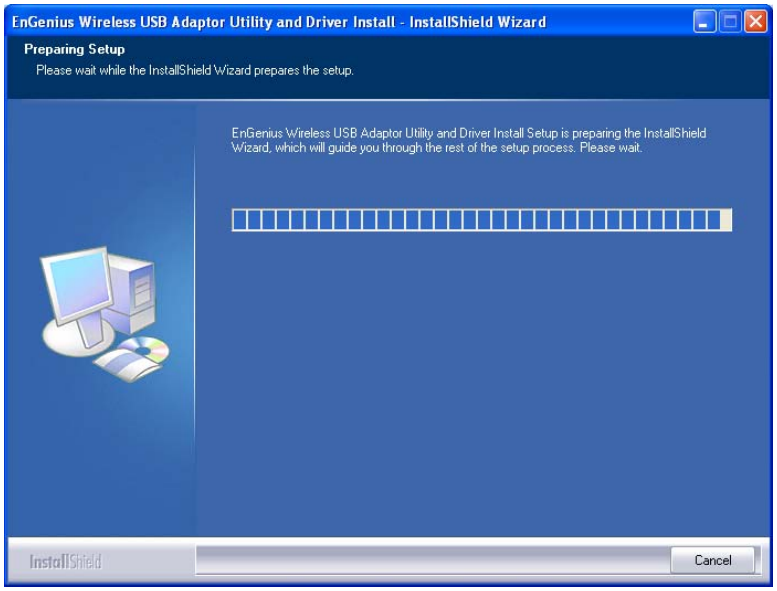
1. **Driver**
2. **Utility**
3. **EEPROM binary**
4. **Firmware**
5. **IP Address (current)**
6. **MAC address of the PHY**
7. **Subnet MASK Address**
8. **Default Gateway**



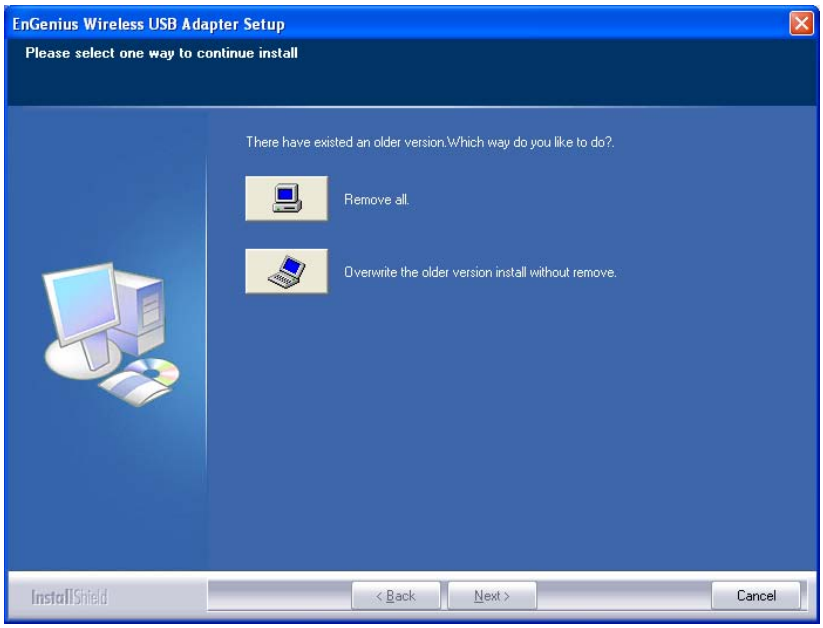
17 Uninstalling EnGenius Utility/Driver

Select Uninstall option from the start menu.

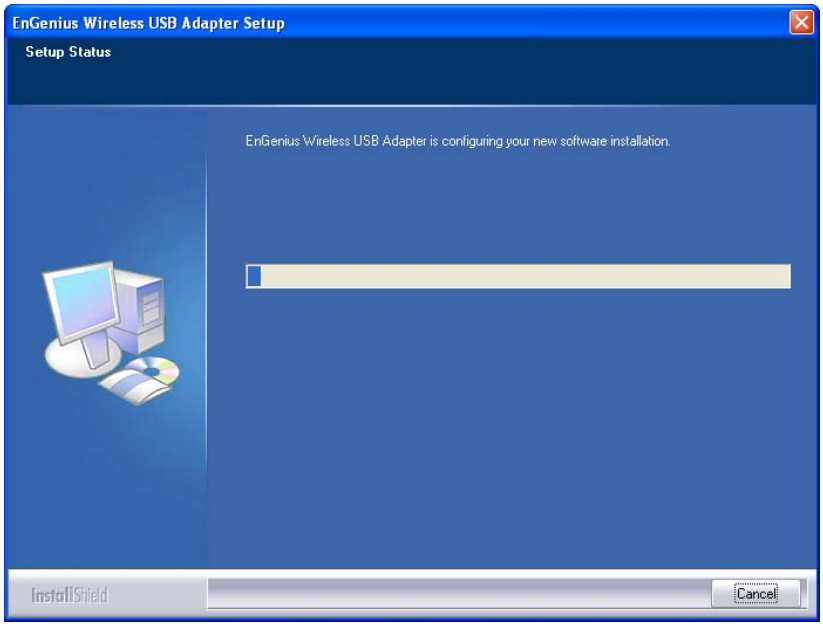
You can see the wizard preparing for uninstallation

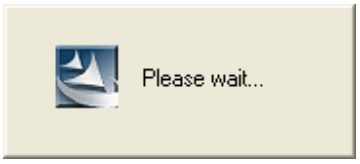


Select **Remove All**

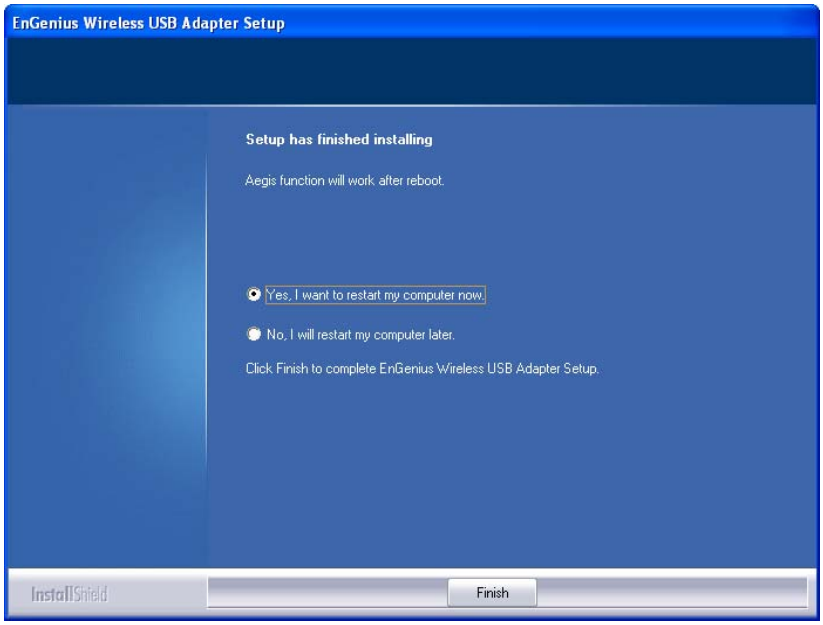


Removing the utility is in progress. At any time you may press **cancel** to abort uninstallation.



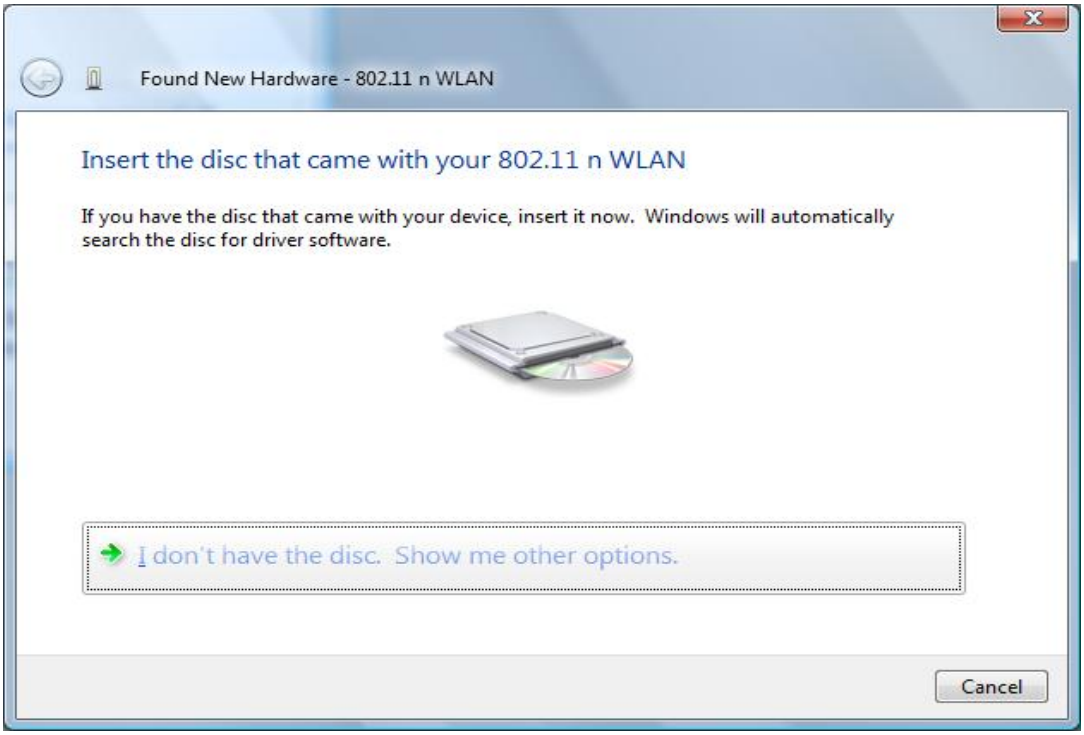


You will need to restart your computer for ensuring a clean removal of the EnGenius Utility.

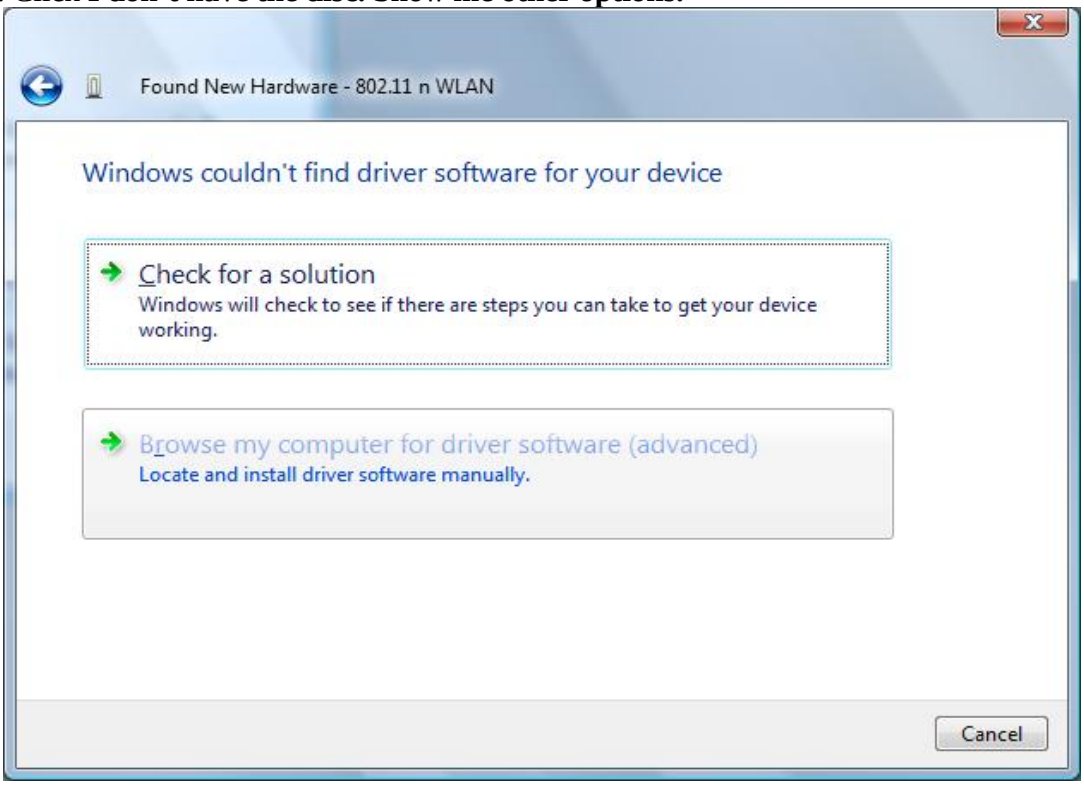


Appendix A – Driver Installation for Windows Vista

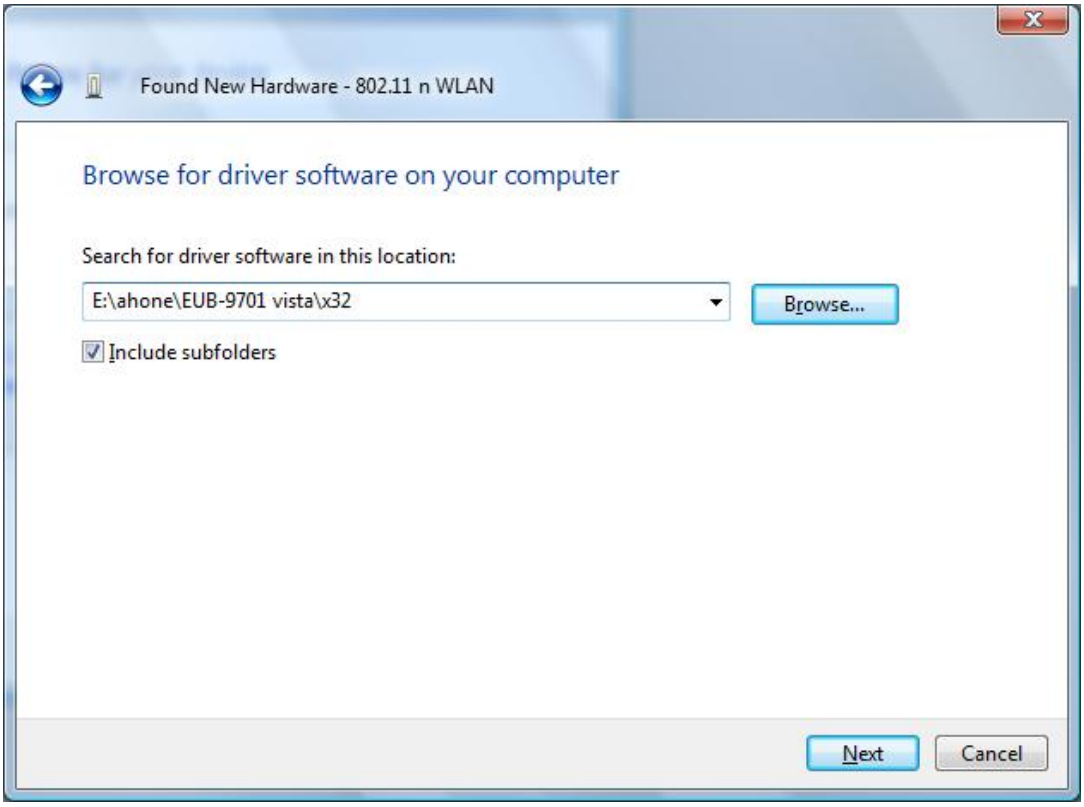
1. Click **Locate and install driver software (recommended)**
2. Click **Countinue**



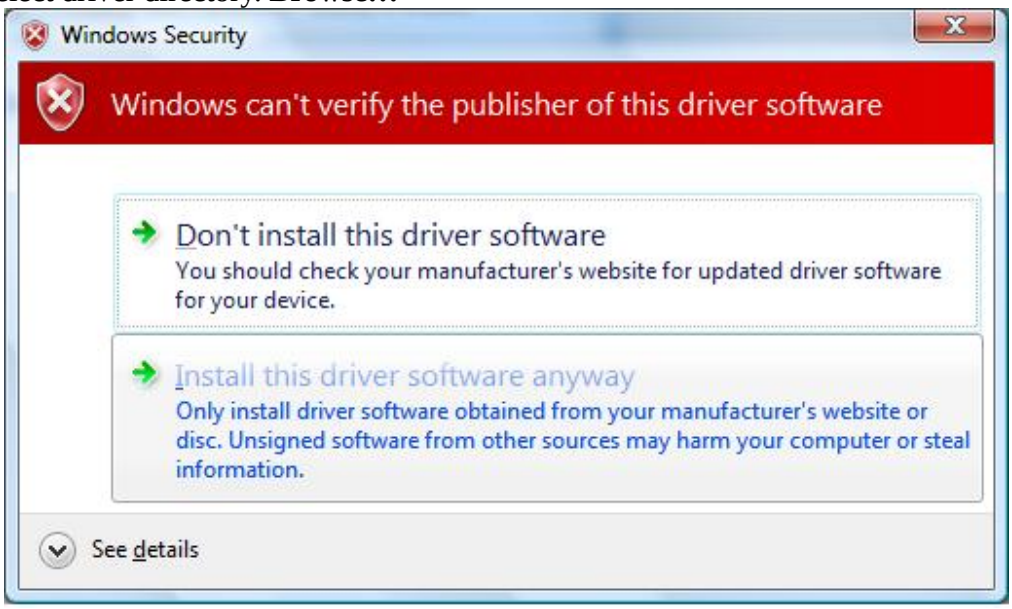
3. Click **I don't have the disc. Show me other options.**



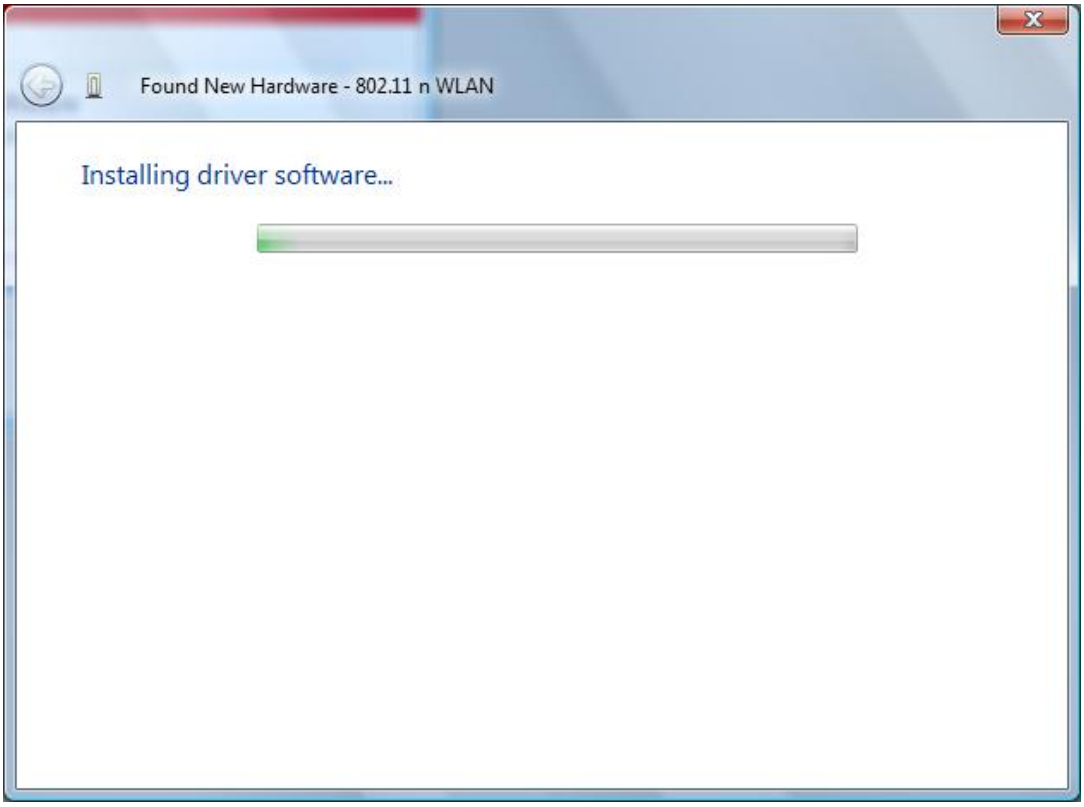
4. Click **Browse my computer for driver software (advanced)**



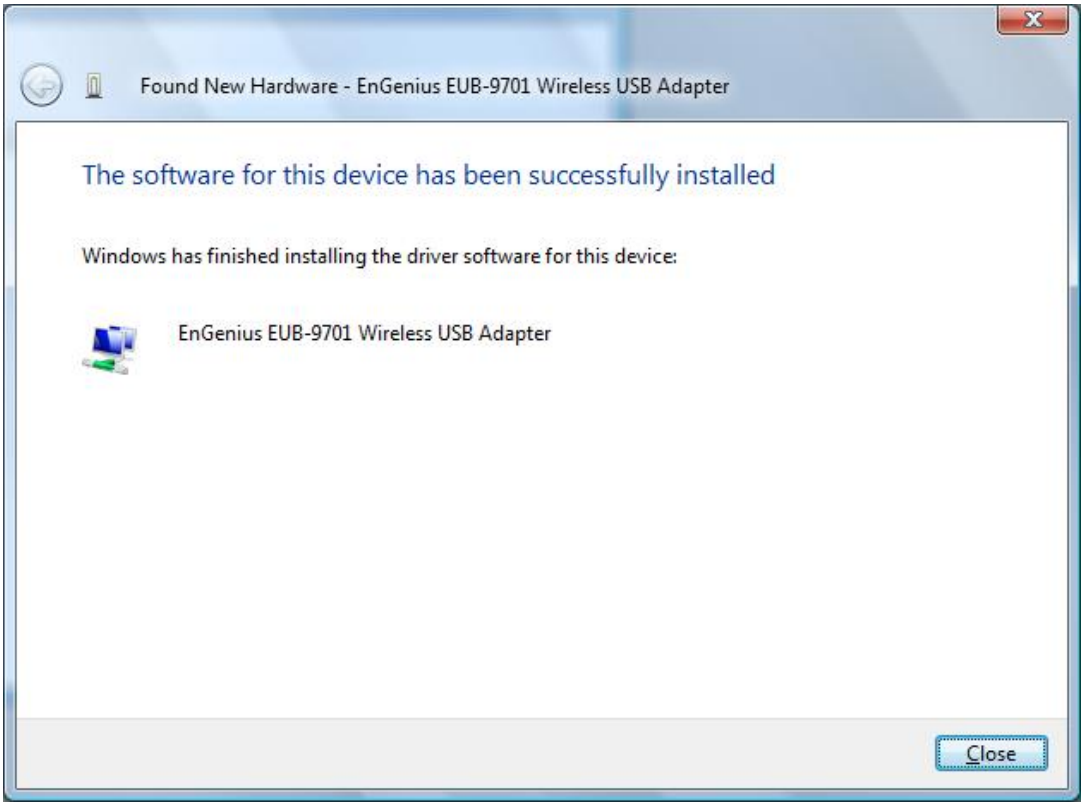
5. Select driver directory. **Browse…**



6. Click **Install this driver software anyway.**



7. Wait a moment.



8. Finish install driver. Click **Close.**

Appendix B – Specifications

Data Rates

1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54, 72, 84, 150 and 300Mbps (with 2-stream on both ends)

Standards / Compliance

IEEE802.3, IEEE802.3u, IEEE802.11b, IEEE802.11g, 802.11n 2.0

Regulation Certifications

FCC Part 15, ETSI 300/328/CE

Operating Voltage

5 V ± 0.25V

Status LEDs

LINK

Drivers

Windows 2000/XP/Vista

RF Information

Frequency Band

U.S., Europe and Japan product covering 2.4 to 2.484 GHz, programmable for different country regulations

Media Access Protocol

Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)

Modulation Technology

802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK)
802.11b: DSSS (DBPSK, DQPSK, CCK)

Operating Channels

11 for North America, 14 for Japan, 13 for Europe

Receive Sensitivity (Typical)

- 2.412~2.472G(IEEE802.11b)
  -91dBm @ 1Mbps
  -90dBm @ 11Mbps
- 2.412~2.472G(IEEE802.11g)
  -90dBm @ 6Mbps
  -74dBm @ 54Mbps
- 2.412~2.472G(IEEE802.11N)
  -90 dBm @ MCS 8
  -65 dBm @ MCS 15

Available transmit power

- 2.412~2.472G(IEEE802.11b)
  18dBm @1~11Mbps
- 2.412~2.472G(IEEE802.11g)
  15 dBm @6Mbps
  14 dBm @54Mbps
- 2.412~2.472G(IEEE802.11N)
  15dBm

Antenna Configuration

2T2R Mode (detachable 2.4GHz antenna/2.0dBi gain)

Networking

Topology

Ad-Hoc, Infrastructure

Security

WPA/WPA2 (AES, 64,128-WEP with shared-key authentication)
Cisco CCS V1.0, V2.0 and V3.0 compliant

Physical

Form Factor

USB 2.0/1.1

Dimensions (HxWxD)

70(L) mm x 57.5(W) mm x 16(H) mm

Weight

55 g/ 2.0oz

Environmental

Temperature Range

Operating: 0°C to 50°C
Storage: -10°Cto 75°C

Humidity (non-condensing)

5%~95% Typical

Package Contents

One Wireless-N USB Adaptor
One CD-ROM with User's Manual and Drivers
One USB cable (1.0M)
Two SMA antennas

Related Product(s)

11N Wireless USB Adapter/MiniPCI
EUB-9701 (802.11n 2.0 Palm type)
EUB-9702 (802.11n 2.0 USB 1T2R)
ESR-9710 (802.11n 2.0 Router)

High power Outdoor AP-Client
EOC-3220 Series (802.11b/g)
EOC-8610 Series (802.11a/b/g)

High power Indoor AP-Client
ECB-3220 Series / ECB-8610 Series

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:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating 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.

Note to US model owner: To comply with US FCC regulation, the country selection function has been completely removed from all US models. The above function is for non-US models only.

Industry Canada statement:

This device complies with RSS-210 of the Industry Canada 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 IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This device has been designed to operate with an antenna having a maximum gain of 2.0dB. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.