TP-LINK®

User Guide

TL-WN422G

High-Gain Wireless USB Adapter

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1910010143

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http://www.tp-link.com

FCC 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 pro-vide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not in-stalled and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

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.
2) This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement

This device has been tested for compliance with FCC RF Exposure (SAR) limits in the typical laptop computer configuration and this device can be used in desktop or laptop computers. This device cannot be used with handheld PDAs (personal digital assistants). This device and its antenna must not be co-located or operated in conjunction with any other antenna or transmitter. SAR measurements are based on a 5mm spacing from the body and that compliance is achieved at that distance.

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.

National Restrictions

2400.0-2483.5 MHz

Country	Restriction	Reason/remark
Bulgaria	None	General authorization required for outdoor use and public service
France	Outdoor use limited to 10 mW e.i.r.p. within the band 2454-2483.5 MHz	Military Radiolocation use. Refarming of the 2.4 GHz band has been ongoing in recent years to allow current relaxed regulation. Full implementation planned 2012
Italy	None	If used outside of own premises, general authorization is required
Luxembourg	None	General authorization required for network and service supply(not for spectrum)
Norway	Implemented	This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund
Russian Federation	None	Only for indoor applications

Note: Please don’t use the product outdoors in France.

TP-LINK TECHNOLOGIES CO., LTD.

DECLARATION OF CONFORMITY

For the following equipment:

Product Description: **High-Gain Wireless USB Adapter**

Model No.: **TL-WN422G**

Trademark: **TP-LINK**

We declare under our own responsibility that the above products satisfy all the technical regulations applicable to the product within the scope of Council Directives:

Directives 1999 / 5 / EC, Directives 2004 / 108 / EC, Directives 2006 / 95 / EC

The above product is in conformity with the following standards or other normative documents

Radio	**ETSI EN 300 328**
EMC	**ETSI EN 301 489-1**
	ETSI EN 301 489-17
Health & Safety	**EN 60950-1**
	EN 50392

The product carries the CE Mark:

CE1588 ⓘ

Signature:

Zhao Jianjun

Director of International Business

Date of Issue: 2008-12-12

TP-LINK TECHNOLOGIES CO., LTD.

South Building, No.5 Keyuan Road, Central Zone, Science & Technology Park, Nanshan, Shenzhen, P. R. China

CONTENTS

Package Contents

The following items should be found in your package:

- One TL-WN422G High-Gain Wireless USB Adapter
- One USB extension cable
- One TL-WN422G High-Gain Wireless USB Adapter Resource CD, including**:**
  - Drivers and Utility
  - User Guide
  - Other Helpful Information

☞ **Note:**

Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact with your distributor.

Chapter 1 Introduction

Thank you for choosing the **TL-WN422G High-Gain Wireless USB Adapter**!

1.1 Overview of the Product

The adapter is a USB 2.0 pen-size wireless adapter supporting IEEE 802.11b/g 2.4GHz radio operation. It provides high-speed wireless connection with data rate up to 54Mbps, and wireless roaming allows the user to move among different AP without losing the current connection. The adapter provides excellent security features, including TKIP, AES, WPA, and up to 256 bit WEP encryption security, which makes the network almost impenetrable.

Featuring high performance of fast transmission rates, simple installation and adaptability, as well as strong security, the TL-WN422G High-Gain Wireless USB Adapter is the perfect solution for personal and small business use.

1.2 Main Features

- Complies with IEEE 802.11b and IEEE 802.11g Standards.
- Provides 64/128/256 bit WEP Encryption.
- Supports WPA, WPA2, IEEE 802.1X, TKIP, AES.
- Supports 54/48/36/24/18/12/9/6Mbps or 11/5.5/2/1Mbps wireless LAN data transfer rates.
- USB 2.0 interface and compatible with USB 1.1.
- High Speed Data Rate Up to 54Mbps.
- Supports Windows 98, ME, 2000, XP, 2003, Vista.
- Simulates AP Mode, And Supports PSP connection.

1.3 LED Status

The TL-WN422G High-Gain Wireless USB Adapter has a LED indicator and a built-in antenna for wireless connectivity.

LED Indicator:

- Ad-hoc Mode: Solid Green, whether the wireless device is connected or not.
- Infrastructure Mode: Solid green while connected, and blinking during activity

1.4 System Requirements

The following are the minimum system requirements in order to use the TL-WN422G High-Gain Wireless USB Adapter.

- PC/AT compatible computer with a USB interface.
- Windows 98/ME/2000/XP/2003/Vista operating system.

  (Windows 98/ME don't support USB 2.0, the performance could influenced)

1.5 Network Configuration

The following part will depict the possible wireless LAN PC card network configurations, which helps you to get a better understanding of how the wireless LAN products work together in a wireless network.

The wireless LAN products can be configured as:

Ad-hoc (peer-to-peer) Mode

This is the simplest network configuration with several computers equipped with the PC Cards that form a wireless network whenever they are within range of one another. In ad-hoc mode, each client is peer-to- peer, would only have access to the resources of the other client and does not require an access point. This is the easiest and least expensive way for the SOHO to set up a wireless network.

The image below depicts a network in ad-hoc mode.

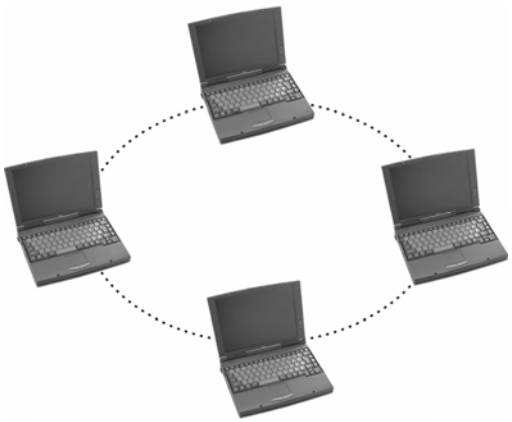


Figure 1-1 Ad-hoc mode.

Infrastructure Mode

The infrastructure mode requires the use of an access point (AP). In this mode, all wireless communication between two computers has to be via the AP. It doesn't matter if the AP is stand-alone or wired to an Ethernet network. If used in stand-alone, the AP can extend the range of independent wireless LANs by acting as a repeater, which effectively doubles the distance between wireless stations.

The image below depicts a network in infrastructure mode.

Figure 1-2 Infrastructure mode.

Chapter 2 Installation Guide

2.1 Before You Begin

The operating distance range of your wireless connection can vary significantly depending on the physical position of the wireless devices. Factors that can weaken signals by getting in the way of your network's radio waves are metal appliances or obstructions, and walls. Typical ranges vary base on the types of materials and background RF (radio frequency) noise in your home or office.

For best performance of your wireless network, you are suggested to:

1. Place your computer with this wireless card near the operating wireless router.
2. Avoid redundant obstacles and interference between the wireless devices.
3. Keep your product far from electrical devices or appliances that generate RF noise, such as microwave ovens, 2.4 GHz cordless phone.

2.2 Hardware Installation

There are two ways to install the Adapter:

1. Plug the Adapter directly to the USB port on your computer.
2. Connect the Adapter and your computer with the extension USB cable attached in package.

☞ **Note:**

Once the Adapter is firmly in place, the **Found New Hardware Wizard** screen will pop up.

2.3 Installation for Windows XP

Follow the steps below in order to install the TL-WN422G High-Gain Wireless USB Adapter drivers:

1. Insert the Resource CD into your CD-ROM drive, and open the folder named TL-WN422G. Then double-click Setup.exe in the proper folder according to your operating system to start the installation.

Once the setup begins you will see the **Install Shield Wizard**, as the image depicts as below.

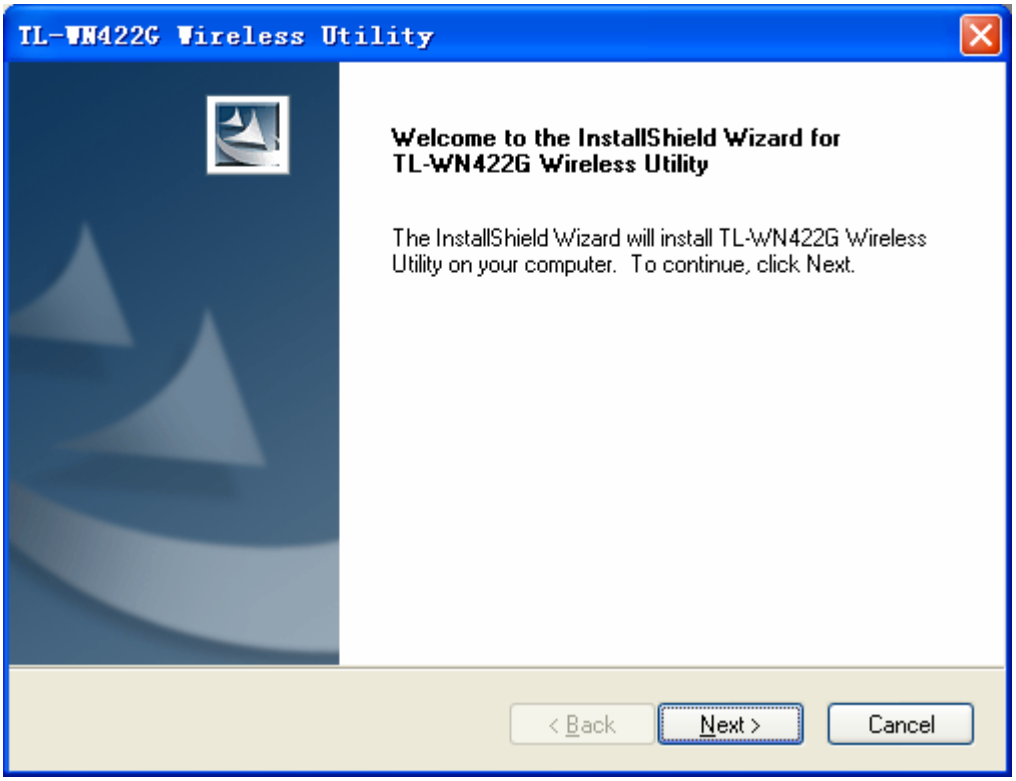


Figure 2-1 Install driver wizard

2. Click on the **Next** button to continue.

3. Select the location where you would like the driver installed. Click on the **Browse** button to change the directory, or click on the **Next** button to continue using the default directory.

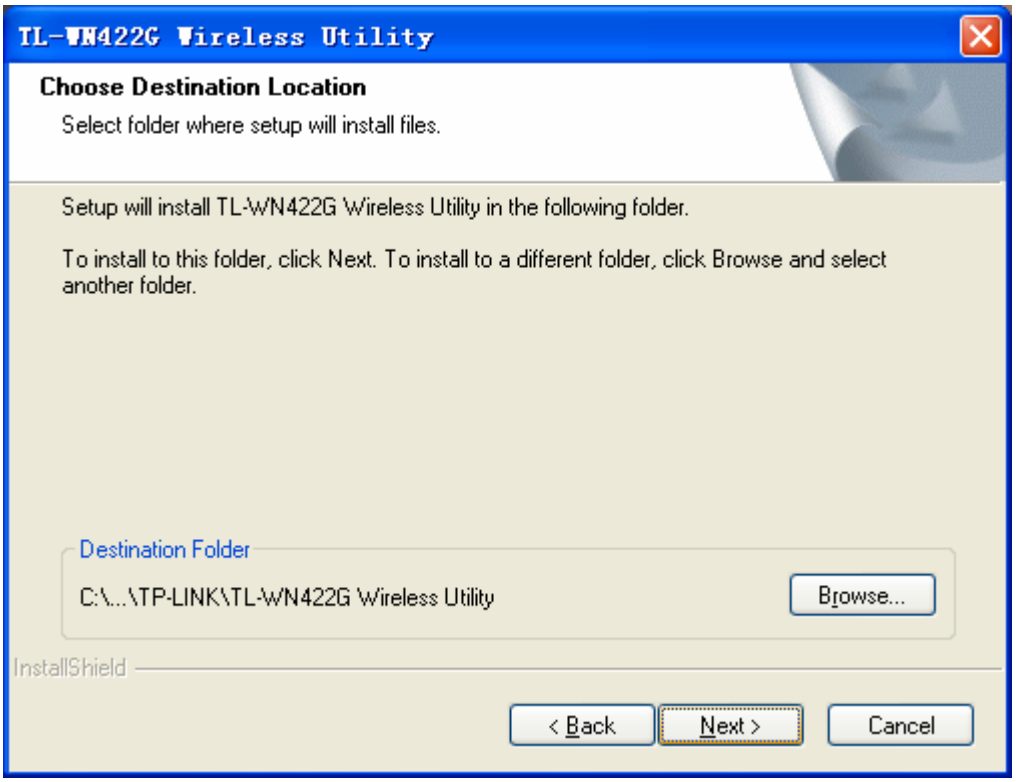


Figure 2-2 Install Shield—Choose Destination Location

4. Wait a few minutes until the files are copied to the computer.

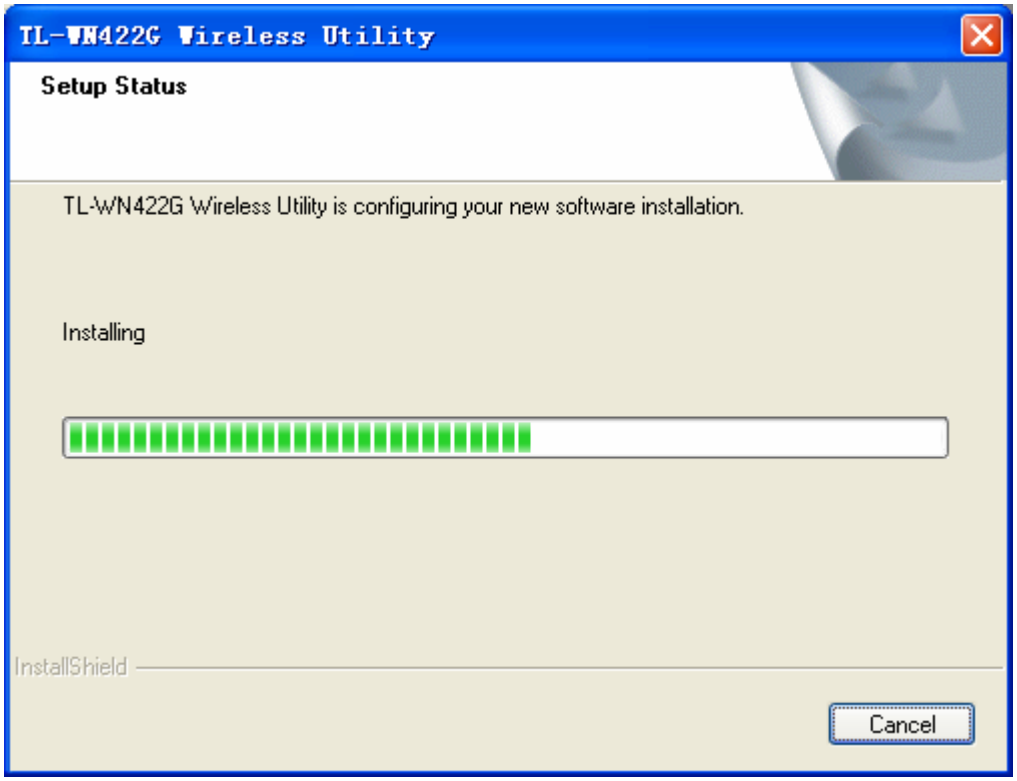


Figure 2-3 Install Shield—Setup Status

5. Click on the **Finish** button to complete the installation.

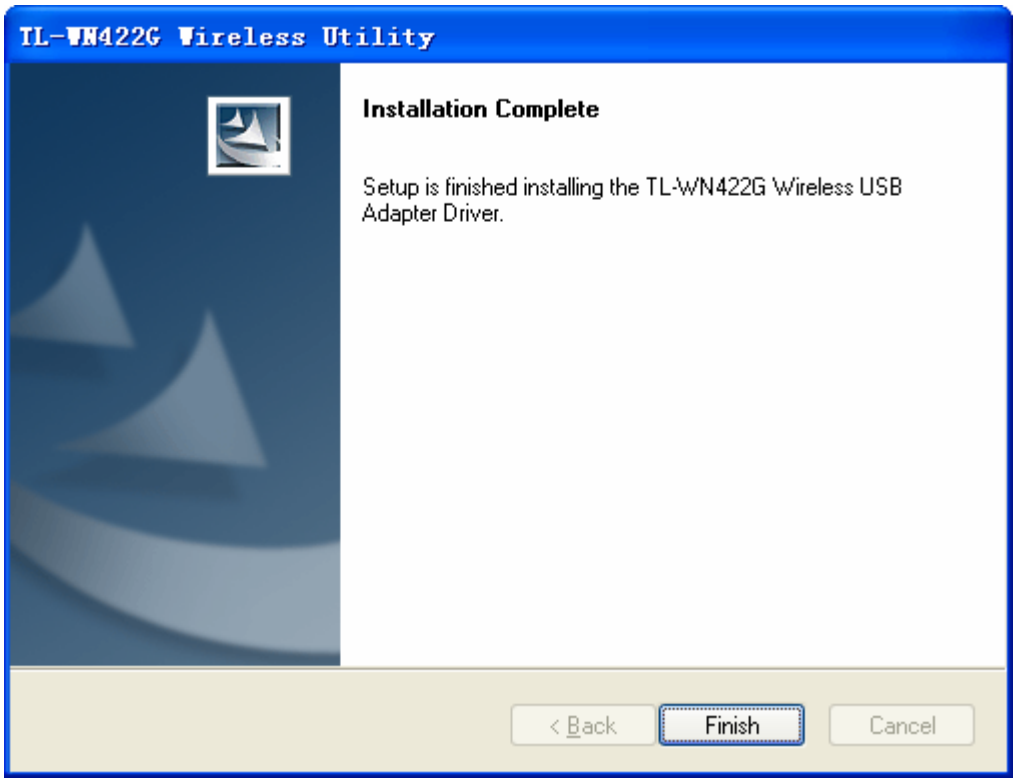


Figure 2-4 Installation Complete

Now, carefully insert the device into the USB port of your computer. Windows will

automatically detect the device and display the icon and below in the taskbar.

2.4 Installation for Windows Vista

After you complete the hardware installation, follow the steps below in order to install the TL-WN422G Wireless USB Adapter drivers for Windows Vista:

1. Insert the Resource CD into your CD-ROM drive, right-click the **Computer** icon as shown in the Figure 2-5, select the **Properties**.

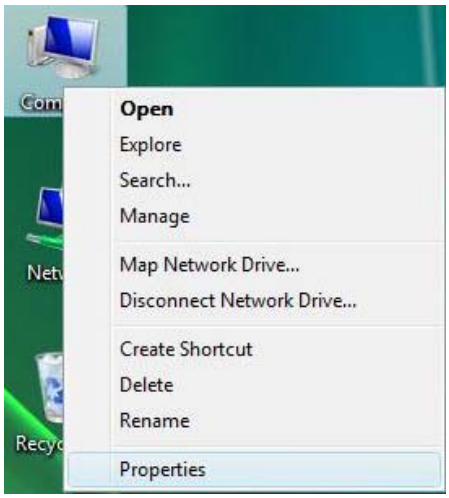


Figure 2-5 Begin installation for Windows Vista

2. Select **Device Manager** as shown in Figure 2-6, then select **Continue** in the next screen.

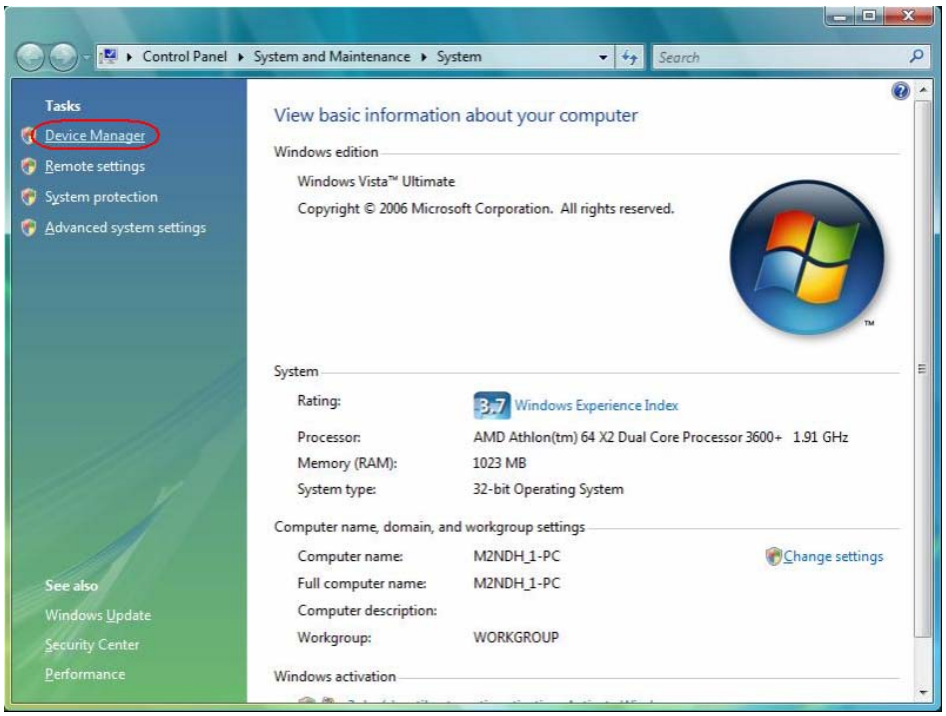


Figure 2-6 Select Device management

3. Right-click the adapter icon “**USB2.0 VLAN**” and select “**Update Driver Software**” to proceed.

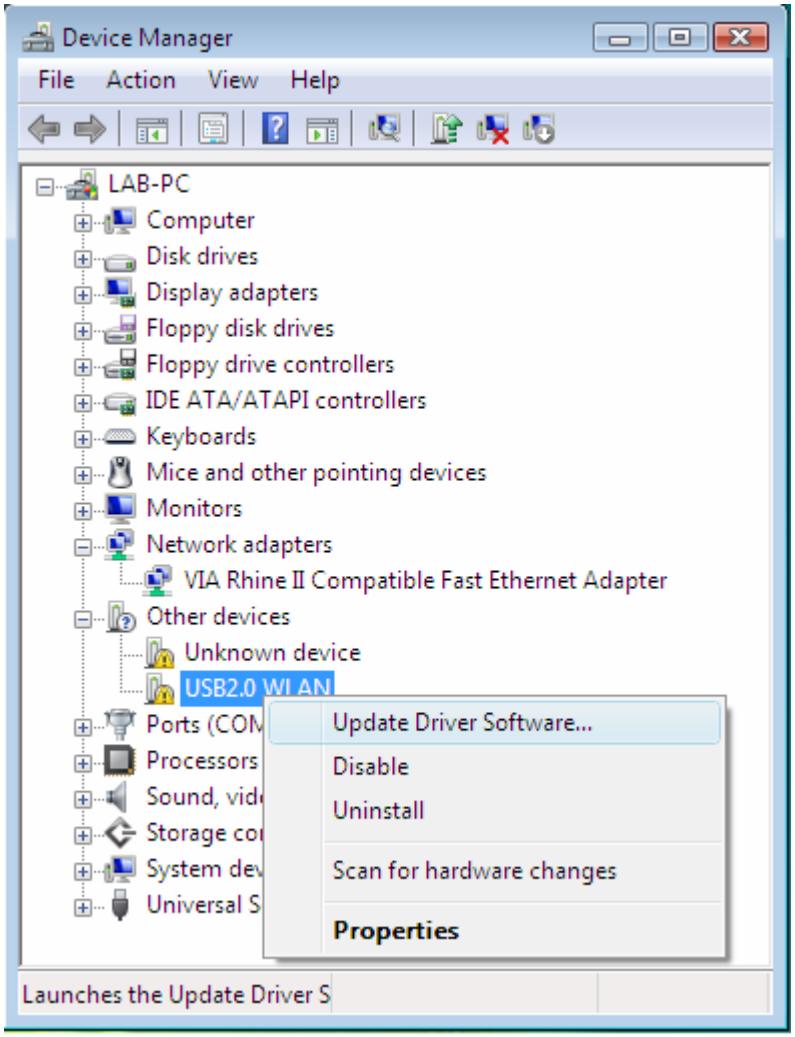


Figure 2-7 Driver management

4. Select the method to update the driver software (see Figure 2-8). If you want the system to search the software automatically, select the first type. Otherwise select “**Browse my computer for driver software**” to install the software (best way).

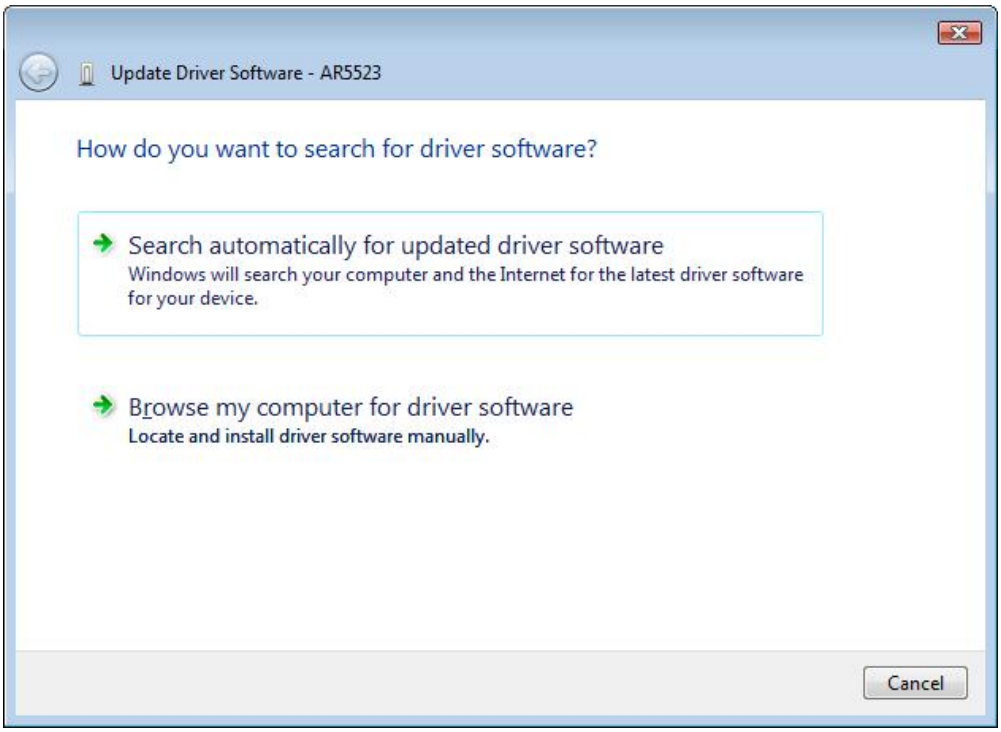


Figure 2-8 Select the method to install

5. Click the **Browse** button in the next screen to select the file which contains the driver software for the adapter. After that, click **Next** to proceed.

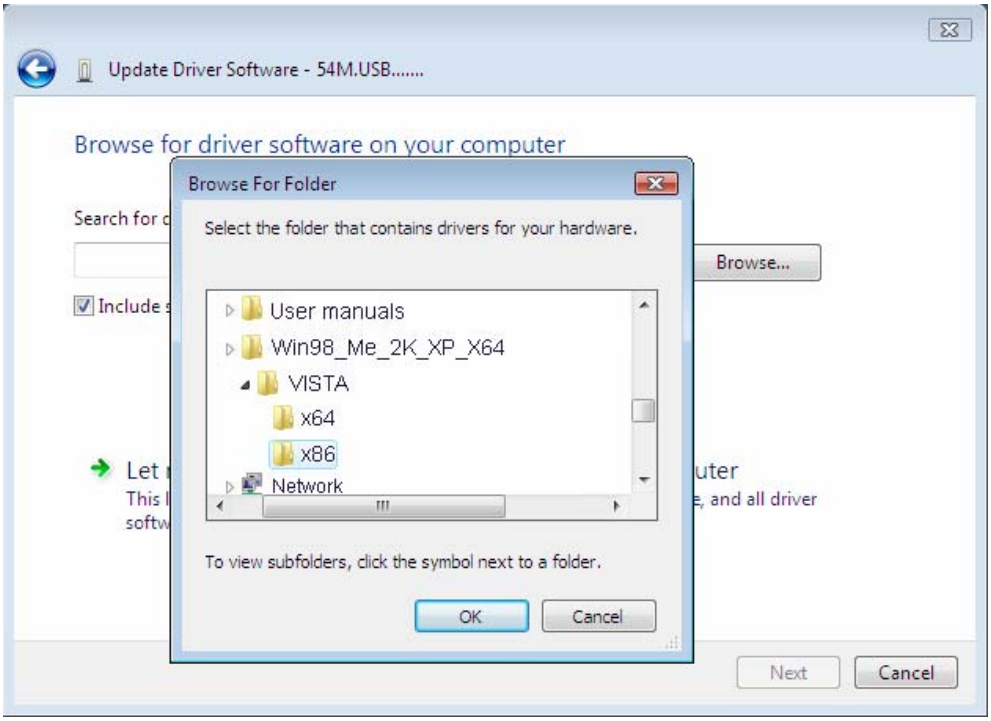


Figure 2-9 Select the driver software

Note:

Vista X86 is designed for the Vista of 32bit, Vista X64 is designed for the Vista of 64bit, please select the right one according to your current operating system.

6. After that, the installation will proceed as shown in Figure2-10.

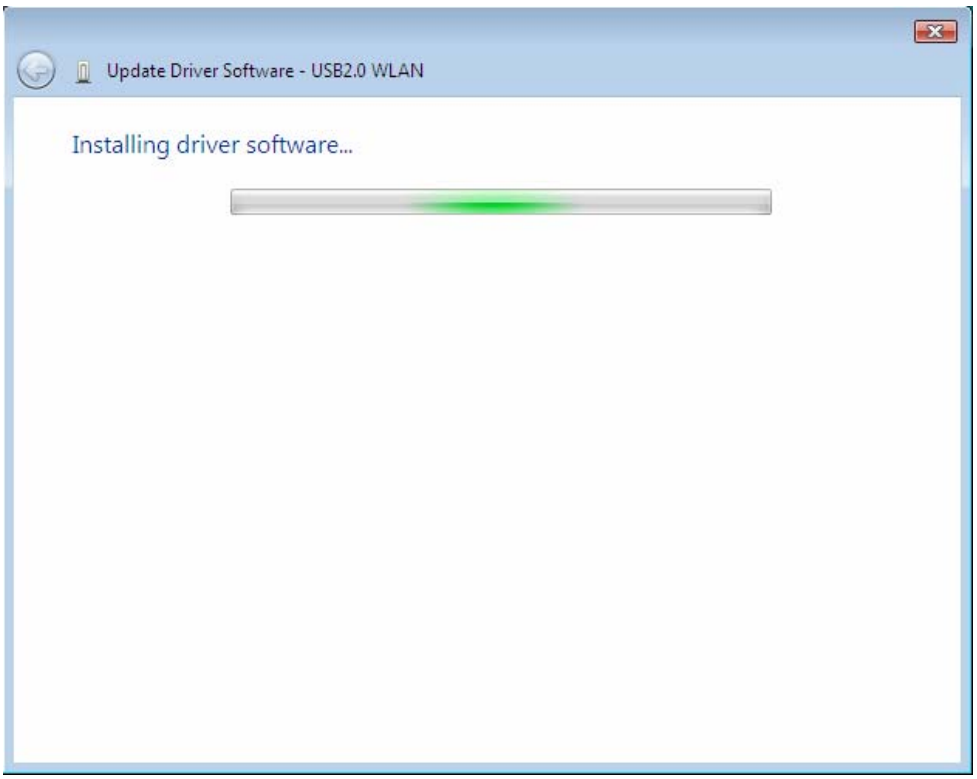


Figure 2-10 Installing

Note:

During the installation, you will see the warning box as shown in figure 2-11, please select "Install this driver software anyway" to proceed.

Figure 2-11 warning for security

7. Finally, click **Close** to finish the installation.

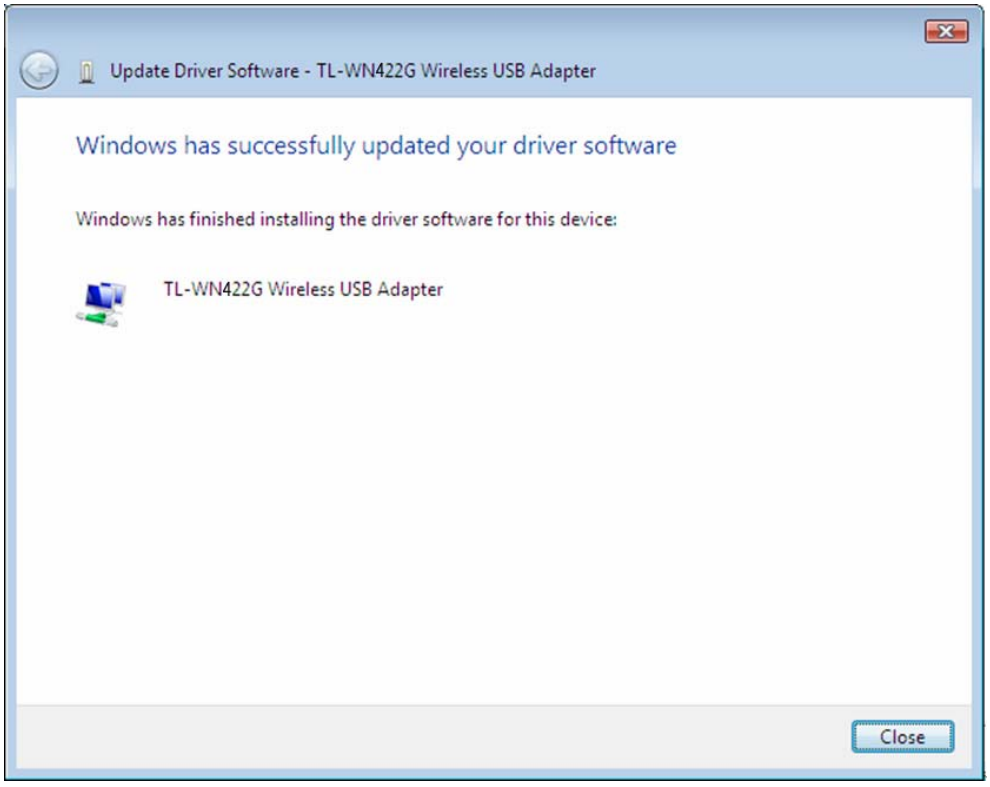


Figure 2-12 Complete the installation

Chapter 3 Uninstall Guide

If the device installation is fails by some mistake, the best way to solve the problem is to completely uninstall the device and utility, and then rerun the “Setup.exe”. The following are three methods to uninstall the Drivers and Utility.

Note:

TL-WN422G doesn’t have utility for windows Vista, so you only need to follow the section 3.3 to uninstall the driver from your computer.

3.1 Uninstall the utility software through Control Panel

Follow the steps below in order to uninstall the Drivers and Utility:

1. Click on **Start > Settings > Control Panel > Add or Remove Programs**
2. You will then see the following window. Select the **TL-WN422G Wireless Utility** and then click on **Remove**.

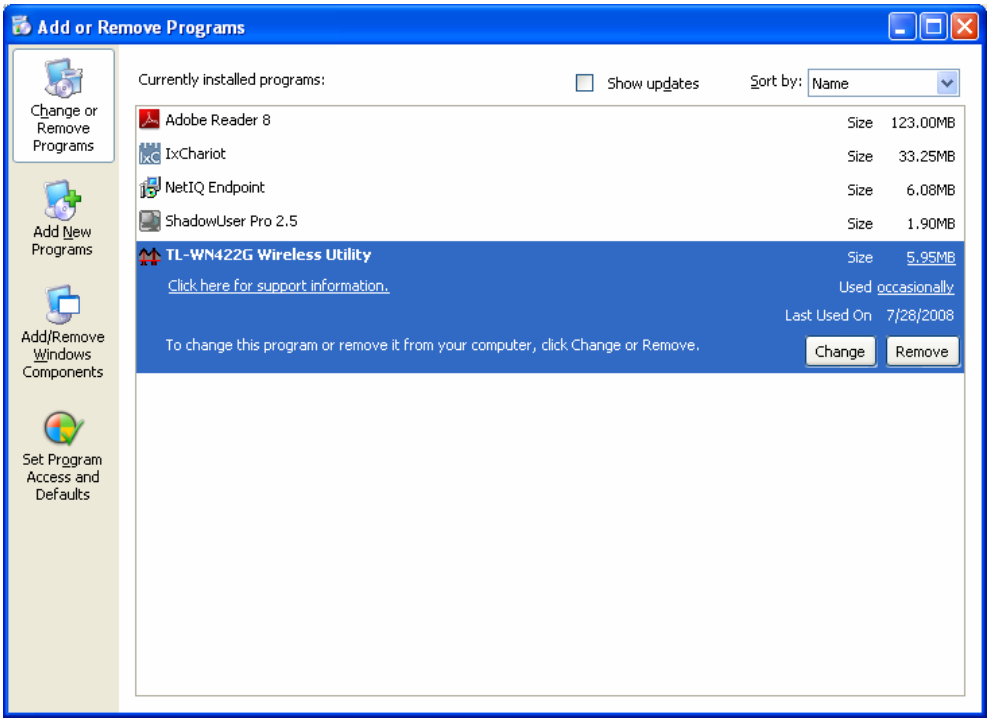


Figure 3-1 Add or Remove Programs

3. Click on the **OK** button to confirm the Uninstalling process.

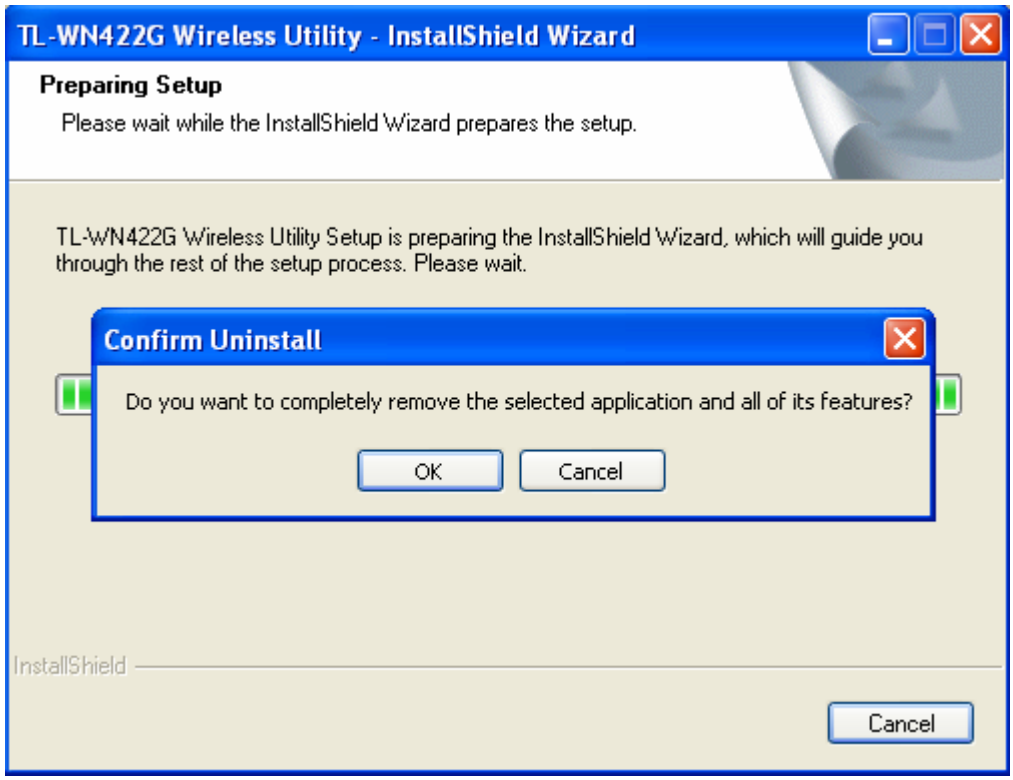


Figure 3-2 Confirm Uninstall

4. The process will then remove TL-WN422G Wireless Utility and the drivers from your computer. Choose the first option, then click on the **OK** button to complete the uninstall and restart your computer.

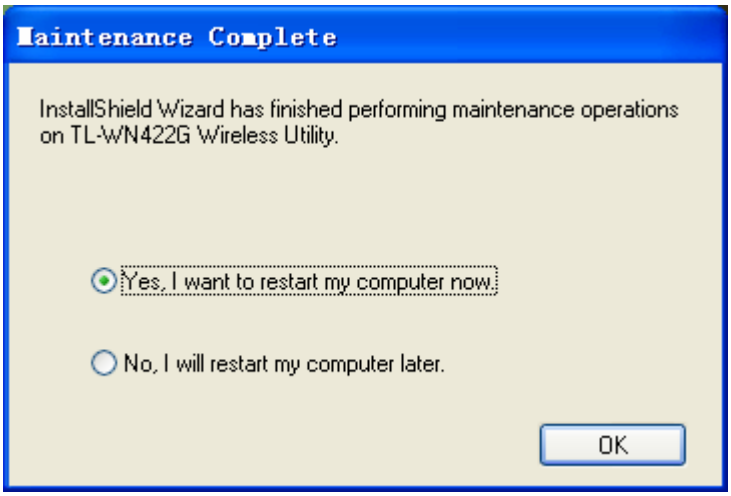


Figure 3-3 Uninstall finished

3.2 Uninstall the utility software through Programs

Follow the steps below in order to uninstall the Drivers and Utility:

- Click on **Start > programs > TP-LINK > TL-WN422G Wireless Utility > Uninstall TL-WN422G Wireless Utility.**

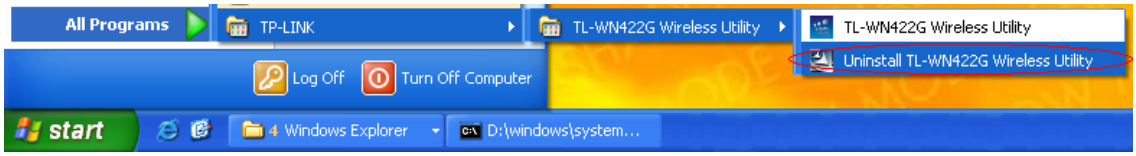


Figure 3-4 Uninstall from programs

➢ Then, process will go to **Install Shield Wizard**. The screen will pop up the following conversation **"Do you want to completely remove the selected application and all of its features"**, Click on the **OK** button to confirm the Uninstalling process.

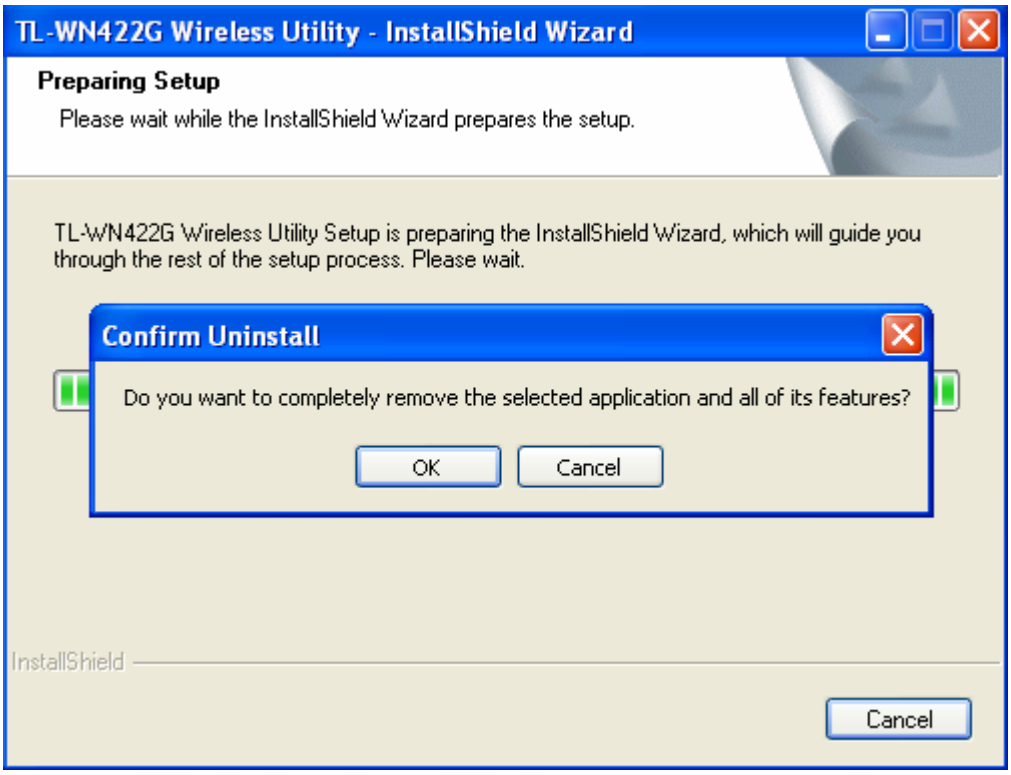


Figure 3-5 Confirm the Uninstalling process.

The process will then remove TL-WN422G Wireless Utility and the drivers from your computer. Choose the first option, then click on the **OK** button to complete the uninstall and restart your computer.

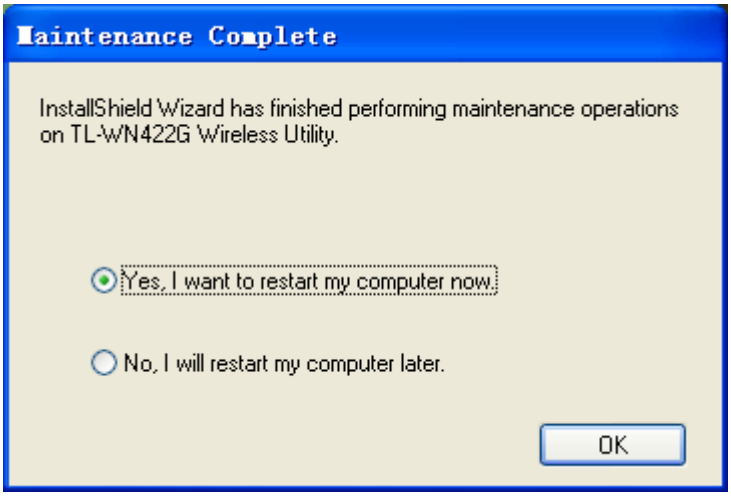


Figure 3-6 Uninstalling process finished

3.3 Uninstall the driver software from your PC

1. On the Windows taskbar, click the **Start** button, point to **Settings**, and then click **Control Panel**.
2. Double-click the **System** icon, click on the **Hardware** tab in the **System** window.
3. Click on the **Device Manager** button, and double-click **Network Adapters,** and then right-click **TL-WN422G Wireless USB Adapter.**

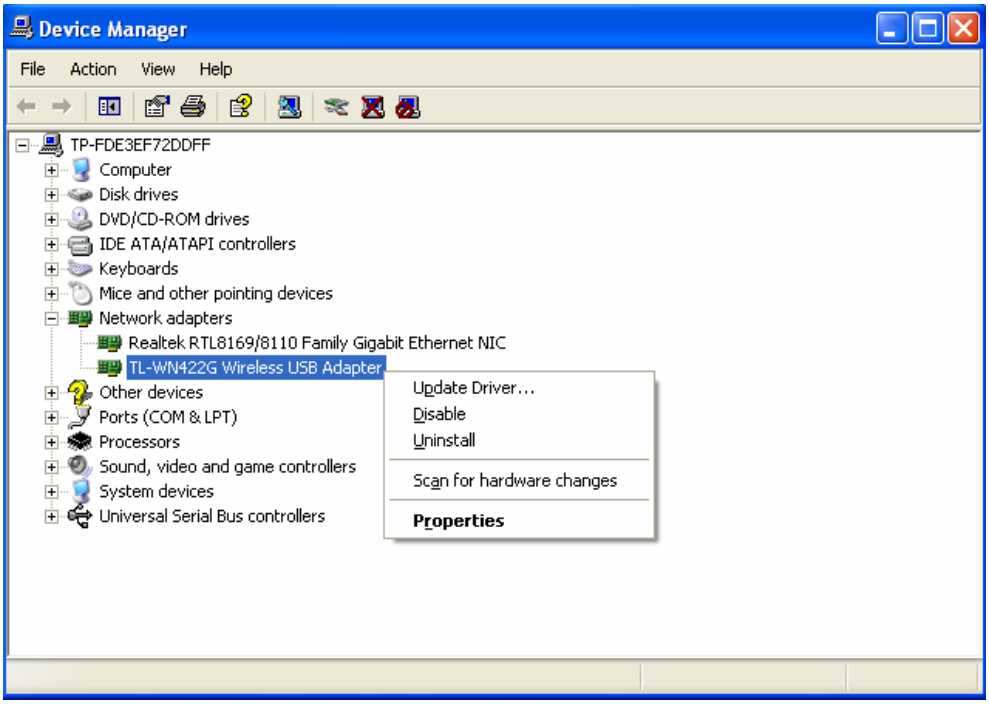


Figure 3-7 Uninstall Driver

4. Click **Uninstall...**, shown in above Figure 3-7, the system will uninstall the driver software of the adapter from your PC.

Chapter 4 Software Configuration

4.1 Station Mode Configuration

This chapter focuses on how to configure the device in Station mode (wireless LAN client).

4.1.1 Current Network Information

The **Current Network Information** screen displays the current status of the network in station mode.

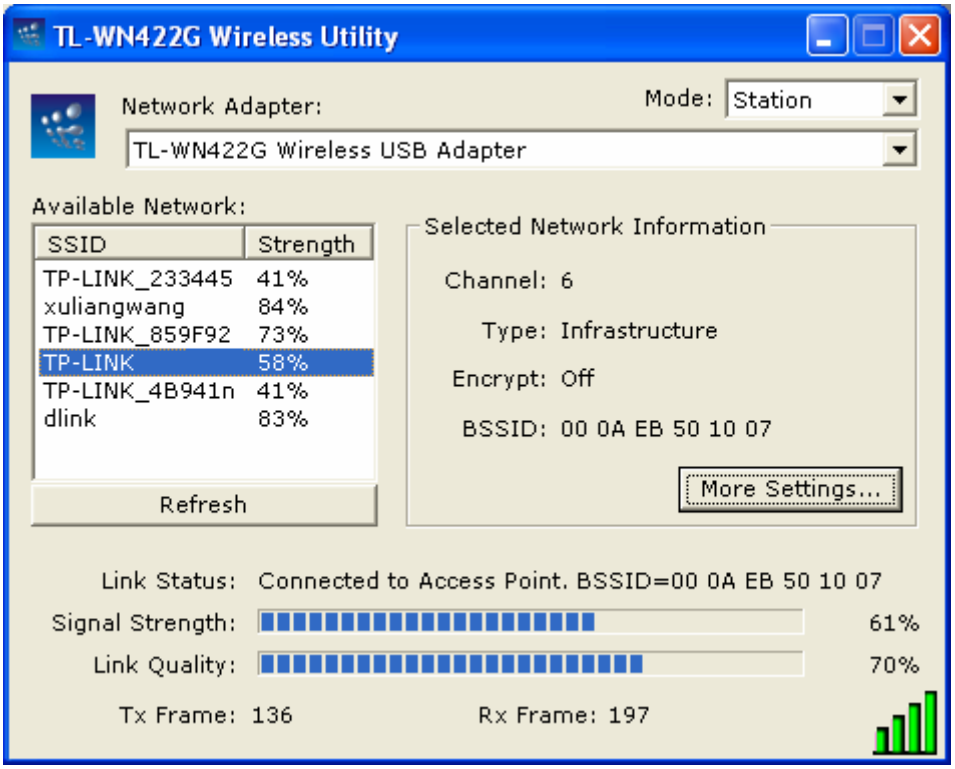


Figure 4-1 Current Network Information

4.1.2 More Settings

4.1.2.1 General Connection Setting

The **General Connection Setting** allows you to configure the SSID, network type, authentication, and encryption type.

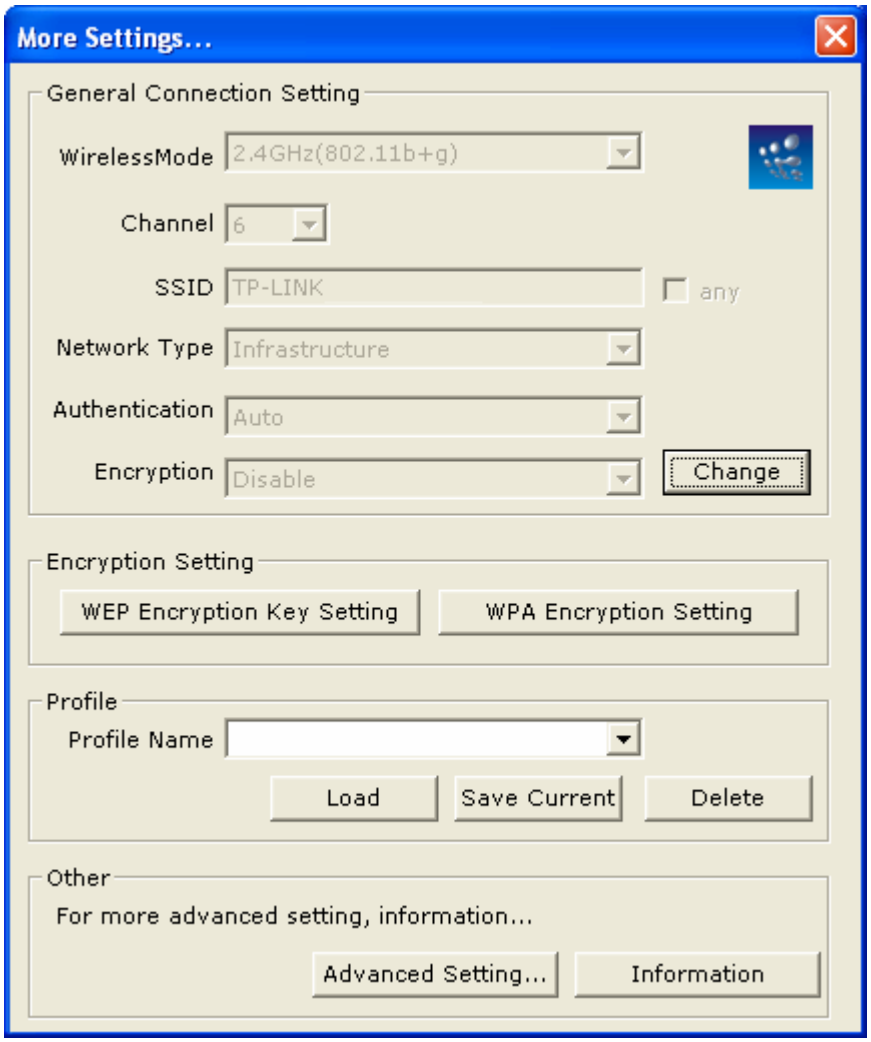


Figure 4-2 More setting

- **SSID:** Enter the SSID of the network. The SSID is a unique name shared among all points in your wireless network. The SSID must be identical for all points in the network, and is case-sensitive. Place a check in the **any** box if you would like the device to connect to the first available Access Point with the strongest signal.
- **Network Type:** Select a network type from the drop-down list.
- **Infrastructure** or **Ad-hoc:** If you select infrastructure, the device must be connected to an Access Point. If you select ad-hoc, you may connect the device to another WLAN client adapter (such as this one).
- **Authentication:** Select an authentication type from the drop down list. Options available are: **Auto, Open System, Shared Key, WPA, WPA-PSK, WPA2,** and **WPA2-PSK**.
- **Encryption:** Select an encryption type from the drop-down list. Options available are: **Disable, WEP, TKIP,** and **AES**.

You can click "**Change**" button to change general connection settings as shown below.

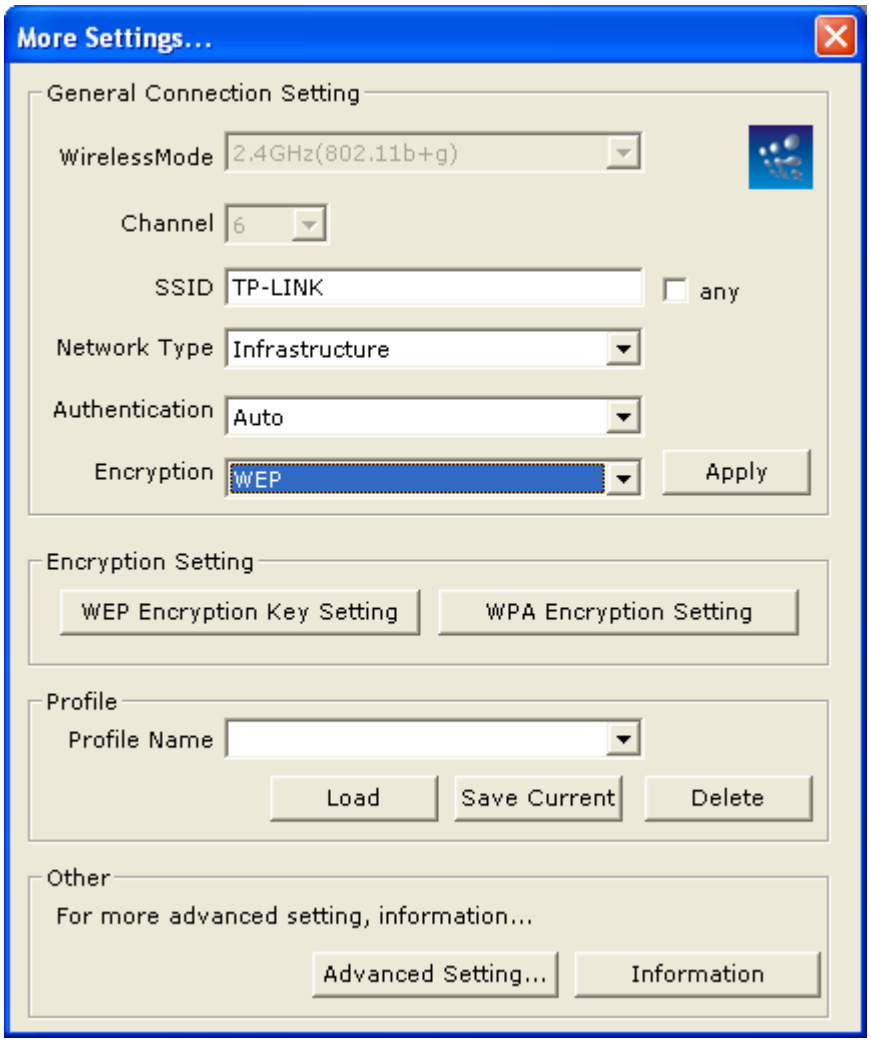


Figure 4-3 More setting—WEP

4.1.2.2 WEP Encryption

You can select 64, 128 or 256 bit WEP (Wired Equivalent Privacy) key to encrypt data (Default setting is Disable).

- **Authentication:** Select **Open System** or **Shared Key** from the drop-down list. If you are not sure which to choose, please select **auto**.
- **Encryption:** Select WEP from the drop-down list.
- Click on the **WEP Encryption Key Setting** button. You will see the figure below.

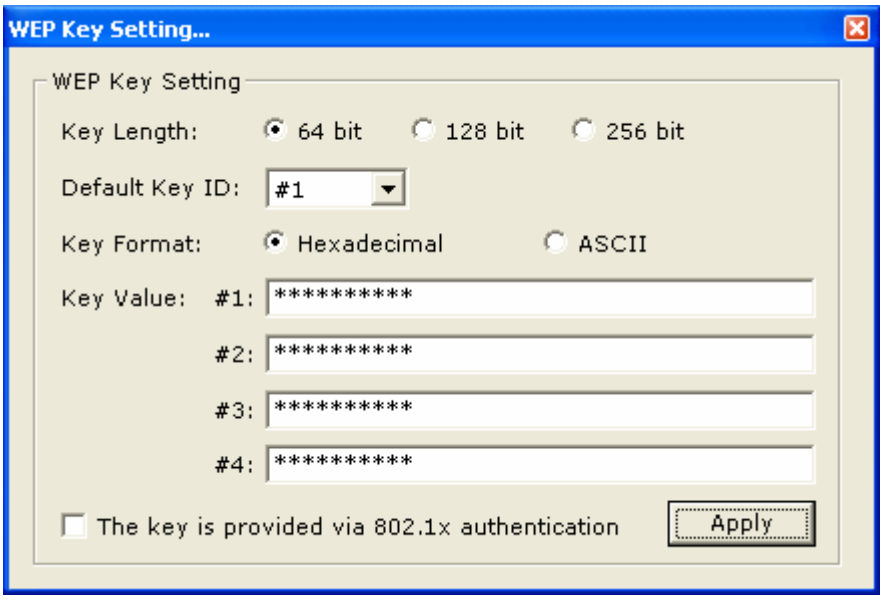


Figure 4-4 WEP Key Setting

- **Key Length:** Select an encryption key length: **64**, **128** or **256 bit**. The setting must be the same as the Access Point.
- **Default Key ID:** Since you can specify up to 4 different WEP keys, select the WEP key value that you want to use in the current network configuration.
- **Key Format:** Select Hexadecimal or ASCII.
- **Key Value #1 - #4:** You may enter up to 4 different WEP keys. The WEP key selected in the **Default Key ID** combo box will be available currently.

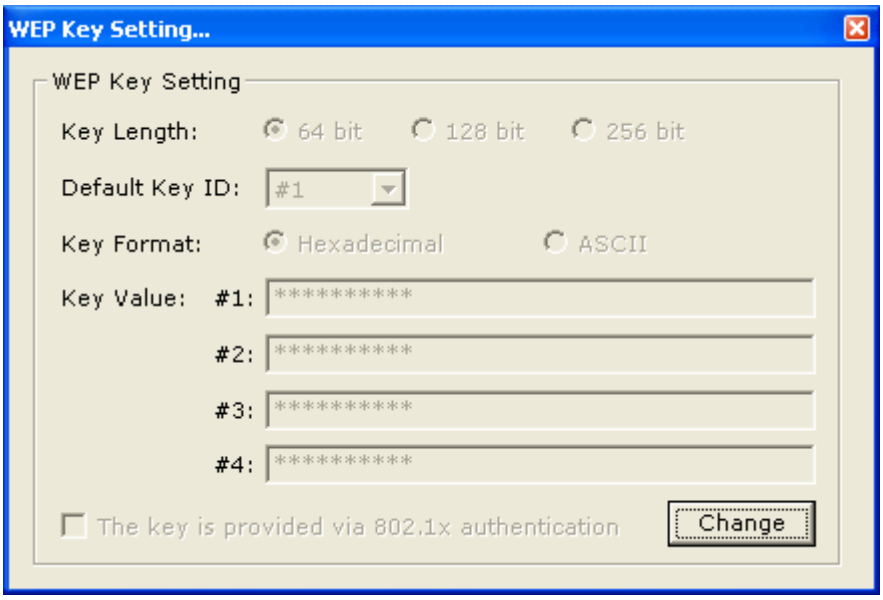


Figure 4-5 Disabled WEP key settings

- **The key is provided via IEEE 802.1X authentication:** By selecting this option, the WEP key settings will be disabled.
- Click on the **Apply** button, and then you can use the IEEE 802.1X

authentication.

4.1.2.3 WPA/WPA2 Authentication with TKIP/AES Encryption

WPA (Wi-Fi Protected Access) was designed to improve upon the security features of WEP (Wired Equivalent Privacy). The technology is designed to work with existing Wi-Fi products that have been enabled with WEP. WPA provides improved data encryption through the Temporal key Integrity Protocol (TKIP), which scrambles the keys using a hashing algorithm and by adding an integrity checking feature which makes sure that keys haven't been tampered with.

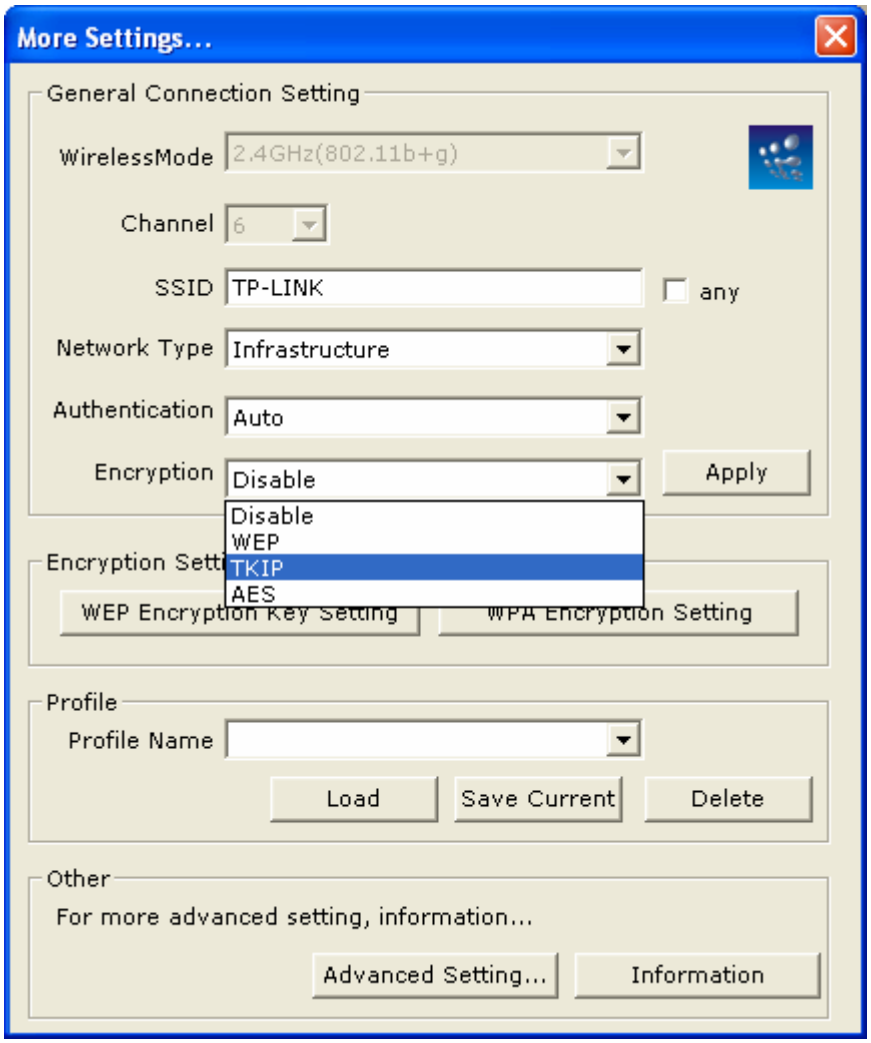


Figure 4-6 More settings—TKIP

- **Authentication:** Select **WPA** from the drop-down list.
- **Encryption:** Select **TKIP** or **AES** from the drop-down list.
- Click on the **WPA Encryption Setting** button.

In this section you can configure the settings for TLS or PEAP. TLS (Transport Layer Security) is an IETF standardized authentication protocol that uses PKI (Public Key Infrastructure) certificate-based authentication of both the client and

authentication server.

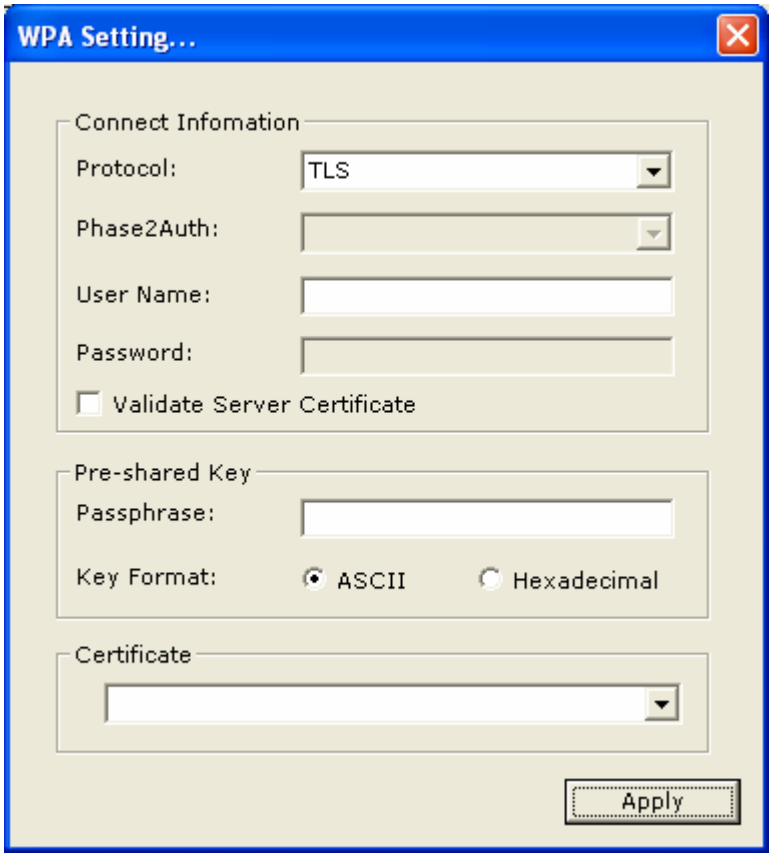


Figure 4-7 WPA setting

- **Protocol:** Select **TLS** from the drop-down list.
- **User Name:** Enter the user name that is used for authentication purposes.
- **Passphrase:** Enter a WPA passphrase. For ASCII text, enter 8-63 characters, for hexadecimal enter 64 characters).
- **Certificate:** Make sure that you have downloaded and installed the certificate on the computer. Then select the appropriate certificate from the drop-down list.
- Click on the **Apply** button to save the changes.

The PEAP authentication type is based on EAP TLS authentication, but uses a password instead of a client certificate for authentication. PEAP uses a dynamic session-based WEP key, which is derived from the device and RADIUS server, to encrypt data.

4.1.2.4 WPA-PSK Authentication

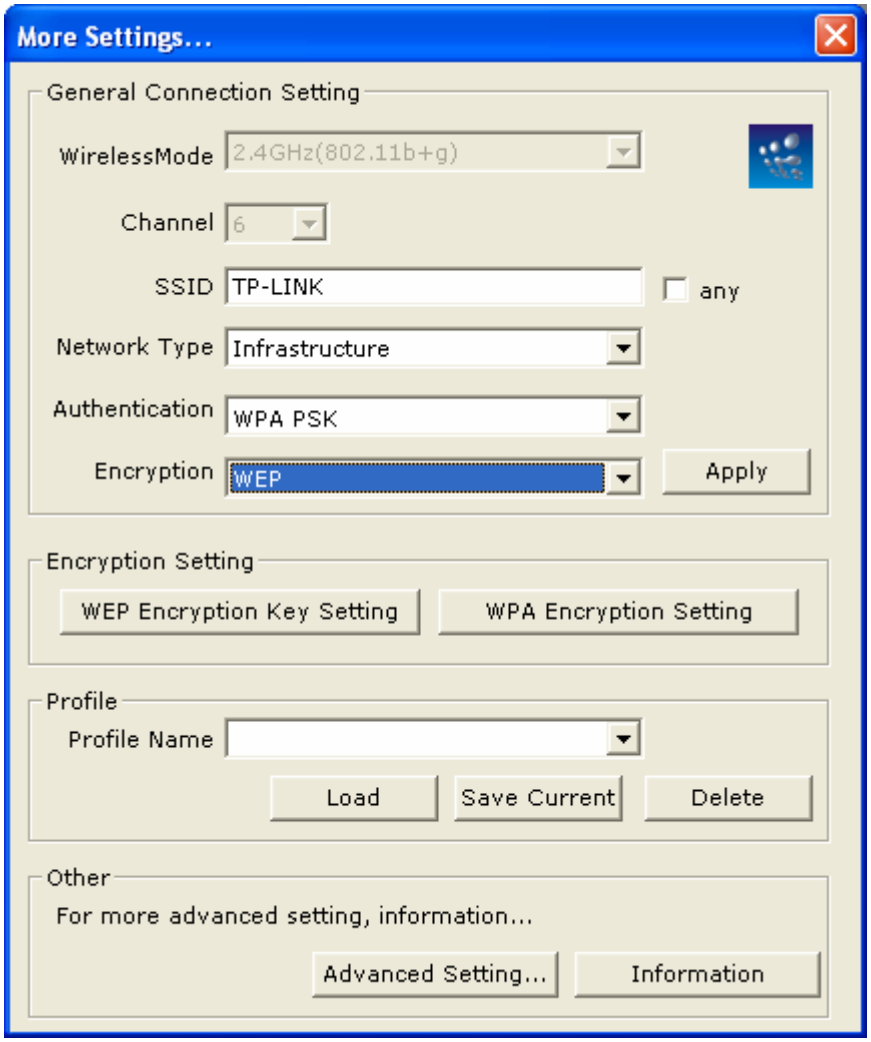


Figure 4-8 WPA-PSK Authentication

- **Authentication:** Select **WPA-PSK** from the drop-down list.
- **Encryption:** Select an encryption type from the drop-down list.
- Click on the **Apply** button to save the changes.

4.1.2.5 Profiles

Multiple profiles can be created for different Network Names (SSIDs) and security settings. You can quickly associate with another network, instead of entering the credentials each time.

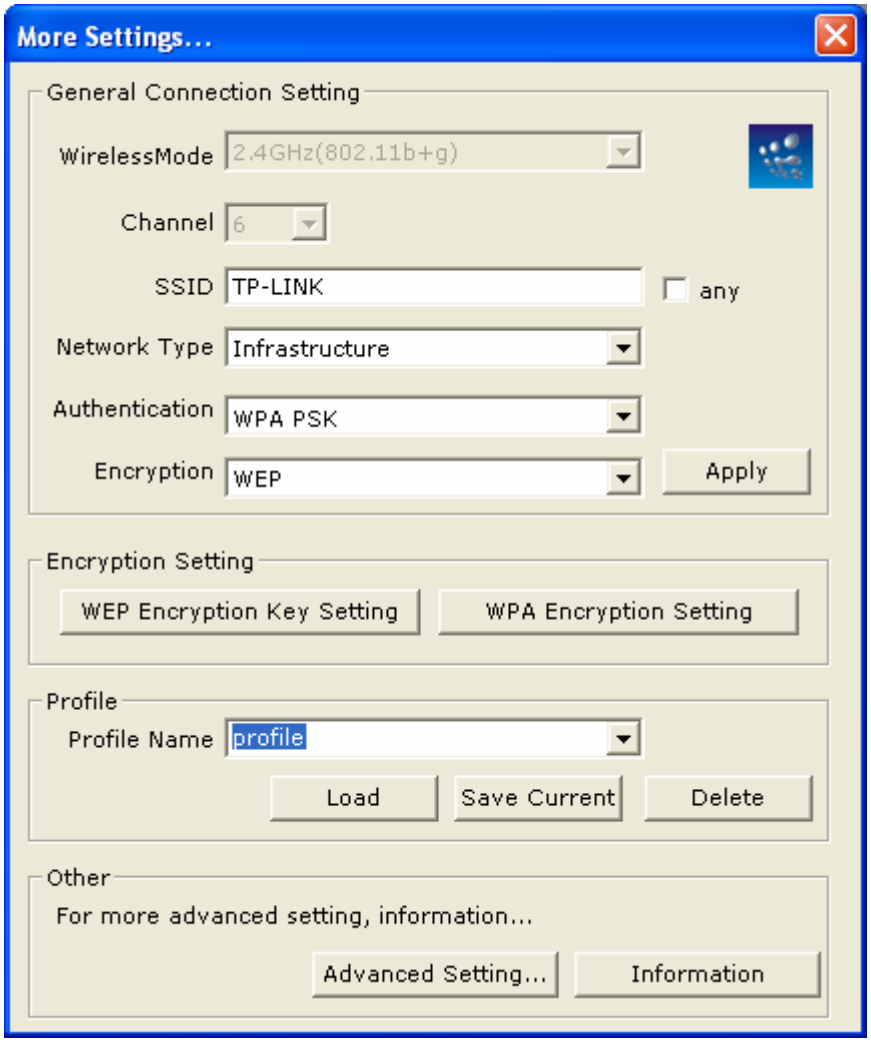


Figure 4-9 More Setting—Profile

- **Profile Name:** Displays the name of current profile. One device can have many profiles, but only one profile can be loaded at a time.
- **Load:** Select a profile from the drop-down list and then click on the **Load** button.
- **Save Current:** Enter a new profile name and then click on the **Save Current** button to save the profile.
- **Delete:** To delete an existing profile, select it from the drop-down list and then click on the **Delete** button.

4.1.2.6 Advanced Settings

The Advanced Settings allows you to configure the power consumption, and threshold values.

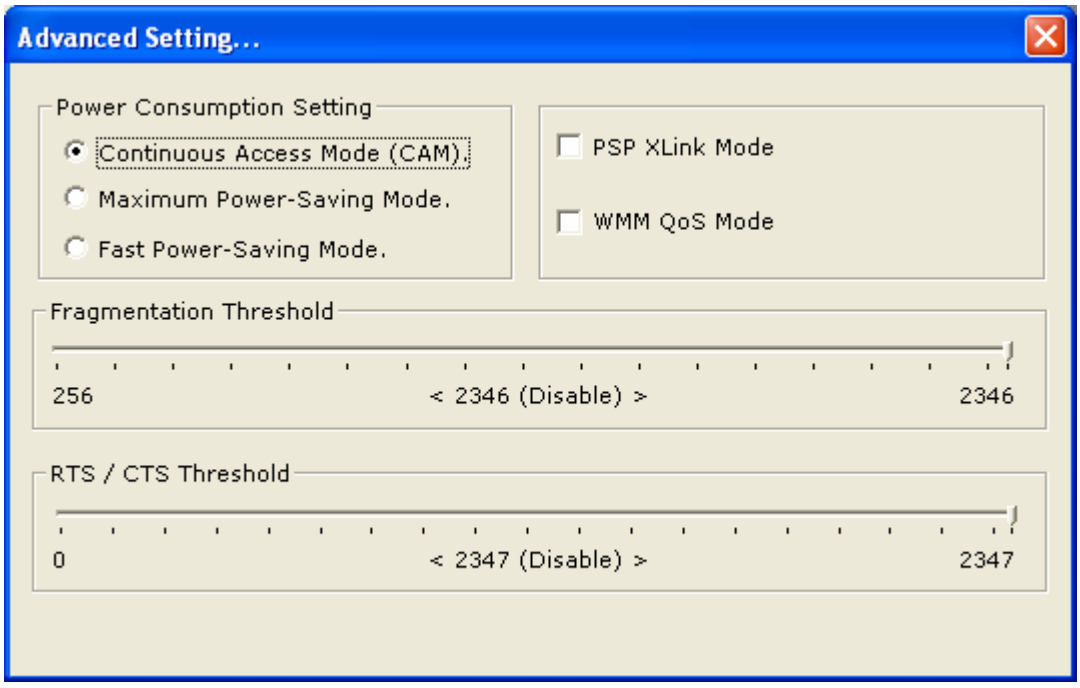


Figure 4-10 Advanced Setting

- **Power Consumption Setting:** If your desktop or notebook is connected to external power, select **Continuous Access Mode (CAM)**, if your notebook is using a battery, select **Maximum Power-Saving Mode**, or **Fast Power-Saving Mode**.

4.2 Access Point mode configuration

The screen of wireless network mode displays as below:

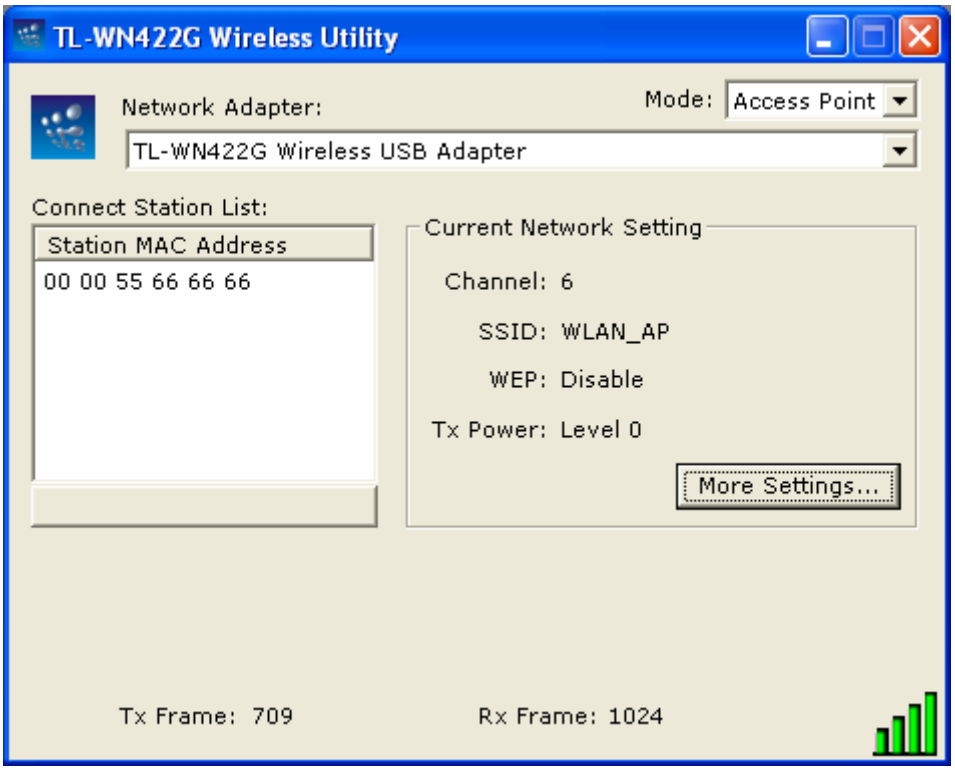


Figure 4-11 Wireless network mode

The more setting screen:

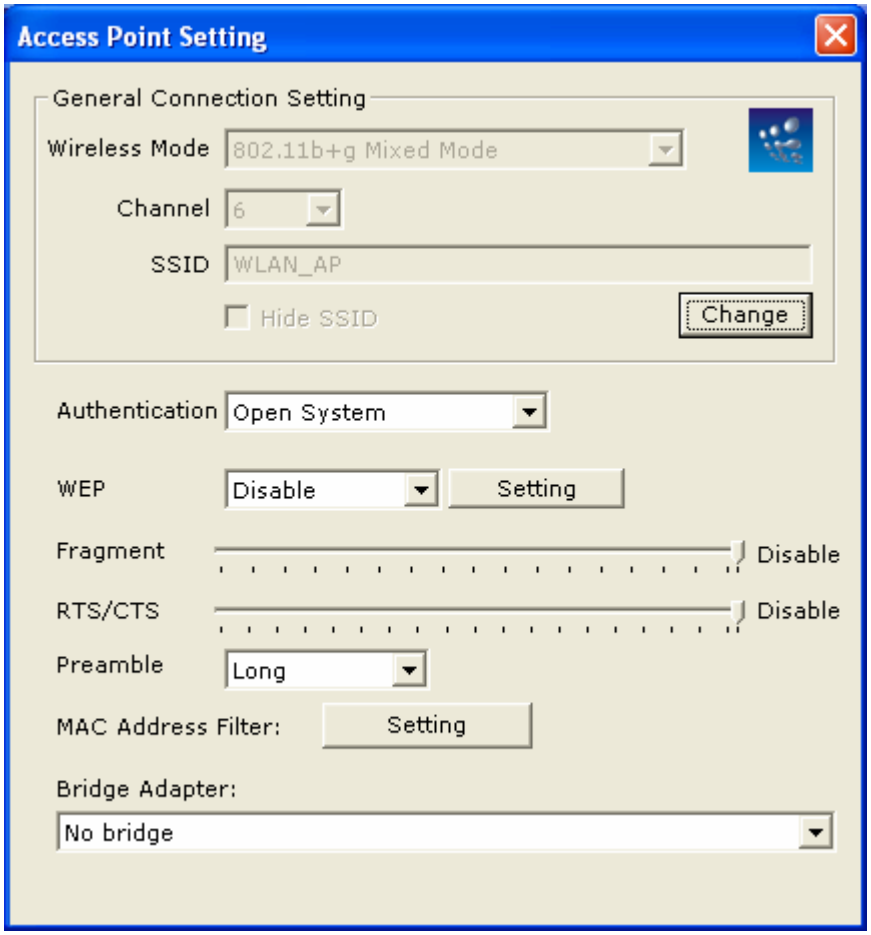


Figure 4-12 Access point setting

Chapter 5 Examples for Application

5.1 Example one: Configuration of WEP Encryption

Suppose you have an installed and using AP, the SSID is TEST and it adopts 64 bit WEP encryption with the key “1111111111”.

To establish a connection with this AP, you should follow five steps below：

Step One： Double click “TEST” in available network taskbar to connect this network.

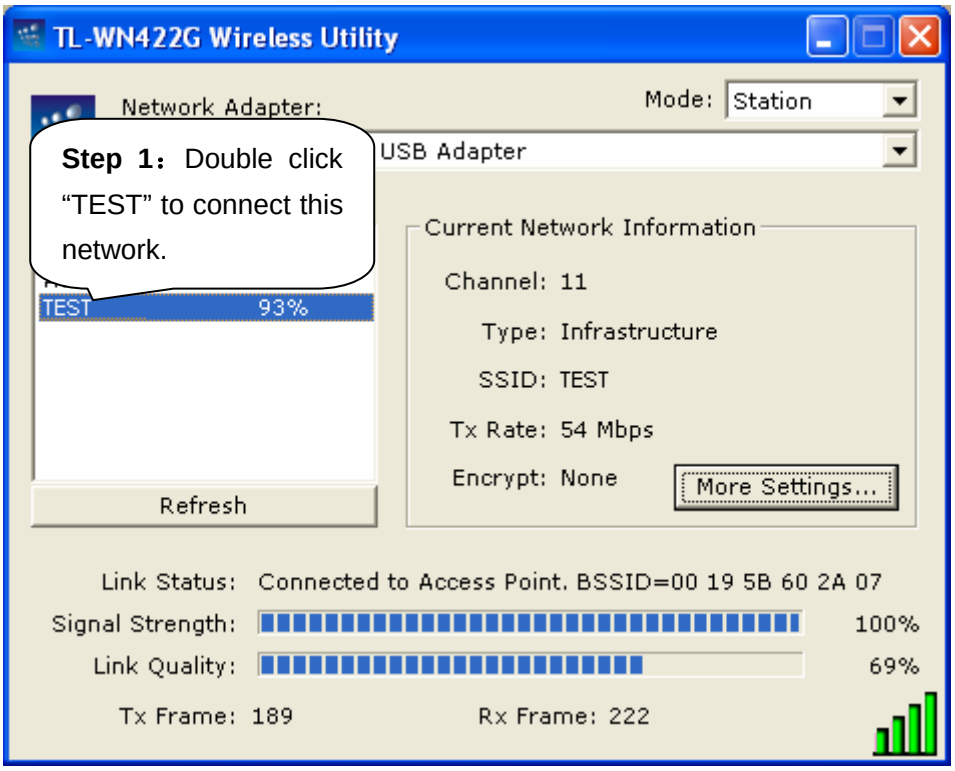


Figure 5-1

Step Two： In WEP key setting dialogue box click “change” to continue our setting.

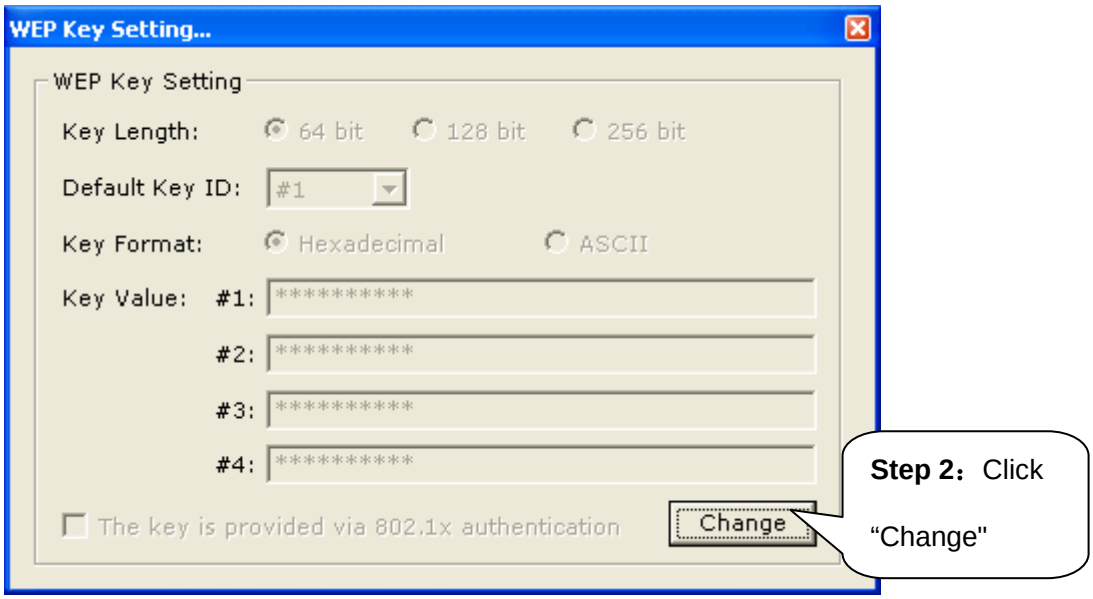


Figure 5-2

Step Three：

- Key length： 64 bit
- Default key ID：#1
- Key format：Hexadecimal
- Key value：enter "1111111111" in #1

Step Four： Click the close button in top right of the screen, and it will return to the screen of wireless utility. Till now we have finished WEP encryption configuration.

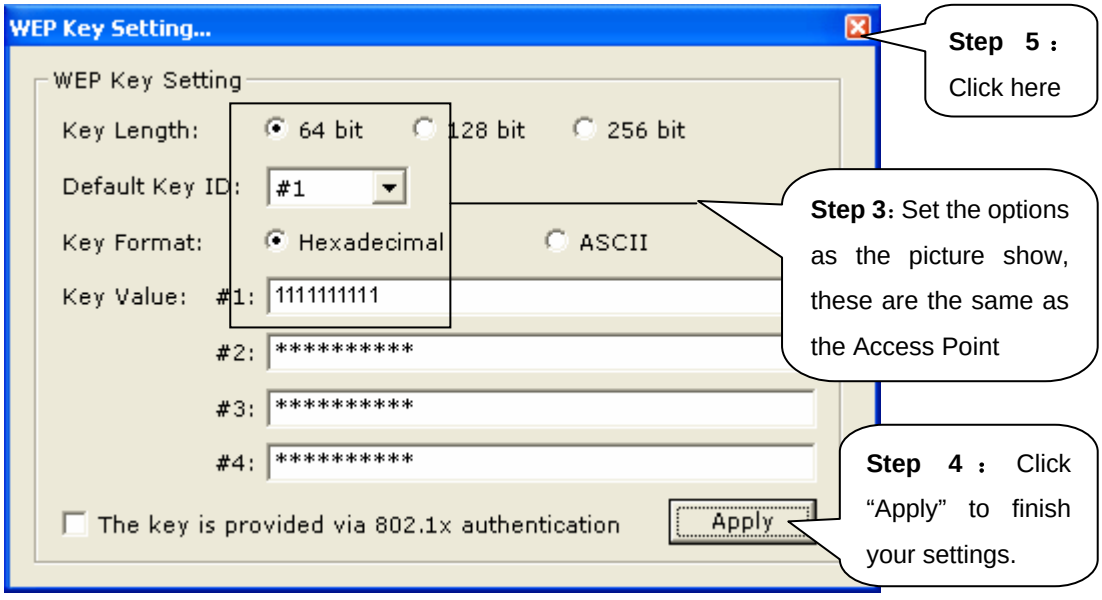


Figure 5-3

Step Five： Click the "  " to close the window.

5.2 Configuration of PSP Mode

Please ensure the software and hardware environments are established well before

configuring. For hardware, at least a PC, a TL-WN422G USB Wireless Adapter and a PSP device are needed. For software, the TL-WN422G Adapter driver should be properly installed.

There are two parts of this setting：

Part 1：Configuration of our TL-WN422G High-Gain Wireless USB Adapter

Step One： Select “Access Point” from the drop down list.

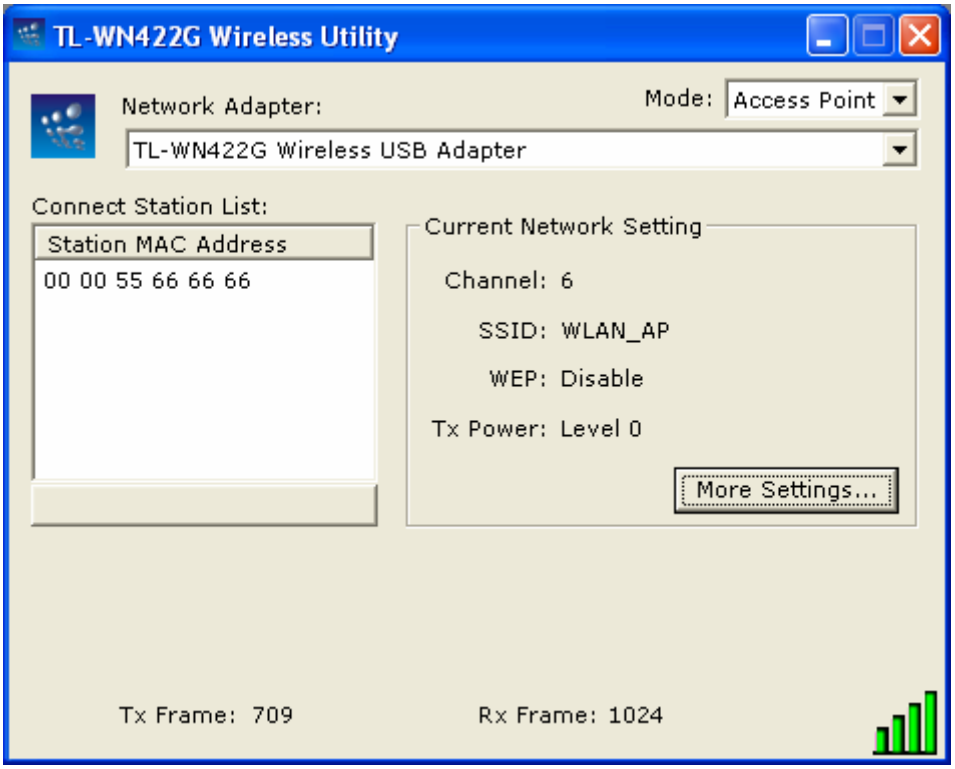


Figure 5-4

Step Two： Select “More Setting”, you can use default network SSID WLAN-AP, channel 6, and then choose WEP Encryption, and enter WEP keys.

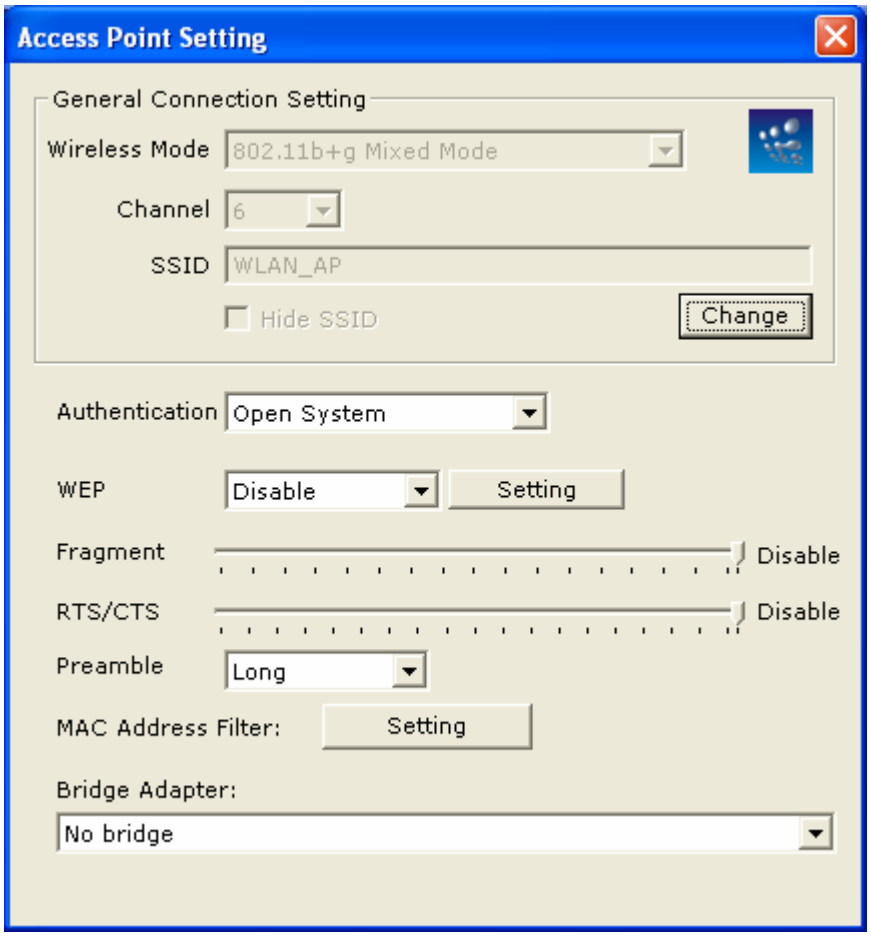


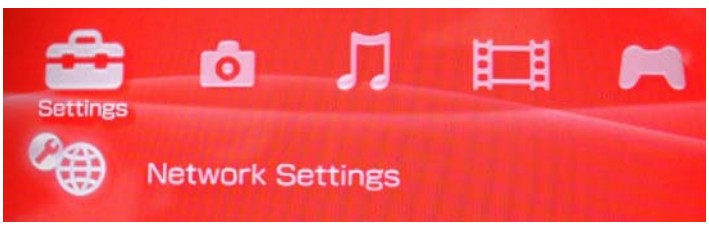
Figure 5-5

Remark:

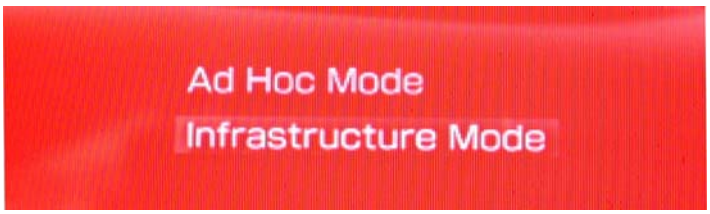
You can change the default network SSID and channel by yourself. If you didn't startup WEP Encryption, any PSP could link in, and the wireless network won't be protected by encryption key.

Part 2： PSP setting

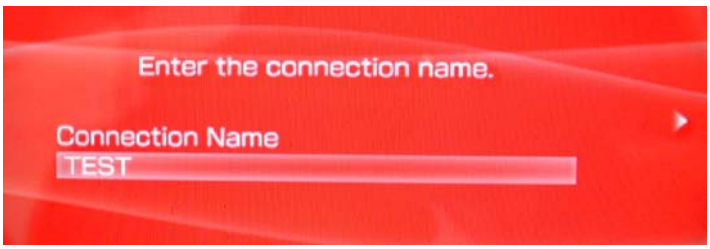
Step One： Choose "Network Settings".



Step Deux： Choose "Infrastructure Mode".

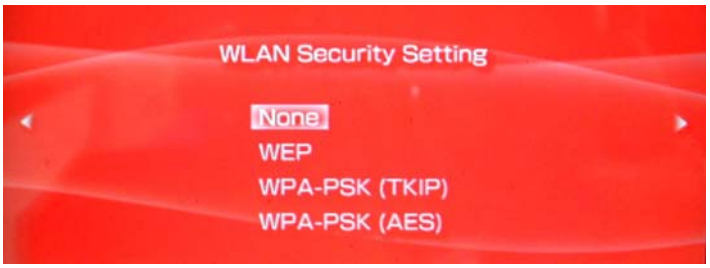


Step Three： Establish a new connection, and enter the name of this connection. (Any is ok), we use TEST for example.

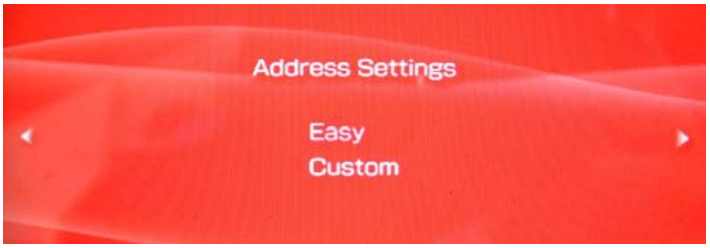


Step Four： Select SCAN, and let PSP scan the nearer AP automatic，then choose the default network SSID WLAN_AP of TL-WN422G High-Gain Wireless USB Adapter.

Step Five： “WLAN Security Setting” If you haven’t set pass phrase. Select the first “None”. If you have set the pass phase, select the second “WEP”, the pass phase must identical with WEP key that you have set.

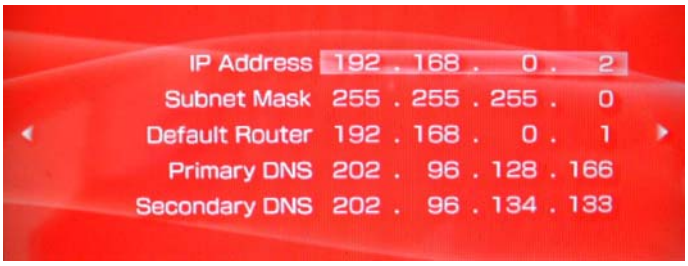


Step Six： Select address settings mode—Easy.



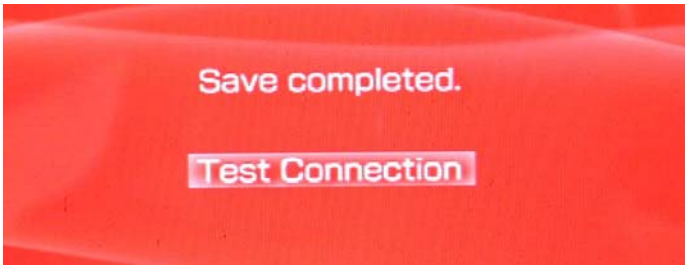
Step Seven： In “IP Address Setting” screen, we select “Manual”.

Step Eight： In “Address Setting” screen, please set IP address.

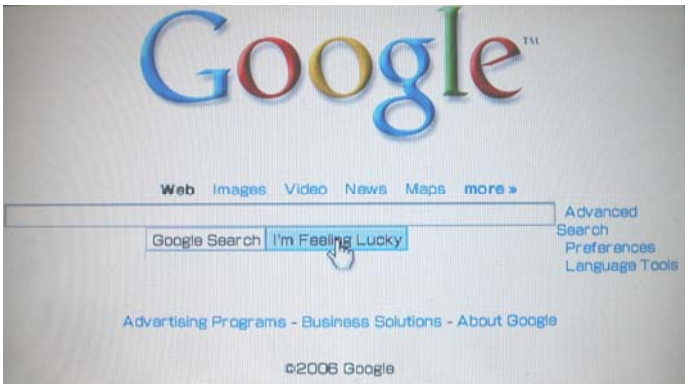


Step Nine： “Proxy Server” selects “Do Not Use”.

Step Ten： Select “Test Connection”.



Step Eleven： Test network connection. After the configuration that was set above, we can connect to web successfully. Till now, we have finished the configuration of PSP mode.



Chapter 6 Configuration for Windows Vista

After the Adapter's driver has been installed, Windows Vista will display a wireless Network Connection message like this one.

Figure 6-1

Icon means the connection has been established. Icon means there is no connection.

To establish a connection, please follow the steps below.

1. Right-click the icon in your system tray, then click **Connect to a network**.

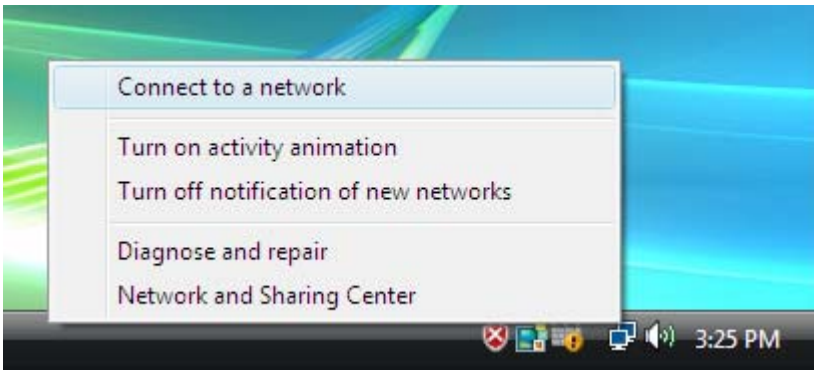


Figure 6-2

2. The following screen will show you available wireless networks. Highlight the one you want to join, and then click **Connect**.

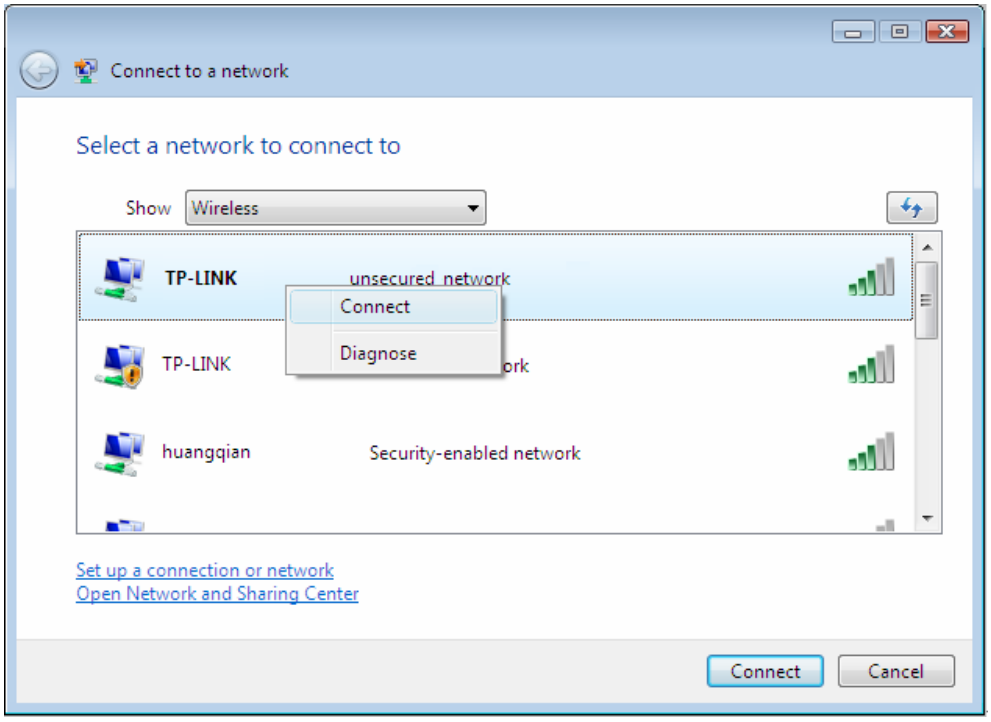


Figure 6-3

3. To continue, click **Connect Anyway**. Click the **Cancel** button to end the connection.

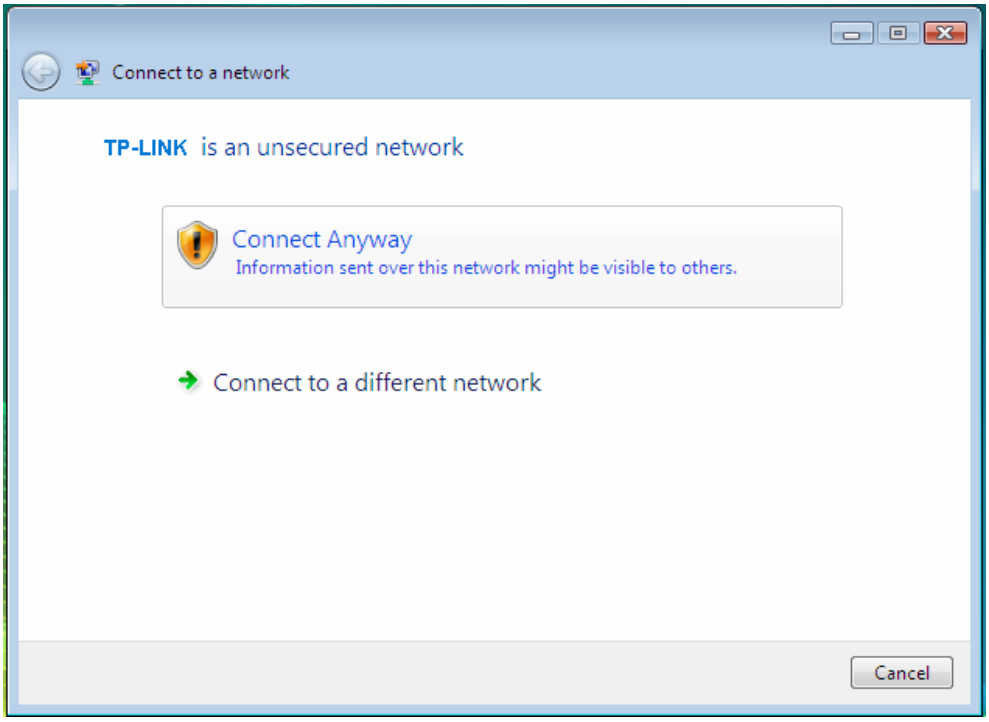


Figure 6-4

4. If the connection is successful established, the following screen will appear. Click **close** to finish the connection.

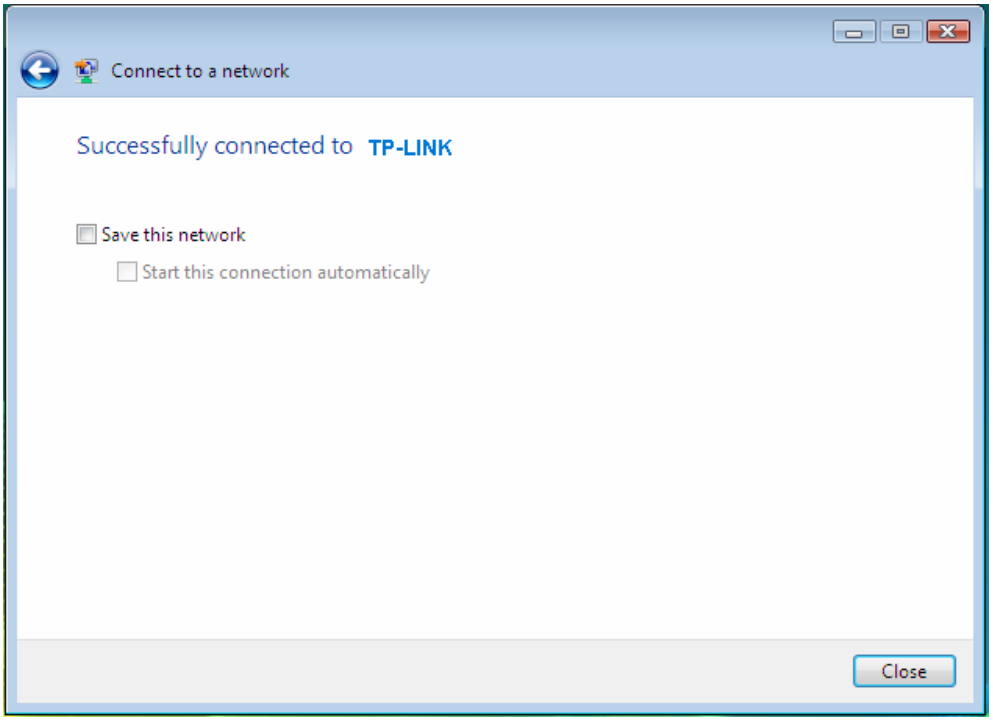

Connect to a network
Successfully connected to TP-LINK
Save this network
Start this connection automatically
Close

Figure 6-5

Appendix A: Glossary

IEEE 802.11b - The IEEE 802.11b standard specifies a wireless networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz, and WEP encryption for security. IEEE 802.11b networks are also referred to as Wi-Fi networks.

IEEE 802.11g - Specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology, using OFDM modulation and operating in the unlicensed radio spectrum at 2.4GHz, and backward compatibility with IEEE 8021b devices, and WEP encryption for security.

Ad-hoc Network - An ad-hoc network is a group of computers, each with a wireless adapter, connected as an independent IEEE 802.11 wireless LAN. Ad-hoc wireless computers operate on a peer-to-peer basis, communicating directly with each other without the use of an access point. Ad-hoc mode is also referred to as an Independent Basic Service Set (IBSS) or as peer-to-peer mode, and is useful at a departmental scale or SOHO operation.

Infrastructure Network - An infrastructure network is a group of computers or other devices, each with a wireless adapter, connected as an IEEE 802.11 wireless LAN. In infrastructure mode, the wireless devices communicate with each other and to a wired network by first going through an access point. An infrastructure wireless network connected to a wired network is referred to as a Basic Service Set (BSS). A set of two or more BSS in a single network is referred to as an Extended Service Set (ESS). Infrastructure mode is useful at a corporation scale, or when it is necessary to connect the wired and wireless networks.

SSID - A **S**ervice **S**et **Id**entification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID. This is typically the configuration parameter for a wireless PC card. It corresponds to the ESSID in the wireless Access Point and to the wireless network name.

WEP (**W**ired **E**quivalent **P**rivacy) **-** A data privacy mechanism based on a 64 bit or 128 bit or 256 bit shared key algorithm, as described in the IEEE 802.11g standard.

Wi-Fi - A trade name for the IEEE 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see http://www.wi-fi.net), an industry standards group promoting interoperability among IEEE 802.11b devices.

WLAN (**W**ireless **L**ocal **A**rea **N**etwork) **-** A group of computers and associated devices communicate with each other wirelessly, which network serving users are limited in a local area.

WPA (**W**i-Fi **P**rotected **A**ccess) **-** A wireless security protocol use TKIP (Temporal Key Integrity Protocol) encryption, which can be used in conjunction with a RADIUS server.

AP- Access **P**oint

PSK- Pre-**S**hared **K**ey

TKIP- Temporal **K**ey **I**ntegrity **P**rotocol

AES- Advanced **E**ncryption **S**tandard

TLS- Transport **L**ayer **S**ecurity

TTLS- Tunnel **T**ransport **L**ayer **S**ecurity

PEAP- Protected **E**xtended **A**uthentication **P**rotocol

RADIUS- Remote **A**uthentication **D**ial **I**n **U**ser **S**ervice

Appendix B: Specifications

General	
Interface	A-type USB 2.0 Connector
Standards	IEEE 802.1b; IEEE 802.1g
Operating System	Windows 98, ME, 2000, XP, 2003, Vista
Transmission Distance	In door up to 100m, out door up to 300m (It is limited to the environment).
Safety & Emission	FCC, CE
Frequency	2.4 ~ 2.4835 GHz
Sensitivity	54M -73dBm, 11M -86dBm
Spread Spectrum	Direct Sequence Spread Spectrum (DSSS)
Wireless	
Radio Data Rate	54/48/36/24/18/12/9/6 Mbps 11g OFDM，11/5.5/2/1 Mbps 11b DSSS,(Auto Rate Sensing)
Modulation	11g OFDM , 11b CCK/DSSS
Media Access Protocol	CSMA/CA with ACK
Data Security	WPA; 64/128/256 bit WEP; TKIP/AES; IEEE 802.1X authentication

Physical Environmental	
Working Temperature	0℃～40℃ (32℉～104℉)
Storage Temperature	-40℃～70℃ (-40℉～158℉)
Humidity	10%～90% RH, Non-condensing