TP-LINK®

User Guide

TL-WN321G

54Mbps Wireless USB Adapter

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Rev: 3.0.0

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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 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 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.

Note: The manufacturer is not responsible for any radio or tv interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

FCC RF 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. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment has been SAR-evaluated for use in hand. 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

This device is intended for home and office use in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

Country	Restriction	Reason/remark
Bulgaria		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		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		Only for indoor applications

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

DECLARATION OF CONFORMITY

For the following equipment:

Product Description: **54Mbps Wireless USB Adapter**

Model No.: **TL-WN321G**

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

The above product is in conformity with the following standards or other normative documents:
ETSI EN 300 328 V1.7.1: 2006
ETSI EN 301 489-1 V1.8.1:2008 & ETSI EN 301 489-17 V1.3.2:2008
EN60950-1:2006
EN62311:2008

Recommendation 1999/519/EC

Person is responsible for marking this declaration:

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CONTENTS

Package Contents **1**

Chapter 1 Introduction **2**

1.1 Product Overview 2

1.2 Main Features 2

1.3 LED Status 2

Chapter 2 Installation Guide **3**

2.1 Hardware Installation 3

2.2 Software Installation 3

2.2.1 Overview 3

2.2.2 Installation Guide 3

2.3 Uninstall Software 7

2.3.1 Uninstall the utility software from your PC 7

2.3.2 Uninstall the driver software from your PC 7

Chapter 3 Configuration **9**

3.1 Configuration of Utility 9

3.1.1 Site Survey 9

3.1.2 Profile 10

3.1.3 Link Information 21

3.1.4 Advanced 23

3.1.5 About 24

3.1.6 An example for application 24

3.2 Configure with Windows XP Wireless Zero Configuration 25

Chapter 4 AP Mode **27**

4.1 Config AP 28

4.2 Advanced 29

4.3 Access Control List 30

4.4 Associate List 32

4.5 About 33

Chapter 5 Example for Application **34**

5.1 Configuration of PSP XLink Online game 34

Appendix A: Glossary **38**

Appendix B: Specifications **40**

Package Contents

The following items should be found in your package:

- One TL-WN321G 54Mbps Wireless USB Adapter
- One USB extension cable
- Quick Installation Guide
- One Resource CD for TL-WN321G 54Mbps Wireless USB Adapter, 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

1.1 Product Overview

The adapter is designed to provide a high-speed and unrivaled wireless performance for your computer. With a faster wireless connection, you can get a better Internet experience, such as downloading, gaming, video streaming and so on.

The TL-WN321G 54Mbps Wireless USB Adapter complies with IEEE 802.11g and IEEE 802.11b standards. It can perfectly interoperate with all the 802.11g/b devices. The TL-WN321G's auto-sensing capability allows high packet transfer rate of up to 54Mbps for maximum throughput.

Additionally, the TL-WN321G adapter has good capability on anti-jamming and supports WEP, TKIP, AES，WPA and WPA2 encryption to prevent outside intrusion and protect your personal information from being exposed.

The adapter is easy to install and manage. The TL-WN321G supports QSS function, which can help you create a wireless connection immediately. Quick Setup Wizard is supported and detailed instructions are provided step by step in this user guide.
Featuring high performance transmission rates, simple installation and adaptability, as well as strong security, the TL-WN321G 54Mbps Wireless USB Adapter is the perfect solution for small office and home needs.

1.2 Main Features

- IEEE 802.11g, IEEE 802.11b standards
- Supports USB 2.0 standard
- Supports WPA data security, IEEE 802.1x authentication, TKIP/AES encryption, 64/128-bit WEP encryption
- Supports wireless LAN data transfer rate of up to 54Mbps
- Supports Ad-Hoc and Infrastructure modes
- Supports roaming between access points when configured in Infrastructure mode
- Eases configuration and provides monitoring information
- Supports Windows XP/ Vista/ 7

1.3 LED Status

The LED on the top of this card indicates Link/Act status. It blinks when sending and receiving data.

Chapter 2 Installation Guide

2.1 Hardware Installation

There are two ways to install the Adapter.

Method 1:

Plug the Adapter into the USB port on your computer directly.

Method 2:

1. Connect one end of the USB cable to the Adapter.
2. Connect the other end of the USB cable to the USB port on your computer. The Adapter gets its power from the host and there is no external power supply. The LED should light up when the Adapter is plugged in and the PC is on.

2.2 Software Installation

2.2.1 Overview

The Adapter's Setup Wizard will guide you through the installation of the Utility and drivers. Before you install the software, please connect the USB adapter with your computer by USB cable. After that, you will be prompted "**Found New Hardware Wizard**", click the **Cancel** button, and run the Setup Wizard program on the CD-ROM.

☞ **Note:**

The Setup steps for Windows XP/ Vista/ 7 are very similar, so the following installation guide takes Windows XP for example.

2.2.2 Installation Guide

1. After inserting the provided Resource CD into your CD-ROM drive, the Setup Wizard will automatically pop up on your computer's screen. Choose "**Install Driver&Utility**" as shown in the following figure to start the installation.

Figure 2-1 Install Driver&Utility

2. Then you'll see the screen as below. You can choose which to be installed.

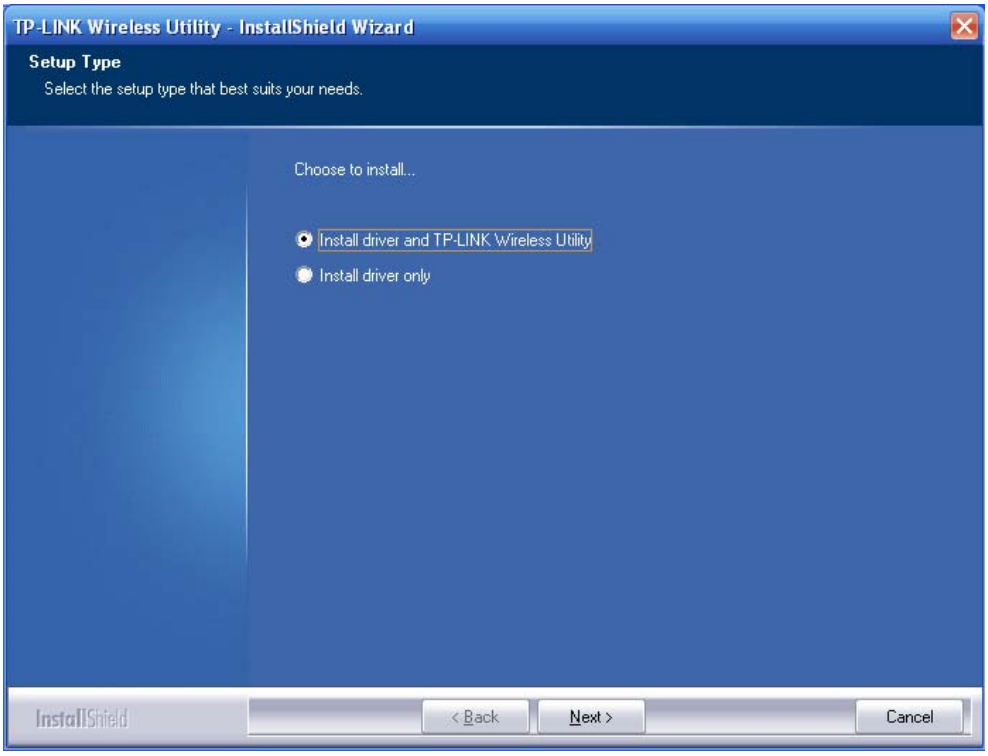

Figure 2-2 Setup Type

3. In the following screen, select the configuration tool.

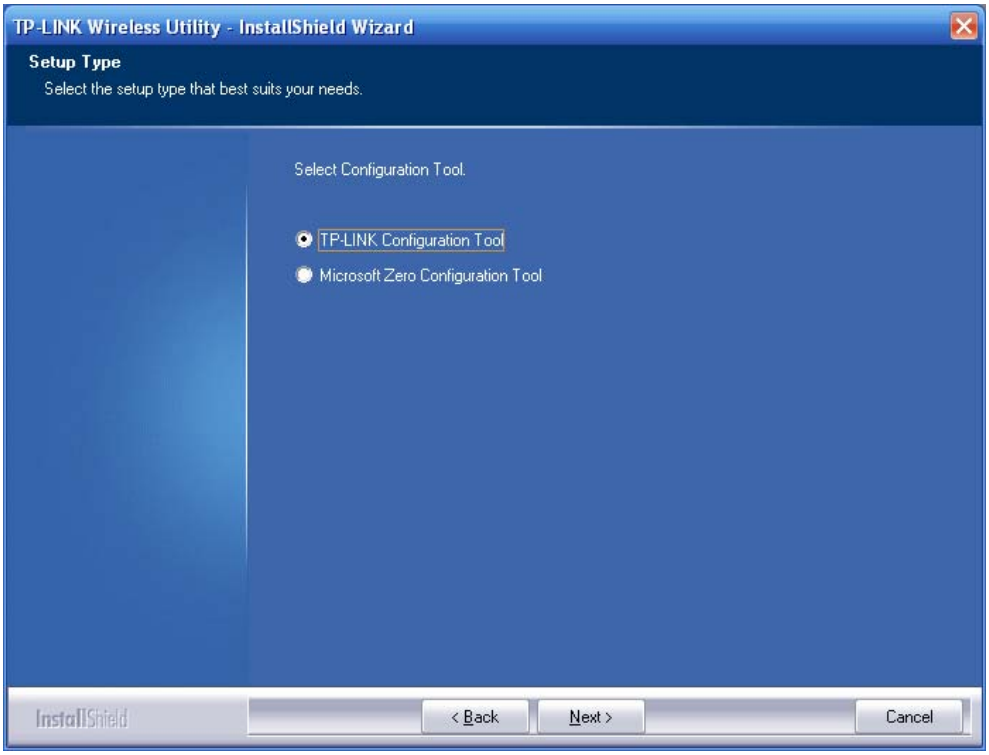

Figure 2-3 Setup Type

I. If you want to install the TP-LINK Wireless Utility, please select the **TP-LINK Configuration Tool** and click **Next**.

II. If you only want to use the **Microsoft Zero Configuration Tool** to configure the wireless connection, please select **Microsoft Zero Configuration Tool** and click **Next**.

4. Then, choose the destination location.

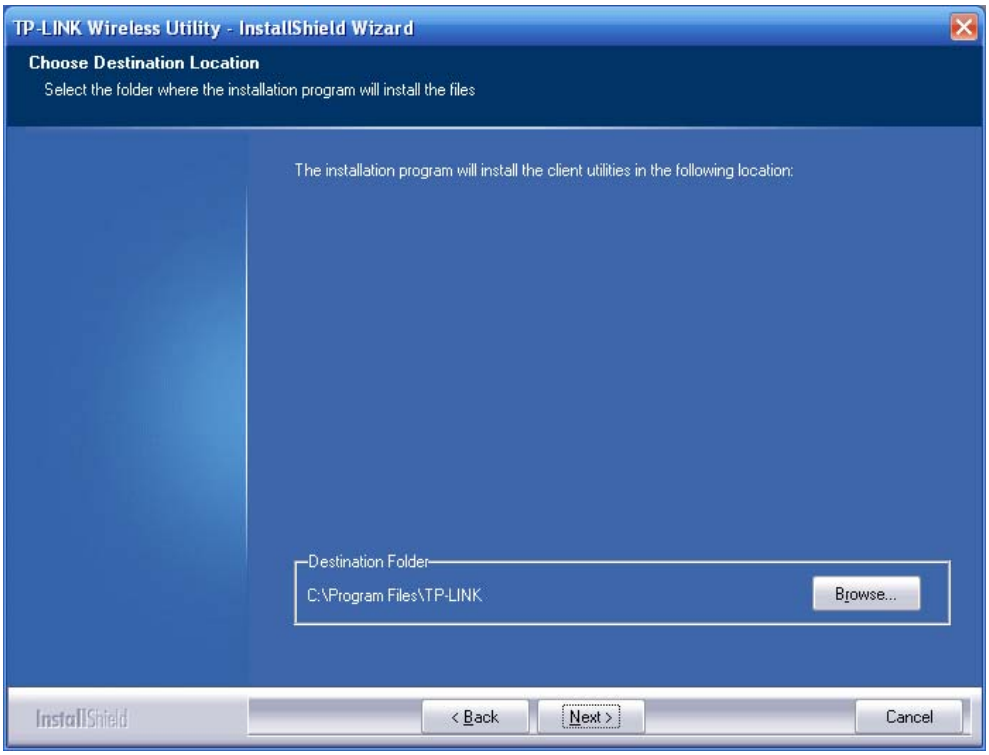

Figure 2-4 Choose Destination Location

5. After that, you will see the next screen as below. Click **Install** to continue.

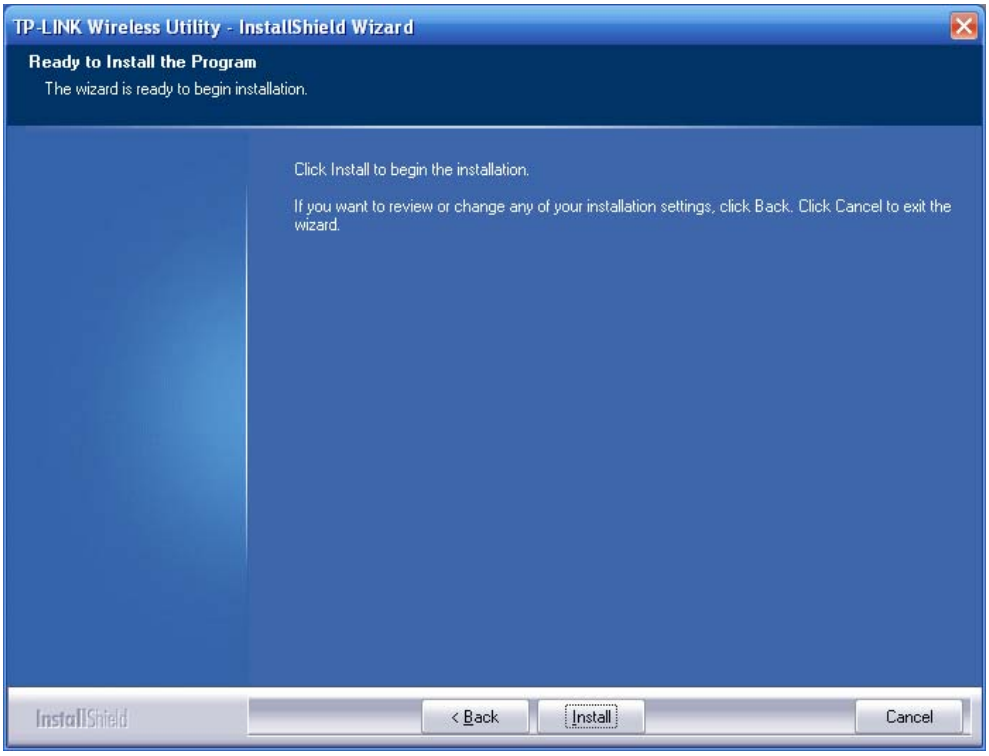

Figure 2-5 Ready to Install the Program

6. The following screen for installing will appear.

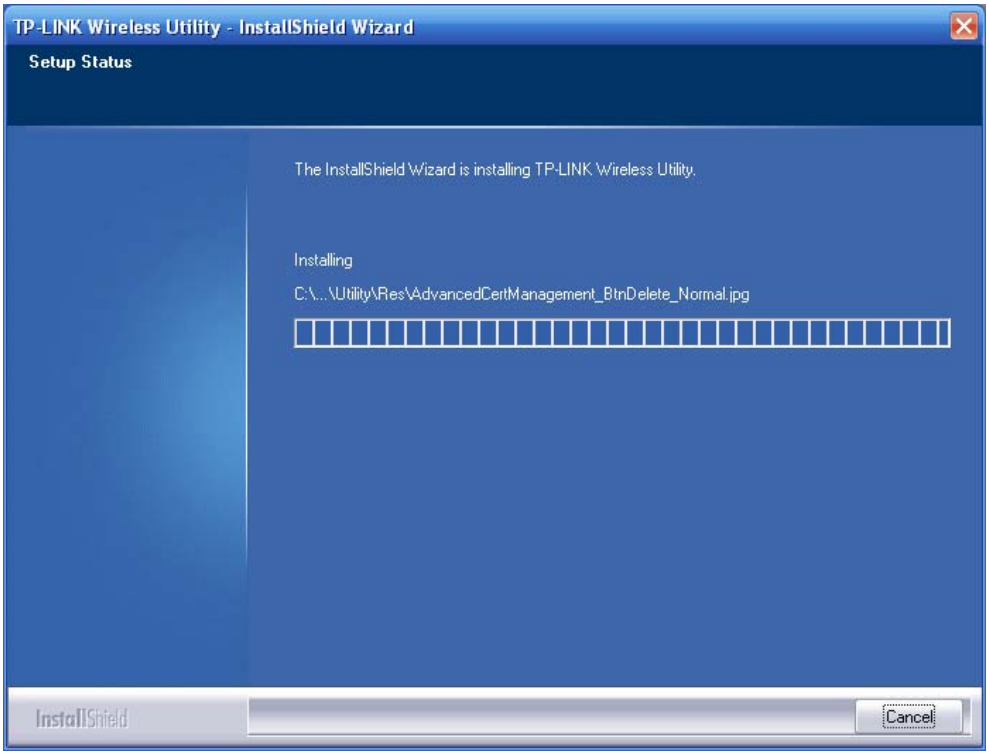

Figure 2-6 Setup Status

7. After the files have been successfully copied, the screen in Figure 2-7 will appear. Click the **Finish** button to finish the installation and reboot the system.

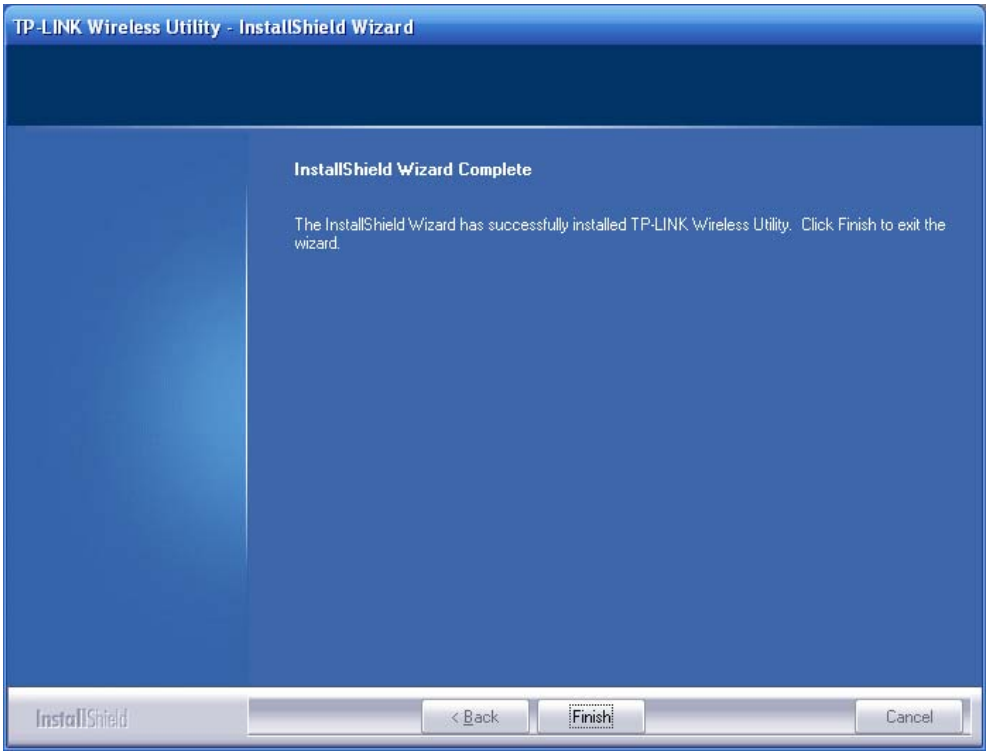

Figure 2-7 InstallShield Wizard Complete

After installing the driver successfully, you should see an icon or in your system tray.

2.3 Uninstall Software

2.3.1 Uninstall the utility software from your PC

1. On the Windows taskbar, click the **Start** button, point to **All programs→TP-LINK**, and then click **Uninstall-TP-LINK Wireless Utility**.

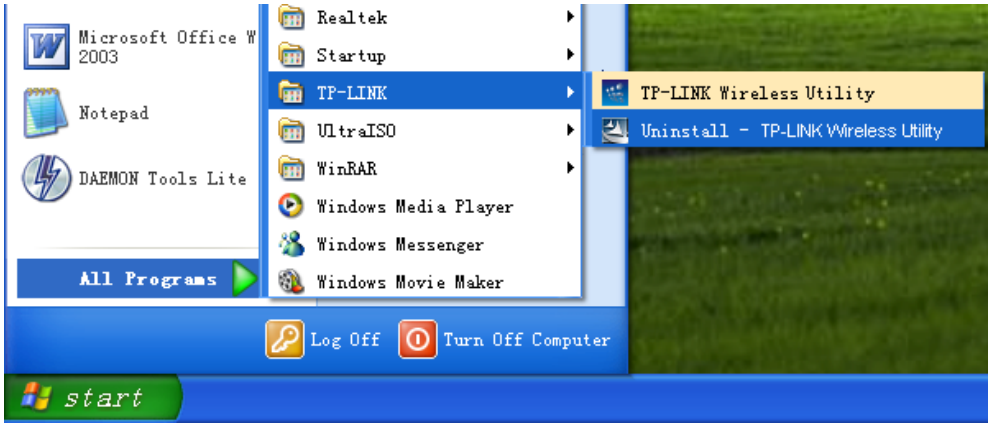

Figure 2-8 Uninstall the Utility

2. Follow the Install Shield Wizard to uninstall the utility software from your PC.

2.3.2 Uninstall the driver software from your PC

1. On the Windows taskbar, click the **Start** button, 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, double-click **Network adapters,** and then right-click **54Mbps Wireless USB Adapter**.

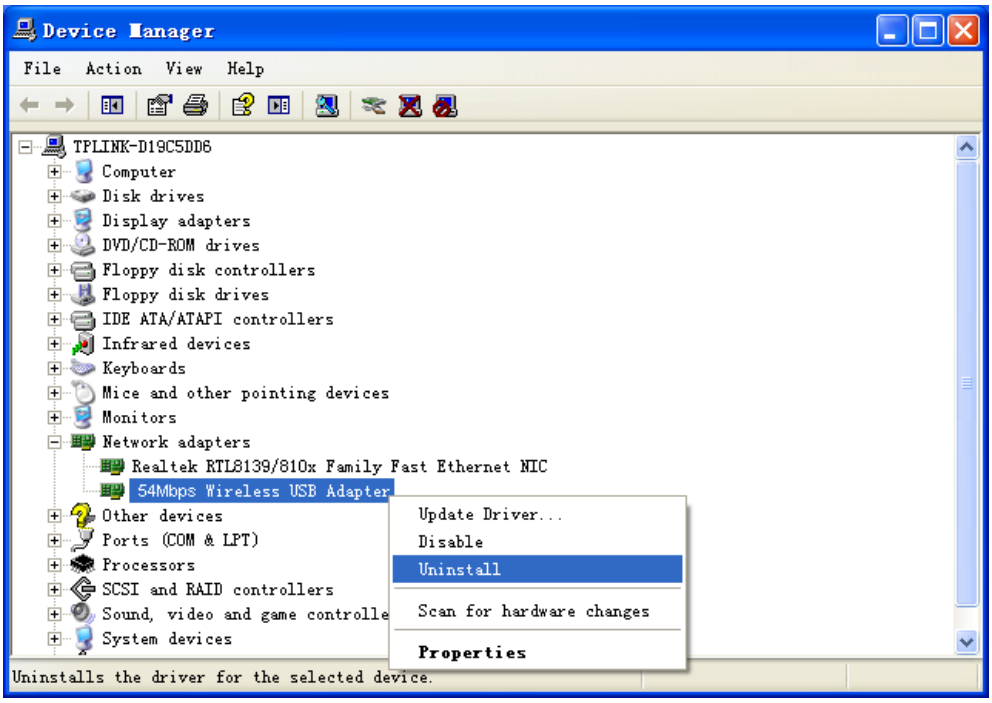

Figure 2-9 Device Manager

4. Click **Uninstall** shown in above Figure 2-9, the system will uninstall the driver software of the adapter from your PC.

Chapter 3 Configuration

3.1 Configuration of Utility

TL-WN321G Wireless USB Adapter can be configured by its utility for Windows XP/ Vista/ 7. This section will take the configuration in Windows XP for example and guide you to configure your wireless adapter for wireless connectivity with trustable data security encryption features.

The configuration steps in Windows XP/ Vista/ 7 are similar. For the configurations in Windows Vista/ 7, please refer to the instructions in Windows XP.

After the Adapter's driver and utility has been installed, the adapter's tray icon, or , will appear in your system tray. It means the utility is running on your system. If the utility does not run, you can run the utility by clicking: **Start**> **All programs**> **TP-LINK**> **TP-LINK Wireless Utility**. If the icon still does not appear, the driver or utility may be installed incorrectly or the adapter is unplugged, please try again.

Icon means the connection has been established.

Icon means there is no connection.

Right-click the icon and choose **Launch Config Utility**, the configuration screen of the utility will appear as shown in the figure below.

Figure 3-1 Configuration Screen

The utility provides complete and easy manage tools to:

- Display current status information
- Edit and add configured profiles
- Display current diagnostics information

Note:

If your OS is Windows XP, you can use Windows XP to configure the wireless network settings. (To use this function, you must upgrade the OS with sp2). Just right-click the icon at the bottom of the screen, and click **Use Zero Configuration as Configuration utility** to switch the utility.

3.1.1 Site Survey

Click the **Site Survey** icon on the screen of the Utility and the **Site Survey** screen with many

available wireless network choices will appear. The AP list will be updated every two seconds. The AP list includes most used fields, such as SSID, network type, channel used, wireless mode, security status and the signal percentage. The dialog box is shown in Figure 3-2.

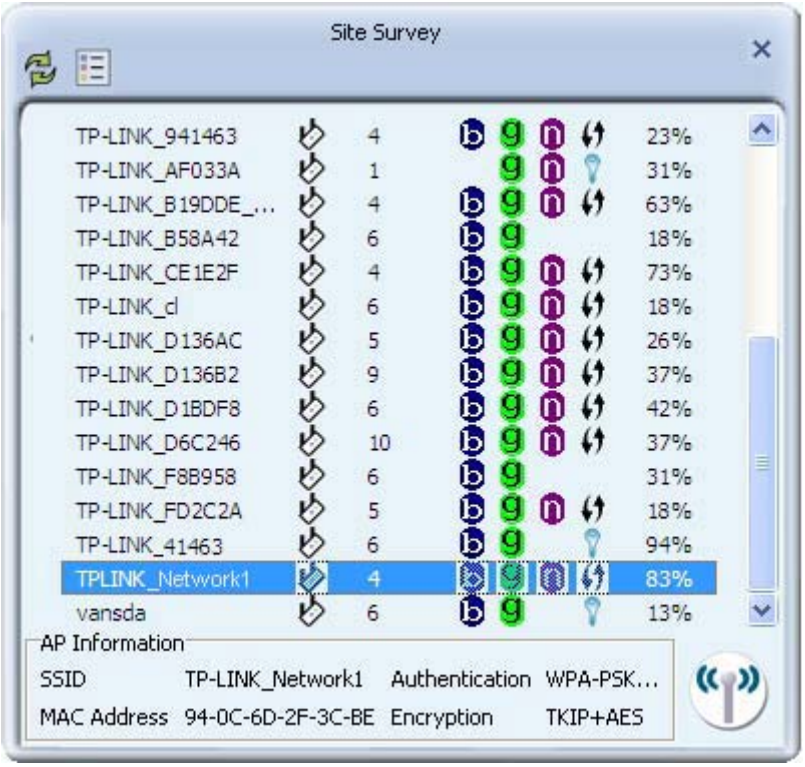

Figure 3-2 Site Survey

- **(Rescan):** Click the **Rescan** icon to refresh the list at any time.
- **(Add to Profile):** Highlight an SSID and click the **Add to Profile** icon to add the network to the profile.
- **(Connect):** Highlight an SSID and click the **Connect** icon to connect to an available network without adding it to the profile.

3.1.2 Profile

Click the icon on the screen of the Utility and the **Profile List** screen will appear as Figure 3-3.

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. Figure 3-3 shows the basic profile section.

The **Profile** screen provides tools to:

- Add a profile
- Delete a profile
- Edit a profile
- Import a profile
- Export a profile
- Add a QSS profile

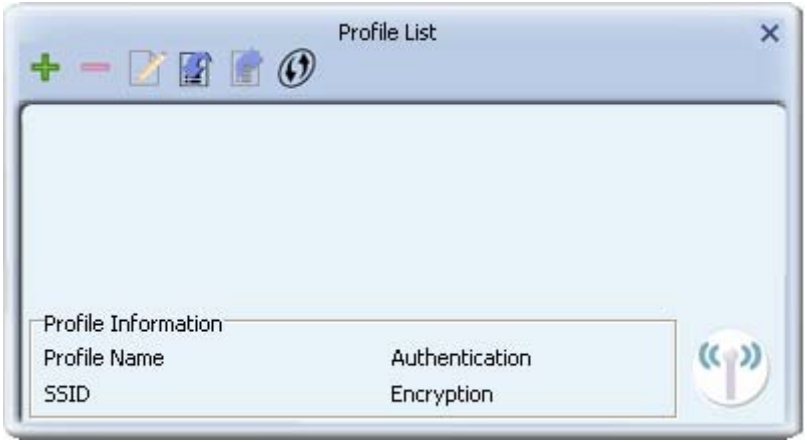

Figure 3-3 Profile List

- - Click to add a new profile.
- - Deletes an existing profile.
- - Click to edit an existing profile.
- - Imports an existing profile.
- - Exports an existing profile.
- **Profile Name -** Name of profile, preset to PROF* (* indicate 1, 2, 3...).
- **SSID -** The access point or Ad-hoc name.
- **Authentication -** Indicates the authentication mode used.
- **Encryption -** Indicates the encryption type used.

3.1.2.1 Add a profile

1. Click the **Add** icon on the Profile List screen (Figure 3-3), the **Profile** configuration screen will appear as shown in Figure 3-4. Enter the **Profile Name** and choose the **SSID** from the pull-down list, then click the **Next** icon to continue.

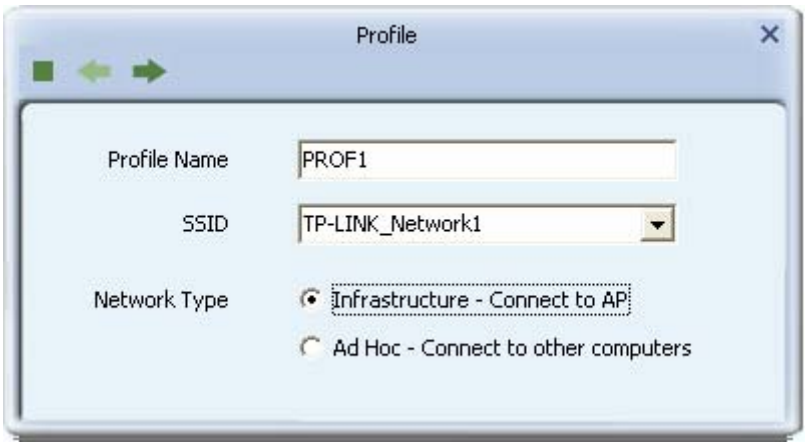

Figure 3-4 Add a new profile

- - Cancel button.
- - Back to the previous page.
- - Continue to the next page.
- **Profile Name -** Identifies the configuration profile. This name must be unique. Profile names

are not case-sensitive.

- **SSID -** The IEEE 802.11 wireless network name. This field has a maximum limit of 32 characters.
- **Network Type:** There are basically two modes of networking:
  - **Infrastructure -** All wireless clients will connect to an access point or wireless router.
  - **Ad Hoc -** Directly connecting to another computer, for peer-to-peer communication, using wireless network adapters on each computer, such as two or more TL-WN321G wireless adapters.

☞ **Note:**

1) An Infrastructure network contains an Access Point or wireless router. All the wireless devices or clients will connect to the wireless router or access point.
2) An Ad Hoc network contains only clients, such as laptops with wireless desktop adapters. All the adapters must be in Ad Hoc mode to communicate.

2. In the following screen, select the corresponding **Authentication** mode and **Encryption** type of the profile from the drop-down lists (here takes **WPA2-PSK** and **AES** for example), then click the **Next** icon to continue.

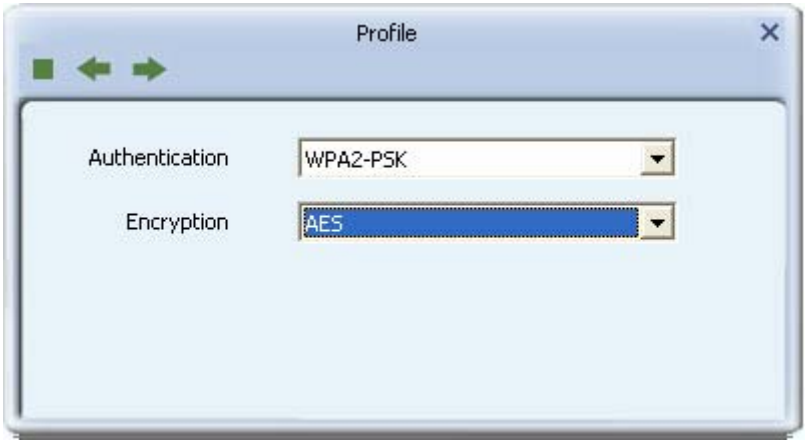

Figure 3-5 Authentication and Encryption

- **Authentication -** You can choose the **Authentication** Type from the pull-down list with seven options, **Open**, **Shared**, **WPA**, **WPA-PSK**, **WPA2**, **WPA2-PSK**, and **802.1X**.
- **Encryption -** Displays which encryption type that the adapter is using. When you select **Open** as **Authentication,** there are two options: **None** and **WEP**. If you select **Shared** and **802.1X** as **Authentication,** there is only one option: **WEP**. When you select **WPA**, **WPA-PSK** or **WPA2-PSK** as **Authentication,** there are two options: **TKIP** and **AES**. When you select **WPA2** as **Authentication,** four options are available: **TKIP**, **AES**, **TKIP(MFP)** and **AES(MFP)**.

3. In the screen that follows, enter the key of the AP in the empty field. Here takes Key 1234567890 for example. If the wireless network you are trying to connect is security-enabled, you must enter the corresponding key to establish a successful connection. Then click the **Next** icon to continue.

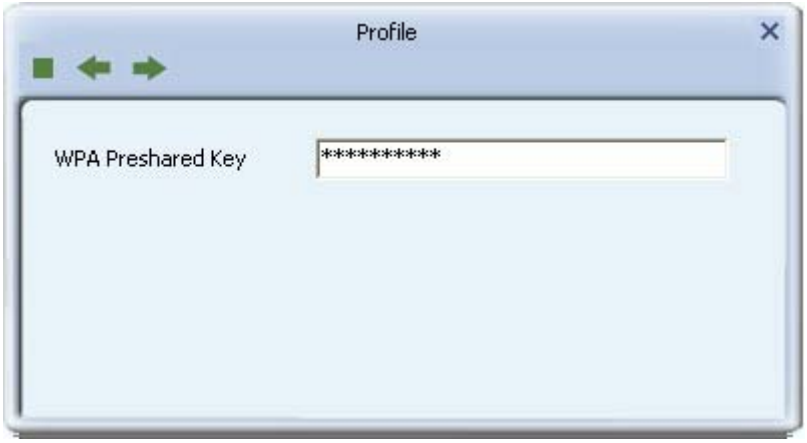

Figure 3-6 Enter the Key

4. The Pre-logon Connect configuration page as shown in Figure 3-7 will then appear. Click the **Next** icon to continue.

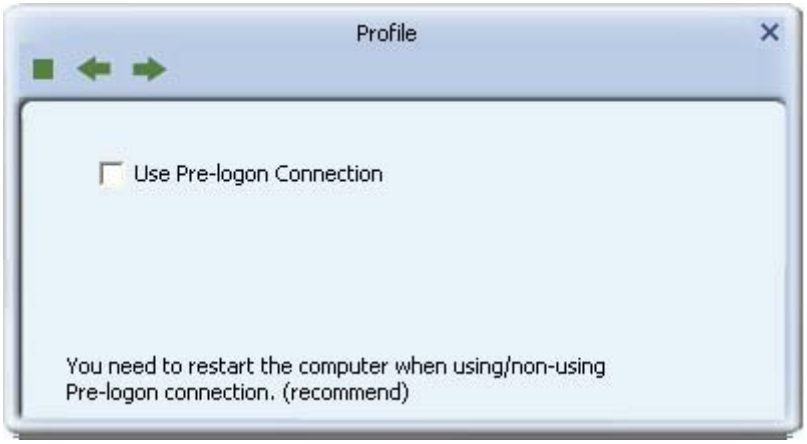

Figure 3-7 Use Pre-logon Connection

- **Use Pre-logon Connection -** Use ID and Password in Profile.

5. Some advanced settings can be made in Figure 3-8.

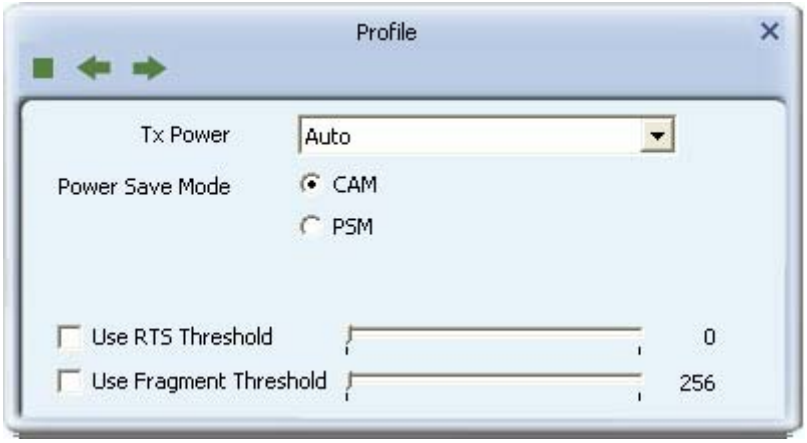

Figure 3-8 Profile

- **Tx Power -** Manually force the AP's transmitting power.
- **Use RTS Threshold -** Here you can specify the RTS (Request to Send) Threshold. If you are not sure, please leave it default here.
- **Use Fragment Threshold -** This value is the maximum size determining whether packets will

be fragmented. Setting the Fragment Threshold too low may result in poor network performance because of excessive packages. You are recommended to leave it default if you are not sure about it.

6. Click the **Active** icon in the screen below to connect to the chosen network. When the screen looks like below, it shows that you have successfully added a new profile and connected to the wireless network.

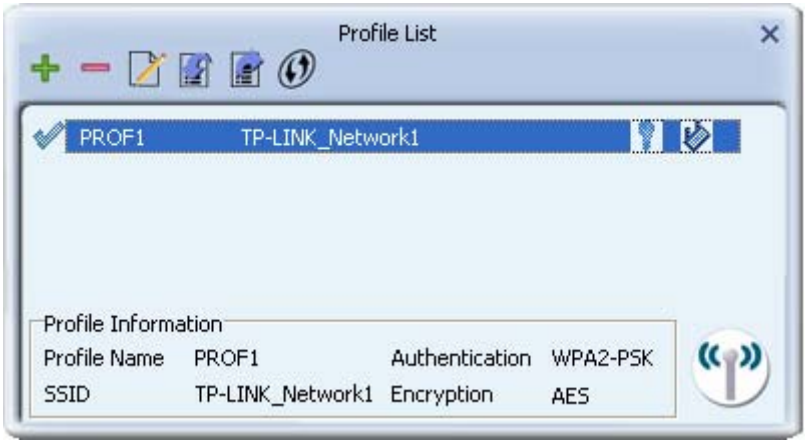

Figure 3-9 Profile Added Successfully

3.1.2.2 Delete a profile

Highlight the desired profile name on **Profile List** and click the **Delete** icon . The profile will be removed from the list.

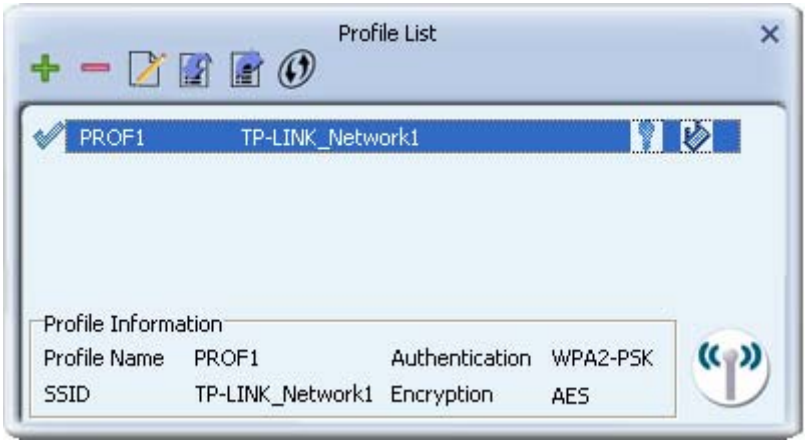

Figure 3-10 Delete a Profile

3.1.2.3 Edit a profile

Highlight the desired profile name on **Profile List**, and click the **Edit** icon , the **Profile** configuration screen will appear as shown in Figure 3-11. You can make some changes of the profile, for instance, you can change the Profile Name to name it like My Network.

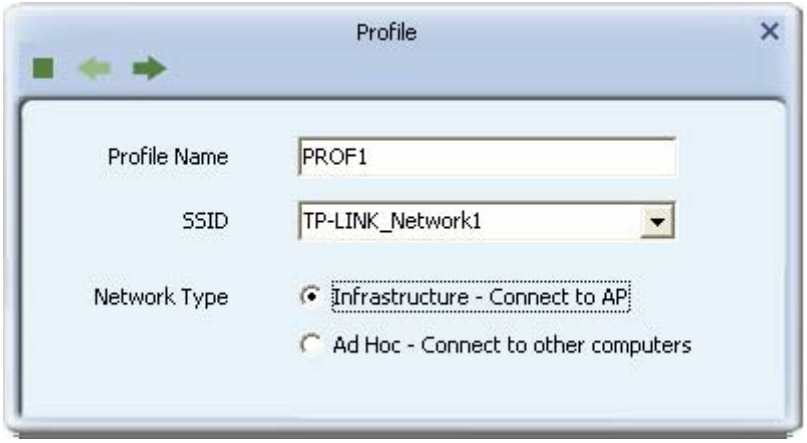

Figure 3-11 Edit a Profile

3.1.2.4 Import a profile

1. From the Profile List screen (shown in Figure 3-3), click the **Import** icon . Then the Import Profile screen will appear below.
2. Browse to the directory where the profile is located.
3. Highlight the profile name.
4. Click **Open**, the imported profile will then appear in the Profile List.

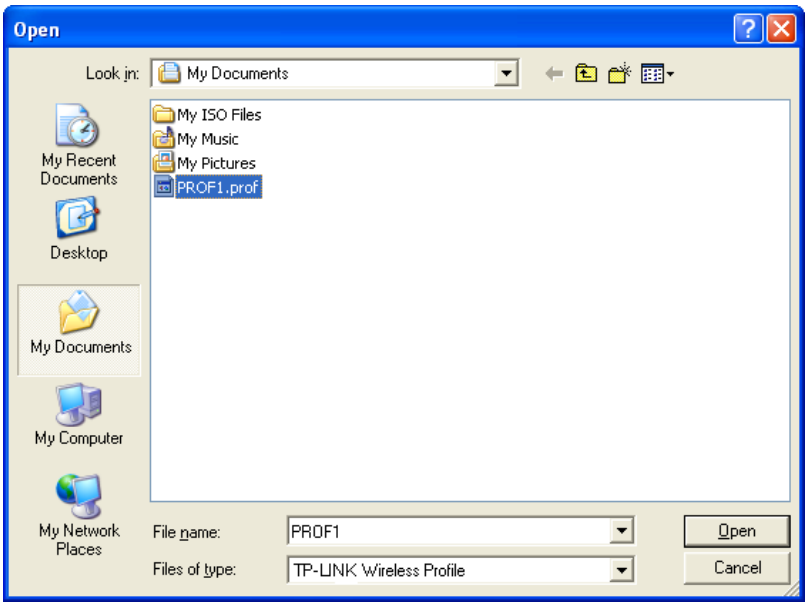

Figure 3-12 Import a Profile

3.1.2.5 Export a profile

1. From the Profile List screen (shown in Figure 3-9), highlight the profile to be exported.
2. Click **Export** icon , the Export Profile window will then appear below.
3. Browse the directory to export the profile to.
4. Click **Save**. The profile should then be exported to the specified location.

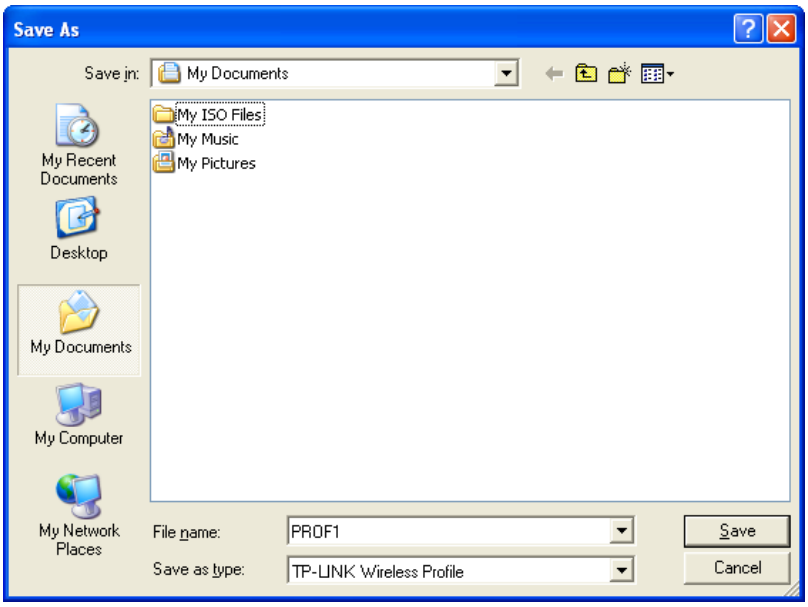

Figure 3-13 Export a Profile

3.1.2.6 Add a QSS profile

Click the **Add QSS Profile** icon of the Utility and you can configure the QSS function to join an existing network quickly in the following screen.

Figure 3-14 Profile List

If the wireless card supports QSS (Quick Secure Setup) or Wi-Fi Protected Setup (WPS), you can establish a wireless connection between wireless card and router using either Push Button Configuration (PBC) method or PIN method. For the configuration of QSS, here takes the Wireless Router of our company for example.

☞ **Note:**

To build a successful connection by QSS, you should also do the corresponding configuration of the Access Point for QSS or WPS function meanwhile.

I. PBC Method

If your Access Point is equipped with a push-button for Wi-Fi Protected Setup, you can connect the adapter to the Access Point by Push-Button Configuration (PBC) method.

Step 1 Press the QSS button on your Access Point device.

Figure 3-15 Press the QSS Button

Step 2 Click the **Add QSS Profile** icon on the screen as Figure 3-14.

Step 3 Select **Push-Button Configuration (PBC)** on the screen below.

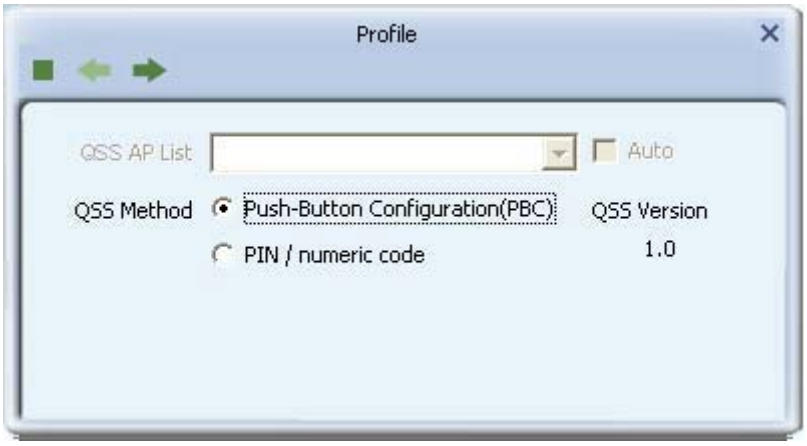

Figure 3-16 Push-Button Configuration

Step 4 Click **Start PBC**.

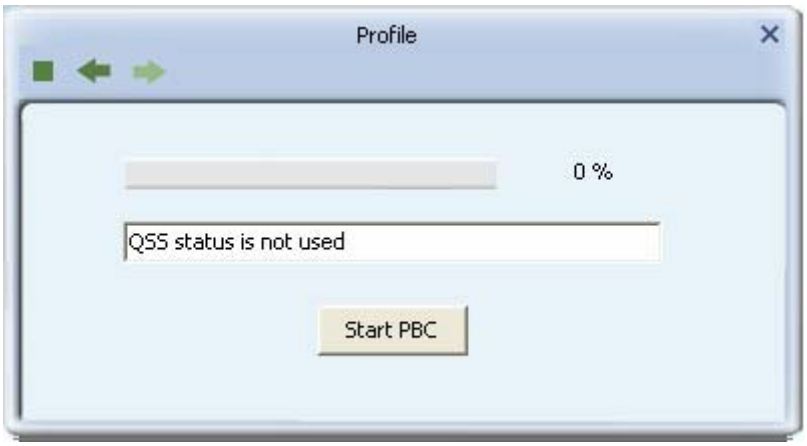

Figure 3-17 Start PBC

Step 5 The Adapter will search for the AP to establish connection automatically.

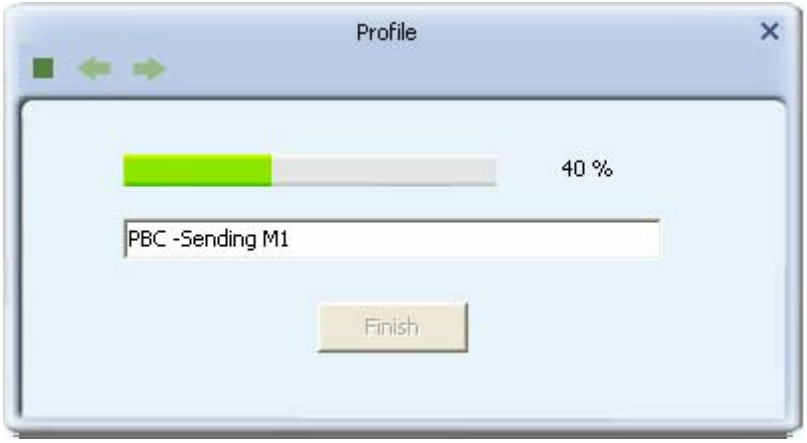

Figure 3-18

Step 6 Then wait a moment until Figure 3-19 appears.

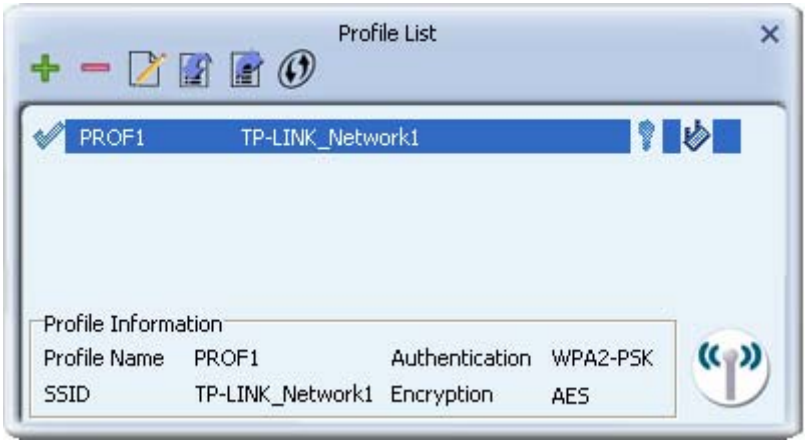

Figure 3-19

II. PIN Method

If your Access Point supports Wi-Fi Protected Setup and the PIN method, you can add the adapter to the network by the following two ways:

1) Enter the PIN into my Access Point

Step 1 Click the **Add QSS Profile** icon on the screen as Figure 3-14.

Step 2 Select the desired SSID from the **QSS AP List** (take TP-LINK_Network1 for example) and then tick **PIN/numeric code** on the screen below.

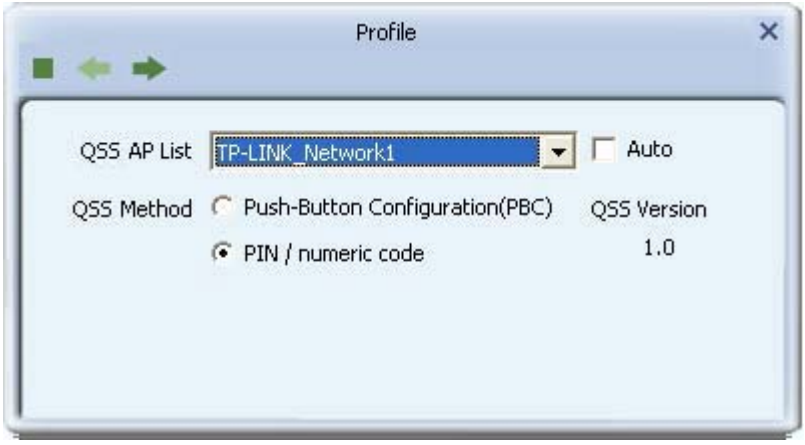

Figure 3-20

Step 3 Choose the **Config Mode** as **Enrollee** and click the **Next** icon on the screen below. Meanwhile, enter the PIN code of the adapter (here takes 39566720 in the screen for example) into the configuration utility of the AP. For the detailed instructions of the AP configuration, please refer to the User Guide of the AP.

Figure 3-21 Enrollee Mode

Step 4 Click **Start PIN** on the following screen.

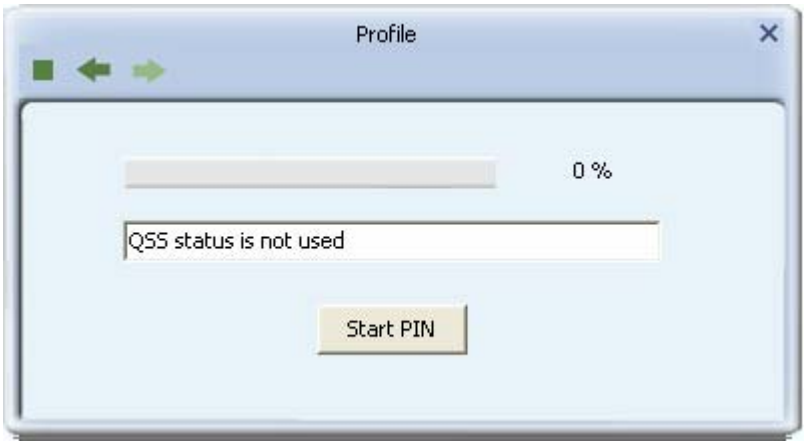

Figure 3-22 Start PIN

Step 5 When Figure 3-19 appears, the configuration is complete.

2) Enter a PIN from my Access Point

Step 1 Click the **Add QSS Profile** icon on the screen as Figure 3-14.

Step 2 Select the desired SSID from the **QSS AP List** (take TP-LINK_Network1 for example) and then tick **PIN/numeric code** on the screen below.

Figure 3-23

Step 3 Choose the **Config Mode** as **Registrar** and enter the PIN of AP (here takes 90377211 for example) into the field beside the **Pin Code** as Figure 3-24 shows. For the detailed instructions of the AP configuration, please refer to the User Guide of the AP. And then click **Next** icon to continue.

Figure 3-24 Registrar Mode

Step 4 Click **Start PIN** on the following screen.

Figure 3-25 Start PIN

Step 5 When Figure 3-19 appears, the configuration is complete.

Note:

The default PIN code of the AP always can be found in its label or User Guide.

3.1.3 Link Information

Click the **Link Information** icon of the Utility and you will see the following screen displaying the receiving and transmitting statistical information.

Click the **Link Status** icon , you can view the current linking status of the Adapter as shown in the figure below.

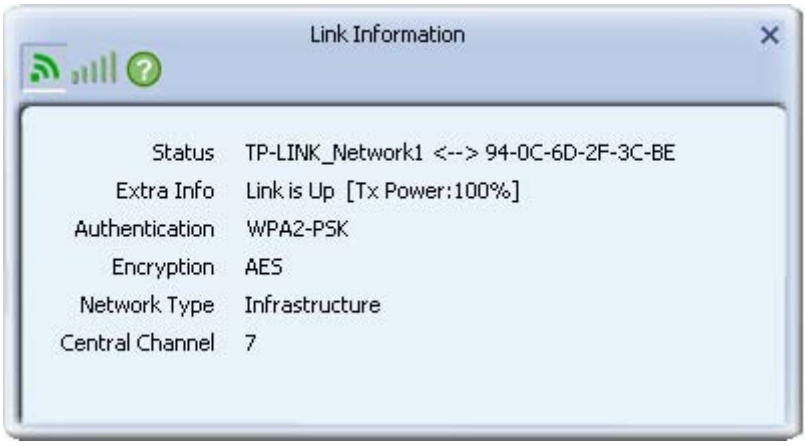

Figure 3-26 Link Status

The following table describes the items found on the Link Status screen.

- **Status -** Current connection status. If no connection, it will show Disconnected. Otherwise, the SSID and BSSID will show here.
- **Extra Info -** Here displays the link status in use.
- **Authentication -** Shows the authentication mode in use.
- **Encrtption -** The encryption type in use is displayed here.

- **Network Type -** The type of network and the station currently connected are shown here. The options include:
  - Infrastructure (access point)
  - Ad Hoc
- **Central Channel -** The channel of the currently connected AP.

Click the **Throughput** icon , you can view the Link Quality, Signal Strength and Link Speed to see whether the Adapter is working well.

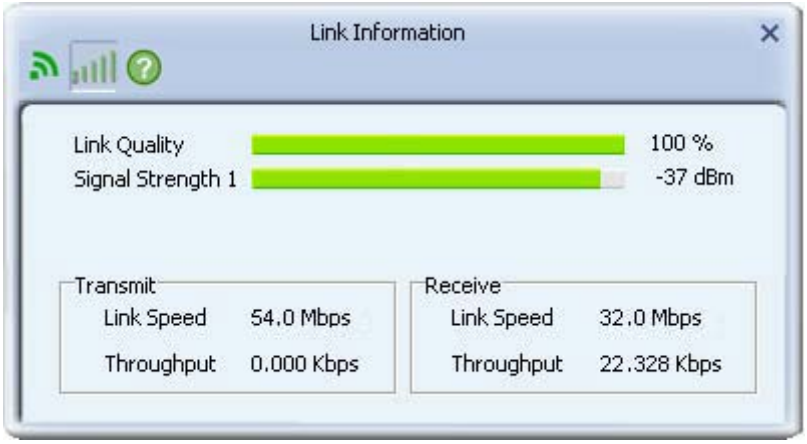

Figure 3-27 Throughput

- **Link Quality -** Displays connection quality based on signal strength and TX/RX packet error rate.
- **Signal Strength -** This shows the strength of the signal.
- **Link Speed -** Shows current transmit rate and receive rate.
- **Throuhput -** Displays transmit and receive throughput in unit of Mbps.

When clicking the **Statistics** icon , you will see the following screens respectively displaying the receiving and transmitting statistical information. Click the **Reset Counter** icon to reset all the counters to zero.

Figure 3-28 Transmit Statistics

- **Transmitted Successfully -** Frames successfully sent.

- **Retransmitted Successfully -** Successfully retransmitted frames numbers.
- **Fail To Receive ACK After All Retries -** Frames failed transmit after hitting retry limit.

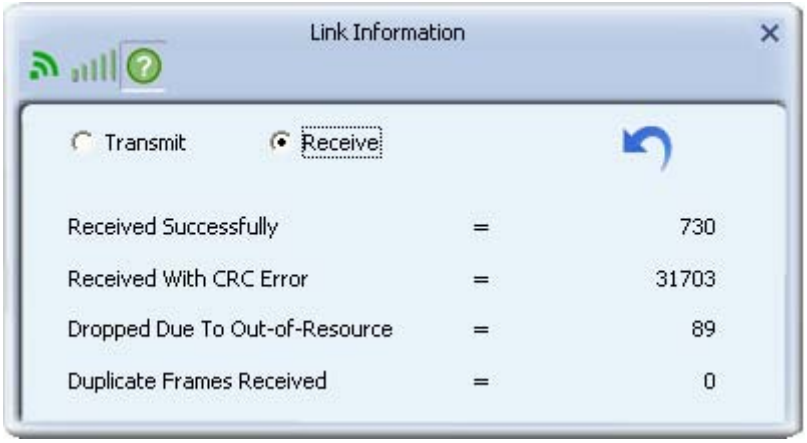

Figure 3-29 Receive Statistics

- **Received Successfully -** The number of frames successfully received.
- **Received With CRC Error -** The number of frames received with a CRC error.
- **Dropped Due To Out-of-Resource -** The number of frames dropped due to a resource issue.
- **Duplicate Frames Received -** The number of duplicate frames received.

3.1.4 Advanced

Click the **Advanced** icon of the Utility and then you can choose the wireless mode on the following screen.

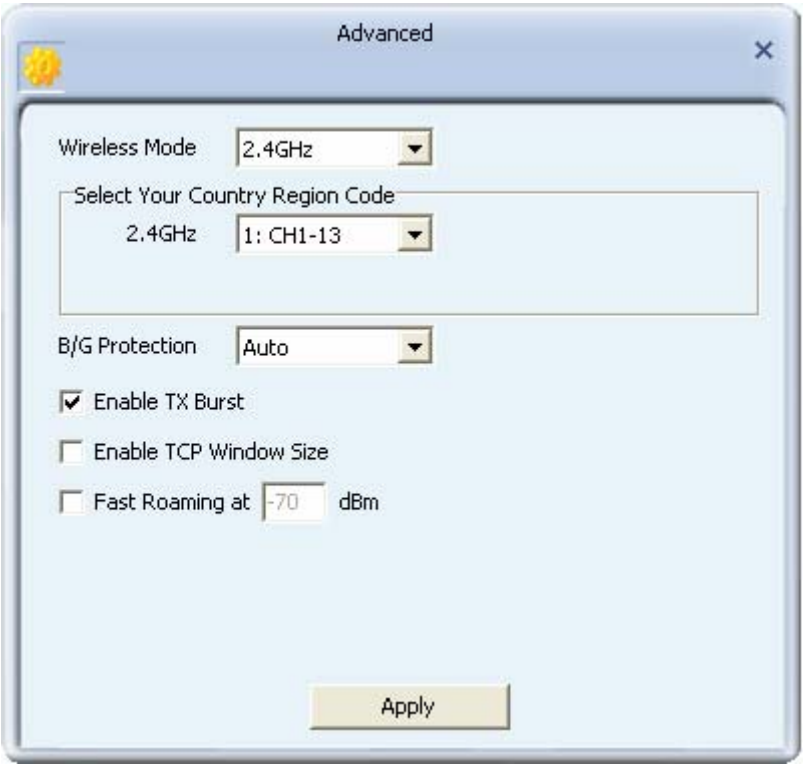

Figure 3-30 Advanced

- **Wireless Mode -** Specifies 2.4 GHz 54 Mbps or 2.4 GHz 11 Mbps operation in an access point network. The Wireless adapter must match the wireless mode of the access point with which it associates.
- **Enable TX Burst -** It can translate more data when it is enabled.
- **Enable TCP Window Size -** It can enhance the TCP throughput when it is enabled.
- **Fast Roaming at -** Roaming will disable when Transmit Power is below some dBm if the function is selected.
- **Apply -** Click the Apply button to save the current setting.

3.1.5 About

Click the **About** icon on the Utility screen and you will see the following screen displaying the wireless card and driver version information.

Figure 3-31 About

- **Version -** The version of the following items.
- **Utility Date -** The creation date of this utility.
- **Driver Date -** The creation date of the wireless network adapter driver.
- **SDK Date –** The creation date of the SDK.
- **Firmware Version -**The version of the adapter firmware.
- **EEPROM Version -** The version of this EEPROM.
- **MAC Address -** The MAC address of the wireless network adapter.

☞ **Note:**

For more help information, you can go to website of our company.**http://www.tp-link.com**.

3.1.6 An example for application

Suppose you are using an AP, the SSID is TPLINK and it adopts 64-bit encryption with the key 0123456789. To establish a connection with this AP, please follow these steps below:

1. Launch TP-LINK Wireless Utility.

2. Click the **Profile** icon of the utility and click the **Add** button on the screen that appears.
3. The Profile configuration screen will appear, please select SSID TPLINK from the drop-down list. Enter *Test* for the Profile Name, and select *Infrastructure* for the Network Type, then click Next to the next page. Select *WPA-PSK* for the Authentication, *AES* for the Encryption and click Next to continue. Enter *0123456789* for the Key. You can make some advanced settings in the following screens or you are recommended to leave the options default if you are not sure about them.
4. Highlight the profile named *Test* on the profile list and click **Active** on the Profile screen. The utility will establish a connection with this AP by configured profile.

3.2 Configure with Windows XP Wireless Zero Configuration

1. Right click the icon on the bottom of the desktop first and you will see Figure 3-32. Click the **Use Zero Configuration as Configuration Utility** option to enable Wireless Zero Configuration function.

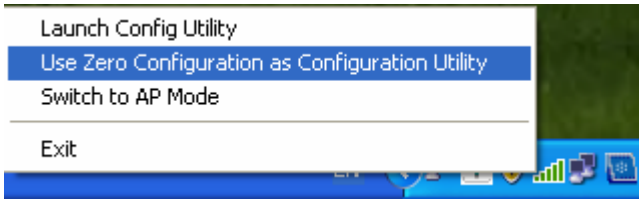

Figure 3-32 Use Zero Configuration as Configuration utility

2. After that, double click the icon , and the following Figure 3-33 will appear with some available wireless network choices. You can highlight a network and then click **Connect** to add to a network.

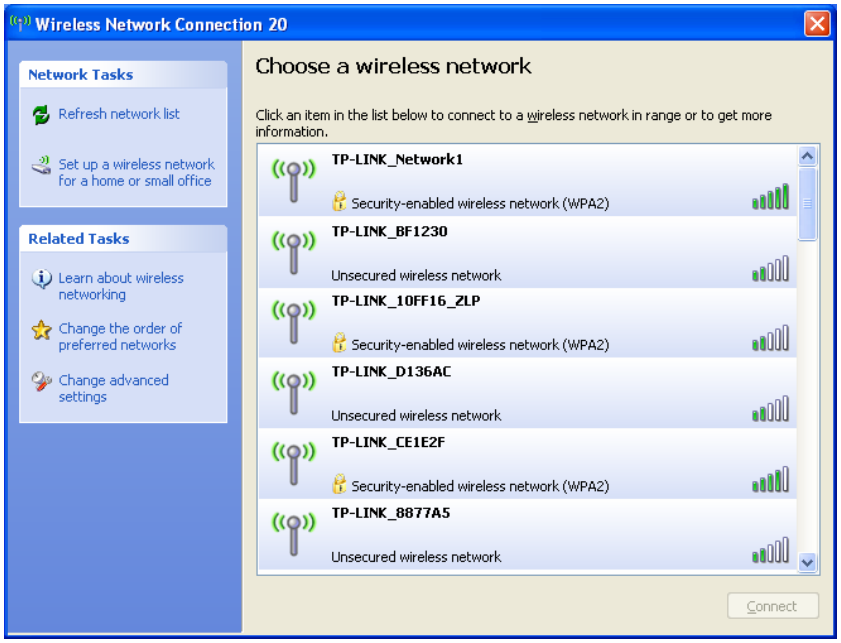

Figure 3-33 Choose a Wireless Network

Note:

If you have not installed SP2 for Windows XP, the screen above will not be available.

3. Enter the key and click **Connect** to continue.

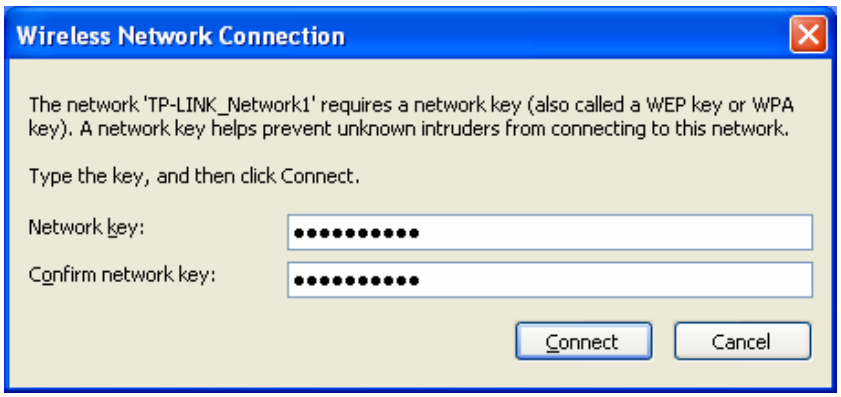

Figure 3-34 Enter Network Key

4. If the connection is finished, you will see the screen as Figure 3-35 shows.

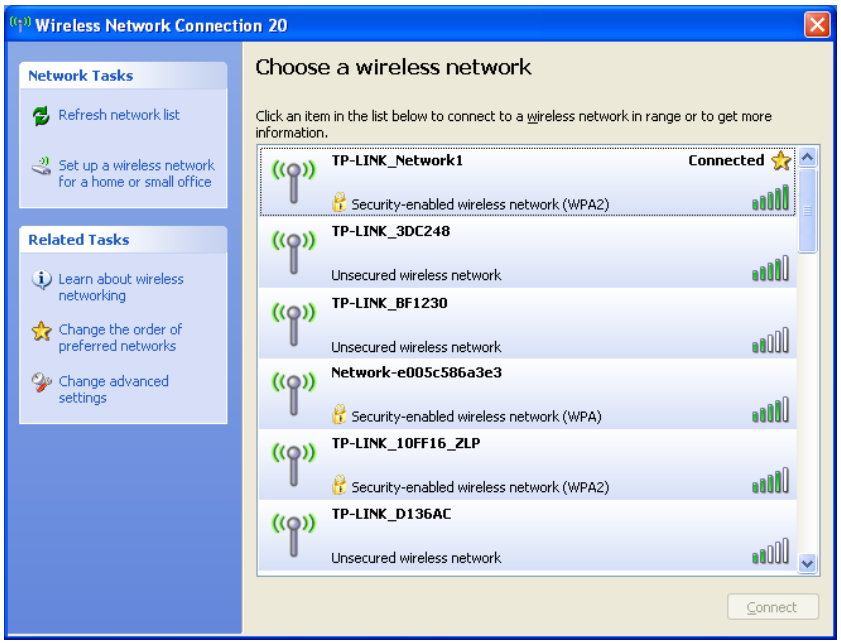

Figure 3-35 Connected

Chapter 4 AP Mode

Right-click the icon to switch to AP Mode. In this mode you can use the TL-WN321G as a soft AP.

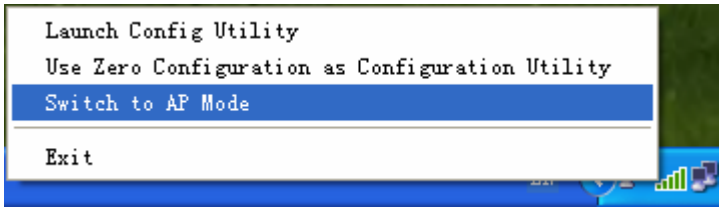

Figure 4-1

Note:

At this time, if your PC have Installed other network card (wireless or wire), you will be prompted "ICS Select WAN Adapter" to select one of them to be "WAN". With this function TL-WN321G can serve as wireless router based on the selected card connecting to the Internet, which will make the APs of the LAN share the Internet.

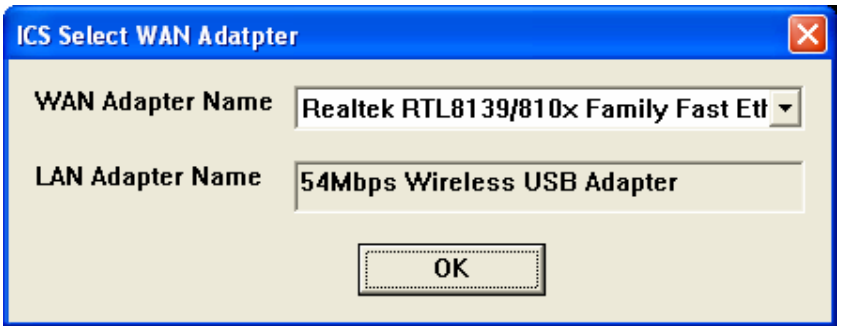

Figure 4-2

The configuration utility screen will then appear as shown in the figure below. By clicking the corresponding icon, you can configure the AP, make some advanced settings and view the AP's status. The tools section shown in the following figure respectively stands for **Config AP**, **Advanced**, **Access Control List**, **Associate List** and **About** from the left to the right .

Figure 4-3

4.1 Config AP

Click the **Config AP** icon to load the following screen and set the AP as you need.

Step 1. Click **Config AP** icon, the following screen will pop up. Click Next to continue.

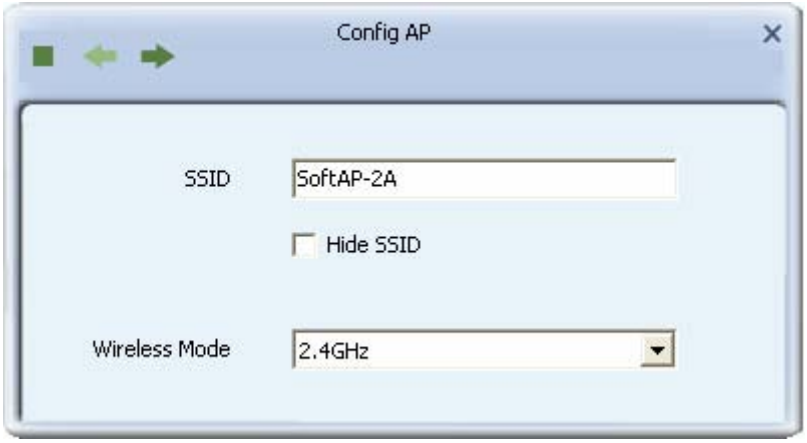

Figure 4-4 Config AP

- **SSID -** Enter the SSID of your soft AP, for example, you can name it My Network instead of the default name SoftAP-2A.

Step 2. Here you can select country region and set the AP's channel.

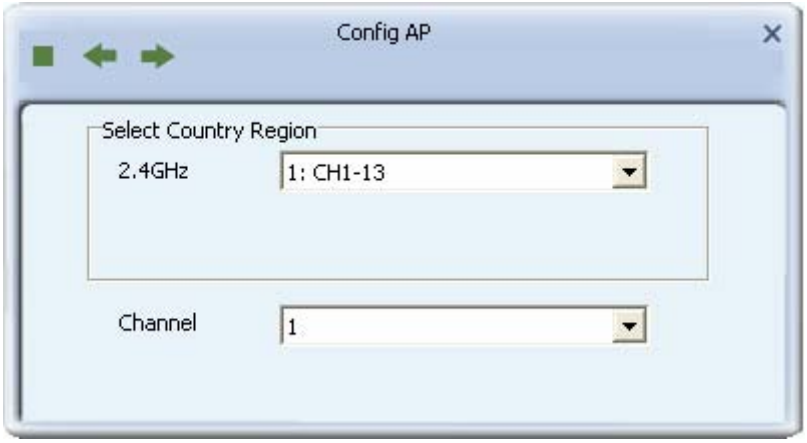

Figure 4-5

- **Channel -** Select the channel from the drop-down list. This field determines which operating frequency will be used.

Step 3. The AP's authentication mode and encryption type can be set in the following figure.

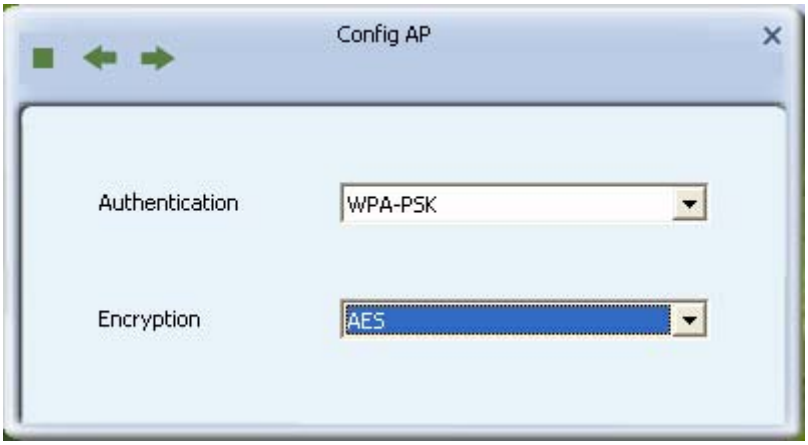

Figure 4-6

Step 4. Enter the Key in the empty field to make your AP security enabled (here takes 123456789 for example). Only by entering the corresponding key can other computers establish a successful connection with your AP.

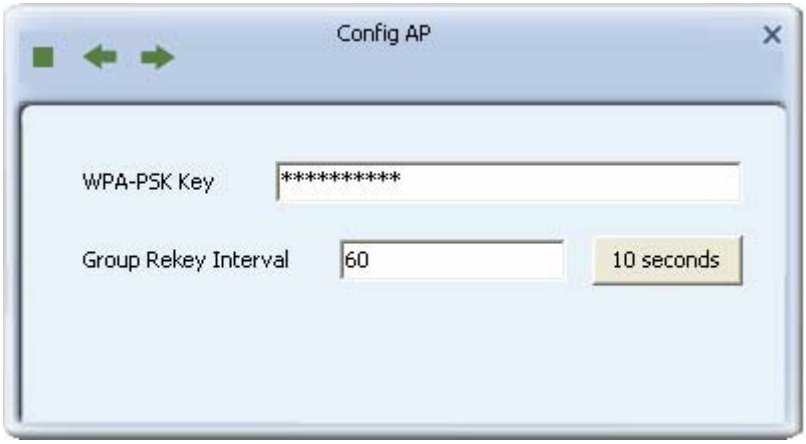

Figure 4-7

4.2 Advanced

Click the **Advanced** icon, the following screen will appear. Here you can make some advanced settings and click **Apply** to make these settings take effect.

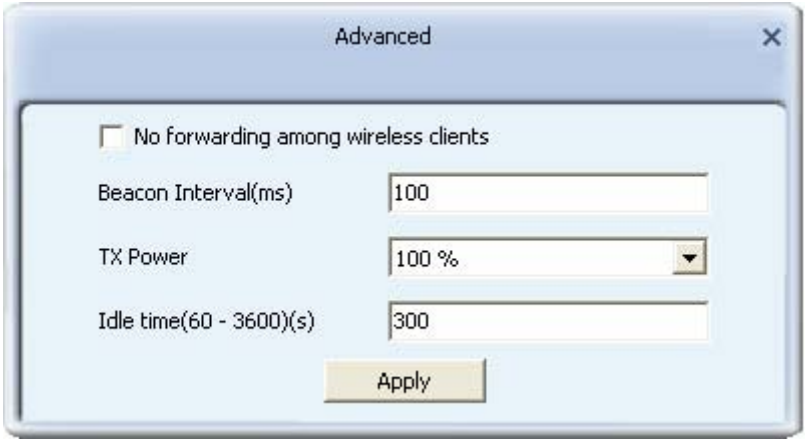

Figure 4-8

- **Beacon Interval(ms)-** Enter a value between 20-1000 milliseconds for Beacon Interval here.

The beacons are the packets sent by the router to synchronize a wireless network. Beacon Interval value determines the time interval of the beacons. The default value is 100.

- **TX Power -** Manually force the AP's transmitting power. System default is 100%.
- **Idle Time -** Manually force the Idle Time using a selected value. The default is 300.

4.3 Access Control List

Click the **Access Control List** icon of the utility and the **Access Control List** screen will appear as Figure 4-9. In this page, you can enable/disable the AP to connect with the specified Mac address. Click **Allow All**, and enter the Mac address allowed to connect to your AP in the empty field beside **MAC Address**, then click to add it to the list, shown in Figure 4-10. Highlight an existing Mac address in the list and click to remove it from the list as shown in Figure 4-11. When clicking , you will clear all the Mac addresses in the Access Control List as Figure 4-12.

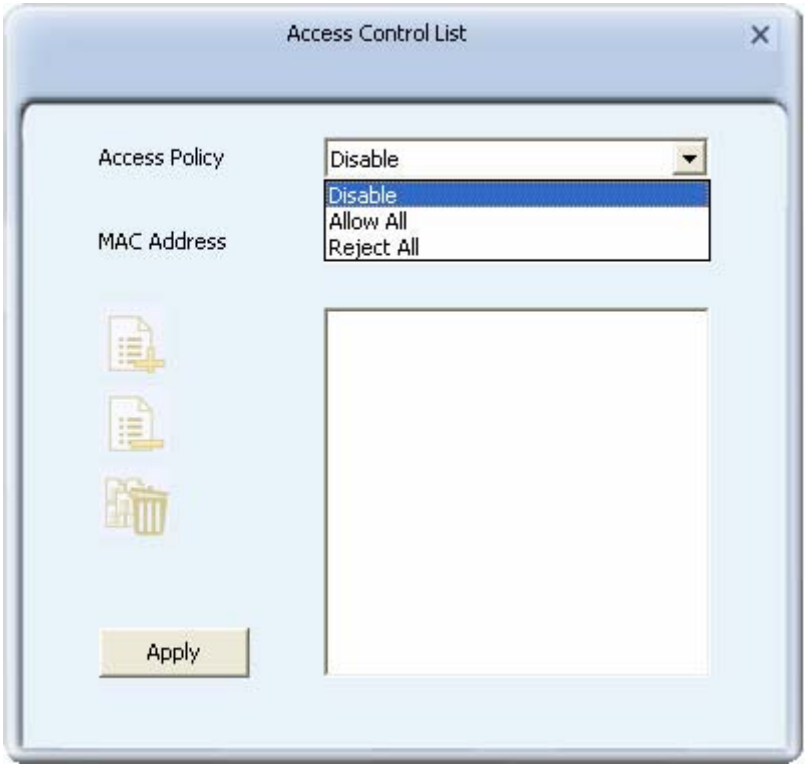

Figure 4-9 Access Control Function

- **Access Policy -** This field allows you to start the function or not. System default is disabled.
  - **Disable -** Disable the Access Policy feature.
  - **Allow All -** Allow all the MAC addresses in the Access List to access the AP.
  - **Reject All -** Disable all the MAC addresses in the Access List to access the AP.
- **Mac Address -** Manually force the Mac address using the function.
- **Apply -** Click to make the settings take effect.

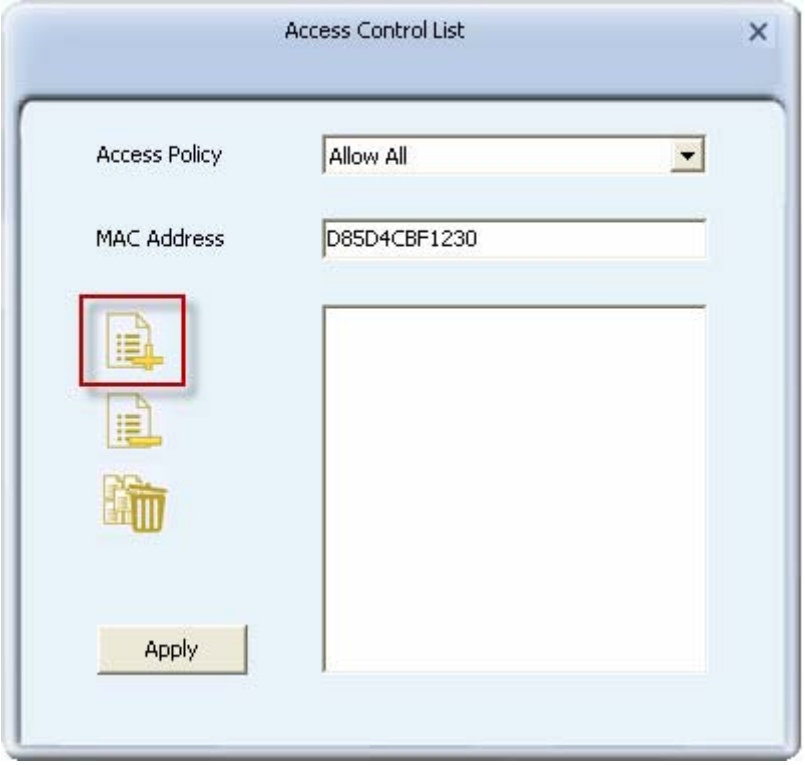

Figure 4-10 Add an Mac Address to the List

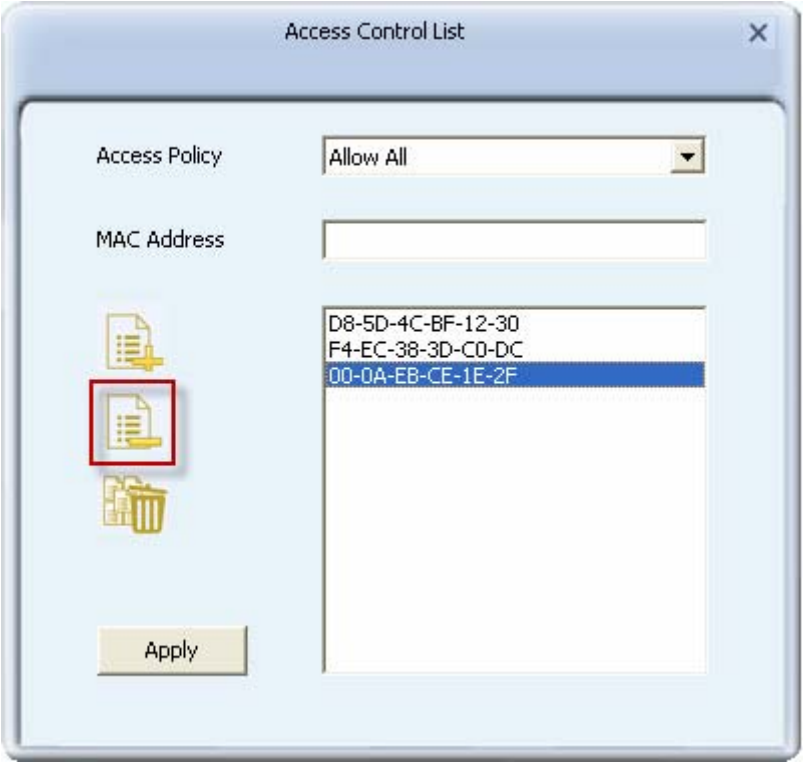

Figure 4-11 Remove an existing Mac Address from the List

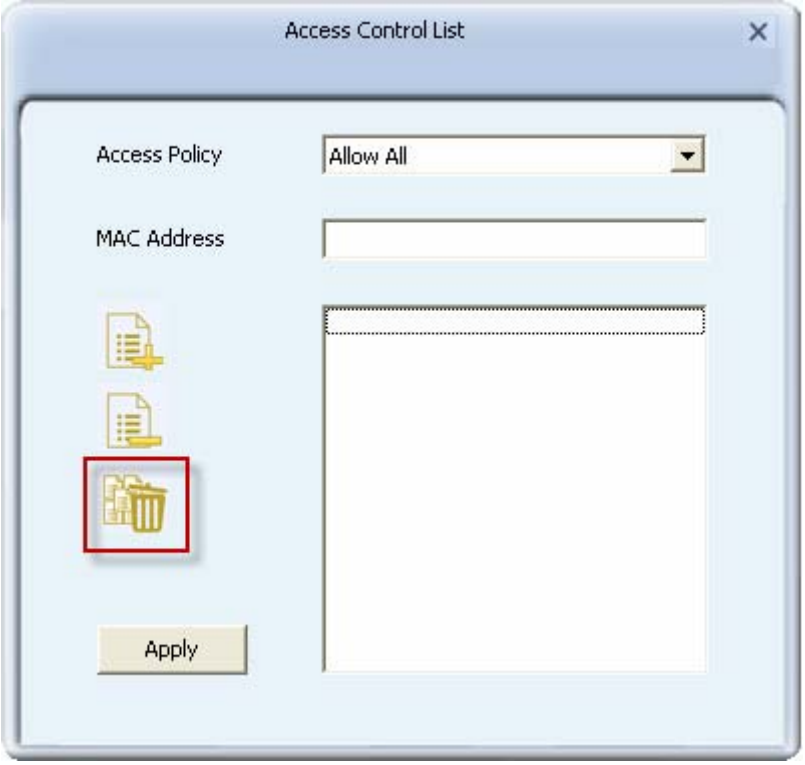

Figure 4-12 Clear All MAC Addresses

4.4 Associate List

Figure 4-13 shows the link status page. It displays detailed station information of current connection.

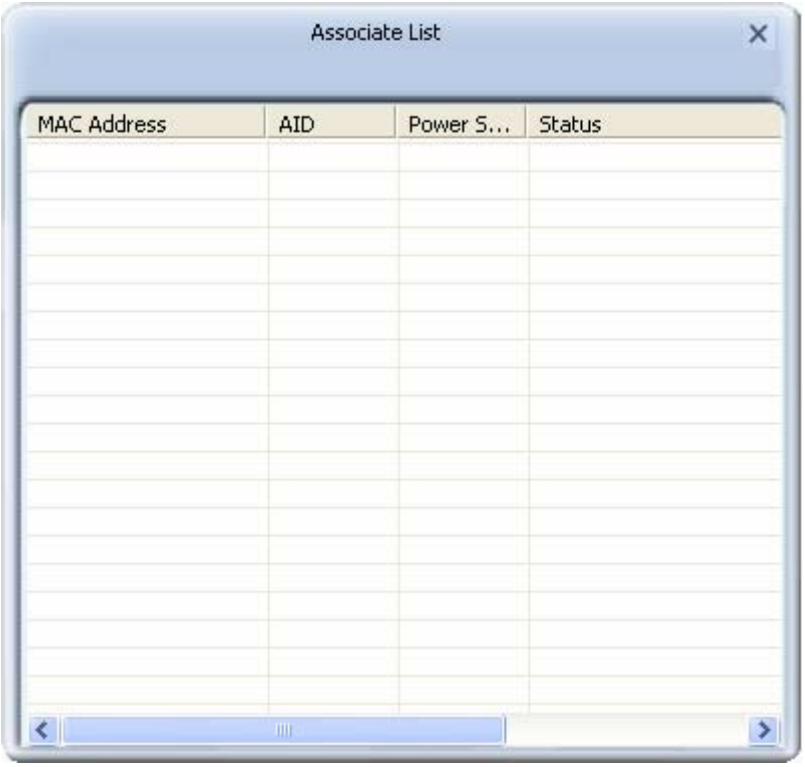

Figure 4-13 Mac Table Function

- **MAC Address -** The station's Mac address of the current connection.
- **AID -** Raise value by current connection.
- **Power Saving Mode -** Support Power Saving Mode on the currently connected station.
- **Status -** The link status of the current connection.

4.5 About

The **About** page displays the wireless card and driver version information as shown in Figure 4-14.

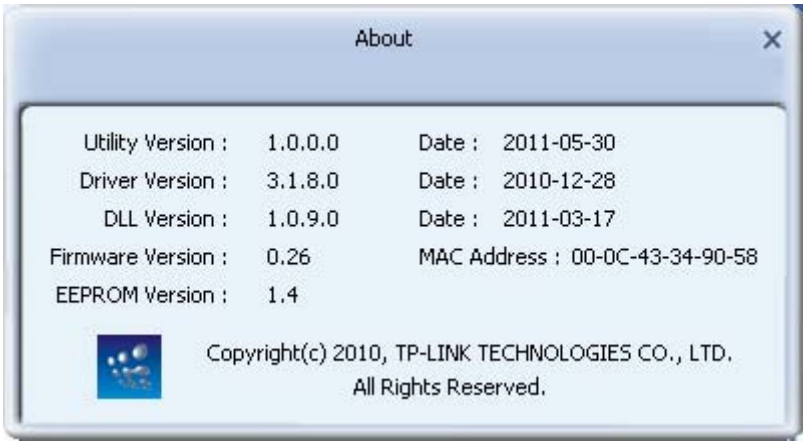

Figure 4-14 About Page

Chapter 5 Example for Application

5.1 Configuration of PSP XLink Online game

Please ensure the software and hardware environments are well established before configuring. For hardware, at least a PC, a TL-WN321G 54Mbps Wireless USB Adapter and a PSP device are needed. For software, the TL-WN321G Adapter driver should be properly installed.

Please operate as follows:

Step 1. Connect the website of X-LINK http://www.teamxlink.co.uk/ to register, and download the latest software of X-LINK Kai.

Step 2. Install the X-LINK Kai software, click **Start > All programs > XLink Kai > Configure Kai**, then set as Figure 5-1.

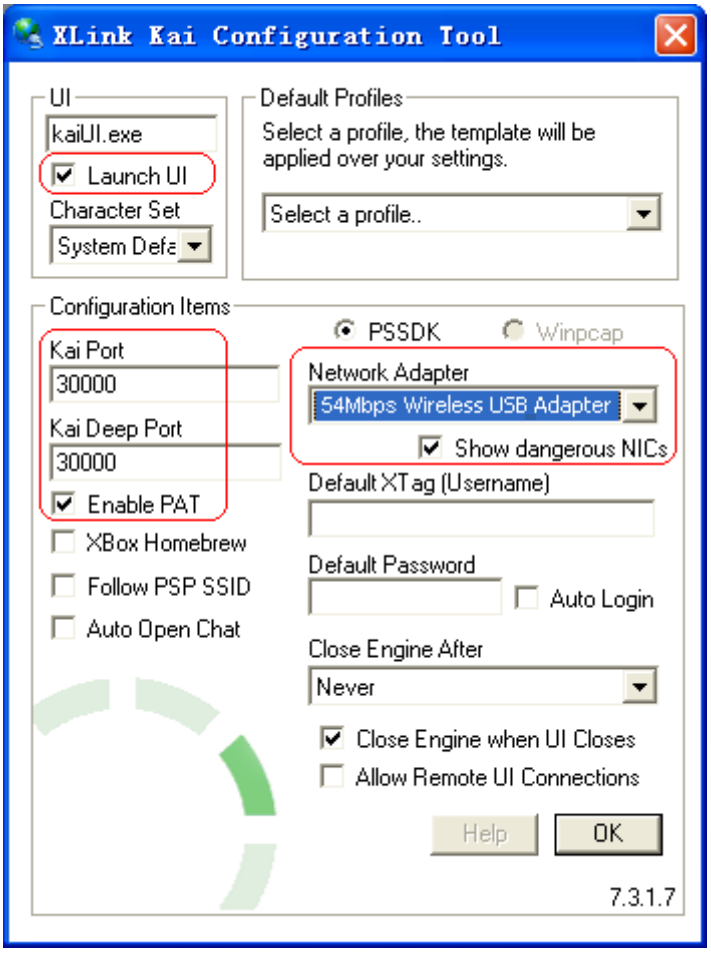

Figure 5-1

Step 3. After completing the settings, please click **Start > All programs > XLink Kai > Start Kai** to connect to XLink Kai.

Step 4. Open the wireless mode of the PSP device, then start an internet game.

Step 5. Right-click "**My Computer**" and select **Management**. In the prompt page, click **Device**

Manager, then right-click “54Mbps Wireless USB Adapter “and select **Properties**. Then set the value of “**PSP Xlink Mode**” as Enable following the red marked instruction in the figure.

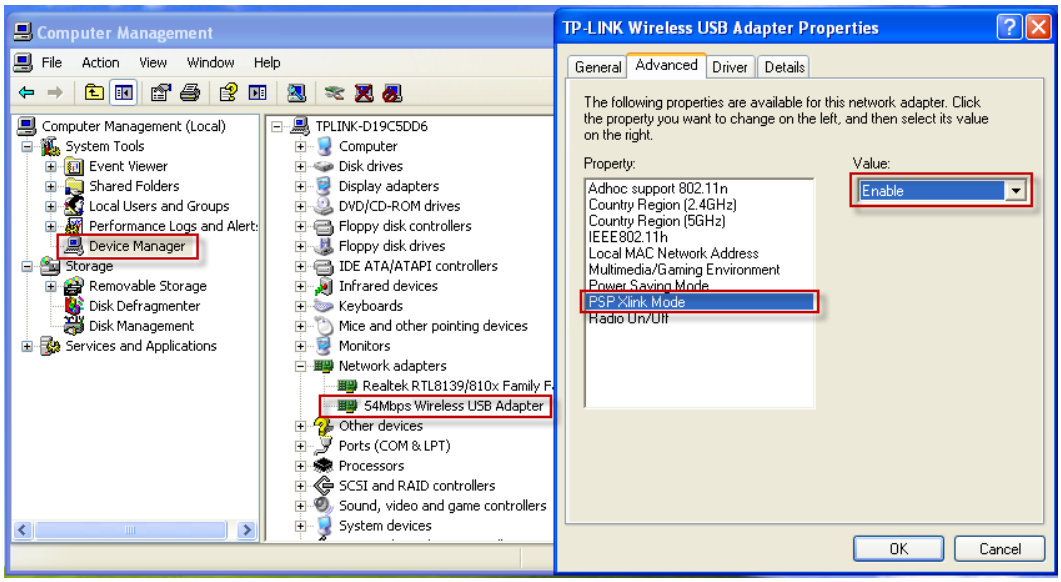

Figure 5-2

Step 6. Click **Start > Control Panel > Network**.

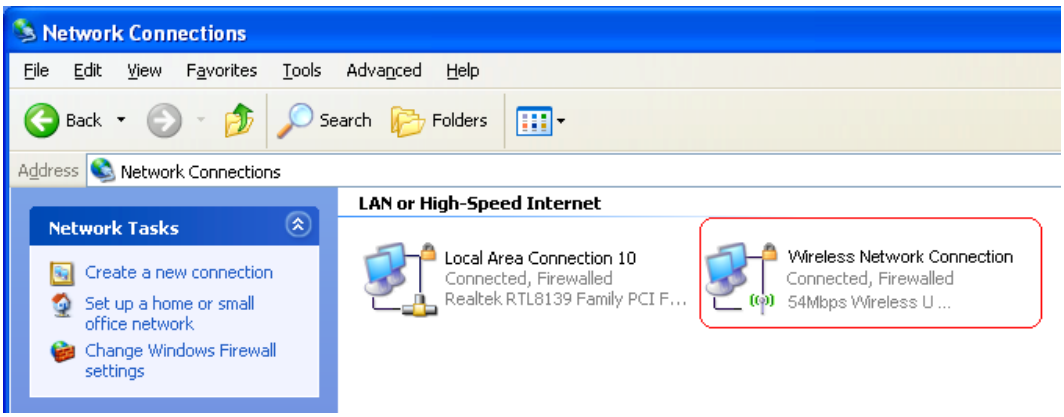

Figure 5-3

Step 7. Right-click **Wireless Network Connection icon** , and select **Properties**. In the following prompt page**,** highlight **Internet Protocol(TCP/IP)** and click **Properties**.

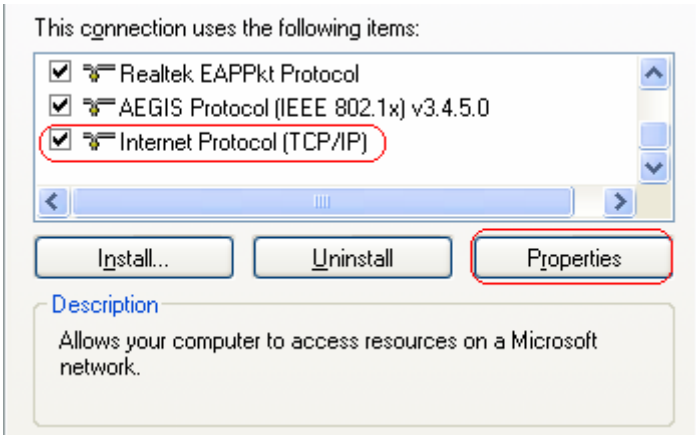

Figure 5-4

Step 8. In the prompt page shown below, select **Use the Following IP Address**, and set the IP and Subnet mask. After completing setting, click **OK**.

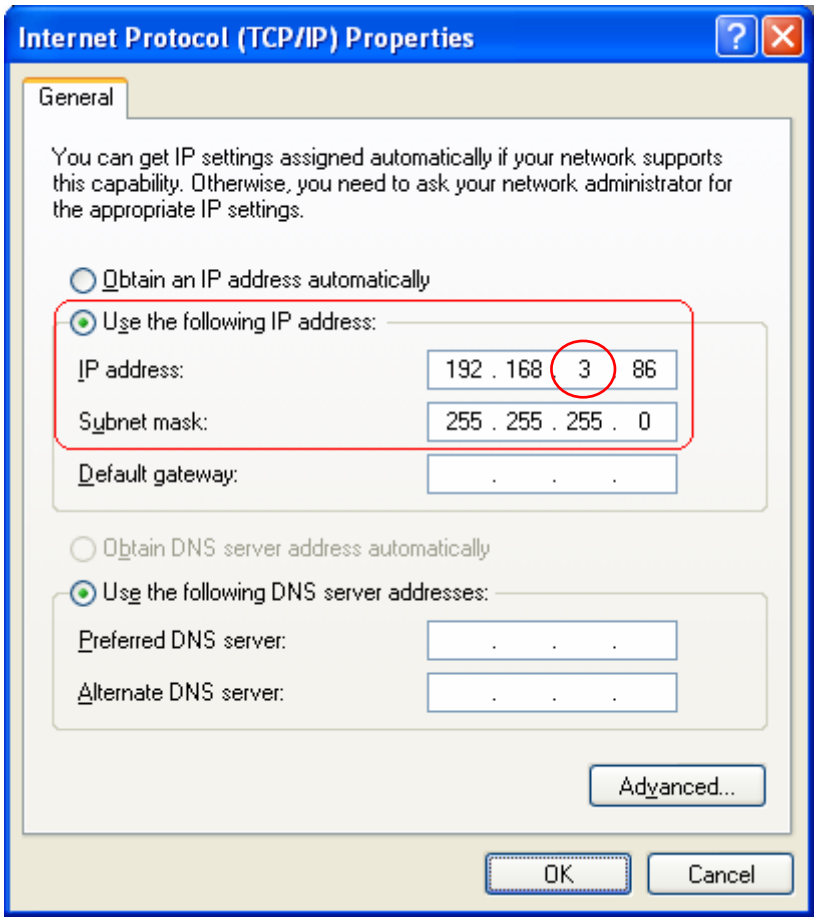

Figure 5-5

☞ **Note:**

Please set the IP address in different network segment with the other network card to avoid conflict.

Step 9. Launch TP-LINK Wireless Utility, then highlight the Network Name (SSID) beginning with “PSP” in the “Network” page, and click **Connect**.

Step 10. Check whether your PSP device is detected in the Diagnostics mode of Kai as Figure 5-6 shown: Click the icon first and then click the folder .

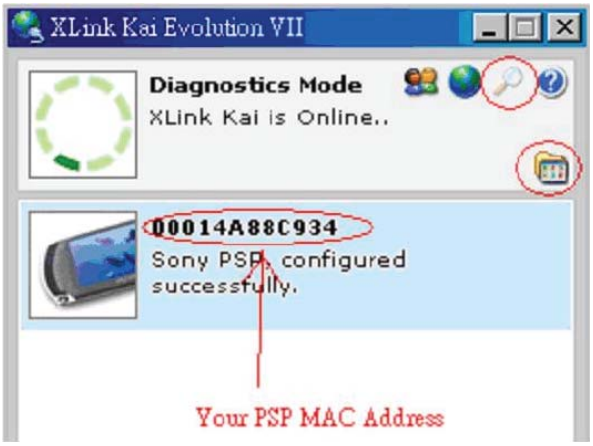

Figure 5-6

Step 11. Click the icon on the right top corner to enter the Arena Mode, highlight the arena of your wanted game, and then join or start a new game.

Figure 5-7

Appendix A: Glossary

802.11b - The 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. 802.11b networks are also referred to as Wi-Fi networks.

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 802.11b 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 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.

DSSS (**D**irect-**S**equence **S**pread **S**pectrum) **-** DSSS generates a redundant bit pattern for all data transmitted. This bit pattern is called a chip (or chipping code). Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the receiver can recover the original data without the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers. However, to an intended receiver (i.e. another wireless LAN endpoint), the DSSS signal is recognized as the only valid signal, and interference is inherently rejected (ignored).

FHSS (**F**requency **H**opping **S**pread **S**pectrum) **-** FHSS continuously changes (hops) the carrier frequency of a conventional carrier several times per second according to a pseudo-random set of channels. Because a fixed frequency is not used, and only the transmitter and receiver know the hop patterns, interception of FHSS is extremely difficult.

Infrastructure Network - An infrastructure network is a group of computers or other devices, each with a wireless adapter, connected as an 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.

Spread Spectrum - Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communications systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. If a receiver is not tuned to the right frequency, a spread-spectrum signal looks like background noise. There are two main alternatives, Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread

Spectrum (FHSS).

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 shared key algorithm, as described in the IEEE 802.11 standard.

Wi-Fi - A trade name for the 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 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.

Appendix B: Specifications

General	
Interface	USB 2.0 Connector
Standards	IEEE 802.11g, IEEE 802.11b
Operating System	Windows XP/ Vista/ 7
Safety & Emission	FCC, CE
Frequency	2.4 ~ 2.4835 GHz
Sensitivity	130M: -68dBm 54M: -68dBm 11M: -85dBm
Spread Spectrum	Direct Sequence Spread Spectrum (DSSS)
Wireless	
Radio Data Rate	Up to 54Mbps
Modulation	11g OFDM , 11b CCK/DSSS
Media Access Protocol	CSMA/CA with ACK
Data Security	WPA, 64/128 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