TP-LINK®

User Guide

TL-WN7200N

150Mbps High Power Wireless USB Adapter

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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.

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DECLARATION OF CONFORMITY

For the following equipment:

Product Description: **150Mbps High Power Wireless USB Adapter**

Model No.: **TL-WN7200N**

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:

Yang Hongliang
Product Manager of International Business

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-WN7200N 150Mbps High Power Wireless USB Adapter

➢ One USB extension cable

➢ One Resource CD for TL-WN7200N 150Mbps High Power 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

Thank you for choosing the TL-WN7200N 150Mbps High Power Wireless USB Adapter.

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-WN7200N 150Mbps High Power Wireless USB Adapter complies with IEEE 802.11n, IEEE 802.11g and IEEE 802.11b standards. It can perfectly interoperate with all the 802.11n/g/b devices. The TL-WN7200N's auto-sensing capability allows high packet transfer rate of up to 150Mbps for maximum throughput.

Additionally, the TL-WN7200N 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-WN7200N 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-WN7200N 150Mbps High Power Wireless USB Adapter is the perfect solution for small office and home needs.

1.2   Main Features

➢   Desktop USB Adapter

➢   IEEE 802.11n, IEEE 802.11g, IEEE 802.11b standards

➢   Supports USB 2.0 bus 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 150Mbps

➢   Provides Mini-USB interface

➢   Supports Ad-Hoc and Infrastructure modes

➢   Supports roaming between access points when configured in Infrastructure mode

➢   Eases configuration and provides monitoring information

➢   High transmitting power and high receiving sensitivity

➢   Supports Windows 2000/ XP/ Vista/ 7

➢   External Antenna

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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

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. Because the Adapter gets its power from the host, 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

For Windows 7, the driver will be searched and installed automatically after you finish hardware installation.

For Windows 2000/ XP/ Vista, 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.

The Setup steps for Windows 2000/ XP/ Vista are very similar, so the following installation guide takes Windows XP for example.

2.2.2 Installation Guide

1. Insert the Resource CD into your CD-ROM drive, and open the folder named TL-WN7200N. Double-click **Setup.exe** in the proper folder according to your operating system to start the installation, then the following screen for preparing setup will appear.
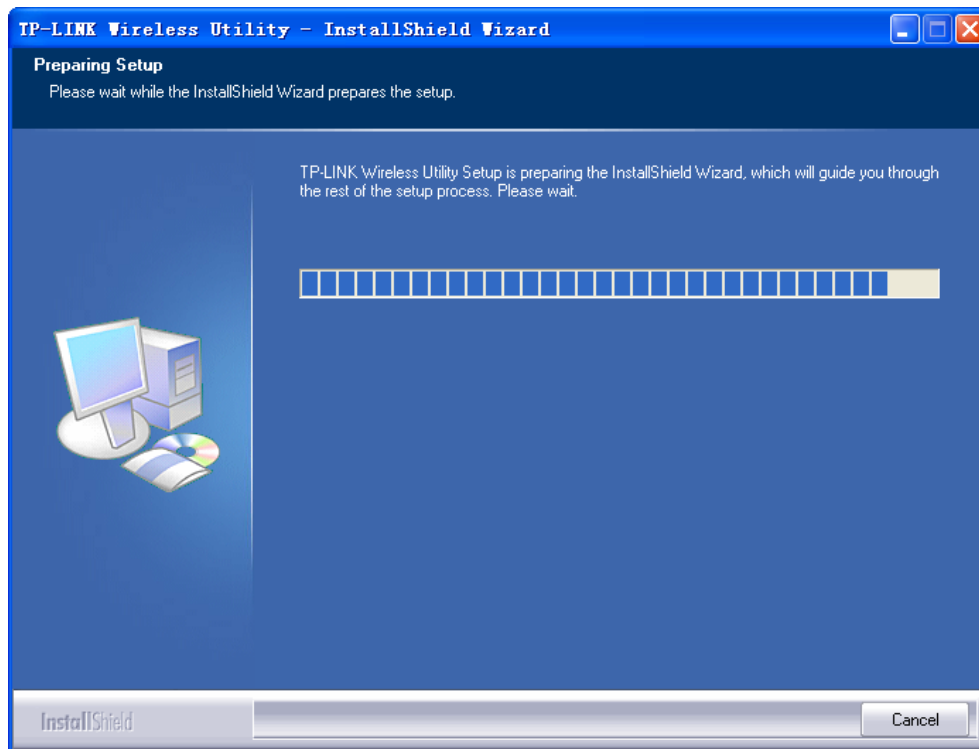
Figure 2-1 Preparing Setup

2. Then you'll see the screen as follow, you can choose what to be installed.
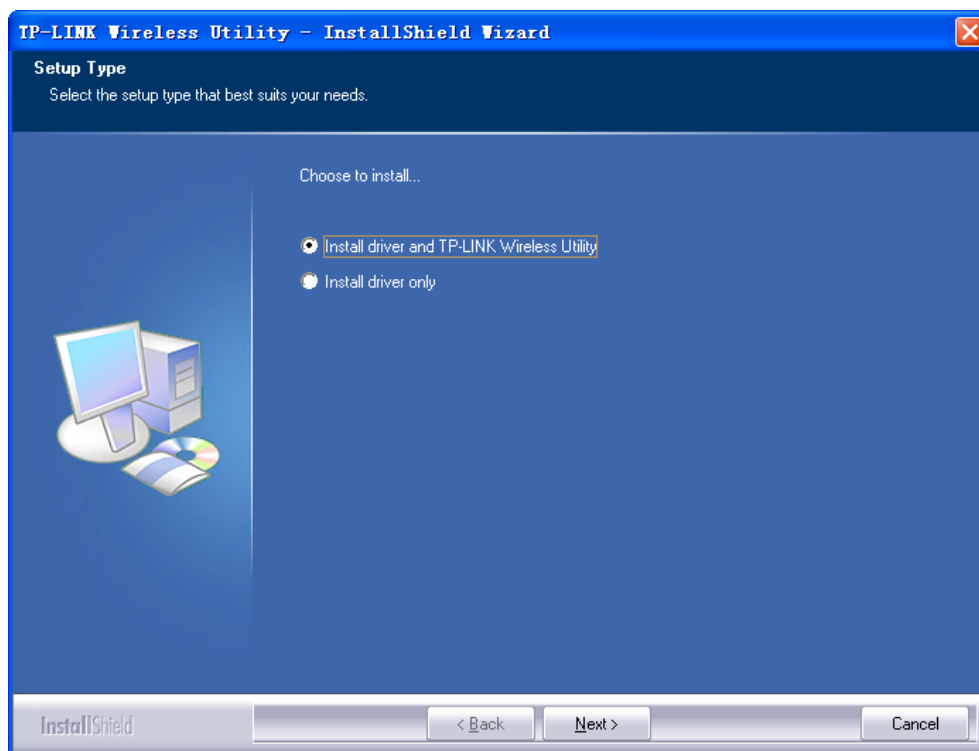

Figure 2-2 Setup Type

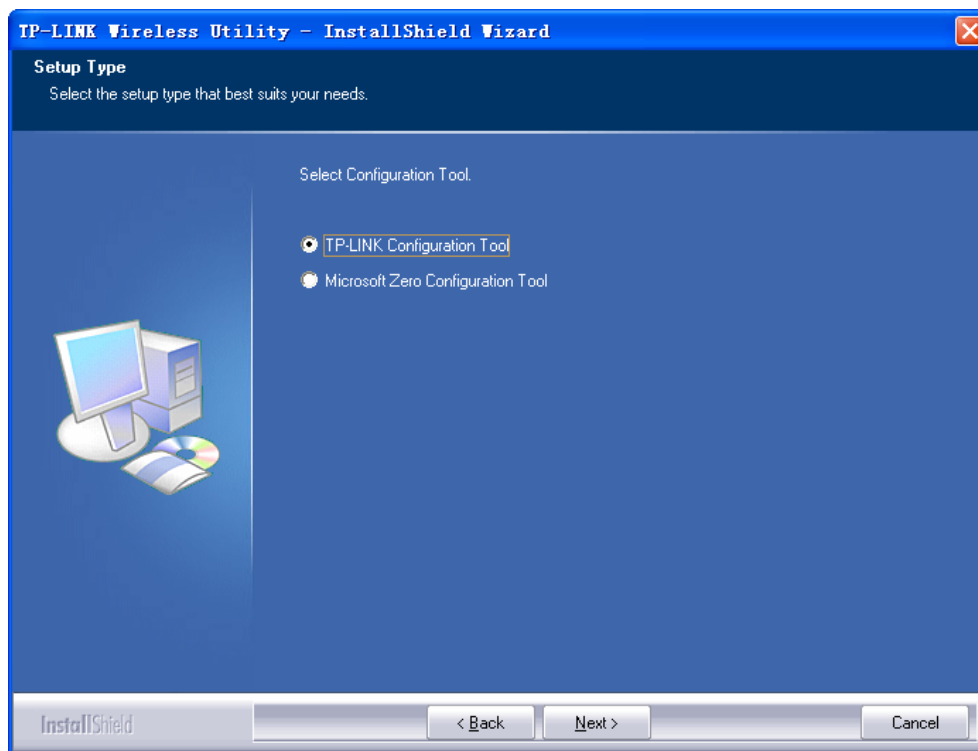3. As next screen, you can select the configuration tool here.

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.
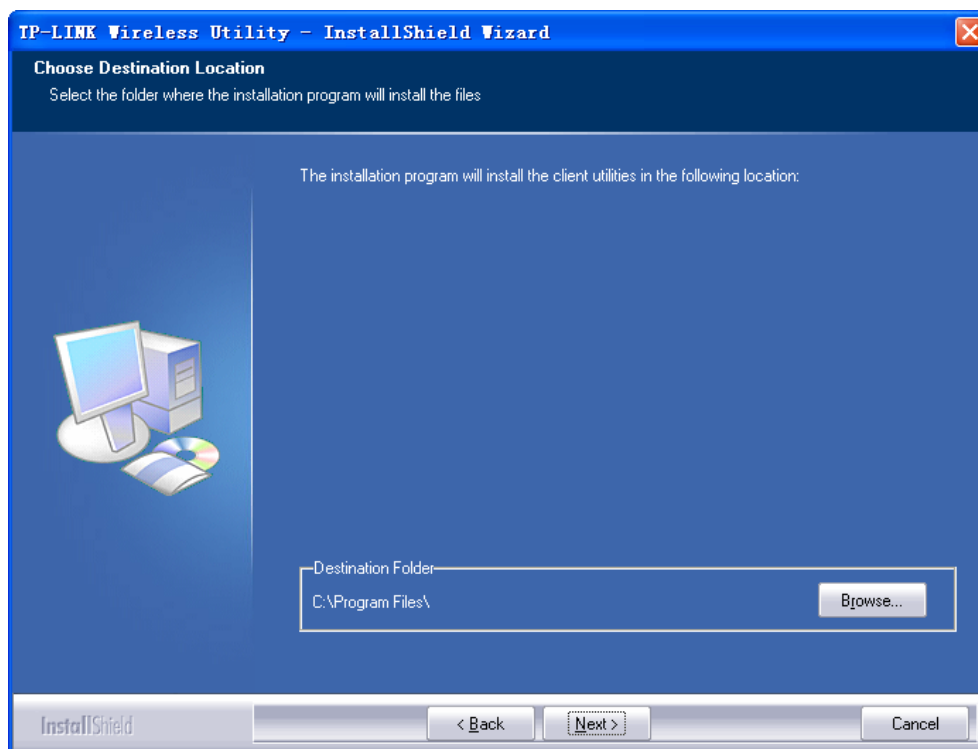
Figure 2-4 Choose Destination Location

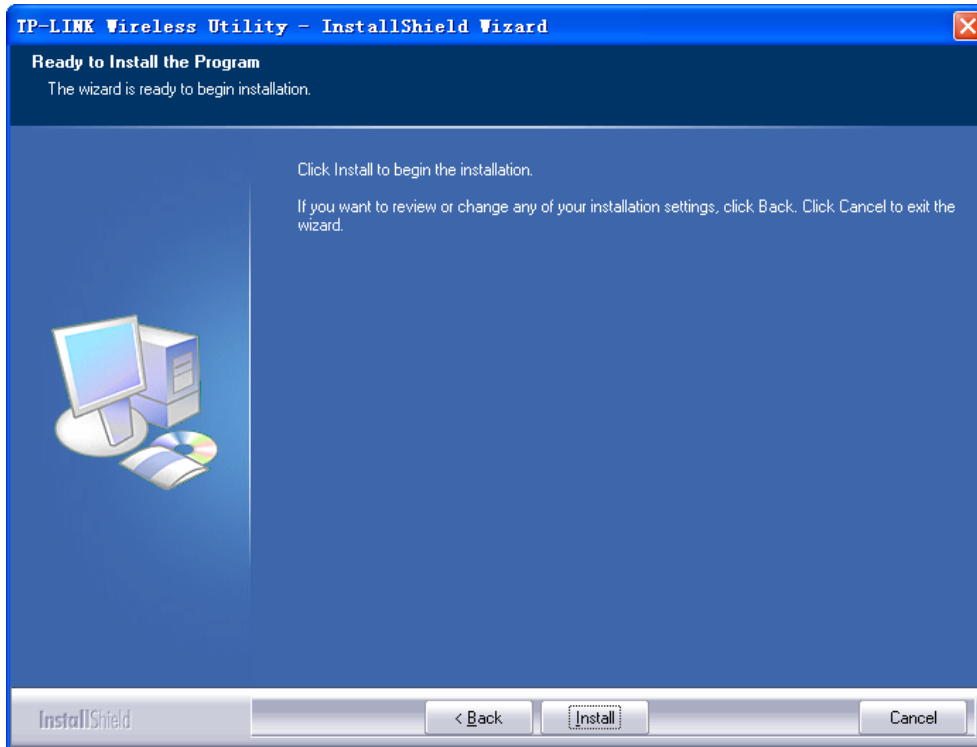5. After that, you will see the next screen as below. Click **Install** to continue.

Figure 2-5 Ready to Install the Program

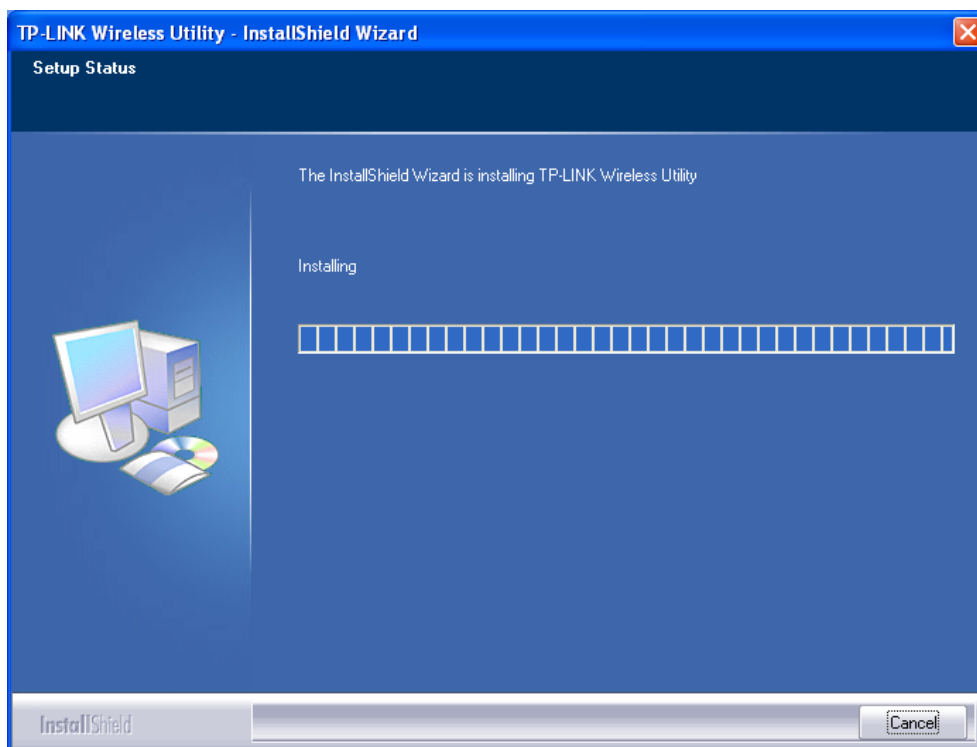6. The following screen for installing will appear.

Figure 2-6 Setup Status

☞ **Note:**

While files are copying, a warning box about Windows Logo testing (shown in Figure 2-7) may pop up, please click **Continue Anyway** to continue the installation for our drivers have been tested thoroughly and are able to work with the operating system.

Figure 2-7 Windows XP Warning Box

7. After the files have been successfully copied, the screen in Figure 2-8 will appear. Click the **Finish** button to finish the wizard.
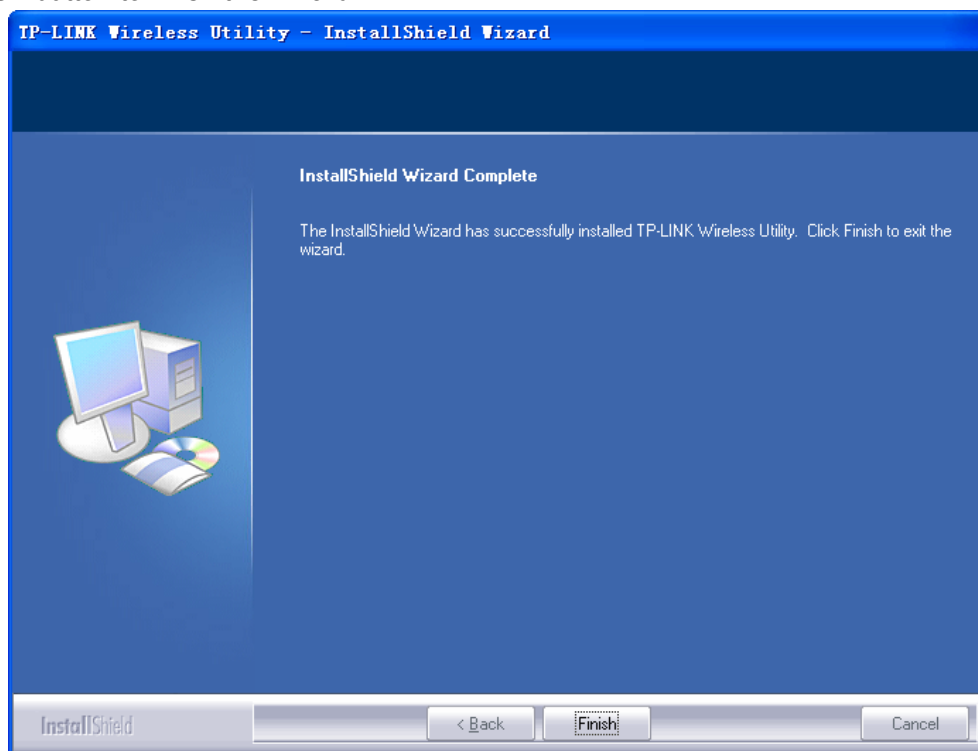

Figure 2-8　InstallShield Wizard Complete

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

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2.3 Uninstall Software

2.3.1 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 **TP-LINK 150Mbps Wireless Lite N Adapter**.
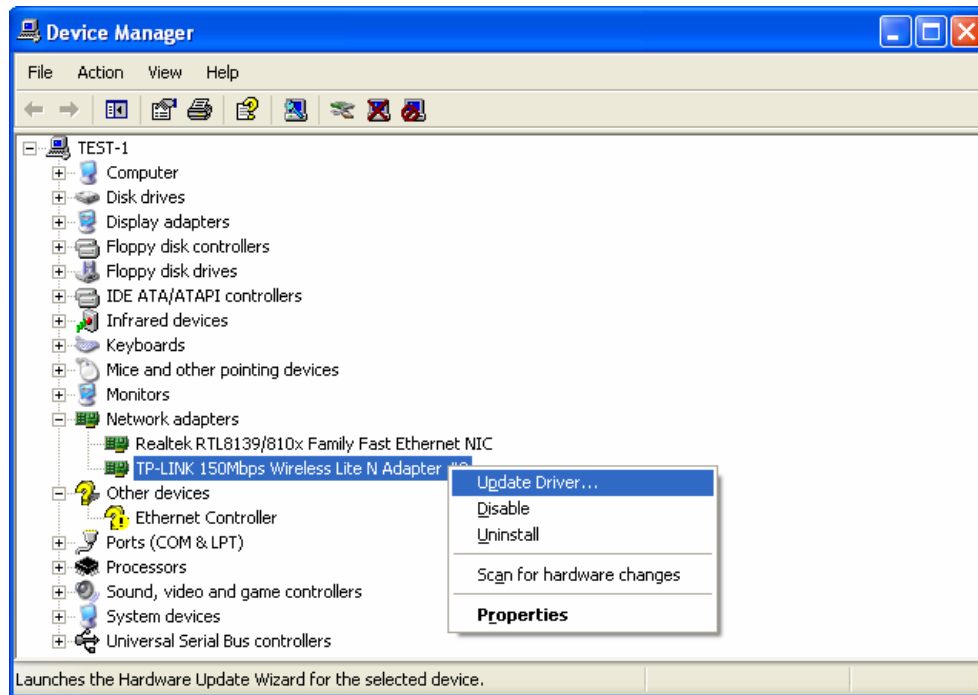

Figure 2-9 Device Manager

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

2.3.2 Uninstall the utility software from your PC

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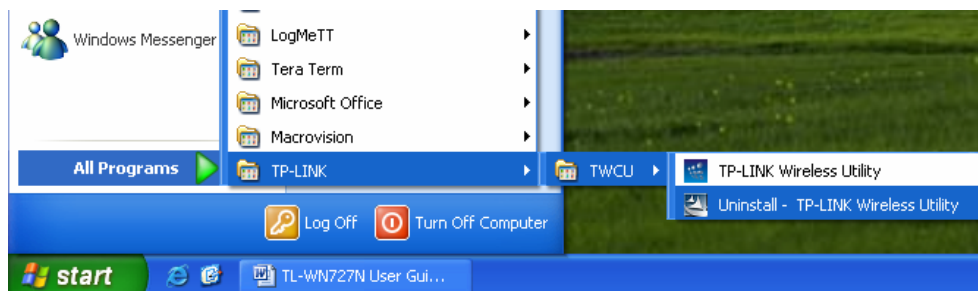

Figure 2-10 Uninstall the utility

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

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Chapter 3   Configuration

3.1   Configuration of Utility

TL-WN7200N Wireless USB Adapter can be configured by its utility for Windows 2000/ XP/ Vista. 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 2000/ XP/ Vista are similar. For the configurations in Windows 2000/ Vista, 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**> **TWCU**> **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.

Double-click the 📶 icon and the configuration screen of the utility will appear. You can also run the utility by clicking: **Start**> **All programs**> **TP-LINK**> **TWCU**> **TP-LINK Wireless Utility**. The utility provides a 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).

If you want to use Windows XP to configure wireless network settings, 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 Profile

Click the **Profile** tab of the utility and the **Profile** screen will appear as Figure 3-1. The **Profile** screen provides tools to:

➢   Add a Profile
➢   Edit a profile
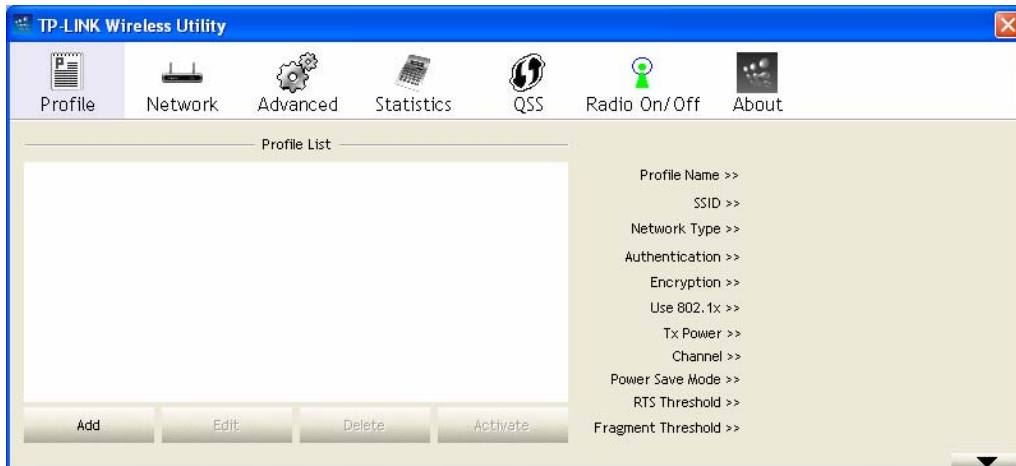➢   Delete a profile
➢   Activate a profile

Figure 3-1 Profile Tab

1. **To Add a new profile:** Click the **Add** button on the Profile tab, the **Profile** configuration screen will appear as shown in Figure 3-2. Enter the **Profile Name** and choose the **SSID** from the pull-down list, then click **OK** to add it.
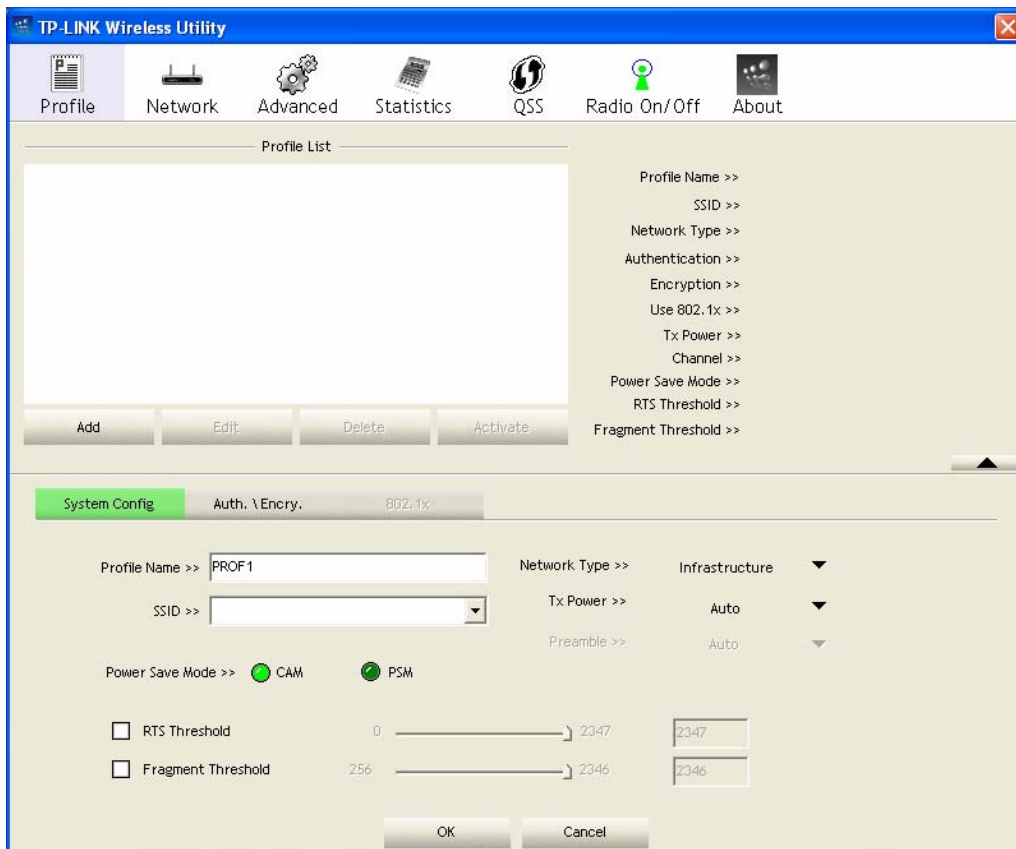

Figure 3-2 Add a new profile

➢ **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.

➢ **RTS Threshold -** Here you can specify the RTS (Request to Send) Threshold. The default value is 2347.

➢ **Fragmentation Threshold -** This value is the maximum size determining whether packets

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will be fragmented. Setting the Fragmentation Threshold too low may result in poor network performance since excessive packages. 2346 is the default setting and is recommended.

2. **To edit a profile:** Highlight the desired profile name on **Profile List,** and click the **Edit** button, the **Profile** configuration screen will appear shown in Figure 3-3.
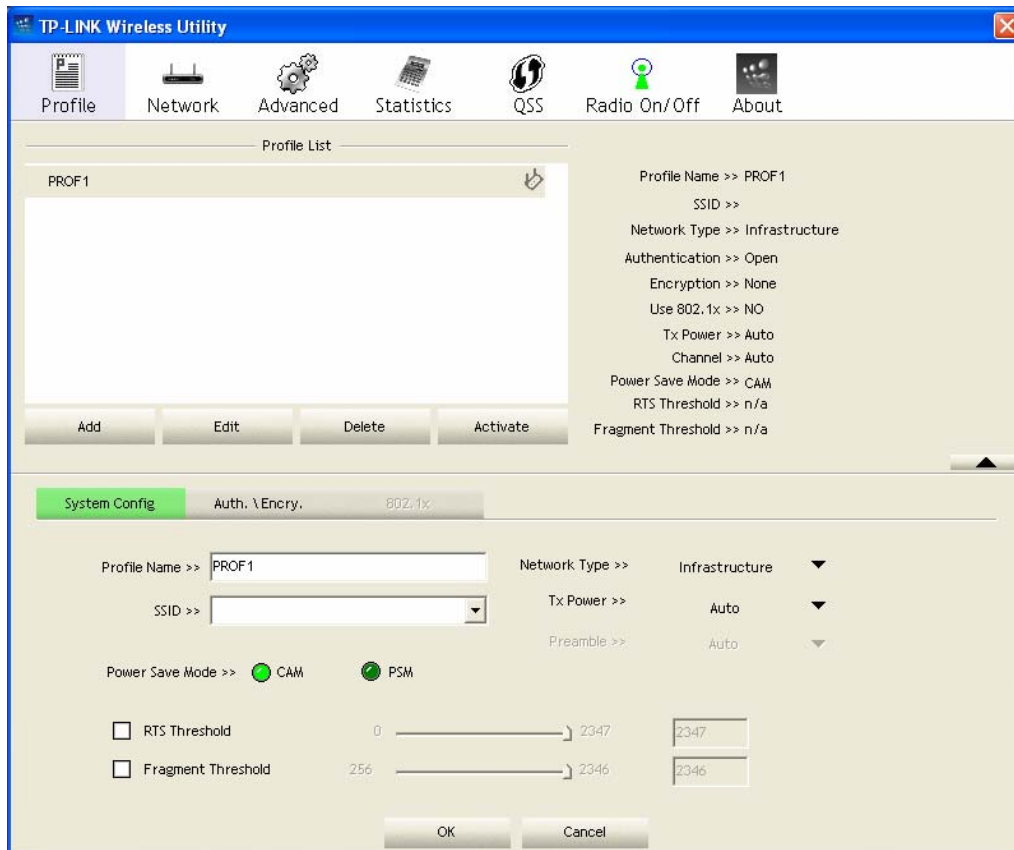

Figure 3-3 Edit a Profile-System Configuration

➢ **System Config:** Here you can change the **Profile Name** and **SSID.**

➢ **Auth.\Encry.:** Click the **Auth.\Encry.,** you can skip to the following screen.
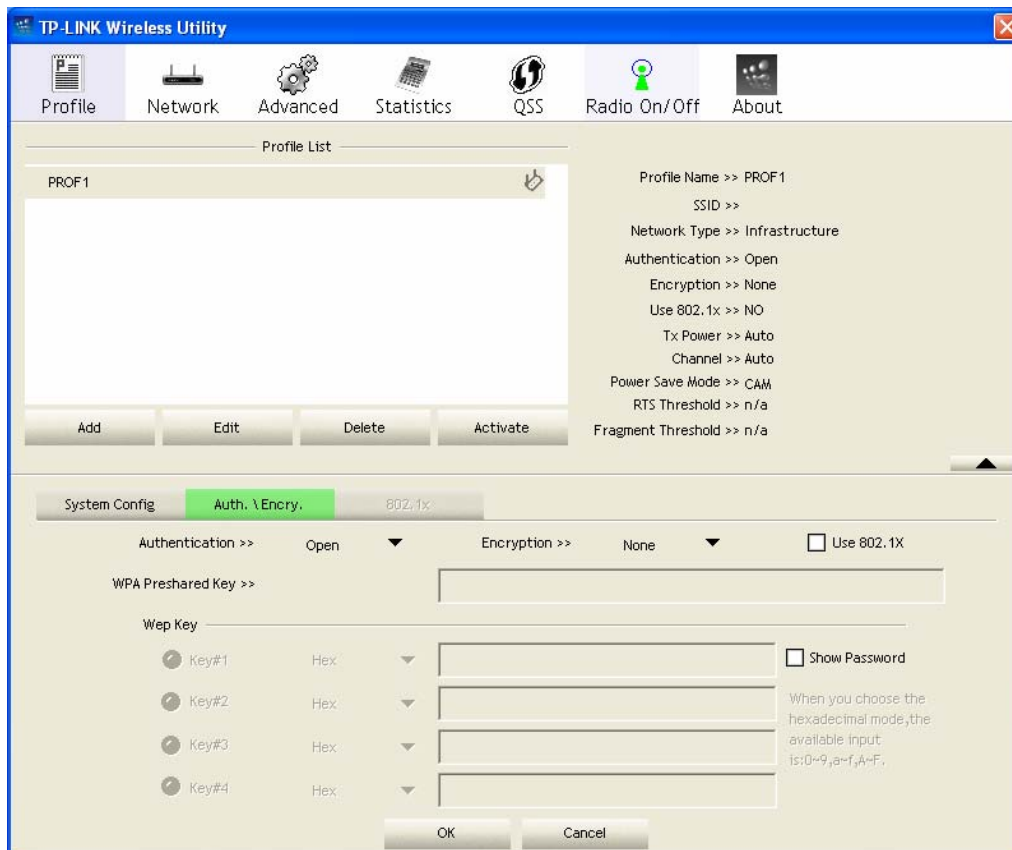
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Figure 3-4 Edit a Profile-Auth.\Encry.

➢ **Authentication –** You can choose the **Authentication** Type from the pull-down list with three options, **Open System**, **Shared-Key System** or **LEAP.**

➢ **802.1x –** It enables when Authentication Type is setting to WPA.

➢ **Encryption –** Displays which encryption type that the driver is using. When you select **Open System**, **Shared-Key System** as **Network Authentication,** there are two options: **WEP** and **Disabled**. If you select **WPA-PSK** as **Network Authentication,** there are **TKIP** and **AES** options instead of **WEP** and **Disabled.**

➢ **Wep Key –** Key #1, Key #2, Key #3, Key #4, the Key groups. You can enter 10 hexadecimal digits (any combination of 0-9, a-f, A-F) or 5 ASCII characters for 64-bit (also called 40bits) encryption. You can enter 26 hexadecimal digits (any combination of 0-9, a-f, A-F) or 13 ASCII characters for 128-bit (also called 104bits) encryption.

3. **To delete a profile:** Highlight the desired profile name on **Profile List**, and click the **Delete** button.

4. **To switch to another profile:** Highlight the desired profile name on **Profile List,** and click the **Activate** button.

3.1.2 Network

Click the **Network** tab of the Utility and the **Network** screen with many available wireless network
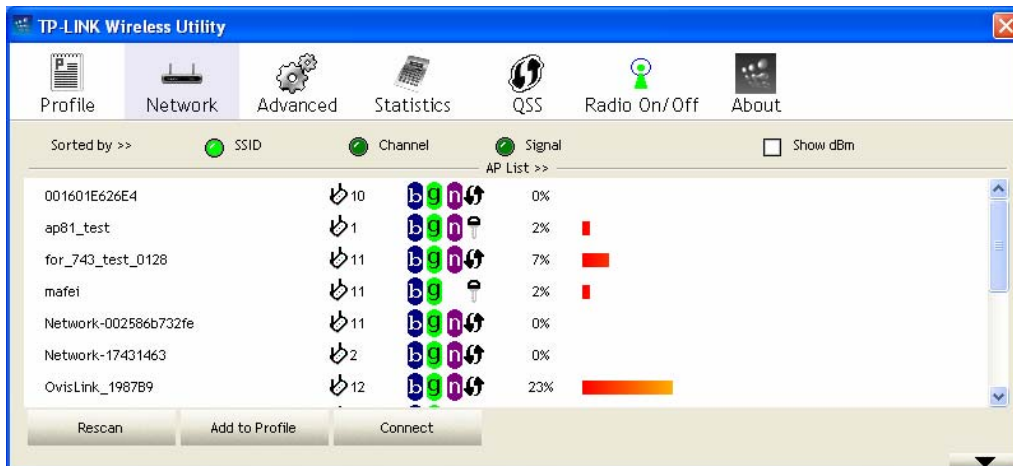
choices will appear as Figure 3-5.

Figure 3-5 Network tab

➢ **Rescan:** Click the **Rescan** button to refresh the list at any time.

➢ **Add to Profile:** Highlight an SSID and click the **Add to Profile** button to add the network to the profile. The continued steps are similar to add a new profile, please refer to the 3.1.1 Profile: **To Add a new profile**.

➢ **Connect:** Highlight an SSID and double-click or click the **Connect** button to connect to an available network without adding it to the profile.

3.1.3 Advanced

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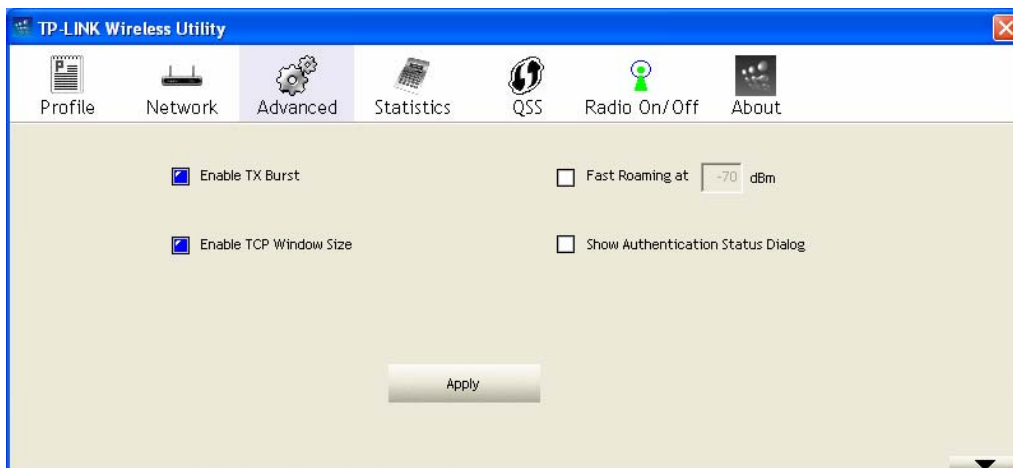

Figure 3-6 Advanced

➢ **Enable TX Burst -** It can translate more data when it enable.

➢ **Fast Roaming at –** Roaming will disable when Transmit Power is below some dBm if the function is selected.

➢ **Show Authentication Status Dialog-** Click the checkbox to show the Authentication Status Dialog.

➢ **Apply -** Click the Apply button to save the current setting.

3.1.4 Statistics

Click the **Statistics** tab of the Utility and you will see the following screen displaying the receiving and transmitting statistical information. Click the **Reset Counter** button to reset the count of the statistics information.

Figure 3-7 Statistics tab

3.1.5 QSS

Click the **QSS** tab of the Utility and you can configure the QSS function to joint an existing network quickly in the following screen.
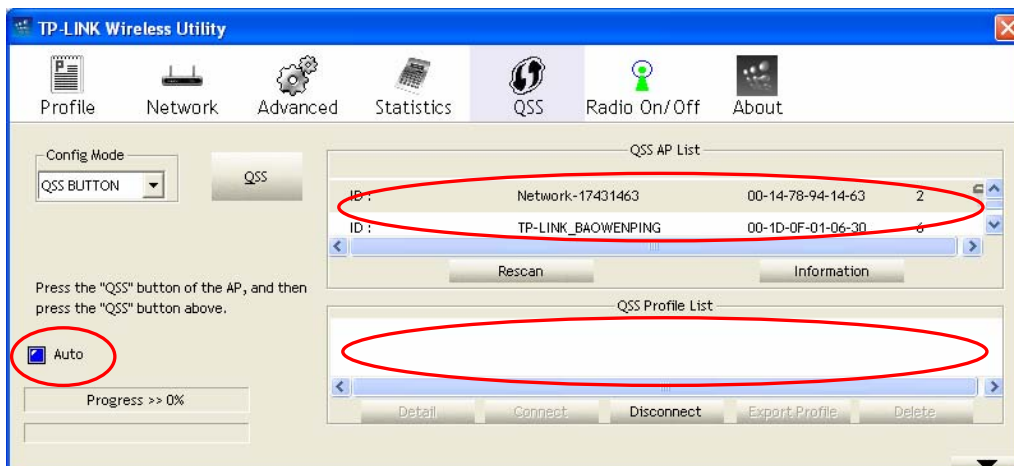

Figure 3-8 QSS tab

➢ The QSS connection will be automatically displayed on the **QSS Profile List**. Pitch on the Profile and click **Export Profile** to add a Profile to the Profile List (Section 3.1.1).

➢ The **Auto** function is default to enable that the adapter will automatically try to build the connection with the Access Point devices shown in the **QSS AP List** one by one.

➢ You can also establish a wireless connection by using either **Push QSS Button** method or **PIN** method. It is recommended that you choose the simplest method that your AP device supports.

☞ **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 QSS Button method.
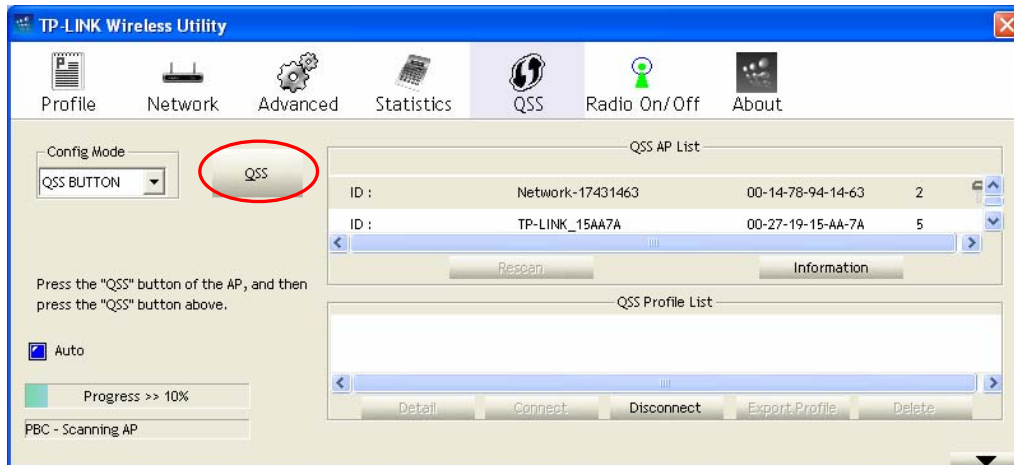

Figure 3-9 QSS- QSS BUTTON mode

Step 1   Click the **QSS** button (marked by the red circle) on the screen as Figure 3-9.

   Or: Press and hold the QSS button on the adapter (shown on the following figure) for 2 or 3 seconds.

Step 2   Press the QSS button on your Access Point device to build the connection.

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:

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1)   Enter a PIN from my Access Point

Choose the **Config Mode** as **Registrar** and enter the PIN of AP into the field under the **Pin Code** as Figure 3-10 shown. And then click **PIN** button to start the wireless connection without doing any configuration for AP.
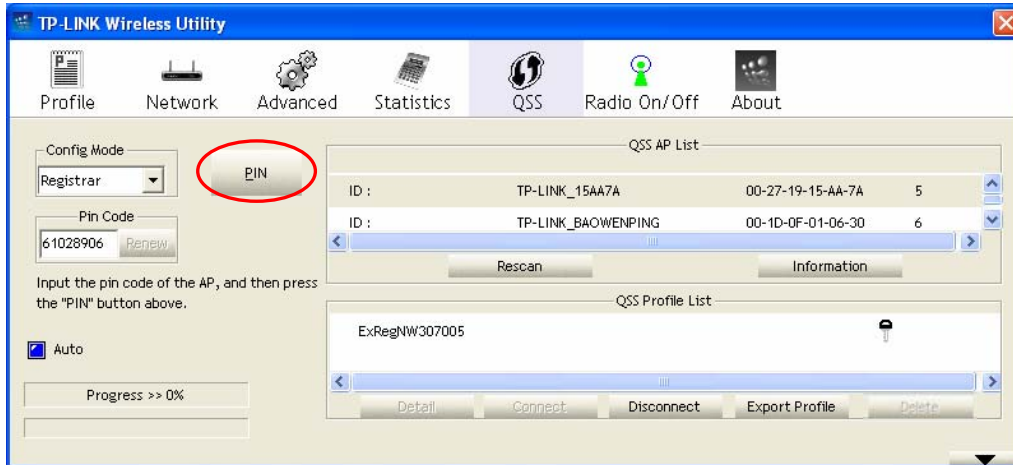

Figure 3-10 QSS - Registrar mode

☞ **Note:QSS**

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

2)   Enter the PIN into my Access Point

Choose the **Config Mode** as **Enrollee** and click the **PIN** button on the screen as Figure 3-11. Meanwhile, enter the PIN code of the adapter into the configuration utility of the AP. For the detailed instructions of the AP configuration, please refer to the User Guide of the AP.
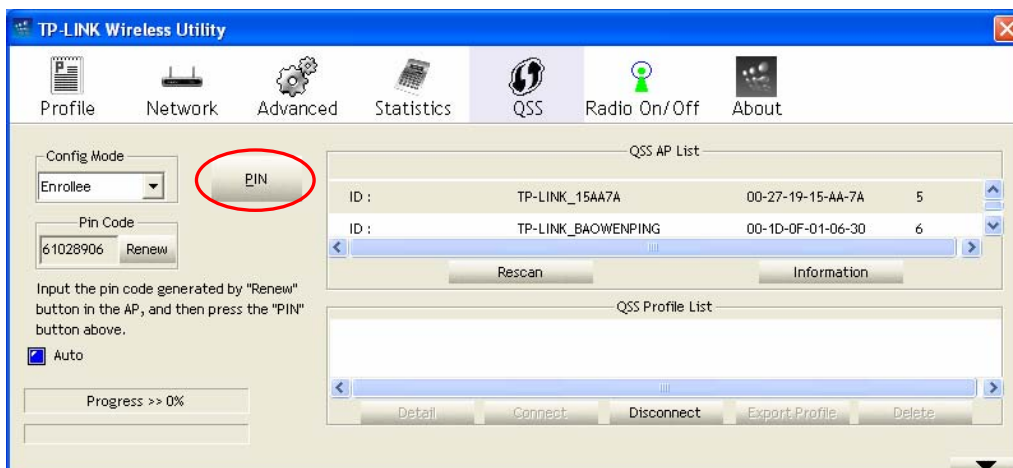

Figure 3-11 QSS - enrollee mode

☞ **Note:**

The PIN code of the adapter is displayed on the QSS configuration screen as Figure 3-11 (the default PIN code for this adapter is 08781949 as Figure 3-11 shown)

3.1.6 Radio On/Off

You can turn on/off the wireless radio by clicking the icon ![green icon] of the Utility. The green icon will turn to red ![red icon]　when the wireless radio is turned off.

3.1.7 About

Click the **About** tab of the Utility and you will see the following screen with some information about this adapter.

Figure 3-12 About

➢ **Utility Version -** The version of this utility.

➢ **Utility Date -** The creation date of this utility.

➢ **Driver Version -** The version of the wireless network adapter driver.

➢ **Driver Date -** The creation date of the wireless network adapter driver.

➢ **Firmware Version -**The version of the adapter firmware.

➢ **EEPROM Version -** The version of this EEPROM.

➢ **Phy_Address -** The MAC address of the wireless network adapter.

☞ **Note:**

For more help information, you can click the **http://www.tp-link.com** button on the screen to connect to website of our company.

3.1.8 An example for application

Suppose you have an installed and using 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** tab of the utility and click the **Add** button on the screen that appears.

3. The Profile configuration screen will appear, please enter *Test* for the Profile Name, *TPLINK* for the SSID, select *Infrastructure* for the Network Mode, select *WEP* for the Data Encryption and enter *0123456789* for Network key.

4. Click **OK** to save this profile.

5. Highlight the profile named *Test* on the profile list and click **Activate** 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 3-13. Double click the **Use Zero Configuration as Configuration utility** option to enable Wireless Zero Configuration function.
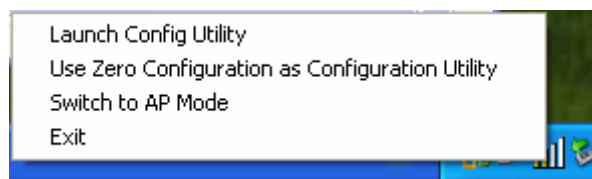
Figure 3-13 Use Zero Configuration as Configuration utility

2. After that, double click the icon 🖥, and the following Figure 3-14 will appear with some available wireless network choices. You can highlight a network and then click **Connect** to add to a network.

Figure 3-14 Choose a wireless network

☞ **Note:**

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

3. During the connection, you will see the screen as Figure 3-15 shown.
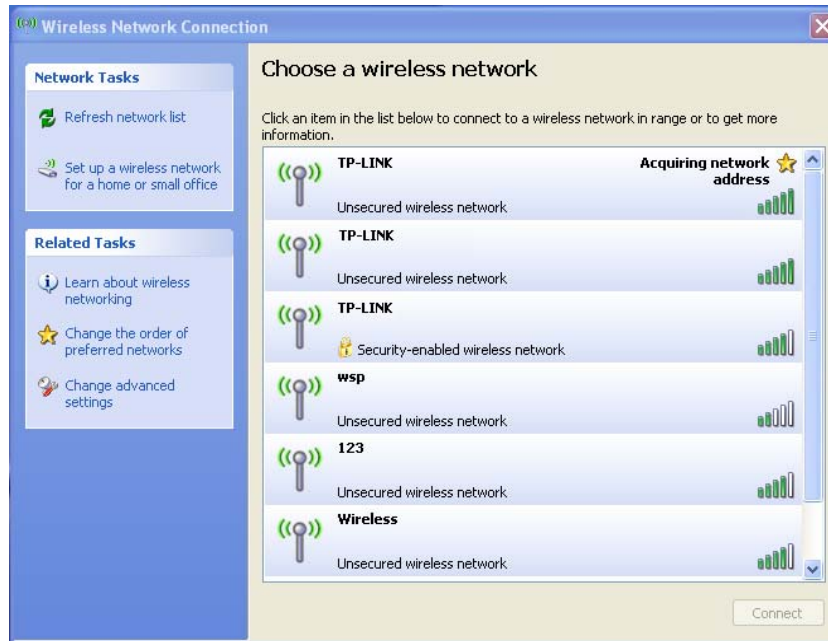
Figure 3-15 Acquiring network address

4. If the connection is finished, the icon will display like the next screen shown.

Figure 3-16 Finish

Chapter 4   AP Mode

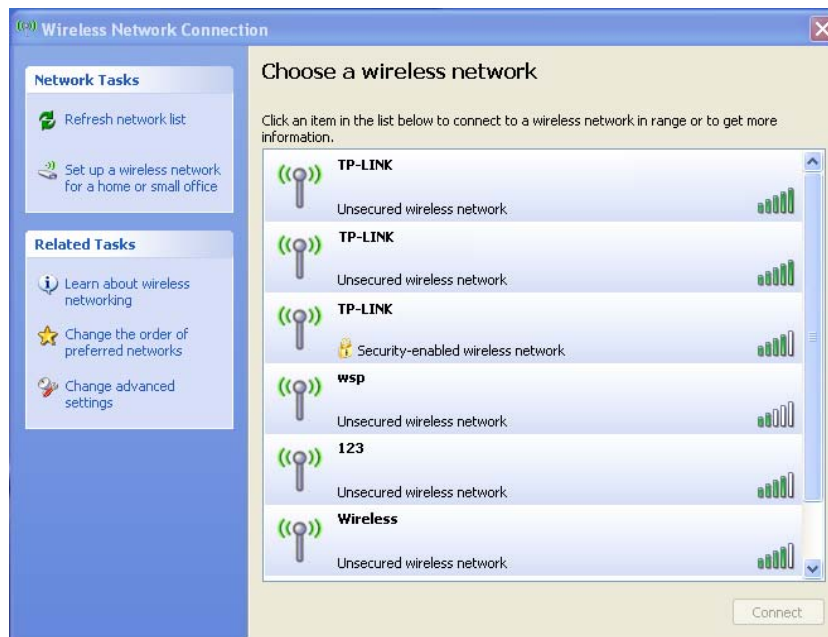Click the ⬛ icon to switch to AP Mode. In this mode you can use the TL-WN7200N as a soft AP.
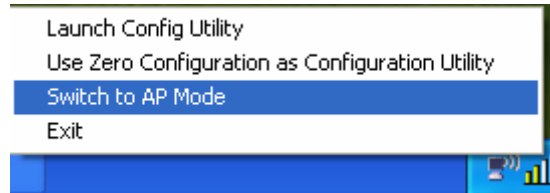
Figure 4-1

☞ **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-WN7200N 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.
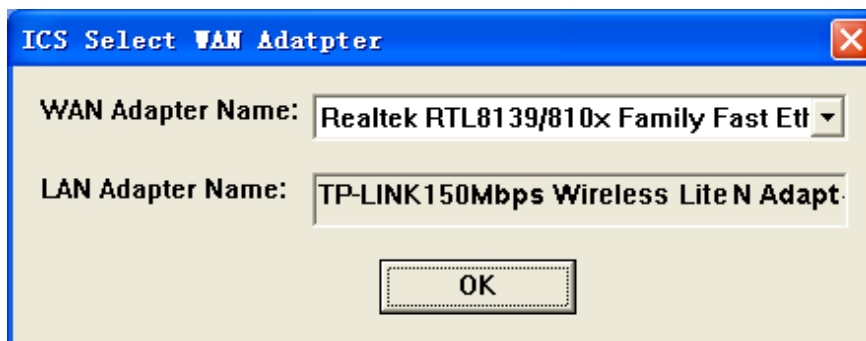
Figure 4-2

4.1   Config

Here you can do some basic configurations.
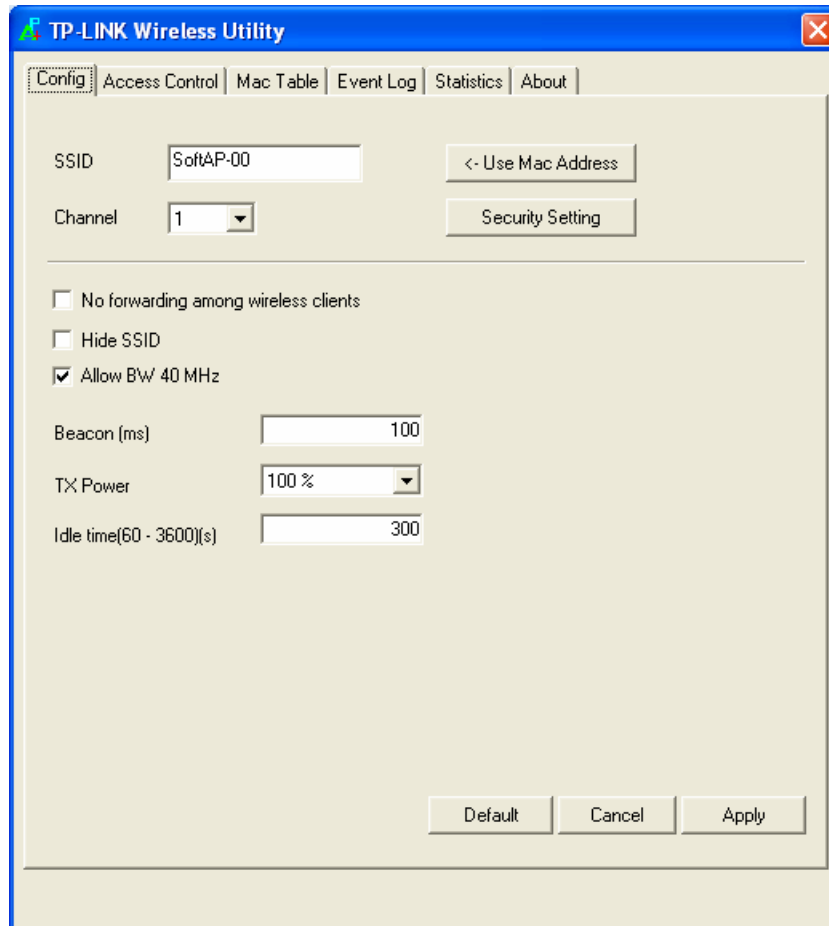
Figure 4-3 Config Setting Page

➢ **SSID –** Enter the SSID of your soft AP, or you can press "**<- Use Mac Address**" button to keep the Mac Address as your SSID.

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

➢ **Beacon –** 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.

4.2 Access Control

Click the **Access Control** tab of the utility and the **Access Control** screen will appear as Figure 4-4. In this page, you can enable/disable the AP to connect with the specified Mac address.
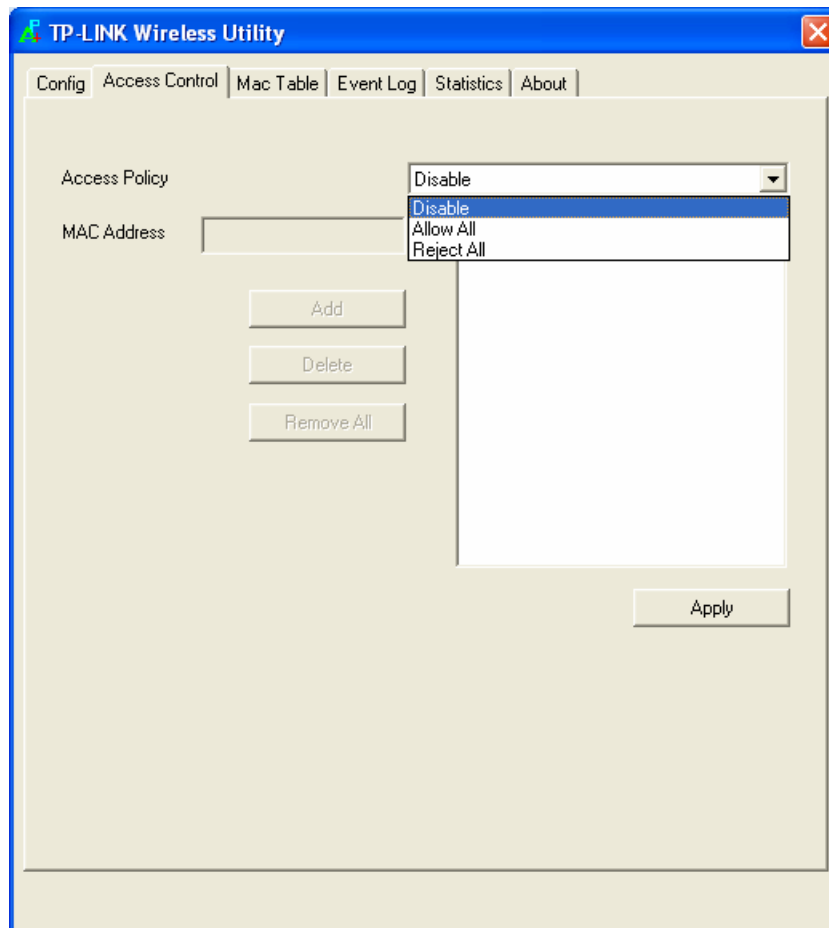
Figure 4-4 Access Control Function

➢ **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, and press **Add** to **Access List**.

➢ **Access List –** Display all Mac Addresses that the user has set.

4.3 Mac Table

Figure 4-5 shows the link status page. It displays detailed station information of current connection.

Figure 4-5 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.

4.4 Event Log

A record of all event times and messages, shown as below.

Figure 4-6 Event Log Page

➢ **Event Time (yy/mm/dd-hh:mm:ss) –** Displays the event time recorded.

➢ **Message –** Displays all event messages.

4.5 Statistics

The statistics page displays detailed counter information based on the 802.11 MIB counters. The information is translated into a format easier for the user to understand.
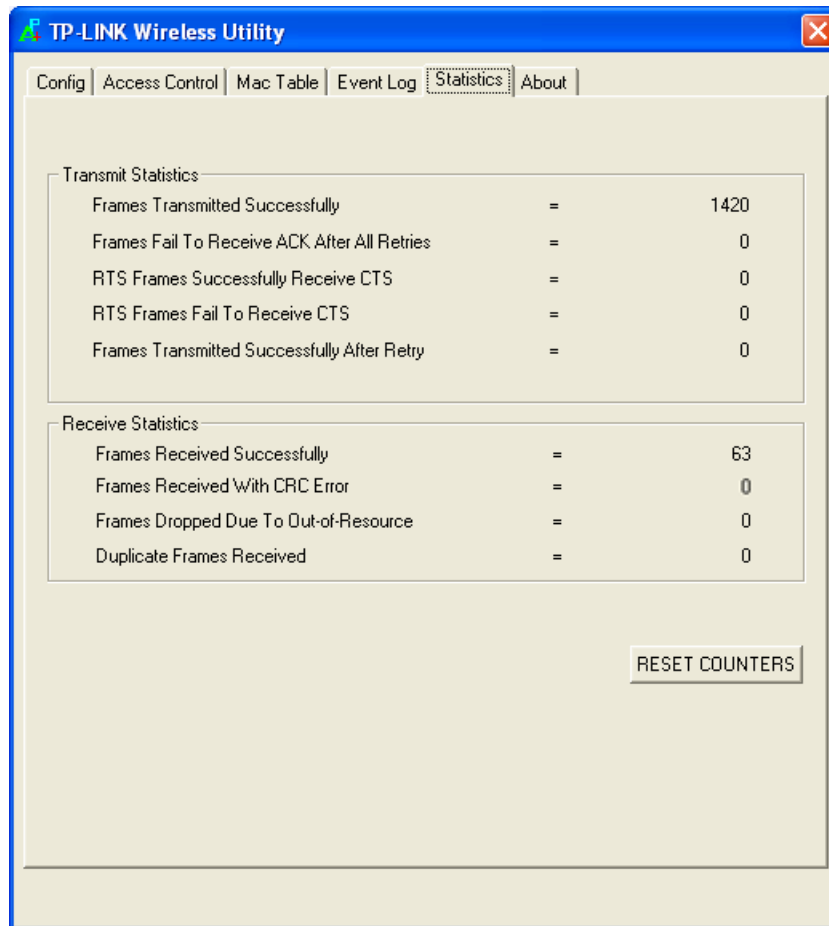
Figure 4-7 Transmit and Receive statistics

4.6 About

The About page displays the wireless card and driver version information as shown in Figure 4-8.
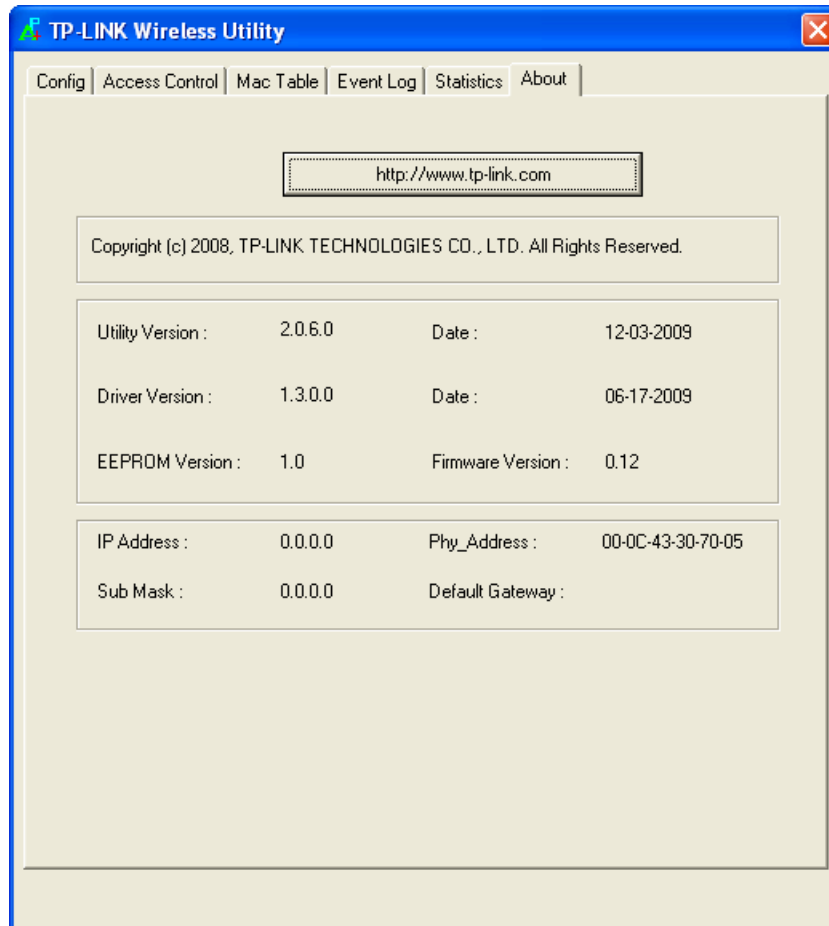
Figure 4-8 About Page

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-WN7200N 150Mbps High Power Wireless USB Adapter and a PSP device are needed. For software, the TL-WN7200N 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.
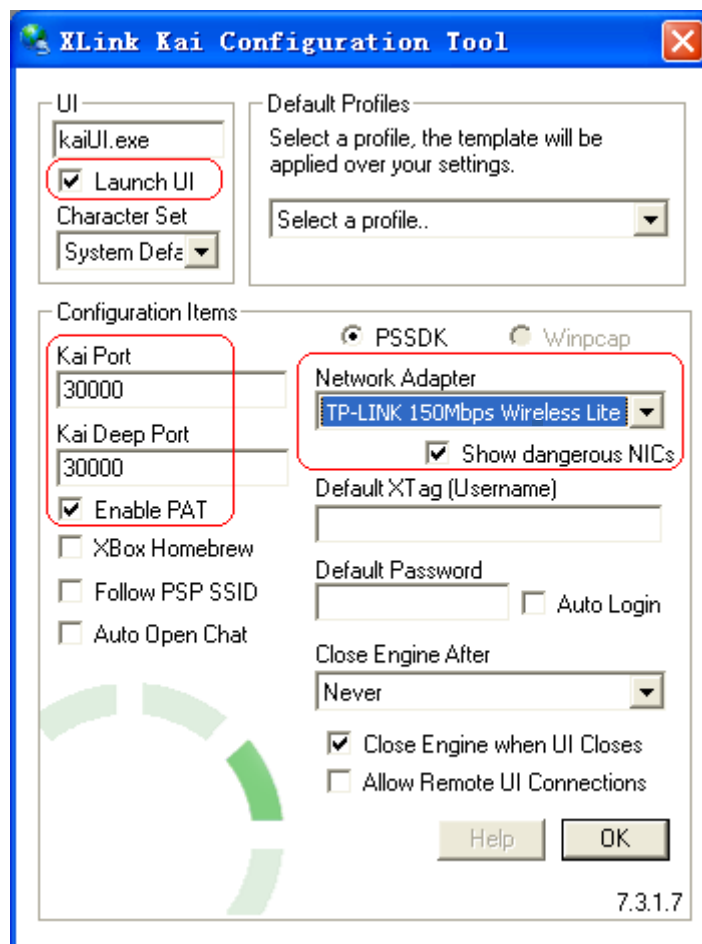

Figure 5-1

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 "TP-LINK 150Mbps Wireless Lite N Adapter "and select **Properties**. Then set the value of "**PSP Xlink Mode**" as Enable following the red marked instruction in the figure.
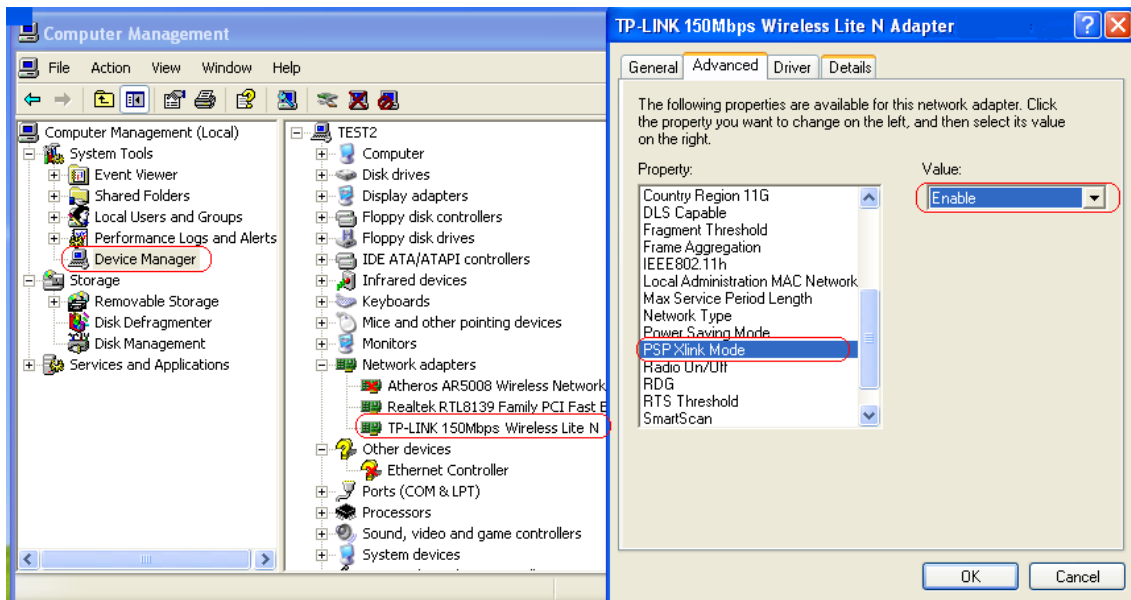
Figure 5-2

Step 6. Click **Start > Control Panel > Network**.
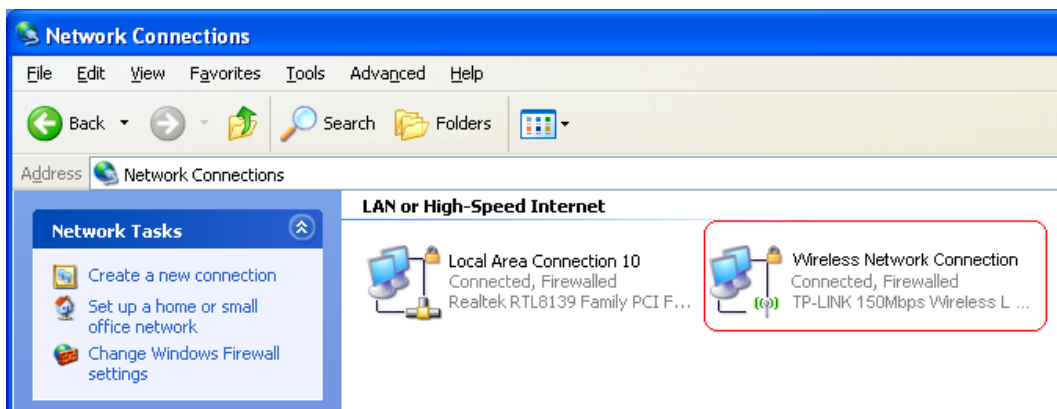
Figure 5-3

Step 7. Right-click **Wireless Network Connection icon** , and select **Properties**. In the following prompt page**,** highlight **Internet Protocol(TCP/IP)** and click **Properties**.
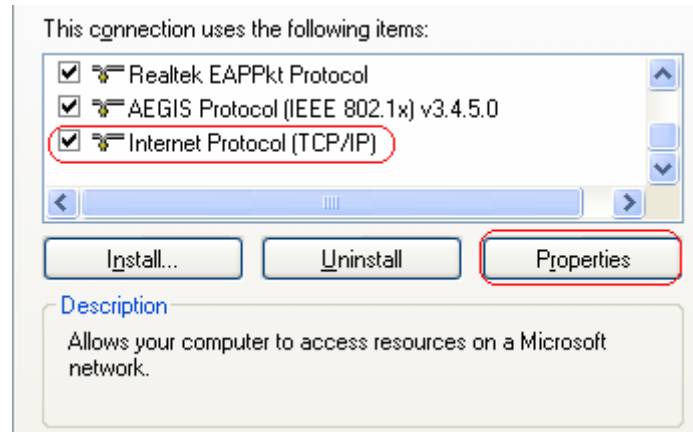
Figure 5-4

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**.
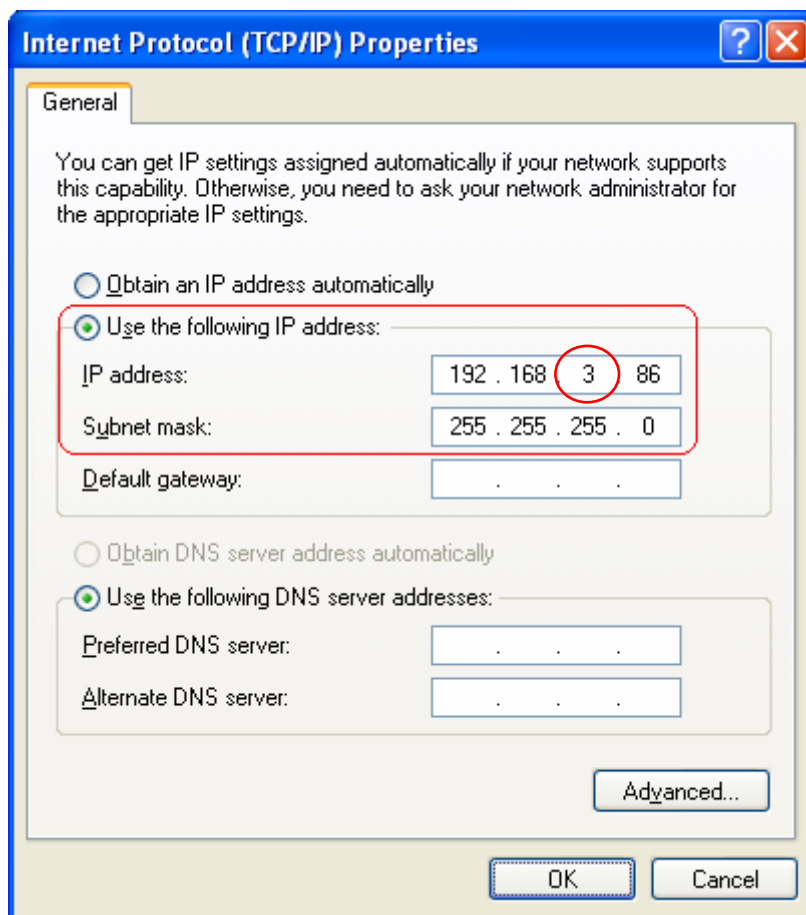
Figure 5-5

☞ **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**.
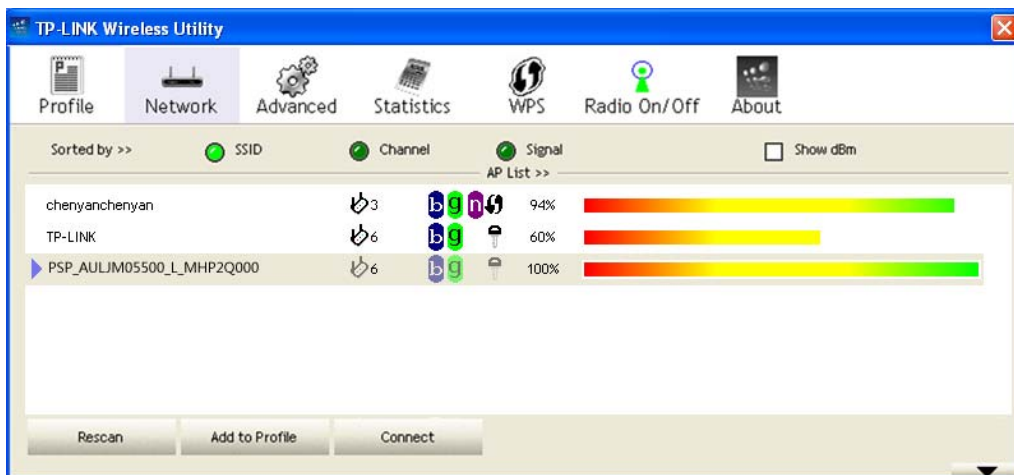
Figure 5-6

Step 10. Check whether your PSP device is detected in the Diagnostics mode of Kai as Figure

5-7 shown: Click the icon 🔍 first and then click the folder 📁.
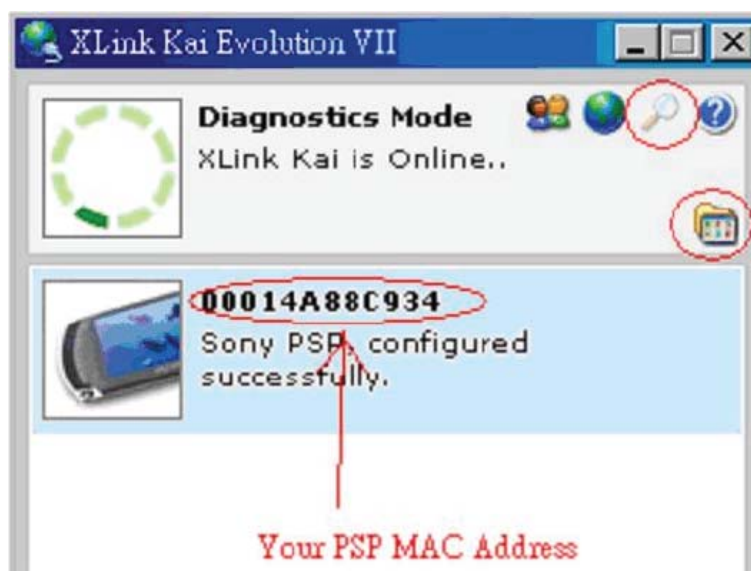
Figure 5-7

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 5-8

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.

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Appendix B: Specifications

General	
Interface	Mini-USB Connector
Standards	IEEE 802.11n, IEEE 802.11g, IEEE 802.11b
Operating System	Windows 2000/ XP/ Vista/ 7
Safety & Emission	FCC, CE
Frequency	2.4 ~ 2.4835 GHz
Sensitivity	150M -67dBm 54M -75dBm 11M -91dBm
Spread Spectrum	Direct Sequence Spread Spectrum (DSSS)
Wireless	
Radio Data Rate	Up to 150Mbps
Modulation	11n OFDM, 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

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