Wireless 802.11g
USB 2.0 Adapter
User's Manual

Wistron NeWeb Corporation

Version 1.0__August, 2004

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Regulatory Information

Federal Communication commission interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the use is encouraged to try to correct the interference by one of the following measures:

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

FCC Caution: To assure continued compliance, (example-use only shielded interface cables when connecting to computer or peripheral devices) any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device many not cause harmful interference, and

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

Important Notice:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

End users must follow the specific operation instruction for satisfying RF exposure compliance.

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

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1 Introduction

Thank you for purchasing our 802.11g USB 2.0 Adapter, and welcome to Wireless LAN- the easiest way to wireless networking!

This user's manual introduces our 802.11g USB 2.0 Adapter and describes the most common configurations, which will help you connect to your network easily. Please read this guide to get familiar with the IEEE 802.11g Wireless LAN. This manual contains detailed instructions in operation of this product. Please keep this user's manual for future reference.

As this product is designed especially to run under Microsoft Windows' system, it is recommended that to be installed by people who are familiar with the installation procedures for network operating systems under Microsoft Windows.

1.1 Package Contents

Your 802.11g USB 2.0 Adapter kit includes following items:

- 1 x 802.11g USB 2.0 Adapter;
- 1 x CD (Utility and Driver Installation Software);
- 1 x User's Manual.

Note! If any of the items mentioned are missing or mismatched, please contact your distributor.

1.2 Main Features of 802.11g USB 2.0 Adapter

- ✓ Compact Size for Easy Wireless Enjoyment.
- ✓ High-speed Wireless Connection, up to 54Mbps.
- ✓ IEEE 802.11g (DSSS) Standard for 2.4GHz Wireless LAN.
- ✓ Plug-and-Play Installation.
- ✓ Full Mobility and Seamless Cell-to-Cell Roaming.
- ✓ Worldwide Radio Support.
- ✓ Five Times Faster than 802.11b Wireless LANs.
- ✓ Backward Complaint with 802.11b.
- ✓ Support of the standard Access Point mode for connection to wireless clients.
- ✓ Supports up to 128-bit WEP.
- ✓ Includes Ad Hoc Mode and Infrastructure Mode Access.
- ✓ Longer Range Support than 802.11a-based WLAN.

1.3 Wireless Networking Scenarios

As our 802.11g USB 2.0 Adapter is interoperable and compatible with other IEEE 802.11g compliant products from other manufacturers, it offers you the most freedom to establish your ideal wireless network. Therefore, after installing 802.11g USB 2.0 Adapter, you can connect your computer to:

1. A ***Peer-to-Peer Workgroup*** of 802.11g compliant wireless devices.
2. A ***LAN*** (Local Area Networking) constructed by Access Point(s) or other 802.11g compliant systems.
3. ***Share your Internet access*** by using just one connection, share printers and other peripheral devices, share data and image files between networked PCs, play multi-player games, and use other network enabled sharing resources.

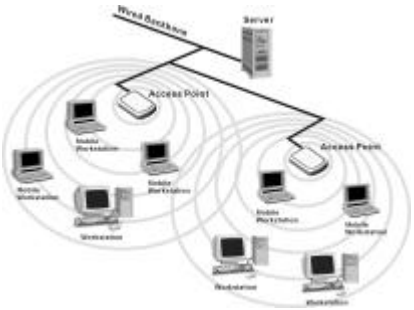
Ad Hoc Mode

A group of wireless stations can form a wireless network without a centralized Access Point involved. This is called an Independent Basic Service Set (IBSS or Ad Hoc).

An Ad Hoc Network could be easily set up with this 802.11g USB 2.0 Adapter, PCs or other WLAN devices. Therefore, it is very convenient to build a network for temporary use, such as for demonstration in exhibition, for new sales point/branch use and alike.

Cooperate LAN (Local Area Networking)

With some 802.11g USB 2.0 Adapters and Access Points, it will be easy to construct a LAN with access to Internet for enterprise use.
The construction is quite easy that 802.11g USB 2.0 Adapter and Access Point will automatically work at the most suitable frequency when Access Point is set within the proper range.
In addition, commonly manufactures will bundle the Site-Survey tool for users to check the communication quality.



1.4 Advantages for Using Wireless Network

802.11g USB 2.0 Adapter can wirelessly transmit and receive data, minimizing the need for wired connections, at a speed of up to eleven megabits per second. With the 802.11g USB 2.0 Adapter you can locate your PC wherever you want without wires or cables.

The 802.11g USB 2.0 Adapter provides LAN users with an access to real-time information anywhere in their organization. The mobility provides effectiveness and efficiency, which are not available under wired networks.

The 802.11g USB 2.0 Adapter configuration is easy to switch between peer-to-peer networks, suitable for a small number of users, and full infrastructure networks of thousands of users that allow roaming around a broad area.

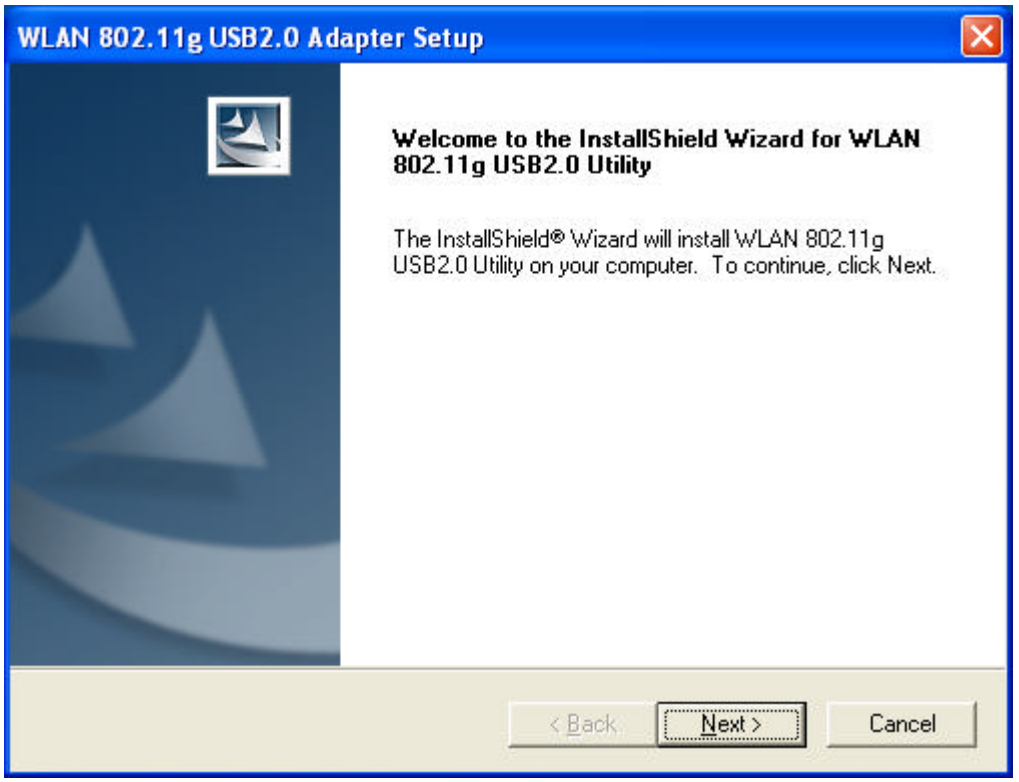
Therefore, you may see many advantages for adopting Wireless Networking as follows:

- ***Less Space Limits***: The 802.11g USB 2.0 Adapter provides access to network services without wires; therefore, it gives you more freedom to allocate and style your living and working space. In addition, in some areas where is hard or expensive to connect to wired networks, such as historic buildings, classrooms or mobile connectivity, then you can count on wireless networking.
- ***Flexible Workgroups and Lower Cost***: For workspaces that are frequently reconfigured for temporarily use such as demo in exhibitions, wireless networking is easy to set up of lower total cost—and all equipments are recyclable. You do not have to remove the old wires and then build up the new ones again and again.
- **Networked Conference Rooms**: Users can access the network as they move from a meeting to another, getting the access to information/data and the ability to communicate decisions while “on the go”.
- ***Ad Hoc Networking***: On site consulting and small workgroups may increase productivity with quick network setup and collaboration software.
- ***Branch Office Networking***: With an Access Point to bridge between the LAN and Internet, wireless networking provides an easy to install, use and maintain network for a remote or sales office.
- ***Campus-Wide Network Mobility****:* The roaming capabilities allow enterprise to set up easy to use wireless networks that cover the entire campus transparently.

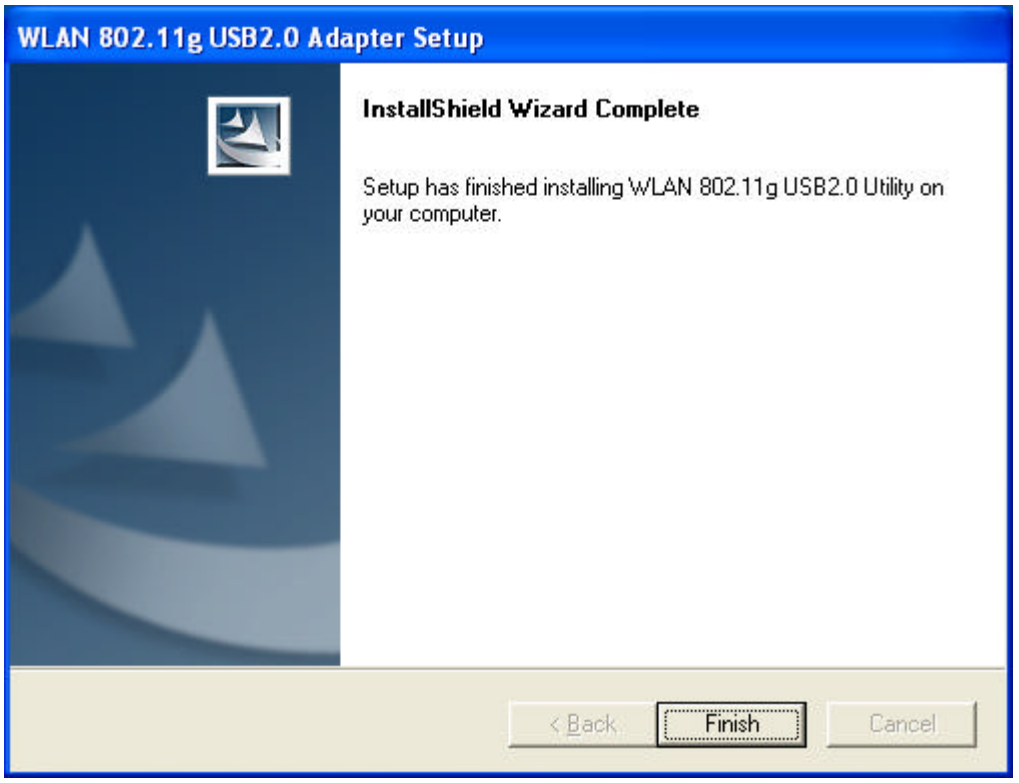
2 Quick Start Guidance

2.1 Installation

1. Insert the **Installation CD**. It automatically starts the setup program for software installation.

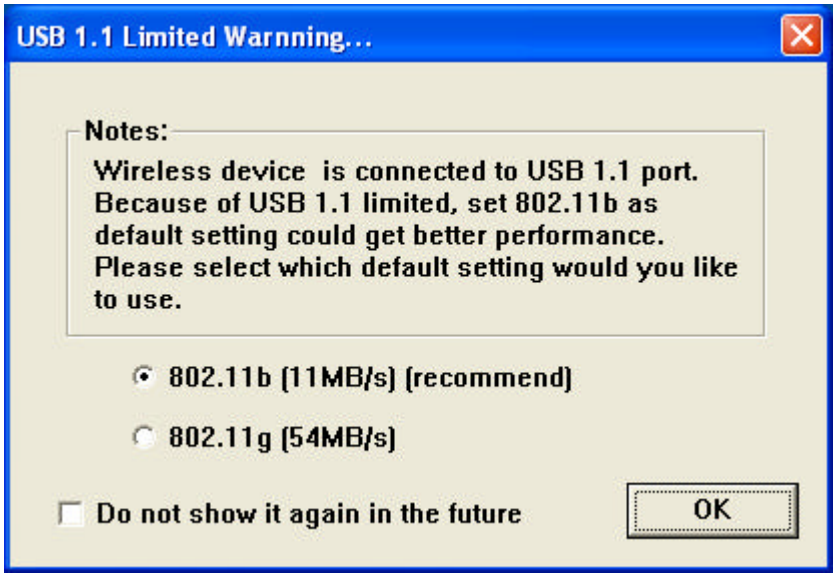


2. **Follow the Installation Wizard** to complete the software installation process and restart your computer if necessary.



3. **Connect your 802.11g USB 2.0 Adapter** to your laptop PC or desktop PC.

Note! If your device is connected to an USB 1.1 port, a pop-up message indicates on your screen, reminding you to set 802.11b as the default setting to get a better connection quality.

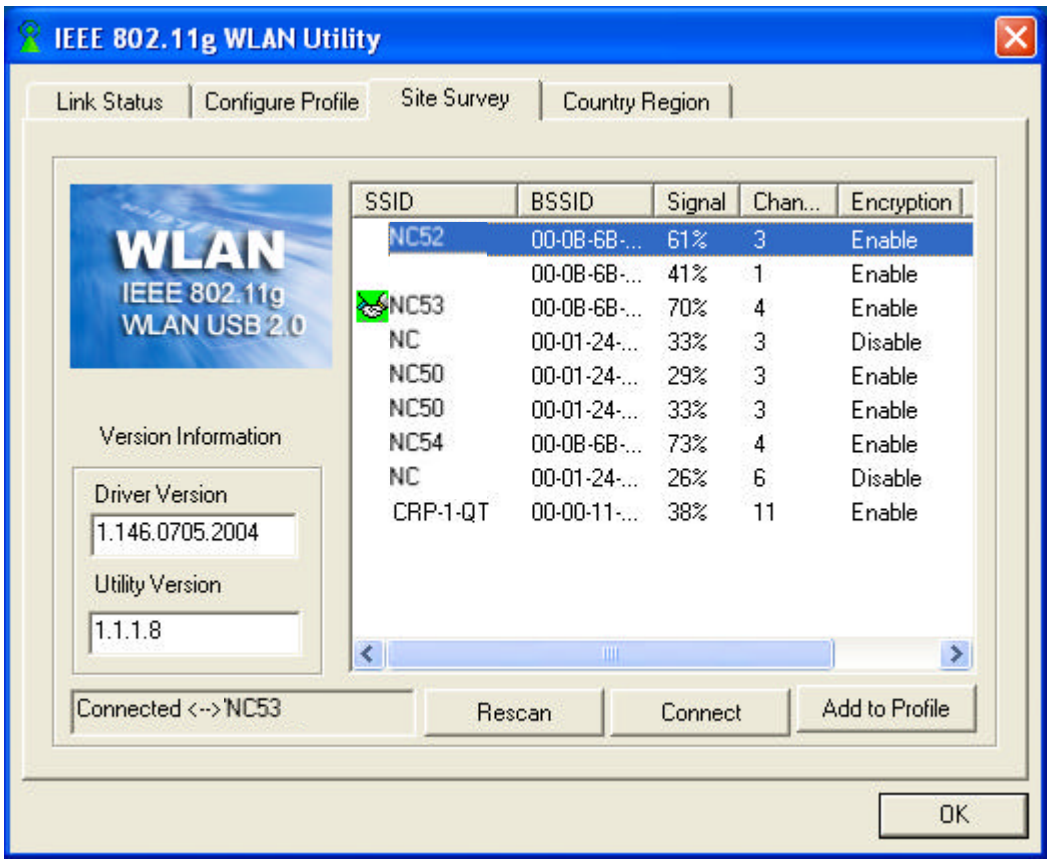


4. **Operation System** will detect new device and verify the driver automatically.

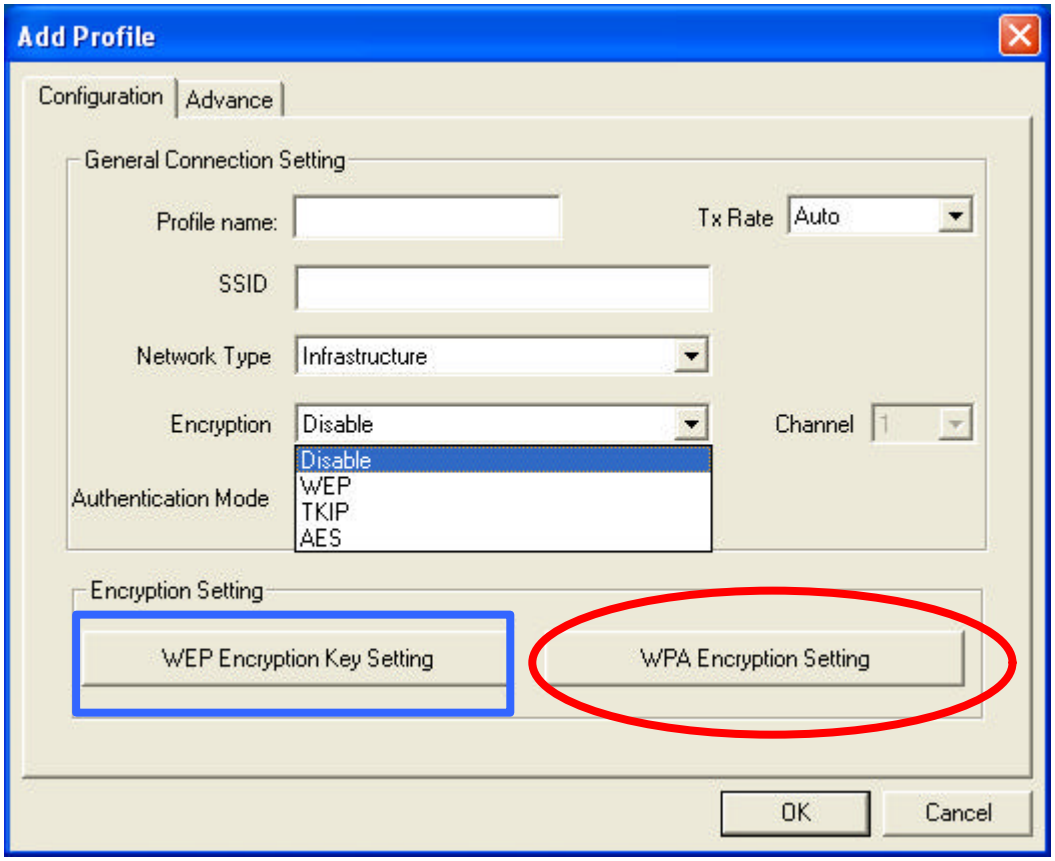
2.2 Connecting to an Existing Network

1. Go to Windows **Start > Programs > WLAN 802.11g USB2.0 Utility > WLAN 802.11g USB2.0 Utility** to open the utility. The 802.11g USB2.0 Adapter Utility window appears. You can see the wireless configuration icon in Windows System Tray. Double click the shortcut icon or the wireless configuration icon to open the utility.

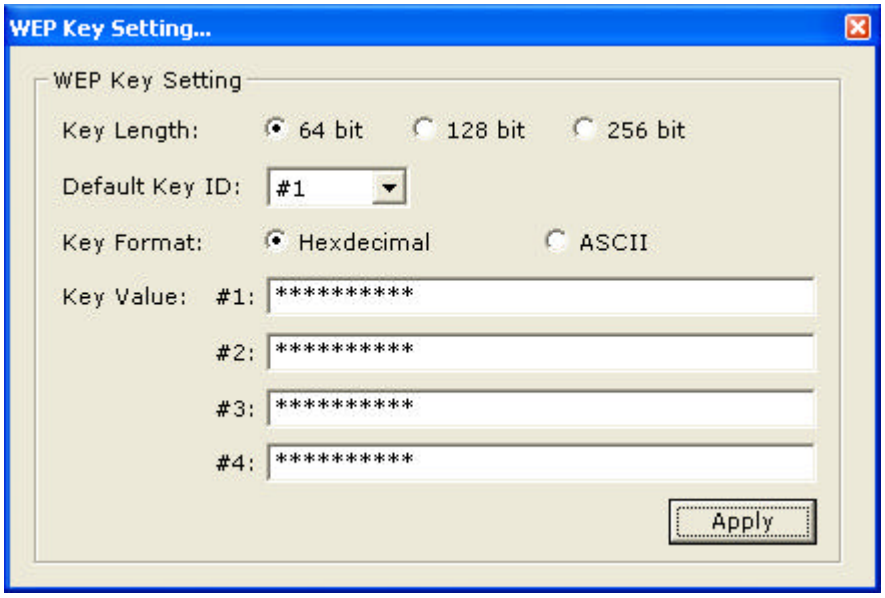
2. 802.11g USB2.0 Adapter automatically searches and connects to an available network (network with security disabled) if there is any. And then the red wireless configuration icon changes to Green. Follow the next step to connect to a designated network.
3. In **Site Survey** tab, choose (click) one network from the listed available networks list, and click **OK** button.



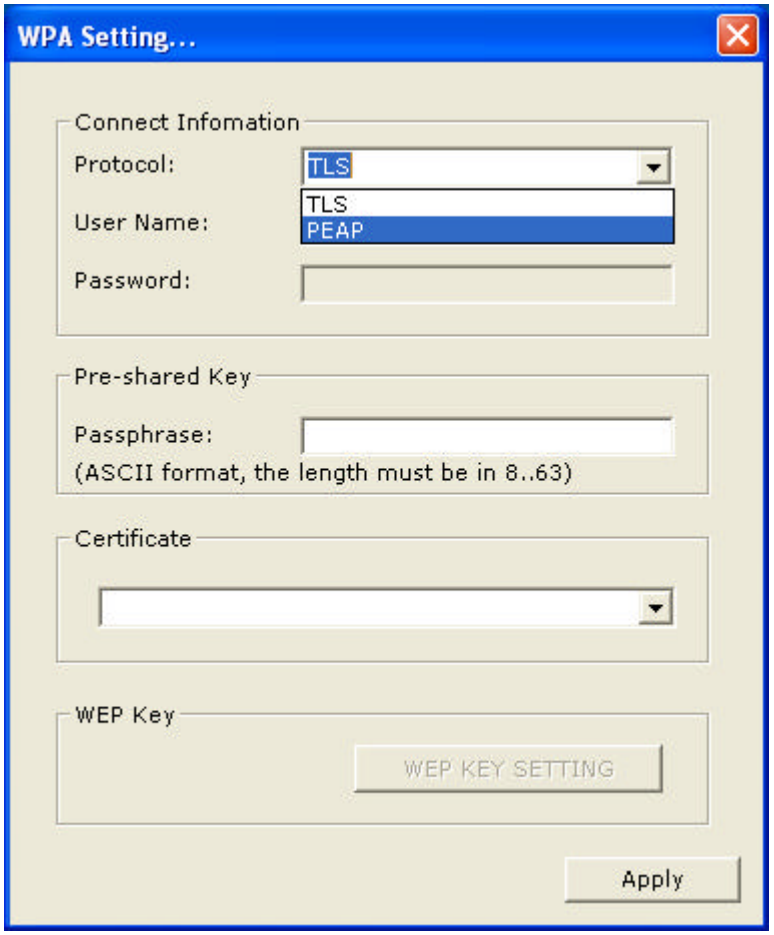
4. If the chosen network is security enabled, in **Configure Profile** tab click **Add** and **Add Profile** window pops up. In **Configuration** tab, you can either click **WEP Encryption Key Setting** or **WPA Encryption Setting** for the **Encryption Setting**.



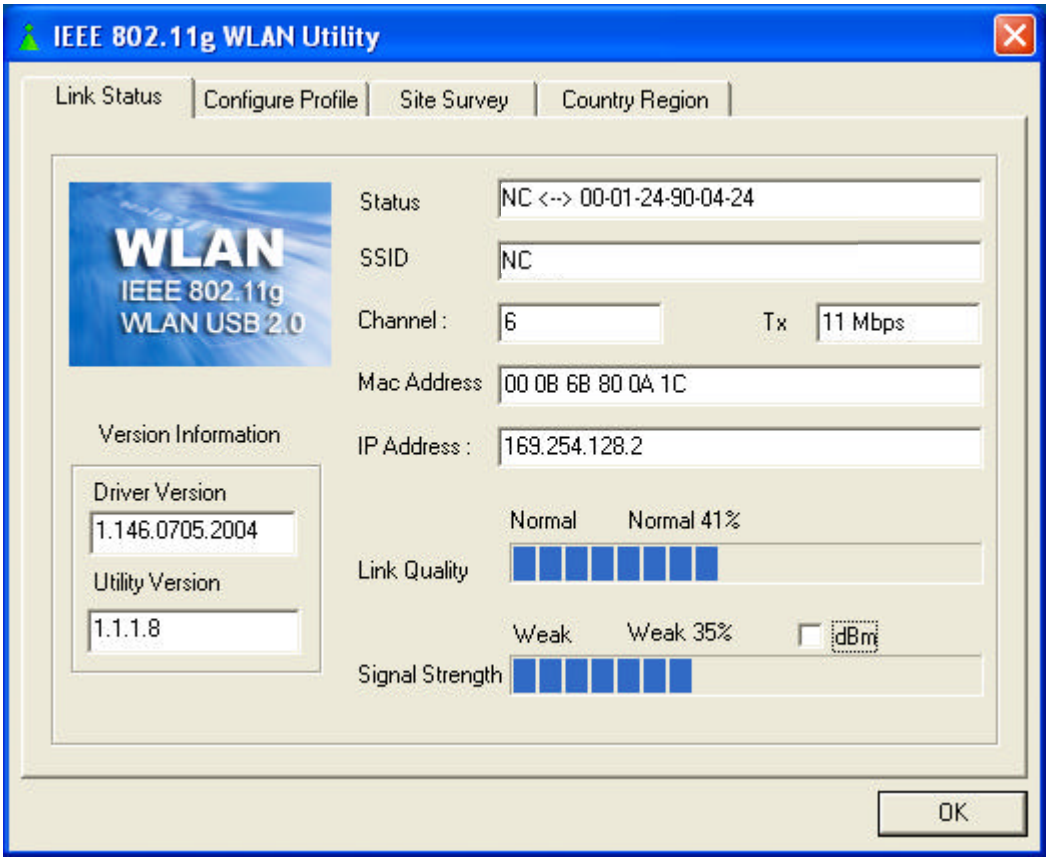
➢ In **WEP Encryption Key Setting**'s menu, click **Change** button and create WEP keys manually. Insert the network key for **Key Value**, click **Apply** to confirm the setting.



- In **WPA Encryption Setting**'s menu, select specific **Protocol**, key in **User Name** and **Password** for authentication, then click **Apply** button. (Further details contact your network provider).



5. Once connected, the wireless configuration icon appears green and the icon shown in selected networks appears connected. You can click **Link Status** tab to check the connection status.



6. For details of each tab in WLAN 802.11g USB2.0 Utility, please read Chapter 6.

2.3 Connecting to an Access Point (AP)

Your 802.11g USB 2.0 Adapter also enables a group of wireless stations to communicate with each other through it. Such a network is called an Infrastructure BSS.

When the 802.11g USB 2.0 Adapter used as an ACCESS POINT(AP) , it can be configured to operate as the following network configuration:

Your 802.11g USB 2.0 Adapter functioned as the **ACCESS POINT** (AP) further provides bridging functions between the wireless network and the wired LAN network.

3 Step-by-Step Installation

This section will lead you through the installation of 802.11g USB 2.0 Adapter (both software and hardware) in detail. People who are familiar with the installation and settings of wireless device may refer to Quick Start Guidance to establish a network in a snap.

To establish your wireless network connection, the following steps should be executed:

1. Install the software by using the installation CD.
2. Install the 802.11g USB 2.0 Adapter.
3. Install the required network protocols to communicate with your network. Mostly, you will need to set the TCP / IP protocol.

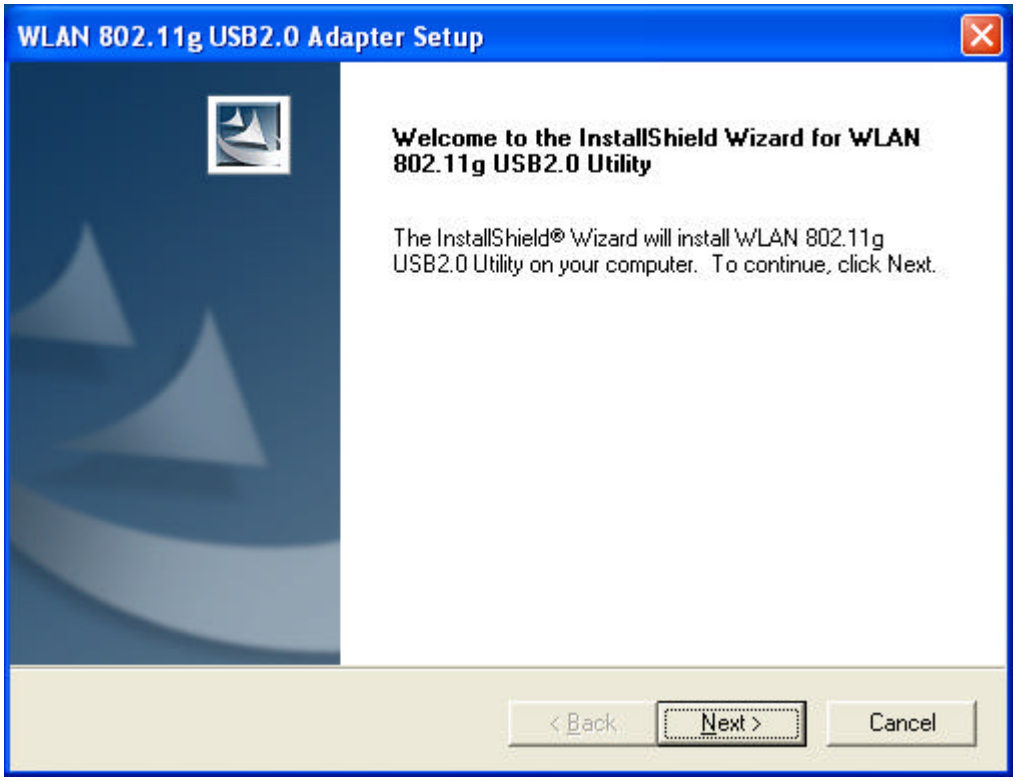
The product is designed to operate under Windows 98SE, Me, 2000 and XP. The installation procedure is about the same. Please follow the installation wizard to install the software.

3.1 Installing WLAN 802.11g USB2.0 Adapter

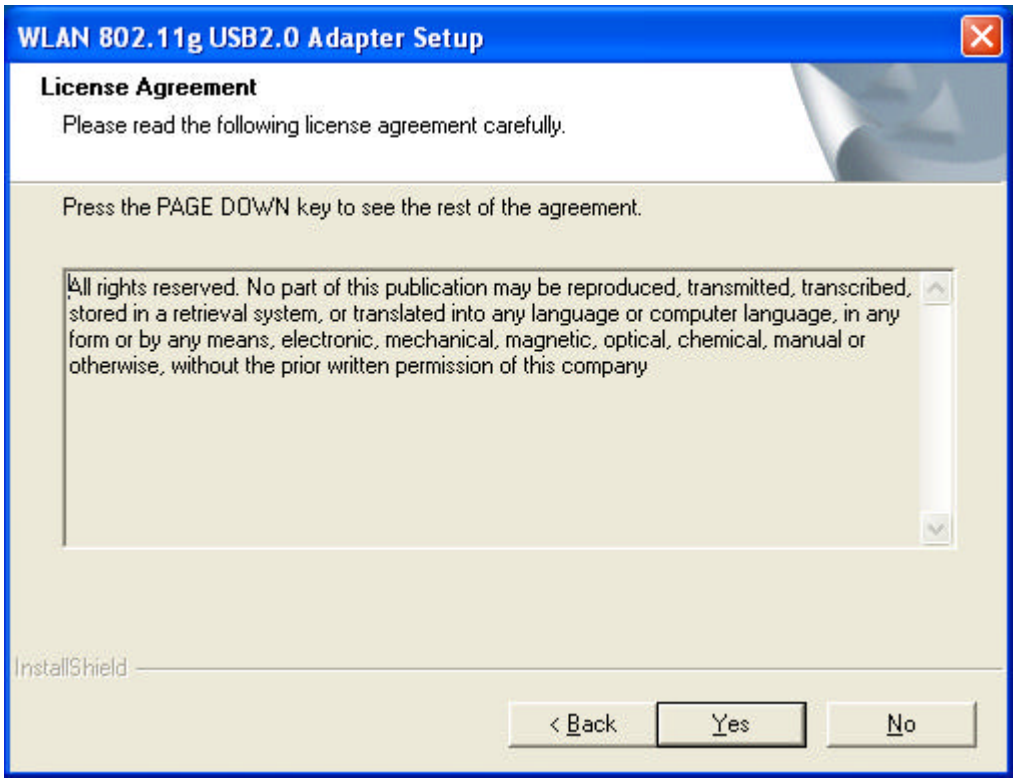
Note! Please install the software ***before*** inserting the 802.11g USB 2.0 Adapter.

1. **Insert the Installation CD.** Insert the installation CD into your CD-ROM drive. The **Setup** program automatically starts.

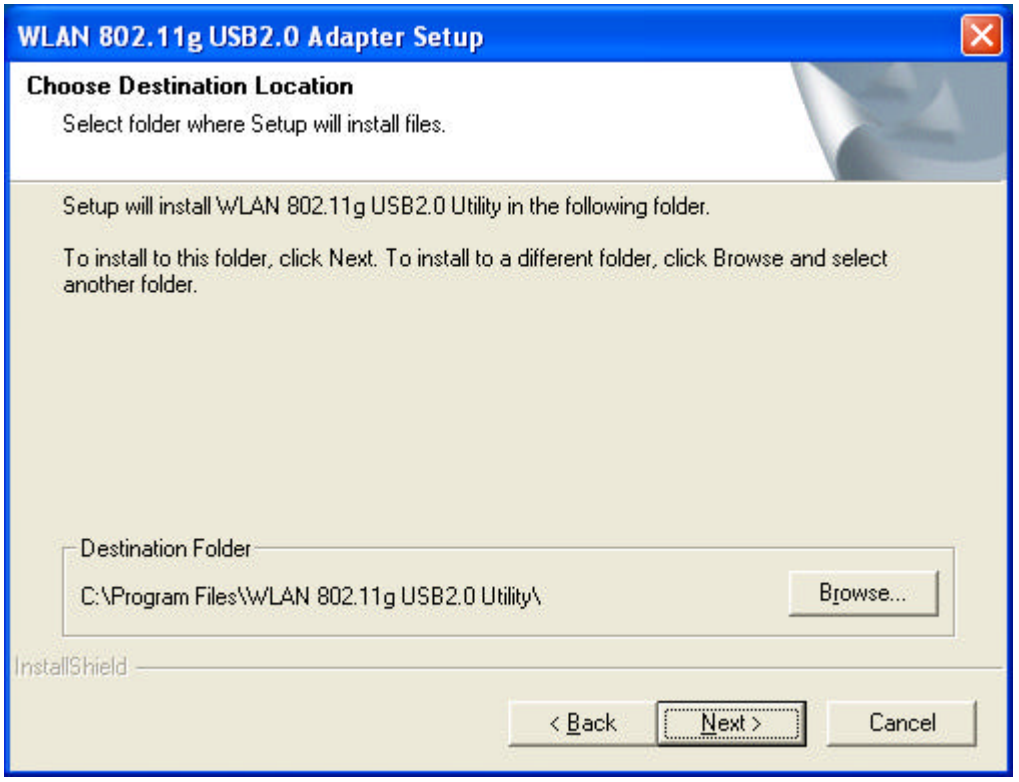
2. Click **Next>**.



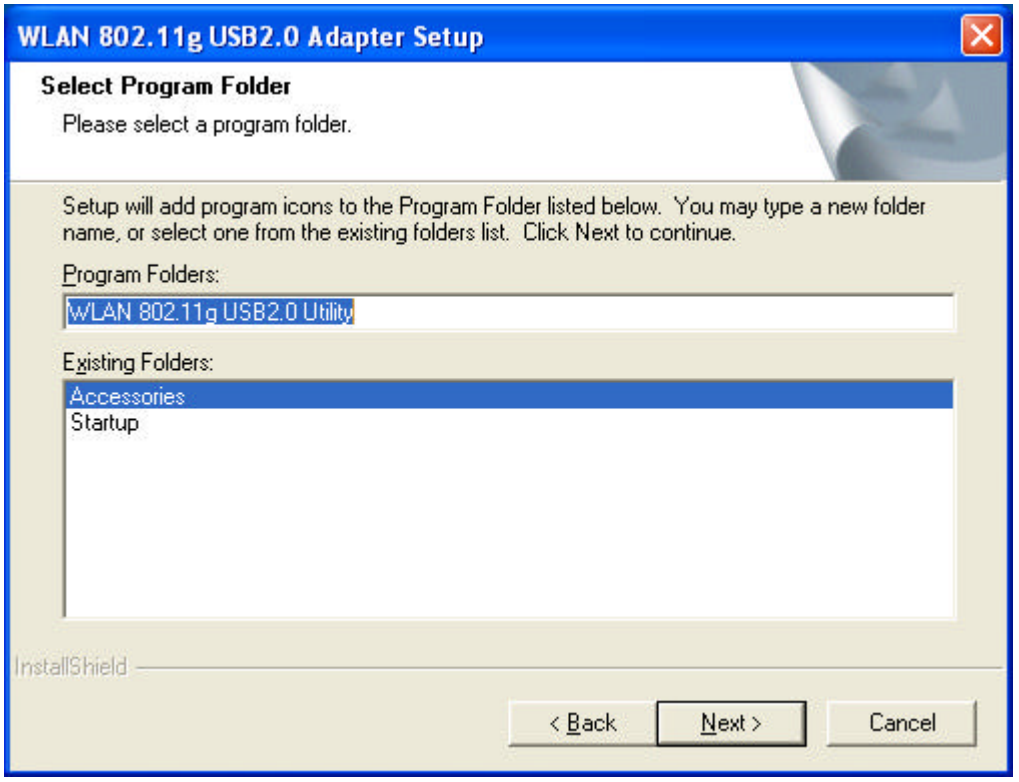
3. Click **Yes**.



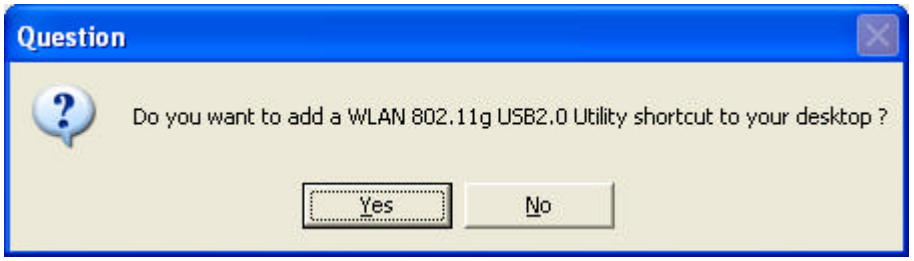
4. **Read the Destination Folder and click Next>.** The default destination folder is displayed in the setup dialog box. You may change the default folder by clicking "**Browse**" and select the destination folder you prefer. Click **Next>** to go to the next screen.



5. Click **Next>**.



6. Click **Yes** to create a shortcut. Installation is completed. Restart your computer if necessary.



7. **Connect** the **802.11g USB 2.0 Adapter** to your laptop PC/desktop PC.

3.1.1 Additional Setup Processes

During software installation procedure, each operating system may prompt different specific options. Mostly, you will be asked to add some necessary protocols and to edit some networking settings.

1. **Windows 98SE:** The system may request the original Windows CD during the installation process. Please check with the network administrator for the values of the settings. When the installation is finished, you'll have to restart your computer.

2. **Windows Me:** Please check with the network administrator for the values of the settings. Please restart your computer when the installation is finished.

3. **Windows 2000:** When "Welcome to the InstallShield Wizard for WLAN 802.11g USB2.0 Utility" appears on the screen, click "**Next**" to continue installation.

4. **Windows XP:** When "Welcome to the InstallShield Wizard for WLAN 802.11g USB2.0 Utility" appears on the screen, click "**Next**" to continue installation.

3.2 Setting Your 802.11g USB 2.0 Adapter

Your 802.11g USB 2.0 Adapter has its own management software, named **IEEE 802.11g WLAN Utility**. You can control all provided functions from it. The wireless configuration icon is displayed on the Windows System Tray.

The IEEE 802.11g WLAN Utility contains three major tabs: **Link Status**, **Configure Profile**, **Site Survey**.

<u>Wireless Configuration Icons</u>:

✓ Connected (Green)

✓ Disconnected (Red)

To communicate in a Peer-to-Peer network, every station must have the same channel number and Network Name, and all connected computers should have the same net ID and subnet ID.

Note! To open IEEE 802.11g WLAN Utility, you may double click the wireless configuration icon in the Windows System Tray.

3.3 Removing Your 802.11g USB 2.0 Adapter

You can remove the device after you finished the action with the device. However, in Windows XP, Me and 2000, please follow the safe removal procedure. You can figure out a safe removal icon in your computer's notification area.

1. Double click the **safe removal icon**.

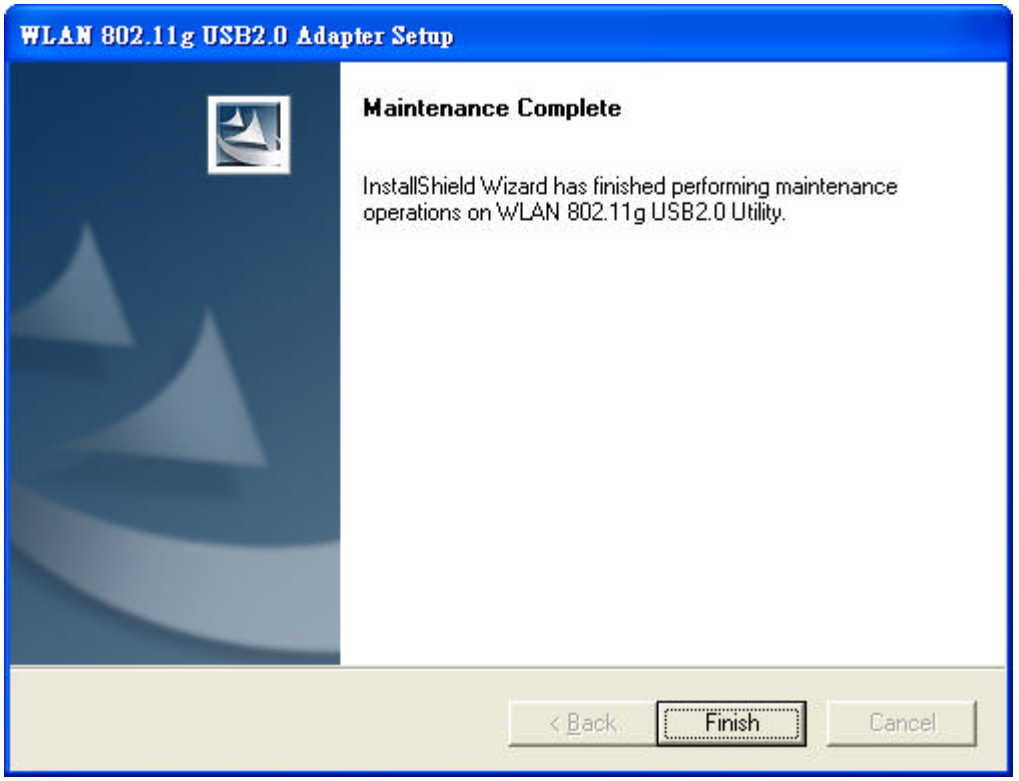
2. The "**Unplug**" or "**Eject Hardware**" window will pop up. You can select the device you want to remove.
3. Then click the "**Stop**" button.

Note! When removing the 802.11g USB 2.0 Adapter, you will lose your connection to the network. Make sure you have closed all files and network applications (such as e-mail) prior to removing the 802.11g USB 2.0 Adapter.

3.4 Uninstalling Your 802.11g USB 2.0 Adapter

1. Make sure the **Utility** is **closed**.
2. Go to windows **Start > Programs >WLAN 802.11g USB2.0 Utilily > UnInstall WLAN 802.11g USB2.0 Adapter**.
3. Follow the Uninstall Wizard to complete the uninstallation.

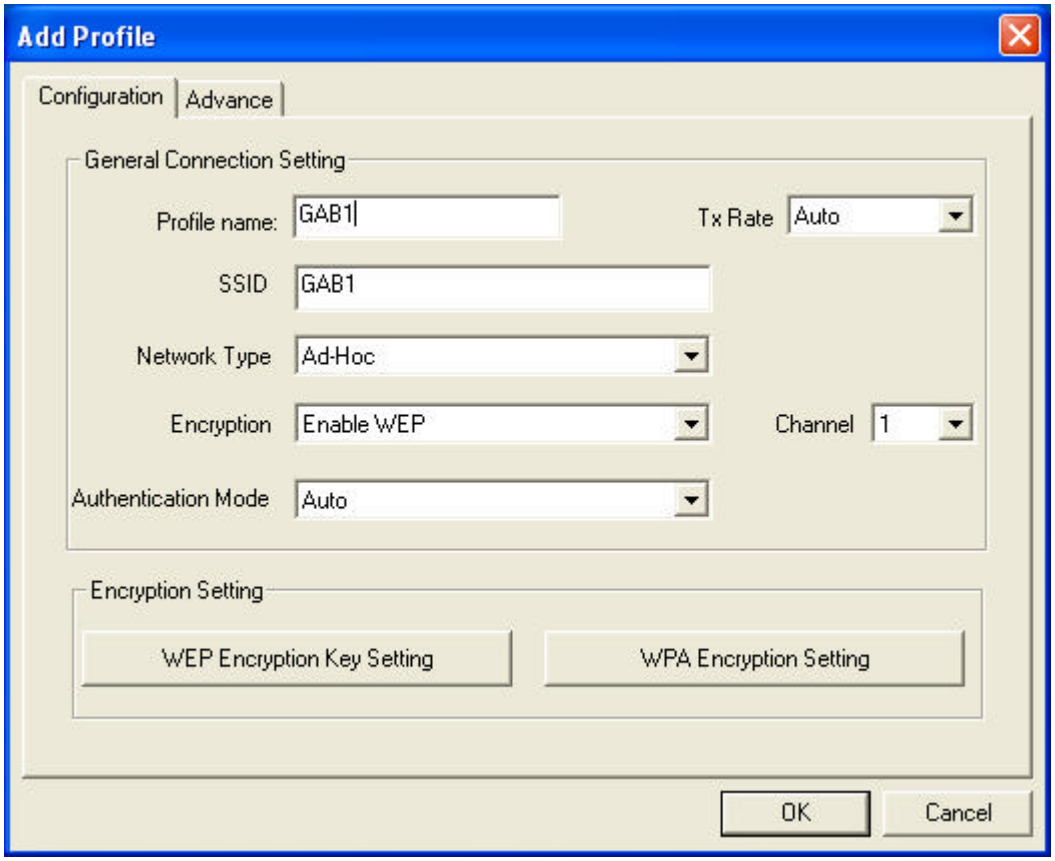
4. When the process is completed, click **Finish** to close the wizard.



4 Creating an Ad-Hoc Network

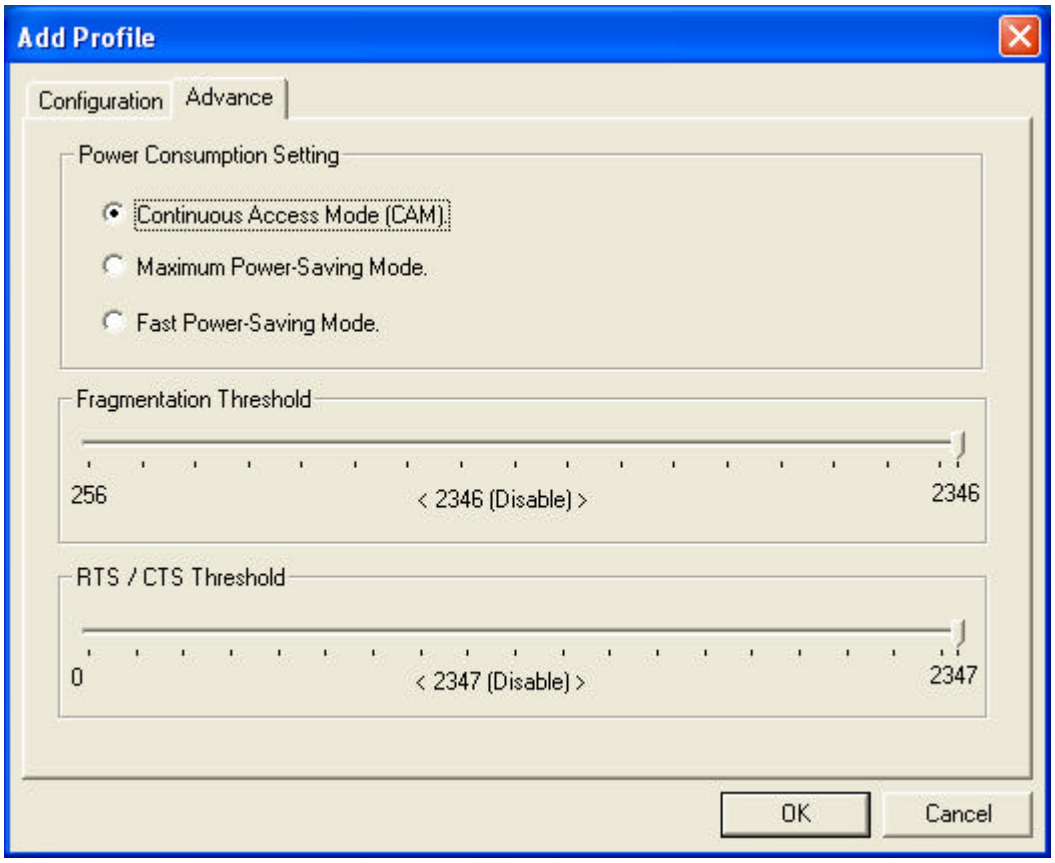
- If you have more computers and only want to place them in a local area network, or you want to communicate directly without using an Access Point or any connection to a wired network, you can create a new Ad-Hoc Network.

1. In **Configure Profile** tab, click **Add** button. **Add Profile** window pops up.
2. Select **Network Type** to **Ad-Hoc**.
3. Set **Encryption** if necessary.
4. Input **Profile name** and **SSID**.
5. The default value for **Authentication Mode** is set as **Auto**.



6. Click **OK** button.

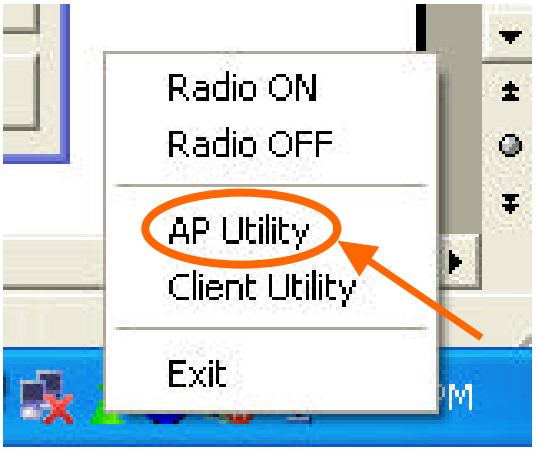
7. In **Advance** tab (Ad-Hoc Mode), there are alternatives for **Power Consumption Setting**, **Fragmentation Threshold** and **RTS/CTS Threshold**.



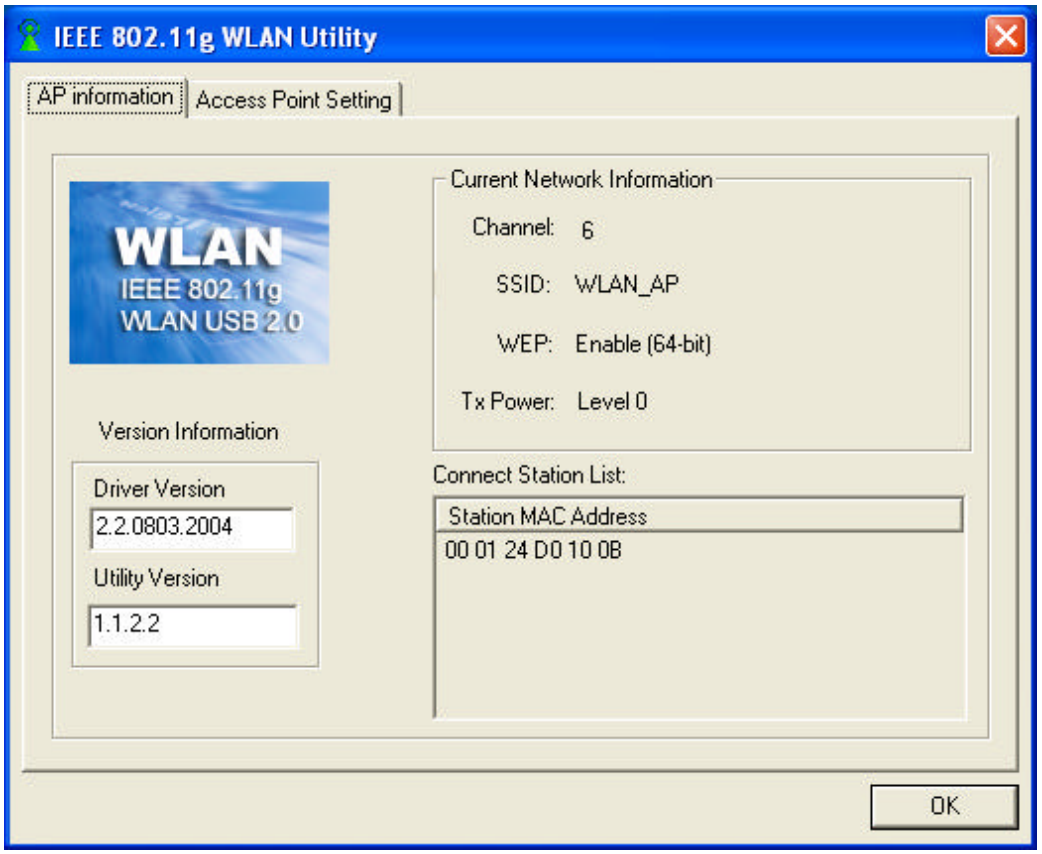
5 Acting as an Access Point (AP)

- The 802.11g USB 2.0 Adapter can function as a simple Access Point (AP), and act as the center point of a wireless network supporting a data rate of up to 11 Mbps. It can also connect these wireless devices to wired network through the LAN interface.
- **Radio ON** indicates to connect the network ; if you want to disconnect the network, then click **Radio OFF**.

1. Go to the wireless configuration icon in Windows System Tray, press the right key, an option list pops up and click **AP Utility**.

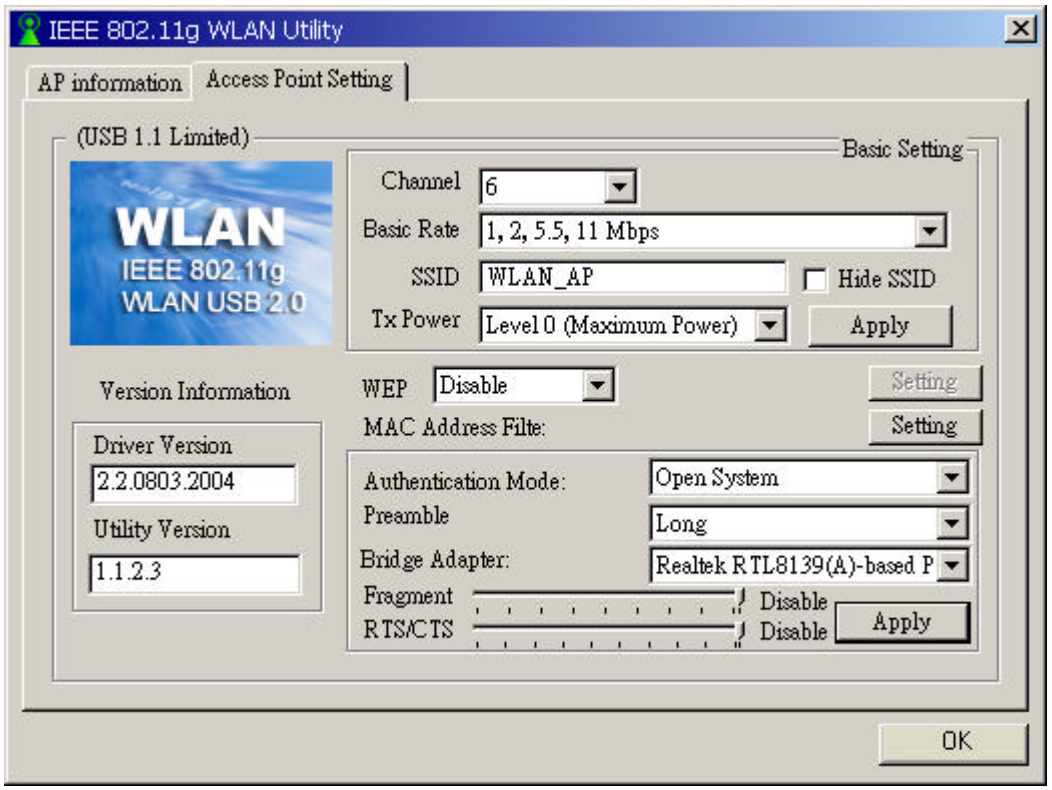


2. In **AP information** tab, all information related to the **Current Network** is listed. The **Connect Station List** allows you to grant/deny access to/from specified wireless stations.

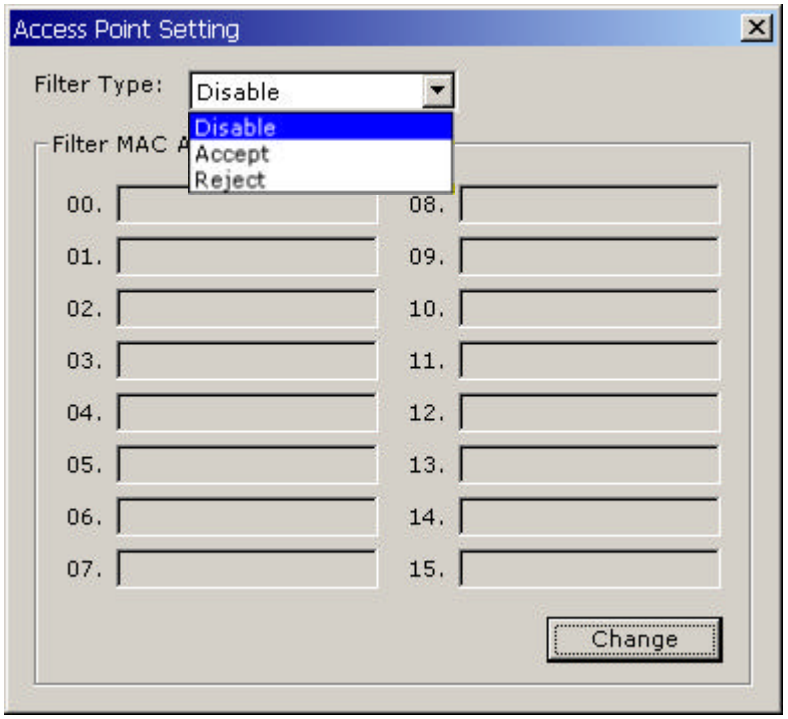


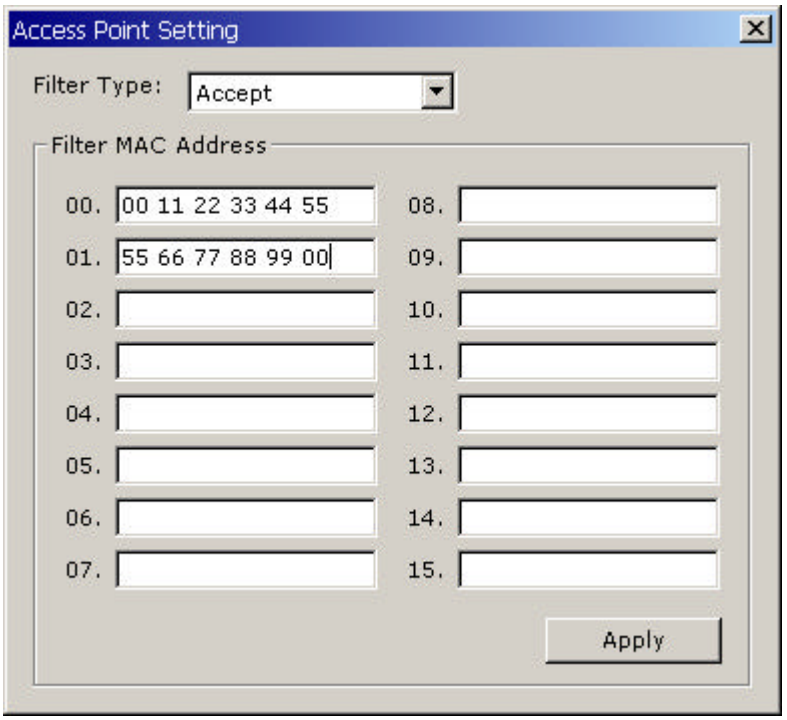
3. In **Access Point Setting** tab, you can set **Channel** (1 to 6), **Basic Rate** (usually remain as default value), **SSID** and **Tx Power**. Your setting will be consistent as indicated in Current Network information.

4. After the **Basic Setting** is done, click **Apply** to renew the values.



5. For **MAC Address Filter** setting, you may set **Filter Type** and add **Filter Mac Address**.
   - ✓ Filter Type **Disable**: Not activate Filter Type.
   - ✓ Filter Type **Accept**: Accept networks added in Filter Mac Address.
   - ✓ Filter Type **Reject**: Reject networks noted in Filter Mac Address.



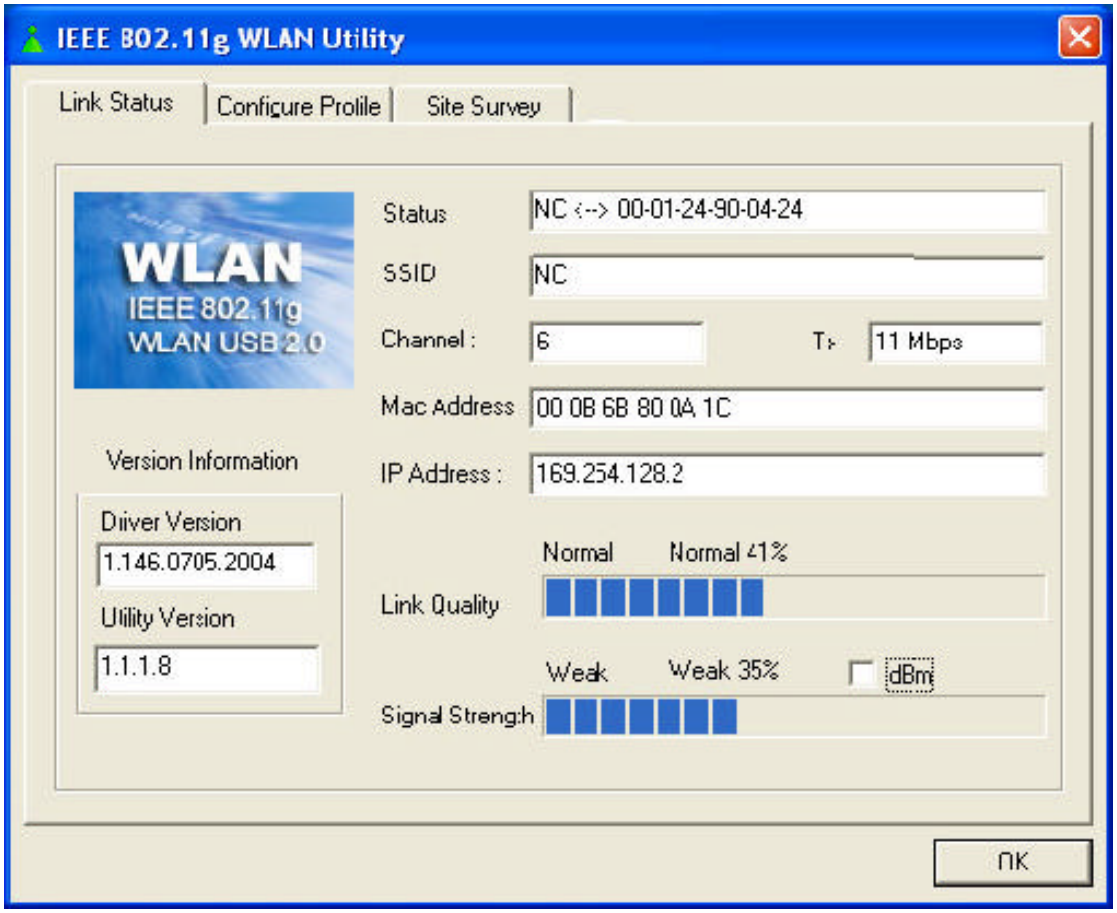


6. After setting Filter Type and Filter MAC Address, click **Apply** to renew the values.
7. For details of each tab in WLAN 802.11g USB2.0 Utility (for **AP Setting**), please read Chapter 7.

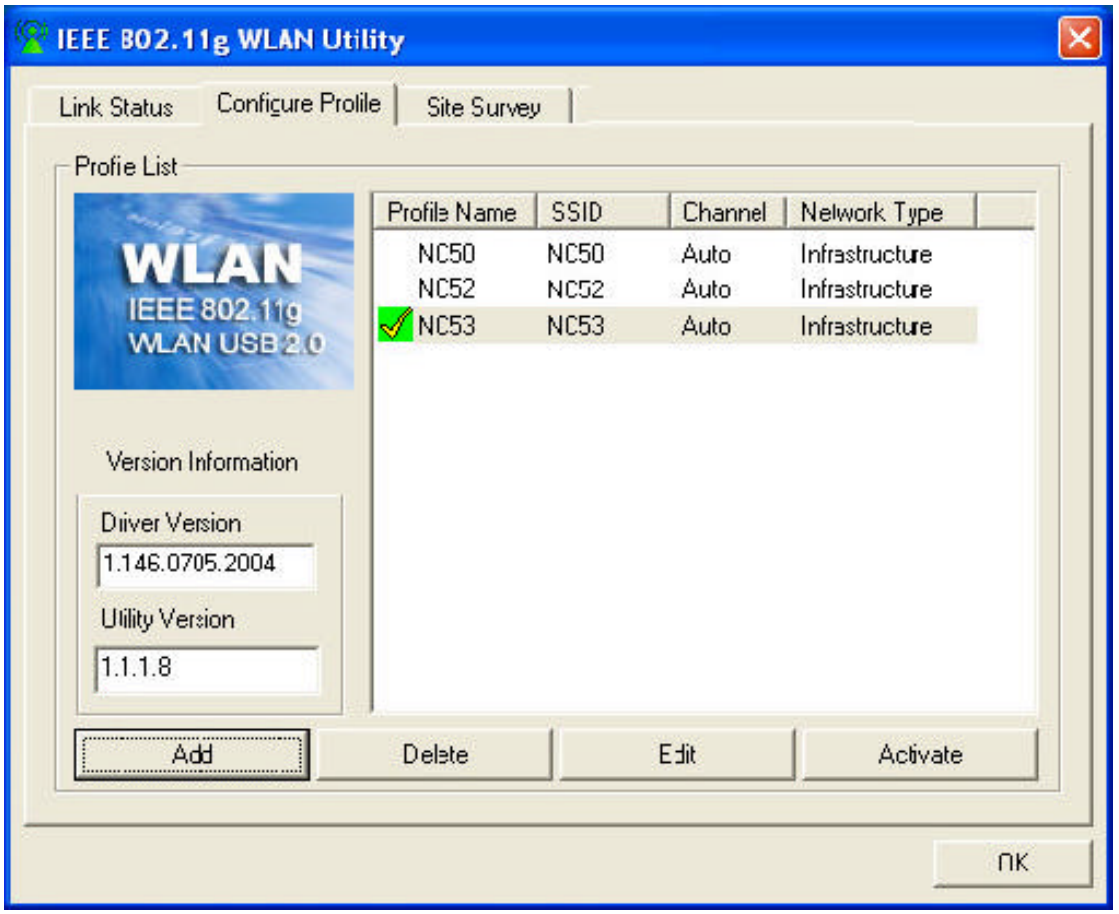
6 Using the Utility (Client)

6.1 Link Status Tab

This tab indicates Connection information such as the Status, Link Quality, Signal Strength, SSID, etc.



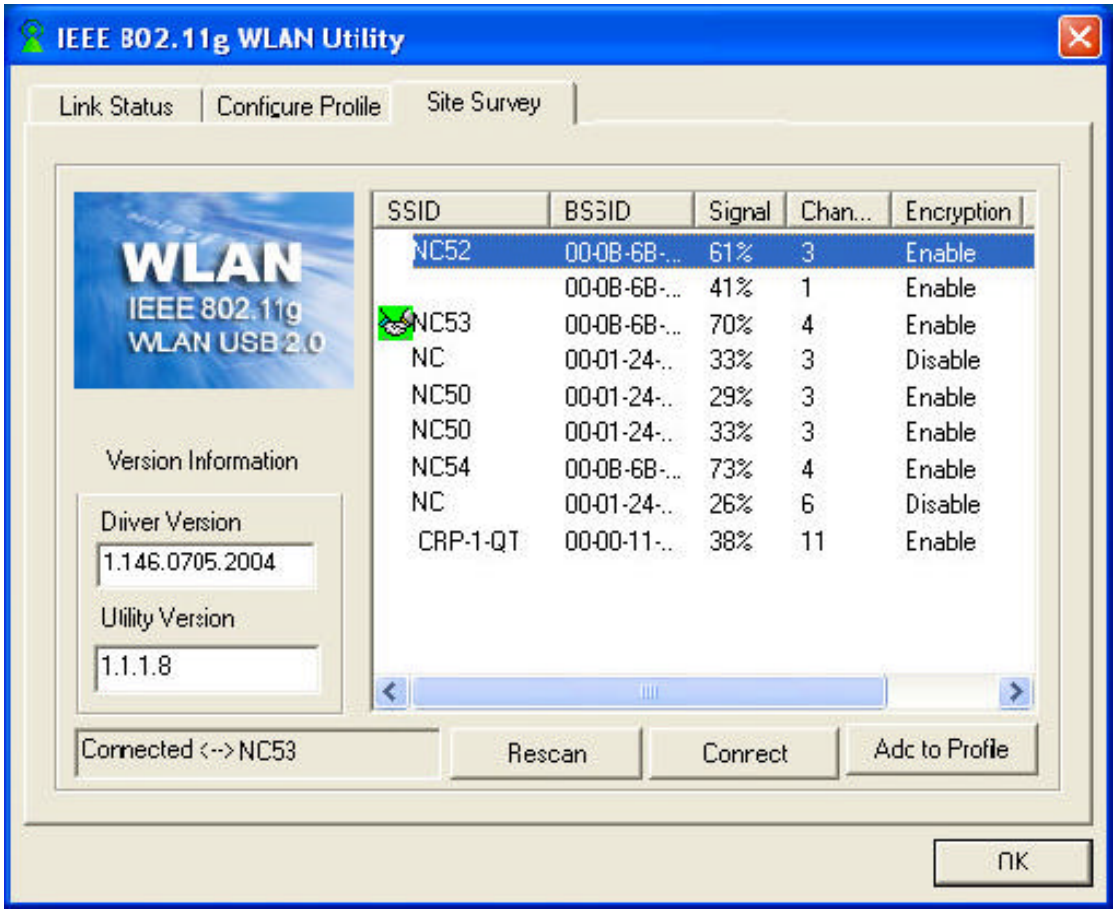
6.2 Configure Profile Tab



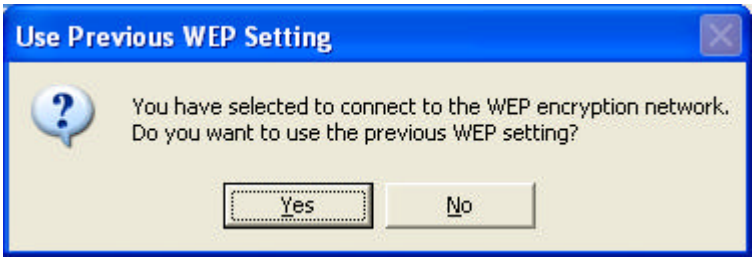
1. **Profile Name**: You may create several profiles to save different sets of network settings.
2. **SSID**: The name of the wireless network.
3. **Channel**: Every station in the network should set the same number of channel.
4. **Network Type**: Ad hoc mode or Infrastructure mode.
5. **Add** button: Click to create a new network.
6. **Delete** button: Click to remove a selected network.
7. **Edit** button: Click to modify the network.
8. **Activate button**: Activate the highlighted profile.
9. **Driver Version**: Help to recognize the current driver version.
10. **Utility Version**: Help to recognize the current utility version.

6.3 Site Survey Tab

This tab lists all available networks and indicates each network's information such as SSID, BSSID, Signal, Channel and Encryption.



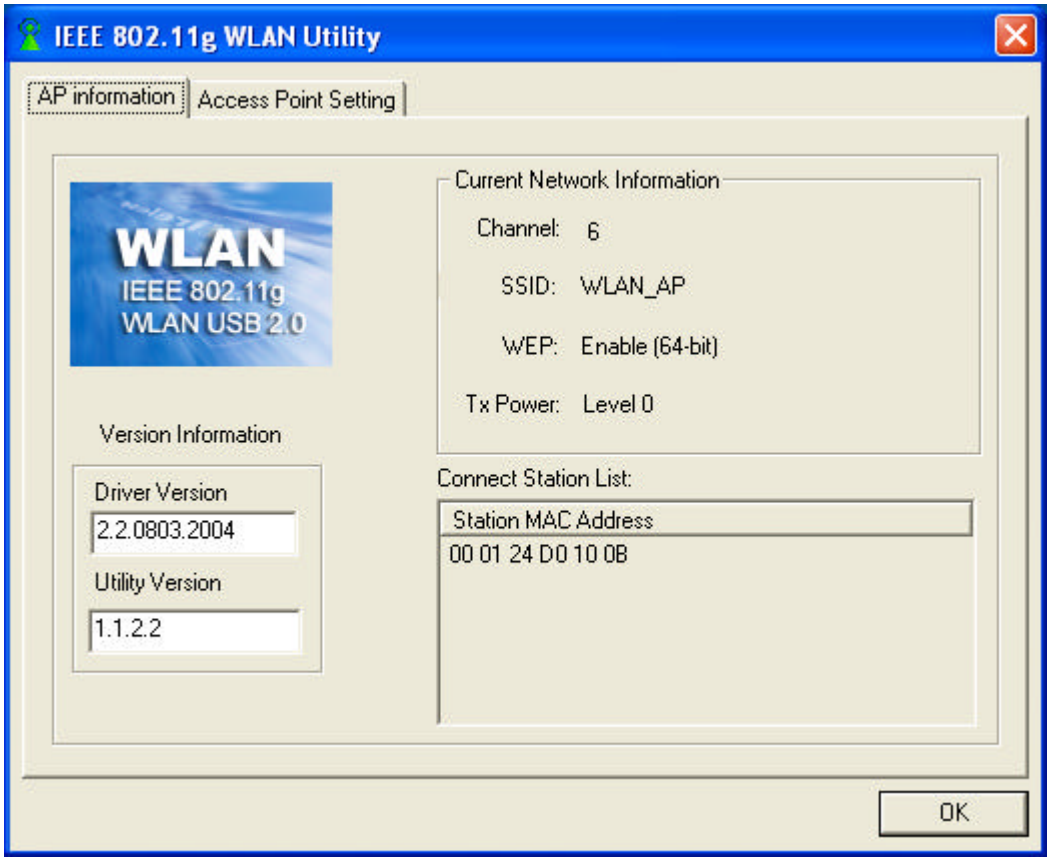
Note! Before changing to another network, a message will pop up asking you whether to use the previous WEP setting or not.



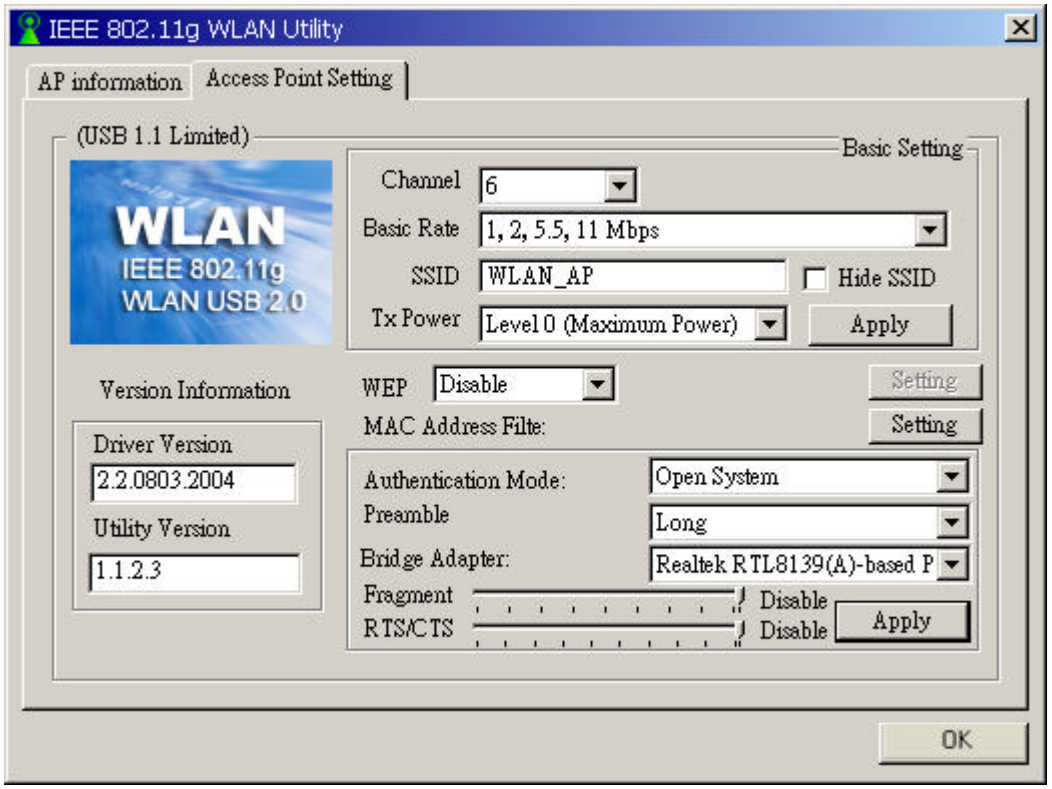
7 Using the Utility (AP)

7.1 AP Information Tab

This tab indicates the **Current Network Information** such as SSID, WEP and Power Transmission Rate (Tx Power). All Client MAC Addresses will also list in the **Connect Station List**.



7.2 Access Point Setting



Channel: Six categories (1 to 6).

Basic Rate: Four categories (1, 2, 5.5 or 11 Mbps) of network connecting rate.

SSID: The name of the wireless network.

Hide SSID: Conceal the name of the wireless network while site surveying.

Tx Power: Different power transmission rate can save power cost.

WEP: Two options (Enable/Disable).

Authentication Mode: Two options (Open System/Shared Key).

Preamble: Two options offered (Long/Short).

Bridge Adapter: Activate or not activate bridge adapter.

Fragment: Sending data by batches.

RTS/CTS: RTS: Request To Send; CTS: Clear To Send.

8 Network Application

This section consists of the network applications of 802.11g USB 2.0 Adapter, including:

- To survey the network neighborhood
- To share your folder with your network member(s)
- To share your printer with your network member(s)
- To access the shared folder(s)/file(s) of your network members(s)
- To use the shared printer(s) of your network member(s)

In fact, the network applications of 802.11g USB 2.0 Adapter are the same as they are in a wired network environment. You may refer to the following 3 examples of Surveying the Network Neighborhood, File Sharing and Using the Shared Folder.

8.1 Surveying the Network Neighborhood

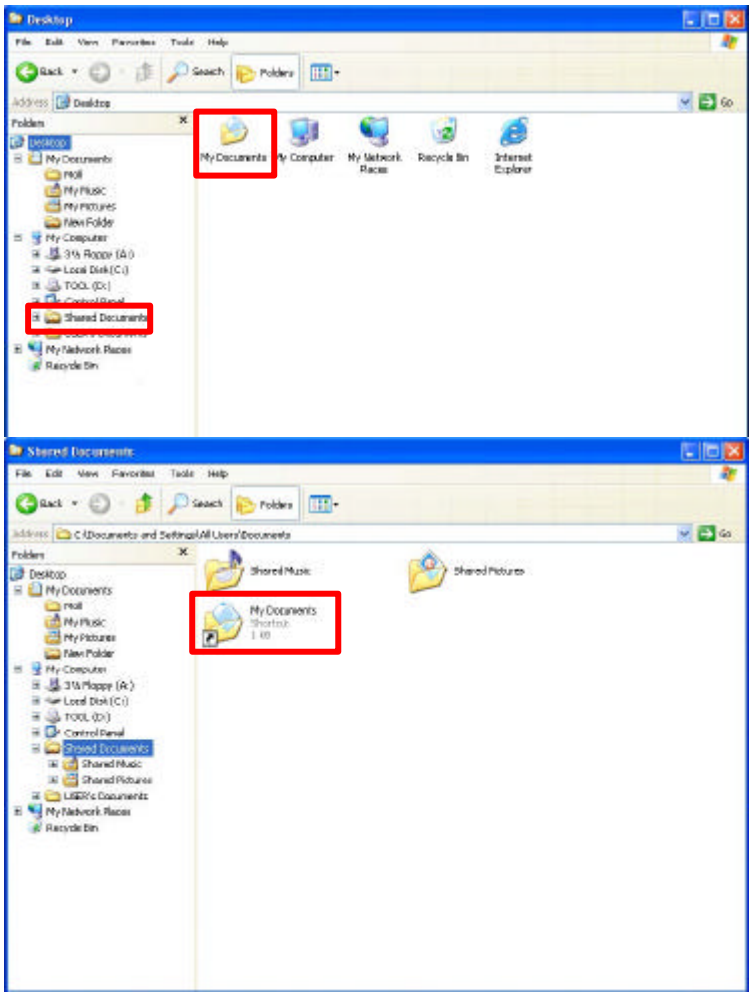
When multiple base stations are up and running in your wireless network, you can use the procedure described below to display the other computers:
Double-click My Network Places to display all stations in your Microsoft Windows Network Group.
To display other workgroups in the network environment, **double-click Entire Network**.
If there is a **second network operating system** running in your network environment (for example a Novell NetWare network), the “Entire Network” window will also display available servers running under the second network operating system. If you click on these servers, you may be asked to **enter your user name and password** that applies to the other network operating system. If you cannot find it, verify whether the other wireless computers are:
Powered up and logged on to the network.
Configured to operate with identical Microsoft Network settings concerning:

- ✓ Networking Protocol.
- ✓ Wireless Network Name.

To enable the sharing of **Internet access**, you should set your WLAN mode as **“Infrastructure”** and connect to the access point.

8.2 File Sharing

802.11g USB 2.0 Adapter allows the sharing of files between computers that are logged onto the same wireless network. If you want to share your folder “My Documents” with other computers of the wireless network, please **highlight the folder “My Documents” and drag it to Shared Documents folder**.



Sharing files in the IEEE802.11g wireless network will be like sharing files on a wired LAN.

8.3 Using the Shared Folder

If you would like to access a shared folder stored in other stations of same network, please follow the process below:

Double-click the “My Network Places” icon, and then double-click the computer where the shared folder is located.

Double-click the folder you want to connect to.

Now you may open the needed file(s).

Note! If a password is required, the Windows will prompt a password column to you. Then you need to enter the password that had been assigned to this shared folder.

9 Product Specification

Item	Key Specifications
Frequency Range	➢ DSSS: 2.4~2.483.5GHz
Modulation Technique	➢ 802.11g: OFDM ➢ 802.11b: CCK (11Mbps), DQPSK (2Mbps), DBPSK (1Mbps)
Host Interface	➢ USB 2.0
Channels Support	➢ US/Canada: 11(1~11)
Output Power	➢ 11b:18 dBm ➢ 11g:19 dBm
Operation Voltage	➢ 5.0V +/-10%
Power Consumption	➢ Transmission Mode: 350mA@5V ➢ Receive Mode: 180mA@5V ➢ Power Saving Mode: 80mA@5V ➢ Suspend Mode: 1.7mA @ 5V
Operation System Supported	➢ Windows® XP, 2000, ME
Dimension	➢ 80mm (L) x 25mm (W) x 10mm (H)
Weight	➢ Approx. 20g.
Security WEP	➢ 64-bit/128-bit WEP ➢ AES ➢ WPA
Operation Mode	➢ Infrastructure and Ad-Hoc Mode
Transfer Data Rate	➢ 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps ➢ 802.11b:1,2, 5.5, 11Mbps
LED Indicator	➢ Wireless LAN Activity Indicator
Operation Temperature	➢ 0^0C~55^0C
Storage Temperature	➢ -25^0C~70^0C
WHQL	➢ Microsoft® XP, 2000 Complaint
EMC Certification	➢ FCC part 15 (USA)

10 Glossary

CHAP: Challenge Handshake Authentication Protocol. Security feature supported on lines using PPP encapsulation that prevents unauthorized access. CHAP does not itself prevent unauthorized access, but merely identifies the remote end. The router or access server then determines whether that user is allowed access.

EAP: Extensible Authentication Protocol. Framework that supports multiple, optional authentication mechanisms for PPP, including clear text passwords, challenge-response, and arbitrary dialog sequences.

LEAP: Lightweight Extensible Authentication Protocol is a Cisco proprietary EAP-Type. It is designed to overcome some basic wireless authentication concerns through **Mutual Authentication** and the use of dynamic **WEP** keys.

MD5: **MD5** is an EAP-Type for authentication. It is analogous to the PPP CHAP protocol. A challenge string is sent from the **Authentication Server** to the **Supplicant** in the MD5-Challenge Request. The challenge string with the user password is hashed using MD5 and the hash is returned in the MD5-Challenge Response. The Authentication Server performs the same hash and compares the result with that returned by the Supplicant to determine whether the authentication is a Success.

PAP: Password Authentication Protocol. Authentication protocol that allows PPP peers to authenticate one another. The remote router attempting to connect to the local router is required to send an authentication request. Unlike CHAP, PAP passes the password and the host name or username in the clear (unencrypted). PAP does not itself prevent unauthorized access but merely identifies the remote end. The router or access server then determines whether that user is allowed access. PAP is supported only on PPP lines.

PEAP: Protected Extensible Authentication Protocol is a two-phase authentication like TLS. In the first phase the Authentication Server is authenticated to the **Supplicant**. Using TLS, a secure channel is established through which any other EAP-Type can be used to authenticate the **Supplicant** to the **Authentication Server** during the second phase. A certificate is only required at the **Authentication Server**. **PEAP** also supports identity hiding where the **Authenticator** is only aware of the anonymous username used to establish the TLS channel during the first phase but not the individual user authenticated during the second phase.

SSID: Name of wireless network.

TLS: **TLS** is an EAP-Type for authentication based upon X.509 certificates. Because it requires both the **Supplicant** and the **Authentication Server** to have certificates, it provides explicit **Mutual Authentication** and is resilient to man-in-the-middle attacks. After successful authentication a secure TLS link is established to securely communicate a unique session key from the **Authentication Server** to the **Authenticator.**

TTLS: Tunneled TLS is an EAP-Type for authentication that employs a two-phase authentication process. In the first phase the **Authentication Server** is authenticated to the **Supplicant**. Using TLS, a secure channel is established through which the Supplicant can be authenticated to the **Authentication Server** using legacy PPP authentication protocols such as PAP, CHAP, and MS-CHAP. **TTLS** has the advantage over **TLS** that it only requires a certificate at the **Authentication Server**. It also makes possible forwarding of **Supplicant** requests to a legacy RADIUS server. **TTLS** also supports identity hiding where the **Authenticator** is only aware of the anonymous username used to establish the TLS channel during the first phase but not the individual user authenticated during the second phase.

WPA: Wi-Fi Protected Access is a replacement security standard for **WEP**. It is a subset of the IEEE 802.11i standard being developed. **WPA** makes use of **TKIP** to deliver security superior to WEP. 802.1X access control is still employed. The **Authentication Server** provides the material for creating the keys.