802.11g USB 2.0 Adapter

DRUC-U3

User’s Guide

Version: 0.02 — May 2006

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 user is encouraged to try to correct the interference by one of the following measures:

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

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

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.
(3) This device shall automatically discontinue transmission in case of either absence of information to transmit or operation failure.

Information to User

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate this equipment.

IMPORTANT NOTE:
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.

The maximum reported SAR values are -
Body: 0.303 **W/kg (802.11b); Body:** 0.177 **W/kg (802.11g)**

Table of Contents

1. Welcome

Thank you for purchasing our 802.11b/g USB 2.0 Adapter, and welcome to Wireless LAN—the easy way to wireless networking.

This user's guide introduces to you the 802.11b/g USB 2.0 Adapter and describes the most common configurations, which will help you connect to your network easily.

Please read this manual to get familiar with the IEEE802.11b/g Wireless LAN. This manual contains detailed instructions in operation of this product. Please keep this manual for future reference.

As this product is designed to run under Microsoft Windows, 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 Kit Contents

The 802.11b/g USB 2.0 Adapter kit should include the following items: One 802.11b/g USB 2.0 Adapter with USB cable, one CD and one Quick Start Guide.

a. One 802.11b/g USB 2.0 Adapter

b. One Software CD including:

   1. Utility & Driver Installation Software
   2. Acrobat Reader
   3. User Manual PDF File

c. Quick Start Guide

If any of the items mentioned above are damaged or missing, please contact your distributor.

1.2 Main Features of 802.11b/g USB 2.0 Adapter

- High-speed wireless connection, up to 54 Mbps
- IEEE802.11b/g (DSSS) standard for 2.4 GHz Wireless LAN
- Plug-and-Play installation
- Solid design with an integrated antenna
- Full mobility and seamless cell-to-cell roaming
- Automatic scale back at per packet level
- Automatic load balancing for optimized bandwidth
- Advanced power management
- Supports Windows®98SE, ME, 2000 and XP (subject to availability)

1.3 Wireless Networking Scenarios

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

1. A Peer-to-Peer Workgroup of 802.11b/g compliant wireless devices.
2. A LAN (Local Area Network) constructed by Access Point(s) or other 802.11b/g 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.

Peer-to-Peer Networking:

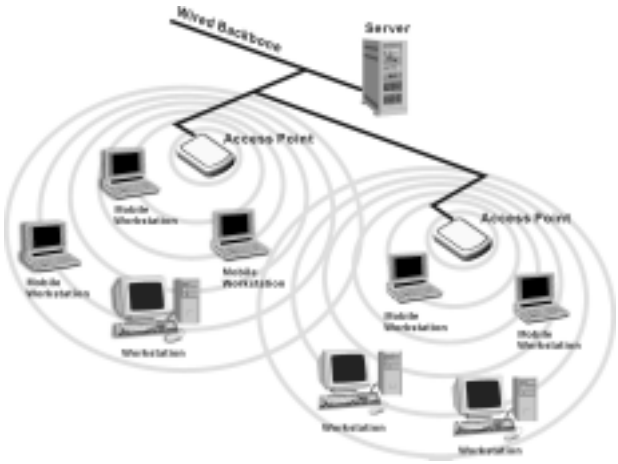
An Ad Hoc Network could be easily set up with some PCs and this 802.11b/g USB 2.0 Adapter or our other WLAN devices. Therefore, it is very suitable to build a network for temporary use, such as for demonstration in exhibition, for new sales point/branch use and alike.

Cooperate LAN (Local Area Networking):

With some 802.11b/g USB 2.0 Adapters and Access Points, it is easy to construct a LAN with access to Internet for enterprise use.

The construction is quite easy that the 802.11b/g 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 manufacturers will bundle the Site-Survey tool for users to check the communication quality.



2. Quick Start to Wireless Networking

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

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

Note! *During installation procedure, each operating system may prompt different specific options:*

Windows 98SE: The system will request the original Windows CD during the installation process. When the installation is finished, you'll have to restart your computer.

Windows Me: Please restart your computer when the installation is finished.

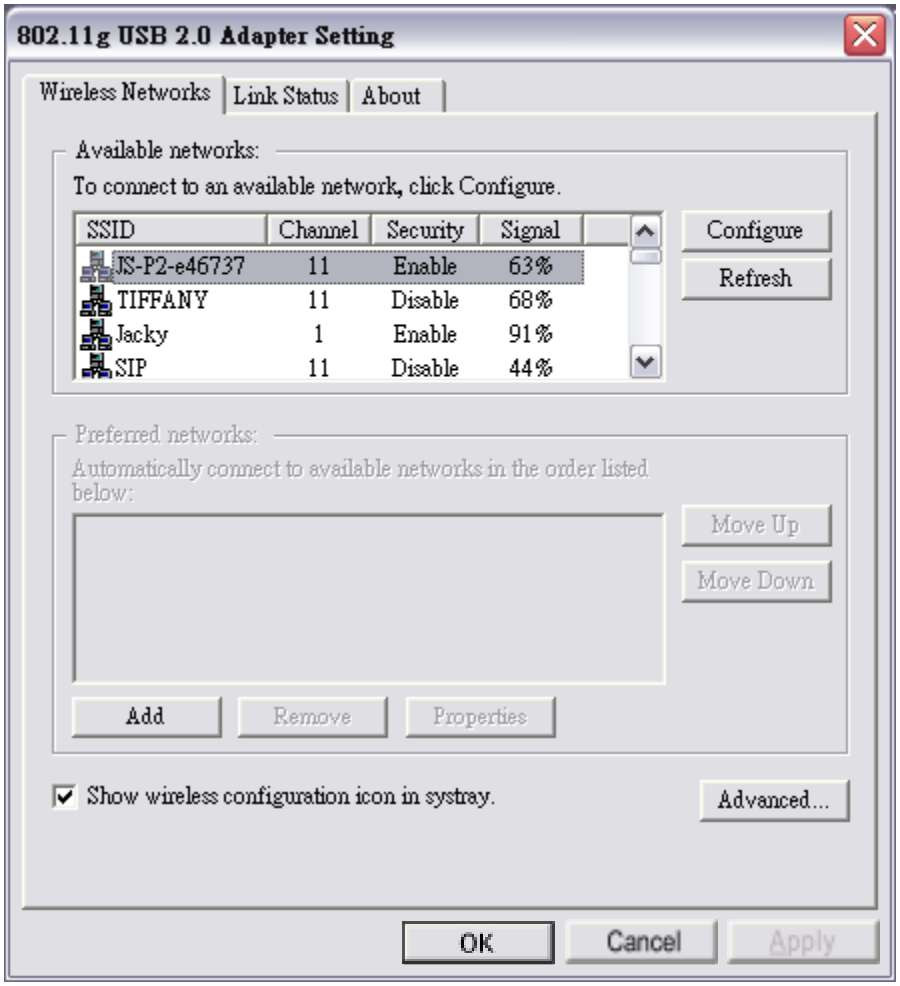
Windows 2000/XP: Select "Install the software automatically" when the window with this option appears, and then click "Next" to continue installation.

2.2 Connecting to an Existing Network

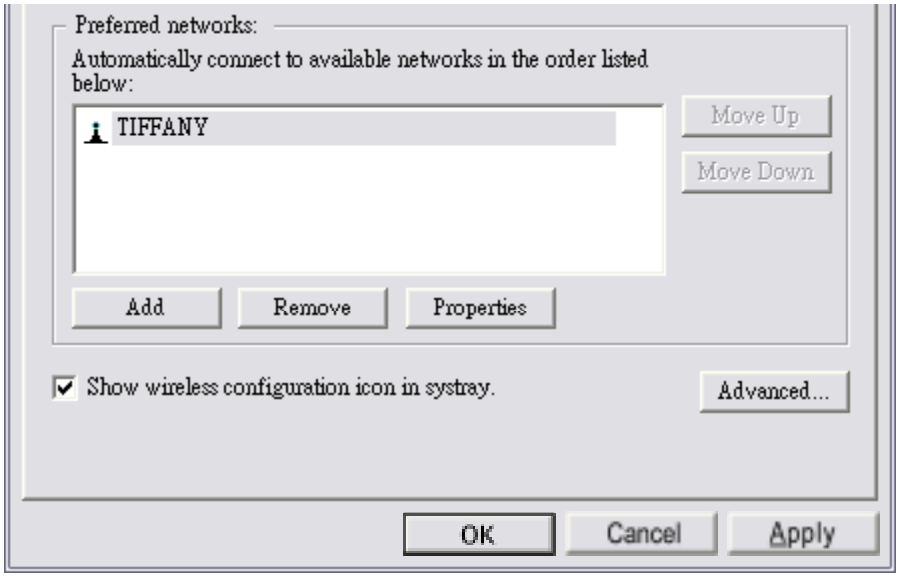
1. Go to windows **Start > Programs > 802.11g USB2.0 adapter > 802.11g USB2.0 adapter setting** to open the utility. The 802.11b/g USB2.0 Adapter Setting window appears. You can see the wireless configuration icon in Windows System Tray. Double click the shortcut icon or the wireless configuration icon can also open the utility.

: Shortcut Icon

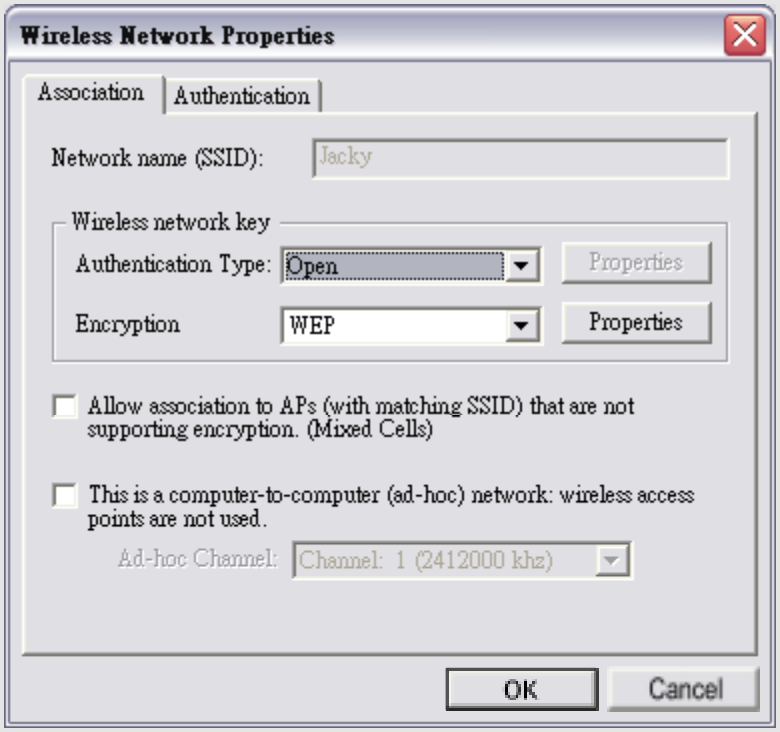
: Wireless Configuration Icon



2. From the **Available Networks** list, click a network with better signal and click "**Configure**". The chosen network will appear in the Preferred Networks list.



Note! If the chosen network is secured (the Security is Enable), Wireless Network Properties window pops up. Key in the Association and Authentication settings and then click "OK". (Contact your network administrator for details of the settings.)



3. Click "**Apply**" and then wait for a while for the adapter to associate to the AP.
4. Once connected, the wireless configuration icon appears green and the icon

shown in Preferred networks appears connected  . You can click **Link Status** tab to check the connection status.

5. For details of each tab in 802.11b/g USB2.0 WLAN Utility, please read User's Guide Chapter 4.

3. Step-by-Step Installation Guide

This section will lead you through the installation of 802.11b/g USB 2.0 Adapter (both software and hardware) in detail.

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

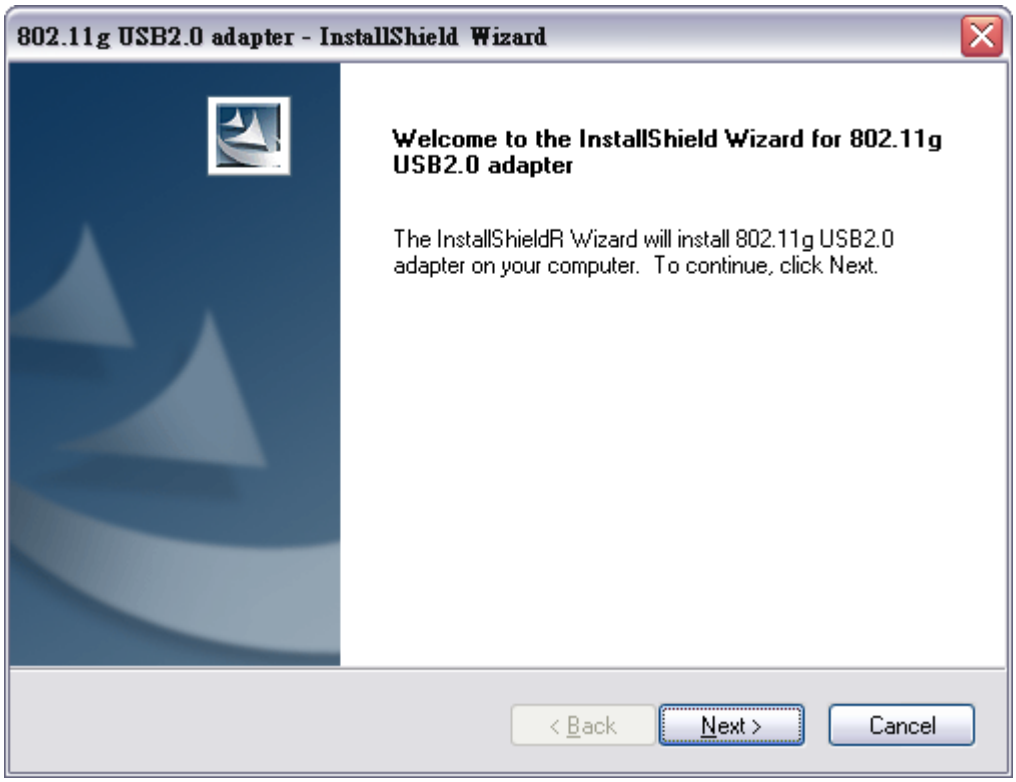
1. Install the software by using the installation CD.
2. Install the 802.11b/g USB 2.0 Adapter.
3. Install the required network protocols to communicate with your network. Mostly, you will need to set the TCP / IP protocol.

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.

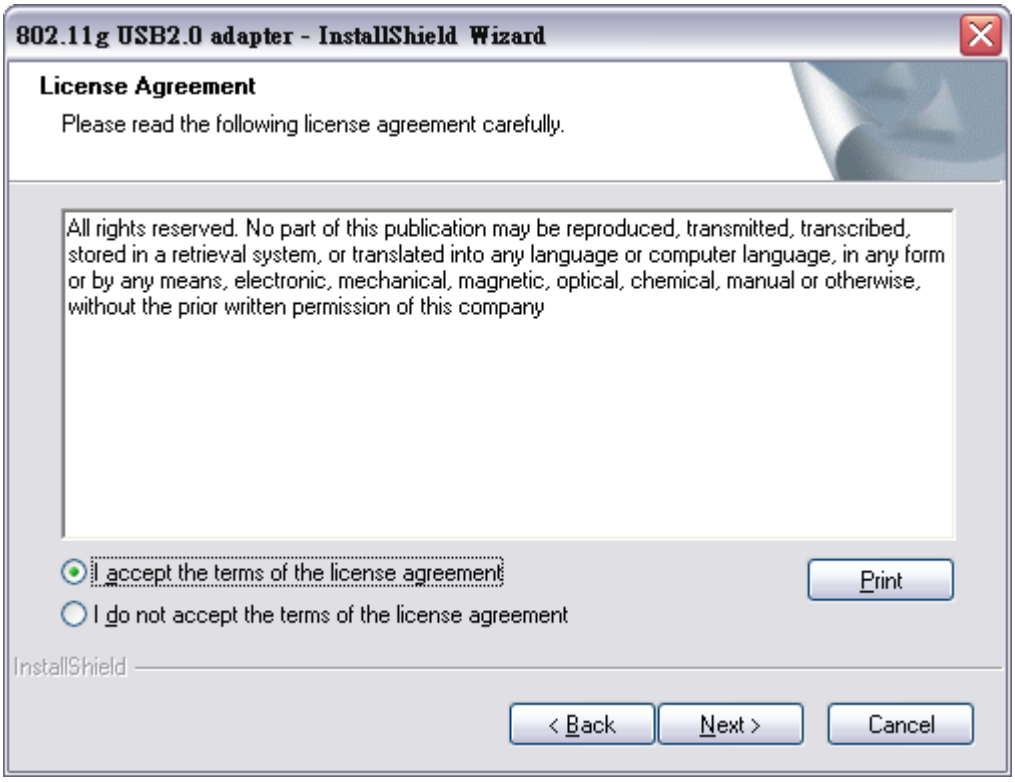
3.1 Driver / Utility Installation

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

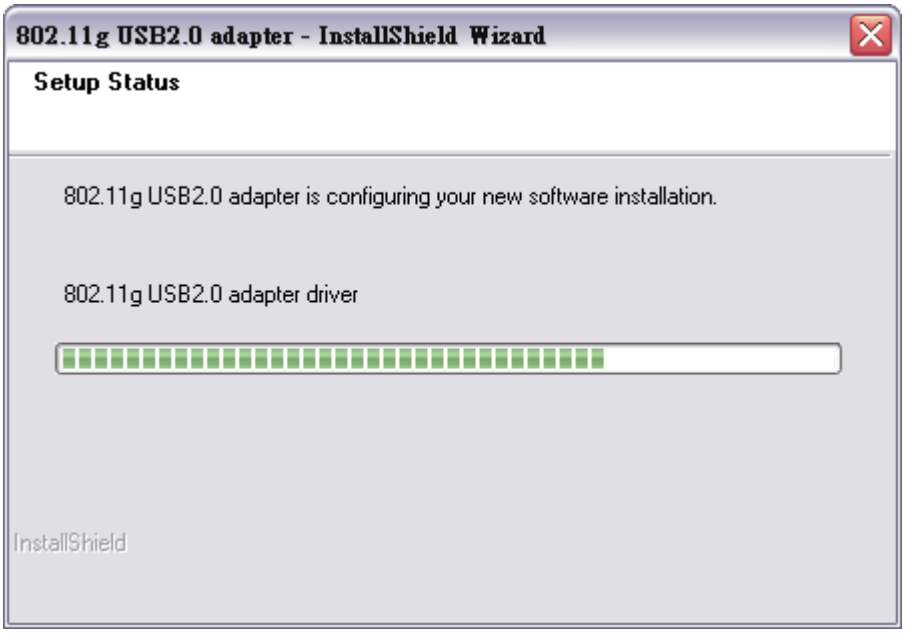
1. **Insert the installation CD.** Insert the installation CD into your CD-ROM drive. The setup program automatically starts.
2. **Click "Next".**



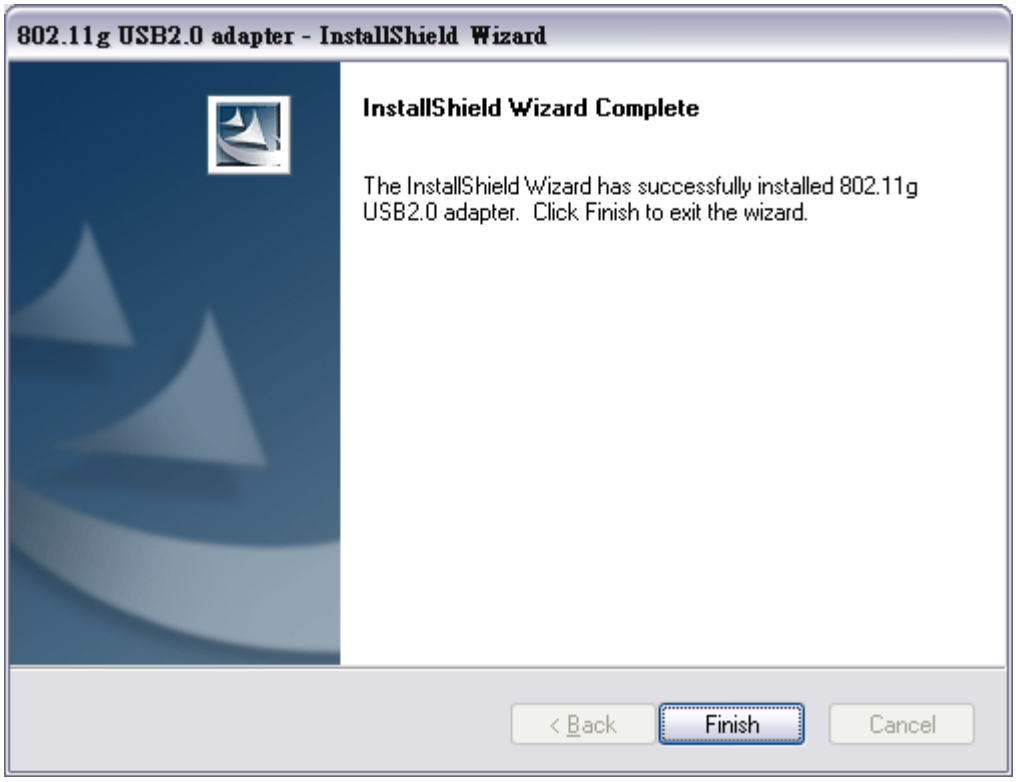
3. **Choose “I accept the terms of the license agreement” and then click “Next”.**



4. **Wait for the installation.**



5. **Click “Finish”.**



6. **Connect the 802.11b/g 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:** Please check with the network administrator for the values of the settings. Select “Install the software automatically” when the window with this option appears, and then click “Next” to continue installation.

4. **Windows XP:** Select “Install the software automatically” when the window with this option appears, and then click “Next” to continue installation.

3.2 Verifying the Driver/Utility

1. Windows 98SE/Me:

Step 1. Right-click “My Computer” icon on the desktop and choose “Properties”.

Step 2. Select **Device Manager** tab and open “Network adapters”. You should see your 802.11b/g USB 2.0 Adapter in the list. Highlight it and click “**Properties**” button.

Step 3. From the “Device status”, you should see the line “This device is working properly”. If, instead, you see error messages displayed, please remove this Adapter (highlight this Adapter and click “**Remove**” button). Restart your PC and go through the installation process again.

2. Windows 2000:

Step 1. Right-click “My Computer” icon on the desktop and choose “Properties”.

Step 2. Select **Hardware** tab and click “Device Manager”. Open “Network adapters”. You should see your 802.11b/g USB 2.0 Adapter in the list. Right-click this Adapter and choose “Properties”.

Step 3. From the “Device status”, you should see the line “This device is working properly”. If, instead, you see error messages displayed, please uninstall this Adapter (right-click this Adapter from the “Network adapters” list and choose “Uninstall”). Restart your PC and go through the installation process again.

3. Windows XP:

Step 1. Click “Start>Control Panel> System”.

Step 2. Select **Hardware** tab, and click “Device Manager”. Open “Network adapters”. You should see your 802.11b/g USB 2.0 Adapter in the list. Right-click this Adapter and choose “Properties”.

Step 3. From the “Device status”, you should see the line “This device is working properly”. If, instead, you see error messages displayed, please uninstall this Adapter (right-click this Adapter from the “Network adapters” list and choose “Uninstall”). Restart your PC and go through the installation process again.

3.3 802.11b/g USB2.0 adapter Setting

802.11b/g USB 2.0 Adapter has its own management software, named 802.11b/g USB2.0 Adapter Setting, and users can control all functions provided with it. The wireless configuration icon appears in the Windows System Tray. The Utility includes three tabs: Wireless Networks, Link Status and About.

Wireless configuration icons:

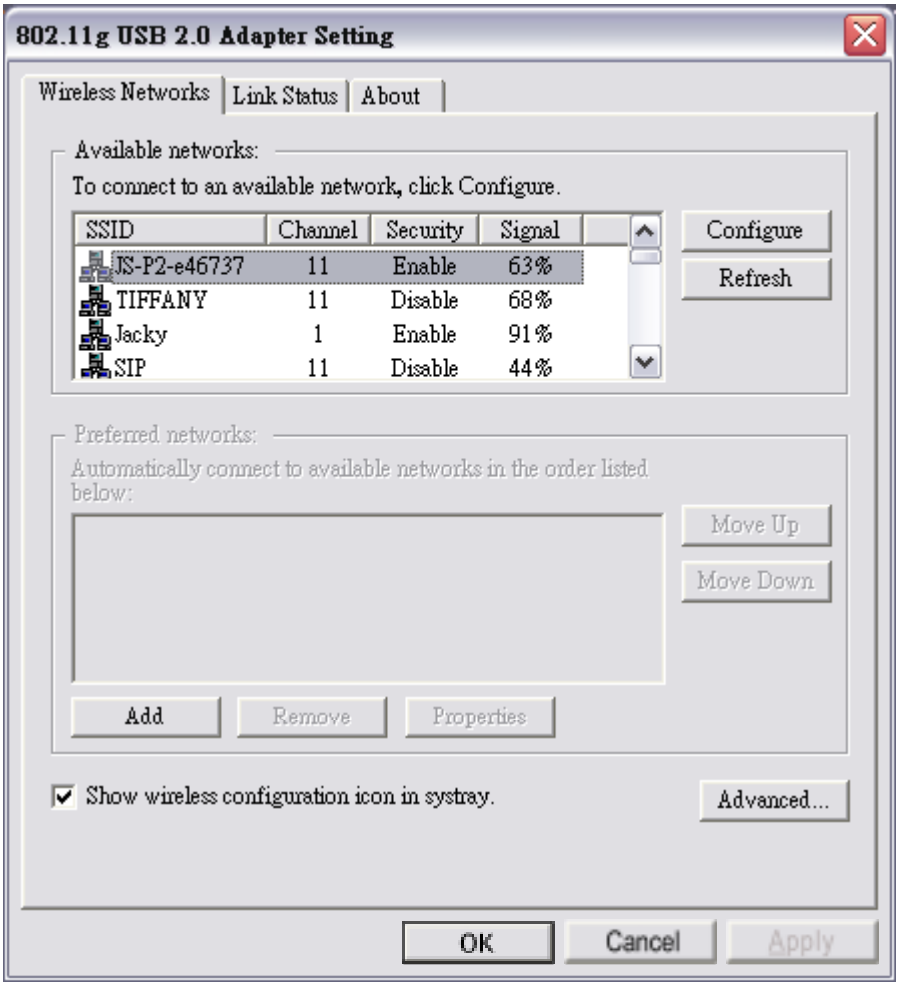
Connected (Green)

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.

3.4 Connecting to an Infrastructure Network

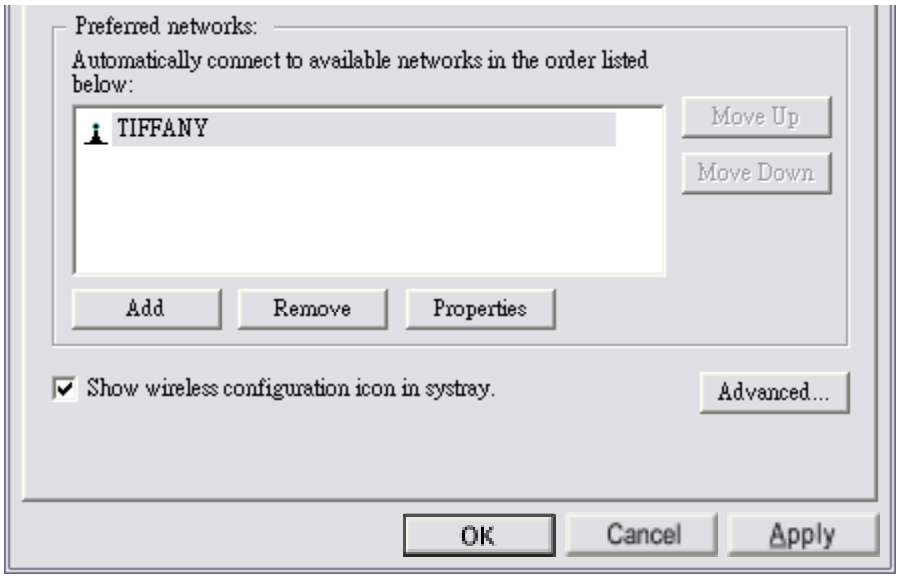
1. Select the **Wireless Networks** tab.



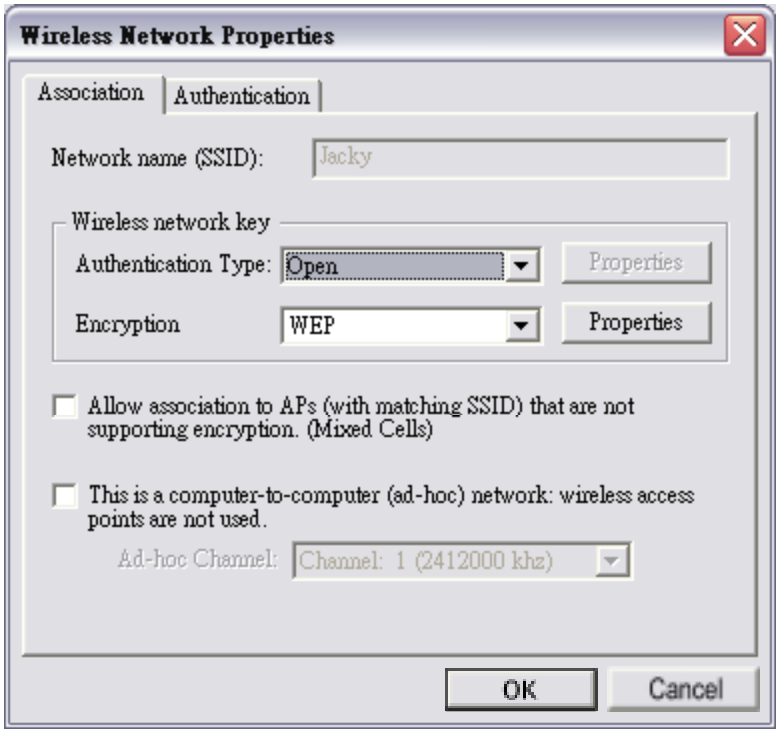
2. Click **Refresh** button to rescan all available networks in vicinity.
3. From the Available Networks list, click a network with better signal and click "Configure".

   : Infrastructure Mode

   : Ad-hoc Mode
4. The chosen network will appear in the Preferred Networks list.



5. If the chosen network is Security-Enabled, **Wireless Network Properties** window pops up. Contact the network administrator for the encryption settings.



6. Click "Apply" and then wait for a while for the adapter to associate to the AP.
7. Once connected, the wireless configuration icon appears green and the icon

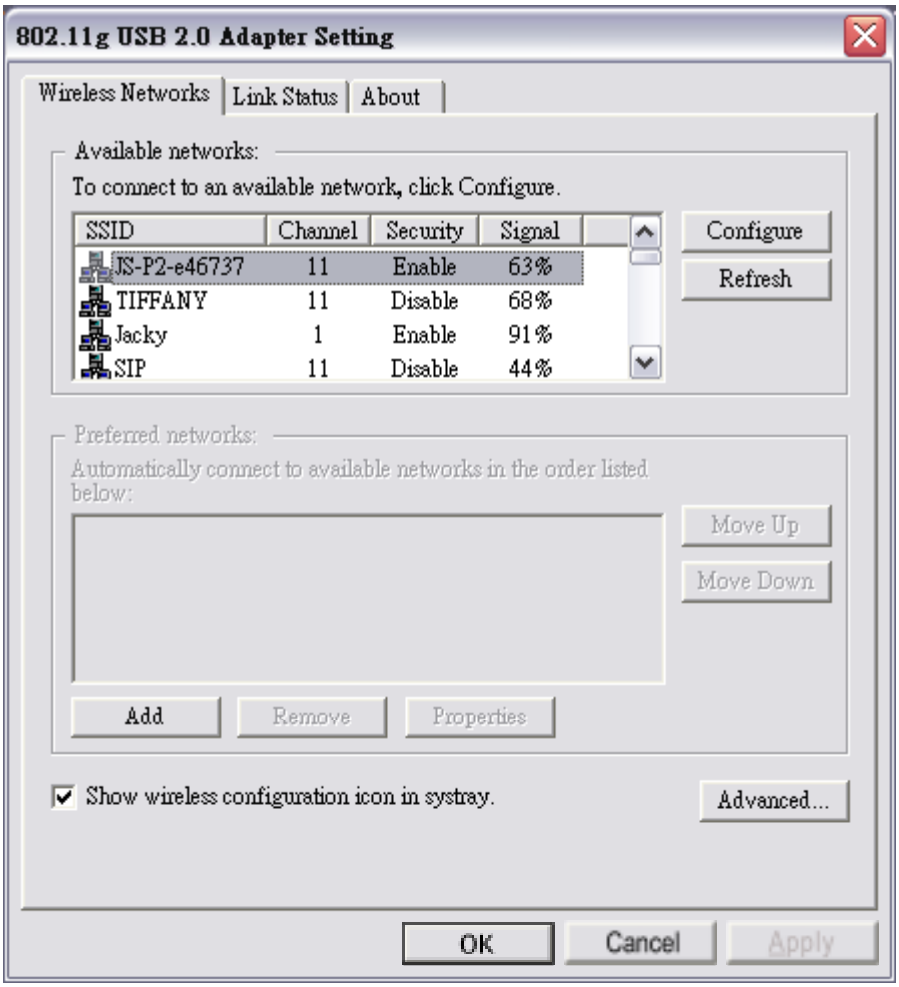
shown in Preferred networks appears connected . You can click **Link Status** tab to check the connection status.

8. For details of each tab in 802.11b/g USB2.0 WLAN Utility, please read refer to Chapter 4.

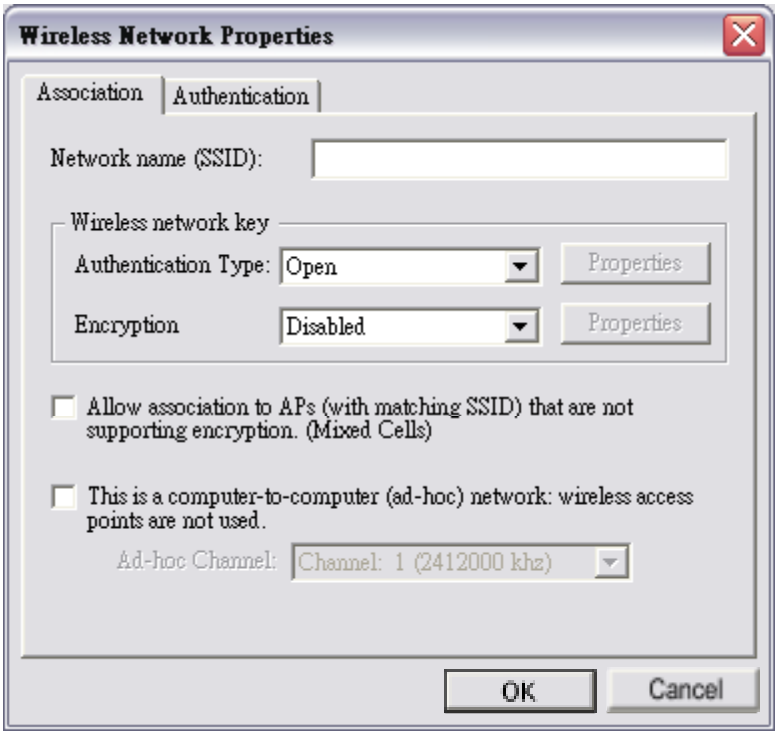
3.5 Creating an Ad-Hoc Network

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 **Wireless Networks** tab, click **Add** button.



2. **Wireless Network Properties** window pops up.



3. Select the check box "**This is a computer-to-computer (ad-hoc) network: wireless access points are note used.**".
4. Set **Wireless network key** and **Ad-hoc Channel** if necessary.
5. Click **OK** button.

3.6 Removing your 802.11b/g USB 2.0 Adapter

In Windows XP/ME and Windows 2000, please follow the safe removal procedure. You can find a safe removal icon in your computer's notification area.

1. Double click on the taskbar icon to "Unplug or Eject hardware".

2. The "Safety Remove Hardware" dialogue box will appear. Click the device in the list and then click "Stop".

Note! *When removing the 802.11b/g 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 802.11b/g USB 2.0 Adapter.*

3.7 Driver / Utility Uninstallation

1. Make sure the **Utility is closed**.

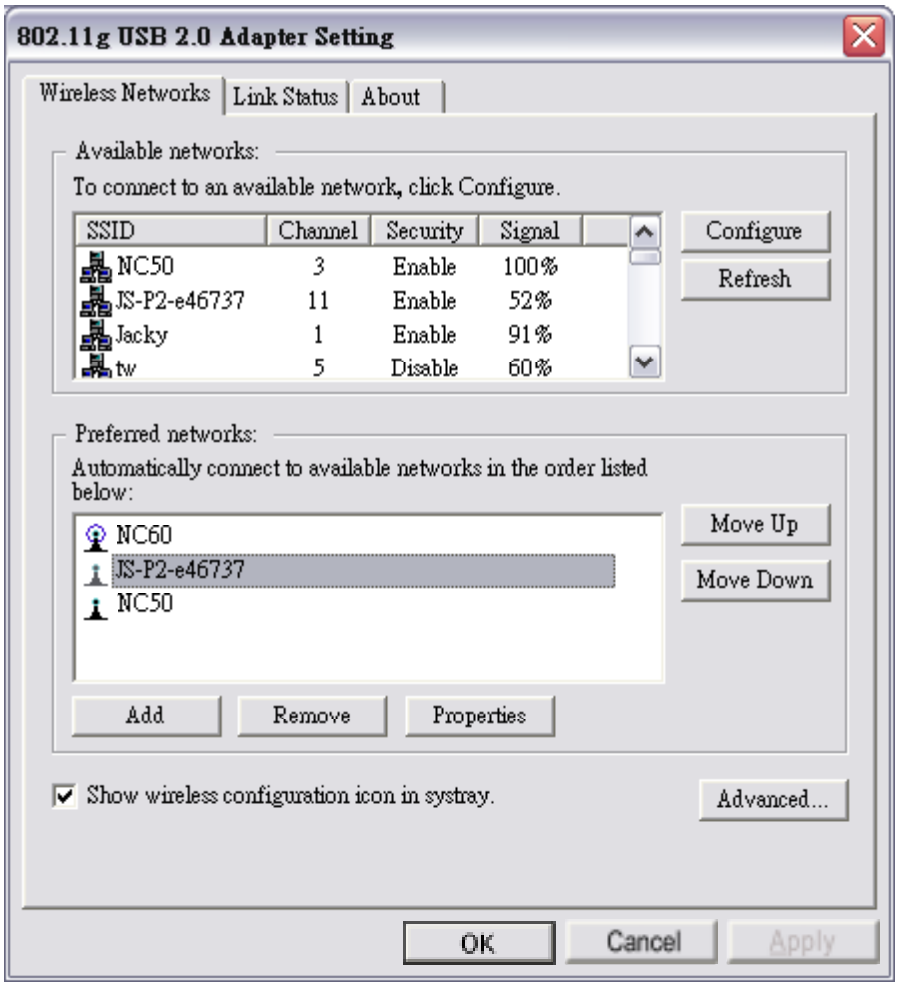
2. Go to windows **Start > Programs >802.11g USB2.0 adapter > Uninstall 802.11g USB2.0 adapter**

3. **Follow the uninstall wizard** to complete the uninstallation.

4. **Restart** your computer.

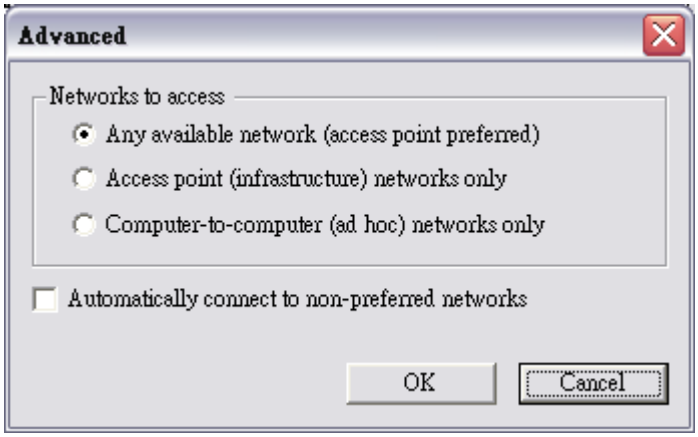
4. Using the Utility

4.1 Wireless Networks Tab

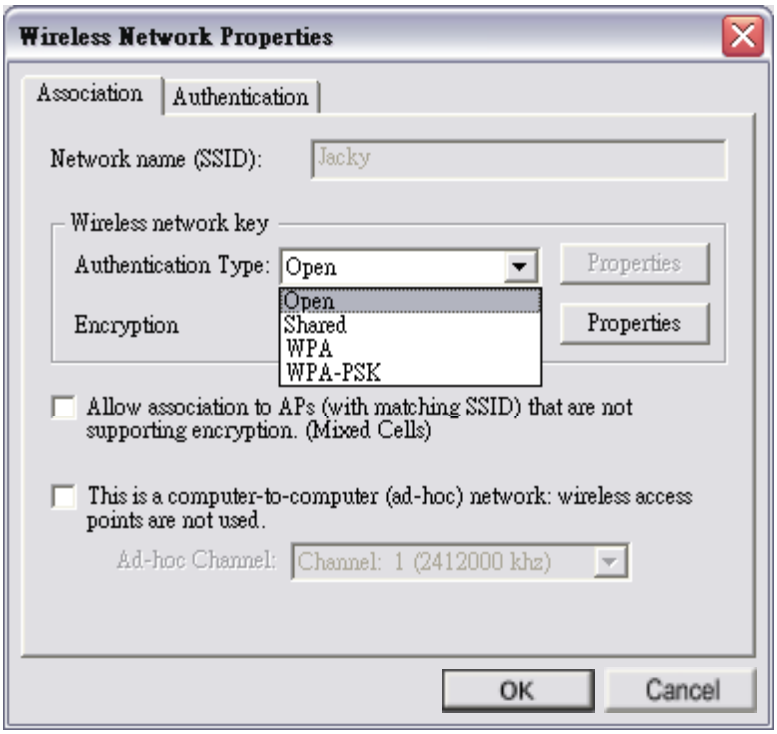


- **Available networks:** Lists all available networks (infrastructure or Ad-hoc networks) in vicinity and shows each network's information such as SSID, Channel, Security and Signal.
- **Preferred networks:** The order of preferred networks. It shows one network is connected, disconnected or unavailable.
- **Configure** button: Make configuration of the chosen network.
- **Refresh** button: Click to rescan all available networks in vicinity.
- **Move Up / Move Down** button: Click to arrange the order of the Preferred networks.
- **Add** button: Click to create new networks.
- **Remove** button: Click to remove the chosen network from Preferred networks list.
- **Properties** button: Click to configure the chosen network.

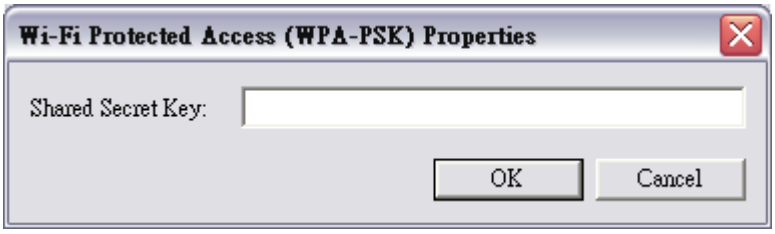
- **Show wireless configuration icon in systray:** Checked to display wireless configuration icon  in Windows System Tray.
- **Advanced** button: Click to choose one network access alternative.
  - ✓ Any available network (access point preferred)
  - ✓ Access point (infrastructure) networks only
  - ✓ Computer-to-computer (ad hoc) networks only
  - ✓ Automatically connect to non-preferred networks



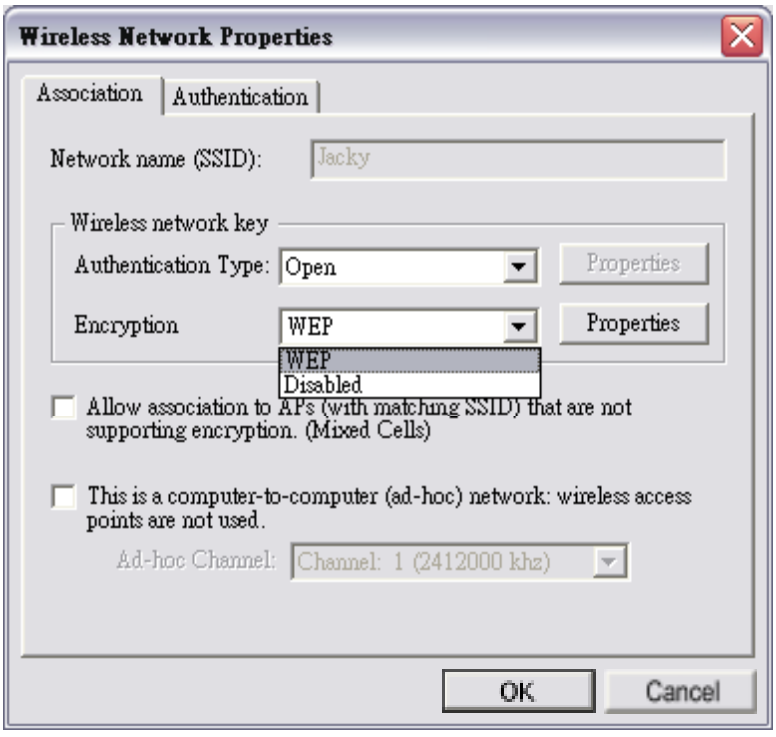
4.1.1 Configure-Association Tab



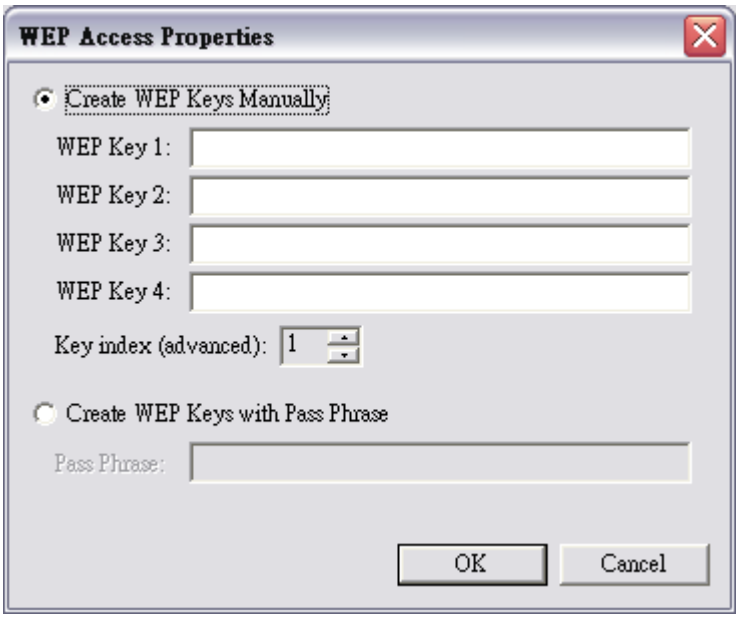
- For **Authentication Type**, you can choose the following options from the drop-down menu:
  - ✓ **Open**
  - ✓ **Shared**
  - ✓ **WPA**
  - ✓ **WPA-PSK:** Choose this option and then click "**Properties**" to set the Shared Secret Key.



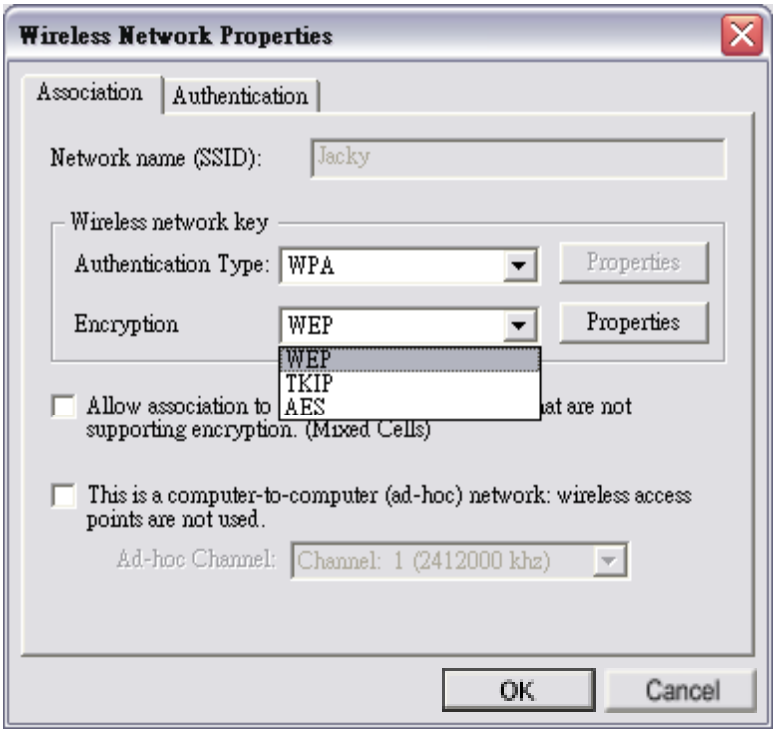
- For **Encryption**, you can choose the following options from the drop-down menu:
  - ✓ **WEP**
  - ✓ **Disabled**



- If you set **Authentication Type** to **Open** or **Shared** or **WPA**, and set **Encryption** to **WEP**, click "**Properties**" to key in WEP keys.

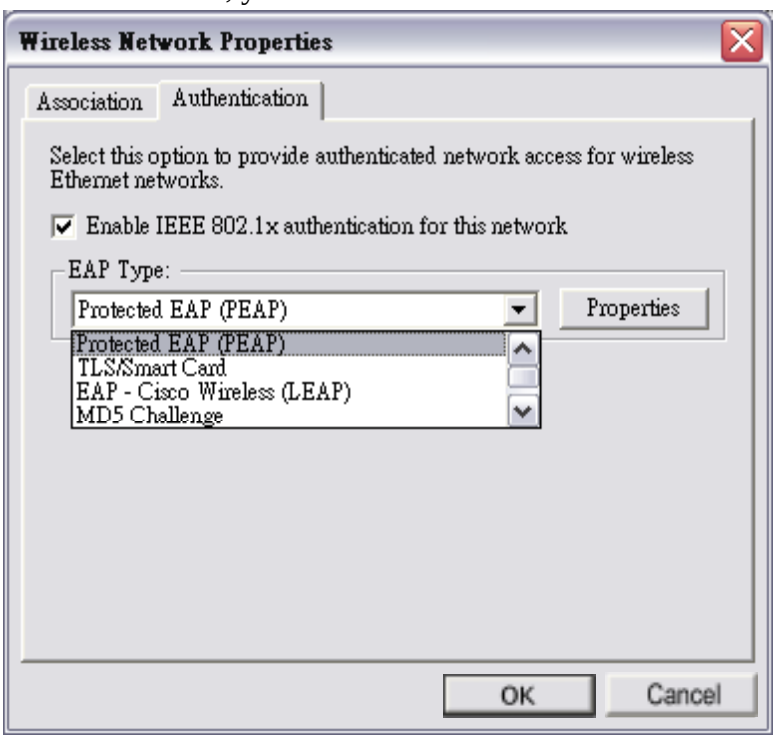


- If you set **Authentication Type** to **WPA** or **WPA-PSK**, you can choose the following options for Encryption setting:
  - ✓ **WEP**
  - ✓ **TKIP**
  - ✓ **AES**

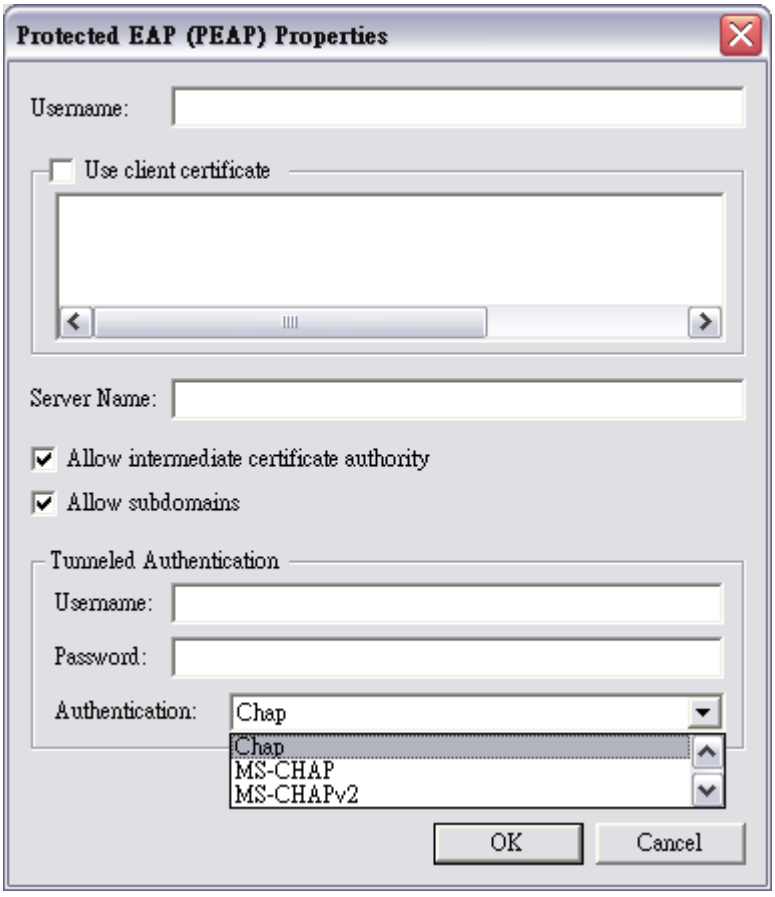


4.1.2 Configure-Authentication Tab

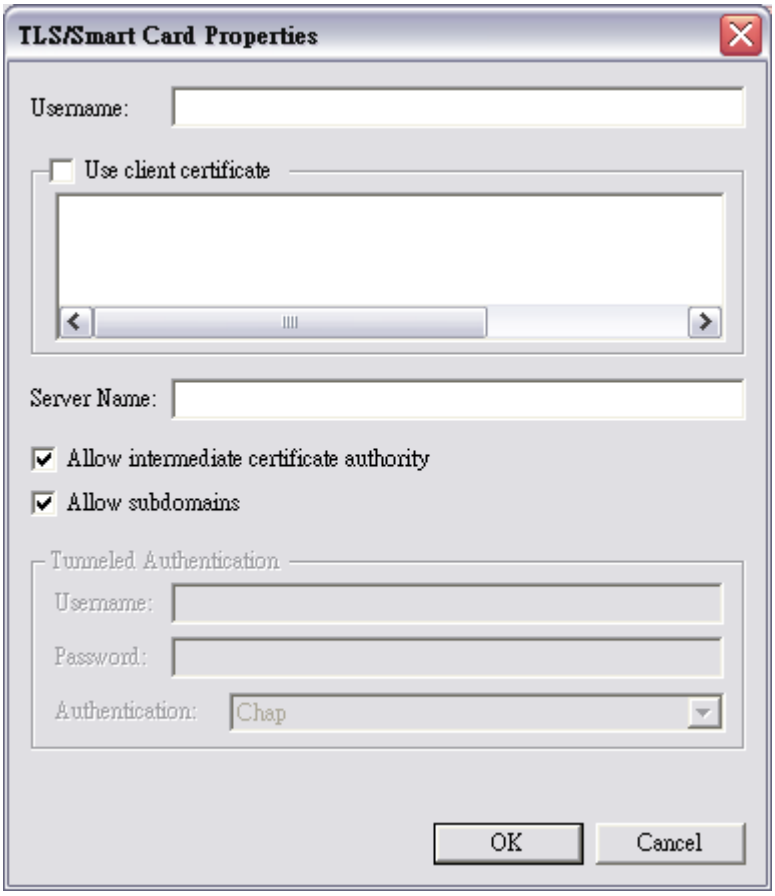
- In Authentication tab, you can enable IEEE 802.1x authentication.



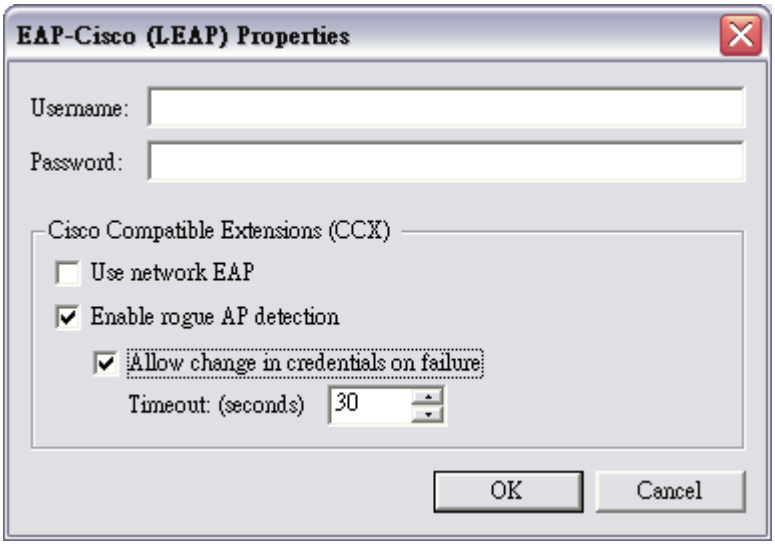
- You can choose the following items from EAP Type drop-down menu:
  - ✓ **Protected EAP (PEAP):** Click Properties to input further settings.



✓ **TLS/Smart Card:** Click Properties to input further settings.

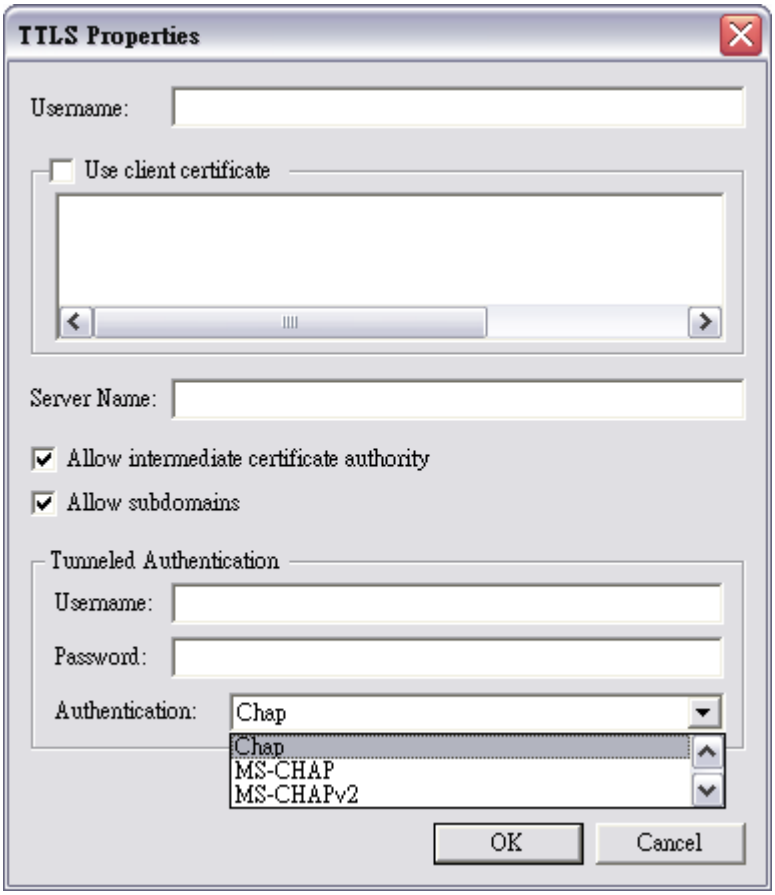


✓ **EAP-Cisco Wireless (LEAP):** Click Properties to input further settings.



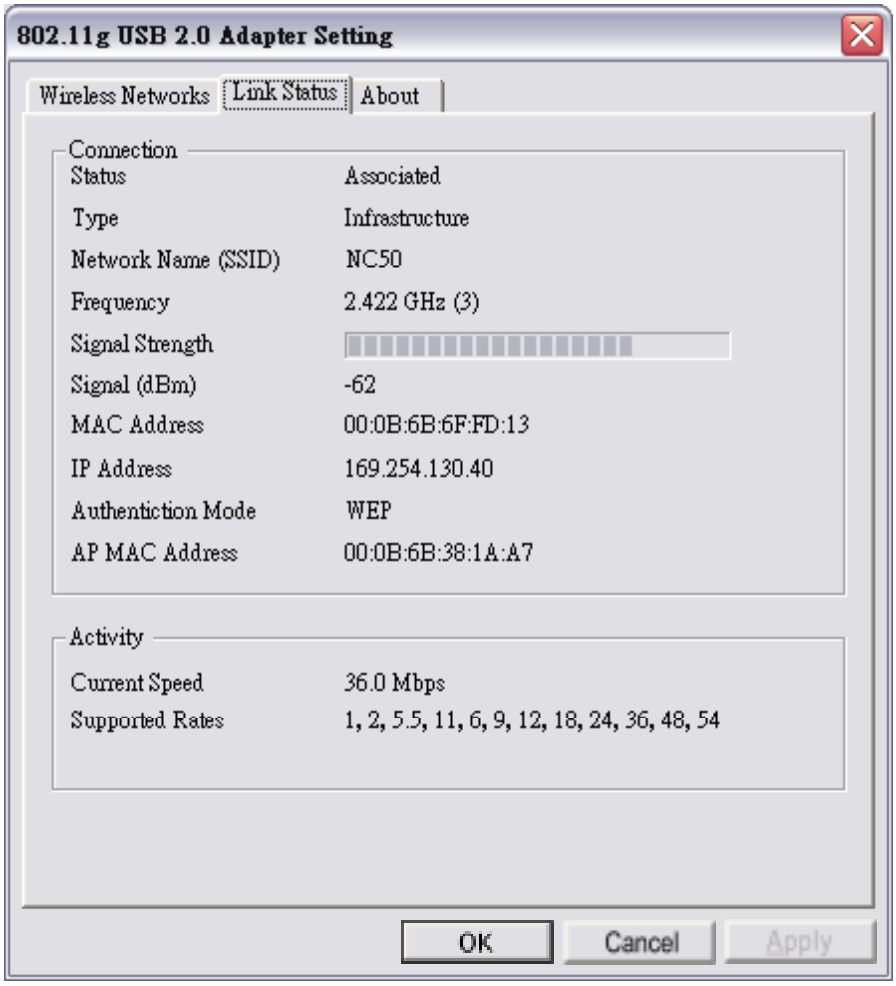
- ✓ **MD5 Challenge:** Click Properties to input further settings.

- ✓ **TTLS:** Click Properties to input further settings.



4.2 Link Status Tab

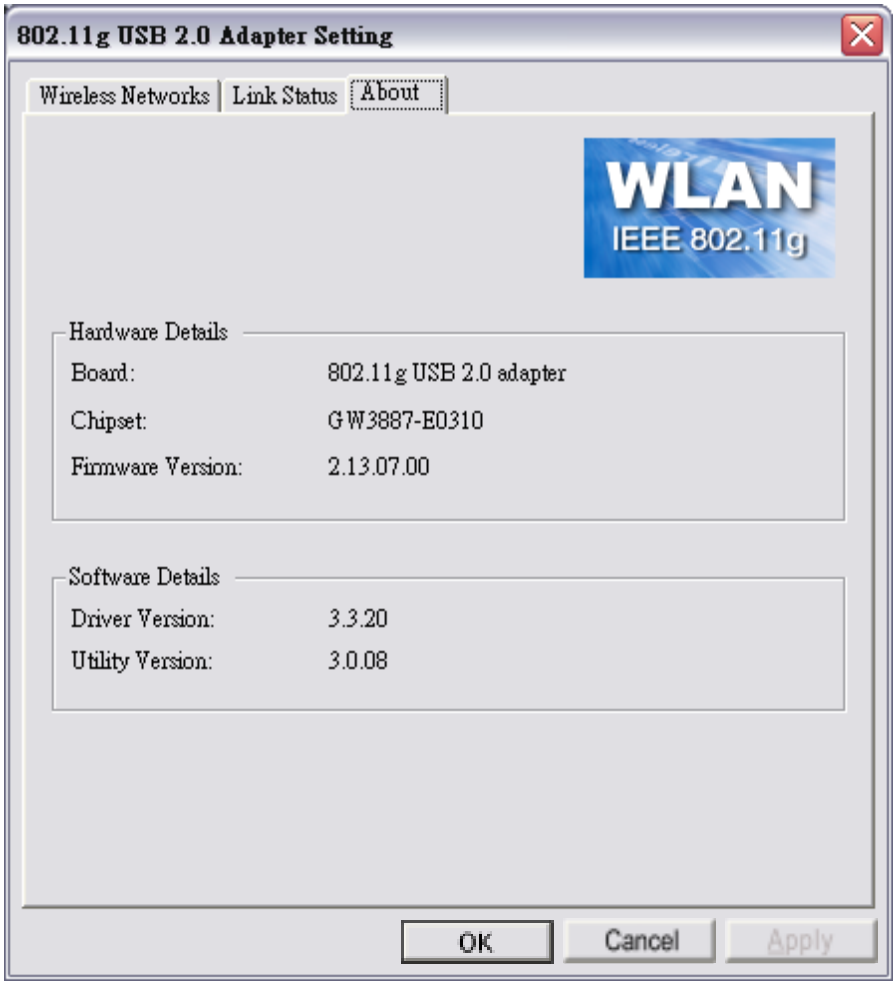
This tab shows Connection information.



This tab shows the following information:

- **Status:** Associated (connected) or Scanning (disconnected).
- **Type:** Infrastructure or Ad-hoc.
- **Network Name (SSID):** The current connected network name.
- **Frequency**
- **Signal Strength**
- **Signal (dBm)**
- **MAC Address**
- **IP Address**
- **Authentication Mode**
- **AP MAC Address**
- **Current Speed**
- **Supported Rates**

4.3 About Tab



This tab shows hardware and software details.

- **Hardware Details**
  - ✓ **Board:** Product name.
  - ✓ **Chipset**
  - ✓ **Firmware Version**
- **Software Details**
  - ✓ **Driver Version**
  - ✓ **Utility Version**

5. Network Application

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

1. To survey the network neighborhood
2. To share your folder with your network member(s)
3. To share your printer with your network member(s)
4. To access the shared folder(s)/file(s) of your network members(s)
5. To use the shared printer(s) of your network member(s)

In fact, the network applications of 802.11b/g 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.

5.1 Surveying the Network Neighborhood

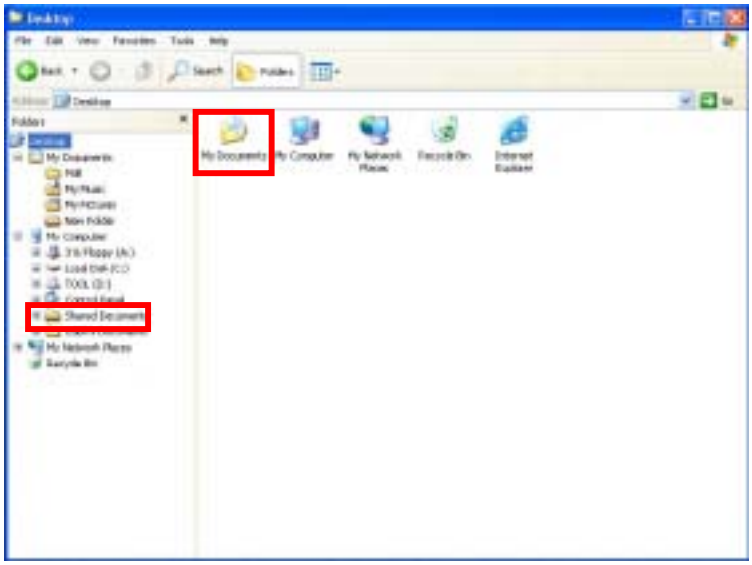
When multiple base stations are up and running in your wireless network, you can use the procedure described below to display the other computers:

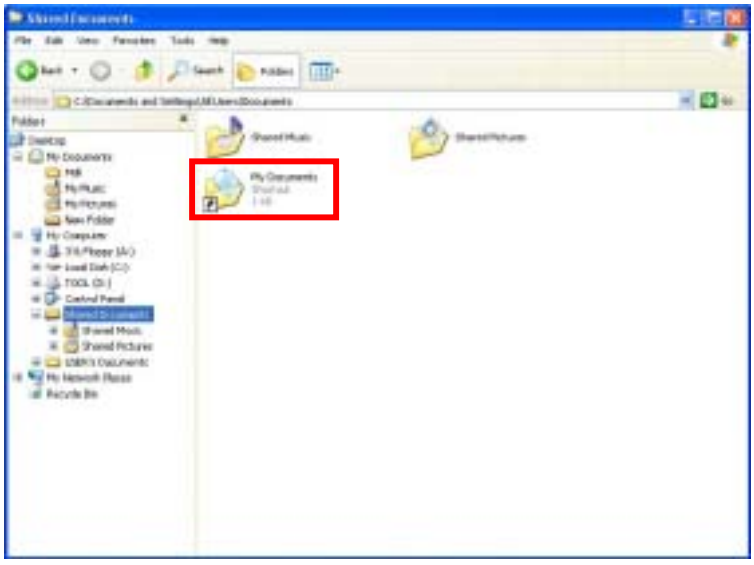
1. **Double-click My Network Places** to display all stations in your Microsoft Windows Network Group.
2. To display other workgroups in the network environment, **double-click Entire Network**.
3. If there is a **second network operating system** running in your network environment (for example a Novell 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.

5.2 File Sharing

802.11b/g 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 IEEE802.11b/g wireless network will be like sharing files on a wired LAN.

5.3 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:

1. Double-click the “My Network Places” icon, and then double-click the computer where the shared folder is located.
2. Double-click the folder you want to connect to.
3. 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.*

6. Glossary

802.1X: The 802.1X standard is designed to enhance the security of wireless local area networks (WLANs) that follow the IEEE 802.11 standard. 802.1X provides an authentication framework for wireless LANs, allowing a user to be authenticated by a central authority.

AES: Short for **A**dvanced **E**ncryption **S**tandard, a symmetric 128-bit block data encryption technique developed by Belgian cryptographers Joan Daemen and Vincent Rijmen.

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, includes 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.

TKIP: Short for **T**emporal **K**ey **I**ntegrity **P**rotocol. TKIP scrambles the keys using a hashing algorithm and, by adding an integrity-checking feature, ensures that the keys have not been tempered with.

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.

WEP: Short for **W**ired **E**quivalent **P**rivacy, a security protocol for wireless local area networks (WLANs) defined in the 802.11b standard. WEP is designed to provide the same level of security as that of a wired LAN.

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.

7. Product Spec.

Item	Key specifications
Main Chipset	➢ Conexant Cohiba Blunt (GW3887A, ISL3686)
Frequency Range	➢ US/Canada: 2.400 ~ 2.4835GHz
Modulation Technique	➢ 802.11b: DSSS (CCK, BPSK, QPSK) ➢ 802.11g: OFDM
Host Interface	➢ USB 2.0
Channels Support	➢ US/Canada: 11 (1 ~ 11)
Operation Voltage	➢ 5V +/- 10%
Current Consumption	➢ Transmission mode 460mA @ 5VDC(Ave) ➢ Receive mode 480mA @ 5VDC(Ave) ➢ Standby mode 380mA @ 5VDC(Ave)
Output Power (typ.)	➢ 13 dBm@ 802.11g 48,54Mbps 15 dBm@ 802.11g 24,36Mbps 17 dBm@ 802.11g 6,9,12,18Mbps ➢ 17 dBm@ 802.11b mode
Sensitivity PER < 0.08(11b) PER < 0.1(11g)	 ➢ -80dBm@ 11M 802.11b mode ➢ -65dBm@ 54M 802.11g mode
Operation Distance (typ.)	➢ Indoor: 50m ➢ Outdoor: 250m
Operation System Supported	➢ Windows® 98, 98SE, Me, 2K, XP, X64 ➢ WinCE 4.2, 5.0 are supported by Conexant
Dimension	➢ 96.5mm (L) * 32.6mm(W) * 13.0mm(H)
Security	➢ 64-bit WEP, 128-bit WEP ➢ WPA, WPA2 ➢ PEAP ➢ TLS ➢ LEAP ➢ MD5
Operation Mode	➢ Infrastructure & Ad-hoc mode
Transfer Data Rate	➢ **802.11g:** 54, 48, 36, 24, 18, 12, 9, 6Mbps, auto-fallback ➢ **802.11b:** 11, 5.5, 2, 1Mbps, auto-fallback
LED Indicator	➢ WLAN activity indicator

Operation Temperature	➢ 0^o ~ 55^o C
Storage Temperature	➢ -25^o ~ 70^o C
Wi-Fi®	➢ WiFi Alliance Compliant
EMC Certificate	➢ FCC part 15 (USA) ➢ IC RSS210 (Canada) ➢ Telec (Japan) ➢ ETSI (Europe) ➢ The above regulation depends on customer's request