IEEE 802.11b Wireless Module

XI-825M

User's Manual

Date of Issue: Sep. 15th, 2004

Technical Support

The firmware version of the 11Mbps Wireless Module is displayed on the utility main window. Users could download and upgrade the most recent software version from the supplier's web site or refer to the selling contact for the latest software information. If you have difficulty resolving the problem while installing or using the 11Mbps Wireless Module, please contact the supplier for support.

About This Manual

The manual includes procedures for the setup of the 11Mbps Wireless Module under Windows XP, Windows 2000, Windows 98 or Windows ME. Take a moment to read through this manual and familiarize yourself with wireless technology.

FCC Information

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.

Federal Communications Commission (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.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

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Chapter 1 About Wireless Module

The 11Mbps Wireless LAN PC Card is a standard PCMCIA adapter that fits into any standard PCMCIA Type II slot in a notebook computer. Its 11Mbps data rate gives equivalent Ethernet speed to access corporate network or the Internet in a wireless environment. In addition, a detachable antenna version is specifically designed for system integrator application. When installed, 11Mbps Wireless Module is able to communicate with any 802.11 and 802.11b compliant products.

1-1 Features and Benefits

1. Fully IEEE 802.11b compatible.
2. Direct Sequence Spread Spectrum (DSSS) technology provides robust, interference-resistant and secure wireless connection.
3. Supports 1, 2, 5.5 and 11 Mbps data rate.
4. Working range up to 800 ft. in an open environment.
5. Seamless connectivity to wired Ethernet and PC network LAN's augments existing networks quickly and easily.
6. Greater flexibility to locate or move networked PCs.
7. Wireless connection without the cost of cabling.
8. Easy to install and user friendly, just Plug and Play.
9. Low power consumption.
10. Supports a variety of operating systems (Win98/ME/2000/XP)
11. Supports not only the 64-bits and 128-bits WEP encryption, but also the Wi-Fi protected Access (WPA).
12. Provides Window-based Diagnostic Tools, most notably, Site Survey, Link Quality Test and Access Point Browser.

1-2 Applications

11Mbps Wireless Module offers a fast, reliable, cost-effective solution for wireless client access to the network in applications like these:

1. **Remote access to corporate network information**
   E-mail, file transfer and terminal emulation.

2. **Difficult-to-wire environments**
   Historical or old buildings, asbestos installations, and open area where wiring is difficult to deploy.

3. **Frequently changing environments**
   Retailers, manufacturers and those who frequently rearrange the workplace and change location.

4. **Temporary LANs for special projects or peak time**
   C1- Trade shows, exhibitions and construction sites where a temporary network will be practical.
   C2- Retailers, airline and shipping companies need additional workstations during peak period.
   C3- Auditors requiring workgroups at customer sites.

5. **Access to database for mobile workers**
   Doctors, nurses, retailers, accessing their database while being mobile in the hospital, retail store or office campus.

6. **SOHO (Small Office and Home Office) users**
   SOHO users need easy and quick installation of a small computer network.

7. **High security connection**

   The secure wireless network can be installed quickly and provide flexibility.

1-3 Product Kit

11Mbps Wireless Module comes with the following items. Please go through each item below. If any of listed items appears to be damaged or missing, please contact your local dealer.

11Mbps Wireless Module

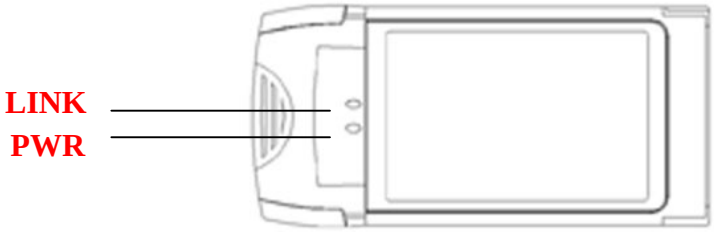
- 11Mbps Wireless Module…….……..…..… x 1
- 11Mbps Wireless Module Product CD…… x 1
- 11Mbps Wireless Module User Manual……..…… x 1

1-4 About Wireless LAN Card LED Indicators

The 11Mbps Wireless Module has two LED indicators. The behavior of the indicators is described as below:

Power LED

- OFF – No light
- ON – Solid Green



Link LED

- Solid Green – Associated with the Access Point or Ad-Hoc wireless workstation.
- Blinking Green – Not connecting to the Access Point or Ad-Hoc wireless workstation.

Chapter 2 Getting Started

This chapter describes the instructions that guide you through the proper installation of your 11Mbps Wireless Module for the Windows XP/2000/ME/98 operating systems.

The complete installation of the 11Mbps Wireless Module consists of the following steps:

STEP 1: Insert your Wireless Module into your notebook.
STEP 2: Install the corresponding driver and utility.
STEP 3: Set basic settings.
STEP 4: Finish Installation.

2-1 Before Installation

In addition to the items shipped with the client card, you will also need the following in order to install the card:

1. A computer equipped with a Type II or Type III PCMCIA slot, and a PCMCIA card and socket services compliant with revision 2.10 of the PCMCIA specification (or higher).
2. Windows XP/2000/98/ME (with a Windows installation CD-ROM, diskettes for use during installation)
3. Minimum 500 Kbytes free disk space for installing driver and utility program.

2-2 Insert the 11Mbps Wireless Module

To install the 11Mbps Wireless Module, please do the following:

1. Find an available Type II or Type III PCMCIA slot on your computer.
2. With the Wireless Module's 68-pin connector facing the PCMCIA slot and its label facing up, slide the PCMCIA adapter completely into the PCMCIA slot.

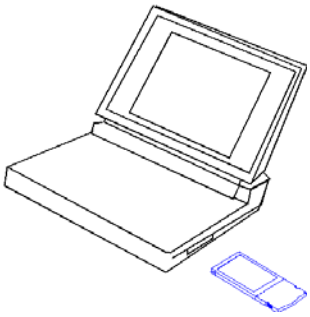


Fig Insert the 11Mbps Wireless LAN Card into the notebook.

CAUTION: Do not force the client card into the slot. Forcing it will damage both the client card and the slot. If the client card does not go in easily, remove the card and reinsert it.

Chapter 3 Install Driver for Windows

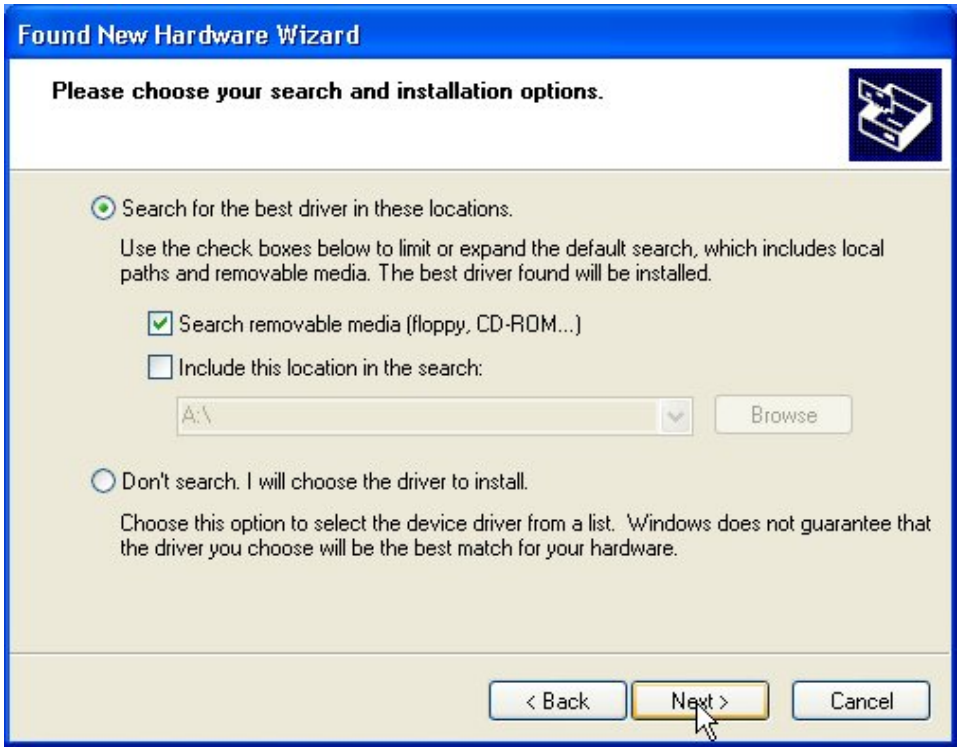
This section describes the installation of the 11Mbps Wireless Module driver for the Windows 98/ME/2000 and Windows XP operating systems. The installation procedures for Windows XP refer to ***3-1 Set up Wireless Module for Windows XP***; for Windows 2000 please see ***3-2 Set up Wireless Module for Windows 2000;*** for Windows 98/ME refer to ***3-4 Set up Wireless Module for Windows 98/ME.***

Note: Before you start the installation, you are advised to keep the Windows CD-ROM in case you might need certain system files.

3-1 Set up Wireless Module for Windows XP

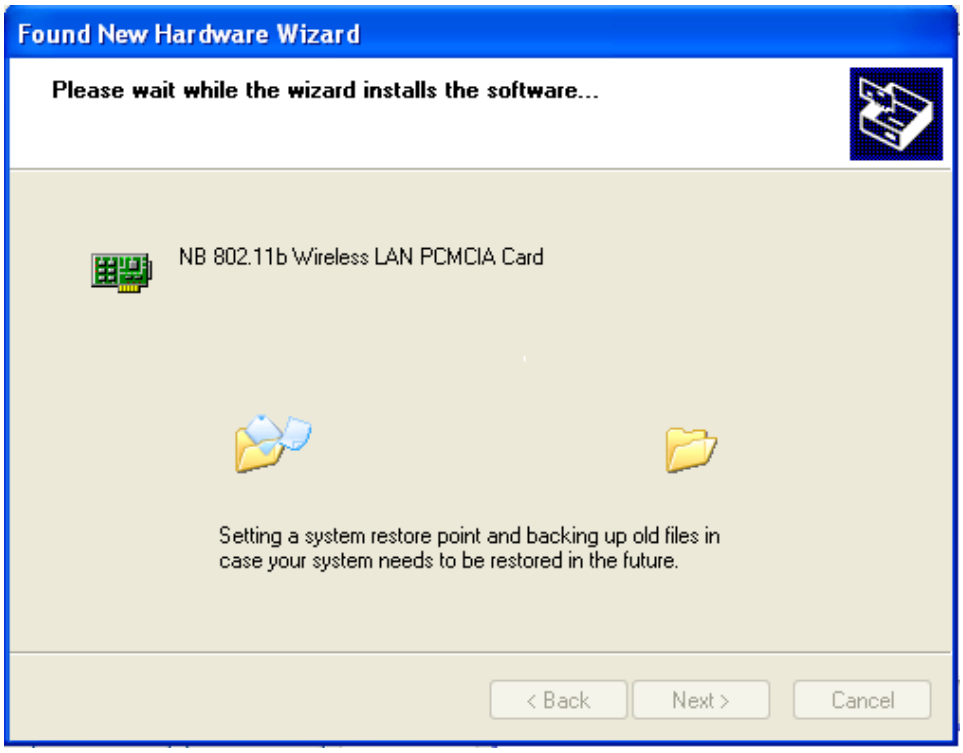
Step 1: After inserting the 11Mbps Wireless Module into the PCMCIA slot on your notebook, the Windows will auto-detect the Wireless LAN Card and a "**Found New Hardware Wizard**" window will show up. Select "**Install from a list or specific (Advanced)**" to install the driver.

Step 2: Insert the Product CD-ROM into the CD-ROM drive. Specify the location where the driver is placed. Click on **Next** to install the driver.



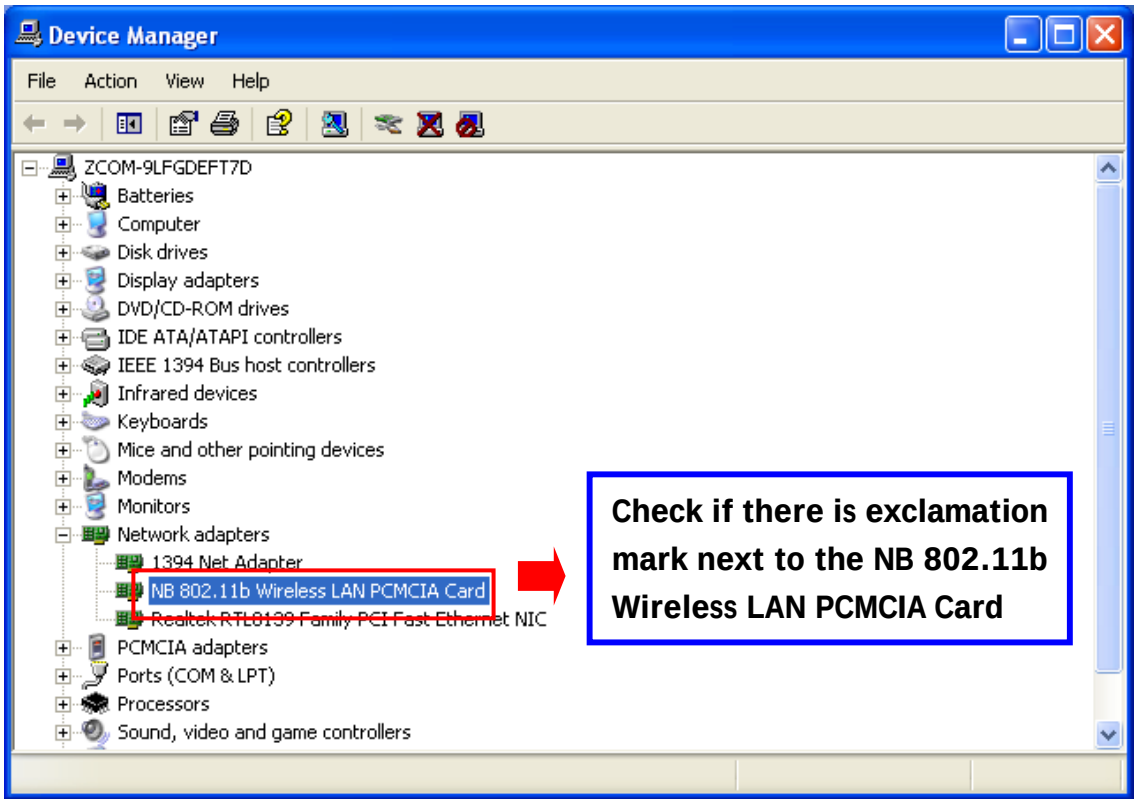
Step 3: The windows will appear the message about the IEEE802.11b Wireless Network PCMCIA Card has not passed Windows Logo testing to verify its compatibility with Windows XP. Click on **Continue Anyway** button to continue installing.

Step 4: The windows will find "**NB 802.11b Wireless Module**" and start copying corresponding files into the system. Click on **Next** to continue.



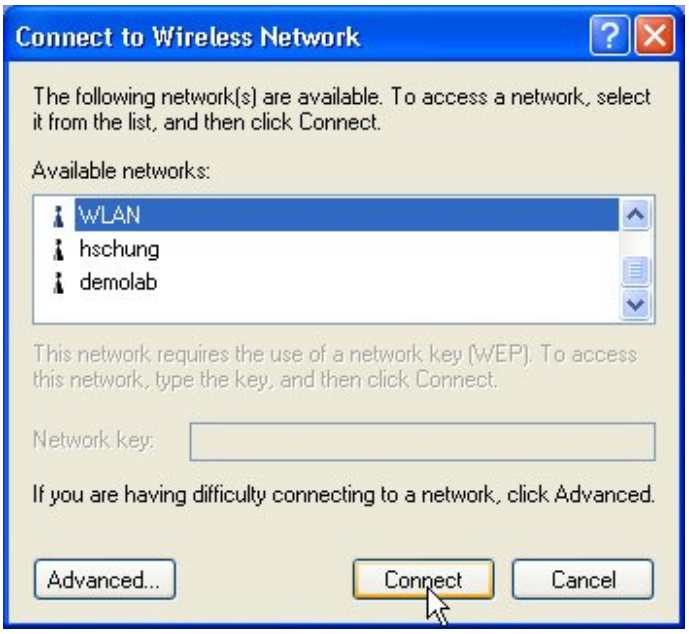
Step 5: Click **Finish** to complete the installation.

Step 6: Right click "**My Computer**" from **Start**, select **Properties**, go to the **Hardware** tab and click the **Device Manager** button to see if any error icon appears next to the **NB 802.11b Wireless Module**. If no, your 11Mbps Wireless Module is working well.



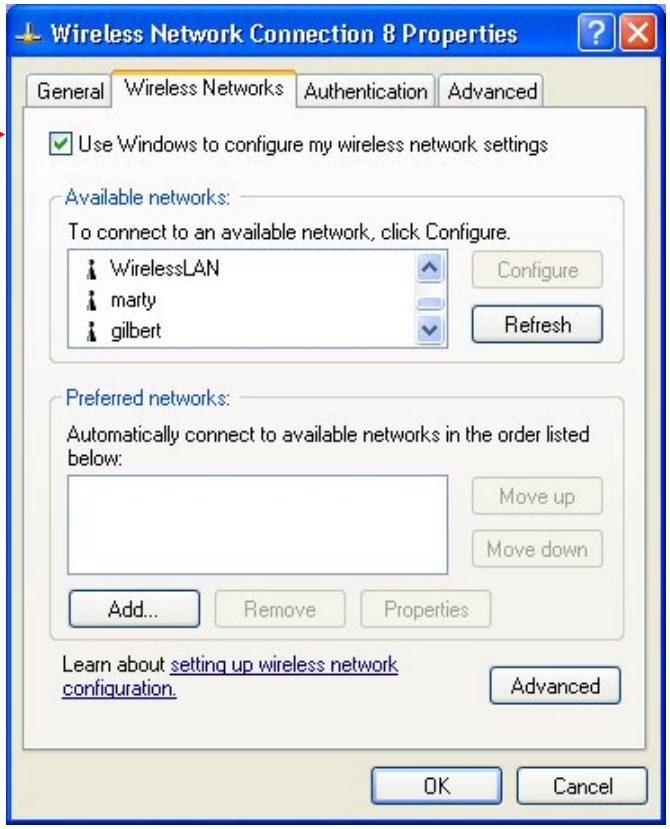
After installing the Wireless Module, the Windows XP will display a "Wireless Network Connection # " message.

Click on the message and the "*Automatic Wireless Network Configuration*" will then appear automatically and allow users to connect to an available wireless infrastructure network (Access Point), shown as follows. You may click the **Advanced** button to make advanced configuration for the Wireless Module, shown as below.



For more information on using the automatic wireless network configuration please refer to Windows XP **Help** file.

If you desire to use our WLAN Utility, you need to disable the Windows XP ***Automatic Wireless Network Configuration*** **first by un-checking this check box.**



However, the WLAN Utility, which comes with the Wireless Module, provides you more tools to configure the Wireless Module and monitor the wireless connection. For more information on installing and using the WLAN Utility, please refer to the following sections "*Install the WLAN Utility*" and "*Use the WLAN Utility*".

Note: To use the WLAN utility under Windows XP, you need to disable the ***Automatic Wireless Network Configuration*** first. Steps are described as follows:

- Right click the **Network Connections** icon. Select **Properties**.
- Go to the **Wireless Networks** tab.
- Uncheck the "**Use Windows to configure my wireless network settings**" check box and click the **OK** button (see the above picture).

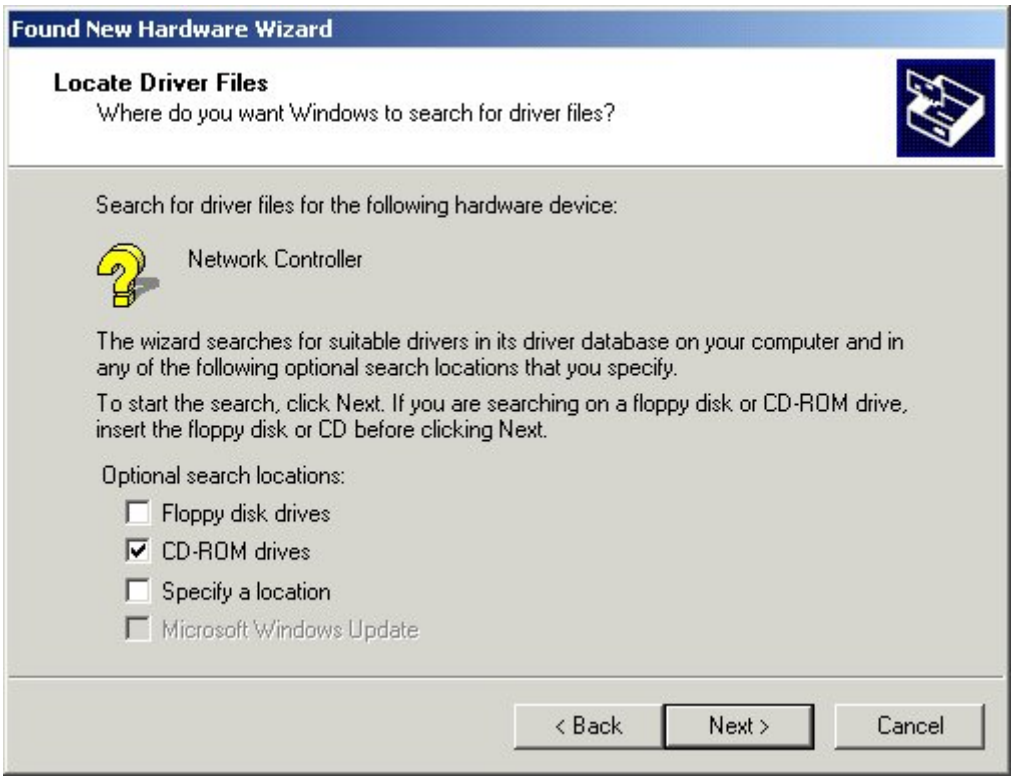
3-2 Set up Wireless Module for Windows 2000

Step 1: After inserting the 11Mbps Wireless Module into the PCMCIA slot on your notebook, Windows will auto-detect the 11Mbps Wireless Module.

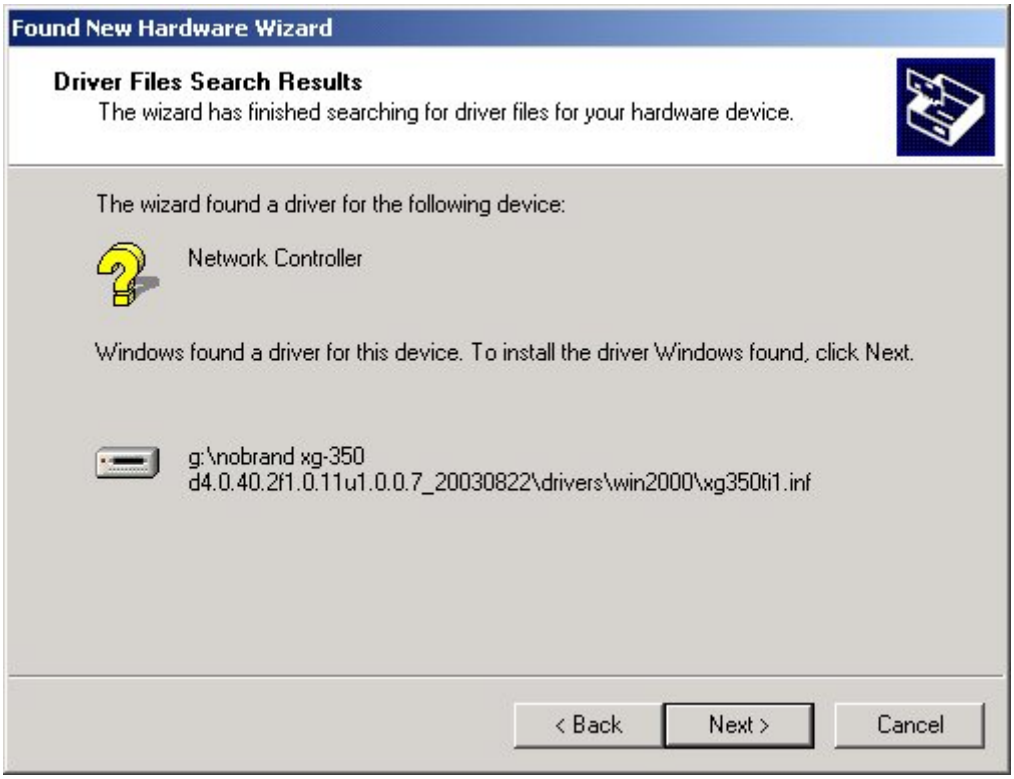
Step 2: A "**Found New Hardware Wizard**" window shows up. Click **Next** to proceed.

Step 3: Select "**Search for a suitable driver for my device (recommended)**" and click **Next**.

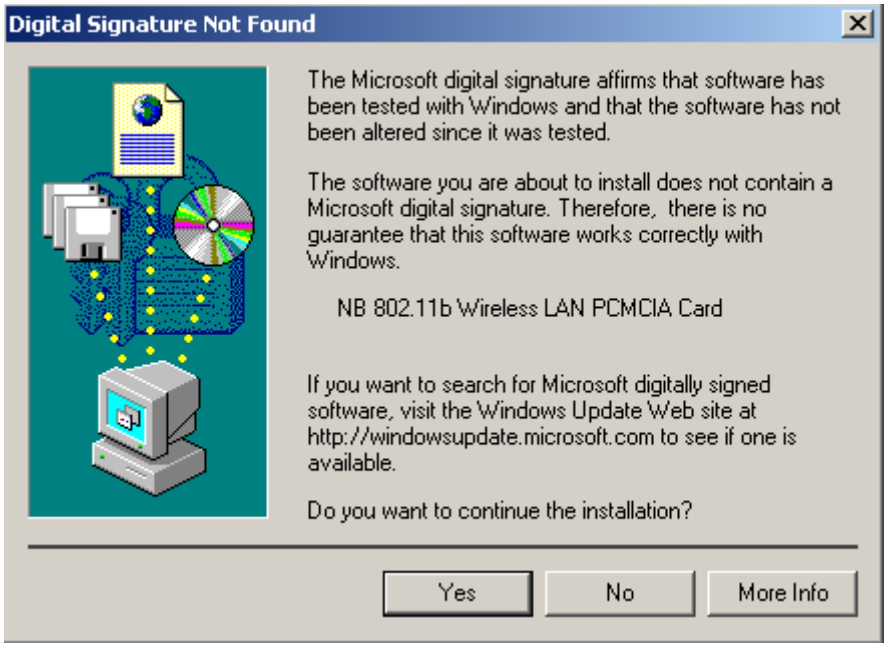
Step 4: Insert the Product CD-ROM into the CD-ROM drive. Specify the location where the driver is placed. Click on **Next** to install the driver.



Step 5: The windows will find "**NB 802.11b Wireless Module**". Click on **Next** to continue.

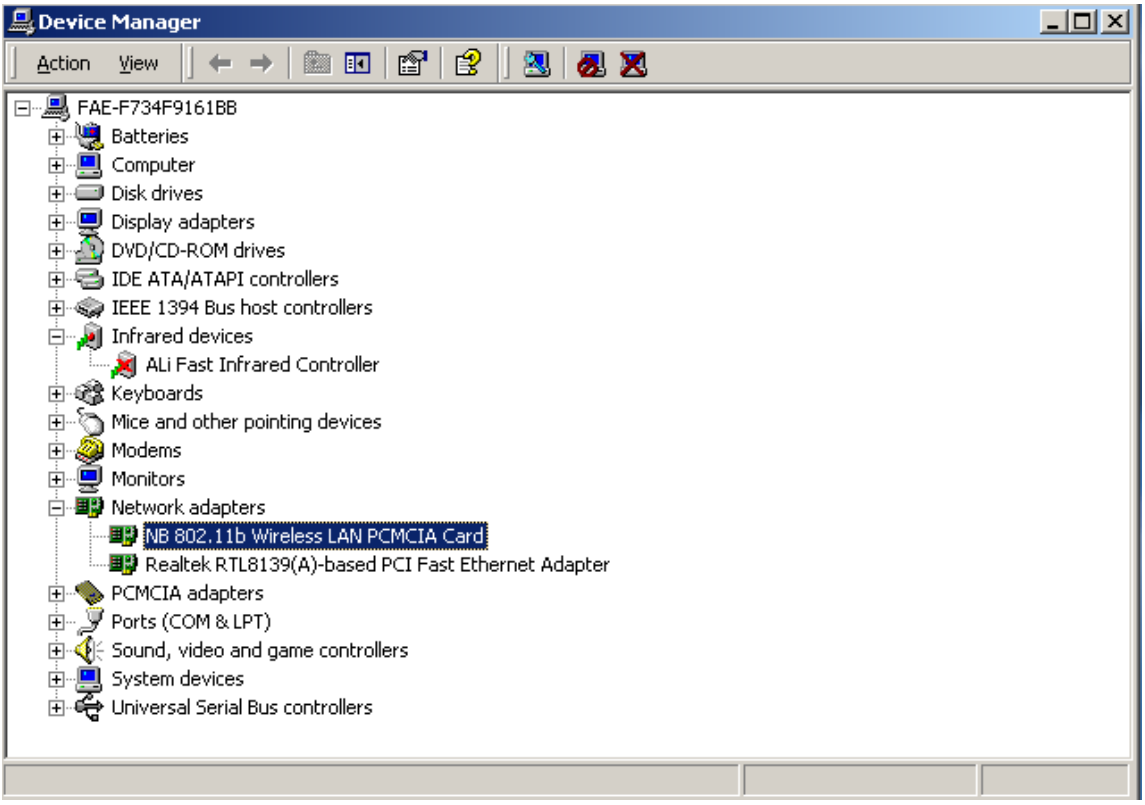


Step 6: The windows will appear the message about the Microsoft digital signature affirms that software has not been tested with Windows and that the software has not been altered since it was tested. Click on **Yes** button to continue installing.



Step 7: Click **Finish** to complete the installation.

Step 8: Open **Control Panel**/**System**/**Device Manager**, and check **Network Adapters** to see if any error icon appears. If no, your 11Mbps Wireless Module is working well.



3-4 Set up Wireless Module for Windows 98/ ME

Step 1: After inserting the 11Mbps Wireless Module into the PCMCIA slot on your notebook, Windows will auto-detect new hardware and will display an "**Add New Hardware Wizard**" window. Click **Next** to continue.

Step 2: Select "**Search for the best driver for your device (Recommended)**" and click **Next**.

Step 3: Insert the Product CD-ROM into the CD-ROM drive. Select the "**CD-ROM drive**" check box and click on **Next** to install the driver.

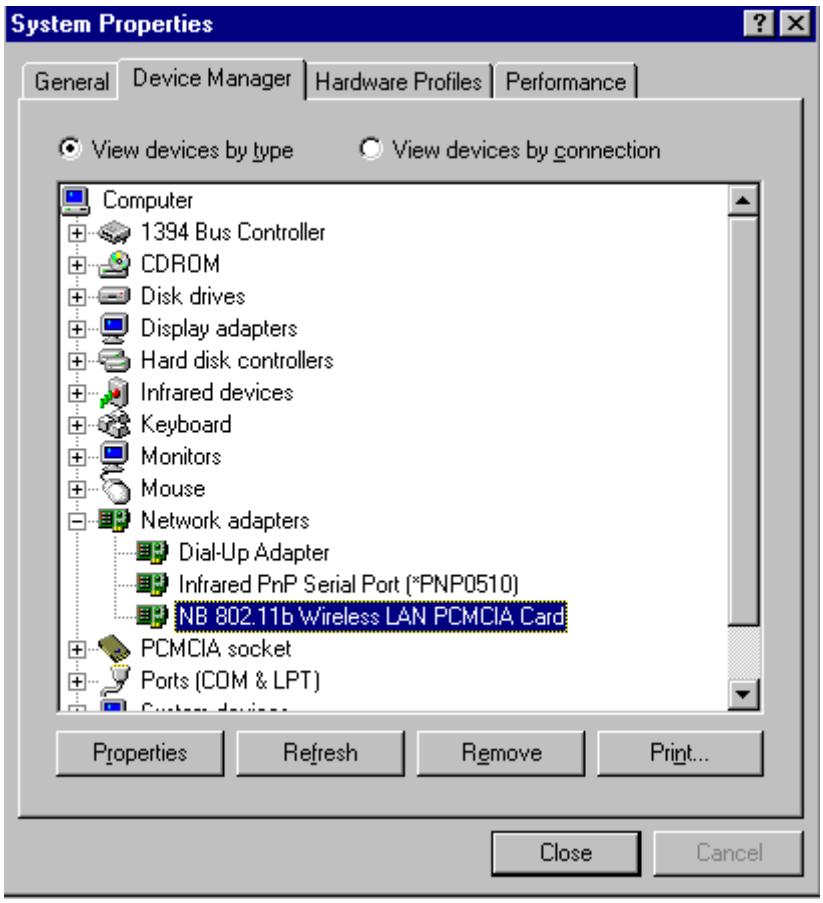
Step 4: The Windows will find "**NB 802.11b Wireless Module**". Click **Next** to continue.

Step 5: Once the [Please insert the disk labeled 'Windows 98 Second Edition CD-ROM/ME CD-ROM", and then click OK] window appears, enter the path corresponding to the appropriate drives and click **OK**. Usually these files can be found at C:\Windows or C:\Windows\system.

Step 6: Click **Finish** to complete the software installation.

Step 7: Restart the computer.

Step 8: Open **Control Panel**/**System**/**Device Manager**, and check **Network Adapters** to see if any error icon appears next to the IEEE 802.11b Wireless Module. If no, your 11Mbps Wireless Module is working well.



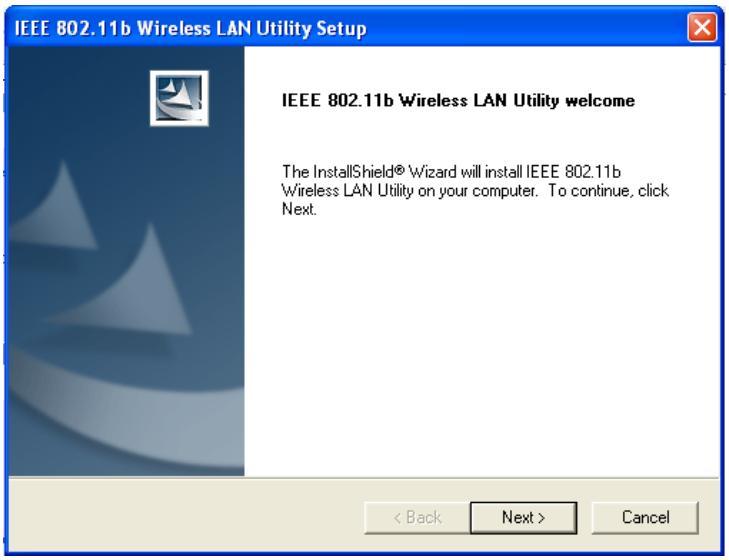
Chapter 4 Configure the Wireless LAN Card

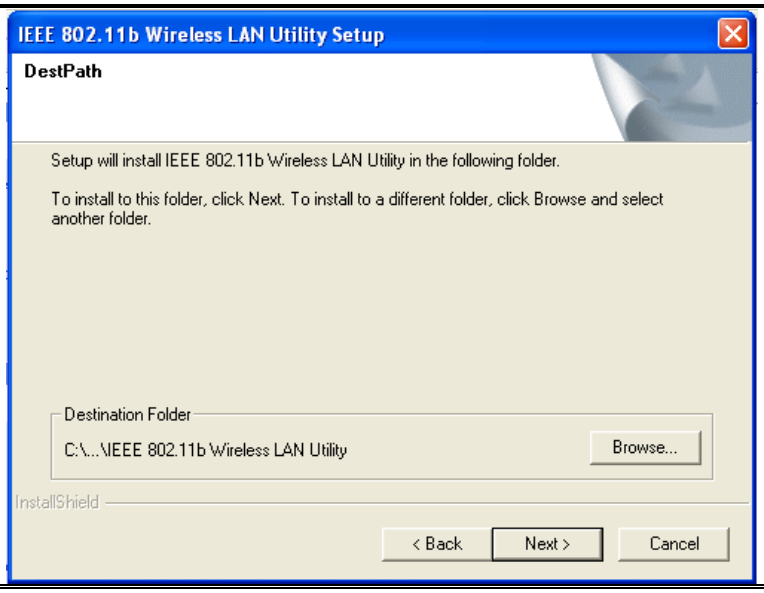
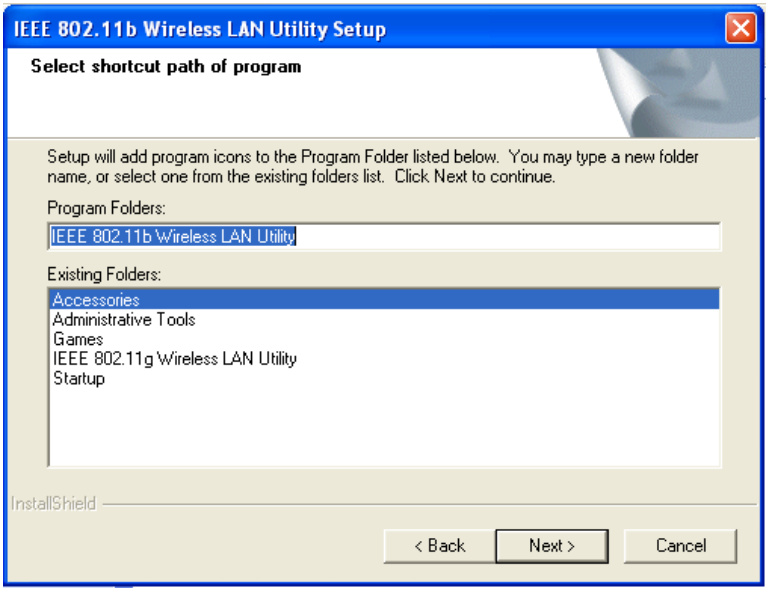
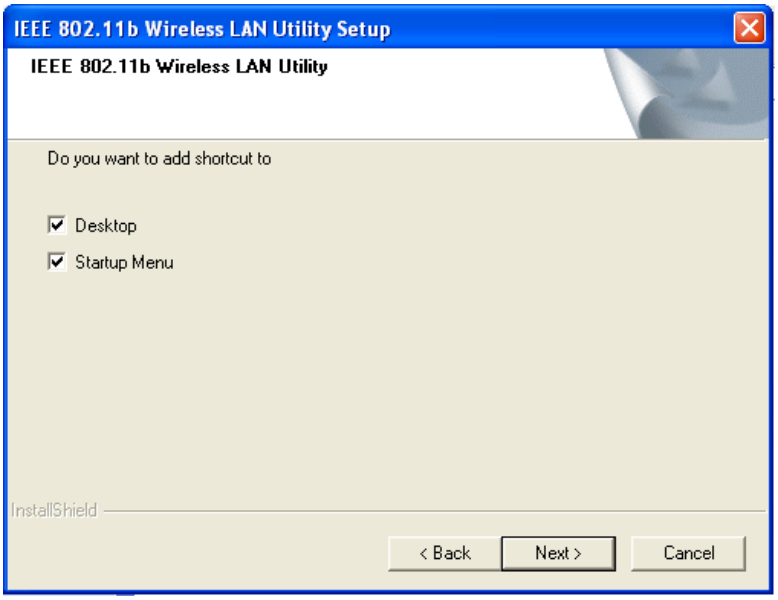
This chapter gives you assistance with detailed configuration for the 11Mbps Wireless Module under Windows XP/2000/98/ME.

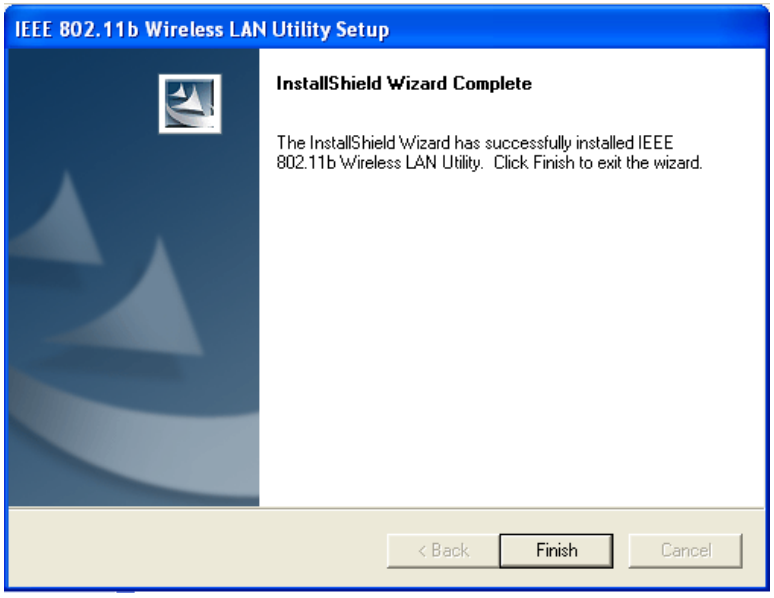
4-1 Install the WLAN Utility

To install the WLAN Utility, follow these steps:

Step 1: Insert the Product CD-ROM or floppy disk again.
Step 2: Go to the **utility** folder and run **setup.exe**.
Step 3: The InstallShield Wizard will show up and guide you through the rest of the setup process.

Run the Setup Utility and click Next to continue.	

*Choose Destination Location and click **Next** to continue.*	
*Select a program folder and click **Next**.*	
*You may add a shortcut in the startup folder as desired and click **Next**.*	

*Click on **Finish** to complete the installation*	

Upon completion, go to **Program Files** and run the WLAN Utility and its icon will appear in the **System Tray** in the bottom right corner of your task bar. Clicking on the icon will open the configuration window. When you minimize the window, the system tray icon will be loaded in the System Tray again.

The color behind the system tray icon indicates the link status:

Blue indicates a good or excellent link.

Yellow indicates a usable but weak link.

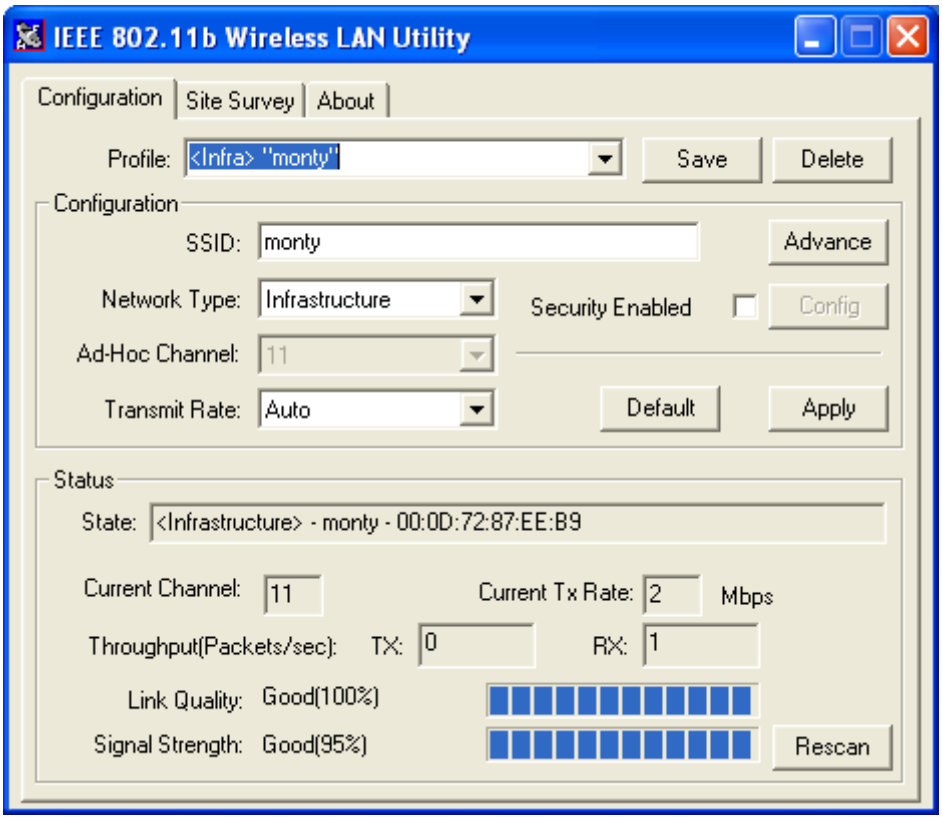
Red indicates no or very poor link quality.

4-2 Use the WLAN Utility

The WLAN Utility enables you to make configuration changes and perform user-level diagnostics on your 11Mbps Wireless Module in the Windows XP/2000/98/ME operating system environments. The WLAN Utility consists of window with 3 items for you to monitor and configure the 11Mbps Wireless Module: **Configuration**, **Site Survey** and **About**.

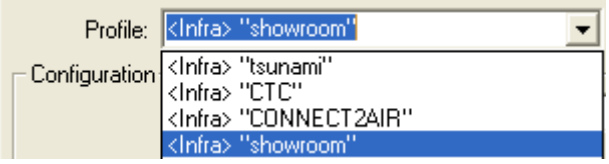
Configuration:

The **Configuration** item allows you to modify the configuration parameters for the 11Mbps Wireless Module such as **Profile**, **Network Type**, **Ad-Hoc Channel**, **Transmit Rate**, **ESSID**, **WEP**, **RTS/CTS**, **Fragment Threshold**, and **Power Save** mode. Furthermore, you may monitor the current status of the Wireless Module such as **State**, **Current Channel**, **Current Tx Rate**, **Throughput**, **Link Quality** and **Signal Strength**.



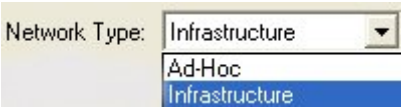
Profile

The **Profile** field allows you to set values for all parameters by selecting a previously defined profile. To create the profile, go to the **Profile** field, type a profile name and set the corresponding parameters. If one of the profiles is no longer used, you may remove it by clicking the **Delete** button. After changing parameters, save the profile and click the **Apply** button to take effect. You can have multiple profiles and modify the profile at any time.



Network Type

There are two network types for the Wireless LAN Card to operate. If you need to access company network or Internet via an Access Point, select "**Infrastructure**". To set up a group of wireless stations for file and printer sharing, select " **Ad-Hoc**" (without Access Point). For standard **802.11 Ad-Hoc**, note that you may set wireless stations with the *same ESS ID* and the *same channel*.



SSID

The SSID is the unique ID used by Access Points and stations to identify a wireless LAN. Wireless clients associating to any Access Point must have the same SSID. The default setting is ANY, which allows your Wireless LAN Card to automatically associate to any Access Point (Infrastructure mode) in the vicinity of your wireless adapter. The ESSID can be set up to *32 characters* and is case sensitive.

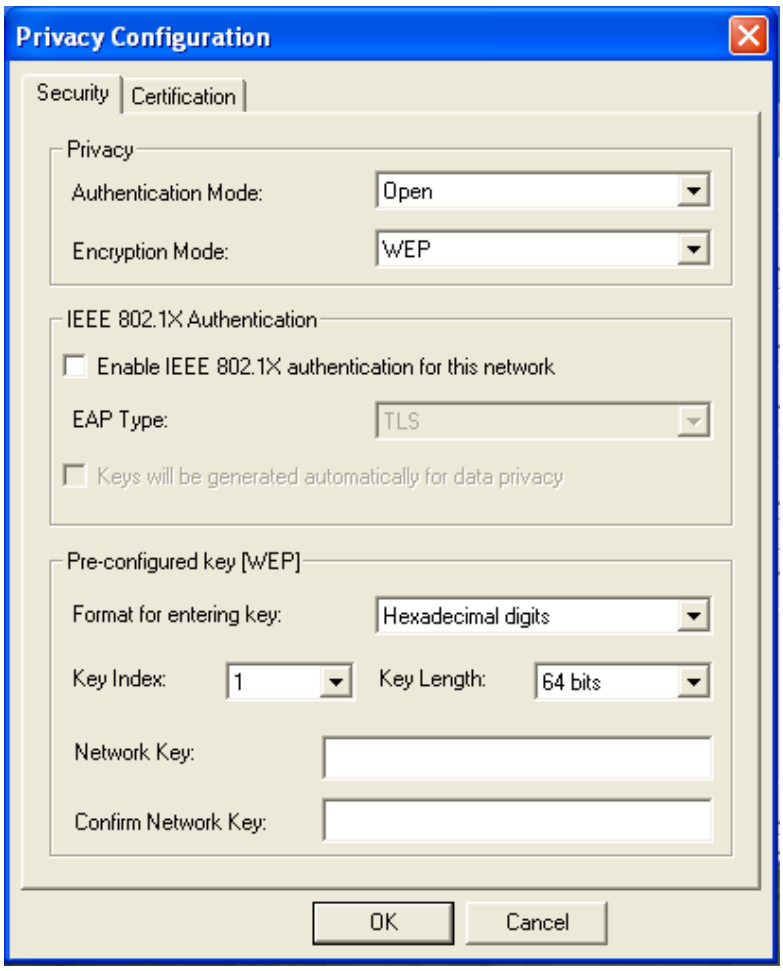
Transmit Rate

This Wireless LAN Card provides various data rate options for you to select. Data rates options include **Auto**, **1 or 2 Mb**, **5.5 Mb**, **11 Mb** in most networking scenarios, you will see that the factory-set default "**Auto**" will prove the most efficient. This setting will allow your Wireless LAN Card to operate at the maximum data rate. When the communications quality drops below a certain level, the Wireless LAN Card will automatically switch to a lower data rate. Transmission at lower data speed is usually more reliable. However, when the communications quality improves again, the Wireless LAN Card will gradually increase the data rate again, until it has reached the highest available transmit rate.

Security Enable

To protect against hacker entering your system and prevent unauthorized wireless station from accessing data transmitted over the network, the WLAN Utility offers a sophisticated security algorithm. To activate security enable, click the check box next to **Security Enable**.

A **Privacy Configuration** window will then appear.

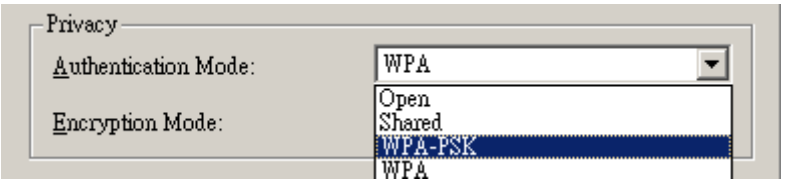


Privacy Configuration consists of specifying **Security** and **Certification**, as explained in the following:

Security Tab

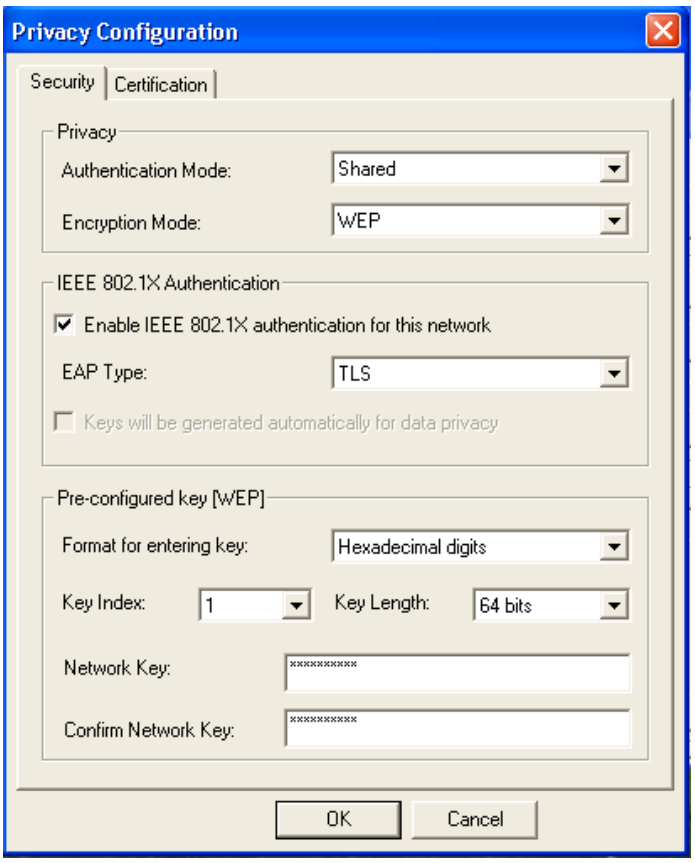
In order to join a network, networks may require an encryption key for association. You must configure the Authentication Mode and Encryption Mode for your keys in the **Privacy** section of this menu.

For Authentication Mode:

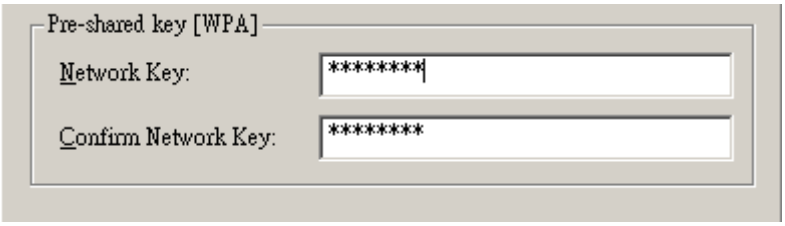


Open: Requires NO authentication, since it allows any device to join a network without performing any security check.

Shared: Requires that the station and the access point use the same WEP key to authenticate. This basically means that WEP must be enabled and configured on both the access point and the client with a same key, showed as below:



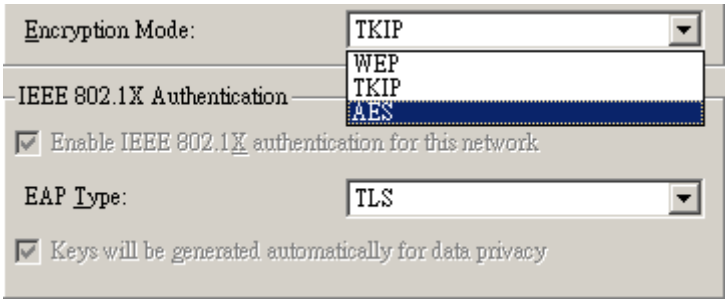
WPA-PSK: Allows you to gain access to a secured wireless network that the station and the access point use the same pre-shared key to authenticate. You must type a mixture of numbers and letters in the **Pre-shared key [WPA]** section of this menu. You may input either 8-63 ASCII characters or 64 HEX characters. Pre-shared key is usually used for SOHO authentication.



WPA: Allows you to gain access to a more secured wireless network that requires mutual authentication between client and access point with a Radius authentication server. This product supports various EAP types (TLS and PEAP), which require different credential authentication. In order to access the wireless network, you must select EAP type your service provider supplied in the section of **IEEE802.11X Authentication**.

WPA consists of methods to strengthen data encryption (Wired Equivalent Privacy [WEP], Temporal key integrity Protocol [TKIP], Advanced Encryption Standard [AES]) and to provide user authentication (strong EAP type such as TLS, PEAP, LEAP).

Once you choose your Authentication Mode, you then need to select the Encryption Mode.



For Encryption Mode

WEP: Specify the encryption keys. There are two methods to set the WEP keys, as described below:

Key will be generated automatically for data private

To create encryption keys automatically, click the **Key will be generated automatically for data private** check box.

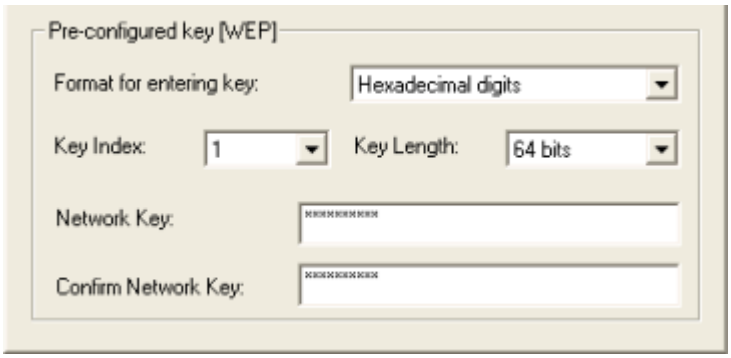
> **Note:** This function is used in IEEE802.1X Authentication mode. Keys are dynamically generated and distributed by the authentication server. Actually, you can obtain keys by asking your service provider for further configuration and information to gain access to the wireless network.

Pre-configured key [WEP]

You can also create encryption keys manually by pulling down the **Key Length** menu and select either **64bit** or **128bit** encryption method in the Pre-configured key section of this menu.

For 64bit encryption you may choose:

- **Alphanumeric*:*** entering ***5 characters*** (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (e.g. MyKey).
- **Hexadecimal**: entering ***10 hexadecimal digits*** in the range of “A-F”, “a-f” and “0-9” (e.g. 11AA22BB33, showed as below).



For 128bit encryption you may choose:

- **Alphanumeric*:*** entering ***13 characters*** (case sensitive) ranging from “a-z”, “A-Z” and “0-9” (e.g. MyKey12345678).
- **Hexadecimal**: entering **26 *hexadecimal digits*** in the range of “A-F”, “a-f” and “0-9” (e.g. 00112233445566778899AABBCC).

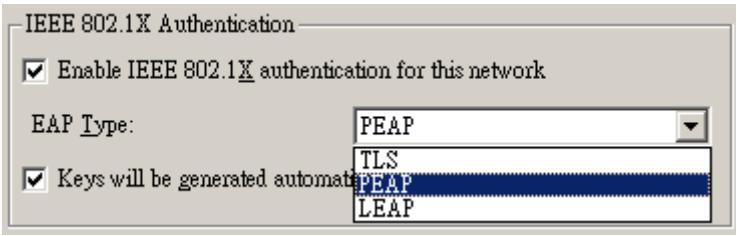
After you type, the utility uses an algorithm to generate 4 keys automatically. The **Key index** field allows you specify which of the four keys you use to transmit data on your wireless LAN. You can change the default key by clicking on the up or down arrow and make sure the default key is set up exactly the same on the Wireless LAN stations as they are on the wireless Access Points.

After entering the WEP keys in the key field, click the **OK** button to make the setting take effect.

TKIP: A greatly enhanced wireless encryption scheme. Designed to enhance protection by most popular WPA-capable devices. When TKIP is enabled, the key value will be generated automatically for data private.

AES: A sophisticated wireless encryption scheme. Designed to increase the strength and complexity of wireless encryption. When AES is enabled, the key value will be generated automatically for data private.

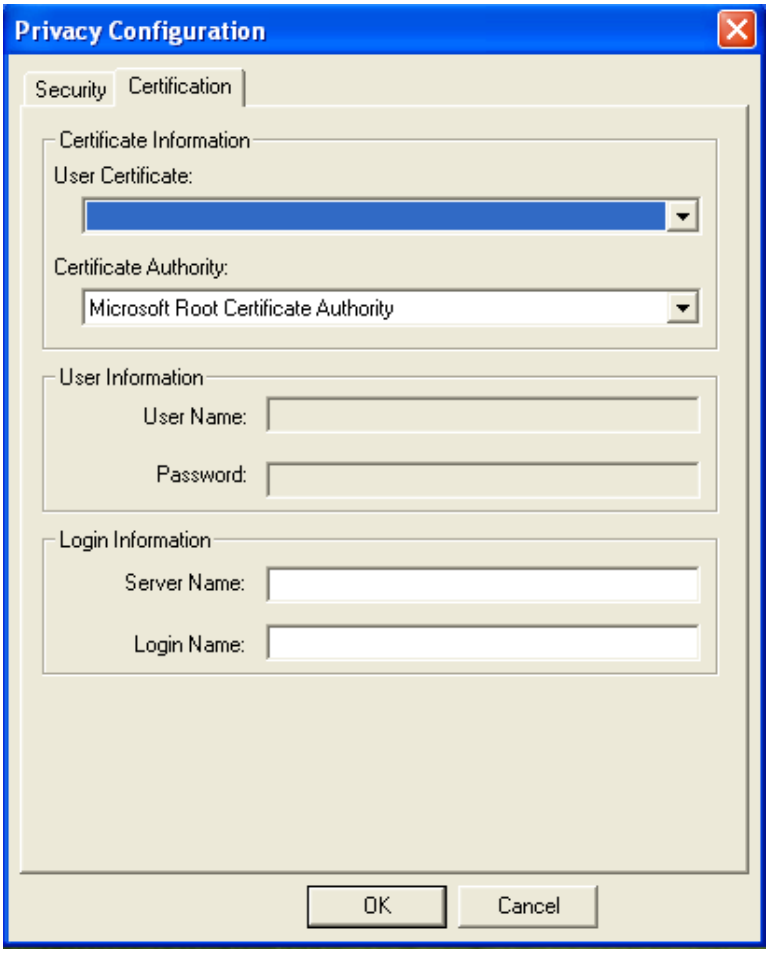
If the Security you are configuring requires authentication, simply go to the **IEEE802.1X Authentication** section of this menu to choose an EAP type.



Certification Tab

After you select the EAP type, you need to click **Certification Tab** to make advanced setting. The following describes configuration of each available EAP type.

TLS: Clicking the **Certification** tab for TLS shows the following menu.



TLS requires the entry of Certificate Information and Login Information for mutual authentication. When security requires TLS, you must choose the appropriate information in the following field using drop-down menu:

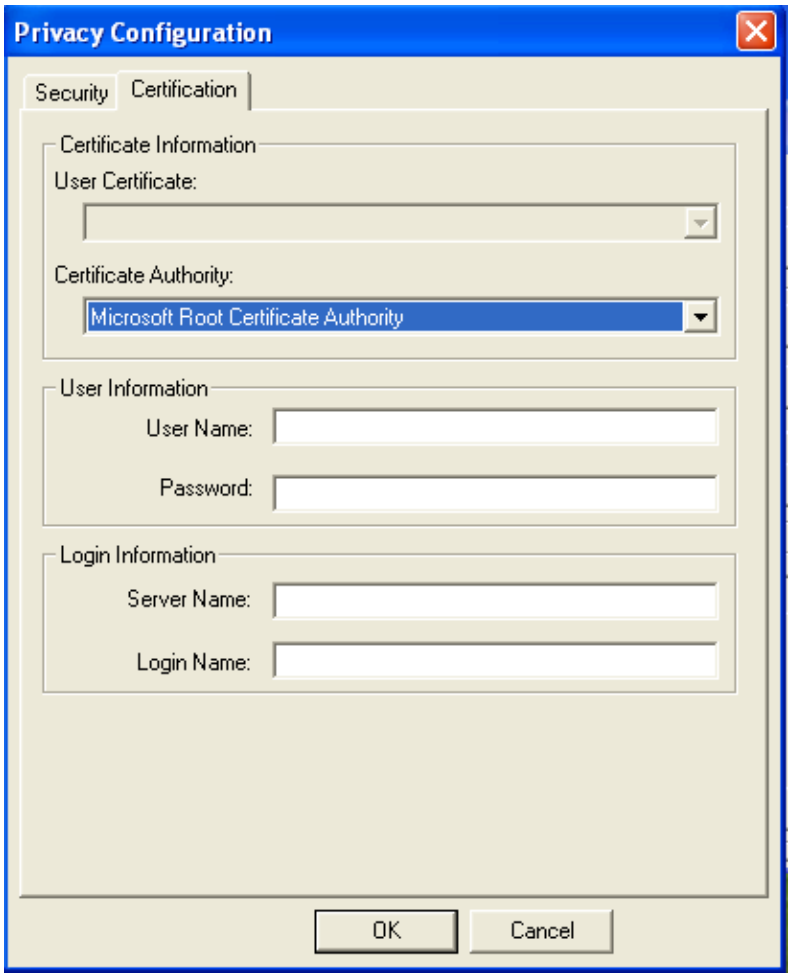
User Certificated: select one of user certificates you have enrolled.

Certificate Authority: select one of certificate authorities you have registered.

TLS is used to create a secure tunnel through which authentication and encryption keys can be passed and require server and client side keys. The Login Information section of this menu lets you to enter Server Name and Login Name to authenticate.

To save the information you entered in the appropriate field, click the **OK** button. Otherwise, click the **Cancel** button to close the menu. If you want to return to select other EAP type, click the **Security** tab.

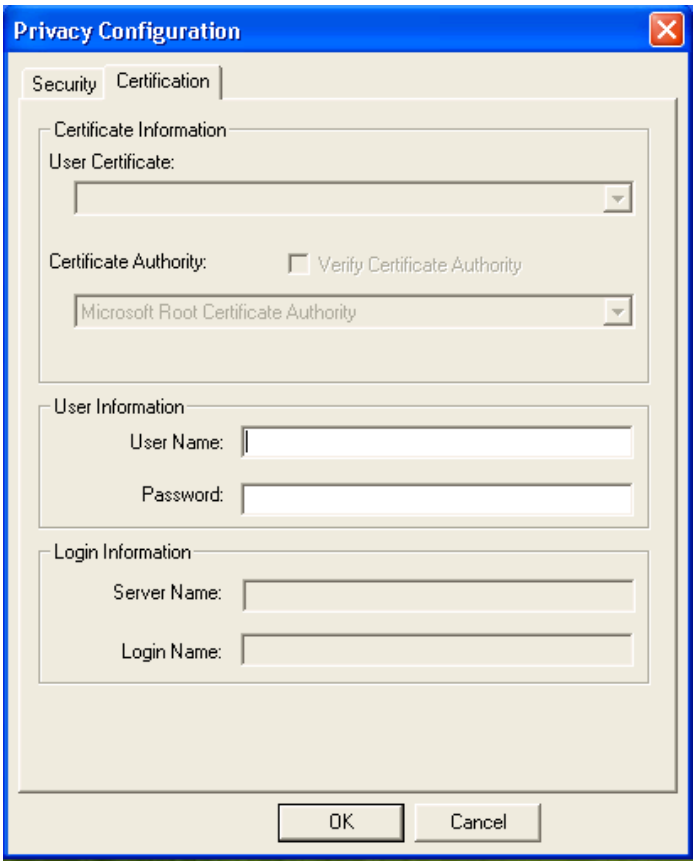
PEAP: Clicking the Certification tab for PEAP displays the following menu.



PEAP requires the use of certificates with **Certification Authority** server, clicking the up and down arrows to the right of this list to display all the **Certification Authority** types and then highlight one of certificate authority to select it. You also need to input User Information and Login Information by entering this information in the appropriate fields on your screen.

To save the information you entered in the appropriate field, click the **OK** button. Otherwise, click the **Cancel** button to close the menu. If you want to return to select other EAP type, click the **Security** tab.

LEAP: Clicking the **Certification** tab for LEAP shows the following menu.

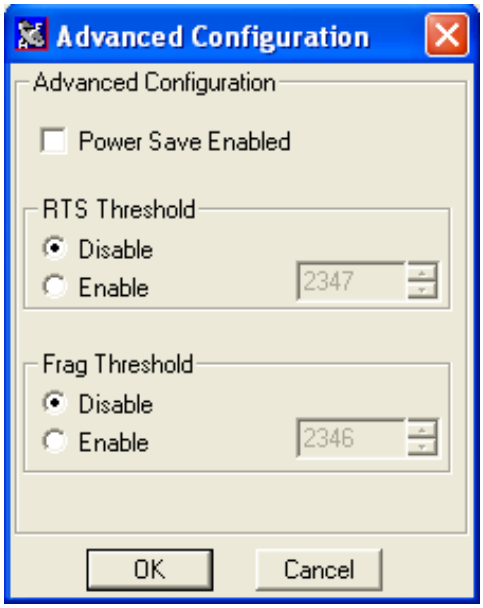


LEAP requires the mutual authentication between station and access points. You must present a **User Name** and **Password** in the User Information field that will be verified by LEAP-capable server. This mutual authentication ensures that only authorized users are allowed access to the network.

To save the information you entered in the appropriate field, click the **OK** button. Otherwise, click the **Cancel** button to close the menu. If you want to return to select other EAP type, click the **Security** tab.

Advance

The WLAN Utility also offers the advanced configuration for user to set the Wireless LAN Card under certain network environment. These advanced options include Power Save Enabled, RTS Threshold, Fragmentation Threshold and Nitro Time. To enable the advanced configuration, go to the **Configuration** tab and click the **Advance** button.



Power Save Enabled

The Power Save option is designed to conserve battery life of you computer. When Power Save is enabled, your Wireless LAN Card will go into sleep mode to minimize power consumption.

> **Note:** When power saving mode is enabled, the Access Points you use need to support power saving as well so that the communication can be established.

RTS Threshold

RTS Threshold is a mechanism implemented to prevent the "Hidden Node" problem. If the "Hidden Node" problem is an issue, please specify the packet size. *The RTS mechanism will be activated if the data size exceeds the value you set.* It is highly recommended that you set the value ranging from 0 to 1500. The default value is **Disable**.

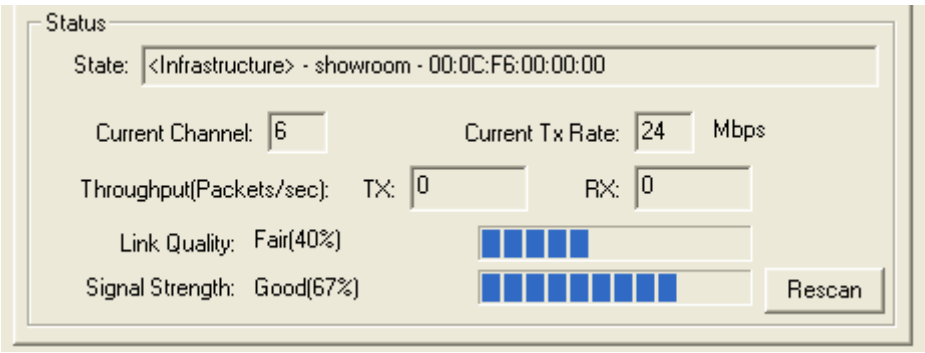
> **Note:** Enabling RTS Threshold would cause redundant network overhead that could negatively affect the throughput performance instead of providing a remedy.

Frag. Threshold

Fragmentation mechanism is used for improving the efficiency when high traffic flows along in the wireless network. If your IEEE 802.11b Wireless LAN Card often transmits large files in the wireless network, you can enable the Fragmentation Threshold by clicking the **Enable** button and the mechanism will split the packet. The default value is 2346 (Disable).

Status:

The Status field on the **Configuration** menu provides the following information.



State: When operating in Infrastructure mode, this field shows the MAC address of the Access Point with which the IEEE 802.11b Wireless LAN Card is communicating. When operating in Ad-Hoc mode, it shows the virtual MAC address used by computers participating in the Ad-Hoc network.

Current Channel: Shows the channel on which the connection is made.

Current Tx Rate: Shows the highest transmit rate of the current association.

Throughput: Shows the short term transmit and receive throughput in bytes/second, and is continuously updated.

Link Quality: Based on the quality of the received signal of the Access Point beacon. There are 5 states of link quality:

100%~80%: Excellent link.
80%~60%: Good link quality.
60%~40%: Fair link quality.
Under 40%: Poor or no connection.

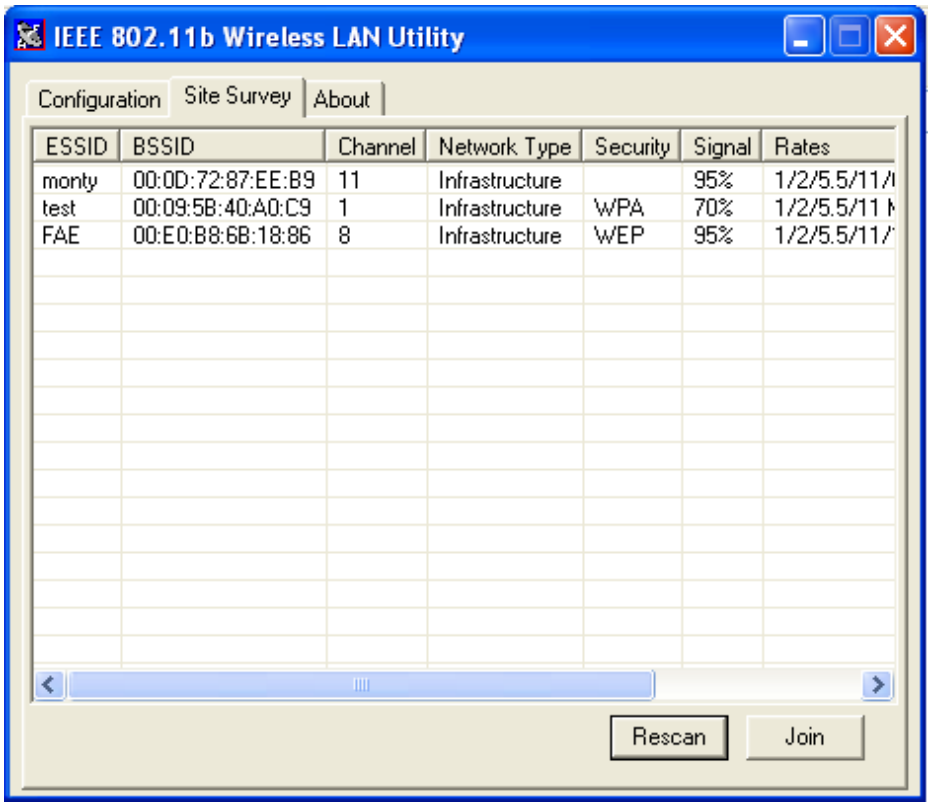
Signal Strength: Based on the received signal strength measurement of the baseband processor of the Beacon signal. Same as link quality, there are 5 states of signal strength:

100%~80%: Excellent signal strength.
80%~60%: Good signal strength.
60%~40%: Fair signal strength.
Under 40%: Poor or no signal strength.

You can click the **Rescan** button to force the radio to rescan all available channels. If your link quality or signal strength is poor, rescanning can be used to push the radio off a weak Access Point and search for a better link with another Access Point.

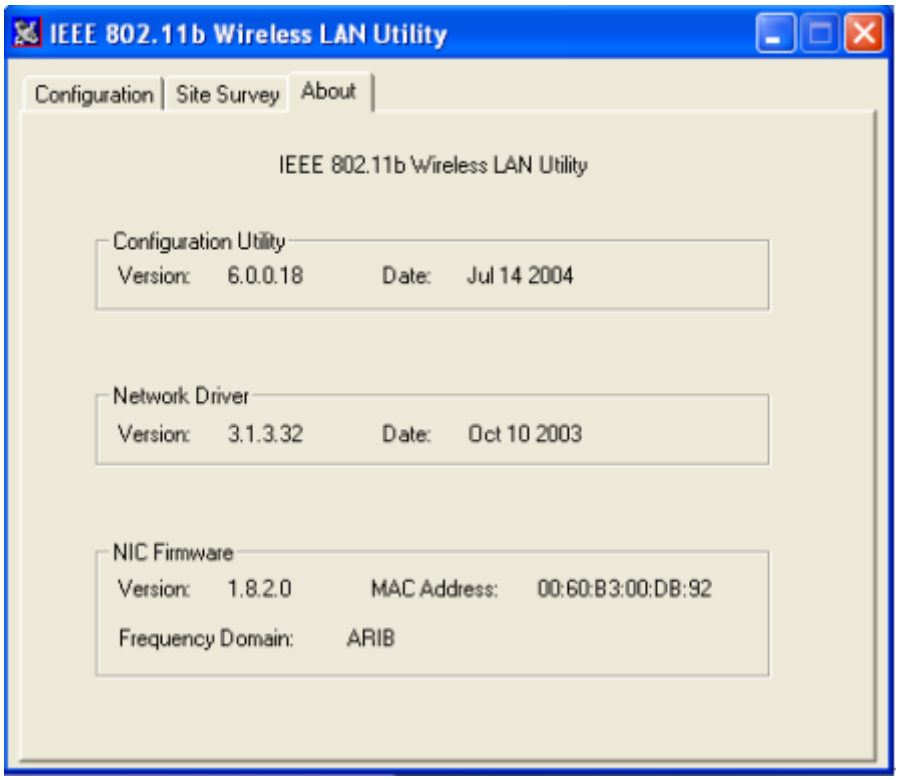
Site Survey:

By clicking the **Rescan** button, the AP Browser can display Access Points around the working environment. Besides showing the ESSID of each Access Point, it also displays BSSID, Channel, Capability, Signal, and Rates. To join any of the displayed Access Points, highlight the Access Point you desire to connect and then click the **Join** button to associate to the AP.



About:

The **About** item shows the versions of the Wireless LAN Utility, and driver, firmware of the IEEE 802.11b Wireless LAN Card. Also, the MAC address and frequency domain are displayed.



Limited Warranty

This Warranty constitutes the sole and exclusive remedy of any buyer or reseller's equipment and the sole and exclusive liability of the supplier in connection with the products and is in lieu of all other warranties, express, implied or statutory, including, but not limited to, any implied warranty of merchantability of fitness for a particular use and all other obligations or liabilities of the supplier.

In no even will the supplier or any other party or person be liable to your or anyone else for any damages, including lost profits, lost savings or other incidental or consequential damages, or inability to use the software provided on the software media even if the supplier or the other party person has been advised of the possibility of such damages.

The following are special terms applicable to your hardware warranty as well as services you may use during part of the warranty period. Your formal Warranty Statement, including the warranty applicable to our Wireless LAN products, appears in the Quick Installation Guide that accompanies your products.

Duration of Hardware Warranty: One Year

Replacement, Repair or Refund Procedure for Hardware:

If your unit needs a repair or replacement, return it to your dealer/distributor in its original packaging. When returning a defective product for Warranty, always include the following documents:

- The Warranty Repair Adapter
- A copy of the invoice/proof of purchase, and
- The RMA Report Form (To receive a Return Materials Authorization form (RMA), please contact the party from whom you purchased the product).

Upon proof-of-purchase we shall, at its option, repair or replace the defective item at no cost to the buyer.

This warranty is contingent upon proper use in the application for which the products are intended and does not cover products which have been modified without the reseller's approval or which have been subjected to unusual physical or electrical demands or damaged in any way.

Please complete the information below and include it along with your products.

Name:	
Title:	
Company:	
Telephone:	
Fax:	
Email:	
City/State/Zipcode:	
Country:	
Product Name:	
Serial Number:	
MAC Address:	
Invoice Date:	
Product Description:	

If you have any further questions, please contact your local authorized reseller for support.