IEEE 802.11b WLAN Cardbus

User Manual

Version: 1.0

Dec. 2002

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.

FCC Caution: 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 may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

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

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

Table of Contents

1. Introduction

Thank you for purchasing the IEEE802.11b WLAN Cardbus that provides the easiest way to wireless networking. This User Manual contains detailed instructions in the operation of this product. Please keep this manual for future reference.

1.1 Kit Contents

- One IEEE802.11b WLAN Cardbus
- One Installation Software CDROM

1.2 System Requirements

- A laptop PC contains:
  - 32-bit Cardbus slot (or Desktop PC with PC Card-PCI adapter)
  - 32 MB memory or greater
  - 300 MHz processor or higher
- Microsoft® Win™98SE/ME/2000/ XP/XP SE

1.3 Status LED

There is 1 Status LED on the IEEE802.11b WLAN Cardbus, by which you can check the network connectivity status.

- **Off:** Power off.
- **Blinking Red:** The Cardbus is powered on.
- **Blinking Red With Steady Green:** Wireless connection is linked.

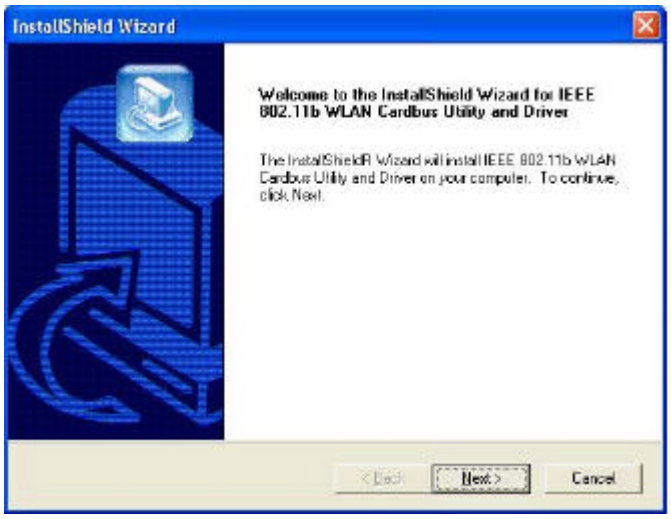
2. Driver/Utility Installation / Uninstallation

2.1 Installation

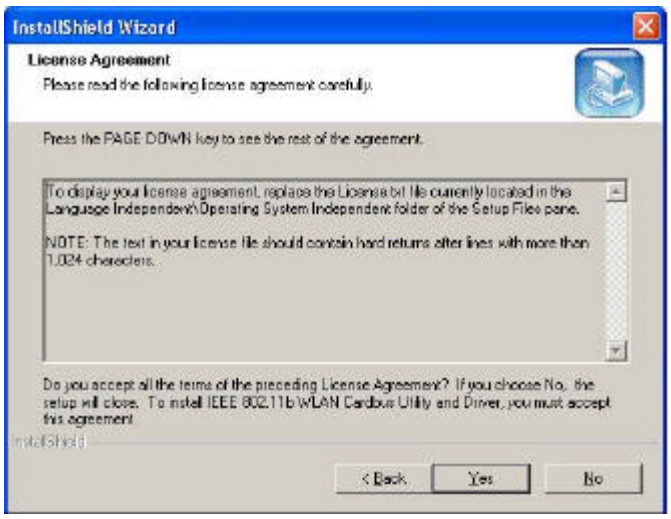
Note! The Installation Section in this User Manual describes the first-time installation for Windows. To re-install the driver, please first uninstall the previously installed driver. See Chapter 2.2 “Uninstallation” section in this User Manual.

Follow the steps below to complete the Driver/Utility installation:

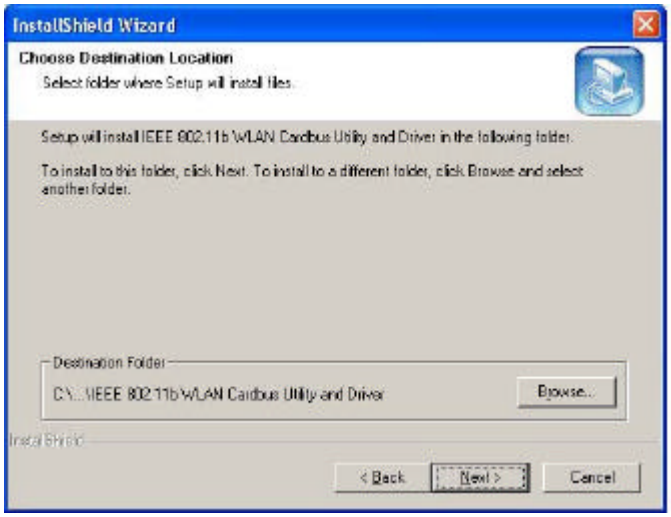
1. Insert the **Installation Software CD** into the CD-Rom Drive. Click “Next”.



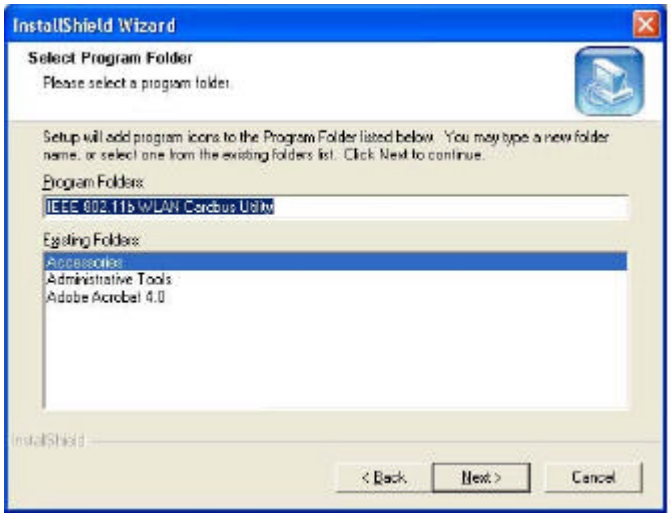
2. Read the **License Agreement** and click **“Yes”**.



3. Click **“Next”** to continue or click **“Browse”** to choose a destination folder.

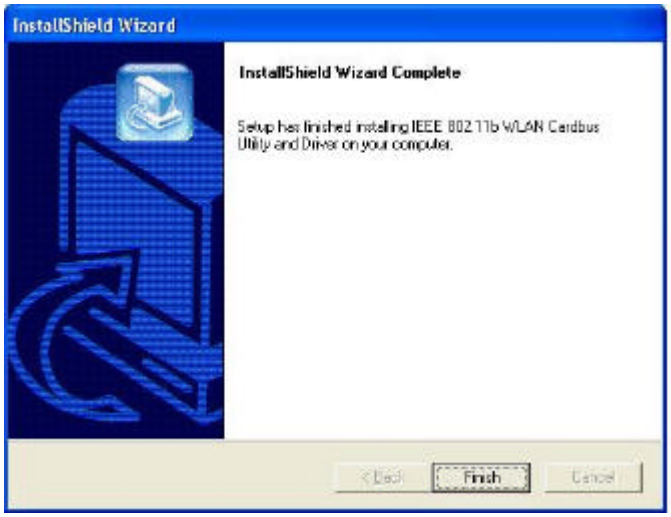


4. Click **“Next”**.



5. Click “Continue Anyway”.

6. Click **“Finish”**.



7. You should now see the shortcut icon on your desktop.

8. Insert the **IEEE802.11b WLAN Cardbus** into the Cardbus slot, and the Windows Operating System will find the new hardware and automatically install it. (For Windows 98SE or Windows Me, please restart your computer before inserting the Adatper).

2.1.1 Additional Setup Processes

During software installation procedure, each operating system may prompt different specific options:

1. **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.

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

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

2.1.2 Verifying the Driver

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 IEEE802.11b WLAN Cardbus 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 IEEE802.11b WLAN Cardbus 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 IEEE802.11b WLAN Cardbus 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.

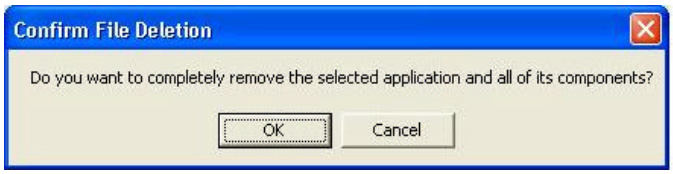
2.2 Uninstallation

Note! Before uninstallation, please close all running programs.

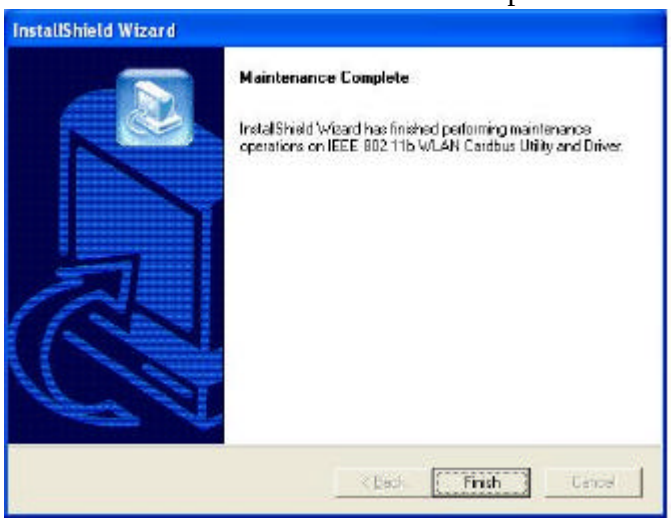
1. Click Programs>IEEE802.11b WLAN Cardbus Utility>Uninstallation.

2. Choose "**Remove**". Click "**Next**".

3. Click "**OK**" to start Uninstall.

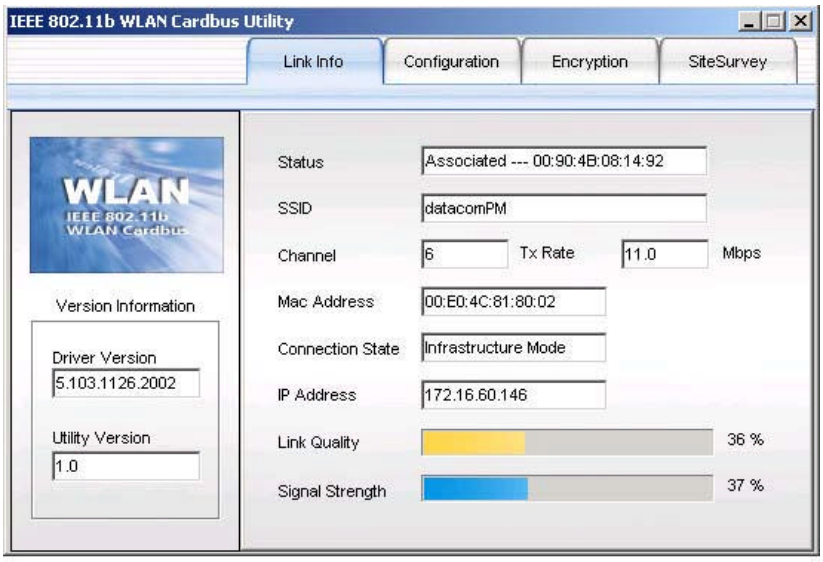


4. Click "**Finish**". Uninstall is now completed.

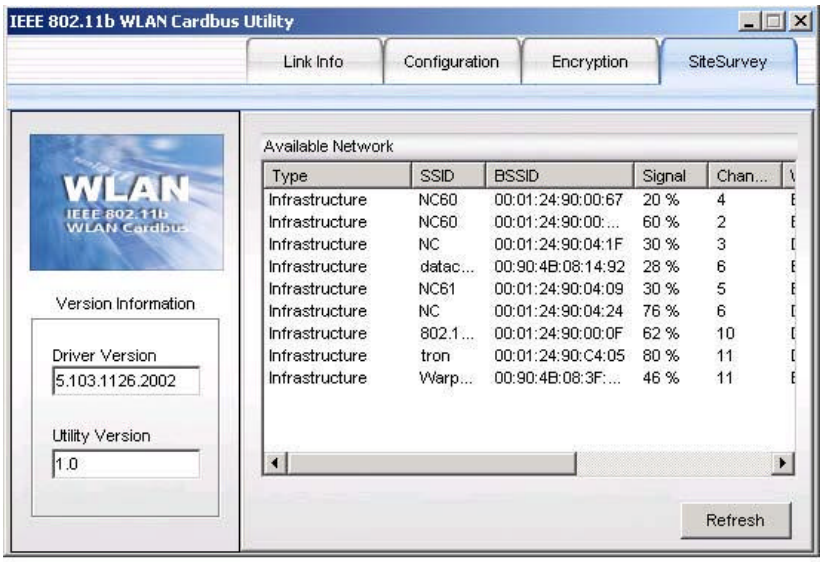


3. Connecting to an Existing Network

1. Double click the shortcut icon of "IEEE802.11b WLAN Cardbus Utility" on the desktop, and the "**IEEE802.11b WLAN Cardbus Utility**" window will appear.



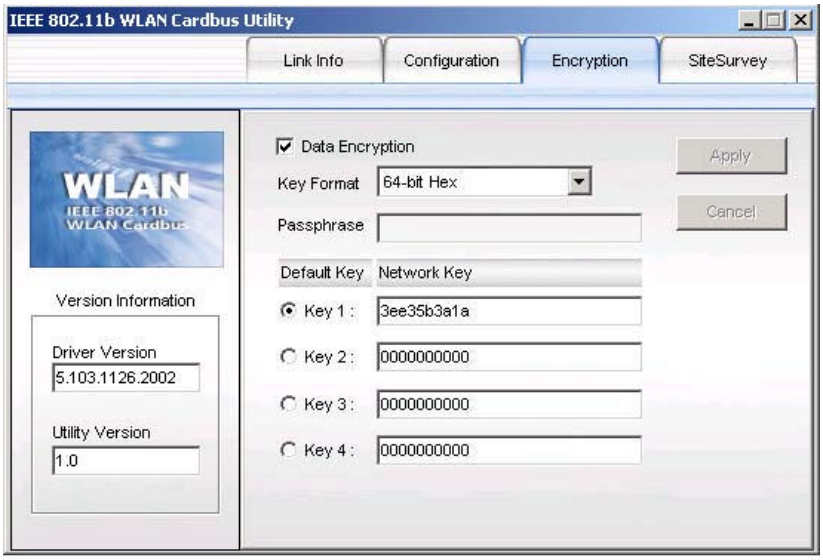
2. In the Windows System Tray, there is a **communication-status icon**  that indicates different connection statuses by showing different colors. Green communication-status icon  indicates the presence of a successful connection, and your network connection process is complete.
3. Red communication-status icon  indicates that no connection is present. In this case, please go to "**SiteSurvey**" page and wait for a second (or click "Refresh" button) to get a list of all available networks.



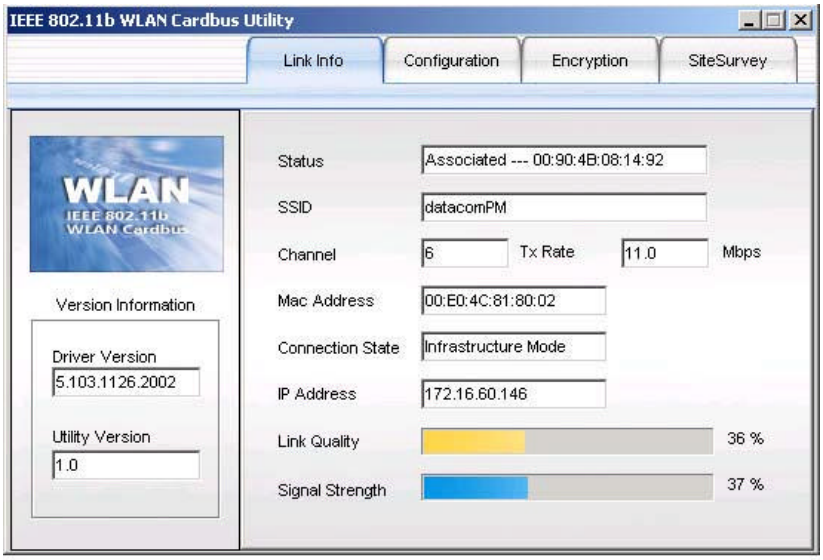
4. From the list of "**Available Network**", double click one chosen network to execute the connection.
5. Go to "Encryption" page. If the WEP of the chosen network is disabled, make

sure the check box of “Data Encryption” is cleared, and click “Apply” button if it appears functional. The connection is then executed and the communication-status icon appears green. If the WEP is enabled, please see next step.

6. If the WEP of the chosen network is enabled, in “Encryption” page, please set the “Network Key”, and then click “Apply” button. You need to contact the network administrator for the values the **Network Keys**.



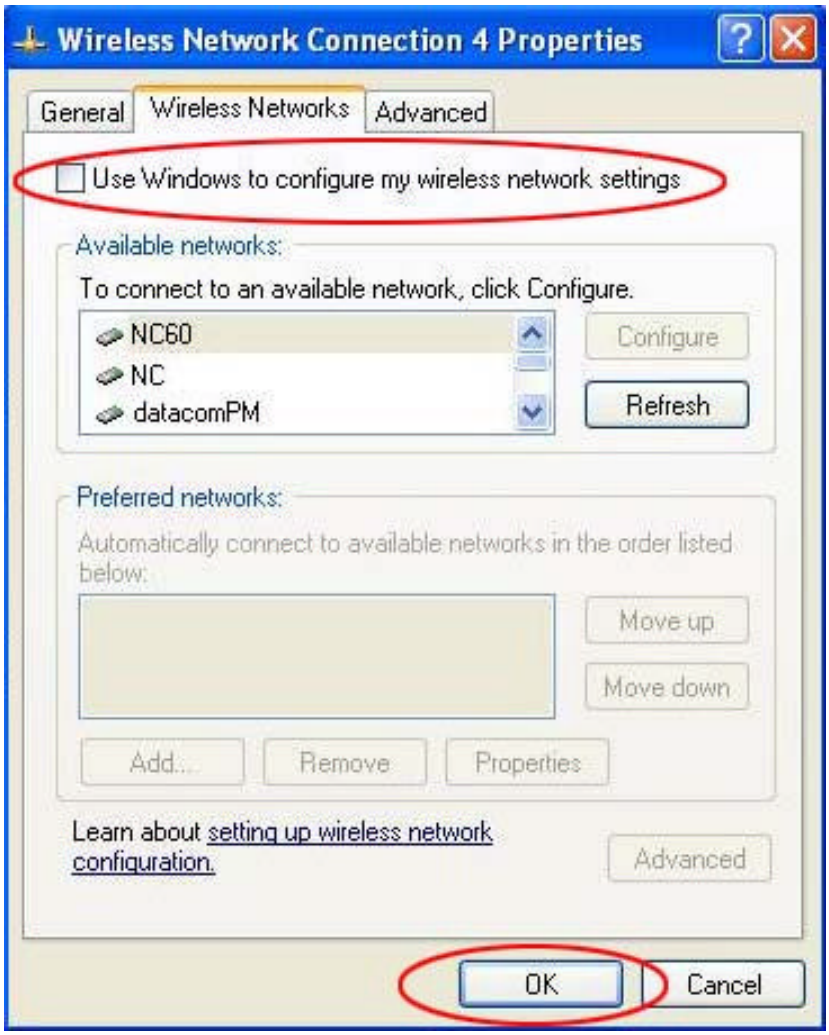
7. Once connected, you can check the Link Quality and Signal Strength from “Link Info” page.



3.1 Additional Note for Windows XP

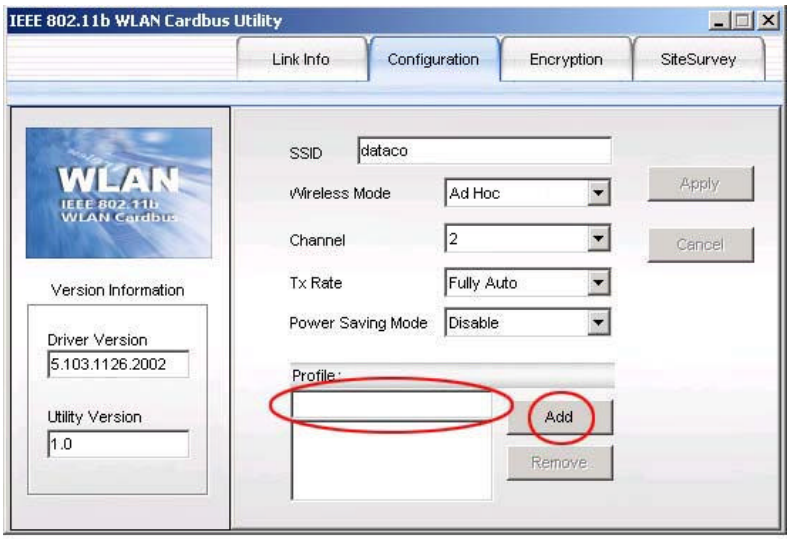
In Windows XP, it is recommended that you use the IEEE802.11b WLAN Cardbus Utility. Before using the Utility, please follow the steps below to disable the Windows XP Zero Configuration:

1. Go to “Control Panel” and double click “Network Connections”.
2. Right-click “Wireless Network Connection” of “IEEE802.11b Cardbus adapter”, and select “Properties”.
3. Select “Wireless Networks” tab, and uncheck the check box of “Use Windows to configure my wireless network settings”, and then click “OK”.

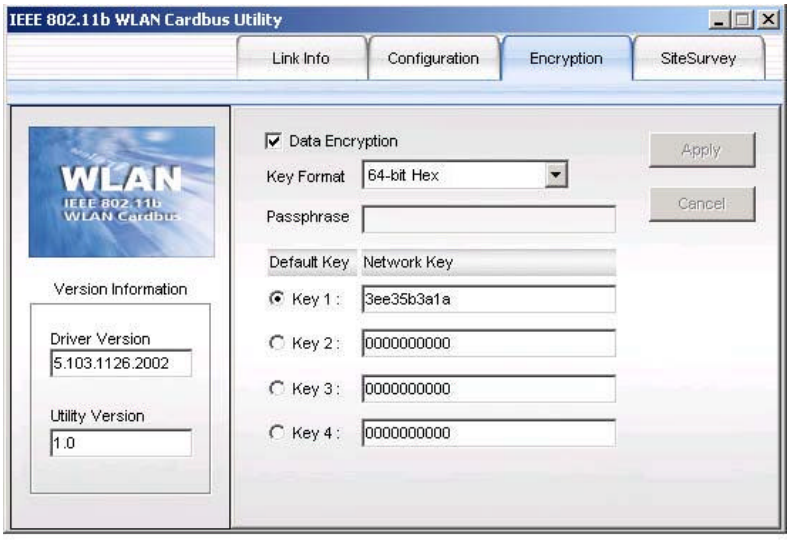


4. Creating a New Ad Hoc Network

1. Prepare two computers with WLAN Cardbus cards inserted, and software Driver/Utility installed. Run the following steps in both computers.
2. Double click the "IEEE802.11b WLAN Cardbus Utility" shortcut icon to open the Utility. Go to "Configuration" page.
3. In Profile field, enter a Profile Name and click "Add" button.



4. Enter the values in each network settings such as SSID, Wireless Mode, Channel, Tx Rate and Power Saving Mode. Click "Apply" to save the settings. Both computers should set the same values.
5. If you want the network to be secured, please go to "Encryption" page to set the "Network Key". Remember to click "Apply" to save the settings.



6. If the network is created successfully, it will be shown in the "Available Network" list in "SiteSurvey" page.

Note! Before creating a new network, if there is no Profile being created yet, you may skip Step 3.

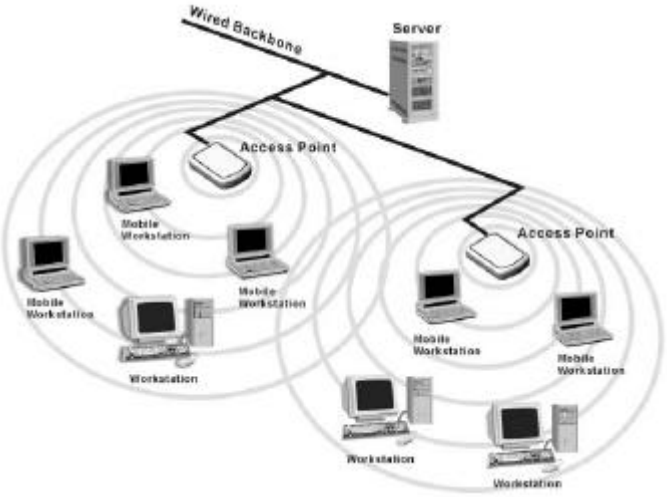
5. Configuration

5.1 Wireless Mode

You have two options of Wireless Mode: Infrastructure and 802.11 Ad Hoc.

Infrastructure Mode

In infrastructure mode, devices communicate with each other by first going through an Access Point (AP). Wireless devices can communicate with each other or can communicate with a wired network. When one AP is connected to wired network and a set of wireless stations, it is referred to as a BSS (Basic Service Set).

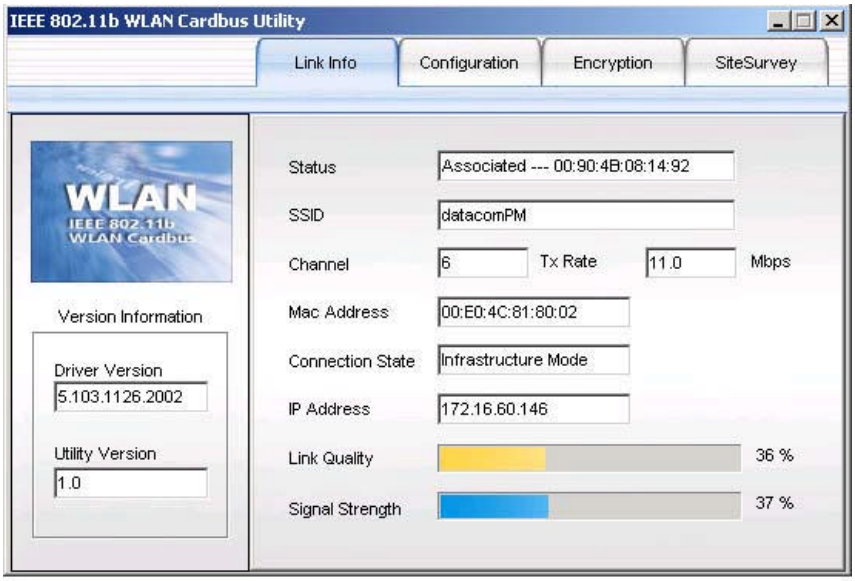


Ad Hoc Mode

Ad Hoc mode is also called “peer-to-peer mode” or “Independent Basic Service Set (IBSS)”. In Ad Hoc mode, devices communicate directly with each other without using an Access Point (AP).

5.2 Link Info Page

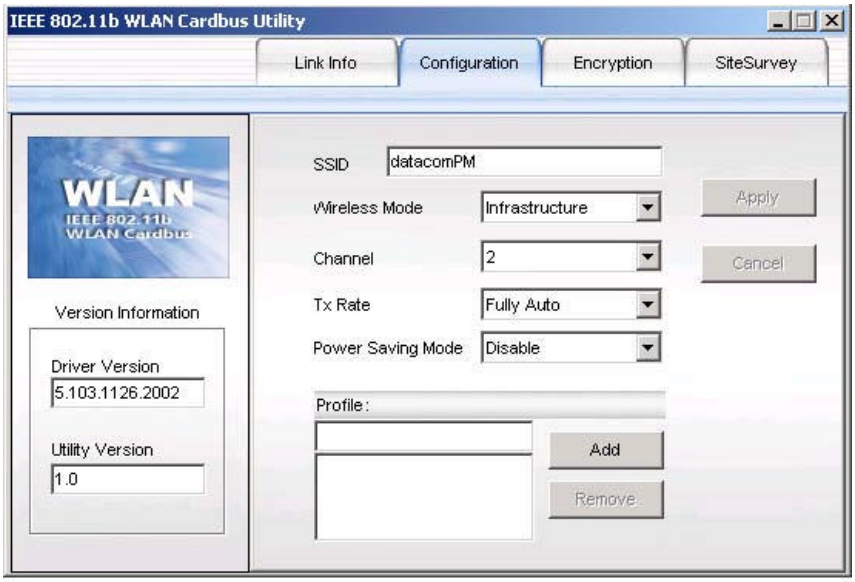
"Link Info" page shows you the information of current network connection, including Status, SSID, Channel, Mac Address, Connection State, IP Address, Link Quality and Signal Strength.



- **Status:** Shows whether the connection is on ("Associated---" or "Ad Hoc---") or failed.
- **SSID:** Service Set Identifier is a group name that will be shared by every member of your wireless network.
- **Channel:** Shows the channel currently in use for Access Point or 802.11 Ad Hoc stations.
- **Mac Address:** Shows the Mac Address of this product.
- **Connection State:** Shows the wireless mode of the connected network.
- **IP Address:** Shows the current Internet Protocol Address of the network.
- **Link Quality / Signal Strength:** An indicator of how clearly the adapter can hear the Access Point.
- **Tx Rate:** Shows the current data transmission rate in use.

5.3 Configuration Page

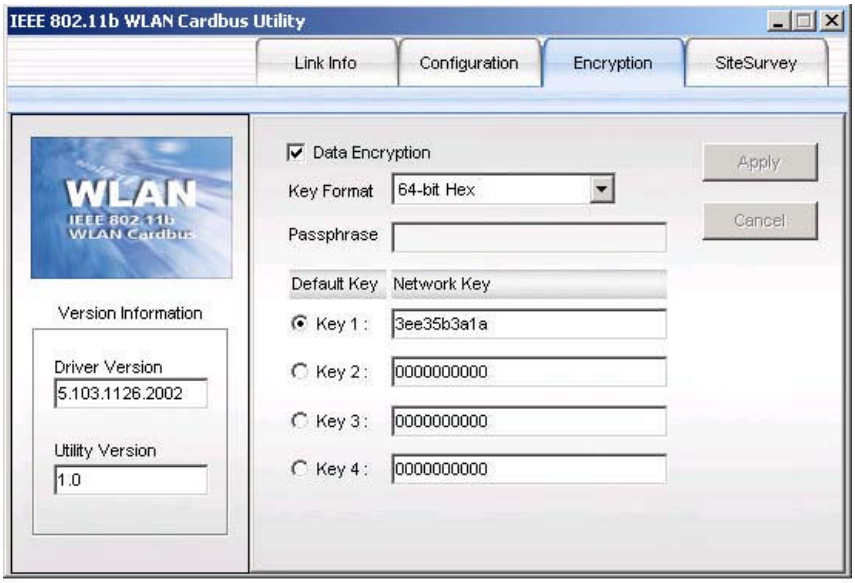
"Configuration" page allows you to edit/modify settings of a network. You may enter a network name in SSID field and click "Apply" to join a specific network.



- **SSID:** The name of the wireless network. This name cannot be longer than 32 characters. The default value is "any", which will automatically scan and connect the best performance Access Point nearby.
- **Wireless Mode:** Two options are available--Infrastructure and 802.11 Ad Hoc.
- **Channel:** Every station in the network should set the same number of Channel. Different countries have different channel ranges.
- **Tx Rate:** Four options are "Fully Auto", "1Mbps", "2Mbps", "5.5Mbps" and "11Mbps".
- **Power Saving Mode:** Allows you to enable or disable Power Saving function. Three options are Disabled, Normal and Maximum.
- **Apply:** Click "Apply" button to save and implement the new settings.
- **Cancel:** Click "Cancel" button to cancel the modification of the settings.
- **Profile:** You may create several Profiles to save different sets of network settings for a network; doing so allows you to switch network settings easily. Please refer to Chapter 5.7 Profile for other information.

5.4 Encryption Page

"Encryption" page allows you to enhance the security of a network. Every station in a secured network should enable the Encryption function and the values of the Network Key should be the same.

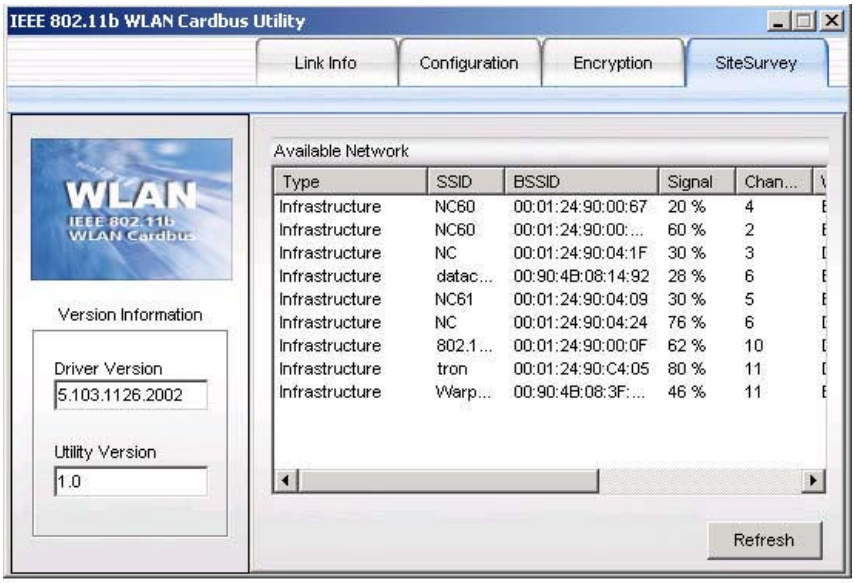


From the pull-down menu of Key Format, you have the following options:

1. **Manual 64-bit ASCII:** Allows you to enter a value of 5 alphanumeric characters for the Network Key.
2. **Manual 128-bit ASCII:** Allows you to enter a value of 10 alphanumeric characters for the Network Key.
3. **Manual 64-bit Hex:** Allows you to enter a value of 5 alphanumeric characters (within the range of 0~9 and a/A~f/F) for the Network Key.
4. **Manual 128-bit Hex:** Allows you to enter a value of 10 alphanumeric characters (within the range of 0~9 and a/A~f/F) for the Network Key.
5. **64-bit Passphrase:** If this option is chosen, type "pass" in "Passphrase" field, and the Network key will be automatically generated in Key 1 box.
6. **128-bit Passphrase:** If this option is chosen, type "pass" in "Passphrase" field, and the Network key will be automatically generated in Key 1 box.
7. **64-bit TKIP:** Allows you to enter a value of 10 alphanumeric characters for the Network Key.
8. **128-bit TKIP:** Allows you to enter a value of 26 alphanumeric characters for the Network Key.

5.5 SiteSurvey Page

"SiteSurvey" page allows you to check the information of each Network or Access Point in vicinity, such as Network Type, SSID, BSSID, Signal, Channel, WEP and Support Rates.

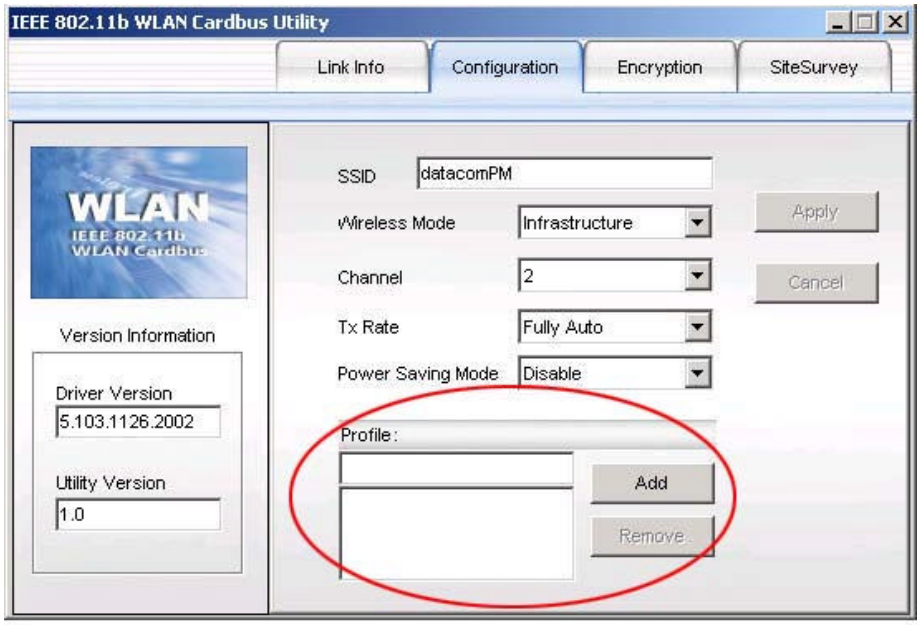


5.6 Versions

You may check the Driver and Utility versions from Version Info in the Utility.

5.7 Profile

This function provides you the convenience of frequently connecting to different networks or connecting to a network frequently modified its settings.



Creating a Profile:

1. Enter a Profile name in the Profile field.
2. Click "Add" button.
3. Enter/edit the values of each setting such as SSID, Wireless Mode, Channel, Tx Rate and Power Saving Mode. Click "Apply" button.
4. If necessary, go to Encryption page to edit the settings and click "Apply".
5. A new Profile is now created.

Modifying an existing Profile:

1. From the list of Profile, highlight the chosen Profile.
2. Modify the values of each setting. Click "Apply" button.
3. If necessary, go to Encryption page to edit the settings and click "Apply".
4. The new settings of the chosen Profile are saved.

Switching between Profiles:

From the list of Profile, please click one Profile and your computer will connect to the chosen Network with the specific Profile.

Removing a Profile:

Highlight the chosen Profile in the Profile list, and click "Remove" button.

5.8 Default Settings Windows XP Zero-Configuration

You may also choose the default parameters and directly proceed to Windows XP zero-configuration through the steps below:

1. Go to “Control Panel” and open “Network Connections”.
2. Right-click the Wireless Network Connection of “IEEE802.11b Cardbus adapter”, and make sure this connection is **Enabled**.
3. Right-click the Wireless Network Connection of “IEEE802.11b Cardbus adapter”, and then click “Properties”.
4. Select “Wireless Networks” tab and select “Use Windows to configure my wireless network settings” check box.

Note! Clear the check box of “Use Windows to configure my wireless network settings” will disable automatic wireless network configuration.

6. Wireless Networking Applications

Available network applications are as follows:

- 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 the IEEE802.11b WLAN Cardbus 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.

6.1 Surveying the Network Neighborhood

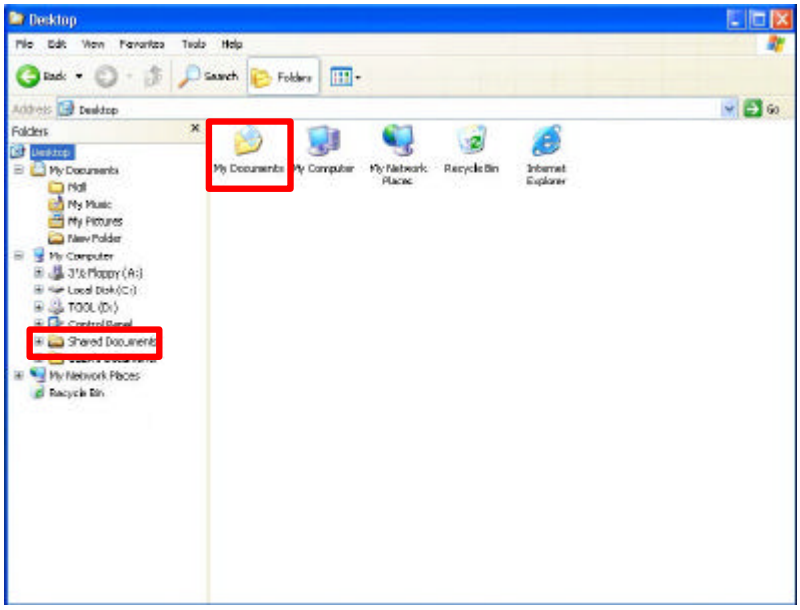
When multiple base stations are up and running in your wireless network, you can use the procedure described below to display the other computers:

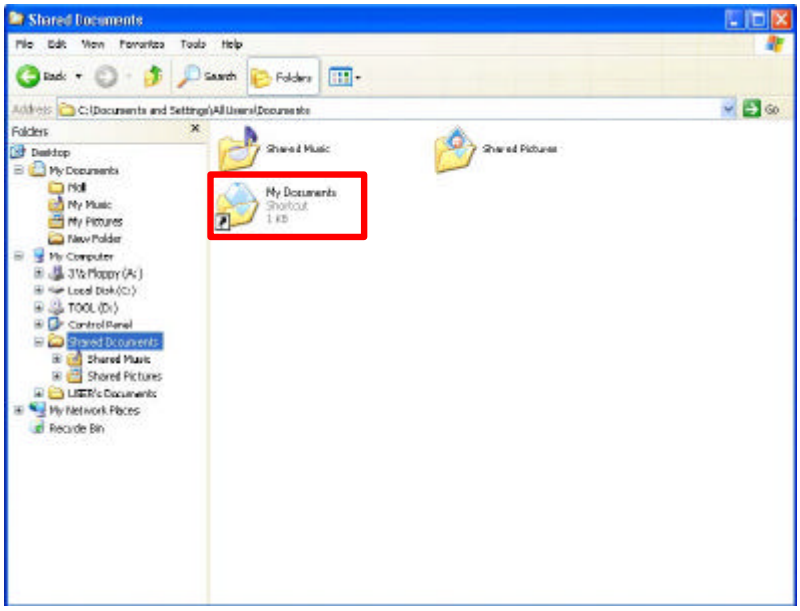
1. **Double-click My Network Places** to display all stations in your Microsoft Windows Network Group.
2. To display other workgroups in the network environment, **double-click Entire Network**.
3. If there is a **second network operating system** running in your network environment (for example a Novell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

6.2 File Sharing

You may share files between computers that are logged onto the same wireless network. For example, 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 wireless network will be like sharing files on a wired LAN.

6.3 Using the Shared Folder

If you would like to access a shared folder stored in other stations of the 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. Please enter the password that had been assigned to this shared folder.

7. Troubleshooting

Problems	Possible Solutions
■ My computer cannot find the Adapter	1. Make sure the Adapter has no physical damage. 2. Make sure the Adapter is properly inserted in the Cardbus slot. 3. Try the Adapter in other Cardbus slots. 4. Try another Adapter in that particular Cardbus slot. 5. Check whether there are conflicts caused by other network cards in the computer: Remove all other cards and try this Adapter separately.
■ Cannot access any network resources from the computer.	1. Make sure the correct software is installed. 2. Uninstall and reinstall the Driver and Utility (see Chapter 2 for the procedures). 3. Make sure all network devices are receiving power and working well. 4. Check whether the SSID is set properly. 5. Check with the network administrator to see whether the Access Point is configured properly to accept your signal. 6. If you have trouble accessing the Internet, make sure to check with the ISP (Internet Service Provider) for further instructions.

7. Product Specification

Frequency range	2.4G ~ 2.4835Ghz
Modulation technique	DSSS (Direct Sequence Spread Spectrum) with BPSK (1Mbps), QPSK (2Mbps), and CCK (5.5 and 11Mbps)
Host interface	Cardbus 32 bit
Form factor	PC card
Operation voltage	3.3V +/- 10%
Power consumption	- Transmission mode: 300mA

	- Receives mode: 180A - Sleep mode: 20mA
Output power	13-17dBm
Operation range	- Indoor: 35 ~100 meter - Outdoor: 200- 350 meter
Sensitivity	@PER <0.08 11Mbps < -84dBm 5.5Mbps < -86dBm 2Mbps < -88dBm 1Mbps < -90dBm
Operation system	Windows 98SE, Me,2K, XP, and XP 2nd edition (subject to availability)
Security	64-bit , 128-bit WEP encryption
Transfer data rate	11Mbps, 5.5Mbps, 2Mbps, 1Mbps , auto-rate
Operation temperature range	0°C ~ 60°C
Storage temperature range	-20°C ~ 65°C
Humidity (non-condensing)	5% ~90%
Warranty	1 year standard warranty, 3 years optional
EMC certificate	- FCC Class B part 15.247 (USA) - IC RSS210 (Canada) - ETSI 300 328, ETSI300 826 (Europe) - ARIB STD-T66, RCR STD-33 (Japan, subject to customer' s request)
Media access protocol	CSMA/CA with ACK
Antenna	Support antenna diversity