



GN-WI01HT

IEEE 802.11a/b/g Mini-PCI Wireless LAN Card

User's Manual

<http://www.gigabyte.com.tw>

Rev. 1.0 First Edition

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.

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.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

If this device is going to be operated in 5.15~5.25GHz frequency range, then it is restricted in indoor environment only.

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The antenna should use a unique coupling to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

1. End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example : Wireless Router. Access point...etc.). The final end product must be labeled in a visible area with the following: "Contains TX FCC ID: JCK-GN-WI01HT".

2. Manual Information That Must be Included

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the users manual of the end product which integrate this module.

The users manual for OEM integrators end users must include the following information in a prominent location " IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter".

If the end product integrating this module is going to be operated in 5.15 ~ 5.25GHz frequency range, the warning statement in the user manual of the end product should include the following "Within 5.15-5.25GHz band, U-NII devices will be restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operations. Usage of this device outdoor could void the user's authority to operate the equipment."

GIGABYTE declares that GN-WI01HT (FCC ID: JCK-GN-WI01HT) is limited in CH1~CH11 for 2.4GHz by specified firmware controlled in U.S.A.

Contents

CHAPTER 1 PRODUCT OVERVIEW	1
1-1. INTRODUCTION.....	1
1-2. FEATURES.....	1
1-3. PHYSICAL DIMENSIONS/PACKAGING.....	1
1-4. SYSTEM REQUIREMENTS.....	1
CHAPTER 2 INSTALLING THE WLAN CARD	2
2-1. INSTALLING THE DRIVER & UTILITY (WIN98SE/ME).....	2
2-2. INSTALLING THE DRIVER & UTILITY (WIN2000/XP).....	8
CHAPTER 3 USING THE UTILITY	12
3-1. LINK STATUS.....	12
3-2. SITE SURVEY.....	16
3-3. CONFIGURATION.....	17
3-4. STATISTICS.....	23
3-5. DRIVER INFO.....	24
CHAPTER 4 TROUBLESHOOTING	25
YOU ARE "802.1X", "WPA" AND "WPA-PSK" CAN NOT BE SELECTED.....	25
I CANNOT CONNECT TO AN AP.....	25
I CAN CONNECT TO AN AP BUT I CANNOT CONNECT TO THE INTERNET.....	25
I ALWAYS HAVE POOR LINK QUALITY AND LOW SIGNAL.....	26
CHAPTER 5 SPECIFICATION	27

Chapter 1 Product Overview

1-1. Introduction

This 802.11a/b/g Wireless Local Area Network (WLAN) card is composed of the MAC, Baseband, and radio components, MiniPCI interface, and two antenna connectors for supporting antenna diversity. It operates in 5GHz and 2.4GHz frequency bands, providing fast (up to 108Mbps) and secure (support AES, 802.1x & WEP, and WPA) connections to 802.11a, 802.11b and 802.11g networks from a single card.

1-2. Features

- Conforms to IEEE 802.11a, IEEE 802.11b and 802.11g specification.
- Transmits data rate up to the maximum speed of 108Mbps.
- Dynamically scales the data rate.
- Automatic power management to reduce battery consumption.
- Two antenna connectors for supporting antenna diversity.
- Seamless roaming between 802.11a, 802.11b and 802.11g networks.
- Supports AES (Advance Encryption System), enterprise-class 802.1x security and multiple levels of WEP encryption (64-bit /128-bit/152-bit), and WPA (Wi-Fi Protected Access)..
- Driver supports Windows 98SE/Me/2000/XP.

1-3. Physical Dimensions/Packaging

Dimensions: 59mm* 44mm* 4mm

1-4. System Requirements

1-4-1. Supported Platform:

IBM PC/AT compatible computer

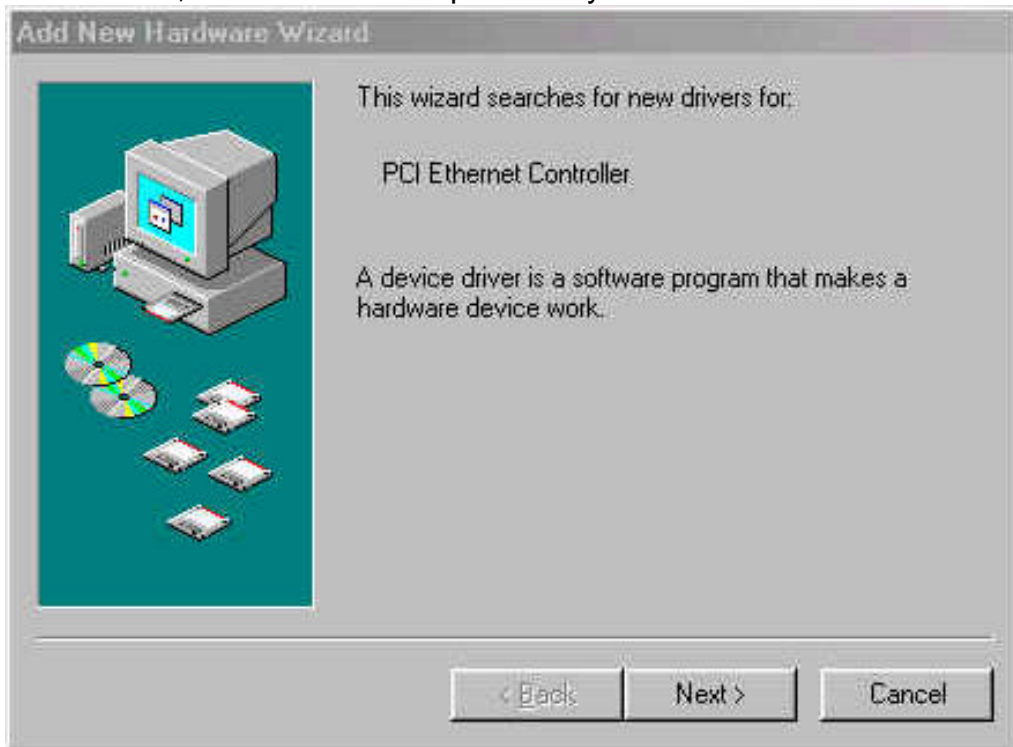
1-4-2. Supported Operation System:

Windows 98SE/Me/2000/XP

Chapter 2 Installing the WLAN Card

2-1. Installing The Driver & Utility (Win98SE/ME)

Step 1: Click “Next”, and Insert our setup CD into your CDROM drive.



Step 2: Click “Search for the best driver for your device”, and Click “Next”.

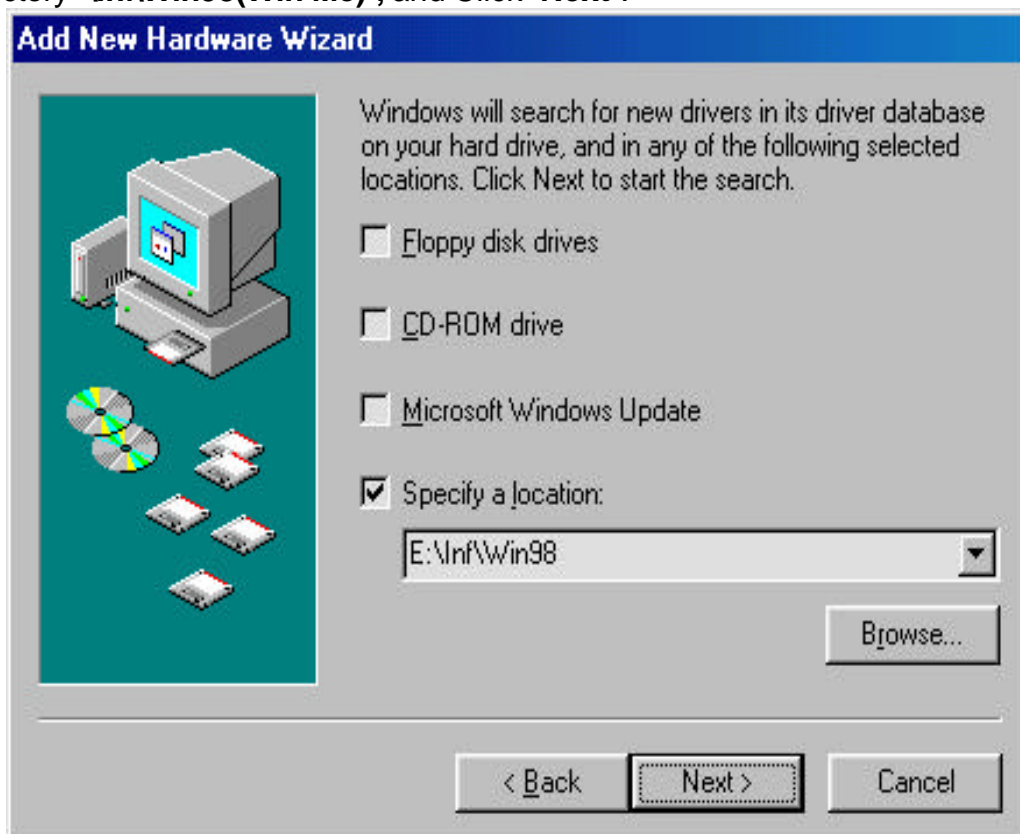


Win 98 SE



Win ME

Step 3: Click “Specify a location” , Click “Browse” , Click “CD-ROM Device:” , Select the directory “\Inf\Win98(Win Me)”, and Click “Next”.



Win 98 SE



Win 98 SE

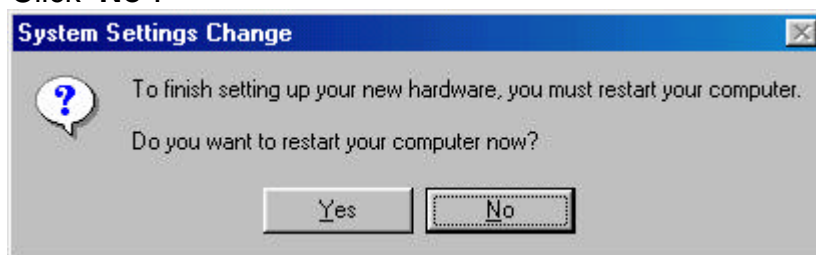
Step 4: Click "Next".



Step 5: Click “Finish”.



Step 6: Click “No”.



Step 7: Click “Install Wireless LAN Utility”.



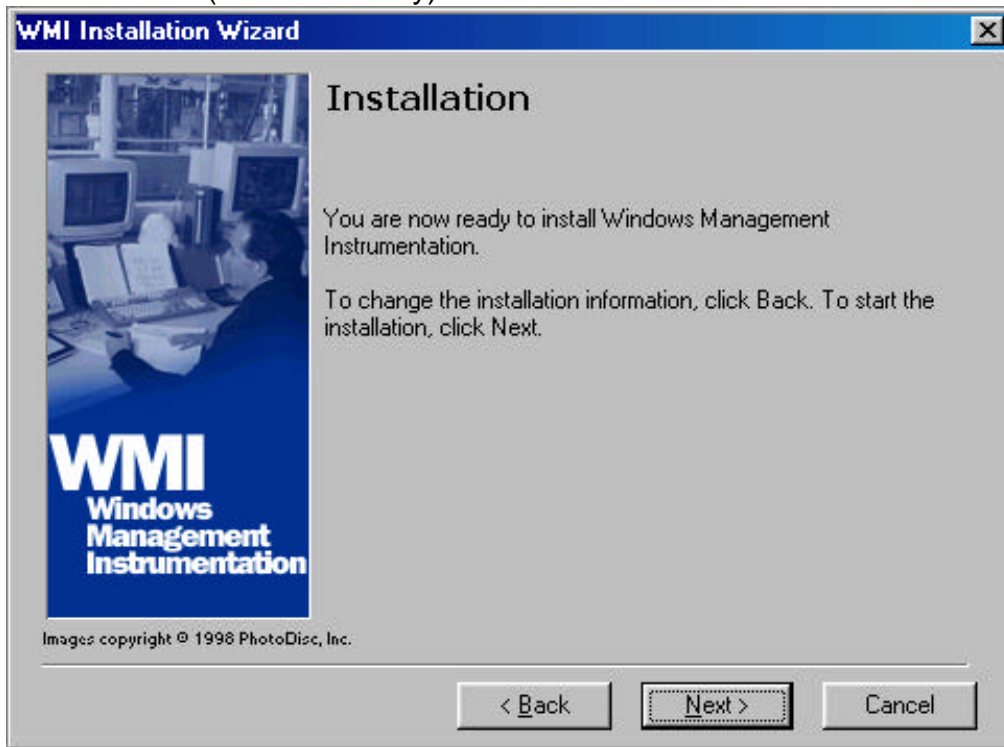
Step 8: Click “Next” (Win 98 SE only).



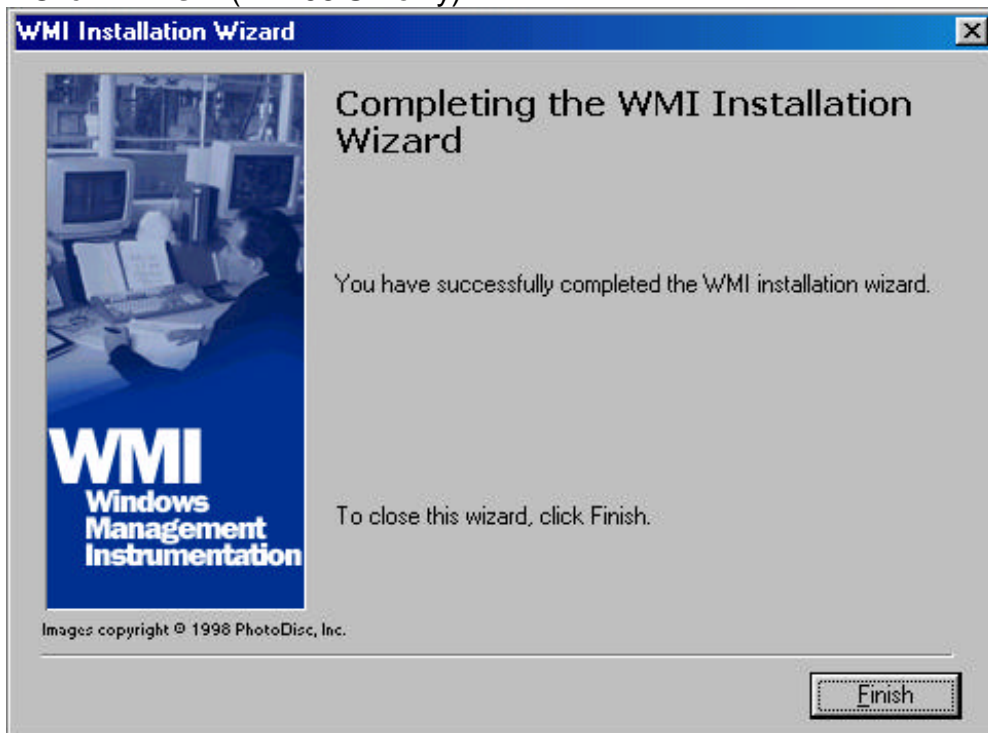
Step 9: Click “I accept this agreement” , and Click “Next” (Win 98 SE only).



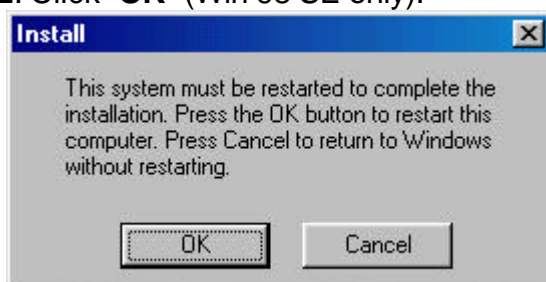
Step 10: Click “Next” (Win 98 SE only).



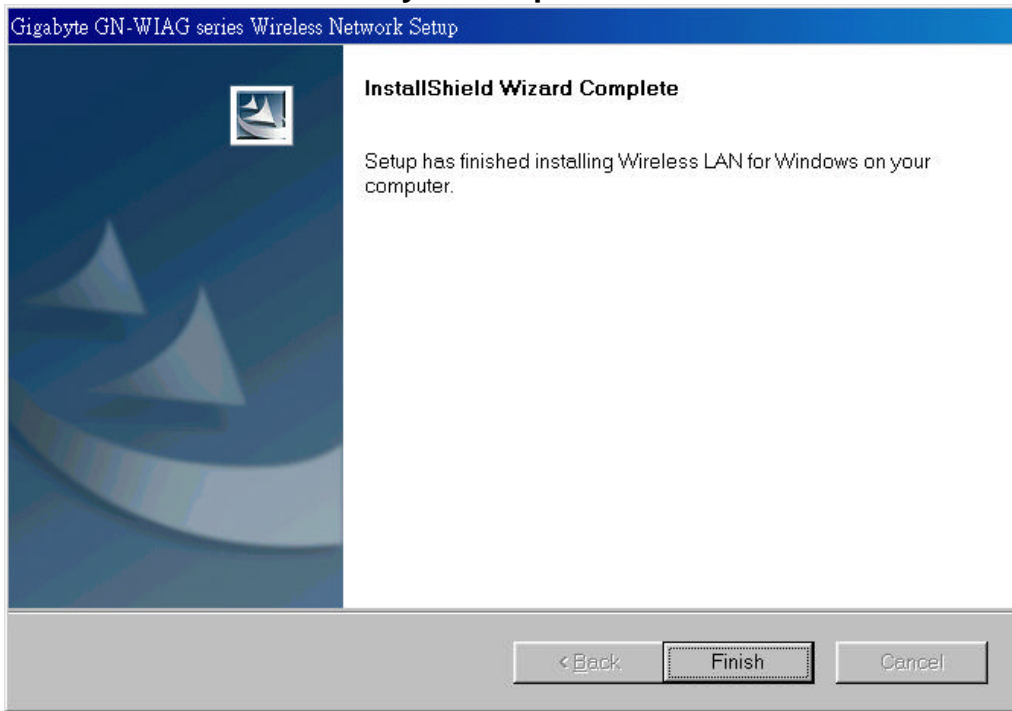
Step 11: Click “Finish” (Win 98 SE only).



Step 12: Click “OK” (Win 98 SE only).



Step 13: Click “Finish” and Reboot you computer.



2-2. Installing The Driver & Utility (Win2000/XP)

Step 1: Click “Cancel”



Win 2K



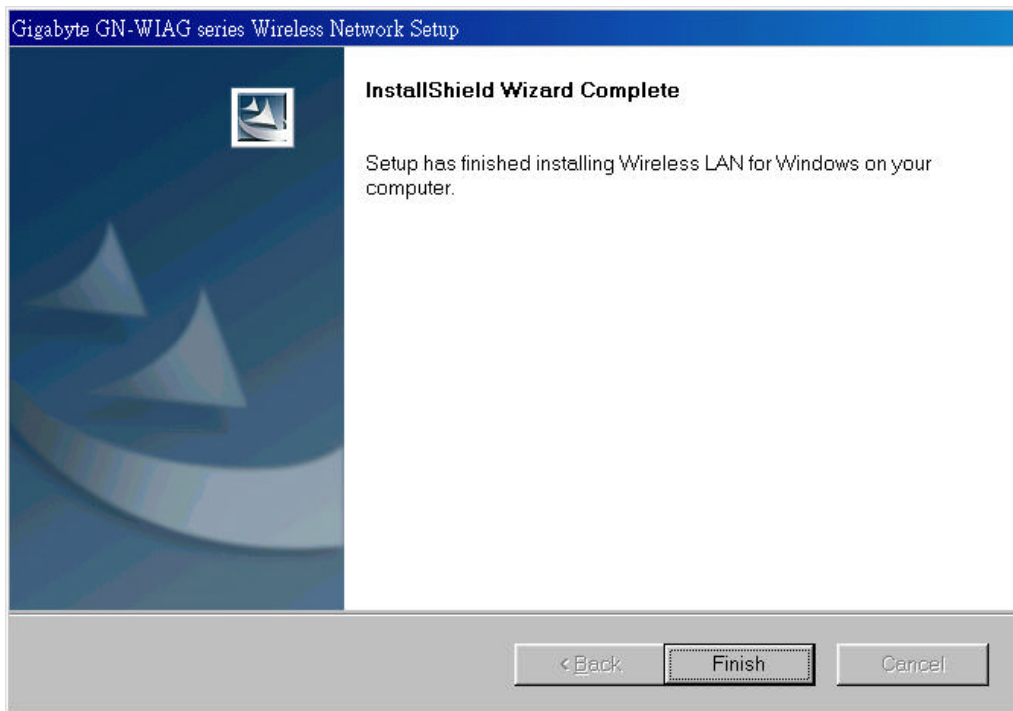
Win XP

Step 2: Insert our setup CD into your CDROM drive, the following window will pop up.

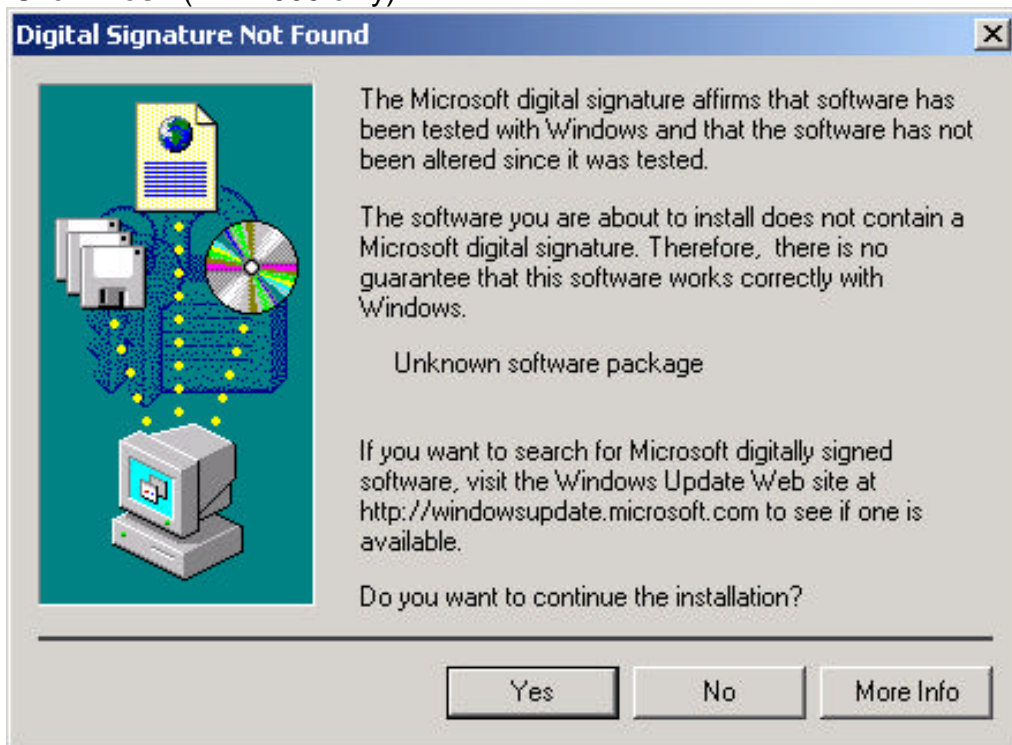
Step 3: Click "Install Wireless LAN Utility".



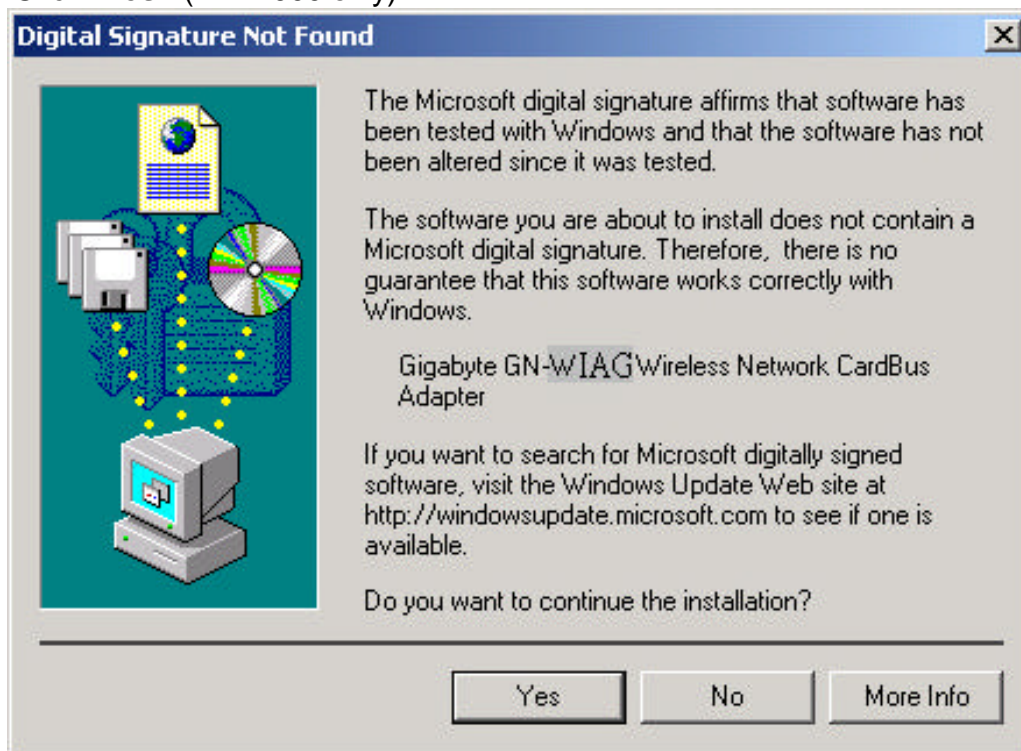
Step 4: Click “Finish”.



Step 5: Click “Yes”. (Win 2000 only)



Step 6: Click “Yes”. (Win 2000 only)



Chapter 3 Using The Utility

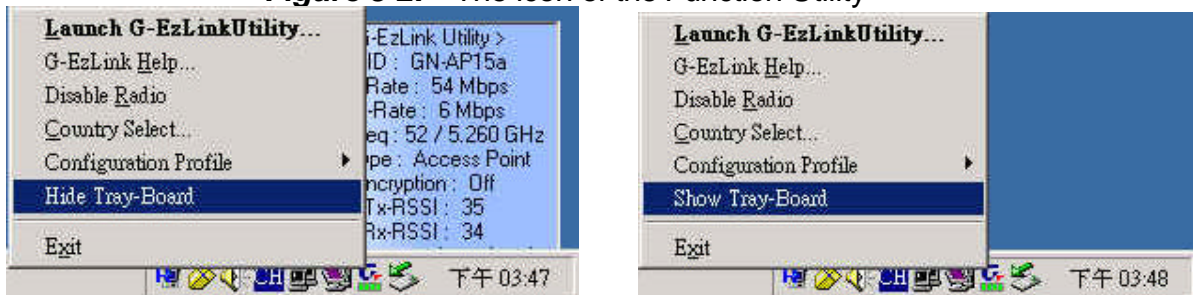
The Configuration & Monitor Utility is a powerful application that helps you to configure the card and monitor the statistics of the communication link. Unlike the standard method of configuring the card via the operating system utilities (e.g. Control Panel), this application permits the dynamic modification of the configuration parameters while the card is operating. It also offers some more configuration options. It appears as an icon on the Windows system tray whenever the card is running (see **Figure 3-1**). The icon can tell you the received signal strength by four small green lights. You can open it by double-clicking on this icon.

Figure 3-1. The icon of the Configuration & Monitor Utility



You can hide or show Tray-board by clicking mouse right key on this icon (see **Figure 3-2**).

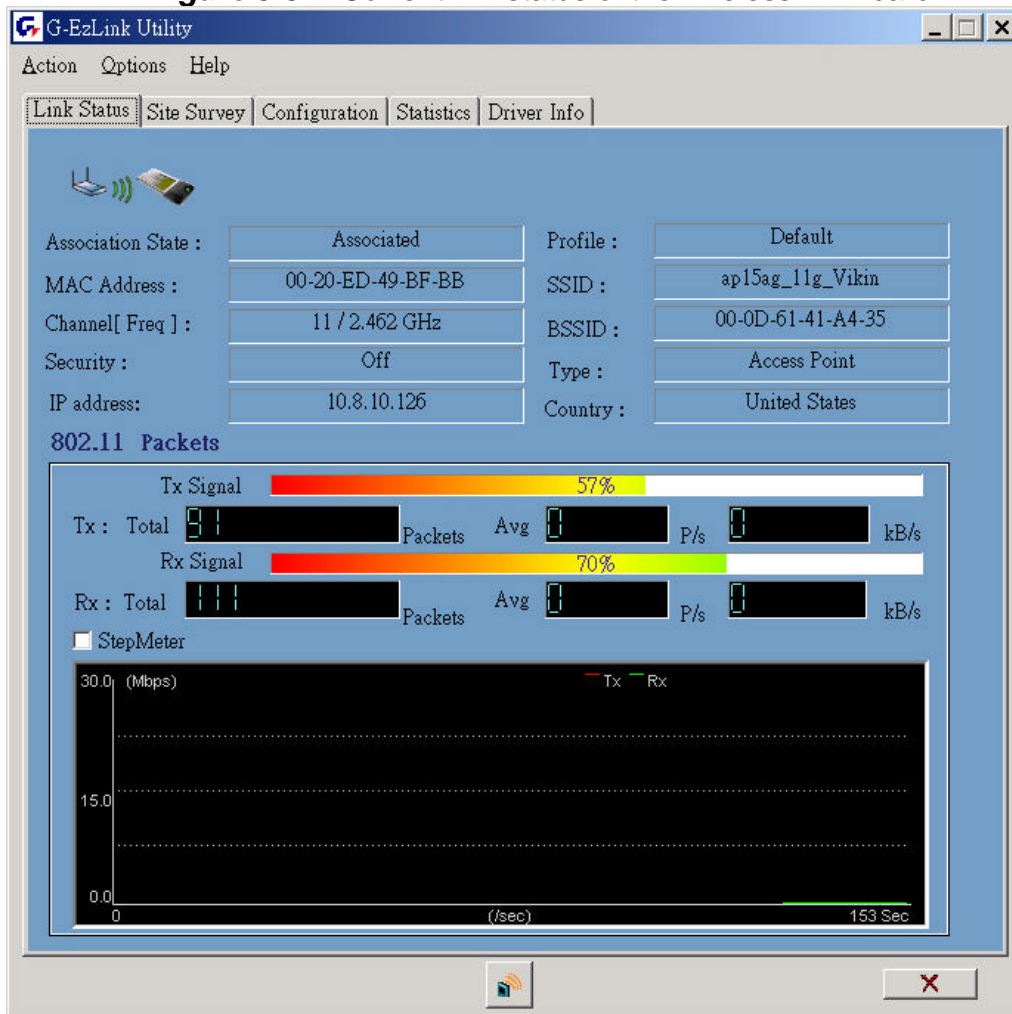
Figure 3-2. The icon of the Function Utility



3-1. Link Status

The “**Link Status**” tab shows you the current association information about the card’s connection with a wireless network. In the middle of the screen, you can see transmit and received signal strength for this card (see **Figure 3-3**).

Figure 3-3. Current link status of the wireless LAN card



If you want to turn off the card's radio, click the radio icon at the bottom of the screen, (see **Fig 3-4**) shows the result Click "Yes" (see **Figure 3-5**). Just click it again to turn on the radio. Click "Yes" (see **Figure 3-6**). In order to exit, click the "X" button at the bottom of the screen (see **Figure 3-4**).

Figure 3-4. Turn off the card's radio

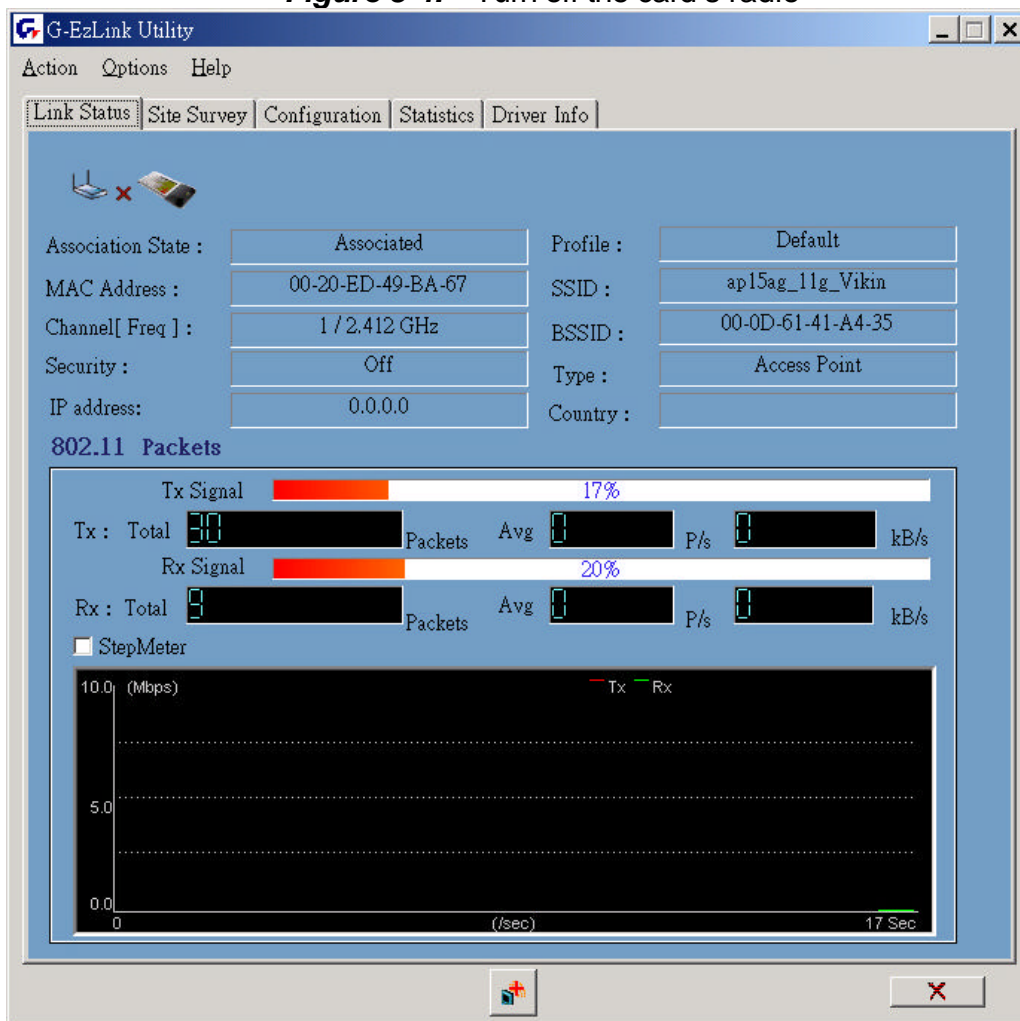


Figure 3-5 Disabled WLAN Card.



Figure 3-6 Enabled WLAN Card.



Other items reports the following information:

Association State: The field shows you if WLAN card is communicating with an access point or peer-to peer group. When the card's network mode is set to Ad Hoc, you can select a channel from the *AD Hoc channel* drop-down menu for your Ad Hoc group to use.

MAC Address: This card's physical address.

Channel [Freq]: The current channel and center frequency used by the WLAN card.

Security: The current security setting.

IP Address: WLAN Card IP Address.

Profile: various wireless settings for different environments.

SSID: Wireless network name. This is the wireless network name expressed as text string that all members within the same network share. Devices that don't share the same network name cannot communicate with each other.

BSSID: Basic service set identification.

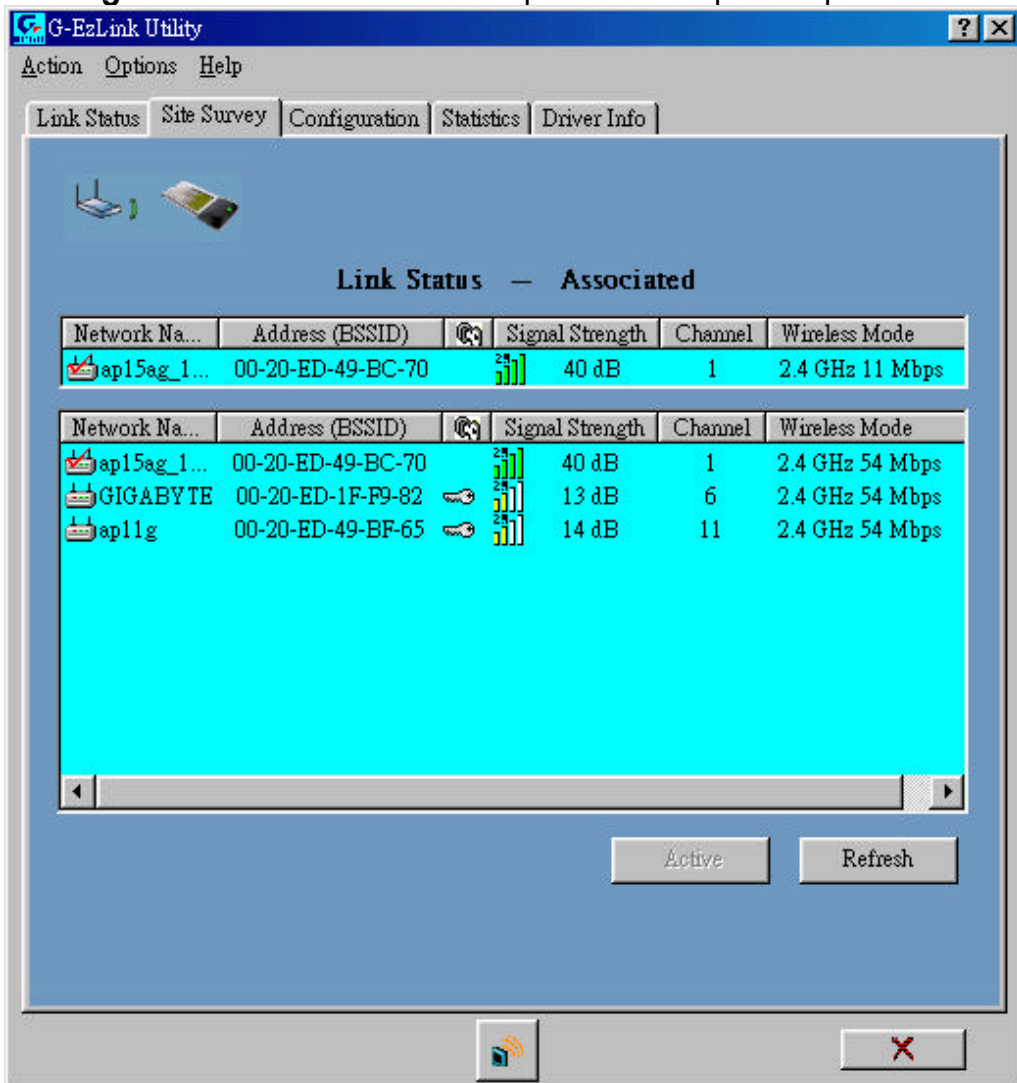
Type: The current network type.

Country: Domain .

3-2. Site Survey

The “Site Survey” tab shows you the list of reachable access points and/or peer-to-peer stations. In Fig 3-7, the card one 802.11b and three 802.11g wireless devices.



Figure 3-7. Reachable access points and/or peer-to-peer stations



Other items reports the following information:

SSID: Wireless network name.

BSSID: Basic service set identification.

 (Security):  (Encrypt data) or not

Signal Strength: It shows the received signal strength from the detected wireless device.

Channel: The current channel number used by the WLAN card.

Wireless Mode: 2.4GHz11Mbps(802.11b) or 2.4GHz54Mbps (802.11g) network.

Refresh: Rescan the available network and then refresh the result.

3-3. Configuration

The “**Configuration**” Tab contains several fields where operating parameters of the driver can be viewed or changed. Just click “**APPLY**” button, changes to any of the parameters in this panel can be applied to the driver without the need to reset the WLAN card. (see **Figure 3-8**)

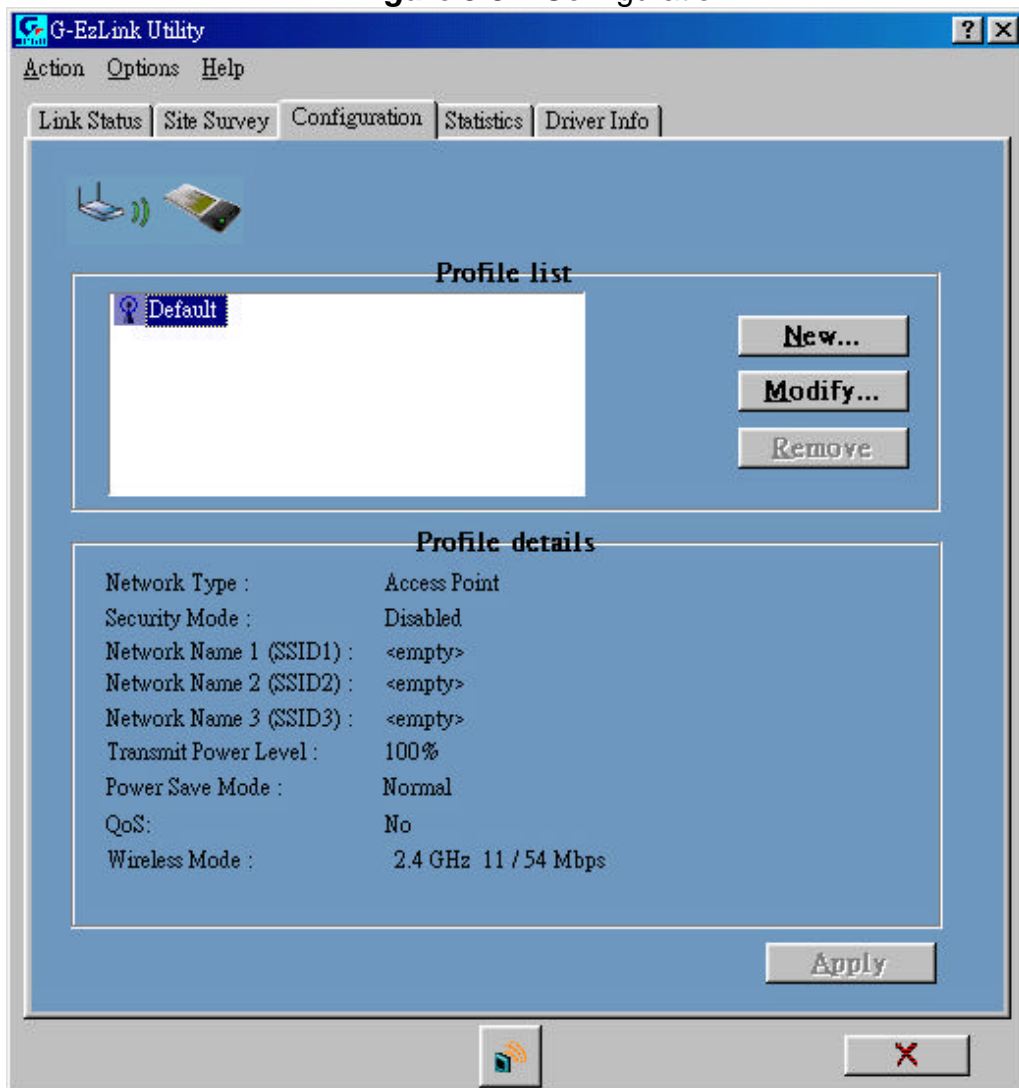
3-3-1. Basic setting:

Profile Name: You can save various wireless settings for different environments.

 : Use Profile,  : Available Profile.

Network Mode: This field allows you to select the mode from a list of supported network mode. The modes displayed have two values: “Ad Hoc” and “Access Point”.

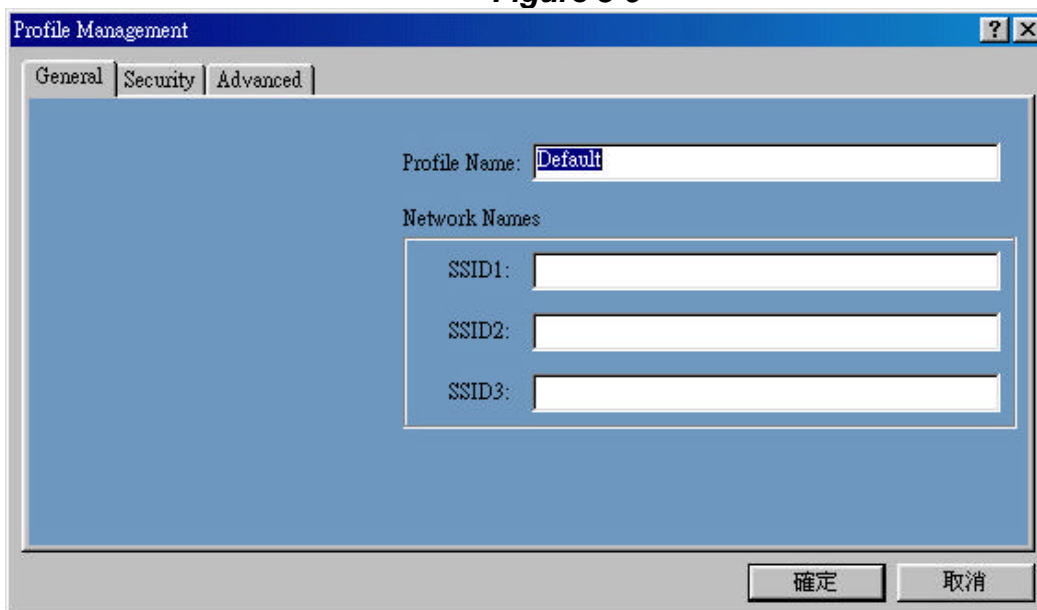
Figure 3-8. Configuration



3-3-2. Advance setting:

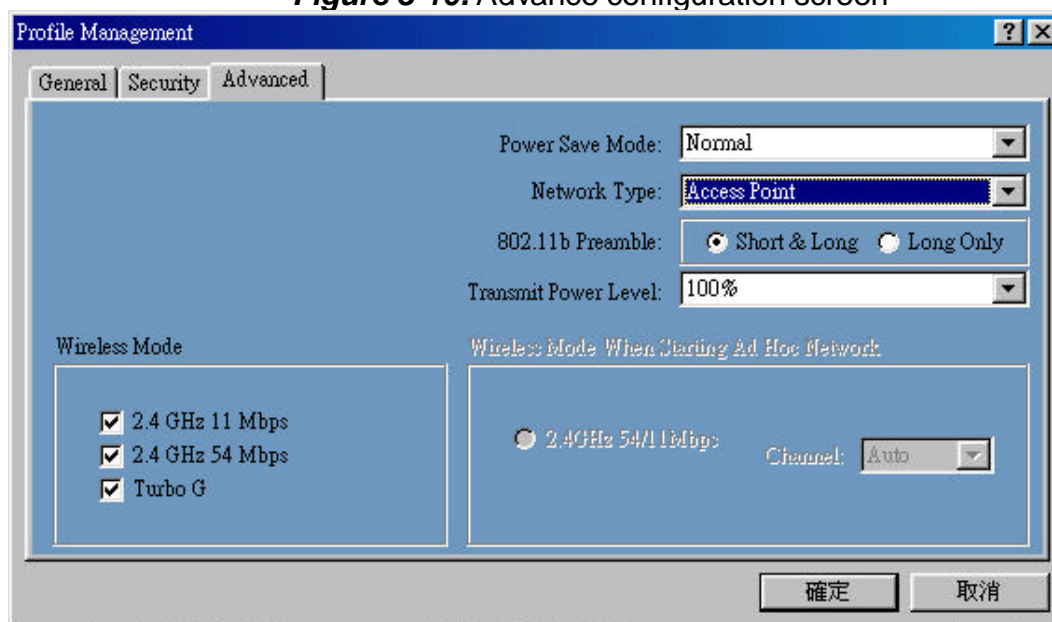
Click “**Modify**” button (see **Figure 3-9**)

Figure 3-9



Click “Advance” button to enter the advance configuration screen (see **Figure 3-10**).

Figure 3-10. Advance configuration screen



Power Saving: The card supports advanced power management to extend battery life.

- When set to “**off**”: the card does not use the power saving mechanism.
- When set to “**Normal**”: the card enters into sleep status when it is inactive and only wakes up periodically to receive some messages from the access point.
- When set to “**Maximum**”: This case is similar to “**Normal**”, but it draws less battery power as a result of less wake up frequently. This also leads to slower response to network request.

Wireless Mode: Specifies “**2.4GHz 11Mbps**”(802.11b) or “**2.4GHz 54Mbps**”(802.11g) operation. The WLAN card will automatically select the optimal mode from these selected wireless modes.

Wireless mode When Starting Ad Hoc Network: Specifies a band to establish an ad hoc network if no matching SSID is found after scanning all available modes. Here, you can select three different wireless modes (**802.11b**, **802.11g**) for the communication link.

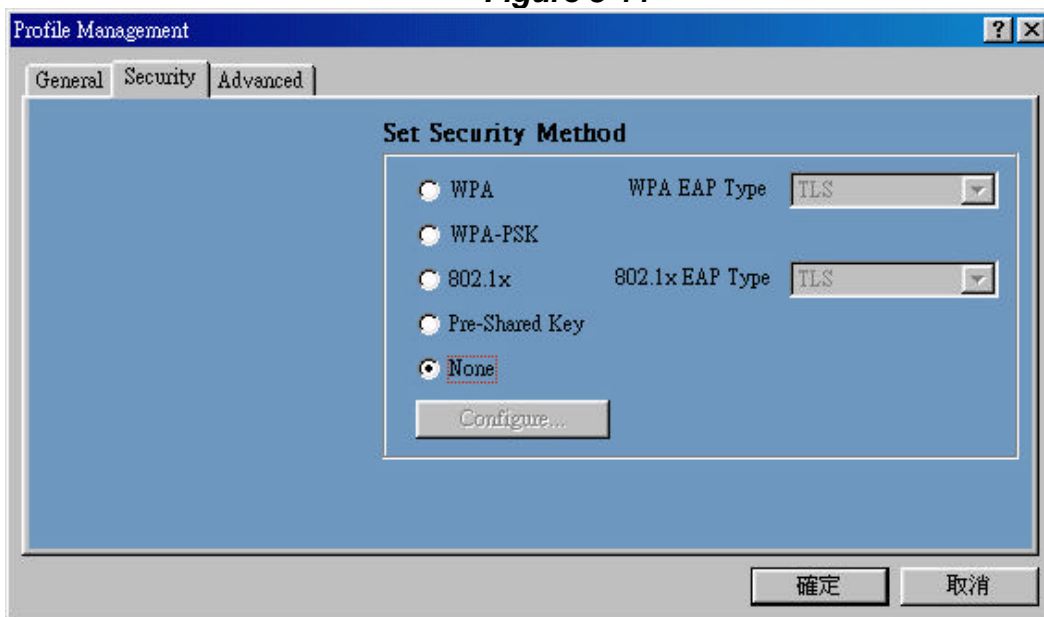
802.11b Preamble: Specifies “**Short & Long**”, or “**Long Only**” preamble. Allows ad hoc compatibility with other 2.4GHz devices.

Transmit Power Level: Select 100%, 50%, 25%, 12.5%, or lowest transmit power.

3-3-3. Security setting:

Click “**Modify**” and “**Security**” button (see **Figure 3-11**)

Figure 3-11



This card provides five security options: No security, WEP encryption, WPA-PSK, WPA security and 802.1x security architecture.

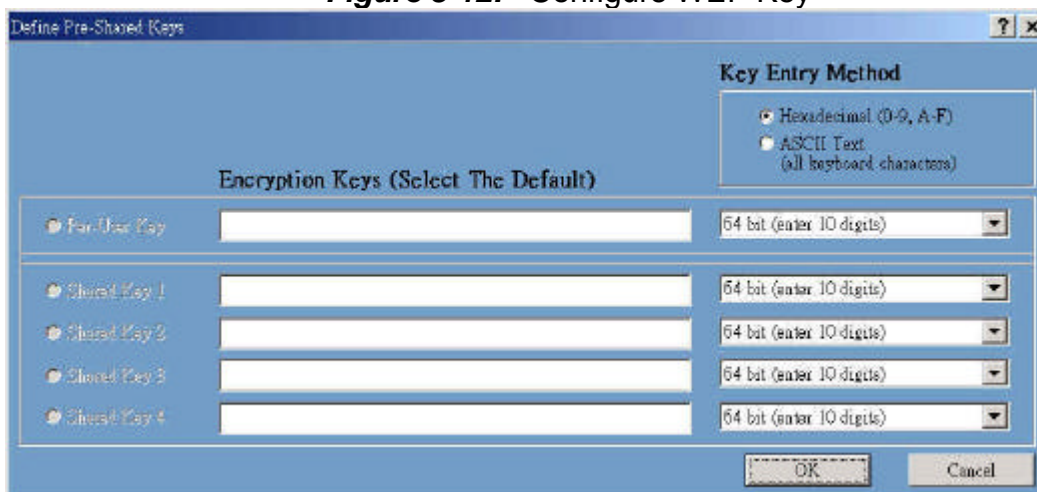
3-3-3-1. No security (None):

Allows the communication between the WLAN card and access point without data encryption.

3-3-3-2. Use WEP for authentication and encryption(Pre-Shared Keys):

To prevent unauthorized user to access the data on wireless stations, the WLAN Card offers a secure data encryption, known as WEP (Wired Equivalent Privacy). When you select this item, the target 802.11 device must has the same encryption keys and be configured to use encryption in order to communicate with each other. To configure your WEP encryption, please click “**Pre-Shared Keys**” then the following window will pop up (see **Figure 3-12**).

Figure 3-12. Configure WEP Key



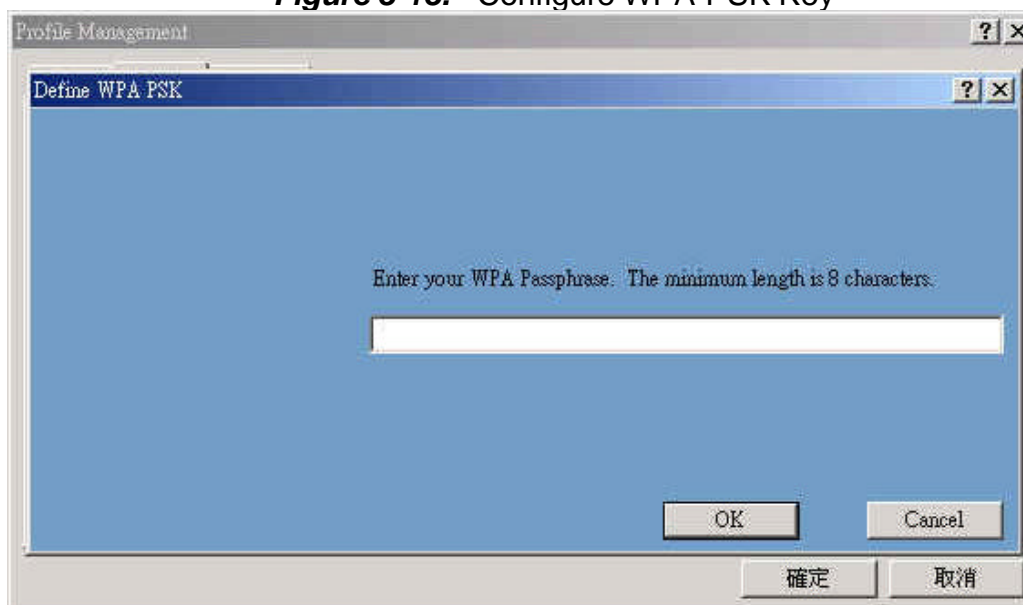
To configure your encryption key, please follow these steps:

1. Select a **Key Entry Method** (Hex or ASCII).
2. Enter one **unique** encryption key and its key length.
3. Enter one to four different **shared** keys and their individual key length.
 - For 64-bit encryption, enter 10 digitals by Hex or 5 characters by ASCII.
 - For 128-bit encryption, enter 26 digitals by Hex or 13 characters by ASCII.
 - For 152-bit encryption, enter 32 digitals by Hex or 16 characters by ASCII.
4. Select only a key to encrypt your transmission data.
5. Click “**OK**” to save these settings.

3-3-3-3. Use WPA-PSK Security (WPA Pre-Shared Keys):

When you select this item, the target 802.11 device must has the same encryption keys and be configured to use encryption in order to communicate with each other. To configure your **WPA-PSK** encryption, please click “**WPA-PSK**” then the following window will pop up (see **Figure 3-13**).

Figure 3-13. Configure WPA-PSK Key



3-3-3-4. Use Dynamic Security (WPA, 802.1X etc.):

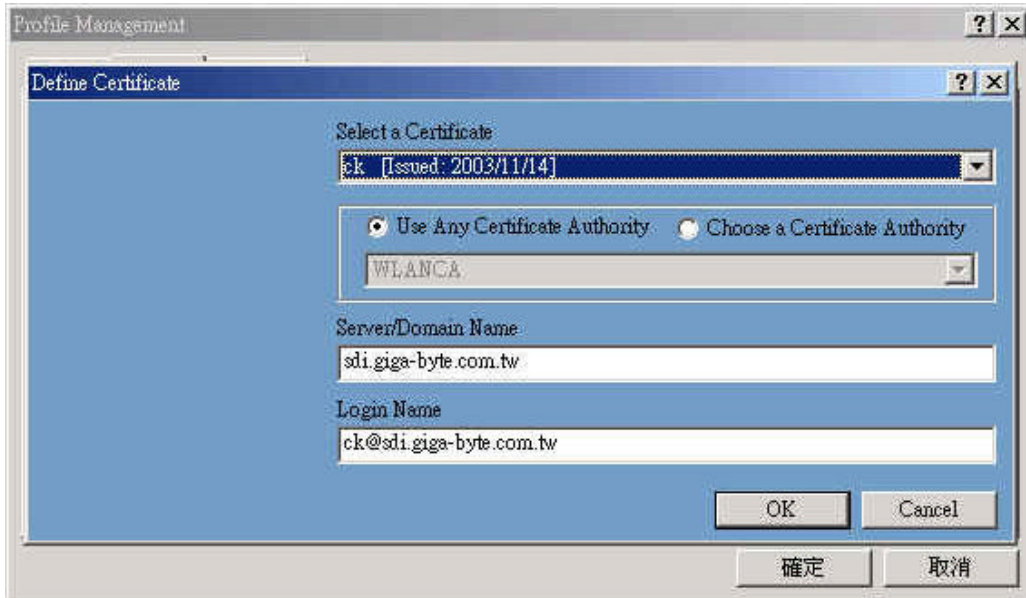
WPA & 802.1X is an IEEE security standard for network security access control. It is

used to control access to wired and wireless networks and dynamically provide keys for encryption. To use this function, an access point with its WPE or 802.1X function is required to act as an intermediary between WLAN card and the network's RADIUS (Remote Authentication Dial-In User Service) server. The access point blocks all traffic from the card until the server has authenticated it. please follow these steps:

Step 1: Download Certificate.

Step 2: please click "**WPA**" or "**802.1x**" then the following window will pop up (see **Figure 3-14**).

Figure 3-14. Configure WPA or 802.1X



Please follow these steps:

Step 1: Select a Certificate.

Step 2: Key-in Server(RADIUS).

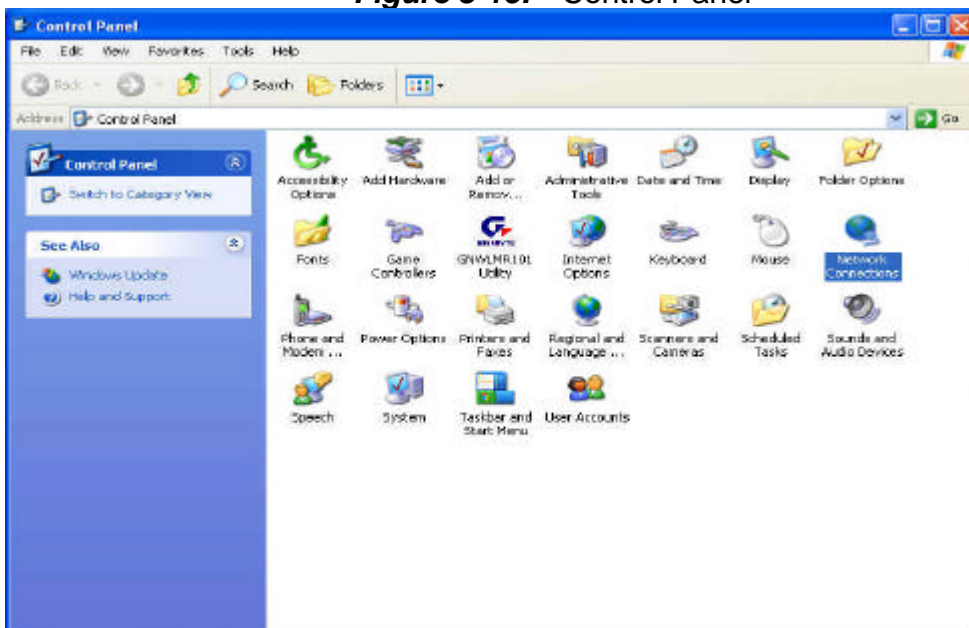
Step 3: Key-in Login name.

Step 4: Click "**OK**" to save these settings.

Microsoft Windows XP operation system, please follow these steps:

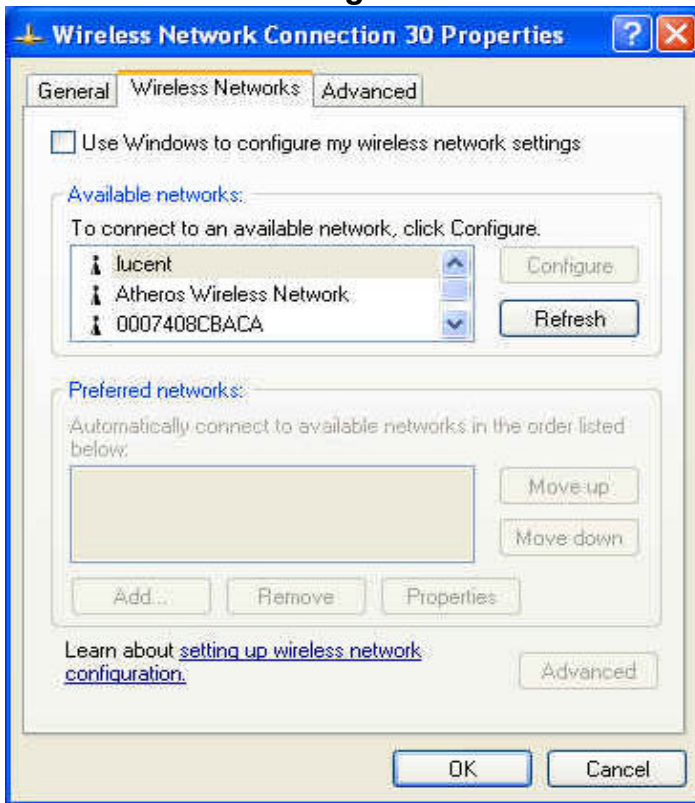
Step 1: 「**Control Panel**」 run 「**Network Connections**」 (see **Figure 3-15**).

Figure 3-15. Control Panel



Step 3: Setup Wireless LAN card(see *Figure 3-16*), Click "Use Windows to configure" to cancel the schedule and Click 「OK」 .

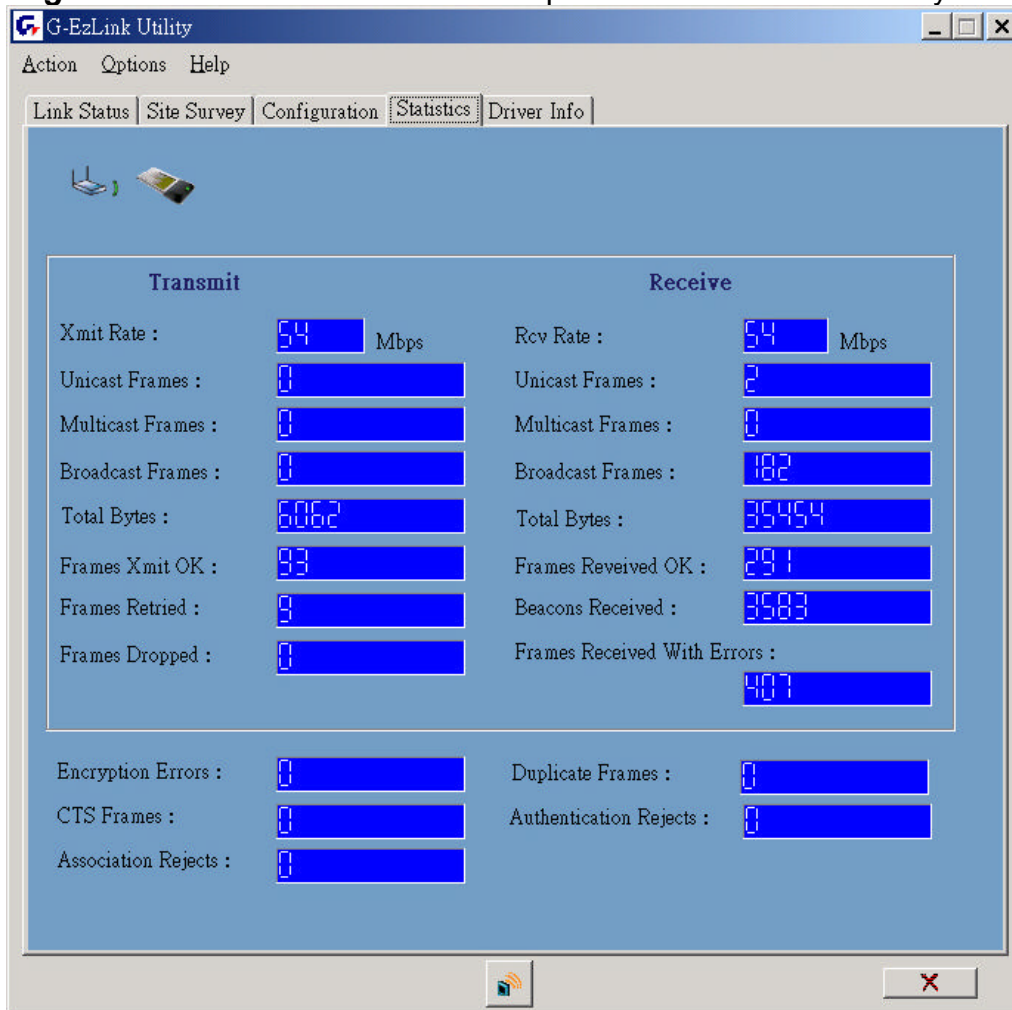
Figure 3-16. Wireless Networks



3-4. Statistics

The “Statistics” tab shows you the number of packets sent and received by the card(see **Figure 3-17**).

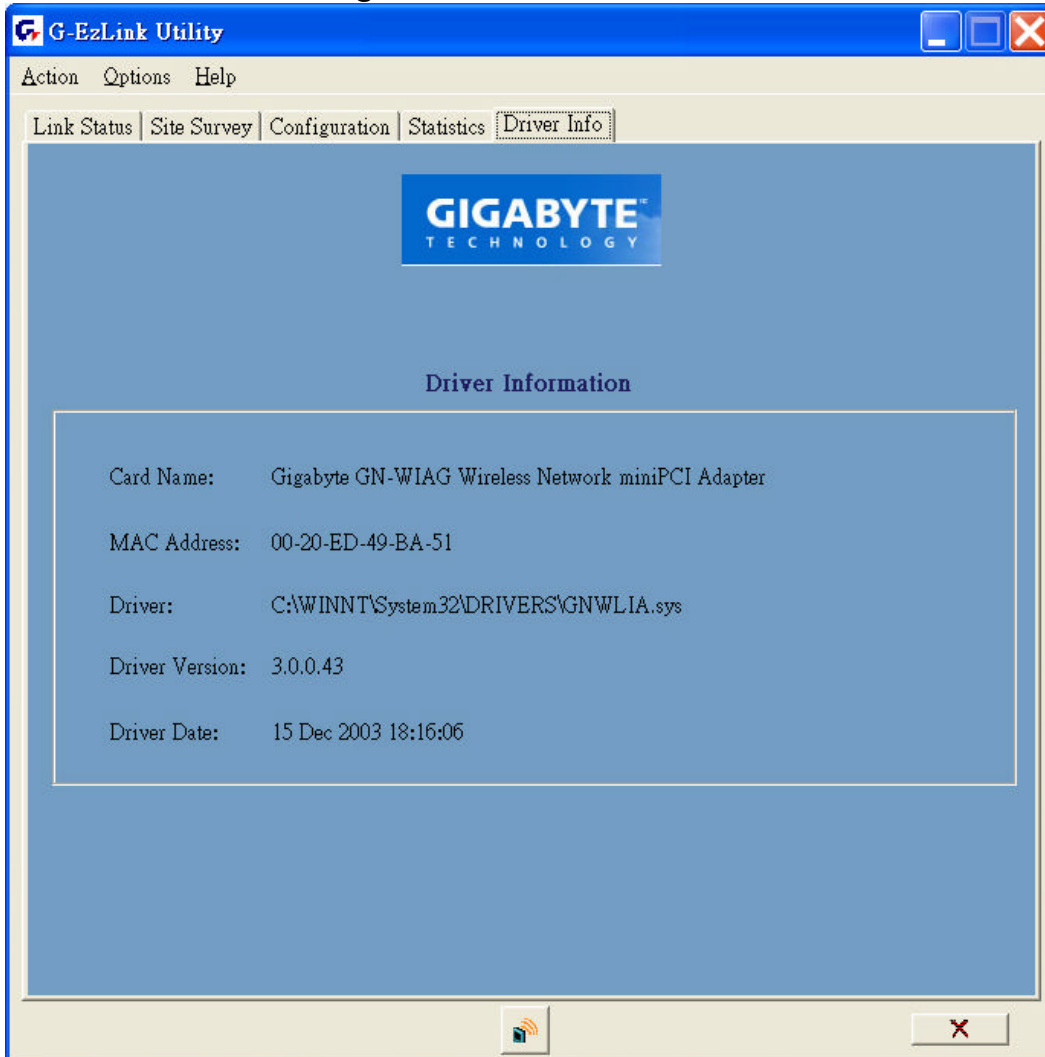
Figure 3-17. The statistic number of packets sent and received by the card



3-5. Driver Info

The “**Driver Info**” tab shows you the information of the card’s driver(see **Figure 3-18**).

Figure 3-18. Driver’s information



Chapter 4 Troubleshooting

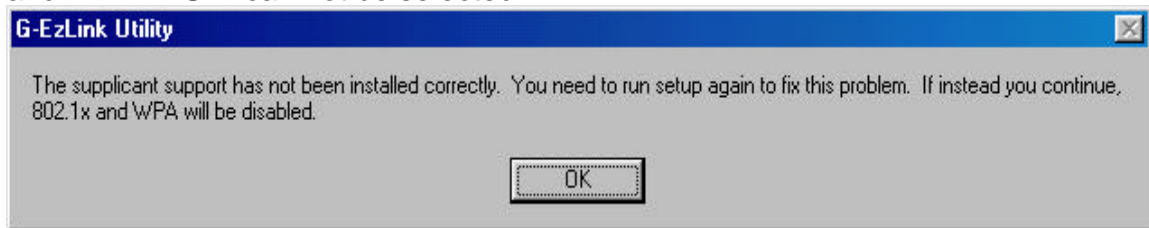
This troubleshooting guide provides answers to some common problems which you may encounter while installing or using GIGABYTE WLAN card products.

These problems requires simple troubleshooting that you can perform by yourself.

Contact the WLAN Technical Support if you encounter problems not mentioned in this section.

◆ You are “802.1x”, “WPA” and “WPA-PSK” can not be selected

- If the utility shows the following window and the security option “802.1x”, “WPA” and “WPA-PSK” can not be selected.



- Windows XP and Windows 2000:
 1. Insert the CD.
 2. Launch the program at \WPA\Win2kXP\AegisI5.exe
 3. Click Install
- Windows 98SE:
 1. Insert the CD.
 2. Launch the program at \WPA\win9x\AegisI2.exe
 3. Click Install
- Windows ME:
 1. Right click on “Network Place”
 2. Click “Add”
 3. Select “Protocol” and click “Add”
 4. Click “Have Disk”
 5. Select the directory \WPA\WPA_FIX_ME
 6. Reboot

◆ I cannot connect to an AP

- Check if the WLAN has the some Service Set Identifier (SSID) as that of The AP.
- Check if the WLAN card and the AP have the same Encryption. if WEP or WPA encryption is enabled, set the same WEP or WPA keys for the WLAN and AP.
- Check if the MAC address of the WLAN card is added in the AP Authorization Table. Inquire this with your LAN administrator.

◆ I can connect to an AP but I cannot connect to the internet

- Check if the WLAN card and the AP have the same Encryption. if WEP or WPA

- encryption is enabled, set the same WEP or WPA keys for the WLAN and AP.
- Make sure the network protocol parameters (IP address, subnet mask, gateway, and DNS) of your computer are correctly set.
- Check the proxy settings of the WEB browser.

◆ **I always have poor link quality and low signal**

- Keep the WLAN card away from microwave ovens and large metal objects to avoid radio interference.
- Shorten the distance between the WLAN card and the AP or station.

Chapter 5 Specification

System	
Host Interface	MiniPCI Type III B
Operating Voltage	3.3V
RF Performance	
2.11a	
Frequency Band	5150 ~ 5350, 5725-5850 MHz (subject to local regulation)
Modulation Technology	OFDM (Orthogonal Frequency Division Multiplexing)
Modulation Techniques	64QAM, 16QAM, QPSK, BPSK
Rate Rates	54, 48, 36, 24, 18, 12, 9 and 6Mbps, auto fallback Turbo mode: 108, 96, 72, 48, 36, 24, 18 and 12 Mbps
Typical Power Consumption	Doze: 25mA Receive: 295mA Transmit: 590mA
Peak Output Power	20dBm @ Nominal Temp Range
Minimum Receive Sensitivity	Minimum -66 dBm@54Mbps; typical -68dBm
2.11g (Backward Compatible to 802.11b)	
Frequency Bands	2412-2462 MHz (subject to local regulations)
Modulation Technology	OFDM and DSSS
Modulation Techniques	64QAM, 16QAM, QPSK, BPSK, CCK, DQPSK, DBPSK
Rate Rates	Base mode: 54, 48, 36, 24, 18,12, 9, 11, 6, 5.5, 2, and 1 Mbps, auto fallback Turbo mode: 108, 96, 72, 48, 36, 24, 18 and 12 Mbps auto fallback
Typical Power Consumption	Doze: 25mA Receive: 295mA Transmit: 530mA
Peak Output Power	21dBm @ Nominal Temp Range at antenna connector
Receive sensitivity	Minimum -69 dBm@54Mbps; typical -72dBm
Antenna connectors	Two antenna connectors for supporting antenna diversity
Safety Regulation and Operating Environment	
MC certification	FCC Part 15 (USA)
Temperature Range	Operating: 0 ~ 55 deg C, Storing: -20 ~ 65 deg C
Humidity	Max. 90% Non-condensing
Software Support	
Driver	Windows 98SE/Me/2000/XP
Security	AES; 802.1x client for Windows XP 64/128/152 bit WEP; LEAP
Quality of Service	802.11e draft supported
DFS (Dynamic Frequency Selection) PC (Transmit Power Control)	Supported
Roaming	Seamless roaming among 802.11a/b/g access points.
Management Utility	Monitors the network situation.
Mechanical	
Dimensions	59.7mm*44.6mm*3.5mm ±0.15mm
Weight	12.5 ± 1 g
Packaging	Packaging specially used by Gigabyte.

*This specification is subject to change without notice.