GIGABYTE
TECHNOLOGY

GN-WMKG

IEEE 802.11b/g CardBus 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.

FCC Caution: 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.
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. End users must follow the specific operating instructions for satisfying RF exposure compliance.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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Chapter 1 Product Overview

1-1. Introduction

This 802.11b/g Wireless Local Area Network (WLAN) card is composed of the MAC, Baseband, and radio components, CARDBUS interface, and two built-in antennas. It operates in 2.4GHz frequency bands, providing fast (up to 54Mbps) and secure (support AES, 802.1x & WEP and WAP) connections to 802.11b and 802.11g networks from a single card.
This product features the compact size, low power consumption, and power management functions, and provides a high-speed wireless data communication. Therefore, this product is ideally suitable for being integrated into the personal mobile and handheld platform.

1-2. Features

- Conforms to 802.11b/802.11g specification.
- Transmits data rate up to the maximum speed of 54Mbps.
- Dynamically scales the data rate.
- Automatic power management to reduce battery consumption.
- Built-in diversity antenna.
- Seamless roaming between 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), and WPA (Wi-Fi Protected Access)..
- Driver supports Windows 98SE/Me/2000/XP.

1-3. Physical Dimensions/Packaging

Dimensions: 120mm* 54mm* 6mm

Before the installation procedures, please ensure the components are not damaged during the shipping. The shipment of the GN-WMAG includes:

One GN-WMKG Wireless LAN Card
One Installation CD (including User's Guide and Driver)
One User Guide

Please contact your local distributor or authorized reseller immediately for any missing or damaged components. If you require returning the damaged product, you must pack it in the original packing material or the warranty will be voided.

1-4. LED Indicating Light

Power	OFF	ON	ON
Link		ON	Blink
Meaning	No power applied to card	Looking for network association	the card has an active connection

LED Blinking	● ○ GIGABYTE	○ ● GIGABYTE
Condition of the Receiver	**Link**	**Power**

1-5. System Requirements

1-5-1. Supported Platform:

IBM PC/AT compatible computer

1-5-2. Supported Operation System:

Windows 98SE/Me/2000/XP

Chapter 2 Installing the WLAN Card

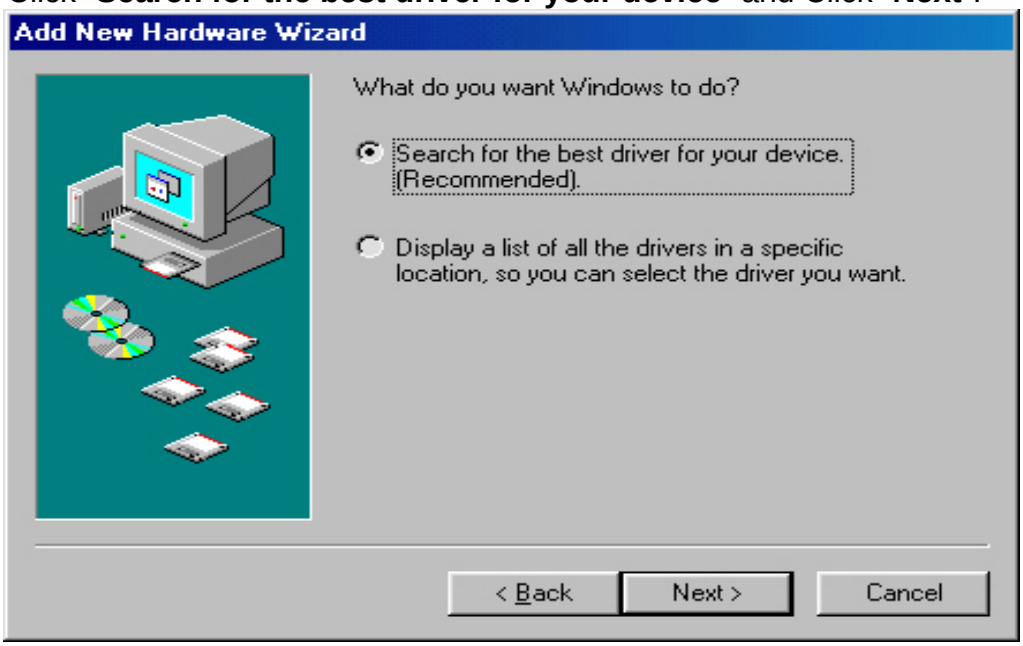
2-1. Installing The Driver & Utility (Win 98SE/ME)

Step 1: Insert our setup CD into your CDROM drive, the following window will pop up.

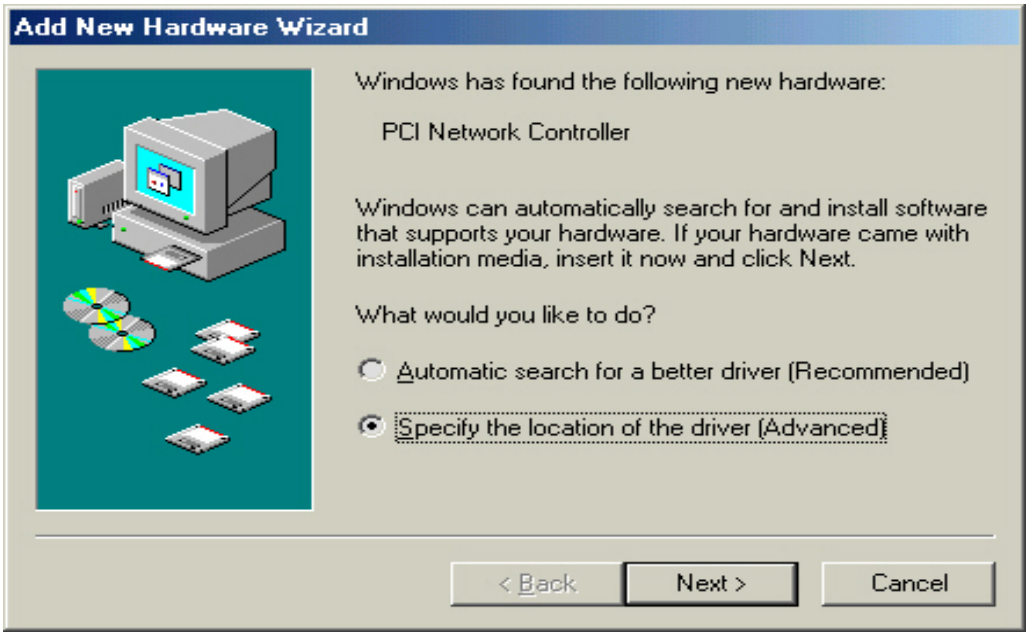
Step 2: Please plug-in your “Gigabyte” WLAN card device.

Step 3: Click “**Next**”.

Step 4: Click “**Search for the best driver for your device**” and Click “**Next**”.



Win 98 ES



Win ME

Step 5: Click "**Specify a location**", Click "**CD-ROM:\Driver\win9xme**"and Click "**Next**".

Win 98 ES

Win ME

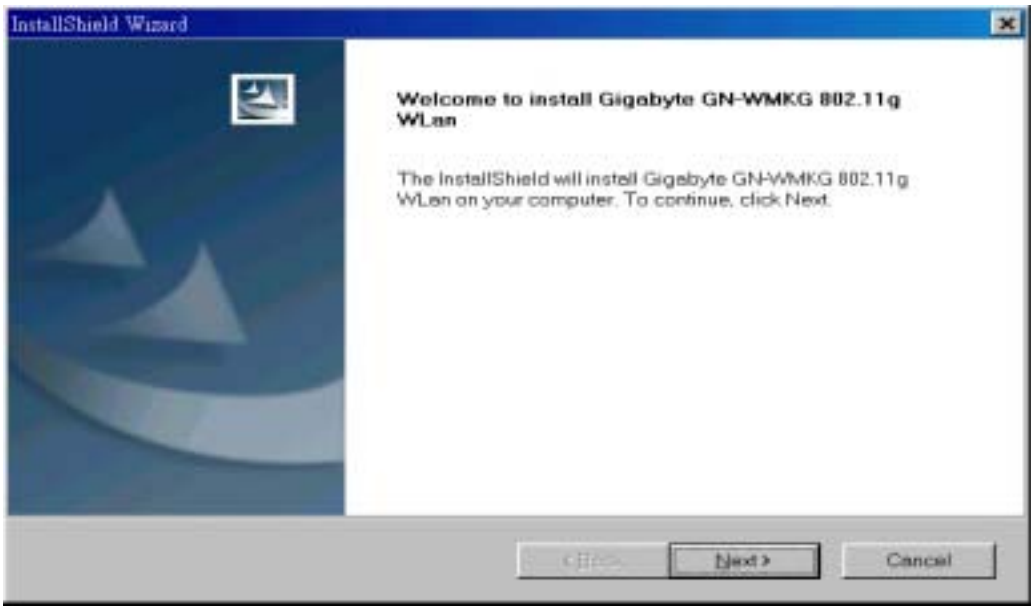
Step 6: Click "**Next**".

Step 7: Click "**Finish**".

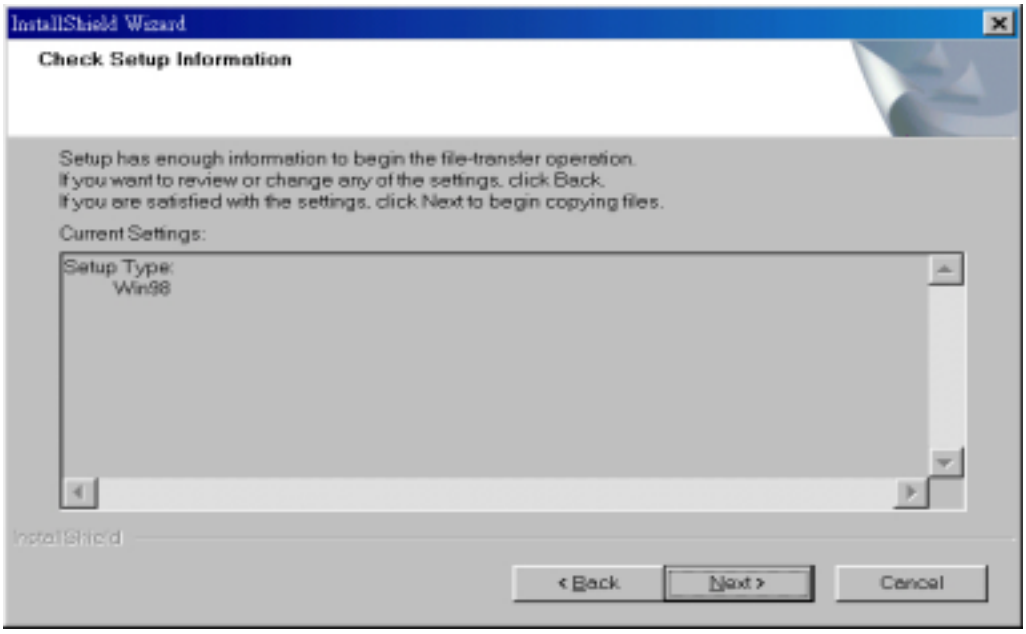
Step 8: Click "**No**".

Step 9: Click "**Install Wireless LAN Driver**".

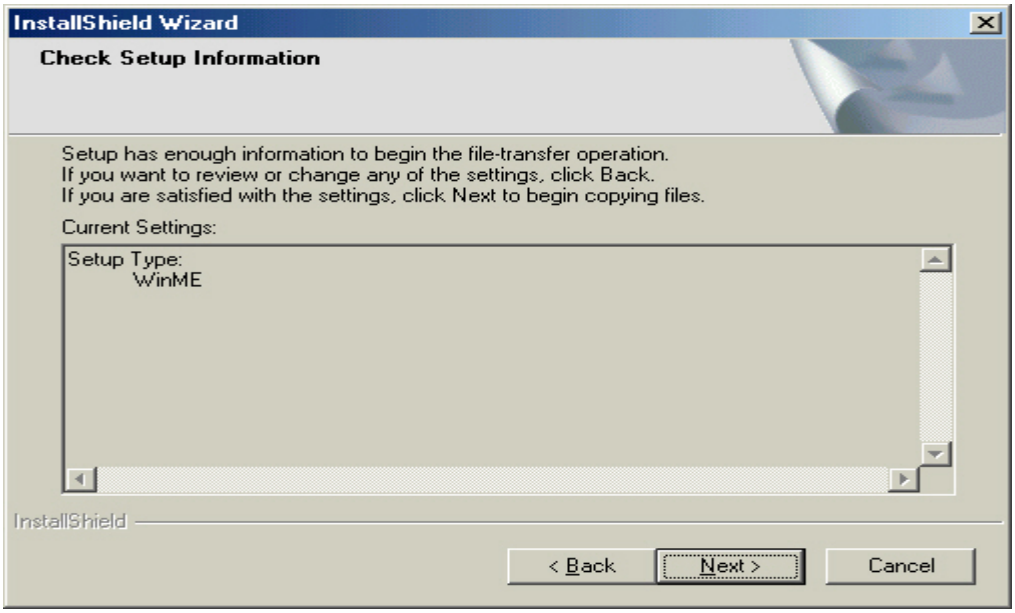
Step 10: Click "**Next**".



Step 11: Click "**Next**".

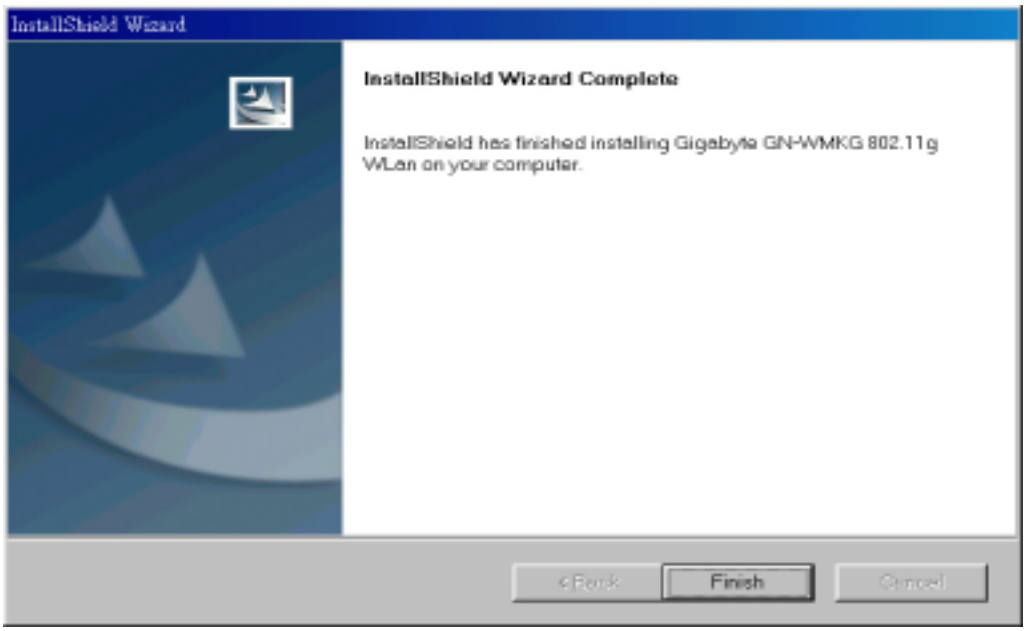


Win 98 ES



Win ME

Step 12: Click "**Finish**".



2-2. Installing The Driver & Utility (Win 2000/XP)

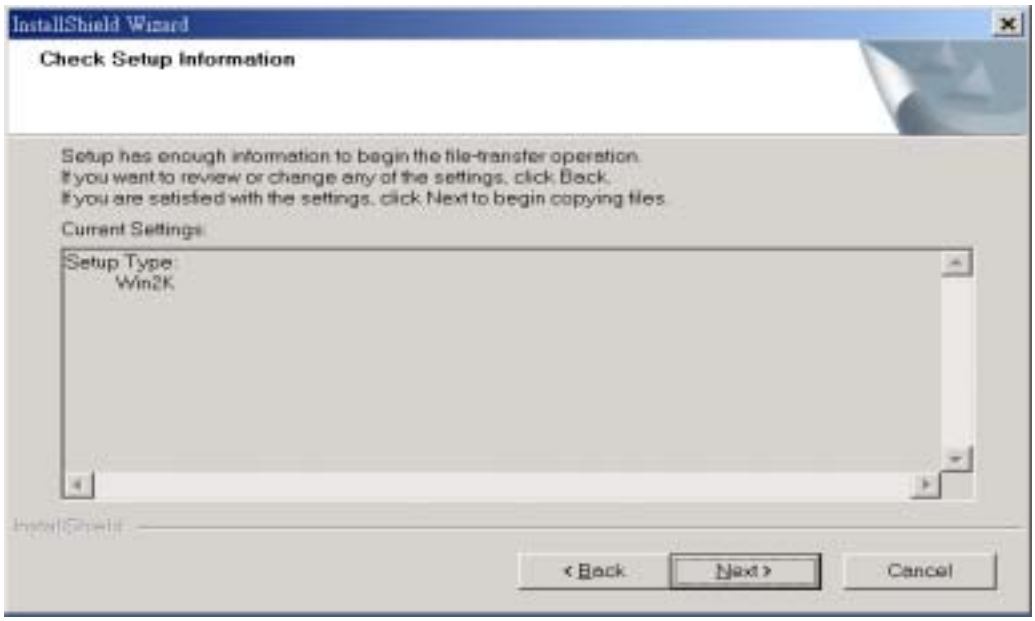
Step 1: Please make sure that you don't plug your card yet.

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

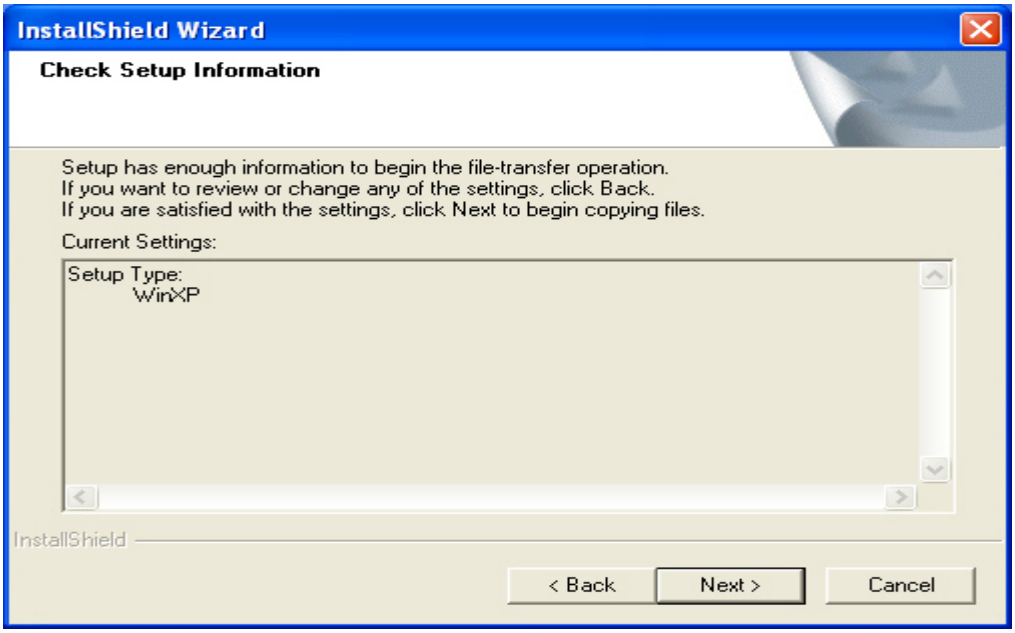
Step 3: Click "**Install Wireless LAN Driver**".

Step 4: Click "**Next**".

Step 5: Click "**Next**".



Win 2000



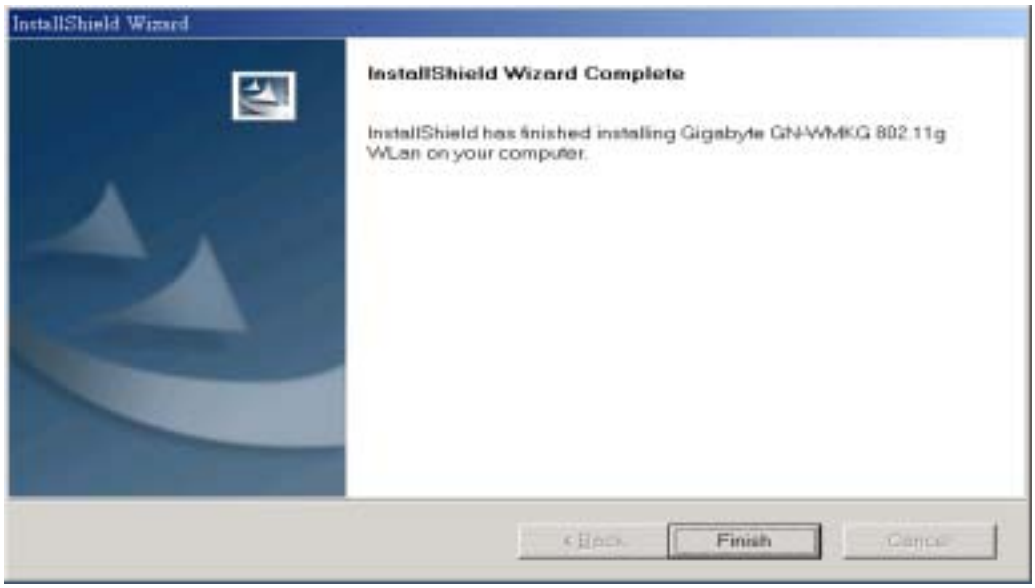
Win XP

Step 6: Click "**Yes**" (Win 2000).

Win 2K

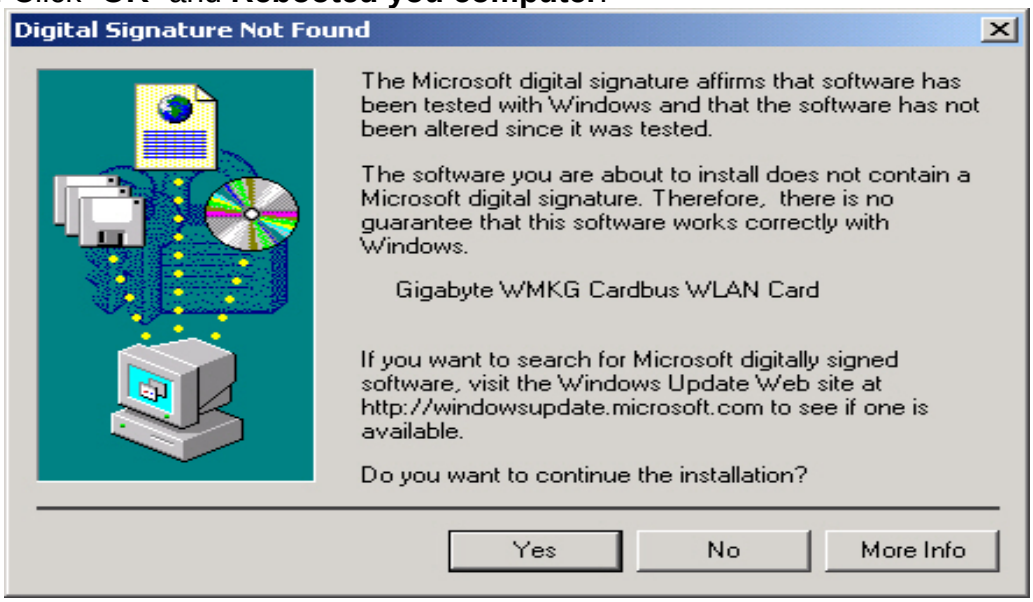
Win XP

Step 7: Click “**Finish**”.



Step 8: Please plug-in your “Gigabyte” WLAN card device.

Step 9: Click “**OK**” and **Rebooted you computer**.



Win 2K

Win XP

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.

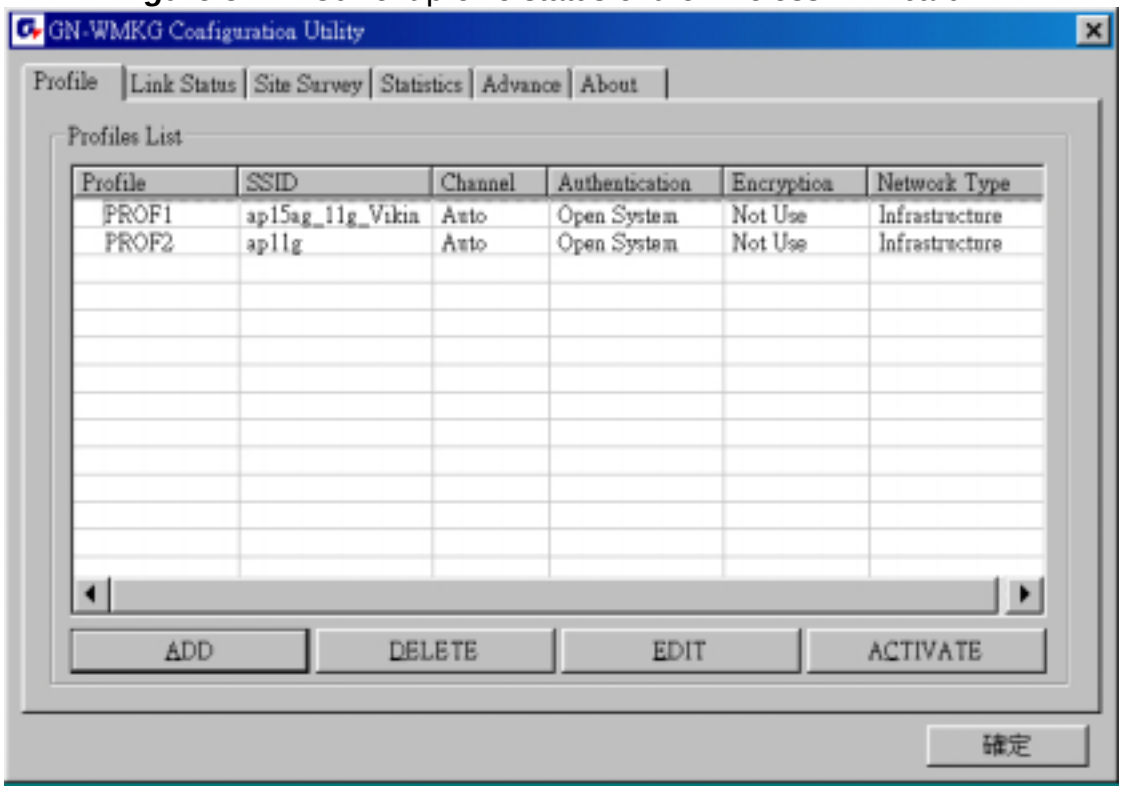
Figure 3-1. The icon of the Configuration & Monitor Utility

You can open the utility by double-clicking on this icon. Or through 「**Start**」\「**Programs**」\「**GIGABYTE GN-WMKG**」\「**GN-WMKG Utility**」

3-1. Profile

The "**Profile**" tab shows you the current association information about the card's connection with a wireless network. (*see* ***Figure 3-2***).

Figure 3-2. Current profile status of the wireless LAN card



Other items reports the following information:

Profile Name: You can save various wireless settings for different environments.
: Use Profile, **:** Available Profile.

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.

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

Authentication: Use Open System(No WEP key) or Shared Key(WEP key) to authenticate the peer side when association was initiated.

Encryption: The current Encryption setting (No security, WEP encryption, WPA-PSK),.

Network Type: Set the station operation mode to "802.11 Ad Hoc" for network configurations that do not have an access point, or to "Infrastructure" for configurations with an access point.

ADD: You can set up a new file by clicking "ADD".

DELETE: Click "Delete" if you wish to delete the selected profile.

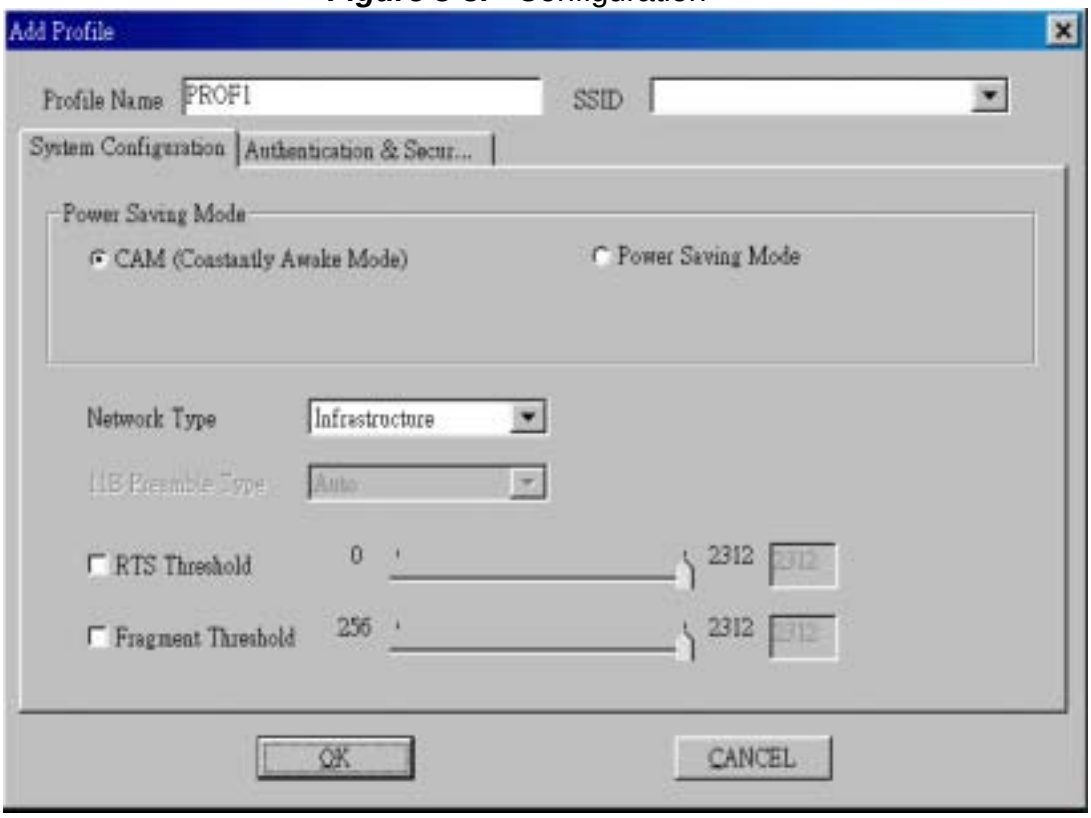
EDIT: You can specify a profile name to modify all parameters.

ACTIVATE: To activate the profile with which the Access point or station you want to associate. The activated profile is the default profile this WLAN card firstly applies to when this utility program starts running.

3-1-1. Basic setting:

System Configuration: One of the settings in the Profile Page; this settings includes Power Saving Mode selection, Antenna Diversity, Network Type, RTS Threshold, and Fragment Threshold, etc. **(*see* *Figure 3-3*)**

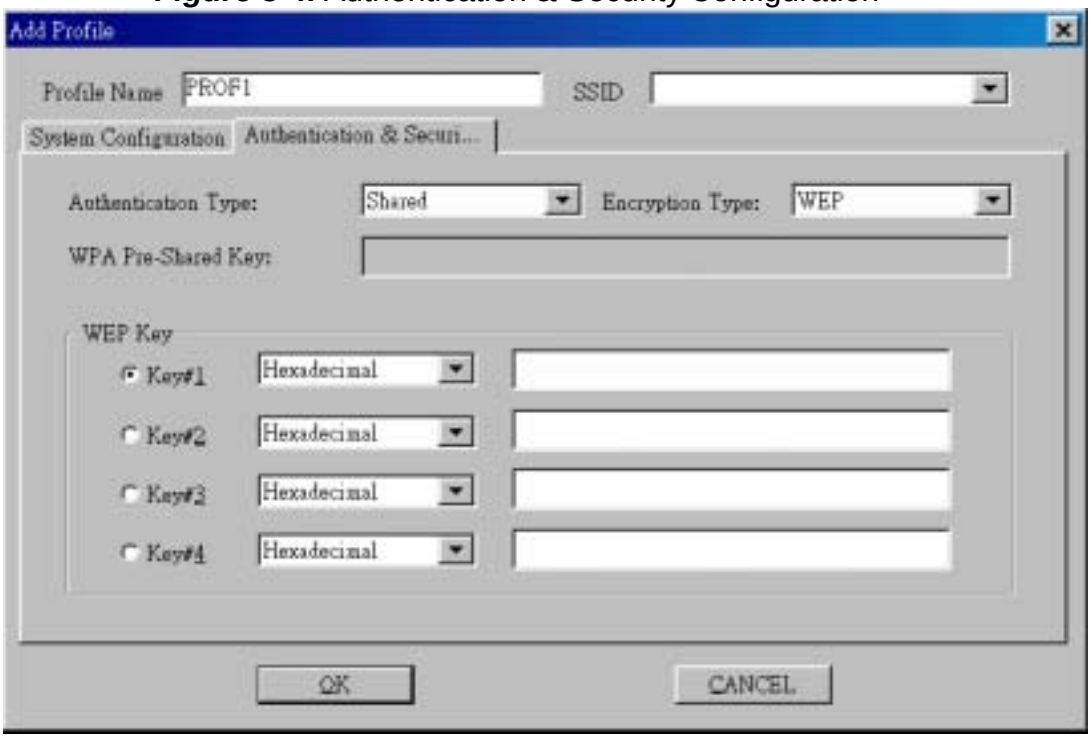
Figure 3-3. Configuration



3-1-2. Authentication & Security setting:

Authentication & Security: One of the settings in the Profile Page; this settings includes Authentication type selection, Encryption key input type & length of the encrypted/decrypted payload information, and WEP key index selection. **(*see* *Figure 3-4*)**

Figure 3-4. Authentication & Security Configuration



This card provides Three security options: No security, WEP encryption, WPA-PSK security architecture.

3-1-2-1. No security (None):

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

3-1-2-2. Use WEP for authentication and encryption:

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 "**Encryption Type** "then the following window will pop up (***see*** *Figure 3-4**)***.

To configure your encryption key, please follow these steps:

1. Select a **Key Entry Method** (Hexadecimal 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.

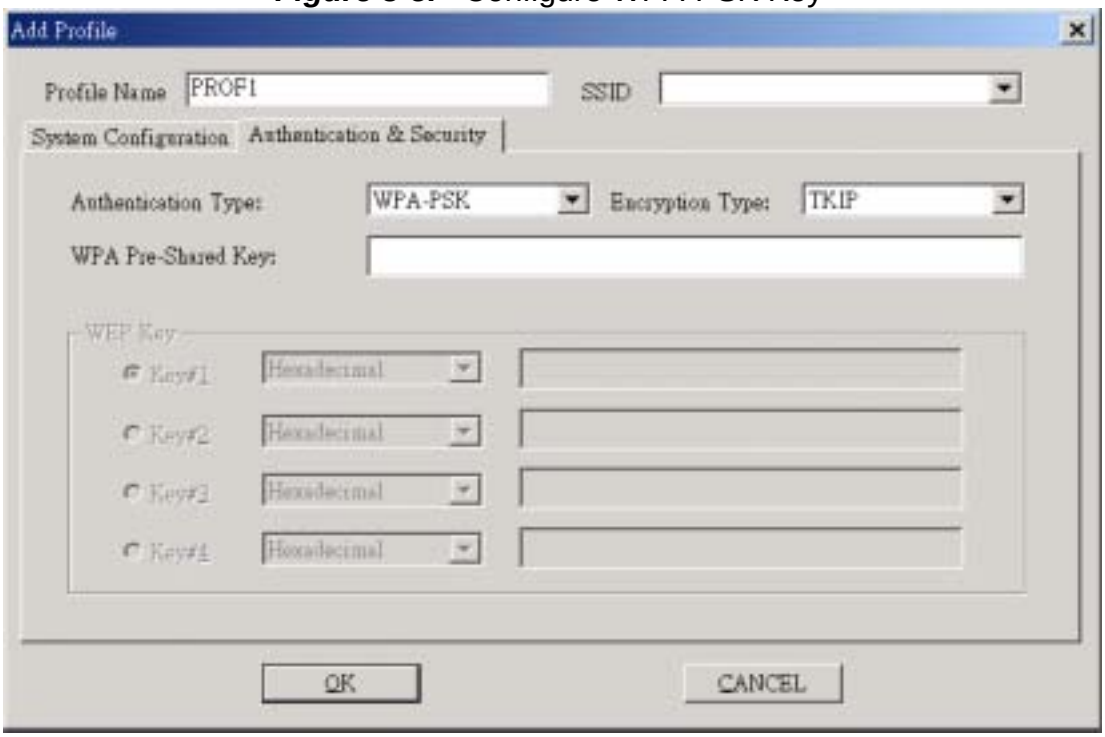
- For 64-bit encryption, enter 10 digitals by Hex or 5 characters by ASCII.
- For 128-bit encryption, enter 26 digitals by Hex or 13 characters by ASCII.

4. Select only a key to encrypt your transmission data.
5. Click "**OK**" to save these settings.

3-1-2-3. 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 "***Authentication*** "then the following window will pop up (***see*** *Figure 3-5**)***.

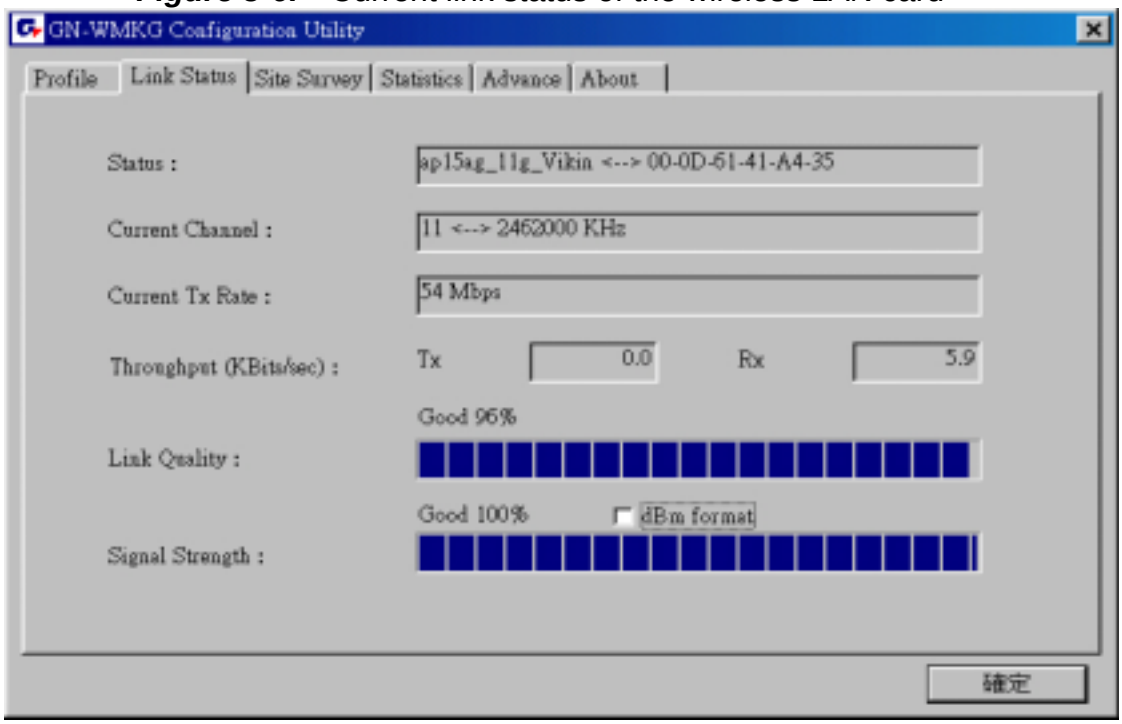
Figure 3-5. Configure WPA-PSK Key



3-2. 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 Link Quality and Signal Strength for this card (***see*** *Figure 3-6**)***.

Figure 3-6. Current link status of the wireless LAN card



Other items reports the following information:

Throughput: Display current total number of Tx/Rx packets in KBits/sec.

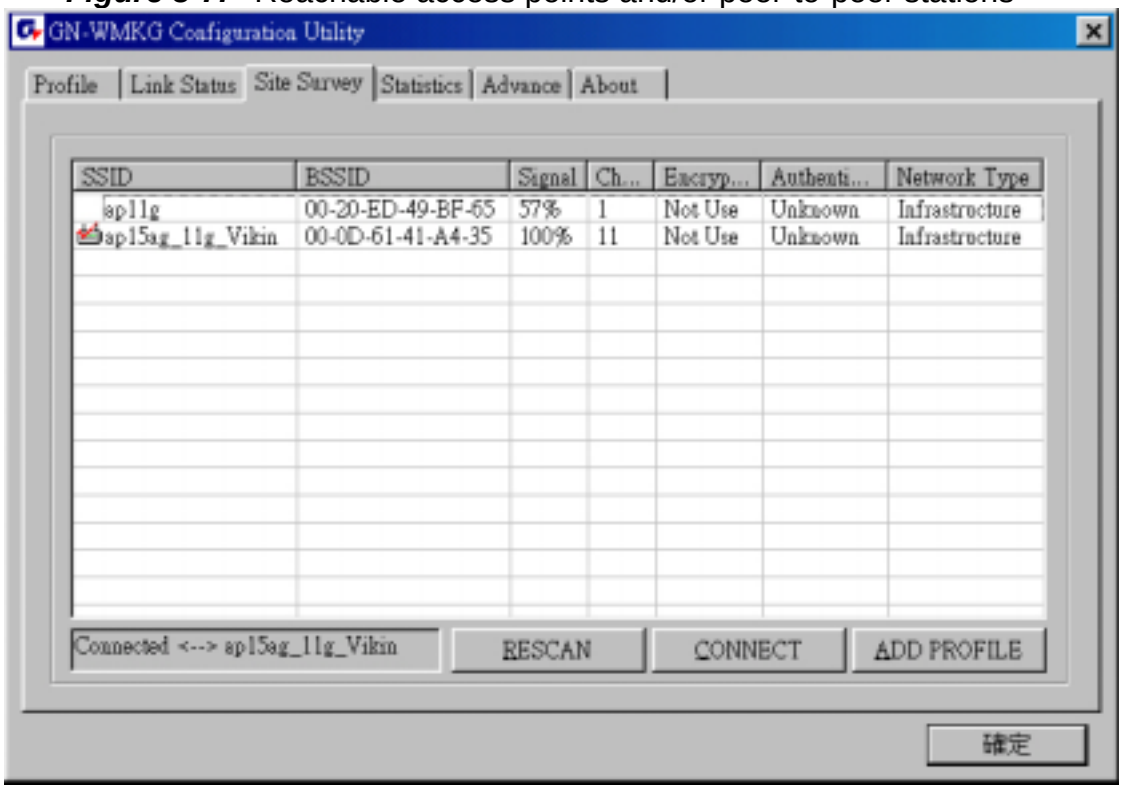
Link Quality: The percentage of the radio link quality while communicates with the associated Access Point or peer station.

Signal Strength: The percentage of the signal strength while communicates with the associated Access Point or peer station.

3-3. Site Survey

The "**Site Survey**" tab shows you the list of reachable access points and/or peer-to-peer stations (*see* ***Figure 3-7***).
You can select one of them to connect to by double-clicking or pushing "**CONNECT**" button on an entry.

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.

Signal: Signal strength detected in the station site for each Access Point or peer station.

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

Authentication: The current Authentication setting.

Encryption: The current Encryption setting.

Network Type: The current network type.

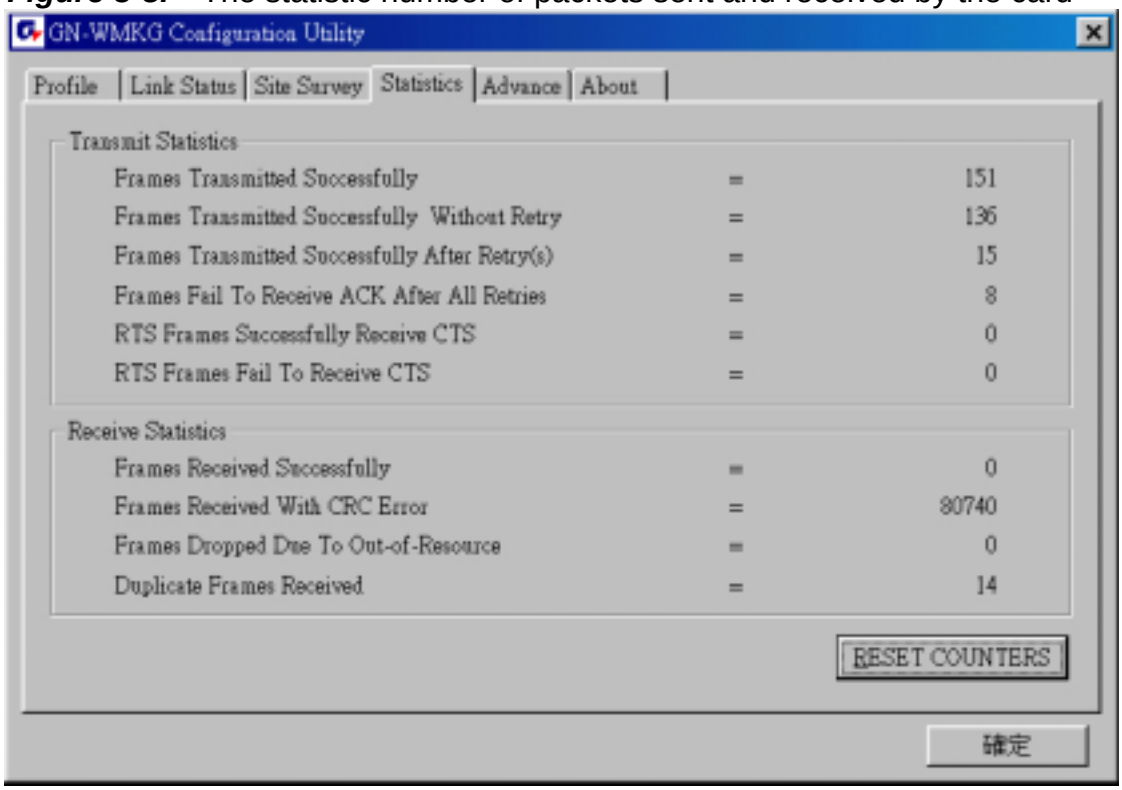
Rescan: Rescan the available network and then refresh the result.

Add to Profile: Add the selected entry and save into Profile Page.

3-4. Statistics

The "**Statistics**" tab shows you the number of packets sent and received by the card(*see* ***Figure 3-8***).

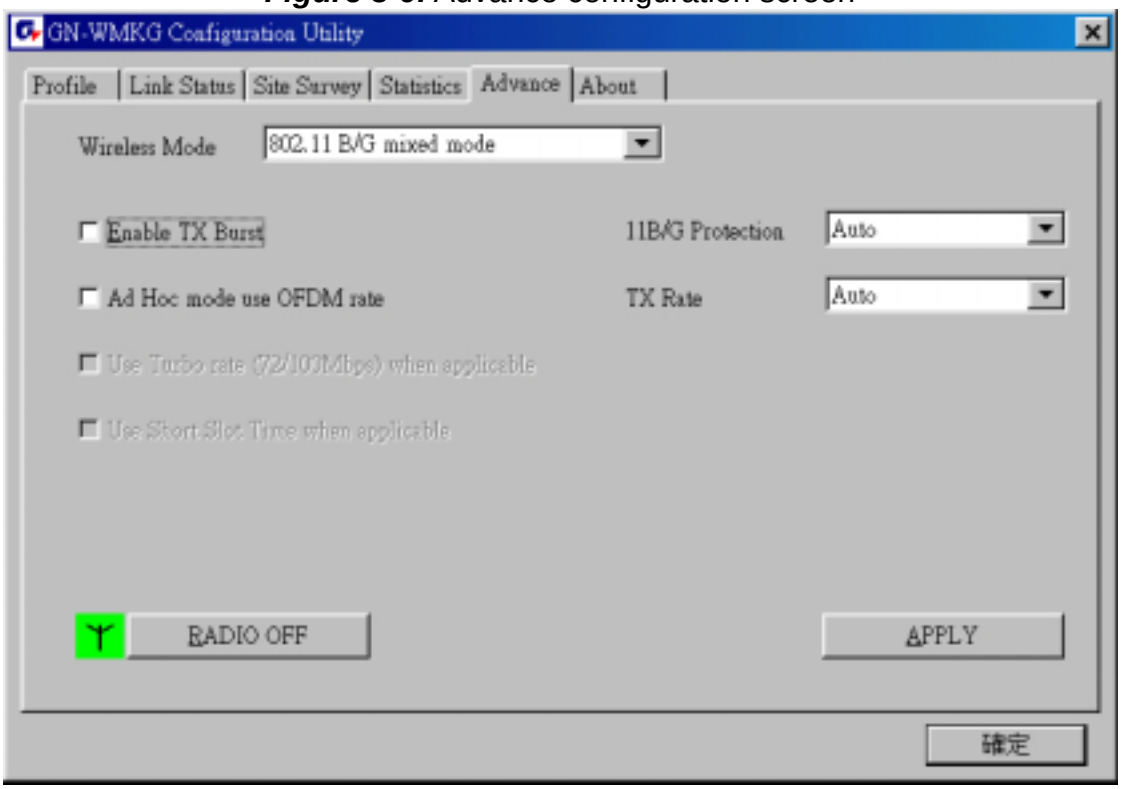
Figure 3-8. The statistic number of packets sent and received by the card



3-5. Advance

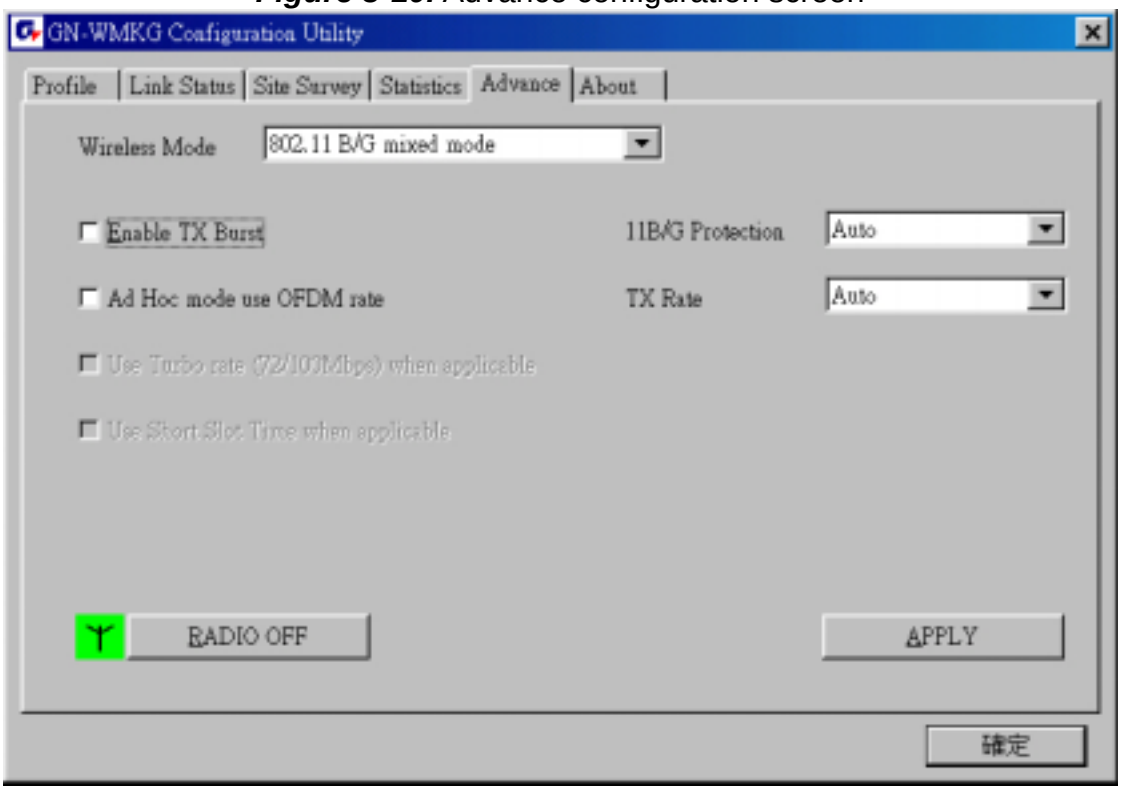
The "**Advance**" Tab contains several fields where operating parameters of the driver can be viewed or changed. Just click "**APPLY**" button, changes to any of the parameters in this panel can be applied to the driver without the need to reset the WLAN card. (*see* ***Figure 3-9***).

Figure 3-9. Advance configuration screen



If you want to turn off the card's radio, click 「**RADIO OFF**」of the screen, (*see* **Fig 3-10)** Just click it「**RADIO ON**」 again to turn on the radio. (*see* ***Figure 3-9***).

Figure 3-10. Advance configuration screen



Wireless Mode: Wireless Mode: Select wireless mode. 802.11b only and 802.11 b/g mixed mode are supported.

Enable TX Burst: Ralink's proprietary frame burst mode.

Ad Hoc Mode use OFDM rate: you can select OFDM wireless modes for the “Ad Hoc Mode” communication link.

11B/G Protection: ERP protection mode of 802.11G definition. User can chosse from Auto, On, and Off.

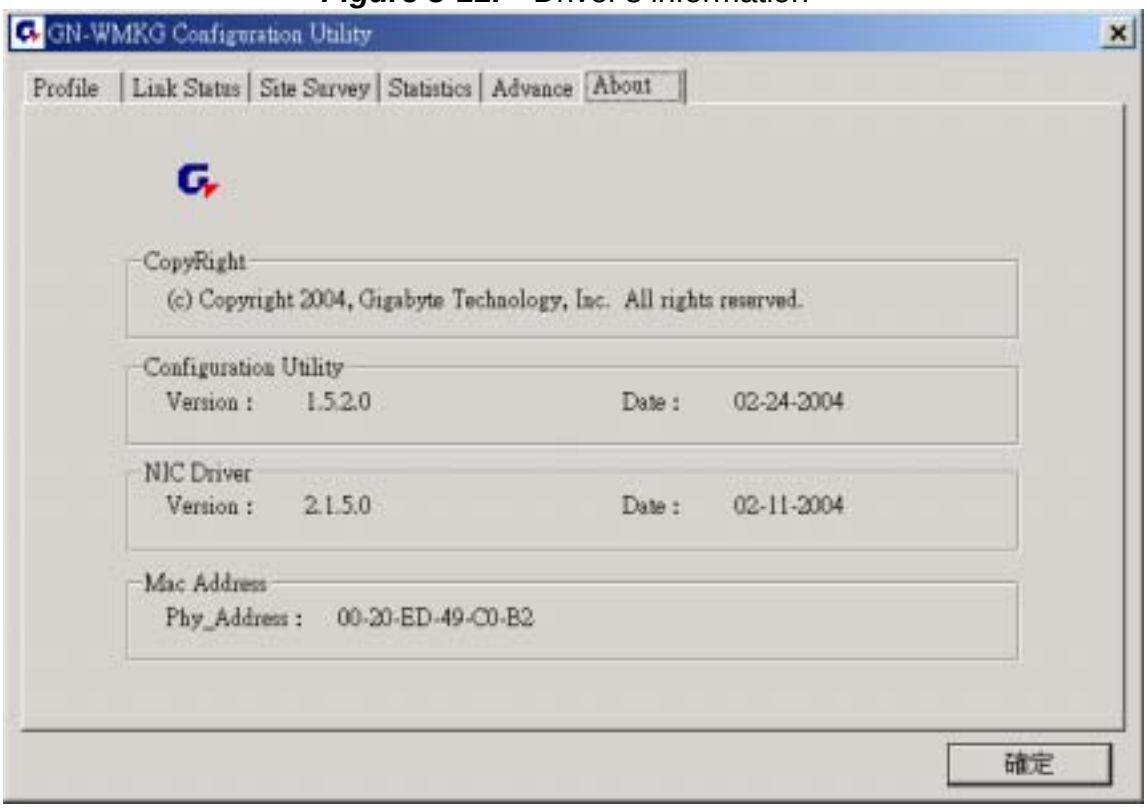
1. Auto: STA will dynamically change as AP announcement.
2. On: Always send frame with protection.
3. Off: Always send frame without protection.

TX Rate: Manually force the Transmit using selected rate. Default is auto.

3-6. About

The “**About**” tab shows you the information of the card’s driver(*see* ***Figure 3-11***).

Figure 3-11. 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.

◆ 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

1. System		
Host Interface	CARDBUS (32-bit) card Type II	
Operating Voltage	3.3VDC ± 5%	
2. RF Performance		
802.11g(BACKWARD COMPATIBLE TO 802.11b)		
Frequency Bands	2412-2484 MHz (subject to local regulations)	
Modulation Technology	OFDM and DSSS	
Modulation Techniques	64QAM, 16QAM, QPSK, BPSK, CCK, DQPSK, DBPSK	
Date Rates	54, 48, 36, 18,12, 9, 11, 6, 5.5, 2, and 1 Mbps, auto fallback	
Typical Power Consumption	Receive: 240 mA Transmit: 400 mA	
Peak Output Power	20 dBm @ Nominal Temp Range	
Receive sensitivity	-68dBm @54Mbps; -85dBm@11Mbps	
Antenna	Two Printed antennas for supporting antenna diversity	
3.Safety Regulation and Operating Environment		
EMC certification	FCC Part 15 (USA)	DGT (Taiwan)
	CE (Europe)	
Temperature Range	Operating: 0 ~ 55 deg C, Storing: -20 ~ 65 deg C	
Humidity	Max. 90% Non-condensing	
4. Software Support		
Driver	Windows 98SE/Me/2000/XP	
Security	WPA-PSK(TKIP,AES); 802.1X client for Windows XP ,64/128 bit WEP	
Roaming	Seamless roaming among 802.11b/g access points.	
Management Utility	Monitors the network situation.	
5. Mechanical		
Dimensions	120 x 54 x 6 mm	
Weight	40± 1 g	
Packaging	Packaging specially used by Gigabyte.	
LED indicators	Link, Power	

Subject to Change without Notices