GN-WMAG

IEEE 802.11b/g Dual-Mode 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.

Contents

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 108Mbps) 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 108Mbps.
- 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/152-bit), and WPA (Wi-Fi Protected Access)..
- Driver supports Windows 98SE/Me/2000/XP.

1-3. Physical Dimensions

Dimensions: 120mm* 54mm* 7mm

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

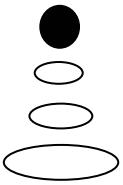
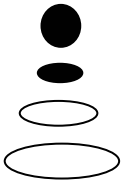
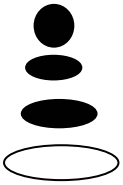
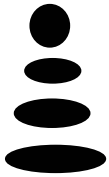
One GN-WMAG Wireless LAN Card
One Installation CD (including User's Guide and Driver)
One User Guide

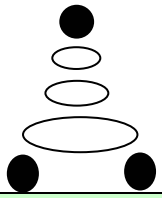
Please contact your local distributor or authorized reseller immediately for any missing or damaged components. If you require returning the damaged product, you must pack it in the original packing material or the warranty will be voided.

1-4. LED Indicating Light

This WLAN card conforms to the PC card Type II standard. There are six LED indicators, front two indicate currently Tx/Rx status, the other four show the receive signal strength from the linking Access Point.

The LED display window shows the current condition of the receiver signals. It specifies the four conditions of "***POOR***", "***FAIR***", "***GOOD***", and "***EXCELLENT***" receiver signals. It also provides additional information if the station is "***SCANING***", "***Rx*** " or in "***Tx*** " mode.

LED Continuously				
Condition of the Receiver	***POOR***	***FAIR***	***GOOD***	***EXCELLENT***

LED Blinking			
Condition of the Receiver	***SCANING***	***Rx***	***Tx***

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 (Applicable to any supported OS)

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.

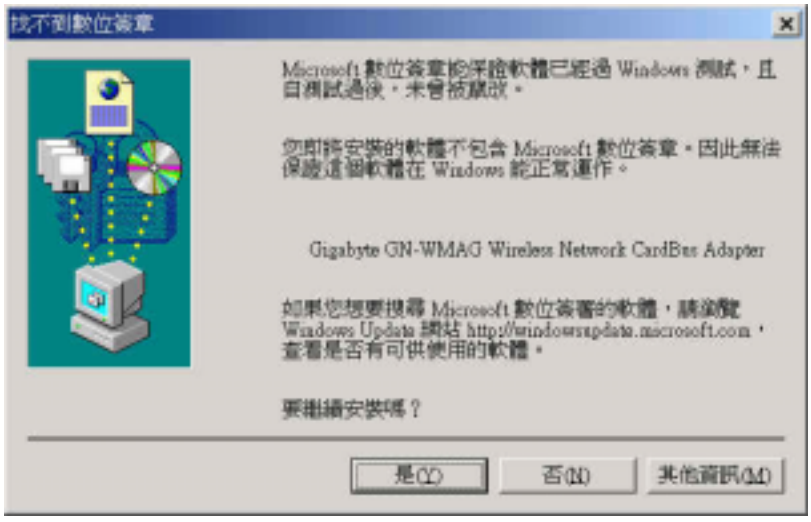
Step 3: Click "**Install Wireless LAN Driver**".

Step 4: Please remove the WLAN Card from your PCMCIA adapter and Click "**OK**".

Step 5: Click “**Finish**”.

Step 6: Please plug-in your “Gigabyte” WLAN card device ! and will install the device driver Click “**OK**”.

Step 7: Click “**Yes**” **, and then your installation is ok.**.



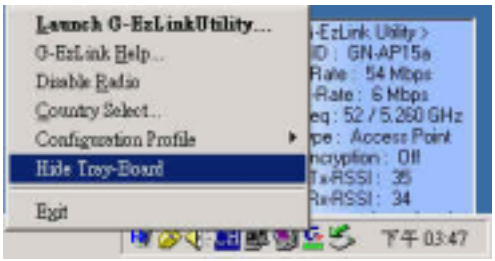
Chapter 3. Using The Utility

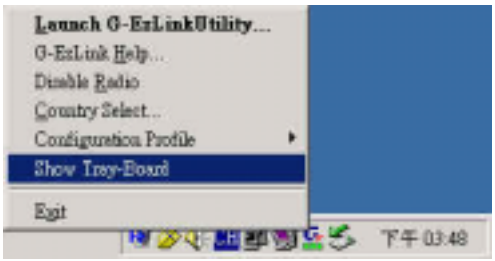
The Configuration & Monitor Utility is a powerful application that helps you to configure the card and monitor the statistics of the communication link. Unlike the standard method of configuring the card via the operating system utilities (e.g. Control Panel), this application permits the dynamic modification 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

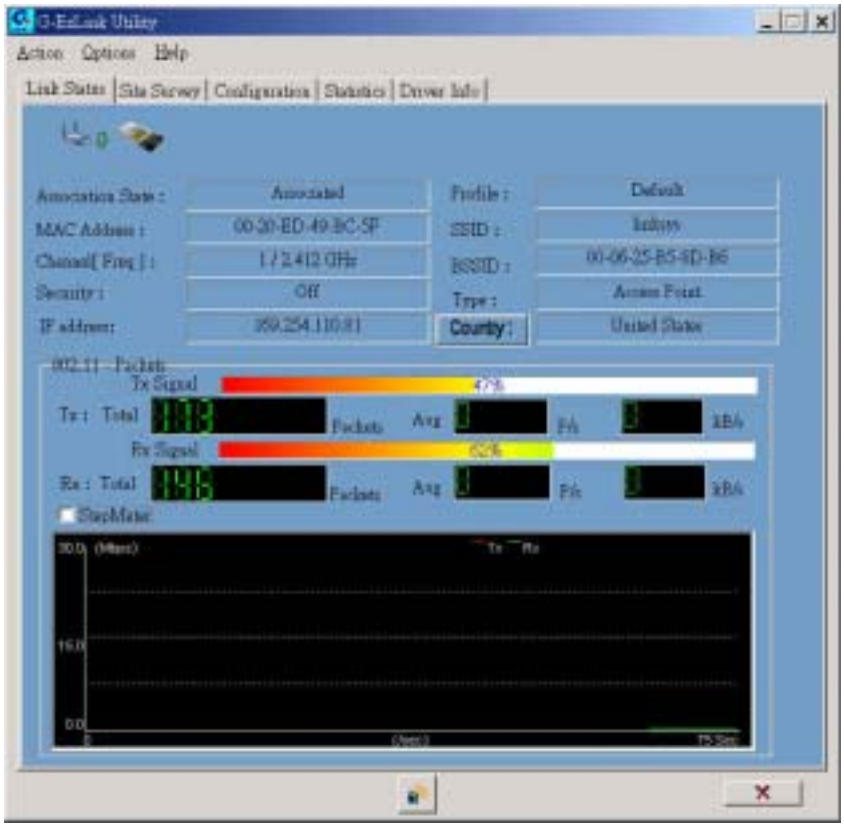




3-1. Link Status

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, **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.

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

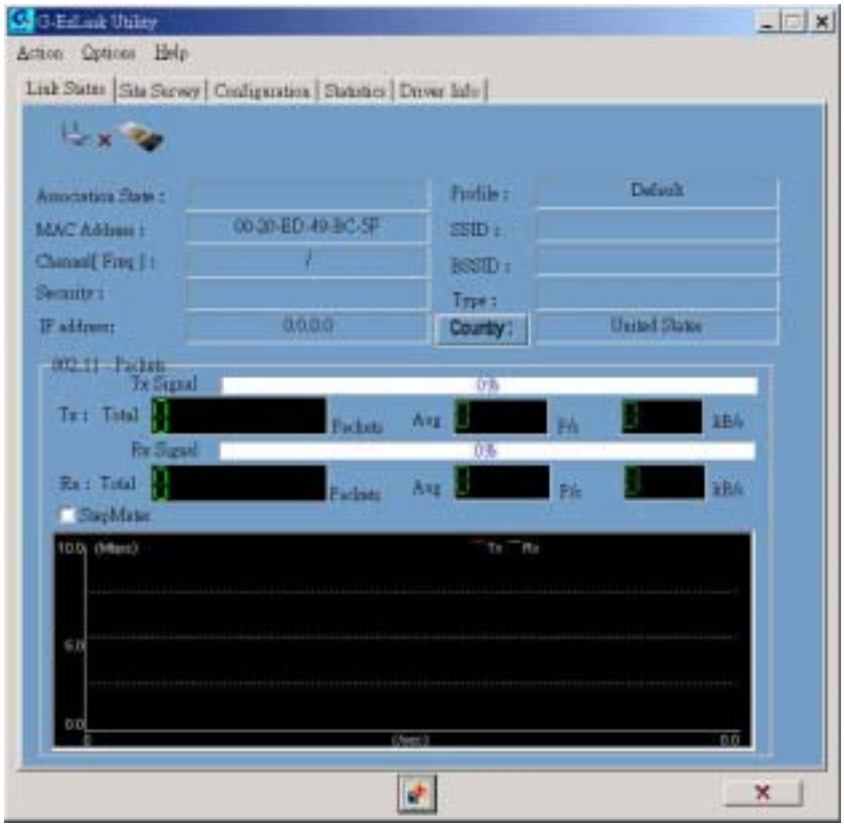


Figure 3-5 Disabled WLAN Card.

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.

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.

BSSID: Basic service set identification.

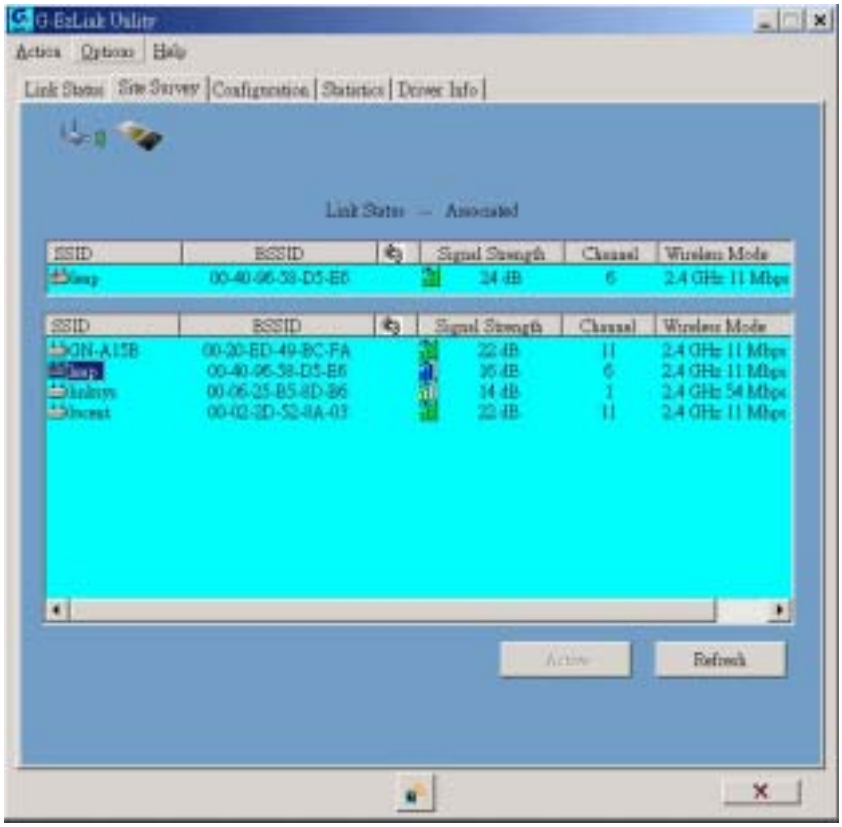
Type: The current network type.

Country: Language.

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 three 802.11b and one 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. If you want to restore the default value, click "**Default**" button. (*see **Figure 3-8***)

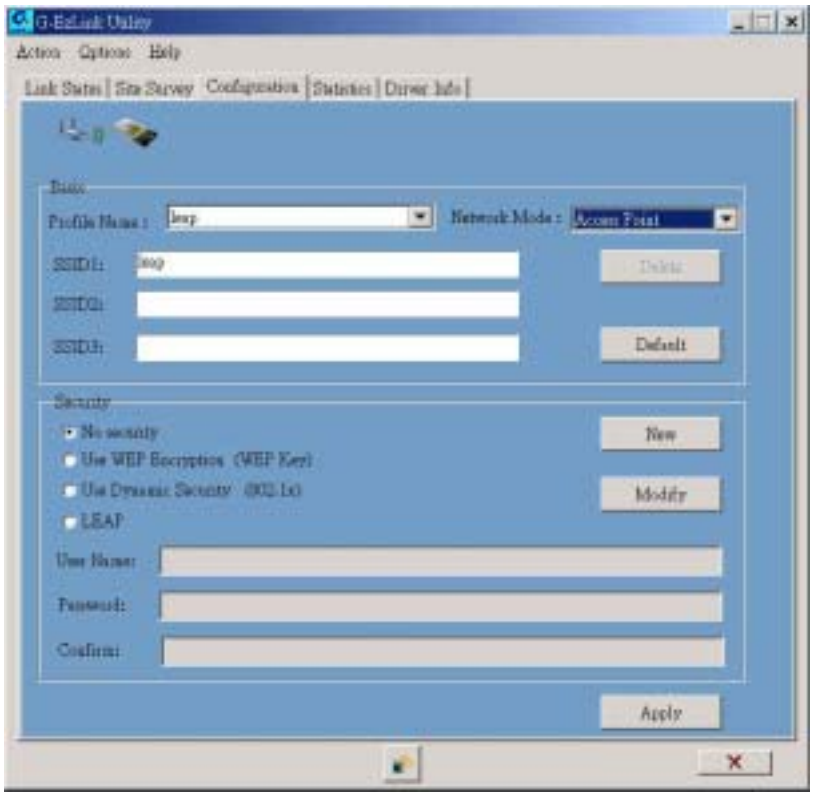
3-3-1. Basic setting:

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

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



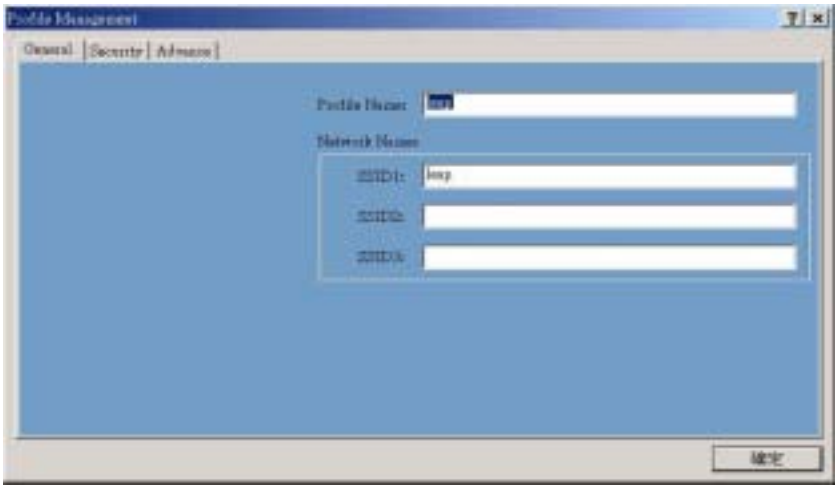
Ad Hoc channel: When the card’s network mode is set to Ad Hoc, you can select a channel from the ***AD Hoc channel*** drop-down menu for your Ad Hoc group to use.

SSID: 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. If configured to “**any**” (the default setting), your card can communicate with any available access point (If the access point isn’t closed system).

3-3-2. Advance setting:

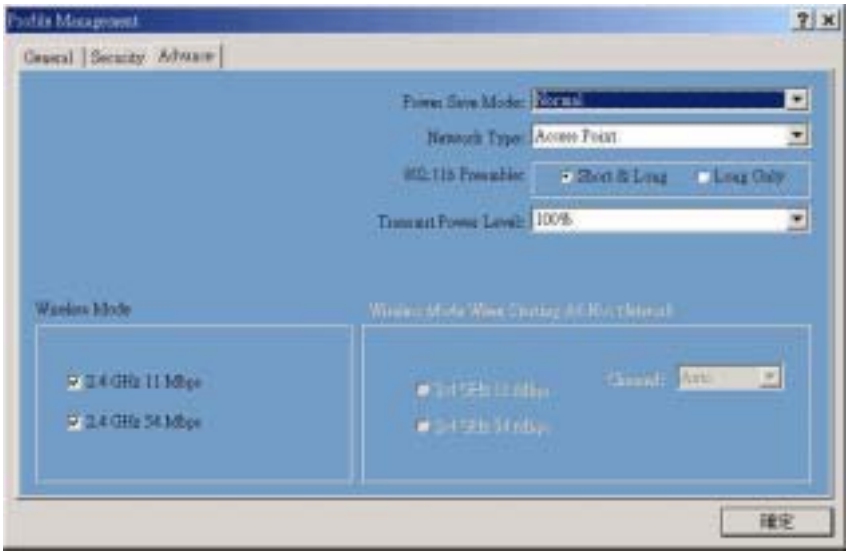
Click “**Modify**” button(*see* ***Figure 3-9***)

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.

a. When set to "***off*** ": the card does not use the power saving mechanism.
b. 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.
c. 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.

Network Type: 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".

Wireless Mode: Specifies ***802.11b (2.4GHz, 11Mbps) or 802.11g (2.4GHz, 54Mbps)*** 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.

Scan Mode: Specifies passive, or auto scanning.

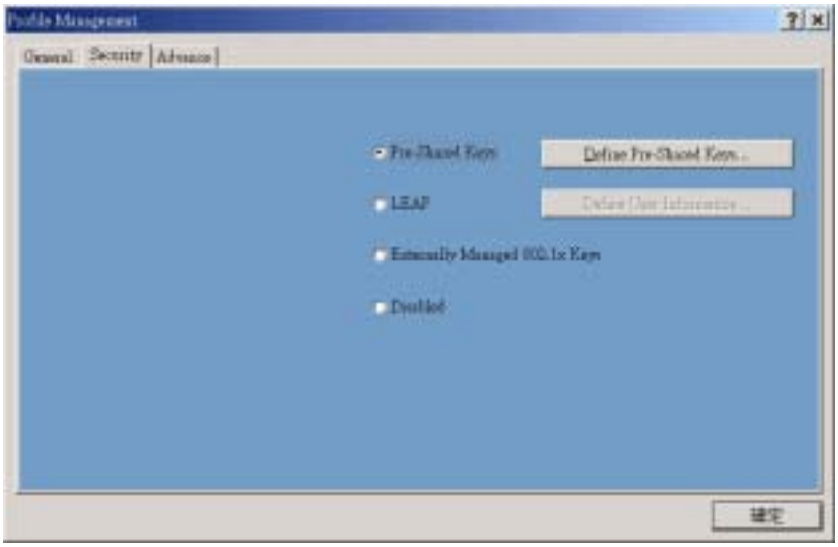
802.11b/802.11g Preamble: Specifies "***Short & Long***", or "***Long Only***" preamble. Allows ad hoc compatibility with other 2.4GHz devices.

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 four security options: No security, WEP encryption, LEAP security and802.1x security architecture.

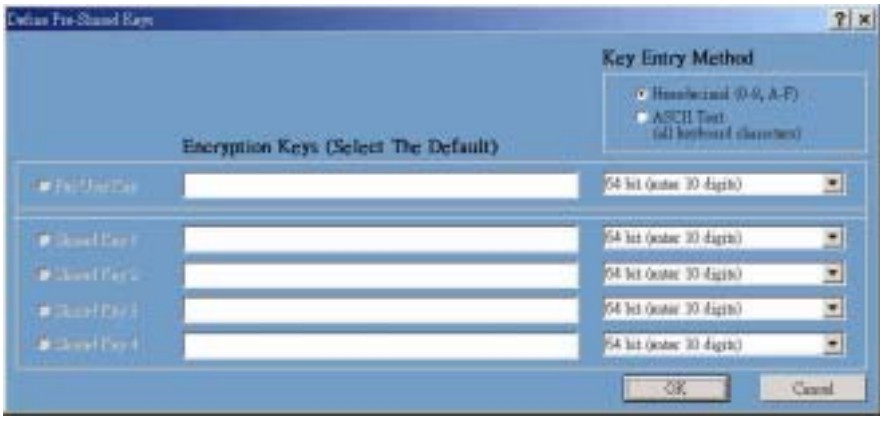
3-3-3-1. No security(Disabled):

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

3-3-3-2. Use WEP for authentication and encryption(Pro-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 "***Define Pro-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 Dynamic Security (Leap, 802.1X, etc.):

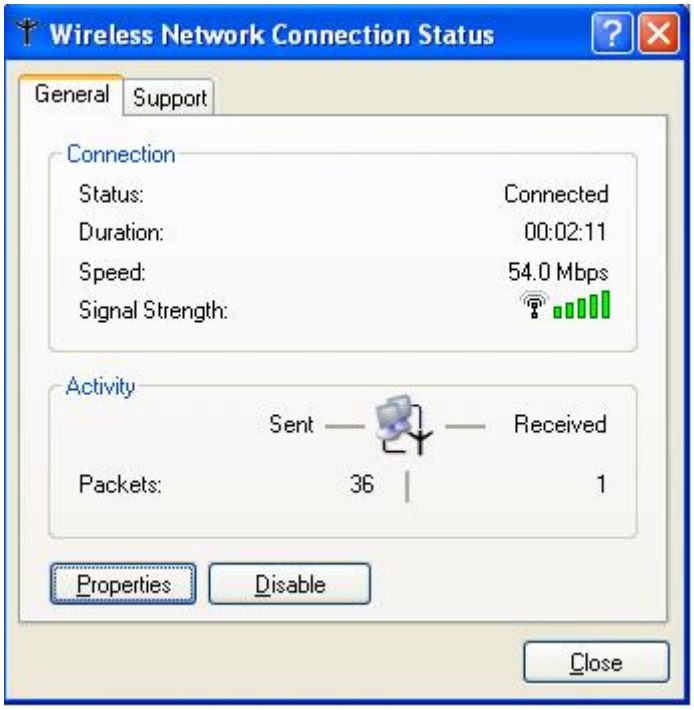
802.1X is an IEEE security standard for network security access control. It is used to control access to wired and wireless networks and dynamically provide keys for encryption. To use this function, an access point with its 802.1X function is required to act as an intermediary between WLAN card and 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. Microsoft Windows XP supports 802.1X as part of the operation system. To active this function, please follow these steps:

1. Click "**Use Dynamic Security**"
2. Click "**APPLY**" to save your new security setting.
3. Click the networking icon in the taskbar (*see* ***Figure 3-13***)

Figure 3-13. The networking icon

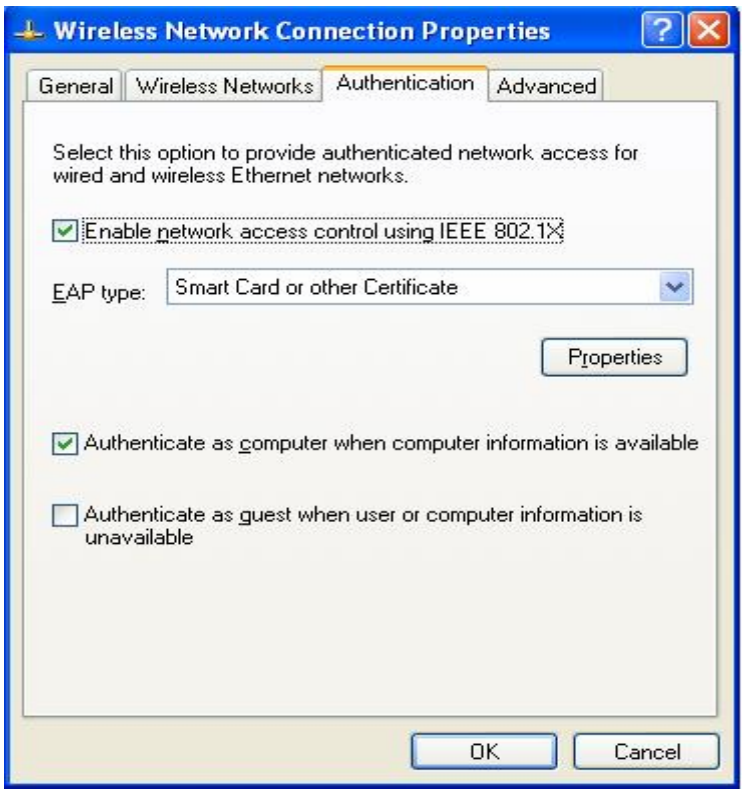
4. Click "**Properties**" (*see* ***Figure 3-14***)

Figure 3-14. Wireless Network Connection Status



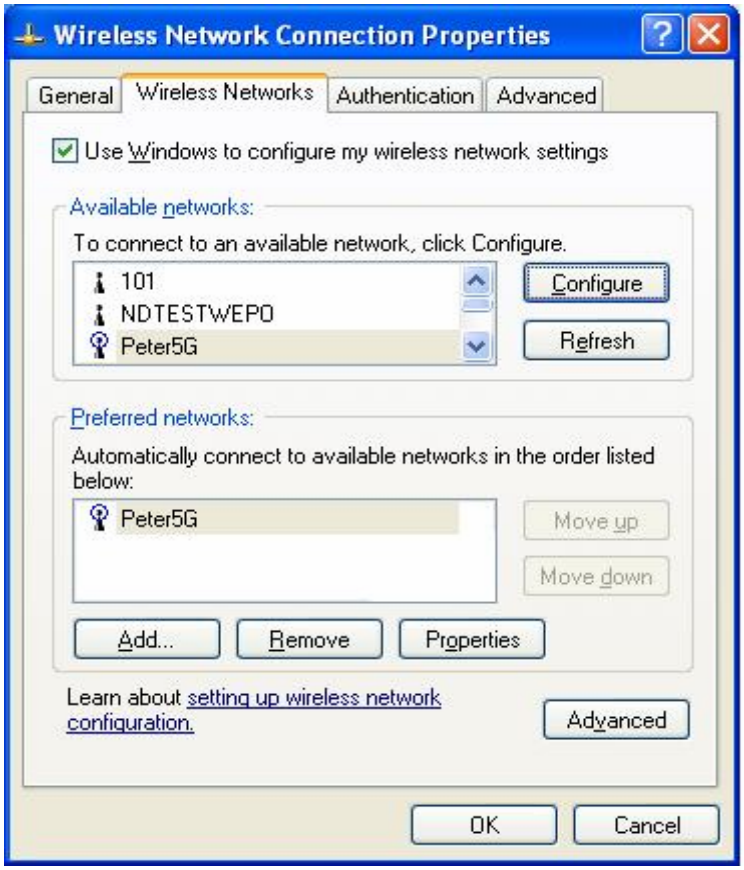
5. Click "**Authentication**" tab (*see* ***Figure 3-15***). Configure your 802.1X settings.

Figure 3-15. Authentication Screen



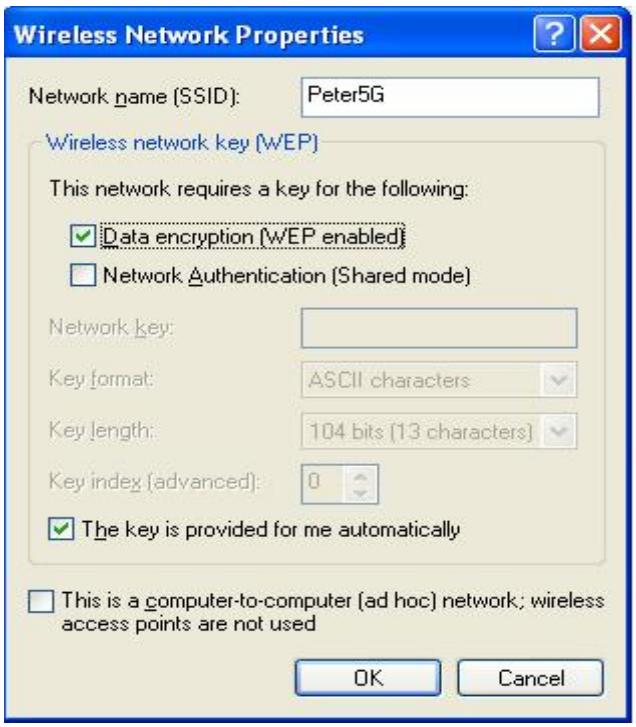
6. Click "**Wireless Networks**" tab (*see* ***Figure 3-16***).

Figure 3-16. Wireless Networks Screen



7. Click "**Configure**" button, then the following window will pop up (*see* ***Figure 3-17***).

Figure 3-17. Wireless Networks Properties

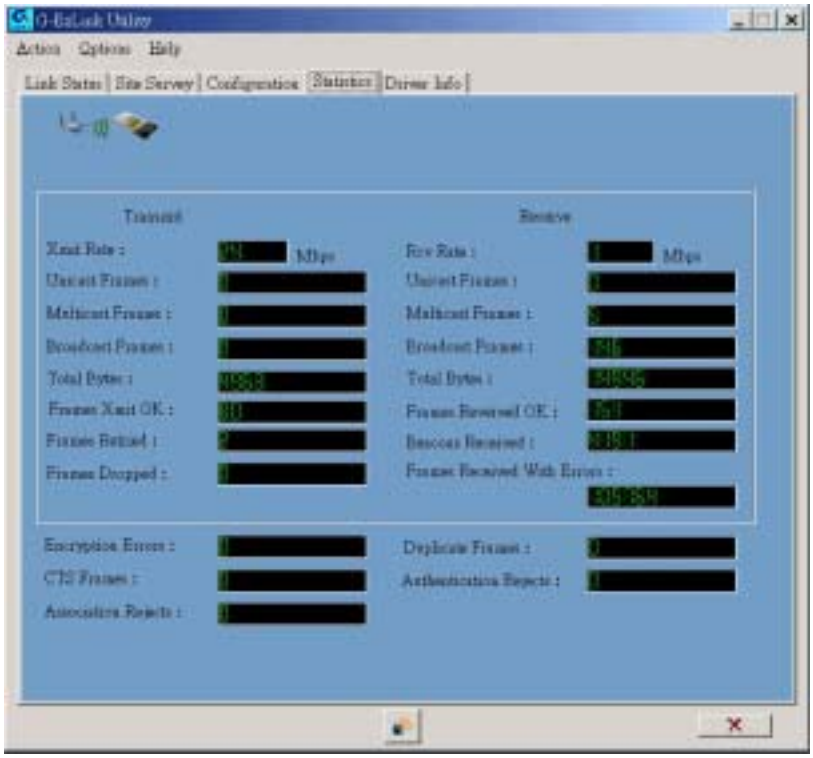


8. Click "**Data encryption (WEP enabled)**" and "**The key is provided for me automatically**".
9. Click "**OK**" twice to save these setting and exits the windows.

3-4. Statistics

The "**Statistics**" tab shows you the number of packets sent and received by the card(*see* ***Figure 3-18***).

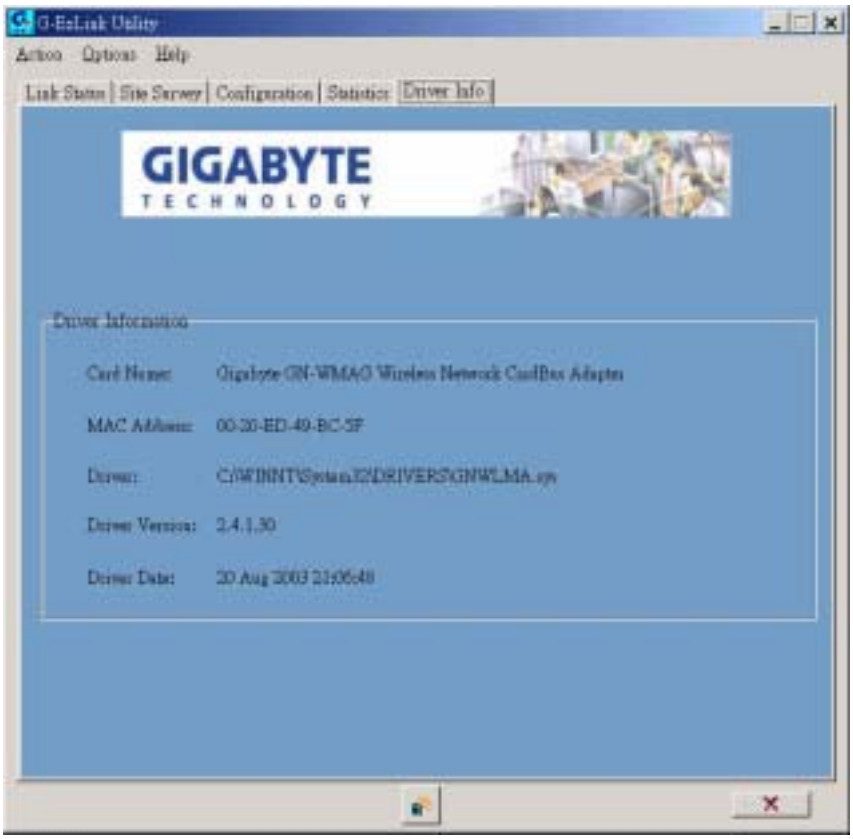
Figure 3-18. The statistic number of packets sent and received by the card



3-5. Driver Info

The “**Driver Info**” tab shows you the information of the card’s driver(*see* ***Figure 3-19***).

Figure 3-19. Driver’s information



Chapter 4. Specification

4-1. System		
Host Interface	CARDBUS (32-bit) card Type II v7.1	
Operating Voltage	3.3VDC ± 5%	
4-2. RF Performance		
802.11B		
Frequency Band	2412 ~ 24835 MHz (subject to local regulation)	
Modulation Technology	DSSS (Direct Sequence Spread Spectrum)	
Modulation Techniques	DBPSK, DQPSK, CCK	
Date Rates	11, 5.5, 2, 1 Mbps, auto fallback	
Typical Power Consumption	Doze: 25mA Receive: 350mA Transmit: 470mA	
Peak Output Power	20dBm @ Nominal Temp Range	
Minimum Receive Sensitivity	- 88dBm @ 11 Mbps @ Nominal Temp Range	
Antenna	Internal antennas supporting diversity	
802.11G(BACKWARD COMPATIBLE TO 802.11B)		
Frequency Bands	2412-24835 MHz (subject to local regulations)	
Modulation Technology	OFDM and DSSS	
Modulation Techniques	64QAM, 16QAM, QPSK, BPSK, CCK, DQPSK, DBPSK	
Date Rates	Base mode: 54, 48, 36, 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: 350 mA Transmit: 520 mA (Base mode)	
Peak Output Power	20 dBm @ Nominal Temp Range	
Receive sensitivity	Minimum -73dBm, typical -76dBm @54Mbps @ Nominal Temp Range	
Antenna	Internal antennae supporting diversity	
4-3.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	
4-4. Software Support		
Driver	Windows 98SE/Me/2000/XP	
Security	WPA; AES; 802.1X client for Windows XP; 64/128/152 bit WEP	
Roaming	Seamless roaming among 802.11b/g access points.	
Management Utility	Monitors the network situation.	
4-5. Mechanical		
Dimensions	120 x 54 x 7 mm	
Weight	40± 1 g	
Packaging	Packaging specially used by Gigabyte.	
LED indicators	Rx, Tx, and the receive signal strength	