



GN-WLM01

IEEE 802.11b PCMCIA Wireless Adapter

User's Manual

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Chapter1. Product Overview

1-1. Introduction to The Client Adapter:

This module is made up of the IEEE 802.11b MAC, Baseband, and radio components, PCMCIA interface, two internal antenna.

It uses direct sequence spread spectrum (DSSS) technology and implements DBPSK, DQPSK, and CCK modulation. This provides a very robust radio channel and excellent receiver sensitivity.

With its PCMCIA Type-II extended form factor, low power consumption, power management and high-speed wireless data communication, it is ideally suited for integration into mobile and handheld platform.

Furthermore, it provides a set of received signal strength indicator LED. This function provides a user-friendly intuitional view. From these indicators, users can know the information of the present received signal strength conveniently and also the use may take a advantage to adjust the receiving position or direction for getting a better receiving status.

1-2. Features

- Conforms to IEEE 802.11 and IEEE 802.11b specification
- Delivers data rate up to 11Mbps.
- Dynamic data rate scaling at 11, 5.5, 2, and 1Mbps
- Automatic power management to reduce battery use.
- Internal antenna diversity.
- Supports wireless data encryption with 64-bit /128-bit WEP standard for security.
- Driver support Windows 98/98SE/Me, Windows2000/XP.
- Received Signal strength indicator LED for a user-friendly intuitional view.

1-3. Physical Dimensions/Packaging



Dimension: 118.4 mm x 54 mm x 6 mm

This module is developed to conform the PCMCIA standard, for Type II extended PC card. There are five LED: one indicating power on and the others indicating the received RF signal strength.

1-4. LED Display Indicator

1-4-1. Purpose

The LED display indicator is the function that provides the users to review the received RF signal strength of NIC. It is convenient for users to adjust the location of NIC and then gain better receive signal strength refer to LED sight.

1-4-2. Description

The LED display window is based on the index of the received RF signal strength. it specifies the condition of "**POOR**", "**FAIR**", "**GOOD**", and "**EXCELLENT**", respectively. TABLE 1. shows the relation of LED sight and the condition of receiver.

 LED sight				
Condition of receiver	POOR	FAIR	GOOD	EXCELLENT

Table 1. The relation of LED Sight and condition of receiver.

Note: The LED indicator status shown depended on the data transmission between AP and Station

1-5. System Requirements

1-5-1. Supported Platform

IBM PC/AT compatible computer

1-5-2. Supported Operation System

Windows 98/98SE/Me
Windows 2000/XP

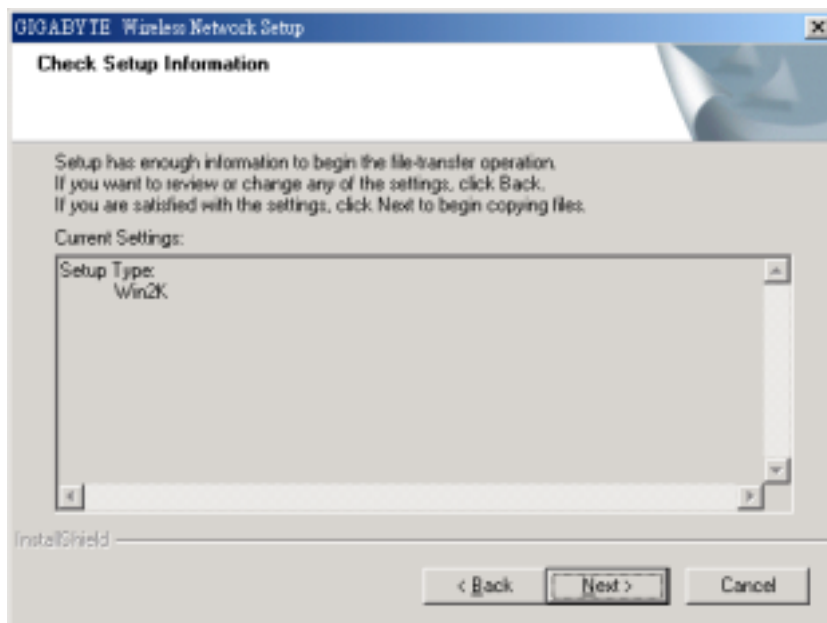
Chapter2. Installing The Client Adapter

2-1 Installing The Driver & Utility (Apply to any supported OS)

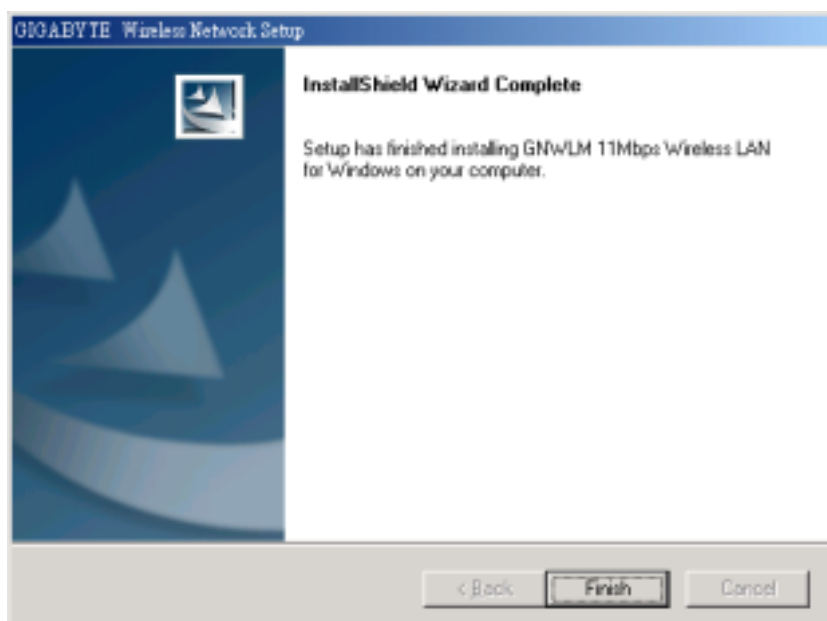
Step 1: Insert our setup CD into your CDROM

Step 2: Execute the setup.exe on our CD

Step 3: If you haven't ever install any wireless LAN card's driver, the following window will pop up, else the setup program will uninstall your previous driver for a afresh installation.



Step 4: Press "Next".



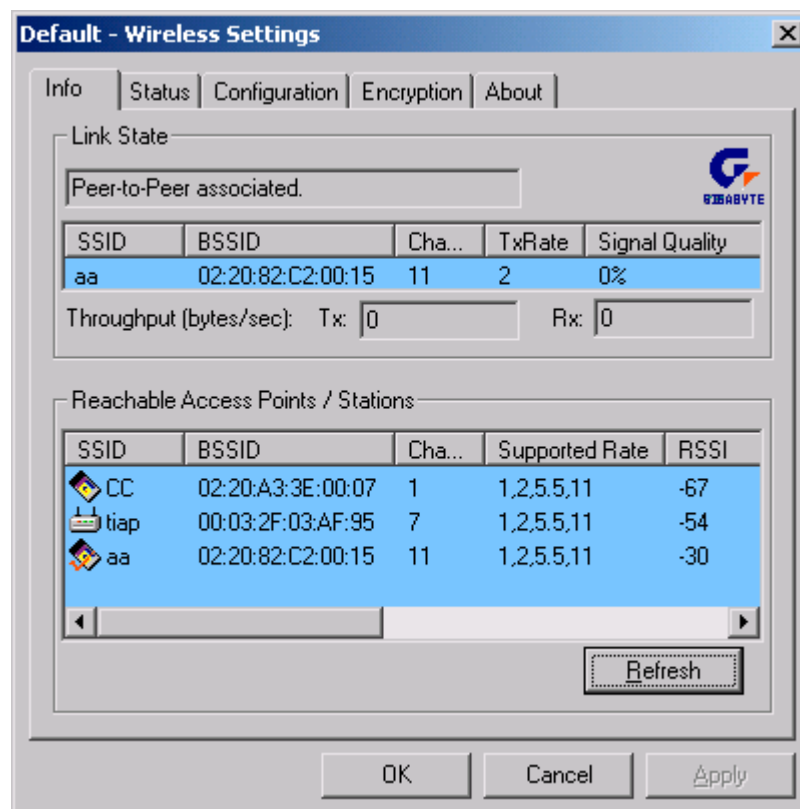
Step 5: Press “Finish”, and then your installation is ok.

Chapter3. Using The Utility

The Wireless LAN Monitor Utility enables you to make configuration changes on your 11Mbps Wireless LAN Card. The Wireless LAN Utility consists of window with 5 items for you to monitor and configure the 11Mbps Wireless LAN Card: **Info**, **Status**, **Configuration**, **Encryptions** and **About**.

3-1. Info:

The Info tab shows you the current Link State of Wireless LAN Card and Reachable Access points and Stations in the wireless environment.



Link State: There are five kinds of states for a Wireless LAN Card:

Access Point associated: The wireless LAN card is now connecting to an Access Point.

Peer-to-Peer associated: The wireless LAN card is joining a Peer-to-Peer network now.

Access Point scanning: The wireless LAN card now search for an Access Point with the same network name, or SSID to connect.

Peer-to-Peer scanning: The Wireless LAN Card now searches for another Wireless LAN

Card with the same SSID and the same channel to join.

WEP security rejection: This will occur if you join an wireless network with incorrect WEP key.

The other items in the table are details about the link state and will only be available when the wireless LAN card is associated with an Access Points or other wireless LAN card.

SSID: This is also known as network name.

BSSID: This is the MAC address of the Access Point when the Wireless LAN Card connects an Access Point or a special serial number when the Wireless LAN Card is in Peer-to-Peer mode.

Channel: This represents the channel now used by the Wireless LAN Card.

TxRate: This represents the transmission rate now the Wireless LAN Card uses.

Signal Quality: This is only available in Access Point mode and represents the quality of communication between the Wireless LAN Card and Access Point.

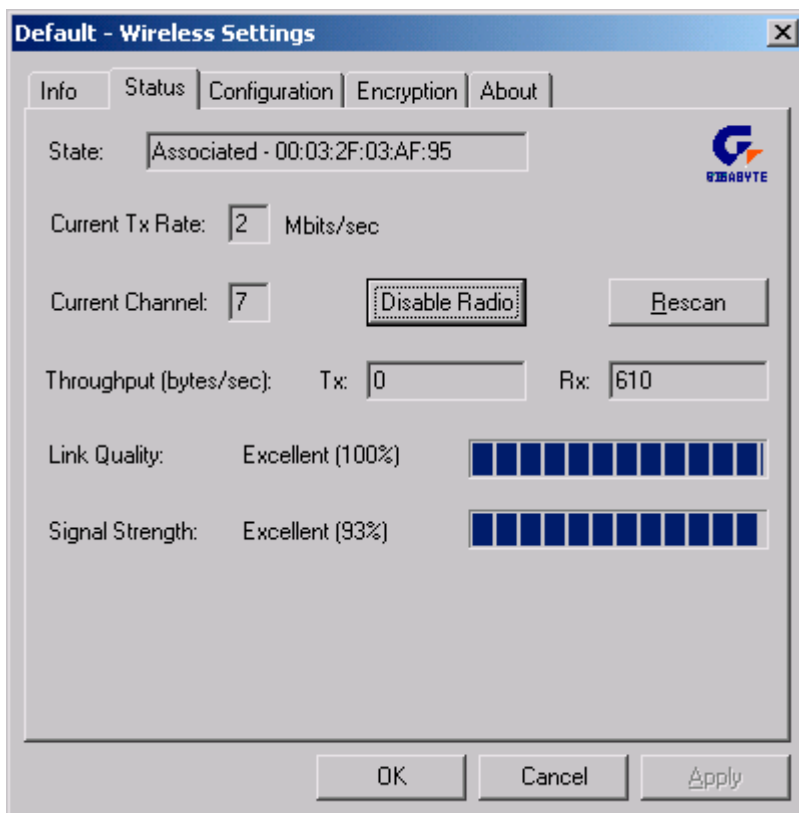
Reachable Access Points / Stations:

This item will show you all the other 802.11 Access Points or Wireless LAN Card s in your wireless environment. The icon in the front of every item represents this point is an Access Point or a Wireless LAN Card in Peer-to-Peer mode. One can join a network easily by clicking the SSID which you want to join.

Refresh: Clicking this button, the wireless LAN card will rescan the wireless environment an show you all the newest reachable Access Points and Stations.

3-2. Status:

The Status tab will show you the detailed status of the wireless net card.



State

This field is used to display the current state of the Wireless LAN Card. When the state is "Associated " means normal flow of operation in Infrastructure mode. The PC is connected to access point. BSSID is shown in the form of hex digits. Networking is available. A state of "Scanning " means that the node is searching for available access point and unable detects the SSID for an available access point within range. This field will also display an error message if for some reason the driver failed to initialize.

Rescan

Pressing the rescan button causes the driver to restart and begin its Connection Procedure. The connection procedure differs depending on the Mode of the driver.

Access Point Mode - The driver will scan all available channels continuously until it finds one or more Access Points that matches its SSID. At that point it will try and authenticate and associate with the Access Point.

Point-to-Point Mode - The driver will scan for 5 seconds looking for an existing Ad Hoc networking the same SSID.

Current Channel and Tx Rate

Shows the channel of the radio and transmit rate are being currently used for an active connection. This value has no meaning when the radio is "Scanning"

Throughput

These two fields display the instantaneous wireless Receive and Transmit throughput displayed in bytes per second. These values are updated every two seconds.

Link Quality

The Link Quality bar graph is only active when the node is in Infrastructure Mode. The bar graphically displays the quality of the link between the node and its Access Point. A label summarizes the quality of the link over the bar graph, which can take on one of the following values:

“Poor”

“Weak”

“Fair”

“Good”

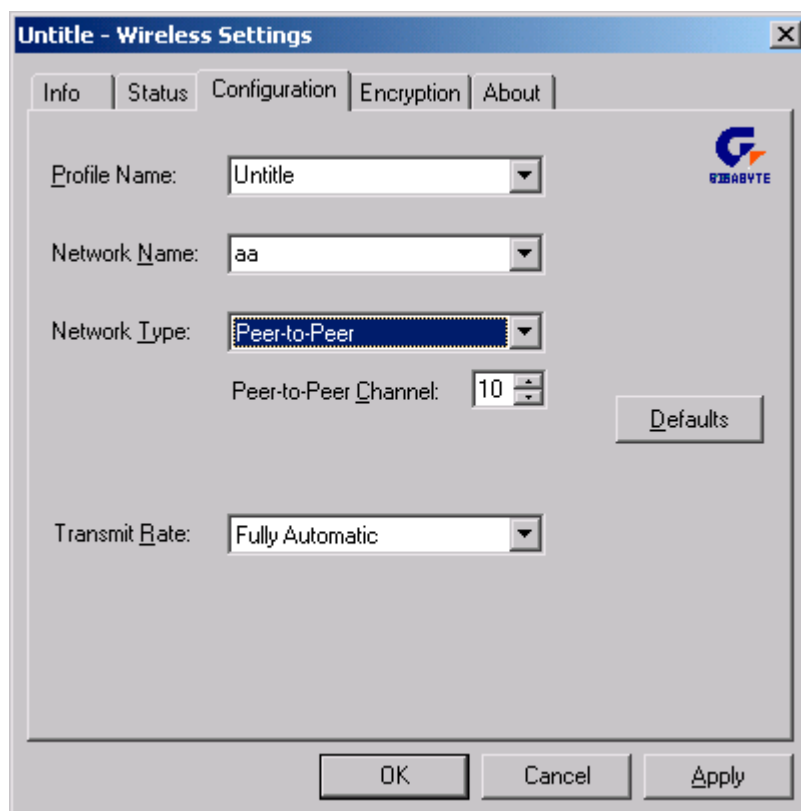
“Excellent”

Signal Strength

The Signal Strength bar graph is only active when the node is in Infrastructure Mode. The bar graphically displays normalized signal strength as reported by the radio, averaged over all frames over 100 bytes long that are received from the Access Point.

3-3. Configuration:

The Configuration Tab contains several fields where operating parameters of the driver can be viewed or changed. Changes to any of the parameters in this panel can be applied to the driver without the need to reboot the PC.



Defaults: Pressing this button restores each field in the panel to its default value. The Apply Changes button or OK must be pressed before the default values are saved to the driver and registry.

Profile: You can save various wireless settings for different environment. The system allows you to have 5 different configurations.

Network Name: It is also known as SSID and is the unique name shared among all points in the wireless network. The SSID must be identical for all points in the network. It is case sensitive and must not exceed 32 characters.

Network Type:

This field allows you to select from a list of supported Network “Modes”. The modes displayed have two values: “Peer-to-Peer” and “Access Point”.

Peer-to-Peer: This is the 802.11 peer-to-peer mode of operation. All communication is done from Client to Client without the use of an Access Point. Peer-to-Peer networking uses the same SSID for establishing the wireless connection.

Access Point: This mode of operation requires the presence of an 802.11 Access Point. All communication is done via the Access Point, which relays packets to other wireless Clients in the BSS as well as to nodes on a wired network such as Ethernet.

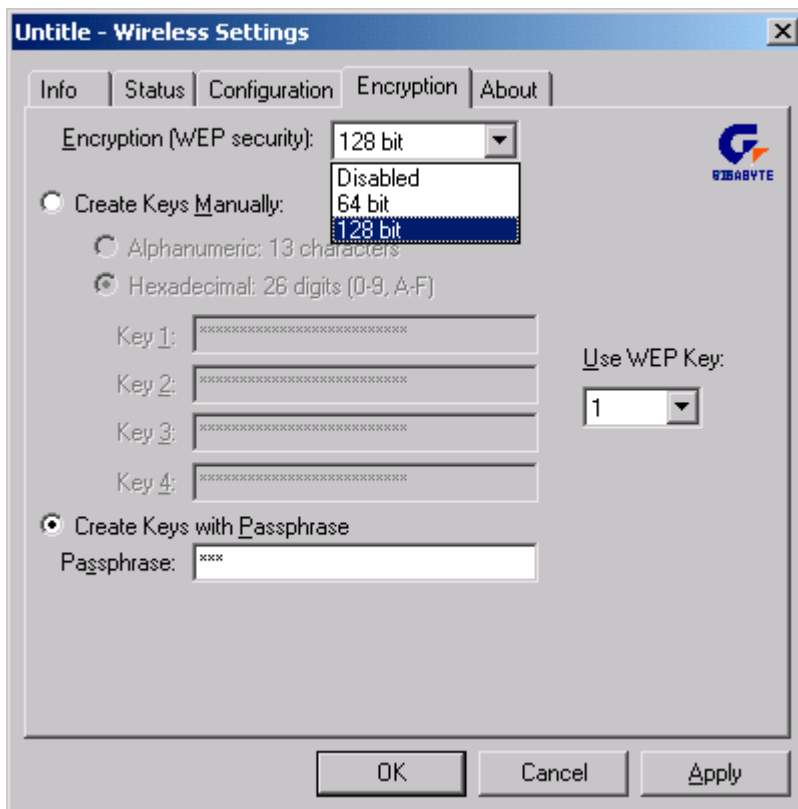
Peer-to-Peer channel: This specifies the channel used in wireless communication and should be set to same channel as the other points in the wireless network. This setting can only be adjusted in Peer-to-Peer mode.

TX Rate: The transmission rate at which client of AP transmits the data packets. You may set this to Auto 1 or 2 Mb, 5.5 Mb, 11 Mb, or Fully Automatic.

3-4. Encryption:

To prevent unauthorized wireless stations from accessing data transmitted over the network, the 11Mbps Wireless LAN Card offers highly secure data encryption, known as WEP (Wired Equivalent Privacy). If you require high security in transmission, go to the **Encryption** tab and do the following.

- Pull down the **Encryption** menu and select either **64bit** or **128bit** encryption method.
- Specify the encryption keys. There are two methods to set the WEP keys, as described below:



From the WEP encryption item, pull down the menu and it will list three options:

Disable – Allows wireless adapters communicate with Access Points without any data encryption.

64 Bit – Requires wireless stations to use data encryption with 64 Bit algorithm when communicating with the Access Point.

128 Bit – Allows wireless clients to communicate with the Access Point with 128 Bit encryption algorithm.

The **Encryption** tab enables you to identify up to 4 different encryption keys and select one of them to encrypt your transmission data. The key value of your choice may either be:

For 64-bit encryption:

- Five alphanumeric characters in the range of “a-z”, “A-Z” and “0-9” (e.g. MyKey)
- 10 digit hexadecimal values in the range of “A-F” and “0-9” (e.g. 11AA22BB33).

For 128-bit encryption:

- 13 alphanumeric characters in the range of “a-z”, “A-Z” and “0-9” (e.g. WEPencryption).
- 26 digit hexadecimal values in the range of “A-F” and “0-9” (e.g. 11AA22BB33123456789ABCDEFF).

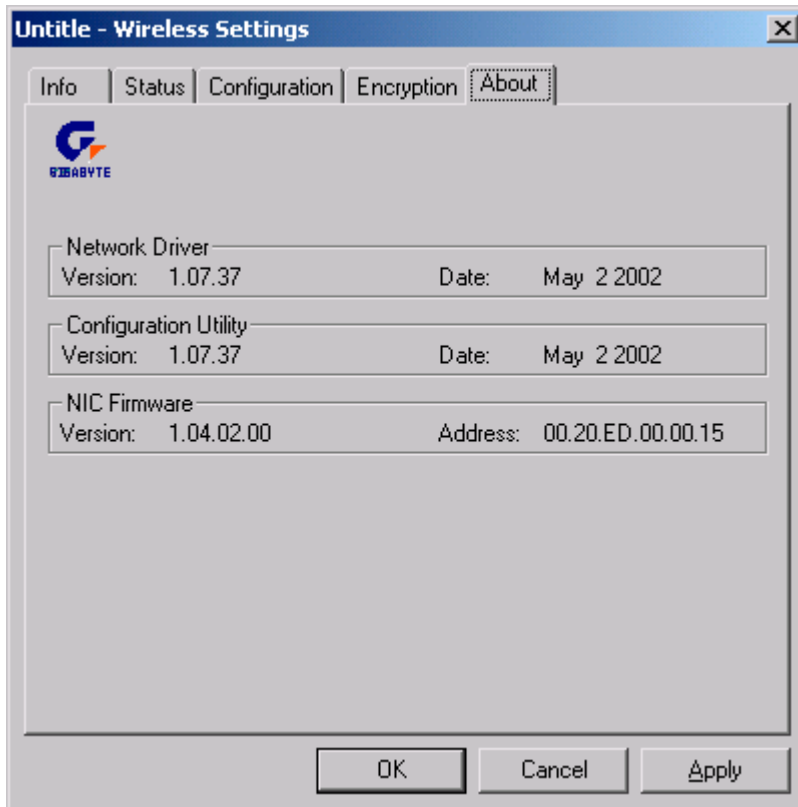
Alternatively a **Passphrase** can be entered which is used as a “seed” to randomly generate the four keys. This saves considerable time since the same keys must be entered into each node on the wireless network.

Key 1 – Key 4

These four fields can be used to manually enter the keys. This may be necessary if you wish this node to match keys in a different vendor’s product. These fields also display the

keys when they are generated using a Pass-phrase.

3-5. *About:*



About tab shows the product version including the detail of Driver, Configuration Utility, and NIC firmware version. Users must use this version number when reporting their problems to technical support.

Chapter4. Specification

4-1. System		
Standards	IEEE 802.11b compliant, Wi-Fi compatible	
Host Interface	PCMCIA PC Card Type II	
Modulation	1Mbps : DBPSK; 2Mbps : DQPSK; 5.5 and 11 Mbps : CCK	
Data Rate	1, 2, 5.5, 11 Mbps	
Operating Voltage	3.3V / 5V DC	
Operating Range	Open space : 100 - 300m; Indoor : 30 - 100m	
4-2. RF		
Frequency Band	2.400 ~ 2.4835 GHz (subject to local regulation)	
Radio Technology	DSSS (Direct Sequence Spread Spectrum)	
Number of Channel	11 Channels (US, Canada)	4 channels (France)
	14 Channels (Japan)	13 Channels (Most European countries, ETSI)
Minimum radiated output power	15dBm @ Nominal Temp Range	
Receive Sensitivity	Typical: - 83dBm @ 11 Mbps data rate, 8% PER	
Antenna	Two internal antenna supporting diversity	
4-3. Regulatory and Environmental Compliance		
EMC certification	FCC part 15 (USA)	
	R&TTE (Europe)	
	ARIB-Telec (Japan)	
Temperature Range	Operating : 0 ~ 55 deg C , Storing : -20 ~ 65 deg C	
Humidity	Max. 95% Non-condensing	
4-4. Software		
Driver	Windows 95/98/Me; Windows 2000/XP; Windows NT4.0	
Roaming	Full mobility and seamless roaming	
Network Protocol	TCP/IP, IPX, NetBEUI, NDIS4, NDIS5, NDIS5.1	
Security	64 bit WEP (128 bit WEP optional)	
Management Utility	Link Configuration for network join and diagnostic	
4-5. Mechanical		
Dimensions	118.4 x 54 x 6 mm	
Weight	43 g	
Packaging	Generic, Gigabyte, private labeling optional	
LED indicator	Power on/Link/Received signal strength	

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, (example - use only shielded interface cables when connecting to computer or peripheral devices) 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 equipment should be installed and operated with minimum distance 2.5cm between the radiator & your body.

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

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter. End-users must be provided with specific operating instructions for satisfying RF exposure compliance."