

# GIGABYTE

T E C H N O L O G Y



## PCI Wireless LAN Card GN-WPMG

# User's Manual

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

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Version 3.0

## **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 to the GN-WPMG Wireless PCI Adapter

The GIGABYTE WPMG Wireless PCI Adapter installs quickly into your motherboard's PCI slot, connecting wirelessly to your Wi-Fi Router - instantly transforming your PC into a wireless AP, broadening the range of your wireless network.

The WPMG is fully 802.11b interoperable, meaning it connects seamlessly to both 11b and 11g wireless traffic, and with its dynamic speed adjustment feature, it will always connect at the highest possible speed – up to 54Mbps.

The GIGABYTE WPMG Wireless G PCI Adapter makes connecting to a wireless router or access point a cinch with its included Wireless Client that automatically detects and lists all available wireless networks. Since the WPMG can be setup in Wireless Distribution System (WDS), it transforms your desktop into an wireless access point, effectively expanding the range of your wireless network.

### Secure

With its support for the highest level of encryption common today - 128 bit WEP, 802.1X, and WPA - the WPMG is perfect for the home user, keeping your data secure.

### Robust

Move huge files and digital video blazingly fast! Up to 5 times faster than the common 11b solution. The high gain antenna and 802.11g wireless standard gives you continuous access to your home wireless router or office network,

### Convenient

Saves the time and expense of installing Ethernet cabling when you want to set up or expand a network, and makes it simple to relocate your desktop PC.

## 1.2 Features

- Connects to any 802.11b, and 802.11g wireless network
- Data rates up to 54 Mbps\*
- Switch between AP and Station mode using SoftAP
- Dynamic rate shifting ensures fastest possible connection
- External antenna
- Seamless roaming between wireless access points
- Supports AES (Advance Encryption System), enterprise-class 802.1x security and multiple-levels WEP encryption (64-bit /128-bit/), and WPA (Wi-Fi Protected Access)

\*Note: Standards IEEE 802.11b and IEEE 802.11g specify that when in **Ad-Hoc mode**, wireless products **only support 11 Mbps**. These IEEE standards apply to all 11b, 11g, and Super G products.

## 1.3 Physical Dimensions & Packaging

Dimensions: 134mm x 81mm x 22mm

Before beginning the installation procedures, please inspect the components to assure that they have not been damaged during shipping. The components include:

### **Package Contents**

- GN-WPMG PCI Adapter
- Low profile external antenna
- Setup CD
- Quick Start Guide

In case of any missing or damaged accessories, please contact your local distributor or authorized reseller immediately. 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 Indicator**

The WPMG PCI Adapter has One LED light indicating Activity located on the outward facing bracket frame.

## **1.5 System Requirements**

For trouble free installation and operation, please assure your PC meets the following minimum system requirements:

- Notebook or Desktop PC with a Pentium® 300 MHz or higher compatible processor with an available PCI slot.
- A CD-ROM drive.
- 20 Mbytes of free hard disk space.

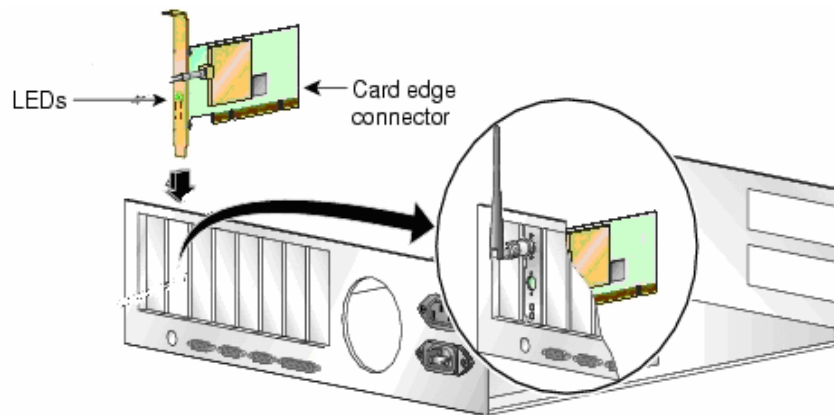
## Chapter 2 Installation

This chapter covers the installation of the WPMG Adapter for your desktop PC. The following sections will assist you with proper installation of the PCI Adapter, and also with installing the necessary drivers and utilities. For specific information regarding your Version of Windows, please refer to the appropriate sections as indicated

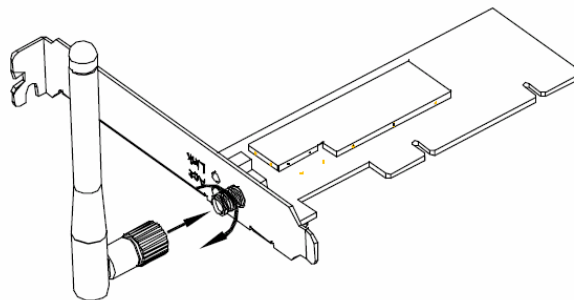
### 2-1. Installing the Adapter (Hardware Installation)

**Step 1:** Power off your PC.

**Step 2:** Plug the PCI Adapter into an open PCI slot on the motherboard by pressing the card gently until the card edge connector is completely and firmly inserted into your motherboards PCI slot.



**Step 3:** Once inserted, attach the antenna on the mount of the PCI Adapter by screwing it on clockwise as shown in the figure below.

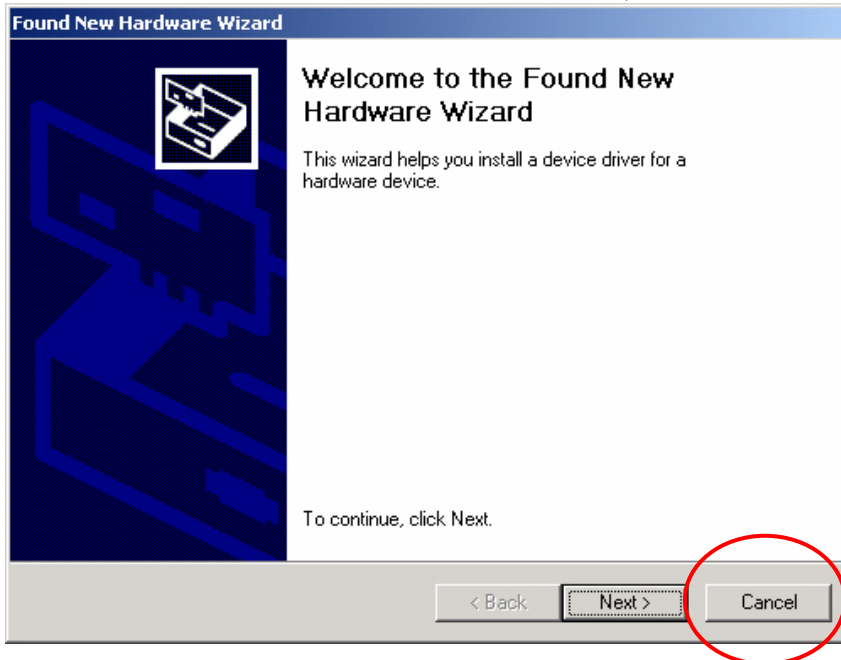


**Step 4:** Power on your PC.

## 2-2. Installing the Driver & Utility

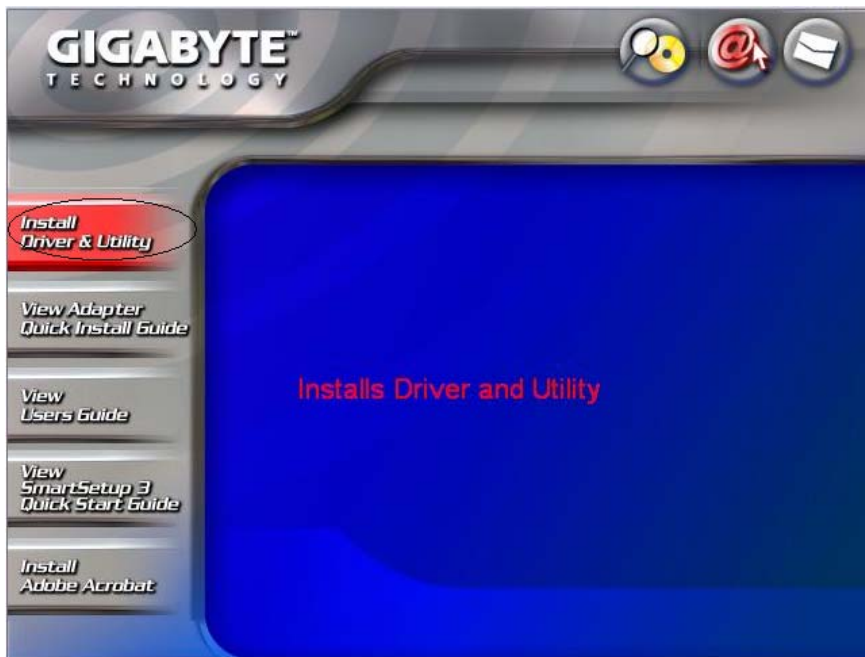
After restarting your computer the Windows **Found New Hardware** wizard will open. When it does, please click **Cancel** to close it. GIGABYTE drivers and utilities offer more power and control over your new WPMG PCI Adapter than does Windows native Zero Configuration Utility.

**Step 1:** At the Found New Hardware Wizard screen, click **Cancel**.



**Step 2:** Insert the WPMG Setup CD into the CD-ROM drive. The WPMG Welcome screen window will automatically open.

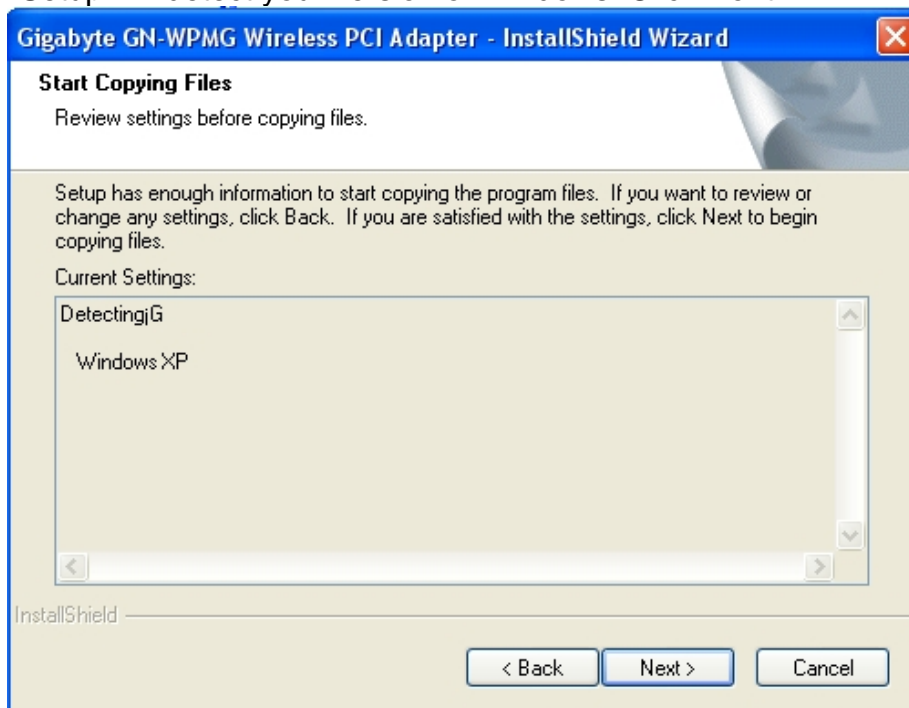
**Step 3:** From the main menu, click **“Install Wireless LAN Utility”**.



**Step 4:** InstallShield will install the WPMG drivers. Click **Next** to proceed.

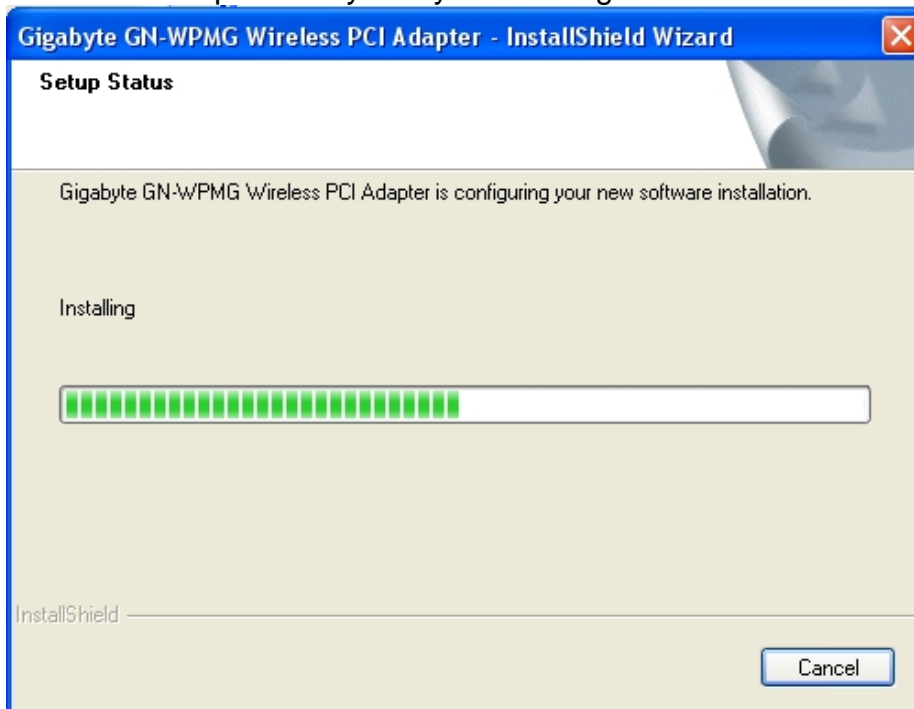


**Step 5:** Setup will detect your version of Windows. Click **Next**.

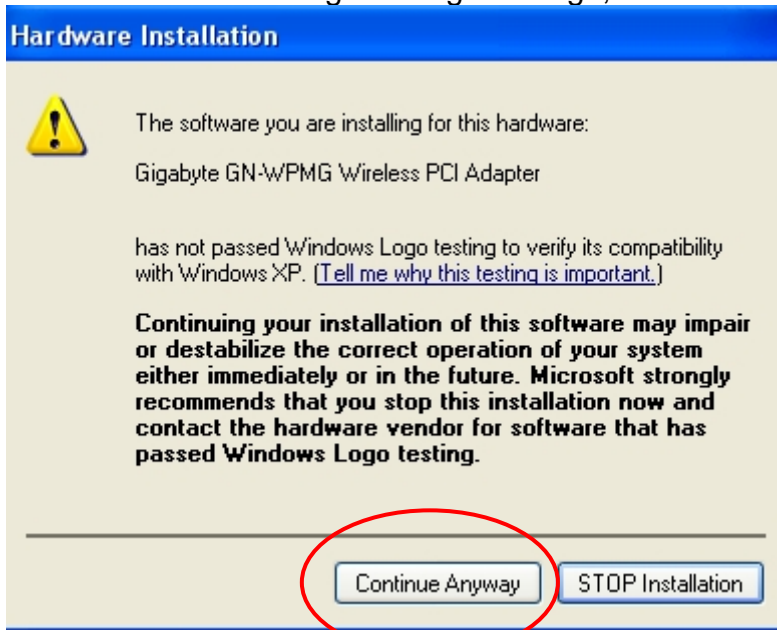




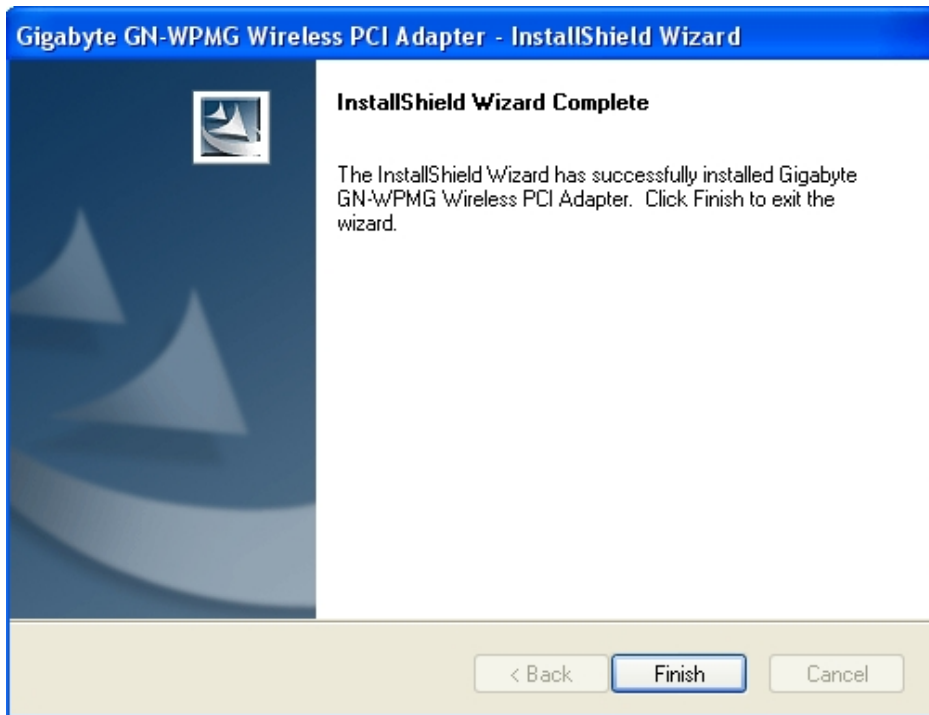
**Step 6:** Files will be copied and your system configured.



**Step 7:** At the Windows XP Logo testing message, Click **Continue Anyway**.



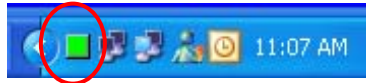
**Step 8:** When InstallShield has completed, click **Finish** to finish installation.



Installation of the GN-WPMG is complete.

## Chapter 3 Using the Wireless Client Utility

The WPMG Wireless Utility is a powerful application that helps you to configure the network card and monitor the statistics of the communication link. It appears as a square icon (green when connected, red when not) in the task bar at the bottom right corner of screen (see **Figure 3-1**).



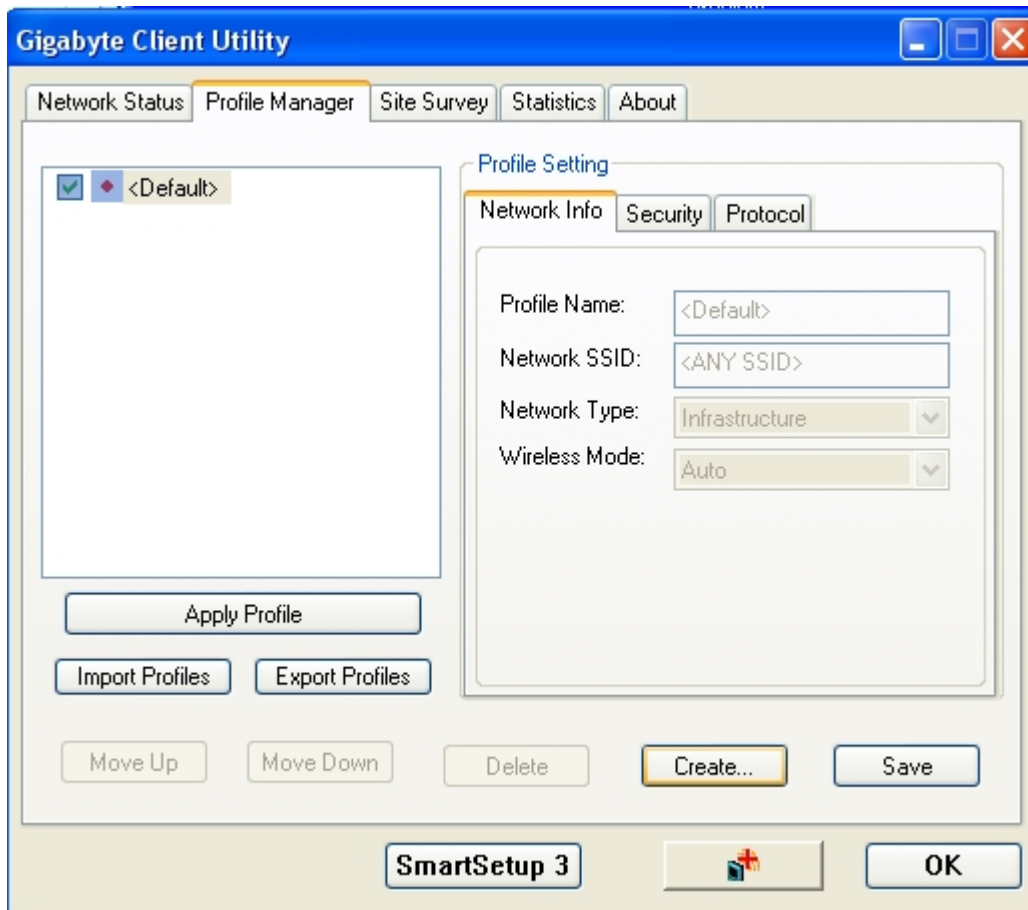
**Figure 3-1.** WPMG Client Utility quick start icon

To open the WPMG Utility, either double click the quick start icon located in your system tray, or from the Windows **Start** menu, select **Programs, GIGABYTE Wireless Network Adapters, GN-WPMG**, and then **GN-WPMG Utility**.

**Note:** You may only use the utility to change wireless configurations when the WPMG Adapter is enabled and operating. You have to use Windows native Zero Configuration tool provided with Windows when the Adapter is not enabled.

### 3.1. Creating a Profile

The **Profile Manager** tab shows you the current association information about the profile. (see **Figure 3-2**). Profiles are useful if you often associate with different access points. You can configure a group of settings depending on the access point you often associate with. and save as a profile, Click the **Create** button to create a new profile (see section below for further details), When you have finished creating a profile, return to Profile Manager Screen and click the **Apply Profile** button to have a selected profile become active.



**Figure 3-2.** Profile Manager

Description of items in **Figure 3-2** is as follows:

### Profile Setting

A profile can be saved for various wireless settings in different environments, i.e. home, office, or the coffee shop. Every session uses a profile (even if it's the Default profile). To Create a new profile, just click the “**Create...**” button.

**Profile Name:** Create a profile name of your choice.

**Network SSID:** Specify which Network name to connect to (Default: ANY)

**Wireless Mode:** The type of radio mode (802.11b or 802.11g) to be used. (Default is Auto Detect)

**Network Type:** Specify whether to connect to Ad-Hoc or Infrastructure mode (Default: Infrastructure).

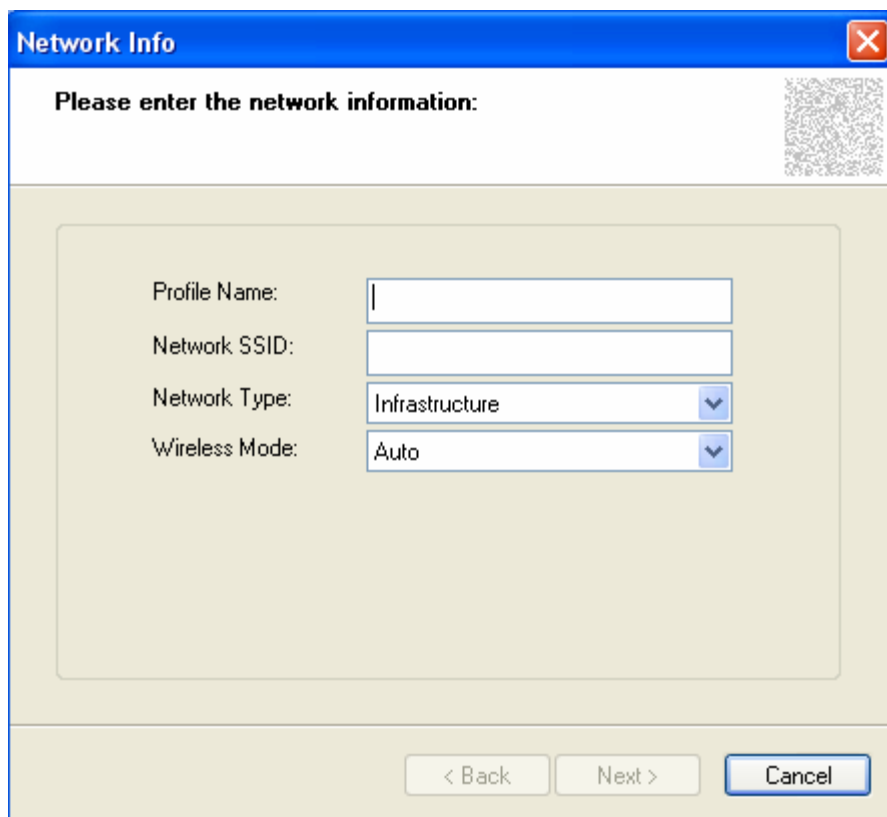
**SmartSetup 3 (Button):** Use SmartSetup 3 to instantly create a WPA-PSK encrypted connection with a new GIGABYTE AP or Wireless Router.

To proceed with New Profile Configuration, click **Create...**

### Step 1: Network Info

### Network Info Screen

Create a Profile Name, Network SSID Name, and select Network Type & Wireless Mode to use for this profile. (see **Figure 3-3**)



**Figure 3-3.** Network Info

**Profile Name:** Create a name for your new profile, a useful name is one that is both descriptive and short.

**Network SSID:** Define which Network SSID your profile will connect to. Note, SSID Names are case sensitive, the name must match exactly or your profile won't associate. Default is BLANK (associate with any SSID).

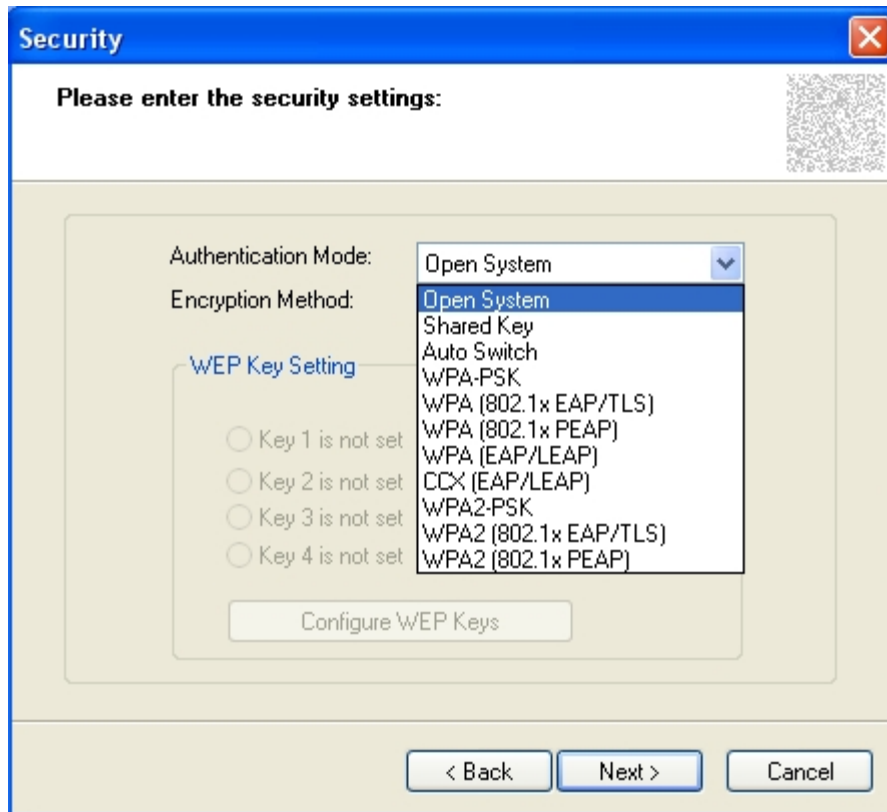
**Network Type:** Users can select from Infrastructure (Default) or Ad-Hoc (Point-to-Point only access).

**Wireless Mode:** Auto (Default) will accept traffic from both 1b and 11g Access Points, while 802.11b Only, will accept only 11b traffic.

## Step 2: Establish Security

### Security Screen

Select which security mode you wish to use for this profile. (see **Figure 3-3**)



**Figure 3-4.** Security

Description of items in **Figure 3-3** is as follows:

**Authentication Mode:** Users can select from a range of different security modes. (Default: Open System).

**Encryption Method:** Select from the drop down box the desired encryption method.

Shared Key - This is when both the sender and recipient share a secret key.

Auto Switch -

WPA-PSK - A user sets a static key or "Passphrase" as with WEP. But WPA-PSK automatically changes the keys at a preset time interval, making it much more difficult for hackers to find and exploit them.

WPA (802.1x EAP/TLS) & WPA (802.1x PEAP) - authentication processes derive mutually-determined unicast encryption keys. EAP-TLS or PEAP authentication provides secure wireless networking in a Windows environment.

WPA (EAP/LEAP) – Similar to PEAP, it is a proprietary protocol which was developed by Cisco.

CCX (EAP/LEAP) – Another Cisco proprietary standard, using Cisco extensions similar to WPA.

### WEP Key Setting

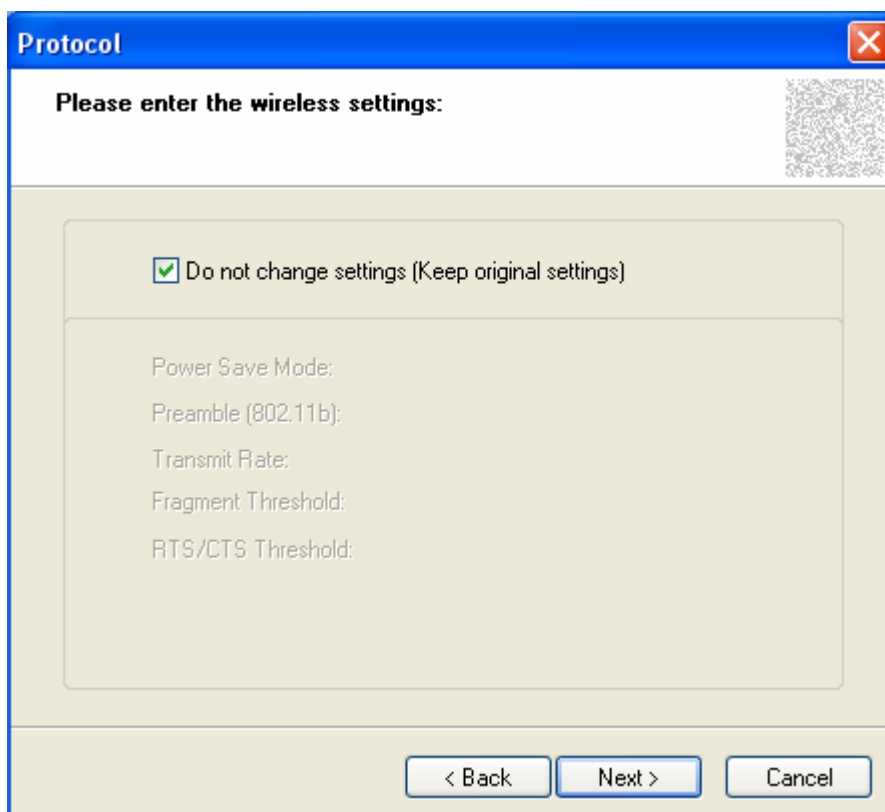
When enabling WEP type encryption, up to 4 WEP Keys may be configured. Click

on “Configure WEP Keys” and select either ASCII or HEX based keys.

Click **Next >** to proceed with Profile Configuration.

### Step 3: Set Wireless Protocol Settings

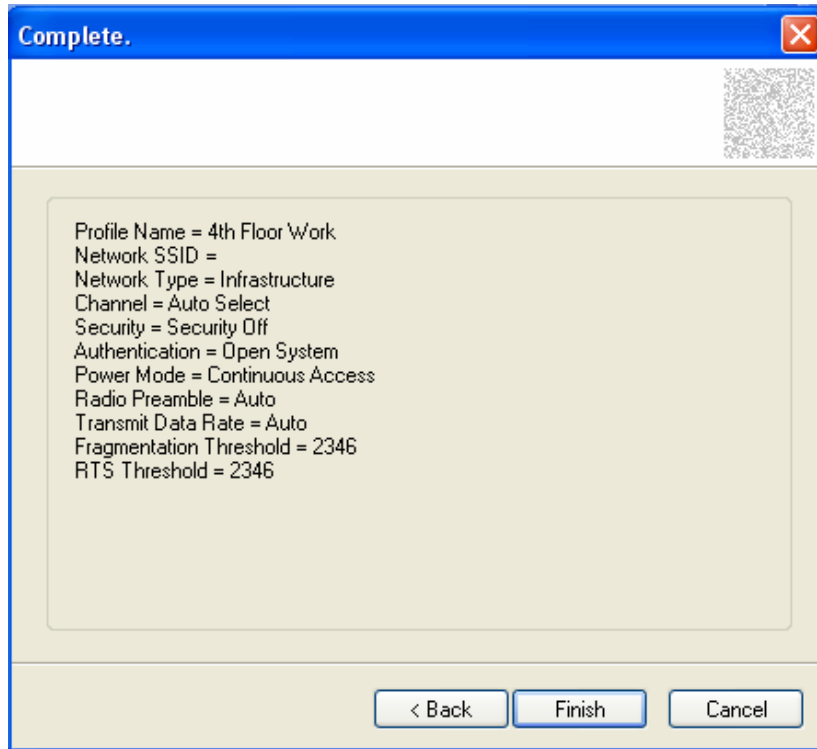
#### Wireless Protocol Screen



**Figure 3-5** – Protocol Screen

**Do Not Change settings (Keep original settings):** Leave this checked to keep default settings in place (recommended) for Power save, Preamble, Transmit Rate, Fragment Threshold, and RTS/CTS Threshold. Or, if you wish, uncheck this option so as to manually configure these settings.

Click **Next >** to Complete New Profile Configuration.



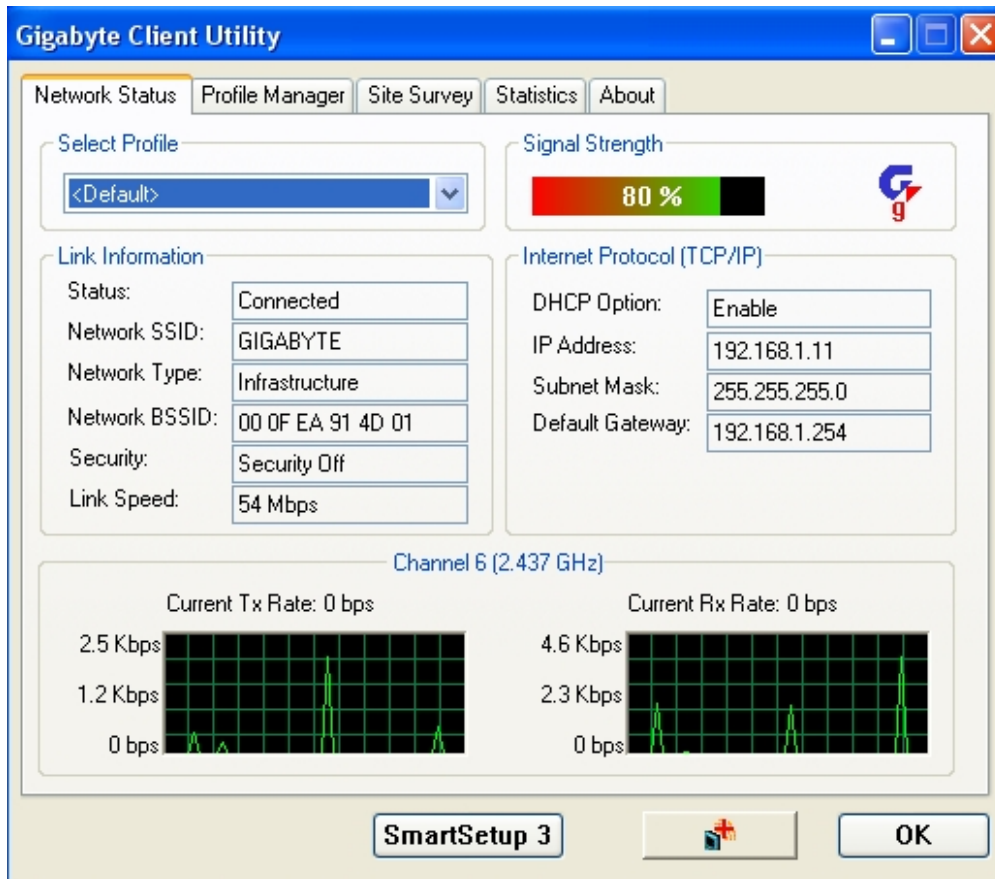
**Figure 3-6.** New Profile Complete – Summary Screen

The wireless settings for this profile will be summarized on the Complete screen. Click **Finish** to complete new profile configuration.

## 3.2. Network Status Tab

The **Network Status** tab displays the current association information about the Adapter connection with a wireless network. (see **Figure 3-9**)





**Figure 3-7.** Network Status

Description of items in **Figure 3-9** is as follows:

### Select Profile

Shows the current connection profiles. New profiles can be loaded by simply selecting them from this drop-down list. Remember, every connection uses a Profile, even if it's the <Default> profile.

### Signal Strength

The relative strength of the adapter's association with the Router or Access Point.

### Link Information

**Link Status:** The current connection status, you'll either be connected or not-connected.

**Network SSID:** Also known as Network Name. The network which your adapter is associated with.

**Network Type:** Either Infrastructure or Ad-Hoc modes are possible.

**Network BSSID:** This is the MAC address of your WPMG PCI adapter.

**Security:** The current security mode being used.

**Link Speed:** Transmission rate (transferring and receiving) at which data is transferred between Stations with Adapter and AP. **Note that in Ad-Hoc mode, only 11Mbps is possible.**

### Internet Protocol (TCP/IP)

**DHCP Option:** Display if DHCP (automatic assignment of client IP address) is enabled (or disabled) for the current profile.

**IP Address:** The current IP Address of the WPMG network adapter.

**Subnet Mask:** The IP Subnet which the WPMG network adapter belongs to.

**Default Gateway:** The IP Address of the network gateway. Also known as the IP address of your wireless Router.

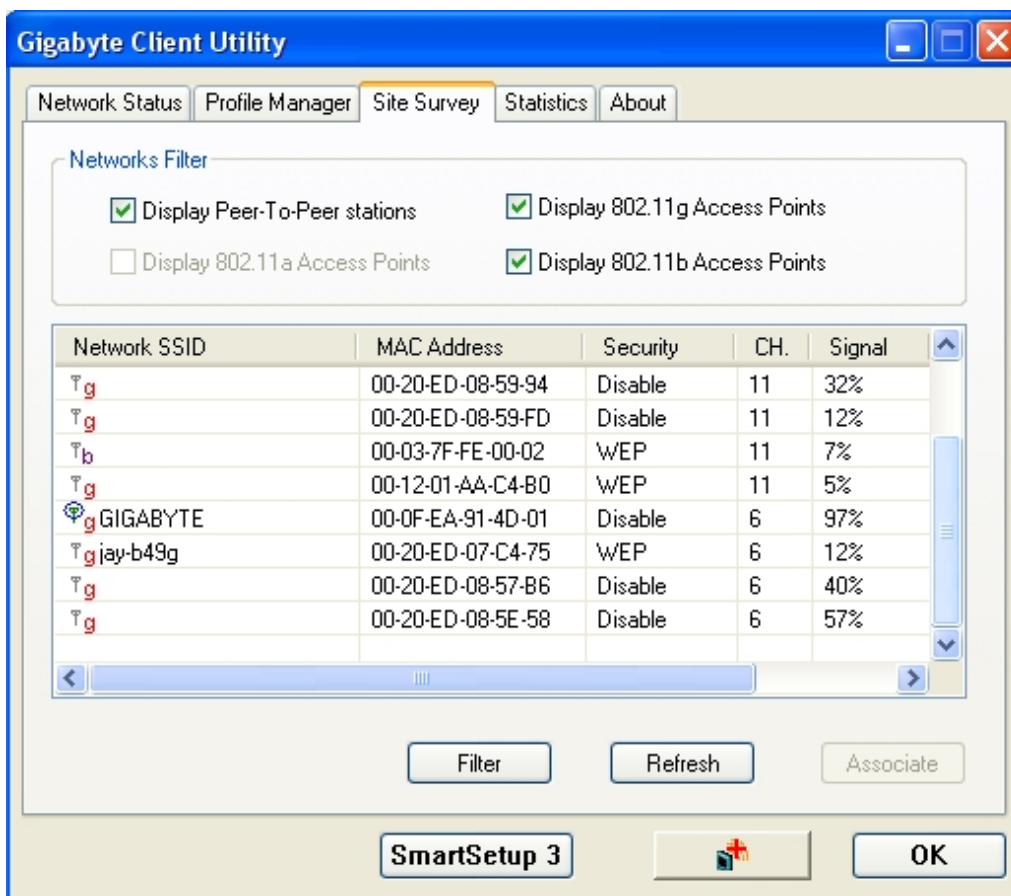
### Channel Throughput Window

Displays transmit & receive throughput as a function of time.

**SmartSetup 3 (Button):** Use SmartSetup 3 to instantly create a WPA-PSK encrypted connection with a new GIGABYTE AP or Wireless Router.

## 3.3. Site Survey Tab

The **Site Survey** tab shows you the list of reachable access points and/or peer-to-peer Stations. Just double click on the SSID that you want to connect or click the **Associate** button. (see **Figure 3-9**)



**Figure 3-8.** Site Survey

Description of items in **Figure 3-10** is as follows:

## Network Filter

**Display Peer-To-Peer stations:** When Checked, only displays P2P configured Access Points.

**Display 802.11g Access Points:** When checked, only displays 11g Access Points or Routers (no 11b Access Points will be displayed).

**Display 802.11b Access Points:** When checked, only displays 11b Access Points or Routers (no 11g Access Points will be displayed).

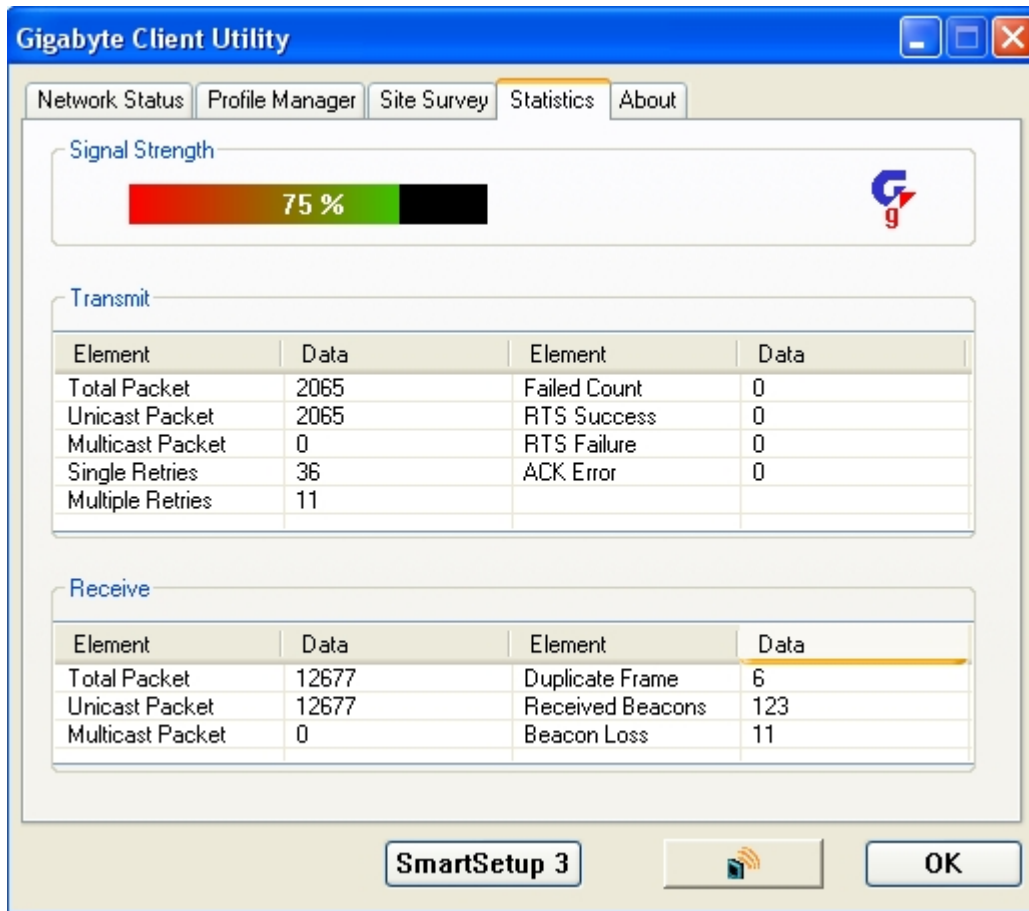
**Filter (Button):** Advanced filters based on SSID Name, MAC Addresses, and wireless channel.

**Refresh (Button):** Refresh the list of available access points.

**SmartSetup 3 (Button):** Use SmartSetup 3 to instantly create a WPA-PSK encrypted connection with a new GIGABYTE AP or Wireless Router.

### 3.4. Statistics Tab

The **Statistics** tab shows you the number of packets sent and received by the Adapter (see **Figure 3-11**)



**Figure 3-9.** Statistics

Description of items in **Figure 3-11** is as follows:

#### Signal Strength

The relative strength of the adapter's association with the Router or Access Point.

#### Transmit

**Total Packet:** Number of packets transmitted successfully.

**Unicast Packet:** Number of unicast packets transmitted successfully, excluding packets transmitted successfully with more than one retry.

**Multicast Packet:** Number of multicast packets transmitted successfully with more than one retry.

**Single Retries:** Number of frames failing to receive ACK after many retries.

**Multiple Retries:** Representing the number of transmits that required more than one retry.

**Failed count:** Representing the transmit excessive retries.

**RTS Success:** Representing the number of successful Ready To Send

**RST Failure:** Value representing the failed Ready To Send.

**ACK Error:** Representing the number of failed acknowledgements.

## Receive

**Total Packet:** Number of RTS frames successfully received CTS (Clear To Send) from AP.

**Unicast Packet:** Number of RTS frames fail to receive CTS from AP.

**Multicast Packet:** Number of frames received successfully.

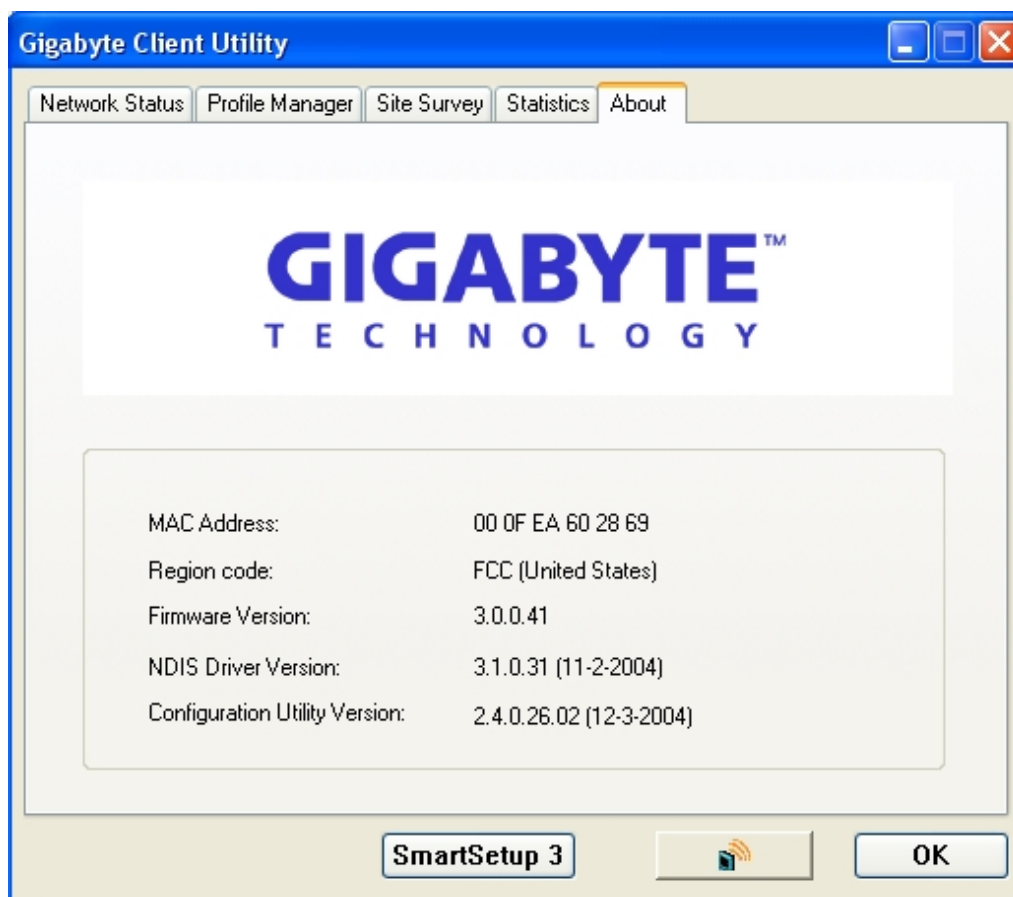
**Duplicate Frames:** Representing the duplicate frames received.

**Received Beacons:** The number of beacon packets received by the adapter.

**Beacons Lost:** The number of beacon packets lost.

## 3.5. About Tab

The **About** tab displays information about current drivers and physical MAC address (see **Figure 3-13**).



**Figure 3-10.** About Tab

**Region Code (Location)** – The region which the current firmware has been localized to.

**Firmware Version** - Hardware version number of the Adapter's EEPROM.

**MAC Address** – The hardware address of the Adapter.

**NDIS Driver Version** – The Adapter's network driver interface specification version.

**Configuration Utility Version** – The GIGABYTE configuration utility version number.

# Appendix A Troubleshooting

This troubleshooting guide provides answers to some common problems which you may encounter while installing or using GIGABYTE Wireless Adapters. Contact the GIGABYTE Wireless Technical Support Team at [www.giga-byte.com](http://www.giga-byte.com) if you encounter problems not mentioned in this section.

Problem: Cannot connect to an AP

Advice:

- Make sure the SSID for the Wireless PCI Adapter is the same as the Access Point.
- Make sure the security settings are the same as that of Access Point. When WEP or WPA encryption is enabled, check if the WEP or WPA keys for the PCI Adapter and AP are the same.
- Make sure if the MAC address of the Adapter is added in the AP Authorization Table.

Problem: Can connect to an AP but cannot connect to the Internet

Advice:

- Make sure the security settings are the same as that of Access Point. When WEP or WPA encryption is enabled, check if the WEP or WPA keys for the PCI Adapter and AP are the same.
- Make sure the network configuration (IP address, subnet mask, gateway, and DNS) of your computer are correct.
- Check the proxy server of the WEB browser is correctly set.

Problem: Poor link quality and signal strength

Advice:

- Keep the Adapter away from microwave ovens and large metal objects to avoid radio interference.
- Keep the distance between the Adapter and the AP as close as possible.

Please check [www.giga-byte.com](http://www.giga-byte.com) for more complete and up to date troubleshooting tips.

## Appendix B Specifications

<b>1. System</b>		
Host Interface	PCI (low profile) 1 bracket standard size	
Operating Voltages	3.3V+/- 5%	
<b>2. RF Performance</b>		
Frequency Bands	2412-2483.5MHz (subject to local regulations)	
Modulation Technology	OFDM and DSSS	
Modulation Techniques	64QAM, 16QAM, QPSK, BPSK, CCK, DQPSK, DBPSK	
Data Rates	54, 48, 36, 24, 18, 12, 9, 11, 6, 5.5, 2 and 1 Mbps, auto fallback	
Peak Output Power	Targeted at 20dBm @ Nominal Temp Range at antenna connector	
Receive sensitivity	Targeted at -72dBm @54Mbps; -86dBm@11Mbps	
Antenna	External antenna with the gain of 2dBi, L type	
<b>3. Safety Regulation and Operating Environment</b>		
EMC certification	FCC Part 15 (USA)	DGT (Taiwan)
	CE (Europe)	
Temperature Range	Operating: 0 ~ 55 deg C, Storing: -20 ~ 65 deg C	
Humidity	10% ~ 90% Non-condensing	
<b>4. Software Support</b>		
Driver	Windows 98SE/Me/2000/XP	
Security	WPA; AES; 802.1x; 64/128 bit WEP	
Roaming	Seamless roaming among 802.11b/g access points.	
Management Utility	Monitors the network situation.	
Software AP support	Yes	
<b>5. Mechanical</b>		
Dimensions	120mm*121mm*20mm (120mm*81mm*20mm)	
Weight	58.5(54.5)± 1 g	
Packaging	Color box with anti-static bag	
LED indicator	Act and Link	

\* Subject to change without notice.



# Appendix C

## Regulatory Information

**CE Mark Warning:** This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

**FCC 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 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 20cm between the radiator & your body. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

### Europe - Declaration of Conformity



This device is a 2.4 GHz low power RF device intended for home and office use in EU and EFTA member states. In some EU / EFTA member states some restrictions may apply. Please contact local spectrum management authorities for further details before putting this device into operation.

GIGA-BYTE Technology, Inc. declares that the product: **Wireless Broadband Router Model Number: GN-B49G** is in conformity with and in accordance with the European Directive of EMC, 89/336 EEC for the following sections:

EN 61000-3-2, EN 61000-3-3, EN 55024, and EN 55022 Disturbances and Immunities

GIGA-BYTE Technology, Inc. also declares the conformity of above mentioned product with the actual required safety standards in accordance with LVD Directive 73/23 EEC:

EN 60950 Safety

In accordance with R&TTE Directive 1995/5/EC, Part 17: Requirements for Operation in the European Community, GIGA-BYTE Technology, Inc declares the conformity of the above mentioned products for:

EN 300 328-2 V1.2.1, ETSI EN 300 328-1 : V1.3.1, EN 301 489-1, and EN 301 489-17 Technical Requirements for Radio Equipment

#### Countries of Operation and Conditions of Use in the European Community

The user should run the configuration utility program provided with this product to check the current channel of operation and confirm that the device is operating in conformance with the spectrum usage rules for European Community countries as described in this section. European standards dictate a maximum radiated transmit power of 100mW EIRP and a frequency range of 2.400 - 2.4835 Ghz.

#### Operation using 2.4 GHz Channels in France

2.4 GHz Bande: les canaux 10, 11, 12, 13 (2457, 2462, 2467, et 2472 MHz respectivement) sont complètement libres d'utilisation en France (en utilisation intérieur). Pour ce qui est des autres canaux, ils peuvent être soumis à autorisation selon le département. L'utilisation en extérieur est soumise à autorisation préalable et très restreinte. Vous pouvez contacter l'Autorité de Régulation des Télécommunications (<http://www.art-telecom.fr>) pour de plus amples renseignements.

Please check ART's web site for latest requirements for use of the 2.4GHz band in France: <http://www.art-telecom.fr/eng/index.htm>.

When operating in France, this device may be operated under the following conditions:

Indoors only, using any channel in the 2.4465-2.4835 GHz band.

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# Appendix D Warranty

## Limited Warranty Statement (1-Year Warranty)

Thank you for purchasing the GIGABYTE Product. This limited warranty statement will provide you one year warranty starting from the purchase date. Of which if any defect is occurred due to accidents or any man-made factors, or any unauthorized torn-off or damage to GIGABYTE's sticker on the product, GIGABYTE Technology will not provide after-sale services, such as:

- Products are damaged due to any violation of instructions on user manual.
- Hardware is damaged due to inappropriate assembling.
- Products are damaged due to the use of illegal accessory.
- Products are damaged due to parts disassembling without authorization.
- Products are damaged due to exceeding environment limits.
- Products are damaged due to unexpected external force.
- Products are damaged due to nature disasters.
- Products are copies or illegally smuggled goods.

PLEASE RECORD THE FOLLOWING INFORMATION REGARDING YOUR WARRANTY

<b>Name of Customer:</b>	
<b>Phone No:</b>	
<b>Address:</b>	
<b>Email:</b>	
<b>Model:</b>	
<b>Serial:</b>	
<b>Date of Purchase:</b>	
<b>Place of Purchase:</b>	
<b>From Whom:</b>	
<b>Distributor:</b>	

### Customer Service

GIGA-BYTE TECHNOLOGY CO., LTD.

No.6, Bau Chiang Road, Hsin-Tien,  
Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-8665-2665 Fax:886-2-89124007

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

Technical Support

E-mail: [networksupport@GIGABYTE.com.tw](mailto:networksupport@GIGABYTE.com.tw)

## FCC Caution:

1. 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.
2. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.
3. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.