

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	the card has an
		association	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".

Add New Hardware Wiz	ard
	This wizard searches for new drivers for: PCI Network Controller A device driver is a software program that makes a hardware device work.
	< <u>B</u> ack Next > Cancel

Step 4: Click "Search for the best driver for your device" and Click "Next".

	 What do you want Windows to do? Search for the best driver for your device. (Recommended). Display a list of all the drivers in a specific location, so you can select the driver you want. 		
	< <u>B</u> ack Next > Cancel		

Win 98 ES

Add New Hardware Wizard			
	 Windows has found the following new hardware: PCI Network Controller Windows can automatically search for and install software that supports your hardware. If your hardware came with installation media, insert it now and click Next. What would you like to do? Automatic search for a better driver (Recommended) Specify the location of the driver (Advanced) 		
< <u>B</u> ack Next > Cancel			

Win ME

Step 5: Click "Specify a location", Click "CD-ROM:\Driver\win9xme"and Click "Next".
Add New Hardware Wizard

	Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected locations. Click Next to start the search. Eloppy disk drives CD-ROM drive Microsoft Windows Update Specify a location: E:\Driver\win9xme Browse
	< <u>Back</u> Next > Cancel Win 98 ES
Add New Hardware Wiz	Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected Image: Search for the best driver for your device. (Recommended). Image: Removable Media (Floppy, CD-ROM) Image: Specify a Jocation: E:\Driver\win9xme Image: Display a list of all the drivers in a specific location, so you can select the driver you want.
	< <u>B</u> ack Next > Cancel

Win ME

Step 6: Click "Next".

Add New Hardware Wizard			
	Windows driver file search for the device: Gigabyte GN-WMKG Cardbus WLAN Adapter		
	Windows is now ready to install the best driver for this device. Click Back to select a different driver, or click Next to continue. Location of driver: E:\DRIVER\WIN9XME\GNWMKG.INF		
	< <u>B</u> ack Next > Cancel		

Step 7: Click "Finish".

Add New Hardware Wizard			
	Gigabyte WMKG Cardbus WLAN Card		
	Windows has finished installing the software that your new hardware device requires.		
	< <u>B</u> ack Finish Cancel		

Step 8: Click "No".

System S	Settings Change 🛛 🕅
?	To finish setting up your new hardware, you must restart your computer. Do you want to restart your computer now?
	Yes <u>No</u>

Step 9: Click "Install Wireless LAN Driver".



Step 10: Click "Next".



Step 11: Click "Next"

nstallShield Wizard		×
Check Setup Information		4
Setup has enough information to begin the fill If you want to review or change any of the set If you are satisfied with the settings, click Nex	le-transter operation. tlings. click Back. ¢ to begin copying files.	
Current Settings:		
Setup Type: Win98		×.
orden senter de	< Back Next >	Cancel

Win 98 ES

InstallShield Wizard	×
Check Setup Information	
Setup has enough information to begin the file-transfer operation. If you want to review or change any of the settings, click Back. If you are satisfied with the settings, click Next to begin copying files.	
Current Settings:	
Setup Type: WinME	× ×
InstallShield <u>ABack</u>	Cancel







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".

InstallShield Wizard	The second s	×
Check Setup Information		
Setup has enough information to begin t if you want to review or change any of th if you are satisfied with the settings, click	the file-transfer operation. e settings, click Back. < Next to begin copying tiles.	
Current Settings		
Setup Type Win2K		×.
1		ت ک
andoration and a second se	< Back Next >	Cancel

Win 2000

InstallShield Wizard	
Check Setup Information	
Setup has enough information to begin the file- If you want to review or change any of the setti If you are satisfied with the settings, click Next	ransfer operation. ngs, click Back. o begin copying files.
Current Settings:	
Setup Type: WinXP	
InstallShield	
n istano neito.	< Back Next > Cancel

Win XP

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

Digital Signature Not Four	nd X
	The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested. The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows. Unknown software package If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
	Yes No More Info
	Win 2K
Software Installation	
The software testing to veri this testing is Continuing or destabili either imme recommend contact the passed Wir	you are installing has not passed Windows Logo fy its compatibility with Windows XP. (<u>Tell me why</u> <u>important.</u>) your installation of this software may impair ze the correct operation of your system diately or in the future. Microsoft strongly is that you stop this installation now and a software vendor for software that has adows Logo testing.
	Continue Anyway STOP Installation

Win XP

Step 7: Click "Finish".



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

Step 9: Click "OK" and Rebooted you computer.

Digital Sigr	nature Not Found	×				
	 The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested. The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows. Gigabyte WMKG Cardbus WLAN Card If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available. 					
	Do you want to continue the installation?	_				
Yes No More Info						
Win 2K						
Har dwar	e Installation					
Image: A series of the software						
	Continue Anyway STOP Installation					

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.



You can open the utility by double-clicking on this icon. Or through **Start**, **Programs**, **GIGABYTE**

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*).

rofile	SSID	Channel	Authentication	Encryptica	Network Type
PROF1	ap15ag_11g_Vikin	Auto	Open System	Not Use	Infrastructure
PROF2	apllg	Auto	Open System	Not Use	Infrastructure
					I N
			1 PRIT	1	LOTIVATE .

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. **1**: Use Profile, **1**: 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*)

Profile Name [PKOP1 SSID] System Configuration Authentication & Secur Power Saving Mode © CAM (Coastantly Awake Mode) © Power Saving Mode	
Vystem Configuration Authentication & Secur Power Saving Mode © CAM (Constantly Awake Mode) © CAM (Constantly Awake Mode)	
Power Saving Mode CAM (Coastantly Awake Mode) C Power Saving Mode	
CAM (Constantly Awake Mode) C Power Saving Mode	
Network Type	
11B Presmble Type Auto	
C RTS Threshold 0 2312 2312	
755	
Fragment Threshold	
CANCEL	

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*)

Tollie Ivame Prov	41	SSID	-
rstem Configuration	Authentication & Securi	Ū.	
Authentication Typ	pe: Shared	Encryption Type: WEP	
WPA Pre-Shared I	Key:		
WEP Kay			
@ Key#1	Hexadecimal		
€ Key#2	Hexadecinal		
C Kevel3	Hexadecimal		

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).

Authentication Ty	pe:	WPA-P	SK	٣	Encryption	Type:	TKIP	•
WPA Pre-Shared	Key:		_	_	_	_		
WEP Key-								2
@ Loyf1	Heradecu	Ial	¥					
C Key#2	Hexadecia	lai	*					
€ Key≠3	Hexadeca	lan	Ψ.					
C Key#1	Horadecir	Ial	-	-				

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. Curre	ent link status of the wireless LAN card
GN-WMKG Configuration Utility	×
Profile Link Status Site Survey St	atistics Advance About
Status :	ap15ag_11g_Vikin <> 00-0D-61-41-A4-35
Current Channel :	11 <> 2462000 KHz
Current Tx Rate :	54 Mbps
Throughput (KBits/sec) :	Tx 0.0 Rx 5.9
Link Quality :	Good 96%
Signal Strength :	Good 100% F dBm format
	確定

. . _--

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.

SID	BSSID	Signal	Ch	Encryp	Authenti	Network Type
ap15ag_11g_Vikin	00-20-ED-49-BP-05 00-0D-61-41-A4-35	100%	11	Not Use	Unknown	Infrastructure

Eigure 2.7 Deschable access points and/or poor to poor 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*).

Profile Link Status Site Survey Statistics Advance About	1	
Transmit Statistics		
Frames Transmitted Successfully	=	151
Frames Transmitted Successfully Without Retry	=	136
Frames Transmitted Successfully After Retry(s)	=	15
Frames Fail To Receive ACK After All Retries	=	8
RTS Frames Successfully Receive CTS	=	0
RTS Frames Fail To Receive CTS	=	0
Receive Statistics		
Frames Received Successfully	-	0
Frames Received With CRC Error	=	80740
Frames Dropped Due To Out-of-Resource	-	0
Duplicate Frames Received	=	14
		RESET COUNTERS
		確定

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 c	onfiguration scr	een
GN-WMKG Configuration Utility		×
Profile Link Status Site Survey Statistics Advance	About	
Wireless Mode 802.11 B/G mixed mode	•	
Enable TX Burst	11B/G Protection	Auto
☐ Ad Hoc mode use OFDM rate	TX Rate	Auto
\blacksquare Use Turbo rate (72/103Mbps) when applicable		
Use Short Slot Time when applicable		
T RADIO OFF		APPLY
		確定

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

Figure 3-10. Advance configuration screen

GN-WMKG Configuration Utility		×
Profile Link Status Site Survey Statistics Advance A	About	
Wireless Mode 802.11 B/G mixed mode	•	
□ Enable TX Burst	11B/G Protection	Auto
T Ad Hoc mode use OFDM rate	TX Rate	Auto
Use Turbo rate (72/100Mbps) when applicable		
Use Short Slot Time when applicable		
T BADIO OFF		APPLY
		確定

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).

G,				
CopyRight				- 12
(c) Copyright 2004, (Jigabyte Technology,	Inc. All right	s reserved.	
Configuration Utility				
Version : 1.5.2.0):	Date :	02-24-2004	
NJC Driver		243		
Version : 2.1.5.0)	Date :	02-11-2004	
Mac Address				
Phy_Address: 00	20-ED-49-C0-B2			

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±1g				
Packaging	Packaging specially used by Gigabyte.				
LED indicators	Link, Power				

Subject to Change without Notices