

GIGABYTE

T E C H N O L O G Y



108 Mbps High-speed Wireless Broadband Router GN-B49G

User's Guide

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Contents

Chapter 1 Getting To Know Your B49G	1
Overview.....	1
Package Contents	1
Side Panel	2
LEDs	3
Key Features	3
Chapter 2 Wireless Networking.....	5
Chapter 3 Before You Start	6
What You Will Need	6
Chapter 4 Connecting the B49G.....	7
Overview.....	7
Using a Wired Connection.....	7
Using a Wireless Connection.....	8
Chapter 5 Connecting the Router to the Internet	9
Overview.....	9
Logging into the GN-B49G	9
Chapter 6 Advanced Setup.....	13
Overview.....	13
The Status Page.....	13
The Network Configuration Screen	20
The Wireless Configuration Screen	28
The Static Routing Table Screen	35
The Virtual Server Screen.....	36
The Firewall Rule Screen.....	39
The DNS Configuration Screen.....	43

The URL Blocking Configuration Screen.....	44
Chapter 7 Using Management Tools.....	45
Overview.....	45
The PPP Monitor Screen.....	45
The Reboot Screen.....	45
The Initialization Screen	46
The Change Password Screen.....	46
The Change WAN MAC Screen	47
The Upgrade Firmware Screen	48
The Backup / Restore Screen.....	48
The Log Information Screen.....	49
The Save Maintenance Screen.....	50
The Ping Screen	51
The Help Screen	51
The About Screen.....	52
Appendix A FAQ.....	53
Appendix B Using Setup Wizard.....	55
Appendix C Configuring TCP/IP Settings.....	62
Appendix D Troubleshooting	65
Appendix E Glossary	69
Appendix F Specifications.....	72
Appendix G Warranty.....	73
Appendix H Regulatory Information	74
Appendix I General Public License.....	76

Chapter 1

Getting To Know Your B49G

Overview

Thank you for purchasing the GN-B49G High-Speed Wireless Router. Providing transmission speeds of up to 108Mbps, the GN-B49G allows users to share network resources, retrieve emails, download large files, conduct a video conference, and distribute or display digital photos, videos or MP3 files. The B49G is the ideal networking device for you to share a broadband connection in your home or office. The GN-B49G gives you a simple, cost-effective wireless networking solution.

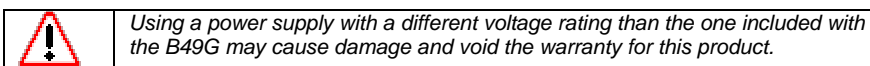
The B49G offers the newest, strongest, most advanced security features available today. Unlike most other wireless routers, the B49G offers advanced features such as SmartDHCP (the ability to assign IP addresses to other network devices while still using DHCP), a user editable routing table, Dynamic DNS mapping (allowing you to host a website on your dynamic DSL account), and more. Advanced security features such as WPA (Wi-Fi Protected Access) and 802.1x safeguard your privacy on-line, while URL blocking keeps kids safe from explicit websites.

Like all 802.11g wireless products, the B49G is fully backwards compatible with 802.11b products. This means that you don't need to change your entire network to maintain connectivity.

Package Contents

- GN-B49G High-Speed 2.4GHz Wireless Broadband Router
- Power adapter (5V DC, 2.0A)
- Vertical Stand
- User Guide on CD-ROM
- Quick Start Guide
- SmartSetup 3 Guide
- Ethernet cable – All of the B49G Ethernet ports are Auto-MDIX

If there are any missing or damaged parts, please contact your local distributor or dealer immediately.



Side Panel

The side panel of the GN-B49G High-speed Wireless Broadband Router contains all the Router's ports as well as the DC power port and initialization button.

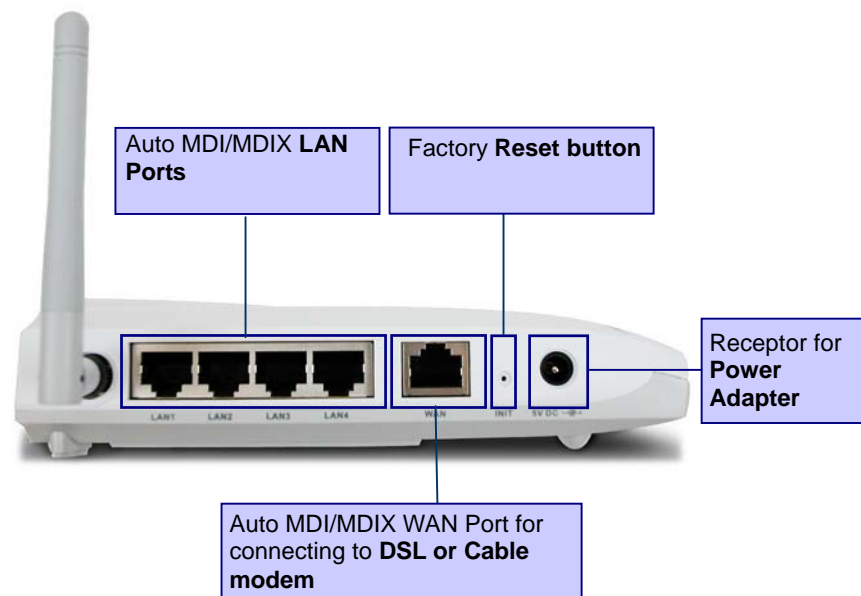


Figure 1: Router's Side Panel

- | | |
|----------------------|---|
| Reset Button | There are two ways to reset the Router's factory defaults. Either press the Reset Button, for approximately five seconds, or restore the defaults from the Management Tools>Router Initialization screen in Router's Web-based Utility. |
| WAN | The WAN port is where you will connect your broadband Internet connection. |
| LAN1, 2, 3, 4 | These ports (1, 2, 3, 4) connect the Router to PCs on your wired network and other Ethernet network devices. |
| Power | The Power port is where you will connect the power adapter. |

LEDs

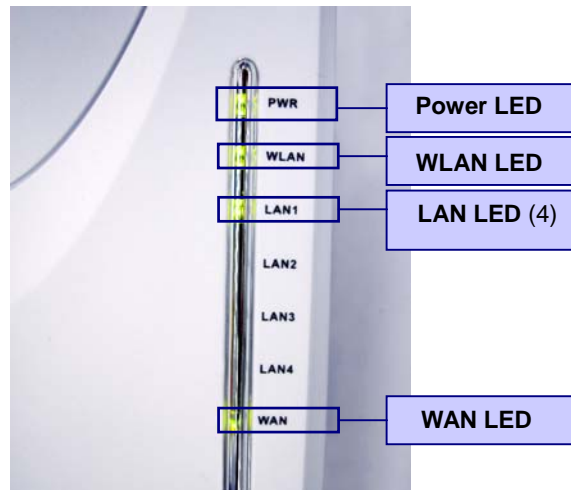


Figure 2: LED Layout

The table below describes the LED indicators on the front panel of the GN-B49G. All LEDs are green when lit.

LED	STATUS	DESCRIPTION
Power	Green	Power is supplied to the Router
	Off	Power is NOT supplied to the Router
WLAN	Flashing	Data is being transmitted wirelessly
WAN	On	WAN port has detected a wired link with a DSL or Cable modem.
	Flashing	Data is being transmitted / received through WAN port.
LAN	On	LAN port has detected a link with a 10/100Mbps device
	Flashing	Data is being transmitted / received through LAN port.

Key Features

- Conforms to IEEE 802.11g specification.
- Wireless transmits data rate up to the maximum speed of 108Mbps*.
- Supports 64-bit /128-bit/152-bit WEP encryption, 802.1x, and WPA™.

GN-B49G High-Speed Wireless Broadband Router

- Supports PPPoE and PPPoE Unnumbered DSL connection
- Supports up to 4 WAN configuration records
- Supports DHCP client for cable/DSL connection
- SmartDHCP server for combination static and dynamic style
- Supports UPnP IGD 1.0
- Supports MSN messenger and most Internet applications
- Supports Advanced Firewall Features
- Supports Virtual Server and DMZ
- Supports Stateful Packet Inspection (SPI) and DoS Protection
- Supports Stealth Mode
- VPN Packets Pass Through (Support PPTP/IPSec/L2TP Protocol)
- Log Management (Support Firewall/UPnP/WAN Connection Log)
- Supports WAN side Remote Management
- DNS Relay and Dynamic DNS
- Supports URL Blocking

*Theoretical throughput

Chapter 2

Wireless Networking

A wireless local area network (or Wi-Fi for short) is exactly like a regular local area network (LAN), except that each computer in the wireless network uses a wireless device to connect to the network. Computers in a wireless network share the same frequency channel and SSID, which is an identification name shared by the wireless devices belonging to the same wireless network.

The Router transmits data to PCs equipped with wireless network adapters, which can roam within a certain radial range of the Router. You can arrange the Router and multiple access points to work in succession to extend the roaming range, and you can set up your wireless network to communicate with your Ethernet hardware as well. The big advantage of Wi-Fi is its simplicity. You can connect computers anywhere in your home or office without the need for wires. The computers connect to the network using radio signals, and computers can be up to 100 feet or so apart.

Wireless Network Layout

The B49G High-speed wireless Router has been specifically designed for use with both your 802.11b and 802.11g products, and retains full backward compatibility. After you have finished setting up your GN-B49G High-speed Wireless Router, your home network will be similar to the diagram shown at the right.

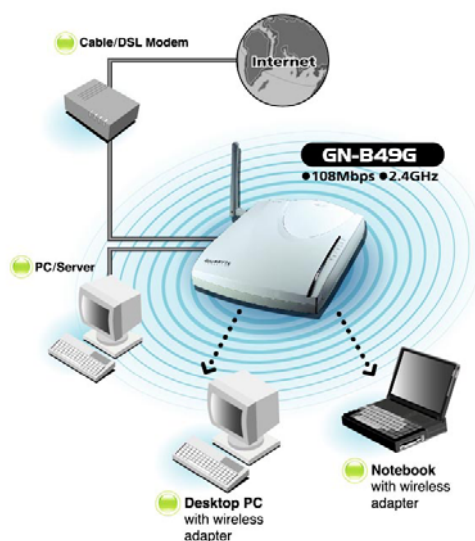


Figure 3: Typical Home Wireless Network

Chapter 3

Before You Start

What You Will Need

Internet

You will need to have an active Internet account, supplied through either ADSL or cable Modem, and your ISP user account and password information. (Your ISP can supply you with this)

Hardware Requirements

A minimum of one PC with an installed Ethernet NIC (network interface card). (If you have a DSL or Cable modem broadband connection to the Internet, you should already have this). If you wish to connect wirelessly to your B49G from a laptop, a wireless network PCMCIA notebook card is needed, and this manual assumes it is already properly installed.

System Requirements

The B49G will work with Windows, Macintosh or Linux Operating System. You just need a HTTP standard JavaScript-enabled browser, for example, Microsoft Internet Explorer or Netscape Navigator 4.0 or above.

ISP Configuration Information

Depending on the type of ISP connection you have, you may need one or more of the following configuration parameters.

- ✓ ISP User ID and Password
- ✓ ISP Domain Name Server (DNS)
- ✓ Fixed IP address or Static IP address
- ✓ Subnet Mask
- ✓ Default Gateway
- ✓ Host and Domain Names

If you are unsure of any of these settings, contact your ISP customer service.

Chapter 4

Connecting the B49G

Overview

You can connect to, and configure the B49G using either a wireless connection (via notebook PC) or using a wired connection to your desktop PC. It is **HIGHLY** recommended for the first time setup that configuration be done using a wired connection to your desktop PC as shown in the figure below.

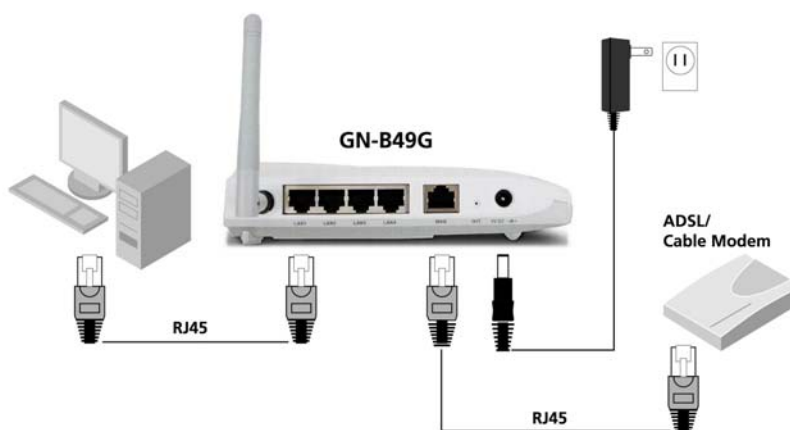


Figure 4: Wired Connection Diagram

Using a Wired Connection

It is suggested for first time setup your Router that you used the wired connection method. It is simpler, and eliminates the possibility of error due to improperly setup wireless connection.

- Step 1 Turn off all the hardware devices in your network, including the ADSL/Cable modem by unplugging their power supply.
- Step 2 Connect the Ethernet cable of your ADSL/Cable modem to the WAN port of the GN-B49G.
- Step 3 Connect one end of an Ethernet cable (provided) to a LAN port in the

GN-B49G High-Speed Wireless Broadband Router

side panel of the GN-B49G and the other end to the 10/100 Ethernet port of your computer. (It does not matter which LAN port you select).

- Step 4 Plug the power adapter cord into the router's power jack and then plug the power adapter into a power outlet.
- Step 5 Turn on your ADSL/Cable modem. After verifying all the connections, proceed to **Chapter 5 Connecting the Router to the Internet**.

Using a Wireless Connection

- Step 1 Turn off all the hardware devices in your network, including the ADSL/Cable modem by unplugging their power supply.
- Step 2 Connect the Ethernet cable of your ADSL/Cable modem to the WAN port of the GN-B49G.
- Step 3 Plug the power adapter cord into the router's power jack and then plug the power adapter into a power outlet.
- Step 4 Turn on your ADSL/Cable modem.
- Step 4 Insert your PCMCIA notebook card, or wireless USB adapter into your notebook PC.
- Step 5 If using a GIGABYTE PCMCIA notebook card, SmartSetup 3 will automatically detect your B49G and walk you through the setup procedure (for more details refer to your SmartSetup 3 Guide). Please refer to your vendor's users manual for connecting to the wireless network.
- Step 6 When scanning for available wireless networks, your B49G's factory default SSID name is **GIGABYTE**. Select it using the procedures described in your particular vendor's notebook adapter users manual.
- Step 7 After verifying all the connections, proceed to **Chapter 5 Connecting the Router to the Internet**.

Chapter 5

Connecting the Router to the Internet

Overview

The B49G High-speed wireless router is configured to work “out of the box”, and the default settings generally do not require any modification. However, for initial setup, you must log into the router and key in your Internet Service Provider (ISP) settings. This only needs to be done once. Your ISP customer service desk can provide you with the all the information you will need.

This chapter includes two sets of instructions. First, by using SmartSetup to configure ISP settings in your Router, and then by using Setup Wizard to for users who wish to take more control over the ISP settings

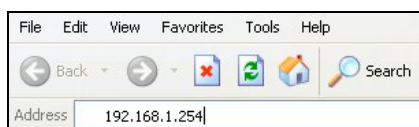
Logging into the GN-B49G



SmartSetup 3 is the quickest way to securing your wireless network with WPA-PSK, and then controlling your Wi-Fi network with its powerful and intuitive G-EZlink utility. **Please refer to your SmartSetup 3 Guide for more information.**

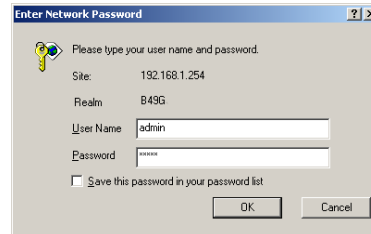
To login to your B49G follow the steps described below:

- A. In the address bar of your browser, type “**192.168.1.254**” and then press the **ENTER** key.



- B. When the password page appears; use **admin** as both the default User Name and default Password. Then click the **OK** button.

GN-B49G High-Speed Wireless Broadband Router

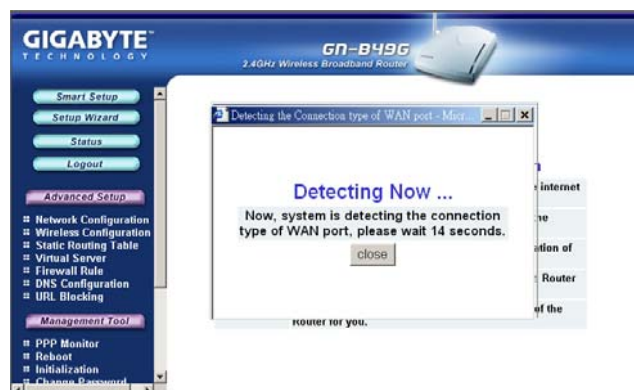



A dialog box titled "Enter Network Password" with a key icon. It prompts the user to enter their username and password. The fields are: Site (192.168.1.254), Realm (B49G), User Name (admin), and Password (masked with asterisks). There is a checkbox for "Save this password in your password list" and "OK" and "Cancel" buttons.

- C. You are now connected to the Router and SmartSetup will detect your ISP type. If you do not see the menu shown below, click the Smart Setup button in the upper left of the main menu.

After SmartSetup detects your Internet connection, it will report the connection it finds. The possible options are:

- PPPoE
- Dynamic IP
- Static IP



-  If your connection is not detected automatically, simply press the "Smart Setup" button on the menu panel to activate it.

PPPoE Internet Connection Type

If you have a **PPPoE** type connection, the following screen shown below will appear prompting you to enter the ISP User Name and Password.

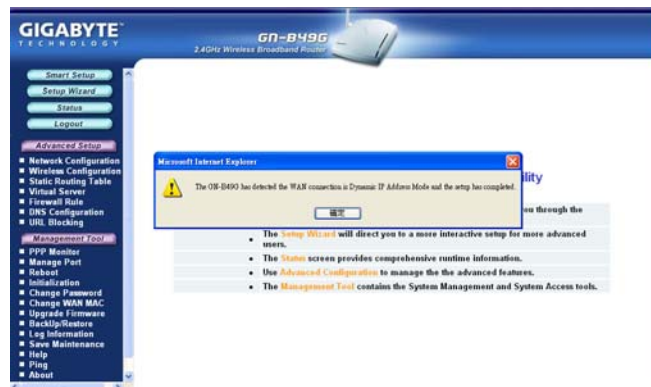
GN-B49G High-Speed Wireless Broadband Router



Note that you only have to enter the ISP information during initial setup only.

Dynamic IP Internet Connection Type

If you are connecting through a **Dynamic IP** address, no ISP login information is required. Just click the **OK** to allow the router to save the Dynamic IP settings and the Router will reboot, bringing you to the Utility Main Page.



Static IP Internet Connection Type

If you have a **Static IP** address, the following screen show below will appear prompting you to enter your WAN IP address, WAN subnet mask, WAN gateway, and DSN information. This information is provided by your ISP.

GN-B49G High-Speed Wireless Broadband Router



- D. After signing in to your ISP, the router will restart and the web based configuration utility will restart again automatically. You will be presented with the GIGABYTE Wireless Router Main Page shown below.



Your B49G High-speed wireless router is now fully installed, and you are able to wirelessly share network resources, retrieve emails, download large files, conduct a video conference, and distribute or display digital photos, videos or MP3 files.

Chapter 6 Advanced Setup

Overview

This chapter explains the Advanced Setup options available for the B49G. The Advanced Setup Screens offer LAN and WLAN Network Configuration, Static Routing Table, Virtual Server, Firewall Rules, DNS Configuration, and URL Blocking. The Advanced Setup screens are available from the links on the Main menu.

The Status Page

On the **Status** page the router's current connection and configuration information is displayed for the following; LAN Ethernet, WAN Ethernet, ARP Table, DHCP Lease Table, Routing Table, UPnP Port Mapping Table.



LAN IP 1 Address Displays the primary IP address being used by the Local (LAN) port of the Router. The default is 192.168.1.254

LAN Netmask 1 Displays the IP Subnet Mask being used by the

GN-B49G High-Speed Wireless Broadband Router

	Local (LAN) port of the router. Default is 255.255.255.0
LAN IP 2 Address	Displays the alternate IP address being used by the Local (LAN) port of the Router
LAN Netmask 2	Displays the alternate IP Subnet Mask being used by the alternate Local (LAN) port of the router.
LAN DHCP Status	Identifies if the Router's built-in DHCP server is active for the LAN attached devices.
LAN DHCP Start IP	The starting IP number in the range possible IP addresses issued by the DHCP server
LAN DHCP End IP	The last IP number in the range possible IP addresses issued by the DHCP server
Session Name	Primary ISP session
ISP Number	The number of ISP accounts configured in the current session.
ISP Name	System assigned name given to the ISP

GN-B49G High-Speed Wireless Broadband Router

The LAN Ethernet Status Tab

On the LAN Ethernet Status the Router displays the Ethernet Status of the current LAN current connection.



MAC	This field displays the MAC address of the GN-B49G as seen on your wireless network.
MTU	This specifies the maximum size of the packet permitted for Internet transmission.
RX packets	The number of data packets received by the router.
TX packets	The number of data packets transmitted by the router.
RX bytes	The current bandwidth (receive) on the LAN port.
TX bytes	The current bandwidth (transmit on the LAN port.

ARP Table Tab

The **ARP Table** displays the associated MAC address and IP address pairs of your local network devices. In the example below, only the B49G Router is in the ARP Table.



DHCP Lease Table Tab

The DHCP server "leases" out address for specific times (Time To Live) to the various hosts. If a host does not use a given address for some period of time, that IP address can then be assigned to another machine. When assignments are made or changed, the DHCP server must update the information in the DNS server. The B49G DHCP Lease Table displays the associated IP/MAC assignment and Time To Lease.



IP Address	MAC Address	TTL
192.168.1.2	08:20:ed:01:9e:94	4 hours, 45 minutes, 0 seconds

IP Address DHCP assigned IP address on WLAN

MAC Address MAC address of the device with the assigned IP

TTL The time to live (TTL) in seconds that a resolver will use data received from a nameserver before it will ask for the same data again.

Routing Table Tab

To determine the best path to a distant network, the B49G uses RIP to always select the path that has the least number of hops. Each router that data must traverse is considered to be one hop. The routing table in a router using RIP contains an entry for every known destination network. The **Routing Table** displays the GN-B49G RIP routing details.

GN-B49G High-Speed Wireless Broadband Router

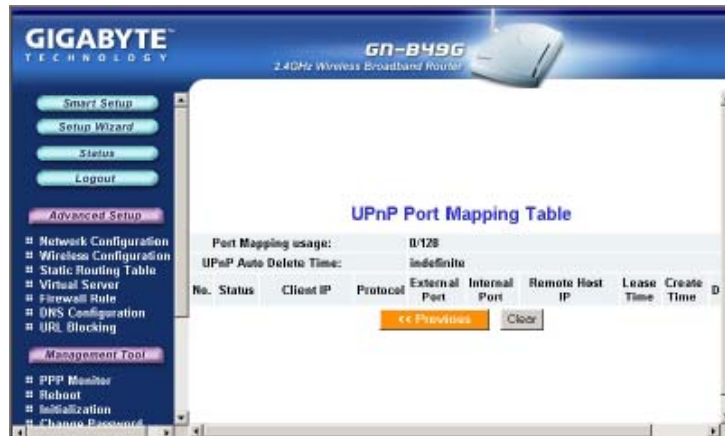


Destination	The IP address of the destination network address
Netmask	The subnet of that destination IP address
Gateway	Gateway of the destination IP address
Metric	Hop count to the destination network
Interface	Type of interface used

UPnP Port Mapping Table

The UPnP specification is based on TCP/IP and Internet protocols that let devices communicate with each other - UPnP technology doesn't rely on specific device drivers, using instead these standard protocols. UPnP devices can automatically configure network addressing, announce their presence on a network subnet, and permit the exchange of device and service descriptions. The **UPnP Port Mapping Table** displays the GN-B49G port mapping and UPnP packet request details.

GN-B49G High-Speed Wireless Broadband Router



No.	The event number
Status	Current status of the UPnP port (enable/disable)
Client IP	The IP address of the client utilizing the port
Protocol	IP protocol (UDP/TCP)
External Port	The external port mapping
Internal Port	The Internal port mapping
Remote Host IP	The IP of the remote host (if applicable)
Lease Time	Length of time the port may be utilized for UPnP
Create Time	Time the port was established for UPnP
Description	UPnP process

The Network Configuration Screen

The **Network Configuration** screen consists of three areas: **LAN Configuration**, **WAN Configuration** and **WAN settings**.

The LAN Configuration Tab

GIGABYTE TECHNOLOGY **GN-B49G** 2.4GHz Wireless Broadband Router

Smart Setup
Setup Wizard
Status
Logout
Advanced Setup

- Network Configuration
- Wireless Configuration
- Static Routing Table
- Virtual Server
- Firewall Rule
- DNS Configuration
- URL Blocking

Management Tool

- PPP Monitor
- Reboot
- Initialization
- Change Password

LAN Configuration

LAN IP Address	LAN Subnet Mask	DHCP Setup	Start Address	End Address
192.168.1.254	255.255.255.0	enable	192.168.1.2	192.168.1.254

Force IP-MAC Mapping

No.	Enable	IP	MAC
1	disable		
2	disable		
3	disable		
4	disable		
5	disable		

LAN Configuration

Allows you to modify the LAN parameters, and if you want to enable DHCP automatic IP address assignments, you can enable it here, and specify a Start and End address for the IP range.

Force IP-MAC Mapping

Allows you to manually assign a specific IP address to a specific network device (MAC address) on the network. This will be updated in the ARP table automatically.

The WAN Configuration Tab



The B49G has many advanced WAN configuration features. As a special redundant feature, you can configure up to 4 WAN connections and each may have its own connection type (PPPoE, PPPoE Unnumber, Dynamic IP address, Static IP address) and other properties. The device can automatically attempt to connect to these in order if your primary connection fails.

Click the **Edit** button to the right of the ISP that you wish to modify. A screen will appear allowing you to change the Internet connection type. (see below) Click the **Next** button to continue with modifications.



Depending on the WAN type you select, the corresponding WAN setup screen will appear next.

GN-B49G High-Speed Wireless Broadband Router

WAN Configuration Tab – Dynamic IP Address

The screenshot shows the Gigabyte GN-B49G 2.4GHz Wireless Broadband Router's web interface. The left sidebar contains navigation links: Smart Setup, Setup Wizard, Status, Logout, Advanced Setup, Network Configuration, Wireless Configuration, Static Routing Table, Virtual Server, Firewall Rule, DNS Configuration, URL Blocking, Management Tool, PPP Monitor, Reboot, Initialization, and Change Password. The main content area is titled 'Dynamic IP Address' and includes the following fields: ISP No: 1, ISP Name: SetupWizard, Host Name, Gateway, Manual DNS1, Manual DNS2, DNS Domain Name, MTU: 1500 (Bytes) (576 - 1500), NAT Setup: Disable, Enable, and UPnP/NAT (selected), and UPnP Delete time: Unlimited. At the bottom are buttons for << Previous, Finish, and Clear.

Your Internet Service Provider will supply you with the following account information you will need:

- **ISP Name**
- **Host Name**
- **Gateway**
- **DNS1 and DS2 Address**
- **DNS Domain Name**

Enter the information provided by your ISP in the spaces provided.

MTU (Maximum Transmission Unit)

The largest packet unit is sent from your computer to the network. Any message larger than MTU will be divided into smaller packets before being sent. You should keep the default setting (1500). Setting MTU size is largely a process of trial-and-error: If you suspect your MTU setting is causing a connection problem, start with the maximum value of 1500, and then reduce the size down to 1400 until the problem goes away.

NAT Setup

The Network Address Translation (NAT) is a standard that allows multiple computers on a private network to share a single IP address. Universal Plug and Play (UPnP) is a technology based on Internet standards and technologies, such as TCP/IP, HTTP, and XML, that allows devices on a network to automatically connect with other

GN-B49G High-Speed Wireless Broadband Router

devices.

UPnP Delete Time

Select the duration that UPnP will be active. Since allowing this may present a security risk, the default setting is 0.

- i** If the WAN IP address and LAN IP address obtained from DHCP server are from the same subnet, the LAN IP address will *automatically* change to another subnet and reboot the router.

PPPoE Tab

The screenshot displays the GIGABYTE GN-B49G 2.4GHz Wireless Broadband Router configuration interface. The main content area is titled "PPPoE" and contains the following fields and options:

- ISP No.: 1
- ISP Name: [Text Field]
- User ID: [Text Field]
- Password: [Text Field]
- Service Name: [Text Field]
- AC Name: [Text Field]
- Manual DNS1: [Text Field]
- Manual DNS2: [Text Field]
- DNS Domain Name: [Text Field]
- Authentication Type: ☒ Auto ☐ CHAP ☐ PAP
- Connection: ☒ Automatic ☐ Manual
- MTU: 1500 (bytes) [256 - 1500]

The left sidebar includes the following navigation options:

- Smart Setup
- Setup Wizard
- Status
- Logout
- Advanced Setup
 - Network Configuration
 - Wireless Configuration
 - Static Routing Table
 - Virtual Server
 - Firewall Rule
 - DNS Configuration
 - URL Blocking
- Management Tool
 - PPP Monitor
 - Reboot
 - Initialization
 - Channel Rescanned

Your Internet Service Provider will supply you with the following account information you will need:

- **ISP Name**
- **User ID/Password**
- **Service Name**
- **AC Name**
- **DNS1 and DNS2 Address**
- **DNS Domain Name**

Enter the information provided by your ISP in the fields provided.

Authentication Type

GN-B49G High-Speed Wireless Broadband Router

Select one of the following authentication settings: **Auto**, **CHAP** or **PAP**. The default setting is "**Auto**" (automatic authentication).

Challenge Handshake Authentication Protocol (CHAP) is the most common authentication method using PPP dialup method. With CHAP, the server will send a challenging signal to a remote Router, which will send back an encryption key.

Password Authentication Protocol (PAP) is a simple PPP authentication protocol allowing a Router to send a simple user ID and password to another Router for authentication. PAP has been defined in RFC1334.

Connection

- | | |
|------------------|---|
| Automatic | When the GN-B49G is powered on, it automatically establishes a connection with the network. If the link becomes disconnected for any reason, the GN-B49G will re-connect automatically. |
| Manual | When you click "connection", the system will establish a connection to the network. If the link becomes disconnected for any reason, the GN-B49G will <u>not</u> re-connect automatically. |

Dial on Demand

- | | |
|----------------|---|
| Enable | When there is no Internet activity for a period, the WAN connection will automatically end. If a browser is launched again, the GN-B49G will automatically connect to Internet. |
| Disable | When there is no Internet activity for a period, the WAN connection will automatically end. If a browser is launched again, the GN-B49G will <u>not</u> automatically connect to Internet. |

Static IP Address Tab

GN-B49G High-Speed Wireless Broadband Router



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- ISP No: 1
- ISP Name:
- WAN IP Address:
- WAN Subnet Mask:
- WAN Gateway:
- Manual DNS1:
- Manual DNS2:
- DNS Domain Name:
- MTU: 1500 (Bytes) (576 - 1500)
- NAT Setup: ☐ Disable ☐ Enable ☒ UPnP/NAT
- UPnP Delete time: unlimited

At the bottom of the form are three buttons: << Previous, Finish, and Clear.

Your Internet Service Provider will supply you with the following account information you will need:

- **ISP Name**
- **WAN IP Address**
- **WAN Subnet Mask**
- **WAN Gateway**
- **DNS1 and DNS2**
- **DNS Domain Name**

This information is all provided by your ISP. In the event that your ISP has assigned you several Static IP addresses, you will only need to one.

WAN Configuration Tab - PPPoE Unnumber

PPPoE Unnumbered is a PPPoE service provided by some ISPs. The B49G supports services that provide multiple global IP addresses. When using PPPoE Unnumbered, you can have up to 16 Global IP address depending upon your ISP's service policy. Among these Global IP addresses, one is used as Router's WAN IP address and the others can be used by the downstream clients of the Router.

The screenshot shows the GIGABYTE GN-B49G 2.4GHz Wireless Broadband Router's web interface. The left sidebar contains the following navigation links: Smart Setup, Setup Wizard, Status, Logout, Advanced Setup, Network Configuration, Wireless Configuration, Static Routing Table, Virtual Server, Firewall Rule, DNS Configuration, URL Blocking, Management Tool, PPP Monitor, Reboot, Initialization, and Change Password. The main content area is titled "PPPoE Unnumber" and contains the following fields: ISP No. (1), ISP Name, User ID, Password, Service Name, AC Name, Manual DNS1, Manual DNS2, DNS Domain Name, WAN IP Address, WAN Subnet Mask, and Authentication Type (Auto, CHAP, PAP).

Your Internet Service Provider will supply you with the following account information you will need:

- **ISP Name**
- **User ID/Password**
- **Service Name**
- **AC Name**
- **DNS1 and DNS2**
- **DNS Domain Name**
- **WAN IP Address**
- **WAN Subnet Mask**

Enter the information provided by your ISP for each of your Global IP's, then click next to proceed to enter additional IP's.

WAN Settings

WAN Multi-Session Select Tab

The WAN Multi-Session Select Tab displays the settings of the **Main Session** and **Backup Session**.



Select a WAN connection type for the Main Session from the drop-down menu and select Backup Session type. The Backup Session will become active if the Main Session fails to establish a connection to the Internet.

In the event that neither the Main Session nor the Backup Session can successfully establish a connection with your ISP, the following process will apply:

Automatic: Main -> Backup, Main -> Backup (repeat) Attempts to establish connection is repeated until successful.

Manual: Main -> Backup (Backup Session attempts only once)



The Backup Session can have a specific LAN type connection assigned.

GN-B49G High-Speed Wireless Broadband Router

The Wireless Configuration Screen

The **Wireless Configuration** screen allows you to configure the Router's WLAN function.

The 802.11g Tab

The screenshot shows the 'Wireless LAN 802.11g Configuration' page. The left sidebar contains a tree view with categories like 'General', 'Advanced', 'Security', 'Performance', and 'Tools'. The main content area is titled 'Wireless LAN 802.11g Configuration' and includes the following fields:

- Region: Example (dropdown)
- 802.11g Only Mode: Disable (checkbox)
- Super G Mode: Disable (checkbox)
- Channel: 1 (dropdown)
- SSID: GIGABYTE (text box)
- Hidden SSID: Disable (checkbox)
- Authentication Type: Open system (dropdown)
- WEP: Disable (checkbox)
- WEP Default Key: Key 1 (text box)
- WEP Key: Key 1, Key 2, Key 3, Key 4 (text boxes)
- WPA Encryption: TKIP (dropdown)
- WPA Key: Enable (checkbox)
- WPA Key Timer: 30 (minutes)
- WPA PSK Passphrase: GIGABYTE (text box)
- WPA PSK Key: Enable (checkbox)
- WPA PSK Key Timer: 30 (minutes)

Region

Indicates the geographical region you are in. Verify that the region indicated is correct. If not, please contact your local distributor or dealer immediately.

RF Type

Select the radio frequency (RF) standard or 'wireless mode' from the drop-down list. 802.11g Mixed: Supports both 11b and 11g simultaneously, also working with devices from different vendors.

802.11g Only Mode

The mixture of both 11b and 11g traffic on your wireless network results in the former reducing the performance of the latter. For this reason, the B49G 802.11g Only Mode allows you to restrict all traffic to 11g (54Mbps) traffic only. Keep in mind, however that enabling this feature comes at the expense of eliminating all 11b based traffic will be received or transmitted by the B49G. Enable will restrict all traffic to 802.11g traffic, while disable will allow a mixture of both 11b and 11g. The default setting is disable.

Super G Mode

Super G™ is a group of performance enhancement features that increase the end user application throughput in an 802.11b/g network. These features include:

- Dynamic Packet Bursting

GN-B49G High-Speed Wireless Broadband Router

- Fast Frames
- Hardware Compression and Encryption

Turbo Mode

Turbo Mode capability operates by using two radio channels instead of just one. Providing a theoretical 108Mbps transmission. When Turbo mode is set to enabled, Channel 6 is used and cannot be changed to any other channels.

Super G with Static Turbo

- Not backwards compatible with non-Turbo (legacy) devices
- Turbo mode is always on
- Only Turbo mode devices can talk to each other, meaning all devices must be set to Turbo.

Super G with Dynamic Turbo

- Backwards compatible with non-Turbo (legacy) devices
- Turbo mode only enabled when all nodes on the wireless network is Super G with Turbo enabled
- Will drop down from Turbo mode to 11g mode to allow association of legacy devices.
- Any wireless device on network not Turbo capable causes entire network not to be Turbo capable.

Super G without Turbo

Use Super G features but no Turbo Mode

Disabled

Super G Mode is disabled.

Auto Channel Select

The Router uses channel 6 as the default channel. Enabling Auto Channel Select allows the Router to auto-select a non-conflicting channel.

Channel

The channel may be manually changed (if there are other wireless networks operating in your area) by selecting a channel from the drop-down list.

SSID

GN-B49G High-Speed Wireless Broadband Router

The SSID (Service Set Identifier) is the name of your wireless network. The SSID is up to 32 ASCII characters in length and case sensitive (i.e. Letters in upper case “**A~Z**” and lower case “**a~z**” are unique). The default SSID is “**GIGABYTE**”. To change the SSID, type in the SSID you want to use in the SSID field and click **Submit**. If you make a change to the SSID, any wireless devices on your network must also be reconfigured to connect to the new network name.

Rate

Select a wireless data transmission rate from the drop-down list. The default setting **auto/best** automatically detects and sets the optimum transmission rate.

Hidden SSID

For security purposes, you may choose to hide your network's SSID by selecting **enable** from the drop-down list. This will prevent computers scanning for the presence of wireless networks to detect your network name. The default setting is **disable**.

Authentication Type

Select an authentication type from the drop-down list. The default setting is **Open System**.

Open System: The sender and the receiver do NOT share a secret key. Each party generates its own key-pair and asks the receiver to accept a randomly generated key. Once accepted, this key will only be used for a short period of time. Afterwards, a new key will be generated and agreed upon.

Shared Key: Authentication is based upon a secret key shared by both the sender and the receiver. If **Shared Key** is selected, you cannot choose the WEP **disable** option.

WPA Pre-shared key: The WPA Pre-shared Key authentication standard uses a password or “key” between 8 and 32 characters. This encryption key is changed after every dialog box using the Temporary Key Integrity Protocol (TKIP), which allows users to change keys based on dialog box and automatically synchronize keys between devices on the network. The TKIP encryption algorithm is stricter than the one used by WEP but is based on the same standard.

WPA: The 802.1x authentication protocol, allows users to authenticate wireless network access through a RADIUS Server and is a required by WPA standard. If no RADIUS

GN-B49G High-Speed Wireless Broadband Router

Server exists in your network environment, you still can use WPA through the use of WPA Pre-shared Key.

WEP Key

The GN-B49G supports two WEP standards: **64-bit,152-bit**. Select either **64-bits** or **152-bits** from the drop-down list activate WEP encryption. The **64-bits** encryption uses 40 bits as a secret key, (user-defined) and the remaining 24 bits are reserved. The **128-bits** encryption uses 104 bits as a secret key, (user-defined) and the remaining 24 bits are reserved.

WPA Re-key

Enabling the requirement for WPA rekeying of a Passphrase for increased security. Default is disable.

WEP Re-key Timer

Specify time (in minutes) for expiration of the current WPA Key.

WPA PSK Passphrase

The Passphrase must be between 8 and 64 characters.

WPA PSK Re-key

A user without a RADIUS server, may specify generating a new WPA PSK key more frequently than each time he connects to the network.

WPA PSK Re-key Timer

Specify time (in minutes) for expiration of the current WPA PSK key

The MAC Access Control Tab

GIGABYTE
TECHNOLOGY

GN-B49G
2.4GHz Wireless Broadband Router

Smart Setup
Setup Wizard
Status
Logout

Advanced Setup

- Network Configuration
- Wireless Configuration
 - 802.11g
 - 802.1x
 - MAC Access Control**
 - WDS
- Static Routing Table
- Virtual Server
- Firewall Rule
- DNS Configuration
- URL Blocking

MAC Access Control

☒ Disable ☐ Enable

MAC Setting

MAC Type: XX:XX:XX:XX:XX:XX

1		17	
2		18	
3		19	
4		20	
5		21	
6		22	

The **MAC Access Control** screen allows you to specify the Media Access Controller (MAC) address of up to 32 devices on your network. Only those devices listed in the table will have access to transmit data through the GN-B49G. In this way, even if someone manages to obtain all the information necessary to connect to your network, if their MAC address is not permitted, they still cannot connect. Keep in mind, however that MAC addresses can be spoofed, so it is not a panacea but rather another component of your existing security process. Enable the feature, then key in the MAC addresses to be allowed. Enter the MAC in the form separated by colon. The default setting is **Disable**.

The Radius Server Configuration Tab

The screenshot shows the web-based configuration interface for a Gigabyte GN-B49G 2.4GHz Wireless Broadband Router. The interface has a blue header with the Gigabyte logo and the router model. On the left is a navigation menu with options like Smart Setup, Setup Wizard, Status, Logout, and Advanced Setup. The Advanced Setup menu is expanded, showing sub-options: Network Configuration, Wireless Configuration, 802.11g, MAC Access Control, 802.1x, WDS, Static Routing Table, Virtual Server, Firewall Rule, DNS Configuration, and URL Blocking. The 802.1x option is selected, leading to the 'Wireless Lan 802.1x Configuration' page. This page contains three text input fields: 'Radius Server IP:', 'Radius Server Port:', and 'Shared Secret:'. Below these fields is a 'Radius' dropdown menu set to 'enable'. At the bottom right of the form are 'Submit' and 'Clear' buttons.

Your B49G supports 802.1x and RADIUS Server authentication. RADIUS provides a centralized, server-based authentication of client access to the network.

RADIUS Server IP	Assign an IP address for the RADIUS Server.
RADIUS Server Port	Enter a value within the range 1~65536 for the port.
Shared Secret	Enter a password up to 256 characters (uppercase "A~Z", lowercase "a~z" or numeric "0~9") in length.

GN-B49G High-Speed Wireless Broadband Router

The WDS Tab


WDS Configuration		
WDS MAC Type: XX:XX:XX:XX:XX:XX		
1	<input type="text"/>	disable
2	<input type="text"/>	disable
3	<input type="text"/>	disable
4	<input type="text"/>	disable

Wireless Distribution System (WDS) technology enables several access points to increase the coverage of a wireless network. Although enterprises or home users can reduce most wiring problems by using access points that support WDS, they still need cables to connect external ISP.

To use WDS, please make sure:

- ✓ All routers/AP's participating in the WDS must use the same RF Channel
- ✓ DHCP (if used) must only be enabled on the bridge Router and **not** on the node AP's.

Example: Suppose Router1 is connected to the DSL modem, and uses DHCP to dish out IP's to your WLAN. To use Router1 to bridge to a remote AP, key in AP's Wireless MAC Address in Router1's WDS configuration list and select "enable" then press Submit. In AP's LAN settings, disable DHCP and assure the AP uses the same RF Channel as the Router1. You should now be able to connect to Router1 through AP.

 Note that bridging between different vendors wireless gear is not guaranteed. Your GN-B49G may only create a WDS environment with other Gigabyte Routers (B41G) or GIGABYTE Access Points (GN-A17GU, GN-A11G).

The Static Routing Table Screen

The **Static Routing Table** displays the GN-B49G routing settings. To add or modify, enter a value into the field and click the **Submit** button.

List	Destination IP	Netmask	Gateway	Metric
1				
2				
3				
4				

Submit Clear

Destination IP

Enter the Destination IP address that will be assigned to a specific network or host.

Netmask

Enter the netmask associated with the Destination IP.

Gateway

Enter an IP address that will be assigned to the interface connecting to subnets.

Metric

The "**Metric**" value is a number between 1 and 15 that represents the number of Routers between your network and the destination. Generally, setting the Metric value as either 2 or 3 is sufficient for most applications. If this is a direct connection, please set the value to 1. The default setting is 1.

The Virtual Server Screen

The **Virtual Server** screen allows you to manage the virtual server settings of the GN-B49G. There are two virtual server options: 1. The router has only one IP address or, 2. The router has multiple IP addresses (8 or 16 in most instances). If you have only one IP address click on the **PPPoE/DHCP/Static** tab. If you have multiple IP addresses, click on the **PPPoE Unnumber** tab. The DMZ Support tab allows you to enable a Demilitarized Zone (Zone) on your network.

The DMZ Setting Tab



With a firewall setup, it sometimes necessary to place some clients (e.g. Internet games, video conferencing, or VPN connections) outside of the firewall while leaving the others protected. You can do this using a Demilitarized Zone. The DMZ feature allows you to specify the IP address of the computer that will be placed outside the firewall of your network. Enter the IP Address of your computer (e.g. 192.168.1.2) into the LAN IP Address field and click the **Submit** button.



Note: DMZ servers pose a security risk. A computer designated as the default DMZ server loses much of the protection of the firewall, and is exposed to exploits from the Internet. If compromised, the DMZ server can be used to attack your network.

The Virtual Server PPPoE/DHCP/Static Configuration Tab

No.	Protocol	Port	Virtual Server IP	Enable
1.	Protocol			disable
2.	Protocol			disable
3.	Protocol			disable
4.	Protocol			disable
5.	Protocol			disable
6.	Protocol			disable
7.	Protocol			disable
8.	Protocol			disable
9.	Protocol			disable
10.	Protocol			disable
11.	Protocol			disable

The B49G is configurable to behave as a Virtual Server, allowing remote computers on the WAN (Internet) side of the network to be automatically redirected to local server(s) on the LAN (your private network) side of the network.

Protocol The protocol used for the virtual service

Port The port number of the service used by the PC on the LAN side.

Virtual Server IP The server computer in the LAN that will be providing the virtual services

For example, if you have an FTP server on the LAN side you wanted Internet users to access, suppose the PC has a local IP address of 192.168.1.1, you would use the following virtual server settings:

- Protocol: TCP
- Port: 21 (FTP uses port 21)
- Virtual Server IP: 192.168.1.1
- Enable: enable

GN-B49G High-Speed Wireless Broadband Router

The PPPoE Unnumber Tab

No.	Global IP	Protocol	Port	Virtual Server IP	Enable
1		Protocol			disable
2		Protocol			disable
3		Protocol			disable
4		Protocol			disable
5		Protocol			disable
6		Protocol			disable
7		Protocol			disable
8		Protocol			disable
9		Protocol			disable
10		Protocol			disable
11		Protocol			disable

Advanced feature of the B49G is that it supports services that offer multiple global IP addresses, with each IP address requires its own setting. This feature is normally only found on enterprise class routers. The B49G has an IP allocation scheme capable of directly assigning global IP to LAN clients.

You can only take advantage of this feature if your ISP service packages will provide you with a range of valid "Global IP". (For example **61.222.10.1 ~ 61.222.10.7**) These seven addresses can be individually configured.

- Global IP** An IP within the range of IP's assigned to you by your ISP
- Protocol** The protocol used for the Unnumbered service
- Port** The port number of the service used by the LAN side
- Virtual Server IP** The computer on the LAN that will be providing the Unnumbered virtual services

Example: Taking the IP address of 192.168.1.1 of a PC connected to the B49G for example would use the following settings:

- Global IP: 61.222.10.2
- Protocol: TCP
- Port: 21
- Virtual Server IP: 192.168.1.1
- Enable: enable

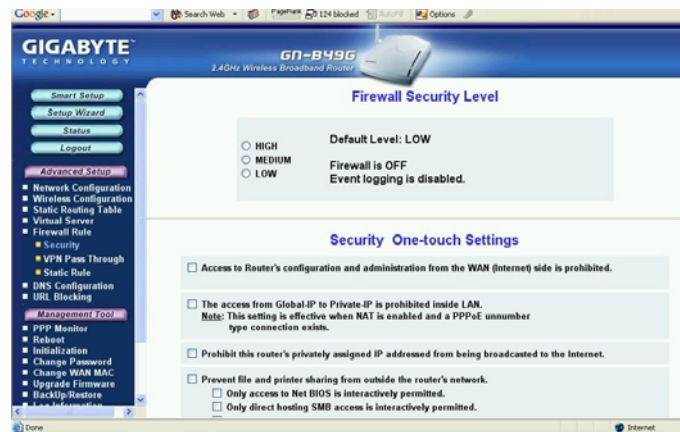
The Global IP 61.222.10.2 is now directly assigned to the FTP server at the IP address 192.168.1.1 located within the B49G's LAN.

The Firewall Rule Screen

The Firewall Rule screen displays your network security settings. Use this screen to create network security policies to prevent unauthorized access to your network.

The Security Configuration Tab

Select security configuration options from this page including **Security One-Touch Setting**, **Stealth Mode** and **Unlawful Computer Access Detection**. You can select with one click a 'High' 'Medium' or 'Low (off)' level of Security. You can fine tune your security level settings with the One-touch Settings section. Just check /uncheck the boxes to include/remove that particular setting.



i When any item in Security One-touch setting combined with **"Stateful Packet Inspection is used"** under the **Unlawful Computer Access Detection** group are checked, the **URL Blocking** feature becomes unavailable.

GN-B49G High-Speed Wireless Broadband Router

The VPN Pass Through Tab



A Virtual Private Network (VPN) is a type of secured private network connection, built upon publicly-accessible infrastructure such as the Internet. They usually provide connectivity to various devices behind a gateway or firewall.

The GN-B49G supports Internet-industry standard technologies to provide open and interoperable VPN solutions, including Internet Protocol Security (IPSec), Layer 2 Tunneling Protocol (L2TP) and Point-to-Point Tunneling Protocol (PPTP).

PPTP Pass Through setting

Point-to-Point Tunneling Protocol (PPTP) allows you to establish a connection to an enterprise network. To allow PPTP tunnels to pass through the Router, click Enable and key in the Router's IP address.

IPSec Pass Through setting

IP Security (IPSec) provides authentication and encryption. Since it is mainly a Layer 3 technology, it can secure all data on the network. To allow IPSec tunnels to pass through the Router, click Enable and key in the Router's IP address.

L2TP Pass Through setting

Layer 2 Tunneling Protocol (L2TP) is an extension of the Point-to-Point Tunneling Protocol and is also used to establish virtual private networks. To allow L2TP tunnels to pass through the Router, click Enable, and key in the Router's IP address.

The Static Rule Tab

The Static Rule screen allows you to manually edit the firewall rule table, thereby helping to protect your network from external attacks as well as provide a method to restrict Internet access to users on your network. Additionally, it can filter out specific packets which are used by hackers to trigger the Router to establish an outgoing connection.

The screenshot shows the 'Firewall Rule Table' configuration page. On the left is a navigation menu with sections: 'Smart Setup' (Smart Setup, Setup Wizard, Status, Logout), 'Advanced Setup' (Network Configuration, Wireless Configuration, Static Routing Table, Virtual Server, Firewall Rule, DNS Configuration, URL Blocking), and 'Management Tool' (PPP Monitor, Reboot, Initialization, Change Password). The main area has a table with headers: No, Policy, Direction, Source IP, Source Port, Destination IP, Destination Port, Protocol, and Log. Below the table are 'Submit', 'Clear', and 'Add' buttons.

No	Policy	Direction	Source IP	Source Port	Destination IP	Destination Port	Protocol	Log
<input type="button" value="Submit"/> <input type="button" value="Clear"/> <input type="button" value="Add"/>								

To edit the current settings, click the **Add** button. The following screen will appear.

The screenshot shows the 'Firewall Table' configuration page. The left navigation menu is identical to the previous screen. The main area has a table with headers: No, Policy, Direction, Source IP, Source Port, Destination IP, and Destination Port. The first row contains a dropdown menu with 'drop' selected, a dropdown menu with 'W->L' selected, and several input fields. Below the table are '<< Previous', 'Submit', and 'Clear' buttons.

No	Policy	Direction	Source IP	Source Port	Destination IP	Destination Port
	drop	W->L				
<input type="button" value="Submit"/> <input type="button" value="Clear"/>						

GN-B49G High-Speed Wireless Broadband Router

Rule Number (No.)

Enter a number for the rule between 1 and 64. Rules are ranked in priority based on their number in descending order, so that rule 1 is given the highest priority and rule 64 the lowest priority.

Policy

Select an **accept** or **drop** option. You can specify the Router to drop (or accept) all packets which meets the Rule criteria.

Direction

Specify the packet flow direction according to data filtering rule.

- a. **W->L:** WAN to LAN, filtering incoming packets
- b. **L->W:** LAN to WAN, filtering outgoing packets

Protocol

Select a setting from the drop-down list to specify the protocol (s) for the static rule.

Log

Enable or disable the log feature.

The DNS Configuration Screen

DNS Relay

DNS Relay will set your PC's DNS entries to point to the Router's Gateway address, which will then forward DNS queries to the DNS server used by the Router. This is needed when using DHCP to assign IP address to the PC's in you LAN. The default value of DNS relay is **Enable**.

Dynamic DNS

The GN-B49G offers a **Dynamic Domain Name Server** (DDNS) service that allows you to assign a fixed host and domain name to a dynamic Internet IP address. This gives Internet users the ability to connect with a virtual sever using a FQDN, rather than with an IP address. Before using this feature, you must first register an account with the dynamic DNS service. (<http://www.dyndns.org>)

Service Provider	From this pull down menu, enter the DDNS service with which you have membership.
Domain Name	This is the DDNS URL assigned by the DDNS service.
Login Name	Enter the User Name for your DDNS account.
Password	Enter the Password for your DDNS account.
Wildcards	If your dynamic DNS provider allows using

GN-B49G High-Speed Wireless Broadband Router

wildcards in resolving your URL, you may select Enable to activate this function.

The URL Blocking Configuration Screen

The URL Blocking Configuration screen allows you to restrict access based upon specific web addresses and/or keywords.

GIGABYTE TECHNOLOGY **GN-B49G** 2.4GHz Wireless Broadband Router

Smart Setup
Setup Wizard
Status
Logout
Advanced Setup

URL Blocking Configuration

URL Blocking: ☒ Disable ☐ Enable

Monitor Port: 80

URL Blocking List

No.	Keyword	Port	Status
1		80	Disable

Submit Clear

After Configuration URL Blocking, please reboot the router.

Reboot the Router Reset URL Blocking

To activate the **URL Blocking** feature:

- | | |
|-----------------------|--|
| Disable/Enable | Select the Enable option to enable. |
| Monitor Port | Select port 80 to monitor the World Wide Web |
| Keyword | Enter the keyword or domain in the Keyword field that you wish to block. |

All URL's with those keywords in the DOMAIN name will now be blocked.

Chapter 7

Using Management Tools

Overview

Management Tool Screens offer management of the Router itself, such as Firmware Updates, Initialization, and Password administration etc. The instructions in this chapter will help you how to use the management tools of the web-based utility to effectively manage your GN-B49G wireless broadband router.

The PPP Monitor Screen

The **PPP Monitor** screen displays the WAN (Internet) connection status. Click the **Disconnect** button to end your current session. Click the **Connect** button to re-connect to the ISP.



The Reboot Screen

The Reboot screen allows you to reboot the GN-B49G. You are also automatically brought to this screen after you confirm OK to any change of Router settings.

GN-B49G High-Speed Wireless Broadband Router



The Initialization Screen

The **Initialization** screen allows you to reset the GN-B49G back to its original factory settings. To initialize the router, use the tip of a pencil or a paperclip to press and hold the **init** button for 5 seconds. (The init button is located on the side of the unit, next to the AC power input).



The Change Password Screen

The **Change Password** screen allows the administrator to create a new password for the GN-B49G. To change an existing password, enter your account and new password and after re-typing the password to confirm, click the **Submit** button.

GN-B49G High-Speed Wireless Broadband Router

The screenshot shows the web interface of a Gigabyte GN-B49G 2.4GHz Wireless Broadband Router. The left sidebar contains a menu with options: Smart Setup, Setup Wizard, Status, Logout, Advanced Setup, Network Configuration, Wireless Configuration, Static Routing Table, Virtual Server, Firewall Rule, DNS Configuration, URL Blocking, Management Tool, PPP Monitor, Reboot, Initialization, and Change Password. The main content area is titled 'Change Administrator Password' and features three input fields: 'Account', 'New Password', and 'Confirm Password'. Below these fields are 'Submit' and 'Clear' buttons.

The Change WAN MAC Screen

The **Change WAN MAC** screen allows you to assign a new MAC address. If your ISP requires MAC address authentication, choose the **Assign WAN MAC** option and enter the ISP authorized MAC address in the **New WAN MAC Address** field and click the **Submit** button. If you want to restore the factory default MAC address, choose the **Restore Default WAN MAC** option and click the **Submit** button.

The screenshot shows the 'Change WAN MAC Address' screen in the router's web interface. The left sidebar is identical to the previous screenshot. The main content area has a title 'Change WAN MAC Address' and two radio buttons: 'Restore Default WAN MAC' (which is selected) and 'Assign WAN MAC'. Below the radio buttons, the text 'MAC Type: XX:XX:XX:XX:XX:XX' is displayed. A text input field labeled 'New WAN MAC Address:' is provided. A 'Submit' button is located at the bottom of the form.

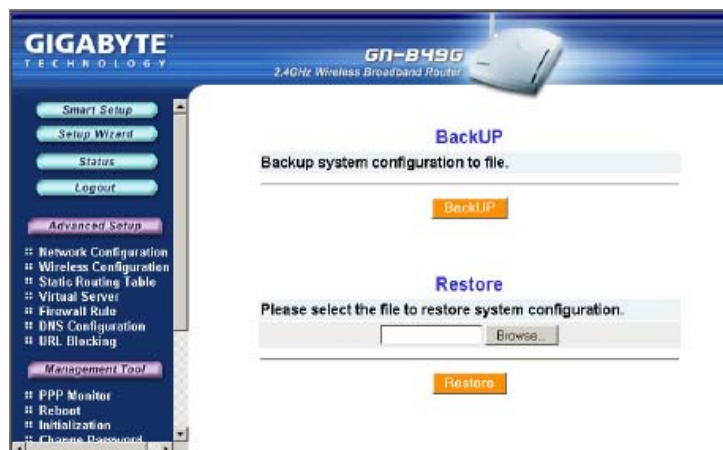
The Upgrade Firmware Screen

The Upgrade Firmware screen allows you to update the current GN-B49G firmware to the latest version directly from the GIGABYTE website. Click the Browse button to locate the firmware file which you just downloaded from the GIGABYTE website, and then click **Upgrade**. **Warning:** Assure you are installing the correct firmware version.



The Backup / Restore Screen

The **Backup / Restore** screen allows you to save the current configuration settings of the GN-B49G as a temp file onto your computer. To revert the GN-B49G to back to a previously saved configuration settings, click the **Browse** to locate the saved configuration file. Then, click the **Restore** button.



The Log Information Screen

The GN-B49G has advanced firewall features, and can effectively prevent intruders and unwanted attacks on your network, while keeping logs of all such attempts including all legitimate WAN connections and UPnP logs. Click on **Firewall Log**, **WAN Connection** or **UPnP Log** to view the list.

The Firewall Log Tab



The WAN Connection Tab

In the WAN connection Log, all logins are chronologically ordered, with indications of connection type and event type.



GN-B49G High-Speed Wireless Broadband Router

The UPnP Log Tab

The Universal Plug and Play log screen records and displays UPnP packets reaching your B49G. It logs details such as Source IP, time of connection, connection status, external port and protocol for LAN port(s) that are UPnP enabled. To refresh the list, press “Check Again”.



The Save Maintenance Screen

The Save Maintenance screen allows you to save logs and status information as a file which can then be sent to the Technical Support team at GIGABYTE.



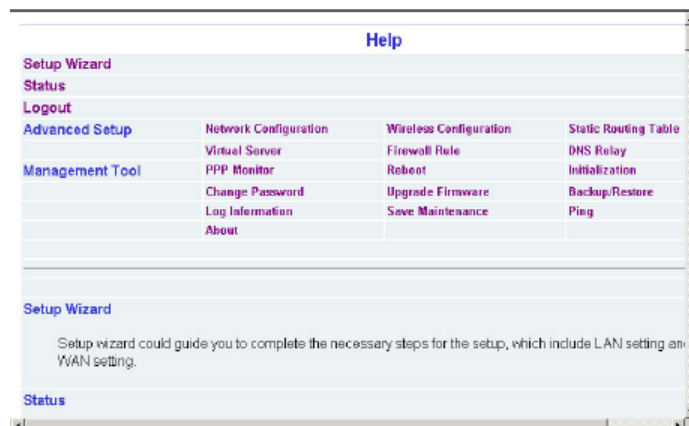
The Ping Screen

'Pinging' involves sending a packet of data to a site and recording how long it takes for the site to acknowledge receipt. This is useful if you think that a web site might be slow or unavailable. Type the IP Address and click the Ping to start.



The Help Screen

The **Help** screen is where you can access online guide to assist in configuring the GN-B49G.



GN-B49G High-Speed Wireless Broadband Router

The About Screen

The **About** screen displays the Router model name and firmware version.



Appendix A

FAQ

This section provides solutions to common problems that may occur during installation, configuration or use of the GN-B49G.

Q: What is the default IP address for the B49G?

A: 192.168.1.254

Q: I can't remember the password or IP address of the router.

A: You can resolve this by pressing the "Init" button on the side of the router. You can also reset the Router from the Web Utility <Initialization Page>. The Router will reboot and all settings (including the default password) will be restored to their default values.

Q: What is the default username and password for the B49G?

A: Username is "admin" and password is "admin".

Q: Why do I have to setup ISP information into my Router?

A: ISPs require a special login protocol, in which you must enter a login name and password in order to access the Internet. In order to share the Internet connection among several computers, you must configure it with the TCP/IP information that your one PC would normally use.

Q: Where in the network do I connect the router?

A: In a typical environment, the GN-B49G is installed directly onto the ADSL/Cable Modem. Plug the RJ45 Ethernet cable of the ADSL or Cable Modem into the WAN port of the Router.

Q: Why should I use the GN-B49G to work as a DHCP server?

A: Using the B49G Router as a DHCP server By default, the router will function as a DHCP (Dynamic Host Configuration Protocol) server, allowing it to assign IP, DNS server, and default gateway addresses to all computers connected to the router's LAN. The assigned default gateway address is the LAN address of the router. IP addresses will be assigned to the attached PCs from a pool of addresses specified in this menu. Each pool address is tested before it is assigned to avoid duplicate addresses on the LAN. DHCP helps prevent IP conflicts.

Q: What is the IEEE 802.11g standard?

A: The IEEE 802.11g standard specifies data rates of up to 54 Mbps in the 2.45-GHz band. It uses Orthogonal Frequency Division Multiplexing (OFDM), which is provided by this standard and is compatible with 802.11b standard offering speeds of about 11 Mbps. This standard uses Complementary Code Keying (CCK) modulation. Both 11g and 11b can operate at a range of up to 300 feet.

GN-B49G High-Speed Wireless Broadband Router

Q: When using B49G in Australia, you will use PPPoA protocol. How to set up your configuration in B49G?

A: Suggestion 1, Using Static IP.

Suggestion 2, Using DHCP client to get IP from ADSL/ Cable modem.

Appendix B

Using Setup Wizard

In addition to Smart Setup, your B49G Router's ISP settings may be configured manually using Setup Wizard. Press the Setup Wizard menu button to proceed. You will be presented with the screen shown below. Please choose your Internet connection (WAN) type from the list and follow the steps for instructions



PPPoE: Most common type for typical home users. If your broadband ISP service PPPoE, please select this item, click the **Next** button and then **go to Step 3** of this section

Dynamic IP Address:
If your broadband ISP service is an 'always-on connection', but you do not have a static IP, please select this item, click the **Next** button and then **go to Step 7** of this section.

Static IP Address:
Common for Enterprise Internet connections. If your broadband ISP service is a 'fixed-connection' and your IP never changes, please select this item, click the **Next** button and then **go to Step 11** of this section.

PPPoE Unnumber:
Common in Japan and some European Countries. If

GN-B49G High-Speed Wireless Broadband Router

you use PPPoE Unnumber, please select this item, click the **Next** button and then **go to Step 15** of this section.

Connection Type - PPPoE

On the **PPPoE** screen, enter your User Name and Password as provided by your ISP. Click the **Finish** button to continue with setup.

The screenshot shows the GIGABYTE GN-B49G 2.4GHz Wireless Broadband Router setup interface. On the left is a navigation menu with options: Smart Setup, Setup Wizard, Status, Logout, Advanced Setup, Network Configuration, Wireless Configuration, Static Routing Table, Virtual Server, Firewall Rule, DNS Configuration, URL Blocking, Management Tool, PPP Monitor, Reboot, Initialization, and Change Password. The main area is titled "PPPoE" and contains two input fields: "User ID:" and "Password:". Below these fields are three buttons: "<< Previous", "Finish", and "Clear".

The **Setup Completed** screen appears. Click the **Reboot** button to restart your router so that the settings take effect.

The screenshot shows the same GIGABYTE GN-B49G 2.4GHz Wireless Broadband Router setup interface, but now the main area displays "Setup Completed!" in blue text. Below this, it says "Please reboot the Router now." and there is a single orange "Reboot" button. The navigation menu on the left remains the same.

GN-B49G High-Speed Wireless Broadband Router

While the router is rebooting, the Router Restarting Screen will display the time remaining. Please be patient and let the router restart itself.



Once your router has successfully rebooted, it will load Router Welcome Screen. **Setup is complete.**

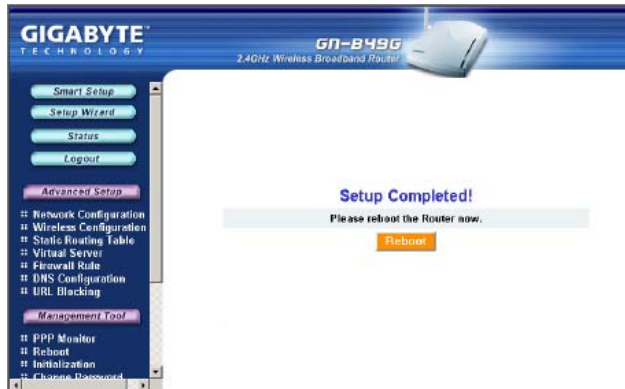
Connection Type - Dynamic IP Address

If you have selected **Dynamic IP Address** ISP Type, the Dynamic IP Address Screen will display, prompting you for the ISP information. Enter it and click the **Finish** button to continue with router setup.



GN-B49G High-Speed Wireless Broadband Router

The **Setup Completed** appears. Click the **Reboot** button to restart your router so that the settings take effect



GN-B49G High-Speed Wireless Broadband Router

While the router is rebooting, the **Router Restarting** screen will display the time remaining.



Once your router has successfully rebooted, it will load Router Welcome Screen. **Setup is complete.**

GN-B49G High-Speed Wireless Broadband Router

Connection Type - Static IP Address

On the **Static IP Address** screen, type in the information provided by your ISP, and then click the **Finish** button to continue with router setup.



If your ISP has assigned you several IP addresses, please enter only one.

The screenshot shows the 'Static IP Address' configuration screen. On the left is a navigation menu with categories: 'Smart Setup' (Smart Setup, Setup Wizard, Status, Logout), 'Advanced Setup' (Network Configuration, Wireless Configuration, Static Routing Table, Virtual Server, Firewall Rule, DNS Configuration, URL Blocking), and 'Management Tool' (PPP Monitor, Manage Port, Backup, Initialization, Change Password, Change WAN MAC, Upgrade Firmware, Backup/Restore, Log Information, Save Maintenance, Help, Ping, About). The main area is titled 'Static IP Address' and contains input fields for 'Internet IP Address', 'Subnet Mask', 'Gateway', 'Primary DNS', and 'Secondary DNS'. At the bottom right of the form are 'Finish' and 'Clear' buttons.

A screen with the message **Setup Completed** appears. Click the **Reboot** button to restart your router so that the settings take effect.

The screenshot shows the 'Setup Completed!' screen. The navigation menu on the left is identical to the previous screen, but the 'Reboot' option under 'Management Tool' is now highlighted. The main area displays the message 'Setup Completed!' followed by 'Please reboot the Router now.' and a prominent orange 'Reboot' button.

While the router is rebooting, the **Router Restarting** screen will display the time remaining.

GN-B49G High-Speed Wireless Broadband Router



Once your router has successfully rebooted, it will load Router Welcome Screen. **Setup is complete.**

Appendix C

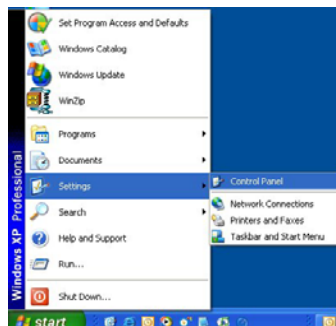
Configuring TCP/IP Settings

Computers access the Internet using a protocol called TCP/IP (Transmission Control Protocol/ Internet Protocol). Each computer on your network must have TCP/IP installed and selected as its networking protocol. If a Network Interface Card (NIC) is already installed in your PC, then TCP/ IP is probably already installed as well. Please follow the steps in this chapter to assure the correct TCP/IP settings. For advanced users who know the TCP/IP settings are already correct, you may skip this section and proceed directly to **Chapter 6 Advanced Setup**.

Enabling DHCP to Automatically Configure TCP/IP Settings

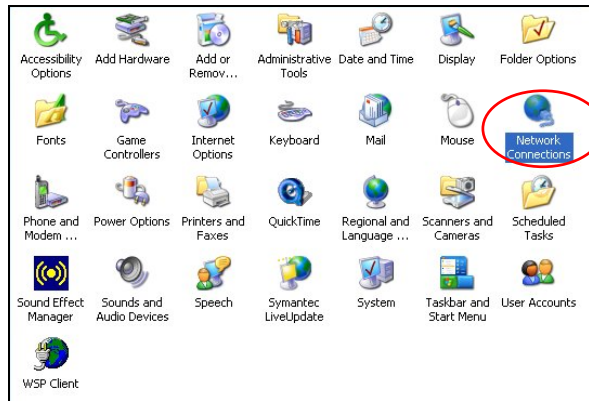
Each PC using accessing the wireless router must be assigned specific information about itself and resources that are available on its network. The simplest way to configure this is to allow the PC to automatically assign the IP by using a DHCP server. Follow the steps below to allow windows to automatically assign IP numbers for you.

- Step 1 Click the **Start** button. Select **Settings** and then click the **Control Panel** icon.

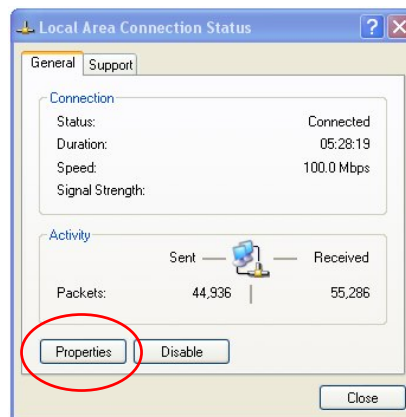


- Step 2 Double-click the **Network and Dial-up Connection** icon.

GN-B49G High-Speed Wireless Broadband Router

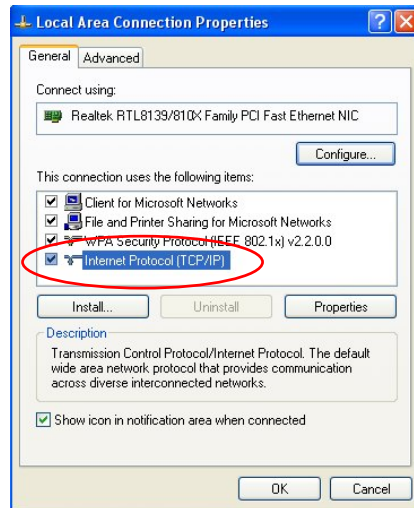


Step 3 Double-click the **Local Area Connection** icon, and then click the **Properties** button.

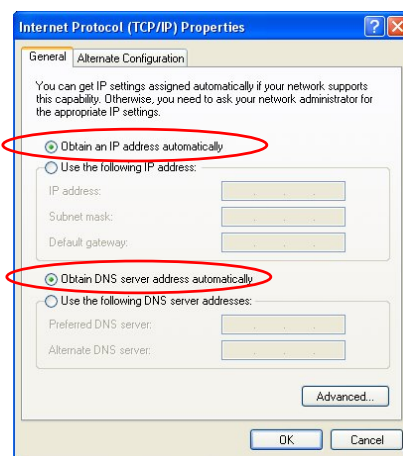


Step 4 The **Local Area Connection Properties** window will appear. For the applicable Ethernet / wireless adapter, make sure that there is a check in the **Internet Protocol (TCP/IP)** checkbox, then double-click on “**Internet Protocol (TCP/IP)**”

GN-B49G High-Speed Wireless Broadband Router



Step 5 Select both the **Obtain IP address automatically** and **Obtain DNS server address automatically**, options and then click **OK**. Continue clicking on the **OK** button to complete the PC configuration.



Windows will now automatically assign IP numbers to computers connecting to your GN-B49G.

Appendix D Troubleshooting

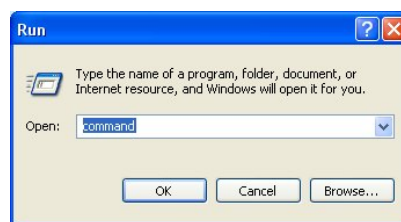
Problem 1: Cannot connect to the Router's Web-based Utility.

Response:

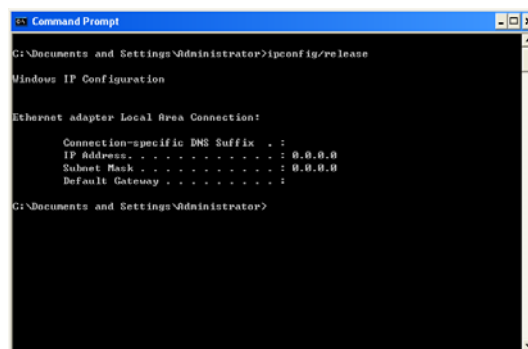
- Make sure that your Router uses DHCP, and make sure your PC's IP address is on the same subnet as the router.
- Check to see if your web browser is automatically detecting LAN settings.
- Try closing all web browsers and trying again.

Make sure that your Router uses DHCP, and make sure your PC's IP address is on the same subnet as the router.

Step 1 Click the **Start** button. Select **Run**, then type "command". Press OK.

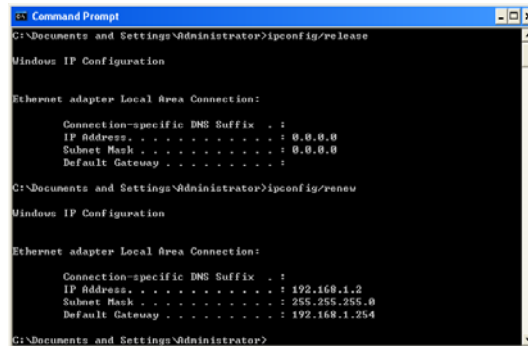


Step 2 At the command prompt, type "**ipconfig /release**" and press the **ENTER** key.



Step 3 At the next command prompt, type "**ipconfig /renew**" and press the **ENTER** key.

GN-B49G High-Speed Wireless Broadband Router



```
Command Prompt
G:\Documents and Settings\Administrator>ipconfig /release

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix . : 
    IP Address. . . . . : 0.0.0.0
    Subnet Mask . . . . . : 0.0.0.0
    Default Gateway . . . . . : 

G:\Documents and Settings\Administrator>ipconfig /renew

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix . : 
    IP Address. . . . . : 192.168.1.2
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.254

G:\Documents and Settings\Administrator>
```

The default gateway represents the IP address of your GN-B49G, that is: 192.168.1.254. All computers accessing this Router **MUST** be in the same subnet (192.168.1.x, where x is anything between 1 and 253)

In the above example, the B49G gateway shown above is 192.168.1.254, and the PC's IP address is 192.168.1.2

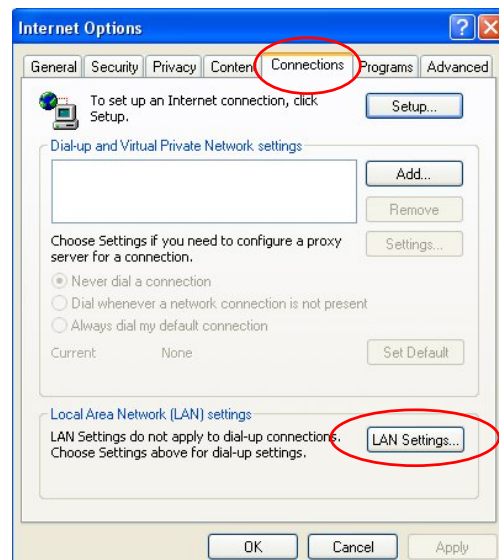
Check to see if your web browser is automatically detecting LAN settings

- Step 1 Open **Internet Explorer**. From the menu select **Tools** and then click **Internet Options**.

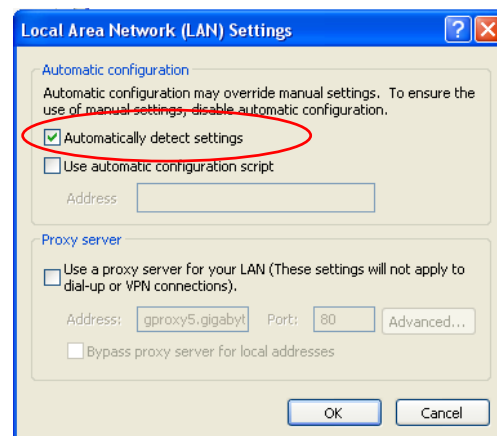


GN-B49G High-Speed Wireless Broadband Router

- Step 2 From the **Internet Options** window, click the **Connections** tab, and then click the **LAN Settings** button (see figure below).



- Step 3 Now verify that none of the checkboxes have been ticked, and click on the **OK** button. Now you will be able to login to the Router and configure or change network settings.



Problem 2: I can't connect to the Internet

GN-B49G High-Speed Wireless Broadband Router

Response :

- Check that the power cord is connected properly, and the router's power LED is lit green.
- Verify that all the TCP/IP configuration settings are correct. (Problem 1 above)
- Check that your ADSL/Cable Modem is operating normally, and/or you have ISP service available.
- Check that all network cabling is properly connected.

Problem 3: **When I Configure WDS bridging, my Wi-Fi Protected Access (WPA) security is cancelled.**

Response: Wi-Fi Protected Access (WPA) and Wireless Distribution System (WDS) cannot be used at the same time.

If you need to secure a WDS network, use the Wireless Encryption Protocol (WEP) feature instead.

If you must use WPA, connect your base stations to a wired local area network (LAN).

Appendix E

Glossary

ADSL

Asymmetric digital subscriber line (ADSL) is a new modem technology that converts existing twisted-pair telephone lines into access paths for high-speed communication of various sorts.

Auto-MDI/MDIX

On a network hub or switch, an auto-MDI/MDIX port automatically senses if it needs to act as a MDI or MDIX port. The auto- MDI/MDIX capability eliminates the need for crossover cables.

Auto-negotiate

To automatically determine the correct setting. The term is often used with communications and networking

DHCP

The Dynamic Host Configuration Protocol (DHCP) is an Internet protocol for automating the configuration of computers that use TCP/IP. DHCP can be used to automatically assign IP addresses, to deliver TCP/IP stack configuration parameters such as the subnet mask and default router, and to provide other configuration information such as the addresses for printer, time and news servers.

DMZ

In computer networks, a DMZ (demilitarized zone) is a computer host or small network inserted as a "neutral zone" between a company's private network and the outside public network. It prevents outside users from getting direct access to a server that stores company data. Typically, the DMZ contains devices accessible to Internet traffic, such as Web (HTTP) servers, FTP servers, SMTP (e-mail) servers and DNS servers.

DNS

The Domain Name System (DNS) is a distributed Internet directory service. DNS is used mostly to translate between domain names and IP addresses, and to control Internet email delivery. Most Internet services rely on DNS to work. If DNS fails, web sites cannot be located and email delivery service will be suspended.

Dynamic IP Address

An IP address is automatically assigned to a user's AP in a TCP/IP network typically by a DHCP server.

Firewall

A system designed to prevent unauthorized access to or from a private network. Firewalls can be implemented in both hardware and software, or a combination

GN-B49G High-Speed Wireless Broadband Router

of both. Firewalls are frequently used to prevent unauthorized Internet users from accessing private networks connected to the Internet, especially intranets. All messages entering or leaving the intranet pass through the firewall, which examines each message and blocks those that do not meet the specified security criteria.

Gateway

A device, usually a Router, that connects hosts on a local network to other networks.

IP Address

Every PC on the Internet has a unique identifying number, called an IP Address. A typical IP address looks like this: 216.27.61.137

IPSec

IPSec stands for IP Security. It provides authentication and encryption over the Internet. It functions at Layer 3 and thus secures everything on the network. It has become a standard protocol used for virtual private networks (VPNs).

MAC Address

On a local area network (LAN) or other network, the MAC (Media Access Control) address is your computer's unique hardware number. Usually written as: 01:23:45:67:89:ab

MTU

The size in bytes of the largest packet that can be sent or received.

NAT

A technique by which several hosts share a single IP address for accessing to the Internet.

Ping (Packet Internet Groper)

A utility to determine whether a specific IP address is accessible. It works by sending a packet to the specified address and waiting for a reply. PING is used primarily to troubleshoot Internet connections.

SSID

SSID is the name representing the Router in WLAN.

PPPoE

Point-to-Point over Ethernet is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.

Router

A device that forwards data packets along networks. A router is connected to at least two networks, commonly two LANs or WANs or a LAN and its ISP network. Routers are located at gateways, the places where two or more networks connect.

Subnet Mask

A mask used to determine which subnet an IP address belongs to. An IP address has two components, the network address and the host address. Subnetting enables the network administrator to further divide the host part of the address into two or more subnets.

TCP/IP

TCP/IP (Transmission Control Protocol/Internet Protocol), the suite of communications protocols used to connect hosts on the Internet.

VPN

Virtual private networks are secured private network connections, built on top of publicly accessible infrastructure, such as the Internet or the public telephone network. VPNs typically employ some combination of encryption, digital certificates, strong user authentication and access control to provide security to the traffic they carry. They usually provide connectivity to many machines behind a gateway or firewall.

WAN

Wide Area Network, a communication network that covers a relatively broad geographic area, consisting of two or more LANs. Broadband communication over the WAN is often through public networks such as the ADSL or Cable systems, or through leased lines or satellites. To simplify it, please image network as a WAN.

WEP

WEP (Wired Equivalent Privacy) is a data privacy mechanism based on a 64/128-bit shared key algorithm, as described in the IEEE 802.11 standard.

Appendix F

Specifications

General	
Standards	IEEE 802.3(10Base-T), IEEE 802.3u(100Base-TX), IEEE 802.11b/g(Wireless)
Ports / Buttons	LAN – 4 ports 10/100 Ethernet (auto-MDIX), RJ-45 WAN - 10/100 Ethernet (auto-MDIX), RJ-45 One Init (Reset) button
Power	External; 5V DC, 2A
Wireless	
Frequency Band	2412 ~ 2483 MHz (subject to local regulation)
Modulation Technology	OFDM and DSSS
Modulation Techniques	64QAM, 16QAM, QPSK, BPSK, DBPSK, DQPSK, CCK
Data Rates	54, 48, 36, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps (auto fallback)
Output power	20 dBm @ Nominal Temp Range
Receive Sensitivity	-68 dBm @ 54Mbps data rate at nominal temperature
Antenna	One external antenna
Wireless Range	<i>Outdoor:</i> 100 to 300m <i>Indoor:</i> 30 to 100m
Regulatory and Environmental Compliance	
EMC certification	FCC part (USA) CE(Europe)
Temperature Range	<i>Operating:</i> 0 to 40 °C, <i>Storage:</i> -20 to 65 °C
Humidity	10% ~ 85% Non-condensing
Protocols	
Routing Protocols	Dynamic, Static Routing with TCP/IP NAT, PPTP, PPPoE VPN Pass-Through (IPSec, L2TP) DHCP (Client & Server)
Security	64/152 bit WEP; WPA-PSK; WPA
Mechanical	
LEDs	Power/Status; WLAN; LAN (1-4); WAN
Gross Weight	240± 5g
Dimensions	110mm x 160mm x 25mm

Appendix G 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.

Appendix H

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

GN-B49G High-Speed Wireless Broadband Router

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 I

General Public License

Licensing Information

This product includes copyrighted software license owned by third-party under terms of the GNU General Public License. Texts of the GPL are included with every CD shipped with our product. All future firmware updates will also be accompanied with their related source code on our website.

Please refer to the following GNU General Public License for further details of this License.

Specially, the parts of this product listed below are subject to the GNU General Public License.

1. The Linux operating system kernel
2. The iptables packet filter and NAT software
3. The busybox swiss army knife of embedded linux
4. The udhcpd DHCP client/server implementation
5. The rp-pppoe PPPoE client implementation
6. The pppd PPP daemon implementation
7. The ez-ipupdate ddns implementation

The Copyright for All listed Software packages are owned by their respective authors, please refer to the source code via our website for further details.

Availability of Source Code

Gigabyte Tech. has provided the full Source Code of the GPL Licensed Software on our website. All future firmware updates will also be accompanied with their related source code.

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Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

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- c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the

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