

BIPAC-7500G / 7500GL

**802.11g ADSL VPN Firewall Router with
3DES Accelerator**

User's Manual

Version Release 1.54c

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Chapter 1: Introduction

Introduction to your BIPAC-7500G / 7500GL Router

Welcome to the Billion BIPAC-7500G / 7500GL Wireless Router. Your Billion router is an “all-in-one” unit, combining an ADSL modem, ADSL router and Ethernet network switch, providing everything you need to get the machines on your network connected to the Internet over your ADSL broadband connection. With features such as an ADSL Quick-Start wizard and DHCP Server, you can be online in no time at all and with a minimum of fuss and configuration, catering for first-time users to the guru requiring advanced features and control over their Internet connection and network.

Features

- **ADSL Multi-Mode Standard**
Supports downstream transmission rates of up to 8Mbps and upstream transmission rates of up to 1024Kbps. It also supports rate management that allows ADSL subscribers to select an Internet access speed suiting their needs and budgets. It is compliant with Multi-Mode standard (ANSI T1.413, Issue 2; G.dmt(G.992.1); G.lite(G992.2)). The Annex A and B are supported in different H/W platforms.
- **Wireless Ethernet 802.11g**
With built-in 802.11g access point for extending the communication media to WLAN while providing the WEP and WPA for securing your wireless networks. The BIPAC-7500G has included the first solution for turbo charging 802.11g systems called PRISM Nitro. It provides up to 50% greater throughput performance in homogenous 802.11g networks and enhanced protection mechanisms to significantly increase mixed-mode network performance.
- **Fast Ethernet Switch**
A 4-port 10/100Mbps fast Ethernet switch is built in with automatic switching between MDI and MDI-X for 10Base-T and 100Base-TX ports. An Ethernet straight or cross-over cable can be used directly for auto detection.
- **Multi-Protocol to Establish A Connection**
Supports PPPoA (RFC 2364 - PPP over ATM Adaptation Layer 5), RFC 1483 encapsulation over ATM (bridged or routed), PPP over Ethernet (RFC 2516), and IPoA (RFC1577) to establish a connection with the ISP. The product also supports VC-based and LLC-based multiplexing.
- **Quick Installation Wizard**

Supports a WEB GUI page to install this device quickly. With this wizard, end users can enter the information easily which they get from their ISP, then surf the Internet immediately.

● **Universal Plug and Play (UPnP) and UPnP NAT Traversal**

This protocol is used to enable simple and robust connectivity among stand-alone devices and PCs from many different vendors. It makes network simple and affordable for users. UPnP architecture leverages TCP/IP and the Web to enable seamless proximity networking in addition to control and data transfer among networked devices. With this feature enabled, users can now connect to Net meeting or MSN Messenger seamlessly.

● **Network Address Translation (NAT)**

Allows multi-users to access outside resources such as the Internet simultaneously with one IP address/one Internet access account. Many application layer gateway (ALG) are supported such as web browser, ICQ, FTP, Telnet, E-mail, News, Net2phone, Ping, NetMeeting, IP phone and others.

● **Firewall**

Supports SOHO firewall with NAT technology, automatically detects and blocks Denial of Service (DoS) attacks. URL blocking, packet filtering and SPI (Stateful Packet Inspection) are also supported. The hacker's attack will be recorded associated with timestamp in the security logging area. More firewall functions will always be implemented through updated firmware releases.

● **Domain Name System (DNS) relay**

Provides an easy way to map the domain name (a friendly name for users such as www.yahoo.com) and IP address. When a local machine sets its DNS server with this router's IP address, every DNS conversion request packet from the PC to this router will be forwarded to the real DNS in the outside network.

● **Dynamic Domain Name System (DDNS)**

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname. This dynamic IP address is the WAN IP address. For example, to use the service, you must first apply for an account from a DDNS service like <http://www.dyndns.org/>. More than 5 DDNS servers are supported.

● **Virtual Private Network (VPN)**

Allows user to make a tunnel with a remote site directly to secure the data transmission among the connection. User can use embedded PPTP and L2TP client/server, IKE and IPSec which are supported by this router to make a VPN connection or users can run the PPTP client in PC and the router already provides IPSec and PPTP pass through function to establish a VPN connection if the user likes to run the PPTP client in his local computer.

● **Virtual Server ("port forwarding")**

Users can specify some services to be visible from outside users. The router can detect incoming service requests and forward either a single port or a range of ports to the specific local computer to handle it. For example, a user can assign a PC in the LAN acting as a WEB server inside and expose it to the outside network. Outside users can browse inside web servers directly while it is protected by NAT. A DMZ host setting is also provided to a local computer exposed to the outside network, Internet.

● **Rich Packet Filtering**

Not only filters the packet based on IP address, but also based on Port numbers. It will filter packets from and to the Internet, and also provides a higher level of security control.

● **Dynamic Host Configuration Protocol (DHCP) client and server**

In the WAN site, the DHCP client can get an IP address from the Internet Service Provider (ISP) automatically. In the LAN site, the DHCP server can allocate a range of client IP addresses and distribute them including IP address, subnet mask as well as DNS IP address to local computers. It provides an easy way to manage the local IP network.

● **Static and RIP1/2 Routing**

Supports an easy static routing table or RIP1/2 routing protocol to support routing capability.

● **Simple Network Management Protocol (SNMP)**

It is an easy way to remotely manage the router via SNMP.

● **Web based GUI**

Supports web based GUI for configuration and management. It is user-friendly and comes with on-line help. It also supports remote management capability for remote users to configure and manage this product.

● **Firmware Upgradeable**

Device can be upgraded to the latest firmware through the WEB based GUI.

● **Rich management interfaces**

Supports flexible management interfaces with local console port, LAN port, and WAN port. Users can use terminal applications through the console port to configure and manage the device, or Telnet, WEB GUI, and SNMP through LAN or WAN ports to configure and manage the device.

Billion BIPAC-7500G / 7500GL 802.11g Wireless ADSL Router Application Diagram

● BIPAC-7500G / 7500GL Wireless ADSL VPN Firewall Router

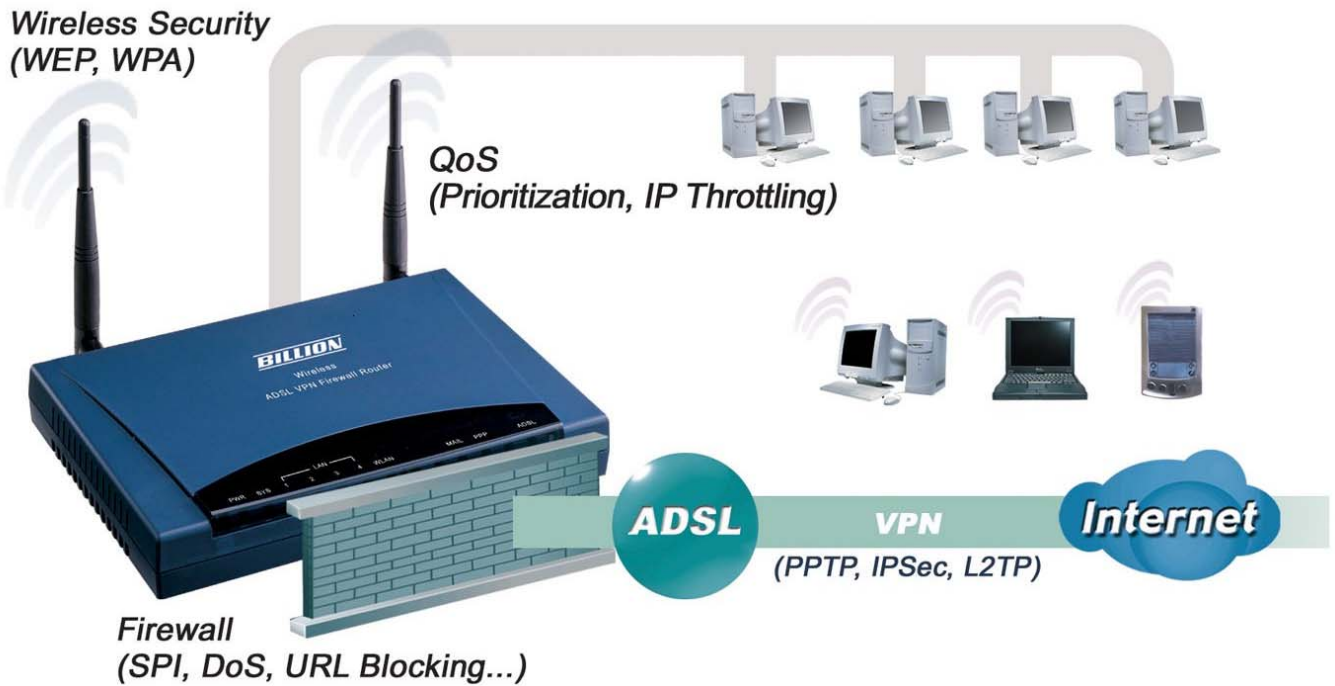


Figure 1.1 Application Diagram of BIPAC-7500G/7500GL 802.11g Wireless ADSL Router

Thank you for your purchase, and welcome to the world of broadband Internet!

Chapter 2: Installing the Router

Important note for using the BIPAC-7500G / 7500GL ADSL Router



Warning

- ✓ Do not use the BIPAC-7500G / 7500GL in high humidity or high temperatures.
- ✓ Do not use the same power source for the BIPAC-7500G / 7500GL as other equipment.
- ✓ Do not open or repair the case yourself. If the BIPAC-7500G / 7500GL is too hot, turn off the power immediately and have it repaired at a qualified service center.



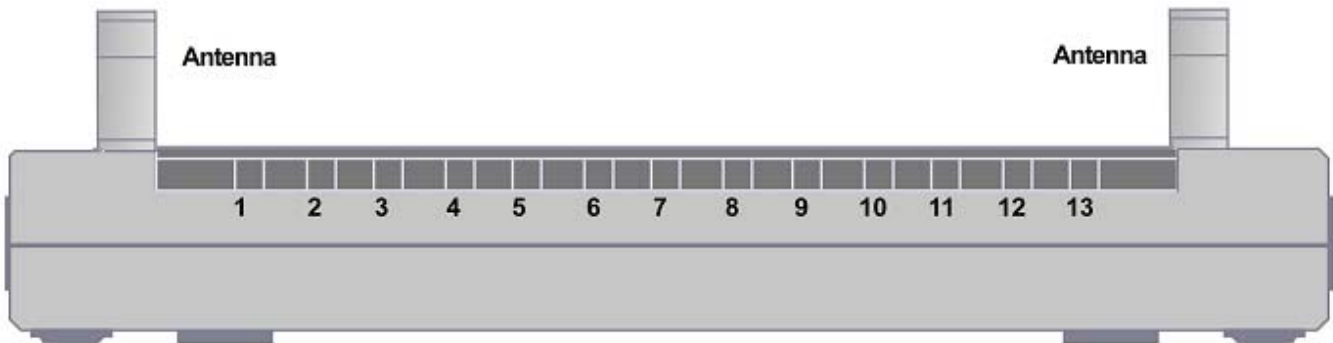
Attention

- ✓ Place the BIPAC-7500G / 7500GL on a stable surface.
- ✓ Only use the power adapter that comes with the package. Using a different voltage rating power adaptor may damage the router.

Package Contents

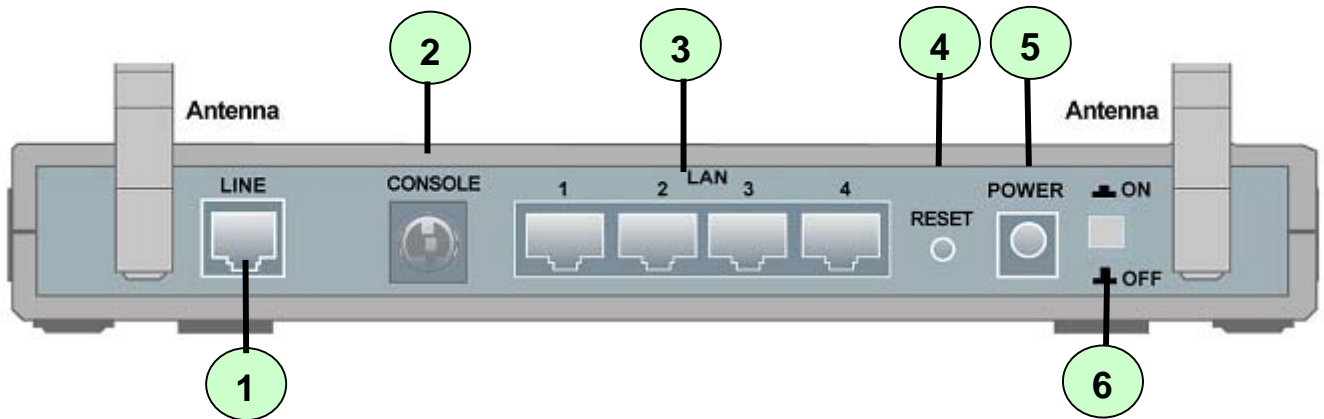
- BIPAC-7500G / 7500GL Wireless ADSL VPN Firewall Router
- CD-ROM containing the online manual
- RJ-11 ADSL/telephone Cable
- Ethernet (CAT-5 LAN) Cable
- Console (PS2-RS232) Cable
- Power adapter (12V DC, 1Amp)
- Quick Start Guide

The Front LEDs



LED		Meaning
1	PWR	Lit when power is ON.
2	SYS	Lit when the system is ready.
3	LAN port 1	Lit when connected to an Ethernet device. Green for 100Mbps; Orange for 10Mbps Blinking when data is transmitted/received.
4	LAN port 2	Lit when connected to an Ethernet device. Green for 100Mbps; Orange for 10Mbps Blinking when data is transmitted/received.
5	LAN port 3	Lit when connected to an Ethernet device. Green for 100Mbps; Orange for 10Mbps Blinking when data is transmitted/received.
6	LAN port 4	Lit when connected to an Ethernet device. Green for 100Mbps; Orange for 10Mbps Blinking when data is transmitted/received.
7	WLAN	Lit green when the wireless connection is established. Flashes when sending/receiving data.
10	MAIL	Flash when there is Email in your configured Email account.
11	PPP	Lit when there is a PPPoA / PPPoE connection.
13	ADSL	Lit when successfully connected to an ADSL DSLAM ("linesync").

The Rear Ports



Port		Meaning
1	LINE	Connect the supplied RJ-11 (“telephone”) cable to this port when connecting to the ADSL/telephone network.
2	CONSOLE	Connect a PS2/RS-232 cable to this port when connecting to a PC’s RS-232 port (9-pin serial port).
3	LAN 1X — 4X (RJ-45 connector)	Connect a UTP Ethernet cable (Cat-5 or Cat-5e) to one of the four LAN ports when connecting to a PC or an office/home network of 10Mbps or 100Mbps.
4	RESET	After the device is powered on, press it to reset the device or restore to factory default settings. 0-3 seconds: reset the device 6 seconds above: restore to factory default settings (this is used when you cannot login to the router. E.g. forgot the password)
5	PWR	Connect the supplied power adapter to this jack.
6	Power Switch	Power ON/OFF switch

Cabling

One of the most common causes of problems is bad cabling or ADSL line(s). Make sure that all connected devices are turned on. On the front of the product is a bank of LEDs. Verify that the LAN Link and ADSL line LEDs are lit. If they are not, verify that you are using the proper cables.

Ensure that all other devices connected to the same telephone line as your Billion router (e.g. telephones, fax machines, analogue modems) have a line filter connected between them and the wall socket (unless you are using a Central Splitter or Central Filter installed by a qualified and licensed electrician), and ensure that all line filters are correctly installed and the right way around. Missing line filters or line filters installed the wrong way around can cause problems with your ADSL connection, including causing frequent disconnections.

Chapter 3: Basic Installation

The router can be configured with your web browser. A web browser is included as a standard application in the following operating systems: Linux, Mac OS, Windows 98/NT/2000/XP/Me, etc. The product provides a very easy and user-friendly interface for configuration.

PCs must have an Ethernet interface installed properly and be connected to the router either directly or through an external repeater hub, and have TCP/IP installed and configured to obtain an IP address through a DHCP server or a fixed IP address that must be in the same subnet as the router. The default IP address of the router is **192.168.1.254** and the subnet mask is **255.255.255.0** (i.e. any attached PC must be in the same subnet, and have an IP address in the range of 192.168.1.1 to 192.168.1.253). The best and easiest way is to configure the PC to get an IP address automatically from the router using DHCP. If you encounter any problems accessing the router's web interface it may also be advisable to **uninstall** any kind of software firewall on your PCs, as they can cause problems accessing the 192.168.1.254 IP address of the router. Users should make their own decisions on how to best protect their network.

Please follow the steps below for your PC's network environment installation. First of all, please check your PC's network components. The TCP/IP protocol stack and Ethernet network adapter must be installed. If not, please refer to your Windows-related or other operating system manuals.



Any TCP/IP capable workstation can be used to communicate with or through the BIPAC-7500G / 7500GL. To configure other types of workstations, please consult the manufacturer's documentation.

Connecting your router

1. Connect the Router to a LAN (Local Area Network) and the ADSL/telephone network.
2. Power on the device.
3. Make sure the PWR, SYS and WLAN LEDs are lit steadily and that the relevant LAN LED is lit.

Configuring PCs in Windows

For Windows XP

1. Go to **Start / Control Panel** (in Classic View). In the Control Panel, double-click **Network Connections**.
2. Double-click **Local Area Connection**. (See Figure 3.1)
3. In the **LAN Area Connection Status** window, click **Properties**. (See Figure 3.2)
4. Select **Internet Protocol (TCP/IP)** and click **Properties**. (See Figure 3.3)
5. Select the **Obtain an IP address automatically** and **Obtain DNS server address automatically** radio buttons. (See Figure 3.4)
6. Click **OK** to finish the configuration.

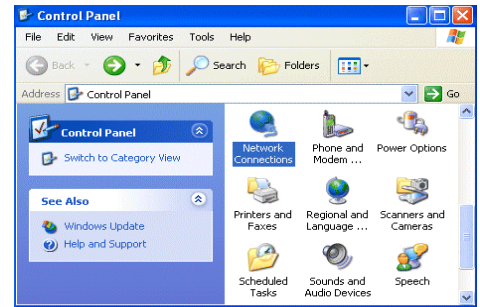


Figure 3.1: LAN Area Connection

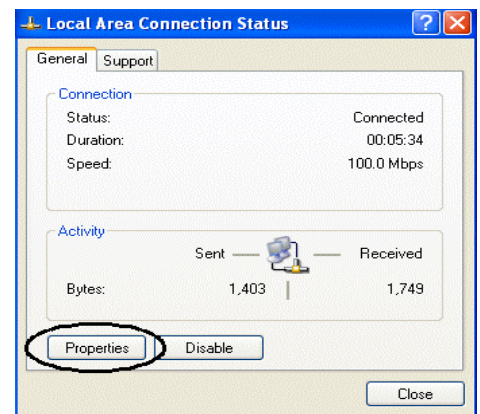


Figure 3.2: LAN Connection Status

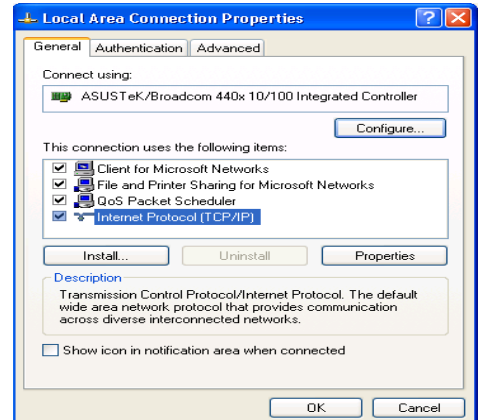


Figure 3.3: TCP / IP

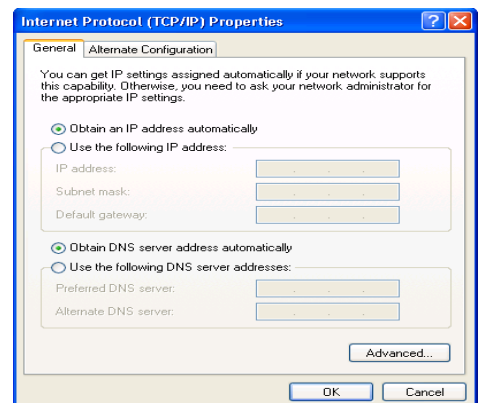


Figure 3.4: IP Address & DNS Configuration

For Windows 2000

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click **Network and Dial-up Connections**.
2. Double-click **Local Area ("LAN") Connection**. (See Figure 3.5)
3. In the **LAN Area Connection Status** window, click **Properties**. (See Figure 3.6)
4. Select **Internet Protocol (TCP/IP)** and click **Properties**. (See Figure 3.7)
5. Select the **Obtain an IP address automatically** and **Obtain DNS server address automatically** radio buttons. (See Figure 3.8)
6. Click **OK** to finish the configuration.



Figure 3.5: LAN Area Connection

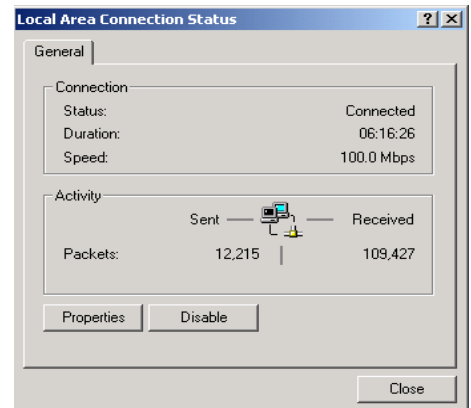


Figure 3.6: LAN Connection Status

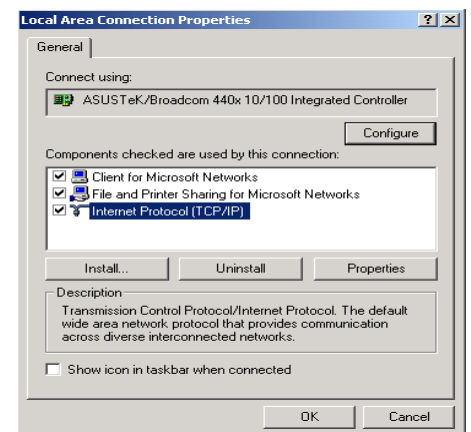


Figure 3.7: TCP / IP

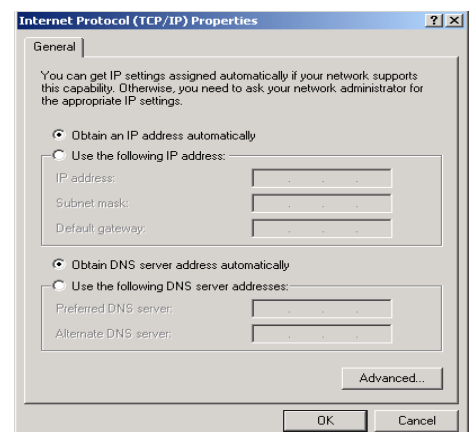


Figure 3.8: IP Address & DNS Configuration

For Windows 98 / ME

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click **Network** and choose the **Configuration** tab.
2. Select **TCP / IP -> NE2000 Compatible**, or the name of any Network Interface Card (NIC) in your PC. (See **Figure 3.9**)
3. Click **Properties**.
4. Select the **IP Address** tab. In this page, click the Obtain an IP address automatically radio button. (See **Figure 3.10**)
5. Then select the **DNS Configuration** tab. (See **Figure 3.11**)
6. Select the **Disable DNS** radio button and click **OK** to finish the configuration.

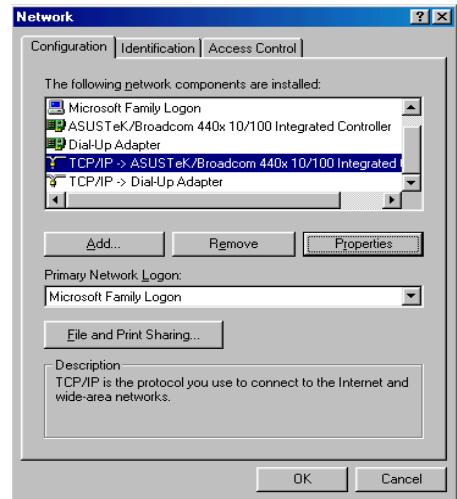


Figure 3.9: TCP / IP

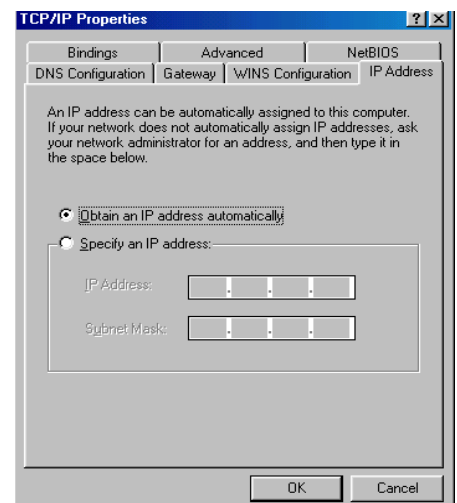


Figure 3.10: IP Address

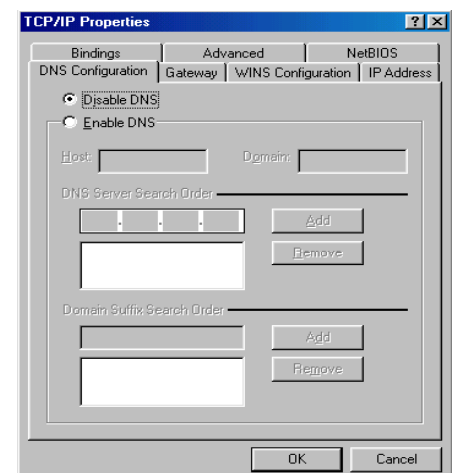


Figure 3.11: DNS Configuration

For Windows NT4.0

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click **Network** and choose the **Protocols** tab.
2. Select **TCP/IP Protocol** and click **Properties**. (See **Figure 3.12**)
3. Select the **Obtain an IP address from a DHCP server** radio button and click **OK**. (See **Figure 3.13**)

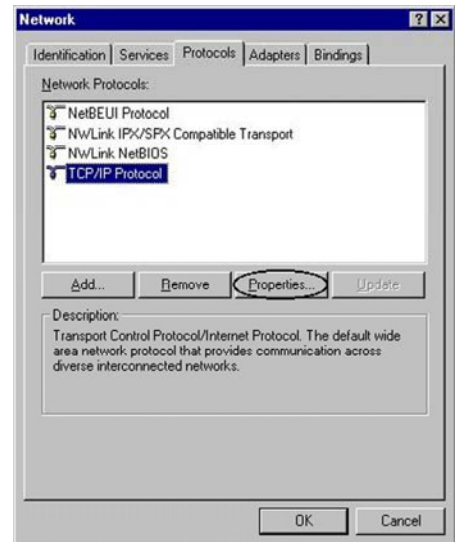


Figure 3.12: TCP / IP

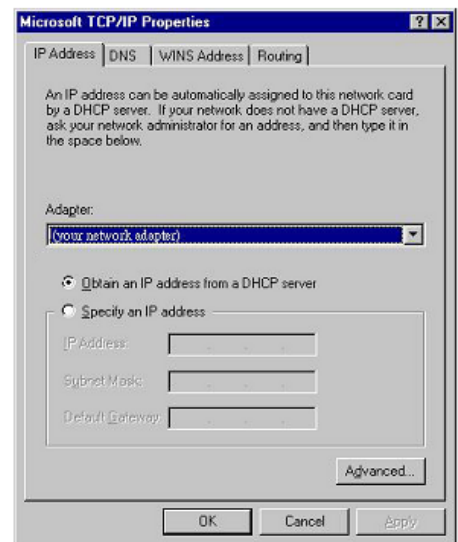


Figure 3.13: IP Address

Factory Default Settings

Before configuring your, you need to know the following default settings.

● Web Interface:

- ✘ Username: admin
- ✘ Password: admin

● LAN Device IP Settings:

- ✘ IP Address: 192.168.1.254
- ✘ Subnet Mask: 255.255.255.0

● ISP setting in WAN site:

- ✘ PPPoE

● DHCP server:

- ✘ DHCP server is enabled.
- ✘ Start IP Address: 192.168.1.100
- ✘ IP pool counts: 100

Username and Password

The default username and password are “**admin**” and “**admin**” respectively.



Attention

If you ever forget the password to log in, you may press the RESET button to restore the factory default settings.

LAN and WAN Port Addresses

The parameters of LAN and WAN ports are pre-set in the factory. The default values are shown below.

LAN Port		WAN Port
IP address	192.168.1.254	The PPPoE function is <i>enabled</i> to automatically get the WAN port configuration from the ISP, but you have to set the uername and password first.
Subnet Mask	255.255.255.0	
DHCP server function	Enabled	
IP addresses for distribution to PCs	100 IP addresses continuing from 192.168.1.100 through 192.168.1.199	

Information from your ISP

Before configuring this device, you have to check with your ISP (Internet Service Provider) what kind of service is provided such as PPPoE, PPPoA, RFC1483, or IPoA.

Gather the information as illustrated in the following table and keep it for reference.

PPPoE	VPI/VCI, VC-based/LLC-based multiplexing, Username, Password, Service Name, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
PPPoA	VPI/VCI, VC-based/LLC-based multiplexing, Username, Password, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
RFC1483 Bridged	VPI/VCI, VC-based/LLC-based multiplexing to use Bridged Mode.
RFC1483 Routed	VPI/VCI, VC-based/LLC-based multiplexing, IP address, Subnet mask, Gateway address, and Domain Name System (DNS) IP address (it is fixed IP address).
IPoA	VPI/VCI, VC-based/LLC-based multiplexing, IP address, Subnet mask, Gateway address, and Domain Name System (DNS) IP address (it is fixed IP address).

Configuring with your Web Browser

Open your web browser, enter the IP address of your router, which by default is **192.168.1.254**, and click “Go”, a user name and password window prompt will appear. **The default username and password are “admin” and “admin”.** (See Figure 3.14)

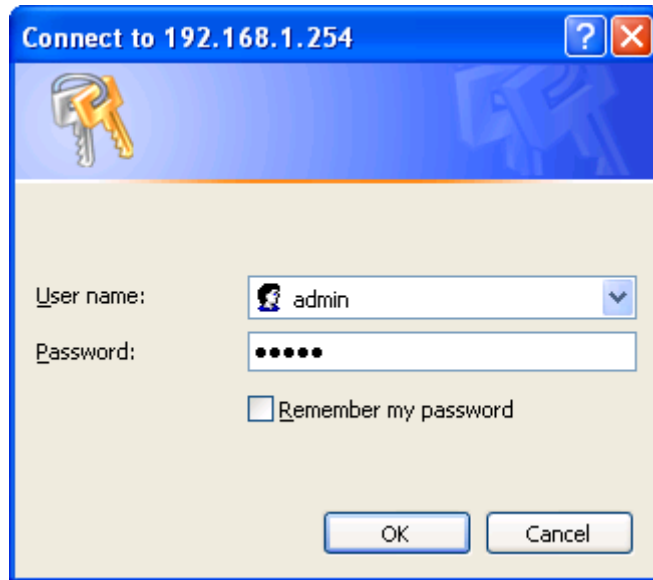


Figure 3.14: User name & Password Prompt Window

Congratulation! You are now successfully logon to the BIPAC-7500G / 7500GL ADSL Router!

Chapter 4: Configuration

At the configuration homepage, the left navigation pane where bookmarks are provided links you directly to the desired setup page, including:

- **Status** (ARP Table, Wireless Association, Routing Table, DHCP Table, PPTP Status, IPSec Status, L2TP Status, Email Status, Event Log, Error Log, NAT Sessions and UPnP Portmap)
- **Quick Start**
- **Configuration** (LAN, WAN, System, Firewall, VPN, QoS, Virtual Server and Advanced)
- **Save Config to FLASH**
- **Language** (provides user interface in English and German languages).

Please see the relevant sections of this manual for detailed instructions on how to configure your Billion router.

Status

ARP Table

This section displays the router's ARP (Address Resolution Protocol) Table, which shows the mapping of Internet (IP) addresses to Ethernet (MAC) addresses. This is useful as a quick way of determining the MAC address of the network interface of your PCs to use with the router's **Firewall – MAC Address Filter** function. See the Firewall section of this manual for more information on this feature.

ARP Table			
IP <> MAC List			
IP Address	MAC Address	Interface	Static
192.168.1.187	00:0c:6e:bd:11:6d	iplan	no

IP Address: A list of IP addresses of devices on your LAN (Local Area Network).

MAC Address: The MAC (Media Access Control) addresses for each device on your LAN.

Interface: The interface name (on the router) that this IP Address connects to.

Static: Static status of the ARP table entry:

- “no” for dynamically-generated ARP table entries
- “yes” for static ARP table entries added by the user

Wireless Association

Wireless Association Table

Wireless client's MAC address and the corresponding IP address

IP Address	MAC
192.168.1.100	00:04:23:73:9a:86

IP Address: It is IP address of wireless client that joins this network.

MAC: The MAC address of wireless client.

Routing Table

Routing Table				
Routing Table				
Valid	Destination	Netmask	Gateway/Interface	Cost

RIP Routing Table			
Destination	Netmask	Gateway	Cost

Routing Table:

Valid: It indicates a successful routing status.

Destination: The IP address of the destination network.

Netmask: The destination netmask address.

Gateway/Interface: The IP address of the gateway or existing interface that this route will use.

Cost: The number of hops counted as the cost of the route.

RIP Routing Table:

Destination: The IP address of the destination network.

Netmask: The destination netmask address.

Gateway: The IP address of the gateway that this route will use.

Cost: The number of hops counted as the cost of the route.

DHCP Table

DHCP Table		
Type		
Leased ▶	Expired ▶	Permanent ▶

Leased: The DHCP assigned IP addresses information.

IP Address: A list of IP addresses of devices on your LAN (Local Area Network).

Expired: The expired IP addresses information.

Permanent: The fixed host mapping information

■ Leased Table

Leased Table			
IP Address	MAC Address	Client Host Name	Expiry

IP Address: The IP address that assigned to client.

Client UID/hw addr: The MAC address of client.

Client Host Name: The Host Name (Computer Name) of client.

Expiry: The current lease time of client.

■ Expired Table

Expired Table			
IP Address	MAC Address	Client Host Name	Expiry

Please refer the **Leased Table**.

■ Permanent Table

Permanent Table			
Name	IP Address	MAC Address	Maximum Lease Time

Name: The name you assigned to the Permanent configuration.

IP Address: The fixed IP address for the specify client.

MAC Address: The MAC Address that you want to assign the fixed IP address

Maximum Lease Time: The maximum lease time interval you allow to clients

PPTP Status

This shows details of your configured PPTP VPN Connections.

PPTP Status						
VPN/PPTP for Remote Access Application						
Name	Type	Enable	Active	Tunnel Connected	Call Connected	Encryption
VPN/PPTP for LAN-to-LAN Application						
Name	Type	Enable	Active	Tunnel Connected	Call Connected	Encryption

Name: The name you assigned to the particular PPTP connection in your VPN configuration.

Type: The type of connection (dial-in/dial-out).

Enable: Whether the connection is currently enabled.

Active: Whether the connection is currently active.

Tunnel Connected: Whether the VPN Tunnel is currently connected.

Call Connected: If the Call for this VPN entry is currently connected.

Encryption: The encryption type used for this VPN connection.

IPSec Status

This shows details of your configured IPSec VPN Connections.

IPSec Status							
VPN Tunnels							
Name	Active	Connection State	Statistics	Local Subnet	Remote Subnet	Remote Gateway	SA

Name: The name you assigned to the particular VPN entry.

Active: Whether the VPN Connection is currently Active.

Connection State: Whether the VPN is Connected or Disconnected.

Statistics: Statistics for this VPN Connection.

Local Subnet: The local IP Address or Subnet used.

Remote Subnet: The Subnet of the remote site.

Remote Gateway: The Remote Gateway IP address.

SA: The Security Association for this VPN entry.

L2TP Status

This shows details of your configured L2TP VPN Connections.

L2TP Status						
VPN/L2TP for Remote Access Application						
Name	Type	Enable	Active	Tunnel Connected	Call Connected	Encryption
VPN/L2TP for LAN-to-LAN Application						
Name	Type	Enable	Active	Tunnel Connected	Call Connected	Encryption

Name: The name you assigned to the particular L2TP connection in your VPN configuration.

Type: The type of connection (dial-in/dial-out).

Enable: Whether the connection is currently enabled.

Active: Whether the connection is currently active.

Tunnel Connected: Whether the VPN Tunnel is currently connected.

Call Connected: If the Call for this VPN entry is currently connected.

Encryption: The encryption type used for this VPN connection.

Event Log

This page displays the router's Event Log entries. Major events are logged to this window, such as when the router's ADSL connection is disconnected, as well as Firewall events when you have enabled Intrusion or Blocking Logging in the **Configuration – Firewall** section of the interface. Please see the **Firewall** section of this manual for more details on how to enable Firewall logging.

Event Log

```
----- system log buffer head -----  
----- system log buffer tail -----
```

Refresh Clear

Error Logging

Any errors encountered by the router (e.g. invalid names given to entries) are logged to this window.

Error Log		
Error Log (<i>times are in seconds since last reboot</i>)		
When	Process	Error Log

NAT Sessions

This section lists all current NAT sessions between interface of types external (WAN) and internal (LAN).

NAT Sessions

Active NAT sessions between interface of types external and internal:

Prot	Local IP: Port local/public	Remote IP: Port	Idle (sec.)
TCP	192.168. 1.201: 1110/ 1110	64. 94.110. 12: 80	29
TCP	192.168. 1. 99: 1982/ 1982	210.184.108.126: 80	729
TCP	192.168. 1. 99: 1979/ 1979	207. 68.178.239: 80	542
TCP	192.168. 1.202: 2011/ 2011	207. 46.107. 27: 1863	21
TCP	192.168. 1.100: 1166/ 1166	207. 46.106. 90: 1863	18
TCP	192.168. 1. 99: 1969/ 1969	207. 46.107. 22: 1863	673
ICMP	192.168. 1.201: 512/ 512	168. 95. 4.211: 512	0

TCP :	6 sessions
UDP :	0 sessions
Others :	1 sessions
Total :	7 sessions

UPnP Portmap

The section lists all port-mapping established using UPnP (Universal Plug and Play). Please see the **Advanced** section of this manual for more details on UPnP and the router's UPnP configuration options.

UPnP Portmap				
UPnP Portmap Table				
Name	Protocol	External Port	Redirect Port	IP Address
emwebigd1024	udp	35324 ~ 35324	15852 ~ 15852	192.168.1.205
emwebigd1025	tcp	48888 ~ 48888	14811 ~ 14811	192.168.1.205
emwebigd1063	udp	9210 ~ 9210	15169 ~ 15169	192.168.1.202
emwebigd1064	tcp	50937 ~ 50937	14500 ~ 14500	192.168.1.202

Quick Start

Quick Start	
Connection	
Encapsulation	<input type="text" value="PPPoE"/> <input type="button" value="Auto Scan"/>
VPI	<input type="text" value="0"/>
VCI	<input type="text" value="32"/>
NAT	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Optional Settings	
IP Address	<input type="text" value="0.0.0.0"/> ('0.0.0.0' means 'Obtain an IP address automatically')
SubNetmask	<input type="text" value="0.0.0.0"/>
Default Gateway	<input type="text"/>
DNS	
Primary DNS	<input type="text"/>
Secondary DNS	<input type="text"/>
PPP	
Username	<input type="text"/>
Password	<input type="text"/>
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

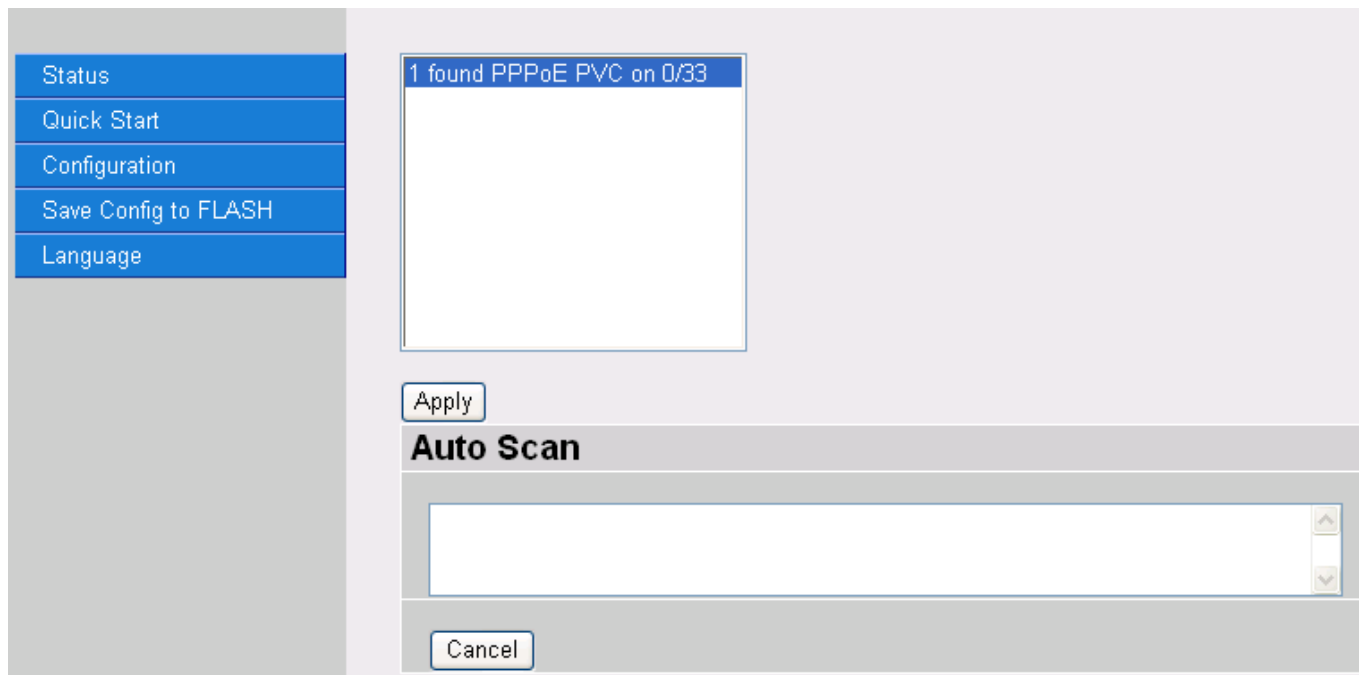
For detailed instructions on configuring your WAN settings, please see the **WAN** section of this manual.

Usually, the only details you will need for the Quick Start wizard to get you online are your login (often in the form of *username@ispname*), your password and the encapsulation type.

Your ISP will be able to supply all the details you need, alternatively, if you have deleted the current WAN Connection in the **WAN – ISP** section of the interface, you can use the router's PVC Scan feature to attempt to determine the Encapsulation types offered by your ISP.

Auto Scan	
Before you scan the PVCs, please DELETE all the WAN interfaces.	
IP Address	<input type="text"/> if provided by ISP
Gateway	<input type="text"/> if provided by ISP
<input type="button" value="Start"/>	

Click **Start** to begin scanning for encapsulation types offered by your ISP. If the scan is successful you will then be presented with a list of supported options:



Select the desired option from the list and click **Apply** to return to the Quick Start interface to continue configuring your ISP connection. Please note that the contents of this list will vary, depending on what is supported by your ISP.

Configuration

When you click this item, you get following sub-items to configure the ADSL router.

LAN, WAN, System, Firewall, VPN, QoS, Virtual Server and Advanced

These functions are described below in the following sections.

LAN (Local Area Network)

There are four items within the LAN section: **Ethernet, Wireless, Wireless Security, Port Setting** and **DHCP Server**.

■ Ethernet

Ethernet				
Primary IP Address				
IP Address	192	168	1	254
SubNetmask	255	255	255	0
RIP	<input type="checkbox"/> RIP v1 <input type="checkbox"/> RIP v2 <input type="checkbox"/> RIP v2 Multicast			
Secondary IP Address				
The Secondary IP Address should be on the same subnet as the Primary IP Address and uses the same Subnet Mask.				
IP Address	0	0	0	0
<input type="button" value="Apply"/>				

The router supports two Ethernet IP addresses in the LAN, and two different LAN subnets through which you can access the Internet at the same time. Users usually only have one subnet in their LAN, so there is no need to configure a Secondary IP address. The default IP address for the router is 192.168.1.254.

RIP: RIP v1, RIP v2, and RIP v2 Multicast. Check to enable RIP function.

Wireless

Wireless	
Parameters	
WLAN Service	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Mode	802.11b + g ▾
Nitro Mode	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
ESSID	wlan-ap
ESSID Broadcast	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Regulation Domain	N.America ▾
Channel ID	Channel 1 (2.412 GHz) ▾
Reset	false ▾
Connected	true
AP Firmware Version	1.2.1.0

WLAN Service: Default setting is set to Enable.

Mode: 802.11b + g (Mixed mode), 802.11b and 802.11g. The factory default is 802.11b + g.

(BIPAC-7500G ONLY) Nitro Mode: Default is enabled for increasing performance in mixed 802.11b and 802.11g wireless networks.

ESSID: Enter the unique ID given to the Access Point (AP), which is already built-in to the router's wireless interface. To connect to this device, your wireless clients must have the same ESSID as the device.

ESSID Broadcast:

Disable: Any client that using the "any" setting cannot discover the Access Point (AP) in question.

Enable: Any client that using the "any" setting can discover the Access Point (AP) in question.

Regulation Domain: There are five Regulation Domains for you to choose from, including **North America (N.America)**, **Europe**, **France**, etc. The Channel ID will be different based on this setting.

Channel ID: Select the ID channel that you would like to use.

Reset: Reset the Access Point (AP), which is already built-in to the router's wireless interface.

Connected: true or false. That it is the connection status between the system and the build-in wireless card.

AP Firmware Version: The Access Point firmware version.

■ Wireless Security

You can disable or enable with WPA or WEP for protecting wireless network. The default mode of wireless security is **disabled**.

Wireless Security	
Parameters	
Security Mode	Disable
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

● WPA Pre-Shared Key

Wireless Security	
Parameters	
Security Mode	WPA Pre-Shared Key
WPA Algorithms	TKIP
WPA Shared Key	<input type="text"/>
Group Key Renewal	600 seconds
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

WPA Algorithms: TKIP (Temporal Key Integrity Protocol) utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers.

WPA Shared Key: The key for network authentication. The input format is in character style and key size should be in the range between 8 and 63 characters.

Group Key Renewal: The period of renewal time for changing the security key automatically between wireless client and Access Point (AP).

WEP

Wireless Security	
Parameters	
Security Mode	WEP
WEP Encryption	<input type="radio"/> WEP64 <input checked="" type="radio"/> WEP128 Hex
Passphrase	<input type="text"/> <input type="button" value="Generate"/>
Default Used WEP Key	0 (0~3)
Key 0	00-00-00-00-00-00-00-00-00-00-00-00
Key 1	00-00-00-00-00-00-00-00-00-00-00-00
Key 2	00-00-00-00-00-00-00-00-00-00-00-00
Key 3	00-00-00-00-00-00-00-00-00-00-00-00
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

WEP Encryption: To prevent unauthorized wireless stations from accessing data transmitted over the network, the router offers highly secure data encryption, known as WEP. If you require high security for transmissions, there are two alternatives to select from: **WEP 64 and WEP 128**. WEP 128 will offer increased security over WEP 64.

Passphrase: This is used to generate WEP keys automatically based upon the input string and a pre-defined algorithm in WEP64 or WEP128. You can input the same string in both the AP and Client card settings to generate the same WEP keys. Please note that you do not have to enter **Key (0-3)** as below when the **Passphrase** is enabled.

Default Used WEP Key: Select the encryption key ID, please refer to **Key (0-3)** below.

Key (0-3): Enter the key to encrypt wireless data. To allow encrypted data transmission, the WEP Encryption Key values on all wireless stations must be the same as the router. There are four keys for your selection. The input format is in HEX style, 5 and 13 HEX codes are required for WEP64 and WEP128 respectively, the separator is "-". For example, using WEP64, 11-22-33-44-55 is a valid key, whilst 1122334455 is invalid.

■ Port Setting

This section allows you to configure the settings for the router's Ethernet ports to solve some of the compatibility problems that may be encountered while connecting to the Internet, as well allowing users to tweak the performance of their network.

Port Setting	
Parameters	
Port1 Connection Type	Auto <input type="button" value="v"/>
Port2 Connection Type	Auto <input type="button" value="v"/>
Port3 Connection Type	Auto <input type="button" value="v"/>
Port4 Connection Type	Auto <input type="button" value="v"/>
IPv4 TOS Priority Control	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Set High Priority TOS	<input type="checkbox"/> 7 <input type="checkbox"/> 6 <input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 0
<input type="button" value="Apply"/>	

Port # Connection Type: Five options to choose from: Auto, 10M half-duplex, 10M full-duplex, 100M half-duplex or 100M full-duplex. Sometimes, there are Ethernet compatibility problems with legacy Ethernet devices, and you can configure different types to solve compatibility issues. The default is **Auto**, which users should keep unless there are specific problems with PCs not being able to access your LAN.

IPv4 TOS priority Control (Advanced users): TOS, Type of Services, is the 2nd octet of an IP packet. Bits 6-7 of this octet are reserved and bit 0-2 are used to specify the priority (precedence) of the packet, and bits 3-5 are specified the delay, throughput and reliability.

This feature uses bits 0-2 to classify the packet's priority. If the packet is high priority, it will flow first. Therefore, when this feature is enabled, the router's Ethernet switch will check the 2nd octet of each IP packet. If the value in the Precedence of TOS field matches the checked values in the table (0 to 7), this packet will be treated as high priority.

DHCP Server

You can disable or enable the DHCP (Dynamic Host Configuration Protocol) server or enable the router's DHCP relay functions. The DHCP protocol allows your router to dynamically assign IP addresses to PCs on your network if they are configured to obtain IP addresses automatically.

DHCP Server	
Configuration	
DHCP Server Mode	<input type="radio"/> Disable
	<input checked="" type="radio"/> DHCP Server
	<input type="radio"/> DHCP Relay Agent
<input type="button" value="Next"/>	

DHCP Server Status	
Allow Bootp	true
Allow Unknown Clients	true
Enable	true
Subnet Definitions	
Subnet Value	192.168.1.0
SubNetmask	255.255.255.0
Maximum Lease Time	86400 seconds
Default Lease Time	43200 seconds
Use local host address as DNS server	true
Use local host address as default gateway	true
Get subnet from IP interface	iplan
IP Range 192.168.1.100- 192.168.1.199	
Option <i>domain-name-servers</i> = 0.0.0.0	

To disable the router's DHCP Server, check **Disabled** and click **Next**, then click **Apply**. When the DHCP Server is disabled you will need to manually assign a fixed IP address to each PCs on your network, and set the default gateway for each PCs to the IP address of the router (by default this is 192.168.1.254).

To configure the router's DHCP Server, check **DHCP Server** and click **Next**. You can then configure parameters of the DHCP Server including the IP pool (starting IP address and ending IP address to be allocated to PCs on your network), lease time for each assigned IP address (the period of time the IP address assigned will be valid), DNS IP address and the gateway IP address. These details are sent to the DHCP client (i.e. your PC) when it requests an IP address from the DHCP server. Click **Apply** to enable this function. If you check "**Use Router as a DNS Server**", the ADSL Router will perform the domain name lookup, find the IP address from the outside network automatically and forward it back to the requesting PC in the LAN (your Local Area Network).

If you check **DHCP Relay Agent** and click **Next**, then you will have to enter the IP address of the DHCP server which will assign an IP address back to the DHCP client in the LAN. Use this function only if advised to do so by your network administrator or ISP.

Click **Apply** to enable this function.

WAN (Wide Area Network)

WAN refers to your Wide Area Network connection, i.e. your router's connection to your ISP and the Internet. There are two items within the **WAN** section: **ISP**, **DNS** and **ADSL**.

■ ISP

WAN Connection						
WAN Services Table						
Name	Description	Creator	VPI	VCI		
wanlink	PPPoE WAN Link	Factory Defaults	0	32	Edit ▶	Change ▶

The factory default is PPPoE. If your ISP uses this access protocol, click **Edit** to input other parameters as below. If your ISP does not use PPPoE, you can change the default WAN connection entry by clicking **Change**.

A simpler alternative is to select **Quick Start** from the main menu on the left. Please see the Quick Start section of the manual for more information.

RFC 1483 Routed Connections

WAN Connection	
RFC 1483 Routed	
Description	<input type="text" value="RFC 1483 routed mode"/>
VPI	<input type="text" value="0"/>
VCI	<input type="text" value="32"/>
ATM Class	<input type="text" value="UBR"/> <input type="button" value="v"/>
NAT	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Encapsulation Method	<input type="text" value="LLC Bridged"/> <input type="button" value="v"/>
IP Assignment	<input checked="" type="radio"/> Obtain an IP address automatically via DHCP client
	<input type="radio"/> Use the following IP address
	IP Address <input type="text"/>
	Netmask <input type="text"/>
	Gateway <input type="text"/>
RIP	<input type="checkbox"/> RIP v1 <input type="checkbox"/> RIP v2 <input type="checkbox"/> RIP v2 Multicast
MTU	<input type="text" value="1500"/>
<input type="button" value="Apply"/>	

Description: Your description of this connection.

VPI and VCI: Enter the information provided by your ISP.

ATM Class: The Quality of Service for ATM layer.

NAT: The NAT (Network Address Translation) feature allows multiple users to access the Internet through a single IP account, sharing the single IP address. If users on your LAN have public IP addresses and can access the Internet directly, the NAT function can be disabled.

Encapsulation method: Select the encapsulation format, the default is LlcBridged. Select the one provided by your ISP.

DHCP client: Enable or disable the DHCP client, specify if the Router can get an IP address from the Internet Service Provider (ISP) automatically or not. Please click **Obtain an IP address automatically via DHCP client** to enable the DHCP client function or click Specify an IP address to disable the DHCP client function, and specify the IP address manually. The setting of this item is specified by your ISP.

RIP: RIP v1, RIP v2, and RIP v2 Multicast. Check to enable RIP function.

MTU: Maximum Transmission Unit. The size of the largest datagram (excluding media-specific headers) that IP will attempt to send through the interface.

● PPPoE Connections

WAN Connection	
PPPoE Routed	
Description	<input type="text" value="PPPoE WAN Link"/>
VPI	<input type="text" value="0"/>
VCI	<input type="text" value="32"/>
ATM Class	<input type="text" value="UBR"/>
NAT	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Username	<input type="text"/>
Password	<input type="text"/>
Service Name	<input type="text"/>
IP Address	<input type="text" value="0.0.0.0"/> <small>('0.0.0.0' means 'Obtain an IP address automatically')</small>
Authentication Protocol	<input type="text" value="Chap(Auto)"/>
Connection	<input type="text" value="Always On"/>
Idle Timeout	<input type="text" value="0"/> minutes Details
RIP	<input type="checkbox"/> RIP v1 <input type="checkbox"/> RIP v2 <input type="checkbox"/> RIP v2 Multicast
MTU	<input type="text" value="1492"/>
<input type="button" value="Apply"/> Advanced Options	

Description: A user-definable name for this connection.

VPI/VCI: Enter the information provided by your ISP.

ATM Class: The Quality of Service for ATM layer.

NAT: The NAT (Network Address Translation) feature allows multiple users to access the Internet through a single ISP account, sharing a single IP address. If users on your LAN have public IP addresses and can access the Internet directly, the NAT function can be disabled.

Username: Enter the username provided by your ISP. You can input up to **128** alphanumeric characters (case sensitive). This will usually be in the format of "username@ispname" instead of simply "username".

Password: Enter the password provided by your ISP. You can input up to **128** alphanumeric characters (case sensitive).

Service Name: This item is for identification purposes. If it is required, your ISP will provide you the information. Maximum input is **20** alphanumeric characters.

IP Address: specify if the Router can get an IP address from the Internet Server Provider (ISP) automatically or not. Please click Obtain an IP address automatically via DHCP client to enable the DHCP client function or click Specify an IP address to disable the

DHCP client function, and specify the IP address manually. The setting of this item is specified by your ISP.

Authentication Protocol: Default is **Chap(Auto)**. Your ISP will advise you whether to use **Chap** or **Pap**.

Connection:

☉ **Always on:** If you want the router to establish a PPPoE session when starting up and to automatically re-establish the PPPoE session when disconnected by the ISP.

☉ **Connect to Demand:** If you want to establish a PPPoE session only when there is a packet requesting access to the Internet (i.e. when a program on your computer attempts to access the Internet).

Idle Timeout: Auto-disconnect the broadband firewall gateway when there is no activity on the line for a predetermined period of time.

☉ **Detail:** You can define the destination port and packet type (TCP/UDP) without checking by timer. It allows you to set which outgoing traffic will not trigger and reset the idle timer.

RIP: RIP v1, RIP v2, and RIP v2 Multicast. Check to enable RIP function.

MTU: Maximum Transmission Unit. The size of the largest datagram (excluding media-specific headers) that IP will attempt to send through the interface.

Advanced Options (PPPoE)

LLC Header: Selects encapsulation mode, true for using LLC or false for using VC-Mux.

Create Route: This setting specifies whether a route is added to the system after IPCP (Internet Protocol Control Protocol) negotiation is completed. If set to *enabled*, a route will be created which directs packets to the remote end of the PPP link.

Specific Route: Specifies whether the route created when a PPP link comes up is a specific or default route. If set to *enabled*, the route created will only apply to packets for the subnet at the remote end of the PPP link. The address of this subnet is obtained during IPCP negotiation.

Subnet Mask: sets the subnet mask used for the local IP interface connected to the PPP transport. If the value *0.0.0.0* is supplied, the netmask will be calculated from the class of the IP address obtained during IPCP negotiation.

Route Mask: Sets the subnet mask used by the route that is created when a PPP link comes up. If it is set to *0.0.0.0*, the subnet mask is determined by the IP address of the remote end of the link. The class of the IP address is obtained during IPCP (Internet Protocol Control Protocol) negotiation.

MRU : Maximum Receive Unit. This is negotiated during the LCP protocol stage.

Discover Primary / Secondary DNS: This setting enables/disables whether the primary/secondary DNS server address is requested from a remote PPP peer using IPCP. The default setting for this command is *enabled*.

Give DNSto Relay: Controls whether the PPP Internet Protocol Control Protocol (IPCP) can request the DNS server IP address for a remote PPP peer. Once IPCP has discovered the DNS server IP address, it automatically gives the address to the local DNS relay so that a connection can be established.

Give DNSto Client: Controls whether the PPP Internet Protocol Control Protocol (IPCP) can request a DNS server IP address for a remote PPP peer. Once IPCP has discovered the DNS server IP address, it automatically gives the address to the local DNS client so that a connection can be established.

Give DNSto DHCP Server: Similar to the above, but gives the DNS server address to the DHCP server.

Discover Primary NBNS / Discover Secondary NBNS: This setting enables/disables whether the primary/secondary NBNS server address is requested from a remote PPP peer using IPCP. The default setting for this command is disabled.

Discover Subnet Mask: Specifies if the subnet mask given by IPCP negotiation process is to be used.

Give Subnet Mask To DHCP Server: Enable to change your DHCP Server settings by using the given information in IPCP negotiation process.

RFC 1483 Bridged Connections

WAN Connection	
RFC 1483 Bridged	
Description	RFC 1483 bridged mode
VPI	0
VCI	32
ATM Class	UBR
Encapsulation Method	LLC Bridged
Ether Filter Type	All
Spanning Bridge Interface	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
<input type="button" value="Apply"/>	

VPI and VCI: Enter the information provided by your ISP.

ATM Class: The Quality of Service for ATM layer.

Encapsulation method: Select the encapsulation format, this is provided by your ISP.

Ether Filter Type: Specify the type of ethernet filtering performed by the named bridge interface.

All	Allows all types of ethernet packets through the port.
Ip	Allows only IP/ARP types of ethernet packets through the port.
Pppoe	Allows only PPPoE types of ethernet packets through the port.

Spanning Bridge Interface: Enable/Disable spanning tree function of modem.

● PPPoA Routed Connections

WAN Connection	
PPPoA Routed	
Description	PPPoA Routed
VPI	0
VCI	32
ATM Class	UBR <input type="button" value="v"/>
NAT	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Username	<input type="text"/>
Password	<input type="text"/>
IP Address	0.0.0.0 <small>(0.0.0.0 means 'Obtain an IP address automatically')</small>
Authentication Protocol	Chap(Auto) <input type="button" value="v"/>
Connection	Always On <input type="button" value="v"/>
Idle Timeout	0 minutes Details <input type="button" value="▶"/>
RIP	<input type="checkbox"/> RIP v1 <input type="checkbox"/> RIP v2 <input type="checkbox"/> RIP v2 Multicast
MTU	1500

[Advanced Options](#)

Description: User-definable name for the connection.

VPI/VCI: Enter the information provided by your ISP.

ATM Class: The Quality of Service for ATM layer.

NAT: The NAT (Network Address Translation) feature allows multiple users to access the Internet through a single IP account, sharing a single IP address. If users on your LAN have public IP addresses and can access the Internet directly, the NAT function can be disabled.

Username: Enter the username provided by your ISP. You can input up to **128** alphanumeric characters (case sensitive). This will usually be in the format of “username@ispname” instead of simply “username”.

Password: Enter the password provided by your ISP. You can input up to **128** alphanumeric characters (case sensitive).

IP Address: Specify an IP address allowed to logon and access the router’s web server.. Note: IP 0.0.0.0 indicates all users who are connected to this router are allowed to logon the device and modify data.

Authentication Protocol Type: Default is **Chap (Auto)**. Your ISP will advise you whether to use **Chap** or **Pap**.

Connection:

Ⓞ **Always on:** If you want the router to establish a PPPoA session when starting up and to automatically re-establish the PPPoA session when disconnected by the ISP.

Ⓞ **Connect to Demand:** If you want to establish a PPPoA session only when there is a packet requesting access to the Internet (i.e. when a program on your computer attempts to access the Internet).

Idle Timeout: Auto-disconnect the broadband firewall gateway when there is no activity on the line for a predetermined period of time.

Ⓞ **Detail:** You can define the destination port and packet type (TCP/UDP) without checking by timer. It allows you to set which outgoing traffic will not trigger and reset the idle timer.

RIP: RIP v1, RIP v2, and RIP v2 Multicast. Check to enable RIP function.

MTU: Maximum Transmission Unit. The size of the largest datagram (excluding media-specific headers) that IP will attempt to send through the interface.

Advanced Options (PPPoA)

LLC Header: Selects encapsulation mode, true for using LLC or false for using VC-Mux.

Create Route: This setting specifies whether a route is added to the system after IPCP (Internet Protocol Control Protocol) negotiation is completed. If set to *enabled*, a route will be created which directs packets to the remote end of the PPP link.

Specific Route: Specifies whether the route created when a PPP link comes up is a specific or default route. If set to *enabled*, the route created will only apply to packets for the subnet at the remote end of the PPP link. The address of this subnet is obtained during IPCP negotiation.

Subnet Mask: sets the subnet mask used for the local IP interface connected to the PPP transport. If the value *0.0.0.0* is supplied, the netmask will be calculated from the class of the IP address obtained during IPCP negotiation.

Route Mask: Sets the subnet mask used by the route that is created when a PPP link comes up. If it is set to *0.0.0.0*, the subnet mask is determined by the IP address of the remote end of the link. The class of the IP address is obtained during IPCP (Internet Protocol Control Protocol) negotiation.

MRU: Maximum Receive Unit. This is negotiated during the LCP protocol stage.

Discover Primary / Secondary DNS: This setting enables/disables whether the primary/secondary DNS server address is requested from a remote PPP peer using IPCP. The default setting for this command is *enabled*.

Give DNS to Relay: Controls whether the PPP Internet Protocol Control Protocol (IPCP) can request the DNS server IP address for a remote PPP peer. Once IPCP has

discovered the DNS server IP address, it automatically gives the address to the local DNS relay so that a connection can be established.

Give DNS to Client: Controls whether the PPP Internet Protocol Control Protocol (IPCP) can request a DNS server IP address for a remote PPP peer. Once IPCP has discovered the DNS server IP address, it automatically gives the address to the local DNS client so that a connection can be established.

Give DNS to DHCP Server: Similar to the above, but gives the DNS server address to the DHCP server.

Discover Primary NBNS / Discover Secondary NBNS: This setting enables/disables whether the primary/secondary NBNS server address is requested from a remote PPP peer using IPCP. The default setting for this command is disabled.

Discover Subnet Mask: Specifies if the subnet mask given by IPCP negotiation process is to be used.

Give Subnet Mask To DHCP Server: Enable to change your DHCP Server settings by using the given information in IPCP negotiation process.

IPoA Routed Connections

WAN Connection		
IPoA Routed		
Description	IPoA routed	
VPI	0	
VCI	32	
ATM Class	UBR	
NAT	<input checked="" type="radio"/> Enable <input type="radio"/> Disable	
IP Assignment	<input checked="" type="radio"/> Obtain an IP address automatically via DHCP client	
	<input type="radio"/> Use the following IP address	
	IP Address	<input type="text"/>
	Netmask	<input type="text"/>
	Gateway	<input type="text"/>
RIP	<input type="checkbox"/> RIP v1 <input type="checkbox"/> RIP v2 <input type="checkbox"/> RIP v2 Multicast	
MTU	1500	
<input type="button" value="Apply"/>		

Description: User-definable name for the connection.

VPI/VCI: Enter the information provided by your ISP.

ATM Class: The Quality of Service for ATM layer.

NAT: The NAT (Network Address Translation) feature allows multiple users to access the Internet through a single IP account, sharing a single IP address. If users on your LAN have public IP addresses and can access the Internet directly, the NAT function can be disabled.

DHCP client: Enable or disable the DHCP client, specifying if the router can obtain an IP address from the Internet Service Provider (ISP) automatically or not. Please click **Obtain an IP address automatically via DHCP client** to enable the DHCP client function or click **Specify an IP address** to disable the DHCP client function, and specify the IP address manually. The setting of this item is specified by your ISP.

RIP: RIP v1, RIP v2, and RIP v2 Multicast. Check to enable RIP function.

MTU: Maximum Transmission Unit. The size of the largest datagram (excluding media-specific headers) that IP will attempt to send through the interface.

DNS

DNS	
Parameters	
Primary DNS	<input type="text"/>
Secondary DNS	<input type="text"/>
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

A Domain Name System (DNS) contains a mapping table for domain name and IP addresses. On the Internet, every host has a unique and user-friendly name (domain name) such as `www.billion.com` and an IP address. An IP address is a 32-bit number in the form of `xxx.xxx.xxx.xxx`, for example `192.168.1.254`. You can think of an IP address as a telephone number for devices on the Internet, and the DNS will allow you to find the telephone number for any particular domain name. As an IP Address is hard to remember, the DNS converts the friendly name into its equivalent IP Address.

You can obtain a Domain Name System (DNS) IP address automatically if your ISP has provided it when you logon. Usually when you choose PPPoE or PPPoA as your WAN - ISP protocol, the ISP will provide the DNS IP address automatically. You may leave the configuration field blank. Alternatively, your ISP may provide you with an IP address of their DNS. If this is the case, you must enter the DNS IP address.

If you choose one of the other three protocols – RFC1483 Routed/Bridged and IPoA check with your ISP, it may provide you with an IP address for their DNS server. You must enter the DNS IP address if you set the DNS of your PC to the LAN IP address of this router.

■ ADSL

ADSL	
Parameters	
Connect Mode	Multimode ▼
Activate Line	true ▼
Coding Gain	auto ▼
Tx Attenuation	0
DSP FirmwareVersion	A.27.4.1
Connected	true
Operational Mode	G.Dmt
Annex Type	AnnexA
Upstream	128000
Downstream	2048000

Connect Mode: The default is Multimode; it will detect the ADSL line code, G.dmt, G.lite, and T1.413 automatically. But in some area, it cannot detect the ADSL line code well. At this time, please adjust the ADSL line code to G.dmt or T1.413 first. If it still fails, please try the other values such as ALCTL, ADI, etc.

Activate Line: Aborting (false) your ADSL line and making it active (true) again for taking effect with setting of **Connect Mode**.

Coding Gain: Configure the ADSL coding gain from 0 dB to 7dB, or automatic.

Tx Attenuation: Setting ADSL transmission gain, the value is between 0~12.

DSP FirmwareVersion: Current ADSL line code firmware version.

Connected: Display current ADSL line sync status.

Operational Mode: Display current ADSL mode standard (Operational Mode) your Router is using when ADSL line has sync.

Annex Type: ADSL Annex A, which works over a standard telephone line. Annex B, which works over an ISDN line.

Upstream: Display current upstream rate of your ADSL line.


Downstream: Display current downstream rate of your ADSL line.

System

There are six items within the **System** section: **Time Zone**, **Remote Access**, **Firmware Upgrade**, **Backup/Restore**, **Restart** and **User Management**.

■ Time Zone

Time Zone	
Parameters	
Time Zone	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Time Zone List	<input checked="" type="radio"/> By City <input type="radio"/> By Time Difference
Local Time Zone (+GMT Time)	(GMT)Greenwich Mean Time ▼
SNTP Server IP Address	carl.css.gov time.nist.gov
	india.colorado.edu time-b.nist.gov
Daylight Saving	<input checked="" type="checkbox"/> Automatic
Resync Period	1440 minutes



The router does not have a real time clock on board; instead, it uses the Simple Network Time Protocol (SNTP) to get the current time from an SNTP server outside your network. Choose your local time zone, click **Enable** and click the **Apply** button. After a successful connection to the Internet, the router will retrieve the correct local time from the SNTP server you have specified. If you prefer to specify an SNTP server other than those in the drop-down list, simply enter its IP address as shown above. Your ISP may provide an SNTP server for you to use.

Resync Poll Interval (in minutes) is the periodic interval the router will wait before it re-synchronizes the router's time with that of the specified SNTP server. In order to avoid unnecessarily increasing the load on your specified SNTP server you should keep the poll interval as high as possible – at the absolute minimum every few hours or even days.

■ Remote Access

Remote Access

You may temporarily permit remote administration of this network device

Allow Access for minutes.

To temporarily permit remote administration of the router (i.e. from outside your LAN), select a time period the router will permit remote access for and click **Enable**. You may change other configuration options for the web administration interface using **Device Management** options in the **Advanced** section of the GUI.

If you wish to permanently enable remote access, choose a time period of 0 minutes. This setting cannot be saved into flash when timer set to zero.

Firmware Upgrade

Firmware Upgrade	
You may upgrade the system software on your network device	
New Firmware Image	<input type="text"/> <input type="button" value="Browse..."/>
<input type="button" value="Upgrade"/>	

Your router's "firmware" is the software that allows it to operate and provides all its functionality. Think of your router as a dedicated computer, and the firmware as the software it runs. Over time this software may be improved and modified, and your Billion router allows you to upgrade the software it runs to take advantage of these changes.

Clicking on **Browse** will allow you to select the new firmware image file you have downloaded to your PC. Once the correct file is selected, click Upgrade to update the firmware in your router.



DO NOT power down the router or interrupt the firmware upgrading while it is still in process. Improper operation could damage the router.

■ Backup / Restore

Backup/Restore

Allows you to backup the configuration settings to your computer, or restore configuration from your computer.

Backup Configuration

Backup configuration to your computer.

Backup

Restore Configuration

Configuration File

Browse...

"Restore" will overwrite the current configuration and restart the device. If you want to keep the current configuration, please use "Backup" first to save current configuration.

Restore

These functions allow you to save and backup your router's current settings to a file on your PC, or to restore a previously saved backup. This is useful if you wish to experiment with different settings, knowing that you have a backup handy in the case of any mistakes. It is advisable to backup your router's settings before making any significant changes to your router's configuration.

Press **Backup** to select where on your local PC to save the settings file. You may also change the name of the file when saving if you wish to keep multiple backups.

Press **Browse** to select a file from your PC to restore. You should only restore settings files that have been generated by the Backup function, and that were created when using the **current version** of the router's firmware. **Settings files saved to your PC should not be manually edited in any way.**

After selecting the settings file you wish to use, pressing **Restore** will load those settings into the router.

■ Restart Router

Click **Restart** with option **Current Settings** to reboot your router (and restore your last saved configuration).

Restart Router	
After restarting. Please wait for several seconds to let the system	
Restart Router with	<input checked="" type="radio"/> Current Settings
	<input type="radio"/> Factory Default Settings
<input type="button" value="Restart"/>	

If you wish to restart the router using the factory default settings (for example, after a firmware upgrade or if you have saved an incorrect configuration), select **Factory Default Settings** to reset to factory default settings.

You may also reset your router to factory settings by holding the small Reset pinhole button on the back of your router in for 10-12 seconds whilst the router is turned on.

User Management

User Management				
Current Defined Users				
Valid	User	Comment		
true	admin	Default admin user	Edit	
Create				

In order to prevent unauthorized access to your router’s configuration interface, it requires all users to login with a password. You can set up multiple user accounts, each with their own password.

You are able to **Edit** existing users and **Create** new users who are able to access the device’s configuration interface. Once you have clicked on **Edit**, you are shown the following options:

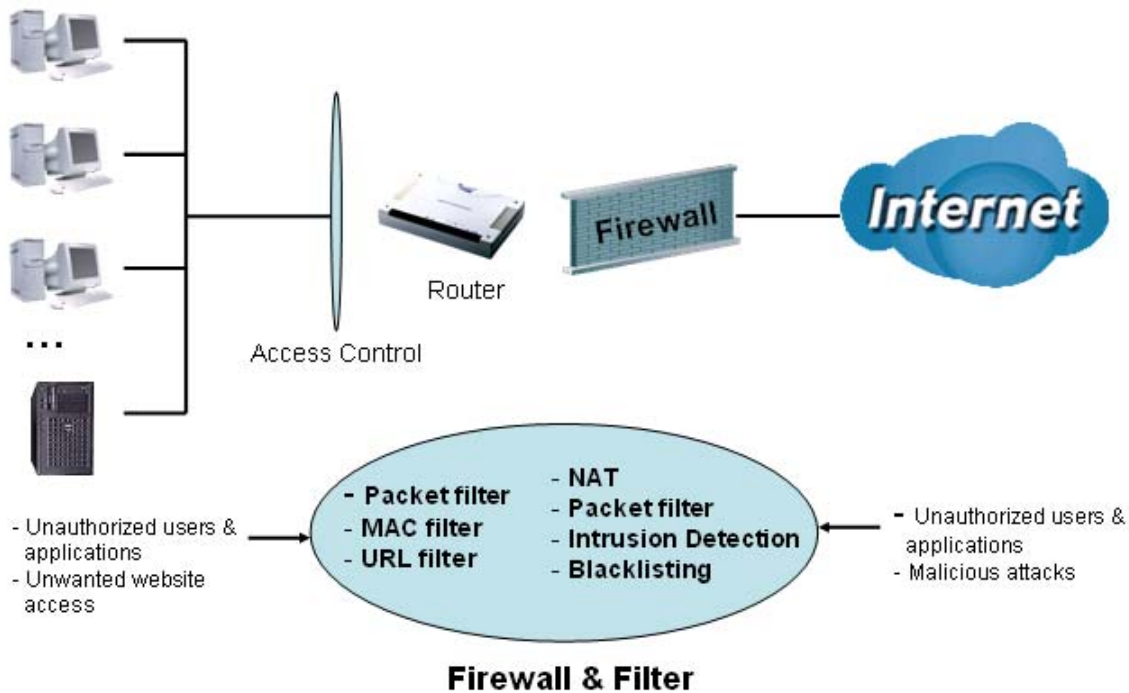
User Management	
Edit	
Username	admin
Password	*****
Confirm	*****
Valid	true <input type="checkbox"/>
Comment	Default admin user
<input type="button" value="Apply"/> <input type="button" value="Reset"/>	

You can change the user’s **password**, whether their account is active and **Valid**, as well as add a comment to each user account. These options are the same when creating a user account, with the exception that once created you cannot change the username. You cannot delete the default admin account, however you can delete any other created accounts by clicking **Delete** when editing the user.

You are strongly advised to change the password on the default “**admin**” account when you receive your router, and any time you reset your configuration to Factory Defaults.

Firewall and Access Control

Your router includes a full SPI (Stateful Packet Inspection) firewall for controlling Internet access from your LAN, as well as helping to prevent attacks from hackers. In addition to this, when using NAT (Network Address Translation. Please see the **WAN** configuration section for more details on NAT) the router acts as a “natural” Internet firewall, as all PCs on your LAN will use private IP addresses that cannot be directly accessed from the Internet.



Firewall: Prevents access from outside your network. The router provides three levels of security support:

NAT natural firewall: This masks LAN users’ IP addresses which are invisible to outside users on the Internet, making it much more difficult for a hacker to target a machine on your network. This natural firewall is on when NAT function is enabled.

NOTE: *When using Virtual Servers your PCs will be exposed to the degree specified in your Virtual Server settings provided the ports specified are opened in your firewall packet filter settings.*

Firewall Security and Policy (General Settings): Inbound direction of Packet Filter rules to prevent unauthorized computers or applications accessing your local network from the Internet.

Intrusion Detection: Enable Intrusion Detection to detect, prevent and log malicious attacks.

Access Control: Prevents access from PCs on your local network:

Firewall Security and Policy (General Settings): Outbound direction of Packet Filter rules to prevent unauthorized computers or applications accessing the Internet.

MAC Filter rules: To prevent unauthorized computers accessing the Internet.

URL Filter: To block PCs on your local network from unwanted websites.

You can find six items under the **Firewall** section: **General Settings, Packet Filter, Intrusion Detection, MAC Address Filter, URL Filter** and **Firewall Log**.

■ General Settings

You can choose not to enable Firewall, to add all filter rules by yourself, or enable the Firewall using preset filter rules and modify the port filter rules as required. The Packet Filter is divided into two sections: Port Filters and Address Filters, used to filter packets based-on Applications (Port) or IP addresses.

There are four options when you enable the Firewall, they are:

- All blocked/User-defined: no pre-defined port or address filter rules by default, meaning that all inbound (Internet to LAN) and outbound (LAN to Internet) packets will be blocked. Users have to add their own filter rules for further access to the Internet.
- High/Medium/Low security level: the pre-defined port filter rules for High, Medium and Low security are displayed in Port Filters of Packet Filter.

Select either **High**, **Medium** or **Low security level** to enable the Firewall. The only difference between these three security levels is the preset port filter rules in the Packet Filter. Firewall functionality is the same for all levels; it is only the list of preset port filters that changes between each setting.

If you choose of the preset security levels and then add custom filters, you may temporarily disable the firewall and recover your custom filter settings by re-selecting the same security level.

The “**Block WAN Request**” is a stand-alone function and not relate to whether security enable or disable. Mostly it is for preventing any scan tools from WAN site by hacker.

General Settings	
Firewall Security	
Security	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Policy	All blocked/User-defined
	High security level
	<input checked="" type="radio"/> Medium security level
	Low security level
(⚠ If some applications cannot work after enabling Firewall, please check the Packet Filter especially Port Filter rules. For example, adding (TCP:443,outbound allowed) will let HTTPS data go through Firewall.)	
Block WAN Request	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
(⚠ Enable for preventing any ping test from Internet, such as hacker attack.)	
<input type="button" value="Apply"/>	



Any remote user who is attempting to perform this action may result in blocking all the accesses to configure and manage of the device from the Internet.

■ Packet Filter

Packet Filter		
Firewall Security		
Type	Configuration	Note
external < > internal	Port Filters ▶ Address Filters ▶	1. By default, all protocol types and TCP/UDP ports are blocked. 2. Only the listed IP addresses are blocked

Port Filters

The pre-defined port filter rules for High, Medium and Low security levels are listed. See Table 1.

Table 1: Pre-defined Port Filter

Application	Protocol	Port Number		Firewall - High		Firewall - Medium		Firewall - Low	
		Start	End	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
HTTP(80)	TCP(6)	80	80	NO	YES	NO	YES	NO	YES
DNS (53)	UDP(17)	53	53	NO	YES	NO	YES	YES	YES
DNS (53)	TCP(6)	53	53	NO	YES	NO	YES	YES	YES
FTP(21)	TCP(6)	21	21	NO	NO	NO	YES	NO	YES
Telnet(23)	TCP(6)	23	23	NO	NO	NO	YES	NO	YES
SMTP(25)	TCP(6)	25	25	NO	YES	NO	YES	NO	YES
POP3(110)	TCP(6)	110	110	NO	YES	NO	YES	NO	YES
NEWS(119)	TCP(6)	119	119	NO	NO	NO	YES	NO	YES
RealAudio (7070)	UDP(17)	7070	7070	NO	NO	YES	YES	YES	YES
PING	ICMP(1)	N/A	N/A	NO	YES	NO	YES	NO	YES
H.323(1720)	TCP(6)	1720	1720	NO	NO	NO	YES	YES	YES
T.120(1503)	TCP(6)	1503	1503	NO	NO	NO	YES	YES	YES
SSH(22)	TCP(6)	22	22	NO	NO	NO	YES	YES	YES
NTP(123)	UDP(17)	123	123	NO	YES	NO	YES	NO	YES
HTTPS(443)	TCP(6)	443	443	NO	NO	NO	YES	NO	YES
ICQ (5190)	TCP(6)	5190	5190	NO	NO	NO	NO	YES	YES

Inbound: Internet to LAN
Outbound: LAN to Internet.

Address Filters

Address Filters are used to block traffic to/from particular IP addresses. They can be used to block IP addresses either on the Internet or on your local network. There are no pre-defined address filter rules; you can add the filter rules to meet your requirements. There are two kinds of address filters, one is inbound, and the other is outbound. The rules can be set to prevent unauthorized users (hosts or network) to access the Internet from LAN (outbound) and/or access LAN from the Internet (inbound).

Host IP Address: This is the IP address you wish to block access to or from.

Host Subnet Mask: This is the subnet mask for the IP address range you wish to block.

Direction: Whether you want to block access to the Internet (“**outbound**”), from the Internet (“**inbound**”) or both to and from the Internet (“**both**”).

Tip: To block access to/from a single IP address, enter that IP address as the **Host IP Address** and use a **Host Subnet Mask** of “255.255.255.255”.

Example: Configuring your firewall to allow for a publicly accessible web server on your LAN

The pre-defined port filter rule for HTTP (TCP port 80) is the same no matter whether the firewall is set to a high, medium or low security level. To setup a web server located on the local network when the firewall is enabled, you have to configure the Port Filters setting for HTTP.

As you can see from the diagram below, when the firewall is enabled with one of the three presets (Low/Medium/High), inbound HTTP access is not allowed.

Port Filters						
Filtering Rules						
Add TCP/UDP Filter		Add Raw IP Filter			Return	
Filtering Table						
Type	Start Port	End Port	Inbound	Outbound		
TCP	80	80	Block	Allow	Edit	Delete
UDP	53	53	Block	Allow	Edit	Delete
TCP	53	53	Block	Allow	Edit	Delete
TCP	21	21	Block	Allow	Edit	Delete
TCP	23	23	Block	Allow	Edit	Delete
TCP	25	25	Block	Allow	Edit	Delete
TCP	110	110	Block	Allow	Edit	Delete
TCP	119	119	Block	Allow	Edit	Delete
UDP	7070	7070	Allow	Allow	Edit	Delete
ICMP	N/A	N/A	Block	Allow	Edit	Delete
TCP	1720	1720	Block	Allow	Edit	Delete
TCP	1503	1503	Block	Allow	Edit	Delete
TCP	22	22	Block	Allow	Edit	Delete
UDP	123	123	Block	Allow	Edit	Delete
TCP	443	443	Block	Allow	Edit	Delete

Configuring Packet Filter

1. Click Packet Filter - you will get the following page:

[Click Port Filters](#)

Packet Filter			
Firewall Security			
Type	Configuration		Note
external < > internal	Port Filters	Address Filters	1. By default, all protocol types and TCP/UDP ports are blocked. 2. Only the listed IP addresses are blocked

- Click **Port Filters**. You will then be presented with the pre-defined port filter rules screen (in this case for the low security level), shown below:

Port Filters

Filtering Rules

[Add TCP/UDP Filter ▶](#)
[Add Raw IP Filter ▶](#)
[Return ▶](#)

Filtering Table

Type	Start Port	End Port	Inbound	Outbound		
TCP	80	80	Block	Allow	Edit ▶	Delete ▶ ← Click Delete
UDP	53	53	Block	Allow	Edit ▶	Delete ▶
TCP	53	53	Block	Allow	Edit ▶	Delete ▶
TCP	21	21	Block	Allow	Edit ▶	Delete ▶
TCP	23	23	Block	Allow	Edit ▶	Delete ▶
TCP	25	25	Block	Allow	Edit ▶	Delete ▶
TCP	110	110	Block	Allow	Edit ▶	Delete ▶
TCP	119	119	Block	Allow	Edit ▶	Delete ▶
UDP	7070	7070	Allow	Allow	Edit ▶	Delete ▶

- Click **Delete** to delete the existing HTTP rule.
- Click **Add TCP Filter**.

Click Add TCP Filter

Port Filters

Filtering Rules

[Add TCP/UDP Filter ▶](#)
[Add Raw IP Filter ▶](#)
[Return ▶](#)

- Input the port number (80) and set both **Inbound & Outbound** to **Allow**.

Port Filters

Add TCP/UDP Filter

Transport	Type	TCP ▼
Port Range	Start Port	80
	End Port	80
Direction	Inbound	Allow ▼
	Outbound	Allow ▼

[Return ▶](#)

Input HTTP port number

Select "Allow"

6. The new port filter rule for HTTP is shown below:

UDP	123	123	Block	Allow	Edit ▶	Delete ▶
TCP	443	443	Block	Allow	Edit ▶	Delete ▶
TCP	80	80	Allow	Allow	Edit ▶	Delete ▶

↓

HTTP inbound & outbound application

7. Configure your Virtual Server (“port forwarding”) settings so that incoming HTTP requests on port 80 will be forwarded to the PC running your web server:

Virtual Server (Port Forwarding)					
Port Mapping Table					IP Table
Enable	Application	Protocol	External Port	Redirect Port	IP Address
<input type="checkbox"/>	FTP	TCP	21	0	192.168.1. []
<input type="checkbox"/>	Telnet	TCP	23	0	192.168.1. []
<input type="checkbox"/>	SMTP	TCP	25	0	192.168.1. []
<input type="checkbox"/>	HTTP	TCP	80	0	192.168.1. []
<input type="checkbox"/>	POP3	TCP	110	0	192.168.1. []

To enable the HTTP service in Virtual Server settings, input the web server PC’s IP address.

Tip: If you wish to setup permanent remote management of your router, you may enter the router’s IP instead.

Intrusion Detection

Intrusion Detection	
Parameters	
Intrusion Detection	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Victim Protection Block Duration	<input type="text" value="600"/> seconds
Scan Attack Block Duration	<input type="text" value="86400"/> seconds
DOS Attack Block Duration	<input type="text" value="1800"/> seconds
Maximum TCP Open Handshaking Count	<input type="text" value="100"/> per second
Maximum Ping Count	<input type="text" value="15"/> per second
Maximum ICMP Count	<input type="text" value="100"/> per second
<input type="button" value="Apply"/>	
<input type="button" value="Clear Blacklist"/>	

The router's *Intrusion Detection System* (IDS) is used to detect hacker attacks and intrusion attempts from the Internet. If the IDS function of the firewall is enabled, inbound packets are filtered and blocked depending on whether they are detected as possible hacker attacks, intrusion attempts or other connections that the router determines to be suspicious.

Blacklist: If the router detects a possible attack, the source IP or destination IP address will be added to the Blacklist. Any further attempts using this IP address will be blocked for the time period specified as the **Block Duration**. The default setting for this function is false (disabled). Some attack types are denied immediately without using the Blacklist function, such as *Land attack* and *Echo/CharGen scan*.

Block Duration:

- **DoS Attack Block Duration:** This is the duration for blocking hosts that attempt a possible Denial of Service (DoS) attack. Possible DoS attacks this attempts to block include *Ascend Kill* and *WinNuke*. Default value is 1800 seconds.
- **Scan Attack Block Duration:** This is the duration for blocking hosts that attempt a possible Scan attack. Scan attack types include *X'mas scan*, *IMAP SYN/FIN scan* and similar attempts. Default value is 86400 seconds.
- **Victim Protection Block Duration:** This is the duration for blocking *Smurf* attacks. Default value is 600 seconds.

Victim Protection: If enabled, IDS will block Smurf attack attempts. Default is false.

Max TCP Open Handshaking Count: This is a threshold value to decide whether a *SYN Flood* attempt is occurring or not. Default value is 100 TCP SYN per seconds.

Max PING Count: This is a threshold value to decide whether an *ICMP Echo Storm* is occurring or not. Default value is 15 ICMP Echo Requests (PING) per second.

Max ICMP Count: This is a threshold to decide whether an *ICMP flood* is occurring or not. Default value is 100 ICMP packets per seconds except ICMP Echo Requests (PING).

For *SYN Flood*, *ICMP Echo Storm* and *ICMP flood*, IDS will just warn the user in the Event Log. It cannot protect against such attacks.

Table 2: Hacker attack types recognized by the IDS

Intrusion Name	Detect Parameter	Blacklist	Type of Block Duration	Drop Packet	Show Log
Ascend Kill	Ascend Kill data	Src IP	DoS	Yes	Yes
WinNuke	TCP Port 135, 137~139, Flag: URG	Src IP	DoS	Yes	Yes
Smurf	ICMP type 8 Des IP is broadcast	Dst IP	Victim Protection	Yes	Yes
Land attack	SrcIP = DstIP			Yes	Yes
Echo/CharGen Scan	UDP Echo Port and CharGen Port			Yes	Yes
Echo Scan	UDP Dst Port = Echo(7)	Src IP	Scan	Yes	Yes
CharGen Scan	UDP Dst Port = CharGen(19)	Src IP	Scan	Yes	Yes
X'mas Tree Scan	TCP Flag: X'mas	Src IP	Scan	Yes	Yes
IMAP SYN/FIN Scan	TCP Flag: SYN/FIN DstPort: IMAP(143) SrcPort: 0 or 65535	Src IP	Scan	Yes	Yes
SYN/FIN/RST/ACK Scan	TCP, No Existing session And Scan Hosts more than five.	Src IP	Scan	Yes	Yes
Net Bus Scan	TCP No Existing session DstPort = Net Bus 12345,12346, 3456	SrcIP	Scan	Yes	Yes
Back Orifice Scan	UDP, DstPort = Orifice Port (31337)	SrcIP	Scan	Yes	Yes
SYN Flood	Max TCP Open Handshaking Count (Default 100 c/sec)				Yes
ICMP Flood	Max ICMP Count (Default 100 c/sec)				Yes
ICMP Echo	Max PING Count (Default 15 c/sec)				Yes

Src IP: Source IP
Dst Port: Destination Port

Src Port: Source Port
Dst IP: Destination IP

■ MAC Address Filter

A MAC (Media Access Control) address is the unique network hardware identifier for each PC on your network’s interface (i.e. its Network Interface Card or Ethernet card). Using your router’s MAC Address Filter function, you can configure the switch to only accept traffic from specified machines, or else to block specific machines from accessing your LAN.

There are no pre-defined MAC address filter rules; you can add the filter rules to meet your requirements

MAC Address Filter	
Filtering Rules	
MAC Address Filter	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
For LAN ethernet frames, only the following Source MAC Address(es) are	<input type="radio"/> Allowed <input checked="" type="radio"/> Blocked
MAC Address	<input type="text" value="00:00:00:00:00:00"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
	<input type="text"/>
<input type="button" value="Apply"/>	

Enable/Disable: To enable or disable the MAC Address Filter function.

Allowed/Blocked: To allow or block the following MAC addresses to surf outside network only. If you check **Allowed**, please be sure your PC’s MAC address is listed. If you check **Blocked**, please be sure your PC’s MAC address is not listed.

MAC Address: There are 10 entries to enter the MAC addresses you want manage.

■ URL Filter

URL (Uniform Resource Locator – e.g. an address in the form of <http://www.billion.com> or <http://www.example.com>) filter rules allow you to prevent users on your network from accessing particular websites by their URL. There are no pre-defined URL filter rules; you can add filter rules to meet your requirements.

URL Filter													
Configuration													
URL Filtering	<input type="radio"/> Enable <input checked="" type="radio"/> Disable												
Block Mode	<input checked="" type="radio"/> Always Block												
	<input type="radio"/> Block from <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>08</td><td>:</td><td>00</td><td>to</td><td>18</td><td>:</td><td>00</td> </tr> <tr> <td colspan="2">Monday</td><td colspan="2">to</td><td colspan="2">Friday</td> </tr> </table>	08	:	00	to	18	:	00	Monday		to		Friday
08	:	00	to	18	:	00							
Monday		to		Friday									
Keywords Filtering	<input type="checkbox"/> Enable Details ▶												
Domains Filtering	<input type="checkbox"/> Enable Details ▶												
	<input type="checkbox"/> Disable all WEB traffic except for Trusted Domains												
Restrict URL Features	<input type="checkbox"/> Block Java Applet												
	<input type="checkbox"/> Block surfing by IP address												
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>													

Enable/Disable: To enable or disable URL Filter feature.

Always Block: Select to always check the URL filter rules (i.e. at all hours of the day).

Block from: Specify the time period to check the URL filter rules (e.g. during work hours).

Keywords Filtering: Allows blocking by specific keywords within a particular URL rather than having to specify a complete URL (e.g. to block any image called “advertisement.gif”). When enabled, your specified keywords list will be checked to see if any keywords are present in URLs accessed to determine if the connection attempt should be blocked. Please note that the URL filter blocks web browser (HTTP) connection attempts using port 80 only.

For example, if the URL is <http://www.abc.com/abcde.html>, it will be dropped as the keyword “abcde” occurs in the URL.

Keywords Filtering	
Create	
Keyword	<input type="text"/>
<input type="button" value="Apply"/>	

Block WEB URLs which contain these keywords		
Name	Keyword	
item0	abcde	Delete ▶

Domains Filtering: This function checks the domain name in URLs accessed against your list of domains to block or allow. If it is matched, the URL request will be sent (Trusted) or dropped (Forbidden). The checking procedure is:

1. Check the domain in the URL to determine if it is in the trusted list. If yes, the connection attempt is sent to the remote web server.
2. If not, check if it is listed in the forbidden list, and if present then the connection attempt is dropped..
3. If the packet does not match either of the above two items, it is sent to the remote web server.
4. Please be note that the domain only should be specified, not the full URL. For example to block traffic to www.sex.com, enter “sex” or “sex.com” instead of “www.sex.com”. In the example below, the URL request for www.abc.com will be sent to the remote web server because it is listed in the trusted list, whilst the URL request for www.sex or www.sex.com will be dropped, because sex.com is in the forbidden list.

Domains Filtering

Domain Name	
Domain Name	<input type="text" value="sex"/>
Type	Forbidden Domain ▼
	<input type="button" value="Apply"/> <input type="button" value="Forbidden Domain"/> <input type="button" value="Trusted Domain"/>

Trusted Domain		
Name	Domain	
item1	www.abc.com	Delete ▶
Forbidden Domain		
Name	Domain	
item0	sex	Delete ▶
<input type="button" value="Return ▶"/>		

Restrict URL Features:

- **Block Java Applet:** This function can block Web content which including the Java Applet. It is for preventing someone who wants to damage your system via standard HTTP protocol.
- **Block surfing by IP address:** Preventing someone who uses the IP address as URL for skipping **Domains Filtering** function.

■ Firewall Log

Firewall Log	
Event will be shown in the Status - Event Log	
Filtering Log	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Intrusion Log	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
URL Blocking Log	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

Firewall Log display log information of any unexpected action with your firewall settings.

Check the **Enable** box to activate the logs.

Log information can be seen in the **Status – Event Log** after enabling.

VPN (Virtual Private Networks)

Your router support three main types of VPN (Virtual Private Network), **PPTP**, **IPSec** and **L2TP**, and these are the two major section choices from the menu on the left.

■ PPTP

PPTP						
VPN/PPTP for Remote Access Application						
Enable	Disable	Name	Type	Status		
VPN/PPTP for LAN-to-LAN Application						
Enable	Disable	Name	Type	Status		
Create ▶						
<input type="button" value="Apply"/>						

There are two types of PPTP VPN supported, **Remote Access** and **LAN-to-LAN** (please refer below for more information.). Click **Create** to configure a new VPN connection.

Remote Access PPTP Connection

PPTP			
Remote Access Connection			
Connection Name	<input type="text"/>		
Type	<input checked="" type="radio"/> Dial out,	Server IP Address (or Hostname)	<input type="text"/>
	<input type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	<input type="text"/>
Username	<input type="text"/>		
Password	<input type="password"/>		
Auth. Type	Chap(Auto) ▾		
Data Encryption	Auto ▾	Key Length	Auto ▾ Mode stateful ▾
Idle Timeout	<input type="text"/> minutes		
<input type="button" value="Apply"/>			

Connection Name: This allows you to identify this particular connection, e.g. "Connection to office".

Type: Check **Dial Out** if you want your router to operate as a client (connecting to a remote VPN server, e.g. your office server), check **Dial In** operates as a VPN server.

- When configuring your router as a Client, enter the remote **Server IP Address (or Hostname)** you wish to connection to.
- When configuring your router as a server, enter the **Private IP Address Assigned to Dial in User** address.

Username: If you are a Dial-Out user (client), enter the username provided by your Host. If you are a Dial-In user (server), enter your own username.

Password: If you are a Dial-Out user (client), enter the password provided by your Host. If you are a Dial-In user (server), enter your own password.

PPP Authentication Type: Default is **Auto** if you want the router to determine the authentication type to use, or else manually specify CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol) if you know which type the server is using (when acting as a client), or else the authentication type you want clients connecting to you to use (when acting as a server). When using PAP, the password is sent unencrypted, whilst CHAP encrypts the password before sending, and also allows for challenges at different periods to ensure that the client has not been replaced by an intruder.

Data Encryption: Data sent over the VPN connection can be encrypted by an MPPE algorithm. Default is **Auto**, so that this setting is negotiated when establishing a connection, or else you can manually **Enable** or **Disable** encryption.

Key Length: The data can be encrypted by MPPE algorithm with 40 bits or 128 bits. Default is **Auto**, it is negotiated when establishing a connection. 128 bit keys provide stronger encryption than 40 bit keys.

Mode: You may select **Stateful** or **Stateless** mode. The key will be changed every 256 packets when you select Stateful mode. If you select Stateless mode, the key will be changed in each packet.

Idle Time: Auto-disconnect the VPN connection when there is no activity on the connection for a predetermined period of time. 0 means this connection is always on.

Click **Apply** after changing settings.

LAN to LAN PPTP Connection

PPTP					
LAN to LAN					
Connection Name	<input type="text"/>				
Type	<input checked="" type="radio"/> Dial out,	Server IP Address (or Hostname)	<input type="text"/>		
	<input type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	<input type="text"/>		
Peer Network IP	<input type="text"/>	Netmask	<input type="text"/>		
Username	<input type="text"/>				
Password	<input type="text"/>				
Auth. Type	Chap(Auto) <input type="button" value="v"/>				
Data Encryption	Auto <input type="button" value="v"/>	Key Length	Auto <input type="button" value="v"/>	Mode	stateful <input type="button" value="v"/>
Idle Timeout	<input type="text" value="0"/> minutes				
<input type="button" value="Apply"/>					

Connection Name: A user-define description of the connection.

Type: Check **Dial Out** if you want your router to operate as a client (connecting to a remote VPN server, e.g. your office server), check **Dial In** operates as a VPN server.

- When configuring your router establish the connection to a remote LAN, enter the remote **Server IP Address (or Hostname)** you wish to connection to.
- When configuring your router as a server to accept incoming connections, enter the **Private IP Address Assigned to Dial in User** address.

Peer Network IP: Enter Peer network IP address.

Netmask: Enter the subnet mask of peer network based on the Peer Network IP setting.

Username: If you are a Dial-Out user (client), enter the username provided by your Host. If you are a Dial-In user (server), enter your own username.

Password: If you are a Dial-Out user (client), enter the password provided by the your Host. If you are a Dial-In user (server), enter your own password.

PPP Authentication Type: Default is **Auto** if you want the router to determine the authentication type to use, or else manually specify CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol) if you know which type the server is using (when acting as a client), or else the authentication type you want clients connecting to you to use (when acting as a server). When using PAP, the password is sent unencrypted, whilst CHAP encrypts the password before sending, and also allows for challenges at different periods to ensure that the client has not been replaced by an intruder.

Data Encryption: Data sent over the VPN connection can be encrypted by an MPPE algorithm. Default is **Auto**, so that this setting is negotiated when establishing a connection, or else you can manually **Enable** or **Disable** encryption.

Key Length: The data can be encrypted by MPPE algorithm with 40 bits or 128 bits. Default is **Auto**, it is negotiated when establishing a connection. 128 bit keys provide stronger encryption than 40 bit keys.

Mode: You may select **Stateful** or **Stateless** mode. The key will be changed every 256 packets when you select Stateful mode. If you select Stateless mode, the key will be changed in each packet.

Idle Time: Auto-disconnect the VPN connection when there is no activity on the connection for a predetermined period of time. 0 means this connection is always on.

Click **Apply** after changing settings.

■ IPsec

IPsec

VPN Tunnels

Enable	Disable	Name	Local Subnet	Remote Subnet	Remote Gateway	IPsec Proposal		
Create ▶								
<input type="button" value="Apply"/>								

Click **Create** to configure a new IPsec VPN connection.

Configure a new VPN Connection

IPSec					
Create					
Connection Name	<input type="text"/>				
Local					
NetWork	<input checked="" type="radio"/> Single Address	IP Address	<input type="text"/>		
	<input type="radio"/> Subnet	IP Address	<input type="text"/>	Netmask	<input type="text"/>
	<input type="radio"/> IP Range	IP Address	<input type="text"/>	End IP	<input type="text"/>
Remote					
Secure Gateway Address(or Hostname)	<input type="text"/>				
NetWork	<input checked="" type="radio"/> Single Address	IP Address	<input type="text"/>		
	<input type="radio"/> Subnet	IP Address	<input type="text"/>	Netmask	<input type="text"/>
	<input type="radio"/> IP Range	IP Address	<input type="text"/>	End IP	<input type="text"/>
Proposal					
<input checked="" type="radio"/> ESP	Authentication	None <input type="button" value="v"/>			
	Encryption	NULL <input type="button" value="v"/>			
<input type="radio"/> AH	Authentication	MD5 <input type="button" value="v"/>			
Perfect Forward Secrecy	None <input type="button" value="v"/>				
Pre-shared Key	<input type="text"/>				
<input type="button" value="Apply"/>					

Connection Name: A user-defined name for the connection (e.g. "connection to office").

Local:

Local Network: Set the IP address, subnet or address range of the local network.

Single Address: The IP address of the local host.

Subnet: The subnet of the local network. For example, IP: 192.168.1.0 with netmask 255.255.255.0 specifies one class C subnet starting from 192.168.1.1 (i.e. 192.168.1.1 through to 192.168.1.254).

IP Range: The IP address range of the local network. For example, IP: 192.168.1.1, end IP: 192.168.1.10

Remote:

Secure Gateway Address (or hostname): The IP address or hostname of the remote VPN device that is connected and establishes a VPN tunnel.

Network: Set the IP address, subnet or address range of the remote network.

Proposal:

Proposal: Select the IPSec security method. There are two methods of checking the authentication information, AH (authentication header) and ESP (Encapsulating Security Payload). Use ESP for greater security so that data will be encrypted and authenticated. Using AH data will be authenticated but not encrypted.

Authentication: Authentication establishes the integrity of the datagram and ensures it is not tampered with in transmit. There are three options, Message Digest 5 (**MD5**), Secure Hash Algorithm (**SHA-1**) or **NONE**. SHA-1 is more resistant to brute-force attacks than MD5, however it is slower.

- ⊙ **MD5:** A one-way hashing algorithm that produces a 128-bit hash.
- ⊙ **SHA-1:** A one-way hashing algorithm that produces a 160-bit hash.

Encryption: Select the encryption method from the pull-down menu. There are four options, **DES**, **3DES**, **AES** and **NONE**. NONE means it is a tunnel only with no encryption. 3DES and AES are more powerful but increase latency.

- ⊙ **DES:** Stands for Data Encryption Standard, it uses 56 bits as an encryption method.
- ⊙ **3DES:** Stands for Triple Data Encryption Standard, it uses 168 (56*3) bits as an encryption method.
- ⊙ **AES:** Stands for Advanced Encryption Standards, it uses 128 bits as an encryption method.

Perfect Forward Secrecy: Choose whether to enable PFS using Diffie-Hellman public-key cryptography to change encryption keys during the second phase of VPN negotiation. This function will provide better security, but extends the VPN negotiation time. Diffie-Hellman is a public-key cryptography protocol that allows two parties to establish a shared secret over an unsecured communication channel (i.e. over the Internet). There are three modes, MODP 768-bit, MODP 1024-bit and MODP 1536-bit. MODP stands for Modular Exponentiation Groups.

Pre-shared Key: This is for the Internet Key Exchange (IKE) protocol, a string from 4 to 128 characters. Both sides should use the same key. IKE is used to establish a shared security policy and authenticated keys for services (such as IPSec) that require a key. Before any IPSec traffic can be passed, each router must be able to verify the identity of its peer. This can be done by manually entering the pre-shared key into both sides (router or hosts).

Select the **Save** button to save the setting.

■ Advanced Option

Click **Advanced Option** to change the following settings:

IPSec	
IPSec Configuration	
IKE Mode	Main <input type="button" value="v"/>
Local ID	
Type	Default <input type="button" value="v"/>
Content	<input type="text"/>
Remote ID	
Type	Default <input type="button" value="v"/>
Identifier	<input type="text"/>
SA Lifetime	
Phase 1(IKE)	<input type="text" value="240"/>
Phase 2(IPSec)	<input type="text" value="60"/>
<input type="button" value="Apply"/> <input type="button" value="Reset"/>	

IKE Mode: Select IKE mode to Main mode or Aggressive mode.

Local ID:

- ⊙ **Type:** Specify local ID type.
- ⊙ **Content:** Input ID's information, like domain name www.ipsectest.com.

Remote ID:

- ⊙ **Type:** Specify Remote ID type.
- ⊙ **Identifier:** Input remote ID's information, like domain name www.ipsectest.com.

SA Lifetime: Specify the number of minutes that a Security Association (SA) will stay active before new encryption and authentication key will be exchanged. There are two kinds of SAs, IKE and IPSec. IKE negotiates and establishes SA on behalf of IPSec, an IKE SA is used by IKE.


Phase 1 (IKE): To issue an initial connection request for a new VPN tunnel. The range can be from 5 to 15,000 minutes, and the default is 240 minutes.

Phase 2 (IPSec): To negotiate and establish secure authentication. The range can be from 5 to 15,000 minutes, and the default is 60 minutes.

A short SA time increases security by forcing the two parties to update the keys. However, every time the VPN tunnel re-negotiates, access through the tunnel will be temporarily disconnected.

Select the **Apply** button to update the settings.

L2TP

L2TP						
L2TP for Remote Access Application						
Enable	Disable	Name	Type	Status		
L2TP for LAN-to-LAN Application						
Enable	Disable	Name	Type	Status		
Create 						
<input type="button" value="Apply"/>						

There are two types of L2TP VPN supported, **Remote Access** and **LAN-to-LAN** (please refer below for more information.). Click **Create** to configure a new VPN connection.

Remote Access L2TP Connection

L2TP			
Remote Access Connection			
Connection Name	<input type="text"/>		
Type	<input checked="" type="radio"/> Dial out,	Server IP Address (or Hostname)	<input type="text"/>
	<input type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	<input type="text"/>
Username	<input type="text"/>		
Password	<input type="text"/>		
Auth. Type	Chap(Auto) ▼		
Idle Timeout	0 <input type="text"/> minutes		
IPSec	<input type="checkbox"/> Enable		
Authentication	None ▼		
Encryption	NULL ▼		
Perfect Forward Secrecy	None ▼		
Pre-shared Key	<input type="text"/>		
<input type="button" value="Apply"/>			

Connection Name: This allows you to identify this particular connection, e.g. “Connection to office”.

Type: Check **Dial Out** if you want your router to operate as a client (connecting to a remote VPN server, e.g. your office server), check **Dial In** operates as a VPN server.

- When configuring your router as a Client, enter the remote **Server IP Address (or Hostname)** you wish to connection to.
- When configuring your router as a server, enter the **Private IP Address Assigned to Dial in User** address.

Username: If you are a Dial-Out user (client), enter the username provided by your Host. If you are a Dial-In user (server), enter your own username.

Password: If you are a Dial-Out user (client), enter the password provided by your Host. If you are a Dial-In user (server), enter your own password.

PPP Authentication Type: Default is **Auto** if you want the router to determine the authentication type to use, or else manually specify CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol) if you know which type the server is using (when acting as a client), or else the authentication type you want clients connecting to you to use (when acting as a server). When using PAP, the password is sent unencrypted, whilst CHAP encrypts the password before sending, and also allows for challenges at different periods to ensure that the client has not been replaced by an intruder.

Idle Time: Auto-disconnect the VPN connection when there is no activity on the connection for a predetermined period of time. 0 means this connection is always on.

Click **Apply** after changing settings.

IPSec: Enable for enhancing your LT2P VPN security.

Authentication: Authentication establishes the integrity of the datagram and ensures it is not tampered with in transmit. There are three options, Message Digest 5 (**MD5**), Secure Hash Algorithm (**SHA-1**) or **NONE**. SHA-1 is more resistant to brute-force attacks than MD5, however it is slower.

- ⊙ **MD5:** A one-way hashing algorithm that produces a 128-bit hash.
- ⊙ **SHA-1:** A one-way hashing algorithm that produces a 160-bit hash.

Encryption: Select the encryption method from the pull-down menu. There are four options, **DES**, **3DES**, **AES** and **NONE**. NONE means it is a tunnel only with no encryption. 3DES and AES are more powerful but increase latency.

- ⊙ **DES:** Stands for Data Encryption Standard, it uses 56 bits as an encryption method.
- ⊙ **3DES:** Stands for Triple Data Encryption Standard, it uses 168 (56*3) bits as an encryption method.
- ⊙ **AES:** Stands for Advanced Encryption Standards, it uses 128 bits as an encryption method.

Perfect Forward Secrecy: Choose whether to enable PFS using Diffie-Hellman public-key cryptography to change encryption keys during the second phase of VPN negotiation. This function will provide better security, but extends the VPN negotiation time. Diffie-Hellman is a public-key cryptography protocol that allows two parties to establish a shared secret over an unsecured communication channel (i.e. over the Internet). There are three modes, MODP 768-bit, MODP 1024-bit and MODP 1536-bit. MODP stands for Modular Exponentiation Groups.

Pre-shared Key: This is for the Internet Key Exchange (IKE) protocol, a string from 4 to 128 characters. Both sides should use the same key. IKE is used to establish a shared security policy and authenticated keys for services (such as IPSec) that require a key. Before any IPSec traffic can be passed, each router must be able to verify the identity of its peer. This can be done by manually entering the pre-shared key into both sides (router or hosts).

LAN to LAN L2TP Connection

L2TP			
LAN to LAN			
Connection Name	<input type="text"/>		
Type	<input checked="" type="radio"/> Dial out,	Server IP Address (or Hostname)	<input type="text"/>
	<input type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	<input type="text"/>
Peer Network IP	<input type="text"/>	Netmask	<input type="text"/>
Username	<input type="text"/>		
Password	<input type="text"/>		
Auth. Type	Chap(Auto) ▼		
Idle Timeout	<input type="text" value="0"/>	minutes	
IPSec	<input type="checkbox"/> Enable		
Authentication	None ▼		
Encryption	NULL ▼		
Perfect Forward Secrecy	None ▼		
Pre-shared Key	<input type="text"/>		
<input type="button" value="Apply"/>			

Connection Name: A user-define description of the connection.

Type: Check **Dial Out** if you want your router to operate as a client (connecting to a remote VPN server, e.g. your office server), check **Dial In** operates as a VPN server.

- When configuring your router establish the connection to a remote LAN, enter the remote **Server IP Address (or Hostname)** you wish to connection to.
- When configuring your router as a server to accept incoming connections, enter the **Private IP Address Assigned to Dial in User** address.

Peer Network IP: Enter Peer network IP address.

Netmask: Enter the subnet mask of peer network based on the Peer Network IP setting.

Username: If you are a Dial-Out user (client), enter the username provided by your Host. If you are a Dial-In user (server), enter your own username.

Password: If you are a Dial-Out user (client), enter the password provided by the your Host. If you are a Dial-In user (server), enter your own password.

PPP Authentication Type: Default is **Auto** if you want the router to determine the authentication type to use, or else manually specify CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol) if you know which type the server is using (when acting as a client), or else the authentication type you want clients connecting to you to use (when acting as a server). When using PAP, the password is sent unencrypted, whilst CHAP encrypts the password before sending, and also allows for challenges at different periods to ensure that the client has not been replaced by an intruder.

Idle Time: Auto-disconnect the VPN connection when there is no activity on the connection for a predetermined period of time. 0 means this connection is always on. Click **Apply** after changing settings.

IPSec: Enable for enhancing your LT2P VPN security.

Authentication: Authentication establishes the integrity of the datagram and ensures it is not tampered with in transmit. There are three options, Message Digest 5 (**MD5**), Secure Hash Algorithm (**SHA-1**) or **NONE**. SHA-1 is more resistant to brute-force attacks than MD5, however it is slower.

- Ⓒ **MD5:** A one-way hashing algorithm that produces a 128-bit hash.
- Ⓒ **SHA-1:** A one-way hashing algorithm that produces a 160-bit hash.

Encryption: Select the encryption method from the pull-down menu. There are four options, **DES**, **3DES**, **AES** and **NONE**. NONE means it is a tunnel only with no encryption. 3DES and AES are more powerful but increase latency.

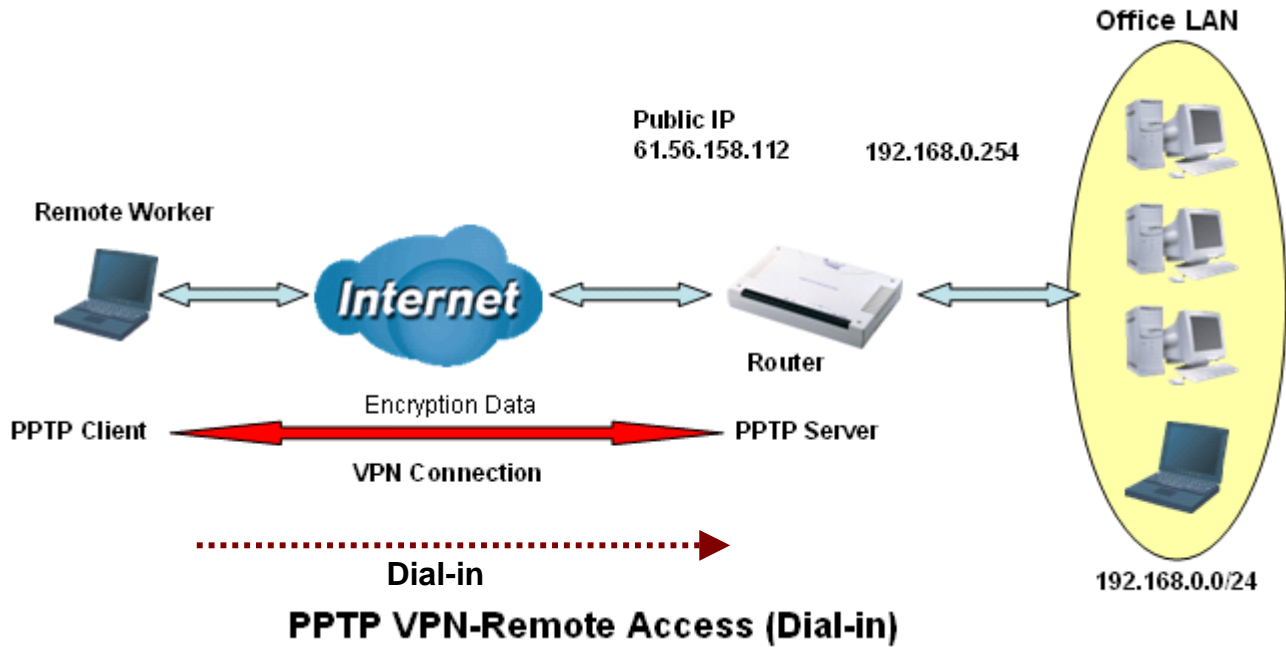
- Ⓒ **DES:** Stands for Data Encryption Standard, it uses 56 bits as an encryption method.
- Ⓒ **3DES:** Stands for Triple Data Encryption Standard, it uses 168 (56*3) bits as an encryption method.
- Ⓒ **AES:** Stands for Advanced Encryption Standards, it uses 128 bits as an encryption method.

Perfect Forward Secrecy: Choose whether to enable PFS using Diffie-Hellman public-key cryptography to change encryption keys during the second phase of VPN negotiation. This function will provide better security, but extends the VPN negotiation time. Diffie-Hellman is a public-key cryptography protocol that allows two parties to establish a shared secret over an unsecured communication channel (i.e. over the Internet). There are three modes, MODP 768-bit, MODP 1024-bit and MODP 1536-bit. MODP stands for Modular Exponentiation Groups.

Pre-shared Key: This is for the Internet Key Exchange (IKE) protocol, a string from 4 to 128 characters. Both sides should use the same key. IKE is used to establish a shared security policy and authenticated keys for services (such as IPSec) that require a key. Before any IPSec traffic can be passed, each router must be able to verify the identity of its peer. This can be done by manually entering the pre-shared key into both sides (router or hosts).

Example: Configuring a Remote Access PPTP VPN Dial-in Connection

A remote worker establishes a PPTP VPN connection with the head office using Microsoft's VPN Adapter (included with Windows 2000/ME, etc.). The router is installed in the head office, connected to a couple of PCs and Servers.



Configuring PPTP VPN in the Office

The input IP address 192.168.1.200 will be assigned to the remote worker. Please make sure this IP is not used in the Office LAN.

PPTP

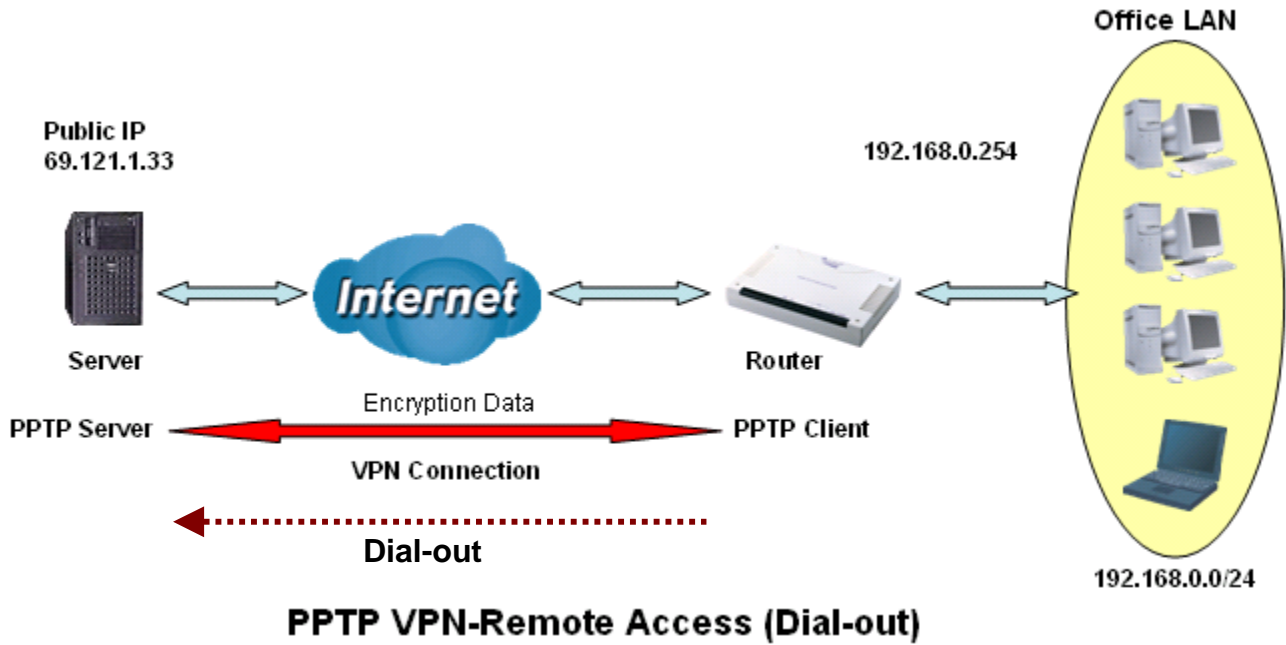
Remote Access Connection

Connection Name	VPN_PPTP 1		
Type	<input type="radio"/> Dial out,	Server IP Address (or Hostname)	<input type="text"/>
	<input checked="" type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	192.168.1.200 2
Username	username 3		
Password	••••••		
Auth. Type	Chap(Auto) v		
Data Encryption	Auto v	Key Length	Auto v Mode stateful v 4
Idle Timeout	0 minutes 5		

Item	Function	Description
1	Connection Name VPN_PPTP	Given a name of PPTP connection
2	Dial in	Check Dial in
	Private IP Address Assigned to Dialing User 192.168.1.200	An assigned IP address for the remote worker
3	Username username	Input username & password to authenticate remote worker
	Password 123456	
4	Auth.Type Chap(Auto)	Keep as default value in most of the cases, PPTP server & client will determine the value automatically. Refer to manual for details if you want to change the setting.
	Data Encryption Auto	
	Key Length Auto	
	Mode stateful	
5	Idle Time 0	The connection will be disconnected when there is no traffic in a predefined period of time. Idle time 0 means the connection is always-on.

Example: Configuring a Remote Access PPTP VPN Dial-out Connection

A company's office establishes a PPTP VPN connection with a file server located at a separate location. The router is installed in the office, connected to a couple of PCs and Servers.



Configuring the PPTP VPN in the Office

You can either input the IP address (69.1.121.33 in this case) or hostname to reach the server.

PPTP

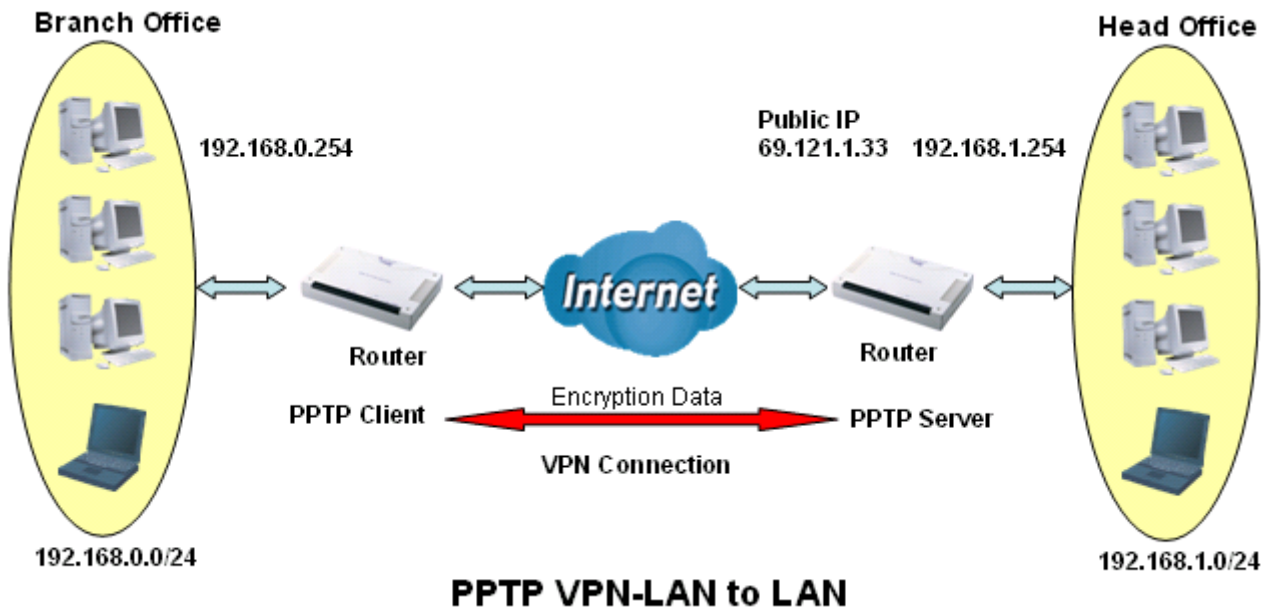
Remote Access Connection

Connection Name	VPN_PPTP 1		
Type	<input checked="" type="radio"/> Dial out,	Server IP Address (or Hostname)	69.121.1.33 2
	<input type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	
Username	username 3		
Password	••••••		
Auth. Type	Chap(Auto) ▼		
Data Encryption	Auto ▼	Key Length	Auto ▼ Mode stateful ▼ 4
Idle Timeout	0 minutes 5		

Item	Function		Description
1	Connection Name	VPN_PPTP	Given name of PPTP connection
2	Dial out		Check Dial out
	Server IP Address (or Hostname)	69.121.1.33	An Dialed server IP
3	Username	username	A given username & password
	Password	123456	
4	Auth. Type	Chap(Auto)	Keep as default value in most of the cases, PPTP server & client will determine the value automatically. Refer to manual for details if you want to change the setting.
	Data Encryption	Auto	
	Key Length	Auto	
	Mode	stateful	
5	Idle Time	0	The connection will be disconnected when there is no traffic in a predefined period of time. Idle time 0 means the connection is always-on.

Example: Configuring a LAN-to-LAN PPTP VPN Connection

The branch office establishes a PPTP VPN tunnel with head office to connect two private networks over the Internet.. The routers are installed in the head office and branch office accordingly.



Attention

Both office LAN networks **MUST** in different subnet with LAN to LAN application.

Configuring PPTP VPN in the Head Office

The IP address 192.168.1.201 will be assigned to the router located in the branch office. Please make sure this IP is not used in the head office LAN.

PPTP

LAN to LAN

Connection Name	HeadOffice 1		
Type	<input type="radio"/> Dial out,	Server IP Address (or Hostname)	<input type="text"/>
	<input checked="" type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	192.168.1.200 2
Peer Network IP	192.168.0.0	Netmask	255.255.255.0 3
Username	username 4		
Password	••••••		
Auth. Type	Chap(Auto) 5		
Data Encryption	Auto 6	Key Length	Auto 5
		Mode	stateful 5
Idle Timeout	0 minutes 6		

Item	Function	Value	Description
1	Connection Name	HeadOffice	Given a name of PPTP connection
2	Dial in		Check Dial in
	Private IP Address Assigned to Dialing User	192.168.1.200	IP address assigned to branch office network
3	Peer Network IP	192.168.0.0	Branch office network
	Netmask	255.255.255.0	
4	Username	username	Input username & password to authenticate branch office network
	Password	123456	
5	Auth.Type	Chap(Auto)	Keep as default value in most of the cases, PPTP server & client will determine the value automatically. Refer to manual for details if you want to change the setting.
	Data Encryption	Auto	
	Key Length	Auto	
	Mode	stateful	
6	Idle Time	0	The connection will be disconnected when there is no traffic in a predefined period of time. Idle time 0 means the connection is always-on.

Configuring PPTP VPN in the Branch Office

The IP address 69.1.121.30 is the **Public IP** address of the router located in head office. If you registered the DDNS (please refer to the **DDNS** section of this manual), you can also use the domain name instead of the IP address to reach the router.

PPTP

LAN to LAN

Connection Name	BranchOffice 1		
Type	<input checked="" type="radio"/> Dial out,	Server IP Address (or Hostname)	69.121.1.33 2
	<input type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	
Peer Network IP	192.168.1.0	Netmask	255.255.255.0 3
Username	username		
Password	***** 4		
Auth. Type	Chap(Auto) 4		
Data Encryption	Auto 5	Key Length	Auto 5
		Mode	stateful 5
Idle Timeout	0 minutes 6		

Item	Function		Description
1	Connection Name	BranchOffice	Given a name of PPTP connection
2	Dial out		Check Dial out
	Server IP Address (or Hostname)	69.121.1.33	IP address of the head office router (in WAN side)
3	Peer Network IP	192.168.1.0	Head office network
	Netmask	255.255.255.0	
4	Username	username	Input username & password to authenticate branch office network
	Password	123456	
5	Auth.Type	Chap(Auto)	Keep as default value in most of the cases, PPTP server & client will determine the value automatically. Refer to manual for details if you want to change the setting.
	Data Encryption	Auto	
	Key Length	Auto	
	Mode	stateful	
6	Idle Time	0	The connection will be disconnected when there is no traffic in a predefined period of time. Idle time 0 means the connection is always-on.

Example: Configuring a IPSec LAN-to-LAN VPN Connection

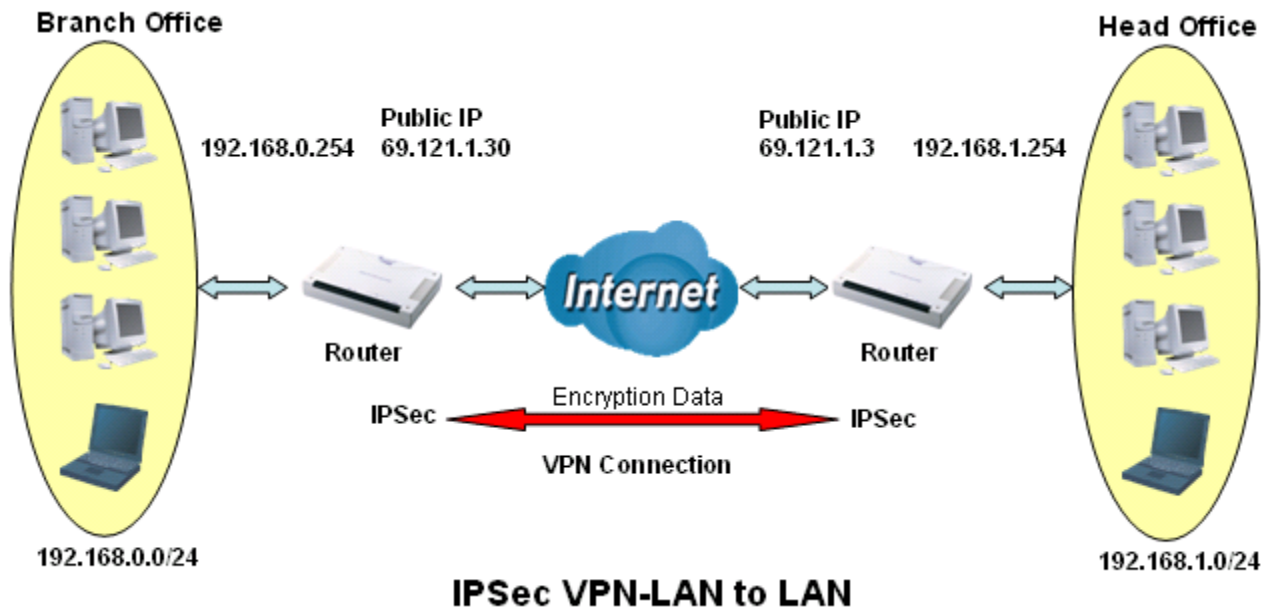


Table 3: Network Configuration and Security Plan

	Branch Office	Head Office
Local Network ID	192.168.0.0/24	192.168.1.0/24
Local Router IP	69.1.121.30	69.1.121.3
Remote Network ID	192.168.1.0/24	192.168.0.0/24
Remote Router IP	69.1.121.3	69.1.121.30
IKE Pre-shared Key	12345678	12345678
VPN Connection Type	Tunnel mode	Tunnel mode
Security Algorithm	ESP:MD5 with AES	ESP:MD5 with AES



Attention

Both office LAN networks **MUST in different subnet** with LAN to LAN application.

Functions of **Pre-shared Key, VPN Connection Type and Security Algorithm MUST BE** identically set up on both sides.

Configuring IPSec VPN in the Head Office

IPSec

Edit

Connection Name: IPSec_HeadOffice (1)

Local

NetWork:

- Single Address
- Subnet (2)
- IP Range

 IP Address: 192.168.1.0, Netmask: 255.255.255.0 (2)

Remote

Secure Gateway Address(or Hostname): 61.121.1.30 (3)

NetWork:

- Single Address
- Subnet (4)
- IP Range

 IP Address: 192.168.0.0, Netmask: 255.255.255.0 (4)

Proposal

ESP (5)

- Authentication: MD5
- Encryption: 3DES

 AH

- Authentication: MD5

 Perfect Forward Security: None

Pre-shared Key: 12345678

Apply Advanced Options

Item	Function	Description
1	Connection Name	IPSec_HeadOffice
2	Subnet	Given a name of IPSec connection
	IP Address	192.168.1.0
	Netmask	255.255.255.0
3	Secure Gateway Address (or Hostname)	69.121.1.30
	Subnet	IP address of the head office router (in WAN side)
	IP Address	192.168.0.0
4	Netmask	255.255.255.0
	Subnet	Check Subnet radio button
	IP Address	192.168.0.0
5	Netmask	255.255.255.0
	ESP	Check ESP radio button
	Authentication	MD5
	Encryption	3DES
	Prefer Forward Security	None
	Pre-shared Key	12345678
	Encryption	
Prefer Forward Security		
	Pre-shared Key	

Configuring IPSec VPN in the Branch Office

IPSec

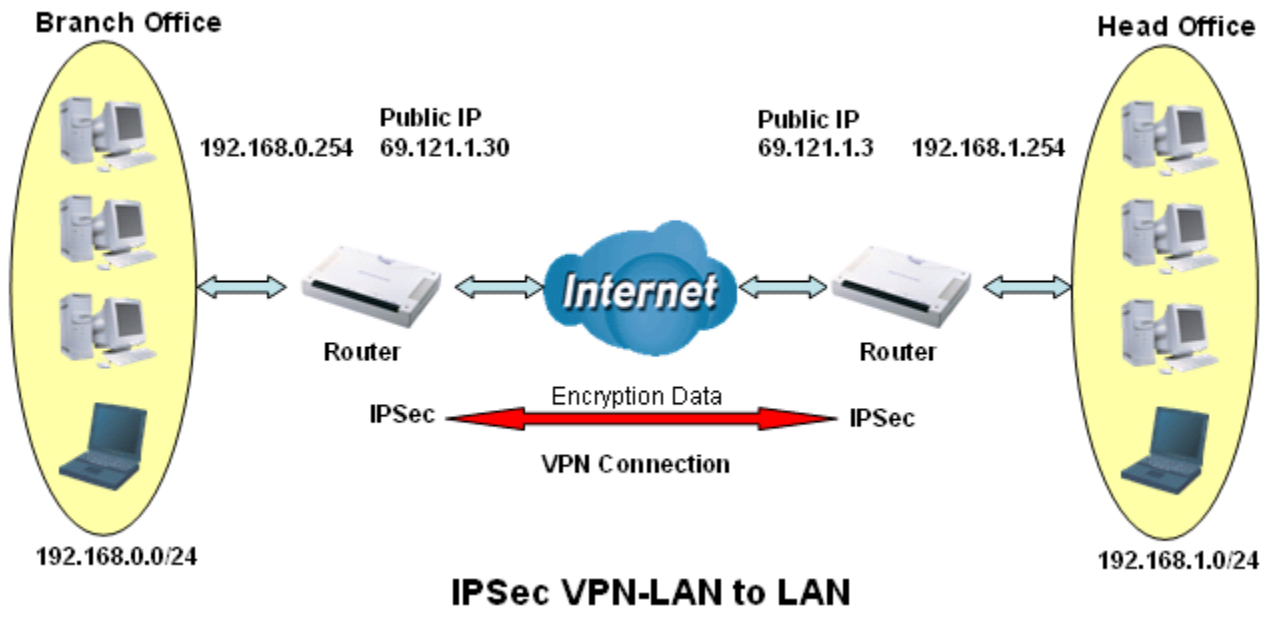
Edit

Connection Name	IPSec_BranchOffice 1			
Local				
NetWork	<input type="radio"/> Single Address	IP Address	<input type="text"/>	
	<input checked="" type="radio"/> Subnet	IP Address	192.168.0.0	Netmask 255.255.255.0 2
	<input type="radio"/> IP Range	IP Address	<input type="text"/>	End IP <input type="text"/>
Remote				
Secure Gateway Address(or Hostname)	61.121.1.3 3			
NetWork	<input type="radio"/> Single Address	IP Address	<input type="text"/>	
	<input checked="" type="radio"/> Subnet	IP Address	192.168.1.0	Netmask 255.255.255.0 4
	<input type="radio"/> IP Range	IP Address	<input type="text"/>	End IP <input type="text"/>
Proposal				
<input checked="" type="radio"/> ESP	Authentication	MD5 <input type="text"/>		
	Encryption	3DES <input type="text"/>		
<input type="radio"/> AH	Authentication	MD5 <input type="text"/>		
Perfect Forward Secrecy	None <input type="text"/>			
Pre-shared Key	12345678			

[Advanced Options](#)

Item	Function	Description
1	Connection Name IPSec_BranchOffice	Given a name of IPSec connection
2	Subnet	Check Subnet radio button
	IP Address 192.168.0.0	Branch office network
	Netmask 255.255.255.0	
3	Secure Gateway Address (or Hostname) 69.121.1.3	IP address of the head office router (in WAN side)
4	Subnet	Check Subnet radio button
	IP Address 192.168.1.0	Head office network
	Netmask 255.255.255.0	
5	ESP	Check ESP radio button
	Authentication MD5	Security plan
	Encryption 3DES	
	Prefer Forward Security None	
	Pre-shared Key 12345678	

Example: Configuring a IPSec Host-to-LAN VPN Connection



Configuring IPSec VPN in the Office

IPSec

Edit

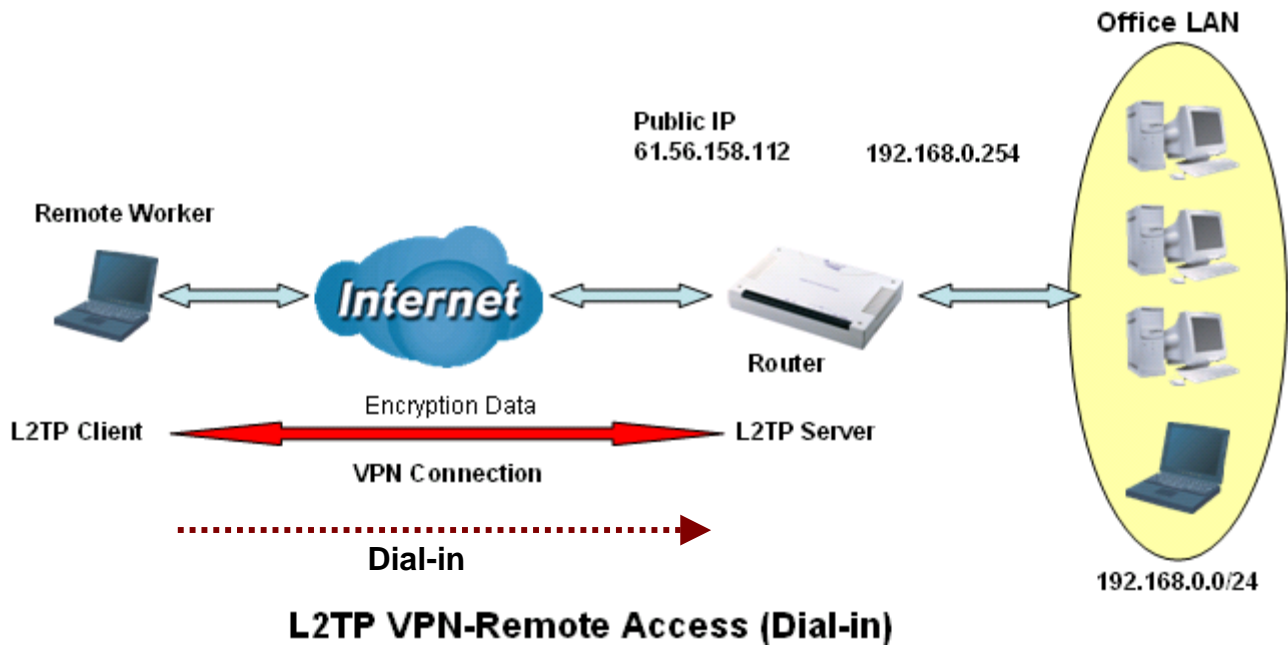
Connection Name	IPSec 1			
Local				
NetWork	<input type="radio"/> Single Address	IP Address		
	<input checked="" type="radio"/> Subnet	IP Address	192.168.1.0	Netmask 255.255.255.0 2
	<input type="radio"/> IP Range	IP Address		End IP
Remote				
Secure Gateway Address(or Hostname)		69.121.1.30 3		
NetWork	<input checked="" type="radio"/> Single Address	IP Address	69.121.1.30 4	
	<input type="radio"/> Subnet	IP Address		Netmask
	<input type="radio"/> IP Range	IP Address		End IP
Proposal				
<input checked="" type="radio"/> ESP	Authentication	MD5 5		
	Encryption	3DES		
<input type="radio"/> AH	Authentication	MD5		
Perfect Forward Secrecy	None			
Pre-shared Key	12345678			

[Advanced Options](#)

Item	Function	Description
1	Connection Name	IPSec
	Subnet	
2	IP Address	192.168.1.0
	Netmask	255.255.255.0
3	Secure Gateway Address (or Hostname)	69.121.1.30
4	Single Address	
	IP Address	69.121.1.30
5	ESP	
	Authentication	MD5
	Encryption	3DES
	Prefer Forward Security	None
	Pre-shared Key	12345678

Example: Configuring a Remote Access L2TP VPN Dial-in Connection

A remote worker establishes a L2TP VPN connection with the head office using Microsoft's VPN Adapter (included with Windows XP/2000/ME, etc.). The router is installed in the head office, connected to a couple of PCs and Servers.



Configuring L2TP VPN in the Office

The input IP address 192.168.1.200 will be assigned to the remote worker. Please make sure this IP is not used in the Office LAN.

L2TP

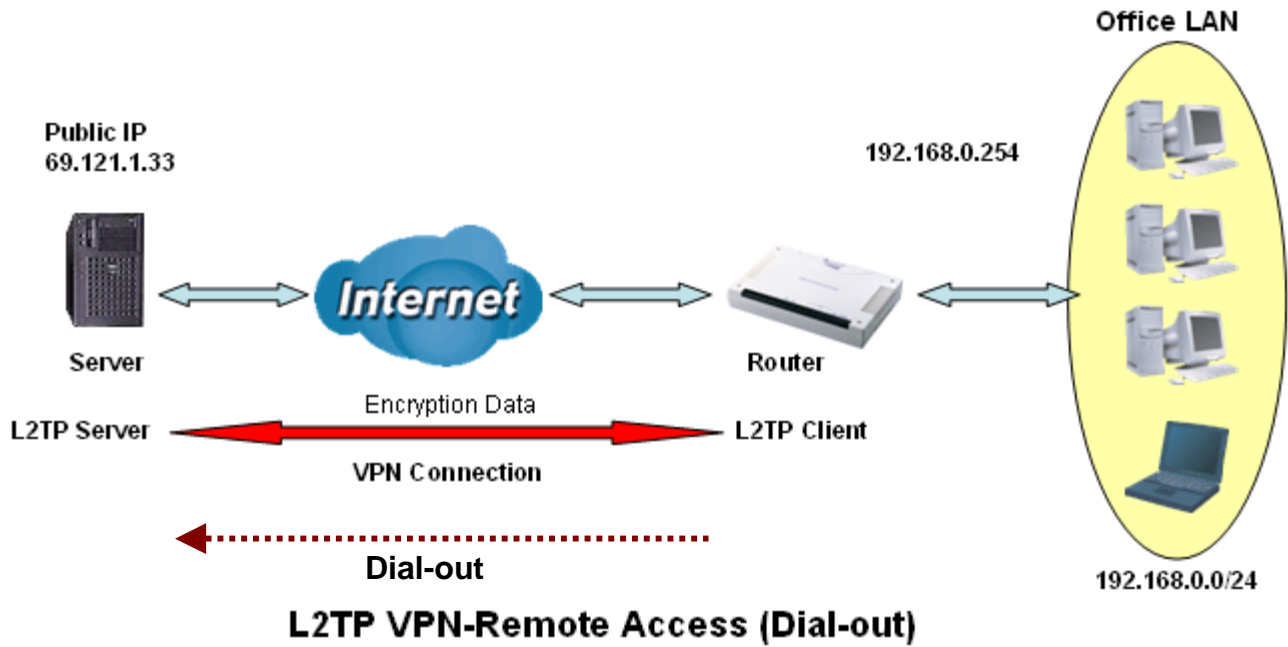
Remote Access Connection

Connection Name	VPN_L2TP 1		
Type	<input type="radio"/> Dial out,	Server IP Address (or Hostname)	<input type="text"/>
	<input checked="" type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	192.168.1.200 2
Username	username 3		
Password	*****		
Auth. Type	Chap(Auto) 4		
Idle Timeout	0 minutes 5		
IPSec	<input checked="" type="checkbox"/> Enable		
Authentication	MD5 6		
Encryption	3DES		
Perfect Forward Secrecy	None		
Pre-shared Key	12345678		

Item	Function	Description
1	Connection Name VPN_L2TP	Given a name of L2TP connection
2	Dial in	Check Dial in
	Private IP Address Assigned to Dialing User 192.168.1.200	An assigned IP address for the remote worker
3	Username username	Input username & password to authenticate remote worker
	Password 123456	
4	Auth. Type Chap(Auto)	Keep as default value in most of the cases.
5	Idle Timeout 0	The connection will be disconnected when there is no traffic in a predefined period of time. Idle time 0 means the connection is always-on.
6	IPSec	Enable for enhancing your L2TP VPN security.
	Authentication MD5	Both sites should use the same value.
	Encryption 3DES	
	Perfect Forward Secrecy None	
	Pre-shared Key 12345678	

Example: Configuring a Remote Access L2TP VPN Dial-out Connection

A company's office establishes a L2TP VPN connection with a file server located at a separate location. The router is installed in the office, connected to a couple of PCs and Servers.



Configuring the L2TP VPN in the Office

L2TP

Remote Access Connection

Connection Name	VPN_L2TP 1		
Type	<input checked="" type="radio"/> Dial out,	Server IP Address (or Hostname)	69.121.1.33 2
	<input type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	
Username	username 3		
Password	*****		
Auth. Type	Chap(Auto) 4		
Idle Timeout	0 minutes 5		
IPSec	<input checked="" type="checkbox"/> Enable		
Authentication	MD5 6		
Encryption	3DES		
Perfect Forward Secrecy	None		
Pre-shared Key	12345678		

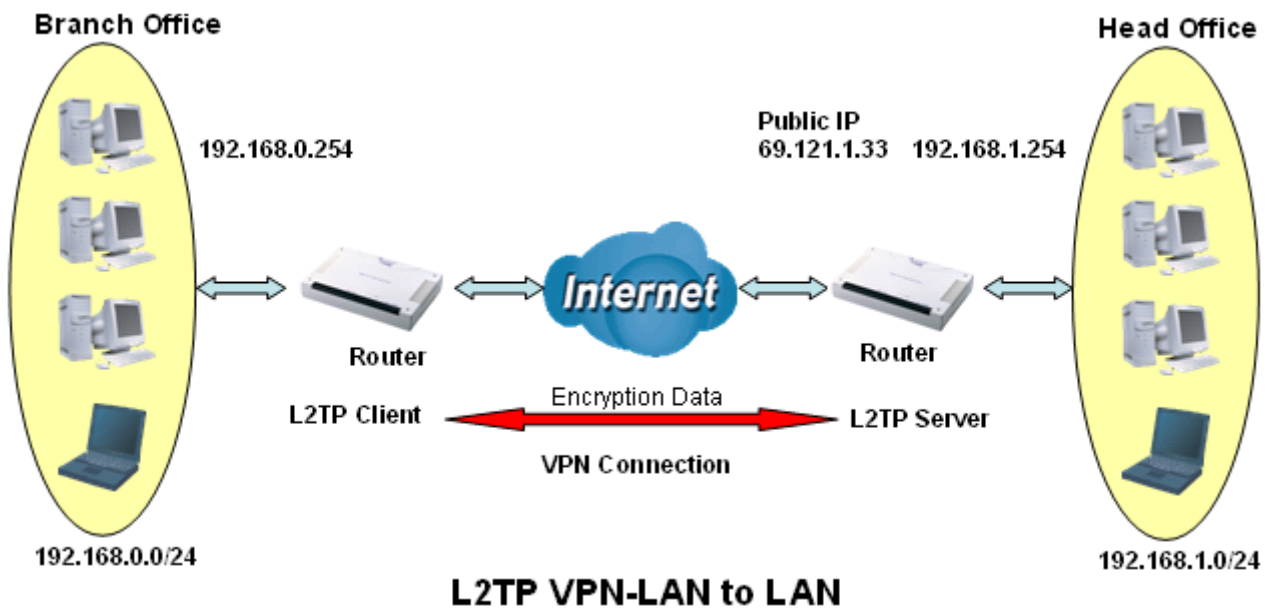
Item	Function		Description
1	Connection Name	VPN_L2TP	Given name of L2TP connection
2	Dial out		Check Dial out
	Server IP Address (or Hostname)	69.121.1.33	An Dialed server IP
3	Username	username	A given username & password
	Password	123456	
4	Auth.Type	Chap(Auto)	Keep as default value in most of the cases.
5	Idle Timeout	0	The connection will be disconnected when there is no traffic in a predefined period of time. Idle time 0 means the connection is always-on.
6	IPSec		Enable for enhancing your L2TP VPN security.
	Authentication	MD5	Both sites should use the same value.
	Encryption	3DES	
	Perfect Forward Secrecy	None	
	Pre-shared Key	12345678	

Example: Configuring your Router to Dial-in to the Server

Currently, Microsoft Windows operation system does not support L2TP incoming service. Additional software may be required to set up your L2TP incoming service.

Example: Configuring LAN-to-LAN L2TP VPN Connection

The branch office establishes a L2TP VPN tunnel with head office to connect two private networks over the Internet. The routers are installed in the head office and branch office accordingly.



Attention

Both office LAN networks **MUST in different subnet** with LAN to LAN application.

Functions of **Pre-shared Key, VPN Connection Type and Security Algorithm MUST BE** identically set up on both sides.

Configuring L2TP VPN in the Head Office

The IP address 192.168.1.200 will be assigned to the router located in the branch office. Please make sure this IP is not used in the head office LAN.

L2TP

LAN to LAN

Connection Name	HeadOffice 1		
Type	<input type="radio"/> Dial out,	Server IP Address (or Hostname)	<input type="text"/>
	<input checked="" type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	192.168.1.200 2
Peer Network IP	192.168.0.0	Netmask	255.255.255.0 3
Username	username 4		
Password	••••••		
Auth. Type	Chap(Auto) 5		
Idle Timeout	0 minutes 6		
IPSec	<input checked="" type="checkbox"/> Enable		
Authentication	MD5 7		
Encryption	3DES		
Perfect Forward Secrecy	None		
Pre-shared Key	12345678		

Item	Function		Description
1	Connection Name	HeadOffice	Given a name of L2TP connection
2	Dial in		Check Dial in
	Private IP Address Assigned to Dialing User	192.168.1.200	IP address assigned to branch office network
3	Peer Network IP	192.168.0.0	Branch office network
	Netmask	255.255.255.0	
4	Username	username	Input username & password to authenticate branch office network
	Password	123456	
5	Auth. Type	Chap(Auto)	Keep as default value in most of the cases.
6	Idle Timeout	0	The connection will be disconnected when there is no traffic in a predefined period of time. Idle time 0 means the connection is always-on.
7	IPSec		Enable for enhancing your L2TP VPN security.
	Authentication	MD5	Both sites should use the same value.
	Encryption	3DES	
	Perfect Forward Secrecy	None	
	Pre-shared Key	12345678	

Configuring L2TP VPN in the Branch Office

The IP address 69.1.121.30 is the **Public IP** address of the router located in head office. If you registered the DDNS (please refer to the **DDNS** section of this manual), you can also use the domain name instead of the IP address to reach the router.

L2TP

LAN to LAN

Connection Name	BranchOffice 1		
Type	<input checked="" type="radio"/> Dial out,	Server IP Address (or Hostname)	69.121.1.33 2
	<input type="radio"/> Dial in,	Private IP Address Assigned to Dialin User	
Peer Network IP	192.168.1.0	Netmask	255.255.255.0 3
Username	username 4		
Password	***** 4		
Auth. Type	Chap(Auto) 5		
Idle Timeout	0	minutes	6
IPSec	<input checked="" type="checkbox"/> Enable		
Authentication	MD5 7		
Encryption	3DES 7		
Perfect Forward Secrecy	None 7		
Pre-shared Key	12345678 7		

Item	Function		Description
1	Connection Name	BranchOffice	Given a name of L2TP connection
2	Dial out		Check Dial out
	Server IP Address (or Hostname)	69.121.1.33	IP address of the head office router (in WAN side)
3	Peer Network IP	192.168.1.0	Head office network
	Netmask	255.255.255.0	
4	Username	username	Input username & password to authenticate branch office network
	Password	123456	
5	Auth.Type	Chap(Auto)	Keep as default value in most of the cases.
6	Idle Timeout	0	The connection will be disconnected when there is no traffic in a predefined period of time. Idle time 0 means the connection is always-on.
7	IPSec		Enable for enhancing your L2TP VPN security.
	Authentication	MD5	Both sites should use the same value.
	Encryption	3DES	
	Perfect Forward Secrecy	None	
	Pre-shared Key	12345678	

QoS (Quality of Service)

QoS function helps you to control your network traffic for each application from LAN (Ethernet and/or Wireless) to WAN (Internet). It facilitates you to control the different quality and speed of through put for each application when the system is running with full loading of upstream.

You can find two items under the **QoS** section: **Prioritization** and **IP Throttling** (bandwidth management).

Prioritization

There are three priority settings to be provided in the modem:

- High**
- Normal** (The default is normal priority for all of traffic without setting).
- Low**

The trigger of check can base on IP protocol, port number and address.

And the balance of utilization of each priorities are High(60%), Normal(30%) and Low(10%).

Prioritization					
Configuration (from LAN to WAN packet)					
Enable	Application	Priority	Protocol	Source Port	Source IP Address Range (0.0.0.0' means Any)
				Destination Port	Destination IP Address Range (0.0.0.0' means Any)
<input type="checkbox"/>	PPTP	High	GRE	none	<input type="text"/> ~ <input type="text"/>
				none	<input type="text"/> ~ <input type="text"/>
<input type="checkbox"/>	<input type="text"/>	High	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>
				<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>
<input type="checkbox"/>	<input type="text"/>	High	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>
				<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>
<input type="checkbox"/>	<input type="text"/>	High	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>
				<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>

Enable: Select it to activate the function.

Application: A name that identifies an existing rule.

Priority: High or Low, the priority for existing rule. All of traffic will be set to normal priority until you change it. The balance of utilizations for each priority is High (60%), Normal (30%) or Low (10%).

Protocol: The name of supported protocol.

Source Port: The source port of packets to be monitored.

Destination Port: The destination port of packets to be monitored.

Source IP Address Range: The source IP address or IP range of packets to be monitored.

Destination IP address Range: The destination IP address or IP range of packets to be monitored.

■ IP Throttling

IP Throttling allows you to limit the speed of IP traffic. The value entered will limit the speed of the application that you set to the specified value's multiple of 32kbps.

The trigger of check can base on IP protocol, port number and address as well.

IP Throttling					
Configuration (from LAN to WAN packet)					
Enable	Application	Protocol	Source Port	Source IP Address Range ('0.0.0.0' means Any)	Upstream Rate Limit
			Destination Port	Destination IP Address Range ('0.0.0.0' means Any)	
<input type="checkbox"/>	<input type="text"/>	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>	<input type="text"/> *32 (kbps)
<input type="checkbox"/>	<input type="text"/>	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>	<input type="text"/> *32 (kbps)
<input type="checkbox"/>	<input type="text"/>	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>	<input type="text"/> *32 (kbps)
<input type="checkbox"/>	<input type="text"/>	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>	<input type="text"/> *32 (kbps)
<input type="checkbox"/>	<input type="text"/>	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>	<input type="text"/> *32 (kbps)
<input type="checkbox"/>	<input type="text"/>	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>	<input type="text"/> *32 (kbps)
<input type="checkbox"/>	<input type="text"/>	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>	<input type="text"/> *32 (kbps)
<input type="checkbox"/>	<input type="text"/>	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>	<input type="text"/> *32 (kbps)
<input type="checkbox"/>	<input type="text"/>	any	<input type="text"/> ~ <input type="text"/>	<input type="text"/> ~ <input type="text"/>	<input type="text"/> *32 (kbps)

Enable: Select it to activate the function.

Application: A name that identifies an existing rule.

Protocol: The name of supported protocol.

Source Port: The source port of packets to be monitored.

Destination Port: The destination port of packets to be monitored.

Source IP Address Range: The source IP address or IP range of packets to be monitored.

Destination IP address Range: The destination IP address or IP range of packets to be monitored.

Upstream Rate Limit: This function allows you to limit the speed of IP traffic from LAN to WAN. The value entered will limit the speed of the application that you identified. The speed can be specified in multiple of 32kbps.

Virtual Server (“Port Forwarding”)

In TCP/IP and UDP networks a port is a 16-bit number used to identify which application program (usually a server) incoming connections should be delivered to. Some ports have numbers that are pre-assigned to them by the IANA (the Internet Assigned Numbers Authority), and these are referred to as “well-known ports”. Servers follow the well-known port assignments so clients can locate them.

If you wish to run a server on your network that can be accessed from the WAN (i.e. from other machines on the Internet that are outside your local network), or any application that can accept incoming connections (e.g. Peer-to-peer/P2P software such as instant messaging applications and P2P file-sharing applications) and are using NAT (Network Address Translation), then you will usually need to configure your router to forward these incoming connection attempts using specific ports to the PC on your network running the application. You will also need to use port forwarding if you want to host an online game server.

The reason for this is that when using NAT, your publicly accessible IP address will be used by and point to your router, which then needs to deliver all traffic to the private IP addresses used by your PCs. Please see the **WAN** configuration section of this manual for more information on NAT.

The Internet Assigned Numbers Authority (IANA) is the central coordinator for the assignment of unique parameter values for Internet protocols. Port numbers range from 0 to 65535, but only ports numbers 0 to 1023 are reserved for privileged services and are designated as “well-known ports”. The registered ports are numbered from 1024 through 49151. The remaining ports, referred to as dynamic ports or private ports, are numbered from 49152 through 65535.

Examples of well-known and registered port numbers are shown in Table 4, for further information, please see IANA’s website at: <http://www.iana.org/assignments/port-numbers>

For help on determining which private port numbers are used by common applications on this list, please see the FAQs (Frequently Asked Questions) at: <http://www.billion.com>

Table 4: Well-know and registered Ports

Port Number	Protocol	Description
20	TCP	FTP Data
21	TCP	FTP Control
22	TCP & UDP	SSH Remote Login Protocol
23	TCP	Telnet
25	TCP	SMTP (Simple Mail Transfer Protocol)
53	TCP & UDP	DNS (Domain Name Server)
69	UDP	TFTP (Trivial File Transfer Protocol)
80	TCP	World Wide Web HTTP
110	TCP	POP3 (Post Office Protocol Version 3)
119	TCP	NEWS (Network News Transfer Protocol)

123	UDP	NTP (Network Time Protocol)
161	TCP	SNMP
443	TCP & UDP	HTTPS
1503	TCP	T.120
1720	TCP	H.323
4000	TCP	ICQ
7070	UDP	RealAudio

Virtual Server (Port Forwarding)

Port Mapping Table

IP Table

Enable	Application	Protocol	External Port	Redirect Port	IP Address
<input type="checkbox"/>	FTP	TCP	21	0	192.168.1.
<input type="checkbox"/>	Telnet	TCP	23	0	192.168.1.
<input type="checkbox"/>	SMTP	TCP	25	0	192.168.1.
<input type="checkbox"/>	HTTP	TCP	80	0	192.168.1.
<input type="checkbox"/>	POP3	TCP	110	0	192.168.1.
<input type="checkbox"/>	NNTP	TCP	119	0	192.168.1.
<input type="checkbox"/>	NTP	UDP	123	0	192.168.1.
<input type="checkbox"/>	HTTPS	TCP	443	0	192.168.1.
<input type="checkbox"/>	IKE	UDP	500	0	192.168.1.
<input type="checkbox"/>	T.120	TCP	1503	0	192.168.1.
<input type="checkbox"/>	H.323	TCP	1720	0	192.168.1.
<input type="checkbox"/>	PPTP	TCP	1723	0	192.168.1.
<input type="checkbox"/>	SIP	TCP/UDP	5060	0	192.168.1.
<input type="checkbox"/>	CUSeeMe	TCP	7648	0	192.168.1.
<input type="checkbox"/>		tcp	0 ~ 0	0 ~ 0	192.168.1.
<input type="checkbox"/>		tcp	0 ~ 0	0 ~ 0	192.168.1.
<input type="checkbox"/>		tcp	0 ~ 0	0 ~ 0	192.168.1.
<input type="checkbox"/>		tcp	0 ~ 0	0 ~ 0	192.168.1.

Because NAT can act as a “natural” Internet firewall, your router protects your network from being accessed by outside users when using NAT, as all incoming connection attempts will point to your router unless you specifically create Virtual Server entries to forward those ports to a PC on your network. When your router needs to allow outside users to access internal servers, e.g. a web server, FTP server, Email server or game server, the router can act as a “virtual server”. You can set up a local server with a specific port number for the service to use, e.g. web/HTTP (port 80), FTP (port 21), Telnet (port 23), SMTP (port 25), or POP3 (port 110), When an incoming access request to the router for a specified port is received, it will be forwarded to the corresponding internal server.

For example, if you set the port number 80 (Web/HTTP) to be mapped to the IP Address 192.168.1.2, then all incoming HTTP requests from outside users will be forwarded to the local server (PC) with the IP address of 192.168.1.2. If the port is not listed as a predefined application, you need to add it manually.

In addition to specifying the port number to be used, you will also need to specify the protocol used. The protocol used is determined by the particular application. Most applications will use TCP or UDP, however you can specify other protocols using the drop-down **Protocol** menu. Setting the protocol to “all” will cause all incoming connection attempts using all protocols on all port numbers to be forwarded to the specified IP address.

DMZ: The DMZ Host is a local computer exposed to the Internet. When setting a particular internal IP address as the DMZ Host, all incoming packets will be checked by the Firewall and NAT algorithms, then passed to the DMZ host when a packet received does not use a port number used by any other Virtual Server entries.



Using port forwarding does have security implications, as outside users will be able to connect to PCs on your network. For this reason you are advised to use specific Virtual Server entries just for the ports your application requires instead of simply using DMZ or create a Virtual Server entry for “All” protocols, as doing so will result in all connection attempts to your public IP address will access the PC specified.



Attention

If you have disabled the NAT option in the WAN-ISP section, the Virtual Server function will hence be invalid.



Attention

If the DHCP server option is enabled, you have to be very careful in assigning the IP addresses of the virtual servers in order to avoid conflicts. The easiest way of configuring Virtual Servers is to manually assign static IP address to each virtual server PC, with an address that does not fall into the range of IP addresses that are to be issued by the DHCP server. You can configure the virtual server IP address manually, but it must still be in the same subnet as the router.

Advanced

Configuration options within the **Advanced** section are for users who wish to take advantage of the more advanced features of the router. Users who do not understand the features should not attempt to reconfigure their router, unless advised to do so by support staff.

There are four items within the **Advanced** section: **Static Route**, **Dynamic DNS**, **Checking Email** and **Device Management**.

■ Static Routing

Click on **Routing Table** and then choose **Create Route** add a routing table.

Static Route			
Create			
Destination	<input type="text"/>		
Netmask	<input type="text"/>		
via Gateway	<input type="text"/>	or Interface	<input type="text" value="v"/>
Cost	<input type="text" value="1"/>		
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>			

Destination: This is the destination subnet IP address.

Netmask: Subnet mask of the destination IP addresses based on above destination subnet IP.

Gateway: This is the gateway IP address to which packets are to be forwarded.

Interface: Select the interface through which packets are to be forwarded.

Cost: This is the same meaning as Hop. This should usually be left at 1.

Dynamic DNS

Dynamic DNS	
Parameters	
Dynamic DNS	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Dynamic DNS Server	www.dyndns.org (dynamic) ▼
Domain Name	<input type="text"/>
Username	<input type="text"/>
Password	<input type="text"/>
Period	25 <input type="text"/> Day(s) ▼
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

The Dynamic DNS function allows you to alias a dynamic IP address to a static hostname, allowing users whose ISP does not assign them a static IP address to use a domain name. This is especially useful for hosting servers via your ADSL connection, so that anyone wishing to connect to you may use your domain name, rather than having to use your dynamic IP address, which changes from time to time. This dynamic IP address is the WAN IP address of the router, which is assigned to you by your ISP.

You will first need to register and establish an account with the Dynamic DNS provider using their website, for example <http://www.dyndns.org/>

There are more than 5 DDNS services supported.

⊙ Disable: Check to disable the Dynamic DNS function.

⊙ Enable: Check to enable the Dynamic DNS function. The following fields will be activated and required:

Dynamic DNS Server: Select the DDNS service you have established an account with.

Domain Name, Username and Password: Enter your registered domain name and your username and password for this service.

Period: Set the time period between updates, for the Router to exchange information with the DDNS server. In addition to updating periodically as per your settings, the router will perform an update when your dynamic IP address changes.

Via WAN Interface: Decide which WAN interface you want to use for sending DDNS request.

■ Check Emails

Check Email	
Parameters	
Check Email	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Account Name	<input type="text"/>
Password	<input type="text"/>
POP3 Mail Server	<input type="text"/>
Period	<input type="text" value="60"/> minutes
Dial-out for Checking Emails	<input type="checkbox"/> Automatic
<input type="button" value="Apply"/>	

This function allows you to have the router check your POP3 mailbox for new Email messages. The **Mail** LED on your router will light when it detects new messages waiting for download. You may also view the status of this function using the **Status – Email Checking** section of the web interface, which also provides details on the number of new messages waiting. See the **Status** section of this manual for more information.

Ⓒ Disable: Check to disable the router’s Email checking function.

Ⓒ Enable: Check to enable the routers Emailing checking function. The following fields will be activated and required:

Account Name: Enter the name (login) of the POP3 account you wish to check.. Normally, it is the text in your email address before the "@" symbol. If you have trouble with it, please contact your ISP.

Password: Enter the account’s password.

POP3 Mail Server: Enter your (POP) mail server name. Your Internet Service Provider (ISP) or network administrator will be able to supply you with this.

Interval: Enter the value in minutes between periodic mail checks.

Automatically dial-out for checking emails: When the function is enabled, your ADSL router will connect to your ISP automatically to check emails if your Internet connection dropped. Please be careful when using this feature if your ADSL service is charged by time online.

■ Device Management

The Device Management advanced configuration settings allow you to control your router's security options and device monitoring features.

Device Management			
Device Host Name			
Host Name	<input type="text" value="home.gateway"/>		
Embedded Web Server			
* HTTP Port	<input type="text" value="80"/>	(80 is default HTTP port)	
Management IP Address	<input type="text" value="0.0.0.0"/>	(0.0.0.0 means Any)	
Expire to auto-logout	<input type="text" value="180"/>	seconds	
Universal Plug and Play (UPnP)			
UPnP	<input checked="" type="radio"/> Enable <input type="radio"/> Disable		
* UPnP Port	<input type="text" value="2800"/>		
SNMP Access Control			
SNMP V1 and V2			
Read Community	<input type="text" value="public"/>	IP Address	<input type="text" value="0.0.0.0"/>
Write Community	<input type="text" value="password"/>	IP Address	<input type="text" value="0.0.0.0"/>
Trap Community	<input type="text"/>	IP Address	<input type="text"/>
SNMP V3			
Username	<input type="text"/>	Password	<input type="text"/>
Access Right	<input checked="" type="radio"/> Read <input type="radio"/> Read/Write		IP Address <input type="text"/>
* : This setting will become effective after you save to flash and restart the router.			
<input type="button" value="Apply"/>			

Embedded Web Server:

HTTP Port: This is the port number the router's embedded web server (for web-based configuration) will use. The default value is the standard HTTP port, 80. Users may specify an alternative if, for example, they are running a web server on a PC within their LAN.

Management IP Address: You may specify an IP address allowed to logon and access the router's web server. Setting the IP address to 0.0.0.0 will disable IP address restrictions, allowing users to login from any IP address.

Expire to auto-logout: Specify a time frame for the system to auto-logout the user's configuration session.

For Example: User A changes HTTP port number to **100**, specifies their own IP address of **192.168.1.55**, and sets the logout time to be **100** seconds. The router will only allow User A access from the IP address **192.168.1.55** to login to the Web GUI by typing:

<http://192.168.1.254:100> in their web browser. After 100 seconds, the device will automatically logout User A.

Universal Plug and Play (UPnP):

UPnP offers peer-to-peer network connectivity for PCs and other network devices, along with control and data transfer between devices. UPnP offers many advantages for users running NAT routers through UPnP NAT Traversal, and on supported systems makes tasks such as port forwarding much easier by letting the application control the required settings, removing the need for the user to control advanced configuration of their device.

Both the user's Operating System and the relevant application must support UPnP in addition to the router. Windows XP and Windows Me natively support UPnP (when the component is installed), and Windows 98 users may install the Internet Connection Sharing client from Windows XP in order to support UPnP. Windows 2000 does not support UPnP.

Ⓒ Disable: Check to disable the router's UPnP functionality.

Ⓒ Enable: Check to enable the router's UPnP functionality.

UPnP Port: Its default setting is 2800. It is highly recommended for users to use this port value. If this value conflicts with other ports already being used you may wish to change the port.

SNMP Access Control (Software on a PC within the LAN is required in order to utilize this function) – Simple Network Management Protocol.

SNMP V1 and V2:

Read Community: Specify a name to be identified as the Read Community, and an IP address. This community string will be checked against the string entered in the configuration file. Once the string name is matched, user obtains this IP address will be able to view the data.

Write Community: Specify a name to be identified as the Write Community, and an IP address. This community string will be checked against the string entered in the configuration file. Once the string name is matched, users from this IP address will be able to view and modify the data.

Trap Community: Specify a name to be identified as the Trap Community, and an IP address. This community string will be checked against the string entered in the configuration file. Once the string name is matched, users from this IP address will be sent SNMP Traps.

SNMP V3:

Specify a name and password for authentication. And define the access right from identified IP address. Once the authentication has succeeded, users from this IP address will be able to view and modify the data.

SNMP Version: SNMPv2c and SNMPv3

SNMPv2c is the combination of the enhanced protocol features of SNMPv2 without the SNMPv2 security. The "c" comes from the fact that SNMPv2c uses the SNMPv1 community string paradigm for "security", but is widely accepted as the SNMPv2 standard.

SNMPv3 is a strong authentication mechanism, authorization with fine granularity for remote monitoring.

Traps supported: Cold Start, Authentication Failure.

The following MIBs are supported:

➤ **From RFC 1213 (MIB-II):**

- System group
- Interfaces group
- Address Translation group
- IP group
- ICMP group
- TCP group
- UDP group
- EGP (not applicable)
- Transmission
- SNMP group

➤ **From RFC1650 (EtherLike-MIB):**

- dot3Stats

➤ **From RFC 1493 (Bridge MIB):**

- dot1dBase group
- dot1dTp group
- dot1dStp group (if configured as spanning tree)

➤ **From RFC 1471 (PPP/LCP MIB):**

- pppLink group
- pppLqr group

- **From RFC 1472 (PPP/Security MIB):**
 - PPP Security Group)

- **From RFC 1473 (PPP/IP MIB):**
 - PPP IP Group

- **From RFC 1474 (PPP/Bridge MIB):**
 - PPP Bridge Group

- **From RFC1573 (IfMIB):**
 - ifMIBObjects Group

- **From RFC1695 (atmMIB):**
 - atmMIBObjects

- **From RFC 1907 (SNMPv2):**
 - only snmpSetSerialNo OID

Save Configuration to Flash

After changing the router's configuration settings, you must save all of the configuration parameters to FLASH to avoid them being lost after turning off or resetting your router. Click **Save** to write your new configuration to FLASH.

Save Config to FLASH

Please confirm that you wish to save the configuration.

There will be a delay while saving as configuration information is written to FLASH chips.

Apply

Logout

To exit the router's web interface, choose **Logout**. Please ensure that you have saved the configuration settings before you logout.

Be aware that the router is restricted to only one PC accessing the configuration web pages at a time. Once a PC has logged into the web interface, other PCs cannot get access until the current PC has logged out of the web interface. If the previous PC forgets to logout, the second PC can access the page after a user-defined period, by default 3 minutes. You can modify this value using the **Advanced – Device Management** section of the web interface. Please see the **Advanced** section of this manual for more information.

Chapter 5: Troubleshooting

If the router is not functioning properly, first check this chapter for simple troubleshooting before contacting your service provider or Billion support.

Problems starting up the router

Problem	Corrective Action
None of the LEDs are on when you turn on the router.	Check the connection between the adapter and the router. If the error persists, you may have a hardware problem. In this case you should contact technical support.
You have forgotten your router login and/or password.	Try the default login and password, refer to Chapter 3. If this fails, you can restore your router to its factory settings by holding the Reset button on the back of your router more than 6 seconds.

Problems with the WAN Interface

Problem	Corrective Action
Initialization of the PVC connection (“linesync”) failed.	Ensure that the telephone cable is connected properly from the ADSL port to the wall jack. The ADSL LED on the front panel of the router should be on. Check that your VPI, VCI, encapsulation type and type of multiplexing settings are the same as those provided by your ISP. Reboot the router GE. If you still have problems, you may need to verify these settings with your ISP.

<p>Frequent loss of ADSL linesync (disconnections).</p>	<p>Ensure that all other devices connected to the same telephone line as your Billion router (e.g. telephones, fax machines, analogue modems) have a line filter connected between them and the wall socket (unless you are using a Central Splitter or Central Filter installed by a qualified and licensed electrician), and ensure that all line filters are correctly installed and the right way around. Missing line filters or line filters installed the wrong way around can cause problems with your ADSL connection, including causing frequent disconnections.</p>
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Problems with the LAN Interface

Problem	Corrective Action
<p>Can't ping any PCs on the LAN.</p>	<p>Check the Ethernet LEDs on the front panel. The LED should be on for a port that has a PC connected. If it is off, check the cables between your router and the PC. Make sure you have uninstalled any software firewall for troubleshooting.</p>
	<p>Verify that the IP address and the subnet mask are consistent between the router and the workstations.</p>

APPENDIX A: Product Support and Contact Information

Most problems can be solved by referring to the **Troubleshooting** section in the User's Manual. If you cannot resolve the problem with the **Troubleshooting** chapter, please contact the dealer where you purchased this product.

Contact Billion

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