

OV501GF

User Manual

VER: 1.0

OvisLink (Canada) INC

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1 Safety Precautions

Read the following information carefully before operating the device. Please follow the following precaution items to protect the device from risks and damage caused by fire and electric power:

- Use volume labels to mark the type of power.
- Use the power adapter that is packed within the device package.
- Pay attention to the power load of the outlet or prolonged lines. An overburden power outlet or damaged lines and plugs may cause electric shock or fire accident. Check the power cords regularly. If you find any damage, replace it at once.
- Proper space left for heat dissipation is necessary to avoid any damage caused by overheating to the device. The holes on the device are designed for heat dissipation to ensure that the device works normally. Do not cover these heat dissipation holes.
- Do not put this device close to a place where a heat source exits or high temperature occurs. Avoid the device from direct sunshine.
- Do not put this device close to a place where is over damp or watery. Do not spill any fluid on this device.
- Do not connect this device to any PC or electronic product, unless our customer engineer or your broadband provider instructs you to do this, because any wrong connection may cause any power or fire risk.
- Do not place this device on an unstable surface or support.

2 Overview

The OV501GF is a VDSL modem, which provides a fast Internet access over plain telephone wire.

It also supports Universal Plug and Play (UPnP) where UPnP devices can dynamically join the OV501GF network.

You can use the Web Configurator to view traffic statistics, upload firmware and allow external management of the OV501GF.

Network and Router management is done through the web-based management interface that can be accessed through the local Ethernet using any web browser. You may also enable remote management to enable configuration of the Router via the WAN interface.

2.1 Application

- Home gateway
- SOHOs
- Small enterprises
- Higher data rate broadband sharing
- Audio and video streaming and transfer
- Network and online gaming

2.2 Features

- User-friendly GUI for web configuration
- Several pre-configured popular games. Just enable the game and the port settings are automatically configured.
- Compatible with all standard Internet applications
- Industry standard and interoperable xDSL interface
- Simple web-based status page displays a snapshot of system configuration, and links to the configuration pages

- Downloadable flash software updates
- Support for up to 8 permanent virtual circuits (PVC)
- Support for up to 8 PPPoE sessions
- Support RIP v1 & RIP v2
- IP routing and bridging
- Asynchronous transfer mode (ATM) and digital subscriber line (DSL) support
- Point-to-point protocol (PPP)
- Network/port address translation (NAT/PAT)
- Quality of service (QoS)
- Universal plug-and-play(UPnP)
- Web filtering
- Management and control
- Web-based management (WBM)
- Command line interface (CLI)
- TR-069 WAN management protocol
- Remote update
- System statistics and monitoring

2.3 Standards Compatibility and Compliance

- Support application level gateway (ALG)
- ITU G.992.1 (G.dmt)
- ITU G.992.2 (G.lite)
- ITU G.994.1 (G.hs)
- ITU G.992.3 (ADSL2)
- ITU G.992.5 (ADSL2+)
- ITU G.993.2 (VDSL)
- ITU-T G.9700/ G.9701(G.fast)
- ANSI T1.413 Issue 2
- IEEE 802.3
- IEEE 802.3u

3 Hardware Description and Installation

Note:

The figures in this document are for reference only.

3.1 Hardware Description

3.1.1 Front Panel

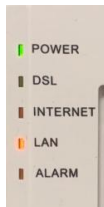


Figure 1 Front panel

The following table describes the indicators on the front panel.

Indicator	Color	Status	Description
Power	Green	On	The device is powered on and the device operates normally.
		Blink	The software is upgrading.
		Off	The device is powered off.
	Red	On	The device is initiating.
		Blink	The software is upgrading.
DSL	Green	On	DSL link has established.
		Blink	The DSL line is training.
		Off	Device is powered off.
Internet	Green	On	Internet is synchronized successfully in the route mode.
		Blink	Internet data is being transmitted.
		Off	Ethernet interface is disconnected.
	Red	On	Authentication has failed.
LAN	Green	On	The Ethernet interface is connected.
		Blink	Data is being transmitted through the Ethernet interface.
		Off	The Ethernet interface is disconnected.

3.1.2 Rear Panel



Figure 2 Rear panel

The following table describes the interfaces or the buttons.

Interface	Description
DSL	RJ-11 port: Connect the router to DSL connector or splitter through telephone cable.
LAN	RJ-45 port, for connecting the router to a PC or another network device.
Reset	Press the button for at least 1 second and then release it. System restores the factory default settings.
Power	Power interface, for connecting the power adapter.
On/Off	Power switch.

Warning:

*Do not press the **Reset** button unless you want to clear the current settings. The **Reset** button is in a small circular hole on the rear panel. If you want to restore the default settings, please press the **Reset** button gently for 1 second with a fine needle inserted into the hole and then release the button. The system reboots and returns to the factory defaults.*

3.2 Hardware Installation

3.2.1 Connecting the Device

Step 1 Connect the **DSL** port of the router

The splitter has 3 ports:

- **Line**: Connect to a wall phone jack (RJ-11 jack)
- **Modem**: Connect to the Line interface of the router

Step 2 Connect the **LAN** port of the router to the network card of the PC through an Ethernet cable.

Step 3 Plug the power adapter to the wall outlet and then connect the other end of it to the **Power** port of the router.

Step 4 Note:

The following figure displays the connection of the DSL router, PC,

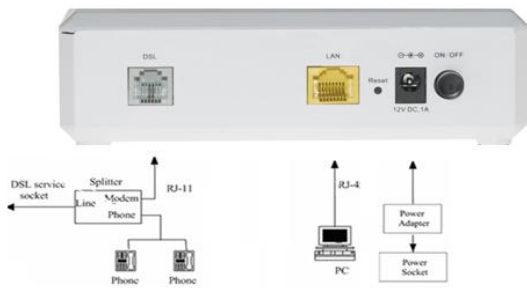


Figure 3 Connecting the DSL router

4 PC Network Configuration and Login

4.1 PC Network Configuration

Each network interface on the PC should either be configured with a statically defined IP address and DNS address, or be instructed to automatically obtain an IP address using the network DHCP server. DSL router provides a DHCP server on its LAN and it is recommended to configure your LAN to automatically obtain its IP address and DNS server IP address.

The configuration principle is identical but should be carried out differently on each operating system.

The following displays the **TCP/IP Properties** dialog box on Windows 10.

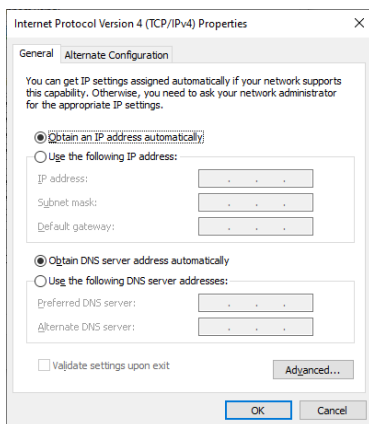


Figure 4 IP and DNS configuration

TCP/IP configuration steps for Windows XP are as follows:

Choose **Start > Settings > Network & Internet > Ethernet > Change Adapter Options > Local Area Connection**.

Right-click the Ethernet connection icon and choose **Properties**.

On the **General** tab, select the **Internet Protocol (TCP/IP)** component and click **Properties**.

The **Internet Protocol (TCP/IP) Properties** window appears.

Select the **Obtain an IP address automatically** radio button.

Select the **Obtain DNS server address automatically** radio button.

Click **OK** to save the settings.

4.2 Logging In to the DSL Router

To log in to the DSL router, do as follows:

Open a Web browser on your computer.

Enter **http://192.168.1.1** (the default IP address of the DSL router) in the address bar. The login page appears.

Enter the user name and the password. The default username and password of the super user are **admin** and **admin**. The username and password of the common user are **user** and **user**. You need not enter the username and the password again if you select the option **Remember my password**. It is recommended to change these default values after logging in to the DSL router for the first time.

Click **Login** to log in to the Web page.



Figure 5

After logging in to the DSL router as a super user, you can query, configure, and modify all the settings, and diagnose the system.

5 Web-Based Management

This chapter describes how to use Web-based management of the DSL router, which allows you to configure and control all of DSL router features and system parameters in a user-friendly GUI.

5.1 Device Information

Choose **Device Info**, and the submenus of **Device Info** are shown as below:

Device Info
 Summary
 WAN
 Statistics
 Route
 ARP
 DHCP

5.1.1 Summary

Choose **Device Info > Summary**, and the following page appears.

The screenshot shows the OvisLink OV501GF web management interface. On the left is a navigation menu with options: Device Info, Advanced Setup, Diagnostics, Diagnostics Tools, Management, and Logout. The main content area is titled 'Device Info' and contains a table of system information and a section for WAN connection status.

Product Class:	OV501GF
Symmetric CPU Threads:	2
Serial Number:	20191021103
Mac Address:	0210181F243C
Build Timestamp:	200219_1431
Hardware Version:	tmp_hardware1.0
Software Version:	1.0.0.3
Bootloader (CFE) Version:	1.0.38-118.3
DSL PHY and Driver Version:	A2j79H05m.d27
Uptime:	00:04:48:285

This information reflects the current status of your WAN connection.

Line Rate - Upstream (Kbps):	0
Line Rate - Downstream (Kbps):	0
LAN IPv4 Address:	192.168.1.1
WAN IPv4 Address:	0.0.0.0
Default Gateway:	
Primary DNS Server:	0.0.0.0
Secondary DNS Server:	0.0.0.0
LAN IPv6 ILLA Address:	
WAN IPv6 Address:	
Primary IPv6 DNS Server:	
Secondary IPv6 DNS Server:	
Default IPv6 Gateway:	

This page displays the device information such as the board ID, software version, and the information of your WAN connection such as the upstream rate and the LAN address.

5.1.2 WAN

Choose **Device Info > WAN** and the following page appears.

WAN Info

Interface	Description	Type	VlanMuxId	IPv6	Igmp Pxy	Igmp Src Enbl	MLD Pxy	MLD Src Enbl	NAT	Firewall	Status	IPv4 Address	IPv6 Address
eth0.1	ipoe_0_9_35	IPoE	Disabled	Enabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Unconfigured	0.0.0.0	

This page displays the information of the WAN interface, such as the connection status, and the IP address.

5.1.3 Statistics

5.1.4 LAN

Choose **Device Info > Statistics > LAN** and the following page appears.

Statistics -- LAN

Interface	Received						Transmitted								
	Total				Multicast	Unicast	Broadcast	Total				Multicast	Unicast	Broadcast	
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Pkts	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Pkts	Pkts
eth0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eth1	340322	2573	0	0	0	561	1485	527	1164920	1558	0	0	40	1517	1

Reset Statistics

In this page, you can view the statistical information about the received and transmitted data packets of the Ethernet and wireless interfaces. Click **Reset Statistics** to restore the values to zero and recount them.

5.1.5 WAN Service

Choose **Device Info > Statistics > WAN Service** and the following page appears.

Statistics – WAN

Interface	Description	Received								Transmitted							
		Total				Multicast		Unicast	Broadcast	Total				Multicast		Unicast	Broadcast
		Bytes	Pkts	Errs	Drops	Bytes	Pkts	Pkts	Pkts	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Pkts	Pkts
atm0.1	pos_0_0_35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

In this page, you can view the statistical information about the received and transmitted data packets of the WAN interface.

Click **Reset Statistics** to restore the values to zero and recount them.

5.1.6 xTM

Choose **Device Info > Statistics > xTM** and the following page appears.

Interface Statistics

Port Number	In Octets	Out Octets	In Packets	Out Packets	In OAM Cells	Out OAM Cells	In ASM Cells	Out ASM Cells	In Packet Errors	In Cell Errors

In this page, you can view the statistical information about the received and transmitted data packets at the xTM interfaces.

Click the **Reset** button to restore the values to zero and recount them.

5.1.7 xDSL

Choose **Device Info > Statistics > xDSL** and the following page appears.

Statistics -- xDSL

Mode:		
Traffic Type:		
Status:		Disabled
Link Power State:		
	Downstream	Upstream
Line Coding(Trellis):		
SNR Margin (0.1 dB):		
Attenuation (0.1 dB):		
Output Power (0.1 dBm):		
Attainable Rate (Kbps):		
Rate (Kbps):		
Super Frames:		
Super Frame Errors:		
RS Words:		
RS Correctable Errors:		
RS Uncorrectable Errors:		
HEC Errors:		
OCF Errors:		
LCD Errors:		
Total Cells:		
Data Cells:		
Bit Errors:		
Total ES:		
Total SES:		
Total UAS:		

xDSL BER Test

Reset Statistics

In this page, you can view the statistical information about the received and transmitted data packets of the xDSL interfaces.

Click **xDSL BER Test** to test the xDSL Bit Error Rate.

Click **Reset Statistics** to restore the values to zero and recount them.

xDSL BER Test

Click **xDSL BER Test** to perform a bit error rate (BER) test on the DSL line. The test page is as follows:

ADSL BER Test - Start

The ADSL Bit Error Rate (BER) test determines the quality of the ADSL connection. The test is done by transferring idle cells containing a known pattern and comparing the received data with this known pattern to check for any errors.

Select the test duration below and click "Start".

Tested Time (sec):

The **Tested Time (sec)** can be 1, 5, 10, 20, 60, 120, 180, 240, 300, or 360. Select a time in the drop-down list and click **Start**. The following pages appear.

ADSL BER Test - Running

The xDSL BER test is in progress. The connection speed is 0 Kbps. The test will run for seconds.

Click "Stop" to terminate the test.

When the ADSL BER test completes, the following page appears.

ADSL BER Test - Result

The ADSL BER test completed successfully.

Test Time (sec):	20
Total Transferred Bits:	0x0000000018696580
Total Error Bits:	0x0000000000000000
Error Ratio:	0.00e+00

Note:

If the BER reaches e-5, you cannot access the Internet.

5.1.8 Route

Choose **Device Info > Route** and the following page appears.

Device Info -- Route

Flags: U - up, I - reject, G - gateway, H - host, R - reinstate

D - dynamic (redirect), M - modified (redirect).

Destination	Destination	Subnet Mask	Flag	Metric	Service	Interface
192.168.1.0	0.0.0.0	255.255.255.0	U	0		br0

In this page, you can view the route table information.

5.1.9 ARP

Choose **Device Info > ARP** and the following page appears.

Device Info -- ARP

IP address	Flags	HW Address	Device
192.168.1.25	Complete	00:1d:0f:19:91:c1	br0

In this page, you can view the MAC address and IP address information of the device connected to the router.

5.1.10 DHCP

Choose **Device Info > DHCP** and the following page appears.

Device Info -- DHCP Leases

Hostname	MAC Address	IP Address	Expires In
gjdcc-d0cf4a448	08:00:27:75:75:2c	192.168.1.2	22 hours, 10 minutes, 8 seconds

In this page, you can view the host name, the IP address assigned by the DHCP server, the MAC address this is corresponding to the IP address, and the DHCP lease time.

5.2 Advanced Setup

Choose **Advanced Setup** and the submenus of **Advanced Setup** are shown as below:

- Advanced Setup
 - Layer2 Interface
 - WAN Service
 - USB Modem Service
 - LAN
 - NAT
 - Security
 - Parental Control
 - Quality of Service
 - Routing
 - DIS
 - DSL
 - UPnP
 - DNS Proxy
 - Print Server
 - DLNA
 - Storage Service
 - Interface Grouping
 - IP Tunnel
 - IPSec
 - Certificate
 - Power Management
 - Batteries
 - Multicast

5.2.1 Layer2 Interface

5.2.1.1 ATM Interface

Choose **Advanced Setup > Layer2 Interface > ATM Interface** . In this page, you can add or remove to configure DSL ATM Interfaces.

OvisLink
OV501GF

Device Info

Advanced Setup

Layer2 Interface

ATM Interface

FTN Interface

WAN Service

LAN

NAT

Security

DSL ATM Interface Configuration

Choose Add or Remove to configure DSL ATM Interface.

Interface	VPI	VCI	DSL Category	Category	Peak Call Rate(Com/Sec)	Sustainable Call Rate(Com/Sec)	Max Burst Size(Bytes)	Min Call Rate(Com/Sec)	Link Type	Cross Mode	IP QoS	PPPoE Pvc/Alg/Weight	Remarks
atm0	8	35	Asym	USB					EoA	VoIP/Full	Support	8/1000/1	

Click **Add** to add ATM Interface and the following page appears.

ATM PVC Configuration

This screen allows you to configure a ATM PVC.

VPI: [0-255]

VCI: [32-65535]

Select DSL Latency

Path0 (Fast)

Path1 (Interleaved)

Select DSL Link Type (EoA is for PPPoE, IPoE, and Bridge.)

EoA

PPPoA

IPoA

Encapsulation Mode:

Service Category:

Select Scheduler for Queues of Equal Precedence as the Default Queue

Weighted Round Robin

Weighted Fair Queuing

Default Queue Weight:

[1-63]

Default Queue Precedence:

[1-8] (lower value, higher priority)

VC WRR Weight:

[1-63]

VC Precedence:

[1-8] (lower value, higher priority)

Note: VC scheduling will be SP among unequal precedence VC's and WRR among equal precedence VC's.

For single queue VC, the default queue precedence and weight will be used for arbitration.

For multi-queue VC, its VC precedence and weight will be used for arbitration.

In this page, you can enter this PVC (VPI and VCI) value, and select DSL link type (EoA is for PPPoE, IPoE, and Bridge.), encapsulation mode, service category.

- **VPI (Virtual Path Identifier):** The virtual path between two points in an ATM network, and its valid value is from 0 to 255.
- **VCI (Virtual Channel Identifier):** The virtual channel between two points in an ATM network, ranging from 32 to 65535 (1 to 31 are reserved for known protocols).
- **DSL Link Type:** EoA (it is for PPPoE, IPoE, and Bridge), PPPoA, or IPoA

- **Encapsulation Mode:** LLC/SNAP-BRIDGING, or VC/MUX
- **Service Category:** UBR Without PCR, UBR With PCR, CBR, Non Realtime VBR, Realtime VBR.
- **Select Scheduler for Queues of Equal Precedence as the Default Queue:** Weighted Round Robin or Weighted Fair Queuing.

Click **Apply/Save** to save the configuration, and return the following page:

DSL ATM Interface Configuration

Choose Add, or Remove to configure DSL ATM interfaces.

Interface	Vpi	Vci	DSL Latency	Category	Peak Cell Rate (cells/s)	Sustainable Cell Rate(cells/s)	Max Burst Size(bytes)	Link Type	Conn Mode	IP QoS	MPAA/L Prec/Alj/Wght	Remove
atm0	0	36	Path0	UBR				EoA	VlanMuxMode	Support	8/WRR/1	<input type="checkbox"/>

If you want to remove this Interface, please select the **Remove** check box and click **Remove**.

5.2.1.2 PTM Interface

Choose **Advanced Setup > Layer2 Interface > PTM Interface** . In this page, you can add or remove to configure DSL PTM Interfaces.



Click **Add** to add PTM Interface and the following page appears.

PTM Configuration

This screen allows you to configure a PTM connection.

Select DSL Latency

Path0 (Fast)

Path1 (Interleaved)

Select Scheduler for Queues of Equal Precedence as the Default Queue

Weighted Round Robin

Weighted Fair Queuing

Default Queue Weight: [1-63]

Default Queue Precedence: [1-8] (lower value, higher priority)

Default Queue Minimum Rate: [1-0 Kbps] (-1 indicates no shaping)

Default Queue Shaping Rate: [1-0 kbps] (-1 indicates no shaping)

Default Queue Shaping Burst Size: [bytes] (shall be >=1600)

In this page, you can configuration the PTM interface Click Apply/Save.

Click **Apply/Save** to save the configuration, and return the following page:

DSL PTM Interface Configuration

Choose Add, or Remove to configure DSL PTM interfaces.

Interface	DSL Latency	PTM Priority	Connection Mode	IP QoS	Remove
ptm0	Path0	Normal&High	VlanMuxMode	Support	<input type="checkbox"/>

If you want to remove this Interface, please select the **Remove** check box and click **Remove**.

5.2.2 WAN Service

Choose **Advanced Setup > WAN Service**, and the following page appears.

Wide Area Network (WAN) Service Setup

Choose Add, Remove or Edit to configure a WAN service over a selected interface.

Interface	Description	Type	Vlan8021p	VlanMuxId	VlanTpid	Tgmp Proxy	Tgmp Source	NAT	Firewall	IPv6	Mld Proxy	Mld Source	Remove	Edit
atm0.1	ppoe_0_0_35	PPoE	N/A	N/A	N/A	Disabled	Disabled	Disabled	Disabled	Enabled	Disabled	Disabled		

In this page, you are allowed to add, remove, or edit a WAN service.

5.2.2.1 Adding a PPPoE WAN Service

This section describes the steps for adding the PPPoE WAN service.

Step1 In the **Wide Area Network (WAN) Service Setup** page, click the **Add** button to display the following page. (At first, you must add a proper ATM interface for this WAN service.)

WAN Service Interface Configuration

Select a layer 2 interface for this service

Note: For ATM interface, the descriptor string is (portId_vpi_vci)

For PTM interface, the descriptor string is (portId_high_low)

Where portId=0 --> DSL Latency PATH0

portId=1 --> DSL Latency PATH1

portId=4 --> DSL Latency PATH0&1

low =0 --> Low PTM Priority not set

low =1 --> Low PTM Priority set

high =0 --> High PTM Priority not set

high =1 --> High PTM Priority set

Step2 In this page, you can select a ATM Interface for the WAN service. After selecting the ATM interface, click **Next** to display the following page.

WAN Service Configuration

Select WAN service type:

PPP over Ethernet (PPPoE)
 IP over Ethernet
 Bridging

Enter Service Description:

For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.
For untagged service, set -1 to both 802.1P Priority and 802.1Q VLAN ID.

Enter 802.1P Priority [0-7]:

Enter 802.1Q VLAN ID [0-4094]:

Network Protocol Selection:

Step3 In this page, select the WAN service type to be **PPP over Ethernet (PPPoE)**. Click **Next** to display the following page.

PPP Username and Password

PPP usually requires that you have a user name and password to establish your connection. In the boxes below, enter the user name and password that you want to use.

PPP Username:

PPP Password:

PPPoE Service Name:

Authentication Method:

MTU[576-1500]:

Config KeepAlive
 Enable Fullcone NAT
 Dial on demand (with idle timeout timer)
 PPP IP extension
 Use Static IPv4 Address
 Enable PPP Debug Mode
 Bridge PPPoE Frames Between WAN and Local Ports

Multicast Proxy

Enable IGMP Multicast Proxy

Step4 In this page, you can modify the PPP username, PPP password, PPPoE service name and authentication method.

- **PPP Username:** The correct user name provided by your ISP.
- **PPP Password:** The correct password provided by your ISP.
- **PPPoE Service Name:** If your ISP provides it to you, please enter it. If not, do not enter any information.
- **Authentication Method:** The value can be AUTO, PAP, CHAP, or MSCHAP. Usually, you can select AUTO.
- **Enable Fullcone NAT:** NAT is one where all requests from the same internal IP address and port are mapped to the same external IP address and port. Furthermore, any external host can send a packet to the internal host, by sending a packet to the mapped external address.
- **Dial on demand (with idle timeout timer):** If this function is enabled, you need to enter the idle timeout time. Within the preset minutes, if the modem does not detect the flow of the user continuously, the modem automatically stops the PPPoE connection. Once it detects the flow (like access to a webpage), the modem restarts the PPPoE dialup. If this function is disabled, the modem performs PPPoE dial-up all the time. The PPPoE connection does not stop, unless the modem is powered off and DSLAM or uplink equipment is abnormal.
- **PPP IP extension:** If you want to configure DMZ Host, you should enable it first.
- **Use Static IPv4 Address:** If this function is disabled, the modem obtains an IP address assigned by an uplink equipment such as BAS, through PPPoE dial-up. If this function is enabled, the modem uses this IP address as the WAN IP address.
- **Enable PPP Debug Mode:** Enable or disable this function.
- **Bridge PPPoE Frames Between WAN and Local Ports:** Enable or disable this function.
- **Enable IGMP Multicast Proxy:** If you want PPPoE mode to support IPTV, enable it.

Step5 After setting the parameters, click **Next** to display the following page.

Routing -- Default Gateway

Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

Selected Default Gateway Interfaces		Available Routed WAN Interfaces
<div style="border: 1px solid black; padding: 5px; min-height: 100px;">ppp0.1</div>	<div style="border: 1px solid black; padding: 2px; width: 20px; margin: 5px auto;">-></div> <div style="border: 1px solid black; padding: 2px; width: 20px; margin: 5px auto;"><-</div>	<div style="border: 1px solid black; padding: 5px; min-height: 100px;">ppp1.1</div>
<div style="display: flex; justify-content: center; gap: 10px;"><div style="border: 1px solid black; padding: 2px 5px;">Back</div><div style="border: 1px solid black; padding: 2px 5px;">Next</div></div>		

Step6 In this page, select a preferred WAN interface as the system default gateway and then click **Next** to display the following page.

DNS Server Configuration

Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.

DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

Select DNS Server Interface from available WAN interfaces:

Selected DNS Server Interfaces		Available WAN Interfaces
<div style="border: 1px solid black; padding: 5px; min-height: 100px;">ppp0.1</div>	<div style="border: 1px solid black; padding: 2px; width: 20px; margin: 5px auto;">-></div> <div style="border: 1px solid black; padding: 2px; width: 20px; margin: 5px auto;"><-</div>	<div style="border: 1px solid black; padding: 5px; min-height: 100px;">ppp1.1</div>
<div style="display: flex; justify-content: center; gap: 10px;"><div style="border: 1px solid black; padding: 2px 5px;">Back</div><div style="border: 1px solid black; padding: 2px 5px;">Next</div></div>		

- Step7** In this page, you can obtain the DNS server addresses from the selected WAN interface. Click **Next**, and the following page appears.

WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

Connection Type:	PPPoE
NAT:	Enabled
Full Cone NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled

Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.

- Step8** In this page, it displays the information about the PPPoE settings. Click **Apply/Save** to save and apply the settings.

5.2.2.2 Adding a MER (IPoE) WAN service

This section describes the steps for adding the MER WAN service.

- Step1** In the **Wide Area Network (WAN) Service Setup** page, click the **Add** button to display the following page. (At first, you must add a ATM interface for this WAN service.)

WAN Service Interface Configuration

Select a layer 2 interface for this service

Note: For ATM interface, the descriptor string is (portId_vpi_vci)

For PTM interface, the descriptor string is (portId_high_low)

Where portId=0 --> DSL Latency PATH0

portId=1 --> DSL Latency PATH1

portId=4 --> DSL Latency PATH0&1

low =0 --> Low PTM Priority not set

low =1 --> Low PTM Priority set

high =0 --> High PTM Priority not set

high =1 --> High PTM Priority set

atm0/(0_0_35) ▼

Step2 Select an ATM Interface, and then click **Next** to display the following page.

WAN Service Configuration

Select WAN service type:

PPP over Ethernet (PPPoE)
 IP over Ethernet
 Bridging

Enter Service Description:

For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.
 For untagged service, set -1 to both 802.1P Priority and 802.1Q VLAN ID.

Enter 802.1P Priority [0-7]:

Enter 802.1Q VLAN ID [0-4094]:

Network Protocol Selection:

Step3 In this page, select the WAN service type to be IP over Ethernet, enter the service description for this service. After finishing setting, click **Next** to display the following page.

WAN IP Settings

Enter information provided to you by your ISP to configure the WAN IP settings.
 Notice: If "Obtain an IP address automatically" is chosen, DHCP will be enabled for IPv4 in IPoE mode.
 If "Use the following Static IPv4/IPv6 address" is chosen, enter the WAN IPv4/IPv6 address, subnet mask/prefix Length and interface gateway.

Obtain an IP address automatically
 Use the following Static IP address

Option 60 Vendor ID:

Option 61 IAD: (8 hexadecimal digits)

Option 61 DUID: (hexadecimal digit)

Option 125: Disable Enable

WAN IP Address:

WAN Subnet Mask:

WAN gateway IP Address:

Primary DNS server:

Secondary DNS server:

Step4 In this page, you may modify the WAN IP settings. You may select obtain an IP address automatically or manually enter the IP address provided by your ISP. Click **Next** and the following page appears.

Note:

*If selecting **Obtain an IP address automatically**, DHCP will be enabled for PVC in MER mode.*

*If selecting **Use the following Static IP address**, please enter the WAN IP address, subnet mask and gateway IP address.*

Network Address Translation Settings

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).

Enable NAT

ONLY IF REQUIRED -- DISABLES NETWORK ACCELERATION AND SOME SECURITY

Enable Firewall

IGMP Multicast

Enable IGMP Multicast

Back Next

Step5 In this page, you can set the network address translation settings, for example, enabling NAT, enabling firewall, and enabling IGMP multicast. After finishing setting, click **Next** and the following page appears.

Routing -- Default Gateway

Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

Selected Default Gateway Interfaces

ppp0.1

->

<-

Available Routed WAN Interfaces

ata0.1

Back Next

- Step6** In this page, select a preferred WAN interface as the system default gateway and then click **Next** to display the following page.

DNS Server Configuration

Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.

DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

Select DNS Server Interface from available WAN interfaces:

Selected DNS Server Interfaces	<input type="button" value="→"/> <input type="button" value="←"/>	Available WAN Interfaces
ppp0. 1		atm0. 1
<input type="button" value="Back"/> <input type="button" value="Next"/>		

- Step7** In this page, you can obtain the DNS server addresses from the selected WAN interface. After finishing setting, click **Next** to display the following page.

WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

Connection Type:	IPoE
NAT:	Disabled
Full Cone NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled

Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.

Step8 In this page, it displays the information about the IPoE settings. Click **Apply/Save** to save and apply the settings.

5.2.2.3 Adding a PPPoA WAN service

This section describes the steps for adding the PPPoA WAN service.

Step1 Choose **Advanced Setup > Layer2 Interface > ATM Interface** to display the **DSL ATM Interface Configuration** page. In this page, you need to add a PVC for PPPoA mode. Click the **Add** button in the **DSL ATM Interface Configuration** page to display the following page.

ATM PVC Configuration

This screen allows you to configure a ATM PVC.

VPI: [0-255]
 VCI: [32-65535]

Select DSL Latency

Path0 (Fast)
 Path1 (Interleaved)

Select DSL Link Type (EoA is for PPPoE, IPoE, and Bridge.)

EoA
 PPPoA
 IPoA

Encapsulation Mode: ▼

Service Category: ▼

Select Scheduler for Queues of Equal Precedence as the Default Queue

Weighted Round Robin
 Weighted Fair Queuing

Default Queue Weight: [1-63]
 Default Queue Precedence: [1-8] (lower value, higher priority)

VC WRR Weight: [1-63]
 VC Precedence: [1-8] (lower value, higher priority)

Note: VC scheduling will be SP among unequal precedence VC's and WRR among equal precedence VC's.
 For single queue VC, the default queue precedence and weight will be used for arbitration.
 For multi-queue VC, its VC precedence and weight will be used for arbitration.

Step2 Select the DSL link type to be **PPPoA**, and select the encapsulation mode to be **VC/MUX** (according to the uplink equipment). After finishing setting, click the **Apply/Save** button to apply the settings.

- Step3** Choose **WAN Service** and click **Add** to display the following page.
WAN Service Interface Configuration

Select a layer 2 interface for this service

Note: For ATM interface, the descriptor string is (portId_vpi_vci)

For PTM interface, the descriptor string is (portId_high_low)

Where portId=0 --> DSL Latency PATH0

portId=1 --> DSL Latency PATH1

portId=4 --> DSL Latency PATH0&1

low =0 --> Low PTM Priority not set

low =1 --> Low PTM Priority set

high =0 --> High PTM Priority not set

high =1 --> High PTM Priority set

atm1/(0_0_37) ▼

Back

Next

- Step4** Select the proper interface for the WAN service, and then click **Next** to display the following page.

WAN Service Configuration

Enter Service Description: pppoa_0_0_37

Network Protocol Selection: (IPv6 Only not support)

IPv4 Only ▼

Back

Next

- Step5** In this page, you may modify the service description. Click **Next** to display the following page.

PPP Username and Password

PPP usually requires that you have a user name and password to establish your connection. In the boxes below, enter the user name and password that your ISP has provided to you.

PPP Username:	<input type="text" value="test"/>
PPP Password:	<input type="password" value="****"/>
Authentication Method:	<input type="text" value="AUTO"/> ▼
MTU[576-1500]:	<input type="text" value="1492"/>

Enable Fullcone NAT

ONLY IF REQUIRED -- DISABLES NETWORK ACCELERATION AND SOME SECURITY

Dial on demand (with idle timeout timer)

Use Static IPv4 Address

Enable PPP Debug Mode

Multicast Proxy

Enable IGMP Multicast Proxy

- **PPP Username:** The correct user name provided by your ISP.
- **PPP Password:** The correct password provided by your ISP.
- **Authentication Method:** The value can be AUTO, PAP, CHAP, or MSCHAP. Usually, you can select AUTO.
- **Enable Fullcone NAT:** NAT is one where all requests from the same internal IP address and port are mapped to the same external IP address and port. Furthermore, any external host can send a packet to the internal host, by sending a packet to the mapped external address.
- **Dial on demand (with idle timeout timer):** If this function is enabled, you need to enter the idle timeout time. Within the preset minutes, if the modem does not detect the flow of the user continuously, the modem automatically stops the PPPoA connection. Once it detects the flow (like access to a webpage), the modem restarts the PPPoA dialup. If this function is disabled, the modem performs PPPoA dial-up all the time. The PPPoA connection does not stop, unless the modem is powered off and DSLAM or uplink equipment is abnormal.
- **PPP IP extension:** If you want to configure DMZ Host, you should enable it first.
- **Use Static IPv4 Address:** If this function is disabled, the modem obtains an IP address assigned by an uplink equipment such as BAS, through

PPPoA dial-up. If this function is enabled, the modem uses this IP address as the WAN IP address.

- **Enable PPP Debug Mode:** Enable or disable this function.
- **Enable IGMP Multicast Proxy:** If you want PPPoE mode to support IPTV, enable it.

Step6 In this page, you can enter the PPP username and PPP password provided by your ISP. Select the authentication method according to your requirement. After finishing setting, click **Next** to display the following page.

Routing -- Default Gateway

Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

Selected Default Gateway Interfaces	<input type="button" value="->"/> <input type="button" value="<-"/>	Available Routed WAN Interfaces
ppp0.1		ppp0a1
<input type="button" value="Back"/> <input type="button" value="Next"/>		

Step7 In this page, select a preferred WAN interface as the system default gateway and then click **Next** to display the following page.

DNS Server Configuration

Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.

DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

Selected DNS Server Interfaces	<input type="button" value="->"/> <input type="button" value="<-"/>	Available WAN Interfaces
ppp0.1		ppp0a1
<input type="button" value="Back"/> <input type="button" value="Next"/>		

- Step8** In this page, you can obtain the DNS server addresses from the selected WAN interface. After finishing setting, click **Next** to display the following page.

WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

Connection Type:	PPPoA
NAT:	Enabled
Full Cone NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Service:	Enabled

Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.

- Step9** In this page, it displays the information about the PPPoA settings. Click **Apply/Save** to apply the settings. You can modify the settings by clicking the **Back** button if necessary.

5.2.2.4 Adding an IPoA WAN service

This section describes the steps for adding the IPoA WAN service.

Step1 Choose **Advanced Setup > Layer2 Interface > ATM Interface** to display the **DSL ATM Interface Configuration** page. In this page, you need to add a PVC for IPoA mode. Click the **Add** button in the **DSL ATM Interface Configuration** page to display the following page.

ATM PVC Configuration

This screen allows you to configure a ATM PVC.

VPI: [0-255]

VCI: [32-65535]

Select DSL Latency

- Path0 (Fast)
 Path1 (Interleaved)

Select DSL Link Type (EoA is for PPPoE, IPoE, and Bridge.)

- EoA
 PPPoA
 IPoA

Encapsulation Mode:

Service Category:

Select Scheduler for Queues of Equal Precedence as the Default Queue

- Weighted Round Robin
 Weighted Fair Queuing

Default Queue Weight: [1-63]

Default Queue Precedence: [1-8] (lower value, higher priority)

VC WRR Weight: [1-63]

VC Precedence: [1-8] (lower value, higher priority)

Note: VC scheduling will be SP among unequal precedence VC's and WRR among equal precedence VC's.

For single queue VC, the default queue precedence and weight will be used for arbitration.

For multi-queue VC, its VC precedence and weight will be used for arbitration.

Step2 Select the DSL link type to be **IPoA**, and select the encapsulation mode to be **LLC/SNAP-ROUTING** (according to the uplink equipment). After finishing setting, click the **Apply/Save** button to save the settings.

Step3 Choose **WAN Service** and click **Add** to display the following page.

WAN Service Interface Configuration

Select a layer 2 interface for this service

Note: For ATM interface, the descriptor string is (portId_vpi_vci)

For PTM interface, the descriptor string is (portId_high_low)

Where portId=0 --> DSL Latency PATH0

portId=1 --> DSL Latency PATH1

portId=4 --> DSL Latency PATH0&1

low =0 --> Low PTM Priority not set

low =1 --> Low PTM Priority set

high =0 --> High PTM Priority not set

high =1 --> High PTM Priority set

ipoa0/ (0_0_38) ▾

Back Next

Step4 Select the proper interface for the WAN service ,and then click **Next** to display the following page.

WAN Service Configuration

Enter Service Description: ipoa_0_0_38

Back Next

Step5 In this page, you may modify the service description. Click **Next** to display the following page.

WAN IP Settings

information provided to you by your ISP to configure the WAN IP settings.

WAN IP Address: 0.0.0.0

WAN Subnet Mask: 0.0.0.0

Primary DNS server: 0.0.0.0

Secondary DNS server:

Back Next

Step6 In this page, enter the WAN IP address, the WAN subnet mask, and primary DNS server provided by your ISP and then click **Next** to display the following page.

Network Address Translation Settings

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).

Enable NAT

Enable Fullcone NAT

ONLY IF REQUIRED -- DISABLES NETWORK ACCELERATION AND SOME SECURITY

Enable Firewall

IGMP Multicast

Enable IGMP Multicast

[Back](#) [Next](#)

In this page, Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).

If you do not want to enable NAT, and wish the user of modem to access the Internet normally, you need to add a route on the uplink equipment. Otherwise, the access to the Internet fails. Normally, please enable the NAT function.

Step7 After finishing setting, click **Next** to display the following page.

Routing -- Default Gateway

Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

Selected Default Gateway Interfaces

ppp0.1

->

<-

Available Routed WAN Interfaces

ipoa0

[Back](#) [Next](#)

- Step8** In this page, select a preferred WAN interface as the system default gateway and then click **Next** to display the following page.

DNS Server Configuration

Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.

DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

Select DNS Server Interface from available WAN interfaces:

Selected DNS Server Interfaces

ppp0.1



Available WAN Interfaces

ipos0

Back Next

- Step9** In this page, you can obtain the DNS server addresses from the selected WAN interface. After finishing setting, click **Next** to display the following page.

WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

Connection Type:	IPoA
NAT:	Enabled
Full Cone NAT:	Enabled
Firewall:	Disabled
IGMP Multicast:	Disabled
Quality Of Service:	Enabled

Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.

Back Apply/Save

- Step10** In this page, it displays the information about the IPoA settings. Click **Apply/Save** to save and apply the settings. You can modify the settings by clicking the **Back** button if necessary.

5.2.2.5 Adding a Bridge WAN service

This section describes the steps for adding the Bridge WAN service.

Step1 In the **Wide Area Network (WAN) Service Setup** page, click the **Add** button to display the following page. (At first, you must add a proper ATM interface for this WAN service.) Click the **Add** button to display the following page.

WAN Service Interface Configuration

Select a layer 2 interface for this service

Note: For ATM interface, the descriptor string is (portId_vpl_vci)

For PTM interface, the descriptor string is (portId_high_low)

Where portId=0 --> DSL Latency PATH0

portId=1 --> DSL Latency PATH1

portId=4 --> DSL Latency PATH0&1

low =0 --> Low PTM Priority not set

low =1 --> Low PTM Priority set

high =0 --> High PTM Priority not set

high =1 --> High PTM Priority set

atm0/(0_0_36) ▼

Back

Next

Step2 Select the proper ATM Interface and then click **Next** to display the following page.

WAN Service Configuration

Select WAN service type:

PPP over Ethernet (PPPoE)

IP over Ethernet

Bridging

Enter Service Description: br_0_0_36

For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.

For untagged service, set -1 to both 802.1P Priority and 802.1Q VLAN ID.

Enter 802.1P Priority [0-7]:

-1

Enter 802.1Q VLAN ID [0-4094]:

-1

Back

Next

- Step3** In this page, you can select the WAN service type, and modify the service description for this service. After finishing setting, click **Next** to display the following page.

WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

Connection Type:	Bridge
NAT:	Disabled
Full Cone NAT:	Enabled
Firewall:	Disabled
IGMP Multicast:	Not Applicable
Quality Of Service:	Enabled

Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.

[Back](#) [Apply/Save](#)

- Step4** In this page, it displays the information about the bridge settings. Click **Apply/Save** to save and apply the settings. You can modify the settings by clicking the **Back** button if necessary.

5.2.3 LAN Configuration

Choose **Advanced Setup > LAN**, and the following page appears.

Local Area Network (LAN) Setup

Configure the Broadband Router IP Address and Subnet Mask for LAN interface. GroupName **Default** ▼

IP Address:
Subnet Mask:

Enable IGMP Snooping

Standard Mode
 Blocking Mode

Enable IGMP LAN to LAN Multicast: ▼
(LAN to LAN Multicast is enabled until the first WAN service is connected, regardless of this setting.)

Enable LAN side firewall

Disable DHCP Server

Enable DHCP Server
Start IP Address:
End IP Address:
Leased Time (hour):
Static IP Lease List: (A maximum 32 entries can be configured)

Enable DHCP Server Relay
DHCP Server IP Address:

Configure the second IP Address and Subnet Mask for LAN interface

[Apply/Save](#)

In this page, you can configure an IP address for the DSL router, enable IGMP snooping, enable or disable the DHCP server, edit the DHCP option, configure the DHCP advanced setup and set the binding between a MAC address and an IP address.

Configuring the Private IP Address for the DSL Router

IP Address:	<input type="text" value="192.168.1.1"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>

In this page, you can modify the IP address of the device. The preset IP address is 192.168.1.1.

Enabling IGMP Snooping

IGMP snooping enables the router to forward multicast traffic intelligently, instead of flooding all ports in the VLAN. With IGMP snooping, the router listens to IGMP membership reports, queries and leave messages to identify the switch ports that are members of multicast groups. Multicast traffic will only be forwarded to ports identified as members of the specific multicast group or groups.

Enable IGMP Snooping

Standard Mode

Blocking Mode

Enabling the LAN Side Firewall

Firewall can prevent unexpected traffic on the Internet from your host in the LAN.

Enable LAN side firewall

In this page, you can enable or disable the LAN side firewall.

Configuring the DHCP Server

Enable DHCP Server

Start IP Address:

End IP Address:

Leased Time (hour):

If you enable the DHCP server, the clients will automatically acquire the IP address from the DHCP server. If the DHCP server is disabled, you need to manually set the start IP address, end IP address and the lease time for the clients in the LAN.

Configuring the DHCP Static IP Lease List

The lease list of static IP address can reserve the static IP addresses for the hosts with the specific MAC addresses. When a host whose MAC address is in the lease list of static IP address requests the DHCP server for an IP address, the DHCP server assigns the reserved IP address to the host.

MAC Address	IP Address	Remove
<input type="text"/>	<input type="text"/>	<input type="text"/>

Click the **Add Entries** button in the **Local Area Network (LAN) Setup** page to display the **DHCP Static IP Lease** page.

DHCP Static IP Lease

Enter the Mac address and Static IP address then click Apply/Save .

MAC Address:

IP Address:

In this page, enter the MAC address of the LAN host and the static IP address that is reserved for the host, and then click the **Apply/Save** button to apply the settings.

Configuring the Second IP Address and Subnet Mask for a LAN Interface

In the **Local Area Network (LAN) Setup** page, you are allowed to set the second IP address and the subnet mask for a LAN interface.

Configure the second IP Address and Subnet Mask for LAN interface

IP Address:

Subnet Mask:

After enabling **Configure the second IP Address and Subnet Mask for LAN interface**, enter an IP address and a subnet mask for the LAN interface. After finishing setting, click the **Apply/Save** button to apply the settings.

5.2.3.1 IPv6 Auto-configuration

Click **Advanced Setup > LAN > IPv6 Autoconfig**, and the following page appears.

IPv6 LAN Auto Configuration

Note:

1: Stateful DHCPv6 is supported based on the assumption of prefix length less than 64. Interface ID does NOT support ZERO COMPRESSION '::'. Please enter the complete information. For example: Please enter '0:0:0:2' instead of '::2'.

2: Unique local address must start with "fd". The prefix and the address must be in same network and the prefix length must be 64.

Enable ULA Prefix Advertisement

IPv6 LAN Applications

Enable DHCPv6 Server

Stateless

Stateful

Start interface ID:

End interface ID:

Leased Time (hour):

Enable RADVD

Enable MLD Snooping

Standard Mode

Blocking Mode

Enable MLD LAN to LAN Multicast:

(LAN to LAN Multicast is enabled until the first WAN service is connected, regardless of this setting.)

Enable Relay

In this page, you can set an IP address for the DSL IPv6 router, enable the DHCPv6 server, enable RADVD and enable the MLD snooping function.

- **Enable DHCPv6 Server:** WIDE-DHCPv6 is an open-source implementation of dynamic host configuration protocol for IPv6 (DHCPv6) originally developed by the KAME project. The implementation mainly complies with the following standards: RFC3315, RFC3319, RFC3633, RFC3646, RFC4075, RFC 4272 etc.
- **Enable RADVD:** The router advertisement daemon (RADVD) is run by Linux or BSD systems acting as IPv6 routers. It sends router advertisement messages, specified by RFC2461, to a local Ethernet LAN periodically and when requested by a node sending a router solicitation message. These messages are required for IPv6 stateless auto-configuration.
- **Enable MLD Snooping:** Multicast Listener Discovery Snooping (MLD Snooping) is an IPv6 multicast constraining mechanism that runs on Layer 2 devices to manage and control IPv6 multicast groups. By analyzing received MLD messages, a Layer 2 device running MLD Snooping establishes mappings between ports and multicast MAC addresses and forwards IPv6 multicast data based on these mappings.

After finishing setting, click the **Save/Apply** button to apply the settings.

5.2.4 NAT

5.2.4.1 Virtual Servers

Firewall can prevent unexpected traffic on the Internet from your host on the LAN. The virtual server can create a channel that can pass through the firewall. In that case, the host on the Internet can communicate with a host on your LAN within certain port range.

Choose **Advanced Setup > NAT > Virtual Servers**, and the following page appears.

HAAT -- Virtual Servers Setup

Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum 32 entries can be configured.

Add Remove

Server Name	External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End	Server IP Address	WAN Interface	Remove
-------------	---------------------	-------------------	----------	---------------------	-------------------	-------------------	---------------	--------

In this page, you are allowed to add or remove a virtual server entry.

To add a virtual server, do as follows:

Step 1 Click the **Add** button to display the following page.

HAAT -- Virtual Servers

Select the service name, and enter the server IP address and click "Apply/Save" to forward IP packets for this service to the specified server.
NOTE: The "Internal Port End" cannot be modified directly. Normally, it is set to the same value as "External Port End". However, if you modify "Internal Port Start", then "Internal Port End" will be set to the same value as "Internal Port Start".

Remaining number of entries that can be configured:32

Use Interface:

Service Name:

Select a Service:

Custom Service:

Enable LAN Loopback

Server IP Address/Hostname:

Status:

Apply/Save

External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		

Save/Apply

- **Use interface:** Select an interface that you want to configure.
- **Select a Service:** Select a proper service in the drop-down list.

- **Custom Server:** Enter a new service name to establish a user service type.
- **Server IP Address:** Assign an IP address to virtual server.
- **External Port Start:** When selecting a service, the port number will automatically be displayed. You can modify it if necessary.
- **External Port End:** When selecting a service, the port number will automatically be displayed. You can modify it if necessary.
- **Protocol:** You may select TCP/UDP, TCP, or UDP in the drop-down list.
- **Internal Port Start:** When selecting a service, the port number will automatically be displayed. You can modify it if necessary.
- **Internal Port End:** When selecting a service, the port number will automatically be displayed. You can modify it if necessary.

Step 2 After finishing setting, click **Save/Apply** to save and apply the settings.

5.2.4.2 Port Triggering

Some applications need some ports to be opened in the firewall for the remote access. When an application initializes a TCP/UDP to connect to a remote user, port triggering dynamically opens the open ports of the firewall.

Choose **Advanced Settings > NAT > Port Triggering**, and the following page appears.

NAT -- Port Triggering Setup

Some applications require that specific ports in the Router's firewall be opened for access by the remote parties. Port Trigger dynamically opens up the "Open Ports" in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the "Triggering Ports". The Router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the "Open Ports". A maximum 32 entries can be configured.

Application Name	Trigger		Open		WAN Interface	Remove
	Protocol	Port Range Start End	Protocol	Port Range Start End		

In this page, you may add or remove an entry of port triggering. Click the **Add** button to display the following page.

NAT -- Port Triggering

Some applications such as games, video conferencing, remote access applications and others require that specific ports in the Router's firewall be opened for access by the applications. You can configure the port settings from this screen by selecting an existing application or creating your own (Custom application) and click "Save/Apply" to add it.

Remaining number of entries that can be configured: 32

Use Interface:

Application Name:

Select an application:

Custom application:

Trigger Port Start	Trigger Port End	Trigger Protocol	Open Port Start	Open Port End	Open Protocol
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>	TCP
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>	TCP
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>	TCP
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>	TCP
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>	TCP
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>	TCP
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>	TCP
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>	TCP
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>	TCP

- **Use interface:** Select an interface that you want to configure.
- **Select an application:** Select a proper application in the drop-down list.
- **Custom application:** Manually define an application.
- **Trigger port Start:** The start port number that LAN uses to trigger the open port.
- **Trigger port End:** The end port number that LAN uses to trigger the open port.
- **Trigger Protocol:** Select the application protocol. You may select TCP/UDP, TCP, or UDP.
- **Open Port Start:** The start port number that is opened to WAN.
- **Open Port End:** The end port number that is opened to WAN.
- **Open Protocol:** Select the proper protocol that is opened to WAN. You may select TCP/UDP, TCP, or UDP.

After finishing setting, click **Save/Apply** to apply the settings.

Note:

You can use a single port number, several port numbers separated by commas, port blocks consisting of two port numbers separated by a dash, or any combination of these, for example 80, 90-140, 180.

5.2.4.3 DMZ Host

DMZ allows all the ports of a PC on your LAN to be exposed to the Internet. Set the IP address of the PC to be DMZ host, so that the DMZ host will not be blocked by firewall.

Choose **Advanced Setup > NAT > DMZ host** to display the following page.

NAT -- DMZ Host

The Broadband Router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer.

Enter the computer's IP address and click 'Apply' to activate the DMZ host.

Clear the IP address field and click 'Apply' to deactivate the DMZ host.

DMZ Host IP Address:

In this page, enter the IP address of the DMZ host.

After finishing the settings, click the **Apply/Save** button to apply the settings.

If you want to clear the DMZ function of the host, please delete the IP address of the host in the field of **DMZ Host IP Address**, and then click the **Apply/Save** button.

5.2.5 Security

Firewall

Choose **Security > IP Filtering** and the following page appears.

Outgoing IP Filtering Setup

By default, all outgoing IP traffic from LAN is allowed, but some IP traffic can be **BLOCKED** by setting up filters.

Choose Add or Remove to configure outgoing IP filters.

Filter Name	IP Version	Protocol	SrcIP/ PrefixLength	SrcPort	DstIP/ PrefixLength	DstPort	Remove
<div style="display: flex; justify-content: center; gap: 20px;"> <input type="button" value="Add"/> <input type="button" value="Remove"/> </div>							

Click **Modify Firewall** or **Remove Firewall** to modify or remove the firewall. And click **Modify Rule** or **Remove Rule** to modify or remove the rule. Click **Add Firewall**, and the following page appears.

Add IP Filter -- Outgoing

The screen allows you to create a filter rule to identify outgoing IP traffic by specifying a new filter name and at least one condition below. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. Click 'Apply/Save' to save and activate the filter.

Filter Name:

IP Version:

Protocol:

Source IP address(/prefix length):

Source Port (port or port:port):

Destination IP address(/prefix length):

Destination Port (port or port:port):

- **name:** The name of firewall.
- **interface:** You can select **LAN** or **WAN** from the drop-down list.
- **type:** You can select **IN** or **OUT** from the drop-down list.
- **defaultaction:** You can select **Permit** or **Drop** from the drop-down list.

MAC Filtering Setup

In some cases, you may want to manage Layer2 MAC address to block or permit a computer within the home network. When you enable MAC filter rules, the DSL router serves as a firewall that works at layer 2.

Note:

MAC filtering is only effective on ATM PVCs configured in bridge mode.

Choose **Security > MAC Filtering** and the following page appears.

MAC filtering Setup

"MAC Filtering is only effective on ATM PVCs configured in Bridge mode. **FORWARDED** means that all MAC layer frames will be **FORWARDED** except those matching with any of the specified rules in the following table. **BLOCKED** means that all MAC layer frames will be **BLOCKED** except those matching with any of the specified rules in the following table.

MAC Filtering Policy For Each Interface(maximum 32 entries):

WARNING: Changing from one policy to another of an interface will cause all defined rules for that interface to be REMOVED AUTOMATICALLY! You will need to create new rules for the new policy.

Interface	Policy	Change
atm3	FORWARDED	<input type="checkbox"/>

Change Policy

Choose Add or Remove to configure MAC filtering rules.

Interface	Protocol	Destination MAC	Source MAC	Frame Direction	Remove
-----------	----------	-----------------	------------	-----------------	--------

Add Remove

In this page, you can add or remove the MAC filtering rule. You may change the MAC filtering policy from **FORWARDED** to **BLOCKED** by clicking the **Change Policy** button.

Click the **Add** button to display the following page.

Add MAC Filter

Create a filter to identify the MAC layer frames by specifying at least one condition below. If multiple conditions are specified, all of them take effect. Click 'Apply' to save and activate the filter.

Protocol Type:

Destination MAC Address:

Source MAC Address:

Frame Direction: LAN<=>WAN

WAN Interfaces (Configured in Bridge mode only)

br_0_0_39/atm3

Apply/Save

- **Protocol Type:** Select the proper protocol type.
- **Destination MAC Address:** Enter the destination MAC address.
- **Source MAC Address:** Enter the source MAC address.
- **Frame Direction:** The direction of transmission frame.
- **WAN Interface (Configured in bridge mode only):** Select the proper WAN interface in the drop-down list.

After finishing setting, click **Apply/Save** to save and apply the filtering rule.

5.2.6 Parental Control

Time Restriction

Choose **Advanced Setup > Parental Control > Time Restriction**, and the following page appears.

Access Time Restriction -- A maximum 16 entries can be configured.

Username	MAC	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Start	Stop	Remove
----------	-----	-----	-----	-----	-----	-----	-----	-----	-------	------	--------

Click the **Add** button to display the following page.

Access Time Restriction

This page adds time of day restriction to a special LAN device connected to the Router. The 'Browser's MAC Address' automatically displays the MAC address of the LAN device where the browser is running. To restrict other LAN device, click the 'Other MAC Address' button and enter the MAC address of the other LAN device. To find out the MAC address of a Windows based PC, go to command window and type 'ipconfig /all'.

User Name

Browser's MAC Address

Other MAC Address

Days of the week Mon Tue Wed Thu Fri Sat Sun

Click to select

Start Blocking Time (hh:mm)

End Blocking Time (hh:mm)

This page is used to control the time restriction to a special LAN device that connects to the DSL router. In this page, set the user name and configure the time settings.

After finishing setting, click the **Apply/Save** button to save and apply the settings.

Url Filter

Click **Advanced Setup > Parental Control > Url Filter**, and the following page appears.

URL Filter -- Please select the list type first then configure the list entries. Maximum 100 entries can be configured.

URL List Type: Exclude Include

Address	Port	Remove

This page is used to prevent the LAN users from accessing some Websites in the WAN.

In this page, you may select the **Exclude** URL list type or the **Include** URL list type. If you select the **Exclude** URL list type, it means that the URLs in the list are not accessible. If you select the **Include** URL list type, you are allowed to access the the URLs in the list.

Click the **Add** button to display the following page.

Parental Control -- URL Filter Add

Enter the URL address and port number then click 'Apply/Save' to add the entry to the URL filter.

URL Address:
Port Number: (Default 80 will be applied if leave blank.)

In this page, enter the URL address and its corresponding port number. For example, enter the URL address **http://www.google.com** and the port number **80**, and then click the **Apply/Save** button. See the following figure:

URL Filter -- Please select the list type first then configure the list entries. Maximum 100 entries can be configured.

URL List Type: Exclude Include

Address	Port	Remove
http://www.google.com	80	<input type="checkbox"/>

5.2.7 Quality of Service

Enabling QoS

Choose **Advance Setup > Quality of Service** and the following page appears.

QoS -- Queue Management Configuration

If Enable QoS checkbox is selected, choose a default DSCP mark to automatically mark incoming traffic without reference to a particular classifier. Click 'Apply/Save' button to save it.

Note: If Enable QoS checkbox is not selected, all QoS will be disabled for all interfaces.

Note: The default DSCP mark is used to mark all egress packets that do not match any classification rules.

Enable QoS

Select Default DSCP Mark

Select **Enable QoS** to enable QoS and configure the default DSCP mark.

QoS -- Queue Management Configuration

If Enable QoS checkbox is selected, choose a default DSCP mark to automatically mark incoming traffic without reference to a particular classifier. Click 'Apply/Save' button to save it.

Note: If Enable QoS checkbox is not selected, all QoS will be disabled for all interfaces.

Note: The default DSCP mark is used to mark all egress packets that do not match any classification rules.

Enable QoS

Select Default DSCP Mark

In this page, enable the QoS function and select the default DSCP mark.
After finishing setting, click **Apply/Save** to save and apply the settings.

Note:

If the **Enable Qos** checkbox is not selected, all QoS will be disabled for all interfaces. The default DSCP mark is used to mark all egress packets that do not match any classification rules.

Queue Configuration

Choose **Advanced Setup > Quality of Service > QoS Queue**, and the following page appears.

QoS Queue Setup

In ATM mode, maximum 16 queues can be configured.

In PTM mode, maximum 8 queues can be configured.

For each Ethernet interface, maximum 8 queues can be configured.

For each Ethernet WAN interface, maximum 8 queues can be configured.

To add a queue, click the **Add** button.

To remove queues, check their remove-checkboxes, then click the **Remove** button.

The **Enable** button will scan through every queues in the table. Queues with enable-checkbox checked will be enabled. Queues with enable-checkbox unchecked will be disabled.

The enable-checkbox also shows status of the queue after page reload.

Note: Ethernet LAN queue configuration only takes effect when all the queues of the interface have been configured.

Name	Key	Interface	Qid	Prec/Alg/Wght	DSL Latency	PTM Priority	Shaping Rate (bps)	Min Bit Rate(bps)	Burst Size (bytes)	Enable	Remove
LAN Q8	1	eth1	8	1/SP						<input checked="" type="checkbox"/>	<input type="checkbox"/>
LAN Q7	2	eth1	7	2/SP						<input checked="" type="checkbox"/>	<input type="checkbox"/>
LAN Q6	3	eth1	6	3/SP						<input checked="" type="checkbox"/>	<input type="checkbox"/>
LAN Q5	4	eth1	5	4/SP						<input checked="" type="checkbox"/>	<input type="checkbox"/>
LAN Q4	5	eth1	4	5/SP						<input checked="" type="checkbox"/>	<input type="checkbox"/>
LAN Q3	6	eth1	3	6/SP						<input checked="" type="checkbox"/>	<input type="checkbox"/>
LAN Q2	7	eth1	2	7/SP						<input checked="" type="checkbox"/>	<input type="checkbox"/>
LAN Q1	8	eth1	1	8/SP						<input checked="" type="checkbox"/>	<input type="checkbox"/>
LAN Q0	0	eth1	0	1/SP						<input checked="" type="checkbox"/>	<input type="checkbox"/>

In this page, you can enable, add or remove a QoS rule.

Note:

The lower integer value for precedence indicates the higher priority.

Click the **Add** button to display the following page.

QoS Queue Configuration

This screen allows you to configure a QoS queue and add it to a selected layer2 interface.

Name:

Enable: ▾

Interface: ▾

- **Name:** Enter the name of QoS queue.
- **Enable:** Enable or disable the QoS queue.
- **Interface:** Select the proper interface for the QoS queue.

After finishing setting, click **Apply/Save** to save and apply the settings.

QoS Classification

Choose **Advanced Setup > Quality of Service > QoS Classification** and the following page appears.

QoS Classification Setup -- maximum 32 rules can be configured.

To add a rule, click the **Add** button.

To remove rules, check their remove-checkboxes, then click the **Remove** button.

The **Enable** button will scan through every rules in the table. Rules with enable-checkbox checked will be enabled. Rules with enable-checkbox un-checked will be disabled.

The enable-checkbox also shows status of the rule after page reload.

If you disable WMM function in Wireless Page, classification related to wireless will not take effects.

The QoS function has been disabled. Classification rules would not take effects.

CLASSIFICATION CRITERIA													CLASSIFICATION RESULTS			
Class Name	Order	Class	Ether Intif	SrcMAC/Type	SrcMAC/Mask	SrcIP/PrefixLength	DstIP/PrefixLength	Proto	SrcPort	DstPort	DSCP Check	802.1P Queue Check	DSCP 802.1P Key	Rate Limit (Kbps)	Enable	Remove

In this page, you can enable, add or remove a QoS classification rule. Click the **Add** button to display the following page.

Add Network Traffic Class Rule

This screen creates a traffic class rule to classify the ingress traffic into a priority queue and optionally mark the DSCP or Ethernet priority of the packet. Click 'Apply/Save' to save and activate the rule.

Traffic Class Name:

Rule Order:

Rule Status:

Specify Classification Criteria (A blank criterion indicates it is not used for classification.)

Class Interface:

Ether Type:

Source MAC Address:

Source MAC Mask:

Destination MAC Address:

Destination MAC Mask:

Specify Classification Results (A blank value indicates no operation.)

Specify Class Queue (Required):

- Packets classified into a queue that exit through an interface for which the queue is not specified to exist, will instead egress to the default queue on the interface.

Mark 802.1p priority:

- Class non-vlan packets egress to a non-vlan interface will be tagged with VID 0 and the class rule p-bits.
- Class vlan packets egress to a non-vlan interface will have the packet p-bits re-marked by the class rule p-bits. No additional vlan tag is added.
- Class non-vlan packets egress to a vlan interface will be tagged with the interface VID and the class rule p-bits.
- Class vlan packets egress to a vlan interface will be additionally tagged with the packet VID, and the class rule p-bits.

Set Rate Limit: [Kbits/s]

5.2.8 Routing

Default Gateway

Choose **Advanced Setup > Routing > Default Gateway**, and the following page appears.

Routing -- Default Gateway

Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

Selected Default Gateway Interfaces	Available Routed WAN Interfaces
ppp0	atm2 ipoa0 pppoa1 ppp3g0

TODO: IPv6 ***** Select a preferred wan interface as the system default IPv6 gateway.

Selected WAN Interface

In this page, you can modify the default gateway settings.

Select a proper WAN interface in the drop-down list of **Selected WAN Interface** as the system default gateway.

After finishing setting, click **Apply/Save** to save and apply the settings.

Static Route

Choose **Advanced Setup > Routing > Static Route** and the following page appears.

Routing -- Static Route (A maximum 32 entries can be configured)

IP Version	DstIP/Mask	Gateway	Interface	Metric	Remove
------------	------------	---------	-----------	--------	--------

In this page, you can add or remove a static routing rule.
Click the **Add** button to display the following page.

Routing -- Static Route Add

Enter the destination network address, subnet mask, gateway AND/OR available WAN interface then click 'Apply/Save' to add the entry to the routing table.

IP Version:

Destination IP address/prefix length:

Interface:

Gateway IP Address:

(optional: metric number should be greater than or equal to zero)

Metric:

- **IP Version:** Select the IP version.
- **Destination IP address/prefix length:** Enter the destination IP address.
- **Interface:** select the proper interface for the rule.
- **Gateway IP Address:** The next-hop IP address.
- **Metric:** The metric value of routing.

After finishing setting, click **Apply/Save** to save and apply the settings.

Policy Routing

Choose **Advanced Setup > Routing > Policy Routing** and the following page appears.

Policy Routing Setting -- A maximum 8 entries can be configured.

Policy Name	Source IP	LAN Port	WAN	Default GW	Remove
-------------	-----------	----------	-----	------------	--------

In this page, you can add or remove a static policy rule.
Click the **Add** button to display the following page.

Policy Routing Setup

Enter the policy name, policies, and WAN interface then click "Apply/Save" to add the entry to the policy routing table.
 Note: If selected "IPoE" as WAN interface, default gateway must be configured.

Policy Name:

Physical LAN Port:

Source IP:

Use Interface:

Default Gateway:

In this page, enter the policy name, source IP and default gateway, and select the physical LAN port and interface.

After finishing setting, click **Apply/Save** to save and apply the settings.

RIP

Choose **Advanced Setup > Routing > RIP** and the following page appears.

Routing -- RIP Configuration

NOTE: RIP CANNOT BE CONFIGURED on the WAN interface which has NAT enabled (such as PPPoE).

To activate RIP for the WAN Interface, select the desired RIP version and operation and place a check in the 'Enabled' checkbox. To stop RIP on the WAN Interface, uncheck the 'Enabled' checkbox. Click the 'Apply/Save' button to start/stop RIP and save the configuration.

Interface	Version	Operation	Enabled
atm2	2	Passive	<input type="checkbox"/>
ipoa0	2	Passive	<input type="checkbox"/>
atm4	2	Passive	<input type="checkbox"/>

In this page, if you want to configure an individual interface, select the desired RIP version and operation, and then select the **Enabled** checkbox for the interface.

After finishing setting, click **Apply/Save** to save and apply the settings.

5.2.9 DNS

DNS Server

Choose **Advanced Setup > DNS > DNS Server** and the following page appears.

DNS Server Configuration

Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.

DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

DSelect DNS Server Interface from available WAN interfaces:

Selected DNS Server Interfaces	<input type="button" value="→"/> <input type="button" value="←"/>	Available WAN Interfaces
ppp0.1		

Use the following Static DNS IP address:

Primary DNS server:

Secondary DNS server:

In this page, you can select a DNS server interface from the available interfaces, manually enter the DNS server addresses, or obtain the DNS address from a WAN interface.

After finishing setting, click **Apply/Save** to save and apply the settings.

Dynamic DNS

Choose **Advanced Setup > DNS > Dynamic DNS** and the following page appears.

Dynamic DNS

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your Broadband Router to be more easily accessed from various locations on the Internet.

Choose Add or Remove to configure Dynamic DNS.

Hostname	Username	Service	Interface	Remove

In this page, you are allowed to modify the DDNS settings.
Click the **Add** button to display the following page.

Add Dynamic DNS

This page allows you to add a Dynamic DNS address from DynDNS.org or TZO.

D-DNS provider	<input type="text" value="DynDNS.org"/>
Hostname	<input type="text"/>
Interface	<input type="text" value="pppoe_0_1_1/ppp0.1"/>
DynDNS Settings	
Username	<input type="text"/>
Password	<input type="text"/>
<input type="button" value="Apply/Save"/>	

- **D-DNS provider:** Select a proper DDNS server in the drop-down list.
- **Hostname:** It is the domain name and it can be modified.
- **Interface:** The interface that the packets pass through on the DSL router.
- **Username:** Enter the username for accessing the DDNS management interface.
- **Password:** Enter the password for accessing the DDNS management interface.

After finishing setting, click **Apply/Save** to save and apply the settings.

5.2.10 DSL

Choose **Advanced Setup > DSL** and the following page appears. In this page, you can view the DSL settings. Usually, you can keep this factory default setting. The modem negotiates the modulation mode with the DSLAM.

DSL Settings

Select the modulation below.

- G.Dmt Enabled
- G.lite Enabled
- T1.413 Enabled
- ADSL2 Enabled
- AnnexL Enabled
- ADSL2+ Enabled
- AnnexM Enabled
- VDSL2 Enabled

Select the profile below.

- 8a Enabled
- 8b Enabled
- 8c Enabled
- 8d Enabled
- 12a Enabled
- 12b Enabled
- 17a Enabled
- 30a Enabled

US0

- Enabled

Select the phone line pair below.

- Inner pair
- Outer pair

Capability

- Bitswap Enable
- SRA Enable

In this page, you can set the DSL settings. Usually, you do not need to modify the factory default settings.

After finishing setting, click **Apply/Save** to save and apply the settings.

5.2.11 UPnP

Choose **Advanced Setup > UPnP** and the following page appears.

UPnP Configuration

NOTE: UPnP is activated only when there is a live WAN service with NAT enabled.

- Enable UPnP

In this page, you can enable or disable the UPnP function.

After finishing setting, click **Apply/Save** to save and apply the settings.

5.2.12 DNS Proxy

Choose **Advanced Setup > DNS Proxy** and the following page appears.

DNS Proxy Configuration

Enable DNS Proxy

Host name of the Broadband Router:

Domain name of the LAN network:

In this page, you can enable or disable the DNS proxy function.

After enabling the DNS proxy function, enter the host name of the broadband router and the domain name of the LAN network, and then click **Apply/Save** to save and apply the settings.

5.2.13 Interface Grouping

Choose **Advanced Setup > Interface Grouping** and the following page appears.

Interface Grouping -- A maximum 16 entries can be configured

Interface Grouping supports multiple ports to PVC and bridging groups. Each group will perform as an independent network. To support this feature, you must create mapping groups with appropriate LAN and WAN interfaces using the Add button. The Remove button will remove the grouping and add the ungrouped interfaces to the Default group. Only the default group has IP interface.

Group Name	Remove	WAN Interface	LAN Interfaces
Default		ppp0.1	eth0
			eth1
			eth2
			eth3
			wlan0
			wl0_Guest1
			wl0_Guest2
			wl0_Guest3

Interface grouping supports multiple ports to PVC and bridging groups. Each group will perform as an independent network. To support this feature, you must create mapping groups with the appropriate LAN and WAN interfaces using the **Add** button. The **Remove** button will remove the grouping and add the ungrouped interfaces to the default group. Only the default group has IP interface.

Click the **Add** button to display the following page.

Interface grouping Configuration

To create a new interface group:

1. Enter the Group name and the group name must be unique.
2. Select interfaces from the available interface list and add it to the grouped interface list using the arrow buttons to create the required mapping of the ports.
3. Click Save/Apply button to make the changes effective immediately.

Group Name:

WAN Interface used in the grouping ▼

Grouped LAN Interfaces		Available LAN Interfaces
	<input type="button" value="→"/> <input type="button" value="←"/>	eth0 eth1 eth2 eth3 wlan0 w10_Guest1 w10_Guest2 w10_Guest3

In this page, please follow the on-screen configuration steps to configure the parameters of the interface grouping.

After finishing setting, click **Apply/Save** to save and apply the settings.

5.2.14 IP Tunnel

5.2.14.1 IPv6 in IPv4

Choose **Advanced Setup > IP Tunnel > IPv6inIPv4** and the following page appears. The default value is IPv6 in IPv4 information.

IP Tunneling -- 6in4 Tunnel Configuration

Name	WAN	LAN	Dynamic	IPv4 Mask Length	6rd Prefix	Border Relay Address	Remove
------	-----	-----	---------	------------------	------------	----------------------	--------

Add Remove

Click **Add** and the following page appears. In this page, you can add a new tunnel.

IP Tunneling -- 6in4 Tunnel Configuration

Currently, only 6rd configuration is supported.

Tunnel Name:

Mechanism: 6RD

Associated WAN Interface:

Associated LAN Interface: LAN/br0

Manual Automatic

IPv4 Mask Length:

6rd Prefix with Prefix Length:

Border Relay IPv4 Address:

Apply/Save

5.2.14.2 IPv4 in IPv6

Choose **Advanced Setup > IP Tunnel > IPv4inIPv6** and the following page appears.

IP Tunneling -- 4in6 Tunnel Configuration

Name	WAN	LAN	Dynamic	Remote IPv6 Address	Remove
------	-----	-----	---------	---------------------	--------

Add Remove

Click **Add** and the following page appears. In this page, you can add a new tunnel of IPv4 in IPv6.

IP Tunneling -- 4in6 Tunnel Configuration

Currently, only DS-Lite configuration is supported.

Tunnel Name

Mechanism: DS-Lite

Associated WAN Interface:

Associated LAN Interface: LAN/br0

Manual Automatic

Remote IPv6 Address:

5.2.15 IPSec

Choose **Advanced Setup > IPSec** and the following page appears.

IPSec Tunnel Mode Connections

Add, remove or enable/disable IPSec tunnel connections from this page.

Connection Name	Remote Gateway	Local Addresses	Remote Addresses	Remove
111	10.10.10.10	192.168.1.0/255.255.255.0	192.168.2.0/255.255.255.0	<input type="checkbox"/>
222	20.20.20.20	192.168.1.2	192.168.3.0/255.255.255.0	<input type="checkbox"/>
333	30.30.30.30	192.168.1.0/255.255.255.0	192.168.6.1	<input type="checkbox"/>

In this page, you can add or remove the IPSec tunnel connections. Click the **Add** button to display the following page.

IPSec Settings

IPSec Connection Name	<input type="text" value="new connection"/>
Tunnel Mode	<input type="button" value="ESP"/>
Remote IPSec Gateway Address (IPv4 address in dotted decimal)	<input type="text" value="0.0.0.0"/>
Tunnel access from local IP addresses	<input type="button" value="Subnet"/>
IP Address for VPN	<input type="text" value="0.0.0.0"/>
IP Subnetmask	<input type="text" value="255.255.255.0"/>
Tunnel access from remote IP addresses	<input type="button" value="Subnet"/>
IP Address for VPN	<input type="text" value="0.0.0.0"/>
IP Subnetmask	<input type="text" value="255.255.255.0"/>
Key Exchange Method	<input type="button" value="Auto (IKE)"/>
Authentication Method	<input type="button" value="Pre-Shared Key"/>
Pre-Shared Key	<input type="text" value="key"/>
Perfect Forward Secrecy	<input type="button" value="Disable"/>
Advanced IKE Settings	<input type="button" value="Show Advanced Settings"/>
	<input type="button" value="Apply/Save"/>

In this page, set the parameters such as the IPSec connection name, tunnel mode, and remote IPSec gateway address.

If you need to configure the advanced settings of this IPSec tunnel connection, please click the **Show Advanced Settings** button to display the other parameters.

After finishing setting, click **Apply/Save** to save and apply the settings.

5.2.16 Certificate

Local

Choose **Advanced Setup > Certificate > local** and the following page appears.

Local Certificates

Add, View or Remove certificates from this page. Local certificates are used by peers to verify your identity. Maximum 4 certificates can be stored.

Notice: Import and Remove Certificate need reboot the gateway

Name	In Use	Subject	Type	Action
<input type="button" value="Create Certificate Request"/> <input type="button" value="Import Certificate"/>				

In this page, you can acquire the local certificate by creating a certificate request or importing a certificate. You may also create or remove a certificate.

- **Creating a New Certificate Request**

Click the **Create Certificate Request** button to display the following page.

Create new certificate request

To generate a certificate signing request you need to include Common Name, Organization Name, State/Province Name, and the 2-letter Country Code for the certificate.

Certificate Name:	<input type="text" value="test"/>
Common Name:	<input type="text" value="test"/>
Organization Name:	<input type="text" value="test"/>
State/Province Name:	<input type="text" value="guangdong"/>
Country/Region Name:	<input type="text" value="CN (China)"/>

In this page, please set the following parameters.

- **Certificate name:** Set the certificate name.
- **Common Name:** The common name is the "fully qualified domain name," (or FQDN) used for DNS lookups of your server (for example, www.mydomain.com). Browsers use this information to identify your Web site. Some browsers will refuse to establish a secure connection with your site if the server name does not match the common name in the certificate. Please do not include the protocol symbol "http://" or any port numbers or pathnames in the common name. Do not use wildcard characters such as * or ?, and do not use an IP address.
- **Organization Name:** The name of the organization to which the entity belongs (such as the name of a company).

- **State/Province Name:** This is the name of the state or province where your organization's head office is located. Please enter the full name of the state or province.
- **Country/Region Name:** This is the two-letter ISO abbreviation for your country (for example, GB for the United Kingdom).

After finishing setting, click the **Apply** button to apply the settings.

Certificate signing request

Certificate signing request successfully created. Note a request is not yet functional - have it signed by a Certificate Authority and load the signed certificate to this device.

Name	test
Type	request
Subject	CN=test/O=test/ST=guangdong/C=CN
Signing Request	<pre>-----BEGIN CERTIFICATE REQUEST----- MIIBfjCBGAIBADAlWQowCwYDQgEwR0EXNOMQvCwYDQgEwR0EXNOMKIwEAYD VQQIEwIndFwZzRbhacxZAJBgNVBAYTAkNOMIGFA0GCSqSgSB3QERABDAAGN ADChASKEqC1ByqbsZt1p16uts+Rn00WEG0t+f9361UsSB31kRdEBrnA8W0-4 iL66+Xp4+vrE+tpgQ6ak0Xy974h0Z-8kKJTD6r4Lxv1DnTf64Nks0H+yq6HT JRGJGDTefA8RenVshJF7C1t0v8RUCu5/XhDKFCGvrtP1tKnUjdnW1DAGAB0Akw DQYJKoZIhvcNAQEEBQAGYEAJ9VxsVIZKLDPYNsA1B6Qii5V9RqzZLGi1G7BZ+6 bKZV1eawQ1GFQvkrzREq64DcAb+qk12JBP6RqqtucVYRHYvH//n6R61pxh59wN YLv4+ZL+DYCaSR6F4b3ofa6qrfobq1BaqA318FV1uL2dwo9YAbz13j0Z17z0F QKk= -----END CERTIFICATE REQUEST-----</pre>

The certificate request needs to be submitted to a certificate authority, which will sign the request. Then the signed certificate needs to be loaded to the DSL router. Click **Load Signed Certificate** in this page, and the following page appears.

Load certificate

Paste signed certificate.

Certificate Name:

```
-----BEGIN CERTIFICATE-----
<insert certificate here>
-----END CERTIFICATE-----
```

Certificate:

In this page, paste the signed certificate, and then click the **Apply** button. A new certificate is created.

- **Importing an Existing Local Certificate**

To import an existing certificate, click the **Import Certificate** button to display the following page.

Import certificate

Enter certificate name, paste certificate content and private key.

Certificate Name:

Certificate:

```
-----BEGIN CERTIFICATE-----
<insert certificate here>
-----END CERTIFICATE-----
```

Private Key:

```
-----BEGIN RSA PRIVATE KEY-----
<insert private key here>
-----END RSA PRIVATE KEY-----
```

In this page, paste the certificate and the private key. Finally, click the **Apply** button to import the certificate.

Trusted CA

Choose **Advanced Setup > Certificate > Trusted CA** and the following page appears.

Trusted CA (Certificate Authority) Certificates

Add, View or Remove certificates from this page. CA certificates are used by you to verify peers' certificates. Maximum 4 certificates can be stored.

Notice: Import and Remove Certificate need reboot the gateway

Name	Subject	Type	Action
acscert	O=Grupo Telefonica/O=TME/ST=A78923125/L=PZ. DE LA INDEPENDENCIA 6 28001 MADRID/CN=CA Telefonica Moviles Espana SA	ca	<input type="button" value="View"/> <input type="button" value="Remove"/>

In this page, you may import or remove a CA certificate.
 Click the **Import Certificate** button to display the following page.

Import CA certificate

Enter certificate name and paste certificate content.

Notice: If certificate use for tr069, the Certificate Name must be "acscert"

Certificate Name:

Certificate:

```

-----BEGIN CERTIFICATE-----
<insert certificate here>
-----END CERTIFICATE-----
    
```

In this page, enter the certificate name and paste the certificate content. Finally, click the **Apply** button to import the certificate.

5.2.17 Power Management

Choose **Advanced Setup > Power Management** and the following page appears. This page allows control of Hardware modules to evaluate power consumption. Use the control buttons to select the desired option.

Power Management

This page allows control of Hardware modules to evaluate power consumption. Use the control buttons to select the desired option, click Apply and check the status response.

MIPS CPU Clock divider when Idle

Enable **Status: Enabled**

Wait instruction when Idle

Enable **Status: Enabled**

DRAM Self Refresh

Enable **Status: Enabled**

Ethernet Auto Power Down

Enable **Status: Enabled**

Number of ethernet interfaces in:

Full power mode: 1

Low power mode: 4

After proper configurations, click **Apply** to take the configurations effect

5.2.18 Multicast

Choose **Advanced Setup > Multicast** and the following page appears.

IGMP Configuration

Enter IGMP protocol configuration fields if you want modify default values shown below.

Default Version:
 Query Interval (s):
 Query Response Interval (1/10s):
 Last Member Query Interval (1/10s):
 Robustness Value:
 Maximum Multicast Data Sources (for IGMPv3):
 Fast Leave Enable:
 Membership Join Immediate (PTV):

MLD Configuration

Enter MLD protocol (IPv6 Multicast) configuration fields if you want modify default values shown below.

Default Version:
 Query Interval (s):
 Query Response Interval (1/10s):
 Last Member Query Interval (1/10s):
 Robustness Value:
 Maximum Multicast Data Sources (for mldv2):
 Fast Leave Enable:

In this page, you can configure the multicast parameters.
After finishing setting, click **Apply/Save** to save and apply the settings.

5.3 Diagnostics

5.3.1 Diagnostics

Click **Diagnostics > Diagnostics**, and the following page appears.
This page is used to test the connection to your local network, the connection to your DSL service provider, and the connection to your Internet service provider.
You may diagnose the connection by clicking the **Test** button or click the **Test With OAM F4** button. If the test continues to fail, click **Help** and follow the troubleshooting procedures.

pppoe_0_1_1 Diagnostics

Your modem is capable of testing your DSL connection. The individual tests are listed below. If a test displays a fail status, click "Rerun Diagnostic Tests" at the bottom of this page to make sure the fail status is consistent. If the test continues to fail, click "Help" and follow the troubleshooting procedures.

Test the connection to your local network

Test your eth0 Connection:	FAIL	Help
Test your eth1 Connection:	FAIL	Help
Test your eth2 Connection:	FAIL	Help
Test your eth3 Connection:	PASS	Help
Test your USB Connection:		Help
Test your Wireless Connection:	PASSFAILFAILFAIL	Help

Test the connection to your DSL service provider

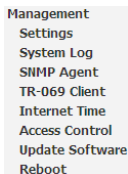
Test xDSL Synchronization:	FAIL	Help
Test ATM OAM F5 segment ping:	DISABLED	Help
Test ATM OAM F5 end-to-end ping:	DISABLED	Help

Test the connection to your Internet service provider

Test PPP server connection:	DISABLED	Help
Test authentication with ISP:	DISABLED	Help
Test the assigned IP address:	DISABLED	Help
Ping default gateway:	FAIL	Help
Ping primary Domain Name Server:	FAIL	Help

5.4 Management

Choose **Management** and the submenus of **Management** are shown as below:



5.4.1 Settings

Backup

Choose **Management > Settings > Backup** to display the following page.

Settings - Backup

Backup Broadband Router configurations. You may save your router configurations to a file on your PC.

Backup Settings

In this page, click the **Backup Settings** button to save your router's settings to your local PC.

Update

Choose **Management > Settings > Update**, and the following page appears.

Tools -- Update Settings

Update Broadband Router settings. You may update your router settings using your saved files.

Settings File Name:

Update Settings

In this page, click the **Browse...** button to select the correct new settings file, and then click the **Update Settings** button to update the router's settings.

Restore Default

Choose **Management > Settings > Restore Default** to display the following page.

Tools -- Restore Default Settings

Restore Broadband Router settings to the factory defaults.

Restore Default Settings

In this page, click the **Restore default settings** button, and then system returns to the default settings.

5.4.2 System Log

Choose **Management > System Log** to display the following page.

System Log

The System Log dialog allows you to view the System Log and configure the System Log options.

Click 'View System Log' to view the System Log.

Click 'Configure System Log' to configure the System Log options.

View System Log

Configure System Log

In this page, you are allowed to configure the system log and view the security log.

- **Configuring the System Log:** Click the **Configure System Log** button to display the following page.

System Log -- Configuration

If the log mode is enabled, the system will begin to log all the selected events. For the Log Level, all events above or equal to the selected level will be logged. For the Display Level, all logged events above or equal to the selected level will be displayed. If the selected mode is 'Remote' or 'Both,' events will be sent to the specified IP address and UDP port of the remote syslog server. If the selected mode is 'Local' or 'Both,' events will be recorded in the local memory.

Select the desired values and click 'Apply/Save' to configure the system log options.

Log: Disable Enable

Log Level:

Display Level:

Mode:

Local
Remote
Both

Apply/Save

In this page, you can set 3 types of system log modes, including **Local**, **Remote**, and **Both**.

- **Local:** When selecting **Local**, the events are recorded in the local memory.
- **Remote:** When selecting **Remote**, the events are sent to the specified IP address and UDP port of the remote system log server.
- **Both:** When selecting **Both**, the events are recorded in the local memory or sent to the specified IP address and UDP port of the remote system log server.

After finishing setting, click the **Apply/Save** button to save and apply the settings.
Note:

*If you want to log all the events, you need to select the **Debugging** log level.*

- **View System Log:** Click the **View System Log** button to display the following page.



In this page, you can view the system log.

Click the **Refresh** button to refresh the system log. Click the **Close** button to exit.

5.4.3 Security Log

Choose **Management > Security Log** to display the following page.

Security Log

The Security Log Dialog allows you to view the Security Log and configure the Security Log options.

Click 'View' to view the Security Log.

Click 'Reset' to clear and reset the Security Log.

Right-click [here](#) to save Security Log to a file.



In this page, you are allowed to configure the system log and view the security log.

- **View:** Click the **view** button to view the Security Log.
- **Reset:** Click the **Reset** button to clean the log

5.4.4 TR-69 Client

Choose **Management > TR-069Client** to display the following page.

TR-069 client - Configuration

WAN Management Protocol (TR-069) allows an Auto-Configuration Server (ACS) to perform auto-configuration, provision, collection, and diagnostics to this device.

Select the desired values and click 'Apply/Save' to configure the TR-069 client options.

Inform Disable Enable

Inform Interval:

ACS URL:

ACS User Name:

ACS Password:

WAN Interface used by TR-069 client:

Display SOAP messages on serial console Disable Enable

Connection Request Authentication

Connection Request User Name:

Connection Request Password:

Connection Request Port:

Connection Request URL:

WAN Management Protocol (TR-069) allows an Auto-Configuration Server (ACS) to perform auto-configuration, provision, collection, and diagnostics to this device.

In this page, you may configure the parameters such as the ACS URL, ACS password, and connection request user name.

After finishing setting, click the **Apply/Save** button to save and apply the settings.

5.4.5 Internet Time

Choose **Management > Internet Time** to display the following page.

Time settings

This page allows you to the modem's time configuration.

Automatically synchronize with Internet time servers

Apply/Save

In this page, you may configure the router to synchronize its time with the Internet time servers.

After enabling **Automatically synchronize with Internet time servers**, the following page appears.

Time settings

This page allows you to the modem's time configuration.

Automatically synchronize with Internet time servers

First NTP time server:	time.nist.gov	▼	
Second NTP time server:	ntp1.tummy.com	▼	
Third NTP time server:	None	▼	
Fourth NTP time server:	None	▼	
Fifth NTP time server:	None	▼	

Current Router Time: Sat Nov 19 04:32:34 2011

Time zone offset: (GMT-08:00) Tijuana, Baja California ▼

Apply/Save

In this page, set the proper time servers, and then click the **Apply/Save** button to save and apply the settings.

5.4.6 Access Control

Passwords

Choose **Management > Access Control > Passwords**, and the following page appears.

Access Control -- Passwords

Access to your DSL router is controlled through three user accounts:admin,support and user .

The user name "admin" has unrestricted access to change and view configuration of your DSL Router.

The user name "support" is used to allow an ISP technician to access your DSL Router for maintenance and to run diagnostics.

The user name "user" can access the DSL Router, view configuration settings and statistics, as well as, update the router's software.

Use the fields below to enter up to 15 characters and click 'Apply/Save' to change or create passwords. Note: Password cannot contain a space.

Username:
New Username:
Old Password:
New Password:
Confirm Password:

Apply/Save

In the page, you can modify the username and password of different users. After finishing setting, click the **Apply/Save** button to save and apply the settings.

Services

Choose **Management > Access Control > Services Control** and the following page appears.

Access Control -- Services

Services access control list (SCL) enable or disable the running services.

Services	LAN	WAN	Port
HTTP	<input checked="" type="checkbox"/> enable	<input type="checkbox"/> enable	80
TELNET	<input checked="" type="checkbox"/> enable	<input type="checkbox"/> enable	23
SSH	<input type="checkbox"/> enable	<input type="checkbox"/> enable	22
FTP	<input checked="" type="checkbox"/> enable	<input type="checkbox"/> enable	21
TFTP	<input checked="" type="checkbox"/> enable	<input type="checkbox"/> enable	69
ICMP	<input checked="" type="checkbox"/> enable	<input type="checkbox"/> enable	0
SNMP	<input checked="" type="checkbox"/> enable	<input type="checkbox"/> enable	161
SAMBA	<input checked="" type="checkbox"/> enable	<input type="checkbox"/> enable	445

Apply/Save

In this page, you can enable or disable the different types of services. After finishing setting, click the **Apply/Save** button to save and apply the settings.

5.4.7 Update Software

Choose **Management > Update Software**, and the following page appears.

Tools -- Update Software

Step 1: Obtain an updated software image file from your ISP.

Step 2: Enter the path to the image file location in the box below or click the 'Browse' button to locate the image file.

Step 3: Click the 'Update Software' button once to upload the new image file.

NOTE: The update process takes about 2 minutes to complete, and your Broadband Router will reboot.

Software File Name:

Update Software

If you want to upload the software, click the **Browse...** button to choose the new software, and then click the **Update Software** button.

Note:

When software update is in progress, do not shut down the router. After software update completes, the router automatically reboots.

Please make sure that the new software for updating is correct, and do not use other software to update the router.

5.4.8 Reboot

Choose **Management > Reboot** and the following page appears.

Click the button below to reboot the router.

A rectangular button with a thin blue border and the word "Reboot" centered inside in a standard sans-serif font.

In this page, click the **Reboot** button, and then the router reboots.

6 Q&A

(1) **Q:** Why all the indicators are off?

A: Check the following:

- The connection between the power adaptor and the power socket.
- The status of the power switch.

(2) **Q:** Why the **LAN** indicator is off?

A: Check the following:

- The connection between the ADSL router and your computer, hub, or switch.
- The running status of your PC, hub, or switch.

(3) **Q:** Why the **DSL** indicator is off?

A: Check the connection between the “DSL” port of router and the wall jack.

(4) **Q:** Why Internet access fails while the **DSL** indicator is on?

A: Check whether the VPI, VCI, user name, and password are correctly entered.

(5) **Q:** Why I fail to access the web configuration page of the DSL router?

A: Choose **Start > Run** from the desktop, and ping **192.168.1.1** (IP address of the DSL router). If the DSL router is not reachable, check the type of the network cable, the connection between the DSL router and the PC, and the TCP/IP configuration of the PC.

(6) **Q:** How to load the default settings after incorrect configuration?

A: To restore the factory default settings, turn on the device, and press the reset button for about 1 second, and then release it. The default IP address and the subnet mask of the DSL router are **192.168.1.1** and **255.255.255.0**, respectively.

- User/password of super user: **admin/admin**
- User/password of common user: **user/user**