

TP-LINK®

User Guide

TD-8816

ADSL2+ Modem Router



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FCC STATEMENT



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference.
- 2) This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CE Mark Warning



This is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

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Package Contents

The following items should be found in your package:

- One TD-8816 ADSL2+ Modem Router
- One Power Adapter for TD-8816 ADSL2+ Modem Router
- Quick Installation Guide
- One RJ45 cable
- Two RJ11 cables
- One ADSL splitter
- One Resource CD , including:
 - This User Guide
 - Other Helpful Information

 **Note:**

Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact your distributor.

Chapter 1. Introduction

Thank you for choosing the **TD-8816 ADSL2+ Modem Router** .

1.1 Product Overview

The device is designed to provide a simple and cost-effective ADSL Internet connection for a private Ethernet network.

The Router is easy to use. The TD-8816 connects to an Ethernet LAN or computers via standard Ethernet ports. The ADSL connection is made using ordinary telephone line with standard connectors. Multiple workstations can be networked and connected to the Internet using a single Wide Area Network (WAN) interface and single global IP address. The advanced security enhancements, **IP/MAC Filter**, **Application Filter** and **URL Filter** can help to protect your network from potentially devastating intrusions by malicious agents from the outside of your network.

The Router is easy to install and manage. **Quick Start** of the Web-based Utility is supplied and friendly help messages are provided for the configuration. Network and Router management is done through the Web-based Utility which can be accessed through local Ethernet using any web browser.

ADSL

The TD-8816 supports full-rate ADSL2+ connectivity conforming to the ITU and ANSI specifications. In addition to the basic DMT physical layer functions, the ADSL2+ PHY supports dual latency ADSL2+ framing (fast and interleaved) and the I.432 ATM Physical Layer.

1.2 Main Features

- 1 10/100M RJ-45 LAN ports (Auto MDI/MDIX), 1 RJ11 port
- Downstream data rates up to 24Mbps, upstream data rates up to 3.5Mbps (With Annex M enabled) .
- Supports long transfers, the max line length can reach to 6.5Km.
- Supports remote configuration and management through SNMP and CWMP.
- Supports PPPoE, it allows connecting the internet on demand and disconnecting from the Internet when idle.
- Quick response semi-conductive surge protection circuit, provides reliable ESD and surge-protect function.
- High speed and asymmetrical data transmit mode, provides safe and exclusive bandwidth.
- Supports All ADSL industrial standards.
- Compatible with all mainstream DSLAM (CO).
- Provides integrated access of internet and route function which face to SOHO user.

- Real-time Configuration and device monitoring.
- Supports Multiple PVC (Permanent Virtual Circuit).
- Built-in DHCP server.
- Built-in firewall, supports IP/MAC filter, Application filter and URL filter.
- Supports Virtual Server, DMZ host and IP Address Mapping.
- Supports Dynamic DNS, UPnP and Static Routing.
- Supports system log and flow Statistics.
- Supports firmware upgrade and Web management.

1.3 Conventions

The Router or device mentioned in this User Guide stands for TD-8816 without any explanations. Parameters provided in the pictures are just references for setting up the product, which may differ from the actual situation.

Chapter 2. Hardware Installation

2.1 The Front Panel



Figure 2-1

The LEDs locate on the front panel, which indicate the device's working status. For details, please refer to LED Explanation.

LED Explanation:

LED	Status	Indication
Power	On	Power is on.
	Off	Power is off.
LAN	On	There is a successful connection on LAN port but no activity.
	Flash	Data is being transferred over LAN port.
	Off	There is no connection on LAN port or the connection is abnormal.
ADSL	On	The LINE port is linked up.
	Flash	The ADSL negotiation is in progress.
	Off	The LINE port is linked down.
Internet	On	A successful PPP connection has been built.
	Flash	Data is being transferred over the Internet on PPP mode.
	Off	There is no successful PPP connection or the Router works on Bridge mode.

2.2 The Back Panel

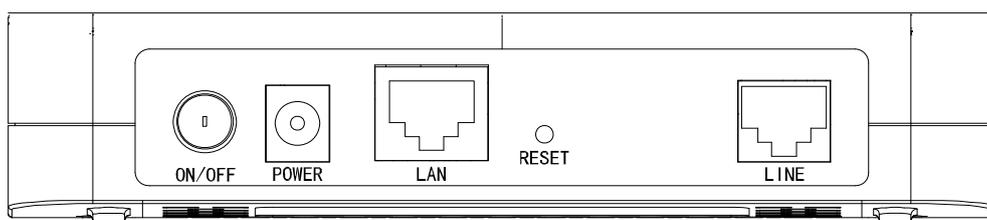


Figure 2-2

- On/OFF: The switch for the power.

- **POWER:** The Power plug is where you will connect the power adapter.
- **RESET:** There are two ways to reset the Router's factory defaults.
 - Method one:** With the Router powered on, use a pin to press and hold the Reset button (about 5 seconds) until the SYS LED becomes quick-flash from slow-flash. And then release the button and wait the router to reboot to its factory default settings.
 - Method two:** Restore the default setting from "Maintenance-SysRestart" of the Router's Web-based Utility.
- **LAN:** Through the port, you can connect the Router to your PC or the other Ethernet network devices.
- **LINE:** Through the port, you can connect the Router with the telephone.

2.3 Installation Environment

- The Product should not be located where it will be exposed to moisture or excessive heat.
- Place the Router in a location where it can be connected to the various devices as well as to a power source.
- Make sure the cables and power cord are placed safely out of the way so they do not create a tripping hazard.
- The Router can be placed on a shelf or desktop.

2.4 Connecting the Router

Before installing the device, please make sure your broadband service provided by your ISP is available. If there is any problem, please contact your ISP. You need to connect the device to the phone jack, the power outlet, and your computer or network. Before cable connection, cut off the power supply and keep your hands dry. You can follow the steps below to install it.

Step 1: Connect the ADSL Line.

Method one: Plug one end of the twisted-pair ADSL cable into the ADSL LINE port on the rear panel of TD-8816, and insert the other end into the wall socket.

Method two: You can use a separate splitter. External splitter can divide the data and voice, and then you can access the Internet and make calls at the same time. The external splitter has three ports:

- **LINE:** Connect to the wall jack
- **PHONE:** Connect to the phone sets
- **MODEM:** Connect to the ADSL LINE port of TD-8816

Plug one end of the twisted-pair ADSL cable into the ADSL LINE port on the rear panel of TD-8816. Connect the other end to the MODEM port of the external splitter.

Step 2: Connect the Ethernet cable. Attach one end of a network cable to your computer's Ethernet port or a regular hub/switch port, and the other end to the LAN port on the TD-8816.

Step 3: Attach the power adapter. Connect the power adapter to the POWER connector on the rear of the device and plug in the adapter to a wall outlet or power extension.

Step 4: Turn on the TD-8816 and power on the computers and LAN devices.

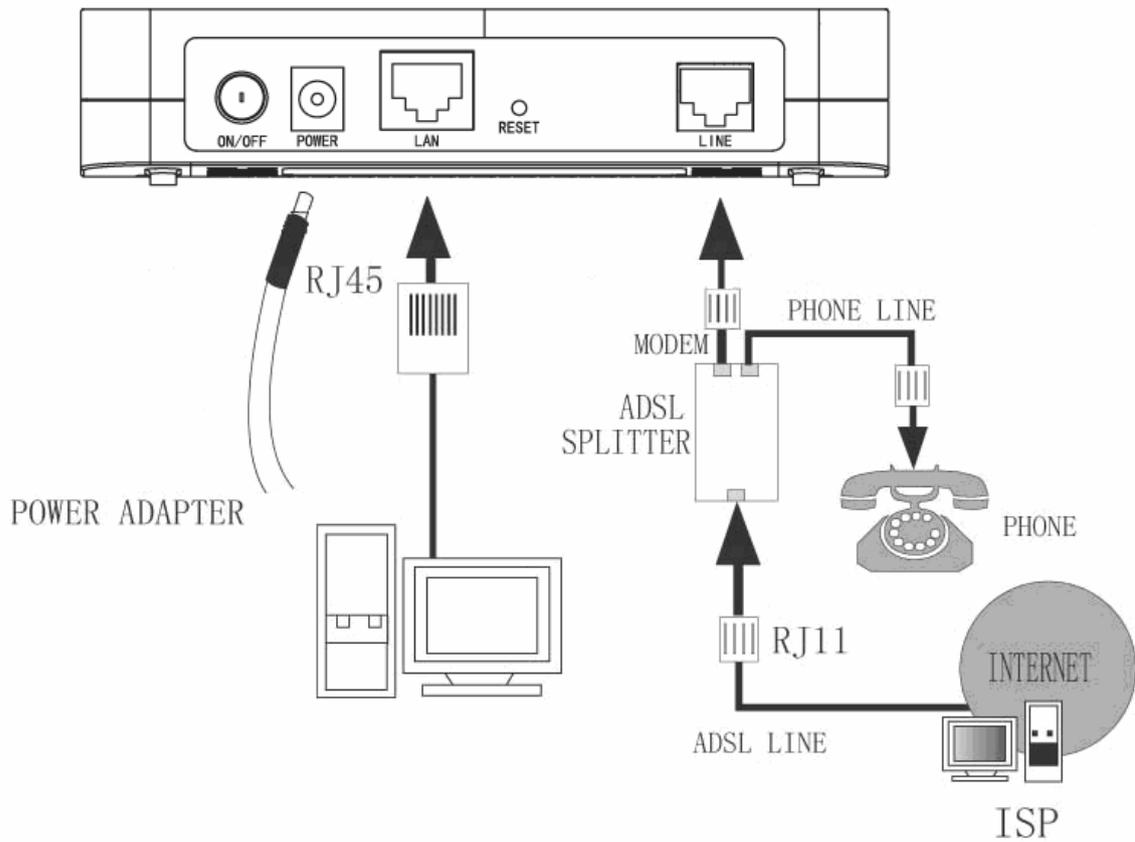


Figure 2-3

Chapter 3. Quick Installation Guide

3.1 Configure PC

After you directly connect your PC to the TD-8816 or connect your adapter to a Hub/Switch which has connected to the Router, you need to configure your PC's IP address. Follow the steps below to configure it.

Step 1: Click the **Start** menu on your desktop, right click **My Network Places**, and then select **Properties** (shown in Figure 3-1).

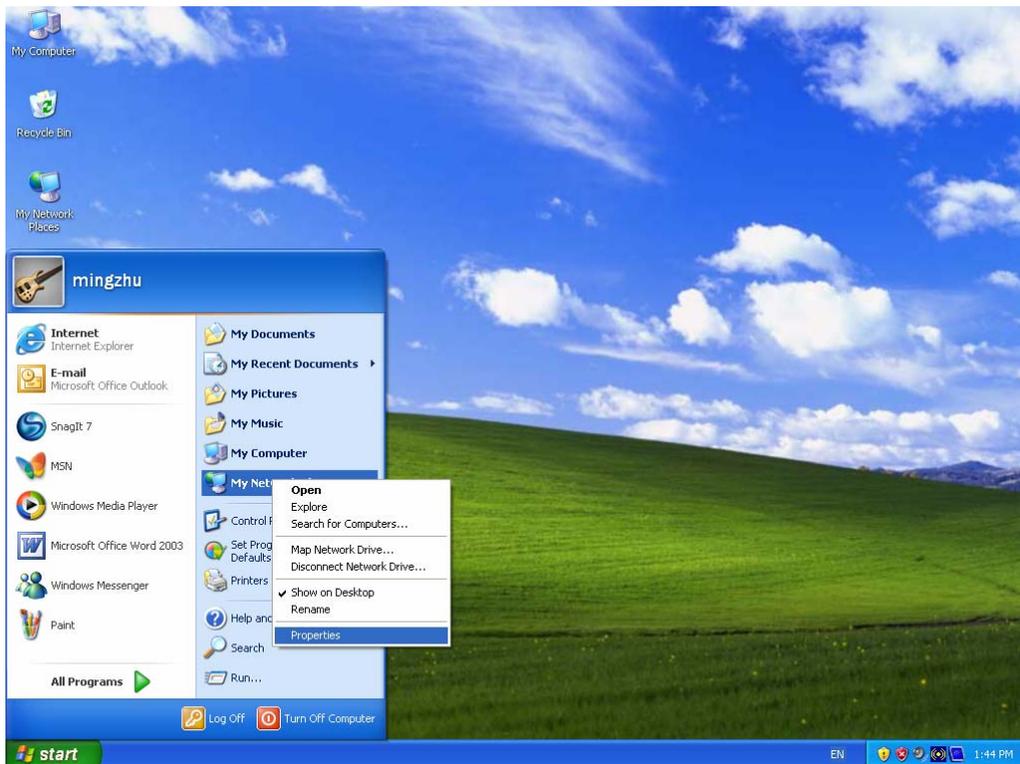


Figure 3-1

Step 2: Right click **Local Area Connection (LAN)**, and then select **Properties**.

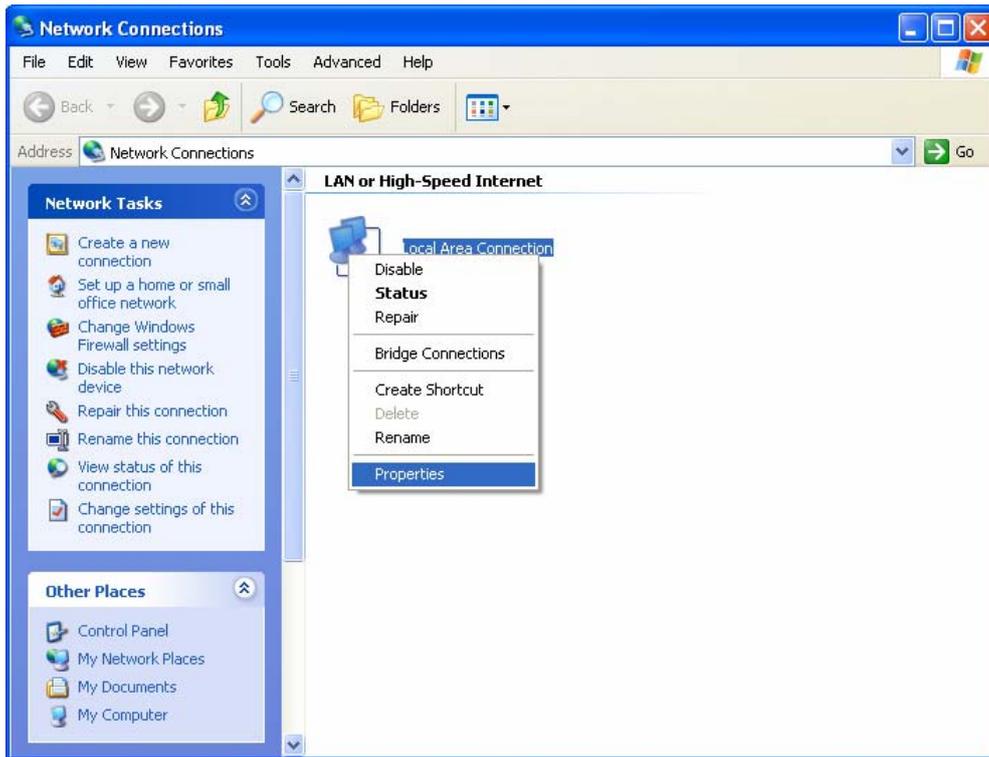


Figure 3-2

Step 3: Select **General** tab, highlight Internet Protocol (TCP/IP), and then click the **Properties** button.

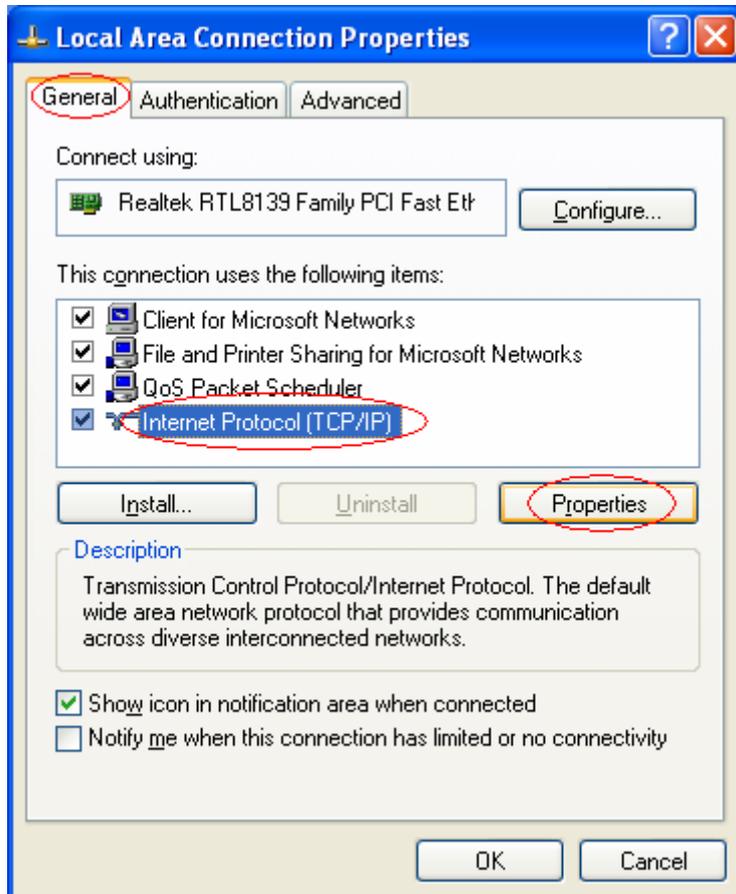


Figure 3-3

Step 4: Configure the IP address as Figure 3-4 shows. After that, click **OK**.

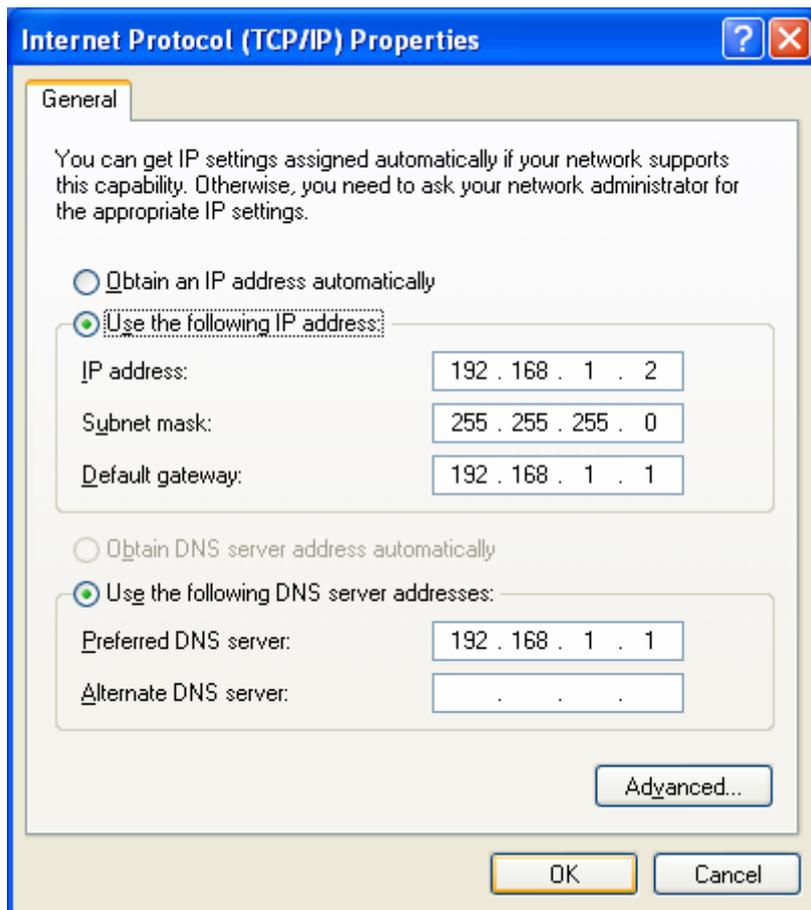


Figure 3-4

Note:

You can configure the PC to get an IP address automatically, select “Obtain an IP address automatically” and “Obtain DNS server address automatically” in the screen above.

Now, you can run the Ping command in the command prompt to verify the network connection. Please click the **Start** menu on your desktop, select **run** tab, type **cmd** in the field, and then type *ping 192.168.1.1* on the next screen, and then press **Enter**.

If the result displayed is similar to the screen below, the connection between your PC and the Router has been established.

```
Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure 3-5

If the result displayed is similar to the screen shown below, it means that your PC has not connected to the Router.

```
Pinging 192.168.1.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Figure 3-6

You can check it follow the steps below:

1) Is the connection between your PC and the Router correct?

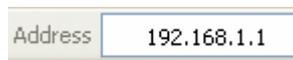
The LEDs of LAN port which you link to the device and the LEDs on your PC's adapter should be lit.

2) Is the TCP/IP configuration for your PC correct?

If the Router's IP address is 192.168.1.1, your PC's IP address must be within the range of 192.168.1.2 ~ 192.168.1.254.

3.2 Login

Once your host PC is properly configured, please proceed as follows to use the Web-based Utility: Start your web browser and type the private IP address of the Router in the URL field: **192.168.1.1**.



After that, you will see the screen shown below, enter the default User Name **admin** and the default Password **admin**, and then click **OK** to access to the **Quick Setup** screen. You can follow the steps below to complete the Quick Setup.



Figure 3-7

Step 1: Select the **Quick Start** tab, then click **RUN WIZARD**, and you will see the next screen. Click the **NEXT** button.

Quick Start

The Wizard will guide you through these four quick steps. Begin by clicking on **NEXT**.

- Step 1. Choose your time zone
- Step 2. Set your Internet connection
- Step 3. Save your current ADSL Router configuration

NEXT EXIT

Figure 3-8

Step 2: Configure the time for the Router, and then click the **NEXT** button.

Quick Start - Time Zone

Select the appropriate time zone for your location and click **NEXT** to continue.

(GMT) Greenwich Mean Time : Dublin, Edinburgh, Lisbon, London

BACK NEXT EXIT

Figure 3-9

Step 3: Select the connection type to connect to the ISP (We select **PPPoE/PPPoA** mode for example here), and then click the **NEXT** button.

Quick Start - ISP Connection Type

Select the Internet connection type to connect to your ISP. Click **NEXT** to continue.

- Dynamic IP Address Choose this option to obtain a IP address automatically from your ISP.
- Static IP Address Choose this option to set static IP information provided to you by your ISP.
- PPPoE/PPPoA Choose this option if your ISP uses PPPoE/PPPoA. (For most DSL users)
- Bridge Mode Choose this option if your ISP uses Bridge Mode.

BACK NEXT EXIT

Figure 3-10

Step 4: Configure the following options provided by your ISP: **Username**, **Password**, **VPI**, **VCI** and **Connection Type**. Then click **NEXT**.

Quick Start - PPPoE/PPPoA

Enter the PPPoE/PPPoA information provided to you by your ISP. Click **NEXT** to continue.

Username:

Password:

VPI: (0~255)

VCI: (1~65535)

Connection Type: 

Figure 3-11

Step 5: Click **NEXT** to finish the Quick Start.

Quick Start Complete !!

The Setup Wizard has completed. Click on **BACK** to modify changes or mistakes. Click **NEXT** to save the current settings.

Figure 3-12

Chapter 4. Software Configuration

This User Guide recommends using the “Quick Installation Guide” for first-time installation. For advanced users, if you want to know more about this device and make use of its functions adequately, maybe you will get help from this chapter to configure the advanced settings through the Web-based Utility.

After your successful login, you can configure and manage the device. There are main menus on the top of the Web-based Utility, submenus will be available after you click one of the main menus. On the center of the Web-based Utility, there are the detailed configurations or status information. To apply any settings you have altered on the page, please click the **SAVE** button.

4.1 Status

Choose “**Status**”, you can see the next submenus: **Device Info**, **System Log** and **Statistics**. Click any of them, and you will be able to configure the corresponding function.



Figure 4-1

4.1.1 Device Info

Choose “**Status**→**Device Info**” menu, and you will be able to view the device information, including LAN, WAN and ADSL. The information will vary depending on the settings of the Router configured on the Interface Setup screen.

Status	Quick Start	Interface Setup	Advanced Setup	Access Management	Maintenance	Status	Help
	Device Info	System Log	Statistics				
Device Information	Firmware Version : 4.0.0 Build 090508 Rel.23545 MAC Address : 00:aa:bb:01:23:45						
LAN	IP Address : 192.168.1.1 Subnet Mask : 255.255.255.0 DHCP Server : Enabled						
WAN	Virtual Circuit : <input type="text" value="PVCO"/> <input type="button" value="v"/> Status : Not Connected Connection Type : Bridge IP Address : N/A Subnet Mask : N/A Default Gateway : N/A DNS Server : N/A						
ADSL	ADSL Firmware Version : FwVer:3.11.2.167_TC3086 HwVer:T14.F7_5.0 Line State : Down Modulation : N/A Annex Mode : N/A						
			Downstream	Upstream			
	SNR Margin :	N/A	N/A	N/A	db		
	Line Attenuation :	N/A	N/A	N/A	db		
	Data Rate :	N/A	N/A	N/A	kbps		

Figure 4-2

4.1.2 System Log

Choose “**Status→System Log**” menu, and you will be able to query the logs of the Router.

The screenshot shows the router's web interface with the following structure:

- Navigation Bar:** Status (selected), Quick Start, Interface Setup, Advanced Setup, Access Management, Maintenance, Status, Help.
- Sub-Menu:** Device Info, System Log (circled in red), Statistics.
- System Log Content:**

```

1/1/2000 0:11:7> No DNS server available
1/1/2000 0:11:7> Last errorlog repeat 10 Times
1/1/2000 0:11:7> adjTimeTask fail: no server available
1/1/2000 0:11:7> adjtime task pause 60 seconds
1/1/2000 0:11:7> No DNS server available
1/1/2000 0:11:7> adjTimeTask fail: wrong domain name
1/1/2000 0:11:7> No DNS server available
1/1/2000 0:11:7> Last errorlog repeat 10 Times
1/1/2000 0:11:7> adjTimeTask fail: no server available
1/1/2000 0:11:7> adjtime task pause 1 day
1/1/2000 0:12:7> No DNS server available
1/1/2000 0:12:7> adjTimeTask fail: wrong domain name
1/1/2000 0:12:7> No DNS server available
1/1/2000 0:12:7> Last errorlog repeat 10 Times
1/1/2000 0:12:7> adjTimeTask fail: no server available
1/1/2000 0:12:7> adjtime task pause 60 seconds
1/1/2000 0:12:7> No DNS server available
1/1/2000 0:12:7> adjTimeTask fail: wrong domain name
1/1/2000 0:12:7> No DNS server available
1/1/2000 0:12:7> Last errorlog repeat 10 Times
1/1/2000 0:12:7> adjTimeTask fail: no server available
1/1/2000 0:12:7> adjtime task pause 60 seconds
1/1/2000 0:12:7> No DNS server available
1/1/2000 0:12:7> adjTimeTask fail: wrong domain name
1/1/2000 0:12:7> No DNS server available

```
- Buttons:** CLEAR LOG, SAVE LOG.

Figure 4-3

The Router can keep logs of all traffic. You can query the logs to find what happened to the Router.

Click the **CLEAR LOG** button to clear the logs.

Click the **SAVE LOG** button to save the logs.

4.1.3 Statistics

Choose "**Status**→**Statistics**" menu, and you will be able to view the network traffic over Ethernet, and ADSL.

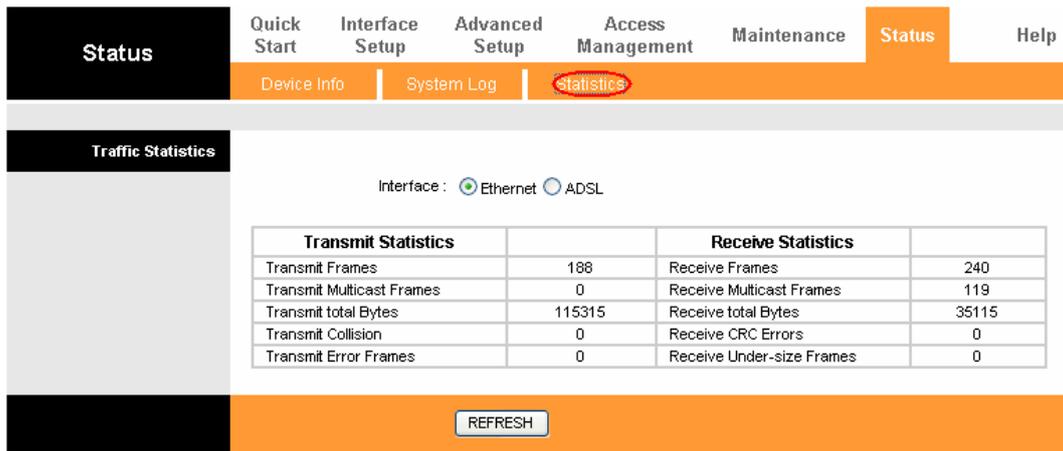


Figure 4-4

- **Interface:** You can select **Ethernet** and **ADSL** to view the corresponding network traffic over different ports.
- Select **Ethernet**, and you will see the statistics table as below.

Interface : Ethernet ADSL

Transmit Statistics		Receive Statistics	
Transmit Frames	188	Receive Frames	240
Transmit Multicast Frames	0	Receive Multicast Frames	119
Transmit total Bytes	115315	Receive total Bytes	35115
Transmit Collision	0	Receive CRC Errors	0
Transmit Error Frames	0	Receive Under-size Frames	0

Statistics Table:

Transmit Statistics	Transmit Frames	The frames transmitted over the Ethernet port.
	Transmit Multicast Frames	The multicast frames transmitted over the Ethernet port.
	Transmit total Bytes	The total bytes transmitted over the Ethernet port.
	Transmit Collision	The collision occurred over the Ethernet port when data is being transmitted.
	Transmit Error Frames	The error frames over the Ethernet port when data is being transmitted.
Receive Statistics	Receive Frames	The frames received over the Ethernet port.
	Receive Multicast Frames	The multicast frames received over the Ethernet port.
	Receive total Bytes	The total bytes received over the Ethernet port.
	Receive CRC Errors	The CRC errors occurred over the Ethernet port when data is being received.
	Receive Under-size Frames	The Under-size frames received over the Ethernet port.

➤ Select **ADSL**, and you will see the statistics table as below.

Interface : Ethernet ADSL

Transmit Statistics		Receive Statistics	
Transmit total PDUs	0	Receive total PDUs	0
Transmit total Error Counts	0	Receive total Error Counts	0

Statistics Table:

Transmit Statistics	Transmit total PDUs	The total PDUs transmitted over the ADSL port.
	Transmit total Error Counts	The total errors occurred over the ADSL port when data is being transmitted.
Receive Statistics	Receive total PDUs	The total PDUs transmitted over the ADSL port.
	Receive total Error Counts	The total errors occurred over the ADSL port when data is being received.

4.2 Quick Start

Please refer to "[3.2: Login](#)".

4.3 Interface Setup

Choose “**Interface Setup**”, you can see the next submenus: **Internet** and **LAN**.



Figure 4-5

Click any of them, and you will be able to configure the corresponding function.

4.3.1 Internet

Choose “**Interface Setup**→**Internet**” menu, you can configure the parameters for WAN ports in the next screen (shown in Figure 4-6).

Interface	Quick Start	Interface Setup	Advanced Setup	Access Management	Maintenance	Status	Help
	Internet	LAN					
ATM VC							
OoS	Virtual Circuit: PVC3 <input type="button" value="PVCs Summary"/> Status: <input checked="" type="radio"/> Activated <input type="radio"/> Deactivated VPI: 0 (range: 0~255) VCI: 100 (range: 1~65535)						
	ATM QoS: UBR PCR: 0 cells/second SCR: 0 cells/second MBS: 0 cells						
Encapsulation							
ISP: <input type="radio"/> Dynamic IP Address <input type="radio"/> Static IP Address <input checked="" type="radio"/> PPPoA/PPPoE <input type="radio"/> Bridge Mode							
PPPoE/PPPoA							
Connection Setting	Servicename: servicename Username: username Password: ***** Encapsulation: PPPoE LLC Bridge Interface: <input type="radio"/> Activated <input checked="" type="radio"/> Deactivated						
	Connection: <input checked="" type="radio"/> Always On (Recommended) <input type="radio"/> Connect On-Demand (Close if idle for 15 minutes) <input type="radio"/> Connect Manually TCP MSS Option: TCP MSS(0:default) 0 bytes						
IP Address	Get IP Address: <input type="radio"/> Static <input checked="" type="radio"/> Dynamic Static IP Address: 0.0.0.0 IP Subnet Mask: 0.0.0.0 Gateway: 0.0.0.0 NAT: Enable Default Route: <input checked="" type="radio"/> Yes <input type="radio"/> No TCP MTU Option: TCP MTU(0:default) 1480 bytes Dynamic Route: RIP1 Direction: None Multicast: Disabled MAC Spoofing: <input type="radio"/> Enabled <input checked="" type="radio"/> Disabled 00:00:00:00:00:00						
	<input type="button" value="SAVE"/> <input type="button" value="DELETE"/>						

Figure 4-6

- **ATM VC:** ATM settings are used to connect to your ISP. Your ISP provides VPI (Virtual Path Identifier), VCI (Virtual Channel Identifier) settings to you. In this Device, you can totally setup 8 VCs on different encapsulations, if you apply 8 different virtual circuits from your ISP. You need to activate the VC to take effect. For PVCs management, you can use ATM QoS to setup each PVC traffic line's priority.
 - **Virtual Circuit:** Select the VC number you want to setup, PVC0~PVC7.
 - **Status:** If you want to use a designed VC, you should activate it.
 - **VPI:** Identifies the virtual path between endpoints in an ATM network. The valid range is

from 0 to 255. Please input the value provided by your ISP.

- **VCI:** Identifies the virtual channel endpoints in an ATM network. The valid range is from 32 to 65535 (1 to 31 is reserved for well-known protocols). Please input the value provided by your ISP.
 - **PVCs Summary:** Click the button, you can view the summary information about the PVCs.
 - **QoS:** Select the Quality of Service types for this Virtual Circuit, including CBR (Constant Bit Rate), UBR (Unspecified Bit Rate) and VBR (Variable Bit Rate). These QoS types are all controlled by the parameters specified below, including PCR (Peak Cell Rate), SCR (Sustained Cell Rate) and MBS (Maximum Burst Size), please configure them according your needs.
- **Encapsulation:** There are four connection types: Dynamic IP Address, Static IP Address, PPPoA/PPPoE and Bridge Mode. Please choose the designed type that you want to use. After that, you should follow the configuration below to proceed.

1. Dynamic IP Address

Select this option if your ISP provides you an IP address automatically. This option is typically used for Cable services. Please enter the Dynamic IP information accordingly.

ISP : Dynamic IP Address
 Static IP Address
 PPPoA/PPPoE
 Bridge Mode

Encapsulation : 1483 Bridged IP LLC

Bridge Interface : Activated Deactivated

NAT : Enable

Default Route : Yes No

TCP MTU Option : TCP MTU(0:default) 1480 bytes

Dynamic Route : RIP1 Direction : None

Multicast : Disabled

Figure 4-7

- **Encapsulation:** Select the encapsulation mode for the Dynamic IP Address, you can leave it default.
- **Bridge Interface:** Activate the option, the Router can also work in Bridge mode.
- **NAT:** Select this option to Enable/Disable the NAT (Network Address Translation) function for this VC. The NAT function can be activated or deactivated per PVC basis.
- **Default Route:** If enable this function, the current PVC will be considered as the default gateway to internet from this device.
- **TCP MTU Option:** Enter the TCP MTU as your desire.
- **Dynamic Route:** Select this option to specify the RIP (Routing Information protocol) version for WAN interface, including **RIP1**, **RIP2-B** and **RIP2-M**. RIP2-B and RIP2-M are both sent in

RIP2 format, the difference is that RIP2-M using Multicast, while RIP2-B using Broadcast format.

- **Direction:** Select this option to specify the RIP direction. **None** is for disabling the RIP function. **Both** means the ADSL Router will periodically send routing information and accept routing information, and then incorporate them into routing table. **IN only** means the ADLS router will only accept but will not send RIP packet. **OUT only** means the ADLS router will only send but will not accept RIP packet.
- **Multicast:** Select IGMP version, or disable the function. IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a multicast group. The ADSL ATU-R supports both IGMP version 1 (**IGMP v1**) and **IGMP v2**. Select “Disabled” to disable it.

2. Static IP Address

Select this option if your ISP provides static IP information to you. You should set static IP address, IP subnet mask, and gateway address in the screen below (shown in Figure 4-8).

The screenshot shows the configuration interface for the Static IP Address option. At the top, under 'ISP:', there are four radio buttons: 'Dynamic IP Address' (unselected), 'Static IP Address' (selected), 'PPPoA/PPPoE' (unselected), and 'Bridge Mode' (unselected). Below this, the configuration fields are as follows:

- Encapsulation: 1483 Routed IP LLC(IPoA) (dropdown menu)
- Static IP Address: 0.0.0.0 (text input)
- IP Subnet Mask: 0.0.0.0 (text input)
- Gateway: 0.0.0.0 (text input)
- NAT: Enable (dropdown menu)
- Default Route: Yes (selected radio button), No (unselected radio button)
- TCP MTU Option: TCP MTU(0:default) 1480 bytes (text input)
- Dynamic Route: RIP1 (dropdown menu), Direction: None (dropdown menu)
- Multicast: Disabled (dropdown menu)

Figure 4-8

Note:

Each IP address entered in the fields must be in the appropriate IP form, which is four IP octets separated by a dot (x.x.x.x), such as 192.168.1.100. The Router will not accept the IP address if it is not in this format.

3. PPPoA/PPPoE

Select this option if your ISP requires you to use a PPPoE connection. This option is typically used for DSL services. Select Dynamic PPPoE to obtain an IP address automatically for your PPPoE connection. Select Static PPPoE to use a static IP address for your PPPoE connection. Please enter the information accordingly.

ISP : <input type="radio"/> Dynamic IP Address	
<input type="radio"/> Static IP Address	
<input checked="" type="radio"/> PPPoA/PPPoE	
<input type="radio"/> Bridge Mode	
Service name :	<input type="text" value="servicename"/>
Username :	<input type="text" value="username"/>
Password :	<input type="password" value="••••••••"/>
Encapsulation :	<input type="text" value="PPPoE LLC"/>
Bridge Interface :	<input type="radio"/> Activated <input checked="" type="radio"/> Deactivated
Connection : <input checked="" type="radio"/> Always On (Recommended)	
<input type="radio"/> Connect On-Demand (Close if idle for <input type="text" value="15"/> minutes)	
<input type="radio"/> Connect Manually	
TCP MSS Option :	TCP MSS(0:default) <input type="text" value="0"/> bytes
Get IP Address : <input type="radio"/> Static <input checked="" type="radio"/> Dynamic	
Static IP Address :	<input type="text" value="0.0.0.0"/>
IP Subnet Mask :	<input type="text" value="0.0.0.0"/>
Gateway :	<input type="text" value="0.0.0.0"/>
NAT :	<input type="text" value="Enable"/>
Default Route :	<input checked="" type="radio"/> Yes <input type="radio"/> No
TCP MTU Option :	TCP MTU(0:default) <input type="text" value="1480"/> bytes
Dynamic Route :	<input type="text" value="RIP1"/> Direction : <input type="text" value="None"/>
Multicast :	<input type="text" value="Disabled"/>
MAC Spoofing :	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
	<input type="text" value="00:00:00:00:00:00"/>

Figure 4-9

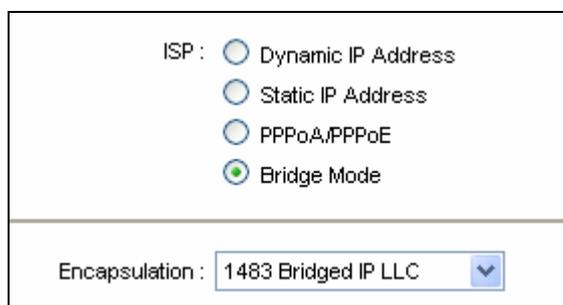
- **Service name:** Specify a name for the PPPoE/PPPoA connection for recognition.
- **Username:** Enter your username for your PPPoE/PPPoA connection to identify and verify your account to the ISP.
- **Password:** Enter your password for your PPPoE/PPPoA connection.
- **Encapsulation:** For both PPPoE/PPPoA connection, you need to specify the type of Multiplexing, either LLC or VC Mux.
- **Bridge Interface:** Activate the option, the Router can also work in Bridge mode.
- **Connection:** For PPPoE/PPPoA connection, you can select **Always on** or **Connect on-Demand** or **Connect Manually**. Connect on demand is dependent on the traffic. If there is no traffic (or **Idle**) for a pre-specified period of time), the connection will tear down automatically. And once there is traffic send or receive, the connection will be automatically on.
- **Static/Dynamic IP Address:** For PPPoE/PPPoA connection, you need to specify the public IP address for this ADSL Router. The IP address can be either dynamically (via DHCP) or given IP address provided by your ISP. For Static IP, you need to specify the IP address,

Subnet Mask and Gateway IP address.

- **Default Route:** You should select **Yes** to configure the PVC as the default gateway to internet from this device.
- **MAC Spoofing:** MAC Spoofing feature allows you to change the assigned MAC address of the ADSL Router to a different one, which may allow the bypassing of access control lists on servers either hiding a computer on a network or allowing it to impersonate another computer. You can select **Enable** and specify a MAC Address for the Router here, or keep the default setting as **Disable**.

4. Bridge Mode

If you select this type of connection, the modem can be configured to act as a bridging device between your LAN and your ISP. Bridges are devices that enable two or more networks to communicate as if they are two segments of the same physical LAN.



The screenshot shows a configuration window for the Internet Service Provider (ISP). It contains four radio button options: 'Dynamic IP Address', 'Static IP Address', 'PPPoA/PPPoE', and 'Bridge Mode'. The 'Bridge Mode' option is selected, indicated by a green dot. Below these options is a horizontal line, and under that line is a label 'Encapsulation:' followed by a dropdown menu currently displaying '1483 Bridged IP LLC'.

Figure 4-10

Note:

After you finish the Internet configuration, please click **SAVE** to make the settings take effect.

4.3.2 LAN

Choose “**Interface Setup**→**LAN**” menu, and you will see the LAN screen (shown in Figure 4-11). Please configure the parameters for LAN ports according to the descriptions below.

The screenshot shows the 'Interface Setup' page for the LAN interface. The navigation bar includes 'Quick Start', 'Interface Setup' (selected), 'Advanced Setup', 'Access Management', 'Maintenance', 'Status', and 'Help'. The 'LAN' interface is highlighted in red. The 'Router Local IP' section contains fields for IP Address (192.168.1.1), IP Subnet Mask (255.255.255.0), Dynamic Route (RIP2-B), Direction (None), Multicast (Disabled), and IGMP Snoop (Disabled). The 'DHCP' section has a radio button for 'Enabled'. The 'DHCP Server' section includes Starting IP Address (192.168.1.100), IP Pool Count (101), and Lease Time (259200 seconds). The 'DHCP Table' section shows a table with columns for Hostname, IP Address (192.168.1.100), MAC Address, and Status (Static). The 'DNS' section includes a dropdown for 'Use Auto Discovered DNS Server Only' and fields for Primary and Secondary DNS Servers (N/A). 'SAVE' and 'CANCEL' buttons are at the bottom.

Figure 4-11

- **Router Local IP:** These are the IP settings of the LAN interface for the device. These settings may be referred to as Private settings. You may change the LAN IP address if needed. The LAN IP address is private to your internal network and cannot be seen on the Internet.
 - **IP Address:** Enter the Router’s local IP Address, then you can access to the Web-based Utility via the IP Address, the default value is 192.168.1.1.
 - **IP Subnet Mask:** Enter the Router’s Subnet Mask, the default value is 255.255.255.0.
 - **Dynamic Route:** Select this option to specify the RIP (Routing Information protocol) version for LAN interface, including **RIP1**, **RIP2-B** and **RIP2-M**. RIP2-B and RIP2-M are both sent in RIP2 format, the difference is that RIP2-M using Multicast, while RIP2-B using Broadcast format.
 - **Direction:** Select this option to specify the RIP direction. **None** is for disabling the RIP function. **Both** means the ADSL Router will periodically send routing information and accept routing information, and then incorporate them into routing table. **IN only** means the ADSL router will only accept but will not send RIP packet. **OUT only** means the ADSL router will only send but will not accept RIP packet.
 - **Multicast:** Select IGMP version, or disable the function. IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a multicast group. The ADSL ATU-R supports both IGMP version 1 (**IGMP v1**) and **IGMP v2**. Select “Disabled” to disable it.
 - **IGMP Snoop:** Enable the IGMP Snoop function if you need.
- **DHCP Server:** Select **Enabled**, then you will see the screen below (shown in Figure 4-12).

The Router will work as a DHCP Server, it becomes the default gateway for DHCP client connected to it. DHCP stands for Dynamic Host Control Protocol. The DHCP Server gives out IP addresses when a device is booting up and request an IP address to be logged on to the network. That device must be set as a DHCP client to obtain the IP address automatically. By default, the DHCP Server is enabled. The DHCP address pool contains the range of the IP address that will automatically be assigned to the clients on the network.

DHCP : Disabled Enabled Relay

Starting IP Address :

IP Pool Count :

Lease Time : seconds (0 sets to default value of 259200)

Hostname	IP Address	MAC Address	Status
	<input type="text" value="192.168.1.100"/>	<input type="text" value="Manual Config"/>	<input type="text" value="Static"/>

DNS Relay :

Primary DNS Server :

Secondary DNS Server :

Figure 4-12

- **Starting IP Address:** Enter the starting IP address for the DHCP server's IP assignment. Because the default IP address for the Router is 192.168.1.1, the default Start IP Address is **192.168.1.100**, and the Start IP Address must be 192.168.1.2 or greater, but smaller than 192.168.1.254.
- **IP Pool Count:** The max user pool size.
- **Lease Time:** The length of time for the IP lease. After the dynamic IP address has expired, the user will be automatically assigned a new dynamic IP address. The default is **259200** seconds.
- **DNS Relay:** If you want to disable this feature, you just need to set both Primary and secondary DNS IP to 0.0.0.0. If you want to use DNS relay, you can setup DNS server IP to 192.168.1.1 on their Computer. If not, the device will perform as no DNS relay.
- **Primary DNS Server:** Type in your preferred DNS server.
- **Secondary DNS Server:** Type in your preferred DNS server.
- **Current Pool Summary:** Click the button, you can view the IP addresses that the DHCP Server gives out.

Note:

If **Use Auto Discovered DNS Server Only** is selected in DNS Relay, this router will accept the first received DNS assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s) during the connection establishment. If **Use User Discovered DNS Server Only** is selected in DNS Relay, it is necessary for you to enter the primary and optional secondary DNS server IP addresses. After type in the address, click **SAVE** button to save it and invoke it.

➤ **DHCP Relay:** Select **Relay**, then you will see the next screen (shown in Figure 4-13), the

Router will work as a DHCP Relay. A DHCP relay is a computer that forwards DHCP data between computers that request IP addresses and the DHCP server that assigns the addresses. Each of the device's interfaces can be configured as a DHCP relay. If it is enabled, the DHCP requests from local PCs will forward to the DHCP server runs on WAN side. To have this function working properly, please run on router mode only, disable the DHCP server on the LAN port, and make sure the routing table has the correct routing entry.

The image shows a configuration window for DHCP. At the top, it says "DHCP :". Below this are three radio buttons: "Disabled", "Enabled", and "Relay". The "Relay" radio button is selected, indicated by a small green dot inside the circle. Below the radio buttons is a horizontal line. Underneath the line, there is a label "DHCP Server IP for Relay Agent:" followed by a text input field containing the IP address "0.0.0.0".

DHCP : <input type="radio"/> Disabled <input type="radio"/> Enabled <input checked="" type="radio"/> Relay	
DHCP Server IP for Relay Agent :	<input type="text" value="0.0.0.0"/>

Figure 4-13

- **DHCP Server IP for Relay Agent:** Enter the DHCP server IP Address runs on WAN side.

 **Note:**

If you select **Disabled**, the DHCP function will not take effect.

4.4 Advanced Setup

Choose “Advanced Setup”, you can see the next submenus:



Figure 4-14

Click any of them, and you will be able to configure the corresponding function.

4.4.1 Firewall

Choose “Advanced Setup→Firewall” menu, and you will see the next screen (shown in Figure 4-15).



Figure 4-15

- **Firewall:** Select this option can automatically detect and block Denial of Service (DoS) attacks, such as Ping of Death, SYN Flood, Port Scan and Land Attack.
- **SPI:** If you enable SPI, all traffics initiated from WAN would be blocked, including DMZ, Virtual Server, and ACL WAN side.

4.4.2 Routing

Choose “Advanced Setup→Routing” menu, and you will see the routing information in the next screen (shown in Figure 4-16).



Figure 4-16

Click **ADD ROUTE** button to add a new route in the next screen (shown in Figure 4-17).

Figure 4-17

- **Destination IP Address:** This parameter specifies the IP network address of the final destination.
- **IP Subnet Mask:** Enter the subnet mask for this destination.
- **Gateway IP Address:** Enter the IP address of the gateway. The gateway is an immediate neighbor of your ADSL Router that will forward the packet to the destination. On the LAN, the gateway must be a router on the same segment as your Router; over Internet (WAN), the gateway must be the IP address of one of the remote nodes.
- **Metric:** Metric represents the "cost" of transmission for routing purposes. IP Routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Enter a number that approximates the cost for this link. The number need not to be precise, but it must between 1 and 15. In practice, 2 or 3 is usually a good number.
- **Announced in RIP:** This parameter determines if the ADSL router will include the route to this remote node in its RIP broadcasts. If set to Yes, the route to this remote node will be propagated to other hosts through RIP broadcasts. If No, this route is kept private and is not included in RIP broadcasts.

4.4.3 NAT

Choose "**Advanced Setup**→**NAT**" menu, you can setup the NAT (Network Address Translation) function for the Router (shown in Figure 4-18).



Figure 4-18

- **Virtual Circuit:** Enter Virtual Circuit Index that you plan to setup for the NAT function.
- **NAT Status:** This field shows the current status of the NAT function for the current VC. You can go to the previous screen (shown in Figure 4-6) to activate the function.
- **Number of IPs;** This field is to specify how many IPs are provided by your ISP for current VC. It can be single IP or multiple IPs. We select Multiple to explain.

Note:

For VCs with single IP, they share the same DMZ and Virtual servers; for VCs with multiple IPs, each VC can set DMZ and Virtual servers. Furthermore, for VCs with multiple IPs, they can define the Address Mapping rules; for VCs with single IP, since they have only one IP, there is no need to individually define the Address Mapping rule.

4.4.3.1. DMZ

Choose “**Advanced Setup**→**NAT**→**DMZ**” in Figure 4-18, you can configure the DMZ host in the next screen. A DMZ (demilitarized zone) is a host between a private local network and the outside public network. It prevents outside users from getting direct access to a server that has company data. Users of the public network outside the company can access to the DMZ host.

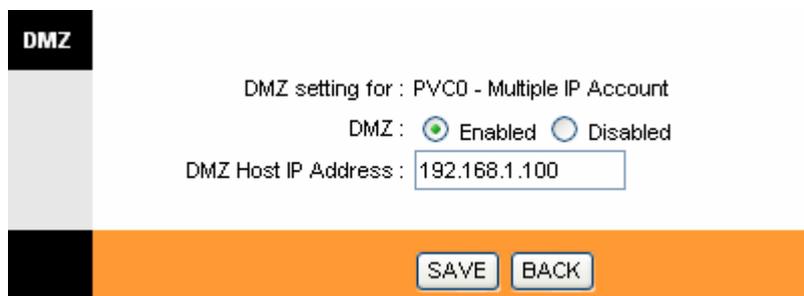


Figure 4-19

- **DMZ Host IP Address:** Enter the specified IP Address for DMZ host on the LAN side.

4.4.3.2. Virtual Server

Choose “**Advanced Setup**→**NAT**→**Virtual Server**” in Figure 4-18, you can configure the Virtual

Server in the next screen.

The Virtual Server is the server or server(s) behind NAT (on the LAN), for example, Web server or FTP server, that you can make visible to the outside world even though NAT makes your whole inside network appear as a single machine to the outside world.

Virtual Server for: PVC0 - Multiple IP Account

Rule Index: 1

Application: FTP HTTP_Server

Protocol: ALL

Start Port Number: 21

End Port Number: 21

Local IP Address: 192.168.1.100

Rule	Application	Protocol	Start Port	End Port	Local IP Address
1	FTP	ALL	21	21	192.168.1.100
2	HTTP	ALL	80	80	192.168.1.101

Figure 4-20

- **Rule Index:** The Virtual server rule index for this VC. You can specify 10 rules in maximum. All the VCs with single IP will use the same Virtual Server rules.
- **Start & End port number:** Enter the specific Start and End Port number you want to forward. If it is one port only, you can enter the End port number the same as Start port number. For example, you want to set the FTP Virtual server, you can set the start and end port number to 21.
- **Local IP Address:** Enter the IP Address for the Virtual Server in LAN side.
- **Virtual Server Listing:** This displays the information about the Virtual Servers you establish.

To add a virtual server entry:

Step 1: Select the “Virtual Circuit” and select “Number of IPs”. After that, select the tab **IP Address Mapping** for the Virtual server (shown in Figure 4-18).

Note:

For VCs with single IP, select **Single**; For VCs with multiple IPs, select **Multiple** for the option.

Step 2: Select the Rule index for the rule as shown in Figure 4-20.

Step 3: Select the application you want from drop-down list, then the protocol and port number will be added to the corresponding field automatically, you only need to configure the IP address for the virtual server; If the application list does not contain the service that you want, please configure the Port number, IP Address and Protocol manually.

Step 4: After that, click **SAVE** to make the entry take effect.

Other configurations for the entries as shown in Figure 4-20:

Enter the index of assigned entry, click the **DELETE** button to delete the entry.

Click the **Back** button to return to the previous screen.

Click the **CANCEL** button to cancel the configuration which is made just now.

4.4.3.3. IP Address Mapping

Choose “**Advanced Setup**→**NAT**→**IP Address Mapping**” in Figure 4-18, you can configure the Address Mapping Rule in the next screen. The IP Address Mapping is for those VCs that configured with multiple IPs. The IP Address Mapping rule is per-VC based (only for Multiple IPs' VCs).

IP Address Mapping

Address Mapping Rule : PVC0

Rule Index :

Rule Type :

Local Start IP : (for all local IPs, enter 0.0.0.0 for Start IP)

Local End IP : (for all local IPs, enter 255.255.255.255 for End IP)

Public Start IP :

Public End IP :

Address Mapping List

Rule	Type	Local Start IP	Local End IP	Public Start IP	Public End IP
1	M-M Ov	0.0.0.0	255.255.255.255	61.141.228.32	61.141.228.254

Figure 4-21

- **Rule Index:** Select the Virtual server rule index for this VC. You can specify 10 rules in maximum. All the VCs with single IP will use the same Virtual Server rules.
- **Rule Typ:** There are four types of one-to-one, Many-to-One, Many-to-Many Overload and Many-to-Many No-overload.
- **Local Start & End IP:** Enter the local IP Address you plan to mapped to. Local Start IP is the starting local IP address and Local End IP is the ending local IP address. If the rule is for all local IPs, then the Start IP is 0.0.0.0 and the End IP is 255.255.255.255.
- **Public Start & End IP:** Enter the public IP Address you want to do NAT. Public Start IP is the starting public IP address and Public End IP is the ending public IP address. If you have a dynamic IP, enter 0.0.0.0 as the Public Start IP.
- **Address Mapping List:** This displays the information about the Mapping addresses.

To add a mapping rule:

Step 1: Select the “Virtual Circuit” and Multiple for the “Number of IPs”. Then select the tab **IP Address Mapping** for the Virtual server (shown in Figure 4-18)..

Note:

IP Address Mapping is only available for VCs with Multiple IPs.

Step 2: Select the Rule index for the rule as shown in Figure 4-21.

Step 3: Select the rule type you want from the drop-down list.

Step 4: Enter the local and public IP addresses in the corresponding fields.

Step 5: After that, click **SAVE** to make the entry take effect.

Other configurations for the entries as shown in Figure 4-21:

Enter the index of assigned entry, click the **DELETE** button to delete the entry.

Click the **Back** button to return to the previous screen.

Click the **CANCEL** button to cancel the configuration which is made just now.

4.4.4 QoS

Choose “**Advanced Setup**→**QoS**”, you can configure the QoS in the next screen. QoS helps to prioritize data as it enters your router. By attaching special identification marks or headers to incoming packets, QoS determines which queue the packets enter, based priority. This is useful when there are certain types of data you want to give higher priority, such as voice data packets give higher priority than Web data packets. This option will provide better service of selected network traffic over various technologies.

The screenshot shows the 'Quality of Service' configuration page. The top navigation bar includes 'Advanced', 'Quick Start', 'Interface Setup', 'Advanced Setup' (highlighted), 'Access Management', 'Maintenance', 'Status', and 'Help'. Below this, sub-navigation tabs include 'Routing', 'NAT', 'QoS' (highlighted), 'VLAN', 'ADSL', and 'Firewall'. The main content area is titled 'Quality of Service' and is split into 'Rule' and 'Action' sections. In the 'Rule' section, 'QoS' is set to 'Activated', and a 'Summary' button is available. The 'Rule Index' is 1, and the rule is 'Active'. The 'Application' is a dropdown menu. 'Physical Ports' has a checked box for 'Enet1'. Below are fields for 'Destination MAC', 'IP', 'Mask', 'Port Range', 'Source MAC', 'IP', 'Mask', 'Port Range', 'Protocol ID', 'Vlan ID Range', and 'IPP/DS Field' (with 'DSCP' selected). The 'Action' section includes 'IPP/DS Field' (with 'DSCP' selected), 'IP Precedence Remarking', 'Type of Service Remarking', 'DSCP Remarking' (with a note '(Value Range: 0 ~ 63)'), '802.1p Remarking', and 'Queue #'. At the bottom, there are 'ADD', 'DELETE', and 'CANCEL' buttons.

Figure 4-22

- **QoS:** Select this option to Activated/Deactivated the IP QoS on different types (IP ToS and

DiffServ).

- **Summary:** Click the button to view the configurations of QoS.
- **Rule:** Configure the rules for QoS. If the traffic complies with the rule, then the Router will take the corresponding action to deal with it.
 - **Rule Index:** Select the index for the rule you want to configure.
 - **Active:** Activate the rule. The rule can take effect only when it is activated.
 - **Application:** Select the application that the rule aimed at.
 - **Physical Ports:** Select the port whose traffic flow are controlled by the rule.
 - **Destination MAC & IP & Mask & Port Range:** Enter the IP information about the Destination host for the rule.
 - **Source MAC & IP & Mask & Port Range:** Enter the IP information about the Source host for the rule.
 - **Protocol ID:** Select one among TCP/UDP, TCP, UDP or ICMP protocols for the application.
 - **Vlan ID Range:** Enter the Vlan range, then the rule will be effective to the selected Vlans.
 - **IPP/DS Field:** Select the type of the action to assign the priority.

When you select IPP/TOS, you can assign the priority via IP information. IP QoS function is intended to deliver guaranteed as well as differentiated Internet services by giving network resource and usage control to the Network operator.

- **IP Precedence Range:** Enter the IP precedence range that the Router takes to differentiate the traffic.
- **Type of Service:** Select the type of service that the Router takes to deal with the traffic.
- **802.1p:** Select the priority range for the rule.

When you select DSCP, you can assign the priority via DHCP (the header of IP group). It maps the IP group into corresponding service class.

- **DSCP Range:** Enter the DSCP range to differentiate the traffic.
- **802.1p:** Select the priority range for the rule.
- **Action:** Configure the action that the Router takes to deal with the traffic which accord with the rule.
 - **IPP/DS Field:** Select the type for the action.
 - **IP Precedence Remarking:** Select the number to remark the priority for IP precedence.
 - **Type of Service Remarking:** Select the type to remark the service.
 - **DSCP Remarking:** Enter the number to remark the DSCP priority.
 - **802.1p Remarking:** Select the type to remark the 802.1p priority.
 - **Queue:** Select the priority type for the action.

4.4.5 VLAN

Choose “**Advanced Setup→VLAN**”, you can activate the VLAN function in the next screen.

Virtual LAN (VLAN) is a group of devices on one or more LANs that are configured so that they

can communicate as if they were attached to the same wire, when in fact they are located on a number of different LAN segments. Because VLANs are based on logical instead of physical connections, it is very flexible for user/host management, bandwidth allocation and resource optimization. There are two types of VLAN as follows:

Port-Based VLAN: Each physical switch port is configured with an access list specifying membership in a set of VLANs.

ATM VLAN: Using LAN Emulation (LANE) protocol to map Ethernet packets into ATM cells and deliver them to their destination by converting an Ethernet MAC address into an ATM address.

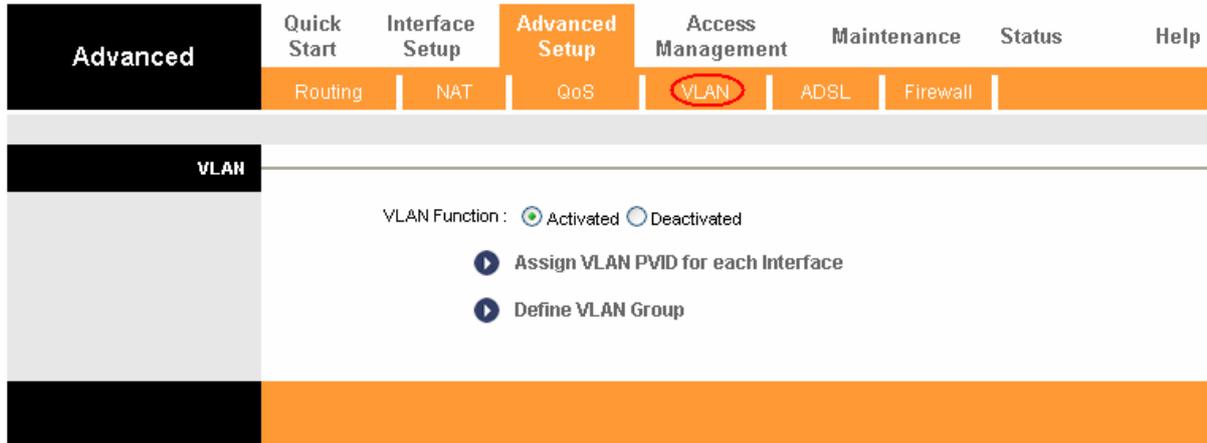


Figure 4-23

1. Assign VLAN PVID for each Interface

Click **Assign VLAN PVID for each Interface** in Figure 4-23, you can assign the PVID for each interface in the next screen (shown in Figure 4-24).

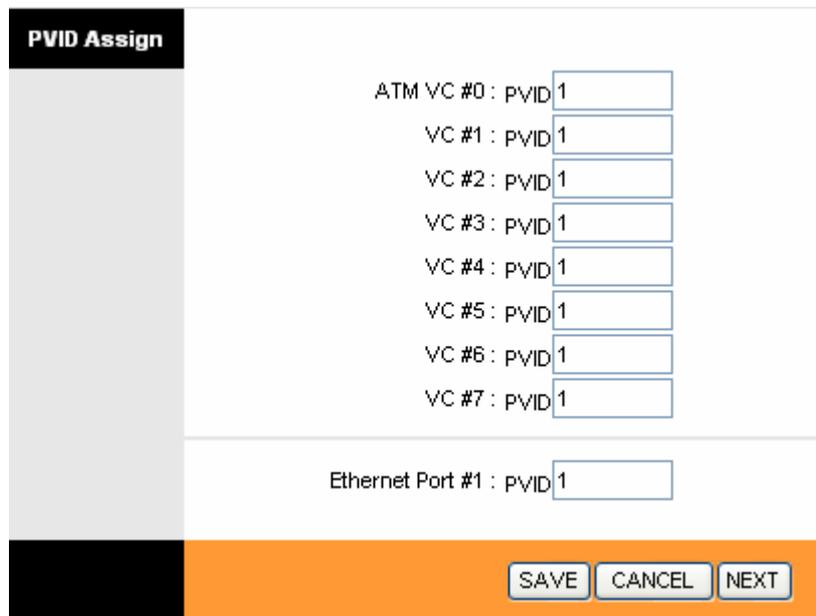


Figure 4-24

➤ **PVID:** Each physical port has a default VID called PVID (Port VID). PVID is assigned to untagged frames or priority tagged frames (frames with null (0) VID) received on this port.

2. Define VLAN Group

Click **Define VLAN Group** in Figure 4-23, you can define VLAN groups in the next screen (shown in Figure 4-25).

VLAN Group Setting

VLAN Index : 1

Active : Yes No

VLAN ID : 1 (Decimal)

ATM VCs :

Tagged	<input type="checkbox"/>						
Port #	<input checked="" type="checkbox"/>						
	0	1	2	3	4	5	6

Ethernet :

Tagged	<input type="checkbox"/>
Port #	<input checked="" type="checkbox"/>
	1

VLAN Group Summary

Group	Active	ID	VLAN Group Ports	VLAN Tagged Ports
1	Yes	1	e1_p0,p1_p2,p3,p4,p5,p6,p7	

p:pvc, e:ethernet

SAVE DELETE CANCEL

Figure 4-25

- **VLAN Index:** Select the VLAN index for this VC. You can specify 8 groups in maximum.
- **VLAN ID:** This indicates the VLAN group.
- **ATM VCs:** Select the ATM VCs as members of VLAN, and if you leave the Tagged blank, the tag in frames will be deleted when transmitted from the VC.
- **Ethernet:** Select the Ethernet port as a member of VLAN, and if you leave the Tagged blank, the tag in frames will be deleted when transmitted from the port.
- **VLAN Group Summary:** This displays the information about the VLAN Groups.

4.4.6 ADSL

Choose “**Advanced Setup→ADSL**”, you can select the ADSL Type and ADSL Mode in the next screen. The ADSL feature can be selected when you meet the physical connection problem. Please check the proper settings with your Internet service provider.

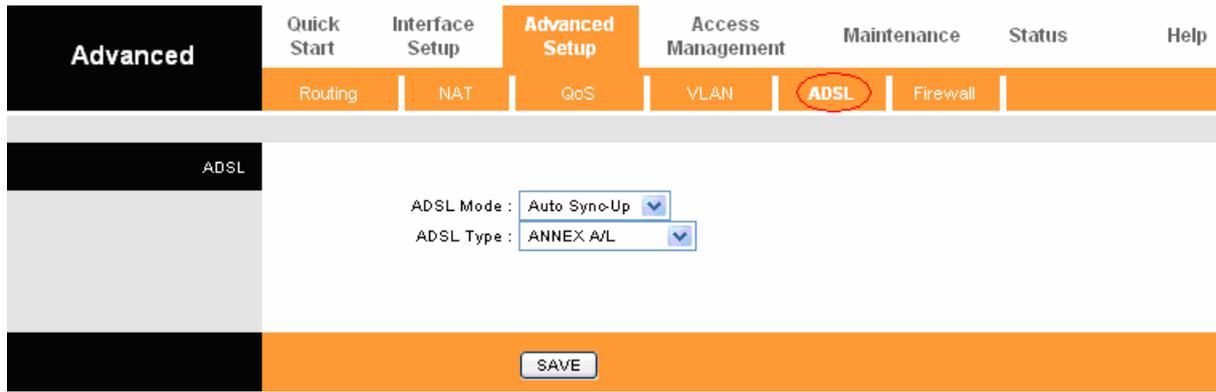


Figure 4-26

- **ADSL Mode:** Select the ADSL operation mode which your ADSL connection uses.
- **ADSL Type:** Select the ADSL operation type which your ADSL connection uses.

4.5 Access Management

Choose “Access Management”, you can see the next submenus:



Figure 4-27

Click any of them, and you will be able to configure the corresponding function.

4.5.1 ACL

Choose “Access Management→ACL”, you can see the next screen (shown in Figure 4-28). You can specify the client to access the ADSL Router once setting his IP as a Secure IP Address through selected applications.

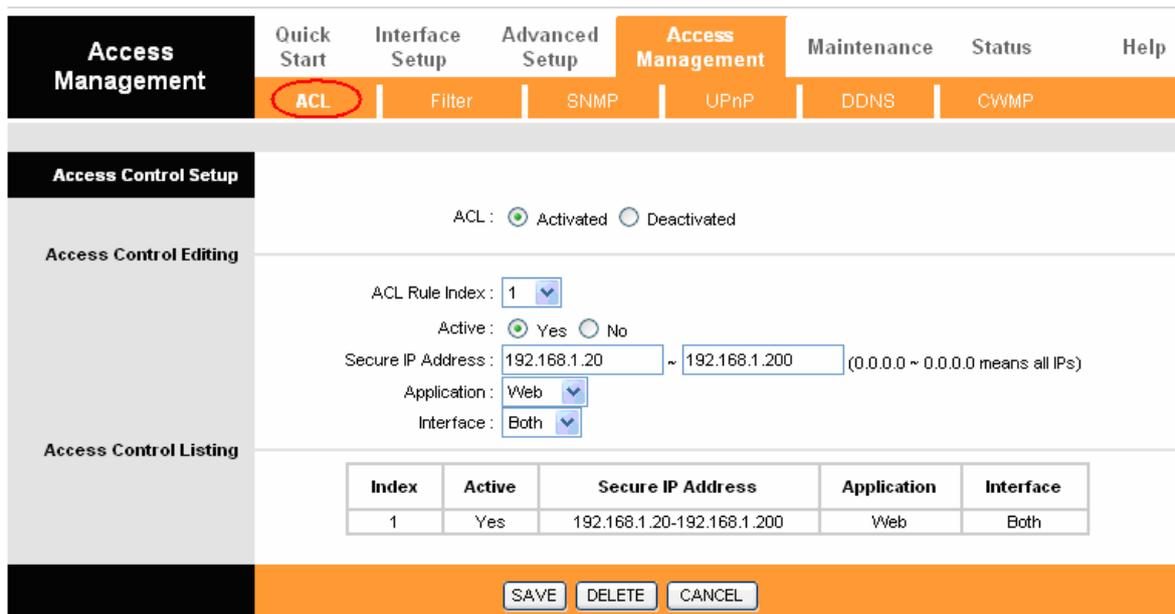


Figure 4-28

- **ACL:** If **Activated**, the IP addresses which are contained in the Access Control List can access to the Router. If **Deactivated**, all IP addresses can access to the Router.
- **ACL Rule Index:** Select the ACL rule index for the entry.
- **Active:** Enable the ACL rule.
- **Secure IP Address:** Select the IP addresses which are permitted to access to the Router remotely. With the default IP 0.0.0.0, any client would be allowed to remotely access the ADSL Router.
- **Application:** Select the application for the ACL rule, and then you can access the Router through it.
- **Interface:** Select the interface for access: LAN, WAN or Both.
- **Access Control of Listing:** This displays the information about the ACL Rules.

4.5.2 Filter

Choose “**Access Management**→**Filter**”, you can see the Filter screen (the default is IP/MAC Filter screen shown in). The filtering feature includes IP/MAC Filter, Application Filter, URL Filter. The feature makes it possible for administrators to control user's access to the Internet, protect the networks.

4.5.2.1. IP Filter

Select **IP/Mac Filter** as the Filter type, and select **IP** as the Rule type (shown in Figure 4-29), then you can configure the filter rules based on IP address. The filtering includes **Outgoing** and **Incoming**, the detailed descriptions are provided below.

Filter

Filter Type

Filter Type Selection: IP / MAC Filter

IP / MAC Filter Set Editing

IP / MAC Filter Set Index: 1
 Interface: PVC0
 Direction: Both

IP / MAC Filter Rule Editing

IP / MAC Filter Rule Index: 1
 Rule Type: IP
 Active: Yes No

Source IP Address: 192.168.1.7 (0.0.0.0 means Don't care)
 Subnet Mask: 255.255.255.255
 Port Number: 0 (0 means Don't care)

Destination IP Address: 0.0.0.0 (0.0.0.0 means Don't care)
 Subnet Mask: 0.0.0.0
 Port Number: 25 (0 means Don't care)

Protocol: TCP
 Rule Unmatched: Next

IP / MAC Filter Listing

IP / MAC Filter Set Index		Interface		Direction			
1		PVC0		Both			
#	Active	Src Address/Mask	Dest IP/Mask	Src Port	Dest Port	Protocol	Unmatched
1	Yes	192.168.1.7/ 255.255.255.255	0.0.0.0/ 0.0.0.0	0	25	TCP	Next
2	Yes	192.168.1.7/ 255.255.255.255	0.0.0.0/ 0.0.0.0	0	110	TCP	Forward
3	Yes	192.168.1.8/ 255.255.255.255	202.96.134.12/ 255.255.255.255	0	0	TCP	Forward
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-

SAVE DELETE CANCEL

Figure 4-29

- **Filter Type Selection:** Select the filter type for the next configuration.
- **IP/MAC Filter Set Index:** Select the Set index for the IP Filter entry. This index can match with six IP / MAC Filter Rule Indexes.
- **Interface:** Select the interface for the entry.
- **Direction:** Select the direction for this IP Filter rule. There are three filtering directions: Both, Incoming, Outgoing.

Note:

Selecting **Outgoing**, the filtering feature only allows some IP traffic from LAN to access to some specifically addresses. Selecting **Incoming**, the filtering feature only allows some IP traffic from WAN to access to some specifically addresses; Selecting **Both**, the IP traffic from LAN and WAN are both blocked. By default, all outgoing IP traffic from LAN is blocked, but some IP traffic can be allowed by setting up filters.

- **IP/MAC Filter Rule Index:** Select the Rule index for the IP Filter entry.

Note:

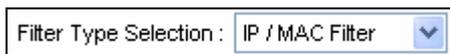
You should set the **IP/MAC Filter Set Index** and **IP/MAC Filter Rule Index** together to appoint the address (shown in the Filter List) for the IP Filter rule. For example, (1, 2), it means the rule will be shown in the row 2 for the matching with 1.

- **Rule Type:** For IP Filter, please select IP here.
- **Active:** Select “Yes” to make the rule to take effect.
- **Source IP Address:** Enter the source IP address for the rule. You can enter 0.0.0.0; it means that all IP addresses are controlled by the rule.
- **Subnet Mask:** Enter the Subnet Mask for the rule.
- **Port Number:** Enter the Port Number for the rule. You can enter 0, it means that all ports are controlled by the rule.
- **Protocol:** Select the protocol: **TCP**, **UDP** or **ICMP** for the filter rule.
- **Rule Unmatched:** If the current rule can not match, and you select **Forward**, the router will skip the rule and transmit directly. If you select **Next**, the router will find the next filter rule (show in Filter list) to match.
- **IP/MAC Filter Listing:** This displays the information about the IP Filter rules.

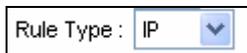
To add an IP Address filtering entry:

For example: If you desire to block E-mail received and sent by the IP address 192.168.1.7 on your local network; And wish to make the PCs with IP address 192.168.1.8 unable to visit the website of IP address 202.96.134.12, while other PCs have no limit. You can configure the rules as follows. Presume the rules are both aimed at the interface PVC0, and their indexes are (1, 1), (1, 2) and (1, 3).

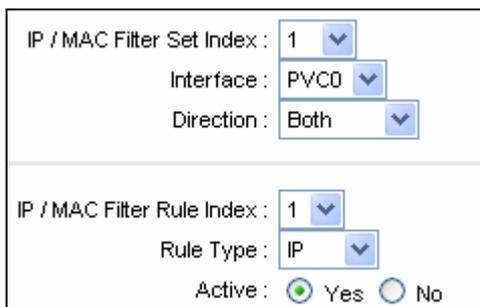
Step 1: Select the “IP/MAC Filter” as the Filer Type Selection (show in Figure 4-29).



Select the “IP” as the Rule Type on the Filter screen, then you can configure the specific rule for the example.



Step 2: Select the **IP/MAC Filter Set Index** and **IP/MAC Filter Rule Index** for the rule, then select the Interface “PVC0”, and select the Direction “Both” for the first rule.



Note:

If you want to make the rule take effect, please select **Yes** to active the rule.

Step 3: Enter the “Source IP Address”, “Destination IP Address”, “Subnet Mask” and “Port Number” in the corresponding field.

Source IP Address :	<input type="text" value="192.168.1.7"/>	(0.0.0.0 means Don't care)
Subnet Mask :	<input type="text" value="255.255.255.255"/>	
Port Number :	<input type="text" value="0"/>	(0 means Don't care)
Destination IP Address :	<input type="text" value="0.0.0.0"/>	(0.0.0.0 means Don't care)
Subnet Mask :	<input type="text" value="0.0.0.0"/>	
Port Number :	<input type="text" value="25"/>	(0 means Don't care)
Protocol :	<input type="text" value="TCP"/>	
Rule Unmatched :	<input type="text" value="Next"/>	

Step 4: Select the Protocol as “TCP” and select the Unmatched rule as “Next”.

Step 5: Finally, click the **SAVE** to save the entry.

Step 6: Go to Step 2 to configure the next two rules: Block E-mail received by the IP address 192.168.1.7 on your local network; Make the PC with IP address 192.168.1.8 unable to visit the website of IP address 202.96.134.12.

Note:

After you complete the IP filter rules for the example, the Filter list will show as follows. You can enter the **IP / MAC Filter Set Index** to view the information about the rule.

#	Active	Src Address/Mask	Dest IP/Mask	Src Port	Dest Port	Protocol	Unmatched
1	Yes	192.168.1.7/ 255.255.255.255	0.0.0.0/ 0.0.0.0	0	25	TCP	Next
2	Yes	192.168.1.7/ 255.255.255.255	0.0.0.0/ 0.0.0.0	0	110	TCP	Forward
3	Yes	192.168.1.8/ 255.255.255.255	202.96.134.12/ 255.255.255.255	0	0	TCP	Forward

Other configurations for the entries as shown in Figure 4-29:

Enter the **IP / MAC Filter Set Index** and **IP/MAC Filter Rule Index** to view or modify the entry.

Enter the **IP / MAC Filter Set Index** and **IP/MAC Filter Rule Index** to locate the specific rule, and then click the **DELETE** button to delete the entry.

4.5.2.2. MAC Filter

Select **IP/Mac Filter** as the Filter type, and select **MAC** as the Rule type (shown in Figure 4-30), then you can configure the filter rules based on MAC address.

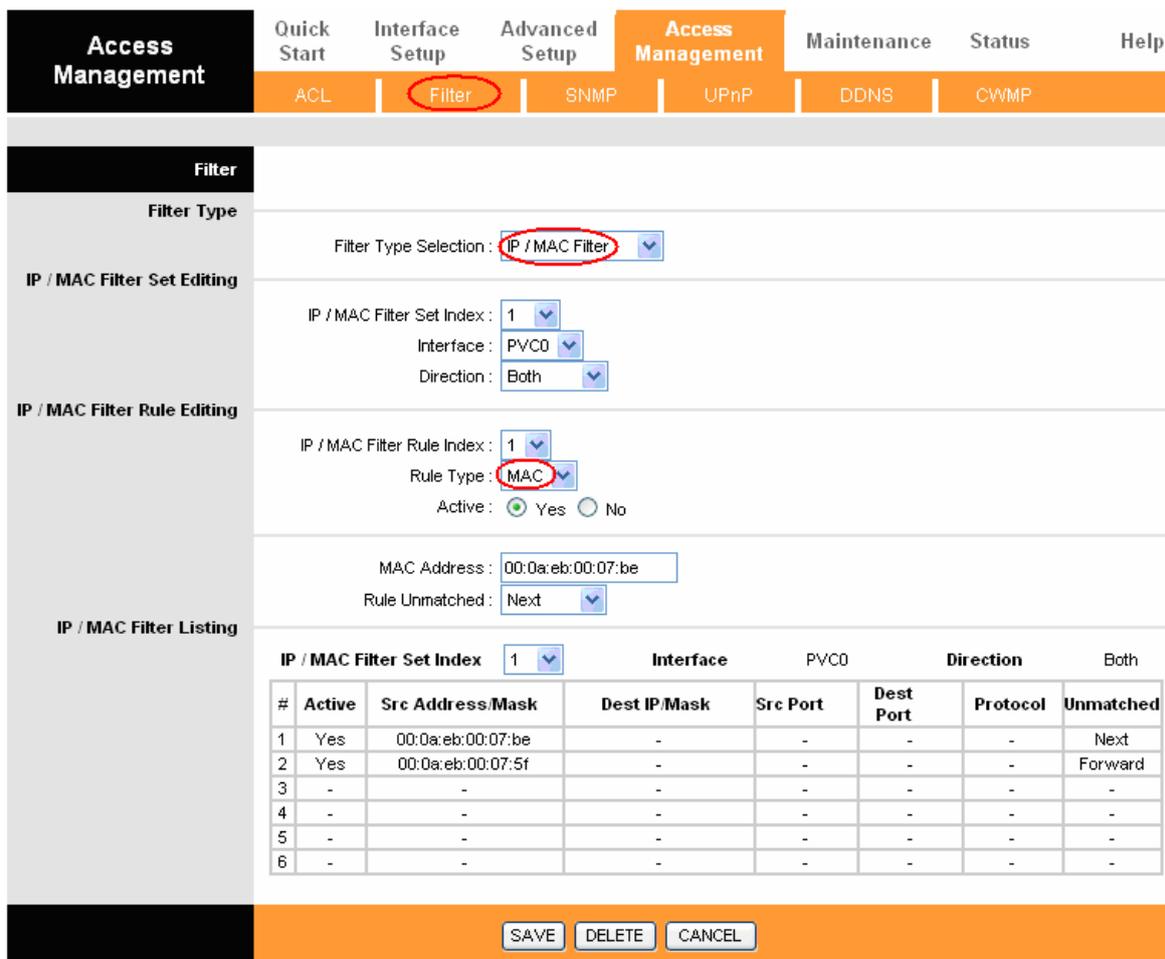


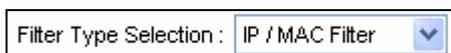
Figure 4-30

- **Rule Type:** Select MAC for the MAC Filter rule.
- **Active:** Select “Yes” to make the rule to take effect.
- **MAC Address:** Enter the MAC address for the rule.
- **Rule Unmatched:** If the current rule can not match, and you select **Forward**, the router will skip the rule and transmit directly. If you select **Next**, the router will find the next filter rule (show in Filter list) to match.
- **IP/MAC Filter Listing:** This displays the information about the MAC Filter rules.

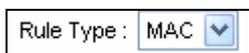
To add a MAC Address filtering entry:

For example: If you want to block the PCs with MAC addresses 00-0A-EB-00-07-BE and 00-0A-EB-00-07-5F to access the Internet, you can configure as follows. Presume the rules are both aimed at the interface PVC0, and their indexes are (1, 1) and (1, 2).

Step 1: Select the “IP/MAC Filter” as the Filer Type Selection:



Select the “MAC” as the Rule Type on the Filter screen (show in Figure 4-30).



, Then you can configure the specific rule for the example.

Step 2: Select the **IP/MAC Filter Set Index** and **IP/MAC Filter Rule Index** for the rule, then

select the Interface “PVC0”, and select the Direction “Outgoing” for the first rule.

Note:

If you want to make the rule take effect, please select **Yes** to activate the rule.

Step 3: Enter the “MAC Address” and select the Unmatched rule as “Next”.

Step 4: Finally, click the **SAVE** to save the entry.

Step 5: Go to Step 2 to configure the next rule: Block the PC with MAC address 00-0A-EB-00-07-5F to access the Internet.

Note:

After you complete the MAC filter rules for the example, the Filter list will show as follows. You can enter the **IP / MAC Filter Set Index** to view the information about the rule.

#	Active	Src Address/Mask	Dest IP/Mask	Src Port	Dest Port	Protocol	Unmatched
1	Yes	00:0a:eb:00:07:be	-	-	-	-	Next
2	Yes	00:0a:eb:00:07:5f	-	-	-	-	Forward

Other configurations for the entries as shown in Figure 4-29:

Enter the **IP / MAC Filter Set Index** and **IP/MAC Filter Rule Index** to view or modify the entry.

Enter the **IP / MAC Filter Set Index** and **IP/MAC Filter Rule Index** to locate the specific rule, and then click the **DELETE** button to delete the entry.

4.5.2.3. Application Filter

Select **Application Filter** as the Filter type (shown in Figure 4-31), then you can configure the filter rules based on application.

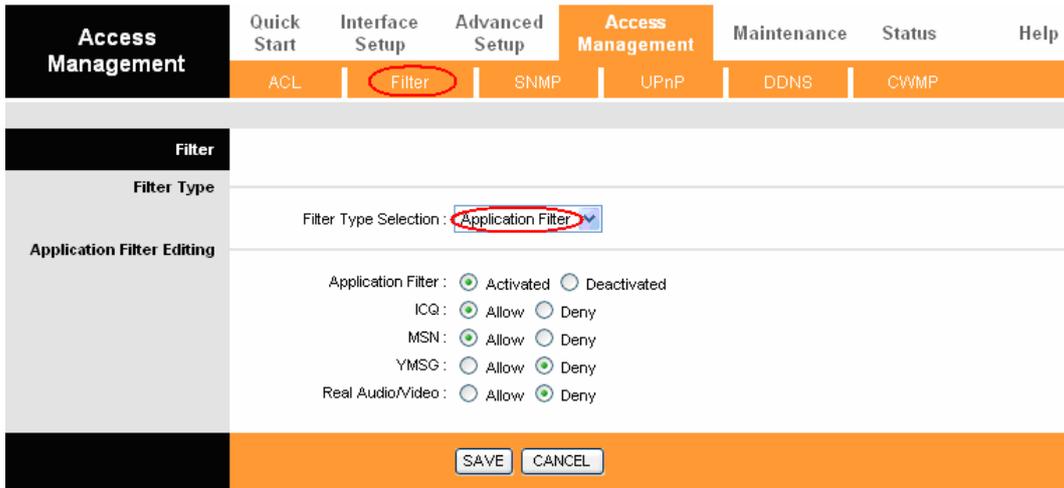


Figure 4-31

- **Filter Type Selection:** Select the Application Filter for the next configuration.
- **Application Filter:** Activate or deactivate the function.
- **ICQ & MSN & YMSG & Real Audio/Video:** Select **Allow** or **Deny** for these applications. If you select Allow, the Router will accept the application; if you select Deny, the Router will forbid the application.

4.5.2.4. URL Filter

Select **URL Filter** as the Filter type (shown in Figure 4-32), then you can configure the filter rules based on URL.

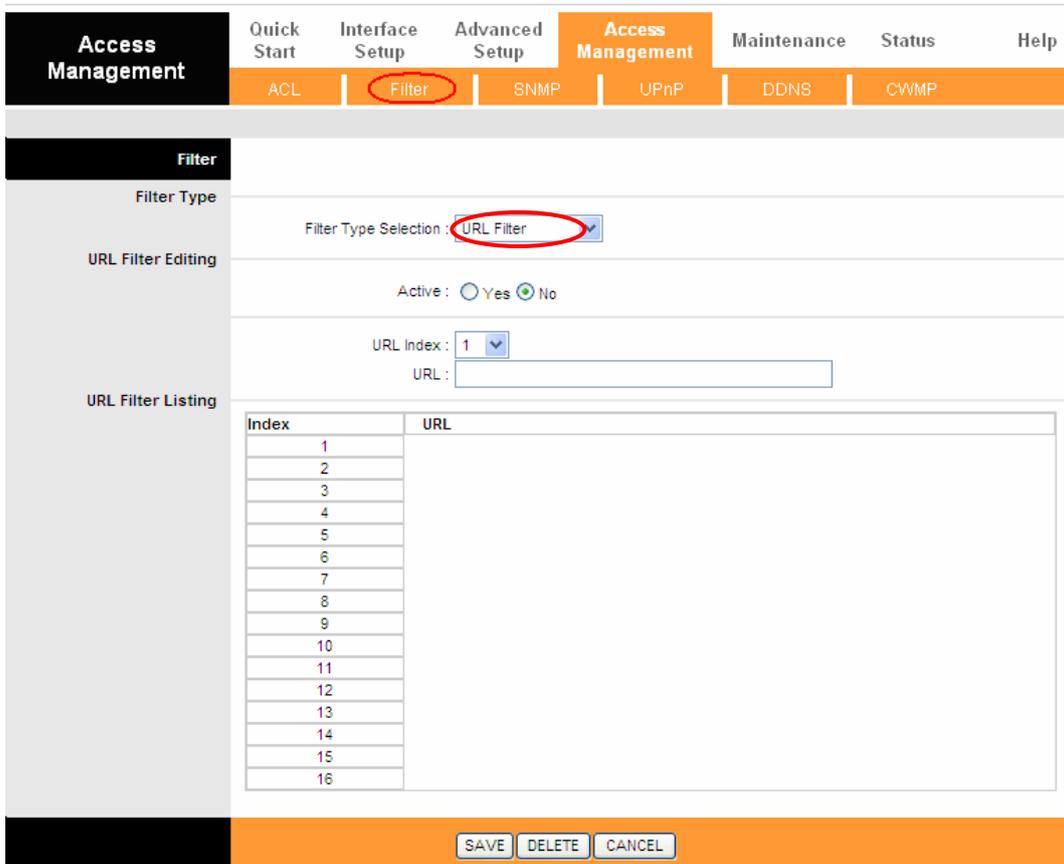


Figure 4-32

- **Filter Type Selection:** Select the URL Filter for the next configuration.
- **Active:** Select “Yes” to make the rule to take effect.
- **URL Index:** Select the index for the URL Filter entry.
- **URL:** Enter the URL for this URL Filter.
- **URL Filter Listing:** This displays the information about the URL Filter rules.

To add a URL filter entry:

For example: If you want to forbid the user to access the website: www.yahoo.com. Presume the rule is aimed at the interface PVC0, and its index is “1”.

Step 1: Select the “URL Filter” as the Filer Type Selection (show in Figure 4-32).

Step 2: Select the Index for the rule, and then enter the website in the URL field.

Step 3: Finally, Select Yes to activate the rule, and then click the **SAVE** to save the entry.

Other configurations for the entries as shown in Figure 4-29:

Enter the **URL Index** to view or modify the entry.

Enter the **URL Index** to locate the specific rule, and then click the **DELETE** button to delete the entry.

4.5.3 SNMP

Choose “**Access Management**→**SNMP**”, you can see the SNMP screen. The Simple Network Management Protocol (SNMP) is used for exchanging information between network devices.

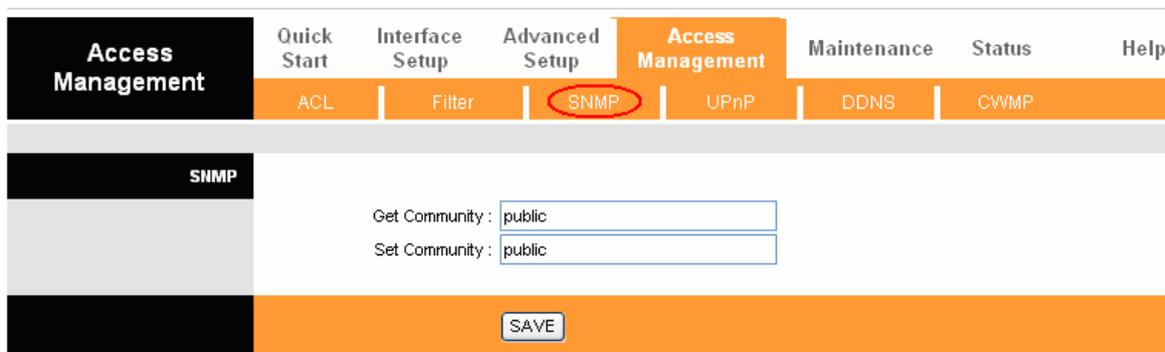


Figure 4-33

- **Get Community:** Select to set the password for the incoming Get and Get next requests from the management station.
- **Set Community:** Select to set the password for incoming Set requests from the management station.

4.5.4 UPnP

Choose “**Access Management**→**UPnP**”, you can configure the UPnP in the screen (shown in Figure 4-34).

UPnP (Universal Plug and Play) is a distributed, open networking standard that uses TCP/IP for simple peer-to-peer network connectivity between devices. An UPnP device can dynamically join a network, obtain an IP address, convey its capabilities and learn about other devices on the

network. In turn, a device can leave a network smoothly and automatically when it is no longer in use. UPnP broadcasts are only allowed on the LAN.



Figure 4-34

- **UPnP:** Activate or Deactivate the UPnP function. Only when the function is activated, can the UPnP take effect.
- **Auto-Configure:** If you activate the function, then the UPnP network devices can automatically configure network addressing, announce their presence in the network to other UPnP devices and enable exchange of simple product and service descriptions.

4.5.5 DDNS

Choose “**Access Management→DDNS**”, you can configure the DDNS function in the screen (shown in Figure 4-35).

The router offers a Dynamic Domain Name System (**DDNS**) feature. The feature lets you use a static host name with a dynamic IP address. User should type the host name, user name and password assigned to your ADSL Router by your Dynamic DNS provider. User also can decide to turn on DYNDNS Wildcard or not.

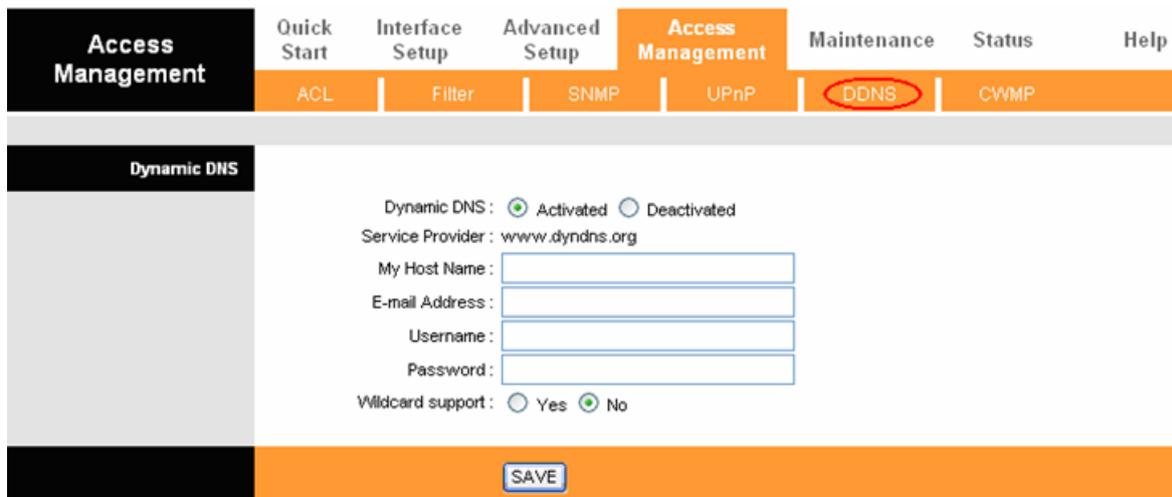


Figure 4-35

- **Dynamic DNS:** Activate the DDNS function or not.
- **Service Provider:** This field displays the service provider of DDNS.
- **My Host Name:** Enter your host name here.

- **E-mail Address:** Enter your E-mail address here.
- **Username & Password:** Type the “User Name” and “Password” for your DDNS account.
- **Wildcard support:** Select the option to use Wildcard function

4.5.6 CWMP

Choose “**Access Management**→**CWMP**”, you can configure the CWMP function in the screen (shown in Figure 4-36).

The router offers CWMP feature. The function supports TR-069 protocol which collects information, diagnoses the devices and configures the devices automatically via ACS (Auto-Configuration Server).

Figure 4-36

- **CWMP:** Select activate the CWMP function.
- **URL:** Enter the website of ACS which is provided by your ISP.
- **User Name/Password:** Enter the User Name and password to login the ACS server.
- **Path:** Enter the path that connects to the ACS server.
- **Port:** Enter the port that connects to the ACS server.
- **User Name/Password:** Enter the User Name and Password that provided the ACS server to login the router.
- **Periodic Inform:** Activate or deactivate the function. If Activated, the information will be informed to ACS server periodically.
- **Interval:** Enter the interval time here.

4.6 Maintenance

Choose “**Maintenance**”, you can see the next submenus:



Figure 4-37

Click any of them, and you will be able to configure the corresponding function.

4.6.1 Administration

Choose “**Maintenance→Administration**”, you can set new password for admin in the screen (shown in Figure 4-38).

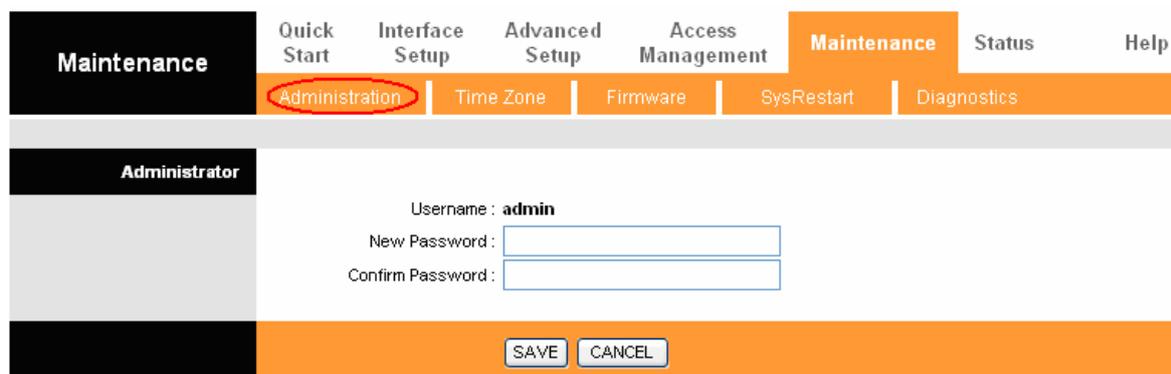


Figure 4-38

Note:

- 1) There is only one account that can access Web-Management interface. The default account is "admin", and the password is "admin". Admin has read/write access privilege.
- 2) When you change the password, you should enter the new password twice, and then click **SAVE** to make the new password take effect.

4.6.2 Time Zone

Choose “**Maintenance→Time Zone**”, you can configure the system time in the screen (shown in Figure 4-38).

The system time is the time used by the device for scheduling services. There are three methods to configure the time. You can manually set the time or connect to a NTP (Network Time Protocol) server. If a NTP server is set, you will only need to set the time zone. If you manually set the time, you may also set Daylight Saving dates and the system time will automatically adjust on those dates.

1. NTP Server automatically

Select **NTP Server automatically** as the Synchronize time, you only need to set the time zone.

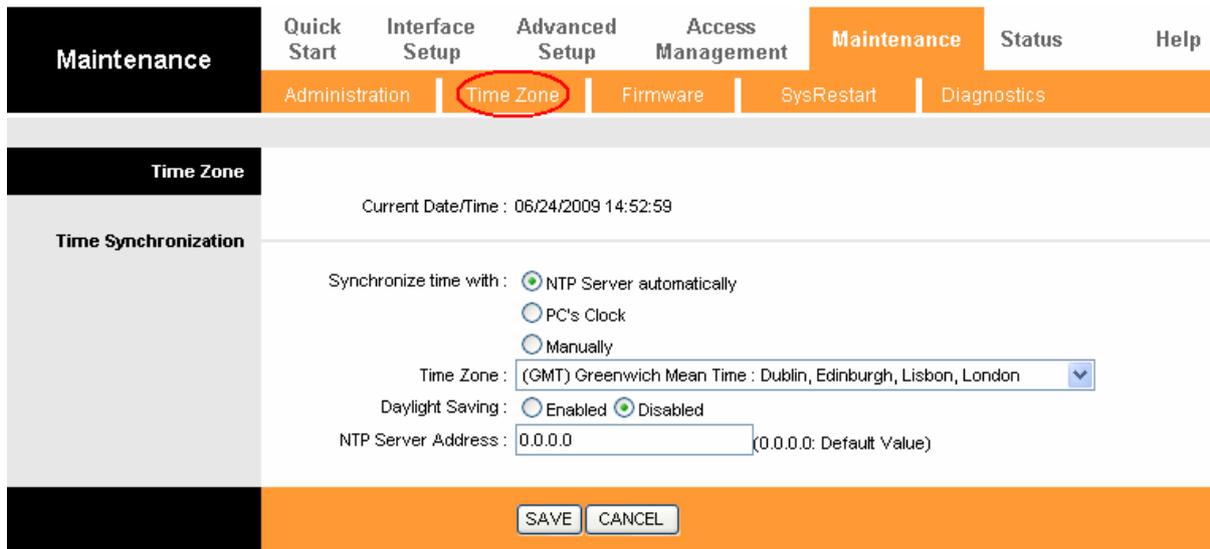


Figure 4-39

Note:

The ADSL Router built-in some NTP Servers, when the Router connects to the Internet, the Router will get the system time automatically from the NTP Server. You can also configure the NTP Server address automatically, and then the Router will get the time from the specific Server firstly.

2. PC's Clock

Select **PC's Clock** as the Synchronize time, you don't need to set any items.

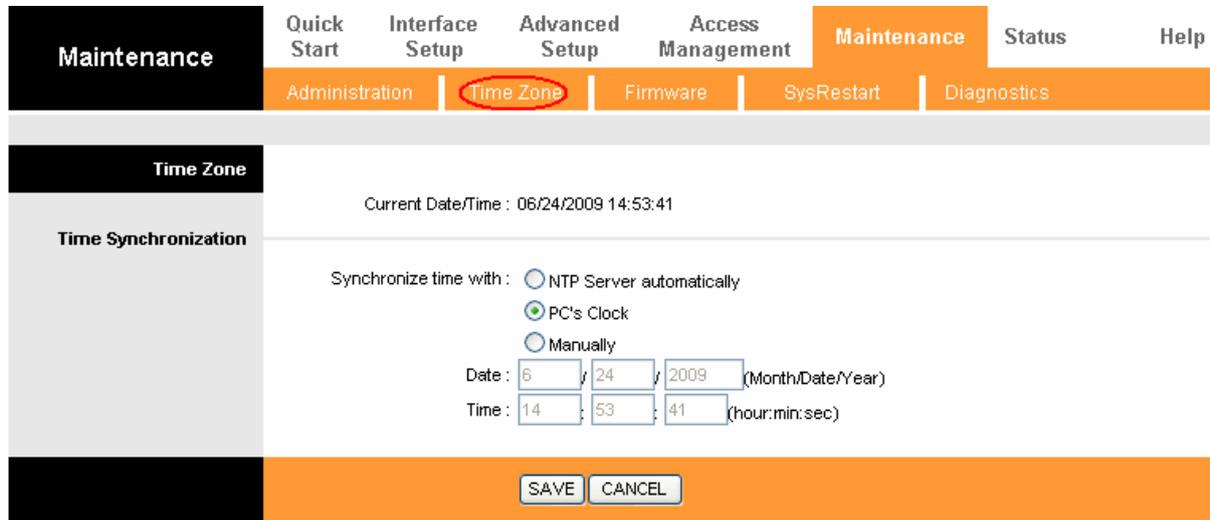


Figure 4-40

3. Manually

Select **Manually** as the Synchronize time, you need to set the date and time corresponding to the current time.

Maintenance	Quick Start	Interface Setup	Advanced Setup	Access Management	Maintenance	Status	Help
	Administration	Time Zone	Firmware	SysRestart	Diagnostics		

Time Zone

Current Date/Time : 06/24/2009 14:54:09

Time Synchronization

Synchronize time with : NTP Server automatically
 PC's Clock
 Manually

Date : / / (Month/Date/Year)
Time : : : (hour:min:sec)

Figure 4-41

4.6.3 Firmware

Choose “**Maintenance**→**Firmware**”, you can upgrade the firmware of the Router in the screen (shown in Figure 4-42). Make sure the firmware or romfile you want to use is on the local hard drive of the computer. Click **Browse** to find the local hard drive and locate the firmware or romfile to be used for upgrade.

Maintenance	Quick Start	Interface Setup	Advanced Setup	Access Management	Maintenance	Status	Help
	Administration	Time Zone	Firmware	SysRestart	Diagnostics		

Firmware/Romfile Upgrade

Current Firmware Version : 4.0.0 Build 090508 Rel.23545

New Firmware Location :

New Romfile Location :

Romfile Backup :

Status :

 It might take several minutes, don't power off it during upgrading. Device will restart after the upgrade.

Figure 4-42

To upgrade the router's firmware, follow these instructions below:

Step 1: Download a more recent firmware upgrade file from the TP-LINK website (www.tp-link.com).

Step 2: Type the path and file name of the update file into the “New Firmware Location” field. Or click the **Browse** button to locate the update file.

Step 3: Click the **UPGRADE** button.

 **Note:**

- 1) New firmware versions are posted at www.tp-link.com and can be downloaded for free. If

the router is not experiencing difficulties, there is no need to download a more recent firmware version, unless the version has a new feature that you want to use.

- 2) When you upgrade the router's firmware, you may lose its current configurations, so please back up the router's current settings before you upgrade its firmware.
- 3) Do not turn off the router or press the Reset button while the firmware is being upgraded.
- 4) The router will reboot after the upgrading has been finished.

To back up the Router's current settings:

Step 1: Click the **ROMFILE SAVE** button (shown in Figure 4-42), click **Save** button in the next screen (shown in Figure 4-43) to proceed.

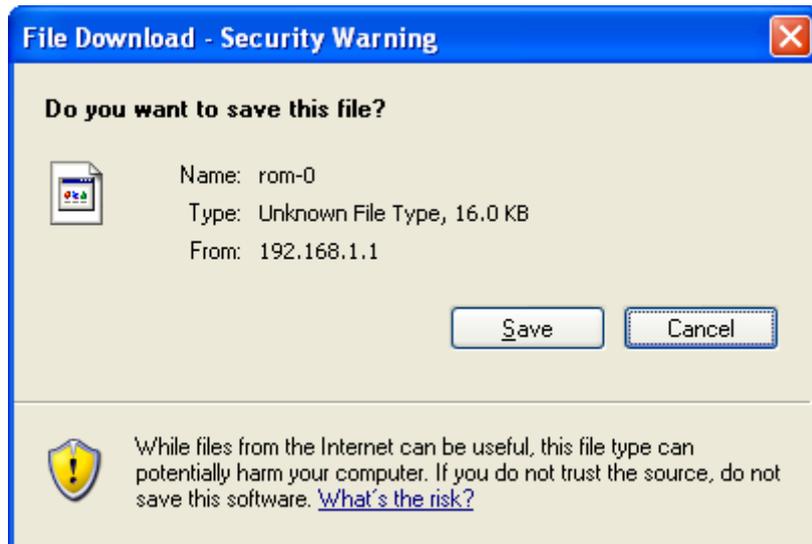


Figure 4-43

Step 2: Save the file as the appointed file (shown in Figure 4-44).

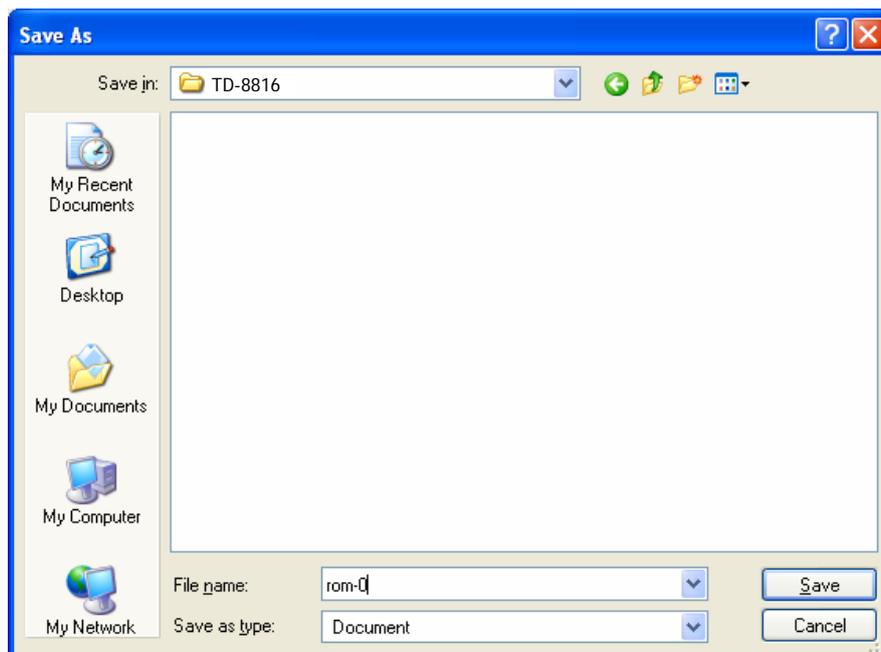


Figure 4-44

To restore the Router's settings:

Step 1: Click the **Browse** button to locate the update file for the device, or enter the exact path in “New Romfile Location” field.

Step 2: Click the **UPGRADE** button to complete.

4.6.4 System Restart

Choose “**Maintenance**→**System Restart**”, you can select to restart the device with current settings or restore to factory default settings in the screen (shown in Figure 4-45).

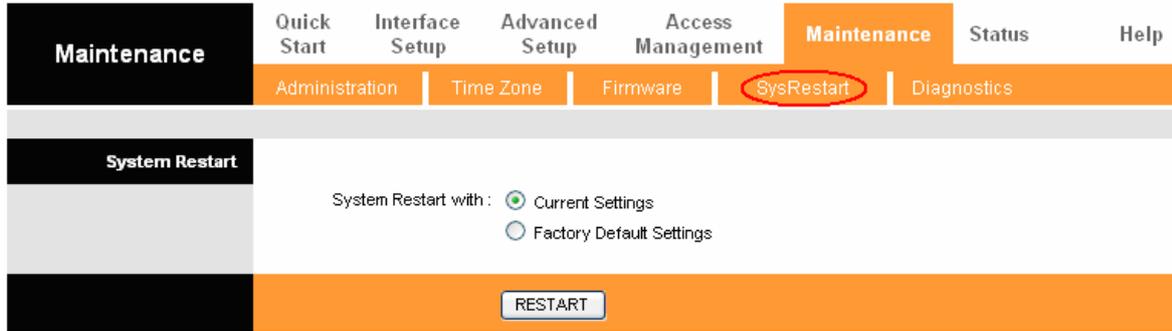


Figure 4-45

4.6.5 Diagnostic

Choose “**Maintenance**→**Diagnostic**”, you can view the test results for the connectivity of the physical layer and protocol layer for both LAN and WAN sides in the screen (shown in Figure 4-46).

The screenshot displays the web interface of the TD-8816 ADSL2+ Modem Router. At the top, a navigation menu includes 'Quick Start', 'Interface Setup', 'Advanced Setup', 'Access Management', 'Maintenance' (highlighted), 'Status', and 'Help'. Below this, a secondary menu shows 'Administration', 'Time Zone', 'Firmware', 'SysRestart', and 'Diagnostics' (highlighted). The main content area is divided into two sections: 'Diagnostic Test' and 'Ping Tool'. The 'Diagnostic Test' section shows a 'Virtual Circuit' dropdown set to 'PVC0' and a list of test results:

>> Testing Ethernet LAN connection ...	PASS
>> Testing ADSL Synchronization .	FAIL
>> Testing ATM OAM F5 segment ping ...	SKIPPED
>> Testing ATM OAM F5 end to end ping ...	SKIPPED
>> Ping Primary Domain Name Server .	SKIPPED
>> Ping www.yahoo.com ...	SKIPPED

The 'Ping Tool' section features an input field for 'IP Address/Domain Name:' and a 'Ping' button. Below the input field is a scrollable text area containing the text '- Info -'.

Figure 4-46

4.7 Help

Choose “**Help**”, you can view the help information for configuration of any function.

Help	Quick Start	Interface Setup	Advanced Setup	Access Management	Maintenance	Status	Help
Quick Start			<ul style="list-style-type: none"> ▶ Quick Start 				
Interface Setup			<ul style="list-style-type: none"> ▶ Internet Settings ▶ LAN Settings 				
Advanced Setup			<ul style="list-style-type: none"> ▶ Firewall ▶ Routing ▶ NAT ▶ QoS ▶ VLAN ▶ ADSL 				
Access Management			<ul style="list-style-type: none"> ▶ ACL ▶ IP Filter ▶ SNMP ▶ UPnP ▶ DDNS 				
Maintenance			<ul style="list-style-type: none"> ▶ Administration ▶ Time Zone ▶ Firmware ▶ SysRestart ▶ Diagnostics 				
Status			<ul style="list-style-type: none"> ▶ Device Info ▶ System Log ▶ Statistics 				

Figure 4-47

Note:

Click the tab, and you will be able to get the corresponding information.

Appendix A: Specification

General	
Standards and Protocols	ANSI T1.413, ITU G.992.1, ITU G.992.2, ITU G.992.3, ITU G.992.5 IEEE 802.3, IEEE 802.3u, TCP/IP, PPPoA , PPPoE, SNTP, HTTP, DHCP, ICMP, NAT,CWMP
Safety & Emission	FCC、CE
Ports	1 10/100M Auto-Negotiation RJ45 port (Auto MDI/MDIX) 1 RJ11 port
LEDs	Power, LAN, ADSL, Internet
Network Medium	10Base-T: UTP category 3, 4, 5 cable 100Base-TX: UTP category-5 Max line length: 6.5Km
Data Rates	Downstream: Up to 24Mbps Upstream: Up to 3.5Mbps (With Annex M enabled)
System Requirement	Internet Explorer 5.0 or later, Netscape Navigator 6.0 or later Win 9x/ME/2000/XP/Vista/7
Physical and Environment	
Working Temperature	0°C ~ 40°C
Working Humidity	10% ~ 90% RH (non-condensing)
Storage Temperature	-40°C ~ 70°C
Storage Humidity	5% ~ 90% RH (non-condensing)