

CT-500S

ADSL Router

User's Manual

Version F1.0 8/19/2002



Preface

This manual is written for the following software version: AD6489 0814. It is written for Web management. It is designed to provide information to network administrators. It covers the installation, operation and applications of the ADSL router.

Version Notes

This software was upgraded from software Version 0725, the following default settings have been added:

1. For PPPoA (VC mux) PVC 8/65
2. For transparent bridging PVC 8/35
3. For RFC 1483 Routing PVC 87/80, WAN IP 172.16.1.1
4. DHCP (DNS 200.72.1.5)

Warning

- Before servicing or disassembling this equipment, always disconnect all power and telephone lines from the device.
- Use an appropriate power supply and a UL Listed telephone line cord. Specification of the power supply is clearly stated in Appendix A - Specifications.

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Part 1: Overview

Chapter 1 Introduction

This chapter introduces the ADSL Router. It includes a product overview, description of the products features and applications, and explains the functions of the Front panel LED indicators.

1.1 Product Overview

The ADSL Router utilizes an ADI chipset to meet the specific needs of multiple users at small/home offices and remote /branch offices. It provides one 10/100 BaseT Ethernet port to connect to a LAN. It can access the Internet; Corporate LAN; or Video on demand, over one ordinary telephone line; at speeds of up to eight Mbps. In addition, it supports up to eight virtual concurrent-connections, to multiple destinations. The ADSL Router has full routing capabilities to segment/route IP protocol, and it is capable of bridging other protocols. The ADSL Router has the speed and stability to be used for multi-media applications; and it can easily be configured and monitored from a web-browser (Internet Explorer, Netscape).

1.2 Features

The ADSL Router is compact and high performance standalone unit. It supports or provides:

- One 10/100 Base-T Ethernet port for LAN connection
- Bridge/Routing function
- Auto-negotiation rate adaptation
- AAL5 for ATM over ADSL
- UBR/CBR ATM services
- VC-based and LLC multiplexing
- Up to 8 VCs
- Embedded SNMP agent and RFC MIB II
- Web-based management
- OAM F5
- Static route/RIP/RIP v2 routing function
- Dynamic IP assignment and Network Address Translation

1.3 Application

Figure 1-1 shows a possible application of the router.

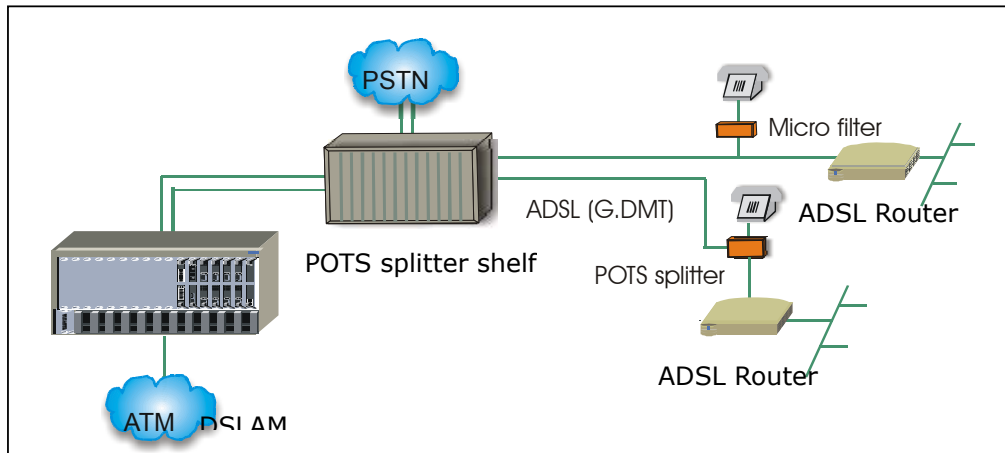


Figure 1-1 Application

1.4 Front Panel LED Indicators

LED Indicator	Color	Mode	Function
Power	Green	On	Power is supplied to the router
		Off	Power is not supplied
Alert	Red	Off	Normal operating status
		On	The ADSL link is not established
LAN Link	Green	On	An Ethernet link is established
		Off	An Ethernet link is not established
		Flash	Activity over the Ethernet link
ADSL Link	Green	Flash	ADSL link is training
		On	An ADSL link is established
		Off	ADSL link not established
ADSL Act	Green	Flash	Receiving or transmitting data over the ADSL link
		Off	Not receiving or transmitting data over the ADSL link

Chapter 2 Hardware Installation

2.1 Preparing for Installation

Installation requires the following equipment:

A VT-100 compatible terminal –

This terminal is essential to perform the initial configuration of the router. Normally this is a terminal with a VT-100 emulation program, such as Telix.

An RS232 straight-through cable to connect to the Console Port-

An RS232, DB9-to-DB9 straight-through cable is required to connect the terminal to the device.

An AC power adapter cord to connect to the Power jack-

A suitable AC-to-AC power adapter cord is shipped with the device. It is used to provide the necessary power for the device's operation.

RJ45 10/100BaseT Ethernet connector cable to connect to the LAN port:

An RJ45 LAN connector cable is used to connect the router to the Local Area Network (LAN). A cross-over cable is used to connect the router to a PC, and a straight-through cable is used to connect to a hub. The pin assignments of the RJ45 connector are listed in Appendix B.

An RJ11 connector cable to connect to the LINE port–

An RJ11 connector cable is used to connect the router to the telephone line from the telephone company. Refer to Appendix B for the pin assignments of the RJ11 connector.

Clip-on stands

Your router is shipped with two clip-on stands. It is recommended that you affix these to your router and operate the router in a vertical-upright position, in order to optimize the performance of your router.

Optional POTS splitter or micro filter

Pots splitters or micro-filters are available if required.

2.2 Installation

Figure 2-2 illustrates connections to the router backplane connectors.

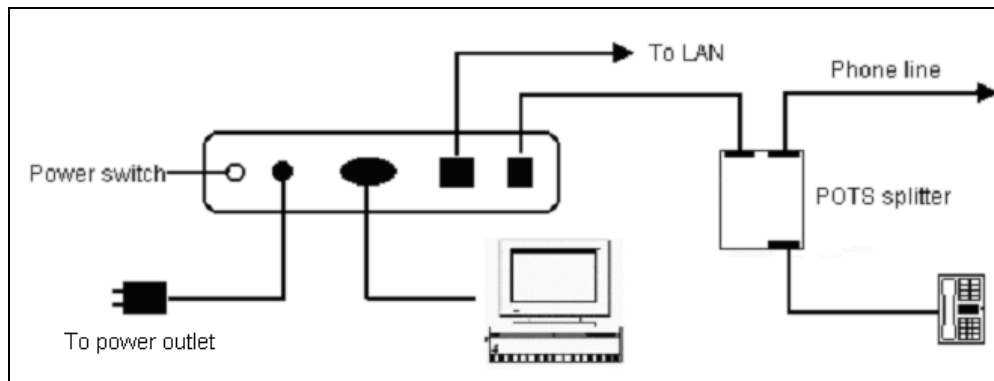


Figure 2-1 Installation

Caution: Always disconnect all telephone lines from the telephone wall-outlet before servicing or disassembling this device.

- STEP 1** Connect the power adapter to the **power jack** of the device, and then plug the power adapter into the wall outlet.
- STEP 2** Connect the **LAN port** to a PC with a cross-over RJ45 cable, or to a hub with a straight-through RJ45 connector cable.
- STEP 3** Connect the **Console port** to a VT-100 compatible terminal with an RS232 straight-through cable.
- STEP 4** Connect the **LINE port** to a POTS splitter or micro filter with an RJ11 connector cable.
- STEP 5** Affix the two clip-on stands to the bottom of the router and place the router in an up-right position (this is strongly recommended in order to optimize the router's performance)
- STEP 6** Turn on the power switch on the rear panel.

Note: If the device fails to power on, or it malfunctions, first verify that the power supply is correctly connected, and then power it on again.

Part 2: Console Management

Chapter 3 Access by Console

This chapter will introduce console management, if you wish to use the web to manage your device you should see Part 3 of this manual. The web section can also be referenced for more complete explanation of some parameters and procedures. In the first section of this Chapter, the conventions used by the console and by this manual to explain the console will be discussed. The second part of the chapter will explain how to establish access by console.

3.1 Conventions

Manual Conventions

1. Characters inside a box indicate that they are keys that need to be pressed. For example, `Enter`, represents "push the Enter key."
2. Text highlighted in gray, represents text that you may see on the screen. For example, `Press Y or N`
3. The user interface has a multi-level menu structure, the following style will be used to indicate menu locations: `1.Basic> 4. LAN IP` This example shows that the **LAN IP** screen can be accessed from the main menu by entering the following keys: `1` `Enter` ; and then `4` `Enter`.
4. Numbers inside round brackets indicate a menu location. For example `(1.4)`, indicates `1.Basic> 4. LAN IP`.

CLI Interface Conventions

1. Values in round brackets are default or previously entered values. For example `(Enabled)`, represents a default value or previously entered value of "enabled".

2. Values in square brackets represent the range of permissible values. For example, [8~35], indicates that a value from 8 to 35 may be entered.

Pop-up messages

You are likely to see the following pop-up messages (messages are highlighted)

Mandatory, Enter Valid Value

This message indicates that a parameter must be entered.

Optional, Press Return To Skip

This message indicates that it is optional to enter a parameter.

Do You Wish To Submit These Values [Y/N] :

This message indicates that the entered parameters will be submitted.

3.2 Console Access

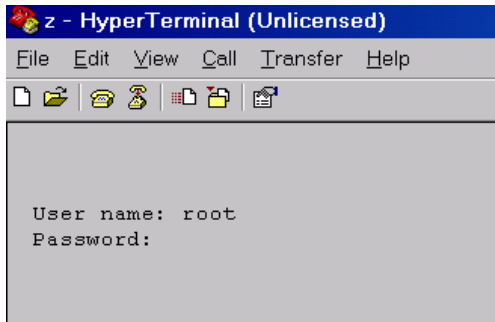
For access by console, the console PC should be installed with a standard VT-100 emulation program, such as HyperTerminal 5 or Telix. The following steps explain how to establish the console session.

STEP 1 Start a standard VT-100 program such as HyperTerminal (Ver. 5 is recommended), or Telix in the local terminal; and select an open com port.

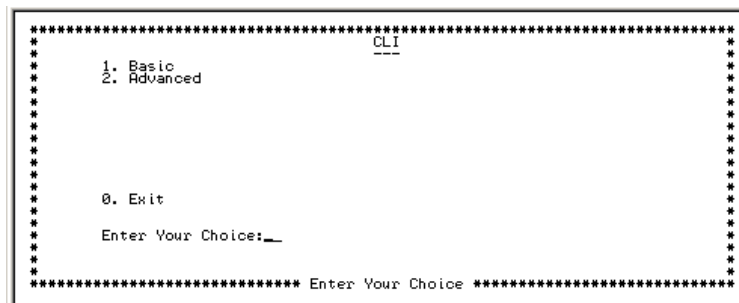
STEP 2 Enter the following port settings:

- Baud rate: 9600
- Data bits: 8
- Parity: none
- Stop bit: 1
- Flow control: none

STEP 3 You will be prompted to enter a User name and Password, enter **root** for User name and **12345** for the Password.



STEP 4 The first screen of the console interface will now display.



3.3 Saving Parameters/ Rebooting

After changing parameters, in order to ensure that they are retained after rebooting or re-powering the router, you must save the parameters to flash memory. These procedures can be performed by completing the following steps:

1. Enter the **Basic** menu, select **6. Save & reboot**
2. Press **Y** to save, or **N** to not save at the prompt: **Do you wish to save (Y/N)?**
3. Press **Y** to reboot, or **N** to not reboot at the prompt: **Do you wish to reboot (Y/N)?**

Part 3: Web Management

This section describes how to manage the router via a Web browser from the remote end. You can use a web browser such as Microsoft Internet Explorer, or Netscape Navigator. It is best to set your display resolution to 1024 x 768. To change the resolution you can go to the Microsoft Windows control panel and click on the **Display** icon, and change the display settings. You will find the display settings there.

Chapter 4 Login via the Web Browser

4.1 IP Address

To log on to the device using a web browser, your workstation and the device should both be on the same network segment. You can either modify the IP address of your workstation to the same domain of the device, or modify the IP address of the device to the same domain as your workstation.

You can modify the IP address of the device by using console mode (see Section 3.2), and follow the steps below:

STEP 1: Enter a console program and go to `1.Basic> 4. LAN IP`

STEP 2: Change the IP address to the same domain as your workstation.

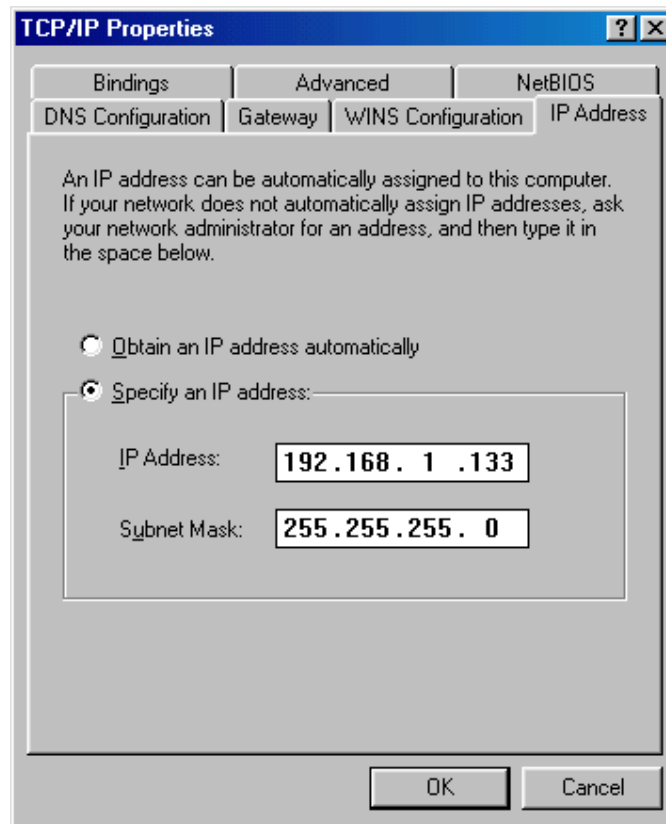
STEP 3: Save the settings to the flash and reboot the device.

```
Basic> 6.Save & reboot
```

STEP 4: Start your Internet browser with the new IP address.

You can modify the IP address of your PC by modifying its TCP/IP. Follow the steps below:

STEP 1: Enter the TCP/IP screen and change the IP address to the domain of 192.168.1.x/24. You should choose an IP address from 192.168.1.132-192.168.1.254 to avoid conflict with IP addresses reserved for the DHCP pool (192.168.1.3 to 192.168.1.131).



STEP 2: Click OK to submit the settings.

STEP 3: Start your Internet browser with the default IP address 192.168.1.1.

4.2 Login Procedure

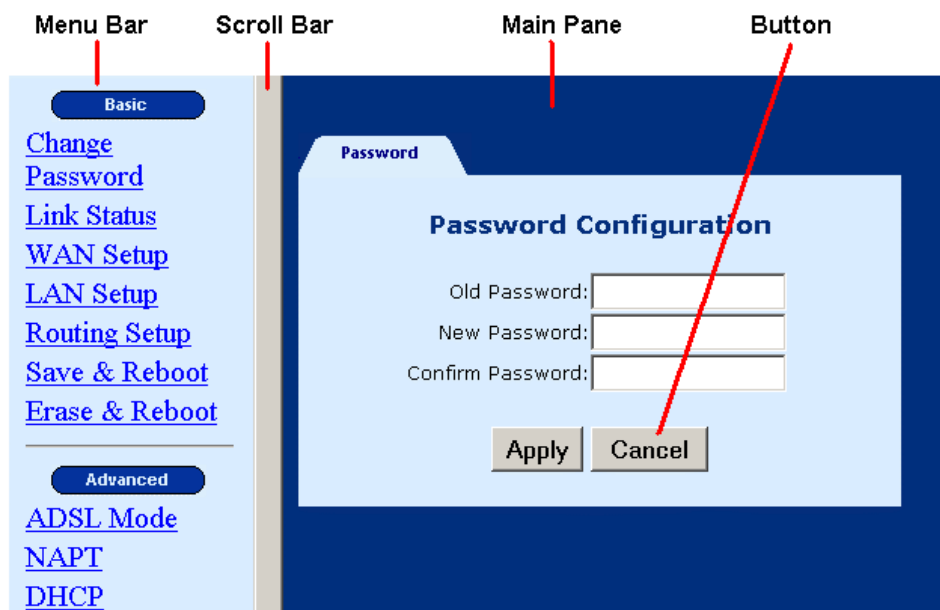
To log on to the system from the Web browser, follow the steps below:

STEP 1: Start your Internet browser.

STEP 2: Type the IP address for the router in the Web address field. For example, if the IP address is 192.168.1.1, type **http://192.168.1.1**

STEP 3: You will be prompted to enter your user name and password. Type the password, or if the password was not changed, type the default passwords. The default USER name is **root**, and the default password is **12345**.

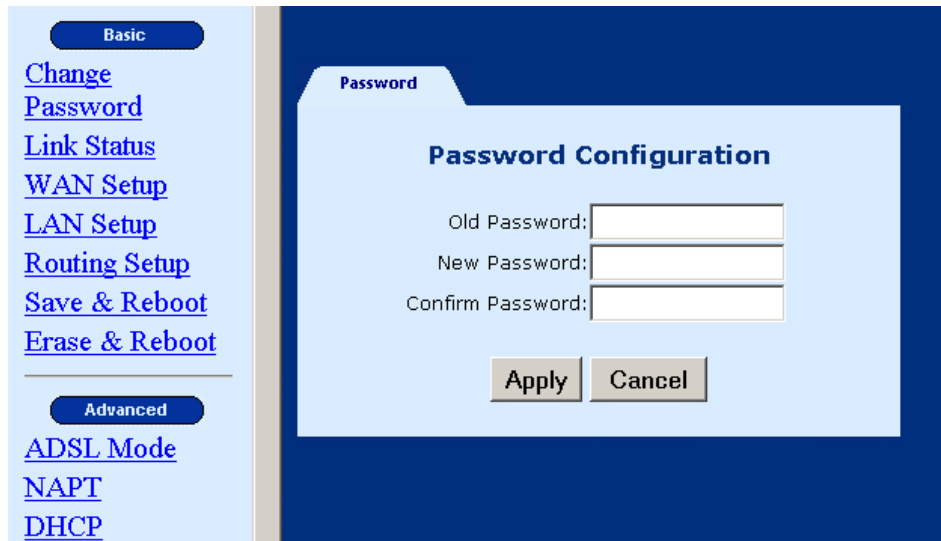
STEP 4: After successfully logging in, you will reach the main menu.



Chapter 5 Basic Configuration

From the **Basic** menu bar you can change passwords, configure the WAN/LAN interfaces, set-up routing, save settings, reboot the device, and retrieve the factory default settings.

5.1 Change the Password



The screenshot shows a web interface for configuring the password. On the left is a navigation menu with a 'Basic' section containing links for 'Change Password', 'Link Status', 'WAN Setup', 'LAN Setup', 'Routing Setup', 'Save & Reboot', and 'Erase & Reboot'. Below this is an 'Advanced' section with links for 'ADSL Mode', 'NAPT', and 'DHCP'. The main content area is titled 'Password Configuration' and contains three input fields: 'Old Password:', 'New Password:', and 'Confirm Password:'. At the bottom of the form are two buttons: 'Apply' and 'Cancel'.

To modify the password, click **Change Password** from the menu bar. Type the old password and type the new password twice. Click **Apply** to submit the settings.

If you change the password, make sure you keep a record of it in a safe place, as you will require it next time you log-on.

5.2 ADSL Link Status

To view the ADSL link status, click **Link Status** from the tool bar. The page includes the following information:

ADSL Line Status	Shows the current status of the ADSL line
ADSL Mode	Shows the ADSL standard that is currently configured. The standards are: MULTI, T1.413, G.DMT, and G.LITE.
Upstream	Upstream data rate negotiated by DSL link (Kbit/s)
Downstream	Downstream data rate negotiated by DSL link (Kbit/s)
Attenuation	Current attenuation (dB) of both near end and far end.
SNR Margin	Current SNR margin (dB)
HEC	Number of ATM cells received with errors, since start of link.
Firmware	The version number of the firmware
15 min ES counter	Number of errored seconds for the current 15 minute period
CRC errors	Number of errors per second since training
1 day ES counter	Number of errored seconds for the current day

Basic

- [Change Password](#)
- [Link Status](#)
- [WAN Setup](#)
- [LAN Setup](#)
- [Routing Setup](#)
- [Save & Reboot](#)
- [Erase & Reboot](#)

Advanced

- [ADSL Mode](#)
- [NAPT](#)
- [DHCP](#)
- [SNMP](#)
- [Configure](#)
- [IGMP Proxy](#)
- [Bridging](#)
- [System Statistics](#)

LinkStatus

ADSL Link Status

Adsl Line Status	UNTRAINED
Adsl Mode	T1.413
Up Stream	0 kb (Interleave)
Down Stream	0 kb (Interleave)
Attenuation	Near End: 0.0
	Far End: 0.0
SNR Margin	Near End: 0
	Far End: 0
HEC Count	0
Firmware	0x40e2be3e
15 min ES Counter	0
CRC Errors	0
1 day ES Counter	0

5.3 WAN Setup

Click WAN Setup from the tool bar and configure the WAN interface for these services: RFC1483 Bridged, RFC1483 Routed, PPPoE, PPPoA, and MER. The following are the common settings to set up these services.

- VPI and VCI
- LLC Encapsulation: With LLC encapsulation, a link control header is added to the Ethernet packet that identifies the protocol type (Ethernet). This allows multiple protocols to be transmitted over the ATM Virtual Circuit.
- VC Multiplexing: With VC Multiplexing, no link control header is needed as the ATM Virtual Circuit is assumed to be carrying a single protocol.
- Enable NAPT: NAPT or Network Address Port Translation is explained further in section 6.2. This feature is available for RFC 1483 Routed, PPPoE, PPPoA, and MER. It is enabled for PPPoE.

5.3.1 RFC 1483 Bridged

When using RFC 1483 style bridging, Ethernet frames are “bridged” over ATM Virtual Circuits. The Ethernet frames are encapsulated using either LLC Encapsulation or VC Multiplexing. With LLC encapsulation, a link control header is added to the Ethernet packet that identifies the protocol type (Ethernet). This allows multiple protocols to be transmitted over the ATM Virtual Circuit. With VC Multiplexing, no link control header is needed as the ATM Virtual Circuit is assumed to be carrying a single protocol. Since the Ethernet packets are bridged, the router’s only responsibility is to pass the Ethernet packets to and from the Internet Service Provider and the local network. The IP addresses of the local network are assigned by the ISP either statically or dynamically.

To set up the RFC 1483 Bridged, configure the common fields on the top of the page and click the Add button to add the entry.

WAN Setup

VPI : VCI : LLC/SNAP Vc Multiplexing Enable NAPT
 RFC1483 Bridged

RFC1483 Routed WAN IP address: WAN subnet mask:

PPPoE (NAT Enabled) User name: Password:
 Mode : Idle Timeout(min) :
 Authentication: Enable DHCP Server:

PPPoA (NAT Enabled) User name: Password:
 Authentication:

MER IP Address: Subnet mask:

Current ATM PVC List

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	PPP Mode	Status
<input checked="" type="radio"/>	Bridged	0	32	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	0	33	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	0	35	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	8	35	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	8	81	LLC	Off	None	None	NA	NA	NA	NA	NA

To modify an entry, complete the following steps:

STEP 1: Select the entry from the **Current ATM PVC List**, at the bottom of the WAN Setup page. The current values of the selected entry will display in the upper section of the page.

STEP 2: Change the parameters.

STEP 3: Click **Modify**.

To delete an entry, Select it from the **Current ATM PVC List**, at the bottom of the WAN Setup page, and click the **Delete** button.

5.3.2 RFC 1483 Routed

To set up the RFC 1483 Routed, configure the common settings on the top of the page, click RFC 1483 Routed and configure the specific settings (WAN IP address and WAN subnet mask). Click the Add button to add the entry.

WAN Setup

VPI : VCI :
 LLC/SNAP
 Vc Multiplexing
 Enable NAPT

RFC1483 Bridged

RFC1483 Routed
WAN IP address:
WAN subnet mask:

PPPoE (NAT Enabled)
User name:
Password:
Mode :
Idle Timeout(min) :
Authentication:
Enable DHCP Server:

PPPoA (NAT Enabled)
User name:
Password:
Authentication:

MER
IP Address:
Subnet mask:

Current ATM PVC List

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	PPP Mode	Status
<input type="radio"/>	Bridged	0	32	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	0	33	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	0	35	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	8	35	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	8	81	LLC	Off	None	None	NA	NA	NA	NA	NA
<input checked="" type="radio"/>	Routed	0	36	LLC	Off	10.0.0.1	255.255.255.252	NA	NA	NA	NA	NA

To modify an entry, complete the following steps:

STEP 1: Select the entry from the **Current ATM PVC List**, at the bottom of the WAN Setup page. The current values of the selected entry will display in the upper section of the page.

STEP 2: Change the parameters.

STEP 3: Click **Modify**.

To delete an entry, Select it from the **Current ATM PVC List**, at the bottom of the WAN Setup page, and click the **Delete** button.

5.3.3 PPPoE

PPPoE provides service providers similar billing and access control as present in dial-up services. And with direct support to Ethernet it provides a low cost solution to supporting multiple hosts at the customer premises. PPPoE provides session authentication using either Password Authentication Protocol (PAP) or Challenge Handshake Authentication Protocol (CHAP). Session accounting is possible and conservation of bandwidth can be done by closing down unused sessions. By utilizing PPP, link and network parameters are easily negotiated between the IAD/Router and the ISP.

When using PPPoE, the system is assigned an IP address from the Internet Service Provider as part of establishing the network connection. The system can be configured as a DHCP server for its LAN and NAT can be used to translate private addresses to public addresses. In this way, computers in the LAN do not have to have their own public IP addresses.

WAN Setup

VPI : VCI :
 LLC/SNAP
 Vc Multiplexing
 Enable NAPT

RFC1483 Bridged

RFC1483 Routed

PPPoE (NAT Enabled)

User name:	<input type="text" value="@net"/>	Password:	<input type="password" value="****"/>
Mode :	<input type="text" value="direct"/>	Idle Timeout(min) :	<input type="text" value="5"/>
Authentication:	<input type="text" value="PAP"/>	Enable DHCP Server:	<input checked="" type="checkbox"/>

PPPoA (NAT Enabled)

MER

Current ATM PVC List

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	PPP Mode	Status
<input type="radio"/>	Bridged	0	32	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	0	33	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	0	35	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	8	35	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	8	81	LLC	Off	None	None	NA	NA	NA	NA	NA
<input checked="" type="radio"/>	PPPoE	0	37	LLC	Off	None	None	@net	Pap	5	direct	InActive

To set up PPPoE, click PPPoE (NAT Enabled), configure the common fields on the top of the page and the following fields. Click the Add button to add the entry.

- **User name/Password:** used for the remote customers to login during dialup.
- **Mode:** Direct and Auto. If the mode is set to AUTO the PPPoE negotiation automatically starts when the system identifies any traffic required to be transferred on the link. When DIRECT is selected the PPPoE negotiation is started manually using the "pppoestart" command. The default is DIRECT.
- **Idle Timeout:** defines the period of idle time (minutes) after which the PPPoE link will be terminated.
- **Authentication:** defines the authentication code: PAP, and CHAP
- **Enable DHCP Server:** enables the DHCP server. This field is automatically checked when PPPoE is selected. Deselect the field to disable the DHCP server. The DHCP server dynamically allocates network addresses and delivers configuration parameters to hosts.

To modify an entry, complete the following steps:

STEP 1: Select the entry from the **Current ATM PVC List**, at the bottom of the WAN Setup page. The current values of the selected entry will display in the upper section of the page.

STEP 2: Change the parameters.

STEP 3: Click **Modify**.

To delete an entry, Select it from the **Current ATM PVC List**, at the bottom of the WAN Setup page, and click the **Delete** button.

5.3.4 PPPoA

To set up PPPoA, click PPPoA, configure the common fields and the following fields. Click the Add button to add the entry.

- **User name** and **Password**: used for remote customers to login upon dialup. PPPoA is manually activated by entering startup commands from the page: Advanced>Configure PPPoA. The **Authentication** field defines the authentication code: PAP or CHAP.
- **Authentication**: defines the authentication code (PAP, CHAP).

WAN Setup

VPI : VCI : LLC/SNAP Vc Multiplexing Enable NAPT

RFC1483 Bridged

RFC1483 Routed WAN IP address: WAN subnet mask:

PPPoE (NAT Enabled) User name: Password:
 Mode : Idle Timeout(min) :
 Authentication: Enable DHCP Server:

PPPoA (NAT Enabled) User name: Password:
 Authentication:

MER IP Address: Subnet mask:

Current ATM PVC List

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	PPP Mode	Status
<input type="radio"/>	Bridged	0	32	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	0	33	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	0	35	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	8	35	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	8	81	LLC	Off	None	None	NA	NA	NA	NA	NA
<input checked="" type="radio"/>	PPPoA	0	37	LLC	Off	None	None	@netnet	Pap	NA	NA	InActive

To modify an entry, complete the following steps:

STEP 1: Select the entry from the **Current ATM PVC List**, at the bottom of the WAN Setup page. The current values of the selected entry will display in the upper section of the page.

STEP 2: Change the parameters.

STEP 3: Click **Modify**.

To delete an entry, Select it from the **Current ATM PVC List**, at the bottom of the WAN Setup page, and click the **Delete** button.

5.3.5 MER

MAC Encapsulation Routing (MER) implements router features over RFC1483 bridged link. MER enables the ATU-R to send and receive IP packets encapsulated as bridged frames with MAC address. The ATU-R runs with full router functions, including NAPT, virtual server, RIP, DHCP, and so on. MER utilizes network address translation (NAT) to allow multiple PCs with different private IP addresses on the LAN to share a public IP addresses. The functions of NAT and allocation of an ATM virtual channel improves the security of network access on the RFC 1483 Bridged link.

To set up the MER service, configure the common fields, and the IP Address and Subnet Mask fields that are highlighted on the screen. Click the Add button to add the entry.

WAN Setup

VPI : VCI : LLC/SNAP Vc Multiplexing Enable NAPT

RFC1483 Bridged

RFC1483 Routed WAN IP address: WAN subnet mask:

PPPoE (NAT Enabled) User name: Password:
 Mode : Idle Timeout(min) :
 Authentication: Enable DHCP Server:

PPPoA (NAT Enabled) User name: Password:
 Authentication:

MER IP Address: Subnet mask:

Current ATM PVC List

Select	Mode	VPI	VCI	Encap	NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	PPP Mode	Status
<input type="radio"/>	Bridged	0	32	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	0	33	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	0	35	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	8	35	LLC	Off	None	None	NA	NA	NA	NA	NA
<input type="radio"/>	Bridged	8	81	LLC	Off	None	None	NA	NA	NA	NA	NA
<input checked="" type="radio"/>	Mer	0	46	LLC	Off	10.1.1.2	255.255.255.255	NA	NA	NA	NA	NA

To modify an entry, complete the following steps:

STEP 1: Select the entry from the **Current ATM PVC List**, at the bottom of the WAN Setup page. The current values of the selected entry will display in the upper section of the page.

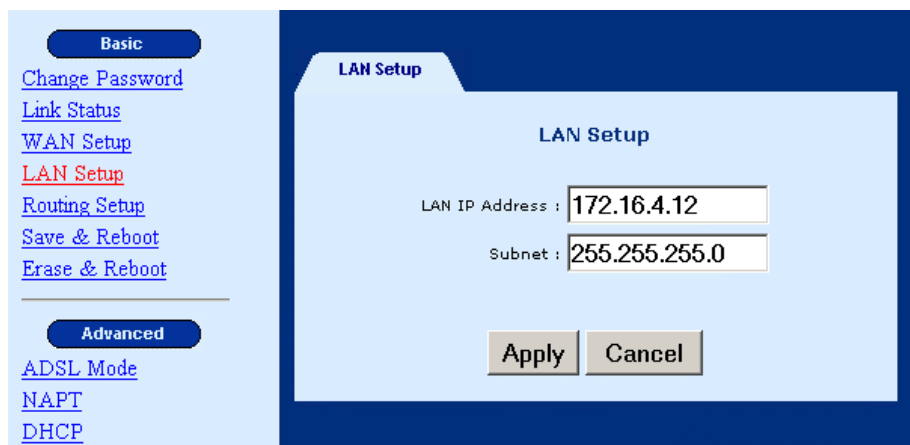
STEP 2: Change the parameters.

STEP 3: Click **Modify**.

To delete an entry, Select it from the **Current ATM PVC List**, at the bottom of the WAN Setup page, and click the **Delete** button.

5.4 LAN IP Address

Click **LAN Setup** from the menu bar to configure the LAN IP address. Type the **IP address** and **subnet mask**. Click **Apply** to submit the settings. When the new IP address is applied, the Web configuration will be interrupted. Use the new IP address to login.



The screenshot shows a web configuration interface. On the left is a navigation menu with two sections: 'Basic' and 'Advanced'. Under 'Basic', there are links for 'Change Password', 'Link Status', 'WAN Setup', 'LAN Setup' (highlighted in red), 'Routing Setup', 'Save & Reboot', and 'Erase & Reboot'. Under 'Advanced', there are links for 'ADSL Mode', 'NAPT', and 'DHCP'. The main content area is titled 'LAN Setup' and contains two input fields: 'LAN IP Address' with the value '172.16.4.12' and 'Subnet' with the value '255.255.255.0'. At the bottom of the form are two buttons: 'Apply' and 'Cancel'.

5.5 Routing

Click **Routing Setup** from the menu bar to configure the routing functions. Routing functions includes RIP and static routing. You can display the RIP information by clicking the **RIP information button**.

Routing Setup

Routes Configuration

Destination Network ID :

Destination Subnet Mask :

Next Hop IP :

List of Static Routes

Select	Network ID	Subnet Mask	Next Hop IP
<input type="radio"/>	10.0.0.0	255.255.255.252	10.0.0.1
<input type="radio"/>	10.1.1.2	255.255.255.255	10.1.1.2
<input type="radio"/>	172.16.5.0	255.255.255.0	172.16.5.2

Rip Information

Rip Status : Version :

The default static routes table has three static routes:

Network ID	Subnet Mask	Next hop IP
10.0.0.0.	255.255.255.252	10.0.0.1
10.11.1.0	255.255.255.255	10.11.1.2
192.168.1.0	255.255.255.0	192.168.1.1

5.5.1 Enable RIP

To enable the RIP, complete the following steps:

STEP 1: Click **Routing Setup** from the menu bar

STEP 2: Select **On** in the Rip Status field.

STEP 3: Select a RIP Version (Version 1 or Version 2) from the Version field.

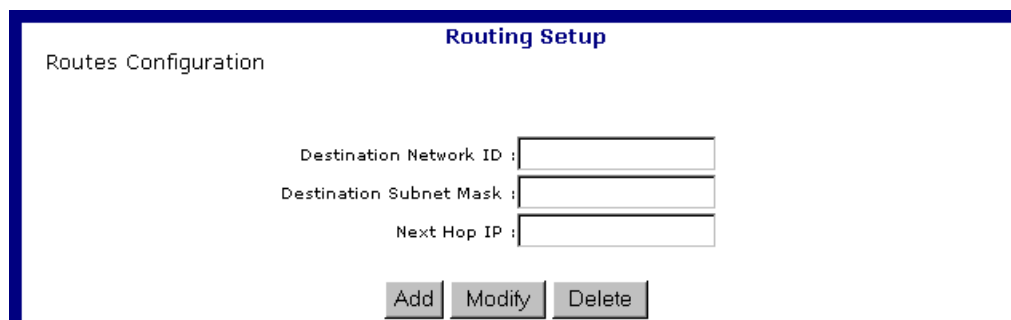
STEP 4: Click **Apply** to submit the settings.



The screenshot shows a web interface titled "Routing Setup". Under the heading "Rip Information", there are two dropdown menus: "Rip Status" set to "Off" and "Version" set to "Version 1". Below these are two buttons: "Apply" and "RIP information".

5.5.2 Static route configuration

The Routes Configuration field allows you to add, modify, and delete a static route. Type the Destination Network ID, subnet mask, and next hop IP and click a button below to perform the requested function.



The screenshot shows a web interface titled "Routing Setup". Under the heading "Routes Configuration", there are three input fields: "Destination Network ID", "Destination Subnet Mask", and "Next Hop IP". Below these fields are three buttons: "Add", "Modify", and "Delete".

Add:

To add a static route complete the following steps:

STEP 1: Click **Routing Setup** from the menu bar

STEP 2: Enter parameters for **Destination Network ID, Subnet Mask, Next Hop IP**

STEP 3: Click the **ADD** button

Modify:

To modify a static route complete the following steps:

STEP 1: Select the entry you wish to modify from the List of Static Routes

STEP 2: Change the parameters

STEP 3: Click the **Modify** button

Delete:

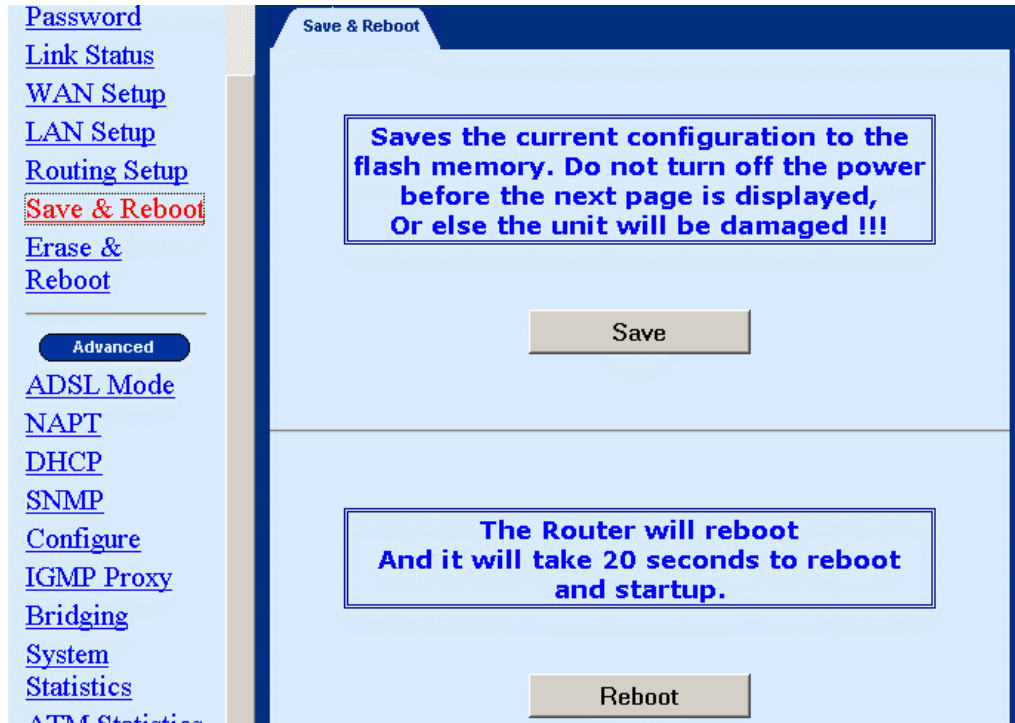
STEP 1: Select the entry you wish to **delete** from the List of Static Routes

STEP 2: Change the parameters

STEP 3: Click the **Delete** button

5.6 Save

To save the settings to Flash, click **Save & Reboot** from the menu bar. In the main pane, click **Save**.

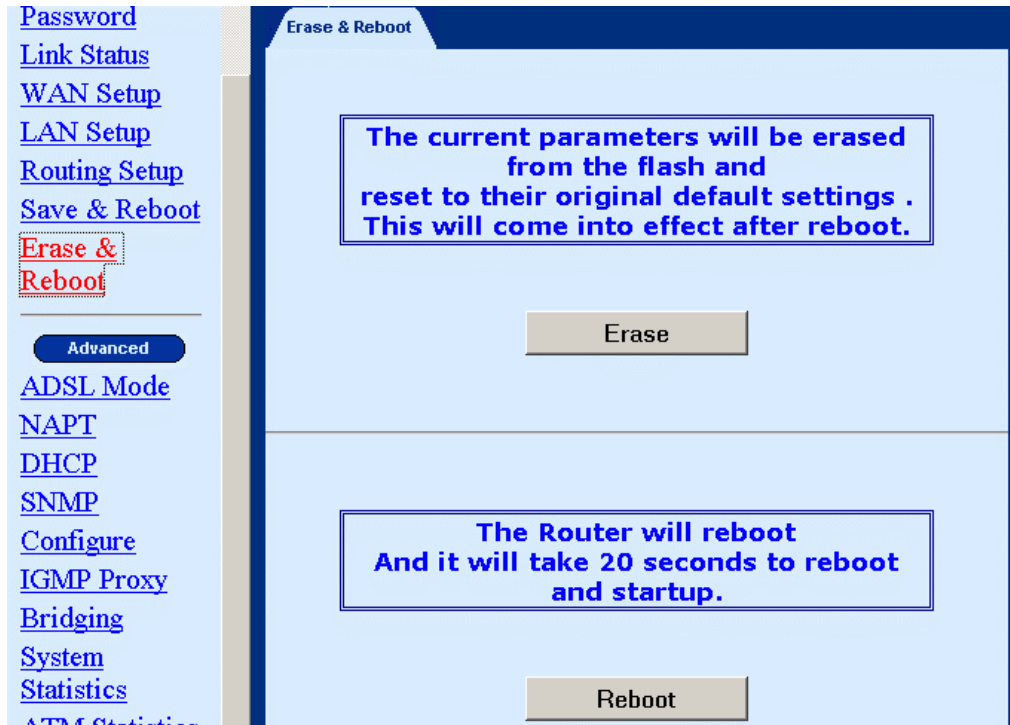


5.7 Reboot

To reboot the router, click **Save & Reboot** from the menu bar. In the main pane, click on **Reboot**.

5.8 Retrieve default settings

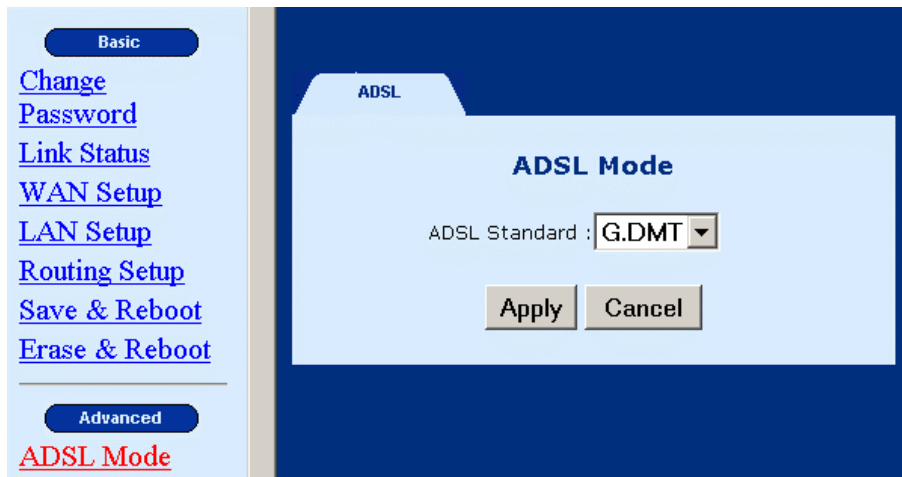
To retrieve the default settings, click **Erase & Reboot** from the menu bar. In the main pane, click **Erase**.



Chapter 6 Advanced Configuration

6.1 ADSL Mode

There are four ADSL modes: MULTI, T1.413, G.DMT, and G.LITE. The default ADSL mode is MULTI. MULTI mode enables the device to auto-adjust its mode to match the remote CO DLSAM. You can specify an ADSL mode on this page, and click the Apply button to submit the settings.

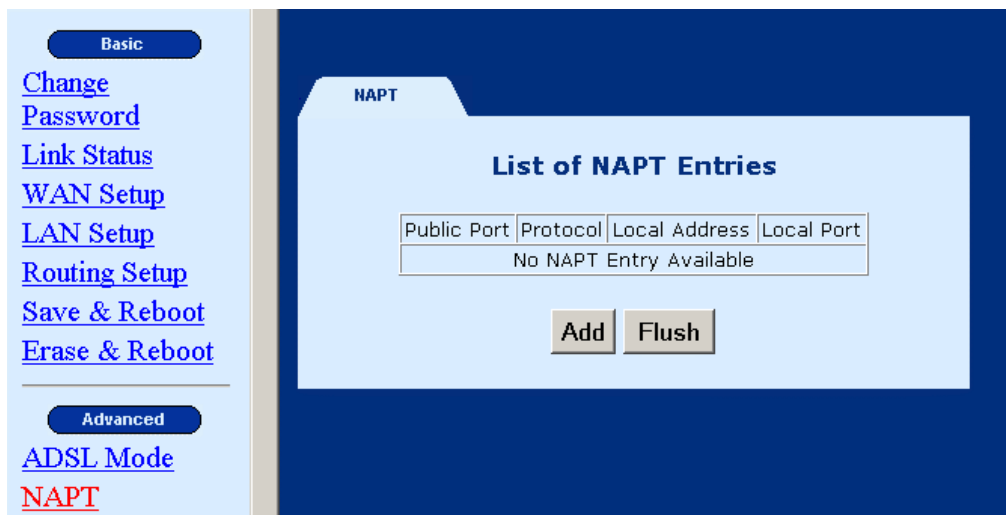


The screenshot shows a web interface for configuring ADSL Mode. On the left is a navigation menu with a 'Basic' tab and an 'Advanced' tab. Under 'Advanced', the 'ADSL Mode' link is highlighted in red. The main content area is titled 'ADSL' and contains a form titled 'ADSL Mode'. The form has a single field labeled 'ADSL Standard' with a dropdown menu currently set to 'G.DMT'. Below the field are two buttons: 'Apply' and 'Cancel'.

6.2 NAPT (Port Translation)

The discussion in this section is for port translation. For IP address translation, refer to Section 17.1.2 WAN Interface. NAPT, also called overloading, is a form of NAT that maps multiple Private IP addresses to a single Public IP address. PAT allows several virtually addressed workstations to share a single global address. PAT uses the TCP and UDP port numbers to map multiple virtual addresses to a single global address.

Click NAPT on the Advanced menu bar to configure the NAPT (Network Address Port Translation). If any NAPT entries have already been configured, they will appear on the right side of the screen.



The screenshot displays a web-based configuration interface for NAPT. On the left, a navigation menu includes 'Basic' and 'Advanced' sections. Under 'Basic', there are links for 'Change Password', 'Link Status', 'WAN Setup', 'LAN Setup', 'Routing Setup', 'Save & Reboot', and 'Erase & Reboot'. Under 'Advanced', there are links for 'ADSL Mode' and 'NAPT'. The main content area is titled 'NAPT' and contains a 'List of NAPT Entries' section. This section features a table with the following structure:

Public Port	Protocol	Local Address	Local Port
No NAPT Entry Available			

Below the table, there are two buttons: 'Add' and 'Flush'.

6.2.1 Add a NAPT

To **add a NAPT**, complete the following steps:

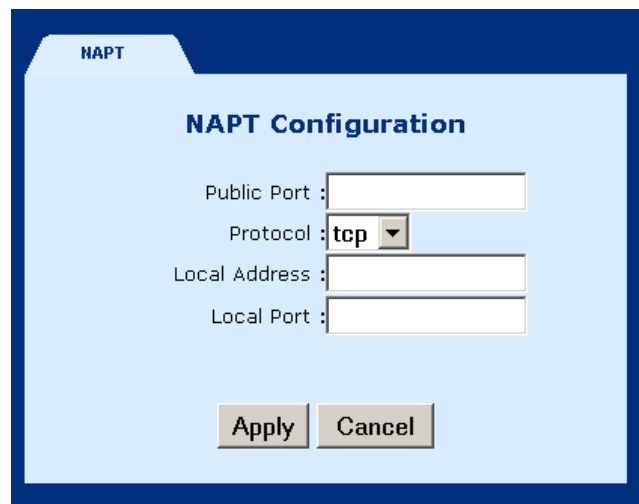
STEP 1: Click NAPT from the Advanced menu bar

STEP 2: Click **Add**.

STEP 3: Enter the following parameters:

Public Port	Enter the public port number. Any packet whose IP header contains the specified destination port will be mapped or redirected.
Protocol	Specifies whether the ports numbers for these arguments are TCP or UDP port numbers.
Local Address	Enter the IP address of the machine on the local LAN.
Local Port	Enter the port number of the machine on the local LAN.

STEP 4: Click **Apply** to accept the parameters.



The screenshot shows a dialog box titled "NAPT Configuration" with a blue header and a light blue background. The dialog contains four input fields: "Public Port" (a text box), "Protocol" (a dropdown menu with "tcp" selected), "Local Address" (a text box), and "Local Port" (a text box). At the bottom of the dialog are two buttons: "Apply" and "Cancel".

6.2.2 Flush NAPT Entries

To flush (delete) all NAPT entries click the **Flush** button on the NAPT screen.

6.3 DHCP

The Dynamic Host Configuration Protocol (DHCP) provides a centralized approach to allocating IP addresses. It allows IP addresses to be dynamically assigned on an as needed basis, from a pool of addresses. The DHCP function of the device is disabled by factory default.

6.3.1 Enable DHCP

STEP 1: Click **DHCP** from the menu bar to configure the DHCP parameters.

STEP 2: Click **Enable** and fill out the following fields:

- **Starting IP Address:** The first IP address of the address pool in the DHCP server. Note the IP address should be in the same subnet as the router's LAN IP address.
- **End IP Address:** The last IP address of the address pool in the DHCP server. Note the IP address should be in the same subnet as the router's LAN IP address.
- **Gateway:** The gateway IP address
- **Netmask:** The subnet mask of the IP network
- **DNS:** The IP address of the Domain Name Server
- **Lease Time (in Days):** Upon login, the remote workstation will obtain an IP address. This field defines the period of time that the workstation can use this IP address to access the Internet.

STEP 3: Click **Apply** to submit the settings.

DHCP Server **BOOTP / DHCP Relay**

DHCP Server Configuration

DHCP Server : Enable Disable

Starting IP Address : 192.168.1.3

End IP Address : 192.168.1.131

Gateway : 192.168.1.1

Netmask : 255.255.255.0

DNS : 192.168.1.1

Lease Time (in Days) : 7

Apply Cancel

6.3.2 Disable the DHCP

STEP 1: Click **DHCP** from the menu bar to configure the DHCP parameters.

STEP 2: Click **Disable**.

STEP 3: Click **Apply**.

6.4 Boot P/DHCP Relay

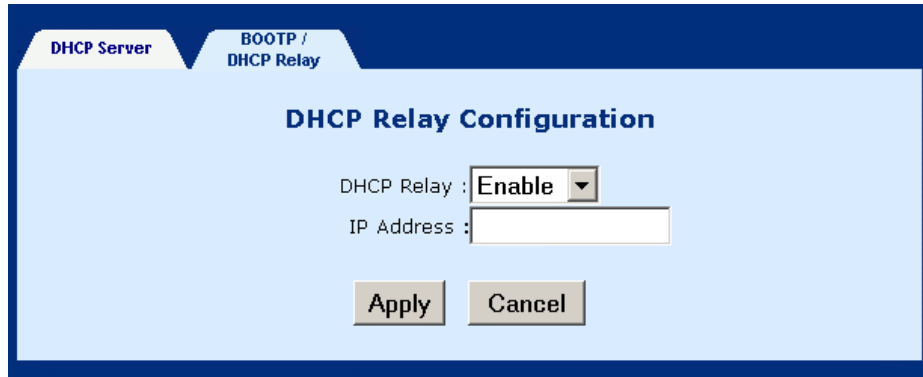
The DHCP packet format is based on a BootP packet. As a result, DHCP uses the BootP relay agent to forward DHCP packets. This scheme provides interoperability between existing BootP clients and DHCP servers. The BootP relay agent uses the same criteria and methods for forwarding both DHCP and BootP packets. The DHCP Relay is disabled by default. To enable it complete the following steps:

STEP 1: Access the BootP/DHCP Relay screen by clicking on **DHCP Server** on the Advanced Menu, and then click the **BootP/DHCP Relay** tab.

STEP 2: In the DHCP Relay field, select **Enable**.

STEP 3: Enter the IP Address of a numbered network interface that you want to receive BOOTREQUEST or DHCP packets from clients.

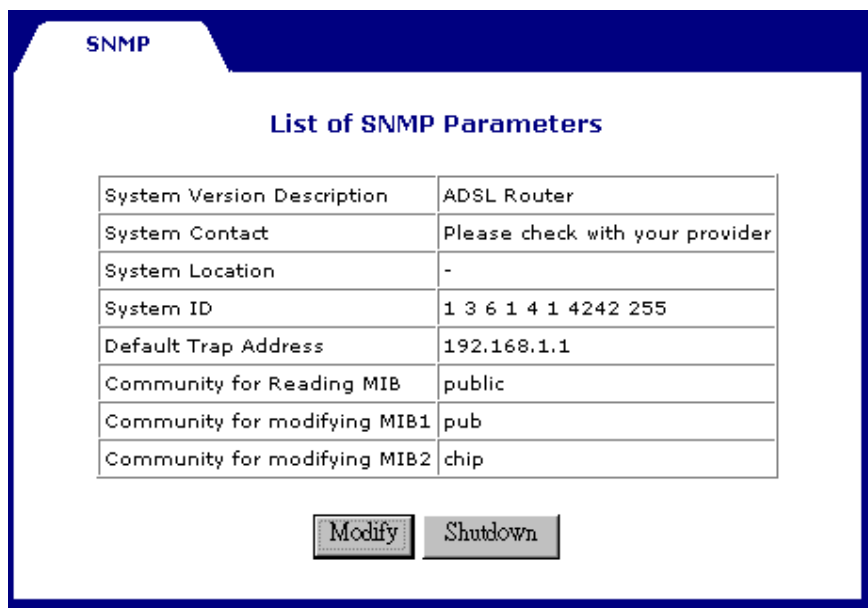
STEP 4: Click on the **Apply** button.



The screenshot shows a configuration window titled "DHCP Relay Configuration". At the top, there are two tabs: "DHCP Server" and "BOOTP / DHCP Relay". The "BOOTP / DHCP Relay" tab is selected. The main content area has a light blue background. It contains a "DHCP Relay" dropdown menu set to "Enable" and an "IP Address" text input field. Below these fields are two buttons: "Apply" and "Cancel".

6.5 SNMP

SNMP is a software entity that responds to information and action request messages sent by a network management station. The messages exchanged enable you to access and manage objects in an active or inactive (stored) MIB on a particular router. To configure the SNMP parameters, click the **SNMP** button on the Advanced menu bar. The window displays the SNMP parameters.



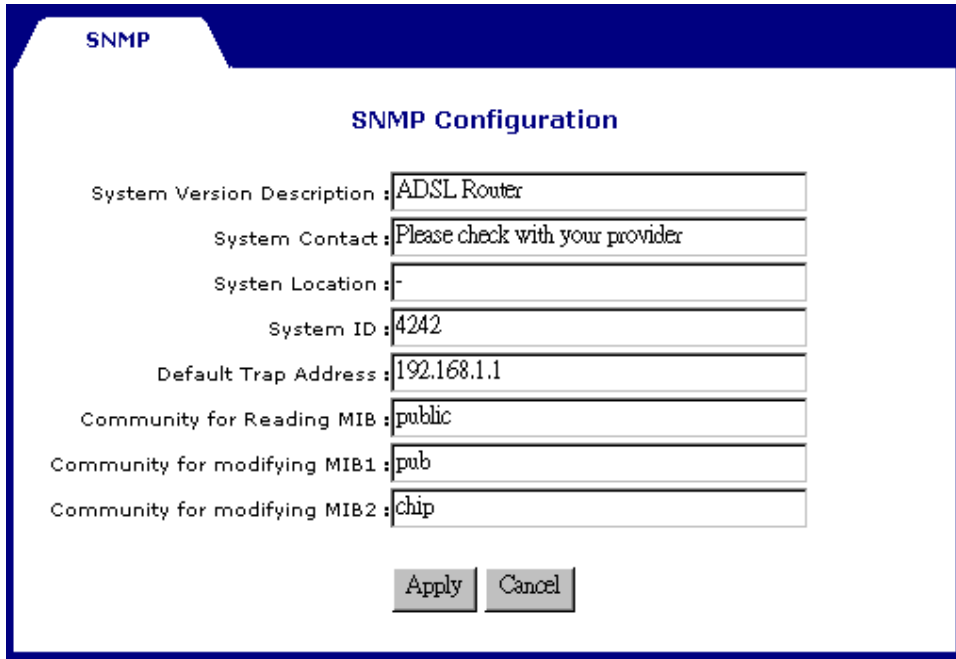
The screenshot shows a window titled "SNMP" with a sub-header "List of SNMP Parameters". It contains a table with the following data:

System Version Description	ADSL Router
System Contact	Please check with your provider
System Location	-
System ID	1 3 6 1 4 1 4242 255
Default Trap Address	192.168.1.1
Community for Reading MIB	public
Community for modifying MIB1	pub
Community for modifying MIB2	chip

Below the table are two buttons: "Modify" and "Shutdown".

6.5.1 Modifying SNMP Parameters

To modify the SNMP parameters, click the Modify button at the bottom of the screen. Click Apply to submit the settings.



The image shows a web-based configuration form titled "SNMP Configuration" within a "SNMP" tab. The form contains several input fields for configuring SNMP parameters. At the bottom, there are "Apply" and "Cancel" buttons.

Parameter	Value
System Version Description	ADSL Router
System Contact	Please check with your provider
System Location	
System ID	4242
Default Trap Address	192.168.1.1
Community for Reading MIB	public
Community for modifying MIB1	pub
Community for modifying MIB2	chip

6.6 Configure

From this page you can configure LAN and WAN interfaces, VCC, PPPoE, PPPoA, DNS & Default Gateway, and NAT.

Basic

[Change Password](#)
[Link Status](#)
[WAN Setup](#)
[LAN Setup](#)
[Routing Setup](#)
[Save & Reboot](#)
[Erase & Reboot](#)

Advanced

[ADSL Mode](#)
[NAPT](#)
[DHCP](#)
[SNMP](#)
[Configure](#)
[IGMP Proxy](#)
[Bridging](#)
[System Statistics](#)
[ATM Statistics](#)
[Diagnostic](#)

Interface VCC PPPoE PPPoA MER

List of Interface Entries

Select	Interface Name	IP Address	Subnet Mask	MAC Address	Status
<input type="radio"/>	eth0	172.16.5.2	255.255.255.0	0:0:0:0:0:0	UP
<input type="radio"/>	mer0	10.1.1.2	255.255.255.255	NA	UP
<input type="radio"/>	lo0	None	None	NA	DOWN
<input type="radio"/>	atm0	10.0.0.1	255.255.255.252	NA	UP
<input type="radio"/>	atm1	None	None	NA	DOWN
<input type="radio"/>	atm2	None	None	NA	DOWN
<input type="radio"/>	atm3	None	None	NA	DOWN
<input type="radio"/>	atm4	None	None	NA	DOWN
<input type="radio"/>	atm5	None	None	NA	DOWN
<input type="radio"/>	atm6	None	None	NA	DOWN
<input type="radio"/>	atm7	None	None	NA	DOWN
<input type="radio"/>	ppp0	None	None	NA	DOWN
<input type="radio"/>	ppp1	None	None	NA	DOWN
<input type="radio"/>	ppp2	None	None	NA	DOWN
<input type="radio"/>	ppp3	None	None	NA	DOWN
<input type="radio"/>	ppp4	None	None	NA	DOWN
<input type="radio"/>	ppp5	None	None	NA	DOWN
<input type="radio"/>	ppp6	None	None	NA	DOWN
<input type="radio"/>	ppp7	None	None	NA	DOWN

6.6.1 Configure Interface

To configure an interface, select it by clicking in the round-box on the left in the screen. Then click on the Configure Interface button at the bottom of the screen.

Note the following:

Interfaces:

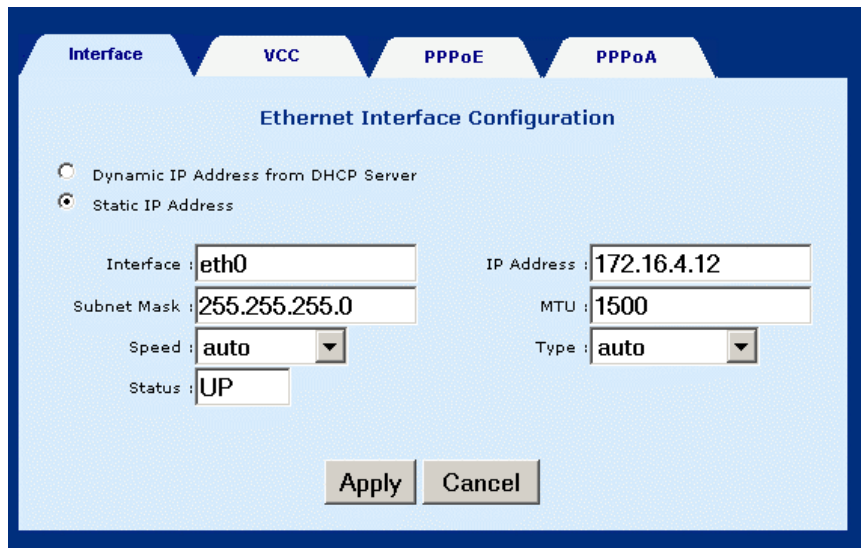
- **Interface mer0** usage is reserved; its status is always **Down**.
- **Interface lo0** is the loopback interface. When an OAM loopback is performed, the status field displays UP.
- **Interfaces Atm1 to Atm 7** display the interfaces configured for RFC1483 Bridged mode or RFC 1483 Routed mode.

- **Interfaces ppp0 to ppp7** display the interfaces configured for PPPoE or PPPoA.

Parameters:

- **Dynamic IP address from DHCP:** Selects the IP address to be assigned by the DHCP server.
- **Static IP address:** Selects the IP address to be statically assigned.
- **Interface:** The name of the interface currently selected.
- **IP address:** The IP address of the selected interface.
- **Subnet Mask:** The subnet mask of the selected interface.
- **MTU:** Sets the maximum transmission unit of the interface. The MTU is used to limit the size of packets that are transmitted on an interface. Not all interfaces support the MTU parameter, and some interfaces, like Ethernet, have range restrictions (80 - 1500).
- **Speed:** Auto, 10 Mbps, or 100 Mbps
- **Status:** UP and Down. When an interface is set to **Down**, the system will not attempt to transmit messages through that interface. When set to **UP**, messages can be transmitted through the interface.

The following is the screen shot for the LAN interface (eth0).



The following is a screen shot for the ATM interface.

The screenshot shows the 'ATM Interface Configuration' window. At the top, there are four tabs: 'Interface', 'VCC', 'PPPoE', and 'PPPoA'. The 'Interface' tab is active. The main title is 'ATM Interface Configuration'. Below the title, there are two radio buttons: 'Dynamic IP Address from DHCP Server' (unselected) and 'Static IP Address' (selected). Below the radio buttons, there are three input fields: 'Interface' with the value 'atm0', 'Subnet Mask' with the value '255.255.255.252', and 'MTU' with the value '1500'. To the right of these fields, there are two more fields: 'IP Address' with the value '10.0.0.1' and 'Status' with a dropdown menu showing 'UP'. At the bottom of the window, there are two buttons: 'Apply' and 'Cancel'.

6.6.2 DNS & Default Gateway:

To configure the DNS and default gateway, complete the following steps:

STEP 1: Click on **Configure** in the menu bar.

STEP 2: Click on **DNS and default gateway** at the bottom of the configuration page.

STEP 3: Complete the fields below:

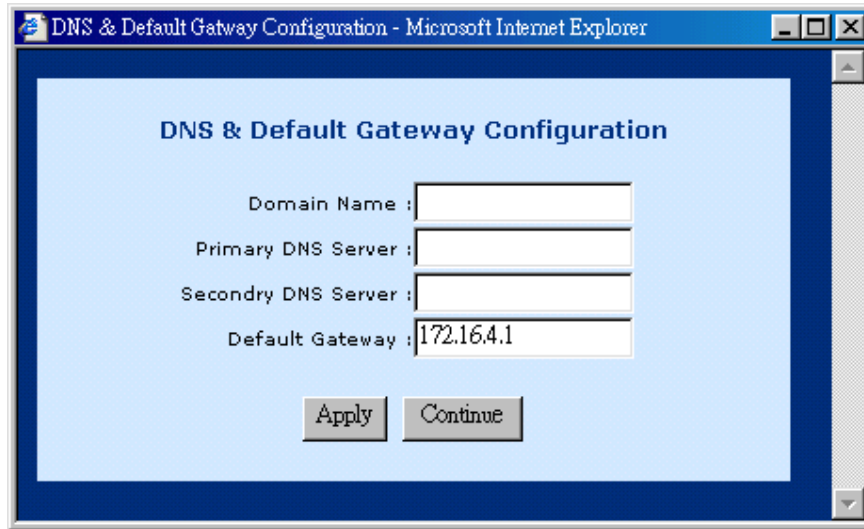
Domain Name: user-defined

Primary DNS server: Enter the primary server IP address.

Secondary DNS server: Enter the secondary server IP address that will be used in the event that the primary server IP address fails or is not available

Default Gateway: The gateway IP address of the IP network

STEP 4: Submit the settings by clicking **Apply**.



DNS & Default Gateway Configuration - Microsoft Internet Explorer

DNS & Default Gateway Configuration

Domain Name :

Primary DNS Server :

Secondary DNS Server :

Default Gateway :

6.6.3 NAT

When NAT is enabled for a WAN interface, all private addresses are mapped to the IP address of the specified WAN interface. To enable or disable NAT on an ATM interface complete the following steps:

STEP 1: Click on **Configure** in the menu bar.

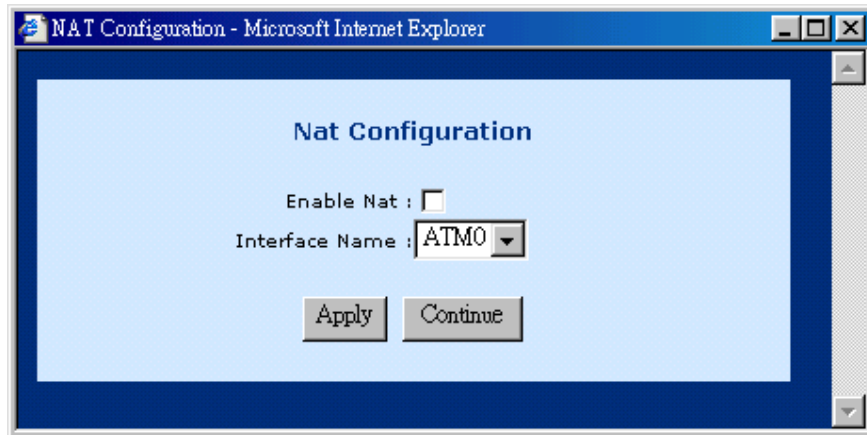
STEP 2: Click on **NAT** at the bottom of the configuration page.

STEP 3: Complete the fields described below:

Enable NAT Tick this box to **enable** NAT or leave it blank to **disable** it.

Interface Name select an interface from ATM 0 to ATM 7

STEP 4: Click **Apply** to submit the setting.



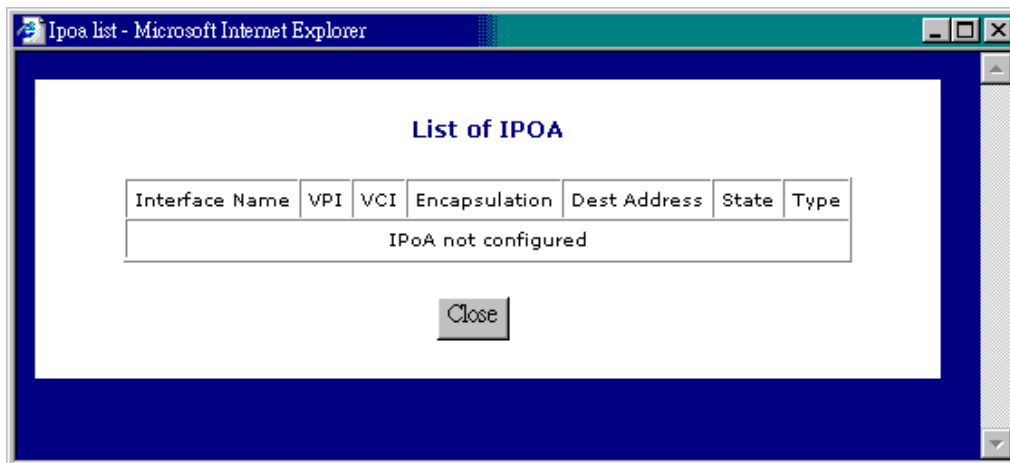
6.7 VCC

This screen lists all current VCC entries in the middle of the screen. From this screen you can also: List IPoA, Delete Encapsulation, Add a VCC, Delete a VCC, and Show VCC quality.

Select	VPI	VCI	Type(Data/Voice)	Encapsulation	Interface	IPaddress
<input type="radio"/>	0	32	Data	Bridge	None	None
<input type="radio"/>	0	33	Data	None	mer0	1.1.2.3
<input type="radio"/>	0	35	Data	Bridge	None	None
<input type="radio"/>	8	35	Data	Bridge	None	None
<input type="radio"/>	8	81	Data	None	None	None
<input type="radio"/>	0	37	Data	None	None	None

6.7.1 List IPoA

To list IP over ATM information click on the **IPoA** button at the bottom-left of the screen.



The IPoA entry is set up from Advanced>Configure>VCC. Click the Add button on the List of VCC screen.

VCC Configuration

VPI : 0 VCI : 37
Peak Cell Rate (cells/sec): 3000 Avg. Cell Rate (cells/sec): 3000
Burst Size (cells): 45 CDVT (cells): 500000
Type : Data Service Type : UBR

For data flow:
 Routed
Interface : ATM0

IPoA
Interface : ATM0
Default PVC :
Next Hop IP Address : 1.23.4.2

PPPoA
Profile Id :
User Name :
Authentication Type : PAP
Encapsulation Type : LLC
SubnetMask : 255.255.255.255
Password :
Interface : PPPo
Trace : OFF
NAT :

6.7.2 Delete Encapsulation

To delete encapsulation first select a VCC entry and then click the **Delete Encap** button.

6.7.3 Add a VCC

To add a VCC entry, complete the following steps:

STEP 1: Click on the Add VCC button, the VCC screen will appear.

STEP 2: Enter values for the parameters (explained below).

STEP 3: Click the **Apply** button at the bottom of the page.

vpi:	Virtual Path Identifier (VPI) that identifies this ATM connection. The vpi is integer numbers which can range from 0 to 4095.
vci:	Virtual Channel Identifier (VCI) that identifies this ATM connection. The vci is an integer number which can range from 65,535.
Peak Cell rate (cells/sec):	Defines the fastest rate a user can send cells to the network. It is expressed in units of cells per second.
Average Cell rate (cells/sec):	Defines the maximum sustainable/average rate a user can send cells to the network. It is expressed in cells per second. This specifies the bandwidth utilization. This value must always be less than or equal to the Peak Cell Rate.
Burst size (cells):	Maximum number of cells the user can send at the peak rate in a burst, within a sustainable rate.
CDVT (cells):	Constrains the number of cells the user can send to the network at the maximum line rate.
Type:	Select data or voice
Service Type: cbr Constant Bit Rate:	Supports real-time applications requiring a fixed amount of bandwidth. The applications produce data at regular intervals such as a video stream. The user can specify how much bandwidth they wish to reserve.
rtvbr Real Time Variable Bit Rate:	Supports time-sensitive applications such as voice. In these applications the rate at which cells arrive are varied.
Nrtvbr Non Real Time Variable Bit Rate:	Supports applications that have no constraints on delay and delay variation, but still have variable-rate and bursty traffic characteristics.

Ubr Unspecified Bit Rate:	Best effort service that does not require tightly constrained delay and delay variation. UBR provides no specific quality of service or guaranteed throughput.
----------------------------------	--

VCC Configuration

VPI : VCI :

Peak Cell Rate (cells/sec): Avg. Cell Rate (cells/sec):

Burst Size (cells): CDVT (cells):

Type : Service Type :

For data flow:

Routed
Interface :

IPoA
Interface :
Default PVC :
Next Hop IP Address :

PPPoA
Profile Id :
User Name : Password :
Authentication Type : Interface :
Encapsulation Type : Trace :
SubnetMask : NAT :

PPPoE
Profile Id :
User Name : Password :
Authentication Type : Interface :
Mode : Idle Time :
Encapsulation Type : Trace :
SubnetMask : NAT :

6.7.4 Delete a VCC

To delete a VCC entry, select the entry from the list of VCCs and then click on the **delete** button, at the bottom-right of the page.

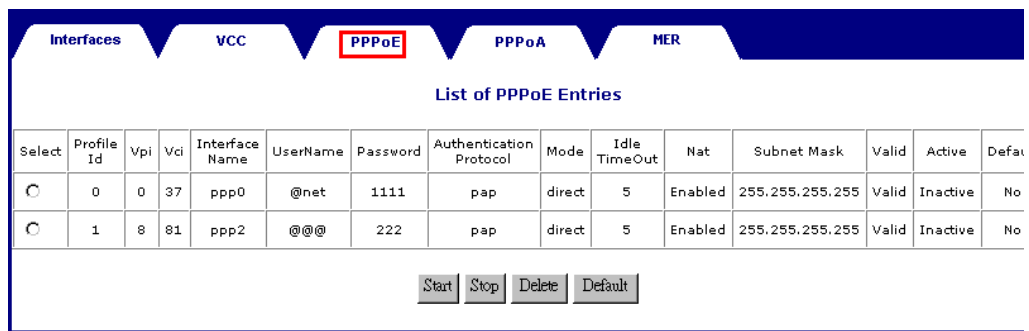
6.7.5 Show VCC quality

To view information regarding the VCC quality, click on the **Show VCC Quality** button, at the bottom-right of the page.

6.7.6 PPPoE

This section will describe how to start, stop, delete, and set a default PPPoE entry. To configure a PPPoE entry in more detail, refer to Chapter 9 Add A VC.

The PPPoE page can be accessed by clicking on **Configure** in the Advanced menu bar. To start, stop, delete, or set as default a PPPoE entry first select the entry from the List of PPPoE entries, and then click the corresponding button at the bottom of the page.



The screenshot shows a web interface with a navigation bar at the top containing tabs for 'Interfaces', 'VCC', 'PPPoE', 'PPPoA', and 'MER'. The 'PPPoE' tab is selected and highlighted with a red box. Below the navigation bar, the title 'List of PPPoE Entries' is centered. A table with 15 columns and 2 rows is displayed. The columns are: Select, Profile Id, Vpi, Vci, Interface Name, UserName, Password, Authentication Protocol, Mode, Idle TimeOut, Nat, Subnet Mask, Valid, Active, and Defau. The first row has values: radio button, 0, 0, 37, ppp0, @net, 1111, pap, direct, 5, Enabled, 255.255.255.255, Valid, Inactive, No. The second row has values: radio button, 1, 8, 81, ppp2, @@@, 222, pap, direct, 5, Enabled, 255.255.255.255, Valid, Inactive, No. Below the table, there are four buttons: Start, Stop, Delete, and Default.

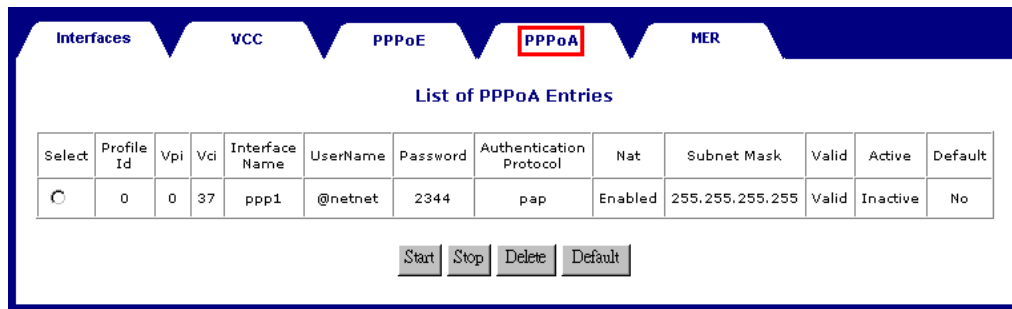
Select	Profile Id	Vpi	Vci	Interface Name	UserName	Password	Authentication Protocol	Mode	Idle TimeOut	Nat	Subnet Mask	Valid	Active	Defau
<input type="radio"/>	0	0	37	ppp0	@net	1111	pap	direct	5	Enabled	255.255.255.255	Valid	Inactive	No
<input type="radio"/>	1	8	81	ppp2	@@@	222	pap	direct	5	Enabled	255.255.255.255	Valid	Inactive	No

Start Stop Delete Default

6.8 PPPoA

This section will describe how to start, stop, delete, and set a default PPPoA entry. To configure a PPPoA entry in more detail, refer to Chapter 9 Add A VC.

The PPPoA page can be accessed by clicking on **Configure** in the Advanced menu bar. To start, stop, delete, or set as default a PPPoA entry first select the entry from the List of PPPoA entries, and then click the corresponding button at the bottom of the page.



The screenshot shows the PPPoA configuration page. At the top, there are tabs for Interfaces, VCC, PPPoE, PPPoA (highlighted with a red box), and MER. Below the tabs is the title "List of PPPoA Entries". A table lists the entries with columns: Select, Profile Id, Vpi, Vci, Interface Name, UserName, Password, Authentication Protocol, Nat, Subnet Mask, Valid, Active, and Default. Below the table are buttons for Start, Stop, Delete, and Default.

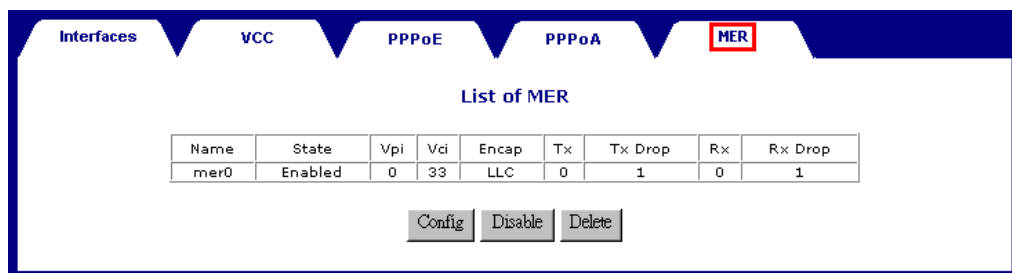
Select	Profile Id	Vpi	Vci	Interface Name	UserName	Password	Authentication Protocol	Nat	Subnet Mask	Valid	Active	Default
0	0	0	37	ppp1	@netnet	2344	pap	Enabled	255.255.255.255	Valid	Inactive	No

Start Stop Delete Default

6.9 MER

This section will describe how to configure, enable, disable, or delete a MER entry. The ATU-R supports one MER entry (named mer0). To configure a MER entry in more detail, refer to Chapter 9 Add A VC.

The MER page can be accessed by clicking on **Configure** in the Advanced menu bar, and click the MER's tab. The page allows configuring, enabling, disabling, or deleting a MER entry. The Enable button displays when no MER entry is established or when mer0 is disabled. If a MER entry was established, the Disable button displays on the screen.



The screenshot shows the MER configuration page. At the top, there are tabs for Interfaces, VCC, PPPoE, PPPoA, and MER (highlighted with a red box). Below the tabs is the title "List of MER". A table lists the entries with columns: Name, State, Vpi, Vci, Encap, Tx, Tx Drop, Rx, and Rx Drop. Below the table are buttons for Config, Disable, and Delete.

Name	State	Vpi	Vci	Encap	Tx	Tx Drop	Rx	Rx Drop
mer0	Enabled	0	33	LLC	0	1	0	1

Config Disable Delete

6.10 IGMP

IGMP (Internet Group Membership Protocol) is a protocol used by IP hosts to report their multicast group memberships to any immediately neighboring multicast routers.



6.10.1 Add an IGMP entry

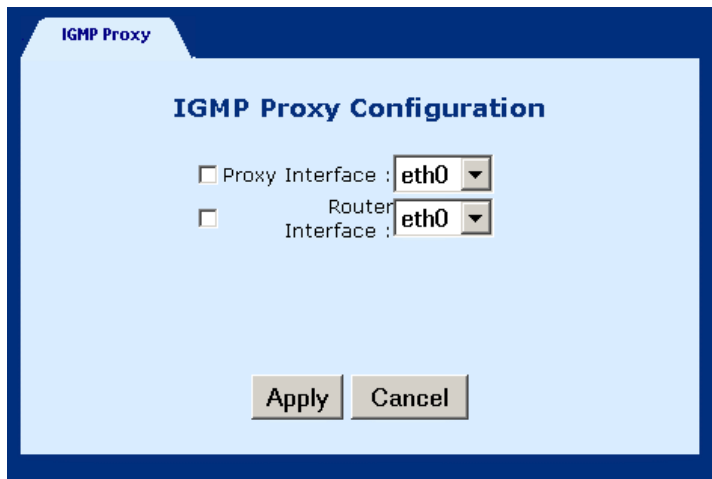
To add an IGMP proxy, complete the following steps:

STEP 1: Select **IGMP Proxy**, from the menu bar.

STEP 2: Click **Add** at the bottom of the screen.

STEP 3: Select Proxy interface, router interface, or both, by checking the box next to the interface and then use the pull-down menu to the left to select the eth, atm, or ppp Interface.

STEP 4: Click **Apply** to activate the parameters.



6.10.2 Delete an IGMP entry

To delete an entry, select an entry from the list, and click **Delete**.

6.11 Bridging

6.11.1 Bridge

The Bridge window displays the configured Bridging PVC entries of the interfaces. There are four buttons at the bottom of the main-pane: Group Info, Add PVC, Flush, and Disable.

Basic

- [Change Password](#)
- [Link Status](#)
- [WAN Setup](#)
- [LAN Setup](#)
- [Routing Setup](#)
- [Save & Reboot](#)
- [Erase & Reboot](#)

Advanced

- [ADSL Mode](#)
- [NAPT](#)
- [DHCP](#)
- [SNMP](#)
- [Configure](#)
- [IGMP Proxy](#)
- [Bridging](#)

Bridge Spaning Tree Filters

List of Bridge Entries

Interface Name	State	MAC Address	Priority	Link Cost	Vpi	Vci	Encapsulation	VPN OUI	VPN ID
eth0	FORWARDING	00:00:00:00:00:00	128	100	NA	NA	NA	NA	NA
atm7	FORWARDING	NA	128	250	0	32	LLC	0	0
atm7	FORWARDING	NA	128	250	0	33	LLC	0	0
atm7	FORWARDING	NA	128	250	0	35	LLC	0	0
atm7	FORWARDING	NA	128	250	8	35	LLC	0	0

- GroupInfo:** This configures the LAN packets that will travel through the LAN interface to the selected WAN interfaces. If you wish to change the interfaces that are configured you must first click on the **Flush button** (to remove the current configuration), and then click on the **Group Info** button, select the group interfaces and then click the **Apply** button. You must select eth0, as eth1 is not enabled for this product version.

Bridge Spaning Tree Filters

Group Interfaces

Eth0

Eth1

Atm0

Atm1

Atm2

Atm3

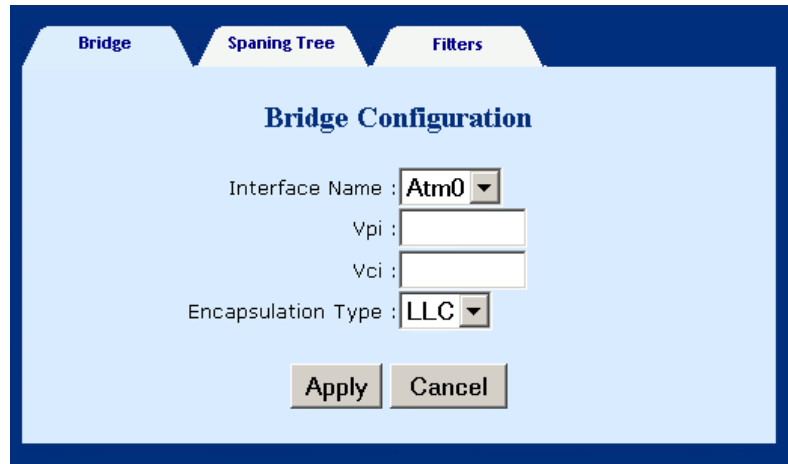
Atm4

Atm5

Atm6

Atm7

- **AddPVC:** You can add a PVC to the ATM interface. From the **Bridging** screen, select an ATM interface Vpi, Vci and Encapsulation type and then click **Apply**.



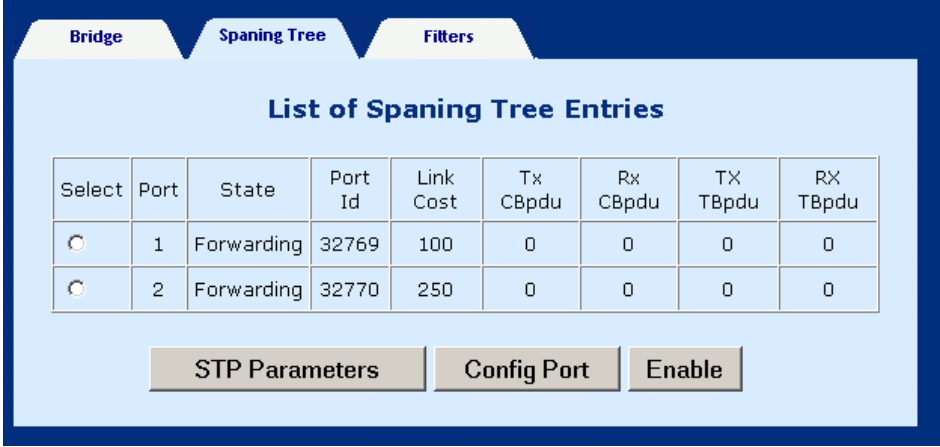
The image shows a 'Bridge Configuration' dialog box with three tabs: 'Bridge', 'Spaning Tree', and 'Filters'. The 'Bridge' tab is selected. The dialog contains the following fields and controls:

- Interface Name :
- Vpi :
- Vci :
- Encapsulation Type :
- Buttons:

- **Flush:** Selecting this command from the **Bridging** screen, will flush all PVC entries.
- **Disable:** Selecting this command from the **Bridging** screen, will disable the PVCs but retain the parameters, so that they can be enabled at a later point.

6.11.2 Spanning tree

To access the spanning tree menu click the **Spanning Tree** tab, located at the top of the **Bridging** screen.




The screenshot shows a web interface with three tabs: "Bridge", "Spaning Tree", and "Filters". The "Spaning Tree" tab is active. Below the tabs is a section titled "List of Spaning Tree Entries" containing a table with the following data:

Select	Port	State	Port Id	Link Cost	Tx CBpdu	Rx CBpdu	TX TBpdu	RX TBpdu
<input type="radio"/>	1	Forwarding	32769	100	0	0	0	0
<input type="radio"/>	2	Forwarding	32770	250	0	0	0	0

Below the table are three buttons: "STP Parameters", "Config Port", and "Enable".

6.11.3 View STP parameters

To view the STP parameters, click the **STP parameters** tab, located at the bottom of the Spanning Tree screen.



The screenshot shows a web interface with a section titled "List of Spaning Tree Parameters" containing a table with the following data:

STP	Disabled
Active Ports	2
Bridge Id	00:00:00:00:80:00
Root Id	00:00:00:00:00:00
Hello Time	2
Max Age	20
Forwarded Delay	15
Root Port	0
Root Path Lost	0
Hold Time	1

Below the table is a "Continue" button.

6.11.4 To configure STP parameters

STEP 1: click the **Spanning Tree** tab, located at the top of the **Bridging** screen.

STEP 2: Click the Configure Port button.

STEP 3: Configure the parameters.

STEP 4: Click the Apply button.

The screenshot shows the 'Port Configuration' dialog box with the following fields and values:

Section	Field	Value
Port Parameters	Interface Name	Eth0
	Link Cost	
	Port Priority	
Bridge Parameters	Bridge Priority (checkbox)	32768
	Max Age Time (checkbox)	20
	Hello Time (checkbox)	2
	Forward Delay Priority (checkbox)	15

6.11.5 Enable/Disable STP

If you wish to Enable/Disable a STP entry, select the entry and then click the **Enable** or **Disable** Button, which is located at the bottom-right of the Spanning Tree screen. Note that if the entry is already enabled the Disable button will be present. Conversely, if the entry is disabled then the Enable button will be present.

6.12 Filtering

Filtering is a type of firewall that is useful to increase network security or to limit unwanted traffic. Filters for this device are based on MAC addresses. The page opens with a list of the currently configured filter entries. From this page, you can also view Filter Parameters, add a filter, delete a filter, modify a filter, or flush filter parameters. These functions are described below.

Select	Name	Port	MAC Address	Age	Action
<input type="radio"/>	None	0	ff:ff:ff:ff:ff:ff	Static	Forward
<input type="radio"/>	None	0	00:00:00:00:00:00	Static	Forward
<input type="radio"/>	eth0	1	00:d0:59:0e:05:0c	Dynamic	Forward
<input type="radio"/>	eth0	1	00:48:54:5e:ed:a1	Dynamic	Forward

Filter Parameters Add Delete Modify Flush

6.12.1 List of filter entries

To display a list of filter parameters click the **Filter parameters** button at the bottom of the Filters page. The following parameters are displayed:

Maximum filter entries	The number of filter entries that can potentially be set
Total filter entries	The number of filter entries that are currently set
Total static entries	The number of static entries that are currently set
Total dynamic entries	The number of dynamic entries that are currently set

List of Filter Parameters	
Maximum Filter Entries	1024
Total Filter Entries	22
Total Static Entries	3
Total Dynamic Entries	19

Continue

6.12.2 Add a filter entry

To add a filtering entry, complete the following steps:

STEP 1: Click the **Add** button at the bottom of the Filters page.

STEP 2: Enter the MAC address

STEP 3: Set the Frame to **forward** to forward packets which match the MAC address, or **Drop**, to drop matching packets.

STEP 4: Click **Apply**

Bridge Spaning Tree Filters

Filter Configuration

MAC Address :

Frame : **Forward** ▼

Apply **Cancel**

6.12.3 Delete a filter entry

To delete a filtering entry Select an entry and then click the **Delete** button at the bottom of the Filters page.

6.12.4 Modify a filter entry

To modify a filter select the entry and then click the **Modify** button at the bottom of the Filters page.

6.12.5 Flush filter entries

To flush all the filtering entries, click the **Flush** button at the bottom of the Filters page.

Chapter 7 Performance monitoring

7.1 ADSL Link Status

To view the ADSL link status, click **Link Status** on the tool bar.

ADSL Line Status	Shows the current status of the ADSL line
ADSL Mode	Shows the ADSL standard that is currently configured. The standards are: MULTI, T1.413, G.DMT, and G.LITE.
Upstream	Upstream data rate negotiated by DSL link (Kbit/s)
Downstream	Downstream data rate negotiated by DSL link (Kbit/s)
Attenuation	Current attenuation (dB)
SNR Margin	Current SNR margin (dB)
HEC	Number of ATM cells received with errors since start of link.
Firmware	The version number of the firmware
15 min ES counter	Number of errored seconds for the current 15 minute period
CRC errors	Number of errors per second since training
1 day ES counter	Number of errored seconds for the current day

The screenshot shows a web interface for ADSL configuration. On the left, there is a sidebar with a 'Basic' tab selected, containing links for 'Change Password', 'Link Status', 'WAN Setup', 'LAN Setup', 'Routing Setup', 'Save & Reboot', and 'Erase & Reboot'. Below this is an 'Advanced' tab with links for 'ADSL Mode', 'NAPT', 'DHCP', 'SNMP', 'Configure', and 'IGMP Proxy'. The main content area is titled 'LinkStatus' and 'ADSL Link Status', displaying a table with the following data:

Adsl Line Status	UNTRAINED
Adsl Mode	T1.413
Up Stream	0 kb (Interleave)
Down Stream	0 kb (Interleave)
Attenuation(Near End)	0.0
SNR Margin(Near End)	0
HEC Count	0
Firmware	0x40e2be29
15 min ES Counter	0
CRC Errors	0
1 day ES Counter	0

7.2 System statistics

To view the system statistics, click on the **System Statistics** button located near the bottom of the menu-bar. Statistics are recorded regarding Interfaces, TCP-IP, and DHCP-Lease.

7.2.1 Interface Statistics

To display the interface statistics, click the **Interface** tab, located at the top-left of the System Statistics screen. The Interface Statistics page displays statistics for all interfaces. The following information is displayed:

Interface Name	The name of the interface
Admin Status	Indicates whether the interface is Up or Down
Octets In	The number of Octets (bytes) recieved
Unicast PktsIn	The number of unicast packets received
Broadcast PktsIn	The number of broadcast packets received
Discards In	The number of packets received that were discarded
Errors In	The number of inward errors
Octets Out	The number of Octets (bytes) transmitted
Unicast PktsOut	The number of unicast packets transmitted
Broadcast PktsOut	The number of broadcast packets transmitted
Discards Out	The number of packets transmitted that were discarded
Errors Out	The number of outward errors

Interface Statistics											
Interface Name	Admin Status	Octets In	Unicast PktsIn	Broadcast PktsIn	Discards In	Errors In	Octets Out	Unicast PktsOut	Broadcast PktsOut	Discards Out	Errors Out
eth0	UP	544100	3831	0	0	0	1193967	1537	0	0	0
mer0	UP	0	0	0	0	0	0	0	0	0	0
lo0	UP	0	0	0	0	0	0	0	0	0	0
atm0	UP	0	0	0	0	0	0	0	0	0	0
atm1	DOWN	0	0	0	0	0	0	0	0	0	0
atm2	DOWN	0	0	0	0	0	0	0	0	0	0
atm3	DOWN	0	0	0	0	0	0	0	0	0	0
atm4	DOWN	0	0	0	0	0	0	0	0	0	0
atm5	DOWN	0	0	0	0	0	0	0	0	0	0
atm6	DOWN	0	0	0	0	0	0	0	0	0	0
atm7	DOWN	0	0	0	0	0	0	0	0	0	0
ppp0	DOWN	0	0	0	0	0	0	0	0	0	0
ppp1	DOWN	0	0	0	0	0	0	0	0	0	0
ppp2	DOWN	0	0	0	0	0	0	0	0	0	0
ppp3	DOWN	0	0	0	0	0	0	0	0	0	0
ppp4	DOWN	0	0	0	0	0	0	0	0	0	0
ppp5	DOWN	0	0	0	0	0	0	0	0	0	0
ppp6	DOWN	0	0	0	0	0	0	0	0	0	0

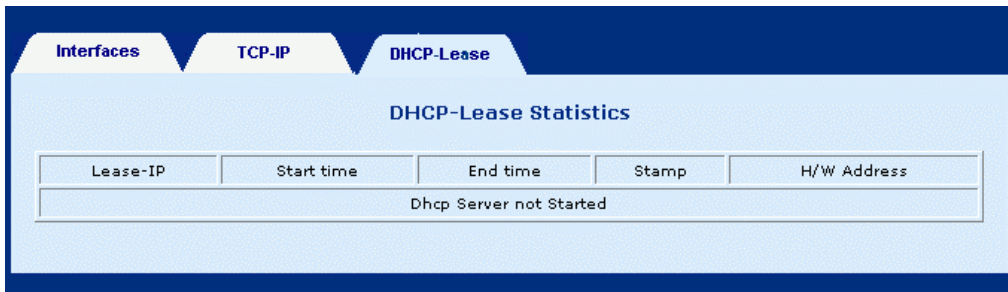
7.2.2 TCP-IP

To view TCP-IP statistics click on the **TCP-IP** tab at the top of the System Statistics page. The TCP-IP page displays the IP statistics, UDP statistics, TCP statistics, and ICMP statistics.

TCP-IP Statistics											
IP Statistics											
In receives	2297	In Errors	0	In Unknown Protos	47	Forwarded Datagrams	1552				
Out Requests	1552	Out Discards	0	Out No Routes	0						
Udp Statistics											
Data grams In	734	Datagrams Out	0	Errors In	0						
Tcp Statistics											
Active Opens	0	Passive Opens	61	Attempt Fails	0	Current Establishments	3				
Segments In	1517	Segments Out	1554	Segments retransmitted	0	Errors In	0				
Icmp Statistics											
IN											
Messages	42	Errors	0	Destination Unreaches	0	Time Exceeds	0				
Source Quenches	0	Redirects	0	Echos	0	Echo Replies	0				
OUT											
Messages	0	Errors	0	Destination Unreaches	0	Time Exceeds	0				
Source Quenches	0	Redirects	0	Echos	0	Echo Replies	0				

7.2.3 DHCP-Lease

To view TCP-IP statistics click on the **DHCP-Lease** tab at the top of the System Statistics page. The DHCP-Lease page shows the PCs that obtained an IP address from the DHCP pool.

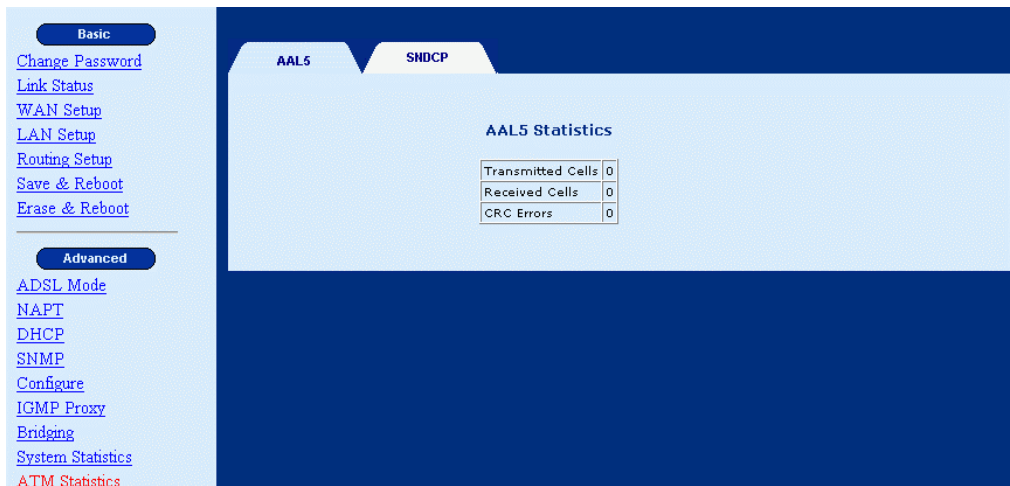


7.3 ATM statistics

Click on **ATM Statistics** on the menu-bar to display the ATM Statistics. The ATM Statistics page monitors information for AAL5 and Encapsulation.

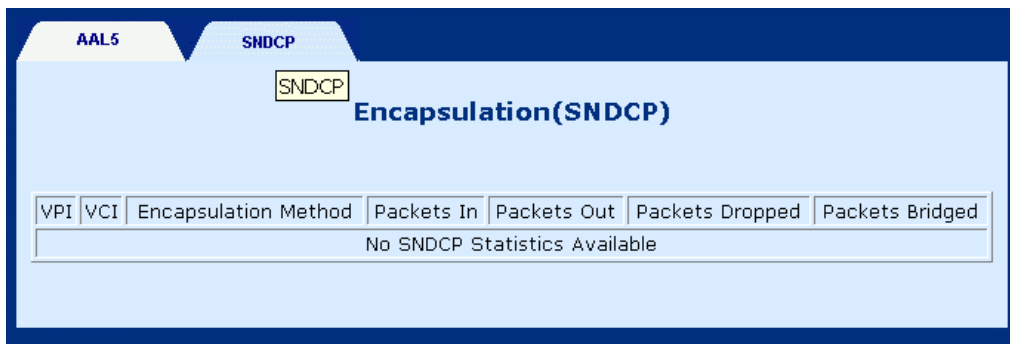
7.3.1 AAL5

The AAL5 page shows the AAL5 statistics.



7.3.2 Encapsulation

Click on the **SNDCP** tab to display encapsulation statistics. This page displays the VCs that are running. (SNDCP stands for sub-network dependency convergence protocol).



The screenshot shows a web interface with two tabs: 'AAL5' and 'SNDCP'. The 'SNDCP' tab is selected, and the page title is 'Encapsulation(SNDCP)'. Below the title is a table with the following columns: VPI, VCI, Encapsulation Method, Packets In, Packets Out, Packets Dropped, and Packets Bridged. The table is currently empty, displaying the message 'No SNDCP Statistics Available'.

VPI	VCI	Encapsulation Method	Packets In	Packets Out	Packets Dropped	Packets Bridged
No SNDCP Statistics Available						

Chapter 8 Diagnostics

To access the Diagnostics screen, click the **Diagnostics** button, which is located on the menu bar. The Diagnostics screen has two test functions: OAM Loopback and Ping test.

8.1 OAM Loopback

STEP 1: click the **Diagnostics** button, on the menu bar.

STEP 2: Click the **Loopback** tab on the Diagnostics screen.

STEP 3: Enter the following information to run the OAM loopback:

- Flow type: F5 SEG (Segment to Segment) and F5 ETE (End-to-End). The **SEG** loopback is from ATUR to DSLAM. The **ETE** loopback is from ATUR to the ISP RAS.
- VPI and VCI: Specify the virtual channel that will run the OAM loopback.
- Loopback ID: Type the loopback pattern for the loopback

STEP 4: Click the **Start Loopback** button at the bottom of the screen.

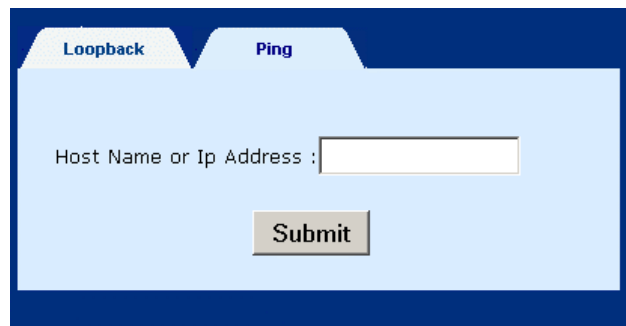
The screenshot shows a web-based configuration interface for OAM Loopback. On the left is a navigation menu with links: [Change Password](#), [Link Status](#), [WAN Setup](#), [LAN Setup](#), [Routing Setup](#), [Save & Reboot](#), [Erase & Reboot](#), [Advanced](#) (highlighted), [ADSL Mode](#), [NAPT](#), [DHCP](#), [SNMP](#), and [Configure](#). The main content area has two tabs: 'Loopback' (selected) and 'Ping'. The 'OAM Loopback' configuration form includes: 'Flow Type' dropdown set to 'F5 SEG', 'VPI' text box containing '0', 'VCI' text box, and 'Loopback ID' text box containing a long string of 'F' characters. A 'Start Loopback' button is at the bottom.

8.2 Ping

A Ping test is used to verify the status of a network connection after the RIP or static route function is enabled. Ping sends a request message to the host and waits for a return message. This diagnostic function can verify if the remote host is reachable. Ping can also measure the round-trip time to the remote host.

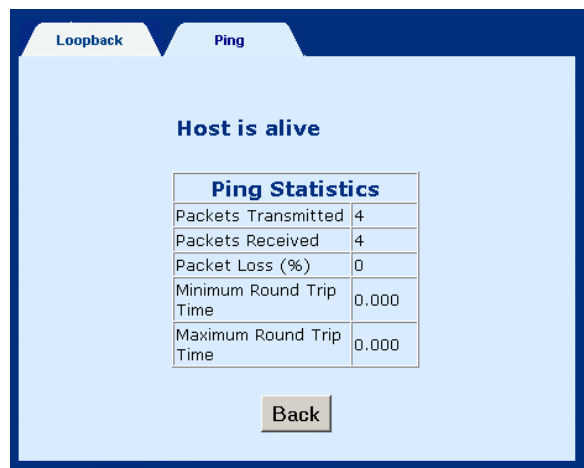
To access the Ping test screen, click the **Ping** tab on the Diagnostics screen.

Enter the **Host Name** or **IP address** of the remote terminal and click **Submit** to start the ping and display the results.



The following is an example of the ping result. The information displayed is as follows:

Packets transmitted	The number of packets that were transmitted
Packets received	The number of packets that were received
Packets lost	The number of packets lost (transmitted-received)
Minimum round trip time	The fastest round-trip time
Maximum round trip time	The slowest round-trip time

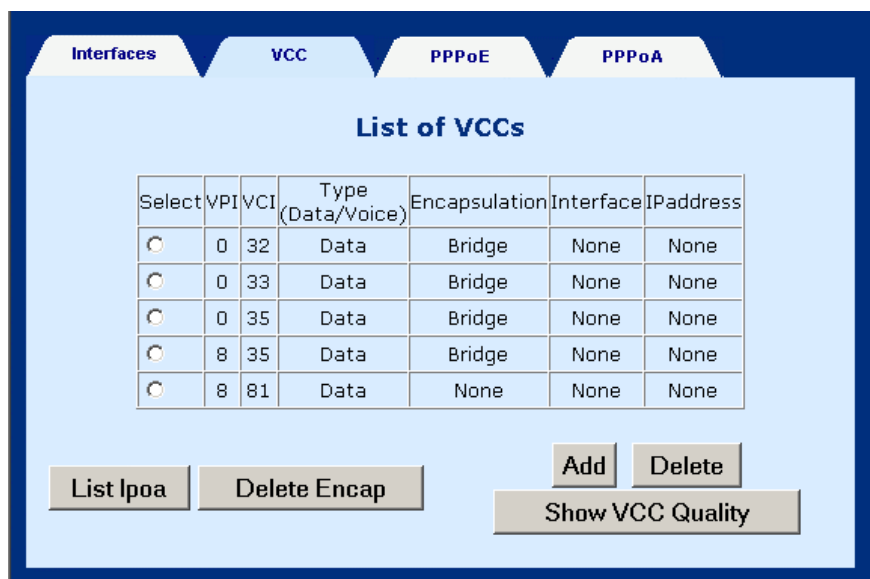


Ping Statistics	
Packets Transmitted	4
Packets Received	4
Packet Loss (%)	0
Minimum Round Trip Time	0.000
Maximum Round Trip Time	0.000

Chapter 9 Adding a PVC

STEP 1: Click Configure from the Advanced menu bar.

STEP 2: Click the VCC tab.



The screenshot displays the 'List of VCCs' configuration page. At the top, there are four tabs: 'Interfaces', 'VCC', 'PPPoE', and 'PPPoA'. The 'VCC' tab is selected. Below the tabs, the title 'List of VCCs' is centered. A table lists five VCC entries with columns for 'Select', 'VPI', 'VCI', 'Type (Data/Voice)', 'Encapsulation', 'Interface', and 'IPaddress'. Below the table, there are several control buttons: 'List Ipoa', 'Delete Encap', 'Add', 'Delete', and 'Show VCC Quality'.

Select	VPI	VCI	Type (Data/Voice)	Encapsulation	Interface	IPaddress
<input type="radio"/>	0	32	Data	Bridge	None	None
<input type="radio"/>	0	33	Data	Bridge	None	None
<input type="radio"/>	0	35	Data	Bridge	None	None
<input type="radio"/>	8	35	Data	Bridge	None	None
<input type="radio"/>	8	81	Data	None	None	None

Buttons: List Ipoa, Delete Encap, Add, Delete, Show VCC Quality

STEP 3: Click **Add**

VCC Configuration

VPI :	<input type="text"/>	VCI :	<input type="text"/>
Peak Cell Rate (cells/sec):	<input type="text" value="3000"/>	Avg. Cell Rate (cells/sec):	<input type="text" value="3000"/>
Burst Size (cells):	<input type="text" value="45"/>	CDVT (cells):	<input type="text" value="500000"/>
Type :	<input type="text" value="Data"/>	Service Type :	<input type="text" value="CBR"/>

For data flow:

Routed
Interface :

IPoA
Interface :
Default PVC :
Next Hop IP Address :

PPPoA
Profile Id :
User Name :
Authentication Type :
Encapsulation Type :
SubnetMask :

Password :
Interface :
Trace :
NAT :

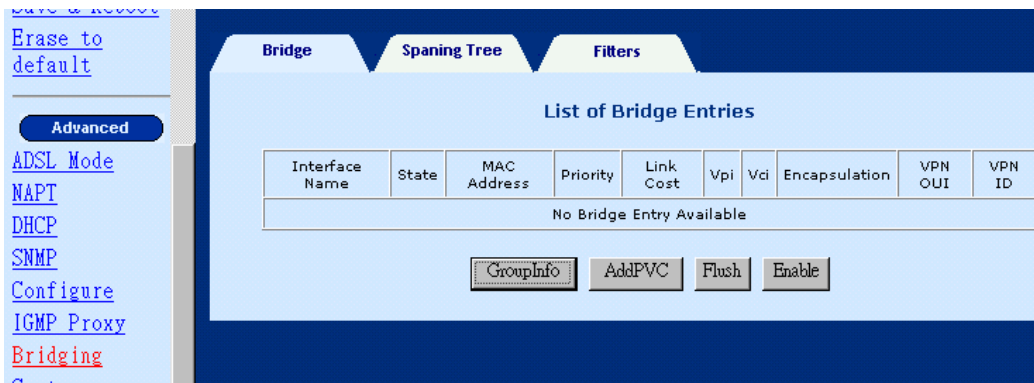
PPPoE
Profile Id :
User Name :
Authentication Type :
Mode :
Encapsulation Type :
SubnetMask :

Password :
Interface :
Idle Time :
Trace :
NAT :

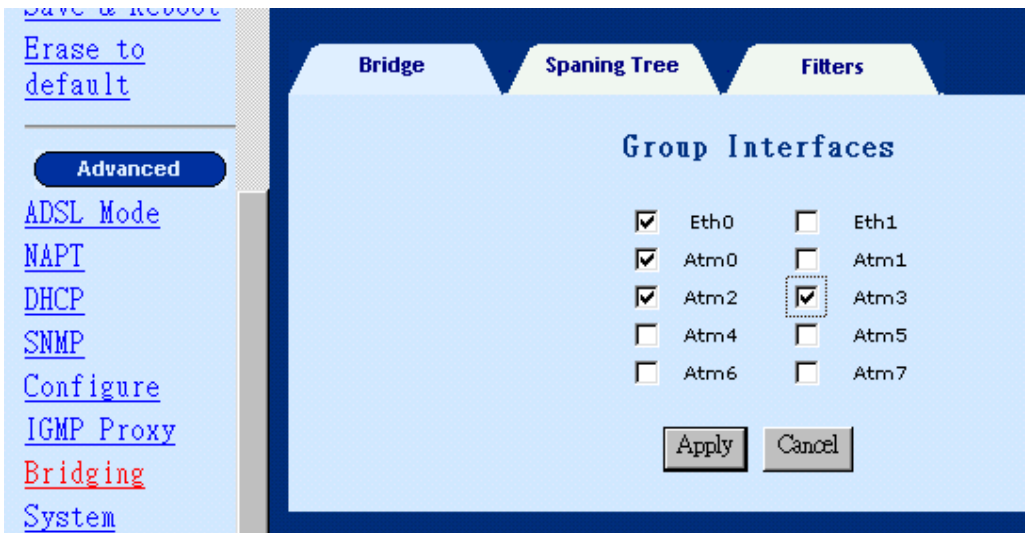
STEP 4: Configure the parameters on this page and click **Apply** to submit the settings.

STEP 5: Save the settings and reboot the device.

STEP 6: Click **Bridging** on the Advanced menu bar.



STEP 7: Click the **GroupInfo** button.



STEP 8: Specify the interfaces that data will be transmitted to the Internet from the LAN port (eth0). The item eth0 must be checked, and also check the ATM interface (s) that data can be forwarded from the LAN interface.

STEP 9: Click Apply to submit the settings.

STEP 10: Return to the previous page and click **AddPVC**.

Save & Reboot
Erase to default
Advanced
ADSL Mode
NAPT
DHCP
SNMP
Configure
IGMP Proxy
Bridging
System

Bridge Spaning Tree Filters

Bridge Configuration

Interface Name : Atm0
Vpi : 2
Vci : 35
Encapsulation Type : LLC

Apply Cancel

STEP 11: Type the VPI and VCI values that were established in Step 4, and select an Encapsulation type. Click Apply to submit the settings.

STEP 12: Return to the previous page and select an bridging entry from the List of entries, and click **Enable** to enable the PVC.

Appendix A: Specifications

■ WAN interface (one ADSL port)

Item	Specifications
ADSL standard	DMT
G.DMT data rate	Downstream: 8 Mbps Upstream: 1 Mbps

■ ATM attributes

Item	Specifications
PPP over AAL5	RFC2364
Multi-protocol over AAL5	RFC2684 (1483)
VCs	8
AAL type	AAL5
ATM service class	UBR/CBR/VBR
ATM UNI support	UNI 3.1 PVC
OAM F4/F5	Yes

■ Management

Item	Specifications
Console port	RS232/DB9
SNMP	Yes
TR-006 ADSL line MIB	Yes
Telnet	Yes
Web-based management	Yes
Configuration backup and restoration	Yes
LED indicators	ADSL status, LAN status, Power

- **Local interface (1 port Ethernet Switch)**

Item	Specifications
Standard	IEEE 802.3 10/100BaseT
Transparent bridging and learning	Yes

- **Routing functions**

Item	Specifications
IP static route	Yes
RIP and RIPv2	Yes

- **Network functions**

Item	Specifications
ARP	Yes
DNS, NAT/PAT, DHCP/BOOTP	Yes
PAP, CHAP	Yes

- **Power supply**

Item	Specifications
Power source	110 VAC or 220 VAC (50 or 60 Hz)

- **Environmental conditions**

Item	Specifications
Operating temperature	0 to 50 degrees Celsius
Relative humidity	5% to 90% (non-condensing)

Appendix B: Pin Assignments

Console Port (RS232 DB9)

Pin number	Definition		Pin number
1	NC		6
2	TD		7
3	RD		8
4	NC		9
5	GND		

Pin Assignments of the Console Port

Line port (RJ11)

Pin	Definition	Pin	Definition
1	-	4	ADSL_TIP
2	-	5	-
3	ADSL_RING	6	-

Pin Assignments of the RJ11 Port

LAN Port (RJ45)

Pin number	Definition	Pin number	Definition
1	Transmit data+	5	NC
2	Transmit data-	6	Receive data-
3	Receive data+	7	NC
4	NC	8	NC

Pin assignments of the LAN Port