

# 1740 SHDSL 2/4-Wire Router

# **User's Guide**

Document Number 1740-A2-GB20-00

July 2004



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#### Preface

This manual is designed to provide information to network administrators. It covers the installation, operation and applications of the 1740 SHDSL router.

# 🛦 Warning

- Before servicing or disassembling this equipment, always disconnect all power and telephone lines from the wall outlet.
- 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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# CHAPTER 1 Overview

The 1740 SHDSL router satisfies the needs of multiple users in small/home offices and remote/branch offices. It provides symmetrical transmission speeds of up to 4.6 Mbps through a SHDSL connection, over a two-wire or four-wire line. In addition, it supports up to 16 virtual concurrent connections to multiple destinations. The integrated four-port switch enables up to four devices to be connected to the LAN.

The SHDSL router can be used for variety of applications, including video conferencing, remote training, e-commerce, and other multimedia applications. Easy configuration and monitoring can be accomplished using the Web browser.

The SHDSL router has full routing capabilities to segment/route IP protocol and is capable of bridging other protocols. It can be also configured in either server or client mode enabling point-to-point connectivity between two sites.

### 1.1 Application

SHDSL SHDSL SHDSL Router

The router can be used for DSLAM and point-to-point applications.

#### **DSLAM Application**



**Point-to-Point Application** 

#### 1.2 LED Indicators

There are eight LEDs on the front panel of the router; the functions of the LEDs are described in the table below.



Figure 1-1 Faceplate LED Indicators

LED	Color	Mode	Function
POWER	Green	On	Power is supplied
		Off	Power is not supplied
LAN 1–4	Green	Off	No data transmitted or received over the Ethernet link
		On	The Ethernet link is established
		Flash	Transmitting or receiving data over Ethernet link
SHDSL LINK	Green	On	The physical link through the RJ45 connection cable is established
		Flash	The SHDSL line is training
		Off	A SHDSL connection is not established
SHDSL	Green	On	Receiving data over the SHDSL link
RX		Off	No data receiving over the SHDSL link
SHDSL	Green	On	Transmitting data over the SHDSL link
		Off	No data transmitting over the SHDSL link

# CHAPTER 2 Installation

# 2.1 Preparing for Hardware Installation

The following equipment may be necessary to install the router:

#### • AC power adapter

A power adapter is shipped with the router.

#### • LAN connection cable

To connect to the hub, use a straight-through RJ45 cable. To connect to a PC, use a crossover RJ45 cable.

#### • Four-wire (8P8C) straight-through RJ45 cable

A four-wire (8P8C) straight through RJ45 cable is needed to connect to the LINE port to the wall outlet.

## 2.2 Rear-panel Connections



#### **DSL** connection

Connect the supplied RJ45 cable to the port marked LINE at the back of the SHDSL router. Connect the other end of the cable to your telephone-line wall outlet. Ensure your computer is turned on before you connect the DSL line to the router. A green LED on the front of the device labeled LINK will illuminate steadily. If the SHDSL LINK LED does not illuminate steadily within one minute of it being connected, check your cable connections to ensure they are correct and securely installed.

#### **Ethernet connection**

Insert one end of the RJ45 Ethernet cable into one of the LAN ports marked LAN on the back of the SHDSL router. Connect the other end of the cable into your Ethernet Network Interface Card (NIC) installed in your computer. When the Ethernet connection is established, the correspondent green LED on the front panel labeled LAN will illuminate steadily. You can connect up to four PCs to the router.

#### Power connection

Connect the supplied external AC adapter into the DC power outlet on the back of the router. Connect the power supply into your wall outlet or surge protector. Turn on the power switch. After powering on, the router performs a self-test. Wait for a few seconds until the test is finished, then the router will be ready to operate. The POWER indicator on the front of the router will illuminate green to indicate that power is being supplied to the router.

- Caution 1: If the router fails to power up, or it malfunctions, first verify that the power supply is connected correctly. Then power it on again. If the problem persists, contact your technical support representative.
- Caution 2: Before servicing or disassembling this equipment always disconnect all power cords and telephone lines from the wall outlet.

# CHAPTER 3 Quick Installation

This section describes how to manage the router via the Web browser from the remote end. The Web page is best read with a display resolution of 1024 x 768. To change the resolution, go to the Microsoft Windows Control Panel and click on the **Display** icon. You will find the display settings there.

#### 3.1.1 Login

**STEP 1:** Configure your workstation to the same network segment as the router, if for example the router is set to its default address of 192.168.1.1, we could set the PC to 192.168.1.133 and subnet mask 255.255.255.0.

TCP/IP Properties		? ×
Bindings DNS Configuration	Advanced Gateway WINS Co	NetBIOS Onfiguration IP Address
An IP address can If your network doe your network admir the space below.	be automatically assig s not automatically as nistrator for an address	ined to this computer. isign IP addresses, ask s, and then type it in
C <u>O</u> btain an IP <b>⊡⊙</b> <u>S</u> pecify an IP	address automatically address:	
<u>I</u> P Address:	192.168.	1.133
S <u>u</u> bnet Masl	c 255.255.2	55.0
		OK Cancel

**STEP 2:** Start your Internet browser.

- STEP 3: Enter the IP address of the router in the Web address field. For example, if the IP address is 192.168.1.1, enter http:// 192.168.1.1
- **STEP 4:** You will be prompted to enter your user name and password. Type your password, or if the password was not changed, type the default passwords. The default ADMINISTRATOR user name and password are **root**.

**STEP 5:** After successfully logging in, you will reach the main configuration page. The left hand side has a menu and the right side is blank.



## 3.1.2 Web Page Layout

On each Web page, there are two areas.

- <u>Menu Bar:</u> On the left side of the Web page is the menu bar. It is divided into two parts: Basic and Advanced. The **Basic** menu bar sets up the device for quick setup. The **Advanced** menu bar configures advance functions such as SNMP, DHCP server, and DNS proxy. The menu also covers the maintenance function.
- <u>Main Window:</u> The main window in middle of the page displays after clicking a button on the menu bar. It includes the tabs on the top of the window. The tabs lead to other sub-screens.

	Main window
SHDSL	Routing Setup RIP Routing Table
Basic	Tabs Routing Setup
<u>Link Status</u> WAN Setup LAN Setup	Rip Configuration
<u>Routing Setup</u> Change Password	Apply
<u>Save &amp; Reboot</u> Erase & Reboot	Static Routes Configuration Destination Network ID :
Advanced	Destination Subnet Mask :
NAPT DHCP	Metric : 1
SNMP	Add Modify Delete
DNS Proxy	List of Static Routes
Menu bar	

## 3.1.3 Monitoring the SHDSL Line

Click **Link Status** on the Basic menu bar. The Link Status screen has two tabs: SHDSL Status and Performance. **SHDSL Status** is used to monitor the SHDSL link and the **Performance** is used to monitor the SHDSL performance.

SHDSL –	SHDSL Status Performance	
Basic		
AN Setup	Terminal Type	CPE
N Setup	Operate State	Handshake
uting Setup	Actual Bit Rate (Kbps)	0
inge Password	Line Attenuation (dB)	0
e & Reboot	SNR Margin (dB)	18
se & Reboot	ESs (current 15 min)	0
	ESs (current 1 day)	0
Advanced	CRCs (since reset)	0
<u>PT</u>		
<u>CP</u>		
<u>MP</u>		
MP Proxy		

The following is the screen after clicking the [Performance] button.

SHDSL	SHDSL Status	Performance
	Line Attenuation	(dB) 0
Basic	SNR Margin (dB)	18
LINK STATUS	CRCs (since rese	t) 0
I A N Setup	ESs (since reset)	0
Routing Setup	SESs (since reset	) 0
Change Password	LOSWs (since res	et) 2292
Save & Reboot	UASs (since reset	i) 2292
Erase & Reboot	CRCs (current 1	5 min) 0
	ESs (current 15	min) O
Advanced	SESs (current 15	min) O
<u>NAPT</u>	LOS Ws (current 1	5 min) 493
DHCP	UASs (current 15	min) 493
<u>SNMP</u>	CRCs (current 1	day) O
<u>IGMP Proxy</u>	ESs (current 1 d	av) 0
<u>DNS Proxy</u>		

#### 3.2 WAN Interface Configuration

The router supports 16 ATM interfaces. A virtual channel (VC) can be configured for each ATM interface such as ATM1 to VC1, ATM 2 to VC2, and so on. Each VC can be specified with a protocol, which can be RFC 1483 bridged, RFC 1483 Routed, PPPoE, or PPPoA.

By default, VC1 is enabled with the parameters VPI/VCI 0/33 and protocol RFC 1483 Bridged. VC1 can work without any modifications. VCs 2 to 16 are disabled.

If the VC is added on the Basic> Wan Setup, it will be added from VC2 to VC16. (VC1 is already enabled for 0/33).

If a PPPoE-based VC is created on Basic>WAN Setup, the DHCP server will be automatically enabled. If a PPPoE based VC is created on Advanced>Interface, the DHCP server function must be enabled manually.

The WAN interface can be configured to operate in the following modes: bridge, router, PPPoE, or PPPoA. Configuration for each mode is explained in the sections that follow.

## 3.2.1 Bridge Mode: Service for One Fixed IP Address

To configure one static IP address, you need to set up the VC in RFC 1483 bridged mode. The router has a default Virtual Channel (VC) of 0/33. It can function without other modifications.

STEP 1: Click WAN Setup on the Basic menu bar, and enter values for: VPI, VCI, Encapsulation (LLC or VC MUX).

VPI	Enter a value for the vitual path identifier
VCI	Enter a value for the virtual channel identifier
LLCEncapsulation:	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	This function cannot be set for bridge mode.

STEP 2: Click on RFC 1483 Bridged.

STEP 3: Click on the Add button. The new VC is added in the Current ATM PVC List on the bottom screen.

To modify the VC, click a VC from the Current ATM PVC List to display the parameters of the VC. Change its parameters and click on the **Modify** button.

SHDSL	WAN Setup		
	WAN Setup		
Basic	VPI : 0 VCI : 33 C LLC/SNAP C Vc Multiplexing Enable NAPT		
<u>Link Status</u>	C R C 1483 Bridged		
WAN Setup			
LAN Setup	© RFC1483 Routed		
Routing Setup	WAN IP address: WAN subnet mask:		
Change Password			
Save & Reboot			
Erase & Reboot	User name: Password: Password:		
	Mode: direct 🔽 Idle Timeout(min): 0 🗖 Enable DHCP Server		
Advanced	Keepalive Interval(sec): 0		
NAPT			
DHCP	PPPoA (NAT Enabled)		
SNMP	User name: Password:		
IGMP Proxy	Keepalive Interval(sec): 0		
DNS Proxy	Add Modify Delete		
WAN Configure			
Bridging	Comment ATM DVO Lint		
PFilter	Gurrent ATM PVG List		
VLAN	Select Mode VPIVCIEncep NAPT Address Mask Name Protocol Timeout Interval Mode Status		
System Statistics	Image: Field ged         0         33         LLC         OFF         -         -         0         0         -         Down		
Interface Monitor			

# 3.2.2 Router Mode: Service for Five Static IP Addresses

To set up the service for five static IP addresses, you need to set up the VC in RFC 1483 Routed mode.

**<u>STEP 1:</u>** Click **WAN Setup** on the Basic menu bar.

STEP 2: Enter values for: VPI, VCI, Encapsulation (LLC or VC MUX), Enable NAPT.

VPI	Enter a value for the vitual path identifier
VCI	Enter a value for the virtual channel identifier
LLCEncapsulation:	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	Selecting <b>Enabling NAPT</b> will enable Network Port Address Translation on the WAN interface.

STEP 3: Click on the RFC 1483 Routed option.

STEP 4: Click on the Add button. The new VC is added in the Current ATM PVC List on the bottom screen.

To modify the VC, click a VC from the Current ATM PVC List to display the parameters of the VC. Change its parameters and click on the **Modify** button.

	MAN Solution		
SHDSL	The second		
	WAN Setup		
Basic	VPI : 🔍 VCI : 📴 🤨 LLC/SNAP 🤇 VC Multiplexing 🗖 Enable NAPT		
Link Status	Comment 1		
WAN Setup	* KFU1483 Bridged		
LAN Setup	© RFC1483 Routed		
Routing Setup	WAN IP address: 10.0.0.1 WAN subnet mask: 255.255.252		
Change Password			
Save & Reboot			
Erase & Reboot	User name: Password: Password:		
	Mode: direct 🗸 Idle Timeout(min): 🕛 🔽 Enable DHCP Server		
Advanced	Keepalive Interval(sec): 0		
NAPT			
DHCP	• PPPoA (NAT Enabled)		
SNMP	User name: Password:		
IGMP Proxy	Keepalive Interval(sec): 0		
DNS Proxy	Add Modify Delete		
WAN Configure			
Bridging	Current ATM BVC List		
PFilter			
VLAN	Select Mode VPIVCIEncap NAPT Address Subnet Mask User Authentication Idle Keepalive PPPot Status Mode Status		
System Statistics	Enidged 0 33 LLC OFF 0 0 - Down		
Interface Monitor	Routed 0 34 LLC OFF 10.0.0.1 255.255.252 0 0 - Down		

After creating an RFC 1483 Routed VC, click LAN Setup to set up the router's Ethernet IP address.

SHDSL	
Basic Link Status	LAN Setup
WAN Setup LAN Setup	LAN Setup
Routing Setup Change Password	LAN IP Address : 172.16.5.2 Subnet : 255.255.0
Save & Reboot Erase & Reboot	
	Apply Cancel

• After changing the IP address, click **Apply** to display the following screen. The Change & Reboot button allows you to use the new IP address and reboot the router immediately. The Change button allows using the IP address immediately but you need to save the setting by clicking **Save & Reboot** on the Basic menu bar. To use the Web Browser, make sure you change the PC's IP address.

LAN IP address is going to change. Use the new IP address to browse the web configuration.
[Change & Reboot] Changes the configuration and reboot now. [Change]Changes the configuration only.
Change & Reboot Change

For example, to change the VC 0/34 from Mode RFC 1483 Bridged to Mode RFC 1483 Routed, follow the steps below.

**STEP1:** Click **WAN Setup** on the Basic menu bar.

**STEP2:** select 0/34 from the Current ATM PVC List to display the parameters and click **RFC 1483 Routed** and then click on the **Modify** button.

WAN Setup	
	WAN Setup
	VPI : O VCI : 34 C LLC/SNAP C Vc Multiplexing Enable NAPT
C RFC1483 Bridged	
RFC1483 Routed	
WAN IP addres:	s: 10.0.0.1 WAN subnet mask: 255.255.255.252
O PPPoE (NAT Enabled	1)
User name	e: Password:
Mode	a: direct 🔽 Idle Timeout(min): 🛛 🔽 Enable DHCP Server
	Keepalive Interval(sec):
O PPPoA (NAT Enabled	4)
User name	2: Password:
	Keepalive Interval(sec): 0
	Add Modify Delete
	Current ATM PVC List
Select Mode \	VPI VCI Encap NAPT IP Subnet Mask User Authentication Idle Keepalive PPPoE Status Mode Status
C Bridged	0 33 LLC OFF 0 0 - Down
C Routed	0 34 LLC OFF 10.0.0.1 255.255.252 0 0 - Down

<u>STEP 3:</u> Click LAN Setup on the menu bar to type the IP address for the LAN port. Click LAN Setup on the menu bar and type the IP address and Subnet (should be 255.255.255.248 for static five IP address service) and then click Apply.

SHDSL	
Basic Link Status	LAN Setup
WAN Setup LAN Setup	LAN Setup
Routing Setup Change Password Save & Reboot	LAN IP Address : 211.75.229.249 Subnet : 255.255.255.248
Erase & Reboot Advanced	Apply Cancel

**Note:** After the IP address is changed, your PC and the router are on different network segments. Therefore, you cannot use the web browser to configure the router. You must change your PC's IP

address.

**<u>STEP 4:</u>** Click **Save & Reboot** on the Basic menu bar to save your settings.

SHDSL	Save & Reboot
Basic Link Status WAN Setup LAN Setup Routing Setup Change Password Save & Reboot	Saves the current configuration to the flash memory. Do not turn off the power before the next page is displayed, Or else the unit will be damaged !!! Save
Advanced NAPT DHCP SNMP IGMP Proxy DNS Proxy	The modem will reboot And it will take 30 seconds to reboot and startup. Reboot

#### 3.2.3 PPPoE

When a VC is set in the PPPoA, the router will auto-detect the Authentication code (PAP or CHAP). The NAPT and DHCP server functions will be enabled automatically.

STEP 1: Click WAN Set	up on the Basic	: menu bar a	and enter the	following param	neters to set	up the
PPPoE.	-					-

VPI	Enter a value for the vitual path identifier
VCI	Enter a value for the virtual channel identifier
LLCEncapsulation:	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	Selecting <b>Enabling NAPT</b> will enable Network Port Address Translation on the WAN interface.
User Name/Password	These two fields are used for remote subscriber to log on for Internet access.
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.

Idle Timeout	The Idle Time field defines the period of idle time after which the PPPoE link will be terminated. It is functional in the auto mode. The default setting is 5 minutes. In Direct mode, this function is not used and the field displays zero.
Enable DHCP server	Check the item to enable the DHCP server or uncheck it to disable it.
Keepalive Interval(sec):	Keep-alive is a networking operation that periodically (default- every 10 seconds) checks the availability of a PPPoE/PPPoA connection between the CO and CPE. If the keep-alive message is not acknowledged, the connection will be interrupted.

- **STEP 3:** Click **PPPoE**, and type the user name and password that the remote subscriber needs for Internet access.
- STEP 4: Click on the Add button. The new VC is added in the Current ATM PVC List on the bottom screen.

To modify the VC, click a VC from the Current ATM PVC List to display the parameters of the VC. Change its parameters and click on the **Modify** button.

WAN Setup											
					WAN Set	սք					
	VPI :	0 vo	ı. <u>34</u>		LC/SNAP C	Vc Multiplexing	🔽 Ena	ble NAPT			
C RFC1483 Bridged											
C RFC1483 Routed											
WAN IP address						WAN s	ubnet mas	sk:			
• PPPoE (NAT Enabled)											
User name:	12345&	ntest					Passwo	ord: <del>******</del>	*		
Mode:	auto	-				Idle Timeout(m	in): 6	Enab	le DHCP	Server	
					Kee	epalive Interval(s	ec): 10				
O PPPoA (NAT Enabled)											
User name:				-			Passv	vord:			_
					К	eepalive Interval(	(sec): 0	_			
				Add	Modify	Delete	,				
				Curr	ent ATM F	VC List					
Select Mode VF		cap NAPT	IP Address	Subnet Mask	User Name	Authentication Protocol	Idle Timeout	Keepalive Interval	PPPoE Mode	Status	
C Bridged C	) 33 L	LC OFF	-	-	-	-	0	0	-	Down	
PPPoE	) 34 L	LC ON	-	-	123458/test	-	6	10	auto	Down	

## 3.2.4 PPPoA

When a VC is configured for PPPoA, the router will auto-detect the Authentication code (PAP or CHAP), and the NAPT function will be enabled automatically.

STEP 1: Click WAN Setup on the Basic menu bar.

STEP 2: Enter values for the following fields: VPI, VCI, Encapsulation (LLC or VC MUX), Enable NAPT.

VPI	Enter a value for the vitual path identifier
VCI	Enter a value for the virtual channel identifier
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	Selecting <b>Enabling NAPT</b> will enable Network Port Address Translation on the WAN interface.
Keepalive Interval(sec):	Keep-alive is a networking operation that periodically checks the availability of a PPPoE/PPPoA connection between the CO and CPE. If the keep-alive message is not acknowledged, the connection will be interrupted.

STEP 3: Click PPPoA, and type the user name and password that the remote subscriber needs for Internet access.

STEP 4: Click on the Add button. The new VC is added in the Current ATM PVC List on the bottom screen.

To modify the VC, click a VC from the Current ATM PVC List to display the parameters of the VC. Change its parameters and click on the **Modify** button.

<b>^</b>	WAN Setup
SHUSL	WAN Setup
Basic	VPI : O VCI : 34 O LLC/SNAP O VC Multiplexing 🗹 Enable NAPT
Link Status	C RFC1483 Bridged
WAN Setup	C RFC1483 Routed
LAN Setup	WAN IP address: WAN subnet mask:
Routing Setup	
Change Password	C PPPoE (NAT Enabled)
Save & Reboot	User name: Password:
Erase & Reboot	Mode: direct 💌 Idle Timeout(min): 🕛 🗖 Enable DHCP Server
Advanced	© PPPoA (NAT Enabled)
NAPT	User name: pCl Password: *****
DHCP	Add Modify Delete
<u>SNMP</u>	
IGMP Proxy	Current ATM BVC List
DNS Proxy	
WAN Configure	Select Mode VPIVCIEncap NAPT Address Mask Name Protocol Timeout Mode Status
Bridging 🗸 🗸	O Bridged 0 33 LLC OFF 0 - Down

## 3.2.5 Password Setup

There are two types of access privileges. A system ADMINISTRATOR is the only person that can configure, change parameters, monitor, and read the performance and status of the system. A USER can only monitor and read the status of the system. The password for access through the Web is the same as for Telnet access.

To set up a password, complete the following steps:

- STEP 1 Click Change Password on the Basic menu bar.
- **STEP 2** Enter the passwords for Administrator and User, and confirm the new password by re-typing the password again.
- STEP 3 Click Apply to complete the settings and save the setting by entering the Save & Reboot screen on the basic menu bar.

<b>SHDSL</b>	
Basic Link Status	System
WAN Setup	System and Password Configuration
Routing Setup	Terminal Type: O co 💿 CPE
Change Password Save & Reboot	Console Password : 💿 Enable 🔿 Disable
Erase & Reboot	Session Timeout (min):0
Advanced NAPT DHCP CNIMP	New Administrator Password: ***** Confirm Password: ***** New User Password: **** Confirm Password: ****
IGMP Proxy DNS Proxy WAN Configure	Apply Cancel

- Terminal Type: When the router is connected to the DSLAM, select CPE. When the router is connect to a router for point to point application, one of the devices should be set to CO with the other set to CPE. The default setting is CPE.
- Console Password: **Disabled**, a local user does not have to enter a password to enter the console mode. **Enabled**, users who attempt to access the device from the console will be prompted for the password.
- Session Timeout: The console or telnet session will be terminated after this idle time. It is calculated in minutes. Users need to re-log on to the device when the session times out. The default setting is zero, which means the function is disabled.

# 3.2.6 Setting the Bridge

Click on **Bridging** on the Advanced menu bar to set up the static bridging and Spanning Tree Protocol (STP) functions.

# 3.3 Spanning Tree Protocol

The STP function is disabled by factory default. To enable it, click **Enable** in the Spanning Tree field and configure the interfaces on the screen. When the parameters are set up, click **Apply** to submit the settings.

Basic Spa	ng Tree Static	
WAN Satur		
LAN Setup	Spanning Tree Configuration	
Routing Setup	Spanning Tree : O Disable C Enable Bridge Priority (0 - 65535) ; 32768	
Change Password	LAN Operation Mode : O Disable 💿 Enable Port Priority (0 - 255) ; 128	
<u>Save &amp; Reboot</u> Erase & Reboot	ATM1 Operation Mode : O Disable O Enable Port Priority (0 - 255) : 128	
	ATM2 Operation Mode : O Disable O Enable Port Priority (0 - 255) : 128	
Advanced	ATM3 Operation Mode : C Disable © Enable Port Priority (0 - 255) : 128	
DHCP	ATM4 Operation Mode : O Disable O Enable Port Priority (0 - 255) : 128	
SNMP	ATM5 Operation Mode : O Disable O Enable Port Priority (0 - 255) : 128	
IGMP Proxy	ATM6 Operation Mode : O Disable O Enable Port Priority (0 - 255) : 128	
<u>DNS Proxy</u> WAN Configure	ATM7 Operation Mode : O Disable O Enable Port Priority (0 - 255) : 128	
Bridging	ATM8 Operation Mode : O Disable O Enable Port Priority (0 - 255) : 128	
System Statistics	ATM9 Operation Mode : O Disable O Enable Port Priority (0 - 255) : 128	
Interface Monitor	ATM10 Operation Mode : O Disable O Enable Port Priority (0 - 255) : 128	

#### 3.4 Static Bridging

Click on the **Static** tab to configure, modify, and delete the static bridging functions.

Basic	Spaning Tree Static
WAN Setup	Static MAC Forwarding Rule
<u>Routing Setup</u> Change Password	MAC Address : 0a:01:1a:11:00:0
Save & Reboot Erase & Reboot	Port Map : LAN 0 FILTER V ATM1 Filter V ATM5 Filter V ATM9 Filter V ATM13 Filter V Filter V
Advanced	ATM2 Filter ATM3 Filter ATM1 F
NAPT DHCP	ATM12 Filter V Filter V Filter V
SNMP IGMP Proxy	Add Modify Delete Flush
DNS Proxy WAN Configure	
System Statistics	List of Static MAC Entries
	Select MAC Address LAN ATM1-ATM4 ATM5-ATM8 ATM9-ATM12 ATM13-ATM16

Add	Add a static bridging entry
Delete	Delete a static bridging static entry
List	Displays all the static bridging entries
Flush	Delete all the static bridging entries

- MAC Address: This is the MAC address of the PC. Each PC has a unique MAC address, such as 0a:01:1a:11:00:0b.
- Port Map: There are three modes to set up the data processing method for the LAN and ATM interfaces: **filter**, **forward**, and **dynamic**. For example, if the Port Map is set to: LAN Forward, and others- Filter, it means the packets will be forwarded to the LAN interface and will not reach the ATM interfaces. In dynamic mode, the operating mode of the MAC address in the interface follows the learning result of the bridging function.

## 3.4.1 Write System Configurations

The new parameters can function immediately without being saved to the flash memory. To use these parameters after you restart the router, you must save them to the flash memory.

To write the configurations, click on the **Save & Reboot** button. Click on the **Save** button on the main screen. If you need to reboot the device after writing the configurations, also click on the **Reboot** button.

SHDSL	Save & Reboot
Basic Link Status WAN Setup LAN Setup Routing Setup	Saves the current configuration to the flash memory. Do not turn off the power before the next page is displayed, Or else the unit will be damaged !!!
Change Password Save & Reboot Erase & Reboot	Save
Advanced <u>NAPT</u> <u>DHCP</u> <u>SNMP</u>	The modem will reboot And it will take 30 seconds to reboot and startup.
IGMP Proxy DNS Proxy WAN Configure Bridging	Reboot

### 3.4.2 Load Factory Default Values

**Caution!** If you reset your device to the factory defaults, any changes to parameters will be lost and all parameters will revert to their default values.

To retrieve the factory default settings:

**STEP 1:** Click **Erase & Reboot** on the Basic menu bar.

**STEP 2:** Click **Erase** and **Reboot** respectively.

SHDSL	Erase & Reboot
Basic       Link Status       WAN Setup       LAN Setup       Routing Setup       Change Password       Save & Reboot	The current parameters will be erased from the flash and reset to their original default settings . This will come into effect after reboot. Erase
Erase & Reboot Advanced NAPT DHCP SNMP IGMP Proxy DNC Decem	The device will reboot And it will take 30 seconds to reboot and startup.

# CHAPTER 4 Setting up WAN and LAN Interfaces

#### 4.1 LAN Interface

To set up the Ethernet Interface:

STEP 1: Click LAN Setup on the Basic Menu bar.

SHDSL	
Basic	LAN Setup
Link Status	
WAN Setup	LAN Setup
LAN Setup	
Routing Setup	LAN IP Address : 172.16.5.2
Change Password	255 255 255 0
Save & Reboot	Subnet : 200.200.00
Erase & Reboot	
	Apply Cancel
Advanced	
NAPT	

STEP 2: Enter the new IP address and Subnet, and click on Apply to display the following screen.

LAN IP address is going to change. Use the new IP address to browse the web configuration.						
[Change & Reboot] Changes the confi [Change]Changes the configuration o	guration and reboot now. nly.					
Change & Reboot	Change					

<u>STEP 3:</u> You can click on the **Change & Reboot** button to use the new IP address and reset the device immediately. This does not require the Save action. Alternatively, you can click on the **Change** button to use the new IP address, but you need to save the new setting before you reset the router. After the IP address is changed, to be able to use the Web browser or Telnet, make sure your PC's IP address is set to the same network segment.

### 4.2 Configuring the WAN Interface

Click **WAN Setup** on the Basic menu bar and configure the VC to RFC 1483 Bridged, RFC 1483 Routed, PPPoE, or PPPoA. To set up these services, refer to Section 3.2.

cunci	WAN Setup								
JUDJL	WAN Setup								
Basic	VPI : O VCI : O LLC/SNAP O Vc Multiplexing D Enable NAPT								
Link Status	© RFC1483 Bridged								
WAN Setup	O RFC1483 Routed								
EAN Setup Routing Setup	WAN IP address: WAN subnet mask:								
Change Password									
Save & Reboot	User name: Password:								
Erase & Reboot	Mode: direct V Idle Timeout(min):								
Advanced	O PPPoA (NAT Enabled)								
<u>NAPT</u>	User name: Password:								
DHCP	Add Modify Delete								
SNMP ICINE D									
DNS Provy	Current ATM PVC List								
WAN Configure	Select Mode VPIVCIEncap NAPT IP Subnet User Authentication Idle PPPOE Status								
	O         Bridged         0         33         LLC         OFF         -         -         -         0         -         Down								

# 4.2.1 VC Data Flow Control

To set up the flow control parameters, such as AAL5 encapsulation, QOS, Peak Cell Rate, Sustainable Cell Rate, and Burst Tolerance, follow the steps below.

Basic	ATM Inter	face		VCC	$\mathbf{T}$	ISP		
Link Status								
WAN Setup LAN Setup	Index	VPI	VCI	AAL5 Encap	QOS	Peak Cell Rate (bps)	Sustainable Cell Rate (bps)	Burst Tolerance (msec)
Routing Setup	O <sub>VC1</sub>	0	33	LLC	UBR	2304000	0	0
Change Password	⊙ vc2	0	36	LLC	UBR	2304000	0	0
Save & Reboot	O ves	0	35	LLC	UBR	2304000	0	0
Erase & Reboot	O vc4	0	36	LLC	UBR	2304000	0	0
	O vc5	0	37	LLC	UBR	2304000	0	0
Advanced	O vc6	0	38	LLC	UBR	2304000	0	0
MART	O vc7	0	39	LLC	UBR	2304000	0	0
DUCP	O vcs	0	40	LLC	UBR	2304000	0	0
CNLO	O vc9	0	41	LLC	UBR	2304000	0	0
ICM (D. Dagange	O <sub>VC10</sub>	0	42	LLC	UBR	2304000	0	0
IGMP PIOXY	O vc11	0	43	LLC	UBR	2304000	0	0
DNS Proxy	O vc12	0	44	LLC	UBR	2304000	0	0
WAN Configure	C vc13	0	45	LLC	UBR	2304000	0	0
Bridging	O vc14	0	46	LLC	UBR	2304000	0	0
System Statistics	O vc15	0	47	LLC	UBR	2304000	0	0
Interface Monitor	O vc16	0	48	LLC	UBR	2304000	0	0
Utilites	-	-		-	-	Modify		·

Click WAN Configure on the Advanced menu bar, and click on the VCC tab on the main menu.

Select a VC in the Index field and click on the **Modify** button to configure the VC's flow control parameters. Click on **OK** to complete the settings.

tus 🛛 🖊	ATM Int	terface	VCC		ISP			
	Index	VPI	VCI	AAL5 Encap	QOS	Peak Cell Rate (bps)	Sustainable Cell Rate (bps)	Burst Tolerance (msec)
	VC2	0	36	LLC 🖵	UBR 🖵	2304000	0	0
	VC3	U	30		UBR	2304000	0	
	VC4	0	36	LLC	UBR	2304000	0	0
	VC5	0	37	LLC	UBR	2304000	0	0
	VC6	0	38	LLC	UBR	2304000	0	0
	VC7	0	39	LLC	UBR	2304000	0	0
	VC8	0	40	LLC	UBR	2304000	0	0
	VC9	0	41	LLC	UBR	2304000	0	0
	VC10	0	42	LLC	UBR	2304000	0	0
	VC11	0	43	LLC	UBR	2304000	0	0
	VC12	0	44	LLC	UBR	2304000	0	0
	VC13	0	45	LLC	UBR	2304000	0	0
	VC14	0	46	LLC	UBR	2304000	0	0
	VC15	0	47		UBR	2304000	0	0
	VC16	0	48	LLC	UBR	2304000	0	

### 4.2.2 Setting up an ISP

The router supports connection to up to 16 ISPs. Each ATM Interface can connect to an ISP.To set up or configure the connection parameters to ISP, click on **WAN Configure** on the Advanced menu bar. Click on the **ISP** tab on the main screen.

Basic Link Status	ATM Interfa	ace VCC	ISP		
WAN Setup LAN Setup	Index	ISP Name	User Name	User Password	PPPoE Idle Time (min)
Routing Setup	C ISP1				0
Change Password			office1	1111	0
Save & Reboot	C ISP3				0
Erase & Reboot	C ISP4				0
	C ISP5				0
Advanced	C ISP6				0
MART	C ISP7				0
DUCP	C ISP8				0
CNUD	C ISP9				0
SINIMP	C ISP10				0
IGMP Proxy	C ISP11				0
DNS Proxy	C ISP12				0
WAN Configure	C ISP13				0
Bridging	C ISP14				0
System Statistics	C ISP15				0
Interface Monitor	C ISP16				0
<u>Utilites</u>					
<li>I I I I I I I I I I I I I I I I I I I</li>			Modify		

Select an ISP and click on the **Modify** button on the bottom screen. After modifying the parameters, click on **OK** to complete the settings.

Basic					
Link Status	AIM Inter	face VCC	ISP		
WAN Setup					
LAN Setup	Index	ISP Name	User Name	User Password	PPPOE Idle Time
Routing Setup	ISP1				(min)
Change Password	ISP2		officel	1111	
Save & Reboot	ISP3		лр		0
Erase & Reboot	ISP4				0
Liase & Kebool	ISP5				0
	ISP7				0
Advanced	ISP8				0
NAPT	ISP10				0
DHCP	ISP11				0
	ISP12				0
SINMP	ISP13 ISP14				0
IGMP Proxy	ISP15				0
DNS Proxy	ISP16				0
WAN Configure					
Bridging			Leone AU		
System Statistics					

# CHAPTER 5 SNMP

The default setting of the SNMP function is enabled. 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.

#### 5.1 Enable SNMP

To configure the SNMP parameters, click on the **SNMP** button on the Advanced menu bar. The window displays the SNMP parameters.

Change Password			
Save & Reboot			
Erase & Reboot	SNMP		
Advanced NAPT	SNMP Parameters		
DHCP	SNMP Service	Disable	
SNMP	System Version Description	COMTREND CORPORATION; SHDSL Termination Unit	
LCVD Days	System Contact	GlobalSP@comtrendcorp.com Phone: 886-2-29998261 Ext: 329	
DNS Drown	System Location	COMTREND CORPORATION; 3F-1 10 Lane 609 Chung Hsin Road, Section 5; San Chung City, Taipei Hsien, Taiwan 241	
DNS PTOXY	System ID	1.3.6.1.4.1.3136	
WAN Configure	Default Trap Address	192.168.26.6	
Bridging	Community for Reading MIB	public	
<u>System</u>	Community for Modifying MIB	private	
<u>Statistics</u>			
<u>Interface</u> Monitor	Modify		

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



#### 5.2 Disable SNMP

Click **SNMP** on the **Advanced** menu bar and click on the **Modify** button at the bottom of the screen. Choose Disable in the SNMP Service field and click on **Apply** to submit the setting.

SNMP
SNMP Parameters
SNMP Service : Enable 💌
System Version Description : Disable D CORPORATION; SHDSL Terminatio:
System Contact : 010000157 @Comtendcorp.com Phone: 886-2-2999826
System Location : COMTREND CORPORATION; 3F-1 10 Lane 609 C
System ID : 1.3.6.1.4.1.3136
Default Trap Address : 192.168.26.6
Community for Reading MIB : public
Community for Modifying MIB : private
,
Apply Cancel
# CHAPTER 6 Packet Filter

Packet filter, a firewall security measure, examines incoming and outgoing packet headers (IP address, port number, and so on) on the network and determines whether to forward the packets based on userdefined rules (deny, accept, and count).

The SHDSL router provides packet filter and stateful packet inspection. It has denial of service protection against attacks such as ICMP Flood, Ping of Death, IP spoofing, Port Scans, Land Attacks, Tear Drop Attacks, IP Source Route and WinNuke Attacks.

To access the packet filter functions, select **Packet Filter** from the advanced menu. The screen will display as below, showing a list of the currently configured filter entries.

<b>^</b>	Packet Filter					
Basic	Packet Filter Setup					
Link Status WAN Setup LAN Setup	Packet Filter Status : C Disable					
Routing Setup Change Password Save & Reboot Erase & Reboot	Rule Parameter         Priority:       65535         Protocol:       IP         TCP       Flag[Fin.Syn.Rst.Psh.Ack.Urg]:					
Advanced NAPT DUCP	Source  IP:    Destinatin IP:  MASK:    Action:  ALLOW    Direction:  BOTH    Interface:					
<u>SNMP</u> IGMP Proxy	Add Modify Delete					
DNS Proxy WAN Configure Bridging	Current PF Rules List           Select Priority Protocol         TCP         SRC         SRC         DST         DST         Action Direction Interface         Message           C         65552         in         222222         22222					
<u>PFilter</u>						

### 6.1.1 Add a Packet Filter entry

To add a Packet Filter, complete the following steps:

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

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

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

Priority	You can enter a number here to assign the priority of a filter, in case there are overlapping rules. The lower the number the higher its priority.
Protocol	Select from TCP/UDP/ICMP/IP.
Source IP	Source IP of a packet you wish to filter.
Source Mask	Source Mask of a packet.
Source Port	Source Port of a packet you wish to filter.

Destination IP	Destination IP of a packet you wish to filter.			
Destination Mask	Destination Mask of a packet.			
Destination Port	Destination Port of a packet you wish to filter.			
TCP Flag ([F.S.R.P.A.U]	This field allows you to filter according to a TCP flag.			
Action	This field determines the action the router will take when it receives a packet that corresponds to a filtering rule. It can be set to:			
	allow, to let the packet pass through the filter.			
	deny, to drop the packet.			
	<b>count</b> , which has no effect on whether the packet will be allowed through the filter, causes the packet to be included in the accounting statistics kept by the filter.			
Interface	You can choose to apply this setting to a specific LAN or ATM interface. This function is called <b>Packet Binding.</b>			
	<b>Packet Binding</b> is a function that can be used when we have multiple Virtual Channels (VC) and we are utilizing IP Packet Filtering. In some cases, we may not wish to apply the packet filtering to all VCs. In this case, we can bind IP packet filtering to a VC. This means that filtering will only be applied to the bound VC, and thus the remaining VCs will not filter packets.			
Direction	This field determines whether the rule applies to <b>In</b> bound, <b>out</b> bound or <b>both</b> directions			

# 6.1.2 Delete a Packet Filter entry

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

# 6.1.3 Enable/Disable Packet Filter

If you wish to Enable or Disable the Packet Filter, click **Enable** or **Disable** and click on the **Apply** button.

# CHAPTER 7 Routing

This chapter describes how to set up the static routes and RIP. Click **Routing Setup** from the Basic menu bar to configure the routing functions.

### 7.1 Static Route

The Static Route 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 router has no default static route. After an RFC 1483-routed VC is created, a static route as follows will be created.

Network ID	Subnet Mask	Next Hop IP
0.0.0.0	0.0.0.0	10.0.0.2

Click **Routing Setup** on the Basic menu bar to access the Routing Setup window. It allows adding, modifying, and deleting the static routes.

	Routing Setup RIP Routing Table
	Routing Setup
Basic Link Status	Rip Configuration Rip Status : Off  Version : Version 2
WAN Setup LAN Setup	Apply
Routing Setup Change Password	Static Routes Configuration Destination Network ID (
Save & Reboot Erase & Reboot	Destination Subnet Mask :
Advanced	Next Hop IP 1 Metric 1
NAPT DHCP	Add Modify Delete
SNMP	List of Static Routes
IGMP Proxy DNS Proxy	Select Network ID Subnet Mask Next Hop IP Metric
WAN Configure	

#### Add:

To add a static route complete the following steps:

STEP 1: Enter the parameters for Destination Network ID, Subnet Mask, Next Hop IP

STEP 2: Click on 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 on 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 on the Delete button

#### 7.2 Set Up the RIP function

To enable the RIP, complete the following steps:

- STEP 1: Click Routing Setup from the Basic 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.

-	Routing Setup RIP Routing Table
Basic Link Status	Routing Setup
LAN Setup	Rip Configuration
Change Password Save & Reboot	Apply
Erase & Reboot	Static Routes Configuration Destination Network ID :
Advanced NAPT	Destination Subnet Mask :
DHCP SNMP	Metric : 1
IGMP Proxy DNS Proxy	Add Modify Delete
VAN Configure	List of Static Routes

To configure the advance functions of the RIP, click on the **RIP** tab on the main screen, and configure the requested parameters.

Mode:	Select Enabled
Version:	RIP version 2 or version 1
Authentication:	<b>none:</b> no authentication code is required.
	<b>PlainText:</b> an authentication code is required. You should also fill in the Authentication Code field to assign a password.
	<b>MD5:</b> an authentication code is required. You should also fill in the Authentication Code field to assign a password.

Poison Reverse:	Enabled: to enable the Poison Reverse				
	Disabled: to enable the Splitting Horizon				
	The default setting of poison reverse parameter is <b>Enabled</b> .				
	It means the router adopts the <u>split horizon with poison reverse</u> scheme to avoid routing loop problems. If the parameter is <b>disabled</b> , the router will use the <u>simple split horizon</u> scheme to solve the problem.				
Authentication Code:	Enter the password for authentication.				

- Mode: Enabled
- Auto Summary: Enabled, Disabled

The RIP function is now enabled. The default RIP parameter for each interface is RIPv2. In this default mode, this router can operate normally without other adjustments. If you want to configure advanced RIP functions, perform the procedures that follow.

Enter BASIC/ROUTING/RIP/INTERFACE/LAN to configure the parameters.

Basic	Routes RIP Routing Table
Link Status	RIP Configuration
LAN Setup	RIP Status : @ Enable C Disable Auto-summary : C Enable @ Disable
Routing Setup Change Pageword	Interface Status Version Poison Authentication Required Authentication Code
Save & Reboot	LAN Enable  2  Enable  None
Erase & Reboot	ATM1 Enable V 2 Enable V None V
Advanced	ATM2 Enable V 2 Enable V None V
NAPT DHCP	Apply

## 7.3 Displaying the Routing Table

To display the routing table, you can enter either of the following screens:

- BASIC/ROUTING SETUP/ROUTING TABLE screen
- Advance/Utilities/Routing Table

The following routing table appears after clicking Basic>Routing Setup>Routing Table.



# CHAPTER 8 NAT

Network Address Translation (NAT or NAPT) is a transparent routing function that translates a private IP address on a LAN into a public address that can be used in a public network. Port Address Translation (PAT) is a form of NAT that maps multiple private IP addresses to a single public IP address. Port numbers (TCP or UDP) ensure that packets are delivered properly. Both Network Address Translation (NAT) and Port Address Translation (PAT) are supported by this router. NAT and PAT are common solutions for: overcoming the shortage of public IP addresses, security (private IP addresses are not transparent), and assisting network administration.



The router supports many types of NAT functions, including:

- Fixed-NAT: this maps a private IP address to a public IP address.
- Multi-NAT: this maps multiple private IP addresses to multiple public IP address.
- PAT: When private IP addresses are more than public IP addresses, port address translation is supported to translate the public IP addresses.

Note the usage of synonyms below: Local: private, illegal, unregistered

Public: legal, registered

In PPPoE or PPPoA mode, the NAT function is automatically enabled. In RFC 1483 Routed mode, to enable NAT, you must select the Enable NAPT item on the WAN Setup screen.

The following pages describe how to set up a virtual server (Redirect port) and different types of NAT.

#### 8.1 Multiple to One

This application requires a series of private IP addresses (such as 192.168.1.140- 192.168.1.150). These private IP address share a public IP address, such as 10.1.1.1.

**STEP 1:** Click on **NAPT** on the Advanced menu bar.

STEP 2: Click on PAT and enter the following parameters:

- Start Private IP Address: Type the first IP address. For example, 192.168.1.140
- End Private IP Address: Type the last IP address. For example, 192.168.1.150
- **Global IP Address:** Type the public IP address. For example, 10.1.1.1.

**STEP 2:** Click on the **Add** button to submit the settings.

Change Password	NAPT	NAT/PAT				
<u>Save &amp; Reboot</u> <u>Erase &amp; Reboot</u>	NAPT Configuration					
Advanced	● PAT	Start local IP Address :	192.168.1.140	End local IP Address :	192.168.1.150	Ī
<u>NAPT</u>		Public IP Address :	10.1.1.1			_
DHCP SNMP	C Fixed-NAT	local IP Address :				_
IGMP Proxy		Public IP Address:				
DNS Proxy	C Multi-NAT	Start local IP Address :		End local IP Address :		
<u>WAN Configure</u> Bridging	🗌 🗆 overload	Start Public IP Address :		End Public IP Address :		
System Statistics		Add Mo	odify Delete 1	Flush		

### 8.2 One to One NAT

One-to-one NAT maps a private IP address to a public IP address, such as 192.168.1.10 to 10.1.1.34.

Click **NAPT** on the **Advanced** menu bar and click on the **NAT/PAT** tab to access the NAT/PAT Configuration screen.

Follow the steps below:

STEP 1: Select Fixed-NAT.

**STEP 2:** Type the private IP address in the **Private IP Address** field (for example, 192.168.1.233), and type the public IP address in the **Public IP Address** field.

STEP 3: Click on the Add button

	NAPT	NAT/PAT				
	NAPT Configuration					
Basic	C PAT 5	tart local IP Address :			End local IP Address :	
WAN Setup	p	ublic IP Address :				
LAN Setup	@ Fixed-NAT	ocal IP Address :	192.168	1.233		
Routing Setup	P	ublic IP Address:	10.1.1.3	1		
Change Password Save & Reboot	C NURS-NAT 8	tart local IP Address :			End local IP Address :	
Erase & Reboot	C overload 8	tart Public IP Address :			End Public IP Address	
Advanced			Add. M	oditfy Delete F.	hith	
DHCP						
SNMP			List	of NAPT Entries		
IOMP Proxy			CI A	Charles - Engliss		
DNS Proxy WAN Configure	Select	local IP	Address	Public I 10.1.1.24	P Address	Mode Fixed-NAT
Pridaina		172.260.1.233	172.100.1.233	10.1.1.34	10.1.1.34	Program.

## 8.3 Multi-NAT

Multi-NAT maps a set of continuous private IP addresses to a set of continuous public IP addresses. There are two ways Multi-NAT can be used to translate the private IP addresses to public IP addresses. One way is to have each public IP address map to an individual private IP address. The other way is to have some of the private IP addresses share the same public IP address. This is required when there are fewer public IP addresses than private IP addresses.

**One-to-one mapping.** When the number of private IP addresses is less than or equal to the number of public IP addresses, each private IP address can be mapped to a public IP address. The following parameters are used:

- Start Private IP address- End Private IP Address: For example, 192.168.1.3- 192.168.1.22
- Start Global IP Address- End Global IP Address: For example, 10.1.1.3-10.1.1.22

Change Password	NAPT	NAT/PAT			
Save & Reboot			T. Ofirmetien		
Erase & Reboot		NAP	of Configuration		
Advanced	O PAT	Start local IP Address :		End local IP Address :	
<u>NAPT</u>		Public IP Address :			
DHCP SNMP	C Fixed-NAT	local IP Address :			
IGMP Proxy		Public IP Address:			
DNS Proxy	• Multi-NAT	Start local IP Address :	192.168.1.3	End local IP Address :	192.168.1.22
<u>VAN Configure</u> Pridaina	🗌 overload	Start Public IP Address :	10.1.1.3	End Public IP Address :	10.1.1.22
System Statistics		Add	odify Delete	Flush	

STEP 1: Enter the above parameters

- Start Private IP address: For example, 192.168.1.3
- End Private IP Address: For example, 192.168.1.22
- Start Global IP Address: For example, 10.1.1.3
- End Global IP Address: For example, 10.1.1.22

STEP 2: Click on the Add button.

**Overload.** When the number of private IP addresses is greater than the number of public IP addresses, private IP addresses must share public IP addresses. The following parameters are used:

- Start Private IP address- End Private IP Address: For example, 192.168.1.3- 192.168.1.22
- Start Global IP Address- End Global IP Address: For example, 10.1.1.3-10.1.1.10

Change Password	NAPT	NAT/PAT			
<u>Save &amp; Reboot</u> <u>Erase &amp; Reboot</u>		NA	PT Configuration		
Advanced	O PAT	Start local IP Address :		End local IP Address :	
<u>NAPT</u>		Public IP Address :			
DHCP SNMP	C Fixed-NAT	local IP Address :			
IGMP Proxy		Public IP Address:			
DNS Proxy	C Multi-NAT	Start local IP Address :	192.168.1.3	End local IP Address :	192.168.1.22
<u>WAN Configure</u>	🗹 overload	Start Public IP Address :	10.1.1.3	End Public IP Address :	10.1.1.10
Bridging					
<u>System</u> <u>Statistics</u>		Add	fodify Delete	Flush	

**STEP 1:** Fill out the above parameters in the relevant fields.

- Start Private IP address: For example, 192.168.1.3
- End Private IP Address: For example, 192.168.1.22
- Start Global IP Address: For example, 10.1.1.3
- End Global IP Address: For example, 10.1.1.10

STEP 2: Select Overload and click on the Add button.

#### 8.4 Virtual Server

If you want to set up Internet servers (such as an e-mail server, web server, or FTP server) on the virtual LAN when PAT is enabled, you should register the servers with the router first to allow Internet users to access the service via the WAN interface of router. This section describes how to configure a virtual server.

Click on **NAPT** on the Advanced menu bar to access the NAPT Configuration screen.

Basic	
Link Status	
<u>WAN Setup</u>	
LAN Setup	NAPT NAT/PAT
Routing Setup	
Change Password	NAPT Configuration
<u>Save &amp; Reboot</u>	Dublic Datt -
Erase & Reboot	
	Protocol:
Advanced	Local Address :
NAPT	Local Port :
DHCP	
SNMP	Add Modify Delete Flush
IGMP Proxy	List of NAPT Entries
DNS Proxy	
<u>WAN Configure</u>	Select Public Port Protocol Local Address Local Port
Bridging	

- Global Port: The virtual server provides service for the Internet users via this port.
- Protocol: **TCP** or **UDP** (default: TCP).
- Private Address: This is the IP address of the Virtual Server
- Private port: This is the port that the virtual server is connected to the Ethernet.

After configuring the parameters, click **Add** to add an entry.

To modify the parameters, select an item from the List of NAPT Entries. Modify the parameters, and click on the **Modify** button.

To delete the parameters, select an item from the List of NAPT Entries. Click on the **Delete** button.

# CHAPTER 9 DHCP

The router can be set as a Dynamic Host Configuration Protocol (DHCP) server or a DHCP relay. The former acts like an IP address pool. Upon power on, the PCs on the same domain will request an available IP address from the IP address pool of DHCP server. 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. DHCP relay acts as an intermediate station. The DHCP server is at a remote location. PCs are directed to the remote location by the DHCP relay to obtain an available IP address.

### 9.1 DHCP Server

When a workstation is configured for automatic IP address assignment, it broadcasts a request to the LAN.

- When the router is configured as a DHCP server, the IP addresses in the DHCP pool should be at the same network segment as the DHCP server.
- DNS IP must be a valid parameter to activate the DHCP server to forward the DNS IP address to the workstations. The router supports DNS Proxy function. It can forward the name of the website to the correct DNS server to obtain the correct IP address.

To configure the router as a DHCP server, click on **DHCP** on the Advanced menu bar. Click **Enable** in the DHCP Server field, and fill out the parameters. Click **Apply** to submit the settings.

Routing Setup	DHCP Server DHCP Relay
<u>Change Password</u> Save & Reboot	DHCP Server Configuration
Erase & Reboot	DHCP Server
Advanced	Starting IP Address : 192.168.1.2
NAPT DHCP	End IP Address : [192.168.1.130
SNMP	Gateway :[192.106.1.1 Netmask :[255.255.0
IGMP Proxy	DNS 1 192.168.1.1
<u>VAN Configure</u>	DNS 2 : Lease Time (day) :/7
Bridging	
<u>System</u> Statistics	Apply         Cancel

### 9.2 DHCP Relay

Click on **DHCP** on the Advanced menu bar. On the main screen, click on the **BOOTP/DHCP Relay** tab and configure the following parameters:

- BOOTP/DHCP Relay: Enable
- IP Address: This defines the IP address of the remote DHCP server.

After completing the settings, click **Apply**] to submit the settings. Also, change the router's LAN IP address.

<u>Save &amp; Reboot</u> <u>Erase to</u> <u>default</u>	DHCP Server BOOTP/ DHCP RELAY
Advanced	BOOTP/DHCP Relay Configuration
NAPT	BOOTP/DHCP Relay : Enable 💌
DHCP	IP Address : 192.168.1.254
SNMP	
<u>DNS Proxy</u>	Apply Cancel
IGMP Proxv	

# CHAPTER 10 DNS Proxy

A Domain Name Server (DNS) provides an IP address to a host computer for an applied Domain Name. The router supports the DNS proxy feature, which receives and attempts to find an entry in its local tables, and when one is not found, it forwards the request to a remote server.

Click **DNS Proxy** on the Advance men bar and configure the following parameters:

DNS proxy:	Enabled/ Disabled (factory default: disabled)		
Primary Server IP address:	Enter the primary server IP address		
Secondary Server IP address:	Enter the secondary server IP address that will be used immediately when the primary server IP address fails or is not available		

Erase & Reboot	DNS Proxy
Advanced NAPT	DNS Proxy Configuration
DHCP	DNS Proxy 💽 Enable O Disable
<u>SNMP</u> IGMP Proxy	Primary Server IP Address :
DNS Proxy	Secondary Server IP Address :
<u>WAN Configure</u> Bridging	Apply Cancel
System	

# CHAPTER 11 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.

STEP 1: Add a VC and set it to RFC 1483 Routed mode.

	WAN Setup
Basic	WAN Setup
VAN Setup	VPI : 0 VCI : 67 © LLC/SNAP C Vc Multiplexing Enable NAPT
LAN Setup	C RFC1483 Bridged
Routing Setup	RFC1483 Routed
Change Password	WAN IP address: 10.0.0.1 WAN subnet mask: 255.255.255.252
Save & Reboot	
Erase & Reboot	O PPPoE (NAT Enabled)
	User name: Password:
Advanced NAPT	Mode: direct
DHCP SNMP	C pppoA (NAT Enabled)
IGMP Proxy	User name: Password:
DNS Proxy	Add Modify Delete
VAN Configure	
Bridging	Current ATM PVC List
<u>Systen</u> Statistics	Select Mode VPI VCI Encap NAPT IP Address Subnet Mask Name Protocol Timeout Mode Status
Interface	C Bridged 0 33 LLC OFF 0 - Down
	ⓒ Routed 0 67 LLC OFF 10.0.0.1 255.255.252 0 - Down

STEP 2: Click IGMP Proxy on the Advanced menu bar.

<u>LAN Setup</u>	IGMP Proxy
<u>Routing Setup</u> <u>Change Password</u>	IGMP Proxy Setup
<u>Save &amp; Reboot</u> <u>Erase &amp; Reboot</u>	IGMP Proxy Enable : ⓒ Enable 🔿 Disable
Advanced	IGMP Proxy Interface : ATM 3 (0/35 Routed)
NAPT DHCP	ATM 2 (0/34 Routed) ATM 3 (0/35 Routed)
IGMP Proxy	

**STEP 3:** Click **Enable** and choose the interface ATM1-ATM16 that the router is used to connect to the server. This depends on VC to which interface it is assigned.

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



# CHAPTER 12 VLAN

To configure the VLAN function, click on **VLAN** in the Advanced menu bar. VLAN is disabled by factory default. To enable it, select **Enable** and click on the **Set** button. Then you can proceed to create the VLAN groups. The router supports four VLAN groups, 1 to 4. You can choose and join different Ethernet ports to the PVC running in RFC 1483 bridged mode. Packets will be transmitted or received from these ports to the appointed PVC. The packets of the VLAN groups are not routable. Packets that do not belong to the VLAN group are routable.

#### **Parameters and buttons**

The PVC field displays the values of the PVCs that have been set up (refer to the WAN Setup section). Click on the Set button to apply the settings, or click on the Clear button to delete a VLAN group.

Notes:

- 1. You must save the parameters and reboot your router before the VLAN will be active.
- 2. Each LAN can be assigned to only one group.
- 3. Each PVC can be assigned to only one group.

VLAN Setup							
	VLAN Information						
	VLA	N:	• Enab	le 💿 D	isable		
۲ _	VLAN		Ethern	et Port		PV	C
G	λroup 1	□LAN1	□LAN2	□LAN3	□ LAN4	NA	•
G	roup 2گ	□LAN1	□LAN2	□LAN3	□LAN4	NA	•
G	Froup 3	□LAN1	□LAN2	□LAN3	□LAN4	NA	•
G	жоир 4	□LAN1	□LAN2	□LAN3	□ LAN4	NA	•
_							
			Set	Clear			

# CHAPTER 13 Maintenance and Diagnostics

This chapter describes how to perform a software upgrade, configuration backup, or configuration restoration, and how to use the diagnostic functions of the router.

## 13.1 Software Upgrade and Configuration Backup /Restoration

The router supports TFTP upgrade via the console, Telnet, and Web browser. Using a TFTP server, you can upgrade the software, back up the configuration, and retrieve past configurations. This section describes how to achieve these tasks using the console port or LAN port.



In the above diagram, the TFTP server is a PC with TFTP software installed. If you will use the console port to perform the TFTP upgrade, connect the console port of the router to your PC. If you will use Telnet or Web browser, connect the LAN port of the router to your Ethernet LAN.

Notes:

After the home page is upgraded, right-click your Internet Explorer shortcut icon on your desktop and choose Properties on the popup menu. On the Internet Properties window, click on the **Clear History** button and click **OK**. Then you can use the Web browser to log on to the router.

Internet Properties	? ×
General Security Content Connections Programs Advanced	
Home page You can change which page to use for your home page. Address:	-
Temporary Internet files Pages you view on the Internet are stored in a special folder for quick viewing later. Delete Files Settings	
History The History folder contains links to pages you've visited, for quick access to recently viewed pages. Days to keep pages in history. 20 Clear History Colors Fonts Languages Accessibility	
OK Cancel App	ply

If a wrong format of the file us uploaded, a failure message will display during the upgrade. The following is an example of upgrade failure resulting from an incorrect file format.



Before performing the TFTP upgrade, run the TFTP software. Click on **Utilities** on the Advanced menu bar. Fill out the TFTP Server IP address, file name, and upgrade type.

- Software upgrade: Check Download and choose Firmware in the column to the right.
- Homepage upgrade: Check Download and choose Homepage in the column to the right.
- Configuration backup: Check Upload and choose Configuration in the column to the right
- Retrieving Configurations: Check Download and choose Configuration in the column to the right

After completing the settings, click Apply to perform the function and note the following.

- After software or homepage upgrades are complete, reboot the device to run the new file.
- After the configurations are retrieved, also write the configurations to the Flash memory.

The following is an example of how to set up the parameters for software upgrade.

Basic	<b>^</b>		
<u>Link Status</u>			
WAN Setup			
LAN Setup	Ping	Loopback Forwarding Table	Routing Table TFTP
Routing Setup			
Change Password		TFTP Application	
Save & Reboot	E 5	FETD Sower ID Addross, 192168110	
Erase & Reboot			
		File Name: dsw502.uz	
Advanced		Type: 💿 Download	Firmware
NAPT		O Upload	Configuration
DHCP		A la David	
SNMP		Apply Reset	
JOINT D			
IGMP Proxy			



The following is an example of how to set up the parameters for homepage upgrade.

To upload the configurations, check **Upload**, select **Configuration**, and click on the **Apply** button to submit the settings.



# 13.2 OAM Loopback

Click on Utilities on the Advanced menu bar, and click on the Loopback tab on the main screen.

Erase & Reboot	Ping	Loopback	Forwarding Table	Routing Table	ТЕТР
Advanced NAPT			OAM Loopback		
DHCP	Flow T	ype : F5 SEG 💌			
<u>SNMP</u> IGMP Proxy		VPI : 0		VCI :	
<u>DNS Proxy</u> WAN Configure	Loopback	ID : FFFFFFFFF; DI	FFFFFFFFFFFFFFFFFFFFFFFF	TFF	
Bridging Sustem					
System Statistics					
<u>Interface</u> Monitor			Start Lo	opback	

After filling out the following parameters, click **Start Loopback** to perform the loopback.

Flow Type	Choose the F5 loopback type. Seg is the segment loopback. It verifies the connection between the router and DSLAM. Ete is the end-to-end loopback, verifying the connection between the router and the ISP Broadband RAS.
VPI	Specify the VPI that will perform the loopback.
VCI	Specify the VCI that will perform the loopback.
Loopback ID	Specify the ID number on the ATM network that will loop back the signals.

### 13.3 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.

Click **Utilities** on the Advanced menu bar, and click on the **Ping** tab on the main screen. After typing the IP address and the ping data size, click **Submit** to perform the test. The ping result will display later.

Basic Link Status						
WAN Setup		Ping	Loopback	Forwarding Table	Routing Table	TETP
LAN Setup			•		•	
Routing Setup				Ping Test		
Change Password						
Save & Reboot						
Erase & Reboot				IP Address : 192.168.	1.2	
	11			Data Size : 32		
Advanced						
NAPT				Submit		
DHCP				D'domit.		

The following is an example of the ping result.

Ping	Loopback Forwarding Table Routing Table		TF
	Ping Result		
	Ping Total	4	
	Ping Success	4	
	Ping Fail	0	
	Ping Average Time(ms)	1	
	Ping Last Time(ms)	1	
	Back		

## 13.4 Performance Monitoring

#### • System statistics

Click **System Statistics** on the Advanced menu bar to monitor the interface status and collect the statistics of the TCP/IP.

Routing Setup	In	terface		TCP-IP						
<u>Save &amp; Reboot</u> <u>Erase to</u> defealt	Interface Statistics									
	IF	Admin Status	InOctets	InUcastPkts	InNUcastPkts	InDiscards	InErrors	OutOctets	OutUcastPkts	OutNUcast
Advanced	LAN	Up	8136761	382	7400	0	0	145186	337	0
NAPT	ATM1	Up	0	0	0	0	0	0	0	0
DHCP	ATM2	Down	0	0	0	0	0	0	0	0
SNMP	АТМЗ	Down	0	0	0	0	0	0	0	0
DNS Proxy	ATM4	Down	0	0	0	0	0	0	0	0
IGMP Proxy	ATM5	Down	0	0	0	0	0	0	0	0
WAN Configure	ATM6	Down	0	0	0	0	0	0	0	0
Bridging	ATM7	Down	0	0	0	0	0	0	0	0
Sustem	ATMS	Down	0	0	0	0	0	0	0	0
Statistics	ATM9	Down	0	0	0	0	0	0	0	0
Interface	ATM10	Down	0	0	0	0	0	0	0	0
Monitor	ATM11	Down	0	0	0	0	0	0	0	0
IItilitog	ATM12	Down	0	0	0	0	0	0	0	0

To display the interface statistics, click on 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:

IF	The name of the interface
Admin Status	Indicates whether the interface is Up or Down
In Octets	The number of Octets (bytes) received
InUncastPkts	The number of unicast packets received
InUncastPkts	The number of broadcast packets received
InDiscards	The number of packets received that were discarded
InErrors	The number of inward errors
OutOctets	The number of Octets (bytes) transmitted
OutUcastPkts	The number of unicast packets transmitted
Broadcast PktsOut	The number of broadcast packets transmitted
OutDiscards	The number of packets transmitted that were discarded
OutErrors	The number of outward errors

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.

LAN Setup	Interfaces	V	TCP-IP				
Routing Setup			`				
Change Password				т	CP/IP Statistics		
Save & Reboot							
Erase & Reboot	IP Statistic	s					
	In receives	8613	In Errors	(none)	In Unknown Protos	(none)	Forwarded Datagram
Aduanced	Out Requests	17858	Out Discards	0	Out No Routes	0	
Advanced							
NAPT	Udp Statist	ics					
DHCP	Data grams In		105	Datag	irams Out	31	Errors In
<u>SNMP</u>							
IGMP Proxy	Tcp Statisti	cs					
DNS Proxy	Active		Passing				Current
WAN Configure	Opens C	)	Opens	28	Attempt Fails	0	Establishments
Bridging	Segments		Segments		Segments	_	
System Statistics		508	Out	17833	retransmitted	U	Errors In
Interface Monitor							
Utilites	Icmp Statis	tics					
<u>▼</u>	IN						

#### Interface

Click Interface Monitor on the Advanced menu bar to monitor the transmission status.

Routing Setup	Monitor					
<u>Save &amp; Reboot</u>						
Erase to						
<u>default</u>	Interface	TxPkts	RxPkts	RxErrors	TxRate(bps)	RxRate(bps)
	0 - ETH	405	108750	0	0	54
Advanced	1 - ATM	0	0	0	0	
NAPT	2 - ATM	0	0	0	0	
DHCP	3 - ATM	0	0	0	0	
SNMP DNG D	4 - ATM	0	0	0	0	
UNS Proxy	5 - ATM	0	0	0	0	
<u>HUN Configure</u>	6 - ATM	0	0	0	0	
Bridging	7 - ATM	0	0	0	0	
System	8 - ATM	0	0	0	0	
Statistics	9 - ATM	0	0	0	0	
Interface	10 - ATM	0	0	0	0	
<u>Monitor</u>	11 - ATM	0	0	0	0	

# CHAPTER 14 Application Example

# 14.1 Adding the Static Route (Web)

Click Routing Setup on the Advanced menu bar.

SHDSL	Routing Setup RIP Routing Table
Basic	Routing Setup
Link Status WAN Setup	Rip Configuration
LAN Setup Routing Setup	Apply
Save & Reboot Erase & Reboot	Static Routes Configuration Destination Network ID :
Advanced	Destination Subnet Mask : Next Hop IP :
NAPT DHCP	Metric : 1
SNMP IGMP Provv	Add Modify Delete
DNS Proxy	List of Static Routes
<u>WAN Configure</u> Bridging	Select Network ID Subnet Mask Next Hop IP Metric
Stratem Statistics	

The following demonstrates a school application as an example.



- Location A: 10.164.32.9; Netmask: 255.255.255.252
- Location B: 10.164.32.10; Netmask: 255.255.255.252
- Network of the School: 210.240.117.0; Netmask: 255.255.255.128

In the above example, you would add the following static route to the router.

210.240.117.0; Netmask: 255.255.255.128; Next hop: 10.164.32.9

Enter the	parameters	of the	static	route a	and	click	on th	e Add	button.
	paramotoro	01 010	0.00.00			00	0.1. 0.		Nation

SHDSL	Routing Setup RIP Routing Table
Basic	Routing Setup
Link Status WAN Setup	Rip Configuration
LAN Setup Routing Setup	Apply
Change Password Save & Reboot	Static Routes Configuration
Erase & Reboot	Destination Subnet Mask : [255.255.255.128
Advanced <u>NAPT</u>	Mext Hop IP : 10.104.22.9 Metric : 1
DHCP SNMP	Add Modify Delete
IGMP Proxy DNS Proxy	List of Static Routes
WAN Configure Bridging	Select         Network ID         Subnet Mask         Next Hop IP         Metric           Image: Comparison of the state of the
System Statistics 📃 🖵	

Click **LAN Setup** on the Basic men bar. After typing LAN IP 10.164.32.10 and Netmask 255.255.255.252, click on **Apply** to submit the settings.

SHDSL	
Basic	LAN Setup
<u>Link Status</u>	
WAN Setup	LAN Setup
LAN Setup	
Routing Setup	LAN TR Address : 10.164.32.10
Change Password	
Save & Reboot	Subnet : 255.255.252
Erase & Reboot	
	Annly Cancel
Advanced	Appy
NAPT	

# CHAPTER 15 Pin Assignments

# Console Port (RS232 DB9)

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

### LAN Port (RJ45)

Pin number	Definition	Pin number	Definition
1	RD+	5	NC
2	RD-	6	TD-
3	TD+	7	NC
4	NC	8	NC

### LINE Port (RJ45)

Pin number	Definition	Pin number	Definition
1	Loop2-1	5	Loop1-2
2	Loop2-2	6	Short with 2
3	Short with 1	7	NC
4	Loop1-1	8	NC

# CHAPTER 16 Console Access

To access the device via the console port the following are required:

#### • VT100 Compatible Terminal

This terminal is essential to perform the initial configuration of the router. This is normally a terminal with a VT100 emulation program, such as Telix or HyperTerminal Edition 5.

#### • Console Port Cable

An RS-232, DB9-to-DB9 straight-through cable is only required if you need to connect the device to a VT100 terminal or equivalent. The cable is not supplied with the SHDSL router.

# 16.1.1 Login

For access by console, the console PC should be installed with a standard VT100 emulation program, such as HyperTerminal 5 or Telix. You must connect the router to a PC using a serial cable. The following steps describe how to establish the console session.

**STEP1:** Run a standard VT100 program such as HyperTerminal (Ver. 5 is recommended), or Telix in the local terminal and select an open com port.

**STEP2:** Enter the following port settings:

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

**STEP3:** After the session parameters are set up, press the Enter Key. You will be requested to enter the user name and password.

**STEP4:** After successfully logging in, the main menu will appear.

SHDSL Router	Main Menu	Ų
>>].[BASIC] 2.[ADUANCE] 3.[MON] 4.[UTIL] 5.[SYS] 6.[WRITE] 7.[REBOOT] 8.[QUIT]	<ul> <li>Basic Configuration</li> <li>Advance Configuration</li> <li>Status/Statistics Monitor</li> <li>Utilities</li> <li>System Information</li> <li>Write Configuration</li> <li>Reboot</li> <li>Disconnect</li> </ul>	
 [Up(^W)] [Down(^Z)] [Left PATH> MAIN	(^A) - Prev Menu] [Right(^D) - Next	Menu]

# 16.1.2 Keyboard Operations

In this table, the caret (^) denotes the Ctrl key.

$\uparrow$	The upward arrow key moves the cursor upward in the menu
$\downarrow$	The downward arrow key moves the cursor downward in the menu.
←	Returns to the previous menu. If you are in a leaf menu you may need to push $^{\rm A}{\rm S}$ first (to save the information)
$\rightarrow$	Skips to the next menu.
^S	Hold down the Ctrl-S keys simultaneously to perform different actions such as Save, Add, Delete and Go.
^Х	In the leaf menu, hold down the Ctrl-X keys simultaneously to return to the previous menu.
^L	Hold down the Ctrl-L keys simultaneously to return to the Home Menu.
^T	Hold down the Ctrl-T keys simultaneously to reset the value or statistics counted.
^R	Hold down the Ctrl-R keys simultaneously to refresh or restore the menu.
Q	Press the Q key to stop certain actions, such as software downloading.
Tab	In the leaf menu, some configuration fields are marked TAB. It means you need to press the TAB key to scroll through and select the pre-defined options.

The following backup keys can be used if your software doesn't support arrow keys:

∧W	Moves the cursor upward [equal to the up arrow key]
^Z	Moves the cursor downward [equal to the down arrow key]
^A	Return to the previous screen [equal to the left arrow key]
^D	Enter the selected item [equal to the right arrow key]

The backup keys displayed at the bottom of the screen.

SHDSL Router		Basic Configuration		
	>>].[SYSTEM] 2.[SHDSL] 3.[WAN] 4.[LAN] 5.[ROUTING] 6.[SAVE] 7.[DEFAULT]	<ul> <li>System and Password Parameters</li> <li>SHDSL Link Status</li> <li>WAN Setup</li> <li>LAN Setup</li> <li>Static Route and RIP Parameters</li> <li>Save and Reboot</li> <li>Erase to Default</li> </ul>		
[Up(^W)]	[Down(^Z)] [Left(	^A) - Prev Menu] [Right(^D) - Next Menu]		
PATH> MAI	N/BASIC			

In addition to the arrow keys to move the cursor in the menu, you can enter the requested screen by entering the number. For example, to enter MAIN/ADVANCE/DHCP/RELAY, follow the steps below:

STEP 1: Press the 2 key, to enter the Advance menu, and then press the Enter key.

SHDSL	Router	Main Menu	
	1.[BASIC] [2]>2.[ADVANCE 3.[MUN] 4.[UTIL] 5.[SYS] 6.[WRITE] 7.[REBOOT] 8.[QUIT]	<ul> <li>Basic Configuration</li> <li>Advance Configuration</li> <li>Status/Statistics Monitor</li> <li>Utilities</li> <li>System Information</li> <li>Write Configuration</li> <li>Reboot</li> <li>Disconnect</li> </ul>	
[Up(^W)]	[Down(^Z)] [Lefi	Ft(^A) - Prev Menu] [Right(^D) - Next Me	nu]

STEP 2: From the MAIN/ADVANCE menu, press the 2 key and then press the Enter key

SHDSL	Router	Ad 	vand	e Configuration
	1. [2]>■2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	[NAT] [DHCP] [SNMP] [IGMP] [DHS] [INTERFACE] [ROUTING] [BRIDGING] [HTTPD] [TFTP] [SHDSL]		NAT Parameters DHCP Parameters SNMP Parameters IGMP Proxy Parameters DNS Proxy Parameters Interface Parameters Routing Parameters Transparent Bridging Parameters Web Server Parameters TFTP Parameters SHDSL Characteristics Parameters
[Up(^W)]	[Down(^Z)]	] [Left(^A	) -	Prev Menu] [Right(^D) - Next Menu]
PATH> MAII	N/ADVANCE			

STEP 3: Press the 2 key, and then press the Enter key in MAIN/ADVANCE/DHCP.

SHDSL	Router	DHCP Parameters	V3.
	1.[Server] - [2]>2.[Relay] - 3.[Fixed] -	DHCP Server Parameters BOOTP/DHCP Relay Parameters Fixed Host IP Address List	
 [Up(^W)] Path> Maii	[Down(^Z)] [Left(^A N/ADUANCE/DHCP	) – Prev Menu] [Right(^D) – Next Me	:]

**<u>STEP 4:</u>** Now you have reached MAIN/ADVANCE/DHCP/RELAY.

SHDSL Router	DSL Router BOOTP/DHCP Relay Par		
BOOTP. Serve	'DHCP Relay(TAB) · IP	: <mark>D</mark> isabled :	
^S – Sa	ve ^L - Home M	enu ^X - Prev Menu	
PATH> MAIN/ADVANCE/DH	P/RELAY		
MESSAGE>			

## 16.1.3 Motoring the SHDSL Line Status

Enter MAIN/BASIC/SHDSL to monitor the SHDSL Line status.

SHDSL Router	SHDSL Link Statu	15	
	Termianl Type/Operate State	:	CPE/Handshake
	Actual Bit Rate(Kbps)	:	0
	Line Attenuation(dB)	:	0
	SNR Marqin(dB)	:	18
	CRC (since reset)	:	0
	ES (since reset)	:	0
	SES (since reset)	:	0
	LOSWS (since reset)	:	15028
	UAS (since reset)	:	15028
	CRC (current 15 min)	:	0
	ES (current 15 min)	:	0
	SES (current 15 min)	:	0
	LOSWS (current 15 min)	:	629
	UAS (current 15 min)	:	629
	CRC (current 1 day)	:	0
	ES (current 1 day)	:	0
	SES (current 1 day)	:	0
	LOSWS (current 1 day)	:	15028
	UAS (current 1 day)	:	15028
iy Key - Prev P	age ^T - Reset Counters ′	`L - I	Home Menu

# 16.1.4 Password Setup

Enter MAIN/BASIC/SYSTEM to change the passwords.

SHDSL Router	<ul> <li>System and Password</li> </ul>	Parameters
	Terminal Type(TAB) Console Password Check(TAB) Session Timeout(min) New Administrator Password Retype Password New User Password Retype Password	: CPE : Enabled : 0 : ***** : ***** : *** : ***
^ ^: Path> Main/Basi(	S – Save <sup>^</sup> L – Home Menu C/SYSTEM	ı ^X - Prev Menu
MESSAGE>		

- New Administrator Password and Retype Password: Enter the administrator password in the New Administrator Password and confirm the password by retyping the password in the Retype Password field.
- New User Password and Retype Password: Enter the user password in the New User Password and confirm the password by retyping the password in the Retype Password field.

### 16.1.5 Retrieve the Factory Default Settings

Enter BASIC/DEFAULT and press the Y key. After the default settings are set to the factory default, return to the main menu and enter MAIN>WRITE to save the configurations.

This will set system parameters to factory default !(Y/N) Set system parameters to factory default! Press any key to return to previous menu ...\_

### 16.1.6 Disable the Web Browser

The router allows access via a Web browser by factory default. To disable this function, enter ADVANCE/HTTPD, choose Disabled, and submit the setting.



## 16.1.7 Save the Configurations

The new parameters can function immediately without being saved to the flash memory. However, to use these parameters after you restart the router, you must save them to the flash memory.

To write the configurations, enter MAIN/WRITE and press the Y key. After saving the configurations, you will be prompted if you need to reboot the device. Press the Y key to reboot the device or press the N key to keep operating the device.

```
This will write configuration to flash!(Y/N)
Write configuration to flash complete!
Reboot the system?(Y/N)
Wait, rebooting ...
```

### 16.1.8 Login

**STEP 1:** Configure your workstation to the same network segment as the router, such as IP address 192.168.1.133 and subnet mask 255.255.255.0.

CP/IP Properties				? ×
Bindings	Advanced		NetBIOS	
DNS Configuration	Gateway	Gateway 🛛 WINS Conf		IP Address
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.				
O Obtain an IP address automatically				
<u>Specify an IP address:</u>				
IP Address:	192	.168.1	.133	
S <u>u</u> bnet Mas	k: <b>255</b>	. 255 . 255	. 0	
		ОК		Cancel

**STEP 2:** Click [Start]> [run], type **telnet 192.168.1.1** and click **OK**. (192.168.1.1 is the default IP address. If it was changed, use the new IP address to login.)



**STEP 3:** Enter the user name and password and press Enter to login (The default password and user name are root)



STEP 4: The following displays the main menu after login.

```
SHDSL Router
                               Main Menu
                                                               U
             >>].[BASIC] - Basic Configuration
              2.[ADVANCE] - Advance Configuration
              3.[MON]

    Status/Statistics Monitor

                         - Utilities
              4.[UTIL]
              5.[SYS]
                         - System Information
              6.[WRITE] - Write Configuration
              7.[REBOOT] - Reboot
              8.[QUIT]
                         - Disconnect
                       _____
[Up(^W)] [Down(^Z)] [Left(^A) - Prev Menu] [Right(^D) - Next Menu]
PATH> MAIN
```
# Appendix A: Specifications

# WAN Interface (One SHDSL port)

SHDSL standard SHDSL Line Interface Encoding scheme Line rate Data rate

### Encapsulation

Multi-protocol over AAL5 Bridged	RFC 2684 (1483)
Multi-protocol over AAL5 Route	RFC 2684 (1483)
PPP over Ethernet	RFC 2516
PPP over AAL5	RFC 2364

ITU-T G991.2

(2 channels)

Per ITU-T G991.2 (SHDSL)

N x 64 Kbps, N=1~36, per Channel

RJ45 TC-PAM

#### **ATM Attributes**

VCs	16
AAL type	AAL5
ATM service class	UBR/CBR/VBR
ATM UNI support	UNI3.1/4.0
OAM	F4/F5

#### Management

Console port	RS232/DB9
SNMP	Yes
TR-006 ADS Line MIB	Yes
Telnet	Yes
Web-based management	Yes
LED Indicators	Power, LAN status, ADSL status

#### Local Interface (Four Ethernet ports)

Standard Transparent bridge and learning IEEE 802.3 10/100 Base-T Yes

## **Routing functions**

IP static route	Yes
RIP and RIPv2	Yes
IGMP Proxy	Yes

# **Network functions**

ARP	Yes
DNS, NAT/PAT, DHCP/BOOTP	Yes
PAP, CHAP	Yes
Automatic IP and DNS Assignment	RFC 1877
Power Supply	
External power adapter	110 VAC or 230 VAC
Frequency	50/60 Hz
Environmental Conditions	
Operating temperature	0–50 degrees Celsius
Relative humidity	5–95%(non-condensing)

Note: Specifications are subject to change without notice