USER MANUAL

X8121r

ADSL Modem/Bridge
Annex A/B

VERSION 1.1

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Revision Marks

Revision	Date	Notes
V 1.0	May 8, 2003	Software: 3.51XAT1.8121A/138030331a3
V 1.1	June 10, 2003	Software: 3.51XAT1.8121A/138030331a3

Chapter 1

Getting Started

I. Overview

X8121r is multi-mode ADSL Router, compliant with ANSIT1.413 Issue 2, ITU G.992.1 (G.dmt) Annex A/B, G.992.2 (G.lite). ***X8121r*** provides high-speed Internet access via one WAN port over ATM over ADSL, and also connects to a corporate network via one 10/100BaseT Ethernet port. ***X8121r*** allows the service provider to deploy ADSL rapidly over existing wire infrastructure (POTS or ISDN line).

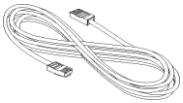
II. Features

- High speed asymmetrical data transmission on a single twisted copper pair
- Full rate operations up to 8Mbps downstream (12Mbps to be provided) and up to 1Mbps upstream. G.lite operation up to 1.5Mbps downstream and 512Kbps upstream
- One 10/100BaseT Ethernet port for PC connection
- DHCP server support for easy LAN IP address management
- Supports PPPoE (RFC2516), PPP (RFC2364), and IP (RFC 2225/RFC1577) over ATM over ADSL
- RFC2684 (RFC1483) Bridged/Routed for both LLC/VC MUX
- Allows LAN users to access the Internet through Network Address Translation (NAT, IP sharing) simultaneously
- Local OAM&P through command line interface via RJ-45 Ethernet port or RS-232 Craft port (optional)
- Configuration and management via Telnet and Web browser through the Ethernet and ADSL interfaces
- Supports applications such as TFTP, DHCP, Telnet, HTTP, and FTP
- Firmware upgradeable through TFTP
- Interoperability complies with TR-48, U-R2
- Supports dying gasp detection (optional)

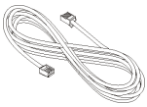
III. Packaging

This package consists of the following items:

X8121r ADSL device unit



RJ-45 Cable



RJ-11 Cable

AC Adapter

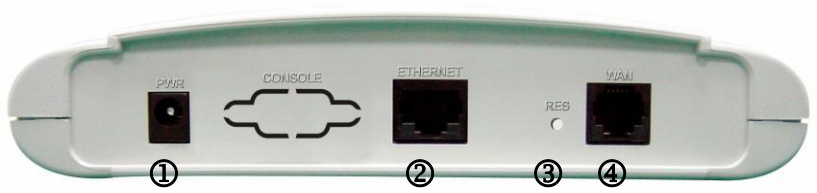
User's Manual CD

IV. Appearance

Front Panel

	Label	LED Status	Color	Description
①	100M	ON	Green	100M Ethernet transmitting.
②	10M	ON	Green	10M Ethernet transmitting.
③	PWR	ON	Green	Power supply is connected.
④	WAN	Blinking	Green	Training with DSLAM.
		ON	Green	ADSL link is ready.
⑤	ALM	Blinking	RED	Booting up.
		ON	RED	Error.

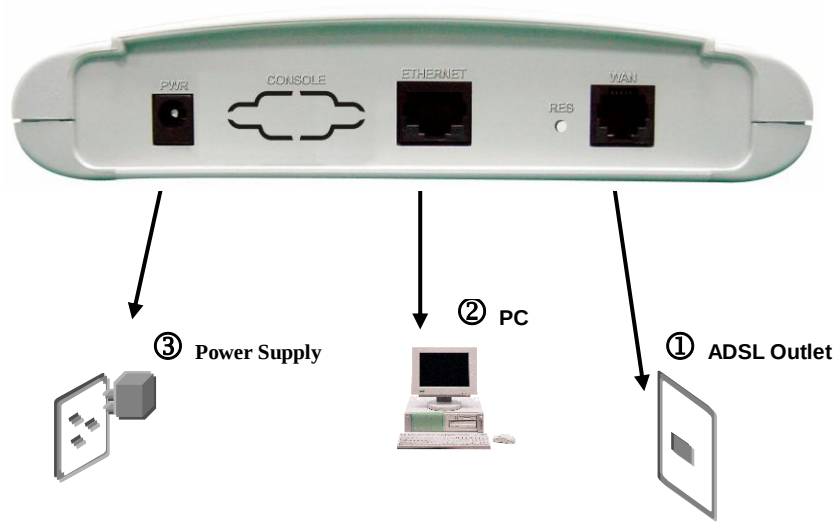
Rear Panel



	Label	Description
①	PWR	Power jack; connect to a power adapter.
②	ETHERNET	RJ-45 port; connect to a PC or LAN.
③	RESET	Reset the modem back to factory settings by holding down on this button.
④	WAN	RJ-11 or RJ-45 port; connect to the ADSL outlet. ***X8121r*** *uses RJ-11 Cable.* ***X8121r-B*** *uses RJ-45 Cable.*

V. Hardware Installation

1. Connect one end of the ADSL cable to the WAN port of ***X8121r*** and the other end to the ADSL wall outlet. *(**X8121r** uses RJ-11 cable and **X8121r-B** uses RJ-45 c*able)
2. Use a RJ-45 cable to connect one end to the Ethernet port of ***X8121r,*** and the other end to the LAN or a PC with an Ethernet adapter installed.
3. Plug in the AC adapter to the AC power socket, and then connect the DC jack to the PWR inlet of ***X8121r***.



Note: Be sure to use a RJ-45 crossover cable while connecting to a hub.

VI. Management

X8121r supports simple, flexible, and easy-to-operate methods for management purposes. ***X8121r*** can be managed via the following paths:

- ✓ **Local Ethernet Port (Telnet)** – connect the Ethernet port to your local area network or directly to a PC. "*Telnet*" ***X8121r*** from any workstation in the LAN. The default local Ethernet IP address is "**192.168.1.1**".
- ✓ **Local Ethernet Port (Web Browser)** – connect the Ethernet port to your local area network or directly to a PC. Launch your web browser and enter default local Ethernet IP address "**192.168.1.1**" into the address bar.
- ✓ **ADSL Port from Remote Site** – while the ADSL connection is in service, you may remotely "*Telnet*" ***X8121r*** from a workstation connected to the CO equipment.

Note: As operating an ADSL device requires technical know-how and experience. It is recommended that only qualified technical staffs manage ***X8121r***. Therefore, a password authentication is required when you enter the web interface. To obtain the password, see the *Default Values* section.

VII. Default Values

X8121r is pre-configured with the following parameters; you may also re-load the default parameters by rebooting the router into the Default configuration from the web browser.

Default Mode: Bridge	**Login Name: admin**
	Password: **admin**
Bridge Mode Setting	**WAN and ADSL**
Ethernet (local) IP: 192.168.1.1	Local Line Code: Auto
Subnet Mask: 255.255.255.0	Trellis Mode: Enable
Full Duplex: Auto	FDM Mode: Fdm
Protocol: RFC1483, Bridge Mode	Coding Gain: Auto
VPI/VCI: 8/35	Transmit Power Attenuation: 0dB
Class (QoS): UBR	
Spanning Tree: Disable	
Packet Filter: Any	
Router Mode Setting	**DHCP Server:** Disable
Ethernet (local) IP: 192.168.1.1	**DNS Relay:** Disable
Subnet Mask: 255.255.255.0	

Note: The User Name and Password are case-sensitive.

VIII. Software Upgrade

You may easily upgrade ***X8121r*** embedded software by obtaining the compressed upgrade kit from the service provider then following the steps:

- ✓ Extract the ZIP file for updated firmware.
- ✓ Connect ***X8121r*** via the local Ethernet port or remote ADSL link. Make sure that ***X8121r*** Ethernet IP address and your terminal are properly configured, then you can successfully "*ping*" ***X8121r***. The default local IP address is 192.168.1.1.
- ✓ Under DOS prompt, execute the **FTP** command **"open <*IP address of X8121r*>"**, then input user name and password.
- ✓ Execute upload command **"put tepatch.bin"**.
- ✓ This upgrading process may last as long as 60 seconds.
- ✓ Then reboot to the default values of ***X8121r*** with new software.

Note 1: ***X8121r*** software may also be upgraded through the web interface. See *Chapter 2: G. Admin, 3. Image Upgrade*

Note 2: Strictly maintain stable power to ***X8121r*** while upgrading its software. If the power fails during the upgrading process, contents in the memory could be destroyed, and the system may hang. In such a case, you must call the dealer or system integrator for repairs.

Chapter 2

Web Interface Management

I. Overview

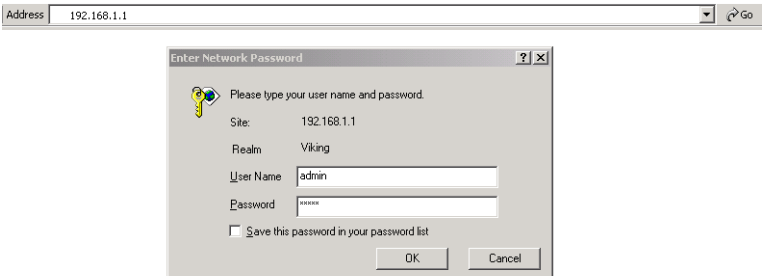
The Web management is provided in order to manage the ADSL device as easily as possible. It provides a very user-friendly configuration and graphical interface through a Web based platform. You can configure a bridge or a router, as you feel appropriate. In the section below, each configuration item is described in detail.

II. Preparation

1) Please refer the hardware installation procedure to install modem.
2) You should configure the PC to the same IP subnet as the modem.
   For example: The modem: 192.168.1.1
   Your PC: 192.168.1**.x**
3) Let your PC access the modem, and make sure that the PING function is working properly. The default IP address of this modem could be found in the default settings section.
4) Open the Web browser (Internet explorer or Netscape), enter the default IP address "**192.168.1.1**" for the website address to access the web management page.
5) The **Login** dialog box will pop up first.

III. Login

- The window **Enter Network Password** will pop up while starting the configuration. With the window open, type **admin** for both the **Username** and the **Password**. You can also edit the Username and Password or add new users. (For further details, see **G. Admin: 1. User Config**)

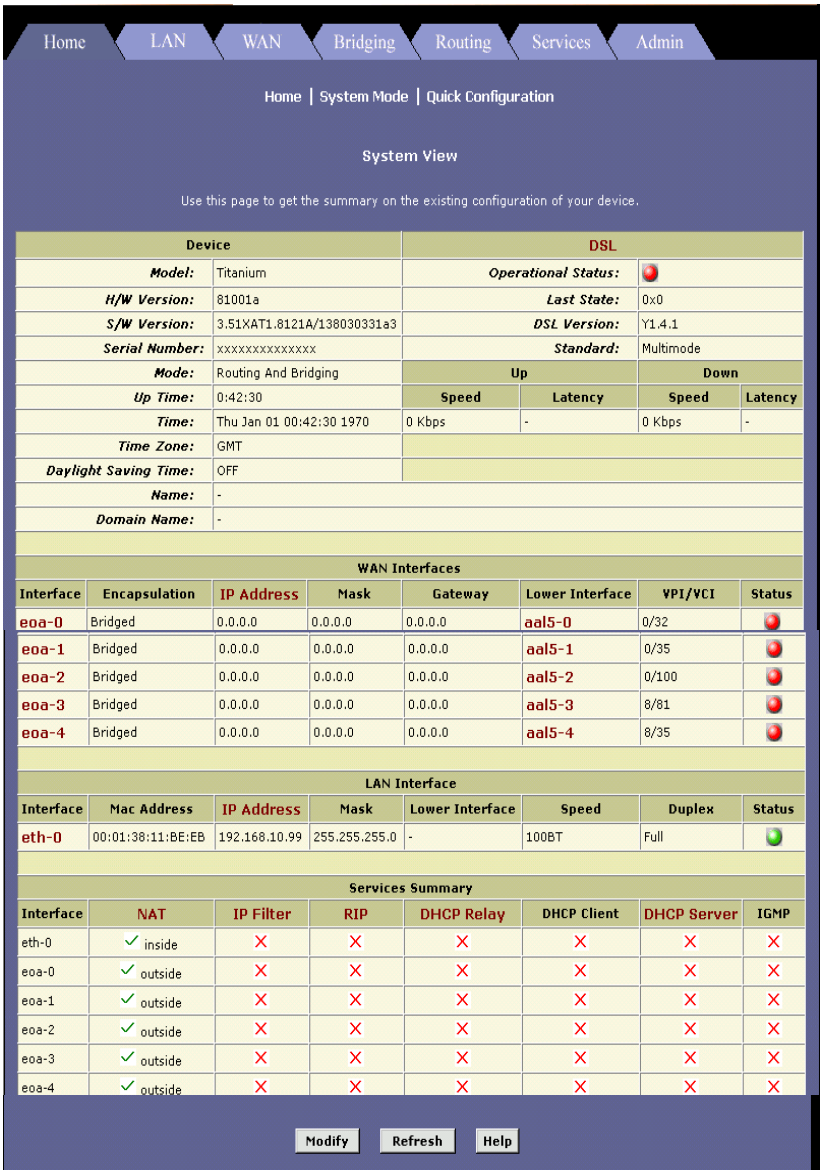


- After you log into the web interface, you will notice that it is divided into seven different sections, or tabs. From this point on, each tab is described in detail along with instructions for configuration. The seven tabs are:

  A. Home
  B. LAN
  C. WAN
  D. Bridging
  E. Routing
  F. Services
  G. Admin

A. HOME

- After logging in, the first tab that will be displayed is the **Home** tab. Under this tab, the **System View** page is displayed. This page displays a summary of the interfaces and their settings.



Home | LAN | WAN | Bridging | Routing | Services | Admin

Home | System Mode | Quick Configuration

System View

Use this page to get the summary on the existing configuration of your device.

Device		DSL			
Model:	Titanium	Operational Status:			
H/W Version:	81001a	Last State:	0x0		
S/W Version:	3.51XAT1.8121A/138030331a3	DSL Version:	Y1.4.1		
Serial Number:	xxxxxxxxxxxxx	Standard:	Multimode		
Mode:	Routing And Bridging	Up		Down	
Up Time:	0:42:30	Speed	Latency	Speed	Latency
Time:	Thu Jan 01 00:42:30 1970	0 Kbps	-	0 Kbps	-
Time Zone:	GMT				
Daylight Saving Time:	OFF				
Name:	-				
Domain Name:	-				

WAN Interfaces

Interface	Encapsulation	IP Address	Mask	Gateway	Lower Interface	VPI/VCI	Status
eoa-0	Bridged	0.0.0.0	0.0.0.0	0.0.0.0	aal5-0	0/32	
eoa-1	Bridged	0.0.0.0	0.0.0.0	0.0.0.0	aal5-1	0/35	
eoa-2	Bridged	0.0.0.0	0.0.0.0	0.0.0.0	aal5-2	0/100	
eoa-3	Bridged	0.0.0.0	0.0.0.0	0.0.0.0	aal5-3	8/81	
eoa-4	Bridged	0.0.0.0	0.0.0.0	0.0.0.0	aal5-4	8/35	

LAN Interface

Interface	Mac Address	IP Address	Mask	Lower Interface	Speed	Duplex	Status
eth-0	00:01:38:11:BE:EB	192.168.10.99	255.255.255.0	-	100BT	Full	

Services Summary

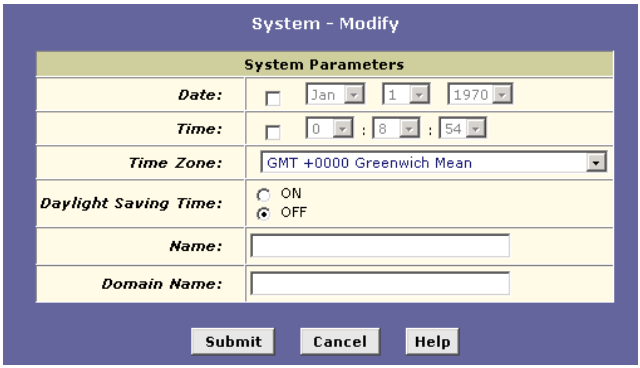
Interface	NAT	IP Filter	RIP	DHCP Relay	DHCP Client	DHCP Server	IGMP
eth-0	✓ inside	X	X	X	X	X	X
eoa-0	✓ outside	X	X	X	X	X	X
eoa-1	✓ outside	X	X	X	X	X	X
eoa-2	✓ outside	X	X	X	X	X	X
eoa-3	✓ outside	X	X	X	X	X	X
eoa-4	✓ outside	X	X	X	X	X	X

Modify Refresh Help

- This page is divided into five sections. The table below describes each section.

Section Name	Description
Device	Displays model name, hardware/software version, device mode, uptime, current time, time zone, daylight savings time, and domain name.
DSL	Displays operation status, last state, DSL version, and DSL standard.
WAN Interface	Displays the WAN interface name, encapsulation type, IP address, subnet mask, lower interface, VPI/VCI values, and operational status.
LAN Interface	Displays the LAN interface name, MAC address, IP address, subnet mask, lower interface, transmission speed, duplex type and operational status.
Services Summary	Displays the interface name, and enabled/disabled features, such as: NAT, IP filter, RIP, DHCP relay, DHCP client, DHCP server, and IGMP.

- To add, change, or remove any of the interface settings, click on the interface name.
- Click on the **Modify** button to set the device date, time, time zone, and other related settings. Click on the **Submit** button when completed.



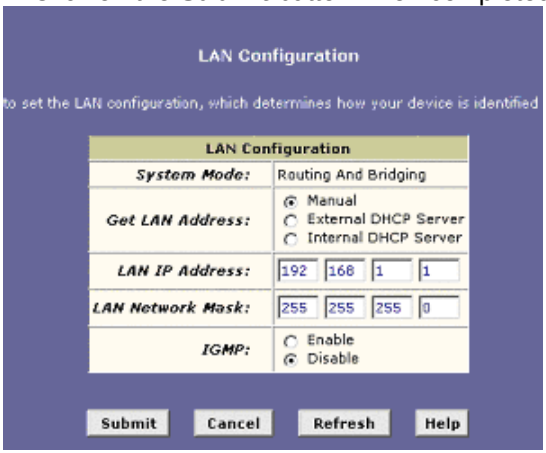
B. LAN

Click on the **LAN** tab to view its sub-menu's and configure the LAN settings. The four sub-menu's are: LAN Config, DHCP Mode, DHCP Server, and DHCP Relay. Each sub-menu is described below.

1. LAN Config

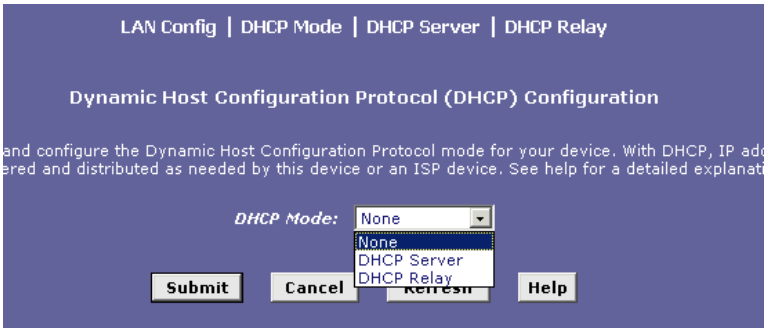
Click on the **LAN Config** link to change the LAN IP address/ subnet mask, decide where the LAN is getting its IP address from, and enable or disable IGMP. Follow the steps below in order to set up the LAN.

I. *Get LAN Address:* Select **Manual** if you would like to enter your own IP address. Select **External DHCP Server** if a DHCP server other than this device assigns the IP addresses. Select **Internal DHCP Server** if you would like this device to assign the IP addresses.
II. *LAN IP Address:* Enter the LAN IP address into these text boxes.
III. *LAN Network Mask:* Enter the subnet mask of the LAN IP address into these text boxes.
IV. *IGMP*: Depending on your ISP's settings, choose to enable or disable IGMP.
V. Click on the **Submit** button when completed.



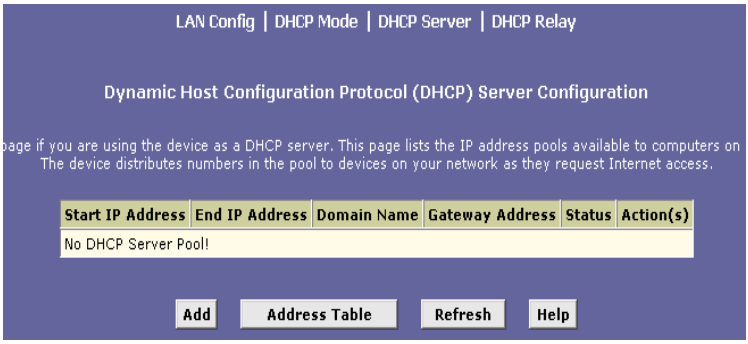
2. DHCP Mode

Click on the **DHCP Mode** link to select a DHCP setting. From the drop down list, select **DHCP Server, DHCP Relay,** or **None**. Click on the **Submit** button when completed.



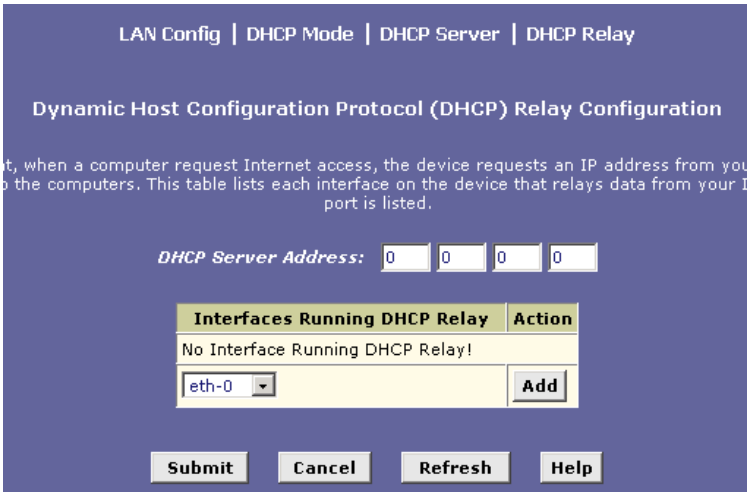
3. DHCP Server

Click on the **DHCP Server** link to view the DHCP Server settings. The table displays the DHCP server settings, this includes: start IP, end IP, domain name, gateway address, and status. Click on the **Add** button to enable a DHCP server and fill in the IP information based on your ISP settings.



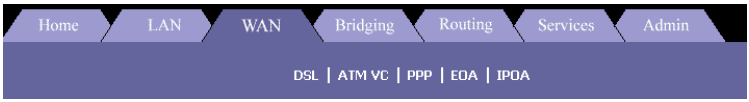
4. DHCP Relay

Click on the **DHCP Relay** link to view the DHCP Relay settings. Fill in the DHCP server IP address in the text boxes and select an interface name from the dorp down list, then click on the **Add** button to complete the DHCP Relay configuration.



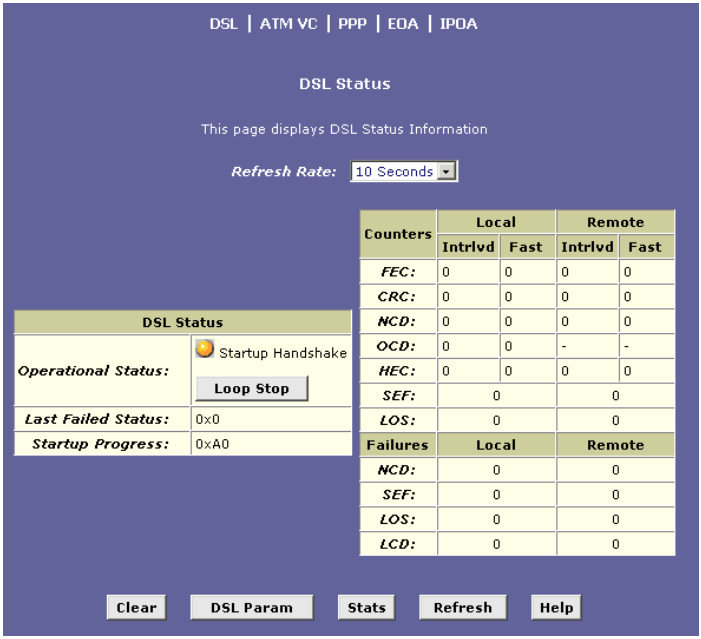
C. WAN

Click on the **WAN** tab to view its sub-menu's and configure the WAN settings. The five sub-menu's are: DSL, ATM VC, PPP, EOA, and IPOA. Each sub-menu is described below.



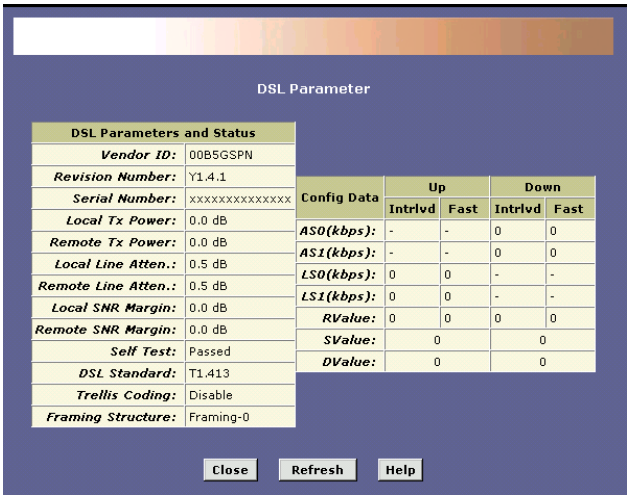
1. DSL

- Click on the **DSL** link to view the DSL status. Click on the **DSL Param** button to view the DSL parameters and the **Stats** button to view the DSL statistics. Both the **DSL Parameters** and **DSL Statistics** are described below.
- Click on the **Clear** button to clear and refresh the DSL status. You may also change the page refresh rate by selecting a different time period from the **Refresh Rate** drop down list.



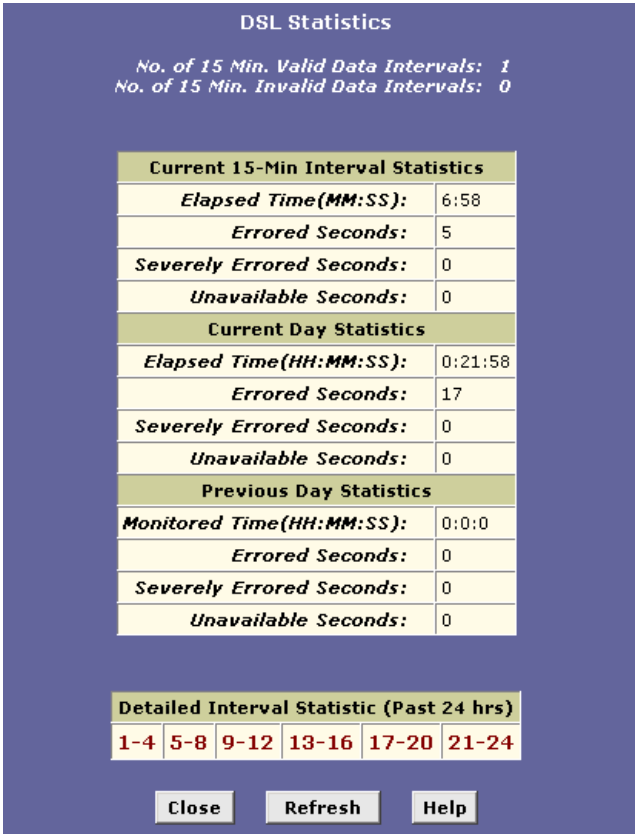
a) DSL Parameters

Click on the **DSL Param** button to view the DSL parameters. Another window will then display the DSL parameters, which may be different due to the type and speed of the network. Click on the **Close** button to close the window, or click on the **Refresh** button to refresh the status.



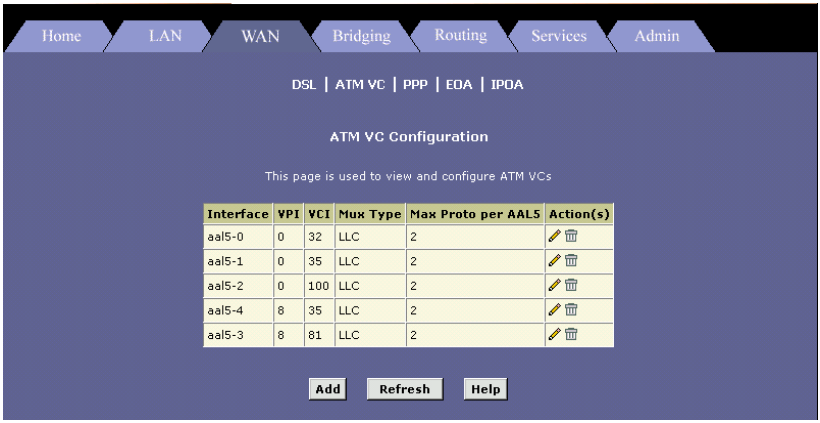
b) DSL Stats

Click on the **Stats** button to view the DSL status. Another window will then display the DSL status, which may be different due to the type and speed of the network. Click on the **Close** button to close the window, or click on the **Refresh** button to refresh the status.

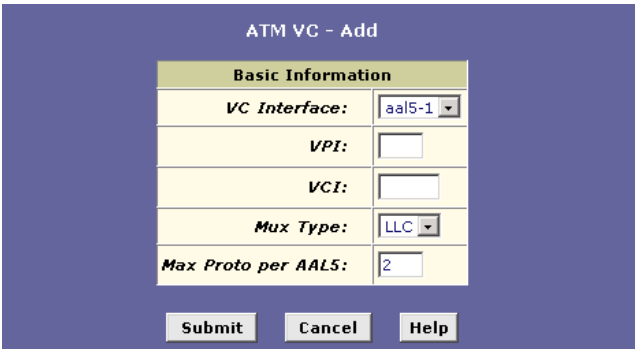


2. ATM VC

- Click on the **ATM VC** link to view the ATM VC table. This table displays the interface name, VPI/VCI values, Mux type, and maximum protocols per AAL5.
- Click on the **trash can** icon to delete the current interface, or edit the current interface by clicking on the **pencil** icon.
- Click on the **Add** button to another interface.

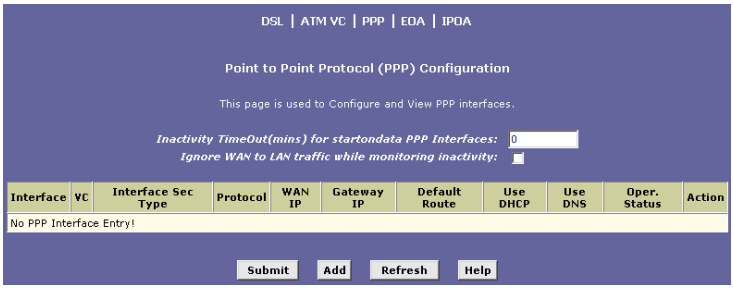


- After you click on the **Add** button, another window will pop-up. First select a VC interface from the drop down list. Then enter the VPI, VCI values into the text box. Select a Mux type from the drop down list, and then enter the number of protocols per AAL5 in the text box.
- Click on the **Submit** button when completed.

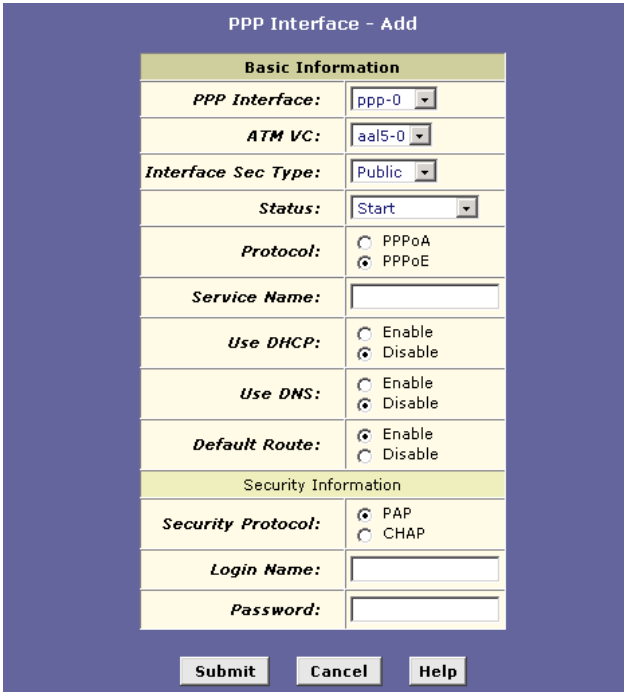


3. Point to Point Protocol (PPP)

- Click on the **PPP** link to view the PPP configuration table. This table displays PPP information such as: interface name, interface type, protocol, WAN IP, gateway IP, default route, DHCP, DNS, and operation status.
- Click on the **trash can** icon to delete the current interface, or edit the current interface by clicking on the **pencil** icon.
- Click on the **Add** button to another interface.



- After you click on the **Add** button, another window will pop-up.



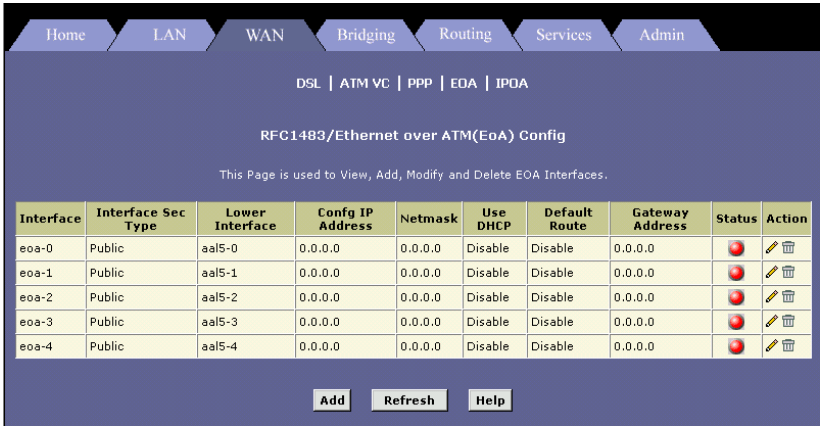
- The following is a list of field names and their descriptions. After filling in the table click on the **Submit** button when completed.

Field Name	Description
PPP Interface	Select an interface name from the drop down list.
ATM VC	Select an ATM VC from the drop down list.

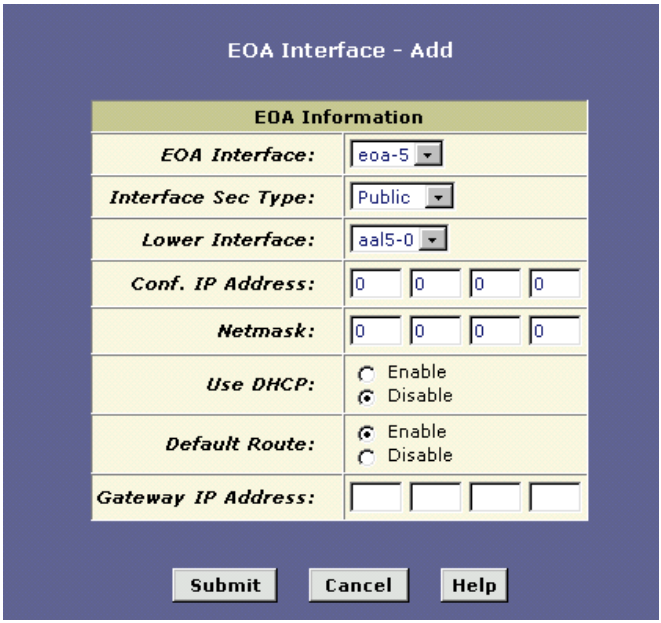
Interface Sec Type	Select between public, private, or DMZ.
Status	Select start, stop, or start on data.
Protocol	Select between PPPoA or PPPoE.
Service Name	Enter a name for this service in the text box.
Use DHCP	Select between enable or disable.
Use DNS	Select between enable or disable.
Default Route	Select between enable or disable.
Security Protocol	Select between PAP or CHAP.
Login Name	Enter the username for this service.
Password	Enter the password for this service.

4. Ethernet over ATM (EoA)

- Click on the EOA link to view the RFC1483/EoA configuration table. This table displays EoA information such as: interface name, interface security type, lower interface, config IP, network IP, DHCP, default route, gateway IP, and status.
- Click on the **trash can** icon to delete the current interface, or edit the current interface by clicking on the **pencil** icon.
- Click on the **Add** button to add another interface.



- After you click on the **Add** button, another window will pop-up.

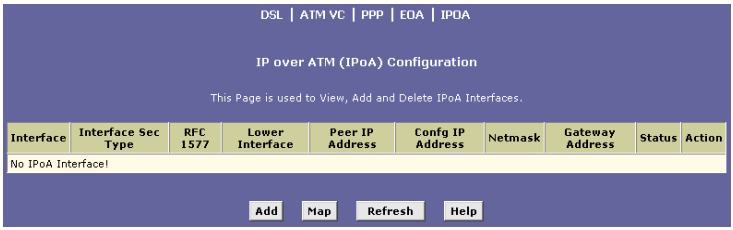


- The following is a list of field names and their descriptions. After filling in the table click on the **Submit** button when completed.

Field Name	Description
EoA Interface	Select an interface name from the drop down list.
Interface Sec Type	Select between public, private, or DMZ.
Lower Interface	Select a lower interface name from the drop down list.
Conf IP Address	Enter the LAN IP address here.
Netmask	Enter the subnet mask here.
Use DHCP	Select between enable or disable.
Default Route	Select between enable or disable.
Gateway IP Address	Enter the gateway IP address here.

5. IP over ATM (IPoA)

- Click on the IPoA link to view the IP over ATM configuration table. This table displays IPoA information such as: interface name, interface security type, lower interface, config IP, network IP, subnet mask gateway IP, and status.
- Click on the **trash can** icon to delete the current interface, or edit the current interface by clicking on the **pencil** icon.
- Click on the **Add** button to add another interface.



- After you click on the **Add** button, another window will pop-up.
- The following is a list of field names and their descriptions. After filling in the table click on the **Submit** button when completed.

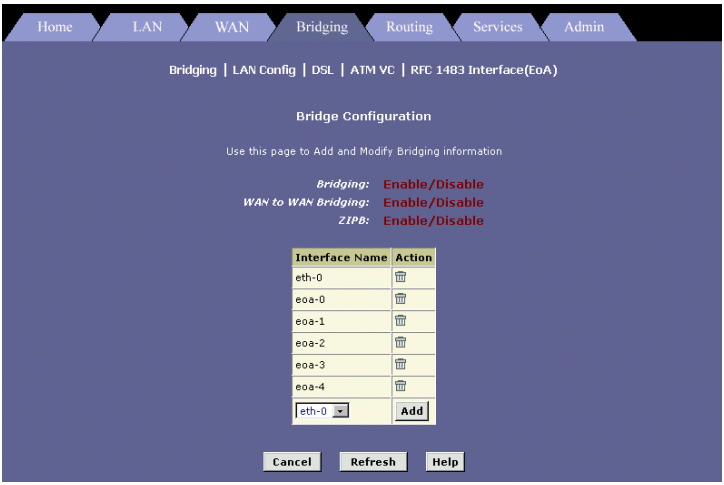
Field Name	Description
IPoA Interface	Select an interface name from the drop down list.
Conf IP Address	Enter the LAN IP address here.
Interface Sec Type	Select a lower interface name from the drop down list.
Netmask	Enter the subnet mask here.
RFC 1577	Select between Yes or No to use RFC 1577.
Use DHCP	Select between enable or disable.
Default Route	Select between enable or disable.
Gateway IP Address	Enter the gateway IP address here.

D. Bridging

Click on the **Bridging** tab to view its sub-menu's and configure the bridge settings. The six sub-menu's are: Bridging, LAN Config, DSL, ATM VC, and RFC 1483 Interface (EoA). The bridging sub-menu is described below. (*Each of the other sub-menus is described in the earlier sections.)*

1. Bridging

- Click on the Bridging link to view the Bridge configuration. This table displays bridge information such as: interface name.
- Click on the **trash can** icon to delete the current interface, or edit the current interface by clicking on the **pencil** icon.
- There are three radio buttons on this page. In order to use bridging, you must enable **Bridging** and **WAN to WAN Bridging**.
- Click on the **Submit** button when completed.

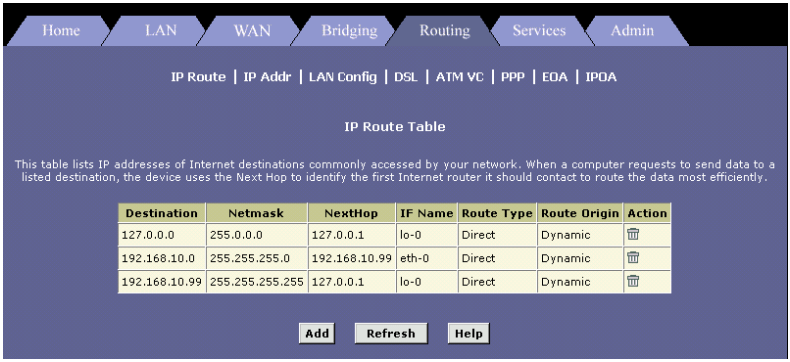


E. Routing

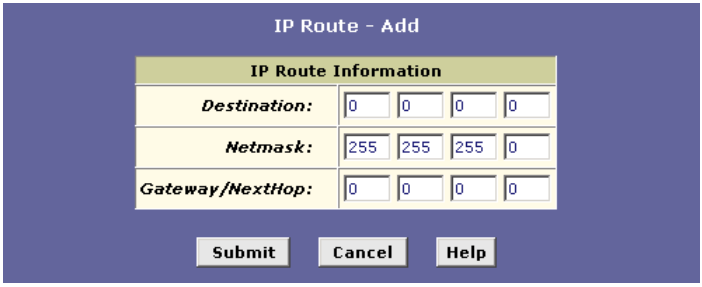
Click on the **Routing** tab to view its sub-menu's and configure the routing settings. The eight sub-menu's are: IP route, IP address, LAN Config, DSL, ATM VC, PPP, EoA, and IPoA. The IP route sub-menu is described below. (*Each of the other sub-menus is described in the earlier sections.)*

1. IP Route

- Click on the IP Route link to view the IP route table. This table displays IP route information such as: destination, net mask, next hop, interface name, route type and route origin. This table lists IP addresses of Internet destinations commonly accessed by your network. When a computer requests to send data to a listed destination, the device uses the Next Hop to identify the first Internet router it should contact to route the data most efficiently.
- Click on the **trash can** icon to delete the current destination or click on the **Add** button to add another destination.



- After you click on the **Add** button, another window will pop-up.



- The following is a list of field names and their descriptions. After filling in the table click on the **Submit** button when completed.

Field Name	Description
Destination	Enter the destination IP address of the router.
Netmask	Enter the subnet mask of the IP address.
Gateway/Next Hop	Enter the IP address of the gateway or the next router hop

F. Services

Click on the **Services** tab to view its sub-menu's and configure the service settings. The six sub-menu's are: NAT, RIP, Firewall, IP filter, DNS, and Blocked Protocols. Each one is described in detail below.

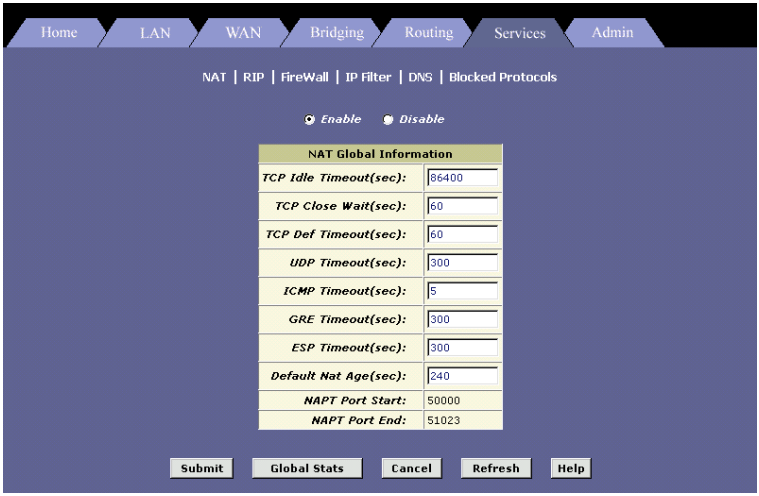
1. NAT

- Click on the NAT link to view the NAT global information table. The table displays the idle times for several protocols; you may change the times and click on the **Submit** button.
- The NAT feature offers three sections. First, click on the **Enable** radio box, to enable the NAT feature. Then select a NAT option from the drop down list.

- The three options are: NAT Global Info, NAT Rule Entry, and NAT translations. Each one is described below.

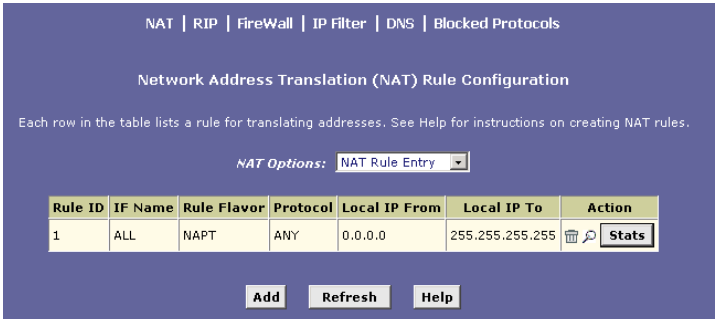
a) NAT Global Info

The table displays the idle times for several protocols; you may change the times and then click on the **Submit** button.

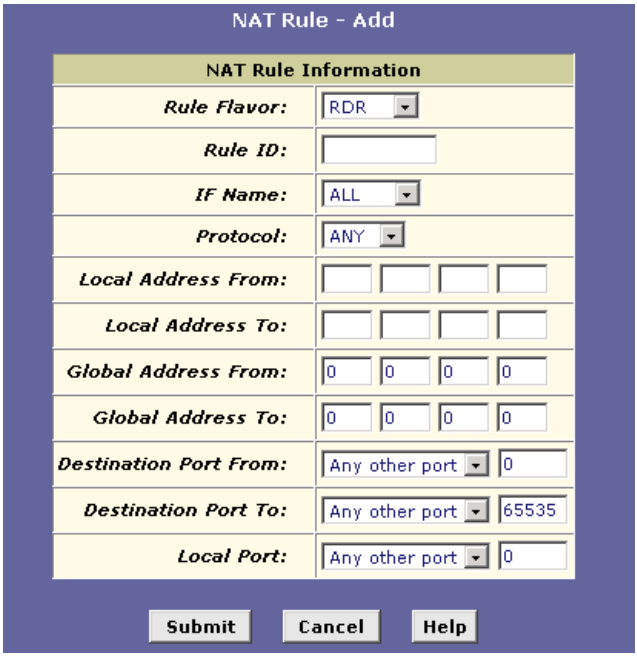


b) NAT Rule Entry

- The table displays NAT route configuration. Click on the **trash can** icon to delete the current rule or click on the **Add** button to add another rule.



- After you click on the **Add** button, another window will pop-up.



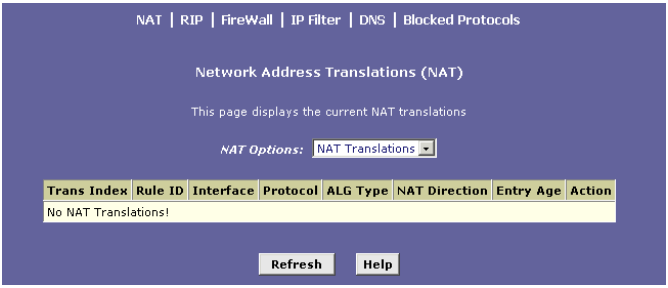
- The following is a list of field names and their descriptions. After filling in the table click on the **Submit** button when completed.

Field Name	Description
Rule Flavor	Select a rule from the drop down list.
Rule ID	Enter a rule ID into this text box.
IF Name	Select an interface name from the drop down list.
Protocol	Select a protocol from the dorp down list.
Local Address From	Enter a local IP address from where NAT will be used.
Local Address To	Enter a local IP address to where NAT will be used.
Global Address From	Enter an Internet IP address from where NAT will be used.
Global Address To	Enter an Internet IP address to where NAT will be used.
Destination Port From	Select a destination port from the drop

	down list, or enter it into the text box.
Destination Port To	Select a destination port from the drop down list, or enter it into the text box.
Local Port	Select a local port from the drop down list, or enter it into the text box.

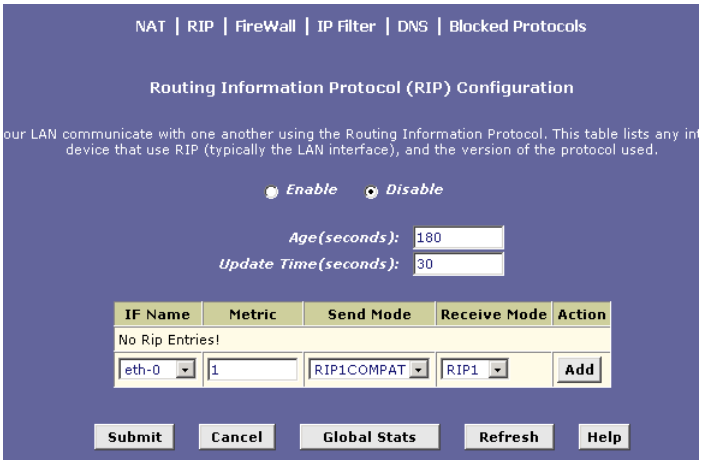
c) NAT Translations

- The table displays the current NAT translations, if any exist.
- Click on the **trash can** icon to delete a translation or click on the **Refresh** button to refresh the page.



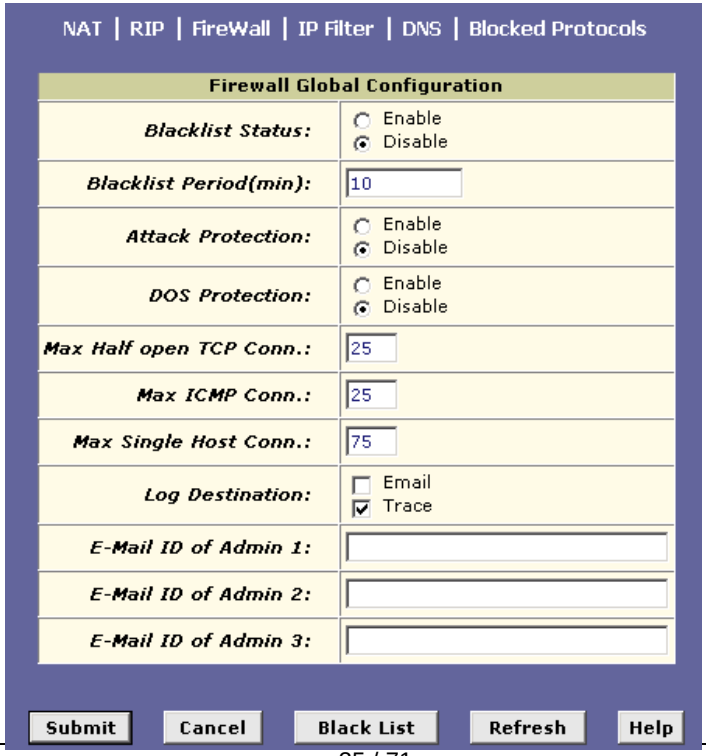
2. RIP

- Click on the RIP link to view the Routing Information Protocol (RIP) Configuration table. Routers on your LAN communicate with one another using the Routing Information Protocol. This table lists any interfaces on your device that use RIP (typically the LAN interface), and the version of the protocol used. In order to add a RIP configuration, follow the steps below:
    a. First, click on the **Enable** radio box, to enable the RIP configuration
    b. Select an **interface name** from the drop down list.
    c. Enter the number of router hops into the **metric** text box
    d. Select a send mode from the drop down list.
    e. Select a receive mode from the drop down list.
    f. Click on the **add** button
- Click on the **trashcan** icon to delete a RIP interface
- Click on the **Global Stats** icon to view the NAT statistics. This table will open in a new window.



3. *Firewall*

- Click on the Firewall link to view the Firewall Configuration table. The Firewall adds security to your network by protecting it from Internet intruders.



- The following is a list of field names and their descriptions. After filling in the table click on the **Submit** button

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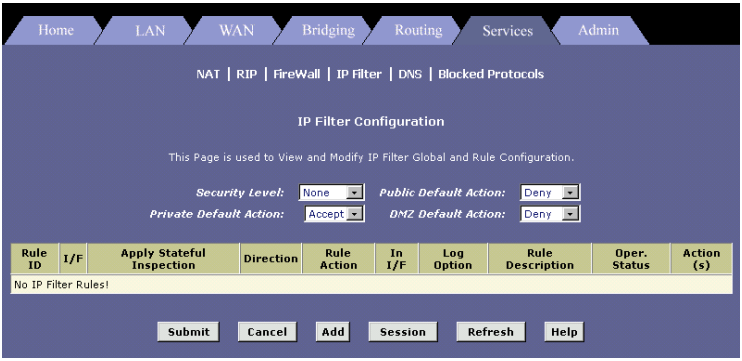
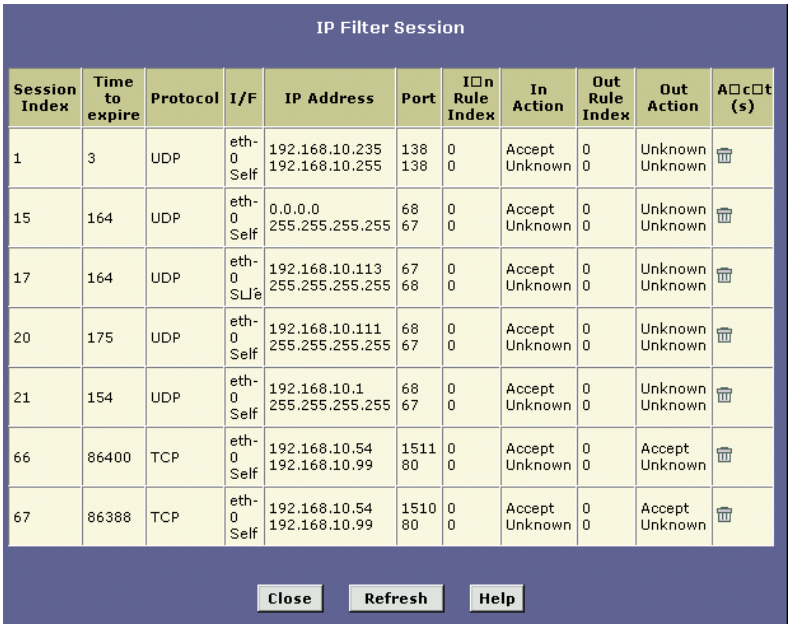
Field Name	Description
Blacklist Status	Select enable or disable blacklist.
Blacklist Period	Enter a time period to hold the blacklist.
Attack Protection	Select enable or disable Attach protection.
DOS Protection	Select enable or disable DoS protection.
Max half open TCP Conn.	Enter the maximum number of TCP connections.
Max ICMP Conn.	Enter the maximum number of ICMP connections.
Max Single Host Conn.	Enter the maximum number of host connections.
Log Destination	Select a destination for the log file.
Email ID of admin	Enter the email addresses of up to three administrators.

4. IP Filter

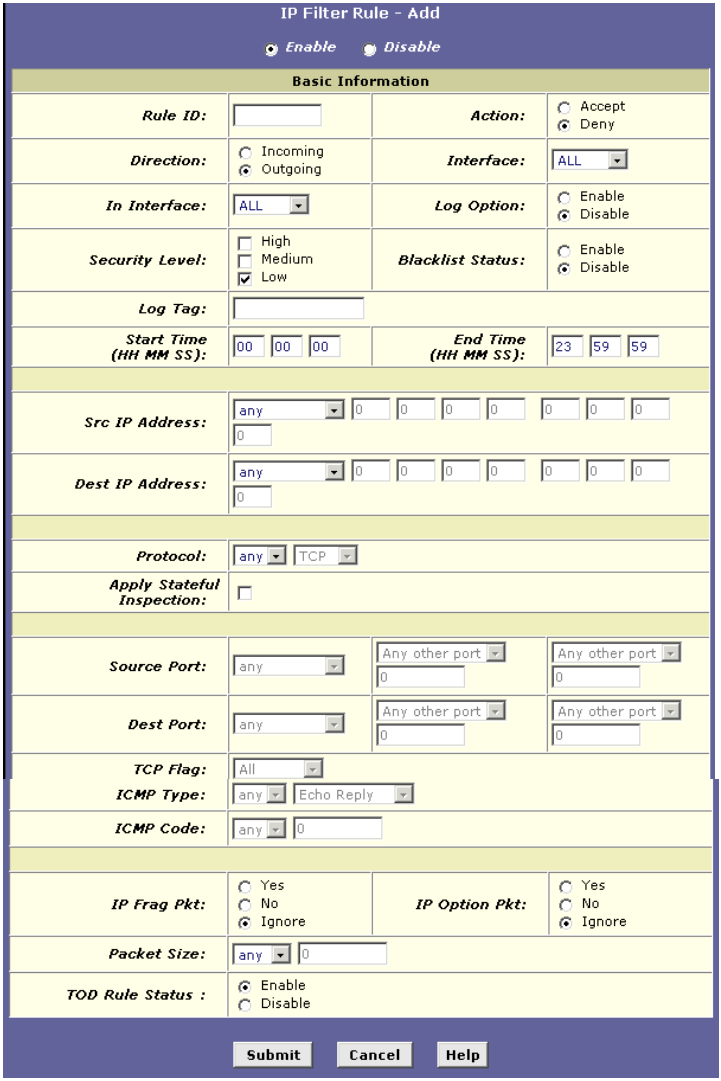
- Click on the **IP Filter** link to view the IP Filter Configuration table. In order to configure the IP filter function, follow the steps below:
  a. Select a **security level** from the drop down list. The options available are: Low, Medium, and High.
  b. Select if you would like to accept or deny the **private default action**. This will apply the security level to the private domain
  c. Select if you would like to accept or deny the **public default action**. This will apply the security level to the public domain
  d. Select if you would like to accept or deny the **DMZ default action**. This will apply the security level to the DMZ domain



- Click on the **Session** to view the IP filter sessions.
- You may delete a session by clicking on the **trash can** icon.
- Click on the **Close** button to close the window.



- To add an IP filter rule, click on the **Add** button .The table will pop-up in a new window.



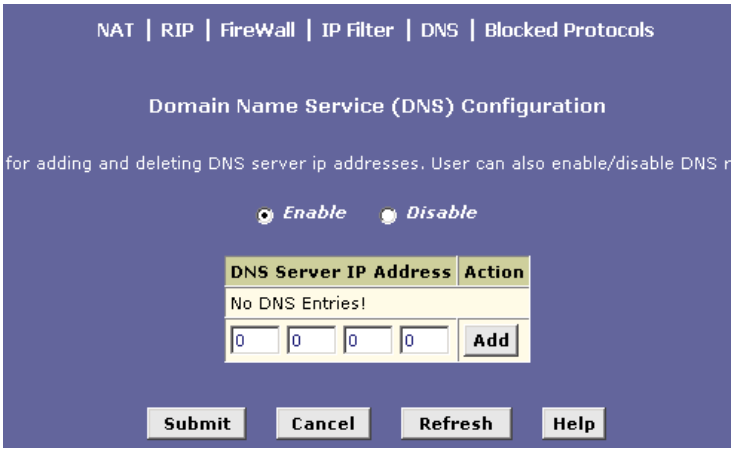
- The following is a list of field names and their descriptions. After filling in the table click on the **Submit** button

Field Name	Description
Rule ID	Enter a Rule ID.
Direction	Select an *incoming* or *outgoing* direction.

In Interface	Select an incoming interface from the drop down list.
Security Level	Select a security level: *high*, *medium*, or *low*.
Log Tag	Enter a name for the log.
Start Time	Enter a start time for the IP filter.
Action	Select *accept* or *deny* incoming IPs.
Interface	Select an outgoing interface from the drop down list.
Log Option	Select to *enable* or *disable* logging.
Blacklist status	Select to *enable* or *disable* the blacklist.
End time	Select an end time for the IP filter.
Src IP Address	Enter the source IP address range.
Dest IP Address	Enter the destination IP address range.
Protocol	Select a protocol from the drop down list.
Apply Stateful Inspection	Check this box if you would like to enable *Stateful* Inspection. If you decide to use Stateful Inspection, you must supply the source/destination port, TCP flag, ICMP type, and ICMP code.
IP Frag Pkt	Select *Yes*, *No*, or *Ignore* packet fragmenting.
Packet Size	Enter the packer size into the text box, or select *any* from the drop down list.
TOD Rule Status	Select to *enable* or *disable* time-out detection.

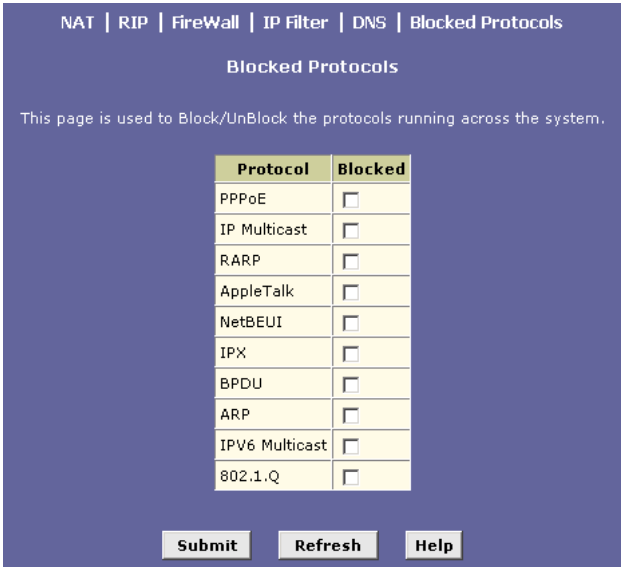
5. Domain Name Service (DNS)

- Click on the **DNS** link to view the DNS Configuration table. This page is used for adding and deleting DNS server IP addresses. You may also enable/disable DNS relay from this page.
- In order to add a DNS server IP addresses follow the steps below.
    a. Select the **enable** radio box to enable the DNS server function.
    b. Enter the IP address of the DNS server and click on the **Add** button.
    c. You may also delete an IP address by clicking on the **trash can** icon.



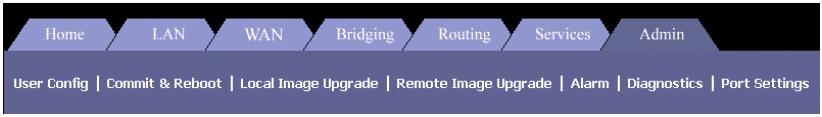
6. Blocked Protocols

- Click on the **Blocked Protocols** link to view the list of protocols. This page is used to block or unblock protocols running across the system.
- Check the box if you would like the protocol blocked, un-check the box to allow the protocol.
- Click on the **Submit** button when completed.



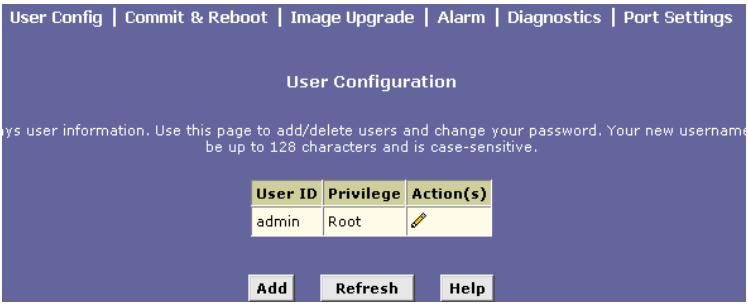
G. Admin

Click on the **Admin** tab to view its sub-menu's and configure the admin settings. The six sub-menu's are: User Config, Commit & Reboot, Local Image Upgrade, Remote Image Upgrade, Alarm, Diagnostics, and Port Settings. Each one is described in detail below.



1. User Config

- Click on the **User Config** link to view the list of users. This page displays user information. Use this page to add/delete users and change your password. Your new username and password can be up to 128 characters and is case-sensitive.
- To add a new user click on the **Add** button, or click on the **pencil** icon to edit the settings of an existing user.



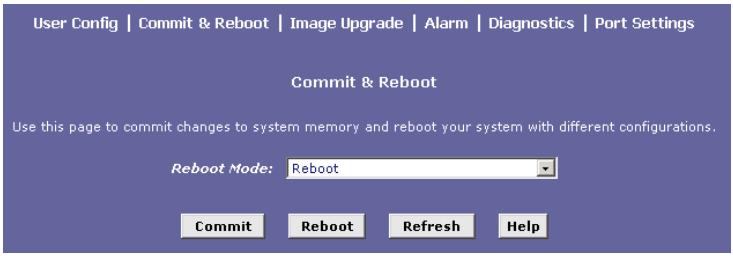
- After you click on the **Add** button, another window will pop-up.

- The following information is required in order to create a new user.
- Click on the **Submit** button when completed.

Field Name	Description
User ID	Enter the username here
Privilege	Select a privilege, *root,* or *user*.
Password	Enter the password here
Confirm Password	Re-enter the password here

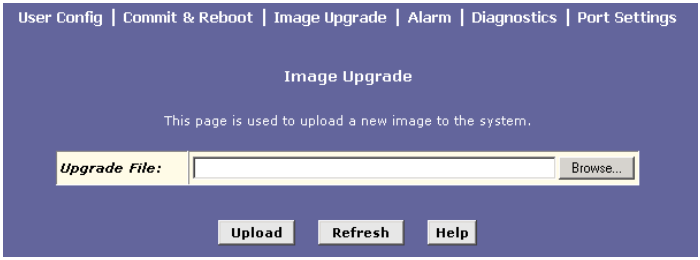
2. Commit & Reboot

- Click on the **Commit & Reboot** link to view the reboot options. This page is used to save the changes into the device's memory and reboot the device using different options.
- Click on the **Commit** button to save the changes.
- In order to reboot the device, select and option from the drop down list. The six options are:
    a. Reboot
    b. Reboot from default configuration
    c. Reboot from backup configuration
    d. Reboot from last configuration
    e. Reboot from clean configuration
    f. Reboot from minimum configuration
- Click on the **Reboot** button after you have made your choice.



3. Local Image Upgrade

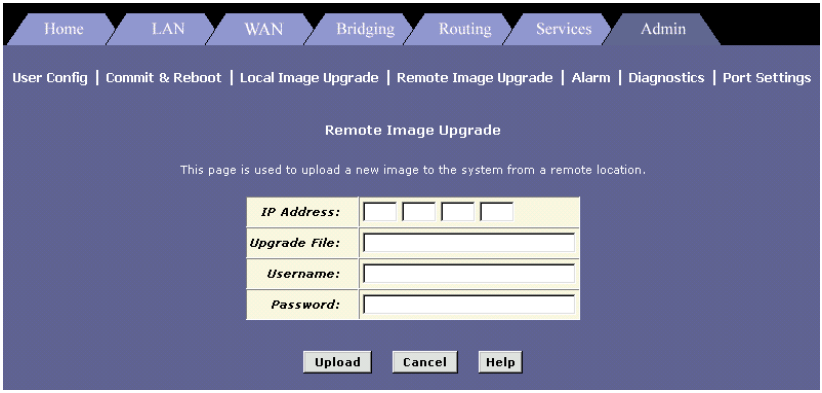
- Click on the **Local Image Upgrade** link to upgrade the software on the modem.
- You may easily upgrade ***X8024r*** embedded software by obtaining the compressed upgrade kit from the service provider and then following the steps:
    a. Click on the **Browse** button to select the upgrade file (tepatch.bin).
    b. Click on the **Upload** button to upload the file into the modem
    c. This process may last as long as 60 seconds.



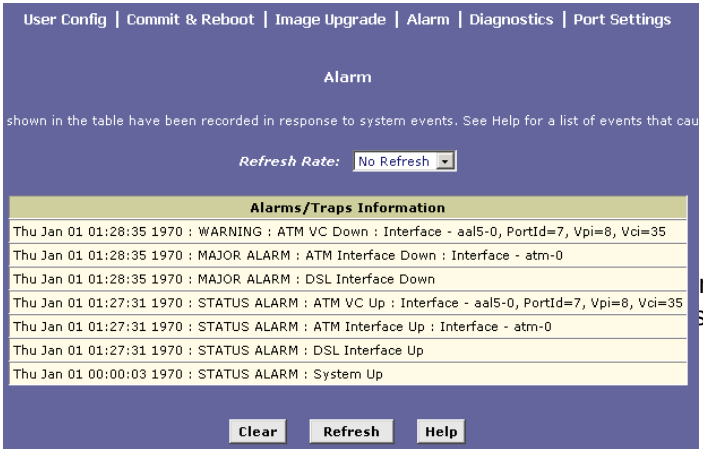
Note: The device software may also be upgraded through the DOS prompt. See *Chapter 1: VIII Software Upgrade* for more details.

4. Remote Image Upgrade

- Click on the **Remote Image Upgrade** link to upgrade the software on the modem.
- Enter the IP address where the software is located, the name of the software, and the User name and password of the site.



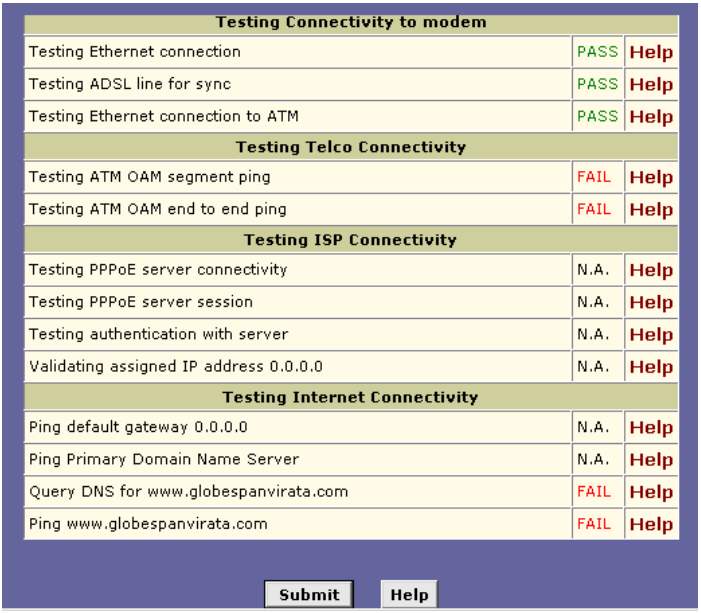
5.



- ms
- stem

6. Diagnostics

- Click on the **Diagnostics** link to test the device. Results will be displayed as *pass, fail*, or *N.A,* depending on your settings.
- Click on the **Submit** button to begin the diagnostic tests.

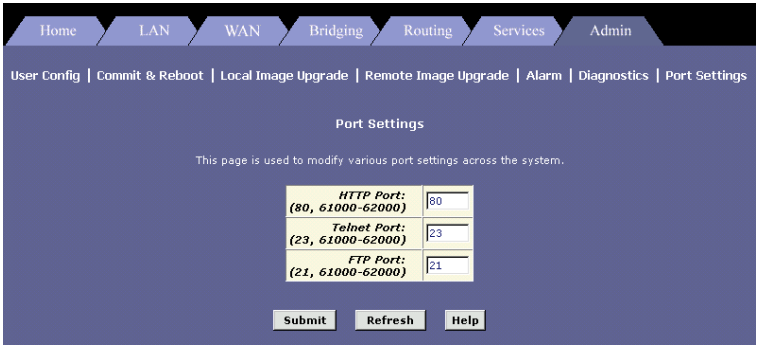


Testing Connectivity to modem		
Testing Ethernet connection	PASS	Help
Testing ADSL line for sync	PASS	Help
Testing Ethernet connection to ATM	PASS	Help
Testing Telco Connectivity		
Testing ATM OAM segment ping	FAIL	Help
Testing ATM OAM end to end ping	FAIL	Help
Testing ISP Connectivity		
Testing PPPoE server connectivity	N.A.	Help
Testing PPPoE server session	N.A.	Help
Testing authentication with server	N.A.	Help
Validating assigned IP address 0.0.0.0	N.A.	Help
Testing Internet Connectivity		
Ping default gateway 0.0.0.0	N.A.	Help
Ping Primary Domain Name Server	N.A.	Help
Query DNS for www.globespanvirata.com	FAIL	Help
Ping www.globespanvirata.com	FAIL	Help

Submit Help

6. Port Settings

- Click on the **Port Settings** link to change the port settings on the device.
- Change the settings by entering the new value into the text box and click on the **Submit** button when completed.



Chapter 3

Quick Protocol Setup

Overview

This chapter provides quick steps on setting up the protocols on this device. From this point on, configuration steps are listed for each of the protocols in their respective sections. The seven sections are:

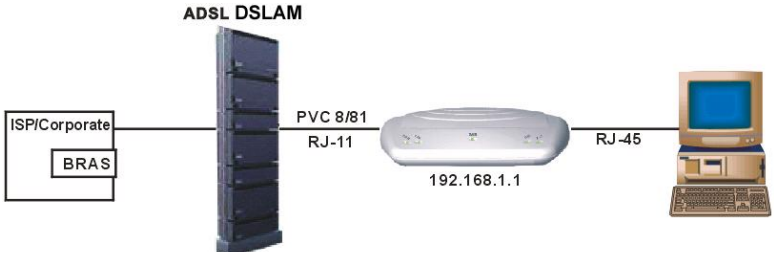
A. RFC 1483 Bridge
B. PPPoE Route Configuration
C. RFC 1483 + NAT
D. PPPoA Route Configuration
E. IPoA Route Configuration
F. DHCP Configuration
G. NAT Configuration

Note: The settings/parameters listed in the next few sections only provide an example to setting up the protocols. Contact your ISP for the actual settings

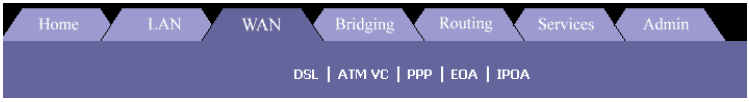
A. RFC 1483 Bridge

Configuration Table:

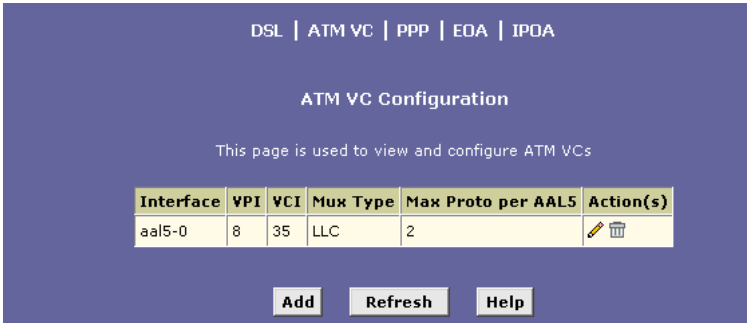
Protocol	RFC1483 Bridge Mode.
WAN IP	The ISP assigns the IP address, or have an IP address assigned from an external/internal DHCP server.
Modem IP	192.168.1.1
Gateway IP	None.
VPI/VCI	8/81



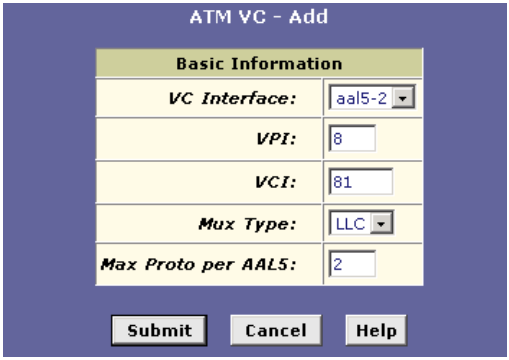
1. Click on the **WAN** tab to view its sub-menu's and configure the WAN settings, then click on the **ATM VC** link below it.



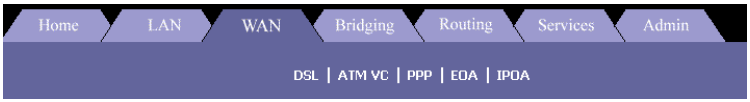
2. You will then see the ATM VC Configuration table. Click on the **Add** button to add a new VPI/VCI setting.



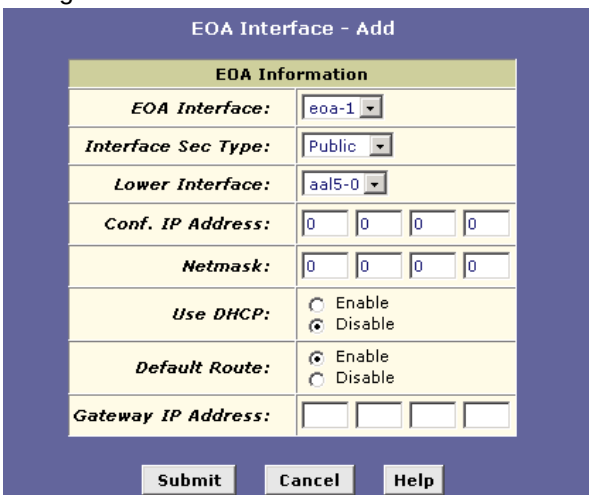
3. Another window will then appear. Enter the VPI/VCI values (8/81) into the VPI and VCI text boxes. Then click on the **Submit** button to confirm the changes.



4. Click on the **EoA** link below the **WAN** tab.

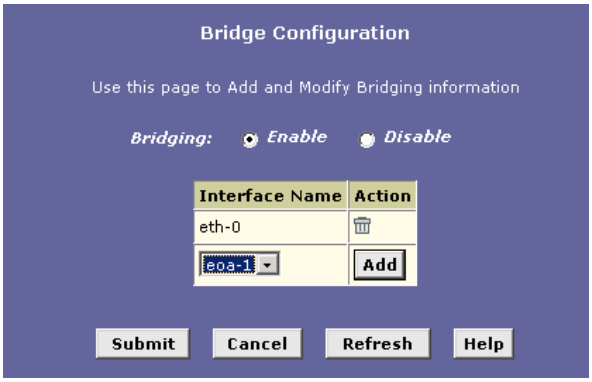


5. Enter the IP address and subnet mask based on your ISP settings. The default gateway is not required in RFC 1483 bridge mode. Then click on the **Submit** button to confirm the changes.



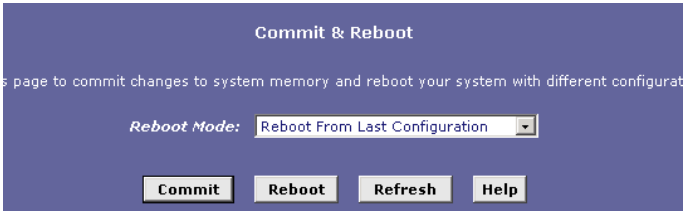
6. Click on the **Bridging** tab to view its sub-menu's and configure the bridging settings, then click on the **Bridging** link below it.

7. Select **EOA-1** from the drop down list, and click on the **Add** button. Then click on the **Submit** button to confirm the changes.



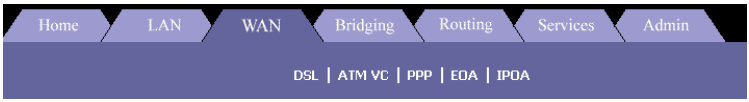
8. Click on the **Admin** tab to view its sub-menu's and configure the bridging settings, then click on the **Commit & Reboot** link below it.

9. Select the **Reboot from last configuration** option from the drop down list, and the click on the **Commit** and **Reboot** button.

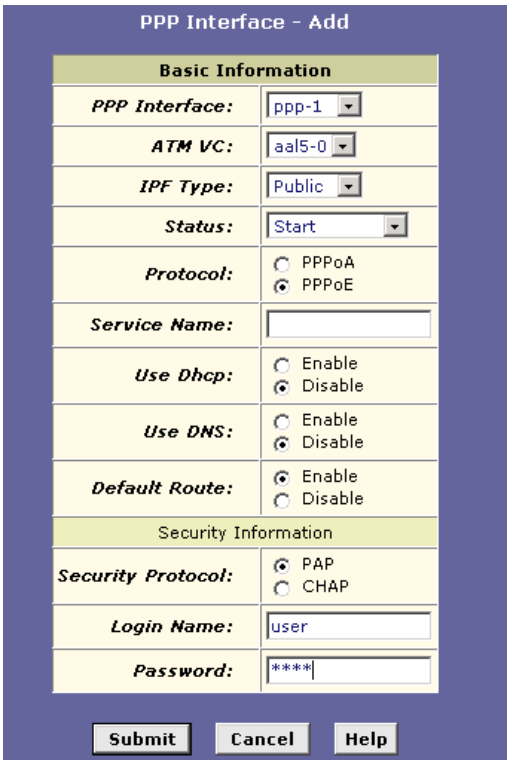


B. PPPoE Route Configuration

1. Click on the **WAN** tab to view its sub-menu's and configure the WAN settings, then click on the **PPP** link below it.



2. You will then see the PPP Configuration table. Click on the **Add** button to add a new **PPPoE** setting.

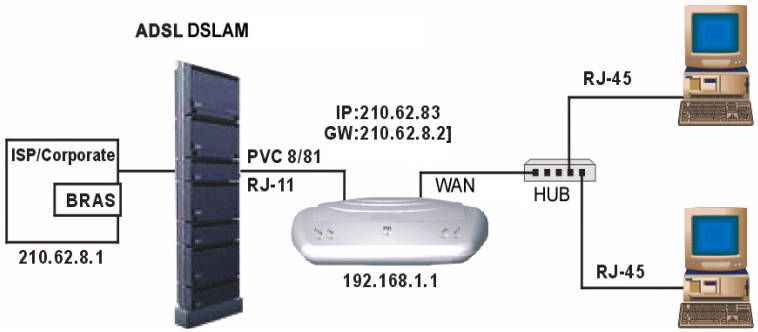


3. Select an interface name: *PPP-1*
4. Select a protocol: *PPPoE*
5. Default Route: *Disable*
6. Security Protocol: Select *PAP* or *CHAP*
7. Login Name: Enter *username* here (from ISP)
8. Password: Enter *password* here (from ISP)
9. Click on the **Submit** button to confirm the changes.

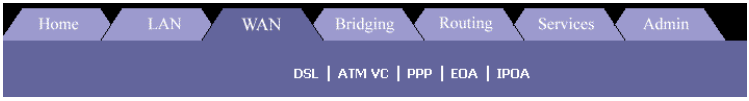
C. RFC 1483 + NAT

Configuration Table:

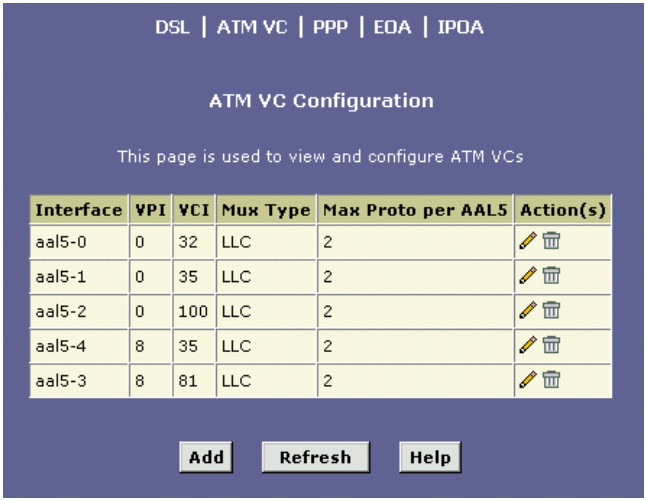
Protocol	RFC1483 Mode + NAT.
LAN IP	192.168.1.xxx or assigned by DHCP server.
Modem IP	192.168.1.1
WAN IP	210.62.8.3
VPI/VC Value	8/81



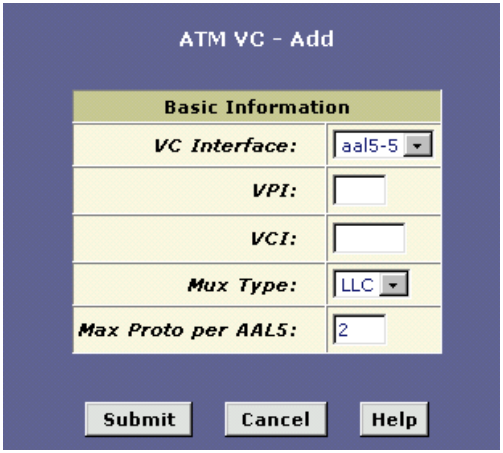
1. Click on the **WAN** tab to view its sub-menu's and configure the WAN settings, then click on the **ATM VC** link below it.



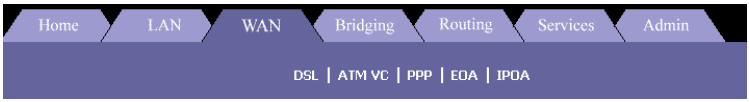
2. You will then see the ATM VC Configuration table. Click on the **Add** button to add a new VPI/VCI setting.



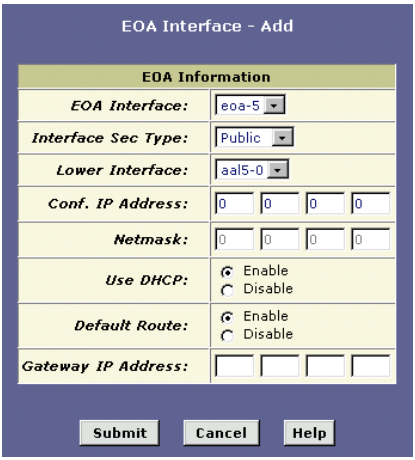
3. Another window will then appear. Enter the VPI/VCI values (8/81) into the VPI and VCI text boxes. Then click on the **Submit** button to confirm the changes.



4. Click on the **EoA** link below the **WAN** tab.

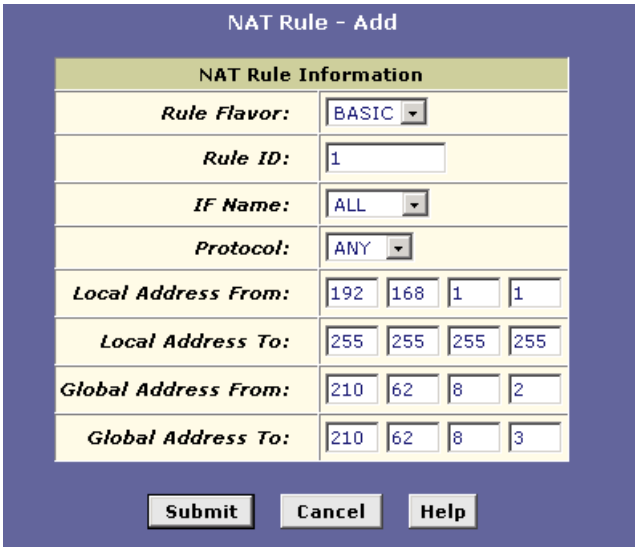


5. Enter the **IP address** and **subnet mask** based on your ISP settings.
6. Enable **DHCP** and **Default Route** and click on the **Submit** button.



7. Click on the **Services** tab to view its sub-menu's and configure the **NAT** settings, then click on the **NAT** link below it.

8. Select **NAT Rule Entry** from the NAT configuration drop down list. Then click on the **Add** button to add a NAT entry.

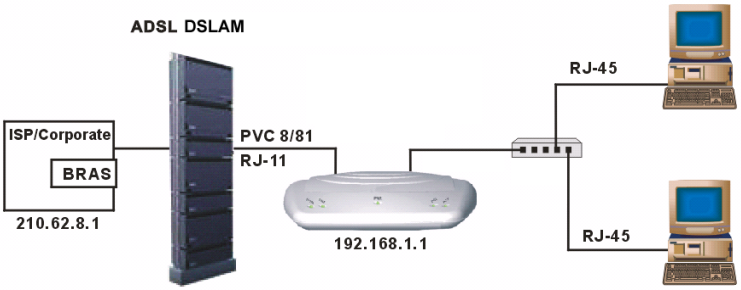


9. Rule Flavor: Select a *Rule flavor* from the drop down list (Basic)
10. Rule ID: *Enter a number here*
11. Local Address From: *Address from where this device will receive IPs*
12. Local Address to: *255.255.255.255 (broadcast) or other*
13. Login Name: Enter *username* here (from ISP)
14. Global Address From: *Global Address from where this device will receive IPs*
15. Global Address From: *Global Address from where this device will send its packets*
16. Click on the **Submit** button to confirm the changes.

D. PPPoA Route Configuration

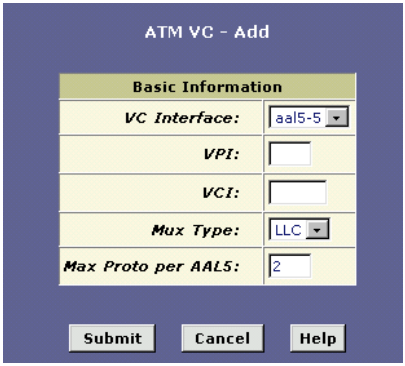
Configuration Table:

Protocol	PPPoA Route Mode.
LAN IP	192.168.1.xxx
Modem IP	192.168.1.1
Gateway IP	Not required.
VPI/VCI	8/81
Username	From ISP.
Password	From ISP.

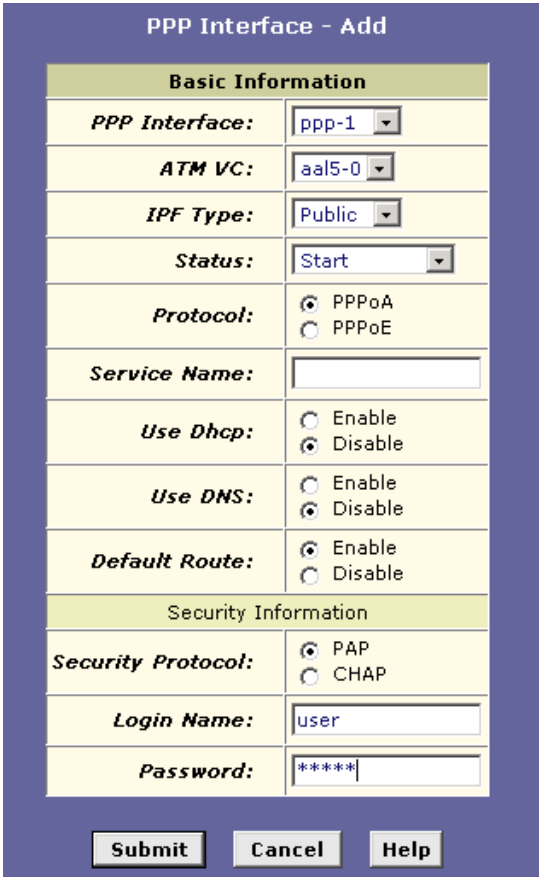


1. Click on the **Routing** tab to view its sub-menu's and configure the Routing settings, then click on the **ATM VC** link below it.

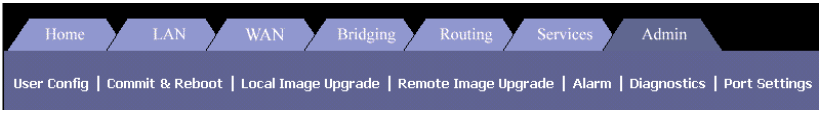
2. You will then see the ATM VC Configuration table. Click on the **Add** button to add a new VPI/VCI setting.
3. Another window will then appear. Enter the VPI/VCI values (8/81) into the VPI and VCI text boxes. Then click on the **Submit** button to confirm the changes.



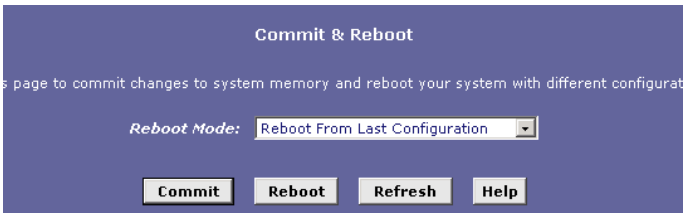
4. Click on the **PPP** link in the **Routing** tab, and then click on the **Add** button to add a **PPPoA** configuration.



5. Select an interface name: *PPP-1*
6. Select a protocol: *PPPoA*
7. Default Route: *Enable*
8. Security Protocol: Select *PAP* or *CHAP*
9. Login Name: Enter *username* here (from ISP)
10. Password: Enter *password* here (from ISP)
11. Click on the **Submit** button to confirm the changes.
12. Click on the **Admin** tab to view its sub-menu's and configure the bridging settings, then click on the **Commit & Reboot** link below it.



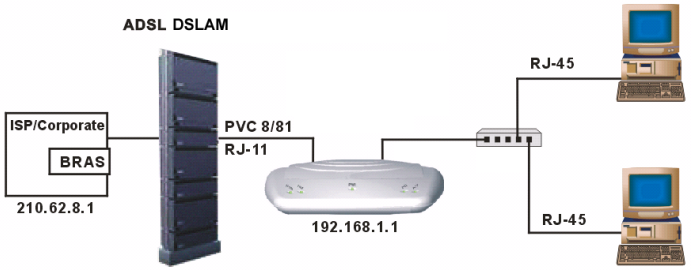
13. Select the **Reboot from last configuration** option from the drop down list, and the click on the **Commit** and **Reboot** button.



E. IPoA Route Configuration

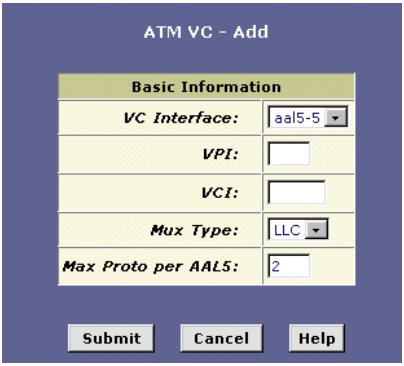
Configuration Table:

Protocol	IPoA Route Mode
LAN IP	192.168.1.xxx
Modem IP	192.168.1.1
Gateway IP	210.62.8.1
VPI/VCI	8/81
WAN IP	210.62.8.2

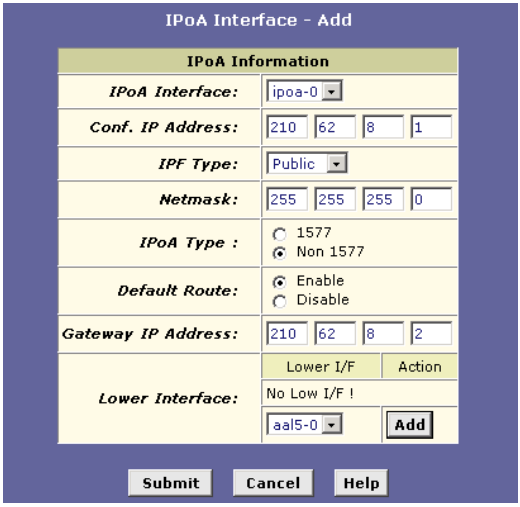


1. Click on the **Routing** tab to view its sub-menu's and configure the Routing settings, then click on the **ATM VC** link below it.

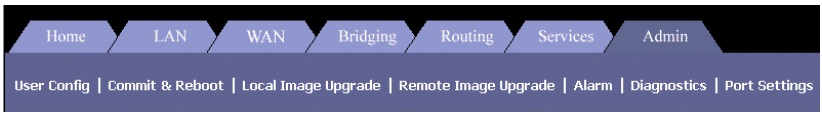
2. You will then see the ATM VC Configuration table. Click on the **Add** button to add a new VPI/VCI setting.
3. Another window will then appear. Enter the VPI/VCI values (8/81) into the VPI and VCI text boxes. Then click on the **Submit** button to confirm the changes.



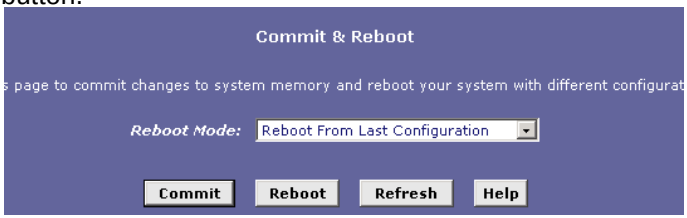
4. Click on the **IPoA** link in the **Routing** tab, and then click on the **Add** button to add an **IPoA** configuration.



5. Select an interface name: *IPoA-0*
6. Conf. IP Address: *From ISP*
7. Net mask: *From ISP*
8. Gateway IP Address: *From ISP*
9. Login Name: Enter *username* here (from ISP)
10. Lower Interface: Select *aal5-0*
11. Click on the **Submit** button to confirm the changes.
12. Click on the **Admin** tab to view its sub-menu's and configure the bridging settings, then click on the **Commit & Reboot** link below it.



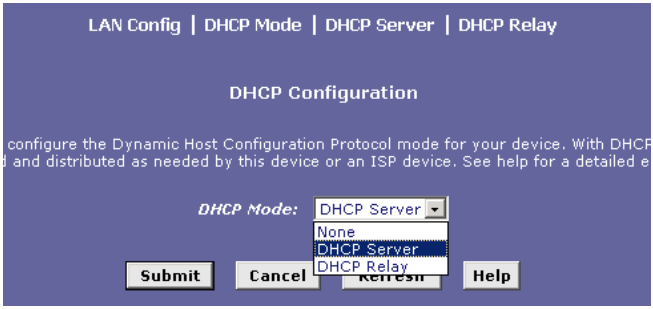
13. Select the **Reboot from last configuration** option from the drop down list, and the click on the **Commit** and **Reboot** button.



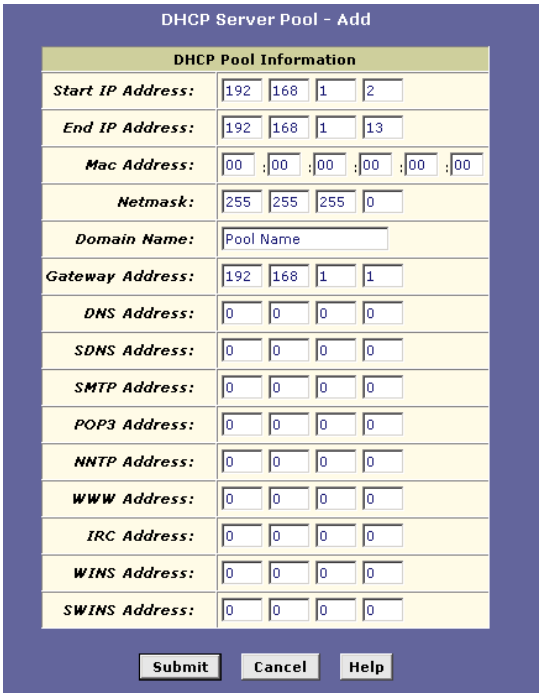
F. DHCP Configuration

1. Click on the **LAN** tab to view its sub-menu's and configure the **LAN** settings, then click on the **DHCP Mode** link below it.

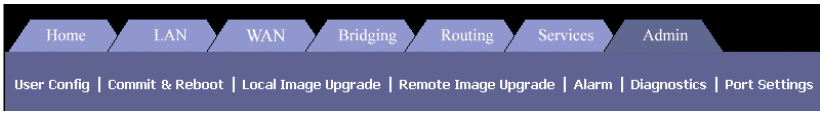
2. From the drop down list, select **DHCP Server**, and click on the **Submit** button.



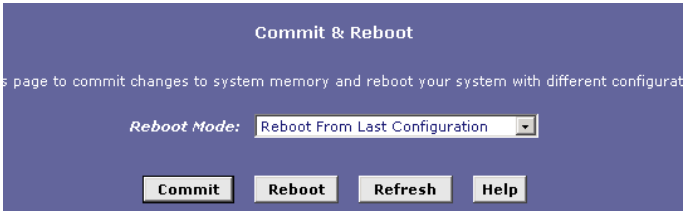
3. Click on the **DHCP Server** link under the LAN tab, and click on the **Add** button.



4. Start IP Address: Enter the *Start IP Address (192.168.1.2)*
5. End IP Address: Enter the *End IP Address (192.168.1.13)*
6. Net mask: *based on IP address (255.255.255.0)*
7. Domain Name: Enter a *name* here
8. Gateway IP Address: Enter a Gateway IP Address here
9. Click on the **Submit** button to confirm the changes.
10. Click on the **Admin** tab to view its sub-menu's and configure the bridging settings, then click on the **Commit & Reboot** link below it.

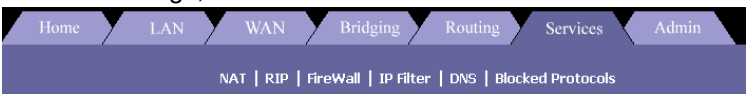


11. Select the **Reboot from last configuration** option from the drop down list, and the click on the **Commit** and **Reboot** button.

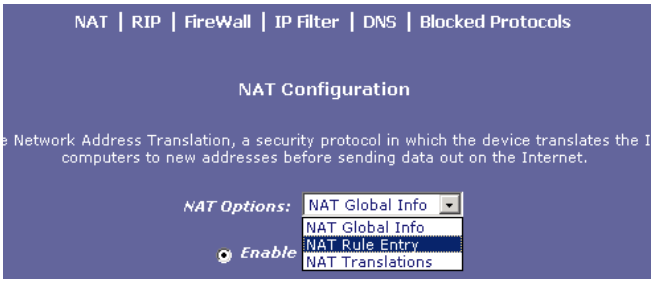


G. NAT Configuration

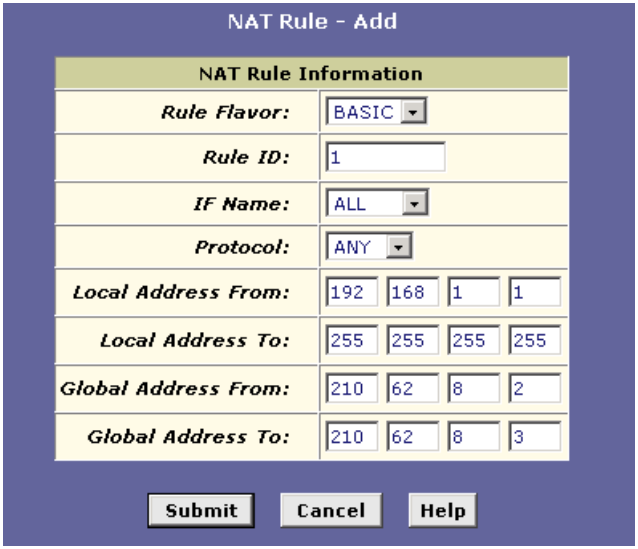
1. Click on the **Services** tab to view its sub-menu's and configure the **NAT** settings, then click on the **NAT** link below it.



2. From the **NAT Options** drop down list, select **NAT Rule Entry**.



3. Click on the **Add** button to add a new **NAT Rule Entry**.



4. Rule Flavor: Select a *Rule flavor* from the drop down list (Basic)
5. Rule ID: *Enter a number here*
6. Local Address From: *Address from where this device will receive IPs*
7. Local Address to: *255.255.255.255 (broadcast) or other*
8. Login Name: Enter *username* here (from ISP)
9. Global Address From: *Global Address from where this device will receive IPs*
10. Global Address From: *Global Address from where this device will send its packets*
11. Click on the **Submit** button to confirm the changes.

Appendix A – Specifications

A1. Hardware Specifications

■ Local Interface
- One 10/100BaseT Ethernet port, IEEE 802.3, RJ-45 connector

■ WAN ADSL Line Interface
- For ADSL over POTS, compliant with ITU G.992.1 (G.dmt) Annex A, ITU G.992.2 (G.lite), and ANSI T1.413 issue 2
- For ADSL over ISDN, Compliant with ITU G.992.1 (G.dmt) Annex B, and ETSI TS 101 388
- Interoperability complies with TR-48 and U-R2
- Line Impedance: 100 Ω
- Connection Loop: Single pair (2-wire)
- Connector: RJ-11 for Annex A, RJ-45 for Annex B

■ Indicators
- PWR – Green LED, indicates power and operation
- 10M – Green LED, indicates 100M Ethernet transmitting/receiving
- 100M – Green LED, indicates 10M Ethernet transmitting/receiving
- WAN – Green LED, indicates ADSL data link
- ALM – Red LED, indicates data error or operation fault

■ OAM&P
- Telnet and Web GUI management

■ Environment
- Operation Temperature: 0°C ~ 45°C
- Operation Humidity: 5% ~ 95%
- Storage Temperature: -20 ~ +85°C
- Storage Humidity: 5%~95%

■ Power
- AC Adapter: Input 120 VAC/60Hz or 230VAC/50Hz; Output 15VAC 1A
- Power Consumption: Less than 10 Watts

■ Physical Dimensions
- 180mm x 143mm x 42mm (W x D x H)

■ Certificates
- CE, CB, FCC Part 15 Class B, UL

A2. Software Specifications

- ATM
  - ATM Cell over ADSL, AAL5
  - Supports UBR/GFR, CBR, VBR-rt and VBR-nrt
  - VPI Range (0-4095) and VCI range (1-65535)
  - Supports up to 8 PVCs (Bridge Mode), 5 PVCs (Router Mode)
  - Support OAM F4/F5, AIS, RDI, and loopback cells
  - Supports Bit Swap
  - Payload Encapsulation –
    - RFC2684 (RFC1483), multi-protocol over ATM
    - RFC2225 (RFC1577), IPoA
    - RFC2364, PPP over ATM (CHAP and PAP supported)
    - RFC2516, PPPoE (PPP over Ethernet) over ATM
- Bridging
  - Transparent Bridging (IEEE 802.1D)
  - RFC2684 (RFC1483) Bridged
  - Spanning Tree Protocol (IEEE 802.1D)
  - Supporting IP, IGMP v1/v2 and PPPoE packets filter function
- Routing
  - Routing Information Protocol (RIP) v1/v2 and Static Routing
  - NAT/PAT – RFC1631 (basic firewall support)
  - Supports Point-to-Point Protocol (PPP)
  - PAP or CHAP for user authentication
  - RFC2684 (RFC1483) Routed
  - DNS relay
- Security
  - Raw IP filtering
  - VPN supports IPSec Pass through, L2TP Client/Server & L2TP/PPTP Pass Through
  - DoS (UDP/TCP), Detection of Known Attacks
  - Detects port attack
  - ID Password Authentication
- Configuration and Network Management
  - DHCP server for IP management
  - FTP, TFTP, Telnet for local or remote management
  - TFTP for firmware upgrade and configuration
  - Web configuration
  - SNMP v1 and MIB II (RFC 1213)
  - Auto Detect – VCI/VPI Setup
  - Auto Detect – PPPoA Setup
  - Command Line Interface

Appendix B – Warranties

B1. Product Warranty

1. XAVi Technologies warrants that the ADSL unit will be free from defects in material and workmanship for a period of twelve (12) months from the date of shipment.
2. XAVi Technologies shall incur no liability under this warranty if
   - The allegedly defective goods are not returned prepaid to XAVi Technologies within thirty (30) days of the discovery of the alleged defect and in accordance with XAVi Technologies' repair procedures; or
   - XAVi Technologies' tests disclose that the alleged defect is not due to defects in material or workmanship.
3. XAVi Technologies' liability shall be limited to either repair or replacement of the defective goods, at XAVi Technologies' option.
4. XAVi Technologies MARKS NO EXPRESS OR IMPLIED WARRANTIES REGARDING THE QUALITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE BEYOND THOSE THAT APPEAR IN THE APPLICABLE USER'S DOCUMETATION. XAVi SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL, OR PUNITIVE DAMAGE, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR DAMAGES TO BUSINESS OR BUSINESS RELATIONS. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES.

B2. Warranty Repair

1. During the first three (3) months of ownership, XAVi Technologies will repair or replace a defective product covered under warranty within twenty-four (24) hours of receipt of the product. During the fourth (4th) through twelfth (12th) months of ownership, XAVi Technologies will repair or replace a defective product covered under warranty within ten (10) days of receipt of the product. The warranty period for the replaced products shall be ninety (90) days or the remainder of the warranty period of the original unit, whichever is greater. XAVi Technologies will ship surface freight. Expedited freight is at customer's expense.
2. The customer must return the defective product to XAVi Technologies within fourteen (14) days after the request for replacement. If the defective product is not returned within this time period, XAVi Technologies will bill the customer for the product at list price.

B3. Out-of-Warranty Repair

XAVi Technologies will either repair or, at its option, replace a defective product not covered under warranty within ten (10) working days of its receipt. Repair charges are available from the Repair Facility upon request. The warranty on a serviced product is thirty (30) days measured from date of service. Out-of-warranty repair charges are based upon the prices in effect at the time of return.

Appendix C – Regulations

C1. FCC Part 15 Notice

Warning: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 to the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, used, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is unlikely to cause harmful interference. But if it does, the user will be required to correct the interference at his or her own expense. The authority to operate this equipment is conditioned by the requirement that no modifications will be made to the equipment unless XAVi expressly approves the changes or modifications.

C2. IC CS-03 Notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements as prescribed in appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee that the equipment will operate to the user's satisfaction.

Before installing this equipment, users should make sure that it is permissible to be connected to the facilities of the local telecommunications company. An acceptable method of connection must be used to install the equipment. The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Warning: Users should not attempt to make such connections themselves, but should contact appropriate electric inspection authority, or electrician, as appropriate.

C3. UL Notice

The following markings and instructions are provided as bellow.

"Disconnect TNV circuit connector before removing cover" or equivalent. "Disconnect TNV circuit connector(s) before disconnecting power." (Instruction)
Including the following: -Do not use this product near water for example, near a bathtub, washbowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool. -Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning. -Do not use the telephone to report a gas leak in the vicinity of the leak. -Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
No. 26 AWG Telephone Line Cord shall either be provided with the equipment or shall be described in the safety instruction, if Fuse (F1) is not present. The caution statement list below: "CAUTION: To reduce the risk of fire, use only No. 26 AWG or larger UL Listed or CSA Certified Telecommunication Line Cord"

Contact Information

You can help us serve you better by sending us your comments and feedback. Listed below are the addresses, telephone and fax numbers of our offices. You can also visit us on the World Wide Web at www.xavi.com.tw for more information. We look forward to hearing from you!

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