# ADSL Bridge/Routers

## AT-AR240E
## AT-AR250E

# User's Guide

Allied Telesyn

Simply Connecting the World

PN 613-50197-00 Rev A

# FCC NOTICE

According to Federal Communications Commission (FCC) Rules regarding radio frequency emissions, the ADSL device complies with FCC Part 15 for Class B computing devices. The following paragraph is required by the FCC.

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with this document, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case, the user, at his own expense, is required to take whatever measures may be necessary to correct the interference. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one or more of the following measures:

- Turn the equipment “OFF” and “ON”.
- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

**NOTE**

**Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.**

### Meets Canadian D.O.C.

This product conforms with Canadian Class B Emissions Regulations.

### Meets Approvals

Safety : FCC Part 68, EN60950, UL 1950, C/UL to CSA 22.2 No.950, TUV, IC CS03

Emissions : FCC Part 15 Class B, EN55022 / CISPR2 Class B

Immunity : EN55024

**Warning**

**Use minimum of 26 AWG line cord for the DSL connection.**

# TABLE OF CONTENTS

# Introduction

The Broadband Intelligent Home Gateway (BIHG) is an emerging new class of CPE device that grows with the home network without requiring Service Providers to change their DSL provisioning. Regardless if the connection is through the USB or the Ethernet port, you are always on. For network expansion, a hub can be connected to the Ethernet port.

The AT-AR240E and the AT-AR250E capabilities save money during deployment by provisioning longer reach with more reliable turn up, less truck rolls and more customer satisfaction by using the BIHG feature. Both the AT-AR240E and the AT-AR250E's flexibility enables it to be set as a router to accommodate more advanced business applications.

With the ADSL device, investments are protected through the support of popular DSL connection models which are also industry-standard interface options such as PPP over Ethernet (PPPoE) and PPP over ATM (PPPoA), Bridging and Routing.

# Package Contents

1. AT-AR240E **OR** AT-AR250E ADSL Bridge/Router
2. DSL Cable (RJ-11, *green cable*)
3. Ethernet Cable (RJ-45, *yellow cable*)
4. USB Cable (*grey cable*)
5. Power Cord **(not included with the AT-AR250E)**
6. Power Adapter
7. CD with the GUI, USB Drivers and Documentation

# Minimum PC Requirements

- A PC with an installed 10BaseT Ethernet card or USB interface.
- TCP/IP network protocol installed on the PC.
- Windows 95 (USB port may have some compatibility issues), Windows 98, Windows 2000, Windows NT 4.0 (no support for USB) or Windows Me.
- For Ethernet connectivity to the ADSL devices, any Operating System with the TCP/IP protocol such as Linux, Mac, OS2 may be used.

CHAPTER

1

# PRODUCT DESCRIPTION

## 1.1 Introduction

This chapter describes the physical and functional properties of the AT-AR240E and the AT-AR250E ADSL Bridge/Router.

# 1.2 Product Description

Using industry-standard Discrete Multi-Tone (DMT) technology, the ADSL device interfaces to any ITU G.dmt, UAWG, G.lite and ANSI T1.413, Issue 2 compliant, Central Office equipment at speeds of 8 Mbps downstream and 1 Mbps upstream (depending on the distance from the Central Office, selectable in increments of 32kbps). The Central Office equipment provides Asynchronous Transfer Mode (ATM) aggregation over ADSL on each copper loop.

A fully integrated IP router featuring Network Address Translation (NAT) automatically assigns local IP addresses and protects network security by not advertising the internal address or network topology. A built-in Dynamic Host Configuration Protocol (DHCP) Server assigns IP addresses to all LAN stations.

The AT-AR250E includes an integral 4-port Ethernet Bridge/Router supporting a directly connected PC from any of its Ethernet ports. or a network of cascaded LAN hubs.

The AT-AR240E and the AT-AR250E both offer Password Protection and User Authentication (PAP/CHAP) with PPP to prevent inadvertent access to the router through the Internet. It also enables Telnet management access.

# 1.3 Front Status Indicators

The AT-AR240E and the AT-AR250E are compact, light-weight communications devices with the following dimensions:

- Height : 1.5"
- Width : 8"
- Depth : 6"
- Weight : 1.5 lbs
- Color : Off White

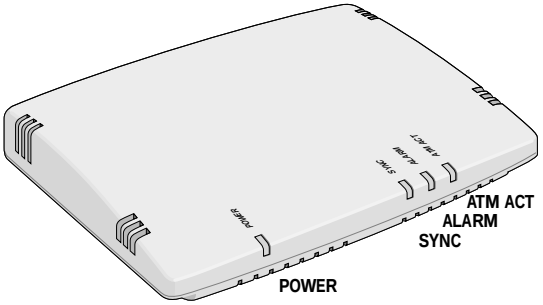


**Figure 1: Front Status Indicators**

| LED | COLOR | EXPLANATION |
|---|---|---|
| **POWER** | ***Green*** (solid) | It will illuminate as soon as the device is powered ON and will remain on till the device is turned OFF. If this LED remains OFF, the device needs to be serviced. Please refer to the Repair Service Procedure. |
| **SYNC** | ***Green*** (solid) | It illuminates to indicate successful DSL connection to the Network. |
| **ALARM** | ***Red*** (solid) | It indicates the device encountering an error. If this LED remains ON, it means it cannot sync up to the device. Check the cable connections or settings. |
| **ATM ACT** | ***Green*** (blinking) | The ATM Activity LED shows data traffic. During normal operation, it should be blinking. |

# 1.4 AT-AR240E Rear Panel

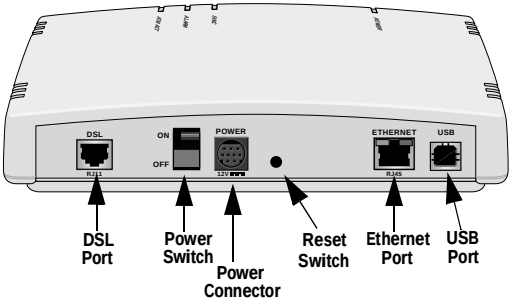


**Figure 2 : AT-AR240E Rear panel**

| | **EXPLANATION** |
|---|---|
| **DSL PORT** | RJ-11 port for DSL connection and requires a RJ-11 cable (provided). |
| **POWER SWITCH** | Permits the device to be turned ON or OFF. |
| **POWER CONNECTOR** | A receptacle for the Power Adapter. |
| **RESET SWITCH** | To return the device to factory settings. |
| **ETHERNET PORT** | Allows the AT-AR240E to establish a connection directly to a PC or a Hub and requires a RJ-45 auto crossing cable (provided). It has 2 LEDs. The (*green*) LED remains solid when linked to an active Ethernet port and will blink when there is traffic. The (*yellow*) LED indicates the speed utilized by the device. |
| **USB PORT** | Allows a direct connection to a PC for greater flexibility and simultaneous sharing of local resources and the ADSL line (cable provided). |

# 1.5 AT-AR250E Rear Panel

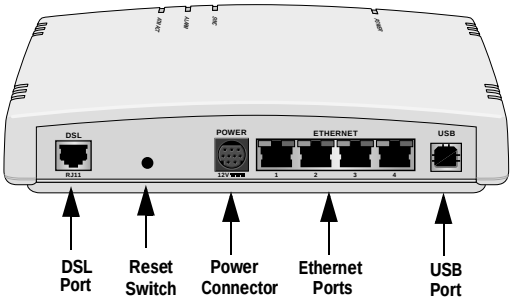


**Figure 3: AT-AR250E Rear panel**

| | **EXPLANATION** |
|---|---|
| **DSL PORT** | RJ-11 port for DSL connection and requires a RJ-11 cable (provided). |
| **RESET SWITCH** | To return the device to factory settings. |
| **POWER CONNECTOR** | A receptacle for the Power Adapter. |
| **ETHERNET PORTS** | Allows the AT-AR250E to establish a connection directly to a PC or a Hub from any of its 4 ports. It requires a RJ-45 auto crossing cable (provided). The ports have the auto-crossing feature which allows connection to any of the Ethernet ports. Each of the 4 ports have 2 LEDs. The (*green*) LED remains solid when linked to an active Ethernet port and will blink when there is traffic. The (*yellow*) LED indicates the speed utilized by the device. It will be lit when the speed is at 100Mbps and will be off when the speed is 10Mbps. |
| **USB PORT** | Allows a direct connection to a PC for greater flexibility and simultaneous sharing of local resources and the ADSL line (cable provided). |

# 1.6 System Inter-operability

The ADSL device's implementation of protocol standards ensures inter-operability with PCs, LANs, Routers, Servers and Central Office equipment such as voice and ATM switches. It also provides inter-operability on the Physical, Data Link and Network layers.

The Physical Layer includes the hardware and electrical signaling characteristics supported by the ADSL device's Ethernet and IP router interfaces. Compliance to ITU ADSL standards guarantees connectivity of the ADSL device to the DSL Access Multiplexer (DSLAM) ports.

The Data Link Layer defines the transmission path of the data packets between the two systems over the LAN and WAN physical links.

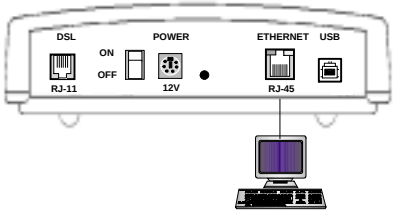


**Figure 4: The AT-AR240E's 10BaseT Ethernet port attaches directly to a PC Ethernet port or an external Ethernet hub.**

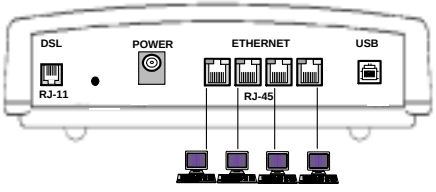


**Figure 5: Any of the 4 Ethernet ports of the AT-AR250E attach directly to a PC Ethernet port or an external Ethernet hub.**

# 1.7 System Interface (LAN)

The AT-AR240E supports Ethernet LANs through its {RJ-45} Ethernet 10BaseT port which acts as a mini-hub. AT-AR250E may be configured to cascade hubs through its {RJ-45} Ethernet 10/100BaseT ports which acts as a mini-hub too.

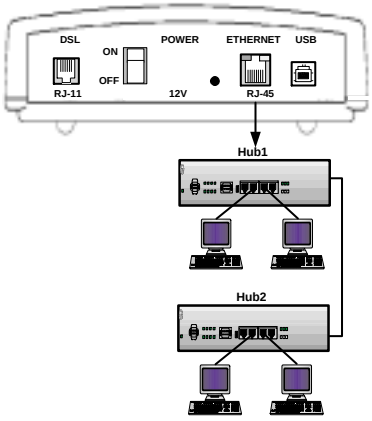


**Figure 6: Demonstrates cascading hubs using the Ethernet port of the AT-AR240E.**

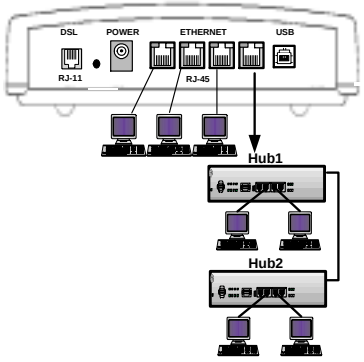


**Figure 7: Demonstrates cascading hubs using any of the 4 Ethernet ports of the AT-AR250E.**

# 1.8 System Interface (DSL)

The ADSL device is connected by a RJ-11 connector to an ADSL line.

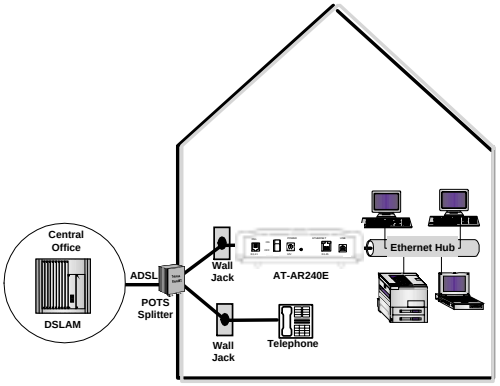


**Figure 8: For a typical installation, the voice terminals of the splitter are connected to the existing house phone wiring. A separate line is connected from the data terminals of the splitter to a RJ-11 wall jack. The ADSL device is connected through the DSL {RJ-11} jack on the Rear panel to this ADSL {RJ-11} wall jack.**

# 1.9 Installation and Configuration

**For information on:**

- Hardware installation procedures
- Connecting the PC to the ADSL device
- How to install the USB driver
- Configuring the PC for the USB

**Please refer to the User's Manual**

CHAPTER

# 2

# OPERATION

## 2.1 Introduction

The following section describes the ADSL devices, their Ethernet and USB ports transmission, ATM and ADSL transmission as well as Security and System Management.

## 2.2 System Description

The ADSL devices provide asymmetric data transport from the Customer's network to a DSLAM at the Central Office. It can be deployed over existing copper loops already supporting a plain old telephone service (POTS).

The ADSL devices configuration consists of the device at the Customer premises interfacing with an ADSL standard compliant line card in a Digital Subscriber Line Access Multiplexer (DSLAM) at the Central Office. Its very rich feature set includes an easy-to-use Setup Wizard and DHCP support for Plug-and-Play installation. It also provides an extensive Firewall for network protection, and VPN capabilities for reduced cost of remote access communications.

The AT-AR240E and the AT-AR250E can be configured and managed locally or remotely via a PC connected to the remote unit, or using the Command Line Interface (CLI) through a Telnet session, or through a Windows-based configuration tool.

The ADSL devices support Permanent Virtual Circuits (PVC). Each PVC is represented by a numeric pair denoted as a Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). A VPI is a number used to switch a logical group of Virtual Circuits as a unit. A VCI is a number assigned to a single circuit to distinguish its cell traffic from other circuits. Each 12-bit VPI has the address range 0-4095 and each 16-bit VCI has the address range 0-65535.

The ADSL devices supports all PCs using standard Ethernet 10BaseT or 100BaseT and TCP/IP protocols.

## 2.3 Routing

The ADSL devices include full-featured integrated IP routers. To route a packet, two basic functions are used:

1 *A path determination function*- enables the device to select the most appropriate interface to transmit a packet.

2 *A switching function* - allows the device to accept a packet from one protocol and forward it to a second protocol.

When routing, the device accesses routing address tables to determine the best path for each packet to take. Routing tables can either be seeded as a static path or built dynamically from broadcast packet information. The ADSL devices switch the internet protocol (IP) between the 10BaseT/LAN interface and the ADSL/ATM interface. The device also supports the Routing Information Protocol, RIP[v1.0] and RIP[v2.0] to collect path routing information.

## 2.4 Network Address Translation

Network Address Translation (NAT) provides a mechanism for private networks to access registered networks, such as the Internet, without requiring a registered subnet address. NAT eliminates the need for host IP numbering and allows the same IP addresses to be used in multiple Internet.

With NAT, the LAN addresses are private. These addresses are translated to public IP addresses when IP addresses are forwarded. The NAT translation function is compatible with standard IP routing.

## 2.5 Static Routing

The ADSL devices support IP Static Routing. With Static Routing, a Network Administrator makes specific LAN IP addresses available for WAN access.

The easiest form of routing is establishing predefined routes through a network. A router that has been programmed for static routing forwards packets out of predetermined ports. Configuring static routing to a sub-network avoids the overhead of dynamic routing.

The many benefits of Static Routing are that they form a more safe and secure network system, since there is only one path a network is connected in to and out of.

Another benefit is that it is more efficient in Resource Management. Since it uses less bandwidth, the router CPU cycles trying to calculate routes are not wasted and it also conserves memory.

## 2.6 Bridging

The ADSL devices support IEEE 802.1d Transparent Learning Bridge connecting Ethernet LANs. Ethernet Bridging is a Data Link Layer function connecting Ethernet addresses, independent of higher layer Internet protocols.

When IP routing is disabled and bridging is enabled in the unit, the incoming frames are forwarded based on MAC layer addresses. The ADSL device supports Transparent Bridging, which forwards frames one hop at a time towards the destination. The Learning Bridge, which performs MAC address learning, reduces traffic on the network by maintaining a table of MAC addresses and interfaces associated with each address.

# 2.7 Point-to-Point Protocol

The ADSL devices support PPP over ATM. PPP is a WAN protocol transmitting multi-protocol data grams over serial links. PPP addresses are:

- Standardized Internet encapsulation of IP over point-to-point links
- Used in assignment and management of IP address
- Asynchronous (start/stop) and bit-oriented encapsulation
- Network protocol multiplexing
- Based on link configuration
- Link quality tested
- Based on error detection
- An option to negotiate for network layering addresses and data compression

To accomplish the above functions, PPP includes the following protocols:

- Link Control Protocol (LCP) : To establish, configure and test the data link connections.
- Network Control Protocol (NCP): TCP/IP Routing Internet Protocol Control Protocol (IPCP)
- PAP/CHAP Security Protocols : Establish a link from the point of origin to the point of destination.

PPP sends LCP frames to configure and (originally) test the data link. After the link has been established and facilities have been negotiated, the originating PPP sends NCP frames to choose and configure IP. This link remains until LCP or NCP frame close the link. PPP maintains the local address to be translated and the pool of addresses from which to allocate outside addresses.

# 2.8 Security

The ADSL devices include security features such as Password Protection, User Authentication, Password Authentication and Protocol/Challenge Handshake Authentication Protocol (PAP/CHAP) to prevent unauthorized or inadvertent access to the router through the Internet.

PAP/CHAP must be enabled by both ends of the link. The following sequence describes how authentication occurs:

PAP verifies passwords between the ADSL devices using a two-way handshake. A device (known as the **Peer**) sends the system name and password to a destination device (or other PPP servers). The destination ADSL device (known as the **Authenticator**) checks the password against the configured password and returns either an 'accept' or a 'reject' reply.

CHAP provides additional security with a three-way handshake. The '**Authenticator**' challenges the originating ADSL device by generating a random number and sending it along with the system name. The '**Peer**' then applies a one-way encryption algorithm to the random number and returns this encrypted information along with the system name. The **Authenticator** then runs the same algorithm and compares the result with the expected value. This authentication method depends upon a password known only to both ends.

The ADSL devices support Virtual Private Networks (VPNs) with PPTP and L2TP.

# 2.9 PC Setup for Telnet

Connect any of the ADSL device's Ethernet ports with the provided Ethernet cable (*yellow*) to the PC's NIC card.

The user needs to set his PC IP address to be of the same subnet as the device.

**For Example:** The default IP address of the device is 10.0.0.1. The PC IP address can be set to 10.0.0.2.

On a Windows PC (example: Windows 95, 98, Me or 2000), select **Start** and then the **Run** option. Verify the Telnet link by entering the following string in the **Open** dialog box:

**For Example:**

ping 10.0.0.1

Click **OK** and a DOS window will pop up with the following reply:

pinging 10.0.0.1 with 32 bytes of data

Reply from 10.0.0.1: bytes=32 time=_ TTL=_ (ICMP reply packet from 10.0.0.1)

If "Request timed out" **OR** any other error message is received, check the PC IP Address and restart the PC.

# 2.10 USB Port Setup

The Rear panel of the device also includes an USB port marked “USB” for direct PC connection. Connect the ADSL device’s USB port with the provided USB cable (*grey*) to the PC’s USB port. Load the Driver provided on to the PC to simulate Ethernet connections.

The user needs to set his PC IP address to be of the same subnet as the device.

**For Example:** The default IP address of the device is 10.0.0.1. The PC IP address can be set to 10.0.0.2.

On a Windows PC (example: Windows 95, 98, Me or 2000), select **Start** and then the **Run** option. Verify the Telnet link by entering the following string in the **Open** dialog box:

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Reply from 10.0.0.1: bytes=32 time=_ TTL=_ (ICMP reply packet from 10.0.0.1)

If “Request timed out” **OR** any other error message is received, check the PC IP Address and restart the PC.

**Follow the instructions on loading the Driver provided and configuring the PC from ‘Connecting the PC to the ADSL device - USB Installation’ in the User’s Manual.**

## 2.11 ADSL Transmission

The ADSL transmission is based on ITU G.dmt, UAWG, G.lite and ANSI T1.413 standard DMT line codes. The device's DMT line rate is up to 8 Mbps downstream and up to 1 Mbps upstream. The DMT transceiver is rate adaptive and capable of providing faster rates over shorter distances and slower rates over longer distances. The ADSL device's transceiver can adjust to changing line conditions to maximize the data throughput over the given distance. Rate adaptation is supported in increments of 32 kbps.

A Service Provider will set the ADSL device's data-rates at the DSLAM network interface depending on the service contract the subscriber buys. The upstream and downstream rates can be set in various ways:

- Maximum bit rate
- Minimum bit rate
- A range between minimum and maximum bit rates
- Maximum bit rate with a threshold in Decibels (dB)

## 2.12 ATM Transmission

ATM over ADSL transmission is based on ITU G.DMT, UWAG, G.Lite and ANSI standard T1.413, Issue 2, standards incorporating ADSL Forum TR-0002 "ATM over ADSL Recommendations".

# 2.13 BOOTP Download Procedure

**NOTES:**

- These are generic directions for successfully updating the Firmware on to the ADSL device via BOOTP.
- There are many Firmware versions. Please contact Customer Service before beginning the download for additional information.
- Connect the ADSL device's Ethernet port with the provided Ethernet cable to the PC's NIC card.

## 2.13.1 Launching the Firmware Upgrade Utility

**NOTE:** The MAC address of the ADSL device is required before beginning the download procedure. If the MAC address is not known, follow the steps as shown below:

- Start a DOS application and type in the following command:

  telnet <IP>

  **<IP>** is the IP address of the ADSL device.

  ```
  password: ********
  logged on; type '@close' to close connection.
  10.0.0.1> chips info
  ADSL USB Modem - ADSL device version 1.35 (Dec. 13 2000)
  Machine Name:
  MAC address: 0:e0:b2:0:0:0
  ```

- Enter the **Administrator's password** (default is **password**).
- Type in the following command:

  10.0.0.1>chips info

- The **MAC address** will be shown on the screen.

**Step 1** Launch the Firmware Upgrade Utility by double-clicking the **BootP.exe**.

**Step 2** Enter the **IP address** of the ADSL device.

**Step 3** Enter the **MAC address** of the ADSL device (as shown above).

**Step 4** Select **Choose File** icon to locate the image file from the Firmware Upgrade Utility screen.

**Step 5** The **Firmware Upgrade Utility** has been activated.

**Step 6** If the ADSL device has a Console port, follow the instructions as shown in **Section C**.

### 2.13.2 ADSL Device's Activation Using Telnet

**Step 1** Connect the ADSL device's Ethernet port with the provided Ethernet cable to the PC's NIC card.

**Step 2** Power **ON** the ADSL device.

**Step 3** As soon as the Alarm LED (*red*) starts flashing, press the **Reset** button for a second and release. The LEDs in the Front panel i.e.: Power, Sync, and the ATM ACT will begin to flash. The image is now being downloaded from the Firmware Upgrade Utility. If the Alarm LED (*red*) stops flashing before the Reset button is pushed, power OFF the ADSL device and try step 2 and 3 again.

**Step 4** Wait for the **Sync LED** to begin flashing.

**Step 5** Open a DOS window and type in the following command:

telnet <IP>

**<IP>** is the IP address of the ADSL device.

**Step 6** Enter the **Administrator's password** (default is **password**).

**Step 7** Issue the following commands to update the firmware:

- flashfs rewrite boot.bin <**password**>
- flashfs update <**password**>

**Step 8** Wait for the Flash update to complete.

**Step 9** The ADSL device is now updated.

### 2.13.3 ADSL Device's Activation Using Console Port

**Step 1** Connect the device's Ethernet port with the Ethernet cable to the PC's NIC card.

**Step 2** Connect a Serial cable from the PC's Serial port to the Console port of the device.

**Step 3** Launch **Hyper Terminal** or **ProComm** and set the connection to:

Bits per second: 9600
Data bits: 8
Parity: None
Stop bits: 1
Flow Control: None

**Step 4** Power **ON** the unit.

**Step 5** The words **StartUp from [Bootp/Ethernet/USB/Flash] „„** will show in Hyper Terminal. Promptly, press the **"e character"** on the keyboard to initiate the Firmware update sequence. A series of dots across the screen means the file is being downloaded.

**Step 6** Wait for the new Firmware image to be updated and the device successfully rebooted.

**Step 7** Type the following commands in the Hyper Terminal application:

- flashfs rewrite boot.bin <**password**>
- flashfs update <**password**>

**Step 8** Wait for the Flash update to complete.

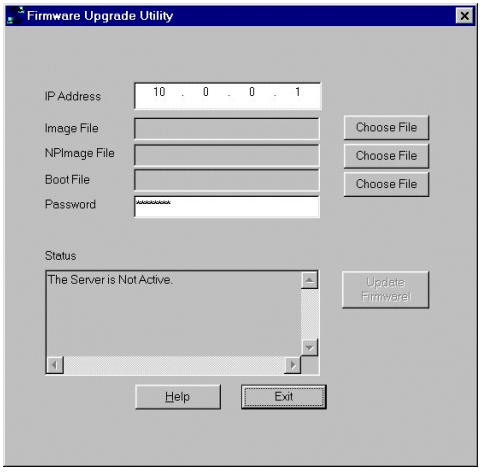
**Step 9** The ADSL device is now updated.

# 2.14 Updating Firmware via TFTP

**NOTES:**

- These are generic directions for successfully updating the Firmware on to the device via TFTP.
- There are many Firmware versions. Please contact Customer Service before beginning the download for additional information.
- Connect the ADSL device's Ethernet or USB port with the provided Ethernet cable to the PC's NIC card or USB port.

**Step 1:** Launch the Firmware Application by double-clicking on the file **"TFTP.exe"**.




**Step 2:** Enter the **IP address** of the ADSL device (default is 10.0.0.1) or the one provided by the Service Provider.

**Step 3:** Select **Choose File** from the Firmware Upgrade Utility.

**Step 4:** In the pop-up dialog box, locate the **Image File** for downloading and select **Open**.

**Step 5:** **NPImage File:** Select **Choose File** from the Firmware Upgrade Utility.

**Step 6:** In the pop-up dialog box, locate the NPImage file that needs to be downloaded and select **Open**. The file name may be **'NPimage.crc'**.

**Step 7:** **Boot File:** Select **Choose File** from the Firmware Upgrade Utility.

**Step 8:** In the pop-up dialog box, locate the Boot file for downloading and select **Open**. The file name may be **'Boot.crc'**.

**Step 9:** Enter the **Administrator's password** of the ADSL device in the Password field (**default is password**).

**Step 10:** The Firmware Upgrade Utility is now ready for downloading. Please ensure that the ADSL device is connected and powered **ON** for at least a minute.

**Step 11:** Select **Update Firmware button** to initiate the download procedure.

**Step 12:** In the first phase, the images will be downloaded and the following screen will appear showing images being downloaded.

**Step 13:** It is very important that the device is not powered **OFF** at this point. Turning OFF the device could cause it to be in-operational. Please wait for at least 3 minutes for the device to be ready as this is the minimum required time for the memory of the device to be totally reprogrammed with the new information.

**Step 14:** The device will be ready when the Alarm LED (*red*) goes off and the Sync LED (*green*) starts flashing.

**Step 15:** Congratulations! The ADSL device is now ready.

CHAPTER

# 3

# APPLICATIONS

## 3.1 Introduction

The ADSL devices allow Network Service Providers (NSPs) such as Regional Bell Operating Companies (RBOCs), Competitive Local Exchange Carriers (CLECs), Internet Service Providers (ISPs) and independent telephone companies to expeditiously and economically provide high-speed data access to their customers.

Some typical applications are described on the following pages.

# 3.2 High-Speed Internet Access

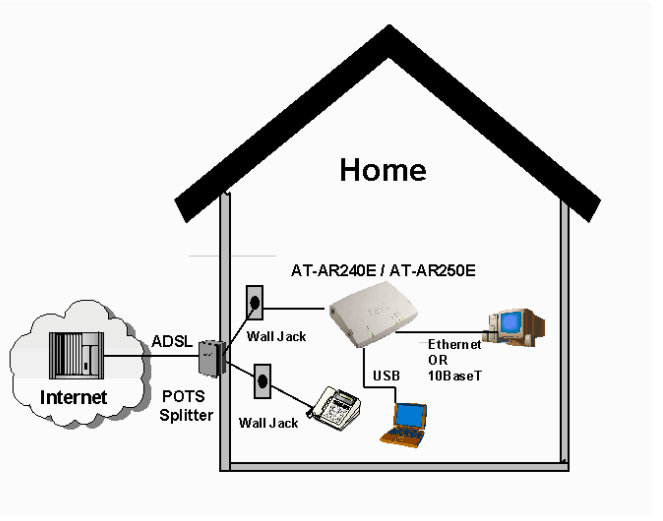



**Figure 9: Demonstration of High-Speed Internet Access**

For high-speed Internet Access, connect an ADSL device to a DSLAM. The DSLAM back haul connects to any Content Provider, Corporate Headquarters or to another ADSL device.

A single Internet Service Provider (ISP) can assign a static IP address to each of the Customer's connected equipment.

It may, however, be more practical to allow the ADSL device's DHCP server to automatically assign IP addresses to customer equipment.

# 3.3 Remote Locations Connectivity

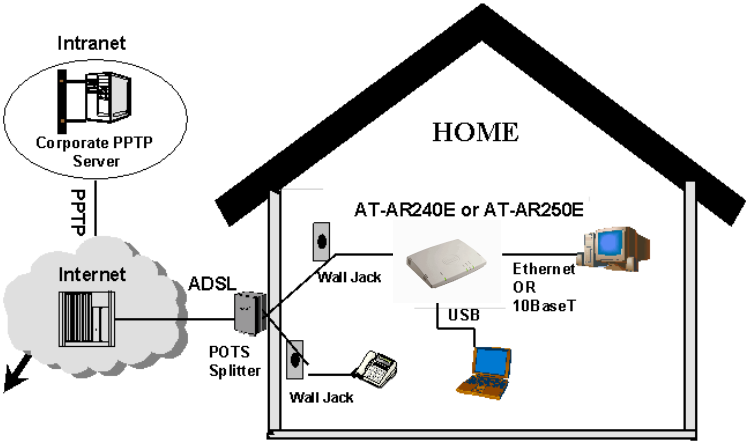



**Figure 10: Connectivity with remote locations for applications**

The ADSL device can be utilized as a link between the Central Office to the Corporate Headquarters and Remote Offices for applications such as e-commerce.

# 3.4 LAN-to-LAN Connectivity

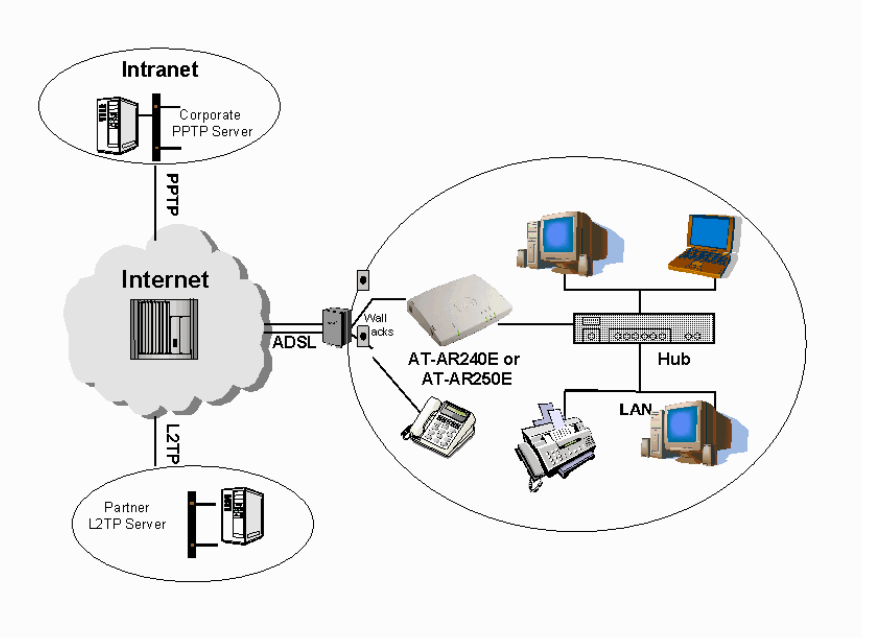



**Figure 11: LAN-to-LAN Connectivity**

The ADSL device's routing functions connect a remote office LAN to Corporate Headquarter LANs for fast intra-networking.

CHAPTER

# 4

# ADVANCED CONFIGURATION

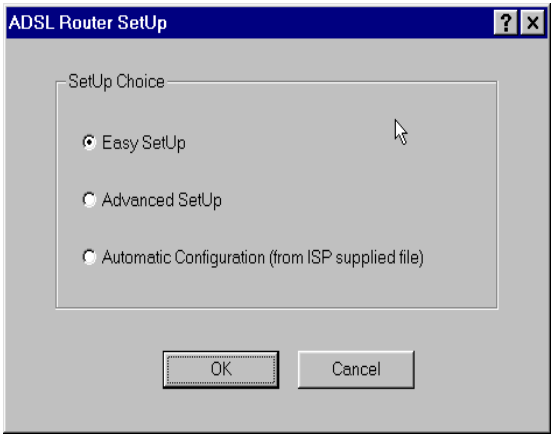
## 4.1 Introduction

This chapter introduces the Advanced Mode of the ADSL device's GUI. The GUI is provided in a CD and requires configuration. If the GUI has not been configured, please refer to **Chapter 3 - Configuration in the User's Manual.**

For more information on Configuration of the ADSL devices, please refer to the **Help File of the GUI software**.

# 4.2 Accessing the Advanced Configuration Mode

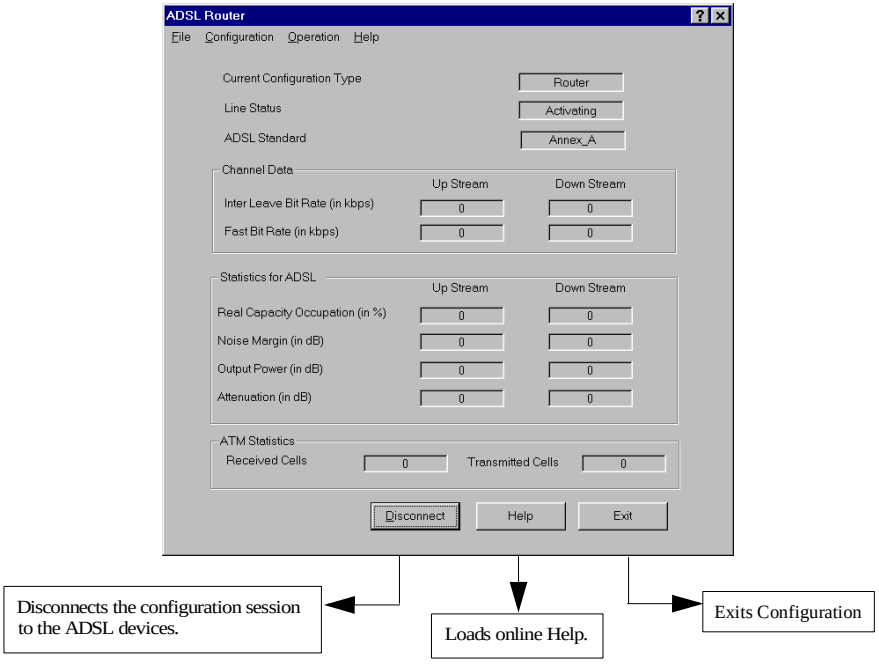
The GUI has 3 options to begin accessing the ADSL devices.




- **Easy Setup** - The default mode to be chosen by the User. It is explained in detail in the User's Manual.
- **Advanced Setup** - Allows the User to access and configure the ADSL device's advanced statistics. Choose the **Advanced SetUp** after logging in to the GUI.
- **Automatic Configuration (from ISP supplied file)** - The initial Configuration File used to set up the device for use with the Service Provider.
- **Cancel** - Allows the User to exit the GUI.

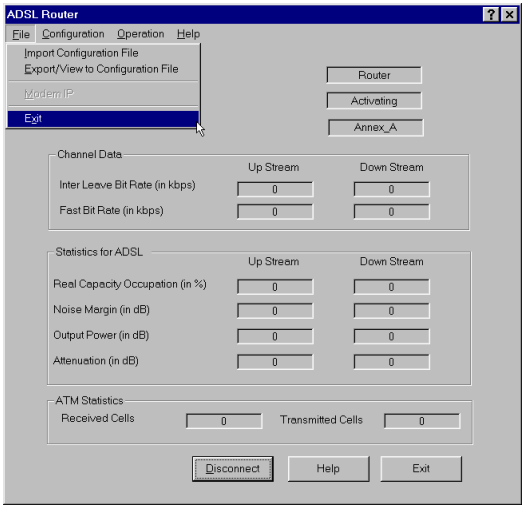
# 4.3 Main Statistics Screen

Once the Advanced Setup is selected, the Main Statistics screen will be displayed.




- The Main Statistics screen provides a quick view of the current configuration.
- It allows the Administrator to configure and access the internal data via the following 4 Drop-down Menus:
    - **File Menu**
    - **Configuration Menu**
    - **Operation Menu**
    - **Help Menu**

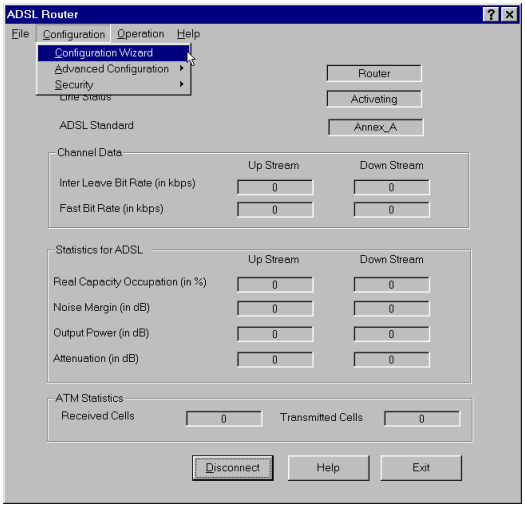
# 4.4 File Drop-down Menu




The File Drop-down Menu option enables the User to save and restore valid configuration settings. The User can also choose the Modem IP option to configure another ADSL device by inputting a separate IP address.

- **Import Configuration File** - To import the ISP supplied initial configuration file for the ADSL device.
- **Export/View Configuration File** - Enables the User to extract configuration information from the ADSL device and view its validity.
- **Modem IP** - Allows changing the configuration of the LAN IP address of the device via the GUI.
- **Exit** - To exit the GUI.

# 4.5 Configuration Drop-down Menu



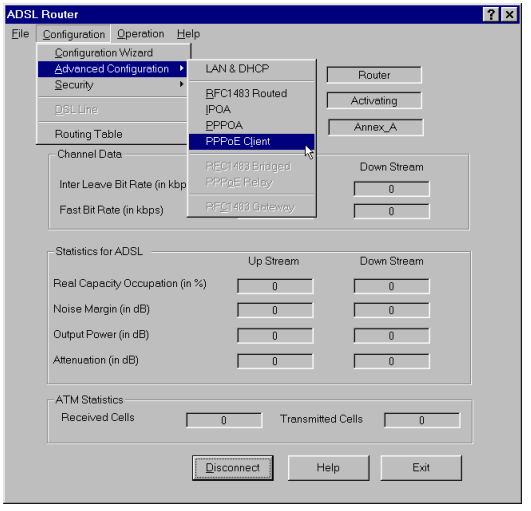

The Configuration Drop-down Menu enables the User to set up multiple PVCs, modify individual PVCs, set the ADSL device's security or set the protocol parameters through the following functions:

- **Configuration Wizard** - Assists the Administrator in setting up multiple channels to the Service Provider.

- **Advanced Configuration**- These options are used to view and configure individual PVCs that have already been set up. These menu options are not meant to set up new channels.

- **Security** - Aids the Administrator to directly configure the various security measures provided by the ADSL device.

### 4.5.1 Configuration Menu - Advanced Configuration



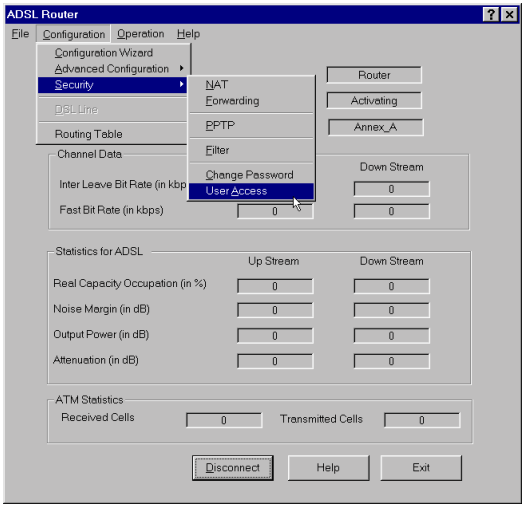

The Advanced Configuration drop-down Menu has a sub-menu which defines the various forms of measures provided by the ADSL device.

- **LAN & DHCP** - Use this option to change the LAN & DHCP server parameters of the ADSL devices.
- **RFC1483 Routed** - The User can use this option in the Routed Mode.
- **IPOA** - The User can use this option in the Routed Mode.
- **PPPOA** - The User can use this option in the Routed Mode.
- **PPPoE Client** - The User can use this option in the Routed Mode.
- **RFC1483 Bridged**- The User can use this option in the Bridged Mode.

- **PPPoE Relay** - The User can use this option in the Bridged Mode.

- **RFC1483 Gateway**- The User can use this option in the Routed Mode.

## 4.5.2 Configuration Menu - Security



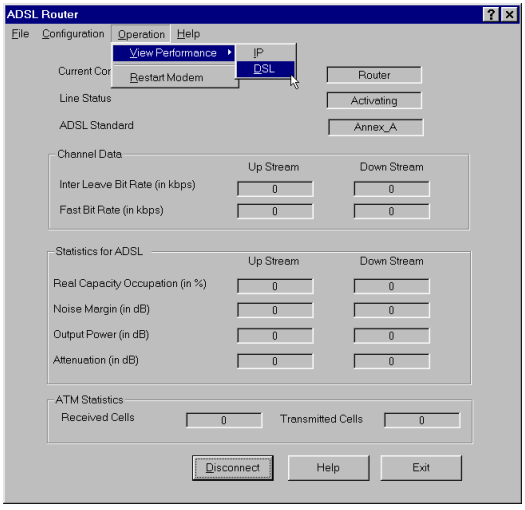

The Security Menu has a sub-menu which defines the various forms of security measures provided by the device.

- **NAT** - Used to configure the Network Address Translation (NAT) on the channels that have been set up. It can be used to share a single IP address among multiple computers on the LAN.

- **Forwarding** - Allows configuration of the ADSL device's IP forwarding tables.
- **PPTP** - The Point-to-Point Tunneling feature creates secure Virtual Private Networks (VPNs).
- **Filter** - Allows the User to use the ADSL device as a Firewall.
- **Change Password** - Option for the Administrator to change the Administration password.
- **User Access** - Manages a list of User who have Read-Only access to the ADSL device.

# 4.6 Operation Drop-down Menu

## 4.6.1 Operation Menu - View Performance




The Operations Drop-down Menu allows viewing of the performance of the device. Its sub menu provides the following options:

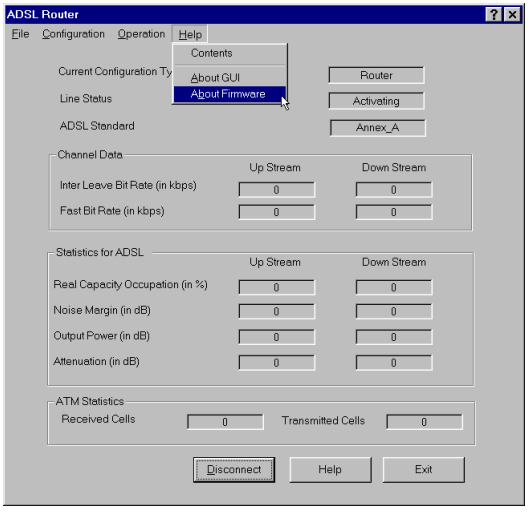
- **View Performance** - Under this option are 2 of the following options:

  The **IP** option retrieves the essential statistics from the device for TCP, UDP, ARP,RAW and IP traffic.

  The **DSL** option displays performance statistics of the device.

- **Restart Modem** - It allows the User to restart the device through the GUI.

# 4.7 Help Menu




The Help Drop-down Menu option enables the User to access the Help File.

- **Contents** - Shows the contents of the Help File for additional assistance.
- **About GUI** - Shows the Configuration GUI version number.
- **About Firmware** - Shows the Firmware and Image version of the ADSL device.

**IMPORTANT : Hitting F1 at any point of configuration, shows the relevant portion of the Help File.**

CHAPTER

5

# COMMAND LINE INTERFACE COMMANDS

## 5.1 Introduction

This chapter provides information on the System Console Commands, the ADSL Commands and the Advanced CLI Commands.

## 5.2 Changing the Password

**Description:** After the system has booted up, the password needs to be set up, before configuring the device in the Router or Bridge Mode.

Enter the old password

....> flashfs password <old password>

Enter the new password

....> flashfs config password <new password>

## 5.3 Update Flash Memory

**Description:** To update Flash File System.

....> flashfs update updates Flash File System

**OR**

....> config save saves configuration files to Flash File System

For example: To save the configuration file

....> config save <password>

....> restart

# 5.4 System Console Commands

## 5.4.1 Bridge Commands

**Console commands should be prefixed with the Bridge in order to direct them to the Bridge.**

### 5.4.1.1 device add

**Syntax:** device add <device>

**Description:** Adds a device to the Bridge configuration. Attempts to add the bridge itself or an existing device to the bridge are rejected. There is a limit on the number of devices that can be attached to the bridge. If a device is successfully added to the bridge, it will only become active after the configuration is saved and the system is rebooted. If the device being added is from a process which supports multiple devices, the /DEVICE attribute must be specified as part of the device name. The table below shows devices which may be attached to the bridge, although not all systems may support all devices. If a device is successfully added to the bridge, it will only become active after the configuration is saved and the system is rebooted.

| Device | Remarks | Source |
|---|---|---|
| **lec1** | Forum LAN emulation | alecjade |
| **ethernet** | Ethernet driver | edd, etherjade |
| **rfc1483** | RFC1483 protocol (PVC) | rfc1483 |
| **ppp** | Point-to-Point protocol | pp |

**Example:** **device add ethernet**

**device add ppp/DEVICE=2**

#### 5.4.1.2 device delete

**Syntax:** device delete <device>

**Description:** Deletes a device from the bridge configuration. The changes will only take place after the configuration is saved and the system is rebooted. The syntax of the device name is the same as that for the **device add** command.

**Example:** **device delete rfc1483**

#### 5.4.1.3 device list

**Syntax:** device list

**Description:** Lists all the devices that are currently attached to the bridge. It does not show the stored configuration (which can be seen with the **config print** command).

**Example:** **device list**

#### 5.4.1.4 filter

**Syntax:** filter

**Description:** Shows the current contents of the bridge's filter table. The MAC entries for each device are shown together with the time that the MAC address was last seen by the bridge. The command also shows the current filter ageing time (seconds), and the number of creation failures since the system was started. Creation failures occur when there is no room left in the filter table for a new entry.

**Example:** **filter**

#### 5.4.1.5 filterage

**Syntax:** filterage [<age>]

**Description:** Sets, or displays the filter table ageing time (if no arguments are given). The ageing time is the time after which MAC addresses are removed from the filter table when there has been no activity.

The time is specified in seconds and may be any integer value in the range 10…100,000 seconds. This value may also be changed through SNMP. Changing the value of filterage has immediate effect. By default, the filter ageing time is set to 300 seconds.

**Example:** **filterage**

#### 5.4.1.6 flush

**Syntax:** flush [<port>]

**Description:** Allows the MAC entries for a specified port, or all ports, to be removed from the filter table. The port number for a device may be determined using the **device list** or **status** commands. If the port number is omitted, all entries for all ports are removed from the filter table.

**Example:** **flush**

#### 5.4.1.7 spanning

**Syntax:** spanning [sub-command]

**Description:** The spanning tree commands are documented in the “ATMOS Spanning Tree” specification.

#### 5.4.1.8 status

**Syntax:** status

**Description:** Shows the status of the bridge and its ports. The status information for a port includes the SNMP type information about time exceeded packets, packets discarded, etc. It also includes the broadcast history of the port over the last five seconds. A high water mark of packets queued on the bridge for this device.

**Example:** **status**

### 5.4.2 DHCP Client Commands

DHCP Client console commands.

#### 5.4.2.1 config

**Syntax:** dhcpclient config

**Description:** Displays the current configuration of the DHCP client, including selected DHCP options.

**Example:** adsl> **dhcpclient config**

#### 5.4.2.2 help

**Syntax:** dhcpclient help <command | all>

**Description:** Provides help on the Console commands. Specifying the command name gives detailed help, and specifying the argument **all** gives detailed help on all commands.

**Example:** adsl> **dhcpclient help**

Help is available on the following commands:

**config help pool status trace untrace**

### 5.4.2.3 status

**Syntax:** dhcpclient status [all]

**Description:** Provides DHCP status information for the active bound lease associated with each valid interface, including IP address, time until lease renewal, subnet mask and DHCP server address. Including the **all** flag shows, for each valid interface, the active lease, leases which are being, or have been offered to the interface, and any leases which are still being held by the client which are not currently active (since a single interface can only have one active lease at a time).

**Example:** adsl> **dhcpclient status**

DHCP Client Lease Status (active lease only)

Interface 'ethernet'

| Status | Server ID | IP address | Subnet mask | Renewal |
|---|---|---|---|---|
| *ACTIVE* | 192.168.219.151 | 192.168.219.1 | 255.255.255.255.0 | 31 secs |

### 5.4.2.4 IP Commands

**Syntax:** ip device add <i/f> <type> <file> [mtu <size>] [<IP address>|dhcp] ip device

**Description:** Adds an interface to the configuration of the IP stack. The last parameter of the command would normally be the IP address of the interface; use of the string **dhcp** causes the IP address to be discovered by the DHCP client software. Using the flag **dhcp** on an interface precludes running a DHCP server on that interface.

The **ip device** command lists the current configuration of any devices attached to the IP stack. A device configured to use DHCP will show **dhcp** in the **IP address** column, followed by the actual IP address discovered and bound by DHCP, if any.

For interfaces configured to use DHCP, saving configuration only marks the interface as using DHCP; it does not save the actual IP address discovered by DHCP, which must be renewed.

A useful method of automatically configuring suitable IP devices is to put a **device add** statement into the file **//isfs/ resolve** and downloading it upon booting the image.

**Example:** adsl> **ip device add ethernet ether //edd dhcp**

adsl> **ip device**

| # | type | dev file | | IP address |
|---|---|---|---|---|
| device ethernet | ether | //edd | mtu 1500 | dhcp |

## 5.4.3 DHCP Server Commands

DHCP Server Console commands.

### 5.4.3.1 config

**Syntax:** dhcpserver config [add <text>|confirm|delete|flush]

**Description:** This command displays or edits the current configuration of the DHCP server. To display current configuration, provide no arguments to the command. Use of the **add** argument adds the line **<text>** to the configuration file. Use of the **confirm** argument reparses the configuration file, confirming the changes made if the parse is successful. Use of the **delete** argument deletes the last line from the configuration file. Use of the **flush** argument deletes the whole configuration. Following any change to the configuration file, it is necessary to **confirm** the changes, issue a **flashfs update** to commit the change to FLASH, and then restart the system before the changes can take effect.

**Example:** adsl> **dhcpserver config**

allow unknown-clients;

allow bootp;

subnet 192.168.219.0 netmask 255.255.255.0 {

range 192.168.219.10 192.168.219.30;

max-lease-time 5000;

}

adsl> **dhcpserver config flush**

Configuration file flushed.

adsl> **dhcpserver config**

Current DHCP server configuration

(Issue **dhcpserver config confirm** followed by **flashfs update** to confirm new configuration).

#### 5.4.3.2 help

**Syntax:** dhcpserver help <command | all>

**Description:** Provides detailed help on the Console commands. Specifying **all** gives specific help on all available commands.

**Example:** adsl> **dhcpserver help**

Help is available on the following commands:

**config help pool status trace untrace**

#### 5.4.3.3 status

**Syntax:** dhcpserver status

**Description:** Provides a summary of all leases of the server on each interface and shows remaining available IP addresses.

**Example:** adsl> **dhcpserver status**

DHCP Server Lease Status

**Interface "ethernet"**

| IP address | Client UID | Expiry |
|---|---|---|
| 192.168.219.1 | 01:00:20:af:20:6f:59 | 11 hours |
| 192.168.219.2 | 01:00:20:af:11:2a:ac | 8 hours |
| 192.168.219.3 | Myclient | 140 seconds |
| 192.168.219.4 | 00:20:af:20:00:2b | 2 days |
| 192.168.219.5 | <unknown> | Never |
| 192.168.219.6 | <unknown> | Never |
| 192.168.219.7 | <unknown> | Never |
| 192.168.219.8 | <unknown> | Expired |
| 192.168.219.9 | <unknown> | Expired |
| 192.168.219.10 | Foobarbozzle | Expired |

## 5.4.4 NAT Commands

### 5.4.4.1 ip nat

**Syntax:** ip nat add | delete <i / f name>

**Description:** Adds or removes NAT from the named interface. The interface name is the name as listed by the **ip device** command. NAT should be enabled only on the interface connecting to the public network, not the interface connecting to the private network.

**Example:** adsl> **ip nat add ethernet**

#### 5.4.4.2 event

**Syntax:** nat event [n]

**Description:** Displays or sets the current level of event tracing in the NAT process. Larger values of **n** result in more verbose trace output.

All trace messages are printed as background output, and therefore will not be displayed asynchronously on the console unless the **event show** command has been issued.

**Example:** adsl> **nat event**

Event level: 1

adsl> **nat event 2**

#### 5.4.4.3 help

**Syntax:** nat help [command]

**Description:** Lists NAT commands.

#### 5.4.4.4 inbound

**Syntax:** nat inbound list

nat inbound add <i/f> <port>/<proto> <new IP> [quiet]

nat inbound delete <#>

nat inbound flush

**Description:** Enables the user to list or to set up a series of rules, to determine what happens to incoming traffic. By default, all incoming packets, other than packets arriving in response to outgoing traffic, will be rejected.

The **nat inbound add** command allows packets arriving on a specific port and IP protocol to be forwarded to a machine on the private network.

**<i/f>** is an interface name as shown by the **nat interface list** command.

**<port>** is the destination UDP or TCP port number to match in the incoming traffic.

**<proto>** is the IP protocol, either **udp** or **tcp**.

**<new IP>** is the new IP address on the private network which the packet's destination IP address should be translated to.

If a rule is added for an interface on which NAT is not enabled, the rule is added, but a warning is printed to alert the user.

**quiet** is a special option which should not normally be issued at the console, and causes this warning to be suppressed. The **quiet** option is automatically added by NAT to when writing its configuration to flash; this is because when a system boots, the NAT process reads in these rules before IP has registered any interfaces.

**nat inbound list** shows the current rules for inbound traffic, including all the arguments to the **nat inbound add** command.

**nat inbound delete** removes a rule, where **<#>** is the rule number as shown by the **nat inbound list** command.

**nat inbound flush** removes all the rules.

**Example:**

adsl> **nat inbound add ethernet 80/TCP 192.168.219.38**

adsl> **nat inbound list**

# InterfacePort/IP ProtocolNew IP address

1 ethernet80/tcp192.168.219.38

2 rfc148321/tcp192.168.219.40

adsl> **nat inbound delete 2**

### 5.4.4.5 protocol

**Syntax:** nat protocols

**Description:** Lists the Application Level Gateways (ALGs) provided in the current image in order to support particular higher-level protocols, and the port or ports which each ALG monitors.

**Example:** adsl> **nat protocols**

NamePort/IP protocol

ftp21/tcp

### 5.4.4.6 sessions

**Syntax:** nat sessions <i/f> [all | summary]

**Description:** Displays active NAT sessions on the interface **<i/f>**.

A **session** is a pair of source IP addresses and port numbers and corresponding new port numbers that NAT regards as one side of an active connection. For each active TCP or UDP session, the source/destination IP address, port number, the local port number and the age of the session are printed.

**all** causes the **sessions** command to print out information on every session, including timed out sessions. The **sessions** command only shows active sessions.

**summary** shows total of active, timed out and available sessions.

**Example:** adsl> **nat sessions ppp**

| Protocol | Age | NAT port | Private address/ port | Public/address port |
|---|---|---|---|---|
| TCP | 34 | 1024 | 192.168.219.38/35 | 194.129.50.6/21 |

| Protocol | Age | NAT port | Private address/ port | Public/address port |
|---|---|---|---|---|
| TCP | 10 | 1025 | 192.168.219.64/35 | 185.45.30.30.80 |

Total : 2 sessions active

101 sessions timed out

126 sessions available

## 5.4.5 PPP Commands

PPP commands are prefixed with PPP.

### 5.4.5.1 channels

**Description:** A channel is a single PPP connection and is numbered from 1. Many PPP Console commands affect only a single channel and is prefixed with the channel number.

### 5.4.5.2 Console Commands

#### 5.4.5.2.1 <channel> clear

**Syntax:** <channel> clear

**Description:** Clears all aspects of the channel back to the default settings. If there is an active connection, it is torn down.

#### 5.4.5.2.2 <channel> enable

**Syntax:** <channel> enable

**Description:** Sets the **enable** flag for a PPP channel. By default, this is disabled.

#### 5.4.5.2.3 <channel> event

**Syntax:** <channel> event [<n>]

**Description:** Read or set the overall trace output level. Configuration saving does not save this value. The default event level is 1.

**Event levels are:**

| | |
|---|---|
| 1 | only very serious errors reported (default) |
| 2 | definite protocol errors or very significant events reported |
| 3 | links going up/down are reported |
| 4 | every packet and significant state change is reported |
| 5 | every packet sent/received is disassembled and hex is dumped |

#### 5.4.5.2.4 <channel> disable

**Syntax:** <channel> disable

**Description:** Clears the **enable** flag for a PPP channel and is the default setting. Disabling does not remove other configured information about this channel. By default, all channels are disabled.

#### 5.4.5.2.5 <channel> interface

**Syntax:** <channel> interface <n>

**Description:** Logically associates the specified channel with the specified interface. **Interface 1** is always the router port. It should be used for any PPP channel over which IPCP communication with the local system's IP router is desired. Other interfaces can be created for bridging. A single PPP channel can only be associated with a single interface, or a single tunnel.

Use **info** to find the current setting.

Calling with **n=0** removes any association and is the default state.

#### 5.4.5.2.6 <channel> pvc

**Syntax:** <channel> pvc [[<port>] <vpi>] <vci> [ip | mac] [listen]

<channel> pvc none

**Description:** Attach an ATM PVC to the given PPP channel. The port as well as the VPI (default is 0), and the VCI can be specified (only for a multi-port device).

The allowable range of the ports, VPI and VCI depends on the ATM driver. Normal limits are 0 only for VPI and 1 to 1023 for VCI.

If a single argument **none** is supplied, any current connection is torn down. This is equivalent to **svc none** on the channel.

In the PPP state machine, providing a link of this form causes the link to be 'up'. **Enable** must also be used, to allow the link to become operational.

The **IP** or **mac** indicates which form of data is transported over the connection: one is IP data (controlled by the IPCP protocol), or it is the MAC data (for BCP). If neither is provided, IP is assumed. If the channel is not linked to an interface, and the channel is for IP data, the channel is linked to interface 1.

If the channel is not linked to an interface, and the channel is for MAC data, the channel is linked to interface 2. Providing a PVC setting changes any SVC setting. See the **svc** command.

It is possible for a PVC to become 'down' in the PPP state machine even though the PVC is still there, for example, due to an authentication failure. If in this state, an incoming packet will cause the PPP state machine to go 'up'.

If **listen** is specified then this is the server end of a PVC. It will not send out PPP Configure Requests until it first receives a packet over the PVC. When a connection is torn down it goes returns to this state.

Use the **info** command to read this information. By default, a channel has no connection information.

**Example:** ppp 3 pvc 3 32set channel 3 to be (VPI=3, VCI=32)

ppp 4 pvcread PVC settings for channel 4

ppp 5 pvc 0remove any PVC settings from channel 5

#### 5.4.5.2.7 <channel> qos

**Syntax:** <channel> qos [cbr | ubr] [pcr <pcr-tx> [<pcr-rx>]]

**Description:** Specify that the VC for a PPP channel should be Constant Bit Rate or Unspecified Bit Rate, and (optionally for UBR) give a Peak Cell Rate for the connection. If two values are specified then they are the transmit and receive PCRs respectively.

If called while not attached to a VC then the settings are saved.

If the channel is already attached to a VC then it is closed, and re-opened with the new values. If it cannot be reopened, it remains closed. By default, channels are established UBRs.

**Example:** ppp 3 qos cbr pcr 10000set channel 3 to be CBR limited at 10000 cells/sec

#### 5.4.5.2.8 <channel> remoteip

**Syntax:** <channel> remoteip [<ipaddress>]

**Description:** If a PPP link is established using IPCP, this call causes the channel to provide the given IP address to the remote end of the connection. PPP will not complete the connection if the other end will not accept.

This is normally used for channels on which the remote party dials in, to allocate the IP address to that remote party.

Call with no argument to find the current setting. Call with 0.0.0.0 to remove any setting and is the default state.

#### 5.4.5.2.9 <channel> svc

**Syntax:** <channel> svc listen | <addr> [ip | mac]

<channel> svc none

**Description:** Specify that the VC for a PPP channel should be an SVC (i.e. created by signalling). This can either be by listening for an incoming call, or by making an outgoing call to a specified ATM address. The outgoing call, or the **listen**, only occurs while the **enable** flag for this channel is set.

Outgoing and incoming UNI signalling calls are identified by a BLLI value that identifies PPP. If the channel is already attached to an SVC or PVC then it is closed and re-opened with the new settings. If it cannot, it remains closed.

If a single argument **none** is supplied, any current connection is torn down. This is equivalent to **pvc none** on the channel.

In the PPP state machine, providing a link of this form causes the link to be ‘up’ or ‘down’. **Enable** must also be used, to allow the link to become operational.

The **IP** or **mac** indicates which form of data is transported over the connection: one is IP data (controlled by the IPCP protocol), or it is the MAC data (for BCP). If neither is provided, IP is assumed. Providing an SVC setting changes any PVC setting. See the **pvc** command. By default, a channel has no connection information.

**Example:** ppp 3 svc 47.00.83.01.03.00.00.00.00.00.00.00.00.00.20.2b.00.03.0b.00

ppp 4 svc listen (listen for incoming call)

ppp 7 svc none (tears down connection and removes setting)

#### 5.4.5.2.10 <channel> tunnel <n>

**Syntax:** <channel> tunnel <n>

**Description:** Associates the specified channel with the specified PPTP tunnel. A single PPP channel can only be associated with a single interface, or a single tunnel.Use **info** to find the current setting. Calling with **n=0** removes any association and is the default state.

#### 5.4.5.2.11 <channel> welogin

**Syntax:** <channel> welogin <name> <password> [pap | chap]

<channel> welogin none

**Description:** Describes how to log in to the far end when a connection is established. A name and password are supplied, and these should be used with the PAP or CHAP authentication protocol. The default is chap.

To remove this information on a channel, use **welogin** with a single argument of **none**.

If **chap** is specified, log in using **pap** if the other end prefers this. If **pap** is specific log in using **pap**. By default, no login is performed.

#### 5.4.5.2.12 <channel> theylogin

**Syntax:** <channel> theylogin pap | chap | none

**Description:** Describes what is required from the far end to log in on this channel. Requiring the other end to log in most frequently happens when they dial us (rather than the other way round), so this is likely to be one of several channels which are set using **svc listen**.

Because of this, exact names and passwords are not attached to individual channels but are matched to particular users, as defined using the **user** command.

It specifies that when using this channel, the user must log on using the specified protocol, and that they must provide any name/password combination which has been defined for that protocol, using the **user** command.To remove this information on a channel, call **theylogin** with a single argument of **none**. By default, no login is required.

#### 5.4.5.2.13 bcp

**Syntax:** bcp stp | nostp

**Description:** Describes parameters for BCP (Bridge Control Protocol), which is used to transport MAC (Ethernet) packets over the PPP link. See the protocol conformance section of this spec for **bcp** option settings which are not controllable.

If Spanning Tree Protocol (**stp**) is specified then it is used by the Bridges to control bridge loops. STP frames should be carried over any links using BCP.If **nostp** is specified, then the frames will not be carried. By default, **stp** is not supported.

#### 5.4.5.2.14 user

**Syntax:** user add <name> [pwd <passwd> [pap | chap]]

user [<name>]

user delete <name> | all

**Description:** Stores information about a particular login name/password combination. This is referred to as a **user**.

When **user** is called on its own, information about all existing users is listed. When **user <name>** is called, details of that user alone are printed. Passwords are not shown.

Use **user delete** to delete an individual user by name, or to delete all users.

Use **user add <name>** to create a new user or update an existing one. The password is stored, and the authentication protocol which must be used for this user. If a user is deleted or changed, existing sessions are not affected.

## 5.4.6 RFC1483 Commands

RFC1483 commands are prefixed with RFC1483.

### 5.4.6.1 pvc

**Syntax:** pvc [<channel> | none]

**Description:** Sets or displays the PVC used for communications. When setting the PVC, the configuration must be saved and the system restarted.

The argument may be **none** to indicate no PVC configured, or a value in the range 1..maxVCI. MaxVCI is typically 1023 but is fixed by system configuration. By default, there is no PVC.

**Example:** rfc1483 pvc 12

## 5.4.7 TCP/IP Commands

### 5.4.7.1 config

**Syntax:** config [save]

**Description:** Displays the IP configuration (not including the **snmp** configuration), or saves it in Flash memory.

### 5.4.7.2 device

**Syntax:** device

device add <i/f> <type> [<file>] [mtu <size>] [<IP address>]

device delete <i/f>

device flush

**Description:** Displays the interfaces IP is configured to use, or adds an interface to the configuration, or deletes an interface, or all interfaces, from the configuration.

It is necessary to save the configuration (e.g. with **ip config save**) and restart the system (e.g. with **ip restart**). **Device** will display both the current interfaces and those that have been configured but are not yet in effect. (Other commands apply only to the devices in effect, rather than those configured.

When adding a device, one may need to issue the **device add** command, then the **config save** and reboot, then issue any other configuration command that depend on the existence of the device, and **config save** again).

#### 5.4.7.3 disable

**Syntax:** disable [<i/f>]

**Description:** Disables all interfaces, or just a specified interface.

**Example:** mymachine> **ip disable vlane**

mymachine> **ip device**

# typedevfileIP address

device ether ether //nice mtu 1500192.168.2.1

device vlane ether //lane mtu1500 192.168.55.1# DISABLED

#### 5.4.7.4 enable

**Syntax:** enable [<i/f> [mtu <size>] [<IP address>]]

**Description:** Enables all interfaces, or just a specified interface. Can also be used to set the MTU and IP address on an interface when enabling it (or change them on an interface that is already enabled); see the **device** command for details. Configuration saving saves the MTU and IP addresses, but not the disabled/ enabled state.

**Example:** mymachine> **ip enable vlane 192.168.56.3**

ip/vlane: IP address 192.168.56.3

mymachine> **ip device**

# typedevfileIP address

device etherether//nicemtu 1500 192.168.2.1

device vlaneether//lanemtu 1500  192.168.56.3

### 5.4.7.5 ipatm lifetime

**Syntax:** ipatm lifetime <secs>

**Description:** Displays or sets idle time-out for IP-over-ATM SVCs. If there is no traffic on an SVC for this period, then it will be disconnected. (It might be disconnected before this period to make room for new connections.) There is no way to disable the time-out, but **ip ipatm lifetime 999999** will have the same effect. The default, lifetime is 60 seconds.

**Example:** mymachine> **ip ipatm lifetime**

Idle lifetime for connections: 1m

mymachine> **ip ipatm lifetime 90**

Idle lifetime for connections: 1m30s

### 5.4.7.6 ipatm pvc

**Syntax:** ipatm pvc

ipatm pvc add <i/f> [<port>] <vci>/[<IP address>][/<pcr>]

ipatm pvc delete <vci> [<port>] ipatm pvc flush

**Description:** Lists configured PVCs for use by IPoA; configures another; deletes one; or deletes all.

**<i/f>** is the name of an interface configured for IPoA using PVCs.

**<vci>** is the VCI to use for the PVC. The range of possible VCI's depends on the system.

**<IP address>** is the IP address of the machine at the other end of the PVC. If it is not specified, ATMOS TCP/IP will use Inverse ATMARP (RFC 1577) to determine the IP address; if it is specified, then Inverse ATMARP will not be used.

**<pcr>** is the peak cell rate, in cells per second. The default is 60000. (If neither IP address nor PCR is specified, the **"/"** after the VCI can be omitted.)

**<port>** is the port name and must be specified if the machine is a switch.

**Example:** myswitch> **ip ipatm pvc add atm 60 a3**

myswitch> **ip ipatm pvc add atm 61//50000 b1**

myswitch> **ip ipatm pvc add atm 62/192.168.4.32 b1**

myswitch> **ip ipatm pvc**

ipatm pvc atm 60//60000 A3

ipatm pvc atm 61//50000 B1

ipatm pvc atm 62/192.168.4.32/60000 B1

### 5.4.7.7 ping

**Syntax:** ping <IP address> [<ttl> [<size>]]

**Description:** Sends an ICMP Echo message to the specified IP address.

**<ttl>** (default 30) is the TTL (time-to-live) to use. A crude **traceroute** functionality can be obtained by repeating the **ping** command with increasing TTL values, starting with 1.

**<size>** (default 56) is the data size of the Echo message. This does not include the IP header (20 bytes) and the ICMP header (8 bytes).

**Example:** mymachine> **ip ping 192.168.4.13 1**

ip: ping - 192.168.1.9 reports pkt #5834 to 192.168.4.13: time-to-liveexceeded

mymachine> **ip ping 192.168.4.13 2**

ip: ping - reply received from 192.168.4.13

mymachine> **ip ping 192.168.77.77**

ip: ping - no reply received

### 5.4.7.8 relay

**Syntax:** relay

relay all | <i/f> [<i/f>] [forward]

**Description:** Displays or sets what forwarding ATMOS TCP/IP will do between interfaces. The combinations of setting forwarding behave as follows:

| Command | Enables forwarding |
|---|---|
| Relay all | from every interface to every non-loopback interface |
| Relay if1 | from if1 to every non-loopback interface, and from every interface to if1 |
| Relay if1 forward | from if1 to every non-loopback interface |
| Relay if1 if2 | from if1 to if2 and from if2 to if1 |
| Relay if1 if2 forward | from if1 to if2 |

(Don't confuse the "forward" keyword, which indicates one-way relaying, with the term "forwarding").

To disable forwarding, use the **norelay** command. By default, all forwarding is disabled.

**Example:** mymachine> **ip relay**

No relaying is being performed

mymachine> **ip relay ether vlane forward**

relay ether vlane forward

mymachine> **ip relay ether forward**

relay ether ether

relay ether vlane forward

mymachine> **ip relay ether vlane**

relay ether ether

relay ether vlane

mymachine> **ip relay all**

relay ether ether

relay ether vlane

relay vlane vlane

#### 5.4.7.9 restart

**Syntax:** restart

**Description:** Reboots the system.

**Example:** mymachine> **ip restart**

#### 5.4.7.10 rip accept

**Syntax:** rip accept [all |<i/f>] [none | <version>*]

**Description:** Controls version or versions of RIP (RIP version 1, RFC 1058, or RIP version 2, RFC 1723). ATMOS TCP/IP will accept incoming information on each interface.By default, both RIP versions are accepted on all interfaces (**rip accept all 1 2**).

**Example:** mymachine> **ip rip accept all 1 2**

mymachine> **ip rip accept ether 2**

mymachine> **ip rip allowed**

rip send ether none

rip send vlane none

rip accept ether 2

rip accept vlane 1 2

#### 5.4.7.11 rip allowed

**Syntax:** rip allowed

**Description:** Displays the RIP versions that will be accepted and sent on each interface.

**Example:** mymachine> **ip rip allowed**

rip send ether 2

rip send vlane 2

rip accept ether 1 2

rip accept vlane 1 2

### 5.4.7.12 rip boot

**Syntax:** rip boot

**Description:** Broadcasts a request for RIP information from other machines. TCP/IP does this automatically when it starts up. The routing information must be kept up to date by regular broadcasts from the other machines.

### 5.4.7.13 route

**Syntax:** route

route add <name> <dest> <relay> [<mask> [<cost> [<timeout>]]]

route delete <name>

route flush

**Description:** Lists routes; adds or deletes a static route; or deletes all routes.

**<name>** is an arbitrary name specified to **route add** that can be used to delete the route using **route delete**.

**<dest>** is the IP address of the network being routed to (only those bits of **<dest>** corresponding to bits set in **<mask>** are relevant).

**<relay>** is the IP address of the next-hop gateway for the route.

**<mask>** (default ff:ff:ff:00) is the subnet mask of the network being routed to, specified as four hexadecimal numbers separated by colons. For example, 0:0:0:0 is a default route (matches everything without a more specific route), ff:ff:ff:0 would match a Class C network, and ff:ff:ff:ff is a route to a single host.

(**Note:** the default is not always sensible; in particular, if **<dest>** is 0.0.0.0 then it would be better for the mask to default to 0:0:0:0. This may change in future versions).

**<cost>** (default 1) is the number of hops counted as the cost of the route, which may affect the choice of route when the route is competing with routes acquired from RIP. (**Note:** using a mixture of RIP and static routing is not advised.)

**<timeout>** (default 0, meaning that the route does not time out) is the number of seconds that the route will remain in the routing table.

**Note:** The routing table does not contain routes to the directly connected networks, without going through a gateway. ATMOS TCP/IP routes packets to such destinations by using the information in the device and subnet tables instead.

The **route** command (with no parameters) displays the routing table. It adds a comment to each route with the following information:

How the route was obtained;
MAN— configured by the **route** command
RIP— obtained from RIP
ICMP— obtained from an ICMP redirect message
SNMP— configured by SNMP network management

**time-out**, if the route is not permanent.

**original time-out**, if the route is not permanent.

The name of the interface (if known) that will be used for the route.

An **asterisk** (*****) if the route was added recently and RIP has not yet processed the change (the asterisk should disappear within 30 seconds, when RIP next considers broadcasting routing information).

Only the routes configured by the **route** command are saved or displayed by **config**.

**Example:** mymachine> **ip route add default 0.0.0.0 192.168.2.3 0:0:0:0**

mymachine> **ip route add testnet1 192.168.101.0 192.168.2.34**

mymachine> **ip route add testnet2 192.168.102.0 192.168.2.34 ff:ff:ff:0 1 60**

mymachine> **ip route**

route add testnet2 192.168.102.0 192.168.2.34 ff:ff:ff:00 1 # MAN 58s/1m via ether *

route add testnet1 192.168.101.0 192.168.2.34 ff:ff:ff:00 1 # MAN via ether

route add default 0.0.0.0 192.168.2.3 00:00:00:00 1 # MAN via ether

#### 5.4.7.14 stats

**Syntax:** stats arp | icmp | ip | tcp | udp [reset]
stats help [<cmd> | all]

**Description:** Displays or clears a subset of IP statistics.

**Example:** mymachine> **ip stats udp**
ip: UDP receptions delivered to users: 0
ip: UDP receptions with no users: 170
ip: Otherwise discarded UDP receptions: 0
ip: Transmitted UDP packets: 35
mymachine> **ip stats udp reset**
mymachine> **ip stats udp**
ip: UDP receptions delivered to users: 0
ip: UDP receptions with no users: 0
ip: Otherwise discarded UDP receptions: 0
ip: Transmitted UDP packets: 0

#### 5.4.7.15 subnet

**Syntax:** subnet
subnet add <name> <i/f> <IP address> <mask>
subnet delete <name>
subnet flush

**Description:** Lists defined subnets; defines a subnet; deletes a subnet definition; or deletes all subnet definitions.

**<name>** is a label, that can be specified by **subnet add** and later used by **subnet delete** to delete the subnet.

**<i/f>** is not used, but is present for historical reasons and must be specified as either "**.**" or a valid interface name.

**<IP address>** is the IP address of the subnet being defined (only those bits of **<dest>** corresponding to bits set in **<mask>** are relevant).

**<mask>** is the subnet mask of the subnet being defined, specified as four hexadecimal numbers separated by colons.

A subnet is defined automatically for each interface, with a name formed by appending **.home** to the device name. The only significant use for the **subnet** command is to change the masks for these automatic subnet, if the default masks (see **device** command) are not correct. Subnet definitions for other subnet can also be useful in conjunction with RIP v1.0, which does not communicate subnet masks.

**Example:**

mymachine> **ip device**

# typedevfileIP address

device etherether//nicemtu 1500  192.168.2.1

device vlaneether//lanemtu 1500  192.168.55.1

mymachine> **ip subnet**

subnet vlane.home. 192.168.55.0ff:ff:ff:00 vlane

subnet ether.home. 192.168.2.0ff:ff:ff:00 ether

mymachine> **ip subnet add vlane.home.192.168.55.1 ff:ff:fc:0**

mymachine> **ip subnet**

subnet vlane.home. 192.168.52.0ff:ff:fc:00 vlane

subnet ether.home. 192.168.2.0ff:ff:ff:00 ether

### 5.4.7.16 trace

**Syntax:** trace [<option>]

**Description:** Turns on an IP tracing option, or lists the available options. **Note:** tracing messages are written to background output, so with the standard console one must use the **event** commands to see them.

An option can be:

One of the various keywords. The details of just what tracing messages are enabled by each keyword are not documented here; examine the source if needed.

For a TCP association, this turns on detailed tracing of events (including all packet transmission and reception) on that association. For a UDP association, it has no effect. The **files** command shows (by appending **TRACE**) whether each association has tracing enabled.

**ip** - Turns on tracing for all interfaces.

**all** - Turns on all tracing.

**Note: trace** does not display which associations and interfaces are being traced; one must use the **files** and **device** commands.

The **trace** command is hidden and not shown by **ip help**. It is useful mainly for debugging and troubleshooting.

**Example:** mymachine> **ip trace**

ip: try trace - <assoc no> <i/f name> all ip errors resolve ipatm atmarp

iploop arp ipether icmp udp tcp tcphdr tcpstate routes riptx riprx names

ip: currently tracing nothing

mymachine> **ip trace tcp**

ip: currently tracing tcp

#### 5.4.7.17 untrace

**Syntax:** untrace [<option>]

**Description:** Turns off IP tracing options. The syntax is the same as **untrace all** turns off all tracing.The **trace** command is hidden and not shown by **ip help**.

### 5.4.8 TFTP Commands

TFTP commands are prefixed with TFTP.

#### 5.4.8.1 init

**Syntax:** init

**Description:** Causes all sessions to be initialized to an idle state. It can be used during testing but is not required in normal operation. The command does not appear in the Help text.

#### 5.4.8.2 put

**Syntax:** put [local_file] <remote_file> (client mode only)

**Description:** The **put** command requests TFTP to transmit a file to the remote host previously specified using the **connect** command. By default, the file is named remotely as the local file name but by specifying a second file name, renaming is performed.

**Example:** put ipaddresses

# 5.5 ADSL Commands

Documentation Conventions:

- Italics — All italic letters shown in this document for the Console command can be omitted.
- [option] — Brackets around a word indicate an optional item.
- {this | that} — The vertical bar indicates that you have a choice.
- <Number> — Indicates that you need to input a digital number.
- <Boolean> — Indicates that you need to input a Boolean value.
  - <Boolean>: {<true> | <false>}
  - <true>: {true | yes | on | enable | 1}
  - <false>: {false | no | off | disable | 0}

## 5.5.1 Help

**Syntax:** help

**Description:** Displays the list of commands supported.

**Example:** … adsl>**help**

**info** **HTUType** **setting** **activate**
**loopback** **status** **atm** **performance** **debug**

"." Repeats the last command

Type **help all** or **help <command>** for more details.

### 5.5.2 Info

**Syntax:** info
**Description:** Displays information about the current ADSL version.
**Example:** … adsl>**info**

### 5.5.3 Setting

**Syntax:** setting
**Description:** Displays the current default ADSL parameters.
**Example:** 10.0.0.1 adsl>**setting**

```
ADSL: Line Status -- Activating

[ADSL Parameters]
ADSLMode = G.LITE 3.6.70
Trellis encoding ---- disable
EC/FDM mode ---- FDM
Coding Gain ---- auto
Power attenuation ---- auto
Up Stream Boost ---- disable

[Control Parameters]
AutoConnect ---- Enable
ActivationRetries = 3
ActivationBackoffPeriod = 0 seconds

[LED control Parameters]
LEDFlashTime = 3 * 100 msec

10.0.0.1 adsl>
```

#### 5.5.3.1 Auto Connect Setting

**Syntax:** setting *Auto*Connect [<Boolean>]

**Description:** Enables the Auto Connect. The Auto Connect indicates the startup process connecting the line automatically when the ADSL line disconnects. The default value is Enable.

**Examples:** 1) … adsl>**setting AutoConnect**

Enables AutoConnect.

2) … adsl>**setting AutoConnect Disable**

Disables Auto Connect.

#### 5.5.3.2 Auto Deativation Setting

**Syntax:** Setting *AutoDeactivation* [<Boolean>]

**Description:** Enables the Auto Deactivation and indicates the firmware deactivating the line automatically when the ADSL line drops (SNR < 22dB). The default value is Enable.

**Examples:** 1) … adsl>**setting AutoDeactivation**

Enables Auto Deactivation.

2) … adsl>**setting AutoDeactivation Disable**

Disables Auto Deactivation.

#### 5.5.3.3 Activation Retries Setting

**Syntax:** setting *Activation*Retries <number>

**Description:** Sets the number of retries the startup process will require when **Auto Connect** is disabled. The default value is 3.

**Example:** … adsl>**setting Retries 3**

Sets the Activation number of retries to 3.

#### 5.5.3.4 Activation Backoff Period Setting

**Syntax:** setting *Activation*BackoffPeriod <number>

**Description:** Sets the Activation Backoff Period (seconds). The startup process will wait the Activation Backoff Period and then activate the ADSL line, when it is deactivated. The default value is 0.

**Example:** … adsl>**setting BackoffPeriod 0**

Sets Activation Backoff Period to 0.

#### 5.5.3.5 LED Flash Time Setting

**Syntax:** setting *LedFlash*Time <number>

**Description:** Sets the LED Flash Time, (when the line starts up, the sync LED will flash). The LED delay time ON and OFF is controlled by this time (100ms). The default value is 3 * 100ms.

**Example:** … adsl>**setting LedFlashTime 3**

Sets the LED Flash delay time to 300ms.

#### 5.5.3.6 SNR Threshold Setting

**Syntax:** Setting SNR*Threshold* <number>

**Description:** Sets the SNR (Signal to Noise Ratio) Threshold. A SNR Threshold alarm will be set when it is low. The default value is 22dB.

**Example:** … adsl>**setting SNRThreshold 22**

Sets SNR Threshold to 22dB.

#### 5.5.3.7 Attenuation Threshold Setting

**Syntax:** Setting Attenuation*Threshold* <number>

**Description:** Sets the Attenuation Threshold. An Attenuation Threshold Alarm will be set when attenuation is high. The default value is 128dB.

**Example:** … adsl>**setting AttenuationThreshold 20**

Sets the SNR Threshold to 20dB.

## 5.5.4 Activate

**Syntax:** activate [<subcommand parameter> | <Boolean>]

**Description:** Displays and controls the ADSL line startup or shutdown.

### 5.5.4.1 Display Activation Status and Control Parameters

**Syntax:** activate

**Description:** Displays ADSL activation status and control parameters.

**Example:** … adsl>**activate**

ActivateLine ---- Enable

### 5.5.4.2 Startup or Shutdown ADSL Line

**Syntax:** activate <Boolean>

**Description:** Starts up (activate) or shuts down (deactivate) the ADSL line.

**Examples:** 1)… adsl>**activate ON**

Activates the ADSL line.

2)… adsl>**activate OFF**

Forces the ADSL line to deactivate.

#### 5.5.4.3 Reset ADSL Line

**Syntax:** activate reset
**Description:** Forces the ADSL line to deactivate and startup again.
**Example:** … adsl>**activate reset**
Resets the ADSL line.

### 5.5.5 Loopback

**Syntax:** loopback [<subcommand parameter> | <Boolean>]
**Description:** Displays ADSL line loopback status and control parameters.

#### 5.5.5.1 Display Loopback Status and Control Parameters

**Syntax:** loopback
**Description:** Displays ADSL line loopback status and control parameters.
**Example:** … adsl>**loopback**
Loopback ---- Disable
LoopbackBackoffPeriod = 0 minutes

#### 5.5.5.2 Enable or Disable ADSL Line Loopback

**Syntax:** loopback <Boolean>
**Description:** Enables or disables the ADSL line remote loopback.
**Examples:** 1)… adsl>**loopback Enable**
Starts the ADSL line loopback.

2)… adsl**>loopback Disable**
Disables the ADSL line loopback.

#### 5.5.5.3 Loopback Backoff Period Setting

**Syntax:** loopback *loopback*Backoff*Period* <number>

**Description:** Sets the Loopback Backoff Period (unit is minute). When the line runs loopback, the loopback process will wait for the Loopback Backoff Period, and then disables the ADSL line loopback. If the Period is 0, the loopback operation will run continuously. The default value is 0 minute.

**Example:** … adsl>**loopback BackoffPeriod 0**

Sets Loopback Backoff Period to 0 (continuous).

#### 5.5.5.4 ADSL Line Digital Loopback

**Syntax:** loopback Digital

**Description:** Executes ADSL line Digital loopback (local loopback).

**Example:** … adsl>**loopback Digital**

Sets the ADSL line Digital Loopback.

#### 5.5.5.5 ADSL Line Analog Loopback

**Syntax:** loopback Analog

**Description:** Executes ADSL line Analog Loopback (local loopback).

**Example:** … adsl>**loopback Analog**

Starts the ADSL line Analog Loopback.

### 5.5.6 Status

**Syntax:** status

**Description:** Displays information about the current ADSL status.

**Example:** … adsl>**status**

The command displays:

| | Local Unit | Remote Unit |
|---|---|---|
| Line Status | Connected | |
| Line Rate | 2312 | |
| Loss Sync Detected | NO | |
| Loss Sync Failure | NO | NO |
| SNR (dB) | 43.9 | |
| SNR Margin | 19 | 16 |
| SNR Alarm | NO | NO |
| Attenuation | 00 | 00 |
| Attenuation Alarm | NO | NO |
| ATM Status | ok | ok |
| HEC Error | 07 | 14 |
| Power Backoff | 00 | 00 |
| Trip/Ring Reversal | NO | NO |

## 5.5.7 ATM

**Syntax:** atm [<subcommand parameter>]

**Description:** Displays ATM status and control parameters.

### 5.5.7.1 Displays ATM Status and Control Parameters

**Syntax:** atm

**Description:** Displays I.4.32 framer control parameters and status.

**Example:** … adsl>**atm**

[ATM Cell Count]
Received Cells = 47990
Transmit Cells = 47962

[ADSL Cell Count]
Received Cells = 47990
Transmit Cells = 47962
Drop Cells = 0

[LED control Parameters]
LedFlashTime = 3 * 100 msec
LedCountWait = 1

### 5.5.7.2 ATM LED Flash Time Setting

**Syntax:** atm *LedFlash*Time <number>

**Description:** Sets the LED Flash Time. It controls the LED ON or OFF delay time (100ms), default value is 3 * 100 ms.

**Example:** … adsl>**atm LedFlashTime 3**

Sets the LED Flash delay time to 300 ms.

#### 5.5.7.3 ATM LedCountWait Setting

**Syntax:** atm *Led*Count*Wait* <number>
**Description:** Sets when ATM cell is received/transmitted, default value is 1.
**Example:** … adsl>**atm LedCount 1**
Sets the received cells to 1 to turn on the ATM LED.

### 5.5.8 Performance

**Syntax:** performance [<subcommand parameter>]
**Description:** Displays ADSL line performance or sets control parameters.

#### 5.5.8.1 Displays ADSL Performance

**Syntax:** performance
**Description:** Displays the ADSL performance.
**Example:** … adsl>**performance**

| | **Interval** | **Global** | **Remote** |
|---|---|---|---|
| Seconds | 00015135 | 00015135 | 00013730 |
| CRC | 00000167 | 00000167 | 00000157 |
| LOSW | 00000010 | 00000010 | 00000002 |
| ES | 00000030 | 00000030 | 00000002 |
| SES | 00000029 | 00000029 | 00000002 |
| UAS | 00000019 | 00000019 | 00000000 |

RemoteEOCRequest ----Enable
RemoteRequestPeriod = 5 seconds

#### 5.5.8.2 Interval Count Reset

**Syntax:** performance reset

**Description:** Resets the Interval performance count.

**Example:** … adsl>**performance reset**

Restarts the interval performance count.

#### 5.5.8.3 Remote EOC Request

**Syntax:** performance *Remote*EOCRequest [<Boolean>]

**Description:** Enables the unit to request remote unit status through EOC. For COT unit, the EOC request is always enabled. For RT, the default value is disable.

**Example:** … adsl>**performance EOCRequest**

Enables Request Remote status through EOC.

#### 5.5.8.4 Remote EOC Request Period

**Syntax:** performance *Remote*RequestPeriod <number>

**Description:** Sets the period (seconds) to request remote unit status through EOC, the default value is 10 seconds.

**Example:** … adsl>**performance RequestPeriod 10**

Sets the Request Period to 10 seconds.

### 5.5.9 Debug

**Syntax:** debug [<subcommand parameter>]

**Description:** Displays the ADSL line debug information and control parameters.

#### 5.5.9.1 Displays ADSL Debug Information

**Syntax:** debug [<subcommand parameter>]

**Description:** Displays the ADSL debug information.

**Example:** … adsl>**debug**

[Show]
ShowStatus ---- Disable
ShowSNR ---- Disable (0)
ShowCell ---- Disable (0)
ShowEthernet ---- Disable (0)
ShowTransmitEOC ---- Disable (0)
ShowReceivedEOC ----Disable (0)

[DSP Interrupt Count]
A valid = 31
Error = 0
[Framer Interrupt Count]
Total = 12081
Receive = 12080

[EOC Transfer Count]
Transmit Request = 11030
Transmit Success = 11030
Transmit Drops= 0
Received Success = 11030
Received Drops = 0
Received CRC Err = 0
Received TanspErr = 0
Received len Err = 0

#### 5.5.9.2 Show Status Settings

**Syntax:** debug *Show*Status [<Boolean>]

**Description:** Enables or disables to display ADSL startup Information.

**Examples:** 1)… adsl>**debug ShowStatus**

Displays the ADSL line startup information.

2)… adsl>**debug Status off**

Disables the display of the ADSL line startup information.

#### 5.5.9.3 Show Cell Settings

**Syntax:** debug *Show*Cell [<number> | <Boolean>]

**Description:** Enables or disables to display ATM received and transmit EOC for <number> of times.

**Examples:** 1)… adsl**>debug EOC 10**

Displays received and transmitted EOC information 10 times.

2)… adsl>**debug EOC off**

Disables display of EOC information.

#### 5.5.9.4 Show SNR Setting

**Syntax:** debug *Show*SNR [<number> | <Boolean>]

**Description:** Enables or disables to display Signal to Noise Ratio for <number> of times. After the SNR has changed, the new SNR will be displayed.

**Examples:** 1)… adsl**>debug SNR 10**

Displays SNR information 10 times.

2)… adsl>**debug SNR off**

Disables the display of SNR information.

### 5.5.10 HTUType

**Syntax:** HTUType [{CPE}]

**Description:** Displays or sets the ADSL Terminal Unit type.

**Examples:** 1)… adsl>**HTUType**

HTUType = HTU-CPE

## 5.6 Advanced CLI Commands

### 5.6.1 Bridge Settings

**Note:** Type in the commands exactly as shown to avoid errors.

**Command:**

**Syntax:** 1) ...>flashfs config bridge [usb] [ [***vpi/***]***vcifirst***[***-vcilast***] [ ( [{r1483 | ppp},] [{llc|hdlc |vcmux},] [{ubr|cbr},] [***pcr***] ) ] ...] [***Ipaddress*** | bridge({***LocalIp***|dhcp[(***lease_time***)}[,***Gateway***[,***SubnetMask***]] [***dhcplow-dhcphigh***[([***routeip***] [, dns( ***dnsserver1, dnsserver2***)] [,***default_lease_time, max_lease_time***])])}] [spanning [ ( [***forwarddelay***,] [***maxage***,] [***hellotime***] ) ] ] <***your password***>

2) ...>bridge config [usb] [[***vpi/***]***vcifirst***[***-vcilast***] [ ( [{r1483 | ppp},] [{llc|hdlc |vcmux},] [{ubr|cbr},] [***pcr***] ) ] ...] [***Ipaddress*** | bridge({***LocalIp***|dhcp[(***lease_time***)}[,***Gateway***[,***SubnetMask***]] [***dhcplow-dhcphigh***[([***routeip***] [, dns( ***dnsserver1, dnsserver2***)] [,***default_lease_time, max_lease_time***])])}] [spanning [ ( [***forwarddelay***,] [***maxage***,] [***hellotime***] ) ] ] <***your password***>

- **usb:** enter ‘usb’ to include usb interface, the default does not include usb.
- ***Ipaddress*:** Enter ‘xxx.xxx.xxx.xxx’ to set the Bridge IP address, the default value is 10.0.0.1.

  *** Now the Bridge sub-command to configure the Bridge IP and other things can be used.**
- **[*vpi/*]*vcifirst*[*-vcilast*]:** Typing ‘xx’, ‘xx/xx’, ‘xx/xx-xx’ or ‘xx-xx’ will set one or more ATM PVC channels - vpi and vci. The default ATM PVC is 0/35. If ***vpi*** is omitted, the value is set to 0. Specify a group of ATM PVCs by entering ‘xx-xx’. The group vci values will be from ***vcifirst*** to ***vcilast***.
- **{r1483 | ppp}:** Enter ‘ppp’ to set these channels as ppp device or enter ‘r1483’ as rfc1483 bridge. The default type is rfc1483 bridge.
- **{llc|hdlc|vcmux}:** For PPP Bridge, specify the PPP record head of LLC or HDLC. The default is learning for record head. For RFC1483 bridge, specify bridge with llc or vcmux mode, the default mode is llc mode.
- **{ubr|cbr}:** Enter ‘ubr’ or ‘cbr’ to specify the VC for this channel, the default VC is ubr.
- ***pcr*:** Enter ‘xxxxx’ to set PCR for these channels, the default value is 8000.
- bridge({***LocalIp***|dhcp[(***lease_time***)}[,***Gateway***[,***SubnetMask***]] [***dhcplow-dhcphigh***[([***routeip***] [, dns( ***dnsserver1, dnsserver2***)] [,***default_lease_time, max_lease_time***])]**:** See **route config**
- **spanning**: Enter ‘spanning’ to enable spanning, the default value is disable.
- **[*forwarddelay,*] [*maxage,*] [*hellotime*]:** Sets the forwarddelay, maxage and hellotime for spanning, if spanning has been enabled.
- **<*your password*>**: Type password to enable the configuration to be saved to Flash Memory.

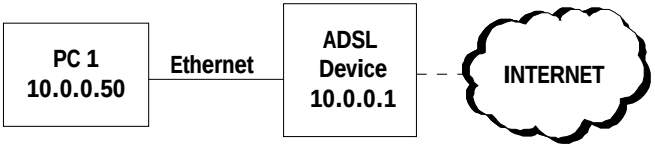
**Description:** Sets the configuration parameters for the Bridge operation.

**Examples:** 1) ...>flashfs config bridge usb 35-42(cbr) 10.10.10.180 password

## Example of Ethernet: RFC1483 Bridged Configuration

Firstly, the PC is configured with the following parameters:

IP address : 10.0.0.50
Subnet Mask : 255.255.255.0
Each device bridges between Ethernet and RFC1483. The RFC1483 encapsulated frames run over a PVC between the two devices.




## Setting the device for - Bridge:

Ethernet & USB LAN IP: 10.0.0.1
PVC : 0/35
Protocol : RFC1483 Bridged
Encapsulation : llc-mux
Class : ubr

**Command:**

10.0.0.1>flashfs config bridge 10.0.0.1usb 0/35 (r1483, llc, ubr) password
10.0.0.1>restart

## Setting the device for - PPPoE Relay:

Ethernet & USB LAN IP: 10.0.0.1
PVC : 0/38
Protocol : RFC1483 PPPoE Relay
Encapsulation : hdlc
Class : cbr

**Command:**

10.0.0.1>flashfs config bridge 10.0.0.1 usb 0/38 (ppp, hdlc, cbr) password
10.0.0.1>restart

## 5.6.2 Router Settings

**Note:** Type in the commands exactly as shown to avoid errors.

**Command:**

**Syntax:** 1) ...>flashfs config route [ether( [{***Ipaddress***[, ***SubnetMask***] | dhcp[(***lease_time***)]},] [***dhcplow-dhcp-high*** [([***routeip***] [,dns( ***dnsserver1***,***dnsserver2***)] [, ***default_lease_time***, ***max_lease_time***])])] [usb[( [{***Ipaddress***[,***SubnetMask***] |dhcp [(***lease_time***)]},] [***dhcplow-dhcphigh*** [([***routeip***] [, dns( ***dnsserver1***, ***dnsserver2***)] [, ***default_lease_time***, ***max_lease_time***])])]] [dns(***dnsip1***,[***dnsip2***])] [ [***vpi/***]***vcifirst***[-***vcilast***] ([{ipoa|r1483|ppp|pppoe|pptp|server|bridge|ppbridge},] [{llc|vcmux|hdlc},] [{ubr |cbr},] [***pcr***,] [ip([***index***,] [{pap|chap},] {***localip***|dhcp[( ***lease_time***)]}, ***remoteip***[,***SubnetMask***]),...] [route([***index***,] {***targetip*** |default}[, {***ipmask*** |a |b |c}]),...] [***dhcplow-dhcphigh***[ ([***routeip***] [,dns( ***dnsserver1***, ***dnsserver2***)] [,***default_lease_time***, ***max_lease_time***])] [login([{pap| chap},] ***username***, ***userpassword***), ] [bind ([{ether | usb | bridge}),] [***pcip***]] [nat] )...] [{***Ipaddress*** | bridge({***Localip***|dhcp[( ***lease_time***)]} [, ***Gateway***[, ***SubnetMask***]] [***dhcplow-dhcphigh***[([***routeip***] [, dns( ***dnsserver1***,***dnsserver2*** )] [, ***default_lease_time***, ***max_lease_time***])])}] user([{pap|chap},] ***username***, ***userpassword*** ),... ***<your password>***

2) ...>ip config [ether( [{***Ipaddress***[, ***SubnetMask***] | dhcp[(***lease_time***)]},] [***dhcplow-dhcp-high*** [([***routeip***] [,dns( ***dnsserver1***,***dnsserver2***)] [, ***default_lease_time***, ***max_lease_time***])])] [usb[( [{***Ipaddress***[,***SubnetMask***] |dhcp [(***lease_time***)]},] [***dhcplow-dhcphigh*** [([***routeip***] [, dns( ***dnsserver1***, ***dnsserver2***)] [, ***default_lease_time***, ***max_lease_time***])])]] [dns(***dnsip1***,[***dnsip2***])] [ [***vpi/***]***vcifirst***[-***vcilast***] ([{ipoa|r1483|ppp|pppoe|pptp|server|bridge|ppbridge},] [{llc|vcmux|hdlc},] [{ubr |cbr},] [***pcr***,] [ip([***index***,] [{pap|chap},] {***localip***|dhcp[( ***lease_time***)]}, ***remoteip***[,***SubnetMask***]),...] [route([***index***,] {***targetip*** |default}[, {***ipmask*** |a |b |c}]),...] [***dhcplow-dhcphigh***[ ([***routeip***] [,dns( ***dnsserver1***, ***dnsserver2***)] [,***default_lease_time***, ***max_lease_time***])] [login([{pap| chap},] ***username***, ***userpassword***), ] [bind ([{ether | usb | bridge}),] [***pcip***]] [nat] )...] [{***Ipaddress*** | bridge({***Localip***|dhcp[( ***lease_time***)]} [, ***Gateway***[, ***SubnetMask***]] [***dhcplow-dhcphigh***[([***routeip***] [, dns( ***dnsserver1***,***dnsserver2*** )] [, ***default_lease_time***, ***max_lease_time***])])}] user([{pap|chap},] ***username***, ***userpassword*** ),... ***<your password>***

- **ether():** Enter ‘ether(..)’ to set Ethernet parameters.
- **usb():** enter ‘usb’ to include usb interface and ‘usb(...)’ to set usb parameters, the default does not include usb.
- **bridge():** Enter ‘bridge(...)’ to set bridge port parameters.
- **{*Ipaddress*|dhcp[(*lease_time*)]}:** Enter ‘xxx.xxx.xxx.xxx’ to set the Ethernet, Bridge or USB IP address. Entering ‘dhcp’ means configuring this port as DHCP Client. The Lease time can be set by the User, its default is 900. The IP address default value is 10.0.0.1 for Ethernet or Bridge and 10.0.1.1 for the USB port.
- [***vpi/***]***vcifirst***[-***vcilast***]**:** Typing ‘xx’, ‘xx/xx’, ‘xx/xx-xx’ or ‘xx-xx’ will set one or more ATM PVC channels - vpi and vci. The default ATM PVC is 0/35. If it is omitted, ***vpi*** is set as 0. Specify a group of ATM PVCs by entering ‘xx-xx’. The group vci values will be from ***vcifirst*** to ***vcilast***.

- **[{ipoa|r1483|ppp|pppoe|pptp|server|bridge|pppridge}:** Enter ‘ipoa’ to specify these channels as ipoa route. Enter ‘r1483’ to specify RFC1483 route, ‘ppp’ to PPP Client, ‘pppoe’ to PPPoE Client, ‘pptp’ to PPTP Tunneling, ‘server’ to PPP Server, ‘bridge’ for RFC1483 Bridge and ‘pppbridge’ for PPP Bridge. The default type is ipoa route. For the Bridge device, only the first IP and NAT parameters are valid. The bridge ip and config ip are really as NAT.
- **{llc|hdlc|vcmux}:** For PPP routing, specify the PPP record head of LLC or HDLC, the default is learning for these record heads. For RFC1483 route, specify the route with LLC or VCMUX Mode. The default mode is llc mode.
- **{ubr|cbr}:** Enter ‘ubr’ or ‘cbr’ to specify the VC for these channels, the default VC is ubr.
- ***pcr*:** Enter ‘xxxxx’ to set the PCR for these channels. The default value is 8000.
- **ip([*index*,] [{pap|chap},] {*localip*|dhcp[(*lease_time*)]}, *remoteip*[,*SubnetMask*]):** Enter ‘ip(..)’ to set an ATM channel to local IP and remote IP.

  - ***index*:** For more channels, enter an index ‘xx’ to specify which channel needs to be set as the local IP and remote IP. If the index is omitted, it will automatically increase 1 with the before 1 index of ‘ip(..)’. The starting default index is 1.
  - **{pap|chap}:** For the PPP server, enter ‘pap’ or ‘chap’ to specify the channel login protocol. The default is none.
  - **{*Ipaddress*|dhcp[(*lease_time*)]}:** Enter ‘xxx.xxx.xxx.xxx’ to set the channel local ip address. Entering ‘dhcp’ means configuring this channel as DHCP Client (only the RFC1483 channel can support DHCP). The Lease Time can be set to 900. The local IP default value is 10.0.2.1 for the first ATM channel, 10.0.3.1 for the second channel,.....

- ***remoteip*:** Enter ‘xxx.xxx.xxx.xxx’ or ‘xx’ to set the channel’s remote IP address. If the local IP and the remote IP are on the same subnet, only the last area ‘xxx’ is needed. For example: the local IP is 192.101.33.72 and the remote IP is 192.101.72.90, the remote IP default value is 10.0.2.2 for the first ATM channel, 10.0.3.2 for the second ATM channel,..... Normally, there is no need to set the remote IP.
- ***SubnetMask*:** Enter ‘xxx:xxx:xxx:xxx’ or ‘a’, ‘b’ or ‘c’ to set the Subnet Mask. The default value is min mask dependence on local IP and, or remote IP.
- If any of the channels are not defined, then they are specified with the same login protocol, local IP and remote IP with the channel before this one, but the third area of IP ‘xxx’ is increased. For example, the channel before has an IP address of 192.168.4.4 and 192.168.4.7. Hence the next channel is specified to 192.168.5.4 and 192.168.5.7.

- **route([*index*,] {*targetip*|default} }[, {*ipmask*|a|b|c}]):** Enter ‘route(..)’ to set which target IP will pass through the ATM channels.

  - ***index*:** For more channels, enter an index ‘xx’ to specify which channel are needed to set the local IP and remote IP. If there is a need to specify the vpifirst channel, then index is from 1.If the index is omitted, it will automatically increase to 1 with the index before the ‘ip(..)’. The starting default index is 1.
  - **{*targetip*|default}:** Enter ‘xxx.xxx.xxx.xxx’ to specify the target IP for the route through the channel, or enter ‘default’ to set the channel as a default route. The default route channel is the first ATM channel.
  - **{*ipmask*|a|b|c}:** Enter ‘xxx:xxx:xxx:xxx’ to specify the target mask, or enter ‘a’, ‘b’ or ‘c’ to set the target ip class. The default is FF:FF:FF:FF or 0:0:0:0.

- **dhcplow-dhcphigh:** Type ‘xx-xx(...)’ to enable the DHCP server IP range. The default is disable.

- ***routeip*:** To specify the DHCP server route IP (for PC gateway). The default value is the local IP of this port.
- dns(***dnsip1***,[***dnsip2***])]**:** Sets the DNS server IP (for PC DNS).
- ***default_lease_time***, ***max_lease_time*:** Type 'xxxx[,xxxx]' to set the default Lease Time and Max Lease Time (seconds). The default value is 86400.

- **login([{pap|chap},] *username, userpassword*):** For PPP client and PPPoE, enter 'login(...)' to set login user name, password and login protocol. The default is chap. If the input for the login parameter (..) is not made, the login parameter is none.
- **bind([{ether|usb},] [*pcip*]):** For PPTP, enter 'bind(...)' to specify the local binding port and PC IP address. The default is the Ethernet port. If the PC IP address is specified, then PPTP will be the PPTP client, otherwise PPTP is the server.
- **nat:** Enter 'nat' to enable NAT. The default is disable.
- **user([{pap|chap},] *username, userpassword*):** For PPP server, enter 'user(...)' to set user name and password that allows remote users to login through the login protocol PAP or CHAP. The default is chap.
- **<*your password*>:** Type password to enable the configuration to be saved to Flash Memory.

**Description:** Sets the configuration parameters for the Router operation.

**Examples:** 1) ...>flashfs config route ether(2-102) usb(10.10.0.1, 2-102) 35-42(r1483, 10000, route(2,default)) password

**This command will set:**

Ethernet: IP = 10.0.0.1 (default), DHCP rang (10.0.0.2-10.0.0.102)
USB: IP = 10.10.0.1, DHCP rang (10.10.0.2 - 10.0.0.102)
0/35: rfc1483. PCR=10000. LocalIP=10.0.2.1, RemoteIP=10.0.2.2
0/36: rfc1483. PCR=10000. LocalIP=10.0.3.1, RemoteIP=10.0.3.2
0/37: rfc1483. PCR=10000. LocalIP=10.0.4.1, RemoteIP=10.0.4.2
0/38: rfc1483. PCR=10000. LocalIP=10.0.5.1, RemoteIP=10.0.5.2
0/39: rfc1483. PCR=10000. LocalIP=10.0.6.1, RemoteIP=10.0.6.2

0/40: rfc1483. PCR=10000. LocalIP=10.0.7.1, RemoteIP=10.0.7.2
0/41: rfc1483. PCR=10000. LocalIP=10.0.8.1, RemoteIP=10.0.8.2
0/42: rfc1483. PCR=10000. LocalIP=10.0.9.1, RemoteIP=10.0.9.2
default route channel is 0/36

2) ...>ip config ether(10.10.10.180) 35(nat), 36-42(r1483,vcmux, cbr, ip(2, 10.9.6.2, 1), ip(5,10.10.2.3, 5), route(10.10.10.1)) password

**This command will set:**
Ethernet: IP = 10.10.10.180, DHCP disable
USB: Disable
0/35: ipoa. LocalIP=10.0.2.1, RemoteIP=10.0.2.2 (default), nat enable
0/36: r1483. vcmux, cbr, LocalIP=10.0.3.1, RemoteIP=10.0.3.(default)
0/37: r1483. vcmux, cbr, LocalIP=10.9.6.2, RemoteIP=10.9.6.1 (set)
0/38: r1483. vcmux, cbr, LocalIP=10.9.7.2, RemoteIP=10.9.7.1
0/39: r1483. vcmux, cbr, LocalIP=10.9.8.2, RemoteIP=10.9.8.1
0/40: r1483. vcmux, cbr, LocalIP=10.10.2.3, RemoteIP=10.10.2.5 (set)
0/41: r1483. vcmux, cbr, LocalIP=10.10.3.3, RemoteIP=10.10.3.5
0/42: r1483. vcmux, cbr, LocalIP=10.10.4.3, RemoteIP=10.10.4.5
All IP date with address 10.10.10.xx is routed to channels 0/36, the other IP data will be routed to channel 0/35 (default route channel).

If the command parameter is too long, use more than one Config command.
**For Example:**
...>ip config.....#
...>ip config.....#
The last character # means that this is a continuous line, more parameters can be written at the next Config command.

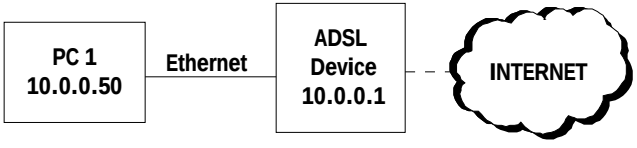
...>ip config flush
This will flush all parameters entered by that continuous line.

## Example of Ethernet RFC1483 Routed Configuration

Firstly, the PC is configured with the following parameters:

IP address : 10.0.0.50
Subnet Mask : 255.255.255.0

Each device bridges between Ethernet and RFC1483. RFC1483 encapsulated frames run over a PVC between the two devices.




## Setting the device for - RFC1483:

| | |
|---|---|
| Ethernet LAN IP | : 10.0.0.1 |
| DHCP Server | : enabled for 9 users, max-lease-time: 300 |
| USB LAN IP | : 11.0.0.1 |
| DHCP Server | : enabled for 9 users, max-lease-time: 300 |
| DNS Server IP | : Primary: 222.222.222.222<br>Secondary: 111.111.111.111 |
| PVC | : 8/36 |
| | |
| Protocol | : RFC1483 Routed |
| Encapsulation | : llc-mux |
| Class | : cbr |
| WAN IP | : 10.2.2.1 |
| Remote WAN IP | : 10.2.2.2 |
| NAT | : enabled |

**Command:**

```
10.0.0.1>ip config ether(10.0.0.1, 2-10, 300) usb(11.0.0.1, 2-10,
        300) dns(222.222.222.222, 111.111.111.111) 8/36(r1483,
        llc, cbr, ip(10.2.2.1, 2), nat) password
10.0.0.1>restart
```

## Setting the device for - IPoA:

| | |
|---|---|
| Ethernet LAN IP | : 10.0.0.1 |
| DHCP Server | : enabled for 9 users, max-lease-time:300 |
| USB LAN IP | : 11.0.0.1 |
| DHCP Server | : enabled for 9 users, max-lease-time:300 |
| DNS Server IP | : Primary: 222.222.222.222<br>Secondary: 111.111.111.111 |
| PVC | : 8/36 |
| Protocol | : IPOA Routed |
| Encapsulation | : llc-mux |
| Class | : cbr |
| WAN IP | : 12.1.1.1 |
| Remote WAN IP | : 12.1.1.2 |
| NAT | : enabled |

**Command:**

```
10.0.0.1>ip config ether(10.0.0.1, 2-10, 300) usb(11.0.0.1, 2-10,
        300) dns(222.222.222.222, 111.111.111.111) 8/36(ipoa,
        llc, cbr, ip(12.1.1.1, 2), nat) password
10.0.0.1>restart
```

## Setting the device for - PPPoA On CO Side:

| | |
|---|---|
| Ethernet LAN IP | : 10.10.10.1 |
| DHCP Server | : enabled for 9 users, max-lease-time:86400 |
| USB LAN IP | : 11.11.11.1 |

| | |
|---|---|
| DHCP Server | : enabled for 9 users, max-lease-time:86400 |
| DNS Server IP | : Primary: 222.222.222.222<br>Secondary: 111.111.111.111 |
| PVC | : 9/37 |
| Protocol | : PPPoA |
| Header Control | : hdlc |
| Class | : cbr |
| WAN IP | : 13.1.1.1 |
| Remote WAN IP | : 14.1.1.1 |
| User | : admin |
| Password | : password |
| Authentication | : PAP |

**Command:**

10.0.0.1>ip config ether(10.10.10.1, 2-10, 86400) usb(11.11.11.1, 2-10, 86400) dns(222.222.222.222, 111.111.111.111) 9/37(server, hdlc, cbr, 1500, ip(pap, 13.1.1.1, 14.1.1.1), user(pap, admin, password) password

10.0.0.1>restart

## Setting the device for - PPPoA On CPE Side:

| | |
|---|---|
| Ethernet LAN IP | : 10.10.10.1 |
| DHCP Server | : enabled for 9 users, max-lease-time:86400 |
| USB LAN IP | : 11.11.11.1 |
| DHCP Server | : enabled for 9 users, max-lease-time:86400 |
| DNS Server IP | : Primary: 222.222.222.222<br>Secondary: 111.111.111.111 |
| PVC | : 9/37 |
| Protocol | : PPPoA |
| Header Control | : hdlc |
| Class | : cbr |
| User | : admin |
| Password | : password |

Authentication : PAP
NAT : enabled

**Command:**

```
10.0.0.1>ip config ether(10.10.10.1, 2-10, 86400) usb(11.11.11.1,
        2-10, 86400) dns(222.222.222.222, 111.111.111.111) 9/
        37(ppp, hdlc, cbr, login(pap, admin, password), nat) pass-
        word
10.0.0.1>restart
```

## Setting the device for - PPPoE Client:

Ethernet LAN IP : 10.0.0.1
DHCP Server : enabled for 9 users, max-lease-time:300
USN LAN IP : 11.0.0.1
DHCP Server : enabled for 9 users, max-lease-time:300
DNS Server IP : Primary: 222.222.222.222
Secondary: 111.111.111.111
PVC : 8/36
Protocol : PPPoE Client
Encapsulation : hdlc
Class : cbr
User : admin
Password : password
Authentication : PAP
NAT : enabled

**Command:**

```
10.0.0.1>ip config ether(10.0.0.1, 2-10, 300) usb(11.0.0.1,
        2-10, 300) dns(222.222.222.222, 111.111.111.111)
        8/36(ppp, hdlc, cbr, login(pap, admin, password),
        nat) password
10.0.0.1>restart
```

APPENDIX

A

# TROUBLESHOOTING GUIDE

This reference section provides information on how to resolve issues related to the ADSL devices.

Some of the sections are also included for an experienced operator.

When applied in conjunction with the Chapters on Operation and Configuration, the troubleshooting sections provides help for successful equipment configuration and internet access.

The following pages will guide the user through general problem resolutions.

| POWER ON SEQUENCE | |
|---|---|
| **STEPS** | **EXPLANATION** |
| Power Plug | The Power cord can work with 12V input and plugs into standard AC outlets. Be sure to use the correct plug for the outlet.<br><br>**For the AT-AR240E,** connect one end of the Power cord to the AC wall output and the other end to the Power Adapter. Connect the round cable end of the Power Adapter to the "Power" receptacle on the back of the AT-AR240E.<br><br>**The AT-AR250E** has either a 5V or a 9V DC Power plug. Connect one end of the Power Adapter to the wall jack and the other end to the Power plug located in the Rear panel of the AT-AR250E. It will be powered automatically as soon as the Power Adapter is plugged in. |
| ON/OFF Power Switch | **The AT-AR240E** has a two-position switch, ON and OFF in the Rear panel.<br><br>When the switch is ON, it means that the power is supplied through the AC Power Adapter. After the AC Power Adapter is connected, flip the switch into the ON position.<br><br>The AT-AR240E will show a steady (*green*) Power LED. The Sync LED will be a blinking (*green*) LED initially and will become steady (*green*) once the connection is established.<br><br>Check if the LEDs are ON for proper connections and initial power-on operation.<br><br>**NOTE: The AT-AR250E does not have the Power Switch. It will automatically connect the device when the Power Adapter is connected.** |

| ADSL DEVICE LEDS | | |
|---|---|---|
| **LEDS** | **COLOR** | **EXPLANATION** |
| POWER | ***Green*** (solid) | With the Power Adapter connected and the Power switch ON, this LED must be ON.<br><br>If this LED is not ON, power OFF the device. Check if all the cables are correctly connected and power ON the ADSL device again.<br><br>If this LED remains OFF, the device needs to be serviced. Please refer to the Repair Service Procedure in Chapter 6, Warranty and Shipping Information. |
| SYNC | ***Green*** (solid) | It illuminates to indicate successful DSL connection to the network.<br><br>If after powering up the ADSL device, the LED does not become solid:<br><br>a. Power OFF the unit.<br>b. In a DOS window, use the Ping Utility to check the connections to the ADSL device. |

**Continued**

| ADSL DEVICE LEDS | | |
|---|---|---|
| **LEDS** | **COLOR** | **EXPLANATION** |
| ALARM | ***Red*** (solid) | It indicates the device encountering an error.<br><br>If immediately after powering up the ADSL device, the LED does not flash:<br><br>It means that the device has not been able to sync up. Check the DSL cable connections and settings of the ADSL device.<br><br>If this LED continues to remain ON, the device needs to be serviced. Please refer to the Repair Service Procedure. |
| ATM ACT | ***Green*** (blinking) | The ATM Activity LED shows data traffic. During normal operation, it should be blinking. |
| ETHERNET | ***Yellow*** (blinking)<br>***Green*** (solid) | Without an Ethernet cable attached, the Ethernet port LED must be OFF. If the Ethernet cable is attached, the *green* LED must be ON indicating Ethernet link integrity.<br>From a PC, use the 'Ping Utility' to test connectivity and find out the ADSL device's LAN IP address. The LED (*green*) remains solid when linked to an active Ethernet port and will blink when there is traffic. The LED (*yellow*) indicates the speed utilized by the device. |

| REAR PANEL PORTS & CABLE CONNECTIONS | |
|---|---|
| **PORTS** | **EXPLANATION** |
| DSL port | The DSL port accepts household grade (Category 2 or 3) single twisted-pair wire terminating in a RJ-11 connector.<br><br>When the ADSL device is properly configured and the DSL cable (*green*) is connected, the SYNC LED (Front panel) will change from blinking to a steady *green* LED after 30 seconds, indicating synchronization to the Service Provider.<br><br>See Appendix D: "Digital Subscriber Line (RJ-11)" for cable pinouts. |
| Power | The Power cord can work with 12V input and plugs into standard AC outlets. Be sure to use the correct plug for the outlet.<br><br>**For the AT-AR240E,** connect one end of the Power cord to the AC wall output and the other end to the Power Adapter. Connect the round cable end of the Power Adapter to the "Power" receptacle on the back of the AT-AR240E.<br><br>**The AT-AR250E** has either a 5V or a 9V DC Power plug. Connect one end of the Power Adapter to the wall jack and the other end to the Power plug located in the Rear panel of the AT-AR250E. It will be powered automatically as soon as the Power Adapter is plugged in. |
| Reset Switch | The Reset Switch located on the Rear Panel of the devices will return the device to factory default settings. Use this switch only after consulting Technical Support. |

**Continued**

| REAR PANEL PORTS & CABLE CONNECTIONS | |
|---|---|
| **PORTS** | **EXPLANATION** |
| Ethernet Port/s | The Ethernet ports of the ADSL devices accepts 10BaseT, 10 mega-bits per second, RJ-45 connector. Ethernet cables are Category 5 with 5 twists per foot, terminating in a RJ-45 8 pin connector.<br><br>Attach the *yellow* auto crossing Ethernet cable (provided) from the PC's NIC card to the AT-AR240E's Ethernet port and power ON the device to check for an Ethernet connection.<br><br>**NOTE:** The AT-AR250E does not have a ON/OFF switch. It will be automatically powered on when the Power Adapter is connected.<br><br>The ADSL device accepts an auto crossing Ethernet cable. For correct connection of the LEDs, check the *green* LED on the port.<br><br>**NOTE:** Any of the 4 Ethernet 10/100BaseT ports of the AT-AR250E can be used to directly connect to a Hub or a PC.<br><br>See Appendix D: "Ethernet (RJ-45)" for cable pinouts. |
| USB Port | Connect one end of the *grey* USB cable (provided) to the USB port of the PC and the other end to the USB port on the ADSL device.<br><br>The USB port will be detected as soon as the PC is started for the 1st time. |

| SETTING UP THE PC IP ADDRESS | |
|---|---|
| **HOW TO** | **EXPLANATION** |
| IP Address | The ADSL device's default IP address is 10.0.0.1. The IP address needs to be of the same subnet as the device.<br><br>**For Example:** The IP address should be 10.0.0.2, if the default IP address of the ADSL device is 10.0.0.1.<br><br>**Note:** The Subnet Mask should be 255.255.255.0.<br><br>To properly communicate, the PC must reach the ADSL device over the Ethernet port of the AT-AR240E or any of its 4 Ethernet ports of the AT-AR250E. Check for the connectivity LED (*green)* of the Ethernet port.<br><br>The following steps are recommended to configure the PC. The Service Provider may provide part of the following information to be entered on the PC:<br><br>a. Click **Start** on the Task Bar of the PC, select **Settings** and select **Control Panel**.<br>b. Double-click the **Network** icon.<br>c. In the Configuration window, select the **TCP/IP Protocol** associated with the installed Ethernet card.<br>d. Click on the **Properties** dialog box and select **IP Address** tab.<br>e. Select **Specify an IP address** and fill in the fields with the **IP Address** (example: 10.0.0.2) and **Subnet Mask** (255.255.255.0).<br>f. Click the **Gateway** tab. Enter the **Gateway IP address** (example: 10.0.0.1) and click **Add**.<br>g. Click the **DNS Configuration** tab and click **Enable DNS**.<br>h. Enter **Host** name and **Domain** name.<br>i. Under the **DNS Server Search Order**, enter the **DNS Server IP address** and click **Add**.<br>j. Click **OK** and follow instructions to restart the PC. |

| TESTING PC TO ADSL DEVICE'S ETHERNET CONNECTIVITY | |
|---|---|
| **UTILITY** | **EXPLANATION** |
| PING SYNC | For GUI management, the PC must be able to communicate with the ADSL device over the Ethernet.<br><br>**NOTE:**<br><br>**a. The ADSL device's default LAN IP address is 10.0.0.1, but may have been changed by the Administrator.**<br><br>On the PC, select **Start** and then the **Run** option. Type the following in the **Open** dialog box and select **OK**. It will show the following text:<br><br>**ping 10.0.0.1**<br>Pinging 10.0.0.1 with 32 bytes of data;<br>Reply from 10.0.0.1: bytes=32 time=10 secs, TTL=32"<br><br>Any other message means that the PC cannot reach the ADSL device over the Ethernet. To test the Ethernet connection, check the cable connections to the device.<br><br>If the problem persists, then configure the PC IP address from "Setting up the PC IP Address". |

| ADSL DEVICE'S GUI CONNECTIVITY | |
|---|---|
| **HOW TO** | **EXPLANATION** |
| GUI | The ADSL device's GUI program ships on a CD provided in the package.<br><br>The following procedures are recommended to configure the device through the GUI.<br><br>a. Insert the CD with the GUI provided in the package from Allied Telesyn into the PC's CD drive.<br><br>b. Double-click the file **'GUI Setup'**.<br><br>c. Click **'Unzip'**. The program will automatically extract all the GUI files to a new directory called **'ADSLRouter'** on the C drive.<br><br>d. After the files are unzipped, click **'OK'** and select **'Close'** to terminate the Winzip Application.<br><br>e. Open the directory **'ADSLRouter'** in the C drive.<br><br>f. Double-click on the executable file **'ADSLRouter'** to begin accessing the GUI. |

| CANNOT CONNECT TO THE ADSL ROUTER | |
|---|---|
| | **EXPLANATION** |
| | Check if the ADSL device is properly installed following the instructions from:<br><br>a: Setting up the PC IP address<br>b: Power ON Sequence<br>c: Rear Panel ports and Cable Connections<br>d: ADSL device's LEDs<br><br>Ensure that the PC and the ADSL device are on the same network segment.<br><br>Ensure that the PC is using an IP address within the default range of 10.0.0.2 to 10.0.0.254. This will make it compatible with the ADSL Device's default IP address of 10.0.0.1.<br><br>The Subnet Mask should be set to 255.255.255.0 to match the ADSL device's subnet.<br><br>These parameters can be checked by using the **Start/Settings/ Control Panel/Network** to check the properties for the TCP/IP protocol. |

APPENDIX

# B

# SPECIFICATIONS OF AT-AR240E

**[ ADSL Features**

- Compatible with all leading DSLAMs
- Supports DMT line modulation
- Supports full-rate ADSL: up to 8 Mbps downstream and up to 1 Mbps upstream (G.992.1 & T1.413, Issue 2)
- Supports G.lite ADSL: up to 1.5 Mbps downstream and up to 512 Kbps upstream (G.992.2)
- Supports DSL handshaking (G.994.1)

**[ Routing Features**

- TCP/IP with RIP v1.0, v2.0
- Static Routing

**[ Bridging Features**

- Transparent Learning Bridging including Spanning Tree Protocol (IEEE 802.1D)

**[ ATM Features**

- RFC1483 Encapsulation (IP, Bridging & Encapsulated Routing)
- PPP over ATM (LLC & VC multiplexing) (RFC2364)
- Classical IP (RFC1577)
- Supports up to 8 PVCs
- Traffic Shaping (UBR, VBR, CBR)
- ILMI v4.0
- OAM (I.610) support
- PPPoE Relay
- PPPoE Client

**[ LAN Features**

- DHCP Server
- DHCP Client
- DHCP Relay
- DNS Relay
- IP Multicast

**[ Physical Interfaces**

- ADSL Router/Bridge with a 10BaseT Ethernet port, an USB port & an ADSL port
- WAN/LAN Status, Power and Ethernet LED indicators

**[ Operating Environment**

- Temperature Conditions : 0° to 40° C, 32° to 104° F
- Humidity : 5% to 90% RH non-condensing

**[ Management Features**

- Plug-and-Play Installation
- Local & Remote Management
- Microsoft Windows configuration
- Telnet Configuration
- Command Line Interface
- Firmware upload/download via TFTP/BOOTP
- Alarm Status and Power Indicators
- Event & History logging
- Network Ping & Traceroute
- SNMP Support

**[ Security Features**

- Fire wall
  - Packet Filtering
  - NAT
  - NAPT
- VPN
  - PPTP Support
  - L2TP Support
- Password protected configuration access
- User authentication (PAP/CHAP) with PPP

## [ LEDs

- *Front Panel:*
  - Power
  - ADSL Sync
  - Alarm
  - ATM ACT

- *Rear Panel:*
  - Ethernet Link Status (*Green*)
  - Ethernet Tx/Rx (Blinking *Yellow* for data traffic)

## [ Physical Specifications

- Height : 1.5"
- Depth : 6"
- Width : 8"
- Weight : 1.5 lbs
- Color : Off White

APPENDIX

C

# SPECIFICATIONS OF AT-AR250E

**[ ADSL Features**

- Compatible with all leading DSLAMs
- Supports DMT line modulation
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- Local & Remote Management
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- Network Ping & Traceroute
- SNMP Support

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  - Packet Filtering
  - NAT
  - NAPT
- VPN
  - PPTP Support
  - L2TP Support
- Password protected configuration access
- User authentication (PAP/CHAP) with PPP

## [ LEDs

- *Front Panel:*
  - Power
  - ADSL Sync
  - Alarm
  - ATM ACT

- *Rear Panel:*
  - Ethernet Link Status (*Green*)
  - Ethernet Tx/Rx (Blinking *Yellow* for data traffic)

## [ Physical Specifications

- Height : 1.5"
- Depth : 6"
- Width : 8"
- Weight : 1.5 lbs
- Color : Off White

APPENDIX

# D

# INTERFACE PIN ASSIGNMENTS

**[ Digital Subscriber Line (RJ-11)**

| • Signal Name | Pin |
|---|---|
| Tip | 3 |
| Ring | 4 |

**[ Ethernet (RJ-45)**

| • ***Signal Name*** | ***Pin*** |
|---|---|
| RD+ | 1 |
| RD- | 2 |
| TD+ | 3 |
| TD- | 6 |

APPENDIX

# E

# DEFAULT SETTINGS

**[ System Module**

- IP Address : 10.0.0.1
- Access Level : Admin/Full Access
- Password : password (minimum 4 alphabetic characters)
- Language : English

**[ ATM Module**

- VPI : 0
- VCI : 35
- Encap type : LLC
- encap protocol : RFC1483 (Bridged)

- encap protocol : RFC1483 (Routed) **FOR AT-AR250E**