ALC1224

ADSL Line Card

Version 3.50 (LK.0), (LV.0)

August 2004

User's Guide

ZyXEL

Unleash Networking Power

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- Warranty information.
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METHOD / LOCATION	SUPPORT E-MAIL SALES E-MAIL	TELEPHONE[1] FAX[1]	WEB SITE FTP SITE	REGULAR MAIL
WORLDWIDE	support@zyxel.com.tw sales@zyxel.com.tw	+886-3-578-3942 +886-3-578-2439	www.zyxel.com www.europe.zyxel.com ftp.zyxel.com ftp.europe.zyxel.com	ZyXEL Communications Corp. 6 Innovation Road II Science Park Hsinchu 300 Taiwan
NORTH AMERICA	support@zyxel.com sales@zyxel.com	+1-800-255-4101 +1-714-632-0882 +1-714-632-0858	www.us.zyxel.com ftp.us.zyxel.com	ZyXEL Communications Inc. 1130 N. Miller St. Anaheim CA 92806-2001 U.S.A.
GERMANY	support@zyxel.de sales@zyxel.de	+49-2405-6909-0 +49-2405-6909-99	www.zyxel.de	ZyXEL Deutschland GmbH. Adenauerstr. 20/A2 D-52146 Wuerselen Germany
FRANCE	info@zyxel.fr	+33 (0)4 72 52 97 97 +33 (0)4 72 52 19 20	www.zyxel.fr	ZyXEL France 1 rue des Vergers Bat. 1 / C 69760 Limonest France
SPAIN	support@zyxel.es sales@zyxel.es	+34 902 195 420 +34 913 005 345	www.zyxel.es	ZyXEL Communications Alejandro Villegas 33 1º, 28043 Madrid Spain
DENMARK	support@zyxel.dk sales@zyxel.dk	+45 39 55 07 00 +45 39 55 07 07	www.zyxel.dk	ZyXEL Communications A/S Columbusvej 5 2860 Soeborg Denmark
NORWAY	support@zyxel.no sales@zyxel.no	+47 22 80 61 80 +47 22 80 61 81	www.zyxel.no	ZyXEL Communications A/S Nils Hansens vei 13 0667 Oslo Norway
SWEDEN	support@zyxel.se sales@zyxel.se	+46 31 744 7700 +46 31 744 7701	www.zyxel.se	ZyXEL Communications A/S Sjöporten 4, 41764 Göteborg Sweden
FINLAND	support@zyxel.fi	+358-9-4780-8411	www.zyxel.fi	ZyXEL Communications Oy Malminkaari 10 00700 Helsinki Finland

[1] "+" is the (prefix) number you enter to make an international telephone call.

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Preface

About this User's Manual

This user's guide gives hardware specifications and explains web configurator and command line configuration, management and troubleshooting for the ADSL line card. It also gives hardware specifications for the ADSL splitter card.

ALC1224 Models and Firmware Releases

The firmware version contains a model code. In firmware version V3.50(LK.0) for example; "LK" is the model code.

- "LK" denotes the ALC1224-71 for ADSL over POTS (Annex A).
- "LV" denotes the ALC1224-73 for ADSL over ISDN (Annex B).

A firmware version also includes the firmware's release number. In firmware version V3.50(LK.0) for example, "0" is the firmware's release number. This varies as new firmware is released. Your firmware's release number may not match what is displayed in this *User's Guide*.

General Syntax Conventions

- Mouse action sequences are denoted using a comma. For example, click **Start, Settings, Control Panel, Network** means first you click **Start**, click or move the mouse pointer over **Settings**, then click or move the mouse pointer over **Control Panel** and finally click (or double-click) **Network**.
- "Enter" means for you to type one or more characters. "Select" or "Choose" means for you to use one of the predefined choices.
- Predefined choices are in **Bold Arial** font.
- Button and field labels, links and screen names in are in **Bold Times New Roman** font.
- A single keystroke is in Arial font and enclosed in square brackets. [ENTER] means the Enter, or carriage return key; [ESC] means the Escape key and [SPACE BAR] means the Space Bar.
- For brevity's sake, we will use "e.g.," as shorthand for "for instance", and "i.e.," for "that is" or "in other words".

Naming Conventions

See also the Integrated Ethernet Switch Overview in chapter 1.

- The ALC1224 (ADSL Line Card) may be referred to as the "ALC", the "line card" or the "card".
- "ALC1224" refers to the ALC1224-71 for ADSL over POTS (Annex A). "ALC1224" also refers to the ALC1224-73 for ADSL over ISDN (Annex B). Differentiation is made where needed.
- The ASC1024 (ADSL Splitter Card) may be referred to as the "splitter card".
- "ASC1024" refers to both the ASC1024-61 for ADSL over POTS (Annex A) and the ASC1024-63 for ADSL over ISDN (Annex B) versions. Differentiation is made where needed.
- The IES-2000 or IES-3000 may be referred to as the "Integrated Ethernet Switch", the "switch" or the "system".

- The MSC1000 or MSC1000A (Management Switch Card) may be referred to as the "management switch card".

Related Documentation

- Web Configurator Online Help

Embedded web help for descriptions of individual screens and supplementary information.

- IES-2000 or IES-3000 User's Guide

Refer to the IES-2000 or IES-3000 User's Guide for directions on installation, connections, maintenance, hardware trouble shooting and safety warnings.

- Management Switch Card User's Guide

This user's guide provides hardware connection details and configuration and management instructions for the management switch card.

- Glossary and ZyXEL Web Site

Please refer to www.zyxel.com for an online glossary of networking terms or the ZyXEL download library for additional support documentation.

Register your product online at www.zyxel.com for global products, or at www.us.zyxel.com for North American products.

Part I:

ALC1224 Overview

This part introduces the general features default settings and hardware of the ADSL line card.

Chapter 1
ALC1224 Overview

This chapter introduces the ADSL line card's general features, factory default settings and hardware.

1.1 Integrated Ethernet Switch Overview

The Integrated Ethernet Switch is an IP-based DSLAM (Internet Protocol Digital Subscriber Line Access Multiplexer) that connects DSL subscribers to the Internet. It includes the following components:

- The IES-3000 or IES-2000 main chassis.
    - The ALC1224 ADSL line card (documented in this user's guide) provides ADSL service for subscribers.
    - The management switch card controls the Integrated Ethernet Switch and connects it to an Ethernet backbone network.
- The IES-3000 or IES-2000 splitter chassis.
    - The ASC1024 is a splitter card (documented in this user's guide) combines phone service and ADSL.

1.2 ALC1224 Overview

The ALC1224 (ADSL Line Card) provides ADSL service for 24 subscribers over existing telephone wiring, thus avoiding the cost and hassle of installing new wiring. ADSL allows you to extend the reach of broadband services up to 18,000 feet. This makes the ADSL line card perfect for providing high bandwidth broadband service to subscribers who are spread out over a large area.

The ASC1024 (ADSL Splitter Card) combines voice service and ADSL on the same telephone wiring.

Use this chapter's Telco-50 connector pin assignments along with the directions and safety warnings in the *Integrated Ethernet Switch's User's Guide* to install the cards and make the necessary connections. Install the ADSL line card in the main chassis. Install the ADSL splitter card in the splitter chassis.

1.3 Features of the ALC1224

ADSL Compliance

- Multi-Mode ADSL standard
    - G.dmt (ITU-T G.992.1)
    - G.lite (ITU-T G.992.2)
    - G.hs (ITU-T G.994.1)

  - ANSI T1.413 issue 2
  - ADSL2: G.992.3, G.992.4[1]
  - ADSL2+: G.992.5
- Rate adaptation support

IEEE 802.1p Priority

Your ADSL line card uses IEEE 802.1p Priority to assign priority levels to individual ports.

Multiple PVC and ATM QoS

The ADSL line card allows you to use different channels (also called Permanent Virtual Circuits or PVCs) for different services or subscribers. Define channels[2] on each DSL port for different services or levels of service and assign each channel a priority. ATM Quality of Service (QoS) allows you to regulate the average rate and fluctuations of data transmission. This helps eliminate congestion to allow the transmission of real time data (such as audio and video).

IEEE 802.1x Port-based Authentication

The ADSL line card supports the IEEE 802.1x standard for centralized user authentication and accounting management through an optional network authentication (RADIUS) server.

Protocol

Multiple Protocols over AAL5 (RFC 1483)

Management

- Remote configuration backup/restore and firmware upgrade
- SNMP manageable
- Text-based management locally via console port and remotely via telnet
- Web configurator

MAC (Media Access Control) Filter

Use the MAC filter to filter incoming frames based on MAC (Media Access Control) address(es) that you specify. You may enable/disable the MAC filter on specific ports. You may specify up to ten MAC addresses per port.

MAC (Media Access Control) Count Filter

You can limit the number of MAC addresses that may be dynamically learned on a port. You may enable/disable the MAC count filter on individual ports.

System Monitoring

[1] At the time of writing, the ALC1224 only supports the line rates for ADSL2 and ADSL2+ (not other features); and the ALC1224's interoperability when using ADSL2 and ADSL2+ has not yet been tested.

[2] Up to eight channels on each DSL port at the time of writing.

- System status (link status, rates, statistics counters)
- Temperatures, voltage reports and alarms.

Overheating Detection, Warning and Safeguard

The **ALM** LED turns on when the line card's internal temperature is too high and turns off when the temperature has returned to a normal level.

1.4 Default Settings

This section lists the default configuration of the ALC1224.

1.4.1 Default ADSL Settings

The following are general default settings of the ADSL ports.

- Enable/Disable State: Disabled
- Operational Mode: auto

1.4.2 Default Profile Settings

The following are the settings of the default profile.

- Name: DEFVAL
- Profile Status: Active
- Latency Mode: Interleave

Downstream ADSL settings:

- Target Signal/Noise Ratio: 6 db
- Maximum Signal/Noise Ratio: 31 db
- Minimum Signal/Noise Ratio: 0 db
- Minimum Transmission Rate: 32 Kbps
- Maximum Transmission Rate: 2048 Kbps
- Latency Delay: 4 ms

Upstream ADSL settings:

- Target Signal/Noise Ratio: 6 db
- Maximum Signal/Noise Ratio: 31 db
- Minimum Signal/Noise Ratio: 0 db
- Minimum Transmission Rate: 32 Kbps
- Maximum Transmission Rate: 512 Kbps

- Latency Delay: 4 ms

1.4.3 Default PVC Settings

The following are the default PVC settings.

- VPI: 0
- VCI: 33
- Super channel
- VC Profile: DEFVAL

1.4.4 Default VC Profile Settings

The following are settings of the default VC profiles.

DEFVAL Profile Settings

- Encapsulation: RFC 1483
- Multiplexing: LLC-based
- AAL: AAL5
- Traffic Class: UBR
- PCR: 300000 Kbps
- CDVT: 0

DEFVAL_VC Profile Settings

- Encapsulation: RFC 1483
- Multiplexing: VC-based
- AAL: AAL5
- Traffic Class: UBR
- PCR: 300000 Kbps
- CDVT: 0

1.4.5 Default VLAN Settings

The following are the default VLAN settings.

- One VLAN created

- VID: 1
- Registration: Fixed for all ports
- Tagging: Untag for all ports

1.5 Front Panels

Figure 1-1 ALC1224-71 Front Panel

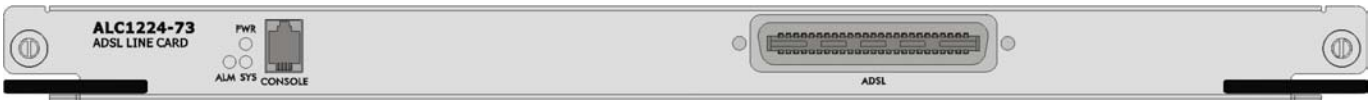


Figure 1-2 ALC1224-73 Front Panel

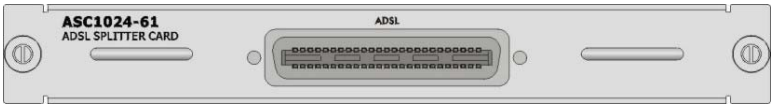


Figure 1-3 ASC1024-61 Front Panel

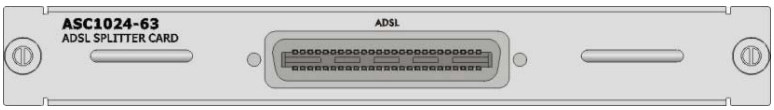


Figure 1-4 ASC1024-63 Front Panel

1.6 Hardware Specifications

These are the hardware details of the ALC1224 and ASC1024.

1.6.1 ALC1224 Ports

Table 1-1 ALC1224 Front Panel Ports

PORT	DESCRIPTION
ADSL	This Telco-50 connector is for connecting to the ASC1024 (ADSL Splitter Card).

Table 1-1 ALC1224 Front Panel Ports

PORT	DESCRIPTION
CONSOLE	This mini-RJ-11 port is for connecting to a computer for local management. Use a console cable to connect this port to a serial port (COM1, COM2 or other COM port) on your computer. Your computer should have a terminal emulation communications program (such as HyperTerminal) set to VT100 terminal emulation, no parity, 8 data bits, 1 stop bit, no flow control and 9600 bps port speed. Only use this port for troubleshooting. Configuration changes that you make using this console port are effective during run-time only and are lost when the card restarts. An ALC1224 console port session has priority over (and blocks) a telnet session. **Do not use the ALC1224's console port while using the management switch card's console port.**

1.6.2 ALC1224 LEDs

Table 1-2 LED Descriptions

LED	COLOR	STATUS	DESCRIPTION
PWR	Green	On	The system is up.
		Off	The system is off or not receiving power.
ALM	Red	Blinking	The line card's temperature and voltage monitoring hardware has failed.
		On	The line card has overheated or its voltage is out of the normal range.
		Off	The line card is functioning within its normal temperature and voltage range.
SYS	Green	Blinking	The line card is starting.
		On	The line card is on and functioning properly.
		Off	The line card is not receiving power, is not ready or has malfunctioned.

1.6.3 ASC1024 Ports

Table 1-3 ASC1024 Front Panel Ports

PORT	DESCRIPTION
ADSL	This Telco-50 connector is for connecting to the ALC1224 (ADSL Line Card).

1.6.4 Fuse Rating

The ALC1224 uses one 5mm (D) x 20mm (L), T type, 4 amp, 250 Volt AC fuse.

1.6.5 Weight

ALC1224: 1.8 kg ASC1024: .8 kg

1.7 Hardware Telco-50 Connector Pin Assignments

The following diagram shows the pin assignments of the Telco-50 connectors on the ADSL line card, the ADSL splitter card and the **USER** Telco-50 connectors on the Integrated Ethernet Switch splitter chassis' rear panel. The pin assignments for the IES splitter chassis with wire wrapping pins are the same as the ones shown for the Telco-50 connectors.

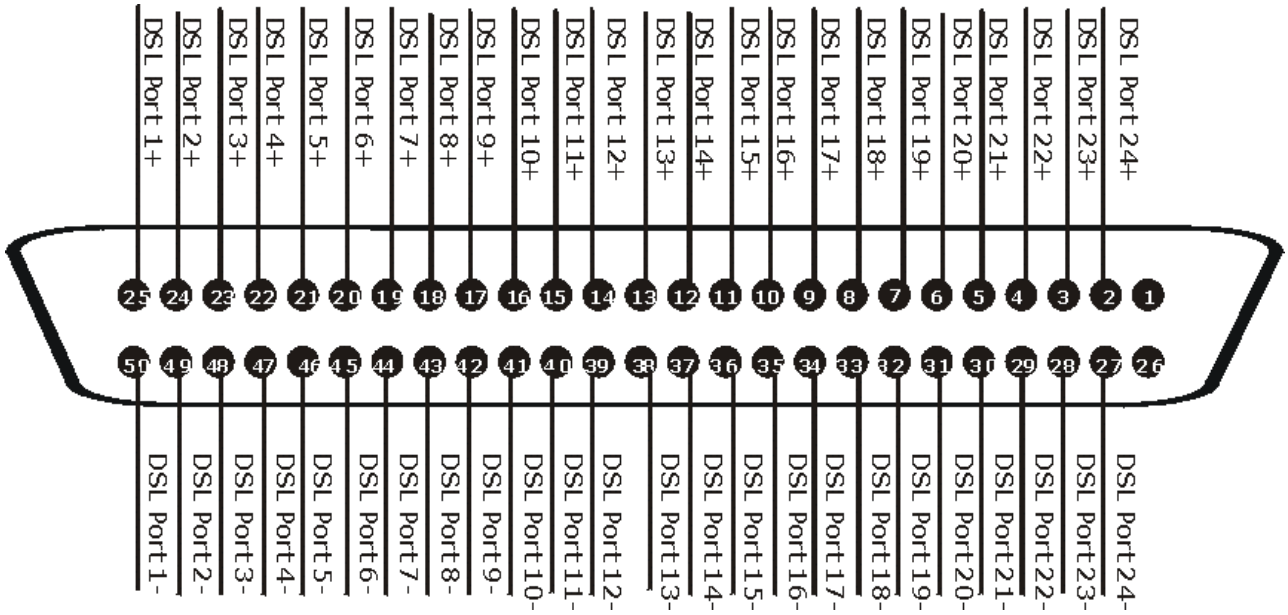


Figure 1-5 ALC1224, ASC1024, and USER Telco-50 Pin Assignments

The following diagram shows the phone port pin assignments of the **CO** Telco-50 connectors on the splitter chassis' rear panel.

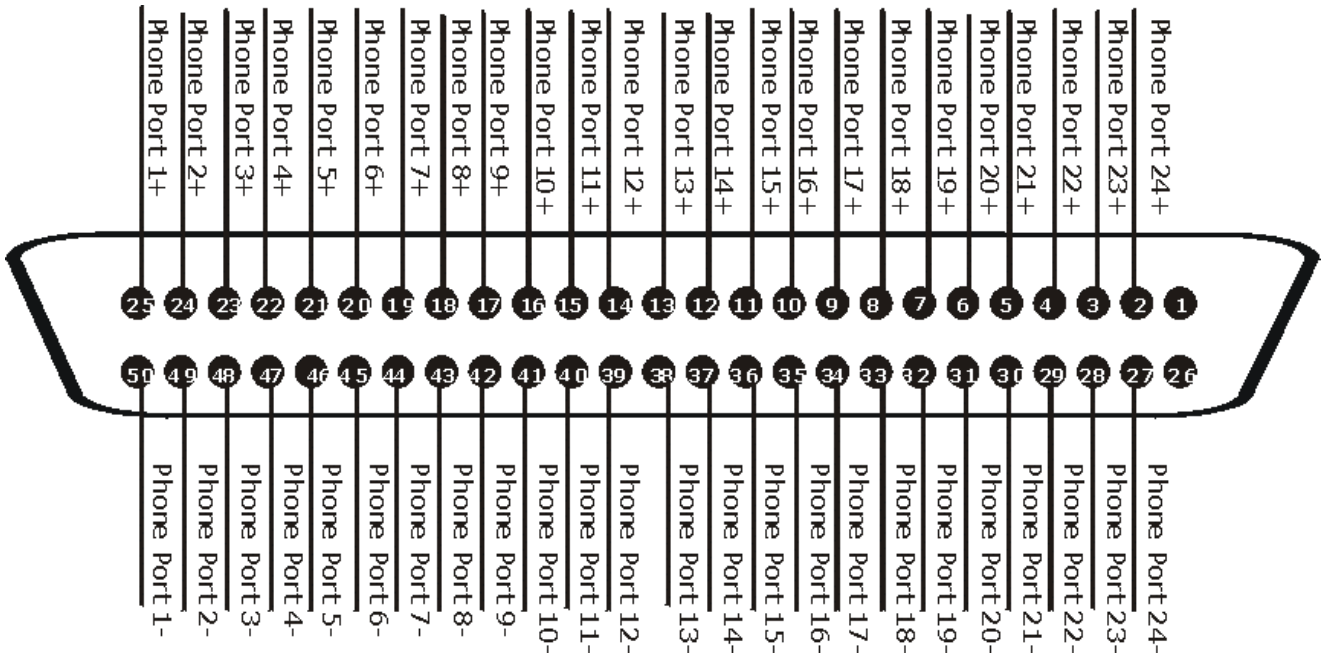


Figure 1-6 CO Telco-50 Pin Assignments

This table lists the ports and matching pin numbers for the hardware Telco-50 connectors.

Table 1-4 Hardware Telco-50 Connector Port and Pin Numbers

PORT NUMBER	PIN NUMBER
1	25, 50
2	24, 49
3	23, 48
4	22, 47
5	21, 46
6	20, 45
7	19, 44
8	18, 43
9	17, 42
10	16, 41
11	15, 40
12	14, 39
13	13, 38
14	12, 37
15	11, 36
16	10, 35
17	9, 34
18	8, 33
19	7, 32
20	6, 31
21	5, 30
22	4, 29
23	3, 28
24	2, 27

1.8 Telco-50 Cable Telco-50 Connector Pin Assignments

Use Telco-50 cables to connect the ADSL line card to the ADSL splitter card. The following diagrams show the pin assignments that you need to have on the Telco-50 connectors on the Telco-50 cables. Refer to

See *Table 1-5* for a list of the pin assignments.

1.8.1 Telco-50 Cable Telco-50 Connector Pin Assignments with IES-2000

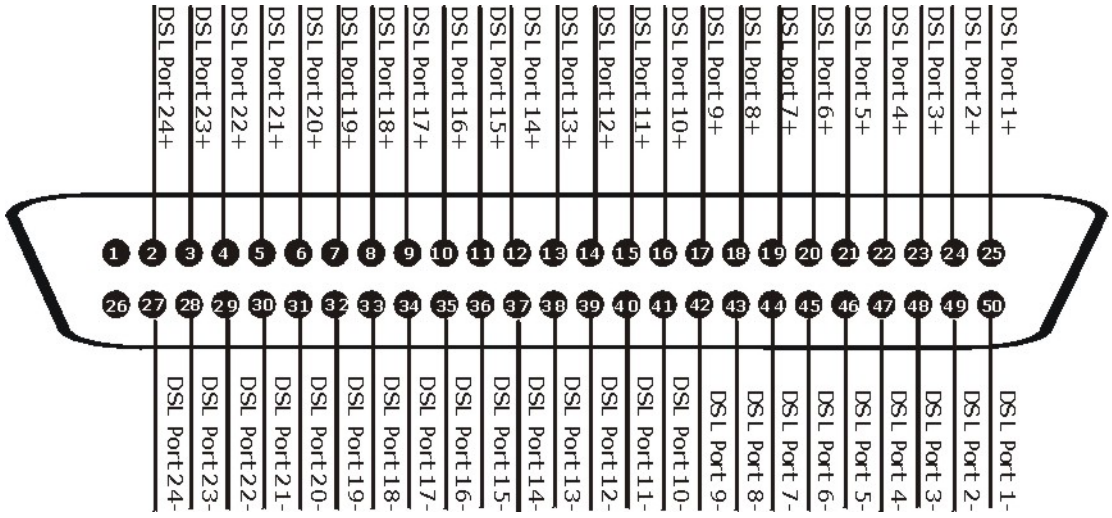


Figure 1-7 IES-2000 Telco-50 Cable Telco-50 Connector Pin Assignments

1.8.2 Telco-50 Cable Telco-50 Connector Pin Assignments with IES-3000

The IES-3000 Telco-50 cable's right Telco-50 connector connects to the splitter chassis card.

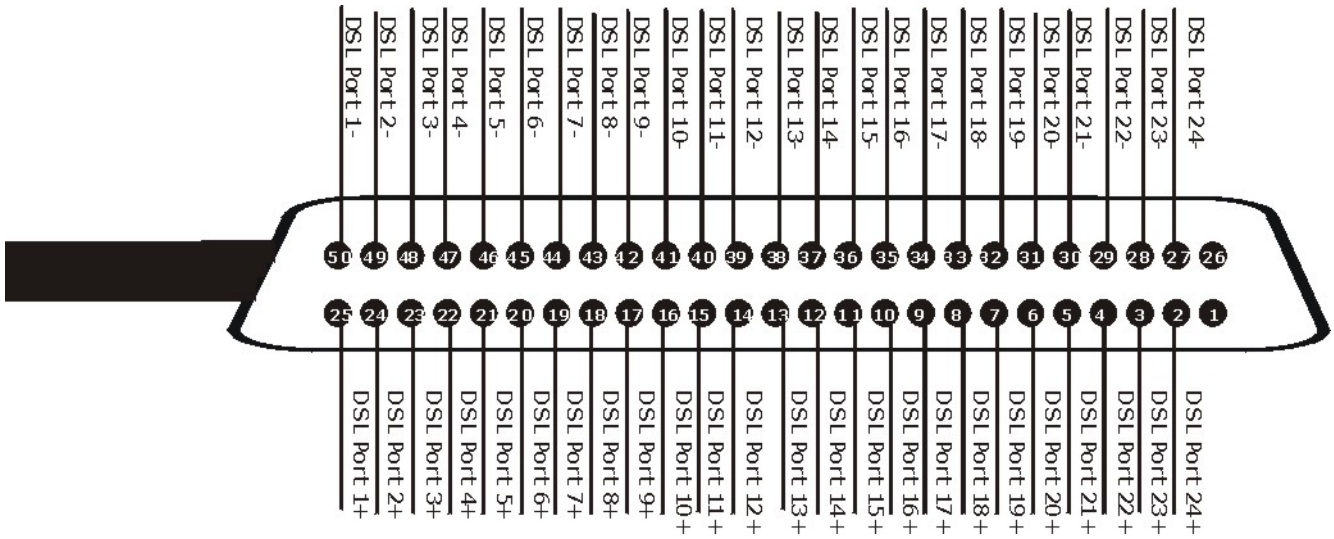


Figure 1-8 IES-3000 Telco-50 Cable Right Telco-50 Connector Pin Assignments

The IES-3000 Telco-50 cable's left Telco-50 connector connects to the DSL line card.

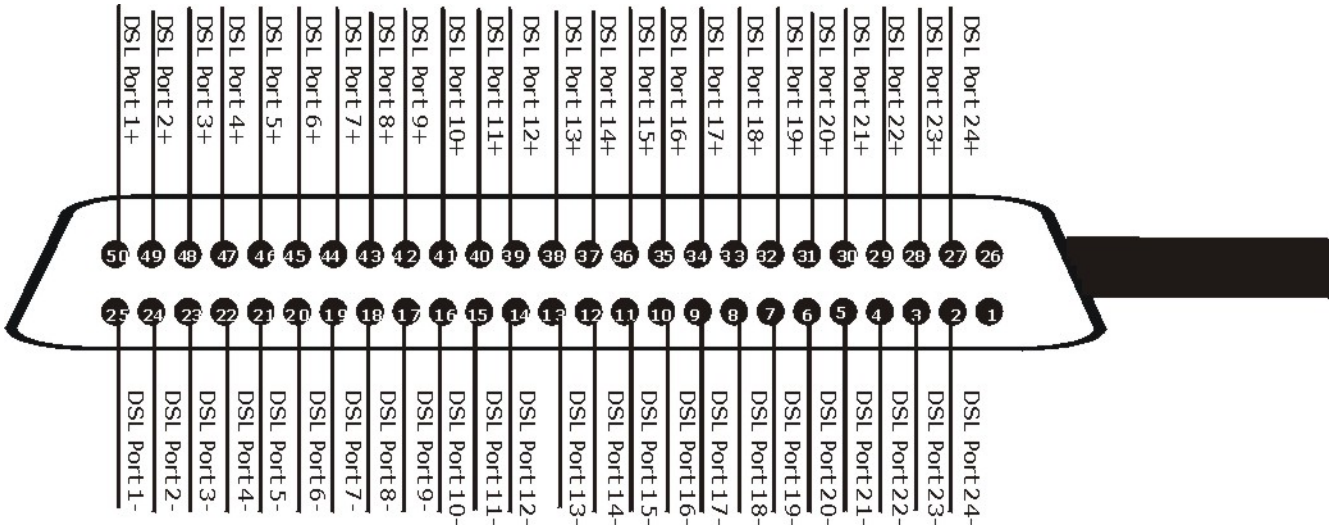


Figure 1-9 IES-3000 Telco-50 Cable Left Telco-50 Connector Pin Assignments

Table 1-5 Telco-50 Cable Telco-50 Pin Assignments

PORT NUMBER	PIN NUMBER
1	25, 50
2	24, 49
3	23, 48
4	22, 47
5	21, 46
6	20, 45
7	19, 44
8	18, 43
9	17, 42
10	16, 41
11	15, 40
12	14, 39
13	13, 38
14	12, 37
15	11, 36
16	10, 35
17	9, 34
18	8, 33
19	7, 32
20	6, 31
21	5, 30
22	4, 29

Table 1-5 Telco-50 Cable Telco-50 Pin Assignments

PORT NUMBER	PIN NUMBER
23	3, 28
24	2, 27

Part II:

Web Configurator Getting Started

This part tells how to access and navigate the web configurator. It also describes the **Getting Started** web configurator screens.

Chapter 2
Web Configurator Introduction

This chapter tells how to access and navigate the web configurator when you use the ADSL line card with the management switch card.

2.1 Web Configurator Overview

The web configurator allows you to use a web browser to manage the ADSL line card while it is behind the management switch card. The chapters on using the web configurator with the management switch card give basic descriptions of the ADSL line card screens.

2.2 Accessing the Web Configurator

Use Internet Explorer 5.5 and later or Netscape Navigator 6 and later versions.

Use the following instructions to log on to the web configurator.

2.2.1 Password

1. Start your web browser.
2. Launch your web browser and enter the IP address of the Integrated Ethernet Switch ("192.168.1.1" is the factory default) in the **Location** or **Address** field. Press **Enter**.
3. The **Password** screen now appears. Type "admin" in the user name field (it may display automatically for you) and your password (factory default "1234") in the password field.
4. Click **Login**.

Figure 2-1 Login Screen

2.2.2 Change Password

This screen prompts you to change your password if it is still set to the default.

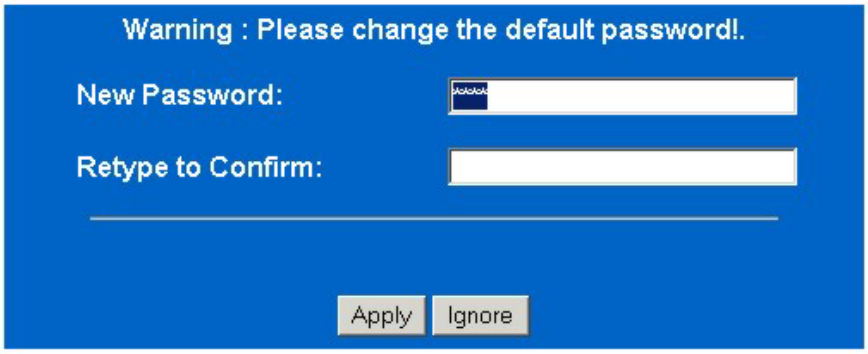


Figure 2-2 Change Password Screen

2.3 Home Screen

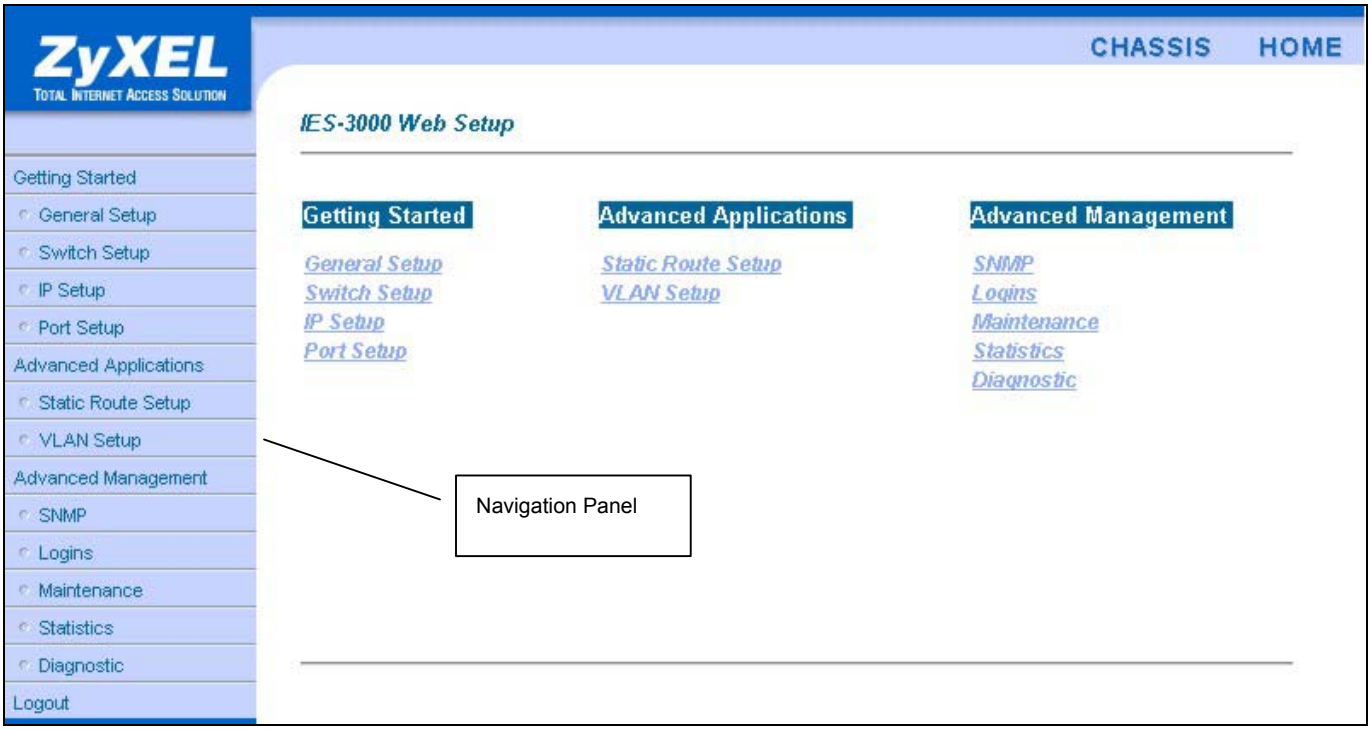


Figure 2-3 Home Screen

This is the web configurator's home screen. Click a link on the navigation panel to go to the corresponding screen.

The following table lists the links that you use to configure or monitor the line card.

Table 2-1 Navigation Panel Links

LABEL	DESCRIPTION
Getting Started	
Port Setup	This link takes you to screens where you can configure settings for the line card's individual DSL ports.
Advanced Applications	
VLAN Setup	This link takes you to screens where you can configure VLANs for the line card.
Advanced Management	
Maintenance	This link takes you to a screen where you can perform firmware file maintenance on the line card.
Statistics	This link takes you to screens where you can view statistical information about the status of the line card.
Diagnostic	This link takes you to a screen where you can view error logs.
Logout	Click this to exit the web configurator.

2.4 Screens Overview

The following table lists the various web configurator screens that pertain to the ADSL line card.

Table 2-2 Web Configurator Screens

GETTING STARTED	ADVANCED APPLICATIONS	ADVANCED MANAGEMENT
Port Setup	VLAN Setup	Maintenance
ALC Port Setup	Static VLAN Setup	Firmware Upgrade
ALC Profile Setup	ALC Add/Edit VLAN	Card Firmware Upgrade
ALC Profile Add/Edit		Statistics
802.1x Setup		ALC Statistics
Edit 802.1x Setup		ALC Hardware Monitor
Packet Type Filter Setup		ALC Port Statistics
Packet Type Filter Edit		ALC Channel Statistics
MAC Filter Setup		ALC 802.1Q VLAN Statistics
MAC Filter Entry List		Diagnostic
MAC Filter Entry Add		ALC Diagnostic
MAC Count Filter Setup		ALC Diagnostic DSL
MAC Count Filter Edit		
ALC Edit Port Setup		
Channel Setup		
VC Profile Setup		
Edit VC Profile Setup		
Edit Channel Setup		

2.5 Saving Your Configuration

Click **Apply** in a configuration screen when you are done modifying the settings in that screen to save your changes back to the switch.

2.6 Navigating the Web Configurator

The web configurator uses multiple levels. You only need to use one level for features that deal with the IES-2000 or IES-3000 as a whole. For example, to configure **General Setup**, click the link on the navigation panel to open the configuration screen.

Features that are based on individual cards, for example **Port Setup**, require you to go down another level. Click the link on the navigation panel, and then click the card's link (see *Figure 2-4*) to open the configuration screen.

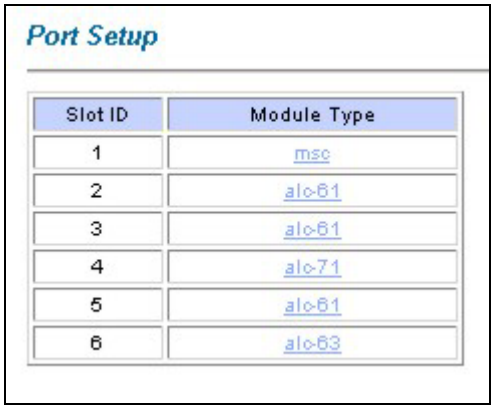


Figure 2-4 Select a Line Card

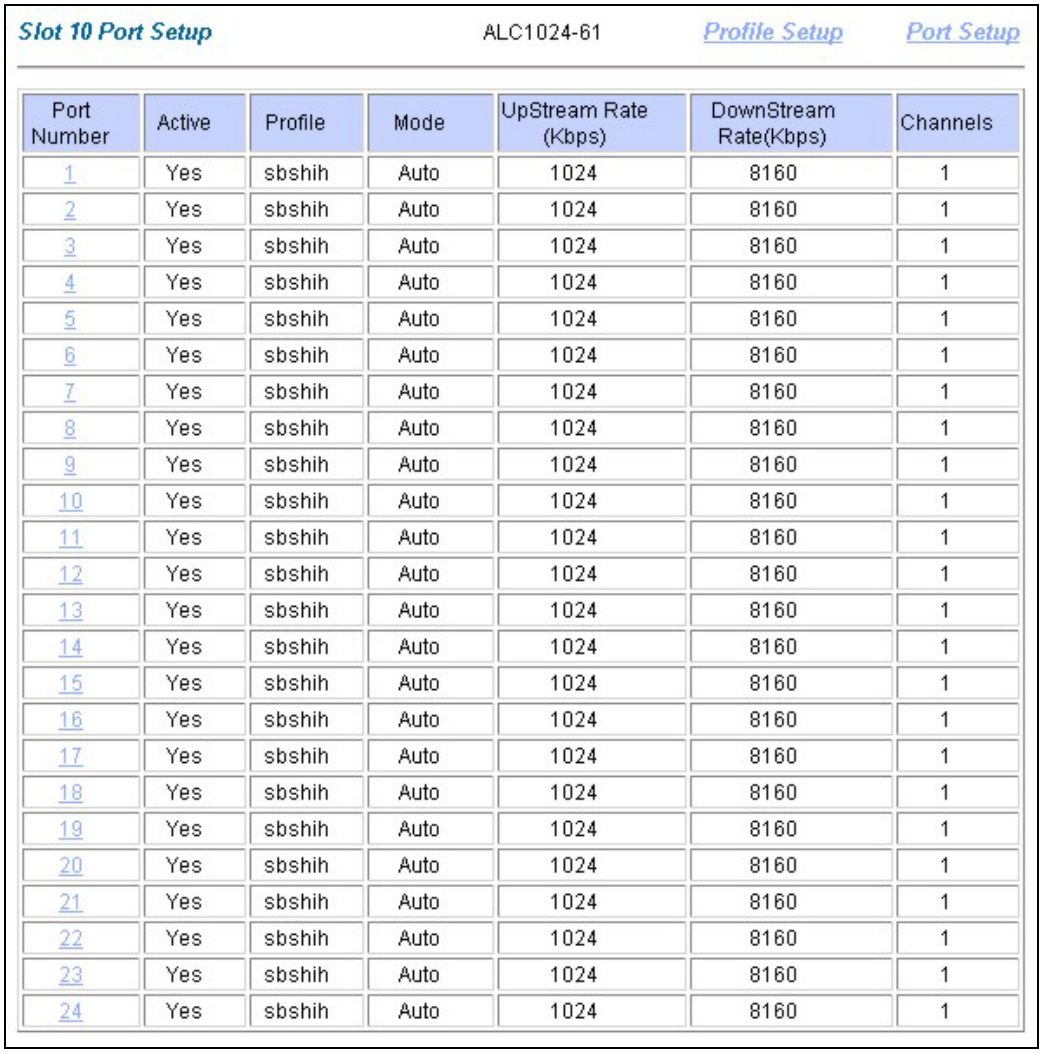
Table 2-3 Select a Line Card

LABEL	DESCRIPTION
Slot ID	This is the slot number.
Module Type	Click a link in this column to go to the port setup screens for a card.

There may be yet more levels below to allow you to make more and more specific configurations, for example **Port Setup** on the ADSL line card has screens that allow you to configure individual profiles and individual ports.

A configuration screen for an individual card displays the card's slot number in front of the screen's title in the upper left corner of the screen (see *Figure 2-5*).

Many of the configuration screens that are based on individual cards have one or more links in the upper-right corner. Click a link to go to the screen with the same name. For example, click **Port Setup** in the **ALC Port Setup** screen (see *Figure 2-5*) to go to the general **Port Setup** screen (see *Figure 2-4*).



Slot 10 Port Setup ALC1024-61 Profile Setup Port Setup

Port Number	Active	Profile	Mode	UpStream Rate (Kbps)	DownStream Rate(Kbps)	Channels
1	Yes	sbshih	Auto	1024	8160	1
2	Yes	sbshih	Auto	1024	8160	1
3	Yes	sbshih	Auto	1024	8160	1
4	Yes	sbshih	Auto	1024	8160	1
5	Yes	sbshih	Auto	1024	8160	1
6	Yes	sbshih	Auto	1024	8160	1
7	Yes	sbshih	Auto	1024	8160	1
8	Yes	sbshih	Auto	1024	8160	1
9	Yes	sbshih	Auto	1024	8160	1
10	Yes	sbshih	Auto	1024	8160	1
11	Yes	sbshih	Auto	1024	8160	1
12	Yes	sbshih	Auto	1024	8160	1
13	Yes	sbshih	Auto	1024	8160	1
14	Yes	sbshih	Auto	1024	8160	1
15	Yes	sbshih	Auto	1024	8160	1
16	Yes	sbshih	Auto	1024	8160	1
17	Yes	sbshih	Auto	1024	8160	1
18	Yes	sbshih	Auto	1024	8160	1
19	Yes	sbshih	Auto	1024	8160	1
20	Yes	sbshih	Auto	1024	8160	1
21	Yes	sbshih	Auto	1024	8160	1
22	Yes	sbshih	Auto	1024	8160	1
23	Yes	sbshih	Auto	1024	8160	1
24	Yes	sbshih	Auto	1024	8160	1

Figure 2-5 ALC Port Setup

Click a link labeled **Up** to go to a screen on the next higher level. For example, click **Up** in the **ALC Edit Port Setup** screen (see *Figure 2-6*) to go to the **ALC Port Setup** screen (see *Figure 2-5*).

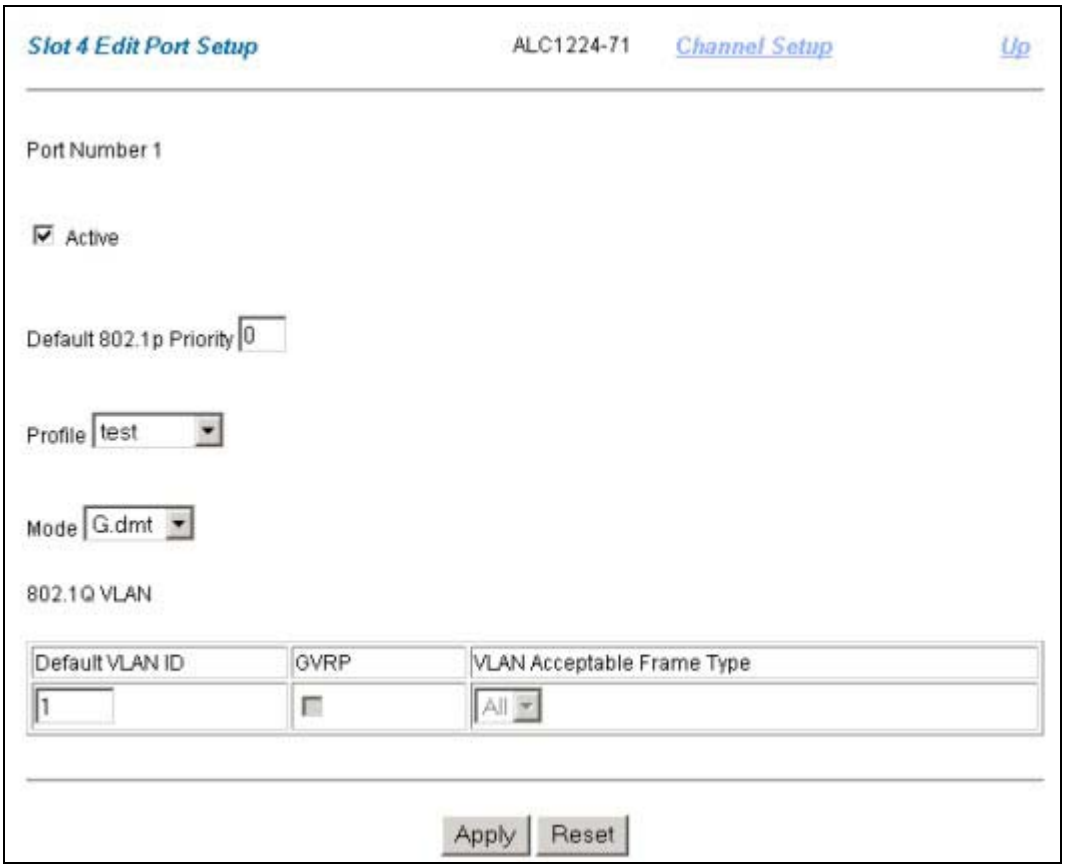


Figure 2-6 ALC Edit Port Setup

Chapter 3
ADSL Port Setup

This chapter explains how to configure the line card's ADSL ports.

3.1 ADSL Port Setup Overview

The web configurator allows you to configure settings for profiles and individual ADSL ports on the line card. See *Chapter 4 Virtual Channel Management* for information on configuring virtual channels and virtual channel profiles.

3.2 ADSL Standards Overview

Table 3-1 Maximum Transfer Rates of the ADSL Ports

STANDARD	MAXIMUM DOWNSTREAM	MAXIMUM UPSTREAM
G.dmt (ALC1224-71)	8160 Kbps	1024 Kbps
G.dmt Annex B (ALC1224-73)	8160 Kbps	1024 Kbps
ETSI (ALC1224-73)	8160 Kbps	1024 Kbps
ANSI T1.413 issue 2 (ALC1224-71)	8160 Kbps	1024 Kbps
ADSL2[1]	12000 Kbps	1200 Kbps
ADSL2+[2]	25000 Kbps	1200 Kbps

3.3 Downstream and Upstream

Downstream refers to traffic going out from the line card to the subscriber's ADSL modem or router. Upstream refers to traffic coming into the line card from the subscriber's ADSL modem or router.

3.4 Profiles

A profile is a table that contains a list of pre-configured ADSL settings. Each ADSL port has one (and only one) profile assigned to it at any given time. The profile defines the latency mode and upstream/downstream latency delay, maximum and minimum upstream/downstream rates, the target upstream/downstream signal noise margins, and the maximum and minimum upstream/downstream acceptable noise margins of all the ADSL ports that have this profile. You can configure multiple profiles, including profiles for troubleshooting.

[1] These are the rates that the ALC1224 supports for the standards at the time of writing.

[2] At the time of writing ADSL2+ is not a standard.

Profiles allow you to configure ADSL ports efficiently. You can configure all of the ADSL ports with the same profile, thus removing the need to configure the ADSL ports one-by-one. You can also change an individual ADSL port by assigning it a different profile.

For example, you could set up different profiles for different kinds of accounts (for example, economy, standard and premium). Assign the appropriate profile to an ADSL port and it takes care of a large part of the port's configuration maximum and minimum transfer rates. You still get to individually enable or disable each port, as well as configure its channels and operational mode. See later in this chapter for how to configure profiles.

3.5 Interleave Delay

Interleave delay is the wait (in milliseconds) that determines the size of a single block of data to be interleaved (assembled) and then transmitted. Interleave delay is used when transmission error correction (Reed- Solomon) is necessary due to a less than ideal telephone line. The bigger the delay, the bigger the data block size, allowing better error correction to be performed.

Reed-Solomon codes are block-based error correcting codes with a wide range of applications. The Reed-Solomon encoder takes a block of digital data and adds extra "redundant" bits. The Reed-Solomon decoder processes each block and attempts to correct errors and recover the original data.

3.5.1 Fast Mode

Fast mode means no interleaving takes place and transmission is faster (a "fast channel"). This would be suitable if you have a good line where little error correction is necessary.

3.6 Configured Versus Actual Rate

You configure the maximum rate of an individual ADSL port by modifying its profile (see the **ALC Edit Profile** screen) or assigning the port to a different profile (see the **ALC Edit Port Setup** screen). However, due to noise and other factors on the line, the actual rate may not reach the maximum that you specify.

Even though you can specify arbitrary numbers using the **ALC Edit Profile** screen, the actual rate is always a multiple of 32 Kbps. If you enter a rate that is not a multiple of 32 Kbps, the actual rate will be the next lower multiple of 32Kbps. For instance, if you specify 60 Kbps for a port, the actual rate for that port will not exceed 32 Kbps, and if you specify 66 Kbps, the actual rate will not be over 64Kbps.

Regardless of a profile's configured upstream and downstream rates, the ALC1224 automatically limits the actual rates for each individual port to the maximum speeds supported by the port's ADSL operational mode. For example, if you configure a profile with a maximum downstream rate of 25000 Kbps, and apply it to a port set to use G.dmt, the ALC1224 automatically uses a maximum downstream rate of 8160 Kbps. This means that if you configure a profile with very high rates, you can still use it with any port. See *Table 3-1* for a list of the maximum rates supported by the different ADSL standards.

3.7 Default Settings

The default profile always exists and all of the ADSL ports use the default profile settings when the ADSL line card is shipped. The default profile's name is set to DEFVAL. The default profile's maximum downstream rate can only be obtained when using the G.dmt standard. Configure a profile with a maximum downstream rate of 1536 Kbps or less for use with G.lite.

Refer to the *ALC1224 Overview* chapter for the settings of the default profile and ADSL port default settings.

3.8 ALC Port Setup Screen

Click **Port Setup** in the navigation panel to open the **Port Setup** screen.

Click the ADSL line card's link in the **Port Setup** screen to open that card's **Port Setup** screen.

This screen is a summary screen that displays read-only information about the DSL ports. Click a port's index number to go to a setup screen for that port.

Slot 5 Port Setup ALC1224-71 Profile Setup | 802.1x Setup | Packet Type Filter | MAC Filter | MAC Count Filter | Port Setup

Port Number	Active	Profile	Mode	UpStream Rate (Kbps)	DownStream Rate(Kbps)	Channels
1	Yes	test	Auto	1024	8160	8
2	Yes	test	Auto	1024	8160	8
3	Yes	test	Auto	1024	8160	8
4	Yes	test	Auto	1024	8160	8
5	Yes	test	Auto	1024	8160	8
6	Yes	test	Auto	1024	8160	8
7	Yes	test	Auto	1024	8160	8
8	Yes	test	Auto	1024	8160	8
9	Yes	test	Auto	1024	8160	8
10	Yes	test	Auto	1024	8160	8
11	Yes	test	Auto	1024	8160	8
12	Yes	test	Auto	1024	8160	8
13	Yes	test	Auto	1024	8160	8
14	Yes	test	Auto	1024	8160	8
15	Yes	test	Auto	1024	8160	8
16	Yes	test	Auto	1024	8160	8
17	Yes	test	Auto	1024	8160	8
18	Yes	test	Auto	1024	8160	8
19	Yes	test	Auto	1024	8160	8
20	Yes	test	Auto	1024	8160	8
21	Yes	test	Auto	1024	8160	8
22	Yes	test	Auto	1024	8160	8
23	Yes	test	Auto	1024	8160	8
24	Yes	test	Auto	1024	8160	8

Figure 3-1 ALC Port Setup

Table 3-2 ALC Port Setup

LABEL	DESCRIPTION
Profile Setup	Click this link to go to the card's **Profile Setup** screen.
802.1x Setup	Click this link to go to the card's **802.1x Setup** screen.
Packet Type Filter	Click this link to go to a screen for editing the packet filter type for each port.
MAC Filter	Click this link to go to a screen for editing the MAC filtering for each port.
MAC Count Filter	Click this link to go to a screen for setting limits on how many MAC addresses may be dynamically learned on a port.
Port Setup	Click this link to go to the general **Port Setup** screen.
Port Number	Click a port's index number to go to that port's **Edit Port Setup** screen.
Active	This field shows whether the port is turned on (**Yes**) or not (**No**). The factory default of all ADSL ports is disabled. A port must be enabled for data transmission to occur.
Profile	This field shows which profile is assigned to this port.
Mode	This field shows which ADSL operational mode the port is set to use.
Upstream Rate (Kbps)	This field shows the maximum upstream speed that is configured for this port.
Downstream Rate (Kbps)	This field shows the maximum downstream speed that is configured for this port.
Channels	This field displays the number of PVCs (Permanent Virtual Circuits) that are configured for this port.

3.8.1 Profile Setup Screen

A profile is a list of settings that you define. Then you can assign them to one or more individual ports.

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **Profile Setup** link in the **ALC Port Setup** screen to go to the card's **Profile Setup** screen.

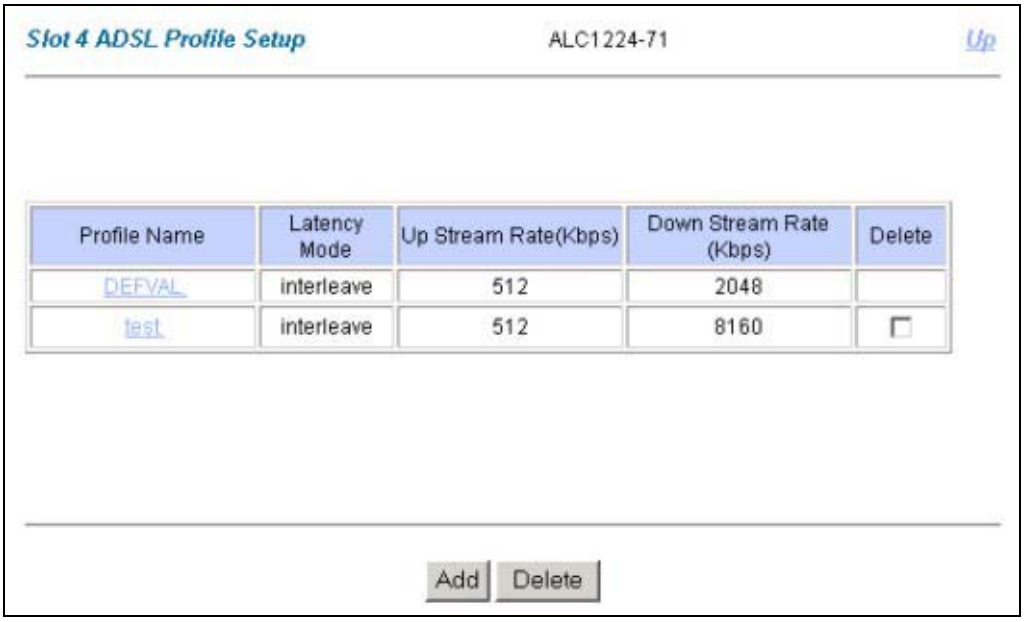


Figure 3-2 Profile Setup

Table 3-3 Profile Setup

LABEL	DESCRIPTION
Up	Click this link to go to the card's **Port Setup** screen.
Profile Name	These are the names of individual profiles. The DEFVAL profile always exists and all of the DSL ports have it assigned to them by default.
Latency Mode	This is the ADSL latency mode (**fast** or **interleave**) for the ports that belong to this profile.
Upstream Max Rate: Kbps	This is the maximum upstream transfer rate for the ports that belong to this profile.
Downstream Max Rate: Kbps	This is the maximum downstream transfer rate for the ports that belong to this profile.
Add	Click this button to configure a new profile.
Delete	Select a profile's **Delete** check box and click the **Delete** button to remove the profile.

Profile Add or Edit Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **Profile Setup** link in the **ALC Port Setup** screen to go to the card's **Profile Setup** screen.

Click the **Add** button in the **Profile Setup** screen to add a new profile or click the name of an existing profile to edit the profile.

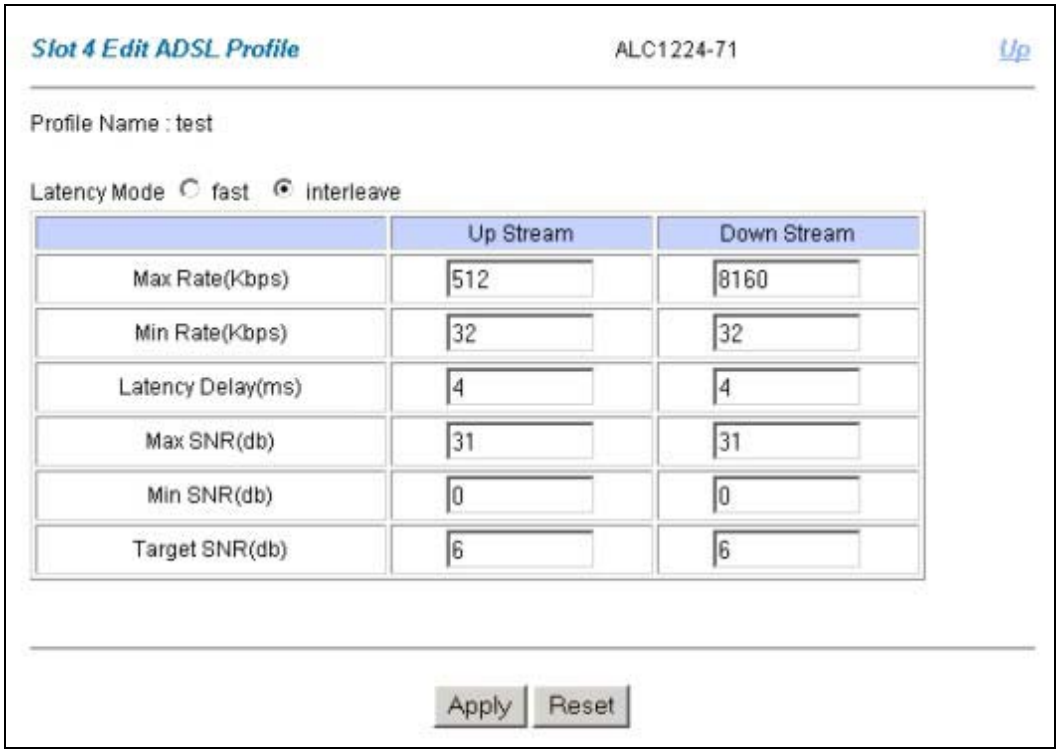


Figure 3-3 Edit Profile

Table 3-4 Edit Profile

LABEL	DESCRIPTION
Up	Click this link to go to the card's **Profile Setup** screen.
Profile Name	When editing a profile, this is the name of this profile. When adding a profile, type a name for the profile.
Latency Mode	This field sets the ADSL latency mode for the ports that belong to this profile. Select **fast** mode to use no interleaving and have faster transmission (a "fast channel"). This would be suitable if you have a good line where little error correction is necessary. Select **interleave** mode to use interleave delay when transmission error correction (Reed-Solomon) is necessary due to a less than ideal telephone line. See section *3.5* for more on interleave delay.
Upstream	The following parameters relate to upstream transmissions.
Max Rate (Kbps)	Type a maximum upstream transfer rate (32 to 3000 Kbps) for this profile. Configure the maximum upstream transfer rate to be less than the maximum downstream transfer rate.
Min Rate (Kbps)	Type the minimum upstream transfer rate (32 to 3000 Kbps) for this port. Configure the minimum upstream transfer rate to be less than the maximum upstream transfer rate.
Latency Delay(ms)	Configure this field when you set the **Latency Mode** field to **interleave**. Type the number of milliseconds (1-255) of interleave delay to use for upstream transfers. It is recommended that you configure the same latency delay for both upstream and downstream.

Table 3-4 Edit Profile

LABEL	DESCRIPTION
Max SNR (db)	Type the maximum upstream signal to noise margin (0-31 dB).
Min SNR (db)	Type the minimum upstream signal to noise margin (0-31 dB). Configure the minimum upstream signal to noise margin to be less than or equal to the maximum upstream signal to noise margin.
Target SNR (db)	Type the target upstream signal to noise margin (0-31 dB). Configure the target upstream signal to noise margin to be greater than or equal to the minimum upstream signal to noise margin and less than or equal to the maximum upstream signal to noise margin.
Downstream	The following parameters relate to downstream transmissions.
Max Rate (Kbps)	Type a maximum downstream transfer rate (32 to 25000 Kbps) bps for this port. Configure the maximum downstream transfer rate to be greater than the maximum upstream transfer rate.
Min Rate (Kbps)	Type the minimum downstream transfer rate (32 to 25000 Kbps) for this port. Configure the minimum downstream transfer rate to be less than the maximum downstream transfer rate.
Latency Delay(ms)	Configure this field when you set the **Latency Mode** field to **interleave**. Type the number of milliseconds (1-255) of interleave delay to use for upstream transfers. It is recommended that you configure the same latency delay for both upstream and downstream.
Max SNR (db)	Type the maximum downstream signal to noise margin (0-31 dB).
Min SNR (db)	Type the minimum downstream signal to noise margin (0-31 dB). Configure the minimum downstream signal to noise margin to be less than or equal to the maximum downstream signal to noise margin.
Target SNR (db)	Type the target downstream signal to noise margin (0-31 dB). Configure the target downstream signal to noise margin to be greater than or equal to the minimum downstream signal to noise margin and less than or equal to the maximum downstream signal to noise margin.
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

3.9 IEEE 802.1x Authentication Introduction

IEEE 802.1x is an extended authentication protocol[3] that allows support of RADIUS (Remote Authentication Dial In User Service, RFC 2138, 2139) for centralized user profile and accounting[4] management on a network RADIUS server. Specify the RADIUS server on the management switch card.

[3] At the time of writing, only Windows XP and Windows 2000 with service pack four of the Microsoft operating systems supports it. See the Microsoft web site for information on other Windows operating system support. For other operating systems, see its documentation. If your operating system does not support IEEE 802.1x, then you may need to install IEEE 802.1x client software.

3.9.1 802.1x Setup Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **802.1x** link in the **ALC Port Setup** screen to go to the card's **802.1x Setup** screen. Use the **802.1x Setup** screen to view the card's IEEE 802.1x authentication settings.

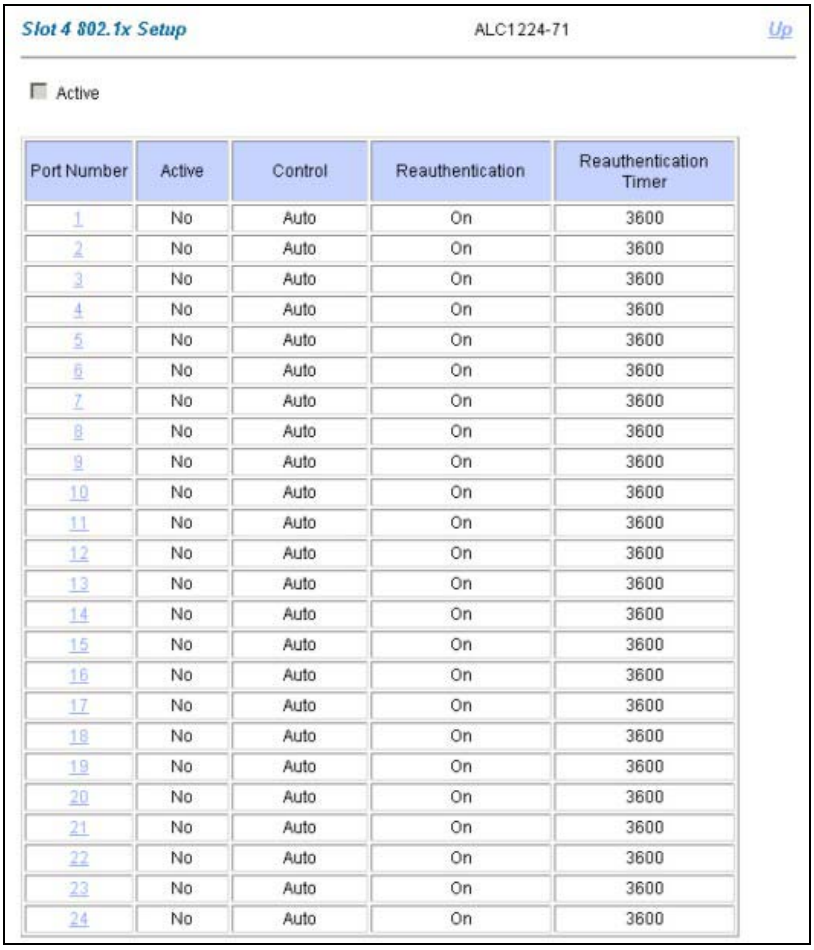


Figure 3-4 802.1x Setup

Table 3-5 802.1x Setup

LABEL	DESCRIPTION
Up	Click this link to go to the card's **Port Setup** screen.
Active	This read only field shows whether or not IEEE 802.1x authentication is enabled on the MSC1000.
Port Number	Click a port's index number to go to that port's **Edit 802.1x Setup** screen.

[4] Not available at the time of writing.

Table 3-5 802.1x Setup

LABEL	DESCRIPTION
Active	This field displays whether (**Yes**) or not (**No**) IEEE 802.1x authentication is enabled on this port.
Control	When this field displays **Auto**, the ALC1224 authenticates all subscribers before they can access the network through this port. When this field displays **Force Authorized**, all connected users are allowed to access the network through this port without authentication. When this field displays **Force Unauthorized**, all subscribers are denied access to the network through this port.
Reauthentication	This field displays whether (**On**) or not (**Off**) a subscriber has to periodically re-enter his or her username and password to stay connected to the port.
Reauthentication Timer	This field displays how often a subscriber has to re-enter his or her username and password to stay connected to the port.

802.1x Edit Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **802.1x** link in the **ALC Port Setup** screen to go to the card's **802.1x Setup** screen.

Click a port's index number in the **802.1x Setup** screen to edit the port's IEEE 802.1x settings.

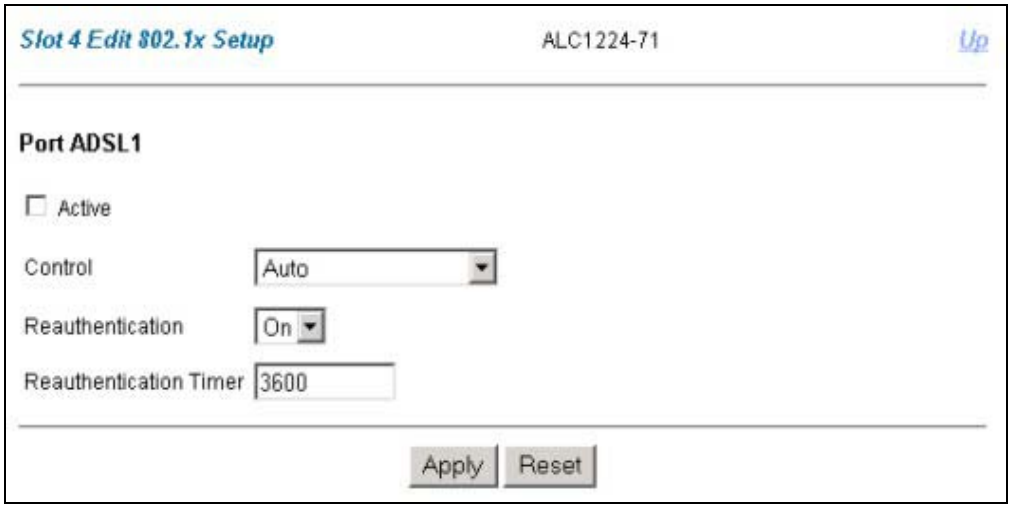


Figure 3-5 Edit 802.1x

Table 3-6 Edit 802.1x

LABEL	DESCRIPTION
Up	Click this link to go to the card's **Profile Setup** screen.
Active	Select this checkbox to turn on IEEE 802.1x authentication on this port.

Table 3-6 Edit 802.1x

LABEL	DESCRIPTION
Control	Select **Auto** to authenticate all subscribers before they can access the network through this port. Select **Force Authorized** to allow all connected users to access the network through this port without authentication. Select **Force Unauthorized** to deny all subscribers access to the network through this port.
Reauthentication	Select (**On**) if a subscriber has to periodically re-enter his or her username and password to stay connected to the port (some IEEE 802.1x clients do this automatically).
Reauthentication Timer	Specify how often (60~65535 seconds) a subscriber has to re-enter his or her username and password to stay connected to the port (some IEEE 802.1x clients do this automatically).
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

3.9.2 Packet Type Filter Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **Packet Type Filter** link in the **ALC Port Setup** screen to open this screen.

Figure 3-6 Packet Type Filter

The following table describes this screen.

Table 3-7 Packet Type Filter

LABEL	DESCRIPTION
Up	Click this link to go to the card's **Port Setup** screen.
Port Number	This field identifies the individual ports.
Packet Type	This field displays **Accept All** when all kinds of packets are allowed on the port. This field displays **Accept PPPoE Only** when only PPPoE packets are allowed on the port. This field displays **Reject** and one or more specific port types (**ARP**, **DHCP**, **EAPoL**, **PPPoE, NETBIOS,** and/or **IGMP**) when this port is set to not accept those types of packets. See *Table 3-8 Packet Type Filter Edit* for information on these packet types.

Packet Type Filter Edit Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **Packet Type Filter** link in the **ALC Port Setup** screen to open the card's **Packet Type Filter** screen.

Click a port's index number in the **Packet Type Filter** screen to edit the port's packet type filter settings.

Figure 3-7 Packet Type Filter Edit

The following table describes this screen.

Table 3-8 Packet Type Filter Edit

LABEL	DESCRIPTION
Packet Type Filter Setup	Click this link to go to the card's **Packet Type Filter** screen.
Port Setup	Click this link to go to the card's **Port Setup** screen.
ADSL (N)	"N" identifies the individual port.
Accept All	Select **Accept All** to allow this port to accept all kinds of packets.
Accept PPPoE Only	Select **Accept PPPoE Only** to allow this port to accept PPPoE packets only.

Table 3-8 Packet Type Filter Edit

LABEL	DESCRIPTION
Reject	Select **Reject** and one or more specific port types to have this port reject those types of packets. **ARP**: Address Resolution Protocol is a protocol for mapping an Internet Protocol address (IP address) to a physical computer address that is recognized in the local network. **DHCP**: Dynamic Host Configuration Protocol automatically assigns IP addresses to clients when they log on. DHCP centralizes IP address management on central computers that run the DHCP server program. DHCP leases addresses, for a period of time, which means that past addresses are "recycled" and made available for future reassignment to other systems. **EAPoL**: EAP (Extensible Authentication Protocol, RFC 2486) over LAN. EAP is used with IEEE 802.1x to allow additional authentication methods (besides RADIUS) to be deployed with no changes to the access point or the wireless clients. **PPPoE**: (Point-to-Point Protocol over Ethernet) relies on PPP and Ethernet. PPPoE is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single DSL line, wireless device or cable modem. **NETBIOS**: (Network Basic Input/Output System) are TCP or UDP broadcast packets that enable a computer to connect to and communicate with a LAN. **IGMP**: Internet Group Multicast Protocol is used when sending packets to a specific group of hosts.
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

3.9.3 MAC Filter Setup Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **MAC Filter** link in the **ALC Port Setup** screen to open this screen.

Slot 5 MAC Filter Setup ALC1224-71 Port Setup

Port Number	Filtering Enabled?	Filter Entry Count
1	No	0
2	No	0
3	No	0
4	No	0
5	No	0
6	No	0
7	No	0
8	No	0
9	No	0
10	No	0
11	No	0
12	No	0
13	No	0
14	No	0
15	No	0
16	No	0
17	No	0
18	No	0
19	No	0
20	No	0
21	No	0
22	No	0
23	No	0
24	No	0

Figure 3-8 MAC Filter Setup

The following table describes this screen.

Table 3-9 MAC Filter Setup

LABEL	DESCRIPTION
Port Setup	Click this link to go to the card's **Port Setup** screen.
Port Number	Click the port name to edit that port's MAC filter setup.
Filtering Enabled?	This field tells whether or not filtering has been enabled for that port.
Filter Entry Count	This field displays how many static MAC addresses are specified for the port.

MAC Filter Entry List Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **MAC Filter** link in the **ALC Port Setup** screen to open the card's **MAC Filter** screen.

Click on a port link in the **MAC Filter Setup** screen to open this screen.

Figure 3-9 MAC Filter Entry List

The following table describes this screen.

Table 3-10 MAC Filter Entry List

LABEL	DESCRIPTION
MAC Filter Setup	Click this link to go to the card's **MAC Filter Setup** screen.
Port Setup	Click this link to go to the card's **Port Setup** screen.
Filtering Enable	Select this check box to enable MAC filtering on this port.
Apply	Click **Apply** to save your changes.
MAC Address	This field lists the MAC addresses that are set for this port.
Add	Click this button to add the MAC address in the edit box to the list in the list box.
Delete	Select a MAC address in the list box and click this button to delete the MAC address from the list.

MAC Filter Entry Add Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **MAC Filter** link in the **ALC Port Setup** screen to open the card's **MAC Filter** screen.

Click on a port link in the card's **MAC Filter Setup** screen to open the **MAC Filter Entry List** screen.

Click **Add** in the **MAC Filter Entry List** screen to open this screen.

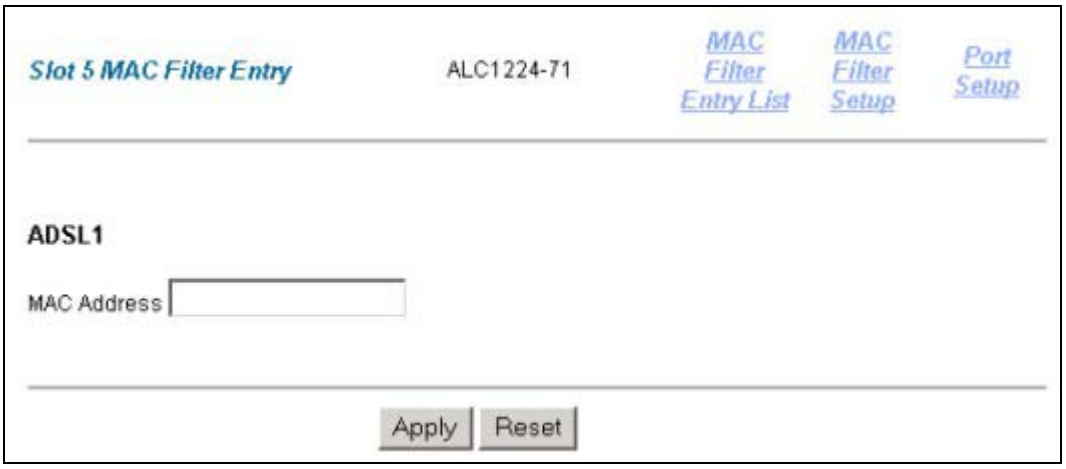


Figure 3-10 MAC Filter Entry Add

The following table describes this screen.

Table 3-11 MAC Filter Entry Add

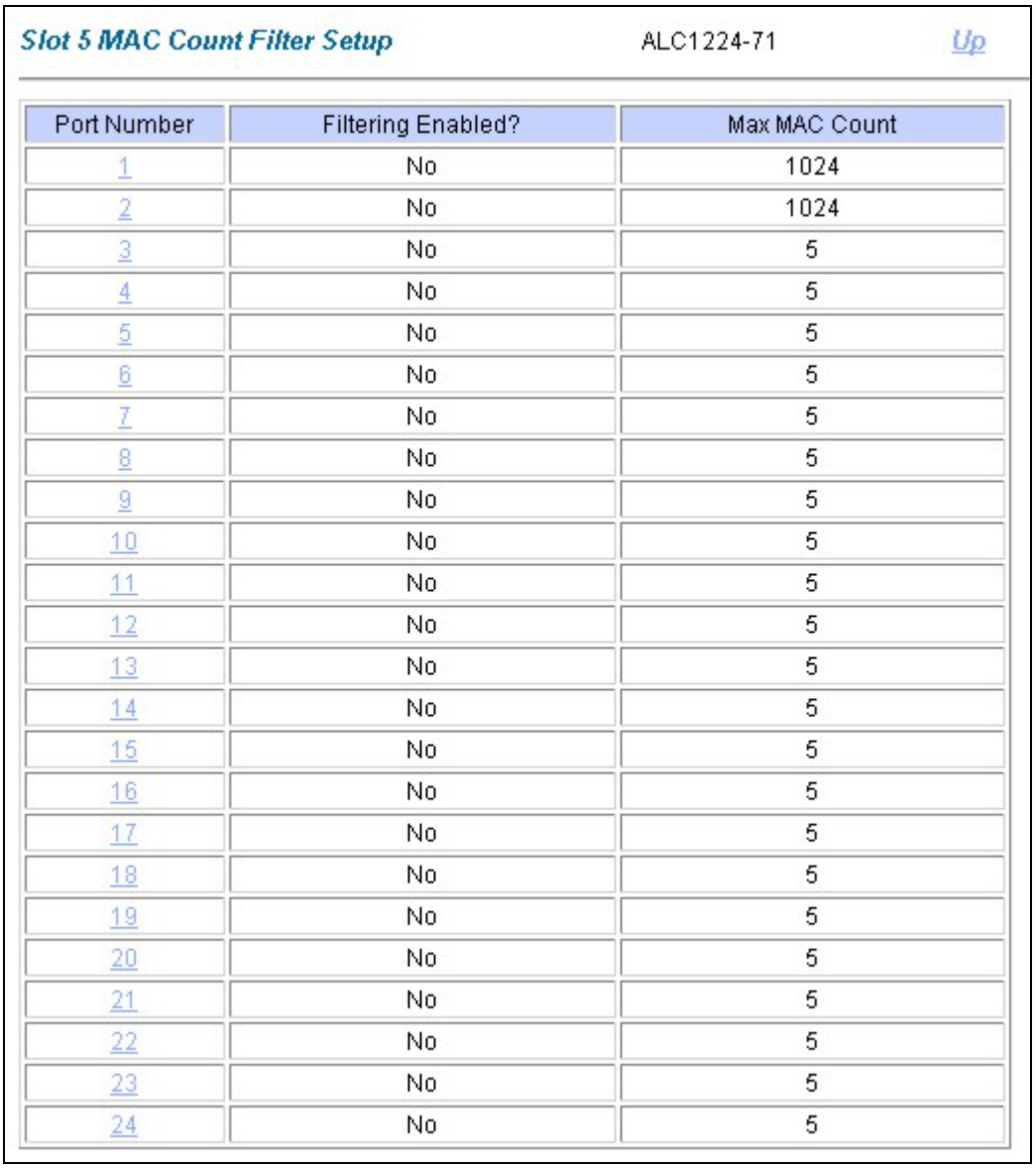
LABEL	DESCRIPTION
MAC Filter Entry List	Click this link to go to the card's **MAC Filter Entry List** screen.
MAC Filter Setup	Click this link to go to the card's **MAC Filter Setup** screen.
Port Setup	Click this link to go to the card's **Port Setup** screen.
MAC Address	Type a MAC address in hexadecimal notation (xx:xx:xx:xx:xx:xx, where x is a number from 0 to 9 or a letter from a to f) in this field. The MAC address cannot be a multicast or broadcast address. Then click **Apply**.
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

3.9.4 MAC Count Filter Setup Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **MAC Count Filter** link in the **ALC Port Setup** screen to open this screen.

Use this screen to limit the number of MAC addresses that may be dynamically learned on a DSL port.



Slot 5 MAC Count Filter Setup ALC1224-71 Up

Port Number	Filtering Enabled?	Max MAC Count
1	No	1024
2	No	1024
3	No	5
4	No	5
5	No	5
6	No	5
7	No	5
8	No	5
9	No	5
10	No	5
11	No	5
12	No	5
13	No	5
14	No	5
15	No	5
16	No	5
17	No	5
18	No	5
19	No	5
20	No	5
21	No	5
22	No	5
23	No	5
24	No	5

Figure 3-11 MAC Count Filter Setup

The following table describes the labels in this screen.

Table 3-12 MAC Count Filter Setup

LABEL	DESCRIPTION
Up	Click this link to go to the card's **Port Setup** screen.
Port Number	This field displays a DSL port number. Click an entry to go to a screen to edit the number of MAC addresses that may be learned on that port.
Filtering Enabled?	This field tells whether or not MAC address count filtering has been enabled for that port.
Max MAC Count	This field displays the limit of how many MAC addresses may be dynamically learned on the port.

3.9.5 MAC Count Filter Edit Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Click the **MAC Count Filter** link in the **ALC Port Setup** screen to open the **MAC Count Filter Setup** screen.

Click a port number in the **MAC Count Filter Setup** screen to open this screen.

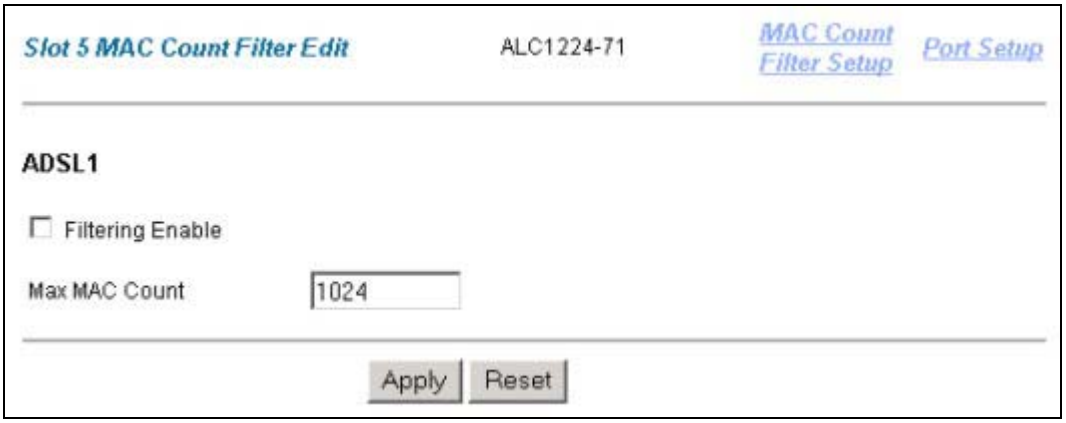


Figure 3-12 MAC Count Filter Edit

Table 3-13 MAC Count Filter Edit

LABEL	DESCRIPTION
MAC Count Filter Setup	Click this link to go to the **MAC Count Filter Setup** screen.
Port Setup	Click this link to go to the card's **Port Setup** screen.
Filtering Enable	Select this check box to enable MAC address count filtering on this port.
Max MAC Count	Use this field to limit the number of MAC addresses that this port may dynamically learn. For example, if you are configuring port 2 and you set this field to "5", then only five devices with dynamically learned MAC addresses may access port 2 at any one time. A sixth device would have to wait until one of the five learned MAC addresses ages out. The valid range is from "1" to "1024".
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

3.9.6 Port Edit Screen

Click **Port Setup** in the navigation panel and then the ADSL line card's link.

Click a port's index number to go to the following setup screen for that port.

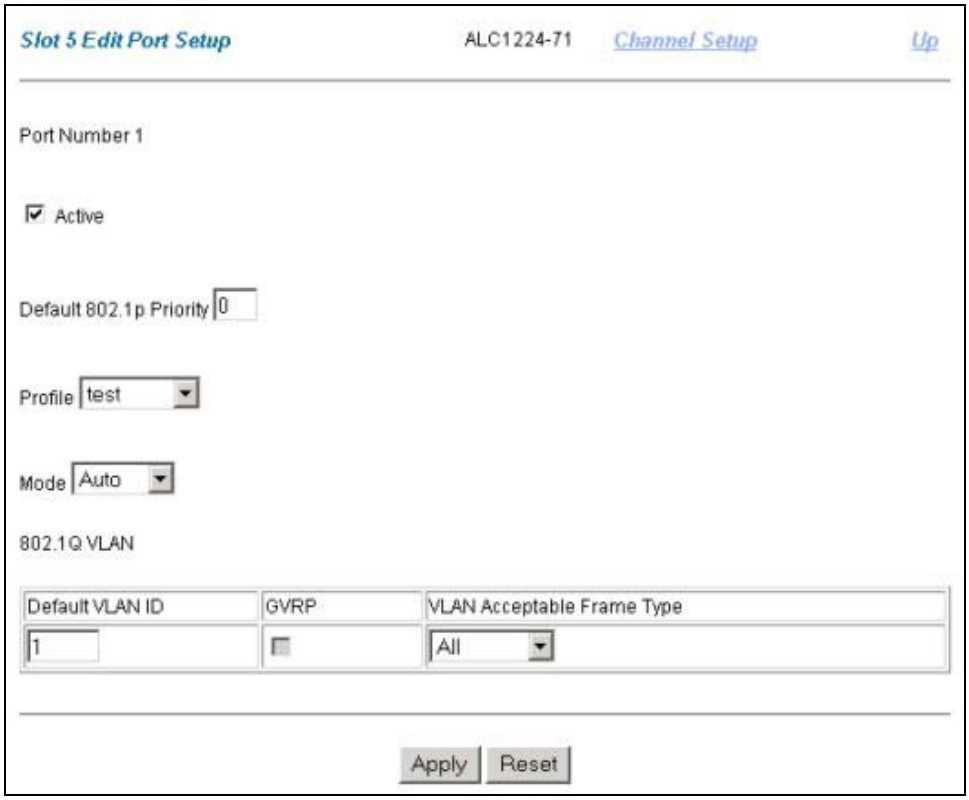


Figure 3-13 Edit Port Setup Screen

Table 3-14 Edit Port Setup

LABEL	DESCRIPTION
Channel Setup	Click this link to go to the port's **Channel Setup** screen.
Up	Click this link to go to the card's **Port Setup** screen.
Active	Select this check box to turn on this ADSL port. The ADSL ports are disabled by default because an enabled but disconnected ADSL port generates more heat than an operating port. Disable ADSL ports when they are not in use to minimize heat generation and enhance reliability.
Default 802.1p Priority	Type the priority value (0 to 7) to add to incoming frames without a (802.1p) priority tag.
Profile	Use the drop-down list box to select a profile to assign to this port. A profile is a list of settings that you define and then assign to individual ports (see sections *3.8.1* and *3.9*).
Mode	Use the drop-down list box to select the ADSL operational mode for this port (see *Table 3-1*).
802.1Q VLAN	

Table 3-14 Edit Port Setup

LABEL	DESCRIPTION
Default VLAN ID	**Default VLAN ID** is the PVID (Port VLAN ID) assigned to untagged frames or priority frames (0 VID) received on this port.
GVRP	GVRP (GARP VLAN Registration Protocol) is a registration protocol that defines a way for switches to register necessary VLAN members on ports across the network. Select this check box to enable GVRP and propagate VLAN information beyond the local switch.[5]
VLAN Acceptable Frame Type	Select **All** if you want the port to accept both tagged and untagged incoming frames (on this port). Choose **Tagged** if you want the port to accept just tagged incoming frames (on this port).
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

[5] At the time of writing, GVRP is not available with the ADSL ports.

Chapter 4
Virtual Channel Management

This chapter shows you how to configure virtual channels.

4.1 About Virtual Channels

Defining channels (also called Permanent Virtual Circuits or PVCs) allows you to set priorities for different services or subscribers. You can define up to eight channels on each DSL port and use them for different services or levels of service. You set the PVID that is assigned to untagged frames received on each channel. You also set an IEEE 802.1p priority for each of the PVIDs. In this way you can assign different priorities to different channels (and consequently the services that get carried on them or the subscribers that use them).

For example, you want to give high priority to voice service on one of the line card's ADSL ports.

Use the **Edit Static VLAN** screen to configure a static VLAN on the ALC1224 line card for voice on the port.

Use the **ADSL Edit Port Channel Setup** screen to:

- Configure a channel on the port for voice service.
- Set the channel to use the PVID of the static VLAN you configured.
- Assign the channel a high priority.

4.1.1 Super Channel

The ALC1224 forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. Enable the super channel option to allow a channel forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The super channel functions in the same way as the channel in a single channel environment. One port can have only one super channel.

4.1.2 LLC

LLC is a type of encapsulation where one VC (Virtual Circuit) carries multiple protocols with each packet header containing protocol identifying information. Despite the extra bandwidth and processing overhead, this method may be advantageous if it is not practical to have a separate VC for each carried protocol, for example, if charging heavily depends on the number of simultaneous VCs.

4.1.3 VC Mux

VC Mux is a type of encapsulation where, by prior mutual agreement, each protocol is assigned to a specific virtual circuit, for example, VC1 carries IP, VC2 carries IPX, and so on. VC-based multiplexing may be dominant in environments where dynamic creation of large numbers of ATM VCs is fast and economical.

4.1.4 Virtual Channel Profile

Virtual channel profiles allow you to configure the virtual channels efficiently. You can configure all of the virtual channels with the same profile, thus removing the need to configure the virtual channels one-by-one. You can also change an individual virtual channel by assigning it a different profile.

The ALC1224 provides two default virtual channel profiles: **DEFVAL** (for LLC encapsulation) and **DEFVAL_VC** (for VC encapsulation). By default, all virtual channels are associated to **DEFVAL**.

4.2 DSL Port Channel Setup Screen

Do the following to open a port's **Channel Setup** screen:

1. Click an ADSL port's index number in the **Port Setup** screen to go to the **Edit Port Setup** screen.
2. Click **Channel Setup** in the **Edit Port Setup** screen to go to the **Channel Setup** screen.

This screen is a summary screen that displays read-only information about the ADSL port's VPI/VCI settings.

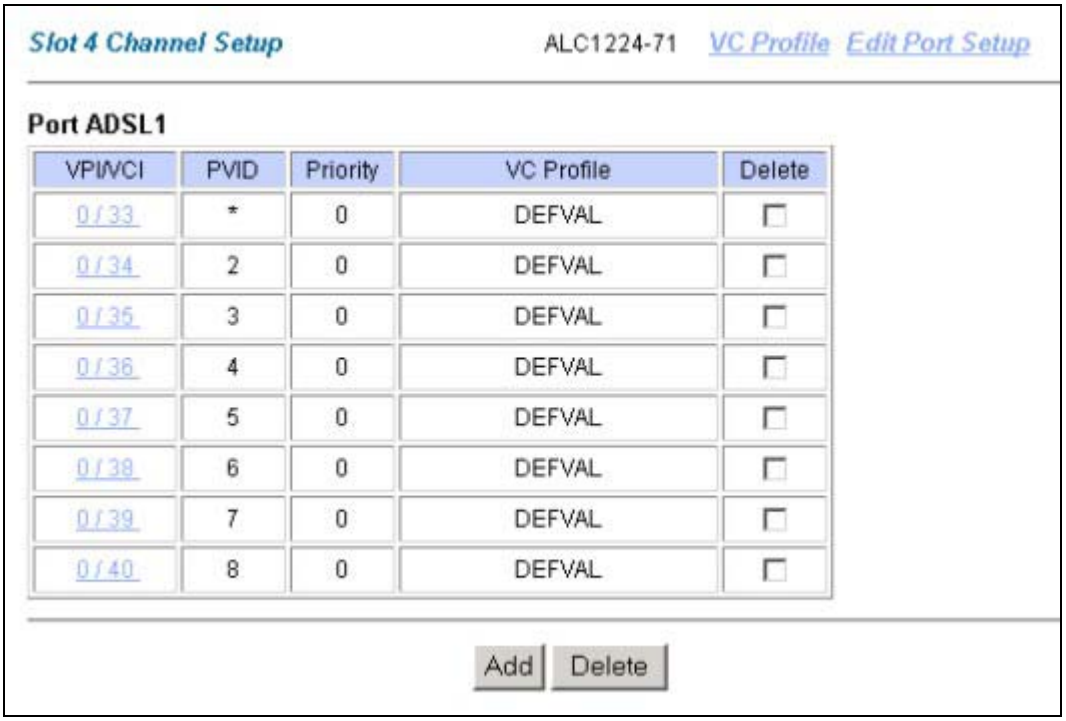


Figure 4-1 ADSL Port Channel Setup

Table 4-1 ADSL Port Channel Setup

LABEL	DESCRIPTION
VC Profile	Click this link to go to the **VC Profile Setup** screen.
Edit Port Setup	Click this link to go to the **Edit Port Setup** screen.

Table 4-1 ADSL Port Channel Setup

LABEL	DESCRIPTION
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port. Click a link in the **VPI/VCI** column to open a screen where you can edit the VPI/VCI settings.
Active	This field shows whether the channel is turned on (**Yes**) or not (**No**).
PVID	This is the PVID (Port VLAN ID) assigned to untagged frames or priority frames (0 VID) received on this channel. An asterisk (*) denotes a super channel.
Priority	Type the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag. An asterisk (*) denotes a super channel.
VC Profile	This shows which VC profile the channel is set to use.
Add	Click this button to configure a new channel.
Delete	Select a channel's **Delete** check box and click the **Delete** button to remove the channel.

4.3 ATM QoS

ATM Quality of Service (QoS) mechanisms provide the best service on a per-flow guarantee. ATM network infrastructure was designed to provide QoS. It uses fixed cell sizes and built-in traffic management (see the following section on traffic shaping). This allows you to fine-tune the levels of services on the priority of the traffic flow.

4.4 Traffic Shaping

Traffic shaping is an agreement between the carrier and the subscriber to regulate the average rate and fluctuations of data transmission over an ATM network. This agreement helps eliminate congestion, which is important for transmission of real time data such as audio and video connections.

4.4.1 ATM Traffic Classes

These are the basic ATM traffic classes defined by the ATM Forum Traffic Management 4.0 Specification.

Constant Bit Rate (CBR)

Constant Bit Rate (CBR) is an ATM traffic class that provides fixed bandwidth. CBR traffic is generally time-sensitive (doesn't tolerate delay). CBR is used for connections that continuously require a specific amount of bandwidth. Examples of connections that need CBR would be high-resolution video and voice.

Variable Bit Rate (VBR)

The Variable Bit Rate (VBR) ATM traffic class is used with bursty connections. Video conferencing is an example of a VBR connection. It requires real-time data transfers and the bandwidth requirement varies in proportion to the video image's changing dynamics.

Unspecified Bit Rate (UBR)

The Unspecified Bit Rate (UBR) ATM traffic class is similar to the ABR traffic class for bursty data transfers. However, while ABR gives subscribers a set amount of bandwidth, UBR doesn't guarantee any bandwidth and only delivers traffic when the network has spare bandwidth.

4.4.2 Traffic Parameters

These are the parameters that control the flow of ATM traffic.

Peak Cell Rate (PCR)

Peak Cell Rate (PCR) is the maximum rate at which the sender can send cells. This parameter may be lower (but not higher) than the maximum line speed. 1 ATM cell is 53 bytes (424 bits), so a maximum speed of 832Kbps gives a maximum PCR of 1962 cells/sec. This rate is not guaranteed because it is dependent on the line speed.

Sustained Cell Rate (SCR)

Sustained Cell Rate (SCR) is the mean cell rate of each bursty traffic source. It specifies the maximum average rate at which cells can be sent over the virtual connection. SCR may not be greater than the PCR.

Maximum Burst Size (MBS)

Maximum Burst Size (MBS) is the maximum number of cells that can be sent at the PCR. After MBS is reached, cell rates fall below SCR until cell rate averages to the SCR again. At this time, more cells (up to the MBS) can be sent at the PCR again.

Minimum Cell Rate (MCR)

Minimum Cell Rate (MCR) is the minimum rate at which the sender can send cells

If the PCR, SCR or MBS is set to the default of "0", the system will assign a maximum value that correlates to your upstream line rate.

The following figure illustrates the relationship between PCR, SCR, MCR and MBS.

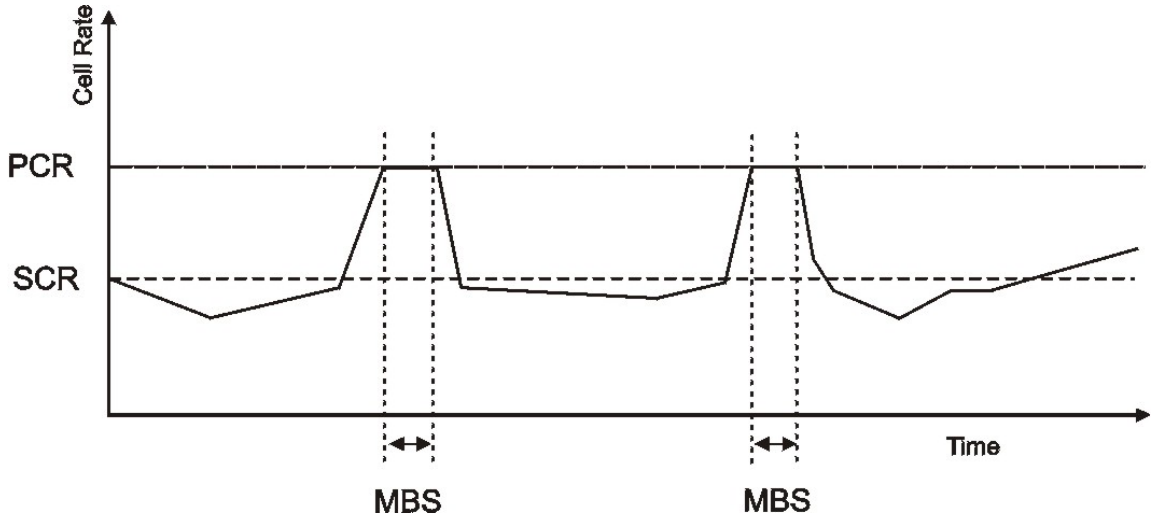


Figure 4-2 PCR, SCR, MCR and MBS in Traffic Shaping

Cell Delay Variation Tolerance (CDVT)

Cell Delay Variation Tolerance (CDVT) is the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay. CDVT controls the time scale over which the PCR is enforced. CDVT is used to determine if a cell arrived too early in relation to PCR.

Burst Tolerance (BT)

Burst Tolerance (BT) is the maximum number of cells that the port is guaranteed to handle without any discards. BT controls the time scale over which the SCR is enforced. BT is used to determine if a cell arrived too early in relation to SCR. Use this formula to calculate BT: (MBS – 1) x (1 / SCR – 1 / PCR) = BT.

Theoretical Arrival Time (TAT)

The Theoretical Arrival Time (TAT) is when the next cell (in an ATM connection's stream of cells) is expected to arrive. TAT is calculated based on the PCR or SCR.

The following figure illustrates the relationship between TAT, CDVT and BT. If a cell arrives at time A, then according to PCR or SCR, the next cell is expected to arrive at time B. If the next cell arrives earlier than time C, it is discarded or tagged for not complying with the TAT. Time C is calculated based on the CDVT or BT.

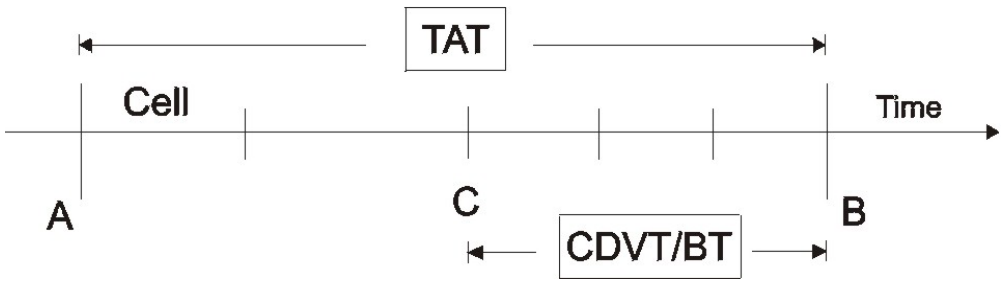


Figure 4-3 TAT, CDVT and BT in Traffic Shaping

4.4.3 ADSL Port VC Profile Setup Screen

Do the following to open the **VC Profile** screen:

1. Click an ADSL port's index number in the **Port Setup** screen to go to the **ADSL Port Setup** screen.
2. Click **Channel Setup** in the **ADSL Port Setup** screen to go to the **Channel Setup** screen.
3. Click **VC Profile** in the **Channel Setup** screen to open the **VC Profile** screen.

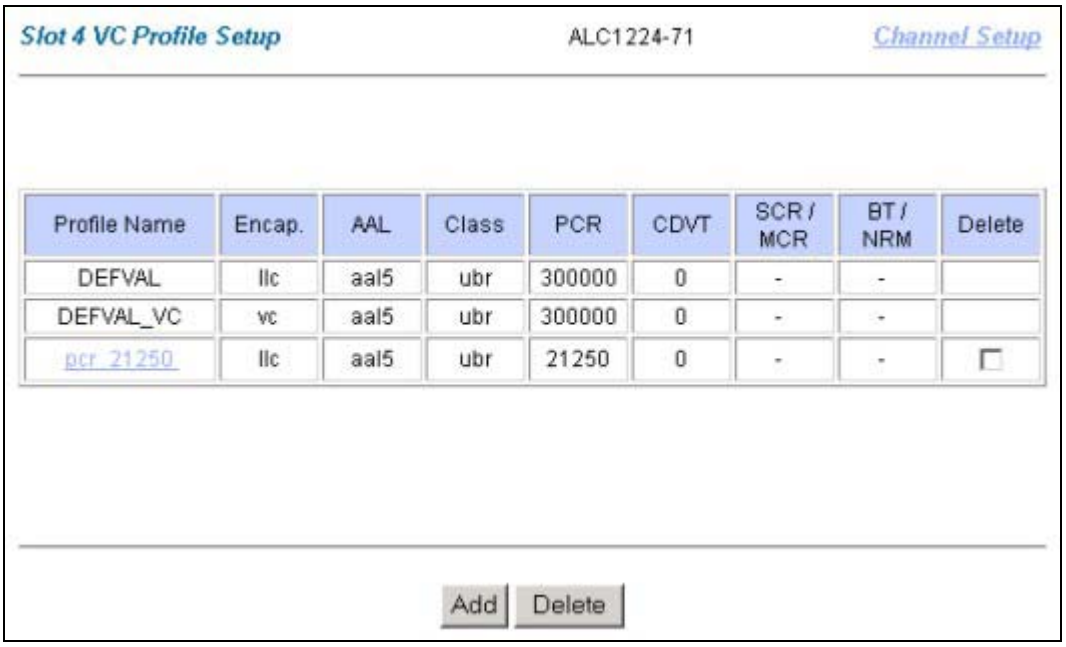


Figure 4-4 ADSL Port VC Profile Setup

Table 4-2 ADSL Port VC Profile Setup

LABEL	DESCRIPTION
Channel Setup	Click this link to go to the **Channel Setup** screen.
Profile Name	This name identifies the profile.
Encap.	This field displays the type of encapsulation (**LLC** or **VC**).
AAL	This field displays the ATM Adaptation Layer (AAL).
Class	This field displays the type of ATM traffic class: **cbr** (constant bit rate), **vbr** (variable bit rate) or **ubr** (unspecified bit rate).
PCR	This is the Peak Cell Rate (PCR), the maximum rate at which the sender can send cells.
CDVT	This field displays the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay.

Table 4-2 ADSL Port VC Profile Setup

LABEL	DESCRIPTION
SCR/MCR	The Sustained Cell Rate (SCR) sets the average cell rate (long-term) that can be transmitted. SCR applies with the **vbr** traffic class. Minimum Cell Rate (MCR) is the minimum rate at which the sender can send cells.
BT/NRM	Burst Tolerance (BT) is the maximum number of cells that the port is guaranteed to handle without any discards. BT applies with the **vbr** traffic class.
Add	Click this button to configure a new VC profile.
Delete	Select a VC profile's **Delete** check box and click the **Delete** button to remove the VC profile.

ADSL Port VC Profile Add or Edit Screen

Do the following to open the **VC Profile** screen:

1. Click an ADSL port's index number in the **Port Setup** screen to go to the **ADSL Port Setup** screen.
2. Click **Channel Setup** in the **ADSL Port Setup** screen to go to the **Channel Setup** screen.
3. Click **VC Profile** in the **Channel Setup** screen to open the **VC Profile** screen.
4. Click the **Add** button in the **VC Profile** screen to add a new VC profile or click an existing VC profile's link in the **Profile Name** column to edit the profile.

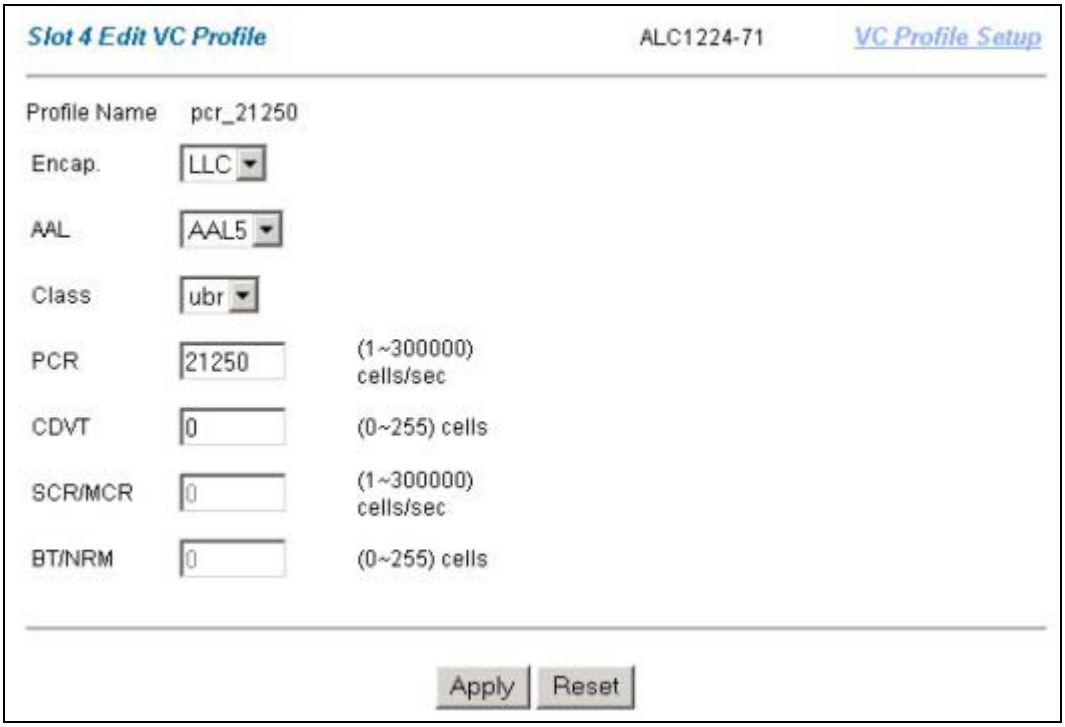


Figure 4-5 ADSL Port VC Profile Edit

Table 4-3 ADSL Port VC Profile Edit

LABEL	DESCRIPTION
VC Profile Setup	Click this link to go to the **VC Profile Setup** screen.
Profile Name	When editing a profile, this is the name of this profile. When adding a profile, type a name for the profile.
Encap.	Select the encapsulation type (**LLC** or **VC**) for this port.
AAL	The ALC1224 supports ATM Adaptation Layer 5.
Class	Select **cbr** (constant bit rate) to specify fixed (always-on) bandwidth for voice or data traffic. Select **ubr** (unspecified bit rate) for applications that are non-time sensitive, such as e-mail. Select **vbr** (variable bit rate) for bursty traffic and bandwidth sharing with other applications.
PCR	Divide the DSL line rate (bps) by 424 (the size of an ATM cell) to find the Peak Cell Rate (PCR). This is the maximum rate at which the sender can send cells. PCR applies with all of the ATM traffic classes. Type the PCR here.
CDVT	Cell Delay Variation Tolerance (CDVT) is the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay. CDVT applies with all of the ATM traffic classes. Type the CDVT here.
SCR/MCR	The Sustained Cell Rate (SCR) sets the average cell rate (long-term) that can be transmitted. Type the SCR, which must be less than the PCR. SCR applies with the **vbr** traffic class.
BT/NRM	Burst Tolerance (BT) sets a maximum number of cells that the port is guaranteed to handle without any discards. Type the BT here. BT applies with the **vbr** traffic class.
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

4.4.4 ADSL Port Channel Add or Edit Screen

Do the following to open the **ADSL Port Channel Add** or **Edit** screen:

1. Click an ADSL port's index number in the **Port Setup** screen to go to the **ADSL Port Setup** screen
2. Click **Channel Setup** in the **ADSL Port Setup** screen to go to the port's **Channel Setup** screen.
3. Click the **Add** button in the **Channel Setup** screen to add a new channel or click an existing channel's link in the **VPI/VCI** column to edit the channel.

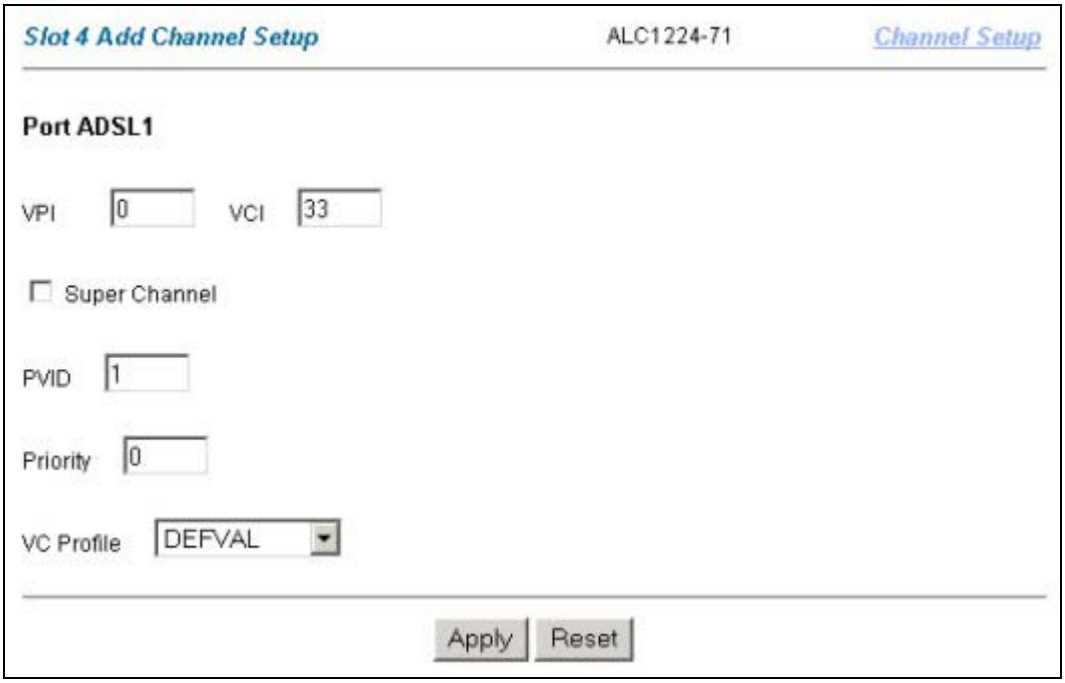


Figure 4-6 ADSL Port Channel Add

Table 4-4 ADSL Port Channel Add

LABEL	DESCRIPTION
Channel Setup	Click this link to go to the port's **Channel Setup** screen.
VPI	Type the Virtual Path Identifier for this port.
VCI	Type the Virtual Circuit Identifier for this port.
Active	Select this check box to turn on the channel.
Super Channel	The Integrated Ethernet Switch forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. Enable the super channel option to have this channel forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The super channel functions in the same way as the channel in a single channel environment.
PVID	This is the PVID (Port VLAN ID) assigned to untagged frames received on this channel. You cannot configure a PVID for a super channel.
Priority	Type the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag. You cannot configure a priority for a super channel.
VC Profile	Use the drop-down list box to select a VC profile to assign to this channel.
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

Part III:

Advanced Applications and Management

This part describes the **Advanced Applications** and **Advanced Management** web configurator screens as well as troubleshooting.

Chapter 5
IEEE 802.1Q VLAN

This chapter explains how to configure IEEE 802.1Q VLANs on the ADSL line card.

5.1 IEEE 802.1Q VLAN Overview

Use the web configurator to configure an IEEE 802.1Q Tagged VLAN (Virtual Local Area Network) to partition a physical network into multiple logical networks. Stations on a logical network belong to one group. A station can belong to more than one group. With VLAN, a station cannot directly talk to or hear from stations that are not in the same group(s); the traffic must first go through a router.

5.2 ALC Static VLAN Setup Screen

Click **VLAN Setup** in the navigation panel and then a card's link in the **VLAN Setup** screen to open the **ALC Static VLAN Setup** screen.

This screen displays the IEEE 802.1Q VLAN parameters.

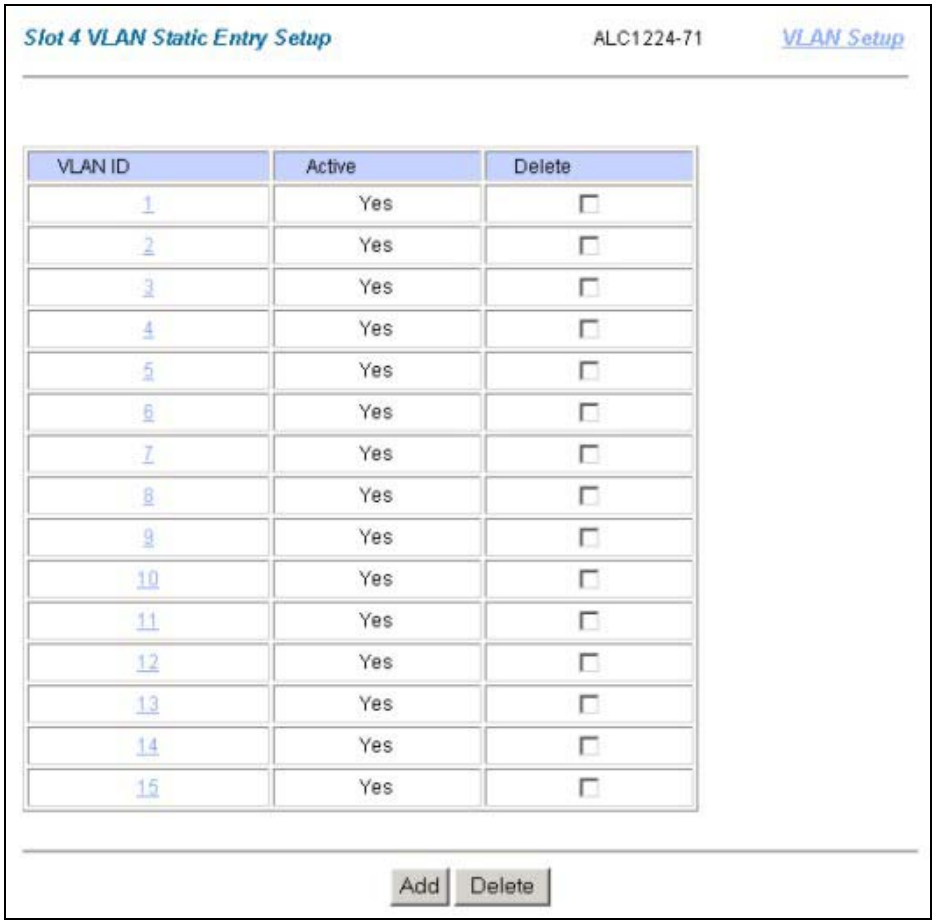


Figure 5-1 ALC Static VLAN Setup

Table 5-1 ALC Static VLAN Setup

LABEL	DESCRIPTION
VLAN Setup	Click this link to go to the **Static VLAN Setup** screen.
VLAN ID	This is the number that identifies the VLAN group. Click a link in the **VLAN ID** column to open a screen where you can edit the static VLAN.
Active	This field displays whether the VLAN is currently enabled **Yes** or disabled **No**.
Add	Click this button to add a new VLAN ID.
Delete	Select a channel's **Delete** check box and click the **Delete** button to remove the channel.

5.3 ALC Static VLAN Entry Add or Edit Screen

Click **VLAN Setup** in the navigation panel and then a card's link in the **VLAN Setup** screen.

Click the **Add** button or a VLAN ID in a card's **Static VLAN Setup** screen to open this screen.

Use this menu to set up IEEE 802.1Q VLAN parameters for this line card. In a typical setup, DSL port or even an individual channel on a port uses a different VLAN ID (VID) to distinguish service types.

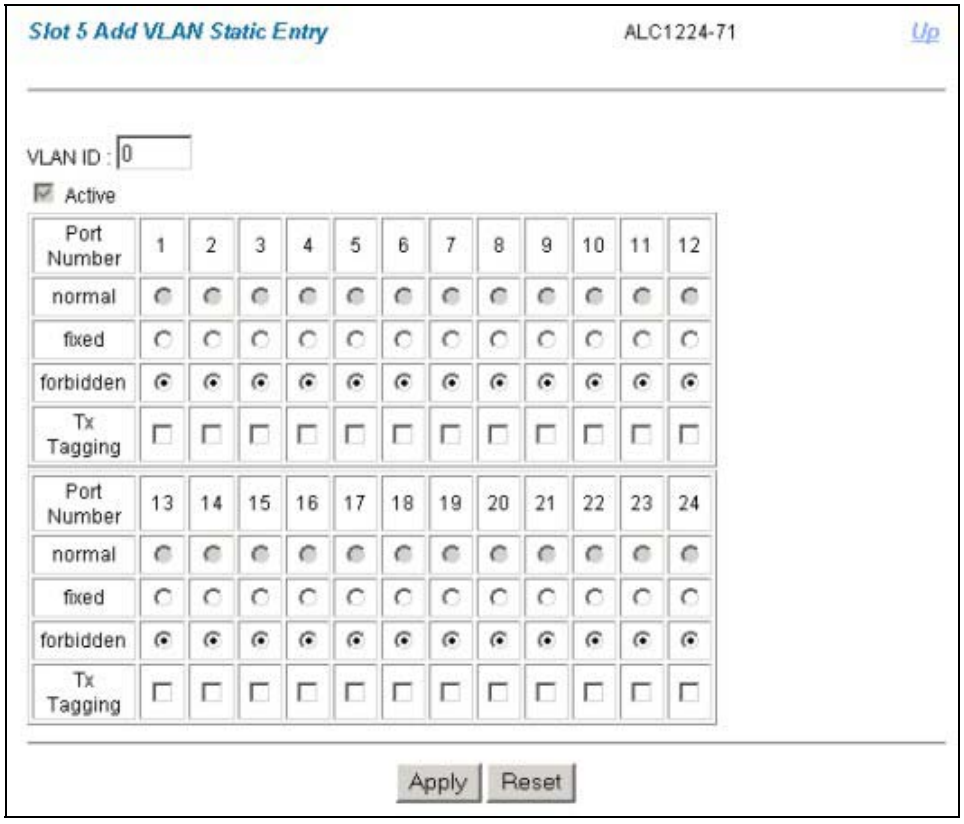


Figure 5-2 ALC Add Static VLAN

Table 5-2 ALC Add Static VLAN

LABEL	DESCRIPTION
Up	Click this link to go to the **Static VLAN Setup** screen.
VLAN ID	This is the number that identifies the VLAN group. When you add a static VLAN, type a number (1-4094) to identify the VLAN. When you edit a static VLAN, you cannot change this number.
Active	Select this check box to enable this VLAN when you click **Apply** below. Clear this check box and click **Apply** below to disable this VLAN without having to delete it.
Port Number	This field displays the port number.
Normal	Select **Normal** registration for the associated port if you want that port to join this VLAN group using GVRP, this item is not available on the ALC1224.
Fixed	Fixed registration ports are permanent members of this VLAN group.
Forbidden	Select forbidden for a port to block that port from joining this VLAN group.
TX Tagging	Select **TX Tagging** registration for the associated port if you want that port to tag all outgoing frames transmitted. Only select this if the subscriber's DSL modem or router supports 802.1Q VLAN.
Click **Apply** to save your changes back to the line card. Click **Reset** to begin configuring this screen afresh.	

5.4 ALC Management VLAN Edit Screen

Click **VLAN Setup** in the navigation panel and then a card's link in the **VLAN Setup** screen.

Click the management card's VLAN ID in the **ALC Static VLAN Setup** screen to open this screen.

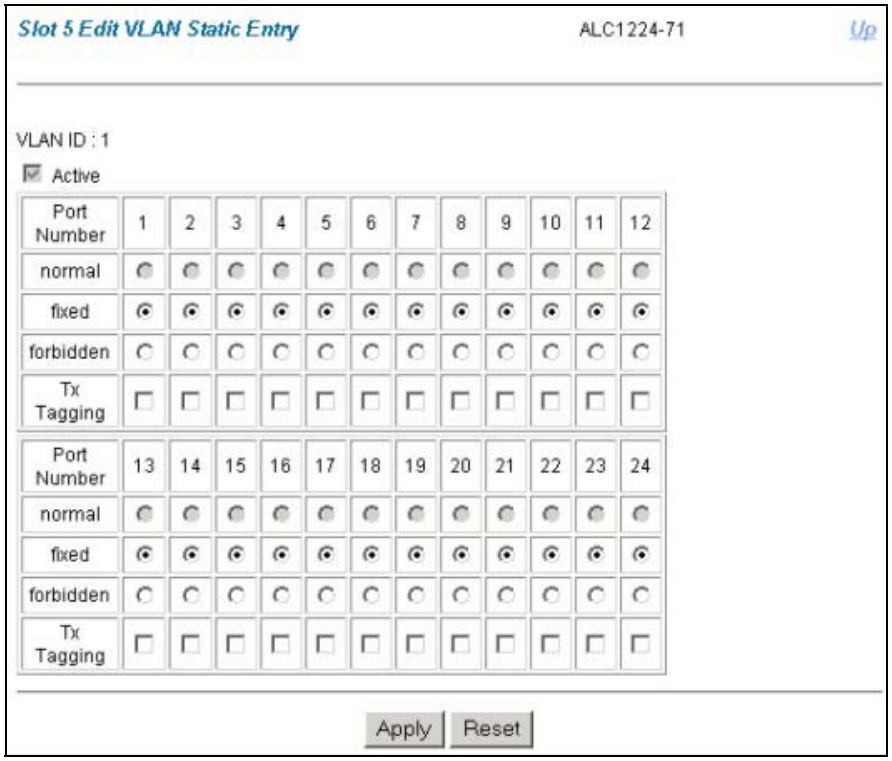


Figure 5-3 ALC Management VLAN Edit

Table 5-3 ALC Management VLAN Edit

LABEL	DESCRIPTION
Up	Click this link to go to the **Static VLAN Setup** screen.
VLAN ID	This is the number that identifies the VLAN group. When you add a static VLAN, type a number (1-4094) to identify the VLAN.
Active	This read only check box is selected when VLAN is enabled on the management switch card. It is cleared when VLAN is disabled on the management switch card.
Port Number	This field displays the port number.
Normal	Select **Normal** registration for the associated port if you want that port to join this VLAN group using GVRP, this item is not available on the ALC1224.
Fixed	Fixed registration ports are permanent members of this VLAN group.
Forbidden	Select forbidden for a port to block that port from joining this VLAN group.
TX Tagging	Select **TX Tagging** registration for the associated port if you want that port to tag all outgoing frames transmitted. Only select this if the subscriber's DSL modem or router supports 802.1Q VLAN.
Click **Apply** to save your changes back to the line card. Click **Reset** to begin configuring this screen afresh.	

Chapter 6 Maintenance

This chapter explains how to use the ADSL line card's maintenance screen.

6.1 Maintenance Overview

The web configurator allows you to upload new firmware to the ADSL line card.

6.1.1 Firmware Upgrade Screen

Click **Maintenance** in the navigation panel and then **Firmware Upgrade** in the **Maintenance** screen.

Click a card's link in the **Firmware Upgrade** screen to open the **Card Firmware Upgrade** screen.

Use the **Card Firmware Upgrade** screen to upgrade the card's firmware. Click **Up** to go to the **Firmware Upgrade** screen.

Do not interrupt the upgrade process, as it may permanently damage the card.

The card automatically restarts when the upgrade process is complete.

Procedure to upgrade your firmware:

Step 1. Use the card's **Statistics** screen to check its current firmware version number.

1. Download and unzip the new firmware.
2. Go to the **Card Firmware Upgrade** screen.
3. Type the path and file name of the firmware file you wish to upload to the line card in the **File Path** field or click **Browse** to display the **Choose File** screen from which you can locate it. After you have specified the file, click **Upload**.

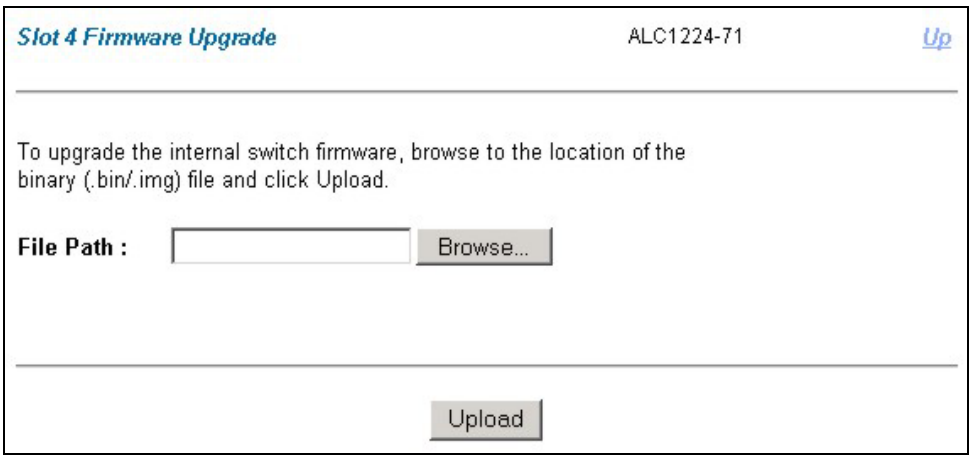


Figure 6-1 Card Firmware Upgrade

Chapter 7 Statistics

This chapter explains the ADSL line card's Advanced Management Statistics screens.

7.1 Statistics Overview

The web configurator provides statistics screens to allow you to see how much traffic the ADSL line card is handling and how it is handling it.

7.2 Statistics Screen

Click **Statistics** in the navigation panel and then the ADSL line card's link in the **Statistics** screen to open the **ALC Statistics** screen.

Use the **ALC Statistics** screen to view general information about the card and to access other screens with more detailed statistical information.

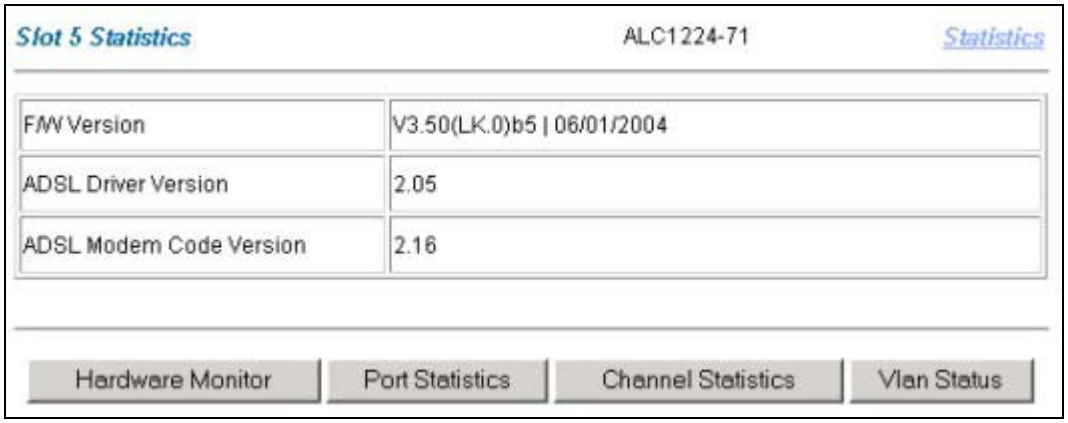


Figure 7-1 ALC Statistics

Table 7-1 ALC Statistics

LABEL	DESCRIPTION
Statistics	Click this link to go to the first **Statistics** screen.
F/W Version	This field displays the version number of the card's current firmware.
ADSL Driver Version	This field displays the version number of the card's current ADSL driver. This driver controls and monitors the card's chipset.
ADSL Modem Code Version	This field displays the version of the current ADSL modem code for the card's chipset.
Hardware Monitor	Click this button to display temperature, and voltage statistics for this card.

Table 7-1 ALC Statistics

LABEL	DESCRIPTION
Port Statistics	Click this button to display statistics for the ports on this card.
Channel Statistics	Click this button to display statistics for the channels on this card's ports.
Vlan Status	Click this button to display IEEE 802.1Q VLAN statistics for this card.

7.2.1 Hardware Monitor Screen

Click **Statistics** in the navigation panel and then the ADSL line card's link in the **Statistics** screen.

Click **Hardware Monitor** in the card's **Statistics** screen to open the **ALC Hardware Monitor** screen.

Use the hardware performance statistics in this screen for hardware troubleshooting. If the card's ALM led is on, use this screen to ascertain the cause.

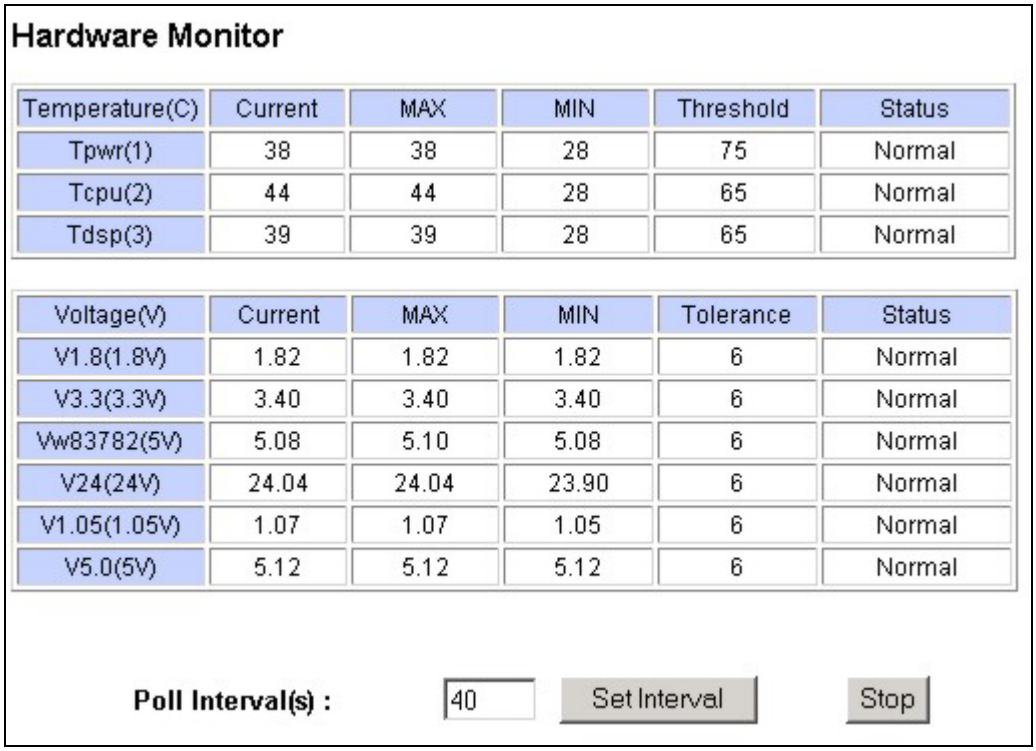


Figure 7-2 ALC Hardware Monitor

Table 7-2 ALC Hardware Monitor

LABEL	DESCRIPTION
Temperature (C)	Each line card temperature sensor is capable of detecting and reporting if the temperature rises *above* the threshold. Tpwr(1) refers to the temperature sensor near the card's power module. Tcpu (2) refers to the temperature sensor near the card's central processing unit. Tdsp(3) refers to the temperature sensor near the card's ADSL chipset. All temperature measurements are in degrees Celsius.

Table 7-2 ALC Hardware Monitor

LABEL	DESCRIPTION
Current	This shows the current temperature at this sensor.
Max	This field displays the maximum temperature measured at this sensor.
Min	This field displays the minimum temperature measured at this sensor.
Threshold	This field displays the upper temperature limit at this sensor.
Status	This field displays **Normal** for temperatures below the threshold and **Over** for those above.
Voltage(V)	The power supply for each voltage has a sensor that is capable of detecting and reporting if the voltage falls out of the tolerance range.
Current	This is the current voltage reading.
Max	This field displays the maximum voltage measured at this point.
Min	This field displays the minimum voltage measured at this point.
Tolerance	A tolerance of five percent is the acceptable deviation from the nominal voltage.
Status	**Normal** indicates that the voltage is within an acceptable operating range at this point; otherwise **Over** or **Under** is displayed.
Poll Interval(s)	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking **Set Interval**.
Stop	Click **Stop** to halt the hardware monitor statistic polling on this card.

7.2.2 Port Statistics Screen

Click **Statistics** in the navigation panel and then the ADSL line card's link in the **Statistics** screen.

Click **Port Statistics** in the card's **Statistics** screen to open the **ALC Port Statistics** screen.

Use the **ALC Port Statistics** screen to check status and performance data about the card's ports.

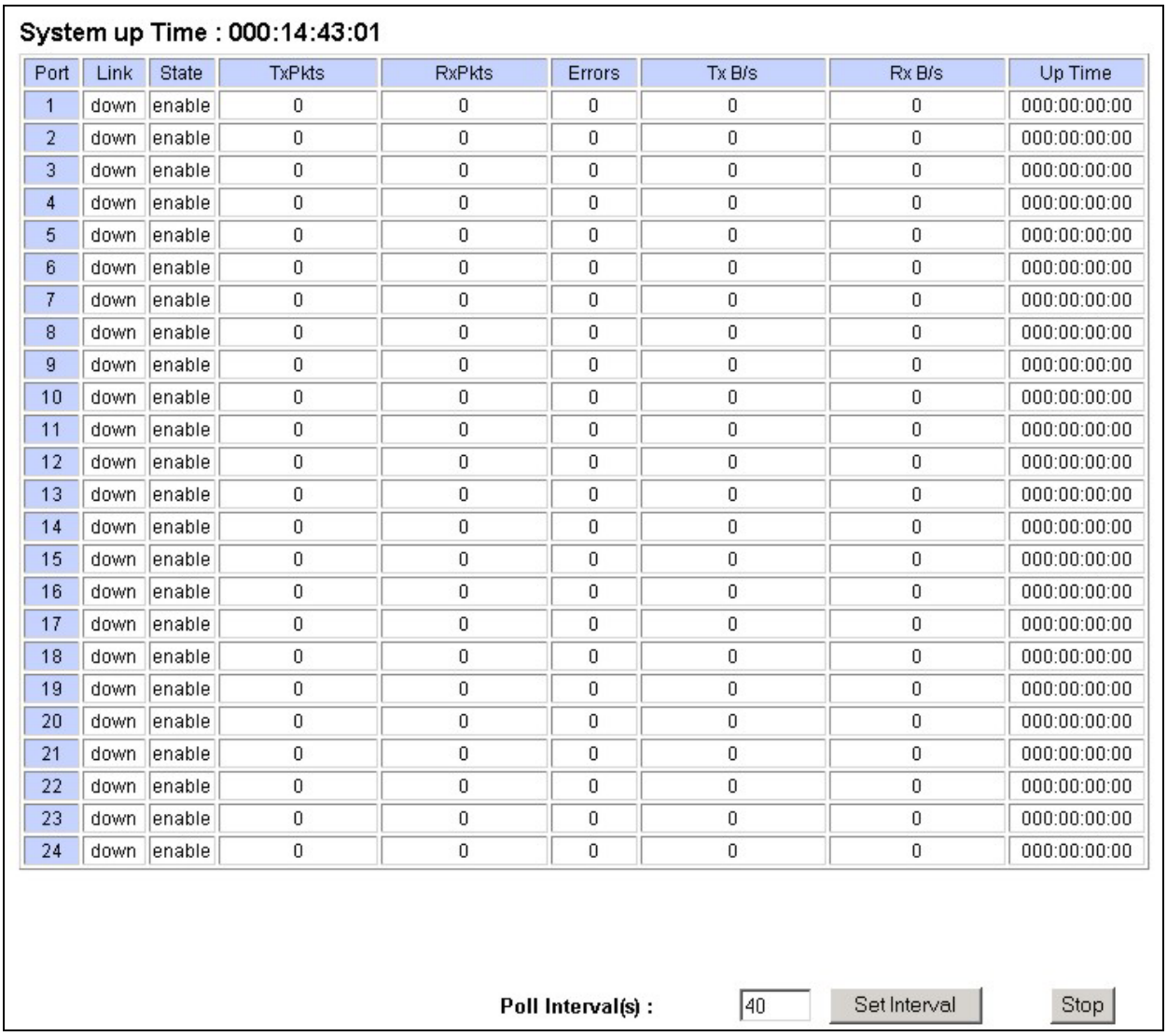


Figure 7-3 ALC Port Statistics

Table 7-3 ALC Port Statistics

LABEL	DESCRIPTION
System Uptime	This field shows how long the system has been running since the last time it was started.
Port	This refers to the DSL port number.
Link	This field shows the upstream/downstream speeds of the DSL connection for ports that have a connection or **Down** for the DSL ports that do not have a connection.
State	This field shows whether a port is turned on (**enable**) or off (**disable**).
TxPkts	This field shows the number of packets transmitted by this port since the DSL connection was last established.
RxPkts	This field shows the number of packets received by this port since the DSL connection was last established.

Table 7-3 ALC Port Statistics

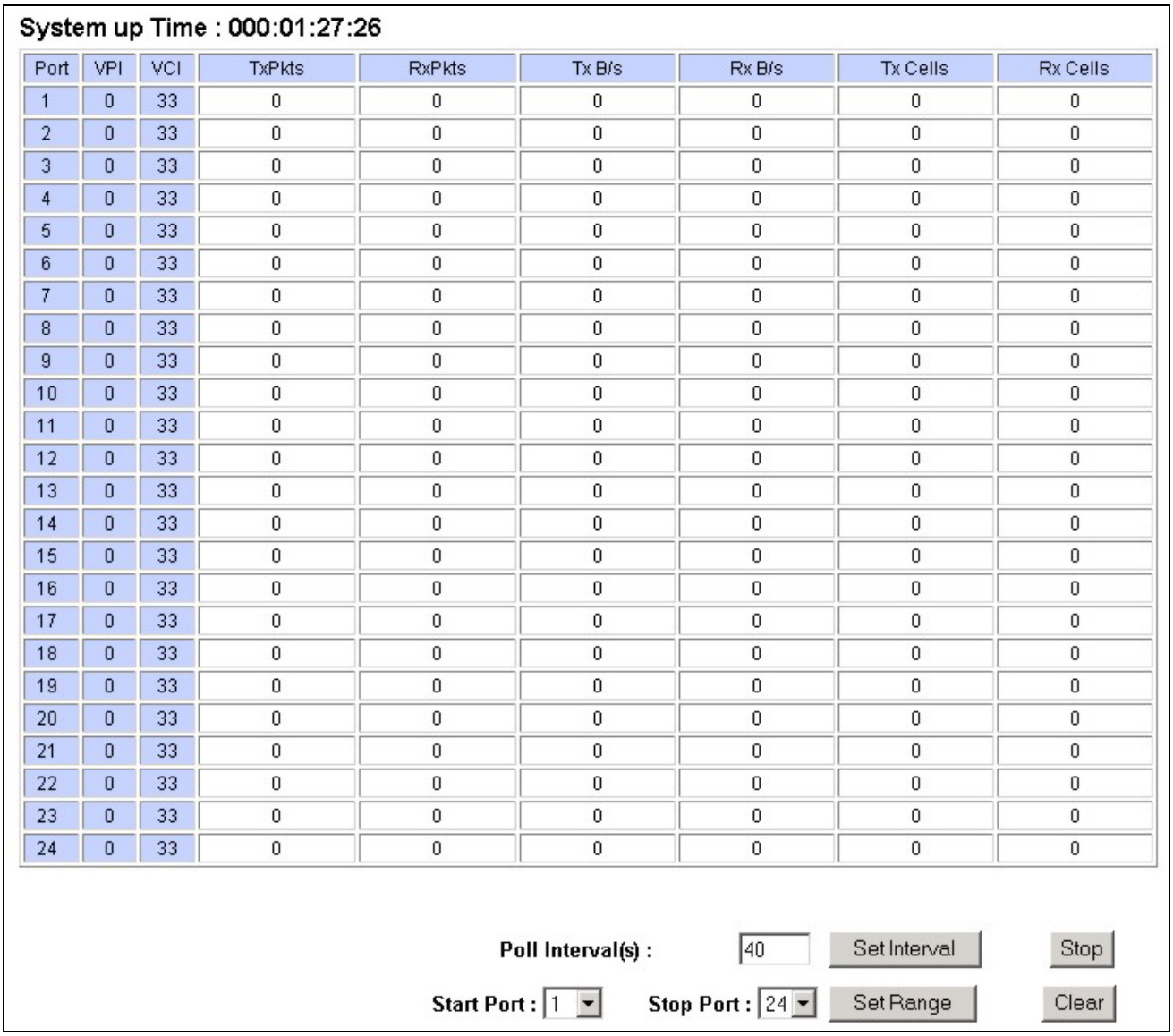
LABEL	DESCRIPTION
Errors	This field shows the number of received errors on this port.
Tx KB/s	This field shows the number of kilobytes transmitted on a per-second basis by this port.
Rx KB/s	This field shows the number of kilobytes received on a per-second basis by this port.
Up Time	This field shows the total amount of time the line has been up.
Poll Interval(s)	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking **Set Interval**.
Stop	Click **Stop** to halt system statistic polling on this card.

7.2.3 Channel Statistics

Click **Statistics** in the navigation panel and then the ADSL line card's link in the **Statistics** screen.

Click **Channel Statistics** in the card's **Statistics** screen to open the **ALC Channel Statistics** screen.

Use the **ALC Channel Statistics** screen to check status and performance data about the channels on the card's ports.



Port	VPI	VCI	TxPkts	RxPkts	Tx B/s	Rx B/s	Tx Cells	Rx Cells
1	0	33	0	0	0	0	0	0
2	0	33	0	0	0	0	0	0
3	0	33	0	0	0	0	0	0
4	0	33	0	0	0	0	0	0
5	0	33	0	0	0	0	0	0
6	0	33	0	0	0	0	0	0
7	0	33	0	0	0	0	0	0
8	0	33	0	0	0	0	0	0
9	0	33	0	0	0	0	0	0
10	0	33	0	0	0	0	0	0
11	0	33	0	0	0	0	0	0
12	0	33	0	0	0	0	0	0
13	0	33	0	0	0	0	0	0
14	0	33	0	0	0	0	0	0
15	0	33	0	0	0	0	0	0
16	0	33	0	0	0	0	0	0
17	0	33	0	0	0	0	0	0
18	0	33	0	0	0	0	0	0
19	0	33	0	0	0	0	0	0
20	0	33	0	0	0	0	0	0
21	0	33	0	0	0	0	0	0
22	0	33	0	0	0	0	0	0
23	0	33	0	0	0	0	0	0
24	0	33	0	0	0	0	0	0

Figure 7-4 ALC Channel Statistics

Table 7-4 ALC Channel Statistics

LABEL	DESCRIPTION
System Uptime	This field shows how long the system has been running since the last time it was started.
Port	This refers to the DSL port number.
VPI	This field displays the channel's Virtual Path Identifier (VPI). The VPI and VCI identify a channel on a port.
VCI	This field displays the channel's Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on a port.
TxPkts	This field shows the number of packets transmitted by this port on this individual channel since the DSL connection was last established.

Table 7-4 ALC Channel Statistics

LABEL	DESCRIPTION
RxPkts	This field shows the number of packets received by this port on this individual channel since the DSL connection was last established.
Errors	This field shows the number of received errors on this port on this individual channel.
Tx B/s	This field shows the number of bytes transmitted on a per-second basis by this port on this individual channel.
Rx B/s	This field shows the number of bytes received on a per-second basis by this port on this individual channel.
Tx Cells	This field shows the number of ATM cells transmitted by this port on this individual channel.
Rx Cells	This field shows the number of ATM cells received by this port on this individual channel.
Up Time	This field shows the total amount of time the line has been up.
Poll Interval(s)	The field displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking **Set Interval**.
Stop	Click **Stop** to halt system statistic polling on this card.
Start Port End Port Set Range	Use these fields to have the screen display channel statistics for a range of ports that you specify. Select a beginning port number in a range of ports in the **Start Port** field and an ending port number in the **End Port** field. Click **Set Range** to have the screen display channel statistics for the range of ports that you specified.
Clear	Click **Clear** to reset statistic records for the channels in the range selected in the **Start Port** to **End Port** range channel.

7.2.4 VLAN Status Screen

Click **Statistics** in the navigation panel and then the ADSL line card's link in the **Statistics** screen.

Click **VLAN Status** in the card's **Statistics** screen to open the **ALC 802.1Q VLAN Status** screen.

Use the **ALC 802.1Q VLAN Status** screen to check status and membership data about the card's IEEE 802.1Q VLANs.

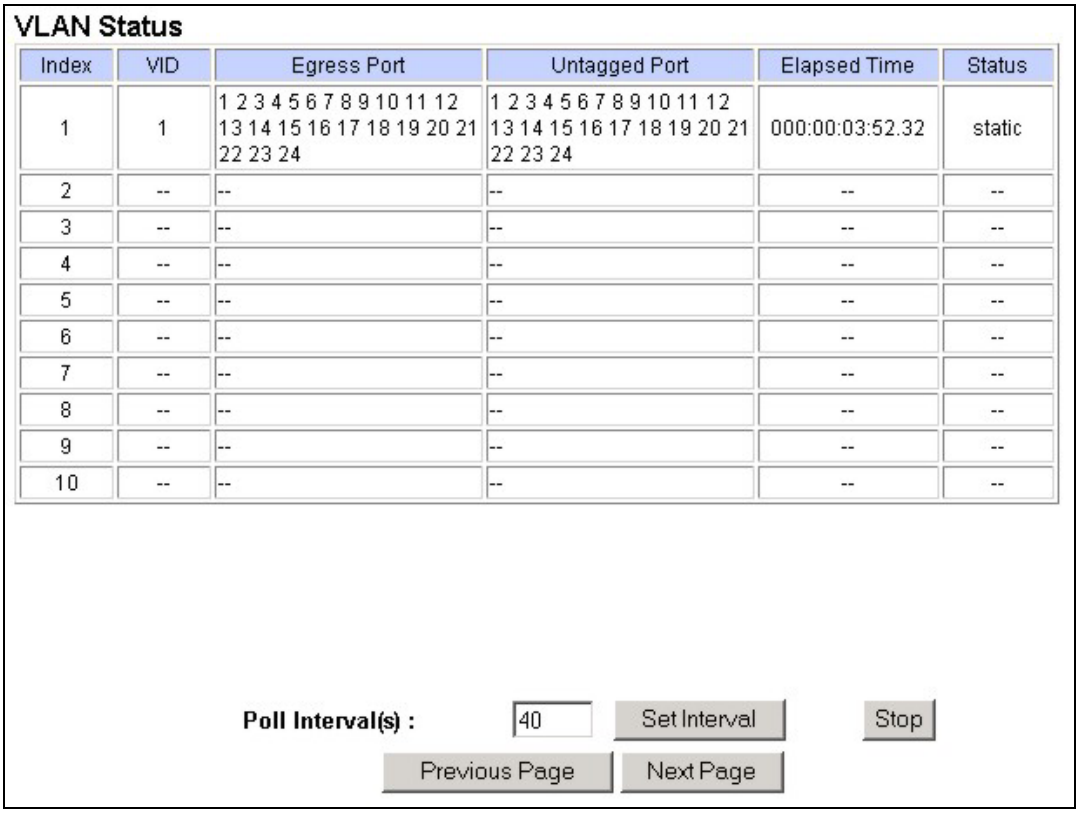


Figure 7-5 ALC 802.1Q VLAN Status

Table 7-5 ALC 802.1Q VLAN Status

LABEL	DESCRIPTION
Index	This is the VLAN index number.
VID	This is the VLAN identification number that was configured in the **VLAN ALC Setup** screen.
Egress Port	Ports that have been added to this VLAN are listed here in numerical order.
Untagged Port	Untagged ports that have been added to this VLAN are listed here in numerical order, separated by commas.
Elapsed Time	This field shows how long it has been since a normal VLAN was registered or a static VLAN was set up.
Status	This field shows how this VLAN was added to the switch. The ALC1224 supports the addition of static (permanent) VLAN entries.
Poll Interval(s)	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking **Set Interval**.
Stop	Click **Stop** to halt polling the VLAN statistics for this card.
Previous Page	Click **Previous Page** to show the preceding screen of VLAN status information (if there is more than one screen of VLAN statistics).

Table 7-5 ALC 802.1Q VLAN Status

LABEL	DESCRIPTION
Next Page	Click **Next Page** to show the subsequent screen of VLAN status information (if there is more than one screen of VLAN statistics).

Chapter 8 Diagnostics

This chapter explains the ADSL line card's Diagnostic screen.

8.1 Diagnostic Overview

The ADSL line card's diagnostic screen aids in troubleshooting.

8.2 Diagnostic Screen

Click **Diagnostic** in the navigation panel and then the line card's link in the **Diagnostic** screen to open the **ALC Diagnostic** screen.

Use this screen to check the card's error logs or reset the card.

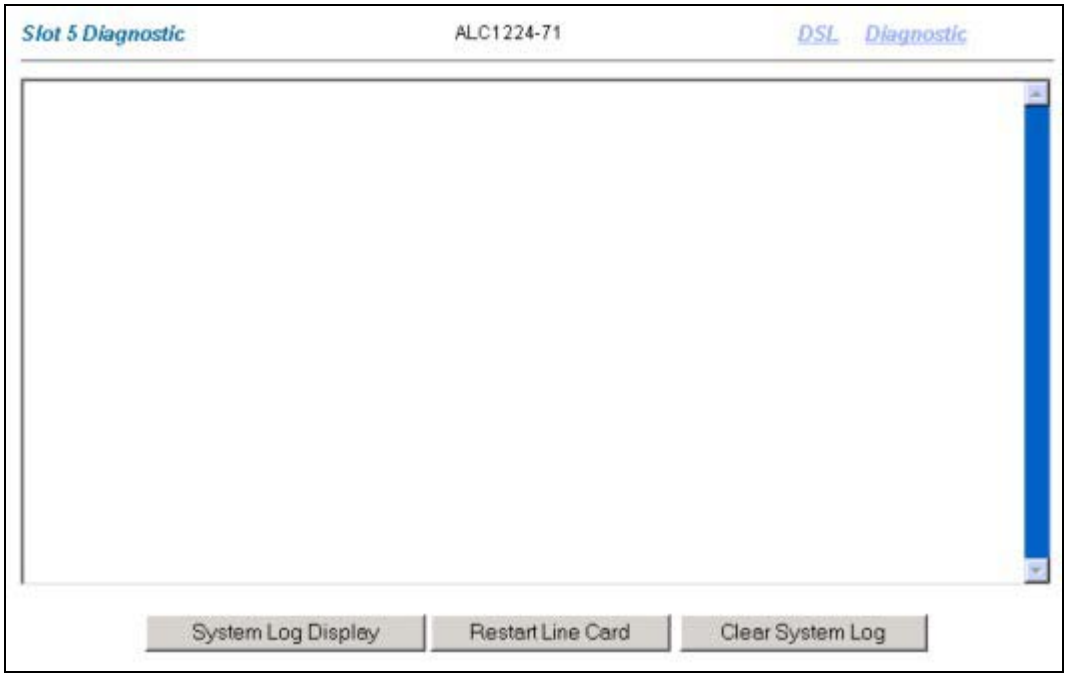


Figure 8-1 Diagnostic

Table 8-1 Diagnostic

LABEL	DESCRIPTION
DSL	Click this to go to the **DSL Diagnostic** screen
Diagnostic	Click this link to go to the first diagnostic screen.
System Log Display	Click this button to display a log of events in the multi-line text box.

Table 8-1 Diagnostic

LABEL	DESCRIPTION
Restart Line Card	Click this button to restart the ALC1224. A warning dialog box displays asking if you're sure you want to restart the card. Click **OK** to proceed.
Clear System	Click this button to clear the log of events in the multi-line text box.

8.3 Log Format

The common format of the system logs is: `<item no> <time> <process> <type> <log message>`

Table 8-2 Log Format

LABEL	DESCRIPTION
`<item no>`	This is the index number of the log entry.
`<time>`	This is the time and date when the log was created.
`<process>`	This is the process that created the log.
`<type>`	This identifies what kind of log it is. "INFO" identifies an information log. "WARN" identifies a warning log.
`<log message>`	This is the log's detailed information (see *Table 8-3 Log Messages*)

8.3.1 Log Messages

The following table lists and describes the system log messages.

Table 8-3 Log Messages

LOG MESSAGE	TYPE	DESCRIPTION
`System Cold Start!`	`INFO`	The line card has started.
`System Warm Start!`	`INFO`	The line card started after rebooting.
`Reboot System`	`WARN`	The line card is restarting due to an error.

`ADSL <port> Link Up(SN=<seq no>): <ds rate>/<us rate>!`
`or`
`ADSL Link Info: NM:<ds NM>/<us NM>!`
	`INFO`	An ADSL port established a connection.
		<port> - port number
		<seq no> - sequence number of the connection
		<ds rate> - downstream rate
		<us rate> - upstream rate
		<us NM> - upstream noise margin
		<ds NM> - downstream noise margin

`ADSL <port> Link Down(SN=<seq no>)!`	`WARN`	An ADSL port lost its connection. <port> - port number <seq no> - sequence number of the connection

Table 8-3 Log Messages

LOG MESSAGE	TYPE	DESCRIPTION
Session Begin!	INFO	A console, telnet or FTP session has begun (see the <process> field for the type of session).
Session End!	INFO	A console telnet or FTP session has terminated (see the <process> field for the type of session).
Incorrect Password!	WARN	Someone attempted to use the wrong password to start a console, telnet or FTP session (see the <process> field for the type of session).
Received Firmware Checksum Error!	WARN	A checksum error was detected during an attempted firmware upload (the <process> field shows whether the web configurator or FTP was used).
Received Firmware Size too large!	WARN	The file size was too large with an attempted firmware upload (the <process> field shows whether the web configurator or FTP was used).
Received Firmware Invalid!	WARN	Someone attempted to upload a firmware file with a wrong identity (the <process> field shows whether the web configurator or FTP was used).
Received File <file>!	INFO	A file was uploaded to the ALC1224 by FTP. <file> - received file's name
THERMO OVER TEMPERATURE: dev:<id> threshold:<threshold>(degree C) value:<temp>(degree C)!	WARN	The temperature was too high at one of the three temperature sensors. <id> - 0: sensor near the power module - 1: sensor near the CPU - 2: sensor near the ADSL chipset <threshold> - threshold temperature <temp> - temperature when the entry was logged
THERMO OVER TEMPERATURE released: dev:<id> threshold:<threshold>(degree C) value:<temp>(degree C)!	INFO	The temperature at one of the three temperature sensors has come back to normal. <id> - 0: sensor near the power module - 1: sensor near the CPU - 2: sensor near the ADSL chipset <threshold> - threshold temperature <temp> - temperature when the entry was logged
THERMO OVER VOLTAGE: nominal:<nominal>(mV) value:<voltage> mV)!	WARN	The line card's voltage went outside of the accepted operating range. <nominal> - nominal voltage of the DC power <voltage> - voltage of the DC power when logged
THERMO OVER VOLTAGE released: nominal:<nominal>(mV) value:<voltage> (mV)!	INFO	The line card's voltage is back inside the accepted operating range. <nominal> - nominal voltage of the DC power <voltage> - voltage of the DC power when logged

8.4 Diagnostic DSL Screen

Click **DSL** in the **Diagnostic** screen to open the **ALC DSL Line Diagnostic** screen.

Use this screen to check the card's DSL chip via **Local Loopback** or connections via **OAM F5** tests.

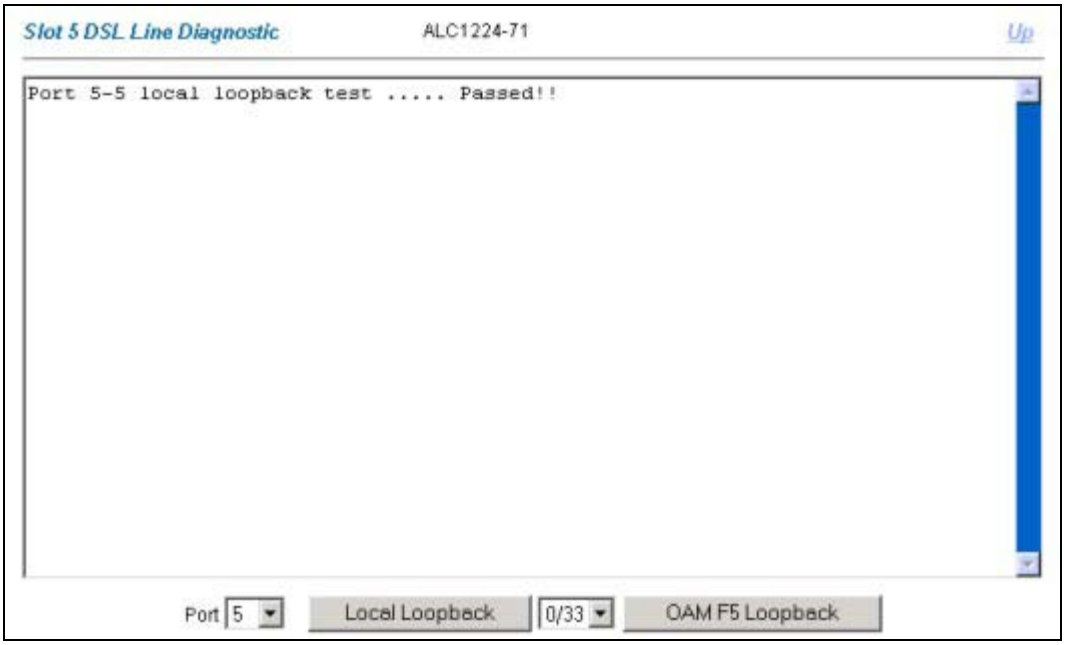


Figure 8-2 ALC Diagnostic DSL

Table 8-4 ALC Diagnostic DSL

LABEL	DESCRIPTION
Up	Click this link to go to the card's **Diagnostic** screen.
Port	Select a DSL port number from the drop-down list box.
Local Loopback	Click this to perform a local loopback test on the specified DSL port. A local loopback test is used to check the device's DSL chip. The results ("Passed" or "Failed") display in the multi-line text box. A local loopback test failure indicates an internal device problem.
OAM F5 Loopback	Select a VPI/VCI from the drop-down list box and click **OAM F5 Loopback** to perform an OAMF5 loopback test on the specified DSL port. An Operational, Administration and Maintenance Function 5 test is used to test the connection between two DSL devices. First, the DSL devices establish a virtual circuit. Then the local device sends an ATM F5 cell to be returned by the remote DSL device (both DSL devices must support ATM F5 in order to use this test). The results ("Passed" or "Failed") display in the multi-line text box.

Chapter 9 Troubleshooting

This chapter covers potential problems and possible remedies. After each problem description, some steps are provided to help you to diagnose and to solve the problem.

9.1 Troubleshooting Overview

See also the *Integrated Ethernet Switch's User's Guide* for additional troubleshooting information.

9.2 Data Transmission

The DSL link is up, but data cannot be transmitted.

Table 9-1 Troubleshooting Data Transmission

STEPS	CORRECTIVE ACTION
1	Check to see that the VPI/VCI and multiplexing mode (LLC/VC) settings in the subscriber's DSL modem or router match those of the DSL port on the line card (refer to the sections on the edit port setup screens). Also, make sure that the subscriber's ADSL modem is using RFC 1483 encapsulation. If the subscriber is using a router (with routing mode), make sure it is using ENET ENCAP.
2	Check the line card's VLAN configuration (see the chapter on VLAN).
3	Ping the line card from the computer behind the DSL modem or router.
4	If you cannot ping, connect a DSL modem to a DSL port (that is known to work) on the same line card. If the DSL modem or router works with a different DSL port, there may be a problem with the original port. Contact the distributor.
5	If using a different port does not work, try a different DSL modem or router with the original port.

9.3 Data Rate

The SYNC-rate is not the same as the configured rate.

Table 9-2 Troubleshooting the SYNC-rate

STEPS	CORRECTIVE ACTION
1	Connect the DSL modem or router directly to the DSL port of the line card using a different telephone wire.
2	If the rates match, the quality of the telephone wiring that connects the subscriber to the line card may be limiting the speed to a certain rate. If they do not match when a good wire is used, contact the distributor.

9.4 Configured Settings

The line card's configured settings do not take effect.

Table 9-3 Troubleshooting the Line Card's Configured Settings

CORRECTIVE ACTION
Click **Apply** after you finish configuring to save the ALC1224's settings. With the commands, use the "config save" command. If these do not work, contact the distributor.

9.5 Recovering the Firmware

Usually you should upload the ALC1224's firmware through the management switch card. If the ALC1224 will not start up, the firmware may be lost or corrupted. Use the following procedure to upload firmware to the ALC1224 only when you are unable to upload firmware through the management switch card. It requires you to disconnect the management switch card, thus disconnecting all of the Integrated Ethernet Switch's subscribers.

This procedure is for emergency situations only.

Using it will disconnect all of the Integrated Ethernet Switch's subscribers.

1. Obtain the firmware file, unzip it and save it in a folder on your computer.
2. Connect your computer to the console port and use terminal emulation software configured to the following parameters:
   - VT100 terminal emulation
   - 9600 bps
   - No parity, 8 data bits, 1 stop bit
   - No flow control
3. Pull the management switch card out of the Integrated Ethernet Switch's chassis (far enough to disconnect it from the back plane of the chassis).
4. Pull the ALC1224 out of the Integrated Ethernet Switch's chassis (far enough to disconnect it from the back plane of the chassis) and push it back in to restart the ALC1224 and begin a session.
5. When you see the message `Press any key to enter Debug Mode within 3 seconds`, press a key to enter debug mode.
6. Type `atba5` after the `Enter Debug Mode` message (this changes the console port speed to 115200 bps).
7. Change the configuration of your terminal emulation software to use 115200 bps and reconnect to the ALC1224.
8. Type `atur` after the `Enter Debug Mode` message.
9. Wait for the `Starting XMODEM upload` message before activating XMODEM upload on your terminal.
10. This is an example Xmodem configuration upload using HyperTerminal. Click **Transfer**, then **Send File** to display the following screen.

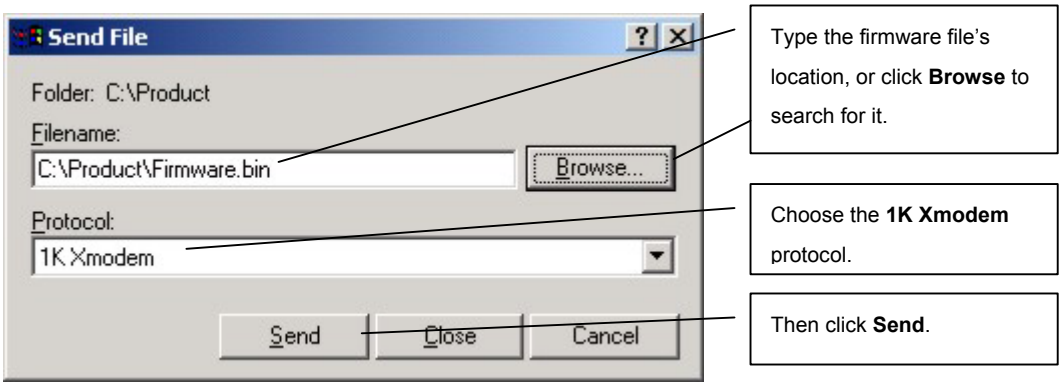


Figure 9-1 Example Xmodem Upload

11. After a successful firmware upload, type `atgo` to restart the ALC1224. The console port speed automatically changes back to 9600 bps when the ALC1224 restarts.

12. After the ALC1224 restarts, put the management switch card back into the Integrated Ethernet Switch's chassis.

Part IV:

Commands and SNMP

This part gives information on how to use commands to configure and manage the ADSL line card. It also provides information about SNMP.

Chapter 10 Commands

This chapter introduces the command line interface and lists all of the commands that are available when you use the line card with the management switch card.

10.1 Command Line Interface Overview

You can use text command lines for software configuration. The rules of the commands are listed next.

1. The command keywords are in `courier new` font.
2. Commands can be abbreviated to the smallest unique string that differentiates the command. For example the "`system date`" command could be abbreviated to "`s d`".
3. The required fields in a command are enclosed in angle brackets <>, for instance, list port <port> means that you must specify the port number for this command. <slot-port> means that you must specify the number of the slot where the ALC1224 is located and the number of an ADSL port. See the following examples for how to specify all slots and all ports or specific ranges of ports.
    a. <*-*> specifies all of the slots and all of the ADSL ports. This only works for commands that are common to all of the line cards (you cannot use an * for the slot if the command is specific to the ALC1224).
    b. <3-*> specifies slot three and all of the line card's ADSL ports.
    c. <3-1,3~5,10~15> specifies slot three and the line card's ADSL ports 1, 3 through 5 and 10 to 15.
4. The optional fields in a command are enclosed in square brackets `[]`, for instance, `config [save]` means that the `save` field is optional.
5. "Command" refers to a command used in the command line interface (CI command).
6. The `|` symbol means "or".

10.1.1 Saving Your Configuration

Always remember to save your configuration using the following syntax:

```
ras> config save
```

Do not turn off your IES-2000 or IES-3000 or remove the line card while saving your configuration.

This command saves all system configurations to nonvolatile memory. You must use this command to save any configuration changes that you make, otherwise the line card returns to its default settings when it is restarted. Save your changes after each configuration session.

10.2 Command Shells

The management switch card provides two full sets of commands called shells. The standard shell commands generally allow you to configure the same settings and display the same statistics information for which you can use the web configurator. The engineer shell commands are for advanced switch diagnosis and troubleshooting. The engineer shell commands are backwards compatible with the command structure of earlier versions of the management switch card's firmware.

10.2.1 Changing Command Shells

Use the `sys chsh` command to display which command shell the management switch card is set to use. You can also use it to change from the standard shell (new) to the engineer shell (old).

Syntax:

```
ras> sys chsh [engsh|stdsh]
```

where

`engsh` = This is the engineer shell.

`stdsh` = This is the standard shell.

The following example sets the management switch card to use the standard command shell.

```
ras> sys chsh stdsh
```

Figure 10-1 Changing to the Standard Shell Commands

Using commands not documented in the user's guide can damage the unit and possibly render it unusable.

Nonvolatile memory refers to the card's storage that remains even if the card's power is turned off. Run time (memory) is lost when the card's power is turned off.

Use the `lcman` commands to configure the line cards

You only need to use `lcman command <slot> <subcommands>` for some statistics commands.

10.3 Standard Shell Commands

The following table lists standard shell commands that you can use with the line card when you use the management switch card.

Table 10-1 Standard Shell Commands

COMMANDS				DESCRIPTION
`lcman`				
	`show`			Shows the status of the line cards.
	`maccount`			

Table 10-1 Standard Shell Commands

COMMANDS				DESCRIPTION
		show		Displays the system's current MAC address count settings.
		enable	<slot>	Turns on a line card's MAC address count filter.
		disable	<slot>	Turns off a line card's MAC address count filter.
		set	<slot> <count>	Sets a line card's MAC address count filter.
	port			
		show	<slot>	Displays a line card's port settings.
		enable	<slot-port>	Turns on a subscriber port.
		disable	<slot-port>	Turns off a subscriber port.
		set	<slot-port> <profile> [mode]	Sets a subscriber port.
		profile		
			show [<adsl|shdsl> [profile]]	Shows profile contents.
			set <adsl|shdsl> <profile> <parameter>	Creates a line profile.
			delete <adsl|shdsl> <profile>	Removes a line profile.
			map <adsl|shdsl> <profile>	Displays a profile's port mapping.
		pvc		
			show	Displays PVC settings.
			set <slot-port-vpi/vci> <super|vid=<vid>> [llc|vc|vcprofile=<vcprofile>] [priority=<pri>]	Creates or modifies a PVC setting.
			delete <slot-port-vpi/vci>	Removes a PVC setting.
		vcprofile	set <vcprofile> <llc|vc> <0|1|2|5> <cbr|vbr|ubr> <opt_param>	Creates a virtual channel profile.
			delete <vcprofile>	Removes a virtual channel profile.
			show [vcprofile]	Shows a virtual channel profile's contents.
			map <vcprofile>	Displays a virtual channel profile's port mapping.
		pvid		
			show <slot id>	Displays port PVID settings.

Table 10-1 Standard Shell Commands

COMMANDS				DESCRIPTION
			set <slot-port> <pvid>	Sets a port's default priority.
		priority		
			show <slot id>	Displays port default priority settings.
			set <slot-port> <priority>	Sets a port's default priority.
		frametype	show <slot>	Displays the acceptable frame type settings for the ports on a card.
			set <slot-port> <all|tag>	Sets the acceptable frame type for a specific port.
		pktfilter	show <slot>	Displays packet type filter settings.
			set <slot-port><params>	Sets the packet type filter for a specific port.
		macfilter	show <slot>	Displays MAC filter settings.
			enable <slot-port>	Turns on the MAC filter.
			disable <slot-port>	Turns off the MAC filter.
			set <slot-port> <mac>	Adds a MAC filter MAC entry.
			delete <slot-port> <mac>	Removes a MAC filter MAC entry.
		maccount	show <slot>	Displays the MAC count filter settings.
			enable <slot-port>	Turns on the MAC count filter.
			disable <slot-port>	Turns off the MAC count filter.
			set <slot-port> <count>	Sets the MAC count filter for a specific port.
		isolate	[enable|disable]	Enables/disables port isolation.
		dot1x	show <slot>	Displays 802.1X settings.
			enable <slot-port>	Turns on 802.1X for specific ports.
			disable <slot-port>	Turns off 802.1X for specific ports.
			control <slot-port><auto|auth|unauth>	Sets the 802.1X port authentication option for specific ports.
			reauth <slot-port><on|off>	Sets the 802.1X re-authentication option for specific ports.
			period <slot-port><seconds>	Sets the 802.1X re-authentication period for specific ports.
	Command <slot>			Sends commands to the line card in the specified slot.
		lineinfo	<port>	This command shows the statistics of the specified DSL ports.

Table 10-1 Standard Shell Commands

COMMANDS				DESCRIPTION
		lineperf	<port>	This command shows the line quality of the specified DSL port.
		loopback	<port> <local | f5>	Performs loopback test. <mode> = "local" or "f5"
		list port	<port>	Displays line settings.
		list ports		Displays line settings on all ports.
		stat ch	<port>	Displays channel status of a DSL line.
		stat chs	<port>	Displays channel status of all DSL lines.
		linedata	<port>	Displays the line data load per symbol (tone).
		linerate	<port>	Displays the line rate.
		show port	<port>	Displays the line status (either up or down) of a port.
		show ports		Displays the line status (either up or down) of all ports.

10.4 Engineer Shell Commands

The following table lists engineer shell commands that you can use with the line card when you use the management switch card.

Table 10-2 Engineer Shell Commands

COMMANDS			DESCRIPTION
config			
	save		This command saves configuration information in all modules to nonvolatile memory.
lcman			
	status		Shows the status of the line card manager.
	svlan	setentry <vid> <slot-port> [<adv> <tag>]	Sets a VLAN entry.
		delentry <vid>	Deletes a VLAN entry.
		list [<vid> | <startVID> <endVID>]	Displays VLAN settings.
		active <vid>	Turns on VLAN.
		deactive <vid>	Turns off VLAN.
		name set <vid> <name>	Sets a name for a VLAN entry.
		name list	Displays the names of the VLAN entries.
	port	enable <slot-port>	Turns on a subscriber port.
		disable <slot-port>	Turns off a subscriber port.

Table 10-2 Engineer Shell Commands

COMMANDS			DESCRIPTION
		`set <slot-port> <profile_name> [<mode>]`	Sets a subscriber port.
		`list <slot>`	Displays a line card's port settings.
		`profile set <"*dsl"> <prof_name> <parameters>`	Creates a line profile.
		`profile delete <"*dsl"> <prof_name>`	Removes a line profile.
		`profile list [<"*dsl"> [<profile_name>]]`	Shows profile contents.
		`profile map <"*dsl"> <prof_name>`	Displays a profile's port mapping.
		`pvc set <slot-port-vpi/vci> <...>`	Creates or modifies a PVC setting.
		`pvc delete <slot-port-vpi/vci>`	Removes a PVC setting.
		`pvc list [<slot-port-vpi/vci>]`	Displays PVC settings.
		`vcprofile set <prof_name> <llc|vc> <0|1|2|5> <cbr|vbr|ubr> <opt_param>`	Creates a virtual channel profile.
		`vcprofile delete <vcprofile>`	Removes a virtual channel profile.
		`vcprofile list [<vcprof_name>]`	Shows a virtual channel profile's contents.
		`vcprofile map <vcprofile>`	Displays a virtual channel profile's port mapping.
		`pvid set <slot-port> <pvid>`	Sets a port's default VID.
		`pvid list <slot>`	Displays port PVID settings.
		`priority set <slot-port> <priority>`	Sets a port's default priority.
		`priority list <slot>`	Displays port default priority settings.
		`isolate [enable/disable]`	Enables/disables port isolation.
		`frametype set <slot-port> all|tag`	Sets the acceptable frame type for a specific port.
		`list <slot>`	Displays the acceptable frame type settings for the ports on a card.
		`pktfilter set <slot-port> <parameters>`	Sets the packet type filter for a specific port.
		`pktfilter list <slot>`	Displays packet type filter settings.
		`macfilter enable <slot-port>`	Turns on the MAC filter.
		`macfilter disable <slot-port>`	Turns off the MAC filter.

Table 10-2 Engineer Shell Commands

COMMANDS			DESCRIPTION
		macfilter set <slot-port> <mac>	Adds a MAC filter MAC entry.
		macfilter delete <slot-port> <mac>	Removes a MAC filter MAC entry.
		macfilter list <slot>	Displays the MAC filter settings.
		maccount enable <slot-port>	Turns on the MAC count filter.
		maccount disable <slot-port>	Turns off the MAC count filter.
		maccount set <slot-port> <count>	Sets the MAC count filter for a specific port.
		maccount list <slot>	Displays MAC count filter settings.
	dot1x	enable	Turns on 802.1X for the whole system.
		disable	Turns off 802.1X for the whole system.
		list <slot>	Displays 802.1X settings.
		port enable <slot-port>	Turns on 802.1X for specific ports.
		disable <slot-port>	Turns off 802.1X for specific ports.
		control <slot-port> auto|auth|unauth	Sets the 802.1X port authentication option for specific ports.
		reauth <slot-port> on|off	Sets the 802.1X re-authentication option for specific ports.
		period <slot-port> <seconds>	Sets the 802.1X re-authentication period for specific ports.
	config	convert	Backward compatibility command.
	maccount	active <slot>	Turns on a line card's MAC address count filter.
		inactive <slot>	Turns off a line card's MAC address count filter.
		set <slot> <count>	Sets a line card's MAC address count filter.
		list	Displays the system's current MAC address count settings.
	command <slot>	<subcommands>	Sends commands to the line card in the specified slot.
		lineinfo <port>	This command shows the statistics of the specified DSL ports.
		lineperf <port>	This command shows the line quality of the specified DSL port.
		loopback <port> <mode>	Performs loopback test. <mode> = "local" or "f5"
		list port <port>	Displays line settings.
		list ports	Displays line settings on all ports.
		stat ch <port> <vpi> <vci>	Displays channel status of all DSL lines.

Table 10-2 Engineer Shell Commands

COMMANDS			DESCRIPTION
		`stat chs <port>`	Displays channel status of a DSL line.
		`linedata <port>`	Displays the line data load per symbol (tone).
		`linerate <port>`	Displays the line rate.
		`show port <port>`	Displays the line status (either up or down) of a port.
		`show ports`	Displays the line status (either up or down) of all ports.

Chapter 11
ADSL Port Commands

This chapter describes some of the ADSL port standard shell commands that allow you to configure and monitor the ADSL ports.

11.1 ADSL Overview

See the web configurator chapter on ADSL for background information about ADSL.

Command syntax and command examples are shown using Standard shell.

11.2 Configured Versus Actual Rate

You configure the maximum rate of an individual ADSL port by modifying its profile (see the `set profile` command) or assigning the port to a different profile (see the `set port` command). However, due to noise and other factors on the line, the actual rate may not reach the maximum that you specify.

Even though you can specify arbitrary numbers in the `set profile` command, the actual rate is always a multiple of 32 Kbps. If you enter a rate that is not a multiple of 32 Kbps, the actual rate will be the next lower multiple of 32Kbps. For instance, if you specify 60 Kbps for a port, the actual rate for that port will not exceed 32 Kbps, and if you specify 66 Kbps, the actual rate will not be over 64Kbps.

Regardless of a profile's configured upstream and downstream rates, the ALC1224 automatically limits the actual rates for each individual port to the maximum speeds supported by the port's ADSL operational mode. For example, if you configure a profile with a maximum downstream rate of 25000 Kbps, and apply it to a port set to use G.dmt, the ALC1224 automatically uses a maximum downstream rate of 8160 Kbps. This means that if you configure a profile with very high rates, you can still use it with any port.

11.3 ADSL Port Commands

Use these commands to configure the line card's ADSL ports.

11.3.1 Port Show Command

Syntax:

```
lcman port show <slot>
```

where

`<slot>` = The number of the slot where the ALC1224 is located.

This command shows the priority, PVID, modes and states of all ADSL ports. An example is shown next.

```
ras> lcman  port show 3
[slot3  (alc-73)]
port enable mode   pvid priority profile
---- ------ ------ ---- -------- --------------------------------
   1   -    auto      1        0 DEFVAL
   2   -    auto      1        0 DEFVAL
   3   -    auto      1        0 DEFVAL
   4   -    auto      1        0 DEFVAL
   5   -    auto      1        0 DEFVAL
   6   -    auto      1        0 DEFVAL
   7   -    auto      1        0 DEFVAL
   8   -    auto      1        0 DEFVAL
   9   -    auto      1        0 DEFVAL
  10   -    auto      1        0 DEFVAL
  11   -    auto      1        0 DEFVAL
  12   -    auto      1        0 DEFVAL
  13   -    auto      1        0 DEFVAL
  14   -    auto      1        0 DEFVAL
  15   -    auto      1        0 DEFVAL
  16   -    auto      1        0 DEFVAL
  17   -    auto      1        0 DEFVAL
  18   -    auto      1        0 DEFVAL
  19   -    auto      1        0 DEFVAL
  20   -    auto      1        0 DEFVAL
  21   -    auto      1        0 DEFVAL
  22   -    auto      1        0 DEFVAL
  23   -    auto      1        0 DEFVAL
  24   -    auto      1        0 DEFVAL
```

Figure 11-1 Port Show Command Example

11.3.2 Port Disable Command

Syntax:

```
lcman port disable <slot-port>
```

where

`<slot-port>` = The number of the slot where the ALC1224 is located and the number of an ADSL port.

This command forcibly disables the specified ADSL port.

The factory default of all ports is disabled. A port must be enabled before data transmission can occur. An enabled but disconnected ADSL port generates more heat than an operating port. To minimize heat generation and to enhance reliability, remember to disable a port when it is not in use.

11.3.3 Port Enable Command

Syntax:

```
lcman port enable <slot-port>
```

where

`<slot-port>` = The number of the slot where the ALC1224 is located and the number of an ADSL port.

This command forcibly enables the specified ADSL port.

The factory default of all ports is disabled. A port must be enabled before data transmission can occur. An enabled but disconnected ADSL port generates more heat than an operating port. To minimize heat generation and to enhance reliability, remember to disable a port when it is not in use.

11.3.4 Linedata Command

Syntax:

```
lcman command <slot> linedata <port>
```

where

`<slot>` = The number of the slot where the ALC1224 is located.

`<port>` = A port number (1 ~ 24).

This command shows the line bit allocation of an ADSL port.

Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into tones. This command displays the number of bits transmitted for each tone. This can be used to determine the quality of the connection, whether a given sub-carrier loop has sufficient margins to support ADSL transmission rates, and possibly to determine whether certain specific types of interference or line attenuation exist. Refer to the ITU-T G.992.1 recommendation for more information on DMT.

The better (or shorter) the line, the higher the number of bits transmitted for a DMT tone. The maximum number of bits that can be transmitted per DMT tone is 15.

"DS carrier load" displays the number of bits received per DMT tone for the downstream channel (from the ALC1224 to the subscriber's DSL modem or router).

"US carrier load" displays the number of bits transmitted per DMT tone for the upstream channel (from the subscriber's DSL modem or router to the ALC1224).

The bit allocation contents are only valid when the link is up.

In the following example, the downstream channel is carried on tones 65 to 241 and the upstream channel is carried on tones 7 to 29 (space is left between the channels to avoid interference).

```
adsl linedata 11
US carrier load: number of bits per symbol(tone):
tone    0-  19: 00 00 00 00 00 00 04 05 06 - 06 06 06 06 07 07 07 06 06 07
tone   20-  39: 07 07 07 07 06 06 07 06 06 06 - 00 00

DS carrier load: number of bits per symbol(tone)
tone    0-  19: 00 00 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 00 00
tone   20-  39: 00 00 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 00 00
tone   40-  59: 00 00 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 00 00
tone   60-  79: 00 00 00 00 00 00 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02 02
tone   80-  99: 02 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 03 03 03 03 04
tone  100- 119: 04 04 04 04 04 04 04 04 04 04 04 - 04 04 04 04 04 04 04 04 04 04
tone  120- 139: 04 04 04 04 04 04 04 04 04 04 04 - 04 04 04 04 04 04 04 04 04 04
tone  140- 159: 04 04 04 04 04 04 04 04 04 04 04 - 04 04 04 04 04 04 04 04 04 04
tone  160- 179: 04 04 04 04 04 04 04 04 04 04 04 - 04 04 04 04 04 04 04 04 04 04
tone  180- 199: 04 04 04 04 04 04 04 04 04 04 04 - 04 04 04 04 04 04 04 04 04 04
tone  200- 219: 04 04 04 04 04 04 04 04 04 04 04 - 04 04 04 04 04 04 04 04 04 04
tone  220- 239: 03 03 03 03 03 03 03 03 03 03 03 - 03 03 03 02 02 02 02 02 02 02
tone  240- 259: 02 02 00 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00
```

Figure 11-2 Linedata Command Example

11.3.5 Lineinfo Command

Syntax:

`lcman command <slot> lineinfo <port>`

where

`<slot>` = The number of the slot where the ALC1224 is located.

`<port>` = A port number (1 ~ 24).

This command shows the line operating values of an ADSL port.

An example is shown next.

```
adsl lineinfo 11
Current operating modes:
    Service type in operation: G.DMT
    TRELLIS operation mode is        : ON
Current connection detail:
    Down/up stream interleaved Delay :  4/ 0 ms
    Total Transceiver Output Power   :  8dBm
Current ATUR information:
    Country code 15
    Provider Code 42434c41
```

Figure 11-3 Lineinfo Command Example

The service type in operation is the ADSL standard that the port is using: G.dmt (ALC1224-71), G.dmt Annex B (ALC1224-73), ETSI (ALC1224-73), G.lite or ANSI T1.413 issue 2 (ALC1224-71).

Trellis coding helps to reduce the noise in ADSL transmissions. Trellis may reduce throughput but it makes the connection more stable.[1]

The numbers of milliseconds of interleave delay for downstream and upstream transmissions are listed. The total output power of the transceiver varies with the length and line quality. The farther away the subscriber's ADSL modem or router is or the more interference there is on the line, the higher the power will be.

`Current ATUR Information` contains data acquired from the ATUR (ADSL Termination Unit – Remote), in this case the subscriber's ADSL modem or router, during negotiation/provisioning message interchanges. This information can help in identifying the subscriber's ADSL modem or router. The country code is from the Vendor ID (g.994.1). The provider code includes the Vendor ID and Version Number obtained from Vendor ID fields (g.994.1) or R-MSGS1(T1.413).

Information obtained prior to training to steady state transition will not be valid or will be old information. Annex A refers to POTS.

11.3.6 Lineperf Command

Syntax:

```
lcman command <slot> lineperf <port>
```

where

`<slot>` = The number of the slot where the ALC1224 is located.

`<port>` = A port number (1 ~ 24).

This command shows the line performance counters of an ADSL port.

An example is shown next.

```
adsl lineperf 11
Current performance counters:
 nfebe-I/nfebe-ni                : 0/1
 ncrc-I/ncrc-ni                  : 0/208
 nfecc-I/nfecc-ni                : 0/1
 nfec-I/nfec-ni                  : 0/21526
 nblks-ds/nblks-us               : 481208/60151
 nsec-ds/nsec-us                 : 0/0
 n-es-ds/n-es-us                 : 41/3
 n-ses-ds/n-ses-us               : 0/2
 n-uas-ds/n-uas-us               : 0/0
```

Figure 11-4 Lineperf Command Example

These counters display line performance data that has been accumulated since the system started. In the list above the definitions of near end/far end will always be relative to the ATU-C (ADSL Termination Unit-Central Office). Downstream (ds) refers to data from the ATU-C and upstream (us) refers to data from the ATU-R. "I" stands for interleaved and "ni" stands for non-interleaved (fast mode).

[1] At the time of writing, the ALC1224 always uses Trellis coding.

A block is a set of consecutive bits associated with the path; each bit belongs to one and only one block. Consecutive bits may not be contiguous in time.

Table 11-1 Line Performance Counters

LABEL	DESCRIPTION
nfebe	The number of far end block errors.
ncrc	Near end cyclic redundancy checks.
nfecc	The number of end forward error correction count.
nfec	The number of end forward error count.
nblks	The number of blocks transmitted.
nsec	The number of seconds the connection has been up.
n-es	The number of errored seconds. This is how many seconds contained at least one errored block or at least one defect.
n-ses	The number of severely errored seconds. This is how many seconds contained 30% or more errored blocks or at least one defect. This is a subset of n-es.
n-uas	The number of unavailable seconds.

11.3.7 Set ADSL Profile Command

Syntax:

```
lcman port profile set adsl <profile> <fast|interleave[=<up delay>,<down
delay>]> <up max rate> <down max rate>[<up target margin> <up min margin> <up
max margin> <up min rate> <down target margin> <down min margin> <down max
margin> <down min rate>]
```

where

<profile>	=	The descriptive name for the profile.
<fast|interleave[=<up delay>,<down delay>]>	=	The latency mode. With interleave, you must also define the upstream and downstream delay (1-255 ms). It is recommended that you configure the same delay for both upstream and downstream.
<up max rate>	=	The maximum ADSL upstream transmission rate (32-3000 Kbps).
<down max rate>	=	The maximum ADSL downstream transmission rate (32-25000 Kbps).
<up target margin>	=	The target ADSL upstream signal/noise margin (0-31db).
<up min margin>	=	The minimum acceptable ADSL upstream signal/noise margin (0-31db).
<up max margin>	=	The maximum acceptable ADSL upstream signal/noise margin (0-31db).
<up min rate>		The minimum ADSL upstream transmission rate (32-3000 Kbps).
<down target margin>	=	The target ADSL downstream signal/noise margin (0-31db).
<down min margin>	=	The minimum acceptable ADSL downstream signal/noise margin (0-31db).

`<down max margin>`	=	The maximum acceptable ADSL downstream signal/noise margin (0-31db).
`<down min rate>`	=	The minimum ADSL downstream transmission rate (32-25000 Kbps).

The profile is a table that contains information on ADSL line configuration. Each entry in this table reflects a parameter defined by a manager, which can be used to configure the ADSL line.

Note that the default value will be used for any of the above fields that are omitted.

The upstream rate must be less than or equal to the downstream rate.

Even though you can specify arbitrary numbers in the `profile set` command, the actual rate is always a multiple of 32 Kbps. If you enter a rate that is not a multiple of 32 Kbps, the actual rate will be the next lower multiple of 32Kbps. For instance, if you specify 60 Kbps for a port, the actual rate for that port will not exceed 32 Kbps, and if you specify 66 Kbps, the actual rate will not be over 64Kbps.

Please see the web configurator chapter on ADSL port setup for more information about fast/interleave mode.

The following example creates a premium profile (named gold) for providing subscribers with very high connection speeds and no interleave delay. It also sets the upstream target signal/noise margin to 5 db, the upstream minimum acceptable signal/noise margin to 0 db, the upstream maximum acceptable signal/noise margin to 30 db, the upstream minimum ADSL transmission rate to 64 Kbps, the downstream target signal/noise margin to 5 db, the downstream minimum acceptable signal/noise margin to 0 db, the downstream maximum acceptable signal/noise margin to 30 db and the downstream minimum ADSL transmission rate to 128 Kbps.

```
ras> lcman port profile set adsl gold fast 800 8000 5 0 30 64 5 0 30 128
```

This next example creates a similar premium profile (named goldi), except it sets an interleave delay of 16 ms for both upstream and downstream traffic.

```
ras> lcman port profile set adsl goldi interleave=16,16 800 8000 5 0 30 64 5 0 30 128
```

After you create an ADSL profile, you can assign it to any of the ADSL ports on any of the ADSL line cards in the Integrated Ethernet Switch.

11.3.8 Delete ADSL Profile Command

Syntax:

```
lcman port profile delete <adsl|shdsl> <profile>
```

where

`<adsl|shdsl>` = ADSL or SHDSL profile.

`<profile>` = A profile name.

This command allows you to delete an individual ADSL profile by its name. You cannot delete a profile that is assigned to any of the DSL ports on any of the line cards in the Integrated Ethernet Switch. Assign a different profile to any DSL ports that are using the profile that you want to delete, and then you can delete the profile.

The following example deletes the gold ADSL profile.

```
lcman port profile delete adsl gold
```

11.3.9 Profile Show Command

Syntax:

```
lcman port profile show [<adsl|shdsl> [profile]]
```

This command displays all ADSL/SHDSL profiles.

The following example displays the ADSL DEFVAL profile.

```
ras> lcman port profile show adsl DEFVAL
adsl profile: DEFVAL    latency mode: interleave
                    up stream down stream
                    --------- -----------
max rate    (kbps):       512        2048
min rate    (kbps):        32          32
latency delay (ms):         4           4
max margin    (db):        31          31
min margin    (db):         0           0
target margin (db):         6           6
ras>
```

Figure 11-5 List Profiles Command Example

11.3.10 Port Set Command

The `port set` command varies depending on your line card models.

Syntax:

```
lcman port set <slot-port> <profile> <gdmt|t1413|glite|auto|adsl2|adsl2+>

lcman port set <slot-port> <profile> <anxb|etsi|auto|adsl2|adsl2+>
```

where

`<slot-port>`	=	The number of the slot where the ALC1224 is located and the number of an ADSL port.
`<profile>`	=	The profile that will define the settings of this port.
`<gdmt|t1413|glite|auto|adsl2|adsl2+>`	=	The operational mode for ALC1224-71 . Choose from `gdmt`, `t1413`, `glite`, `auto`, `adsl2` or `adsl2+`.
`<anxb|etsi|auto|adsl2|adsl2+>`	=	The operational mode for ALC1224-73. Choose from `anxb`, `etsi`, `auto`, `adsl2` or `adsl2+`.

This command assigns a specific profile to an individual port and sets the port's mode (or standard). The profile defines the maximum and minimum upstream/downstream rates, the target upstream/downstream signal noise margins, and the maximum and minimum upstream/downstream acceptable noise margins of all the ADSL ports to which you assign the profile.

The mode parameter specifies the standard that this port is allowed. When set to auto, the line card follows whatever mode is set on the other end of the line.

When the mode is set to auto and the negotiated mode is G.lite, if the configured rates exceed those allowed by G.lite, the actual rates are governed by G.lite, regardless of the configured numbers.

The following example sets ADSL port 1 on the line card in slot 3 to have the gold profile in `anxb` mode.

```
ras> lcman port set 3-1 gold anxb
```

11.3.11 Frame Type Show Command

Syntax:

```
lcman port frametype show <slot>
```

where

`<slot>` = The number of the slot where the ALC1224 is located.

This command displays the acceptable frame type settings for the ports on a line card.

The following example displays the acceptable frame type settings for the ALC1224 in slot 5.

```
ras> lcman port frametype show 5
[slot5  (alc-71)]
port ftype
---- -------
   1 all
   2 all
   3 all
   4 all
   5 all
   6 all
   7 all
   8 all
   9 all
  10 all
  11 all
  12 all
  13 all
  14 all
  15 all
  16 all
  17 all
  18 all
  19 all
  20 all
  21 all
  22 all
  23 all
  24 all
```

Figure 11-6 Frame Type Show Command Example

11.3.12 Frame Type Set Command

Syntax:

```
lcman port frametype set <slot-port> <all|tag>
```

where

`<slot-port>`	=	The number of the slot where the ALC1224 is located and the number of an ADSL port.
`<all|tag>`	=	Type `all` to have the line card accept Ethernet frames with or without VLAN tags. Type `tag` to have the line card only accept Ethernet frames with VLAN tags.

This command sets a port to accept either all Ethernet frames or just those that have a VLAN tag.

The following example sets ADSL port 1 on the line card in slot 3 to only accept Ethernet frames with VLAN tags.

```
ras> lcman port frametype set 3-1 tag
```

11.3.13 Packet Filter Show Command

Syntax:

```
lcman port pktfilter show <slot>
```

where

`<slot>`	=	The number of the slot where the ALC1224 is located.

This command displays the line card's packet type filter settings.

The following example displays the packet type filter settings for the ALC1224 in slot 5.

```
ras> lcman port pktfilter show 5
[slot5  (alc-71)]
port pktfilter
---- ------------------------------
   1 accept-all
   2 accept-all
   3 accept-all
   4 accept-all
   5 accept-all
   6 accept-all
   7 accept-all
   8 accept-all
   9 accept-all
  10 accept-all
  11 accept-all
  12 accept-all
  13 accept-all
  14 accept-all
  15 accept-all
  16 accept-all
  17 accept-all
  18 accept-all
  19 accept-all
  20 accept-all
  21 accept-all
  22 accept-all
  23 accept-all
  24 accept-all
```

Figure 11-7 Packet Filter Show Command Example

11.3.14 Packet Filter Set Command

Syntax:

```
lcman port pktfilter set <slot-port> <pppoe-only|accept-all>
```

or

```
lcman port pktfilter set <slot-port> <[arp]|[dhcp]|[eapol]|[pppoe]|[netbios]|
[igmp]>
```

where

`<slot-port>`	=	The number of the slot where the ALC1224 is located and the number of an ADSL port.
`pppoe-only`	=	Accept PPPoE packets only.
`accept-all`	=	Accept all packets.
`arp`	=	Reject ARP packets.
`dhcp`	=	Reject DHCP packets.
`eapol`	=	Reject EAPol packets.
`pppoe`	=	Reject PPPoE packets.
`netbios`	=	Reject NetBIOS packets.
`igmp`	=	Reject IGMP packets.

This command sets the packet type filter for a specific port.

The following example sets ADSL port 1 on the line card in slot 3 to only accept PPPoE packets.

```
ras> lcman port pktfilter set 3-1 pppoe-only
```

This next example sets ADSL port 2 on the line card in slot 3 to reject ARP, PPPoE and IGMP packets.

```
ras> lcman port pktfilter set 3-1 arp pppoe igmp
```

11.4 MAC Filter Commands

Use MAC filter commands to filter incoming frames based on MAC (Media Access Control) address(es) that you specify. If you do not use this command, your line card will not filter frames. MAC filter commands are listed next. You may specify up to five MAC addresses per port.

11.4.1 MAC Filter Show Command

Syntax:

```
lcman port macfilter show <slot>
```

where

`slot`	=	The number of the slot where the ALC1224 is located.

This command displays the MAC filtering status and the fixed source MAC addresses on a line card.

The following example displays the MAC filtering status and the fixed source MAC addresses on an ALC1224 in slot 5.

```
ras> lcman port macfilter show 5
[slot5  (alc-71)]
port enable macfilter address
---- ------ -----------------
   1   -
   2   -
   3   -
   4   -
   5   -
   6   -
   7   -
   8   -
   9   -
  10   -
  11   -
  12   -
  13   -
  14   -
  15   -
  16   -
  17   -
  18   -
  19   -
  20   -
  21   -
  22   -
  23   -
  24   -
```

Figure 11-8 MAC Filter Show Command Example

11.4.2 MAC Filter Enable Command

Syntax:

```
lcman port macfilter enable <slot-port>
```

where

`<slot-port> =` The number of the slot where the ALC1224 is located and the number of an ADSL port.

This command turns on the MAC filtering feature on a specific port.

The following example turns on the MAC filtering feature on ADSL port 1 on the line card in slot 3.

```
ras> lcman port macfilter enable 3-1
```

11.4.3 MAC Filter Disable Command

Syntax:

```
lcman port macfilter disable <slot-port>
```

where

`<slot-port>` = The number of the slot where the ALC1224 is located and the number of an ADSL port.

This command turns off the MAC filtering feature on a specific port or on all ports if no port is specified.

The following example turns off the MAC filtering feature on ADSL port 1 on the line card in slot 3.

```
ras> lcman port macfilter disable 3-1
```

11.4.4 MAC Filter Set Command

Syntax:

```
lcman port macfilter set <slot-port> <mac>
```

where

`<slot-port>` = The number of the slot where the ALC1224 is located and the number of an ADSL port.

`<mac>` = The source MAC address in "00:a0:c5:12:34:56:78" format.

This command adds a source MAC address fixed on a specified port.

The following example adds source MAC address 00:a0:c5:12:34:56:78 for port 1 on the line card in slot 4.

```
ras> lcman port macfilter set 4-1 0:a0:c5:12:34:56:78
```

11.4.5 MAC Filter Delete Command

Syntax:

```
lcman port macfilter delete <slot-port> <mac>
```

where

`<slot-port>` = The number of the slot where the ALC1224 is located and the number of an ADSL port.

`<mac>` = The source MAC address in "00:a0:c5:12:34:56:78" format.

This command removes a configured source MAC address from a port specified by you.

The following example removes the source MAC address of 00:a0:c5:12:34:56:78 from the MAC filter for port 1 on the line card in slot 4.

```
ras> lcman port macfilter delete 4-1 0:a0:c5:12:34:56:78
```

11.5MAC Count Commands

Use MAC count commands to limit how many MAC addresses may be dynamically learned or statically configured on a port. MAC count commands are listed next.

11.5.1 MAC Count Show Command

Syntax:

```
lcman port maccount show <slot>
```

where

`slot =` The number of the slot where the ALC1224 is located.

This command displays the line card's MAC count settings.

The following example displays the MAC count settings for an ALC1224 in slot 5.

```
ras> lcman port maccount show 5
[slot5  (alc-71)]
port enable count
---- ------ -----
   1   -        5
   2   -        5
   3   -        5
   4   -        5
   5   -        5
   6   -        5
   7   -        5
   8   -        5
   9   -        5
  10   -        5
  11   -        5
  12   -        5
  13   -        5
  14   -        5
  15   -        5
  16   -        5
  17   -        5
  18   -        5
  19   -        5
  20   -        5
  21   -        5
  22   -        5
  23   -        5
  24   -        5
```

Figure 11-9 MAC Count Show Command Example

11.5.2 MAC Count Enable Command

Syntax:

```
lcman port maccount enable <slot-port>
```

where

`<slot-port> =` The number of the slot where the ALC1224 is located and the number of an ADSL port.

This command enables the MAC count filter on a specific port.

The following example turns on the MAC count filter on ADSL port 1 on the line card in slot 3.

```
ras> lcman port maccount enable 3-1
```

11.5.3 MAC Count Disable Command

Syntax:

```
lcman port macccount disable <slot-port>
```

where

`<slot-port> =` The number of the slot where the ALC1224 is located and the number of an ADSL port.

This command disables the MAC filtering feature on a specific port or on all ports if no port is specified.

The following example turns off the MAC count filter on ADSL port 1 on the line card in slot 3.

```
ras> lcman port maccount disable 3-1
```

11.5.4 MAC Count Set Command

Syntax:

```
lcman port maccount set <slot-port> <count>
```

where

`<slot-port> =` The number of the slot where the ALC1224 is located and the number of an ADSL port.

`<count> =` Set the limit for how many MAC addresses that a port may dynamically learn. For example, if you are configuring port 2 and you set this field to "5", then only five devices with dynamically learned MAC addresses may access port 2 at any one time. A sixth device would have to wait until one of the five learned MAC addresses ages out.

The valid range is from "1" to "1024".

This command sets the limit for how many MAC addresses a specified port may dynamically learn.

The following example sets the MAC count filter to allow up to 50 MAC addresses to be dynamically learned on ADSL port 1 on the line card in slot 3.

```
ras> lcman port maccount set 3-1 50
```

11.6 Port Isolate Command

Syntax:

```
ras> lcman port isolate [<enable|disable>]
```

This command turns the Integrated Ethernet Switch isolation feature on or off. Enable the Integrated Ethernet Switch isolation to block communications between subscriber ports. When you enable the Integrated Ethernet Switch isolation feature, you do not need to configure the VLAN to isolate subscribers.

11.7 IEEE 802.1x Commands

IEEE 802.1x is an extended authentication protocol[2] that allows support of RADIUS (Remote Authentication Dial In User Service, RFC 2138, 2139) for centralized user profile and accounting[3] management on a network RADIUS server. IEEE 802.1x commands are listed next. Specify the RADIUS server on the management switch card.

11.7.1 Dot1x Show Command

Syntax:

```
lcman port dot1x show <slot>
```

where

`slot` = The number of the slot where the ALC1224 is located.

This command displays the line card's IEEE 802.1x settings.

The following example displays the IEEE 802.1x settings for an ALC1224 in slot 5.

```
ras> lcman port dot1x show 5
[slot5  (alc-71)]
dot1x feature: disabled
port enable control reauth period
---- ------ ------- ------ ------
   1   -    auto      V      3600
   2   -    auto      V      3600
   3   -    auto      V      3600
   4   -    auto      V      3600
   5   -    auto      V      3600
   6   -    auto      V      3600
   7   -    auto      V      3600
   8   -    auto      V      3600
   9   -    auto      V      3600
  10   -    auto      V      3600
  11   -    auto      V      3600
  12   -    auto      V      3600
  13   -    auto      V      3600
  14   -    auto      V      3600
  15   -    auto      V      3600
  16   -    auto      V      3600
  17   -    auto      V      3600
  18   -    auto      V      3600
  19   -    auto      V      3600
  20   -    auto      V      3600
  21   -    auto      V      3600
  22   -    auto      V      3600
  23   -    auto      V      3600
  24   -    auto      V      3600
```

Figure 11-10 Dot1x Show Command Example

[2] At the time of writing, only Windows XP of the Microsoft operating systems supports it. See the Microsoft web site for information on other Windows operating system support. For other operating systems, see its documentation. If your operating system does not support IEEE 802.1x, then you may need to install IEEE 802.1x client software.

[3] Not available at the time of writing.

11.7.2 Dot1x Enable Command

Syntax:

```
lcman port dot1x enable <slot-port>
```

where

`<slot-port> =`	The number of the slot where the ALC1224 is located and the number of an ADSL port.

This command enables IEEE 802.1x on a specific port.

The following example turns on IEEE 802.1x for ADSL port 1 on the line card in slot 3.

```
ras> lcman port dot1x enable 3-1
```

11.7.3 Dot1x Disable Command

Syntax:

```
lcman port dot1x disable <slot-port>
```

where

`<slot-port> =`	The number of the slot where the ALC1224 is located and the number of an ADSL port.

This command turns off IEEE 802.1x on a specific port or on all ports if no port is specified.

The following example turns off IEEE 802.1x on ADSL port 1 on the line card in slot 3.

```
ras> lcman port dot1x disable 3-1
```

11.7.4 Dot1x Control Command

Syntax:

```
lcman port dot1x control <slot-port> <auto|auth|unauth>
```

where

`<slot-port> =`	The number of the slot where the ALC1224 is located and the number of an ADSL port.
`<auto|auth|unauth> =`	This field sets how the line card uses IEEE 802.1x. Use `auto` to authenticate all subscribers before they can access the network through this port. Use `auth` to allow all connected users to access the network through this port without authentication. Use `unauth` to deny all subscribers access to the network through this port.

This command sets how the line card applies IEEE 802.1x on a specified port.

The following example sets the line card to authenticate all subscribers before they can access the network through ADSL port 1 on the line card in slot 3.

```
ras> lcman port dot1x control 3-1 auto
```

11.7.5 Dot1x Re-authentication Command

Syntax:

```
lcman port dot1x reauth <slot-port> <on|off>
```

where

`<slot-port>` = The number of the slot where the ALC1224 is located and the number of an ADSL port.

`<on|off>` = Use `on` to require a subscriber to periodically re-enter his or her username and password to stay connected to the port (some IEEE 802.1x clients do this automatically).

Use `off` to not require a subscriber to periodically re-enter his or her username and password to stay connected to the port (some IEEE 802.1x clients do this automatically).

This command sets whether or not a subscriber has to periodically re-enter his or her username and password to stay connected to the specified port.

The following example sets the line card to require each subscriber connected to ADSL port 1 on the line card in slot 3 to periodically re-enter his or her username and password to stay connected.

```
ras> lcman port dot1x reauth 3-1 on
```

11.7.6 Dot1x Period Command

Syntax:

```
lcman port dot1x period <slot-port><seconds>
```

where

`<slot-port>` = The number of the slot where the ALC1224 is located and the number of an ADSL port.

`<seconds>` = How often (60~65535 seconds) a subscriber has to re-enter his or her username and password to stay connected to the port.

This command sets how often a subscriber has to re-enter his or her username and password to stay connected to the specified port.

The following example sets the line card to require each subscriber connected to ADSL port 1 on the line card in slot 3 to periodically re-enter his or her username and password every 43,200 seconds (12 hours) to stay connected.

```
ras> lcman port dot1x period 3-1 43200
```

Chapter 12
Virtual Channel Management

This chapter shows you how to use commands to configure virtual channels.

12.1 About Virtual Channels

See the web configurator chapter on virtual channel management for background information on virtual channels.

12.2 Virtual Channel Profile Commands

Use the following commands to configure virtual channel profiles.

12.2.1 Set Virtual Channel Profile Command

Syntax:

```
ras> lcman port vcprofile set <prof_name> <llc|vc> <5> <cbr|vbr|ubr>
<opt_param>
```

where

`<prof_name>`	=	The name of the virtual channel profile (up to 31 ASCII characters). You cannot change the DEFVAL or DEFVAL_VC profiles.
`<llc|vc>`	=	The type of encapsulation (llc or vc).
`<5>`	=	The ATM Adaptation Layer (AAL 5).
`<cbr|vbr|ubr>`	=	The type of ATM traffic class: cbr (constant bit rate), vbr (variable bit rate), or ubr (unspecified bit rate).
`<opt_param>`	=	These are the ATM traffic settings: <pcr> <cdvt>. If you use vbr, you must also set <scr> and <bt>. * sets the default value. <pcr> = Peak Cell Rate (0 to 300000 or *), the maximum rate (cells per second) at which the sender can send cells. <cdvt> = Cell Delay Variation Tolerance The accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay (number of cells). 0 to 255 cells or * (means 0). <scr> = The Sustained Cell Rate sets the average cell rate (long-term) that can be transmitted (cells per second). SCR applies with the vbr traffic class. <bt> = Burst Tolerance this is the maximum number of cells that the port is guaranteed to handle without any discards (number of cells). BT applies with the vbr traffic class.

The `vcprofile set` command creates a virtual channel profile. After you create a virtual channel profile, you can assign it to any of the ADSL ports on any of the ADSL line cards in the Integrated Ethernet Switch.

The following example creates a virtual channel profile named gold that uses LLC encapsulation and AAL 5. It uses constant bit rate and has the maximum rate (peak cell rate) set to 300,000 cells per second. The acceptable tolerance of the difference between a cell's transfer delay and the expected transfer delay (CDVT) is set to 5 cells.

```
ras> lcman port vcprofile set gold llc 5 cbr 300000 5
```

The following example creates a virtual channel profile named silver that uses VC encapsulation and AAL 5. It uses variable bit rate and has the maximum rate (peak cell rate) set to 250,000 cells per second. The acceptable tolerance of the difference between a cell's transfer delay and the expected transfer delay (CDVT) is set to 5 cells. The average cell rate that can be transmitted (SCR) is set to 100,000 cells per second. The maximum number of cells that the port is guaranteed to handle without any discards (BT) is set to 200.

```
ras> lcman port vcprofile set silver vc 5 vbr 250000 5 100000 200
```

The following example creates a virtual channel profile named economy that uses LLC encapsulation and AAL 5. It uses unspecified bit rate and has the maximum rate (peak cell rate) set to 50,000 cells per second. The acceptable tolerance of the difference between a cell's transfer delay and the expected transfer delay (CDVT) is set to 100 cells.

```
ras> lcman port vcprofile set gold llc 5 cbr 50000 100
```

12.2.2 Delete Virtual Channel Profile Command

Syntax:

```
ras> lcman port vcprofile delete <vcprofile>
```

where

`<vcprofile>` = The name of the virtual channel profile (up to 31 ASCII characters). You cannot delete the DEFVAL or DEFVAL_VC profiles.

You cannot delete a virtual channel profile that is assigned to any of the DSL ports on any of the line cards in the Integrated Ethernet Switch. Assign a different profile to any DSL ports that are using the profile that you want to delete, and then you can delete the profile.

The following example deletes the silver virtual channel profile.

```
lcman port vcprofile delete silver
```

12.2.3 Show Virtual Channel Profile Command

Syntax:

```
ras> lcman port vcprofile show [<vcprof_name>]
```

where

`<vcprof_name>` = The name of the virtual channel profile (up to 31 ASCII characters).

Displays a list of configured virtual channel profiles. Specify a virtual channel profile to display its settings.

12.2.4 Virtual Channel Profile Mapping Command

Syntax:

```
ras> lcman port vcprofile map <vcprofile>
```

where

`<vcprofile> =` The name of the virtual channel profile (up to 31 ASCII characters).

Displays to which ports a virtual channel profile is mapped.

12.3PVC Channels

Channels (also called Permanent Virtual Circuits or PVCs) let you set priorities for different services or subscribers. You can define up to eight channels on each DSL port and use them for different services or levels of service. You set the PVID that is assigned to untagged frames received on each channel. You also set an IEEE 802.1p priority for each of the PVIDs. In this way you can assign different priorities to different channels (and consequently the services that get carried on them or the subscribers that use them). Use the following commands to define channels.

12.3.1 PVC Set Command

Syntax:

```
lcman port pvc set <slot-port-vpi/vci> <super|vid=<vid>>
  [llc|vc|vcprofile=<vcprofile>] [priority=<pri>]
```

where

`<slot-port-vpi/vci>` = The slot, port, VPI and VCI numbers. The VPI setting can be 0 to 255. The VCI setting can be 32 to 65535 if the vpi is 0 or 1 to 65535 if the vpi is not 0.

You can use ranges. Here are some examples:

<*-*-0/33 > would configure all of the Integrated Ethernet Switch's DSL ports to use a VPI of 0 and a VCI of 33.

<1-*-0/33> would configure all of the DSL ports on the line card in slot 1 to use a VPI of 0 and a VCI of 33.

<3-1,3~5,10~15-0/33> would configure DSL ports 1, 3-5 and 10-15 on the line card in slot 1 to use a VPI of 0 and a VCI of 33.

`<super|vid=<vid>>` = The super channel inherits the port's default VID (PVID) and IEEE 802.1p default priority. You must assign a default VID (0 to 4094) and IEEE 802.1p default priority (0 to 7) to normal channels. Each PVC must have a unique VID (since the ALC1224 forwards traffic back to the subscribers based on the VLAN ID).

`[llc|vc|vcprofile=<vcprofile>]`	=	Define the multiplexing mode or assign a virtual channel profile to the PVC.
`[priority=<pri>]`	=	This is the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag. You cannot configure a priority for a super channel.

The `pvc set` command allows the configuration of a PVC (permanent virtual circuit) for one or a range of ADSL ports. Two examples are shown next.

```
ras> lcman port pvc set 3-1-0/34 super

ras> lcman port pvc set 3-1-0/35 vid=100 priority=1 llc
```

12.3.2 PVC Show Command

Syntax:

```
lcman port pvc show
```

The `pvc show` command allows you to display the PVC parameters of one or a range of ADSL ports.

12.3.3 Delete PVC Command

Syntax:

```
lcman port pvc delete <slot-port-vpi/vci>
```

where

`<slot-port-vpi/vci>`	=	The slot, port, VPI and VCI numbers. The VPI setting can be 0 to 255. The VCI setting can be 32 to 65535 if the vpi is 0 or 1 to 65535 if the vpi is not 0. You can use ranges. Here are some examples: <*-*-0/33 > would configure all of the Integrated Ethernet Switch's DSL ports to use a VPI of 0 and a VCI of 33. <1-*-0/33> would configure all of the DSL ports on the line card in slot 1 to use a VPI of 0 and a VCI of 33. <3-1,3~5,10~15-0/33> would configure DSL ports 1, 3-5 and 10-15 on the line card in slot 1 to use a VPI of 0 and a VCI of 33.

The `pvc delete` command deletes the specified PVC channel.

Chapter 13 SNMP

This chapter covers Simple Network Management Protocol (SNMP) with the ALC1224.

13.1 SNMP Overview

SNMP (Simple Network Management Protocol) is a protocol used for exchanging management information between network devices. The ALC1224 supports SNMP versions one and two (SNMPv1 and SNMPv2) agent functionality, which allows a manager station to manage and monitor it through the network.

Configure your SNMP server settings on the MSC1000.

13.1.1 Supported MIBs

The ALC1224 supports the MIB II IF MIB and ADSL line MIB (RFC-2662). MIB II is defined in RFC-1213 and RFC-1215. The ALC1224 can also respond with specific data from the ZyXEL private MIBs (zyxel.mib, zyxel-AS.mib, zyxel-AS-ATM.mib and zyxel-AESCommon.mib). MIBs let administrators collect statistics and monitor status and performance.

13.1.2 Supported Traps

The ALC1224 supports the following traps

- ADSL Link Up Trap (defined in RFC 1215) :

  This trap is sent when a DSL port has a connection.

- ADSL Link Down Trap (defined in RFC 1215) :

  This trap is sent when a DSL port is down.

- Thermal Failure Trap (defined in ZYXEL-MIB) :

  This trap is sent when the hardware monitor chip has failed.

- Voltage Out of Range Trap (defined in ZYXEL-MIB) :

  This trap is sent periodically when the ALC1224's voltage is outside of the accepted operating range.

- Voltage Out of Range Release Trap (defined in ZYXEL-MIB) :

  This trap is sent when the ALC1224is no longer outside of the accepted operating range.

- Over Heat Trap (defined in ZYXEL-MIB) :

  This trap is sent periodically when the ALC1224 is overheated.

- Over Heat Release Trap (defined in ZYXEL-MIB) :

  This trap is sent when the ALC1224is no longer overheated.

Part V:

Index

This part provides an index of important terms.

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