ALC1024

ADSL Line Card

Version 2.05 (DV.0) (DW.0)

August 2004

User's Guide

ZyXEL
Unleash Networking Power

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(2) This device must accept any interference received, including interference that may cause undesired operations.

FCC Warning!

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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可能會造成射頻干擾, 在這種情況下,
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Note

Repair or replacement, as provided under this warranty, is the exclusive remedy of the purchaser. This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular use or purpose. ZyXEL shall in no event be held liable for indirect or consequential damages of any kind of character to the purchaser.

To obtain the services of this warranty, contact ZyXEL's Service Center for your Return Material Authorization number (RMA). Products must be returned Postage Prepaid. It is recommended that the unit be insured when shipped. Any returned products without proof of purchase or those with an out-dated warranty will be repaired or replaced (at the discretion of ZyXEL) and the customer will be billed for parts and labor. ZyXEL will ship all repaired or replaced products to the corresponding return address, Postage Paid. This warranty gives you specific legal rights, and you may also have other rights that vary from country to country.

Customer Support

Please have the following information ready when you contact customer support.

- Product model and serial number.
- Warranty information.
- Date that you received your device.
- Brief description of the problem and the steps you took to solve it.

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.
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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

Congratulations on your purchase of the ALC1024 ADSL Line Card.

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.

Online Registration

Register your ZyXEL product online at www.zyxel.com for free future product updates and information.

Firmware Naming Conventions

A firmware version includes the network operating system platform version, model code and release number as shown in the following example.

Firmware Version: V2.05 (DV.0)
"V2.05" is the network operating system platform version.
"DV" is the model code.
"0" is this 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*.

Model codes specific to the ALC1024:

- "DV" denotes the ALC1024-61.
- "DW" denotes the ALC1024-63.

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

- The ALC1024 (ADSL Line Card) may be referred to as the ALC, the line card or the card.
- "ALC1024" refers to the ALC1024-61 and ALC1024-61L for ADSL over POTS (Annex A). "ALC1024" also refers to the ALC1024-63 and ALC1024-63L for ADSL over ISDN (Annex B) versions. 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 IES.
- The IES-2000 or IES-3000 may be referred to as the IES.
- The MSC1000, MSC1000A or MSC1000AL (Management Switch Card) may be referred to as the switch card or MSC.

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.

Part I:

ALC1024 Overview

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

Chapter 1
ALC1024 Overview

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

1.1 ALC1024 Overview

The ALC1024 (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.

The following features, default settings and hardware specifications apply to the ADSL line card used with the MSC (Management Switch Card).

1.2 Features of the ALC1024

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
- 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[1] on each DSL port for different services or levels of service and

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

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)

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.

Static Multicast Filter

Use the static multicast filter to allow incoming frames based on multicast MAC address(es) that you specify. This feature can be used in conjunction with IGMP snooping to allow multicast MAC address(es) that are not learned by IGMP snooping.

IGMP Snooping

IGMP (Internet Group Management Protocol) snooping reduces multicast traffic for maximum performance.

System Monitoring

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

Overheating Detection, Warning and Safegaurd

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.

1.3 Default Settings

IEEE 802.1Q Tagged VLAN: Disabled

1.3.1 Default ADSL Settings

- Encapsulation: RFC 1483
- Multiplexing: LLC-based
- VPI: 0

- VCI: 33
- Enable/Disable State: Disabled
- Operational Mode: auto

1.3.2 Default Profile Settings

The following are the settings of the default profile.

- Name: DEFVAL
- Profile Status: Active

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

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

1.4 Front Panels

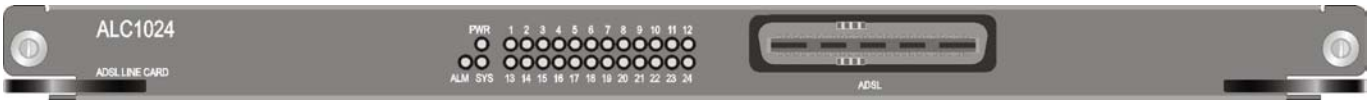


Figure 1-1 ALC1024 Front Panel

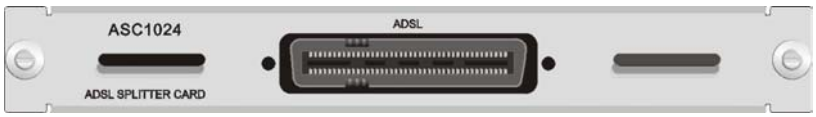


Figure 1-2 ASC1024 Front Panel

1.5 Hardware Specifications

These are the hardware details of the ALC1024 and ASC1024.

1.5.1 ALC1024 Ports

Table 1-1 ALC1024 Front Panel Ports

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

1.5.2 ALC1024 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.
ADSL (1-24)	Green	On	The DSL link is up.
		Off	The DSL link is down.

1.5.3 ASC1024 Ports

Table 1-3 ASC1024 Front Panel Ports

PORT	DESCRIPTION
ADSL	This Telco-50 connector is for connecting to the ALC1024 (ADSL Line Card).

1.5.4 Fuse Ratings

The ALC1024-61/63 uses one 5mm (D) x 20mm (L), T type, 4 amp, 250 Volt AC fuse.

The ALC1024-61L/63L uses one 5mm (D) x 20mm (L), T type, 5 amp, 250 Volt AC fuse.

1.5.5 Weight

ALC1024-61/63: 1.8 kg

ALC1024-61L/63L: 2.2 kg

ASC1024: .8 kg

1.6 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 IES 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.

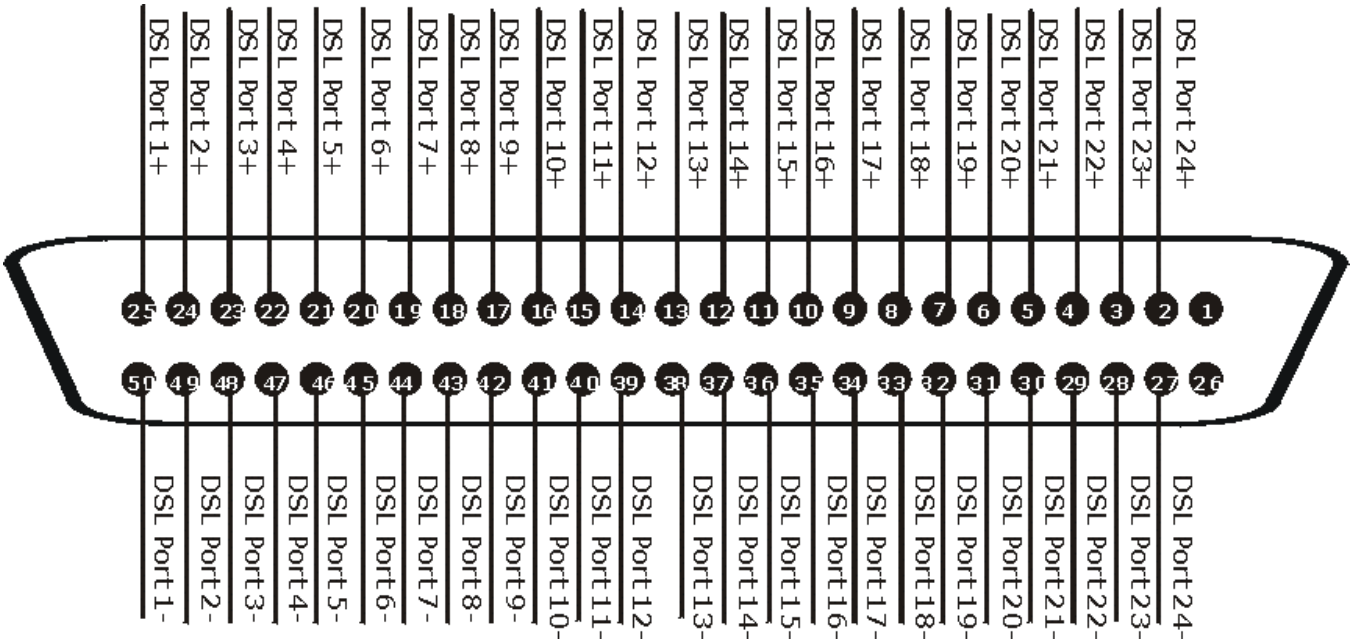


Figure 1-3 ALC1024, ASC1024, and USER Telco-50 Pin Assignments

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

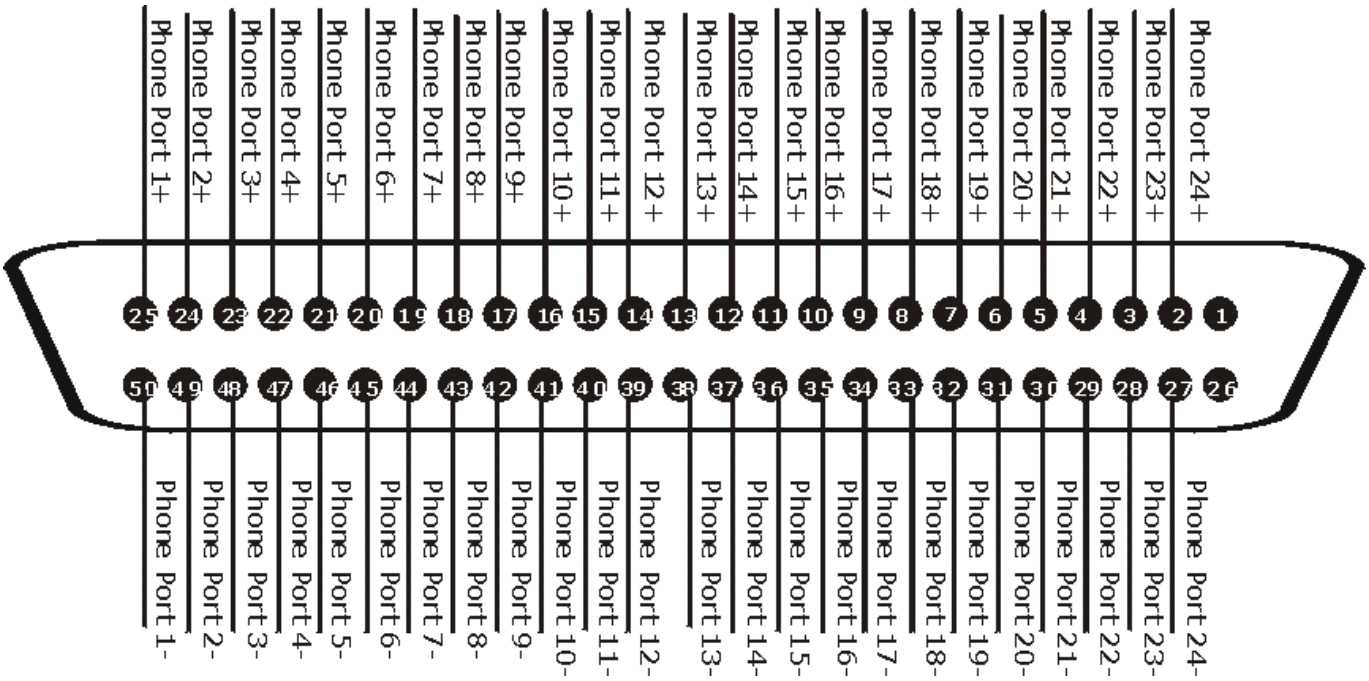


Figure 1-4 CO Telco-50 Pin Assignments

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

1.7 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.

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

1.7.1 Telco-50 Cable Telco-50 Connector Pin Assignments with the IES-2000

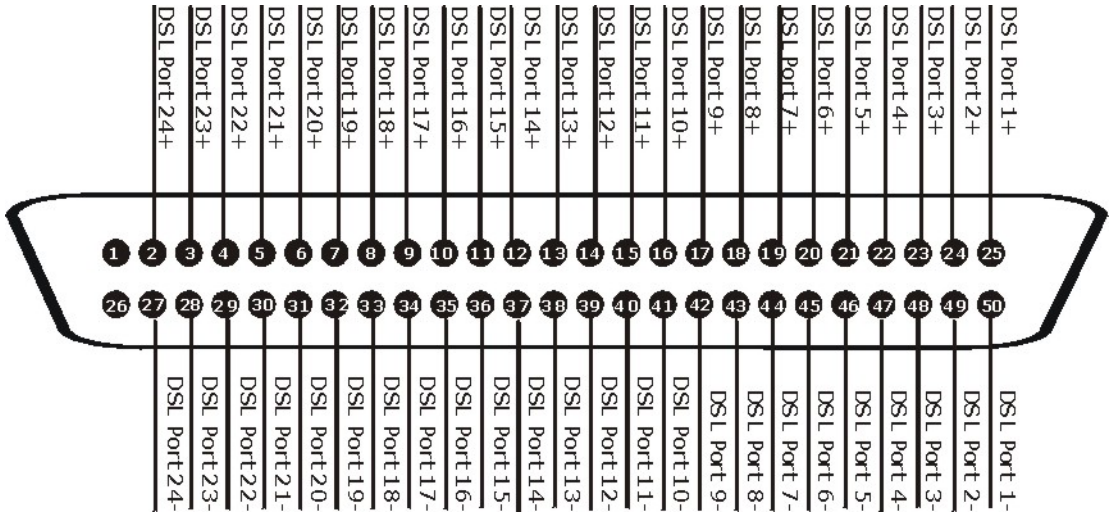


Figure 1-5 IES-2000 Telco-50 Cable Telco-50 Connector Pin Assignments

1.7.2 Telco-50 Cable Telco-50 Connector Pin Assignments with the IES-3000

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

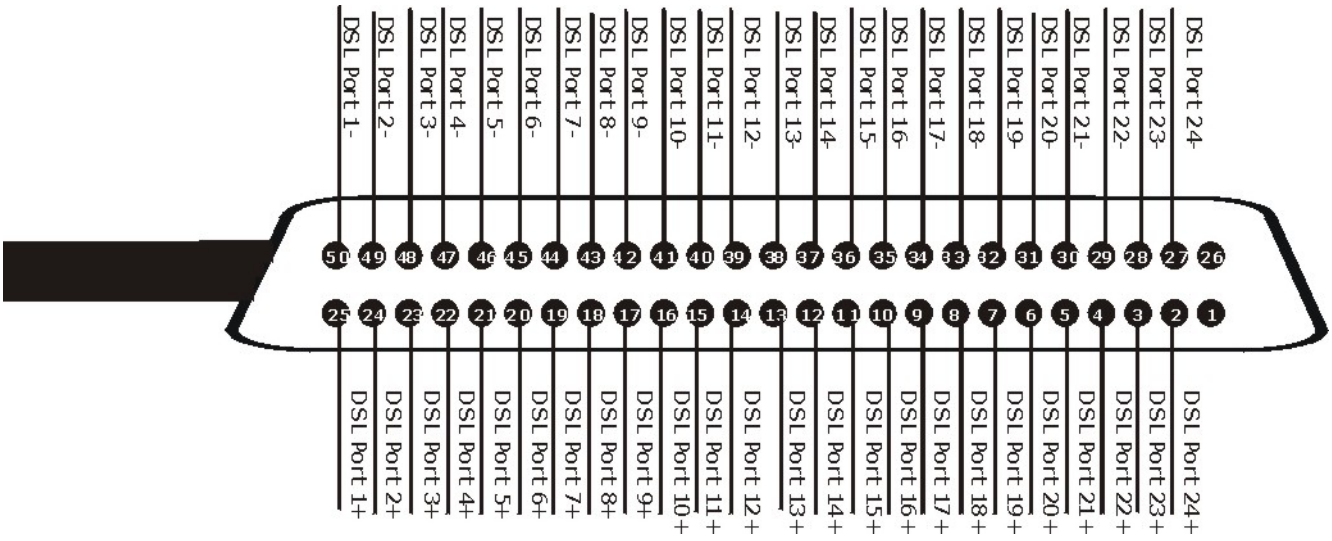


Figure 1-6 IES-3000 Telco-50 Cable Right Telco-50 Connector Pin Assignments

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

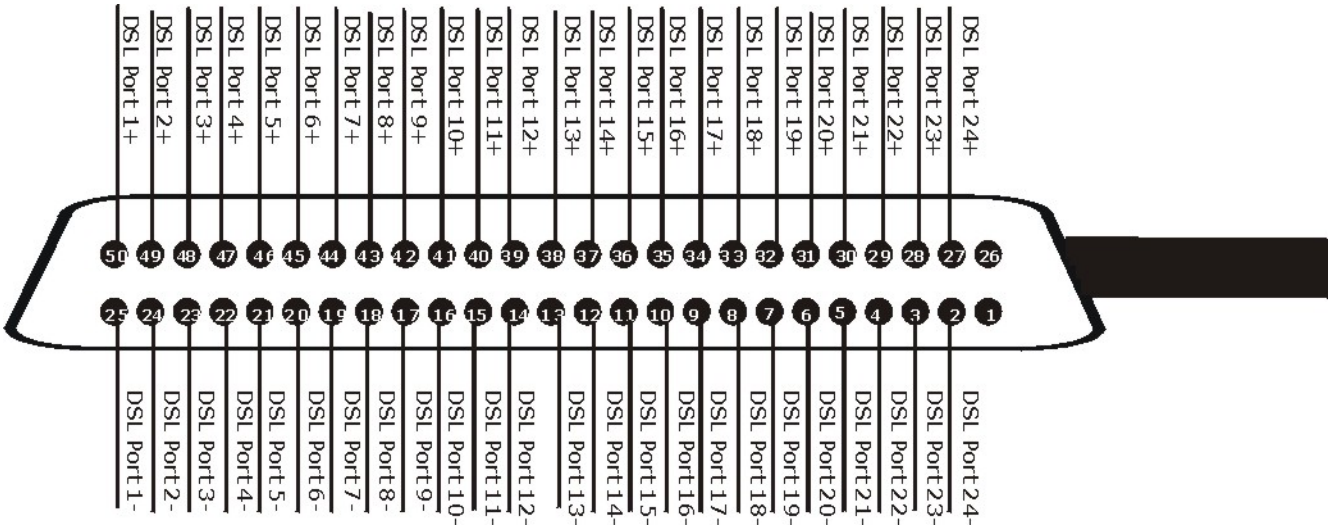


Figure 1-7 IES-3000 Telco-50 Cable Left Telco-50 Connector Pin Assignments

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:

Commands with MSC

This part gives information on commands to use and how to use the web configurator to configure and manage the ADSL line card with the Management Switch Card.

Chapter 2
Commands with MSC

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.

2.1 Command Line Interface with MSC 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. The command keywords must be entered exactly as shown, that is, no abbreviations are allowed.
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.
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".

2.1.1 Saving Your Configuration with MSC

Always remember to save your configuration using the following syntax:

```
192.168.1.1> 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.

2.2 Command Shells

The management switch card provides two full sets of commands called shells. The standard shell commands basically parallel the web configurator. The engineer shell commands are backwards compatible with the command structure of earlier versions of the management switch card's firmware. We recommend that you use the standard shell commands for everyday management and that you use the engineer shell commands for advanced switch diagnosis and troubleshooting.

2.2.1 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 2-1 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 linecards

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

2.3 Standard Shell Commands with MSC

The standard shell (`lcman`) commands allow you to configure the same settings and display the same statistics information for which you can use the web configurator.

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

Table 2-1 Standard Shell Commands

COMMANDS				DESCRIPTION
`lcman`				
	`show`			Shows the status of the line cards.
	`svlan`			
		`show`	`[vid]`	Displays VLAN settings.
		`enable`	`<vid>`	Turns on VLAN.
		`disable`	`<vid>`	Turns off VLAN.
		`set`	`<vid> <slot-port|up1|up2|sub1|sub2|all> [<fixed|forbidden|normal>`	Configures a VLAN entry.

Table 2-1 Standard Shell Commands

COMMANDS				DESCRIPTION
			<tag|untag>]	
		delete	<vid>	Removes a VLAN entry.
		name		
			show	Displays the names of the VLAN entries.
			set <vid> <name>	Names a VLAN entry.
		mgmtvid	show	Displays the VLAN ID of the management VLAN.
			set <vid>	Sets the VLAN ID of the management VLAN.
	alarm	show		Display alarms on the system and the line card.
		clear		Clears the alarm statistics.
		history	<show|clear>	This command displays or allows you to delete a history of alarm statistics.
	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=<pvid>] [priority=<pri>]] [<llc|vc>]	Creates or modifies a PVC setting.
			delete <slot-port-vpi/vci>	Removes a PVC setting.
		frametype		
			show <slot>	Displays frame type tag settings.

Table 2-1 Standard Shell Commands

COMMANDS				DESCRIPTION
			`set <slot-port> <all|tag>`	Sets the 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 or disables port isolation (All connected).
		`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.
		`pvid`		
			`show <slot id>`	Displays port PVID settings.
			`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.

Table 2-1 Standard Shell Commands

COMMANDS				DESCRIPTION
	smcast			You can use the join/leave command to add/remove multicast MAC addresses on specific ports. This can also be applied to a range of ports, all line card ports or all MSC ports. You may specify up to ten MAC addresses per port. The static multicast filter can be applied to pass routing protocols, such as RIP and OSPF.
		set	<slot-port|sub1|sub2|up1|up2|all> <xx:xx:xx:xx:xx:xx> <join|leave>	Use this command to create or modify a static multicast group.
		delete	<xx:xx:xx:xx:xx:xx>	Remove a static multicast frame by deleting the associated MAC address.
		show		Display all MAC addresses joined to static multicast frames.
	Command <slot>			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> <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.

2.4 Engineer Shell Commands with MSC

The engineer shell commands are backwards compatible with the command structure of earlier versions of the management switch card's firmware.

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

Table 2-2 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.
	dot1x	list <slot>	Displays 802.1X settings.
		enable	Turns on 802.1X for the whole system.
		disable	Turns off 802.1X for the whole system.
		port enable <slot-port>	Turns on 802.1X for specific ports.
		port disable <slot-port>	Turns off 802.1X for specific ports.
		port control <slot-port> <auto|auth|unauth>	Sets the 802.1X port authentication option for specific ports.
		port reauth <slot-port> <on|off>	Sets the 802.1X re-authentication option for specific ports.
		port period <slot-port> <seconds>	Sets the 802.1X re-authentication period for specific ports.
		radius show	Displays RADIUS settings.
		radius <index> <ip>	Sets the external RADIUS server IP address.
		radius <index> <port>	Sets the external RADIUS server port number.
		radius <index> <secret>	Sets the external RADIUS server password.
	port	enable <slot-port>	Turns on a subscriber port.
		disable <slot-port>	Turns off a subscriber port.
		set <slot-port> <profile_name> [<mode>]	Sets a subscriber port.
		list <slot>	Displays a line card's port settings.

Table 2-2 Engineer Shell Commands

COMMANDS			DESCRIPTION
		`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.
		`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.
		`frametype show <slot>`	Displays frame type tag settings.
		`frametype set <slot-port> <all|tag>`	Sets the frame type for a specific port.
		`pktfilter show <slot>`	Displays packet type filter settings.
		`pktfilter set <slot-port> <params>`	Sets the packet type filter for a specific port.
		`macfilter show <slot>`	Displays MAC filter settings.
		`macfilter enable <slot-port>`	Turns on the MAC filter.
		`macfilter disable <slot-port>`	Turns off the MAC filter.
		`macfilter set <slot-port> <mac>`	Adds a MAC filter MAC entry.
		`macfilter delete <slot-port> <mac>`	Removes a MAC filter MAC entry.
		`maccount enable <slot-port>`	Turns on a line card's MAC address count filter.
		`maccount disable <slot-port>`	Turns off a line card's MAC address count filter.
		`maccount set <slot-port> <count>`	Sets a line card's MAC address count filter.
		`maccount list <slot>`	Displays the system's current MAC address count settings.

Table 2-2 Engineer Shell Commands

COMMANDS			DESCRIPTION
		`isolate [<enable|disable>]`	Enables or disables port isolation.
	`config`	`convert`	Backward compatibility command.
	`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.
		`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.
	`smcast`		You can use the join/leave command to add/remove multicast MAC addresses on specific ports. The static multicast filter can be applied to pass routing protocols, such as RIP and OSPF.
		`set <slot-port> <xx:xx:xx:xx:xx:xx> <join|leave>`	Use this command to create or modify a static multicast group.
		`delete <xx:xx:xx:xx:xx:xx>`	Remove a static multicast frame by deleting the associated MAC address.
		`list`	Display all MAC addresses joined to static multicast frames.

Chapter 3
ADSL Port Commands

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

3.1 ADSL Overview

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

Command syntax and command examples are shown using Standard shell.

3.2 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.

3.2.1 Port Show Command

Syntax:

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

where

`<slot>` = slot number

The `port show` command shows the priority, PVID, modes and states of all ADSL ports. An example is shown next.

```
ras> lcman  port show 3
[slot3  (alc-63)]
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
ras>
```

Figure 3-1 Port Show Command Example

3.2.2 Port Disable Command

Syntax:

`lcman port disable <slot-port>`

where

`<slot-port>` = slot and/or port number

The `lcman port disable` 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.

3.2.3 Port Enable Command

Syntax:

`lcman port enable <slot-port>`

where

`<slot-port>` = slot and/or port number

The `lcman port enable` 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.

3.2.4 Linedata Command

Syntax:

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

where

`<slot>` = The number of the slot where the ALC1024 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 ALC1024 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 ALC1024).

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).

```
lcman command 2 linedata 2
ras> DS carrier load: number of bits per symbol(tone):

tone   0- 31: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
tone  32- 63: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
tone  64- 95: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

tone  96-127: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
tone 128-159: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
tone 160-191: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

tone 192-223: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
tone 224-255: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
US carrier load: number of bits per symbol(tone)
tone   0- 31: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
tone  32- 63: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Figure 3-2 Linedata Command Example

3.2.5 Lineinfo Command

Syntax:

`lcman command <slot> lineinfo <port>`

where

`<slot>` = The number of the slot where the ALC1024 is located.

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

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

An example is shown next.

```
  lcman command 2 lineinfo 2
ras> Current operating modes:

    Data mode: ATM    Service type in operation: ?,
    Number of channels (down/up stream): 1/1
    Downstream framing structure       : 3
    Active down/up stream rate option  : 1/1
    TRELLIS operation mode is          : ON
Current connection detail:
    Down/up stream interleaved Delay :  0/ 0 ms
    Downstream Parity byte assigned to fast/interleaved : 0/ 0

    Upstream   Parity byte assigned to fast/interleaved : 0/ 0
    Downstream Symbols assigned to fast/interleaved     : 0/ 0
    Upstream   Symbols assigned to fast/interleaved     : 0/ 0
    Down/up stream Depth value       :  0/ 0
    Total Transceiver Output Power   :  0dBm
Current ATUR information:
    Country code 0

    Provider Code 00000000
    Capabilities:
```

Figure 3-3 Lineinfo Command Example

The service type in operation is the ADSL standard that the port is using: G.dmt (ALC1024-71), G.dmt Annex B (ALC1024-73), ETSI (ALC1024-73), G.lite or ANSI T1.413 issue 2 (ALC1024-71).

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.

3.2.6 Lineperf Command

Syntax:

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

where

`<slot>` = The number of the slot where the ALC1024 is located.

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

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

An example is shown next.

```
  lcman command 2 lineperf 12
ras>

Current line performance counters:
 nfebe-I/nfebe-ni                : 0/0
 ncrc-I/ncrc-ni                  : 0/0
 nfecc-I/nfecc-ni                : 0/0
 nfec-I/nfec-ni                  : 0/0
 nblks-ds/nblks-us               : 0/0
 nsec-ds/nsec-us                 : 0/0

 n-eb-ds/n-eb-us                 : 0/0
 n-bbe-ds/n-bbe-us               : 0/0
 n-es-ds/n-es-us                 : 0/0
 n-ses-ds/n-ses-us               : 0/0
 non-ses-blks-ds/non-ses-blks-us : 0/0
 n-uas-ds/n-uas-us               : 0/0
 fe_loss_seconds/ne_loss_seconds : 0/0
 fe_fec_seconds/ne_fec_seconds   : 0/0
 fast_trains                     : 0
 fast_trains_fail                : 0
```

Figure 3-4 Lineperf Command Example

[1] At the time of writing, the ALC1024 always uses Trellis coding.

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).

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 3-1 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.

3.2.7 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.
<up max rate>	=	The maximum ADSL upstream transmission rate.
<down max rate>	=	The maximum ADSL downstream transmission rate.
<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.

<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.

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.

Two examples are shown next,

```
ras> lcman port profile set adsl debug fast 800 8000
```

```
ras> lcman port profile set adsl debug interleave=16,16 800 8000
```

This command creates new profiles (one for fast mode and one fore interleave mode) with the maximum upstream transmission rate of 800 kbps and the maximum downstream transmission rate of 8000 kbps. None of the other settings are set.

3.2.8 Delete ADSL Profile Command

Syntax:

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

where

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

`<profile>` = A profile name.

The `profile delete` command allows you to delete an individual ADSL profile by its name.

3.2.9 Profile Show Command

Syntax:

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

The `profile show` command displays all ADSL/SHDSL profiles.

An example is shown next. This display shows 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 3-5 List Profiles Command Example

3.2.10 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>`

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

where

`<slot-port>`	=	The slot number and port number (ranging from 1 to 8).
`<profile >`	=	The profile that will define the settings of this port.
`<gdmt|t1413|glite|auto>`	=	The operational mode for ALC1024-61 . Choose from `glite`, `gdmt`, `t1413` or `auto`.
`<anxb|etsi|auto>`	=	The operational mode for ALC1024-63. Choose from `anxb`, `etsi` or `auto`.

The `port set` 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.

An example is shown next.

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

This command sets ADSL port 1 on the line card in slot 3 to have the debug profile in `anxb` mode.

3.2.11 PVC Set Command

Syntax:

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

where

`<slot-port-vpi/vci>`	=	The slot, port, VPI and VCI numbers.
`[<super>|<vid=<pvid> [priority=<priority>]>`	=	The super channel inherits the port's VID (PVID) and priority. You must assign a VID and priority to normal channels.
`[llc|vc]`	=	The multiplexing mode.

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
```

3.2.12 PVC Show Command

Syntax:

```
lcman port pvc show [slot-port-vpi/vci]
```

where

`[slot-port-vpi/vci]` = The slot, port, VPI and VCI numbers.

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

Part III:

Web Configurator with MSC

This part gives information on commands to use and how to use the web configurator to configure and manage the ADSL line card with the management switch card.

Chapter 4
Web Configurator with MSC Introduction

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

4.1 Web Configurator with MSC 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 describe the ADSL line card screens.

4.2 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.

4.2.1 Password

Step 1. Start your web browser.

Step 2. Launch your web browser and enter the IP address of the IES ("192.168.1.1" is the factory default) in the **Location** or **Address** field. Press **Enter**.

Step 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.

Step 4. Click **Login**.

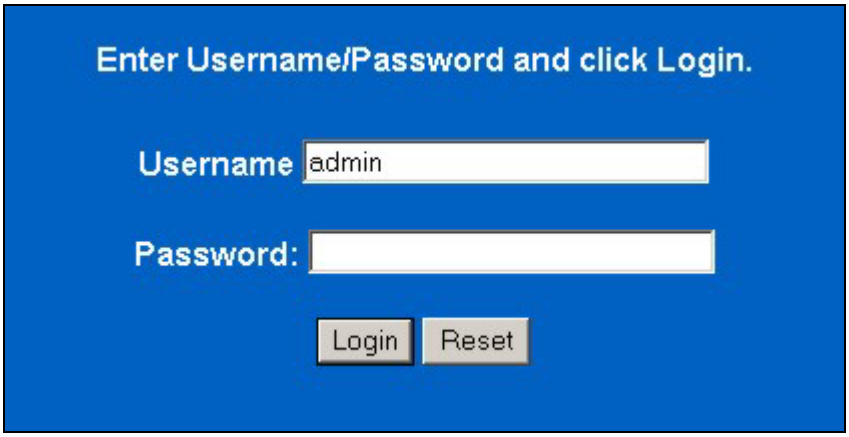


Figure 4-1 Login Screen

4.2.2 Change Password

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

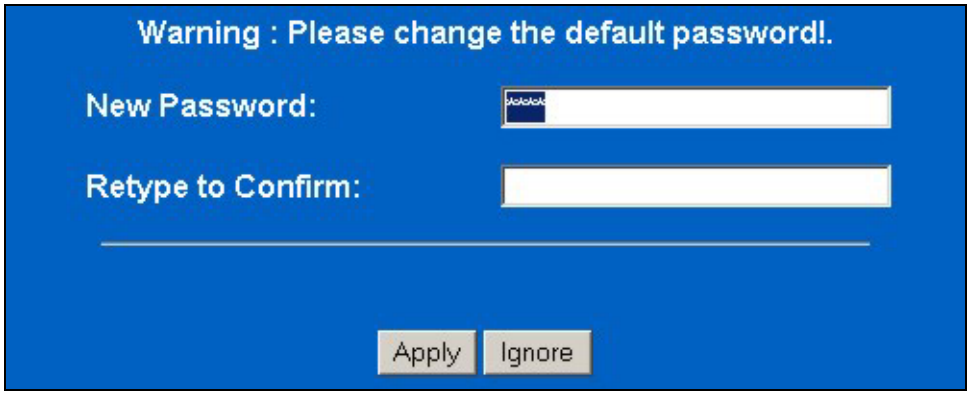


Figure 4-2 Change Password Screen

4.3 Home Screen

Figure 4-3 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 4-1 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.

4.4 Screens Overview

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

Table 4-2 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
ALC 802.1x Setup		ALC Statistics
ALC Edit 802.1x Setup		ALC Hardware Monitor
ALC Packet Type Filter Setup		ALC Port Statistics
ALC Packet Type Filter Edit		ALC 802.1Q VLAN Statistics
ALC MAC Filter Setup		Diagnostic
ALC MAC Filter Entry List		ALC Diagnostic
ALC MAC Filter Entry		
ALC MAC Count Filter Setup		
ALC MAC Count Filter Edit		
ALC Port Setup		
ALC Edit Port Setup		
ALC Channel Setup		
ALC Edit Channel Setup		

4.5 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.

4.6 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 4-4*) to open the configuration screen.

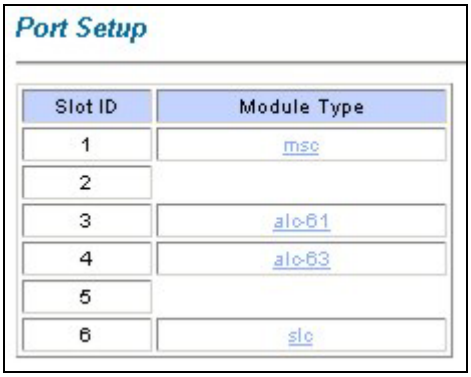


Figure 4-4 Select a Line Card

Table 4-3 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.

Configuration screens for individual cards display the card's slot number in front of the screens title in the upper left hand corner of the screen (see *Figure 4-5*).

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 4-5*) to go to the general **Port Setup** screen (see *Figure 4-4*).

Slot 3 Port Setup ALC1024-61 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	DEFVAL	Auto	512	2048	3
2	Yes	DEFVAL	Auto	512	2048	3
3	Yes	DEFVAL	Auto	512	2048	3
4	Yes	DEFVAL	Auto	512	2048	3
5	Yes	DEFVAL	Auto	512	2048	3
6	Yes	DEFVAL	Auto	512	2048	3
7	Yes	DEFVAL	Auto	512	2048	3
8	Yes	DEFVAL	Auto	512	2048	3
9	Yes	DEFVAL	Auto	512	2048	3
10	Yes	DEFVAL	Auto	512	2048	3
11	Yes	DEFVAL	Auto	512	2048	3
12	Yes	DEFVAL	Auto	512	2048	3
13	Yes	testalc	Auto	1024	8160	3
14	Yes	testalc	Auto	1024	8160	3
15	Yes	testalc	Auto	1024	8160	3
16	Yes	testalc	Auto	1024	8160	3
17	Yes	testalc	Auto	1024	8160	3
18	Yes	testalc	Auto	1024	8160	3
19	Yes	testalc	Auto	1024	8160	3
20	Yes	testalc	Auto	1024	8160	3
21	Yes	testalc	Auto	1024	8160	3
22	Yes	testalc	Auto	1024	8160	3
23	Yes	testalc	Auto	1024	8160	3
24	Yes	testalc	Auto	1024	8160	3

Figure 4-5 ALC Port Setup Screen

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 4-6*) to go to the **ALC Port Setup** screen (see *Figure 4-5*).

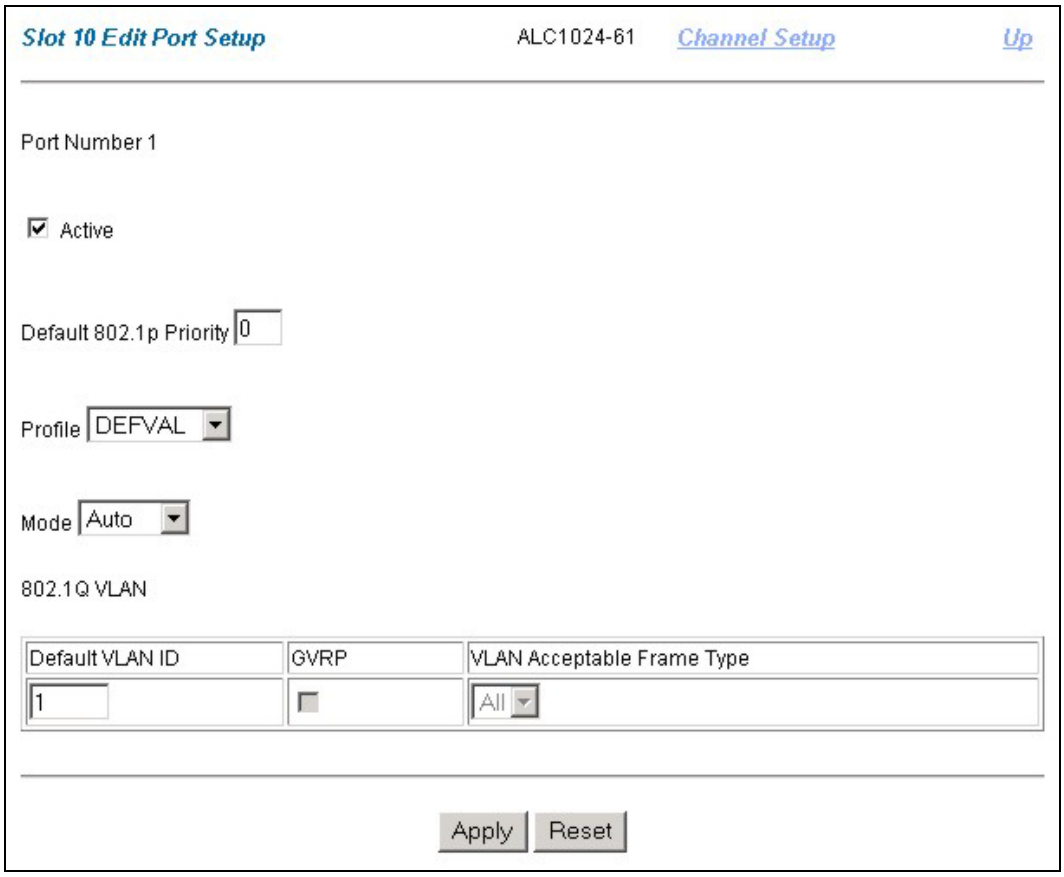


Figure 4-6 ALC Edit Port Setup Screen

Chapter 5
ADSL Port Setup

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

5.1 ADSL Port Setup Overview

The web configurator allows you to configure settings for profiles and individual ADSL ports on the line card.

5.2 ADSL Standards Overview

The line card supports both the G.lite and the G.dmt standards. G.lite is intended to minimize the cost for the consumer market.

Table 5-1 Maximum Transfer Rates of the ADSL Ports

STANDARD	MAXIMUM DOWNSTREAM	MAXIMUM UPSTREAM
G.dmt (ALC1024-61)	8160 Kbps	1024 Kbps
G.dmt Annex B (ALC1024-63)	8160 Kbps	1024 Kbps
ETSI (ALC1024-63)	8160 Kbps	1024 Kbps
G.lite	1536 Kbps	512 Kbps
ANSI T1.413 issue 2 (ALC1024-61)	8160 Kbps	1024 Kbps

5.3 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.

5.4 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.

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.

5.5 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.

5.5.1 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.

5.6 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.

5.7 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 *ALC1024 Overview* chapter for the settings of the default profile and ADSL port default settings.

5.8 ALC Port Setup Screen

Step 1. Click **Port Setup** in the navigation panel to open the **Port Setup** screen.

Step 2. 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 3 Port Setup ALC1024-61 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	DEFVAL	Auto	512	2048	3
2	Yes	DEFVAL	Auto	512	2048	3
3	Yes	DEFVAL	Auto	512	2048	3
4	Yes	DEFVAL	Auto	512	2048	3
5	Yes	DEFVAL	Auto	512	2048	3
6	Yes	DEFVAL	Auto	512	2048	3
7	Yes	DEFVAL	Auto	512	2048	3
8	Yes	DEFVAL	Auto	512	2048	3
9	Yes	DEFVAL	Auto	512	2048	3
10	Yes	DEFVAL	Auto	512	2048	3
11	Yes	DEFVAL	Auto	512	2048	3
12	Yes	DEFVAL	Auto	512	2048	3
13	Yes	testalc	Auto	1024	8160	3
14	Yes	testalc	Auto	1024	8160	3
15	Yes	testalc	Auto	1024	8160	3
16	Yes	testalc	Auto	1024	8160	3
17	Yes	testalc	Auto	1024	8160	3
18	Yes	testalc	Auto	1024	8160	3
19	Yes	testalc	Auto	1024	8160	3
20	Yes	testalc	Auto	1024	8160	3
21	Yes	testalc	Auto	1024	8160	3
22	Yes	testalc	Auto	1024	8160	3
23	Yes	testalc	Auto	1024	8160	3
24	Yes	testalc	Auto	1024	8160	3

Figure 5-1 ALC Port Setup Screen

Table 5-2 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 this card's **802.1x Setup** screen
Packet Type Filter	Click this link to go to this card's **Packet Type Filter** screen
MAC Filter	Click this link to go to this card's **MAC Filter** screen
MAC Count Filter	Click this link to go to this card's **MAC Count Filter** screen
Port Setup	Click this link to go to the general **Port Setup** screen.

Table 5-2 ALC Port Setup

LABEL	DESCRIPTION
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.

5.8.1 ALC Profile Setup Screen

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

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. Click the **Profile Setup** link in the **ALC Port Setup** screen to go to the card's **Profile Setup** screen.

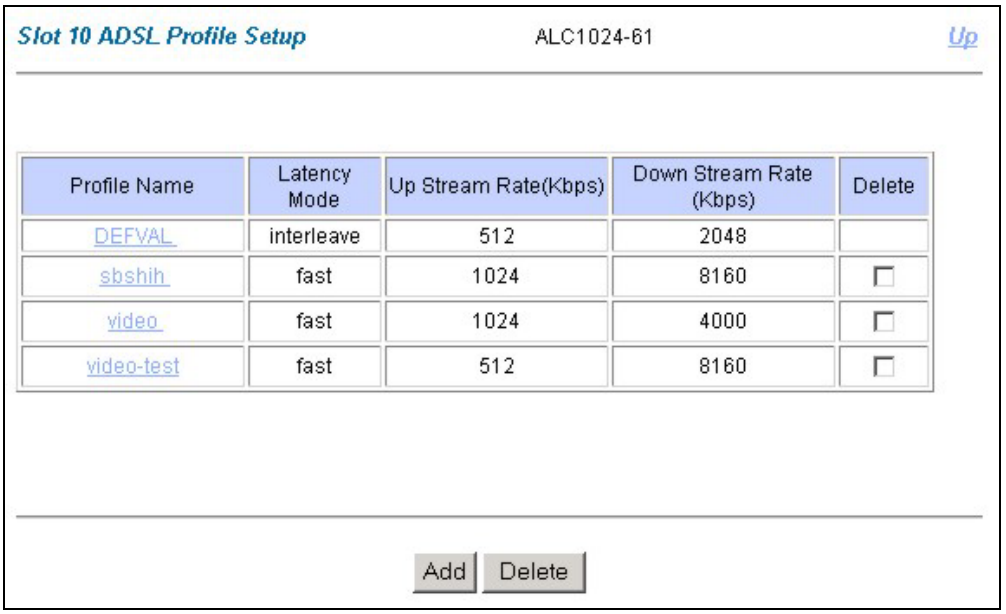


Figure 5-2 ALC Profile Setup Screen

Table 5-3 ALC 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. Speeds from 32 to 1024 kilobits per second (Kbps) are supported.
Downstream Max Rate: Kbps	This is the maximum downstream transfer rate for the ports that belong to this profile. Speeds from 32 to 8160 (Kbps) are supported.
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.

ALC Profile Add or Edit Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. Click the **Profile Setup** link in the **ALC Port Setup** screen to go to the card's **Profile Setup** screen.

Step 3. 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.

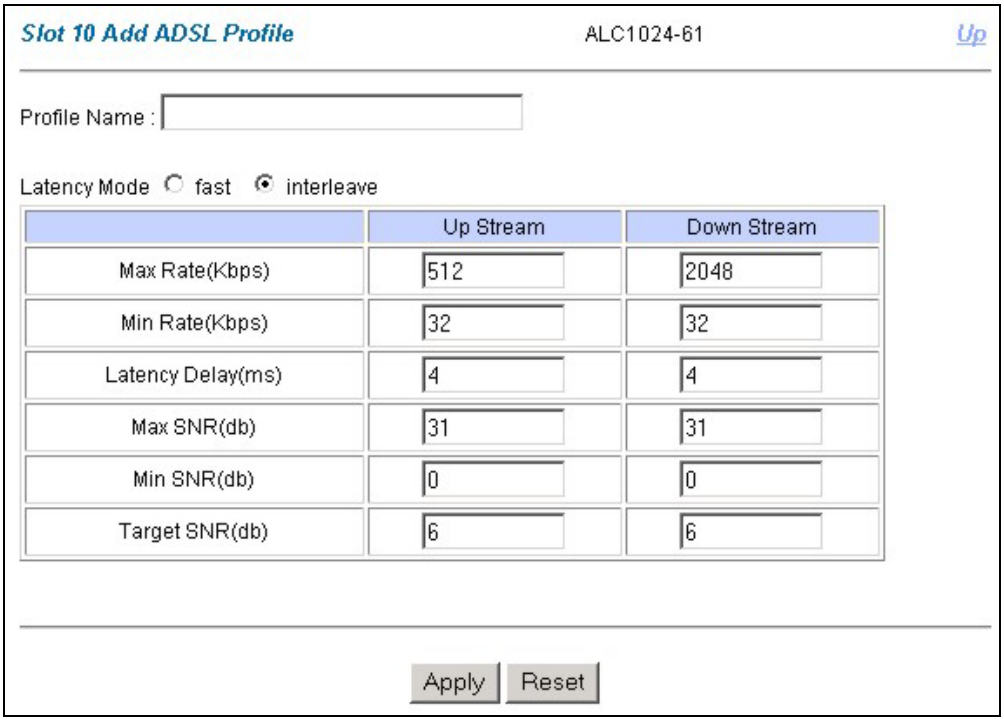


Figure 5-3 ALC Edit Profile Screen

Table 5-4 ALC 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.
Upstream	The following parameters relate to upstream transmissions.
Max Rate (Kbps)	Type a maximum upstream transfer rate for this port. Speeds from 32 to 1024 (Kbps) are supported. Configure the maximum upstream transfer rate to be less than the maximum downstream transfer rate.
Min Rate (Kbps)	Type the minimum upstream transfer rate (from 32 to 1024 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 5-4 ALC 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 in Kbps for this port. Speeds from 32 to 8160 (Kbps) are supported.
Min Rate (Kbps)	Type the minimum downstream transfer rate (from 32 to 8160 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.
Click **Apply** to save your changes back to the line card. Click **Reset** to begin configuring this screen afresh.	

5.8.2 ALC Port Edit Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link.

Step 2. Click a port's index number to go to the following setup screen for that port.

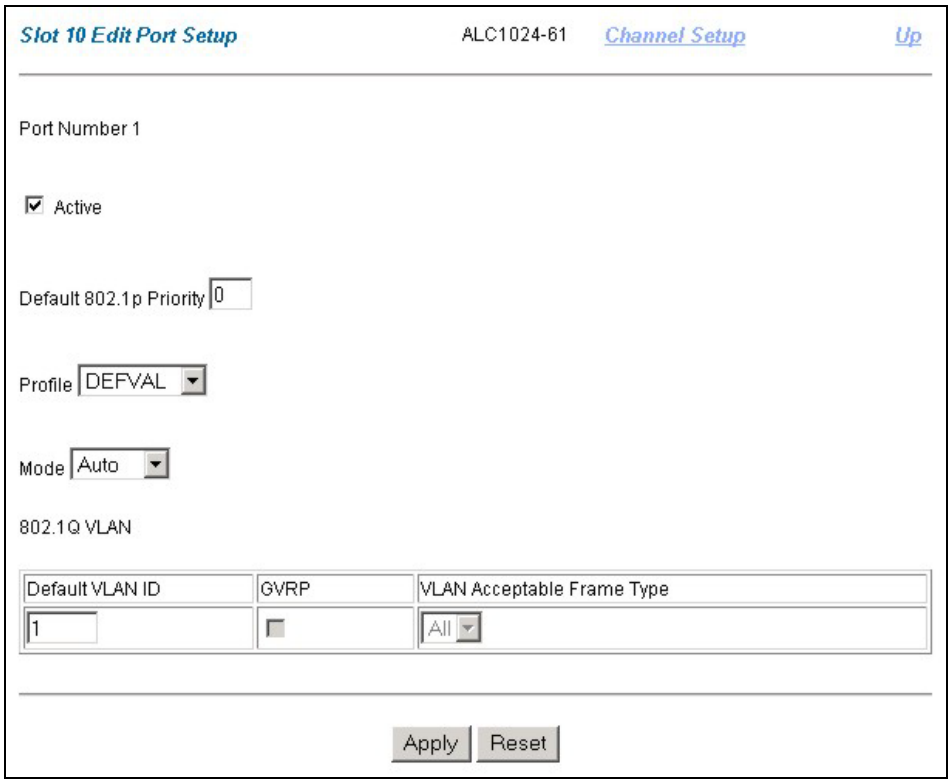


Figure 5-4 ALC Edit Port Setup Screen

Table 5-5 ALC 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 *5.8.1* and *5.8.2*).
Mode	Use the drop-down list box to select the ADSL operational mode for this port (see *Table 5-1*).
802.1Q VLAN	
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.

Table 5-5 ALC Edit Port Setup

LABEL	DESCRIPTION
VLAN Acceptable Frame Type	This port accepts both tagged and untagged incoming packets.
Click **Apply** to save your changes back to the line card. Click **Reset** to begin configuring this screen afresh.	

5.9 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 a port.

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

Use the **ALC 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 IEEE 802.1p priority.

5.9.1 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.

5.9.2 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, VCI 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.

5.10 ALC Port Channel Setup Screen

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

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the **ALC Port Setup** screen.

Step 2. Click a port's index number to go to the **ALC Edit Port Setup** screen.

Step 3. Click **Channel Setup** in the **ALC Edit Port Setup** screen to go to the port's **Channel Setup** screen.

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

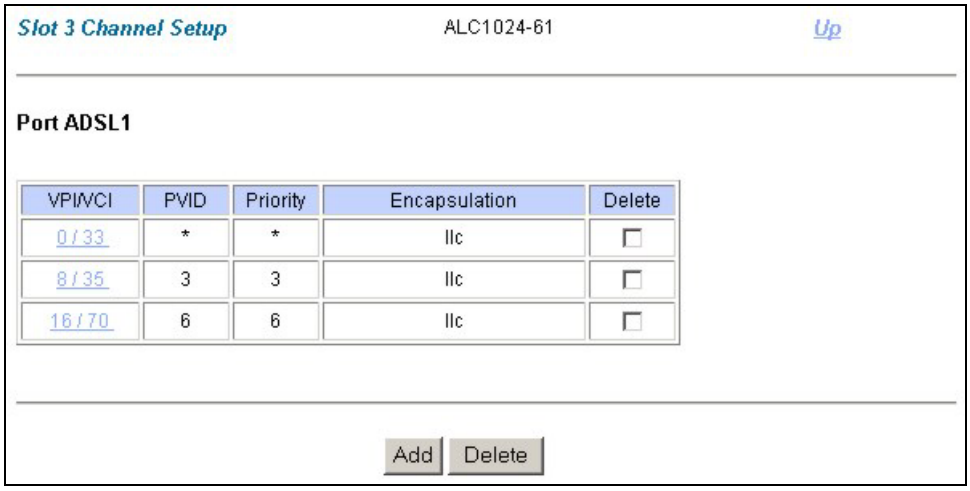


Figure 5-5 ALC Port Channel Setup Screen

Table 5-6 ALC Port Channel Setup

LABEL	DESCRIPTION
Up	Click this link to go to the card's **Edit Port Setup** screen.
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.
PVID	This is the PVID (Port VLAN ID) assigned to untagged frames or priority frames (0 VID) received on this channel. An asterisks (*) denotes a super channel.
Priority	Type the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.
Encapsulation	This shows the encapsulation type **llc** or **vc** that this channel uses.
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.

5.10.1 ALC Port Channel Add or Edit Screen

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

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the **ALC Port Setup** screen.

Step 2. Click a port's index number to go to the **ALC Edit Port Setup** screen.

Step 3. Click **Channel Setup** in the **ALC Edit Port Setup** screen to go to the port's **Channel Setup** screen.

Step 4. 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.

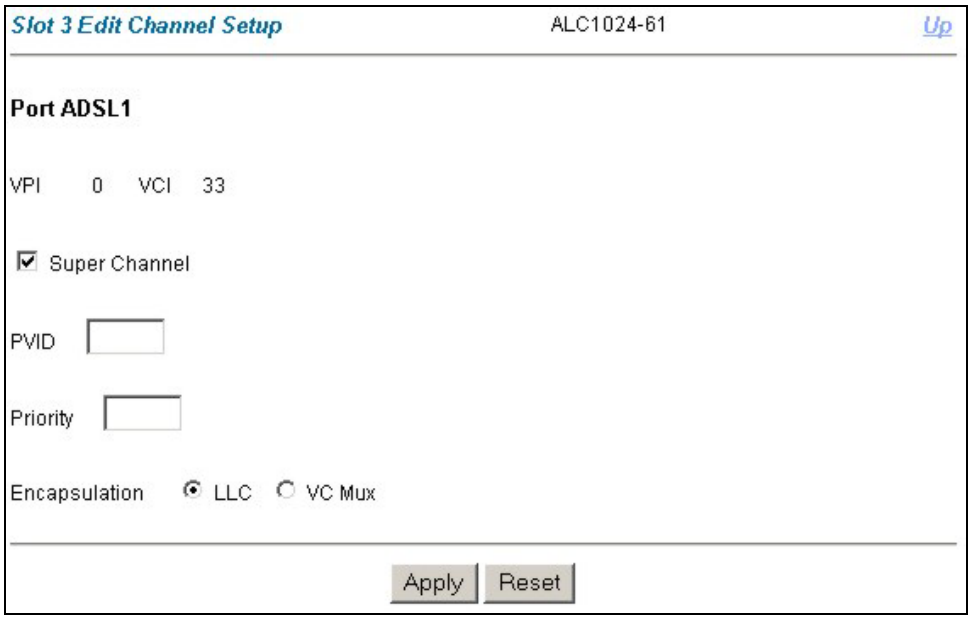


Figure 5-6 ALC Edit Port Channel Setup Screen

Table 5-7 ALC Edit Port Channel Setup

LABEL	DESCRIPTION
Up	Click this link to go to the port's **Channel Setup** screen.
VPI	This field displays the Virtual Path Identifier for this port.
VCI	This field displays the Virtual Circuit Identifier for this port.
Super Channel	The IES 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.
Priority	Type the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.
Encapsulation	Select the encapsulation type (**LLC** or **VC Mux**) for this port.
Click **Apply** to save your changes back to the line card. Click **Reset** to begin configuring this screen afresh.	

5.11 IEEE 802.1x Authentication Introduction

IEEE 802.1x is an extended authentication protocol[1] that allows support of RADIUS (Remote Authentication Dial In User Service, RFC 2138, 2139) for centralized user profile and accounting[2] management on a network RADIUS server. Specify the RADIUS server on the management switch card.

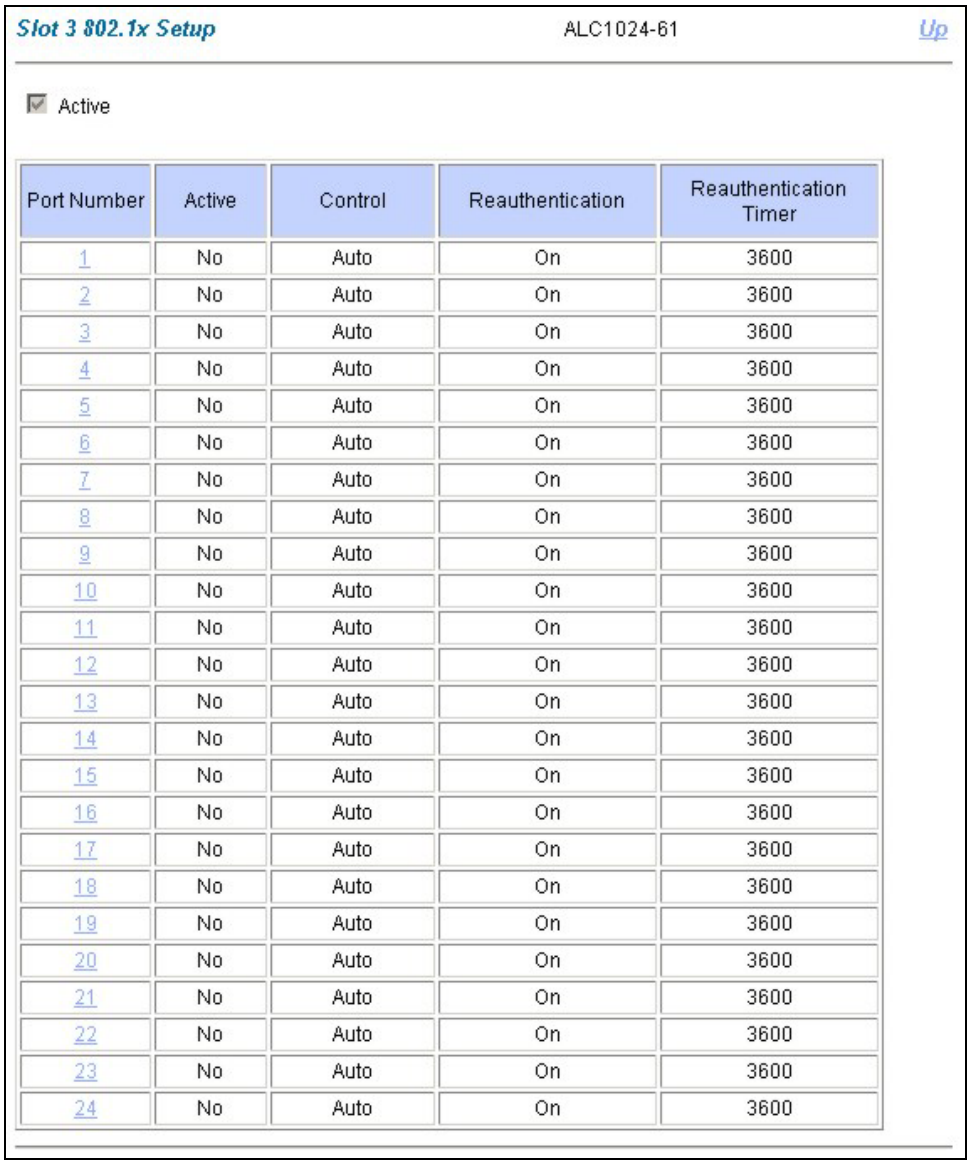
5.11.1 802.1x Setup Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. 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.

[1] 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.

[2] Not available at the time of writing.



Slot 3 802.1x Setup ALC1024-61 Up

Active

Port Number	Active	Control	Reauthentication	Reauthentication Timer
1	No	Auto	On	3600
2	No	Auto	On	3600
3	No	Auto	On	3600
4	No	Auto	On	3600
5	No	Auto	On	3600
6	No	Auto	On	3600
7	No	Auto	On	3600
8	No	Auto	On	3600
9	No	Auto	On	3600
10	No	Auto	On	3600
11	No	Auto	On	3600
12	No	Auto	On	3600
13	No	Auto	On	3600
14	No	Auto	On	3600
15	No	Auto	On	3600
16	No	Auto	On	3600
17	No	Auto	On	3600
18	No	Auto	On	3600
19	No	Auto	On	3600
20	No	Auto	On	3600
21	No	Auto	On	3600
22	No	Auto	On	3600
23	No	Auto	On	3600
24	No	Auto	On	3600

Figure 5-7 802.1x Setup

The following table describes this screen.

Table 5-8 802.1x 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.
Active	This field displays whether (**Yes**) or not (**No**) IEEE 802.1x authentication is enabled on this port.

Table 5-8 802.1x Setup

LABEL	DESCRIPTION
Control	When this field displays **Auto**, the ALC1024 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.

5.11.2 802.1x Edit Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. Click the **802.1x** link in the **ALC Port Setup** screen to go to the card's **802.1x Setup** screen.

Step 3. Click a port's index number in the **802.1x Setup** screen to edit the port's IEEE 802.1x settings.

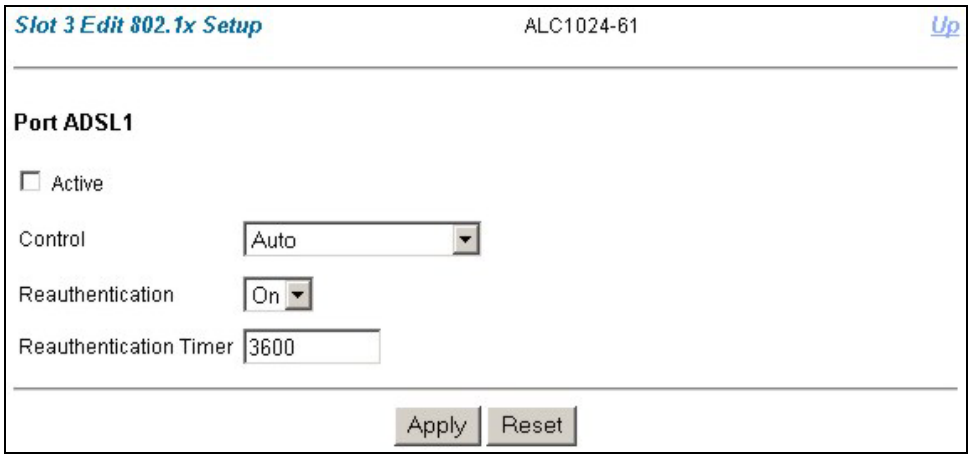


Figure 5-8 Edit 802.1x

The following table describes this screen.

Table 5-9 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 5-9 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.

5.11.3 Packet Type Filter Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. Click the **Packet Type Filter** link in the **ALC Port Setup** screen to open this screen.

Slot 3 Packet Type Filter Setup ALC1024-61 Up

Port Number	Packet Type
1	Accept PPPoE Only
2	Accept PPPoE Only
3	Accept PPPoE Only
4	Accept PPPoE Only
5	Accept PPPoE Only
6	Accept PPPoE Only
7	Accept PPPoE Only
8	Accept PPPoE Only
9	Accept PPPoE Only
10	Accept PPPoE Only
11	Accept PPPoE Only
12	Accept PPPoE Only
13	Accept PPPoE Only
14	Accept PPPoE Only
15	Accept PPPoE Only
16	Accept PPPoE Only
17	Accept PPPoE Only
18	Accept PPPoE Only
19	Accept PPPoE Only
20	Accept PPPoE Only
21	Accept PPPoE Only
22	Accept PPPoE Only
23	Accept PPPoE Only
24	Accept PPPoE Only

Figure 5-9 Packet Type Filter

The following table describes this screen.

Table 5-10 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.

5.11.4 Packet Type Filter Edit Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. Click the **Packet Type Filter** link in the **ALC Port Setup** screen to open the card's **Packet Type Filter** screen.

Step 3. Click a port's index number in the **Packet Type Filter** screen to edit the port's packet type filter settings.

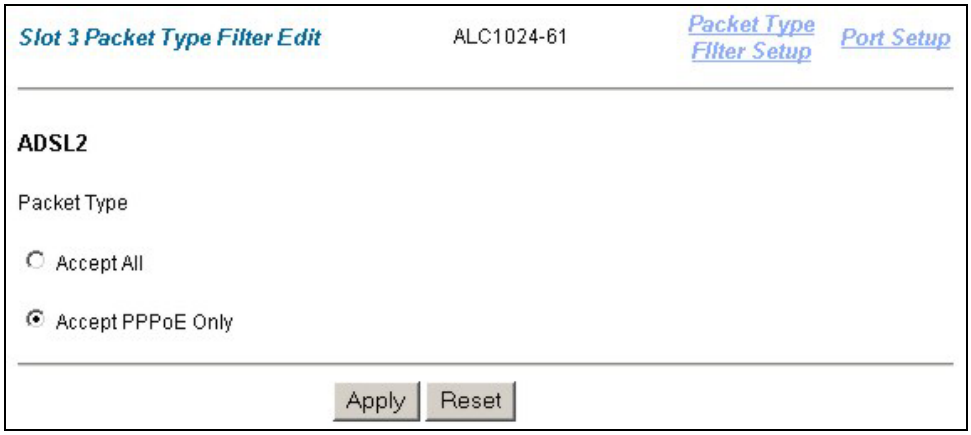


Figure 5-10 Packet Type Filter Edit

The following table describes this screen.

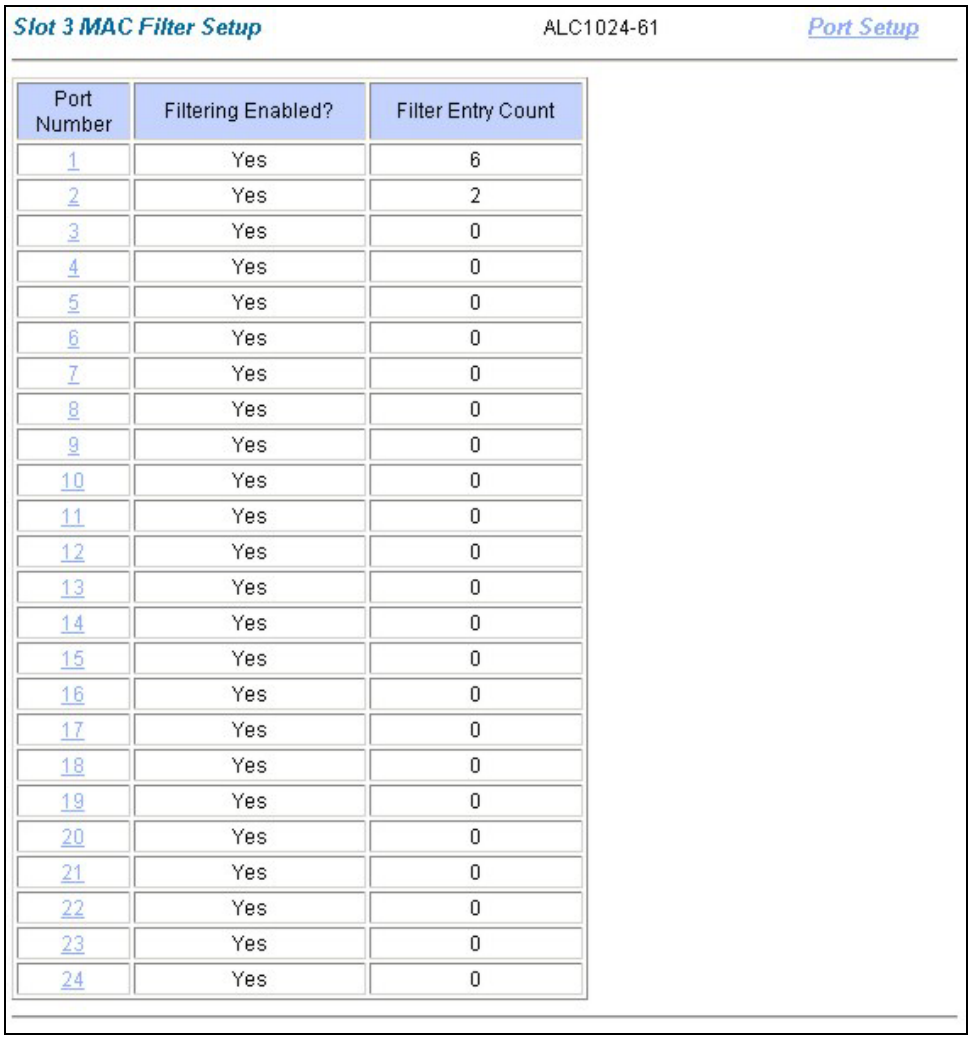
Table 5-11 Packet Type Filter Edit

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.
Apply	Click **Apply** to save your changes.
Reset	Click **Reset** to begin configuring this screen afresh.

5.11.5 MAC Filter Setup Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. Click the **MAC Filter** link in the **ALC Port Setup** screen to open this screen.



Slot 3 MAC Filter Setup ALC1024-61 Port Setup

Port Number	Filtering Enabled?	Filter Entry Count
1	Yes	6
2	Yes	2
3	Yes	0
4	Yes	0
5	Yes	0
6	Yes	0
7	Yes	0
8	Yes	0
9	Yes	0
10	Yes	0
11	Yes	0
12	Yes	0
13	Yes	0
14	Yes	0
15	Yes	0
16	Yes	0
17	Yes	0
18	Yes	0
19	Yes	0
20	Yes	0
21	Yes	0
22	Yes	0
23	Yes	0
24	Yes	0

Figure 5-11 MAC Filter Setup

The following table describes this screen.

Table 5-12 MAC Filter Setup

LABEL	DESCRIPTION
Port Setup	Click this link to go to the card's **Port Setup** screen.
Port Number	Click the port number 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.

5.11.6 MAC Filter Entry List Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. Click the **MAC Filter** link in the **ALC Port Setup** screen to open the card's **MAC Filter** screen.

Step 3. Click on a port link in the **MAC Filter Setup** screen to open this screen.

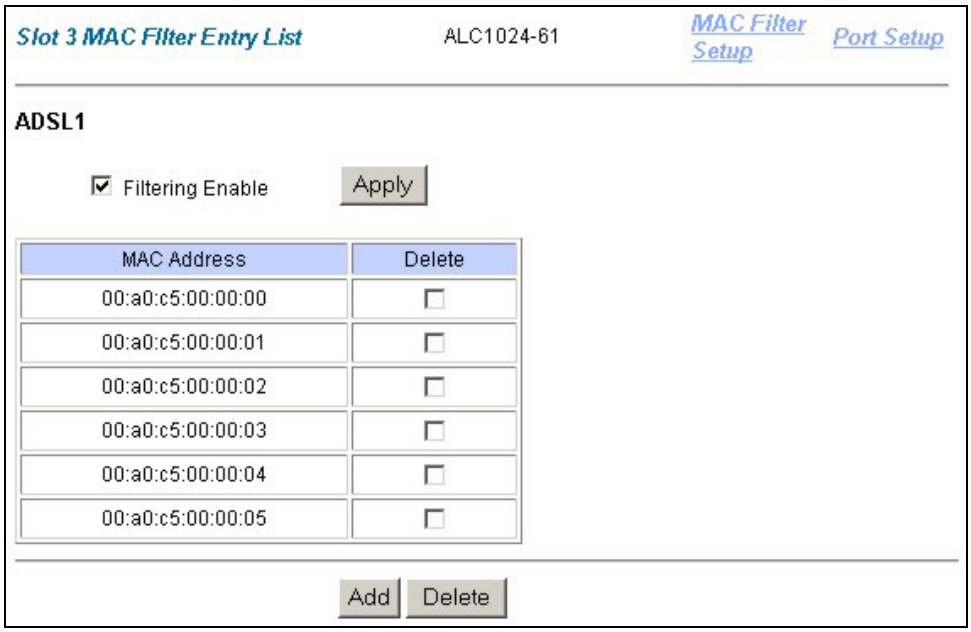


Figure 5-12 MAC Filter Entry List

The following table describes this screen.

Table 5-13 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.

5.11.7 MAC Filter Entry Add Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. Click the **MAC Filter** link in the **ALC Port Setup** screen to open the card's **MAC Filter** screen.

Step 3. Click on a port link in the card's **MAC Filter Setup** screen to open the **MAC Filter Entry List** screen.

Step 4. Click **Add** in the **MAC Filter Entry List** screen to open this screen.

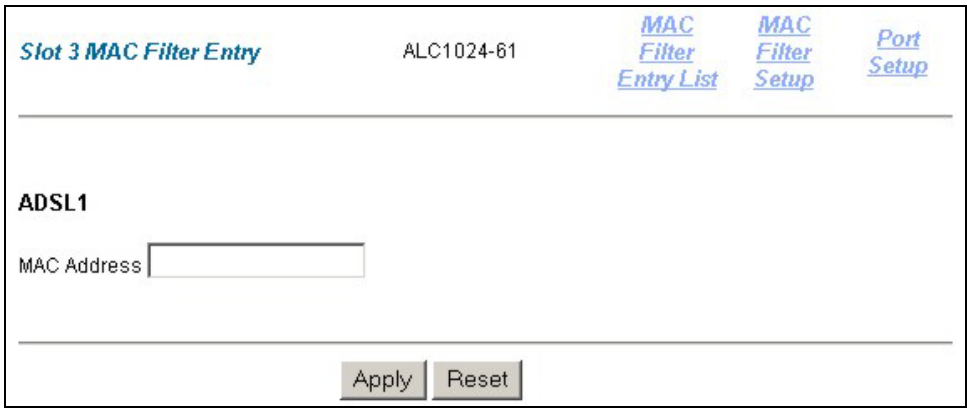


Figure 5-13 MAC Filter Entry Add

The following table describes this screen.

Table 5-14 MAC Filter Entry Add

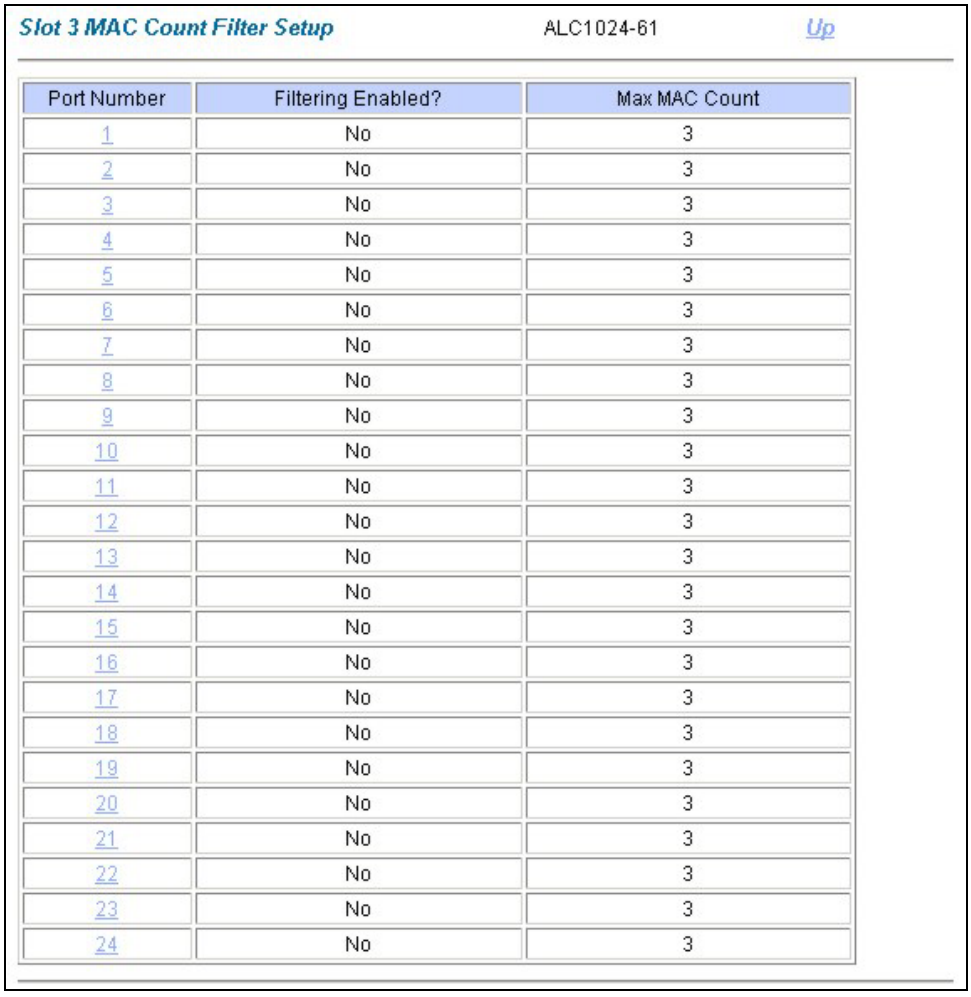
LABEL	DESCRIPTION
MAC Filter Entry List	Click this link to go to the card's **MAC Filter Entry List** screen.
MAC Filter Setup	Click this link to go to the card's **MAC Filter Setup** screen.
Port Setup	Click this link to go to the card's **Port Setup** screen.
MAC Address	Type a MAC address in hexadecimal 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.

5.11.8 MAC Count Filter Setup Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. Click the **MAC Count Filter** link in the **ALC Port Setup** screen to open this screen.

Step 3. Use this screen to limit the number of MAC addresses that may be dynamically learned on a DSL port.



Slot 3 MAC Count Filter Setup ALC1024-61 Up

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

Figure 5-14 MAC Count Filter Setup

The following table describes the labels in this screen.

Table 5-15 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.

5.11.9 MAC Count Filter Edit Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card's link to open the card's **Port Setup** screen.

Step 2. Click the **MAC Count Filter** link in the **ALC Port Setup** screen to open the **MAC Count Filter Setup** screen.

Step 3. Click a port number in the **MAC Count Filter Setup** screen to open this screen.

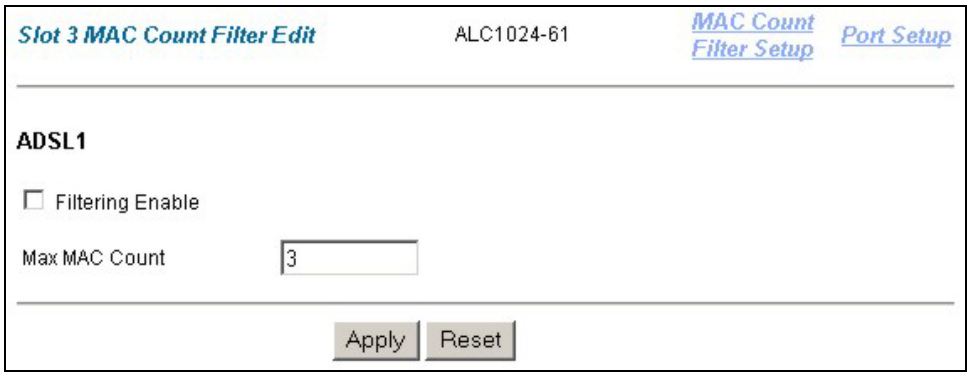


Figure 5-15 MAC Count Filter Edit

Table 5-16 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.

5.11.10 Port Edit Screen

Step 1. Click **Port Setup** in the navigation panel and then the ADSL line card’s link.

Step 2. Click a port's index number to go to the following setup screen for that port.

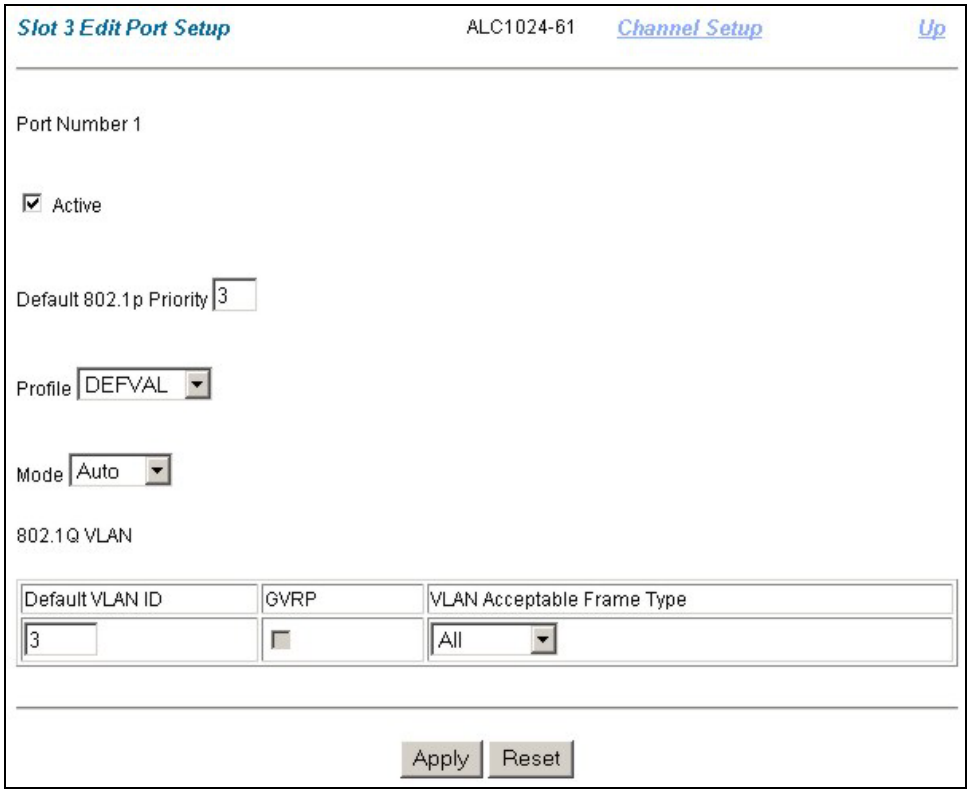


Figure 5-16 Edit Port Setup Screen

Table 5-17 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 *5.8.1* and *5.8.2*).
802.1Q VLAN	
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.[3]

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

Table 5-17 Edit Port Setup

LABEL	DESCRIPTION
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.

Chapter 6
IEEE 802.1Q VLAN

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

6.1 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.

6.2 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.

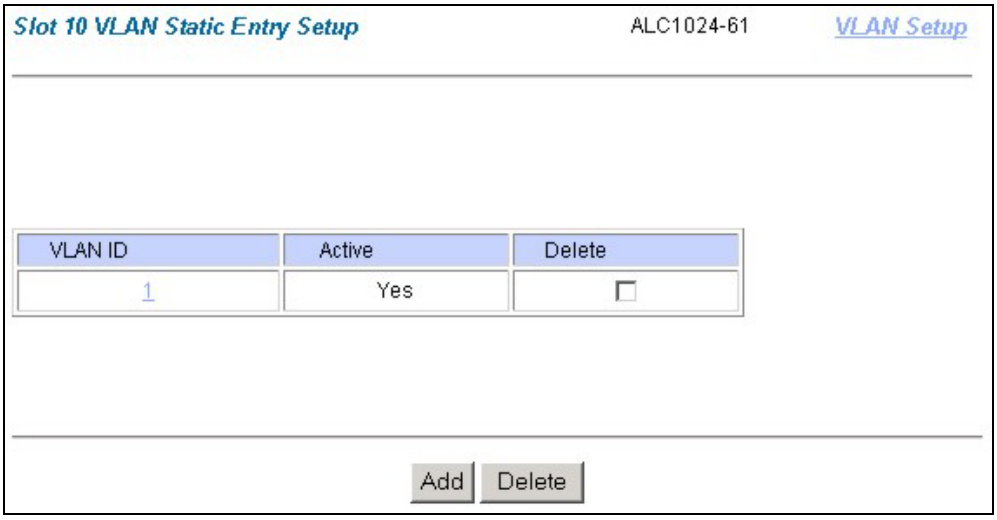


Figure 6-1 ALC Static VLAN Setup Screen

Table 6-1 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**.

Table 6-1 ALC Static VLAN Setup

LABEL	DESCRIPTION
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.

6.2.1 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 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.

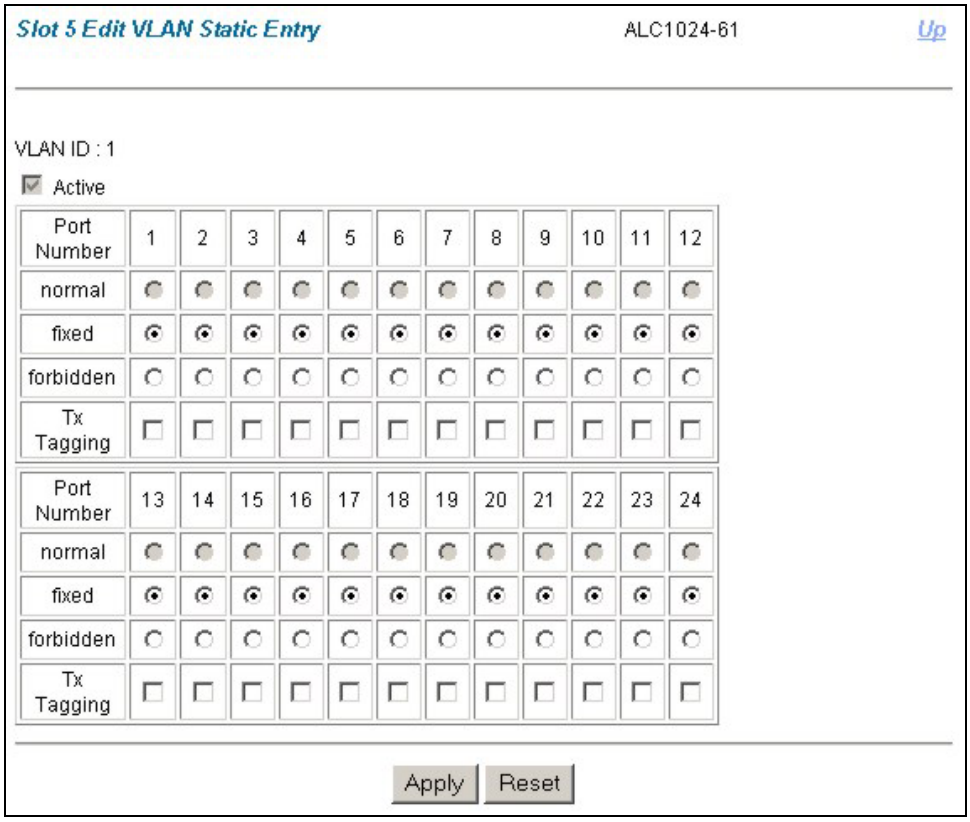


Figure 6-2 ALC Edit Static VLAN Screen

Table 6-2 ALC Edit Static VLAN

LABEL	DESCRIPTION
Up	Click this link to go to the **Static VLAN Setup** screen.

Table 6-2 ALC Edit Static VLAN

LABEL	DESCRIPTION
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.
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.	

6.3 ALC Management VLAN Edit Screen

Step 1. Click **VLAN Setup** in the navigation panel and then a card's link in the **VLAN Setup** screen.

Step 2. Click the management card's VLAN ID in the ALC **Static VLAN Setup** screen to open this screen.

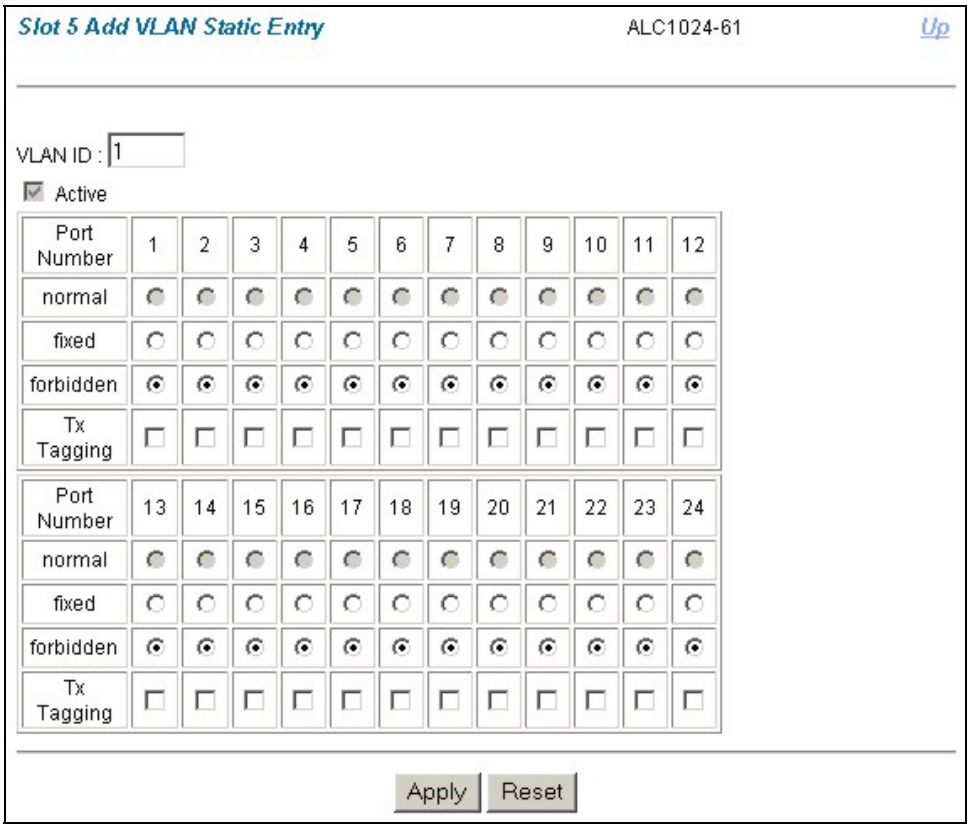


Figure 6-3 ALC Management VLAN Edit Screen

Table 6-3 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	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.
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 7 Maintenance

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

7.1 Maintenance Overview

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

7.1.1 Firmware Upgrade Screen

Step 1. Click **Maintenance** in the navigation panel and then **Firmware Upgrade** in the **Maintenance** screen.

Step 2. 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.

Step 2. Download and unzip the new firmware.

Step 3. Go to the **Card Firmware Upgrade** screen.

Step 4. 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**.

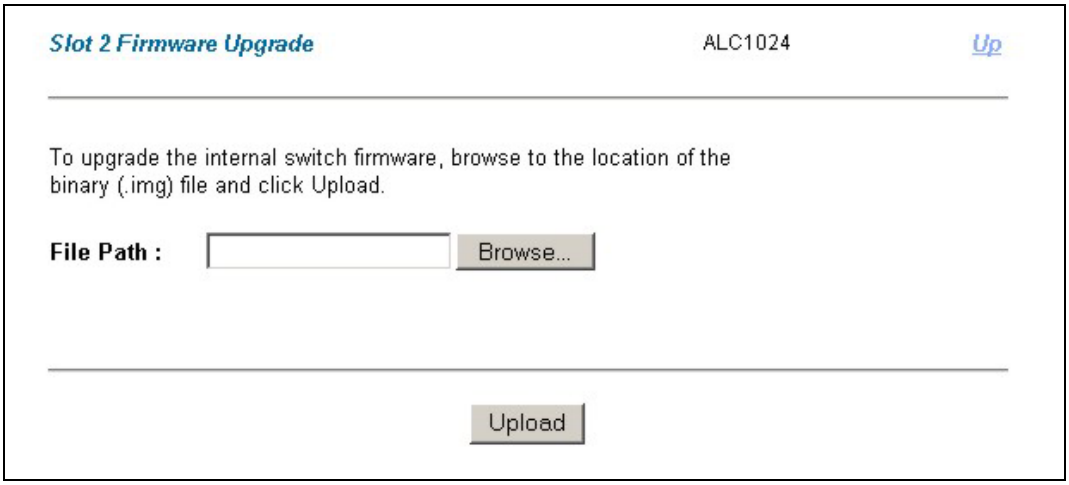


Figure 7-1 Card Firmware Upgrade

Chapter 8 Statistics

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

8.1 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.

8.2 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.

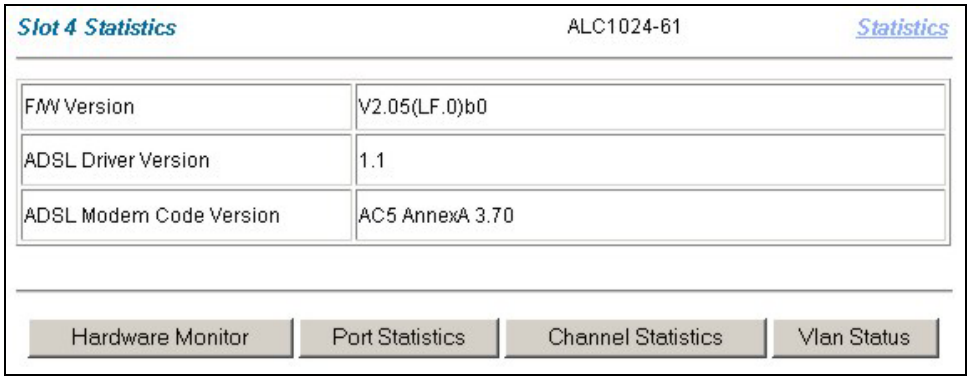


Figure 8-1 ALC Statistics Screen

Table 8-1 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 8-1 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.

8.2.1 Hardware Monitor Screen

Step 1. Click **Statistics** in the navigation panel and then the ADSL line card's link in the **Statistics** screen.

Step 2. 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.

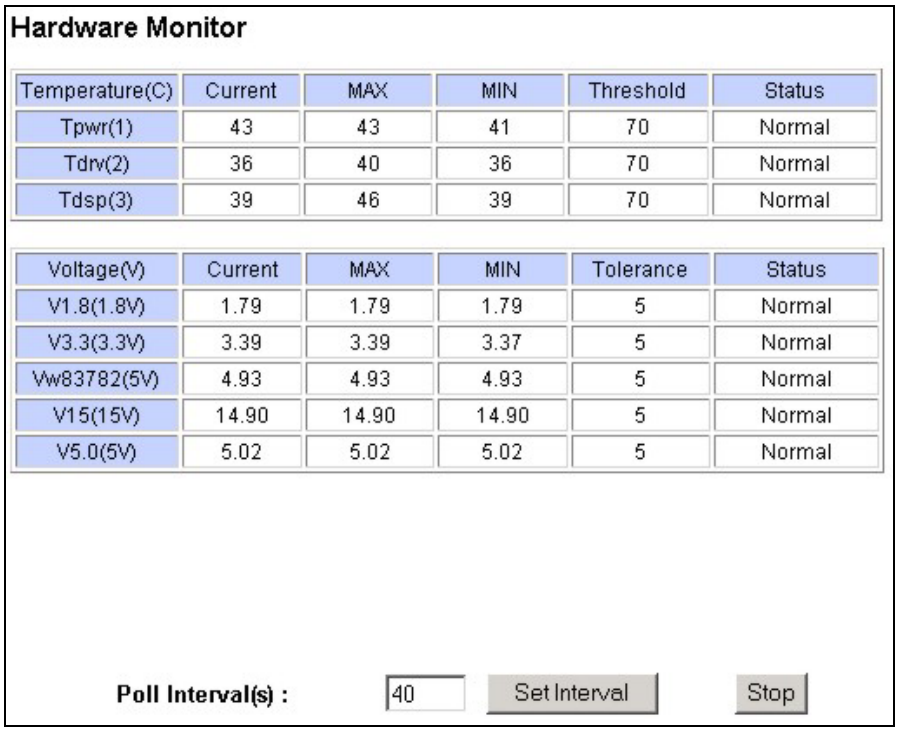


Figure 8-2 ALC Hardware Monitor Screen

Table 8-2 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. Tdrv(2) refers to the temperature sensor near the card's line driver. Tdsp(3) refers to the temperature sensor near the card's ADSL chipset. All temperature measurements are in degrees centigrade.

Table 8-2 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.

8.2.2 Port Statistics Screen

Step 1. Click **Statistics** in the navigation panel and then the ADSL line card's link in the **Statistics** screen.

Step 2. 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.

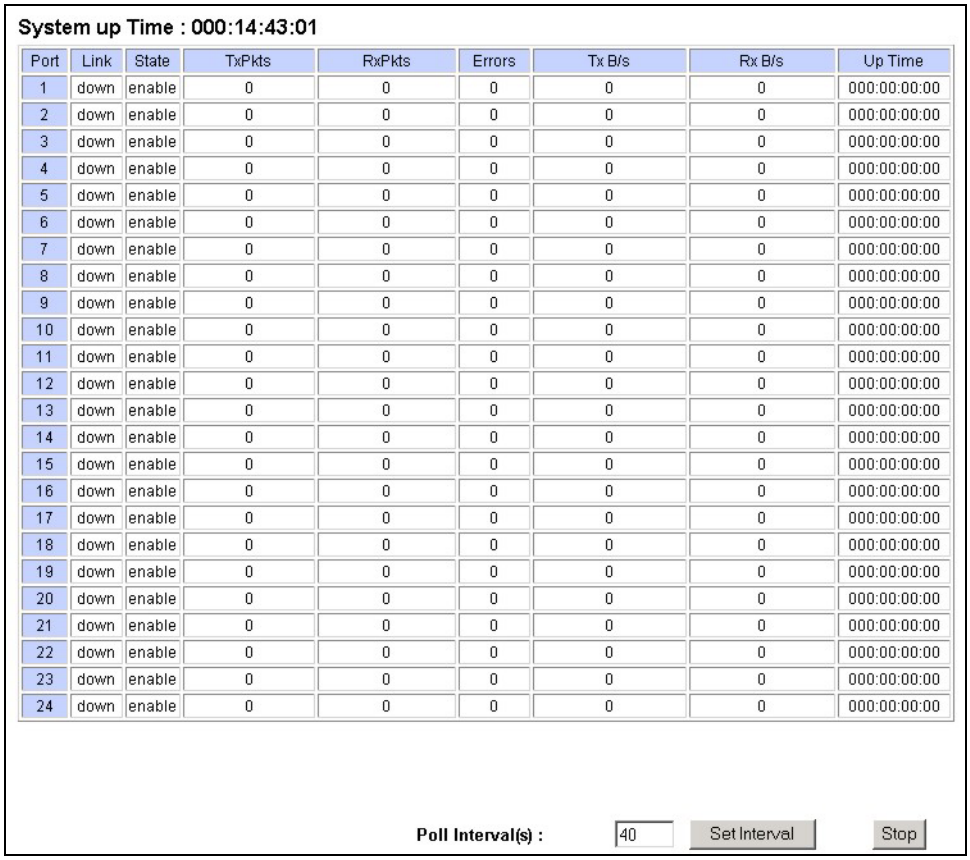


Figure 8-3 ALC Port Statistics Screen

Table 8-3 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 connections that are up or **Down** for the DSL ports that are not connected.
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.
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 since the DSL connection was last established.

Table 8-3 ALC Port Statistics

LABEL	DESCRIPTION
Rx KB/s	This field shows the number of kilobytes received on a per-second basis by this port since the DSL connection was last established.
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.

8.2.3 Channel Statistics

Step 1. Click **Statistics** in the navigation panel and then the ADSL line card's link in the **Statistics** screen.

Step 2. 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.

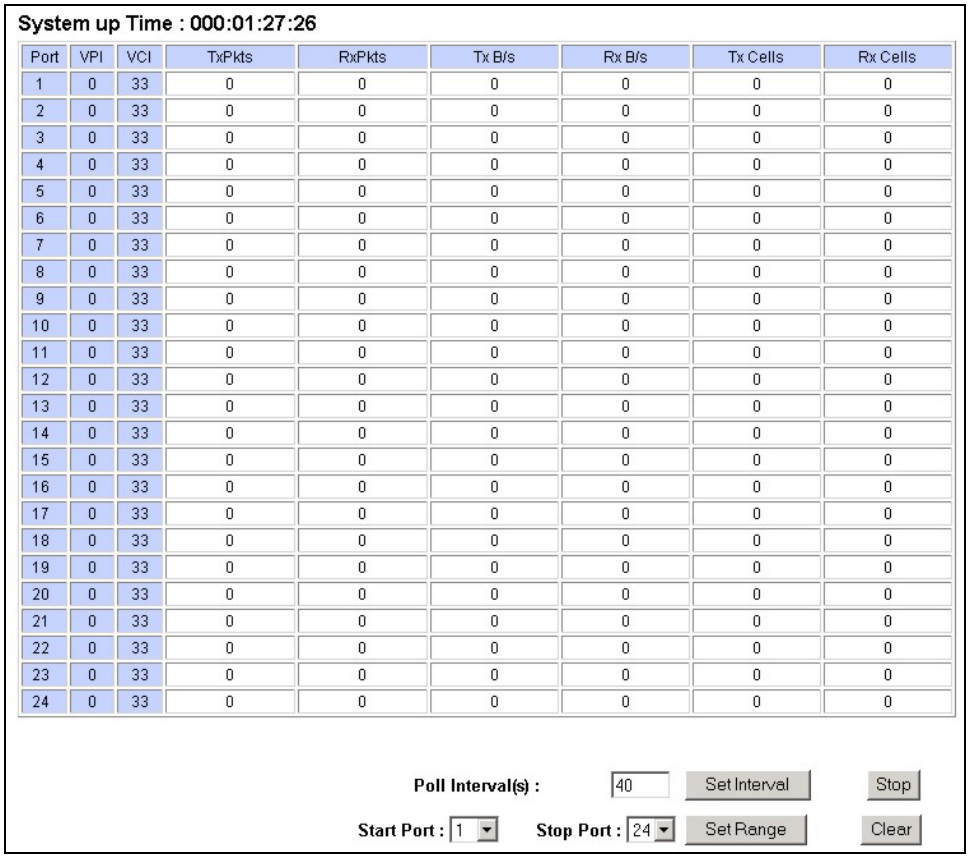


Figure 8-4 ALC Channel Statistics Screen

Table 8-4 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.
RxPkts	This field shows the number of packets received by this port on this individual channel.
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 since the DSL connection was last established.
Rx B/s	This field shows the number of bytes received on a per-second basis by this port on this individual channel since the DSL connection was last established.
Tx Cells	This field shows the number of ATM cells transmitted by this port on this individual channel since the DSL connection was last established.
Rx Cells	This field shows the number of ATM cells received by this port on this individual channel since the DSL connection was last established.
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 this card's statistic records.

8.2.4 VLAN Status Screen

Step 1. Click **Statistics** in the navigation panel and then the ADSL line card's link in the **Statistics** screen.

Step 2. 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.

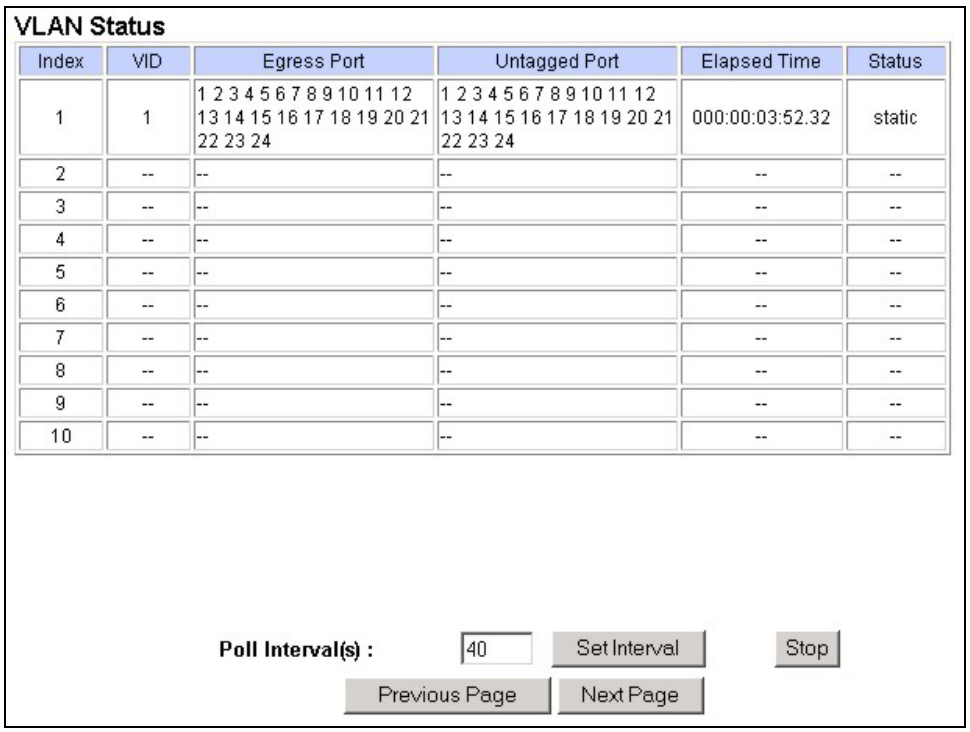


Figure 8-5 ALC 802.1Q VLAN Status Screen

Table 8-5 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; dynamically using GVRP or statically, that is, added as a permanent entry.
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 8-5 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 9 Diagnostics

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

9.1 Diagnostic Overview

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

9.2 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.

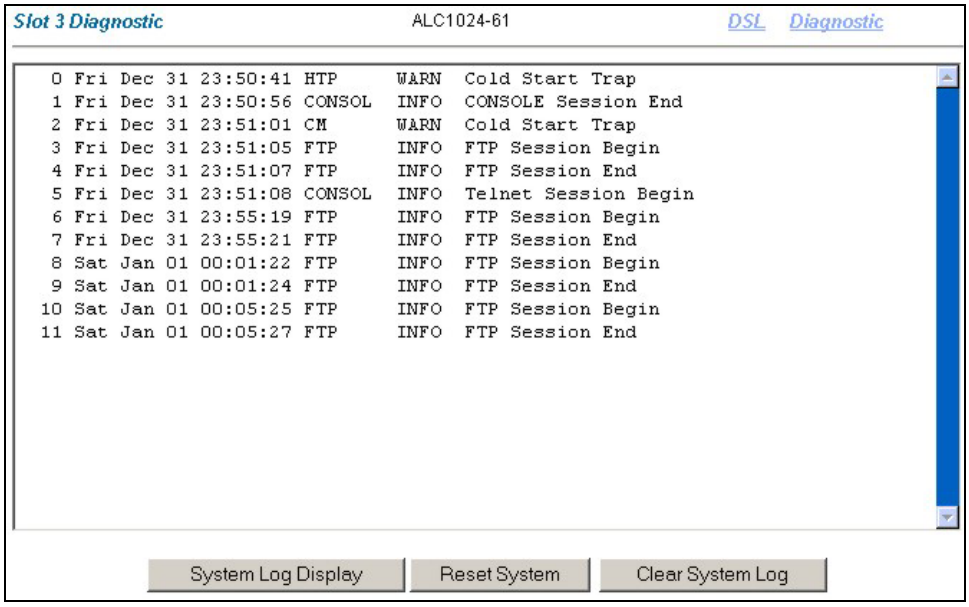


Figure 9-1 Diagnostic Screen

Table 9-1 Diagnostic

LABEL	DESCRIPTION
Slot (N) Diagnostic	This is the card's slot number.
DSL	Click this to go to the **DSL Diagnostic** screen
Diagnostic	Click this link to go to the first diagnostic screen.
Error Log	Click this button to display a log of events in the multi-line text box.

Table 9-1 Diagnostic

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

9.2.1 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.

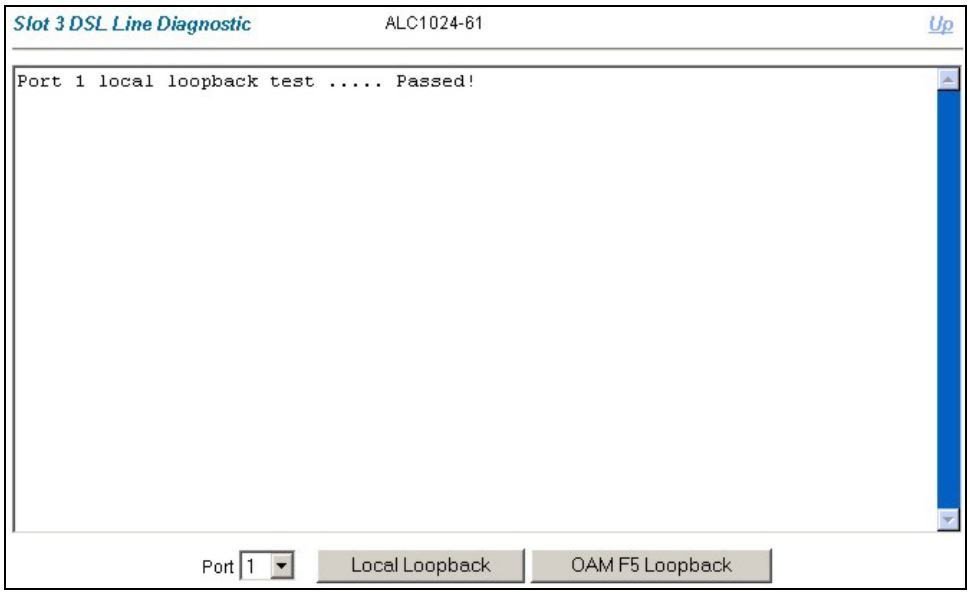


Figure 9-2 ALC Diagnostic DSL Screen

Table 9-2 ALC Diagnostic DSL

LABEL	DESCRIPTION
Up	Click this link to go to the card's **Diagnostic** screen.
Port	This refers to the DSL port number.
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. A local loopback test failure indicates an internal device problem.
OAM F5 Loopback	Click this to perform an OAMF5 loopback test on the specified G.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).

Chapter 10 Troubleshooting with MSC

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.

10.1 Troubleshooting Overview

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

10.2 Data Transmission

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

Table 10-1 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.

10.3 Data Rate

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

Table 10-2 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.

10.4 Configured Settings

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

Table 10-3 Troubleshooting the Line Card's Configured Settings

CORRECTIVE ACTION
Click **Apply** after you finish configuring to save the ALC1024's settings. With the commands, use the "config save" command. If these do not work, contact the distributor.

10.5 Recovering the Firmware

Usually you should upload the ALC1024's firmware through the management switch card. If the ALC1024 will not start up, the firmware may be lost or corrupted. Use the following procedure to upload firmware to the ALC1024 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.

Step 1. Obtain the firmware file, unzip it and save it in a folder on your computer.

Step 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

Step 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).

Step 4. Pull the ALC1024 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 ALC1024 and begin a session.

Step 5. When you see the message `Press any key to enter Debug Mode within 3 seconds`, press a key to enter debug mode.

Step 6. Type `atba5` after the `Enter Debug Mode` message (this changes the console port speed to 115200 bps).

Step 7. Change the configuration of your terminal emulation software to use 115200 bps and reconnect to the ALC1024.

Step 8. Type `atur` after the `Enter Debug Mode` message.

Step 9. Wait for the `Starting XMODEM upload` message before activating XMODEM upload on your terminal.

Step 10. This is an example Xmodem configuration upload using HyperTerminal. Click **Transfer**, then **Send File** to display the following screen.

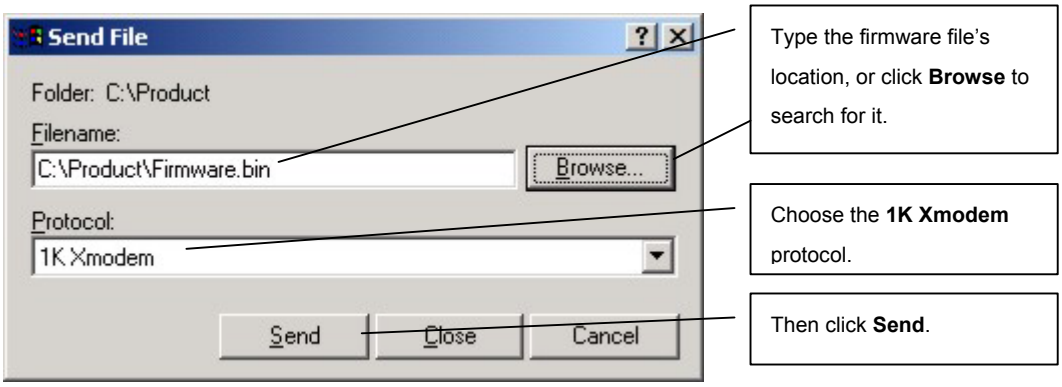


Figure 10-1 Example Xmodem Upload

Step 11. After a successful firmware upload, type `atgo` to restart the ALC1024. The console port speed automatically changes back to 9600 bps when the ALC1024 restarts.

Step 12. After the ALC1024 restarts, put the management switch card back into the Integrated Ethernet Switch's chassis.

Part IV:

Index

This part provides an index of important terms.

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