ALC1024

ADSL Line Card

Version 2.04

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User's Guide

ZyXEL

Unleash Networking Power

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

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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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[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.

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.
- The EEC1020 (Ethernet Extension Card) may be referred to as the EEC.

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.

- EEC1020 User's Guide

The EEC1020 User's Guide gives a hardware description of the EEC1020.

- 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 when you use the ADSL line card with the Ethernet extension 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 whether it is used with the MSC (Management Switch Card) or the EEC (Ethernet Extension Card). Refer to *Chapter 2 ALC1024 with EEC Overview* for other features and default settings that apply to the configuration and management of the ADSL line card when it is used with the Ethernet extension 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.

Protocol

Multiple Protocols over AAL5 (RFC 1483)

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

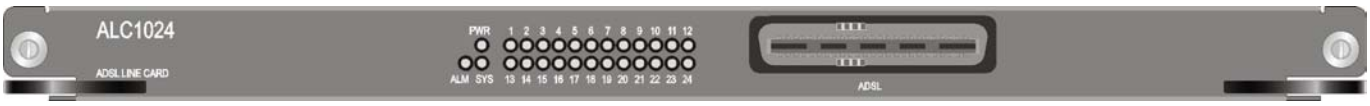


Figure 1-1 ALC1024 Front Panel

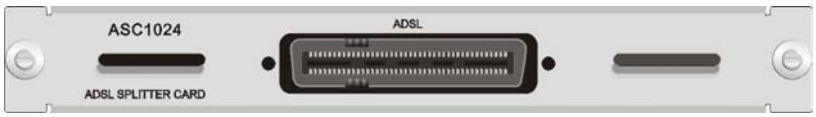


Figure 1-2 ASC1024 Front Panel

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.

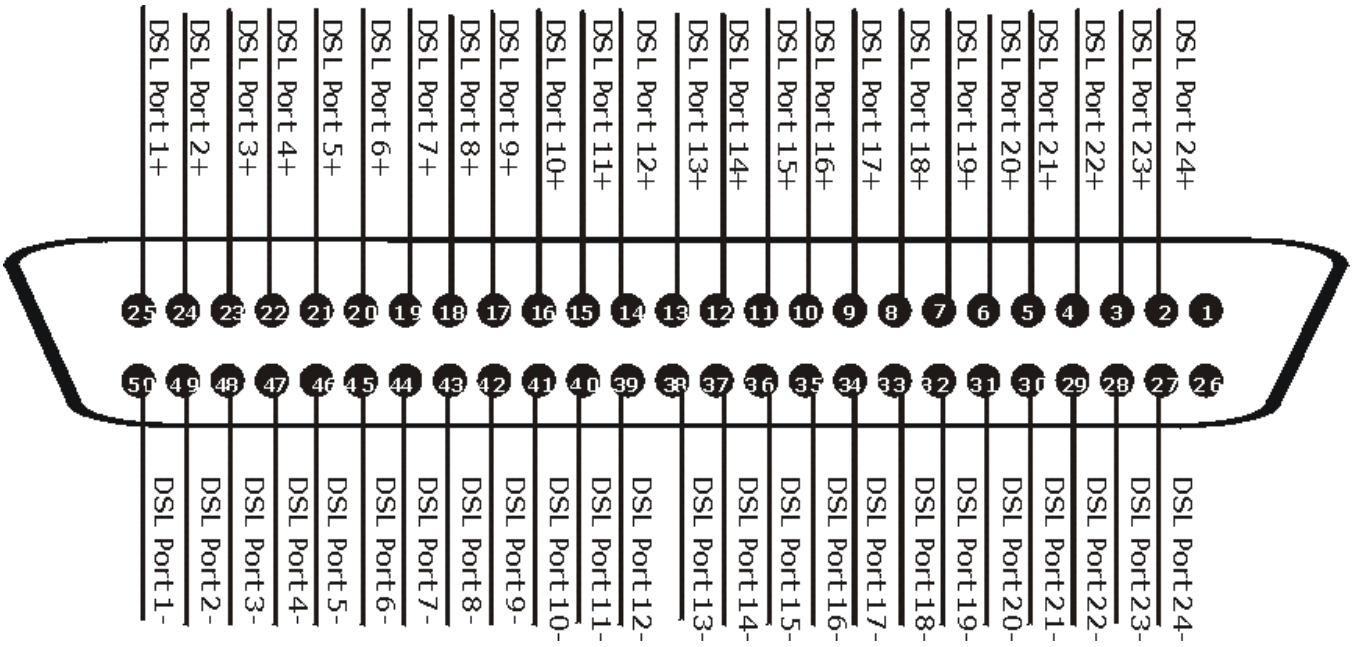


Figure 1-3 ALC1024, ASC1024, and USER Telco-50 Pin Assignments

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

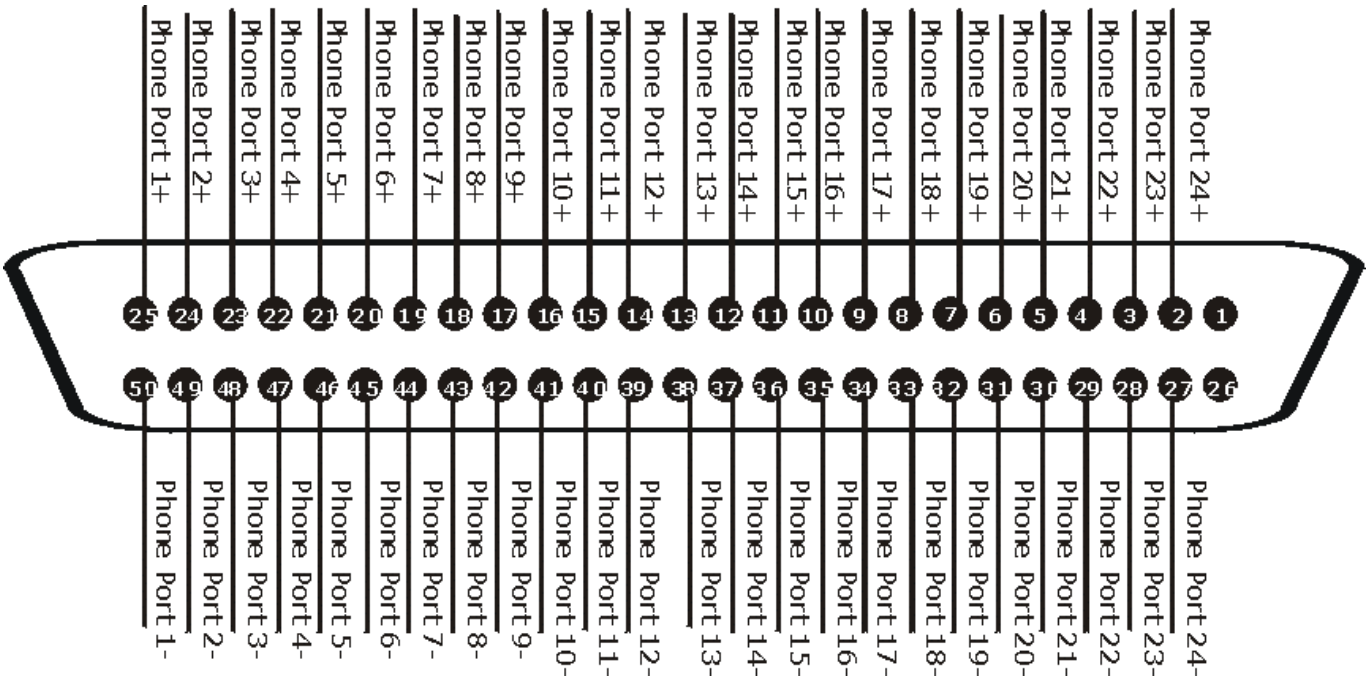


Figure 1-4 CO Telco-50 Pin Assignments

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

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

PORT NUMBER	PIN NUMBER
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. Refer to

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

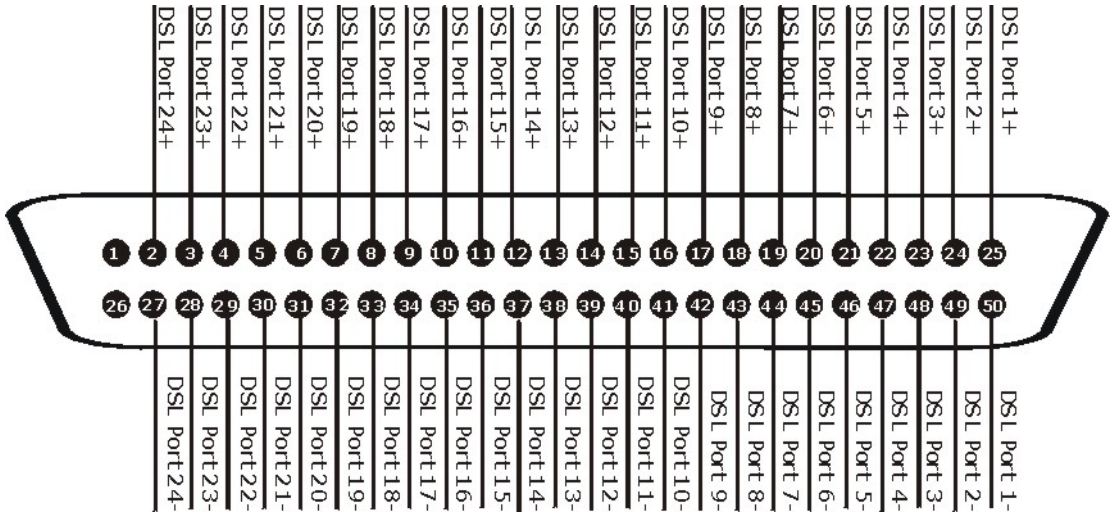


Figure 1-5 IES-2000 Telco-50 Cable Telco-50 Connector Pin Assignments

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.

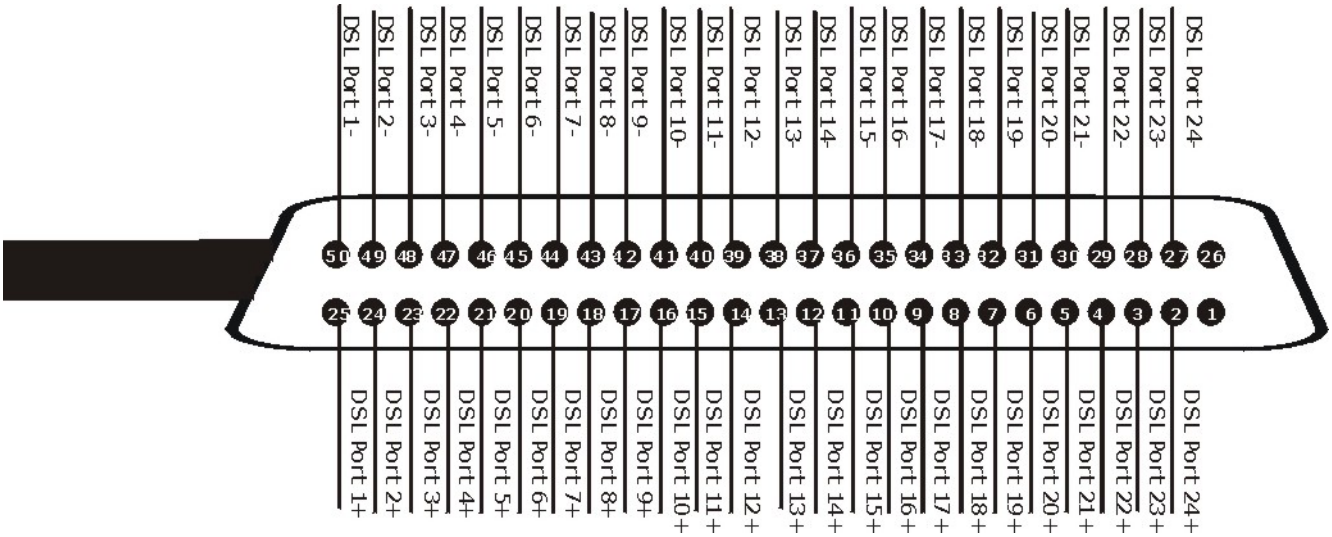


Figure 1-6 IES-3000 Telco-50 Cable Right Telco-50 Connector Pin Assignments

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

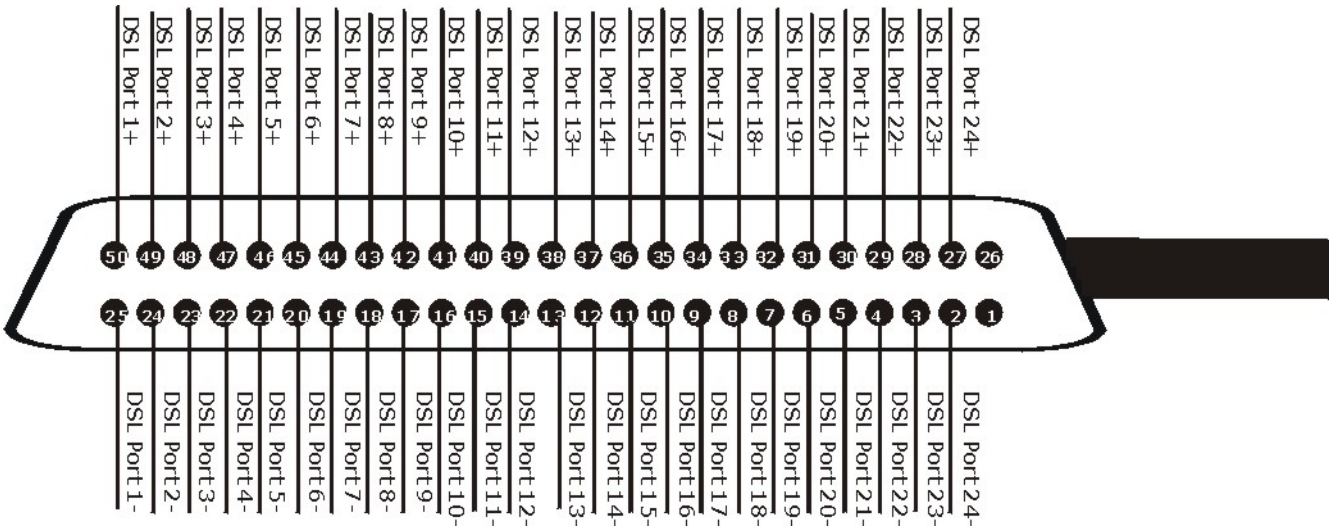


Figure 1-7 IES-3000 Telco-50 Cable Left Telco-50 Connector Pin Assignments

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

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

PORT NUMBER	PIN NUMBER
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

Chapter 2
ALC1024 with EEC Overview

This section introduces the ADSL line card and its factory default settings when it is used with the Ethernet extension card.

2.1 ALC1024 with Ethernet Extension Card Overview

The following features and default settings apply to configuration and management of the ADSL line card when you use it with the EEC (Ethernet Extension Card). Refer to *Chapter 1 ALC1024 Overview* for a general introduction to the ALC1024 and features, default settings and hardware specifications that apply to the line card whether it is used with the management switch card or the Ethernet extension card.

2.2 Features of the ALC1024 with the Ethernet Extension Card

These features apply to the ADSL line card when you use it with the Ethernet extension card.

Bridging

- IEEE 802.1D transparent bridging
- Up to 4096 MAC entries address table
- Port-based VLAN (Virtual Local Area Network)

IEEE 802.1Q Tagged VLAN

Your ADSL line card uses the IEEE 802.1Q Tagged VLAN (Virtual Local Area Network), which allows your device to deliver tagged/untagged frames to and from its ports. The line card supports up to 255 VLANs and the maximum VLAN ID 4094.

Fast Mode

The fast mode makes use of the “tag” subset of the IEEE 802.1Q standard to identify the source port of a frame and speed traffic through a service gateway.

MAC (Media Access Control) Filtering

The line card can filter incoming frames based on MAC (Media Access Control) address(es) that you specify. You may enable/disable specific ports. You may specify up to five MAC addresses per port.

Secured Host

Allow up to ten remote hosts to access the line card via IP addresses you specify.

System Error Logging

The system error log records error logs locally to the line card's memory. These logs may be viewed again after a warm restart.

UNIX Syslog Logging

Use the UNIX syslog commands to send logs to your UNIX server.

Management

- SNMP manageable
- Text-based management via telnet

Remote Firmware Upgrade

You can use FTP to perform configuration backup/restore and firmware upgrade for the line card from a remote location.

Security

- Password protection for system management
- VLAN

IGMP Snooping

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

2.3 Default Settings of the ALC1024 with the Ethernet Extension Card

These are the line card's additional factory default settings when it is used with the Ethernet extension card.

2.3.1 IP Parameters

- IP address = 192.168.1.1
- Subnet mask = 255.255.255.0
- Default gateway = 192.168.1.254

2.3.2 SNMP Community Strings

- Read = public
- Write = 1234

2.3.3 Telnet and FTP Password

1234 (default)

2.3.4 Ethernet Port (For Connecting to the Ethernet Extension Card)

- Auto-negotiation: ON
- Speed used with auto-negotiation OFF: 100Mbps
- Duplex mode used with auto-negotiation OFF: half duplex

2.3.5 Other Factory Defaults

- MAC filter: Disabled
- Secured Host: Disabled
- Sys Error Log: Always Enabled
- UNIX Syslog: Disabled

Part II:

Commands with EEC

This part gives information on commands to use when you use the ADSL line card with the Ethernet extension card.

Chapter 3
Commands with EEC Introduction

This section introduces the command line interface and lists all of the commands that are available when you use the ADSL line card with the Ethernet extension card.

3.1 Commands with EEC Overview

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

The command keywords are in `courier new` font.

1. The command keywords must be entered exactly as shown, that is, no abbreviations are allowed.

   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.

2. The optional fields in a command are enclosed in square brackets `[]`, for instance,

```
config [save]
```

   means that the `save` field is optional.

3. "Command" refers to a command used in the command line interface.
4. The `|` symbol means "or".

3.1.1 Command Structure with EEC

The card uses a two-level command structure with the Ethernet extension card. The commands related to one subsystem are grouped under a primary command of that subsystem, for instance, to configure the Ethernet parameters, you must first enter the Ethernet subsystem by entering the `ethernet` command. When you are in a subsystem, the system reminds you by including the subsystem name in the command prompt, for example,

```
192.168.1.1 ethernet>
```

To get back to the top level prompt from a subsystem, use the `home` command.

3.1.2 Command Help Facility

The system includes a help facility to provide you with online assistance.

You can issue the `help` command to display a list of available commands in response.

You can issue `help` with a command name to get more details about it, for instance:

```
192.168.1.1> help version
```

yields

```
version            - show system software version
```

The system responds with a description of the `version` command.

3.1.3 Saving Your Configuration

Always remember to save your configuration using the following syntax:

```
192.168.1.1> config save
```

This command saves all system configurations into nonvolatile memory. Nonvolatile memory refers to the line card's storage that remains even if the line card's power is turned off. Run time (memory) is lost when the line card's power is turned off. You must use this command to save any configurations that you make, otherwise the line card will return to its default settings when it is restarted.

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

3.2 Commands with EEC

The following table lists all of the commands that you can use with the line card when you use the Ethernet extension card. Refer to the following chapters for descriptions of commonly used commands.

This user's guide describes commands that are helpful for configuring the line card.

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

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
bridge			
	config	save	This command saves the bridge's run time configuration to nonvolatile memory.
		print	This command shows the bridge's run time configuration.
		reset	This command reloads the bridge's run time configuration from nonvolatile memory.
	device		This command shows the line card's bridge settings.
		add <edd | xport/[1..24]>	This command adds a bridge device.
		delete <edd | xport/[1..24]>	This command deletes a bridge device.
	ethertype		This command displays the types of packets that the ports are set to forward.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	COMMAND	ATTRIBUTES	
		<port> <any | ip | pppoe>	This command sets the type of packets that a port is allowed forward.
	filter		This command displays the filtering database.
	filterage		This command displays the filter age time.
		<seconds>	This command sets the filter age time.
	flush		This command clears the filtering database for all ports.
		<portNo>	This command clears the filtering database on an individual port.
	info		This command shows bridge information.
	interface	files	This command shows files opened by upper layer.
		info	This command shows ether-support driver information.
		stats	This command shows bridge upper interface statistics.
		stats reset	This command resets bridge upper interface statistics.
	portfilter		This command displays ports to forward to.
		<srcPort> <all | destPorts>	This command sets ports to forward to.
	status		This command displays bridge management statistics.
	mfilter		This command displays the multicast filtering database.
	fpvid		This command displays default port VLAN IDs in Fast Mode.
		<portNo> <vid>	This command sets a default port VLAN ID in Fast Mode.
	macfilter		This command displays the MAC filtering status and setting on all ports.
		<portNo>	This command displays the MAC filtering status and setting on the specified port.
		enable <portNo>	This command enables the MAC filtering mechanism.
		disable <portNo>	This command disables the MAC filtering mechanism.
		add <portNo> <mac>	This command adds a source MAC address from which to forward packets.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
		delete <portNo> <mac>	This command deletes a source MAC address from which to forward packets.
buffer			
	list		This command lists all buffer pools.
	info		This command shows the current buffer pool's information.
		<poolName>	This command sets the current buffer pool to <poolName> and shows the pool's information.
	show		This command shows all buffers in the current buffer pool.
		<n>	This command shows buffer <n> in the current buffer pool.
	steal	<num>	This command steals <num> buffers from the current buffer pool.
	version		This command displays version information for the buffer driver.
bun			
	version		This command displays the bun driver's version.
	build		This command shows information on the bun driver's build.
	config		This command enters manual configuration request to bun driver.
	list	config	This command shows all configuration requests.
		devices	This command shows all registered bun device drivers.
		ports	This command shows all registered bun ports.
		channels <portName>	This command shows all enabled channels on the specified port.
		all opened channels	This command shows all registered bun channels.
		spices	This command shows all available spices.
		objects	This command shows all data objects.
	show	system	This command shows system attributes.
		device <deviceName>	This command shows device information for the specified device.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
		port <portName>	This command shows information for the specified port.
		channel <portName> <channelNo>	This command shows information on the specified channel of the specified port.
	set	system	This command sets system attributes.
		port <portName> <attr> = <value>	This command sets a port attribute.
		channel <portName> <channelNo> <attr> = <value>	This command sets a channel attribute.
	reset	port <portName>	This command resets port hardware.
	list	classes	This command lists available port classes.
	show	class <className>	This command shows a class's members.
	ethernet	filter	This command shows the NP filter table.
	fluorine	address <addr>	This command selects the PHY address in the SMI bus.
		read <addr>	This command reads the MII register of the device with the selected PHY address.
		write <addr> <data>	This command writes data to the MII register of the device with selected the PHY address.
chips			
	cpu		This command shows CPU usage.
	debug		This command starts debug mode (ATMOS).
	exit		This command exits the debugger (ATMOS).
	info		This command shows version information and MAC address.
	mem		This command shows memory usage on a per-process basis.
	stack		This command shows stack usage on a per-process basis.
	rb	<addr>	This command reads 1 byte from the specified address.
	rh	<addr>	This command reads 1 half-word from the specified address.
	rw	<addr>	This command reads 1 word from the specified address.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
	wb	<addr> <data>	This command writes 1 byte to the specified address.
	wh	<addr> <data>	This command writes 1 half-word to the specified address.
	ww	<addr> <data>	This command writes 1 word to the specified address.
	tell	<process> <cmd> [<attrs>]	This command sends a tell command to the specified process.
config			
	list		This command lists all registered modules.
	print		This command prints configuration information for all modules.
		<module>	This command prints configuration information for the specified module.
	reset		This command resets configuration information in all modules from nonvolatile memory.
		<module>	This command resets configuration information in the specified module from nonvolatile memory.
	save		This command saves configuration information in all modules to nonvolatile memory.
		<module>	This command saves configuration information in the specified module to nonvolatile memory.
	resource		This command shows the controlled resources in all processes.
		<process>	This command shows the controlled resources in the specified process.
		<process> <resource>	This command shows the value of the specified resource in a process.
		<process> <resource> <value>	This command sets the value of a process's resource.
	version		This command shows the configuration driver's version information.
ethernet	set	auto <on | off>	This command enables/disables Ethernet port auto negotiation.
		duplex <full | half>	This command sets the Ethernet port to full or half duplex.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
		speed <100 | 10>	This command sets the operating speed of the Ethernet port (100M or 10M).
	status		This command shows Ethernet link status (auto-negotiation, duplex, speed).
	save		This command saves Ethernet settings.
event	help		This command shows help message of event (data output to background) command.
	next		This command shows the next page of events.
	previous		This command shows the previous page of events.
	recent		This command shows the latest page of events.
	show		This command sets event as foreground output.
	unshow		This command sets event as background output.
exit			This command ends the console or telnet session.
flashfs			
	config		This command displays the configuration of the flash file system.
	default		This command shows the current partition.
		<partition>	This command selects a partition as the current flash file system.
	fsck		This command does a file system check in the current partition.
		<partition>	This command does a file system check in the specified partition.
	format		This command formats the current partition.
		<partition>	This command formats the specified partition.
	id	<n>	This command shows the chip ID of the n'th flash chip.
	info		This command shows file system information.
	partitions		This command shows all partitions information.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
	rewrite	<file>	This command rewrites the boot area with the specified ISFS file.
	trace		This command shows the trace level in the FLASHFS driver.
		<level>	This command sets the trace level in the FLASHFS driver.
	update		This command commits ISFS files to the current partition.
		<partition>	This command commits ISFS files to the specified partition.
	version		This command shows the FLASHFS driver's version information.
	wipe		This command erases the current partition.
		<partition>	This command erases the specified partition.
fm			
	append	<file> <text>	This command appends text to the specified file in the current file system.
	cat	<file>	This command shows the contents of the specified file in the current file system.
	cp	<src file> <dest file>	This command copies a source file to a destination file.
	default	<fs>	This command sets the current file system to either isfs or flashfs.
	info		This command shows the file system information.
	ls	[-l | -L]	This command shows all files in the current file system.
	mv	<src file> <dest file>	This command gives the source file the same name as the destination file.
	rm	<file>	This command removes a file.
	version		This command shows the version information of file system.
adsl			
	config	save	This command saves configuration of ADSL module to nonvolatile memory.
	enable	port <portNo>	This command enables the specified ADSL port.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
		ports	This command enables all ADSL ports.
	disable	port <portNo>	This command disables the specified ADSL port.
		ports	This command disables all ADSL ports.
	lineinfo	<portNo>	This command shows the statistics of the specified ADSL ports.
	lineperf	<portNo>	This command shows the line quality of the specified ADSL port.
	set	profile <profile> <upRate> <downRate> [<up detail> <down detail>]	This command sets the specified profile an upstream (incoming) rate and a downstream (outgoing) rate.
		port <portNo> <profile> <mode>	This command applies a profile setting and operational mode to an ADSL port.
		ports <profile> <mode>	This command applies a profile setting and operational mode to all ADSL ports.
		pvc <portNo> <muxMode> <txvpi> <rxvci> [<rxvpi> <rxvci>]	This command sets the PVC configuration to the specified ADSL port.
		pvcs <muxMode> <txvpi> <rxvci> [<rxvpi> <rxvci>]	This command sets the PVC configuration to all ADSL ports.
	delete	profile <profile>	This command deletes the specified profile.
		profiles	This command deletes all profiles.
	show	profile <profile>	This command shows the contents of the specified profile.
		profiles	This command shows the contents of all profiles.
		port <portNo>	This command shows the line status of the specified ADSL port.
		ports <startNo> <endNo>	This command shows the line status of ADSL ports from the start number to the end number.
		pvc	This command shows the PVC configuration of the specified ADSL port.
		pvcs	This command shows the PVC configuration of all ADSL ports.
	list	port <portNo>	This command shows the port configuration of the specified ADSL port.
		ports	This command shows the port configurations for all ADSL ports.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
		profiles	This command shows the contents of all profiles and profiles applied to all ADSL ports.
	getname	<portNo>	This command gets the name of the specified port.
	getnames		This command gets the names of all ports.
	setname	<portNo> name	This command sets the name of the specified port.
hmon			
	display		This command shows the thermo values.
ip			
	arp	add <if> <ip> <mac>	This command adds ARP record <ip> <mac> to interface <if>.
		delete <if> <ip>	This command deletes ARP record <ip> from interface <if>.
		flush	This command flushes all cached ARP records.
		list	This command lists all resolved ARP records.
		help	This command shows a help message for the ARP command.
	config		This command shows the IP module's run-time configuration.
		save	This command saves the IP module's configuration to the nonvolatile memory.
	enable	<if> <ip>	This command sets the IP address of the specified interface.
	device	[list]	This command lists interface definitions.
		add <if> <type> <file> [mtu <size>] [<IP>] [mask <mask>]	This command adds a new interface.
		delete <if>	This command deletes the specified interface.
		flush	This command deletes all interfaces.
	enable	<if>	This command enables the specified interface.
	disable	<if>	This command disables the specified interface.
	ipatm	help	This command shows the help message for the ipatm command.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
		abort <n>	This command deletes the specified open underlying ATM device file no.
		arp [<list>]	This command shows the IPATM ARP cache entries.
		arpserver <if> <addr> | here	This command sets the ATM ARP server address on the specified interface.
	files		This command lists the files open to underlying ATM devices.
	lifetime		This command shows the lifetime of the ATM connection.
		<secs>	This command removes the ATM connection after the specified number of seconds.
	pvc	add <if> <portNo> [<vpi> /] vci pcr <pcr> remoteip <ip>	This command configures a PVC.
		delete port [<vpi> /]vci	This command deletes a PVC.
		flush	This command deletes all PVCs.
	nat	add <if>	This command installs NAT on the specified interface.
		delete <if>	This command uninstalls NAT on the specified interface.
	relay		This command allows relaying between all interfaces.
		<if1>	This command allows relaying from the specified interface.
		<if1> <if2>	This command allows relaying from the first interface to the second interface.
	norelay		This command disallows relaying between all interfaces.
		<if1>	This command disallows relaying from the specified interface.
		<if1> <if2>	This command disallows relaying from the first interface to the second interface.
	ping	<host> [ttl [size]]	This command does a ping test.
	route	add <routeName> <ip> <relayIp [<mask> [<cost> [<timeout>]]	This command adds a routing entry.
		delete <routeName>	This command deletes a routing entry.
		flush	This command deletes all routing entries.
	rip	help	This command shows the help information for the RIP command.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
		accept [all | <if>] [none | <versionList>]	This command sets one or all interfaces to either not accept RIP or accept a specific RIP version.
		allowed	This command lists RIP versions allowed.
		boot	This command broadcasts RIP requests for routes.
		hostroutes	This command allows RIP routes to hosts.
		hostroutes off	This command disallows RIP routes to hosts.
		killrelay <relay>	This command removes the specified RIP relay.
		poison	This command kills the RIP routes returning to their source.
		poison off	This command doesn't kill the RIP routes returning to their source.
		relay <version> <relay> [<if> [<timeout>]]	This command defines the RIP relay.
		relays	This command shows the active RIP relays.
		rxstatus	This command prints the reception status.
		send [all | <if>] [none | <versionList>]	This command sends only the specified RIP version routes on the list.
		trigger	This command triggers a broadcast of routing information.
	routes		This command shows all routing entries.
	stats	help	This command shows the help information about the stats command.
		arp	This command shows the ARP statistics.
		icmp	This command shows the ICMP statistics.
		ip	This command shows the IP statistics.
		raw	This command shows the raw statistics.
		tcp	This command shows the TCP statistics.
		udp	This command shows the UDP statistics.
	subnet	add <netName> <if> <ip> <mask>	This command creates a subnet.
		delete <netName>	This command deletes a subnet.
		flush	This command removes all subnets.
	version		This command shows the version information for the IP module.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
isfs			
	trace		This command shows the ISFS trace level.
		<level>	This command sets the ISFS trace level.
	version		This command shows version information for the ISFS module.
oam			
	version		This command shows version information for the OAM module.
	cofnig		This command shows the configuration for the the OAM module.
	trace		This command shows the trace level for the OAM module.
		<level>	This command sets the trace level of the OAM module.
	dl		This command dumps the contents of the lookup tables.
passwd			This command changes the management password.
restart			This command saves the configuration and restarts the system.
snmp			
	access	[read | wirte] <community> <ip>	This command adds an SNMP access entry.
		delete <community> <ip>	This command deletes an SNMP access entry.
		flush	This command deletes all SNMP access entries.
		list	This command lists all SNMP access entries.
	trap	add <community> <ip>	This command adds a trap destination.
		delete <community> <ip>	This command deletes a trap destination.
		flush	This command deletes all trap destinations.
		list	This command lists all trap destinations.
	config	save	This command saves access entries and trap destinations to the nonvolatile memory.
sys			

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
	info		This command shows the system information.
	set	name <name>	This command sets the system name.
		contact <name>	This command sets the contact person's name.
		chassis <id>	This command sets the chassis ID number.
		location <loc>	This command sets the location.
		fast | normal	This command sets the bridge operation mode.
	errlog	clear	This command clears the system error log.
		display	This command shows the system error log.
	syslog		This command shows the syslog setting.
		enable | disalbe	This command enables or disables the syslog.
		facility <facility>	This command sets the syslog facility.
		server <ip>	This command sets the syslog server IP.
	secured	host	This command shows the secured host.
		host enable | disable	This command enables or disables checking for the secured host.
		host add <hostIp>	This command adds a secured host.
		host delete <hostIp>	This command deletes a secured host.
	get	slot	This command shows the slot ID.
uptime			This command shows the system uptime.
version			This command shows the system version information.
vlan1q			
	config	save	This command saves the VLAN settings to nonvolatile memory.
		print	This command shows the run-time VLAN settings.
		reset	This command reloads the VLAN settings from nonvolatile memory.
	dvlan	getentry <vid>	This command shows the dynamic VLAN status for the specified entry.
		list	This command shows all dynamic VLAN status.

Table 3-1 Commands with EEC

COMMANDS			DESCRIPTION
MODULE	**COMMAND**	**ATTRIBUTES**	
	svlan	setentry <vid> <portNo>	This command sets a static VLAN entry to normal untagged.
		setentry <vid> <portNo> <ad_control>	This command sets a static VLAN entry to <ad_control> untagged.
		setentry <vid> <portNo> <ad_control> <tag_control>	This command sets a static VLAN entry to <ad_control> and tagged or untagged.
		getentry <vid>	This command shows the static VLAN setting for the specified entry.
		cpu <vid>	This command registers the CPU port to the specified VLAN ID (sets the management VLAN).
		list	This command shows all dynamic VLAN settings.
	vlan	enable/disable	This command enables or disables the VLAN.
		status	This command shows the VLAN's current status.
		list	This command shows the VLAN's current status periodically.
	stop		This command stops showing the VLAN's current status periodically.
	pvid		This command lists the default port VLAN ID for all ports.
		<portNo> <vid>	This command sets the default port VLAN ID for a specific port.
	priority port		This command lists the default priority for all ports.
		<portNo> <priority>	This command sets the default priority for a specific port.
	regen port		This command lists the mapping of the incoming user priority to regen priority.
		<portNo> <user pri> <reg pri>	This command sets the mapping of the incoming user priority to regen priority.

Chapter 4
System Commands

This chapter describes the line card's system-related commands.

4.1 System Commands Overview

Use the commands described in this chapter to configure system functions when you use the line card with the Ethernet extension card.

4.2 Commonly Used Commands

This section shows you commonly used commands.

4.2.1 Uptime Command

Syntax:

```
192.168.1.1> uptime
```

This command shows the elapsed time the system has been running since the last reboot.

An example is shown next.

```
192.168.1.1> uptime
up 3 hours 42 minutes
```

Figure 4-1 Uptime Command Example

4.2.2 Version Command

Syntax:

```
192.168.1.1> version
```

This command shows the system firmware version and date

4.2.3 Restart Command

Syntax:

```
192.168.1.1> restart
```

This command instructs the system to perform a configuration save and then a warm start, that is, restarting the system without turning the power off and on.

4.2.4 Password Command

Syntax:

```
192.168.1.1> passwd
```

This command changes the management password. The management password is used for authentication at Telnet login. The management password must be from one to eight characters long and any character is accepted. The factory default password is “1234”.

It is very important that you remember your password. If you forget it, refer to the *Troubleshooting* section for help.

4.2.5 Config Print Command

Syntax:

```
192.168.1.1> config print
```

This command lists all current system configuration settings.

4.2.6 Exit Command

Syntax:

```
192.168.1.1> exit
```

This command terminates the telnet management session.

4.3 Sys Commands

Enter `sys` at the command prompt to enter the sys commands subsystem.

4.3.1 Info Command

Syntax:

```
192.168.1.1 sys> info
```

This command displays system related information such as the line card’s name, contact person, location, firmware version and build date, MAC address, chassis and slot IDs, and operation mode.

4.3.2 Set Name Command

Syntax:

```
192.168.1.1 sys> set name <name>
```

This command allows you to set the name of your line card. The previous setting will be cleared if the command is entered with the `<name>` parameter omitted.

4.3.3 Set Contact Command

Syntax:

```
192.168.1.1 sys> set contact [<name>]
```

This command allows you to set the name of the contact person for your line card. The previous setting will be cleared if the command is entered with the name omitted.

4.3.4 Set Location Command

Syntax:

```
192.168.1.1 sys> set location [<name>]
```

This command allows you to set the location of your line card. The previous setting will be cleared if the command is entered with the location omitted.

4.3.5 Set Mode Command

Syntax:

```
192.168.1.1 sys> set mode [fast/normal]
```

where

`fast` = Makes use of the “tag” subset of the IEEE 802.1Q standard to identify the source port of a frame and speed traffic through a service gateway.

`normal` = Switches frames using a layer two switch (IEEE 801.1D) transparent bridge standard. Use normal mode when you are using a regular gateway.

This command lets you set the line card into fast or normal mode. Determine which mode you are using by entering the `info` command.

Enable fast mode only when you are using a service gateway.

4.4 Secured Host Commands

Allow up to ten remote computers to access your line card via IP addresses you specify.

4.4.1 Secured Host Command

Syntax:

```
192.168.1.1 sys> secured host [<mode>]
```

where

`<mode>` = `enable` or `disable`.
If `<mode> = disable` (default), then anyone may access your line card.
If `<mode> = enable`, then only those users with IP addresses specified by you may access your line card (refer to the S*ecured Host Add* command).

This command enables/disables the secured host function. To display current secured host settings, simply enter the command `secured host`.

4.4.2 Secured Host Add Command

Syntax:

```
192.168.1.1 sys> secured host add <host IP>
```

where

`<host IP>` = IP address of a secured host.

This command adds the IP address of a secured host. You may add up to ten IP addresses.

4.4.3 Secured Host Delete Command

Syntax:

```
192.168.1.1 sys> secured host delete <host IP>
```

where

`<host IP>` = IP address of a secured host.

This command deletes the IP address of a previously added secured host.

4.5 UNIX Syslog Commands

Use UNIX syslog commands to send logs to your UNIX server. If the DSL link is on or goes down, the line card sends a log to your UNIX server. The table, shown next, indicates what is logged in each case.

Table 4-1 Logs Sent to Your UNIX Server

DSL LINK ON	DSL LINK DOWN
port number	port number
sequence number	sequence number
rate	-

If your UNIX server is down these logs will be lost.

4.5.1 Syslog Command

Syntax:

```
192.168.1.1 sys> syslog [<mode>]
```

where

`<mode>` = `enable` or `disable`.

This command enables or disables the sending of logs to your UNIX server. The default is disabled (`<mode>`= disable). A log is sent if `<mode>= enable`. To display current settings, do not specify a `<mode>` .

4.5.2 Syslog Facility Command

Syntax:

```
192.168.1.1 sys> syslog facility <facility>
```

where

`<facility>` = Local1 to local7.

This command sets the syslog facility for the UNIX system.

4.5.3 Syslog Server Command

Syntax:

```
192.168.1.1 sys> syslog server <server IP>
```

where

`<server IP>` = IP address of syslog server.

This command sets the UNIX server IP address. If `<server IP>=0.0.0.0` (default), then logs will be dropped (not be sent).

4.6 System Error Log Commands

The system error log will record error events locally to the line card's memory. You may clear or display these logs using the commands listed in this section.

The following lists what logs the system error log can record.

`ADSL link on` (port number, sequence number, rate, noise margin, attenuation)	`ADSL link down` (port number, sequence number, noise margin, attenuation)
`ADSL OVER_HEAT_ACTIVE` (temperature)	`ADSL OVER_HEAT_RELEASE` (temperature)
`Console session begin`	`Console session end`
`Telnet session begin`	`Telnet session end`

Incorrect telnet password	Insecure telnet access (IP address)
FTP session begin	FTP session end
Incorrect FTP password	Insecure FTP access (IP address)
FTP image error (reason)	FTP receive file OK (file name)
System reboot	Out of buffer

4.6.1 Errlog Display Command

Syntax:

```
192.168.1.1 sys> errlog display
```

This command displays the system error log.

4.6.2 Errlog Clear Command

Syntax:

```
192.168.1.1 sys> errlog clear
```

This command clears the system error log.

If you clear a log (using the `errlog clear` command), you can not view it again.

4.6.3 Saving and Viewing a Previous Error Log

You may save and view a previous error log after warm restarting the line card (refer to *Figure 4-2*).

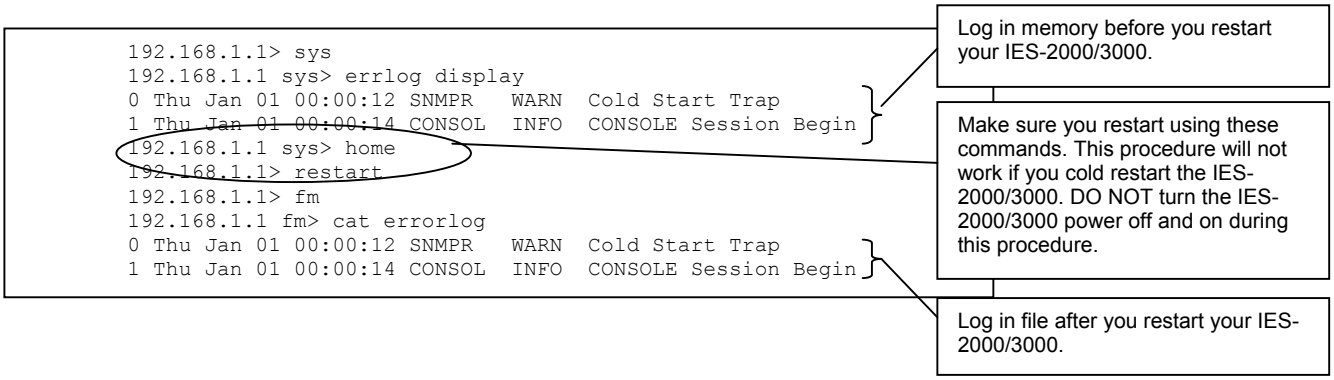


Figure 4-2 Example: Procedure to Save and View a Previous Error Log

4.6.4 Get Slot Command

Syntax:

```
192.168.1.1 sys> get slot
```

This command displays the slot number for this line card in the chassis. This is an optional parameter to help keep track of individual line cards.

4.6.5 Set Chassis Command

Syntax:

```
192.168.1.1 sys> set chassis <chassis number>
```

where

`<chassis number>=` The number for the IES-2000 or IES-3000 chassis (1 to 64).

This command sets a number to identify the IES-2000 or IES-3000 in a network. This is an optional parameter to help network administrators keep track of multiple IES-2000 or IES-3000 units. Enter the command without the chassis number to display the chassis number of this IES-2000 or IES-3000.

Chapter 5
ADSL Commands

The ADSL (Asymmetrical Digital Subscriber Line) subsystem allows you to configure and monitor the line card's ADSL ports.

5.1 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	8160 Kbps	1024 Kbps
G.dmt Annex B	8160 Kbps	1024 Kbps
G.lite	1536 Kbps	512 Kbps
ANSI T1.413 issue 2	8160 Kbps	1024 Kbps

5.2 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.

5.3 ATU-C and ATU-R

ATU-C stands for ADSL Termination Unit-Central and refers to the line card or the traffic going out from one of the line card's ADSL ports. ATU-R stands for ADSL Termination Unit –Remote and refers to the subscriber's ADSL modem or router or traffic coming into the line card from the subscriber's ADSL device.

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 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 by modifying the 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. You still get to individually enable or disable each port, as well as configure its encapsulation type, multiplexing mode, VPI, VCI and operational mode. See later in this chapter for how to configure profiles.

5.5 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 using 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.

Note that when you configure an ADSL port, the upstream rate must be less than or equal to the downstream rate. Note also that the `list port` command displays the configured parameters of the ADSL port, while the `show port` command displays the actual rates.

5.6 Default Settings

The default profile always exists and all of the ADSL ports use the default profile settings when the 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.

5.7 ADSL Commands

Enter `adsl` at the command prompt to enter the ADSL subsystem of commands.

5.7.1 Config Save Command

Syntax:

```
192.168.1.1 adsl> config save
```

The `config save` command saves the ADSL configuration into nonvolatile memory.

5.7.2 Disable Port Command

Syntax:

```
192.168.1.1 adsl> disable port <port number>
```

where

`<port number>` = A port number, from 1 to 24.

The `disable port` command forcibly disables the specified ADSL port.

All ADSL ports are disabled by default. 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.

5.7.3 Disable Ports Command

Syntax:

```
192.168.1.1 adsl> disable ports
```

The `disable ports` command forcibly disables all ADSL ports.

All ADSL ports are disabled by default. 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.

5.7.4 Enable Port Command

Syntax:

```
192.168.1.1 adsl> enable port <port number>
```

where

`<port number>` = A port number, from 1 to 24.

The `enable port` command forcibly enables the specified ADSL port.

All ports are disabled by default. 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.

5.7.5 Enable Ports Command

Syntax:

```
192.168.1.1 adsl> enable ports
```

The `enable ports` command forcibly enables all ADSL ports.

All ADSL ports are disabled by default. 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.

5.7.6 Linedata Command

Syntax:

```
192.168.1.1 adsl> linedata <port number>
```

where

`<port number>` = A port number, from 1 to 24.

The `linedata` command shows the line bit allocation of an ADSL port.

An example is shown next.

```
192.168.1.1 adsl> linedata 7
DS carrier load: number of bits per symbol(tone):
tone   0- 31:  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
tone  32- 63:  0  0  0 22 22 33 33 33 33 33 33 44 33 44 44 44
tone  64- 95:  4 44 44 43 43 33 34 44 33 44 44 34 44 43 33 44
tone  96-127: 44 43 34 44 44 33 43 44 44 34 44 44 33 44 44 44
tone 128-159: 44 44 44 34 44 34 43 44 33 43 34 33 33 33 33 34
tone 160-191: 43 33 33 34 34 33 23 33 33 33 22 33 33 33 33 33
tone 192-223: 33 33 33 23 22 33 33 33 23 33 33 33 22 23 22 32
tone 224-255: 22 22 22 22 20 22 22 22 20  0  0  0  0  0  0  0
US carrier load: number of bits per symbol(tone)
tone   0- 31:  0  0  0  0  2 34 55 77 88 89 99 99 99 98 88 87
tone  32- 63:  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
```

Figure 5-1 Linedata Command Example

The results can determine 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.

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

5.7.7 Lineinfo Command

Syntax:

```
192.168.1.1 adsl> lineinfo <port number>
```

where

`<port number>` = A port number, from 1 to 24.

The `lineinfo` command shows the line operating values of an ADSL port.

An example is shown next.

```
192.168.1.1 adsl> lineinfo 7
Current Operating Modes:
    Data Mode: ATM    Service Type in operation: G.DMT
    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 :  4/ 4 ms
    Downstream Parity byte assigned to fast/interleaved : 0/ 2
    Upstream   Parity byte assigned to fast/interleaved : 0/ 2
    Downstream Symbols assigned to fast/interleaved     : 0/ 1
    Upstream   Symbols assigned to fast/interleaved     : 0/ 1
    Down/up stream Depth value       :  2/ 2
    Total Transceiver Output Power   :  8dB
Current ATUR Information:
    Country code 0
    Provider Code 01020304
    Capabilities:
        g.dmt  POTS overlap (Annex A)
```

Figure 5-2 Lineinfo Command Example

The results contain the operating modes, interleave delay, parity byte assignment, parity bytes per codeword, symbols per codeword and interleave depth. `Current ATUR Information` displays data acquired from the ATUR (stands for ADSL Termination Unit – Remote, in this case the subscriber's ADSL modem or router) during negotiation/provisioning message interchanges. It includes the Vendor ID and Version Number obtained from Vendor ID fields (g.994.1) or R-MSGS1(T1.413) and country code from Vendor ID (g.994.1).

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

5.7.8 Lineperf Command

Syntax:

```
192.168.1.1 adsl> lineperf <port number>
```

where

`<port number>` = A port number, from 1 to 24.

The `lineperf` command shows the line performance counters of an ADSL port.

An example is shown next.

```
192.168.1.1 adsl> lineperf 7
 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               : 120878/120878
 nsec-ds/nsec-us                 : 2060/2060
 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 : 120878/120878
 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 5-3 Lineperf Command Example

These counts contain 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), which is the line card. Downstream (ds) refers to data going from the line card (ATU-C) to the subscriber's ADSL modem or router (the ADSL Termination Unit –Remote or ATU-R). Upstream (us) refers to data coming to the line card from the subscriber's device.

5.7.9 Linerate Command

Syntax:

```
192.168.1.1 adsl> linerate <port number>
```

where

`<port number>` = A port number, from 1 to 24.

The `linerate` command shows the line rate parameters of an ADSL port.

An example is shown next.

```
192.168.1.1 adsl> linerate 7
Current Active Rates:
    AS0 downstream rate             :  2048 Kbps
    AS1 downstream rate             :     0 Kbps
    LS0 upstream   rate             :   512 Kbps
    LS1 upstream   rate             :     0 Kbps
    Down/up stream noise Margin           : 31/22 dB
    Down/up stream Attenuation      :  0/ 0 dB
    Attainable Down/up stream Rate  : 11456/ 1344 Kbps
```

Figure 5-4 Linerate Command Example

These results contain the current downstream and upstream operating values (SHOWTIME) for the requested line, the latest available downstream and upstream noise margins, channel attenuation and the maximum attainable rate.

Downstream and upstream noise margins must both be at least 6 dB. The initial downstream and upstream noise margins are first set during training. The upstream margin is recalculated every 15 seconds during “show time” at the ATU-C and the downstream margin updates every 15 seconds during “show time” by using EOC messaging.

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

5.7.10 List Port Command

Syntax:

```
192.168.1.1 adsl> list port <port number>
```

where

`<port number>` = A port number, from 1 to 24.

The `list port` command shows the configured maximum upstream/downstream rates, the mode (or standard), and enable/disable state of an individual ADSL port.

5.7.11 List Ports Command

Syntax:

```
192.168.1.1 adsl> list ports
```

The `list ports` command shows the configured maximum rates, modes and states of all ADSL ports.

5.7.12 Set Profile Command

Syntax:

```
192.168.1.1 adsl> set profile <name> <atur max rate > <atuc max rate> [<atur
...> <atuc ...>]

        <atux ...> = <target margin> <min margin> <max margin> <min rate>
```

where

`<name>`	=	The name of the profile (up to 32 characters).
`<atur max rate>`	=	The maximum ADSL transmission rate coming to the line card from the subscriber’s ADSL modem or router.
`<atuc max rate>`	=	The maximum ADSL transmission rate going out from the line card to the subscriber’s ADSL device.
`<atur target margin>`	=	The target ADSL signal/noise margin (0..31db) for traffic coming to the line card from the subscriber’s ADSL device.
`<atuc target margin>`	=	The target ADSL signal/noise margin (0..31db) for traffic going out from the line card to the subscriber’s ADSL device.
`<atur min margin>`	=	The minimum acceptable ADSL signal/noise margin (0..31db) for traffic coming to the line card from the subscriber’s ADSL device.

<atuc min margin>	=	The minimum acceptable ADSL signal/noise margin (0..31db) for traffic going out from the line card to the subscriber's ADSL device.
<atur max margin>	=	The maximum acceptable ADSL signal/noise margin (0..31db) for traffic coming to the line card from the subscriber's ADSL device.
<atuc max margin>	=	The maximum acceptable ADSL signal/noise margin (0..31db) for traffic going out from the line card to the subscriber's ADSL device.
<atur min rate>	=	The minimum ADSL transmission rate in Kbps coming to the line card from the subscriber's ADSL device.
<atuc min rate>	=	The minimum ADSL transmission rate in Kbps going out from the line card to the subscriber's ADSL device.

ATU-C (`atuc`) stands for ADSL Termination Unit-Central and refers to transmissions going out from the line card to the subscriber's ADSL device. ATU-R (`atur`) stands for ADSL Termination Unit-Remote and refers to transmissions coming to the line card from the subscriber's ADSL device.

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 rate coming into the line card must be less than or equal to the rate going out.

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.

The following example command sets the maximum transmission rate coming into the line card to 800 kbps and the maximum transmission rate going out from the line card to 8000 kbps. None of the other settings are changed.

```
192.168.1.1 adsl> set profile debug 800 8000
```

Figure 5-5 Set Profile Command Example

5.7.13 Delete Profile Command

Syntax:

```
192.168.1.1 adsl> delete profile <name>
```

where

`<name>` = A profile name.

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

5.7.14 List Profiles Command

Syntax:

```
192.168.1.1 adsl> list profiles
```

The `list profiles` command displays all of the configured ADSL profiles and the ADSL ports that use each.

An example is shown next.

```
192.168.1.1 adsl> list profiles
Profile 1 : DEFVAL
Profile 2 : debug

Port 1, Profile : DEFVAL
Port 2, Profile : DEFVAL
Port 3, Profile : DEFVAL
Port 4, Profile : debug
Port 5, Profile : DEFVAL
Port 6, Profile : DEFVAL
Port 7, Profile : DEFVAL
Port 8, Profile : DEFVAL
Port 9, Profile : DEFVAL
Port 10, Profile : DEFVAL
Port 11, Profile : DEFVAL
Port 12, Profile : DEFVAL
Port 13, Profile : DEFVAL
Port 14, Profile : DEFVAL
Port 15, Profile : DEFVAL
Port 16, Profile : DEFVAL
Port 17, Profile : DEFVAL
Port 18, Profile : DEFVAL
Port 19, Profile : DEFVAL
Port 20, Profile : DEFVAL
Port 21, Profile : DEFVAL
Port 22, Profile : DEFVAL
Port 23, Profile : DEFVAL
Port 24, Profile : DEFVAL
```

Figure 5-6 List Profiles Command Example

This display shows that there are two profiles (DEFVAL and debug) and that port 4 belongs to the debug profile while ports 1, 2, 3, and 5 through 24 belong to the DEFVAL profile.

5.7.15 Show Profile Command

Syntax:

```
192.168.1.1 adsl> show profile <name>
```

where

`<name>` = A profile name.

The `show profile` command displays the settings of an ADSL profile.

An example is shown next.

```
192.168.1.1 adsl> show profile debug
#Entry type : adslLineConfProfileEntry
ConfProfileName : debug
AtucConfTargetSnrMgn : 6 db
AtucConfMaxSnrMgn : 31 db
AtucConfMinSnrMgn : 0 db
AtucChanConfInterleaveMinTxRate : 32 Kbps
AtucChanConfInterleaveMaxTxRate : 8000 Kbps
AturConfTargetSnrMgn : 6 db
AturConfMaxSnrMgn : 31 db
AturConfMinSnrMgn : 0 db
AturChanConfInterleaveMinTxRate : 32 Kbps
AturChanConfInterleaveMaxTxRate : 800 Kbps
ConfProfileRowStatus : active(1)
```

Figure 5-7Show Profile Command Example

This display shows that the maximum transmission rate coming into the line card is set to 800 kbps and the maximum transmission rate going out from the line card is set to 8000 kbps. The `ConfProfileRowStatus` displays `active`; this means that the profile is available for use. It does not mean that the profile has been applied to any of the ports. See the section on the `set profile` command for more information on a profile's settings. Refer to the `set port` command for information on assigning profiles to ports or the `list profiles` command for information on how to list the profiles.

5.7.16 Show Profiles Command

Syntax:

```
192.168.1.1 adsl> show profiles
```

The `show profiles` command displays the settings of all the ADSL profiles.

The following `show profiles` command example shows the settings of the default profile DEFVAL and another profile named debug. See the section on the `set profile` command for more information on a profile's settings.

```
192.168.1.1 adsl> show profiles
#Entry type : adslLineConfProfileEntry
ConfProfileName : DEFVAL
AtucConfTargetSnrMgn : 6 db
AtucConfMaxSnrMgn : 31 db
AtucConfMinSnrMgn : 0 db
AtucChanConfInterleaveMinTxRate : 32 Kbps
AtucChanConfInterleaveMaxTxRate : 2048 Kbps
AturConfTargetSnrMgn : 6 db
AturConfMaxSnrMgn : 31 db
AturConfMinSnrMgn : 0 db
AturChanConfInterleaveMinTxRate : 32 Kbps
AturChanConfInterleaveMaxTxRate : 512 Kbps
ConfProfileRowStatus : active(1)

#Entry type : adslLineConfProfileEntry
ConfProfileName : debug
AtucConfTargetSnrMgn : 6 db
AtucConfMaxSnrMgn : 31 db
AtucConfMinSnrMgn : 0 db
AtucChanConfInterleaveMinTxRate : 32 Kbps
AtucChanConfInterleaveMaxTxRate : 8000 Kbps
AturConfTargetSnrMgn : 6 db
AturConfMaxSnrMgn : 31 db
AturConfMinSnrMgn : 0 db
AturChanConfInterleaveMinTxRate : 32 Kbps
AturChanConfInterleaveMaxTxRate : 800 Kbps
ConfProfileRowStatus : active(1)
```

Figure 5-8 Show Profiles Command Example

5.7.17 Set Port Command

Syntax:

```
192.168.1.1 adsl> set port <port number> <profile name> <oper mode>
```

where

`<port number>`	=	A port number ranging from 1 to 24.
`<profile name>`	=	The profile that will define the settings of this port.
`<oper mode>`	=	Operational mode. Choose from `glite`, `gdmt`, `t1413` or `auto` for Annex A. Choose from `anxb` or `auto` for Annex B.

The `set port` command assigns an individual port to a specific profile and sets the port's mode, or standard. The profile defines the maximum and minimum incoming and outgoing rates, the target upstream/downstream signal noise margins, and the maximum and minimum acceptable noise margins for incoming and outgoing traffic of all the ADSL ports that use the profile. Annex A refers to ADSL over POTS and Annex B refers to ADSL over ISDN.

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 `glite`, the actual rates are governed by G.lite, regardless of the configured numbers.

An example is shown next.

```
192.168.1.1 adsl> set port 4 debug auto
```

Figure 5-9 Set Port Command Example

This command sets ADSL port 4 to have the debug profile. The results of this command are reflected when you use the list profiles command.

5.7.18 Set Ports Command

Syntax:

```
192.168.1.1 adsl> set ports <profile name> <oper mode>
```

where

`<profile name>` = The profile that will define the settings of this port.

`<oper mode>` = Operational mode. Choose from `glite`, `gdmt`, `t1413` or `auto` for Annex A. Choose from `anxb` or `auto` for Annex B.

The `set ports` command assigns a specific profile to all of the ADSL ports and sets all of the ports to one mode, or standard. The profile defines the maximum and minimum incoming and outgoing rates, the target signal noise margins for incoming and outgoing traffic, and the maximum and minimum acceptable noise margins for incoming and outgoing traffic of all the ADSL ports.

The operational mode parameter specifies the standard that this port uses. 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 `glite`, the actual rates are governed by G.lite, regardless of the configured numbers.

5.7.19 Show Port Command

Syntax:

```
show port <port number>
```

where

`<port number>` = A port number, from 1 to 24.

The `show port` command shows the line status (up or down), the actual incoming and outgoing rates and mode of an individual ADSL port.

5.7.20 Show Ports Command

Syntax:

```
192.168.1.1 adsl> show ports
```

The `show ports` command shows the line status (up or down), the actual incoming and outgoing rates and the mode of all ADSL ports.

5.7.21 Set PVC Command

Syntax:

```
192.168.1.1 adsl> set pvc <port number> <multiplexing mode> <tx vpi> <tx vci>
[<rx vpi> <rx vci>]
```

where

`<port number>` = A port number, from 1 to 24.

`<multiplexing mode>` = Either `llc` or `vc`.

`<tx vpi>` = The VPI setting of the ADSL port for use with a TX based network.

`<tx vci>` = The VCI setting for the ADSL port for use with a TX based network.

`<rx vpi>` = The VPI setting for the ADSL port for use with Rx based networks.

`<rx vci>` = The VCI setting for the ADSL port for use with Rx based networks.

The `set pvc` command allows the configuration of a PVC (permanent virtual circuit) for an individual ADSL port.

The `<rx vpi>` and `<rx vci>` settings will be equal to those of `<tx vpi>` and `<tx vci>` if the rx .settings are not configured.

5.7.22 Set PVCs Command

Syntax:

```
192.168.1.1 adsl> set pvcs <multiplexing mode> <tx vpi> <tx vci> [<rx vpi> <rx
vci>]
```

where

`<multiplexing mode>` = either "`llc`" or "`vc`"

`<tx vpi>` = The VPI setting of the ADSL port for use with a TX based network.

`<tx vci>` = The VCI setting for the ADSL port for use with a TX based network.

`<rx vpi>` = The VPI setting for the ADSL port for use with Rx based networks.

`<rx vci>` = The VCI setting for the ADSL port for use with Rx based networks.

The `set pvcs` command allows you to configure a single PVC for all of the ADSL ports at once.

The <rx vpi> and <rx vci> settings will be equal to those of <tx vpi> and <tx vci> if the rx settings are not configured.

5.7.23 Show PVC Command

Syntax:

```
192.168.1.1 adsl> show pvc <port number>
```

where

`<port number>` = A port number, from 1 to 24.

The `show pvc` command allows you to display the PVC parameters of an individual ADSL port.

5.7.24 Show PVCs command

Syntax:

```
192.168.1.1 adsl> show pvcs
```

The `show pvcs` command allows you to display the PVC parameters of all ADSL ports.

Chapter 6
10/100M Fast Ethernet Port Commands

The Ethernet subsystem allows you to configure and monitor the 10/100M fast Ethernet port that connects to the backplane.

6.1 10/100M Auto-Sensing Ethernet Overview

The line card's rear Ethernet port is auto-sensing and supports connections to a 10 or 100Mbps Ethernet. Connect to the EEC's Ethernet port in order to connect to the line card's rear Ethernet port. There are two key factors in connecting to a peer's Ethernet port: speed and duplex mode. In a 10/100Mbps fast Ethernet, the speed can be 10Mbps or 100Mbps and the duplex mode can be half or full. Auto-negotiation allows one Ethernet port to negotiate with a peer to obtain the optimal connection speed and duplex mode automatically.

When auto-negotiation is turned on, the line card negotiates with the peer's Ethernet port automatically to determine the optimal connection speed and duplex mode. If the peer's Ethernet port does not support auto-negotiation or turns off this feature, the line card determines the connection speed by detecting the signal on the cable and using half-duplex mode. When the line card's auto-negotiation is turned off, the Ethernet port uses the pre-configured speed and duplex mode settings when making a connection, thus requiring you to check the settings of the peer's Ethernet port in order to connect.

6.2 Ethernet Commands

6.2.1 Set Auto Command

Syntax:

```
192.168.1.1 ethernet> set auto <ON/OFF>
```

where

```
<ON/OFF> = on or off
```

This command sets the auto-negotiation of the Ethernet port either on or off.

6.2.2 Set Duplex Command

Syntax:

```
192.168.1.1 ethernet> set duplex <mode>
```

where

```
<mode>  = full or half
```

This command sets the duplex mode used when auto-negotiation is turned off.

6.2.3 Set Speed Command

Syntax:

```
192.168.1.1 ethernet> set speed <speed>
```

where

```
<speed>  = 10 or 100
```

This command sets the connection speed used when auto-negotiation is turned off. `10` stands for 10Mbps and `100` stands for 100Mbps.

6.2.4 Status Command

Syntax:

```
192.168.1.1 ethernet> status
```

This command shows the current status of the Ethernet port.

Chapter 7
Bridge Commands

This chapter discusses the bridge subsystem. It allows you to configure and monitor bridging, configure MAC filters, port-based VLANs and tagged frame functions of the line cards.

7.1 Bridging Overview

The line card supports IEEE 802.1D transparent bridging; but not the static filtering feature or spanning tree protocol. The bridge learns the source MAC addresses of sender hosts by inspecting incoming Ethernet frames and recording the learned MAC addresses with their incoming port numbers into its filtering database. Based on the database, the bridge forwards each incoming frame to its destination port.

7.2 IGMP Snooping

Traditionally, IP packets are transmitted in one of either two ways - Unicast (1 sender to 1 recipient) or Broadcast (1 sender to everybody on the network). Multicast delivers IP packets to just a group of hosts on the network.

IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a multicast group - it is not used to carry user data. Refer to *RFC 1112* and *RFC 2236* for information on IGMP versions 1 and 2 respectively.

A layer-2 switch can passively snoop on IGMP Query, Report and Leave (IGMP version 2) packets transferred between IP multicast routers/switches and IP multicast hosts to learn the IP multicast group membership. It checks IGMP packets passing through it, picks out the group registration information, and configures multicasting accordingly.

Without IGMP snooping, multicast traffic is treated in the same manner as broadcast traffic, that is, it is forwarded to all ports. With IGMP snooping, group multicast traffic is only forwarded to ports that are members of that group. IGMP Snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your switch.

7.3 Bridge Port Numbers

The bridge subsystem of the line card defines its own numbering convention for ports.

The bridge has a total of 25 ports: bridge port 1 stands for the Ethernet port, bridge port 2 stands for DSL port 1, bridge port 3 stands for DSL port 2, and so on.

Be sure you have clarified the relation between bridge ports and DSL ports.

7.4 Basic Commands

Below is a list of commonly-used bridge commands.

7.4.1 Config Save Command

Syntax:

```
192.168.1.1 bridge> config save
```

This command saves the bridge configuration into nonvolatile memory. You must use this command to save any configurations that you make, otherwise the line card will return to its default settings when it is restarted.

Do not turn off your IES-2000/3000 while saving your configuration.

7.4.2 Device Command

Syntax:

```
192.168.1.1 bridge> device
```

This command shows information on all bridge ports.

7.4.3 Status Command

Syntax:

```
192.168.1.1 bridge> status
```

This command displays the bridge status.

7.5 MAC Filter Commands

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

7.5.1 MAC Filter Command

Syntax:

```
192.168.1.1 bridge> macfilter [<port>]
```

where

`<port>` = A bridge port number.

This command displays the MAC filtering status and the fixed source MAC addresses on a port or on all ports if no port number is specified.

7.5.2 MAC Filter Enable Command

Syntax:

```
192.168.1.1 bridge> macfilter enable [<port>]
```

where

`<port>` = A bridge port number.

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

7.5.3 MAC Filter Disable Command

Syntax:

```
192.168.1.1 bridge> macfilter disable [<port>]
```

where

`<port>` = A bridge port number.

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

7.5.4 MAC Filter Add Command

Syntax:

```
192.168.1.1 bridge> macfilter add <port> <mac>
```

where

`<port>` = A bridge port number.

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

This command adds a source MAC address fixed on a specified port. You may add up to five MAC addresses.

7.5.5 MAC Filter Delete Command

Syntax:

```
192.168.1.1 bridge> macfilter delete <port> <mac>
```

where

`<port>` = A bridge port number.

`<mac>` = The source MAC address in hexadecimal (xx:xx:xx:xx:xx:xx) format, for example "00:a0:c5:12:34:56".

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

7.6 Filter Commands

Below is a list of commonly-used filter commands.

7.6.1 Filter Command

Syntax:

```
192.168.1.1 bridge> filter
```

This command displays the filtering database.

7.6.2 Mfilter Command

Syntax:

```
192.168.1.1 bridge> mfilter
```

This command displays the multicast filtering database. The `mfilter` command allows you to monitor the line card's IGMP snooping activities.

The following is an example of a multicast filtering database.

```
192.168.1.1 bridge> mfilter


 ID        GDA               MAC        Member Ports
 ═══════════════════════════════════════════════════
  0   239.255.255.250        7f-ff-fa        1, 2
  1   224.000.001.022        00-01-16        1, 3, 4
  2   235.001.001.006        01-01-06        1, 2, 5, 7,8
  3   229.055.150.208        37-96-d0        1, 9
  4   224.000.001.060        00-01-3c        1, 3, 5, 6
  5   235.209.237.084        51-ed-54        1, 4, 6, 9

Total 6 entries.
IGMP version 2
Query Received 343
Max Response Time 100 * 1/10 seconds
Query Interval 125 seconds
```

Figure 7-1 Mfilter Command Example

where

`ID`	=	The location of the entry in the multicast filtering database.
`GDA`	=	Group Destination Address. The IP address of a multicast group destination.
`MAC`	=	The last 3 bytes of the multicast MAC that the GDA is mapped to.
`Member Ports`	=	The ports that belong to this multicast group. 1= Ethernet, 2= DSL port 1, 3=DSL port 2 and so on.
`IGMP version`	=	The version of IGMP being used in the network.
`Query Received`	=	The number of query packets received by the line card.

`Max Response Time =` The longest period of time used to respond to a query packet, measured in tenths of a second.

`Query Interval =` The time period between query packets.

7.6.3 Filterage Command

Syntax:

```
192.168.1.1 bridge> filterage [age]
```

where

`age =` Aging out timer period in seconds.

This command sets or shows the aging out timer period of the filtering database. It is recommended that you use the default setting. If the time interval is set too short, it could increase broadcast traffic and reduce the available bandwidth.

7.6.4 Flush Command

Syntax:

```
192.168.1.1 bridge> flush [port]
```

where

`port =` A bridge port number

This command flushes out the filtering database of the specified bridge port. If the `<port>` field is omitted, this command will flush out the filtering databases of all ports.

7.6.5 Info Command

Syntax:

```
192.168.1.1 bridge> info
```

This command shows the software number of the bridge implementation and the maximum size of the filtering database.

7.7 Port-Based VLAN Commands

The VLAN (Virtual Local Area Network) mechanism can be used to limit the broadcast domain to the members of a VLAN group only. In this way, VLAN increases network performance by limiting broadcasts to a smaller and more manageable logical broadcast domain. In traditional switched environments, all broadcast frames go to each and every individual port.

The stations on a logical network belong to one group; however, a station can belong to more than one group. Users of one group are not allowed to access the resources of other groups and a higher level of security is achieved. This isolates the subscribers from one another and prevents a subscriber from discovering the resources, for example, shared drives or printers, of another subscriber.

In a port-based VLAN, the allowable outgoing port(s) of each incoming port must be defined. Ethernet frames are forwarded according to these rules. Therefore, if you wish to allow two subscriber ports to talk to each other, for example, between conference rooms in a hotel, you must define the egress port (outgoing port) for both ports. An egress port is an outgoing port, that is, a port through which a data frame leaves. Port-based VLANs are specific only to the switch on which they were created.

The factory default settings for the port-based VLAN of the line card are:

- Bridge port 1 (Ethernet port) allowed to all bridge ports
- Bridge port 2 (DSL port 1) allowed to bridge port 1 (Ethernet port) only
- Bridge port 3 (DSL port 2) allowed to bridge port 1 (Ethernet port) only
- Bridge port 4 (DSL port 3) allowed to bridge port 1 (Ethernet port) only
- Bridge port 5 (DSL port 4) allowed to bridge port 1 (Ethernet port) only
- Bridge port 6 (DSL port 5) allowed to bridge port 1 (Ethernet port) only
- Bridge port 7 (DSL port 6) allowed to bridge port 1 (Ethernet port) only
- Bridge port 8 (DSL port 7) allowed to bridge port 1 (Ethernet port) only
- Bridge port 9 (DSL port 8) allowed to bridge port 1 (Ethernet port) only
- Bridge port 10 (DSL port 9) allowed to bridge port 1 (Ethernet port) only
- Bridge port 11 (DSL port 10) allowed to bridge port 1 (Ethernet port) only
- Bridge port 12 (DSL port 11) allowed to bridge port 1 (Ethernet port) only
- Bridge port 13 (DSL port 12) allowed to bridge port 1 (Ethernet port) only
- Bridge port 14 (DSL port 13) allowed to bridge port 1 (Ethernet port) only
- Bridge port 15 (DSL port 14) allowed to bridge port 1 (Ethernet port) only
- Bridge port 16 (DSL port 15) allowed to bridge port 1 (Ethernet port) only
- Bridge port 17 (DSL port 16) allowed to bridge port 1 (Ethernet port) only
- Bridge port 18 (DSL port 17) allowed to bridge port 1 (Ethernet port) only
- Bridge port 19 (DSL port 18) allowed to bridge port 1 (Ethernet port) only
- Bridge port 20 (DSL port 19) allowed to bridge port 1 (Ethernet port) only
- Bridge port 21 (DSL port 20) allowed to bridge port 1 (Ethernet port) only
- Bridge port 22 (DSL port 21) allowed to bridge port 1 (Ethernet port) only
- Bridge port 23 (DSL port 22) allowed to bridge port 1 (Ethernet port) only
- Bridge port 24 (DSL port 23) allowed to bridge port 1 (Ethernet port) only
- Bridge port 25 (DSL port 24) allowed to bridge port 1 (Ethernet port) only

The default VLAN settings allow each DSL port to communicate back and forth with only the Ethernet port, and not with other DSL ports. The following figure illustrates this.

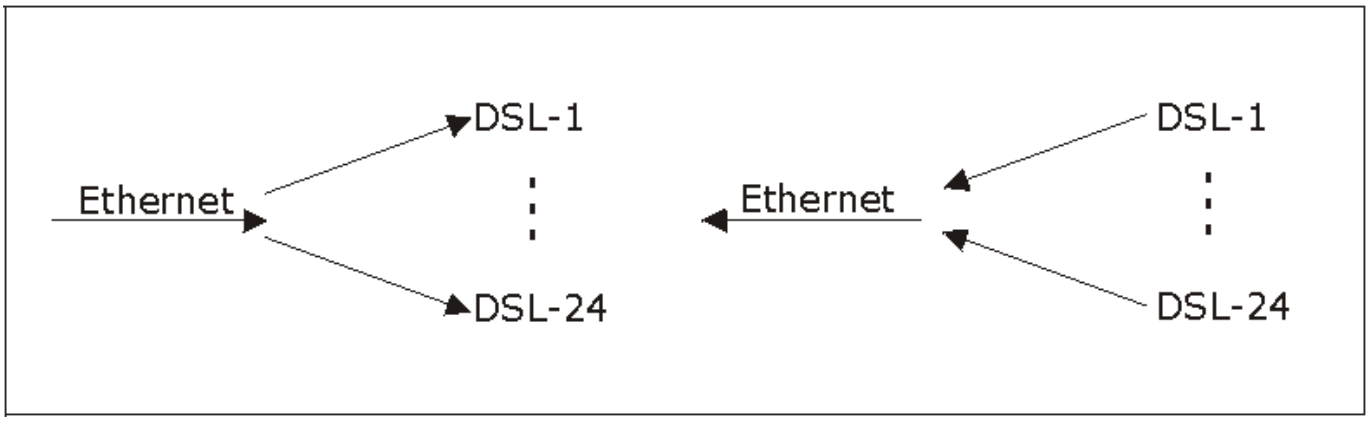


Figure 7-2 Default VLAN Settings

7.7.1 Portfilter Command

Syntax:

```
192.168.1.1 bridge> portfilter [<source port> all|<dest ports>]
```

where

`<source port>`	=	An incoming bridge port number.
`all`	=	All bridge ports are allowed outgoing ports.
`<dest ports>`	=	The outgoing bridge ports. Separate by a space if there is more than one port.

This command sets or displays the port-based VLAN configuration.

An example is shown next.

```
192.168.1.1 > bridge
192.168.1.1 bridge> portfilter
Port 1 (ethernet):       all
Port 2 (dsl1):         1
Port 3 (dsl2):         1
Port 4 (dsl3):         1
Port 5 (dsl4):         1
Port 6 (dsl5):         1
Port 7 (dsl6):         1
Port 8 (dsl7):         1
Port 9 (dsl8):         1
Port 10 (dsl9):        1
Port 11 (dsl10):       1
Port 12 (dsl11):       1
Port 13 (dsl12):       1
Port 14 (dsl13):       1
Port 15 (dsl14):       1
Port 16 (dsl15):       1
Port 17 (dsl16):       1
Port 18 (dsl17):       1
Port 19 (dsl18):       1
Port 20 (dsl19):       1
Port 21 (dsl20):       1
Port 22 (dsl21):       1
Port 23 (dsl22):       1
Port 24 (dsl23):       1
Port 25 (dsl24):       1
```

Figure 7-3 Port Filter Command Example

The above shows the current configuration of the port-based VLAN. It is the same as the default settings.

An example with an altered configuration is shown next.

```
192.168.1.1 > bridge
192.168.1.1 bridge> portfilter 2 1 3
192.168.1.1 bridge> portfilter 3 1 2
```

Figure 7-4 Port Filter Command Configuration Example

This example sets the allowed outgoing bridge ports of port 2 (DSL port 1) to port 1 (Ethernet port) and port 3 (DSL port 2). The allowed outgoing bridge ports of port 3 (DSL port 2) are set to port 1 (Ethernet port) and port 2 (DSL port1). This way, DSL ports 2 and 3 can communicate with each other and the Ethernet port. You can see the effects of this example by using the following command:

```
192.168.1.1 bridge> portfilter
Port 1 (ethernet):       all
Port 2 (dsl1):         1 3
Port 3 (dsl2):         1 2
Port 4 (dsl3):         1
Port 5 (dsl4):         1
Port 6 (dsl5):         1
Port 7 (dsl6):         1
Port 8 (dsl7):         1
Port 9 (dsl8):         1
Port 10 (dsl9):        1
Port 11 (dsl10):       1
Port 12 (dsl11):       1
Port 13 (dsl12):       1
Port 14 (dsl13):       1
Port 15 (dsl14):       1
Port 16 (dsl15):       1
Port 17 (dsl16):       1
Port 18 (dsl17):       1
Port 19 (dsl18):       1
Port 20 (dsl19):       1
Port 21 (dsl20):       1
Port 22 (dsl21):       1
Port 23 (dsl22):       1
Port 24 (dsl23):       1
Port 25 (dsl24):       1
```

Figure 7-5 Port Filter Command Example: Display Configuration

The following figures illustrate the above example. Notice that ports 2 (DSL port 1) and 3 (DSL port 2) are able to communicate with each other, as well as with the Ethernet. All of the other ports will only be able to communicate with the Ethernet port.

The following figure illustrates the

`192.168.1.1 bridge> portfilter 2 1 3`

command line. Port 2 (DSL port 1) is able to send to both the Ethernet port and port 3 (DSL port 2).

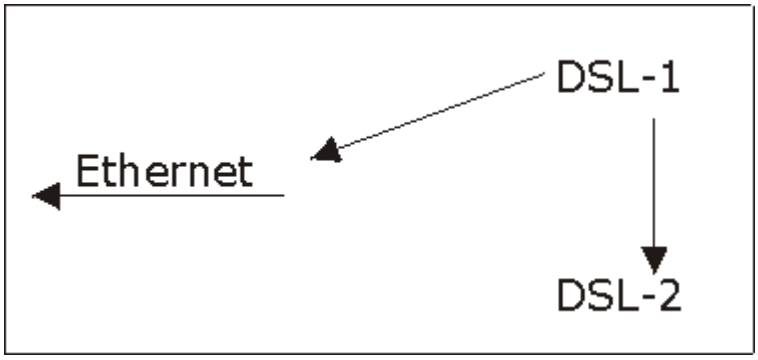


Figure 7-6 Example of Modified VLAN Port 2

The following figure illustrates the

`192.168.1.1 bridge> portfilter 3 1 2`

command line.

Port 3 (DSL port 2) is able to send to both the Ethernet port and port 2 (DSL port 1).

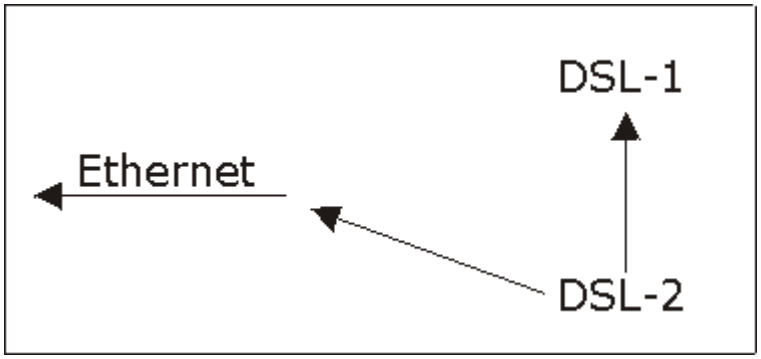


Figure 7-7 Example of Modified VLAN Port 3

The following figure illustrates that port 1 (the Ethernet port) is linked to ports 2 (DSL port 1) and 3 (DSL port 2). Ports 2 (DSL port1) and 3 (DSL port 2) are also linked to each other. Or, in other words, the following figure is a result of the following commands:

```
192.168.1.1 bridge> portfilter 2 1 3

192.168.1.1 bridge> portfilter 3 1 2
```

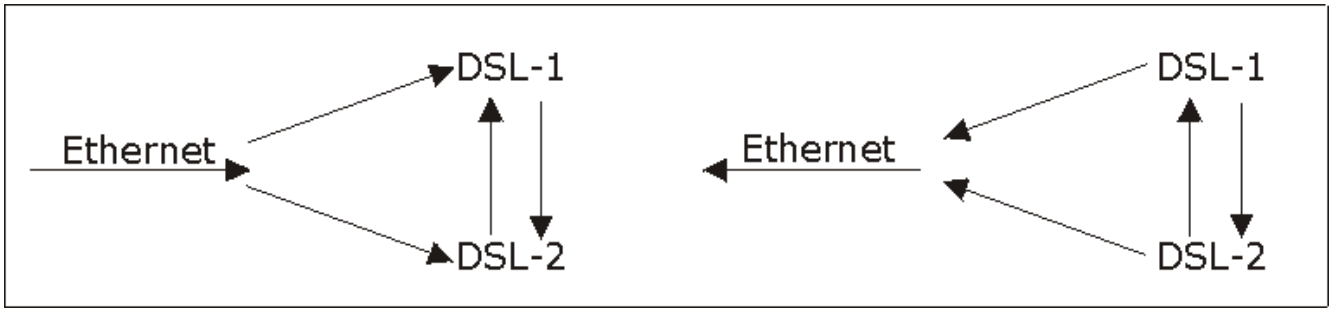


Figure 7-8 Example of Modified VLAN Settings

7.8 Tagged Ethernet Frames Commands (Fast Mode)

The line card's fast mode makes use of the "tag" subset of the IEEE 802.1Q standard to identify the source port of an Ethernet frame and speed traffic through a service gateway. In this way, the source port of a frame can be recognized across switches.

7.8.1 FPVID Command

Syntax:

```
192.168.1.1 bridge> fpvid [<port> <vid>]
```

where

`<port>` = The port number of the line card. Port 0 is the CPU's port, port 1 is the Ethernet port and ports 2-25 are the bridge ports on the line card. These are logical ports.

`<vid>` = The tag number (or IEEE 802.1Q identification) that identifies the source port of an

Ethernet frame. Allocate tag numbers for all logical ports on your line card.

This command lets you allocate IEEE 802.1Q identification numbers (tags) on a port-by-port basis.

The command `192.168.1.1 bridge> fpvid` displays the default port identification of all line card ports.

The IEEE 802.1Q standard uses an explicit tag in the header to specify the VLAN ID (VID) of an Ethernet frame. In this way, the VLAN membership of a frame can be carried across switches. The following table displays the physical port and corresponding default PVID (Port VLAN ID) tag on the line card.

Table 7-1 Physical Ports, Port Numbers and Line Card Default PVID Tags in Fast Mode

PHYSICAL PORT	PORT NUMBER	DEFAULT PVID TAG
CPU (Central Processing Unit)	0	1
Line card LAN Port (Ethernet)	1	N/A
DSL Port 1	2	2
DSL Port 2	3	3
DSL Port 3	4	4
DSL Port 4	5	5
DSL Port 5	6	6
DSL Port 6	7	7
DSL Port 7	8	8
DSL Port 8	9	9
DSL Port 9	10	10
DSL Port 10	11	11
DSL Port 11	12	12
DSL Port 12	13	13
DSL Port 13	14	14
DSL Port 14	15	15
DSL Port 15	16	16
DSL Port 16	17	17
DSL Port 17	18	18
DSL Port 18	19	19
DSL Port 19	20	20
DSL Port 20	21	21
DSL Port 21	22	22
DSL Port 22	23	23
DSL Port 23	24	24
DSL Port 24	25	25

Chapter 8
IEEE 802.1Q Tagged VLAN Commands

This chapter describes the IEEE 802.1Q Tagged VLAN and associated commands.

8.1 IEEE 802.1Q Tagged VLAN Overview

The IEEE 802.1Q Tagged VLAN allows your line card to deliver tagged/untagged frames to and from its ports. The standard gives the line card the ability to recognize VLAN-aware and VLAN-unaware devices and automatically strips tagged frames destined for ports that would normally drop tagged frames.

8.2 IEEE 802.1Q Tagged VLAN -Tags

When a LAN bridge receives a frame from a workstation, the VLAN from whence it came must be known so the bridge may respond, if necessary, to the source of the frame. This is accomplished by tagging. There are two kinds of tagging:

1. Explicit Tagging
   - A VLAN identifier is added to the frame header that identifies the source VLAN.
2. Implicit Tagging
   - The MAC (Media Access Control) number, the port or other information is used to identify the source of a VLAN frame.

The IEEE 802.1Q Tagged VLAN uses both explicit and implicit tagging.

8.3 VLAN-Aware/VLAN-Unaware Devices

It is important for the LAN bridge to determine what devices are VLAN-aware and VLAN-unaware so that it can decide whether to forward a tagged frame (to a VLAN-aware device) or first strip the tag from a frame and then forward it (to a VLAN-unaware device).

8.4 Filtering Databases

A filtering database stores and organizes VLAN registration information useful for switching frames to and from a LAN bridge. A filtering database consists of a static entries (Static VLAN or SVLAN table) and dynamic entries (Dynamic VLAN or DVLAN table).

8.4.1 Static Entries (SVLAN Table)

Static entry registration information is added, modified and removed by administrators only.

8.4.2 Dynamic Entries (DVLAN Table)

Dynamic entries are learned by the bridge and cannot be created or updated by administrators. The bridge learns this information by observing what port, source address and VLAN ID (or VID) is associated with a frame. Entries are added and deleted using GARP VLAN Registration Protocol (GVRP), where GARP is the Generic Attribute Registration Protocol.

8.5 Configuring the Tagged VLAN

In a typical setup, each DSL port is assigned a different VLAN ID (VID) to isolate the subscribers, while the Ethernet port should be a member of every subscriber VID and the management VID. Note that the port-based VLAN is always active and is *NOT* mutually exclusive of the tag-based VLAN. The system performs tagged-VLAN processing first and then port-based VLAN in tandem.

The deletion of the default management VLAN and the enabling of the VLAN *MUST* be the last steps in the configuration procedure, because once you change the settings, you will not be able to connect to the line card with your computer, which is without tagged VLAN capability. You can configure the VLAN associated with the DSL ports before you configure the VLAN for the Ethernet port, or you can do this over the network after the line card is put into service.

See the examples with the following procedure.

Procedure:

Step 1. Use the IEEE 802.1Q tagged VLAN commands to configure tag-based VLAN for the subscribers.

- Use the `svlan setentry` command to configure a VLAN ID for each subscriber.
  - For a typical setup, use `fixed` for the administration control for the DSL port (numbered 2-25) and the Ethernet port (number 1).
  - Select `untag` for the tag control for the DSL port and “tag” for the Ethernet port.
  - Ignore any messages telling you to use the `enable vlan` command in order to enable GVRP. Use the `enable vlan` command when you are finished configuring the VLAN (see the last step).
- Use the `pvid command` to set the VLAN ID you created for a port to that specific port in the PVID table.
- Repeat these steps for the rest of the DSL ports.

Example:

```
1.      192.168.1.1> vlan1q
2.      192.168.1.1 vlan1q> svlan setentry 11 2 fixed untag
3.      192.168.1.1 vlan1q> svlan setentry 11 1 fixed tag
4.      192.168.1.1 vlan1q> pvid 2 11
5.      192.168.1.1 vlan1q> svlan setentry 12 3 fixed untag
6.      192.168.1.1 vlan1q> svlan setentry 12 1 fixed tag
7.      192.168.1.1 vlan1q> pvid 3 12
8.      192.168.1.1 vlan1q> svlan setentry 13 4 fixed untag
9.      192.168.1.1 vlan1q> svlan setentry 13 1 fixed tag
10.     192.168.1.1 vlan1q> pvid 4 13
11.     192.168.1.1 vlan1q> svlan setentry 14 5 fixed untag
12.     192.168.1.1 vlan1q> svlan setentry 14 1 fixed tag
13.     192.168.1.1 vlan1q> pvid 5 14
14.     192.168.1.1 vlan1q> svlan setentry 15 6 fixed untag
15.     192.168.1.1 vlan1q> svlan setentry 15 1 fixed tag
16.     192.168.1.1 vlan1q> pvid 6 15
……..
17.     192.168.1.1 vlan1q> svlan setentry 34 25 fixed untag
18.     192.168.1.1 vlan1q> svlan setentry 34 1 fixed untag
19.     192.168.1.1 vlan1q> pvid 25 34
```

Figure 8-1 Tagged VLAN Configuration Example

Step 2. Configure your management VLAN.

- Use the `svlan setentry` command to configure a VLAN ID for the line card (the “management” or “CPU” VLAN.
- Use the `svlan cpu` command to register your device as a member of the management VLAN.

Example:

```
1.      192.168.1.1 vlan1q> svlan setentry 2 1 fixed tag
2.      192.168.1.1 vlan1q> svlan cpu 2
```

Figure 8-2 Management VLAN Configuration Example

Step 3. Perform the procedure below to complete the VLAN setup after you have configured all the line cards in the chassis. Note that this must be the last step before you lose the connection to the line card.

- Telnet to the operational IP address of a line card.
- Use the `svlan delentry` command to remove the default VLAN ID (1).
- Use the `vlan enable` command to activate the VLAN after you have finished all of your configuration.

Example:

```
1.      192.168.1.1 vlan1q> svlan delentry 1
2.      192.168.1.1 vlan1q> vlan enable
```

Figure 8-3 Deleting Default VLAN and VLAN Activation Example

8.6 IEEE 802.1Q Tagged VLAN Commands

Bridge port 1 stands for the Ethernet port, bridge port 2 stands for DSL port 1, bridge port 3 stands for DSL port 2, and so on.

8.6.1 Enabling the IEEE 802.1Q Tagged VLAN

The IEEE 802.1Q Tagged VLAN is disabled by default. Use the following command to enable the IEEE 802.1Q Tagged VLAN.

Syntax:

```
192.168.1.1 vlan1q> vlan enable
```

8.6.2 Disabling the IEEE 802.1Q Tagged VLAN

You can disable the IEEE 802.1Q Tagged VLAN by using the `VLAN Disable` command.

Syntax:

```
192.168.1.1 vlan1q> vlan disable
```

8.6.3 VLAN Status Command

Syntax:

```
192.168.1.1 vlan1q> vlan status
```

This command displays the current configuration of the IEEE 802.1Q bridge. See the following example.

```
192.168.1.1 vlan1q> vlan status

IEEE 802.1Q VLAN : DISABLED

  VLAN       Egress Ports                          Untagged Ports
   ID        C E 12345678 12345678 12345678        C E 12345678 12345678 12345678
================================================================================
     1       - v vvvvvvvv vvvvvvvv vvvvvvvv        v v vvvvvvvv vvvvvvvv vvvvvvvv

Total 1 VLAN(s).

The default port VLAN id of all bridge ports:
Port  0 (CPU):    1
Port  1 (ethernet):    1
Port  2 (adsl1):    1
Port  3 (adsl2):    1
Port  4 (adsl3):    1
Port  5 (adsl4):    1
Port  6 (adsl5):    1
Port  7 (adsl6):    1
Port  8 (adsl7):    1
Port  9 (adsl8):    1
Port 10 (adsl9):    1
Port 11 (adsl10):    1
Port 12 (adsl11):    1
Port 13 (adsl12):    1
Port 14 (adsl13):    1
Port 15 (adsl14):    1
Port 16 (adsl15):    1
Port 17 (adsl16):    1
Port 18 (adsl17):    1
Port 19 (adsl18):    1
Port 20 (adsl19):    1
Port 21 (adsl20):    1
Port 22 (adsl21):    1
Port 23 (adsl22):    1
Port 24 (adsl23):    1
Port 25 (adsl24):    1
172.21.100.113 vlan1q>
```

Figure 8-4 VLAN Status Command Example

These are the default VLAN settings. The default VLAN allows all ports to connect to each other and sets them to send untagged packets.

8.6.4 PVID Command

Syntax:

```
192.168.1.1 vlan1q> pvid [<port #> <vlan id>]
```

where

`<port #>` = Bridge port number. Valid parameter range = [1 - 25].

`<vlan id>` = VLAN ID. Valid parameter range = [1 - 4094].

This command sets the VLAN ID to a specific port in the PVID table. To display the PVID table simply enter this command without parameters, as shown next.

```
192.168.1.1 vlan1q> pvid
```

```
pvid        port#
-----       -----
1           1
1           2
1           3
1           4
1           5
1           6
1           7
1           8
1           9
1           10
1           11
1           12
1           13
1           14
1           15
1           16
1           17
1           18
1           19
1           20
1           21
1           22
1           23
1           24
1           25
```

Figure 8-5 PVID Command Display Example

8.6.5 SVLAN CPU Command

Syntax:

```
192.168.1.1 vlan1q> svlan cpu [<vid>]
```

where

`<vid>` = VLAN ID. Valid parameter range = [1 – 4094].

This command registers your CPU as a port member of the static VLAN (SVLAN) with `<vid>`. To display the CPU static VLAN identification, simply enter the command without parameters.

8.6.6 SVLAN List Command

Syntax:

```
192.168.1.1 vlan1q> svlan list
```

This command displays the static VLAN (SVLAN) registration table. The following figure is an example of what is displayed when you use this command.

```
vid        port#      ad_control     tag_control
--------   -------    ------------   ------------
   1         1         fixed          Tag
             2         normal         UnTag
             3         normal         UnTag

   2         1         normal         UnTag
             2         fixed          UnTag
             3         normal         UnTag

   3         1         normal         UnTag
             2         normal         UnTag
             3         fixed          UnTag
```

Figure 8-6 Example: SVLAN List Command Display

For more information about the `svlan list` command display, refer to the `svlan setentry` command (shown next).

8.6.7 SVLAN Setentry Command

Syntax:

```
192.168.1.1 vlan1q> svlan setentry <vid> <port#> <ad_control>
<tag_control>
```

where

`<vid>` = The VLAN ID [1 – 4094].

`<port#>` = This is the bridge port number [1 – 25].

`<ad_control>` = This is the Registrar administration control flag.
Valid parameters = [`fixed`, `forbidden`, `normal`].

Select `fixed` to register a `<port #>` to the static VLAN table with `<vid>`.
Select `normal` to confirm registration of the `<port #>` to the static VLAN table with `<vid>`.
Select `forbidden` to block a `<port #>` from joining the static VLAN table with `<vid>`.

`<tag_control>` = Tag control flag. Valid parameters = [`tag`, `untag`].

Select `tag` to tag outgoing frames.
Select `untag` if you do not want to tag outgoing frames.

This command adds or modifies an entry in the static VLAN table. Display your configuration by using the `svlan list` command. An example of a configuration is shown next.

Modify a Static VLAN Table Example

The following is an example of how to modify a static VLAN table.

```
1.      192.168.1.1 vlan1q> svlan setentry  3  3  fixed  untag
2.      192.168.1.1 vlan1q> svlan setentry  2  2  fixed  untag
3.      192.168.1.1 vlan1q> svlan setentry  1  1  fixed  tag
4.      192.168.1.1 vlan1q> svlan list
```

Figure 8-7 Modifying the Static VLAN Example

The arrows, in the next figure, point to the lines in the static VLAN table that have been modified as a result of the previous commands.

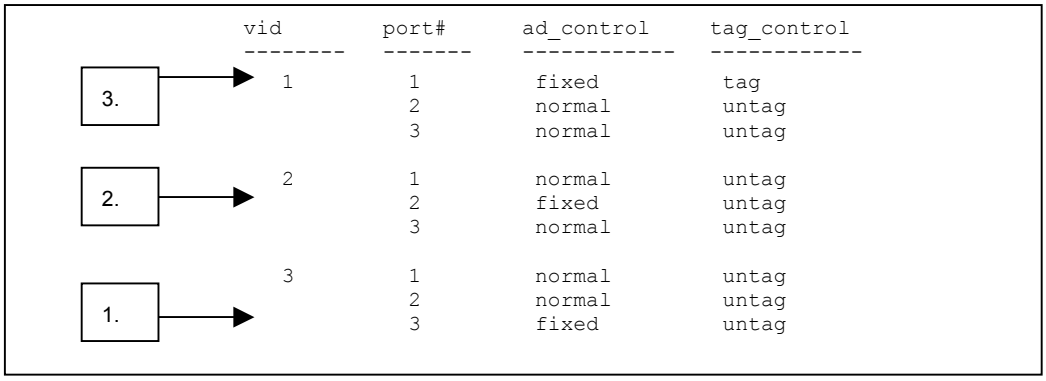


Figure 8-8 SVLAN List Command Display Example

Forwarding Process Example

The switch uses the SVLAN in making frame-forwarding decisions.

Step 1. First the switch checks the MAC address in a frames header against the MAC filtering database.

Step 2. Next the switch checks the VLAN ID (VID) of tagged frames or assigns temporary VIDs to untagged frames (see the *PVID Command*.

Step 3. The switch then checks the VID in a frame's tag against the SVLAN table.

Step 4. The switch notes what the SVLAN table says (that is, the SVLAN tells the switch whether or not to forward a frame and if the forwarded frames should have tags).

Step 5. Then the switch applies the port filter to finish the forwarding decision. This means that frames may be dropped even if the SVLAN says to forward them. Frames might also be dropped if they are sent to a CPE (customer premises equipment) DSL device that does not accept tagged frames.

The following figure shows the flow of the decision process used with a broadcast frame (one that is meant to go to all of the ports).

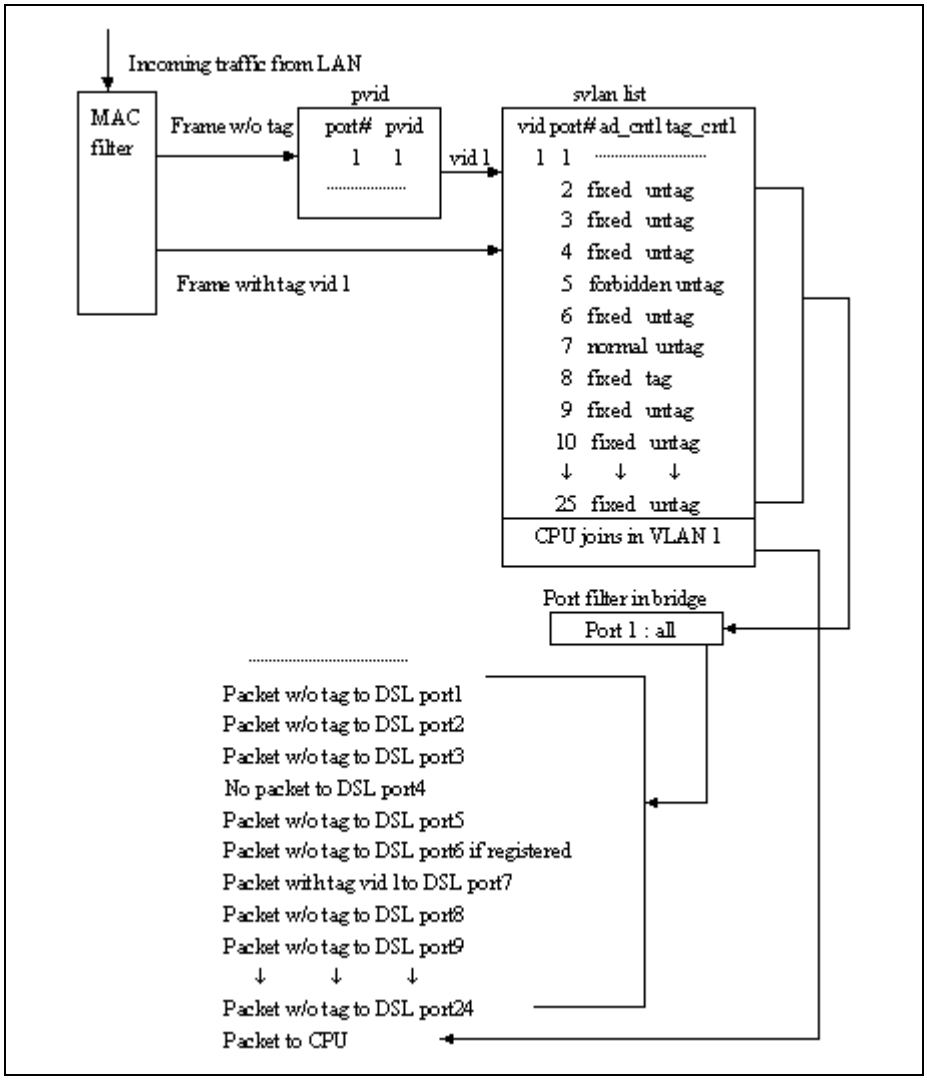


Figure 8-9 SVLAN Example

An untagged frame comes in from the LAN.

Step 1. An untagged frame comes in from the LAN.

Step 2. The switch checks the PVID table and assigns a temporary VID of 1.

Step 3. The switch ignores port# 1 (the LAN port where the frame came in), because the switch does not send a frame to the port that it came in through.

Step 4. The switch sees that port # 2, 3, 4, 6, 8 and 9 through 25 (DSL ports 1, 2, 3, 5, 7, 8 and 9 through 24) are all set to “fixed” and “untag” which means the SVLAN allows the frame to be sent to those ports without a tag.

Step 5. Port # 5 is “forbidden” so the frame is not forwarded to DSL port # 4.

Step 6. Port # 7 (DSL port 6) is “normal” which means that it was entered dynamically, so the SVLAN permits the frame to be forwarded to port # 7 if port # 7 is registered in the DVLAN table.

Step 7. After looking at the SVLAN, the switch sees that the port filter is set for port 1 (the LAN port) to forward frames to all of the ADSL ports, so the switch forwards everything that the SVLAN permits.

8.6.8 SVLAN Getentry Command

Syntax:

```
192.168.1.1 vlan1q> svlan getentry <vid>
```

where

`<vid>` = VLAN ID. Valid parameter range = [1 – 4094].

This command displays an entry with a specified VLAN ID in the static VLAN table.

Display a Static VLAN Table Entry Example

The following figure is an example display of the following command.

```
192.168.1.1 vlan1q> svlan getentry 2
```

```
vid        port#      ad_control     tag_control
--------   -------    ------------   ------------
   2         1          normal         UnTag
             2          fixed          UnTag
             3          normal         UnTag
```

Figure 8-10 Example: Svlan Getentry 2 Command Display

8.6.9 SVLAN Delentry Command

Syntax:

```
192.168.1.1 vlan1q> svlan delentry <vid>
```

where

`<vid>` = VLAN ID. Valid parameter range = [1 – 4094].

This command deletes an entry with a specified VLAN ID in the static VLAN table

Delete a Static VLAN Entry Example

The following example will delete entry 2 in the static VLAN table.

```
192.168.1.1 vlan1q> svlan delentry 2
```

8.6.10 DVLAN List Command

Syntax:

```
192.168.1.1 vlan1q> dvlan list
```

This command displays the dynamic VLAN registration table. The following figure is a partial example of what is displayed when you use this command (there are 25 port numbers with the 24 port ADSL card).

```
vid     01      02      03      04      05      06      07      08      09
----    ----    ----    ----    ----    ----    ----    ----    ----    ----
2       ||      >>      ||      ||      >>      >>      ||      ||      >>
3       >>      >>      ||      ||      ||      >>      >>      >>      ||
4       >>      ||      ||      >>      >>      ||      ||      >>      >>
5       ||      >>      ||      ||      >>      >>      ||      ||      >>
6       >>      >>      ||      ||      ||      >>      >>      >>      ||
7       ||      >>      ||      >>      >>      ||      ||      >>      >>
8       >>      ||      ||      >>      ||      >>      >>      >>      >>
9       ||      >>      ||      ||      ||      >>      ||      >>      >>
```

Figure 8-11 DVLAN List Command Display Example

In the figure above, "||" denotes "filter" and ">>" denotes "forward".

8.6.11 DVLAN Getentry Command

Syntax:

```
192.168.1.1 vlan1q> dvlan getentry <vid>
```

where

`<vid>` = VLAN ID. Valid parameter range = [1 – 4094].

This command displays an entry with a specified VLAN ID in dynamic GVRP table.

Display a Dynamic VLAN Table Entry Example

The following figure is an example display of the following command.

```
192.168.1.1 vlan1q> dvlan getentry 2
```

```
vid     01      02      03      04      05      06      07      08      09
----    ----    ----    ----    ----    ----    ----    ----    ----    ----
2       ||      >>      ||      ||      >>      >>      ||      ||      >>
```

Figure 8-12 DVLAN Getentry 2 Command Display Example

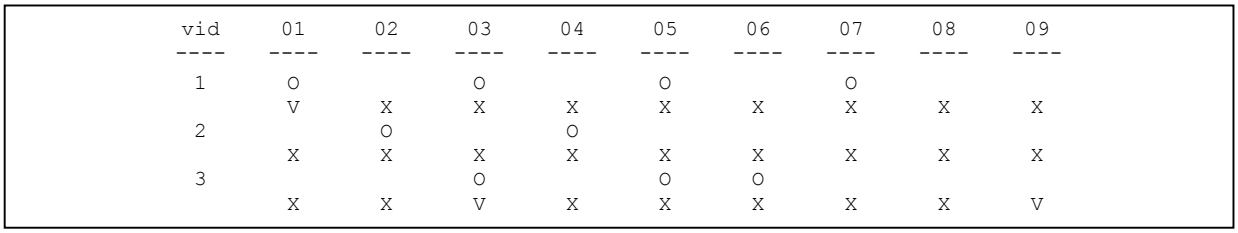
In the figure above, "||" denotes "filter" and ">>" denotes "forward".

8.6.12 VLAN List Command

Syntax:

```
192.168.1.1 vlan1q> vlan list
```

This command displays the entire VLAN table. The display refreshes periodically. Press [ENTER] and then enter the `stop` command to stop the display from refreshing. The following figure is a partial example what is displayed when you use this command (there are 25 port numbers with the 24 port ADSL card).



```
vid     01      02      03      04      05      06      07      08      09
----    ----    ----    ----    ----    ----    ----    ----    ----    ----
 1      O               O               O               O
        V       X       X       X       X       X       X       X       X
 2              O               O
        X       X       X       X       X       X       X       X       X
 3                      O               O       O
        X       X       V       X       X       X       X       X       V
```

Figure 8-13 VLAN List Command Display Example

In the figure above “O" denotes “egress port”, “V” denotes “tagged” and “X” denotes “ untagged”.

Chapter 9
IEEE 802.1p Priority Commands

This chapter explains IEEE 802.1p Priority commands.

9.1 IEEE 802.1p Priority Overview

IEEE 802.1p Priority commands assign priority levels to individual ports. IEEE 802.1p defines up to eight priorities (0-7) by inserting a tag into a MAC-layer frame that contains bits to define priority of service.

9.2 IEEE 802.1p Priority Commands

Bridge port 1 stands for the Ethernet port, bridge port 2 stands for DSL port 1, bridge port 3 stands for DSL port 2, and so on.

9.2.1 Priority Port Command

Syntax:

```
192.168.1.1 vlan1q> priority port <port #> <priority>
```

where

`<port #>`	=	Bridge port number. Valid parameter range = [1 - 25].
`<priority>`	=	Default priority for the specified port. Valid parameter range = [0 - 7], where 0 is the lowest priority and 7 is the highest priority.

This command sets the default priority that is assigned to untagged frames from a specified ingress port.

To display the default port priority table, simply use the `Priority Port` command without parameters, as shown next.

```
192.168.1.1 vlan1q> priority port
```

9.2.2 Regen Port Command

Syntax:

```
192.168.1.1 vlan1q> regen port [<port #> <user priority> <regened
priority>]
```

where

`<port #>`	=	Bridge port number. Valid parameter range = [1 – 25].
`<user priority>`	=	The user priority for a frame received on this port. Valid parameter range = [0 – 7 or *], where 0 is the lowest priority, 7 is the highest priority and * means all user priorities.

`<regened priority>` =	The regenerated user priority the incoming user priority is mapped to for `<port #>`. Valid parameter range = [0 - 7], where 0 is the lowest priority and 7 is the highest priority.

This command changes the priority of a tagged frame from a specified ingress port from the original user priority to the regened priority.

To display the regeneration table, simply use the `Regen Port` command without parameters, as shown next.

```
192.168.1.1 vlan1q> regen port
```

Chapter 10
IP Commands

This chapter shows you how to configure the IP parameters.

10.1 IP Commands Overview

More often than not, you have more than one DSL line card for a particular installation. The IP host implementation in the line cards allows you to manage them over the network. Use the commands in this chapter to configure the line card's Internet Protocol settings. Before you start configuring these settings, make sure that you:

1. Plan ahead.
2. Have a complete diagram showing the whole network.
3. Record the IP parameters assigned to the equipment in your network.

10.2 Setting the IP Address

To set the IP address, default gateway and the subnet mask of the Ethernet port of a line card, use the following command sequence.

```
1.      192.168.1.1> ip
2.      192.168.1.1 ip> enable ether <new ip address>
3.      <new ip address> ip> route delete default
4.      <new ip address> ip> route add default 0.0.0.0 <default gateway> 00:00:0
5.      <new ip address> ip> config save
```

Figure 10-1 Setting the IP Address Sequence

where

`<new ip address>` = The IP address you want to configure for the line card.

`<default gateway>` = The default gateway IP address of the line card.

Line 1 brings you to the IP subsystem.

Line 2 allows you to add a new IP address for the line card. The IP address of the line card is displayed in the command prompt. The system automatically computes the subnet mask when the system is restarted. If you want to specify a subnet manually, add the following two commands before line 3:

`192.168.1.1 ip> subnet delete ether.home`

`192.168.1.1 ip> subnet add ether.home ether <subnet address> <subnet mask>`

where `<subnet mask>` is the subnet mask in hexadecimal, for example "`ff:ff:ff:00`".

Line 3 deletes the existing default route.

Line 4 adds the new default route. The default route tells the system where the gateway (next hop) is when the line card sends packets to a destination that is not on the same subnet as the line card.

Line 5 saves the new configuration to the nonvolatile memory.

For example, if you want the line card to have 172.21.100.1 as the IP address, 255.255.255.0 for the subnet mask and 172.21.100.254 for the default gateway, you may use the following command sequence:

```
192.168.1.1> ip
192.168.1.1 ip> enable ether 172.21.100.1
192.168.1.1 ip> subnet delete ether.home
192.168.1.1 ip> subnet add ether.home ether 172.21.100.0 ff:ff:ff:00
192.168.1.1 ip> route delete default
192.168.1.1 ip> route add default 0.0.0.0 172.21.100.254 00:00:00:00
192.168.1.1 ip> config save
```

Figure 10-2 Setting the IP Address Example

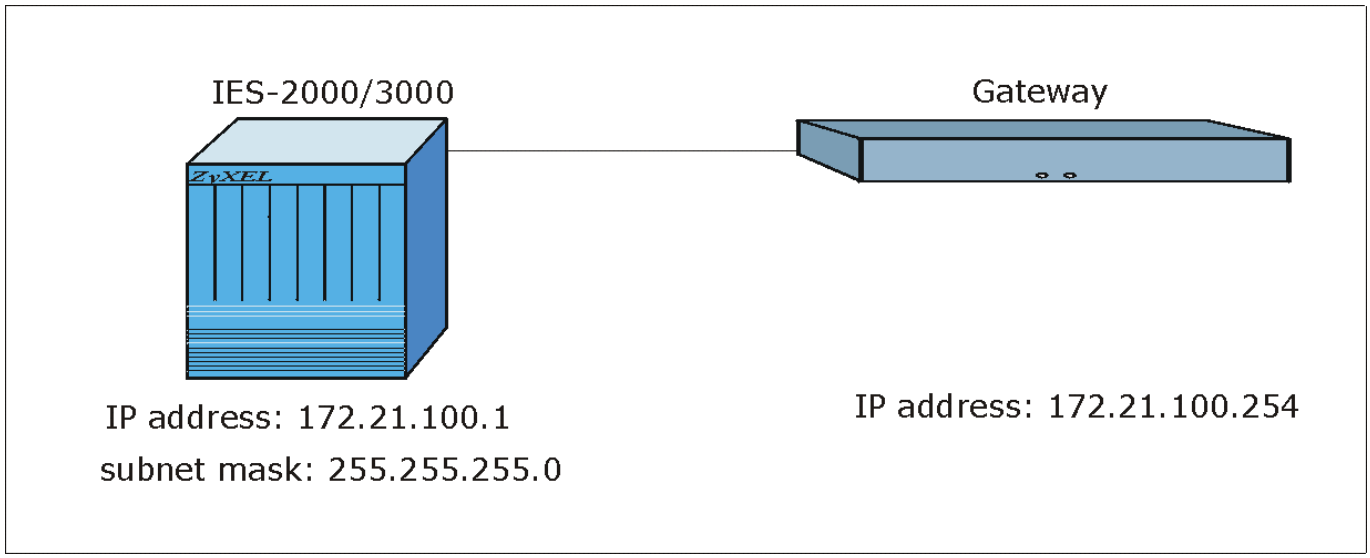


Figure 10-3 Setting IP Address and Default Gateway

Each line card leaves the factory with a default IP address of 192.168.1.1 and a subnet mask of 255.255.255.0, or FF.FF.FF.0 in hexadecimal notation, and the default gateway set at 192.168.1.254. Make sure that you configure the IP parameters correctly before you connect a line card to the network, otherwise, you may interrupt services already running.

10.3 General IP Commands

The following is a list of general IP commands that help with the management of the IP parameters.

10.3.1 Config Command

Syntax:

```
192.168.1.1 ip> config [save]
```

This command shows the IP configuration. The `save` option saves the configuration to the nonvolatile memory.

10.3.2 Version Command

Syntax:

```
192.168.1.1 ip> version
```

This command shows the firmware version and date on the line card.

10.3.3 Ping Command

Syntax:

```
192.168.1.1 ip> ping <host> [<ttl> [<size>]]
```

where

`host`	=	The IP address of the target.
`ttl`	=	Time to Live (optional). This parameter limits the number of hops (routers) that the echo request can travel before it reaches the target.
`size`	=	The parameter specifies the size of the payload, that is, not counting the headers, of the echo request. The default size is 32 octets.

This is an IP facility to check for network functionality by sending an echo request to another IP host and waiting for the reply.

10.3.4 Statistics Command

Syntax:

```
192.168.1.1 ip> stats <sub cmd>
```

This command shows the statistics for the traffic of the type specified by the sub-command. Statistics are available for the following traffic types: ARP, ICMP, IP, raw, TCP and UDP.

10.3.5 Subnet Add Command

Syntax:

```
192.168.1.1 ip> subnet add <net name> <i/f name> a.b.c.d am:bm:cm:dm
```

where

`<net name>`	=	Define the name of the subnet for identification purposes.
`<i/f name>`	=	The name of an interface (“ether” for this device).
`a.b.c.d`	=	The subnet’s IP address.
`am:bm:cm:dm`	=	The subnet’s subnet mask.

This command defines a subnet. Type “subnet” without any parameters to view a list of the configured subnets.

10.3.6 Subnet Delete Command

Syntax:

```
192.168.1.1 ip> subnet delete <net name>
```

where

`<net name>` = The name of the subnet.

This command removes a subnet.

10.3.7 Subnet Flush Command

Syntax:

```
192.168.1.1 ip> subnet flush
```

This command removes all of the subnets.

10.3.8 Route Add Command

Syntax:

```
192.168.1.1 ip> route add <dom name> a.b.c.d <relay> [am:bm:cm:dm [<cost>
[<timeout s>]]]
```

where

`<dom name>`	=	The name of the static route.
`a.b.c.d`	=	The destination IP address of packets that this static route is to route.
`<relay>`	=	The IP address of the gateway that you want to send the packets through.
`am:bm:cm:dm`	=	The destination subnet mask of packets that this static route is to route.
`<cost>`	=	The metric (hop count) of this static route.
`[<timeout s>]`	=	The time period in seconds that this static route is to remain in the system. Type “timeout” followed by an integer (omitting the timeout parameter or using “timeout 0” makes the static route permanent).

This command defines a new, static IP forwarding route or edits an existing one. Type “route” without any parameters to view a list of the configured static routes.

Use 0’s for the destination IP address and subnet mask to configure a default static route for the device. The device uses the default static route to forward packets for which it cannot find another route. The following is the syntax for configuring a static route.

```
192.168.1.1 ip> route add <dom name> 0.0.0.0 <relay> 0:0:0:0
```

10.3.9 Route Delete Command

Syntax:

```
192.168.1.1 ip> route delete <dom name>
```

where

`<dom name>` = The name of the static route.

This command removes a static, IP forwarding route.

10.3.10 Route Flush Command

Syntax:

```
192.168.1.1 ip> route flush
```

This command removes all of the static IP forwarding routes.

10.3.11 Enable Command

Your telnet session disconnects when you change the Ethernet port's IP address. Initiate a telnet session to the new IP address in order to reconnect.

Syntax:

```
192.168.1.1 ip> enable [<i/f> [mtu <size>] [<IPaddr>]]
```

where

`<i/f>` = The name of an interface ("ether" for this device).

`[mtu <size>]` = Maximum Transmit Unit. The maximum packet size that this interface is to send.

`<IPaddr>` = The IP address of the device's interface.

This command sets the Ethernet port's IP address and the largest packet size that this interface sends.

Chapter 11
Remote Management

This chapter shows you how to manage the line card from a remote location.

11.1 Remote Management Overview

The line card's remote management features make it easy and convenient to manage the line card from remote locations.

11.2 Management by Telnet

After you have set up the IP parameters and connected the line card to the network, you can manage it remotely with telnet. You can use any telnet client that you find convenient. The default password for a telnet session is "1234". Only one telnet session is allowed at a time.

11.3 SNMP Management

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

The next figure illustrates an SNMP management operation.

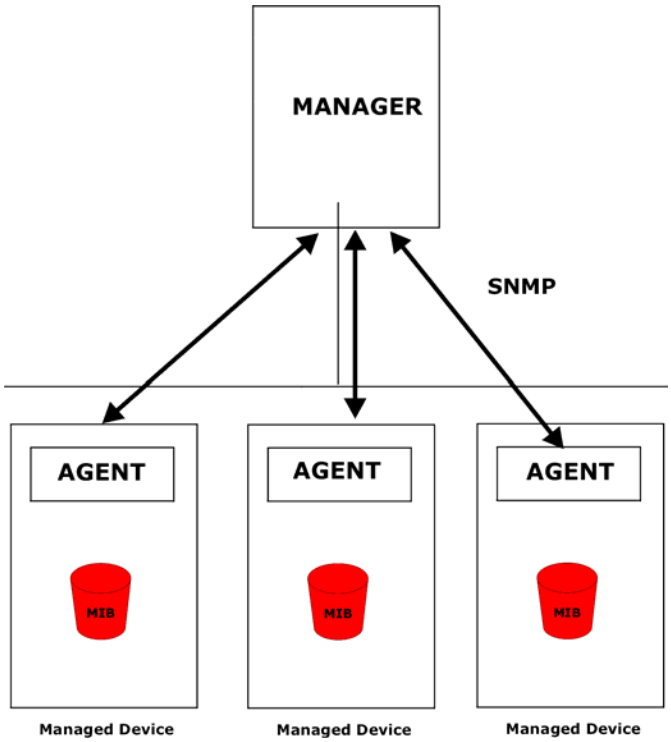


Figure 11-1 SNMP Management Model

An SNMP managed network consists of two main component types: agents and a manager.

An agent is a management software module that resides in a managed device (the line card). An agent translates the local management information from the managed device into a form compatible with SNMP. The manager is the station through which network administrators perform network management functions. It executes operations that control and monitor the managed devices.

The managed devices contain objects that define each piece of information to be collected about a device. Examples of variables include the number of packets received, node port status, etc. A Management Information Base (MIB) is a collection of managed objects. SNMP allows manager and agents to communicate for the purpose of accessing these objects.

SNMP itself is a simple request/response protocol based on the manager/agent model. The manager issues a request and the agent returns responses using the following protocol operations:

- Get

Allows the manager to retrieve an object variable from the agent.

- GetNext

Allows the manager to retrieve the next object variable from a table or list within an agent. In SNMP, when a manager wants to retrieve all elements of a table from an agent, it initiates a Get operation, followed by a series of GetNext operations.

- Set

Allows the manager to set values for object variables within an agent.

- Trap

Used by the agent to inform the manager of some events.

11.3.1 Supported MIBs

The line card supports MIB II that is defined in RFC 1213 and RFC 1215 as well as transparent bridge MIBs defined in RFC 1493. The line card can also respond with specific data from the ZyXEL private MIB (ZYXEL-MIB).

11.4 SNMP Access Configuration

To control access to the agent in the line card, use the `access` commands in the SNMP subsystem. Note that "community" is SNMP's terminology for password. After configuring the SNMP access parameters, save the configuration to the nonvolatile memory with the `config save` command. The default write community string is "1234", and the default read community string is "public".

11.4.1 SNMP Access Read/Write Command

Syntax:

```
access <read | write> <community> [<IP addr>]
```

where

`<read | write>`	=	Specifies read-only/read-write permission.
`<community>`	=	Password needed to access the SNMP agent on the line card.
`[<IP addr>]`	=	Optional IP address of the allowed SNMP manager.

This command allows read-only or read-write access. If the IP address is specified, access is allowed for the manager station with that address only.

11.4.2 SNMP Access Delete Command

Syntax:

```
access delete <community> [<IP addr>]
```

This command revokes SNMP access by the specified community (password). If the IP address is specified, access is denied for that manager station only.

11.4.3 SNMP Access Flush Command

Syntax:

```
access flush
```

This command revokes access by any and all manager stations.

11.4.4 SNMP Access List Command

Syntax:

```
access list
```

This command shows the allowed access.

11.5 SNMP Trap Configuration

The line card uses the SNMP trapping facility to proactively report unusual events to one or more trap servers. To configure the trap parameters, use the `trap` commands in the SNMP subsystem. After configuring the SNMP trap parameters, save the configuration to the nonvolatile memory with the `config save` command.

11.5.1 Supported Traps

The line card supports the following traps

- coldStart Trap (defined in RFC 1215) :

  This trap is sent at system start-up.

- authenticationFailure Trap (defined in RFC 1215) :

This trap is sent if a request arrives with an invalid community string.

- linkUp Trap (defined in RFC 1215) :

  This trap is sent when a DSL port is up.

- linkDown Trap (defined in RFC 1215) :

  This trap is sent when a DSL port is down.

- overheat Trap (defined in ZYXEL-MIB) :

  This trap is sent periodically when a line card is overheated.

- overheatOver Trap (defined in ZYXEL-MIB) :

  This trap is sent when the line card is no longer overheated.

11.5.2 Trap Add Command

Syntax:

```
trap add <community> <IP addr>
```

where

`<community>` = The password used by the line card to authenticate itself to the trap server.

`<IP addr>` = The IP address of the trap server.

This command adds a trap server.

11.5.3 Trap Delete Command

Syntax:

```
trap delete <community> <IP addr>
```

This command deletes a trap destination. The parameters are the same as the `trap add` command.

11.5.4 Trap Flush Command

Syntax:

```
trap flush
```

This command deletes all trap destinations.

11.5.5 Trap List Command

Syntax:

```
trap list
```

This command lists all the trap destinations.

Chapter 12
Configuration Backup/Restore

This chapter describes the process for backing up your user settings (configuration) from the line card onto your computer and how to restore them to the line card.

12.1 Configuration Backup/Restore Overview

The line card uses FTP for configuration backup/restore through its built-in FTP server. You can use any FTP client (for example, ftp.exe in Windows) to backup/restore the line card's configuration.

12.2 Configuration Files of the Line card

The line card uses configuration files to store the user's settings, so they can be applied the next time the line card is booted. The line card has the following two configuration files:

init = The system configuration file for the line card.

password = The configuration file for the Telnet and FTP password.

12.3 Configuration Backup

You can backup all or some configuration files from the line card to your computer. Backup the system configuration by following the example shown next.

Connect to the line card with your favorite FTP client. The command for the line card is generally

```
ftp <linecard IP address>
```

at the computer command prompt.

Enter the User name (just press [ENTER]).

```
User: <ENTER>
```

Enter the management password (1234 by default).

```
Password: 1234

230 Logged in
```

Get the configuration files from the line card

```
ftp> get init
```

Quit FTP.

```
ftp> quit
```

12.4 Configuration Restore

You can restore configuration files from your computer to the line card. Restore the system configuration by following the example shown next.

Do *not* turn off the line card during the restore process, as it may corrupt the firmware and make your line card unusable.

Connect to the line card with your favorite FTP client. The command for the line card is generally

```
ftp <line card IP address>
```

at the computer command prompt.

Enter the User name (just press [ENTER]).

```
User: <ENTER>
```

Enter the management password (1234 by default).

```
Password: 1234

230 Logged in
```

Transfer the configuration files to the line card

```
ftp> put init
```

Quit FTP.

```
ftp> quit
```

Wait for the update to finish. The line card restarts automatically.

Chapter 13
Firmware Upload and Recovery

This chapter describes how to load new firmware onto your line card or recover firmware that is in the non-volatile memory.

13.1 Firmware Upload and Recovery Overview

The line card uses FTP to upload firmware. If the firmware in non-volatile memory is damaged, the line card uses BOOTP/TFTP to recover the firmware. The differences between these two methods are as follows:

Table 13-1 FTP Upload and BOOTP/TFTP Recovery Differences

	FTP UPLOAD	BOOTP/TFTP RECOVERY
Upload Timing:	Done during operation (run-time).	Done when the line card is restarted.
Protocols Used:	Uses FTP protocol.	Uses BOOTP and TFTP protocols.
Remote Upload:	Does not require the line card and your computer to be on the same LAN.	Requires the line card and your computer to be on the same LAN.
Firmware Files Used:	A file with an ".img" extension name.	A file with a ".bin" extension name.
Role of the Line Card:	Uses the line card's built-in FTP server.	Uses the line card's built-in BOOTP/TFTP client.
Impact to the Line Card:	Overwrites the line card's firmware only.	Overwrites the line card's firmware and all configuration files.

13.2 FTP Firmware Upload on the Line Card

ZyXEL periodically releases new firmware. Please check www.zyxel.com periodically for the latest firmware release.

The line cards use FTP for firmware uploads through their built-in FTP server when the line card is operational. To update the firmware, first download it (the file will have an "**img**" extension name) from the ZyXEL web site and store it on your computer. You can use any FTP client (for example, ftp.exe in Windows) to upgrade the line card's firmware. The procedure for FTP upgrade is as follows.

Do *not* turn off the line card during the updating process, as it may corrupt the firmware and make your line card unusable.

1. Connect to the line card with your favorite FTP client.
   The command for the line card is generally: `ftp <line card IP address>` at the computer command prompt.
2. Enter the user name (just press [ENTER]). For example,
   `User: <ENTER>`

3. Enter the management password (1234 by default). For example,
```
Password: 1234
230 Logged in
```
4. Transfer the firmware file to the line card. For example,
```
ftp> put 201AS0b1.img image
```
where

`201AS0b1.img` = The firmware file that you want to upload.

`image` = The internal firmware name in the line card.

5. Quit FTP. For example,
```
ftp> quit
```

Wait for the update to finish. The line card will restart automatically.

Do *not* turn off the IES-2000/3000 during the updating process, as it may corrupt the firmware and make your unit unusable.

13.3 Emergency Console Port

The line card is equipped with a hidden RS-232 console port. It is intended for emergency recovery only, e.g., you misconfigured the management VID, and not for day-to-day operation.

The console port is a 5-pin head with one pin broken off and located near the front panel to the left on the IES-2000 and to the top on the IES-3000.

To access the console port, you must remove the card on top (IES-2000) or to the right (IES-3000) of the card in trouble. Connect the small, soft robber covered terminal of the enclosed RS-232 cable to the console port. Make sure that the side with small windows where metal is visible is facing the center of the line card and line up the triangle on the RS-232 cable with the 1 on the console port (this identifies pin 1). Connect one end of a regular RS-232 cable to the female DB9 connector of the enclosed short cable and the other end to your computer.

You need a computer with a com port and terminal emulation software configured to the following parameters to match the console port:

VT100 terminal emulation

- 9600 bps
- None parity, 8 data bits, 1 stop bit
- No flow control

13.4 BOOTP/TFTP Firmware Recovery of the Line card

The line cards use BOOTP/TFTP for firmware recovery through their built-in BOOTP/TFTP client when the line cards are restarted. To recover the firmware, first download it from the ZyXEL web site and store it on your computer. This process also erases any configurations that you have made and restores the line card's default configuration. You can use any BOOTP/TFTP server (for example, BootpTftp.exe) to update the line card's firmware. The update procedure for BootpTftp.exe is as follows:

Do *not* turn off the IES-2000/3000 during the updating process, as it may corrupt the firmware and make your unit unusable.

1. Telnet to your line card's IP address (192.168.1.1 is the default).
2. Run `BootpTftp.exe`, to bring up the following window. Click **New** to create a MAC address entry.

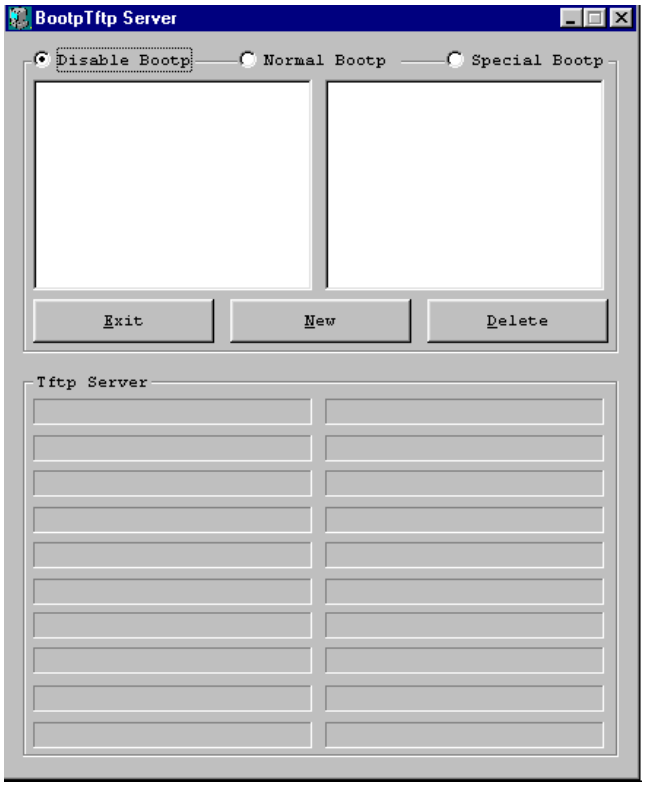


Figure 13-1 BOOTP/TFTP Server

3. The **Input Box** window will pop up as shown next. Type the MAC address of the line card and then click **OK**. You can find the MAC address of the line card on its boot console.

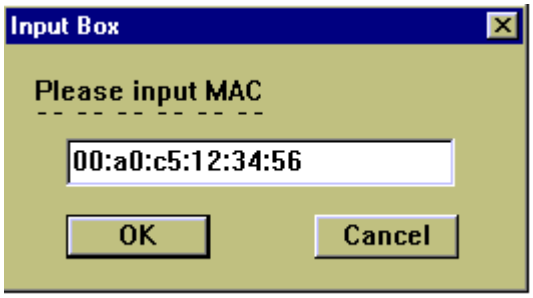


Figure 13-2 Input MAC

4. Type the host IP address (the IP address you want to assign to the line card), server IP address (the IP address of this computer), net mask, gateway and filename (the new firmware name) into the appropriate fields in the screen shown next. Click **Update Database**.

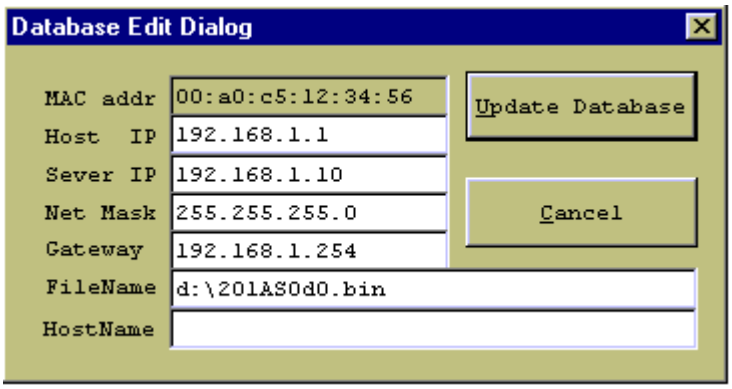


Figure 13-3 Database Edit Dialog

5. Select **Normal Bootp** to enable normal BOOTP/TFTP functions.

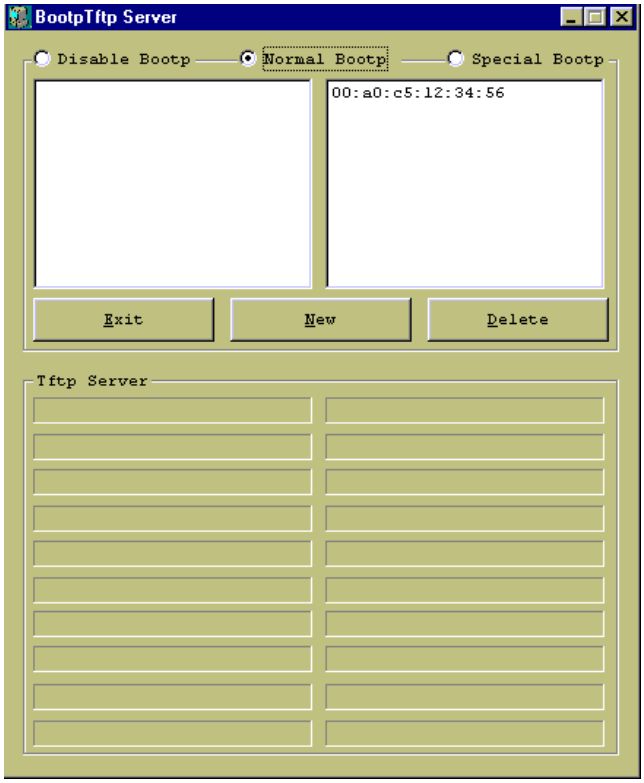


Figure 13-4 Enable BOOTP/TFTP

6. See section *13.3* on the emergency console port. Restart the line card and press any key within three seconds to get the following screen.

```
SDRAM Testing ...
Mac address 00:A0:C5:12:34:56
```

Figure 13-5 Enter Debug Mode

7. Press any key at the "`Press any key within 3 seconds to enter debug mode .....`" message, to enter the debug mode.
8. Enter `atnb` at the line card boot console.
9. Wait for the firmware upload to finish.
10. Use the following command sequence on the line card to write new firmware to flash memory.

```
192.168.1.1> flashfs
192.168.1.1 flashfs> wipe
192.168.1.1 flashfs> update
```

11. Wait for the update to complete and then use the `restart` command from the root directory to restart the line card.

Chapter 14
Troubleshooting with EEC

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.

14.1 DSL LED(s)

A DSL LED is not on.

Table 14-1 Troubleshooting the DSL LED(s)

STEPS	CORRECTIVE ACTION
1	Make sure the DSL port is enabled (refer to the enabling DSL ports sections in the chapter on ADSL commands).
2	Connect a DSL modem directly to the DSL port of the line card using a different telephone wire. If the LED turns on, go to step 4.
3	Check to see that the settings in the DSL modem or router match those of the DSL port (refer to the chapter on ADSL commands). If the DSL LED stays off, there may be a problem with the port. Contact the distributor.
4	Take the DSL modem to the subscriber's location. If the DSL LED stays off, check for a problem with the telephone wiring that connects to the subscriber.

14.2 Data Transmission

The DSL LED is on, but data cannot be transmitted.

Table 14-2 Troubleshooting Data Transmission

STEPS	CORRECTIVE ACTION
1	Check to see that the VPI/VCI settings in the DSL modem or router match those of the line card (refer to the enabling DSL ports sections in the chapter on ADSL commands). Also, make sure that the DSL modem or router is using RFC 1483 encapsulation, bridge mode and LLC- based multiplexing.
2	Make sure that the line card's IP settings are properly configured; refer to the chapter on IP commands.
3	Check the line card's VLAN configuration. Refer to the chapter on bridge commands and the chapter on IEE tagged VLAN commands.
4	Ping the line card from the computer behind the DSL modem or router.

Table 14-2 Troubleshooting Data Transmission

STEPS	CORRECTIVE ACTION
5	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.
7	If using a different port does not work, try a different DSL modem or router with the original port.

14.3 DSL LED(s) Turn On and Off

A DSL LED turns on and off intermittently.

Table 14-3 Troubleshooting a Non-Constant DSL LED

STEPS	CORRECTIVE ACTION
1	Use the `linerate` command to check the subscriber's telephone wiring (refer to the chapter on ADSL commands for details).
2	Connect a DSL modem directly to the DSL port of the line card using a different telephone wire. If the DSL LED still turns on and off repeatedly, contact the distributor.

14.4 Data Rate

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

Table 14-4 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. Use the `linerate` command to check the subscriber's telephone wiring. If they do not match when a good wire is used, contact the distributor.

14.5 Configured Settings

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

Table 14-5 Troubleshooting the Line card's Configured Settings

CORRECTIVE ACTION
Use the `config save` command after you finish configuring to save your settings to the line card. If this does not work, contact the distributor.

14.6 Password

I forgot the password to my line card.

Table 14-6 Troubleshooting the Password

CORRECTIVE ACTION
Refer to *section 13.4* to upload the default configuration file. This returns all of the settings to default values, so you lose any configurations you have made.

14.7 Local Server

The computer behind a DSL modem or router cannot access a local server connected to the IES-2000/3000.

Table 14-7 Troubleshooting a Local Server

STEPS	CORRECTIVE ACTION
1	Refer to *section 14.2* to make sure that the subscriber is able to transmit to the line card.
2	Make sure the computer behind the DSL device has the correct gateway IP address configured.
3	Check the line card's VLAN configuration (refer to the chapter on bridge commands and the chapter on IEEE 802.1Q tagged VLAN commands.
4	Check the cable and connections between the IES and the local server.
5	Try to access another local server. If data can be transmitted to a different local server, the original local server (that could not be accessed) may have a problem.

14.8 SNMP

The SNMP manager server cannot get information from the line card.

Table 14-8 Troubleshooting the SNMP Server

STEPS	CORRECTIVE ACTION
1	Ping the line card from the SNMP server. If you cannot, check the cable, connections and IP configuration (see the chapter on IP commands).
2	Check to see that the community (or trusted host) in the line card matches the SNMP server's community. If these steps fail to correct the problem, contact the distributor.

14.9 Telnet

I cannot telnet into the line card.

Table 14-9 Troubleshooting Telnet

STEPS	CORRECTIVE ACTION
1	Make sure that a telnet session is not already operating. The line card only accepts one telnet session at a time.
2	Check that the client IP address(es) match the configured secured host IP address(es), refer to the secured host commands in the chapter on system commands. The line card immediately disconnects the telnet session if they do not match.

Table 14-9 Troubleshooting Telnet

STEPS	CORRECTIVE ACTION
3	Ping the line card from your computer. If you are able to ping the line card but are still unable to telnet, contact the distributor. If you cannot, check the cable, connections and IP configuration (see the chapter on IP Commands).
4	If you are attempting to telnet from the DSL side of the line card, refer to *section 14.2* to make sure that you can transmit data to the line card.
5	If you are attempting to telnet from the Ethernet side of the line card, check the Ethernet cable and connections between the Ethernet extension card and the Ethernet switch.

Part III:

Web Configurator with EEC 1

This part tells how to access and navigate the web configurator and perform initial configuration. It also describes the Getting Started web configurator screens when you use the ADSL line card with the Ethernet extension card.

Chapter 15
Web Configurator with EEC Introduction

This chapter describes how to log into the web configurator and navigate through it.

15.1 Web Configurator with EEC Overview

The embedded web configurator allows you to use a web browser to manage the line card.

15.2 Accessing the Web Configurator

You will need a computer with an Ethernet 10BaseT, 100Base-TX Network Interface Card (NIC). Connect to the relative port in the EEC.

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.

15.2.1 Password

Step 1. Start your web browser.

Step 2. Launch your web browser and enter “192.168.1.1” (the default IP address of the line card) 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 (default “1234”) in the password field.

Step 4. Click **OK**.

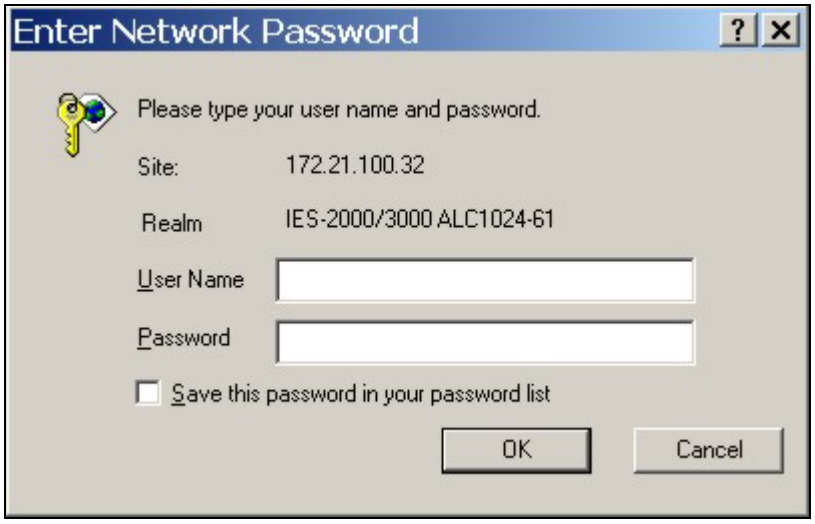


Figure 15-1 Login Screen

15.3 Home Screen

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

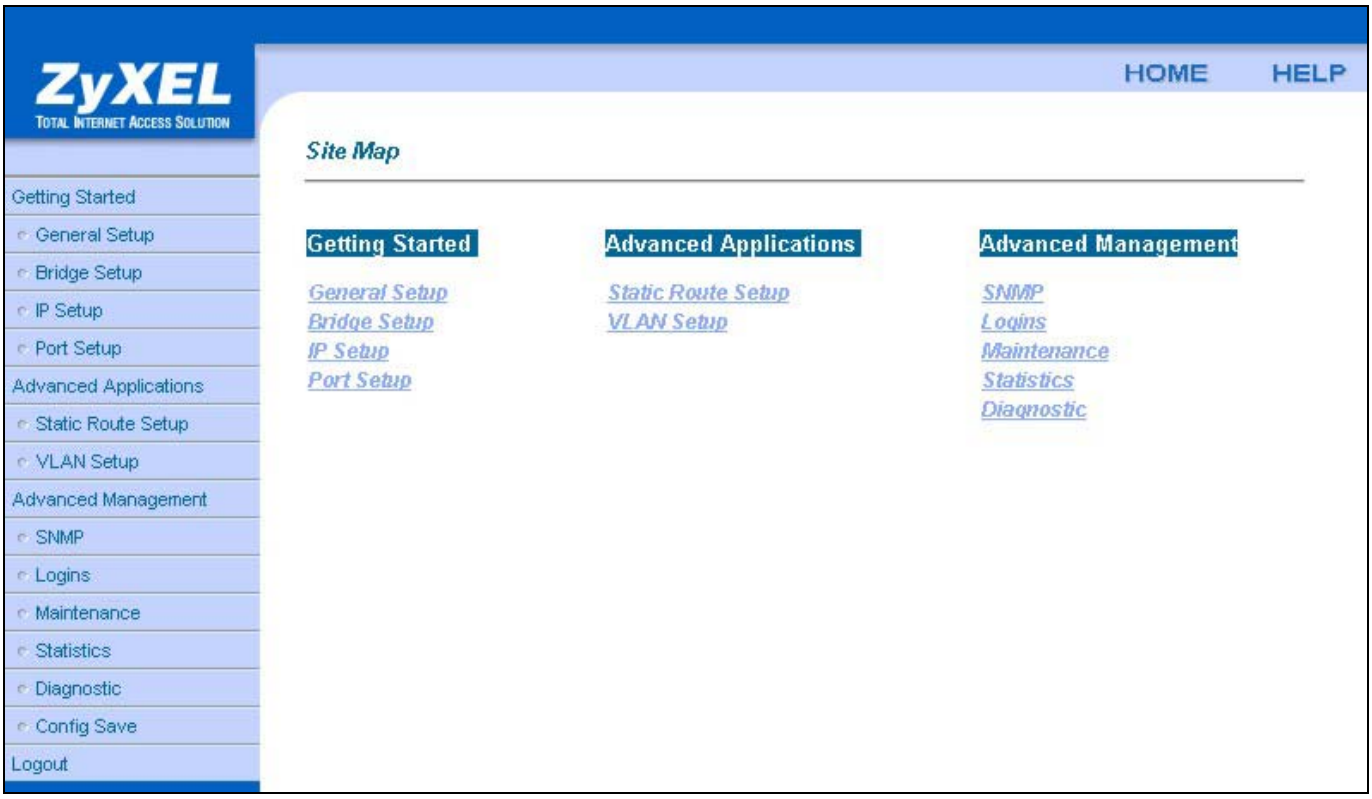


Figure 15-2 Home Screen

The following table describes this screen.

Table 15-1 Navigation Panel Links

LABEL	DESCRIPTION
Getting Started	
General Setup	This link takes you to a screen where you can configure general identification information about the Line Card.
Bridge Setup	This link takes you to a screen where you can configure the line card's Bridge Mode, Ether type, Port and MAC filters and Fast Mode VLAN ID. You can also view the MAC Address History and Multicast Filter Record.
IP Setup	This link takes you to a screen where you can configure the Line Card's IP address information.
Port Setup	This link takes you to screens where you can configure settings for the individual ports on the Line Card.
Advanced Applications	
Static Route Setup	This link takes you to screens where you can configure static routes for the Line Card.
VLAN Setup	This link takes you to screens where you can configure VLANs for the Line Card.
Advanced Management	

SNMP	This link takes you to a screen where you can set up Simple Network Management Protocol.
Logins	This link takes you to a screen where you can change passwords.
Maintenance	This link takes you to screens where you can set UNIX syslog parameters, the time and date and remote management; as well as perform firmware and configuration file maintenance.
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 screens where you can view error logs.
Config Save	Click this to save your changes to the non-volatile memory.
Logout	Click this to exit the web configurator.

15.4 Help

The web configurator's online help has descriptions of individual screens and supplementary information.

Click the **HELP** link from the home screen to view the online help's home screen summary menu.

Click the **HELP** link from a web configurator screen other than the home screen to view an online help description of that screen.

15.5 Screen Overview

The following table lists the various web configurator screens.

Table 15-2 Web Configurator Screens

GETTING STARTED	ADVANCED APPLICATIONS	ADVANCED MANAGEMENT
General Setup	Static Route Setup	SNMP
Bridge Setup	Edit Static Route	Edit SNMP Setup
Bridge Ether Type Filter Setup	VLAN Setup	Logins
Bridge Port Filter Setup	Edit 802.1Q Static Entry	Maintenance
Edit Bridge Port Filter Setup		Secured Client Setup
Bridge Fast Mode VLAN ID Setup		Firmware Upgrade
Bridge MAC Filter Setup		Restore Configuration
Edit Bridge MAC Filter Setup		Configuration Backup
Bridge MAC History		Statistics
Bridge Port Multicast Filter Record		Line Card Statistics
IP Setup		VLAN Status
Port Setup		Diagnostic
Ethernet Port Setup		
ADSL Port Setup		

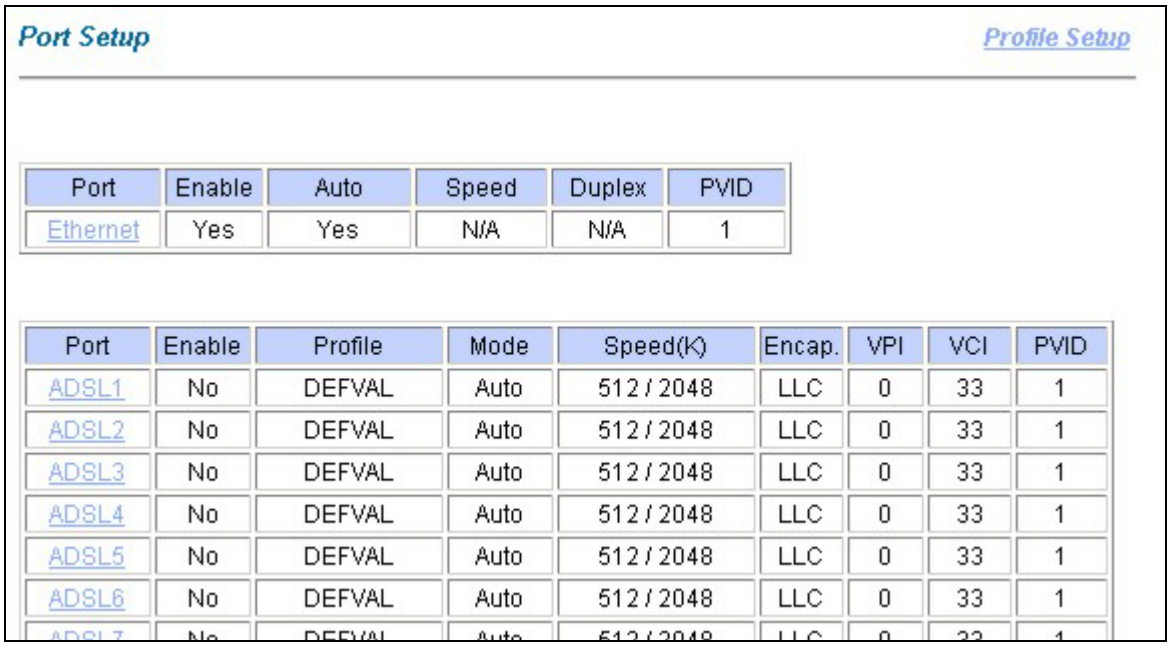
15.6 Saving Your Configuration

Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.

15.7 Navigating the Web Configurator

The web configurator uses multiple levels. Some features only require you to use one level. For example, to configure **General Setup**, click the link on the navigation panel to open the configuration screen.

Some features use more levels. For example, **Port Setup** has screens that allow you to configure individual profiles and individual ports. For example, click **Port Setup** in the navigation panel to go to the general **Port Setup** screen (see Figure 15-3 Port Setup Example) and then click on a port to go down one level and view the **ADSL Port Setup** screen (see Figure 15-4 ADSL Port Setup Example).



Port Setup Profile Setup

Port	Enable	Auto	Speed	Duplex	PVID
Ethernet	Yes	Yes	N/A	N/A	1

Port	Enable	Profile	Mode	Speed(K)	Encap.	VPI	VCI	PVID
ADSL1	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL2	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL3	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL4	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL5	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL6	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1

Figure 15-3 Port Setup Example

Click the link labeled **Port Setup** in the **ADSL Port Setup** screen to go back up a level and view the **Port Setup** screen.

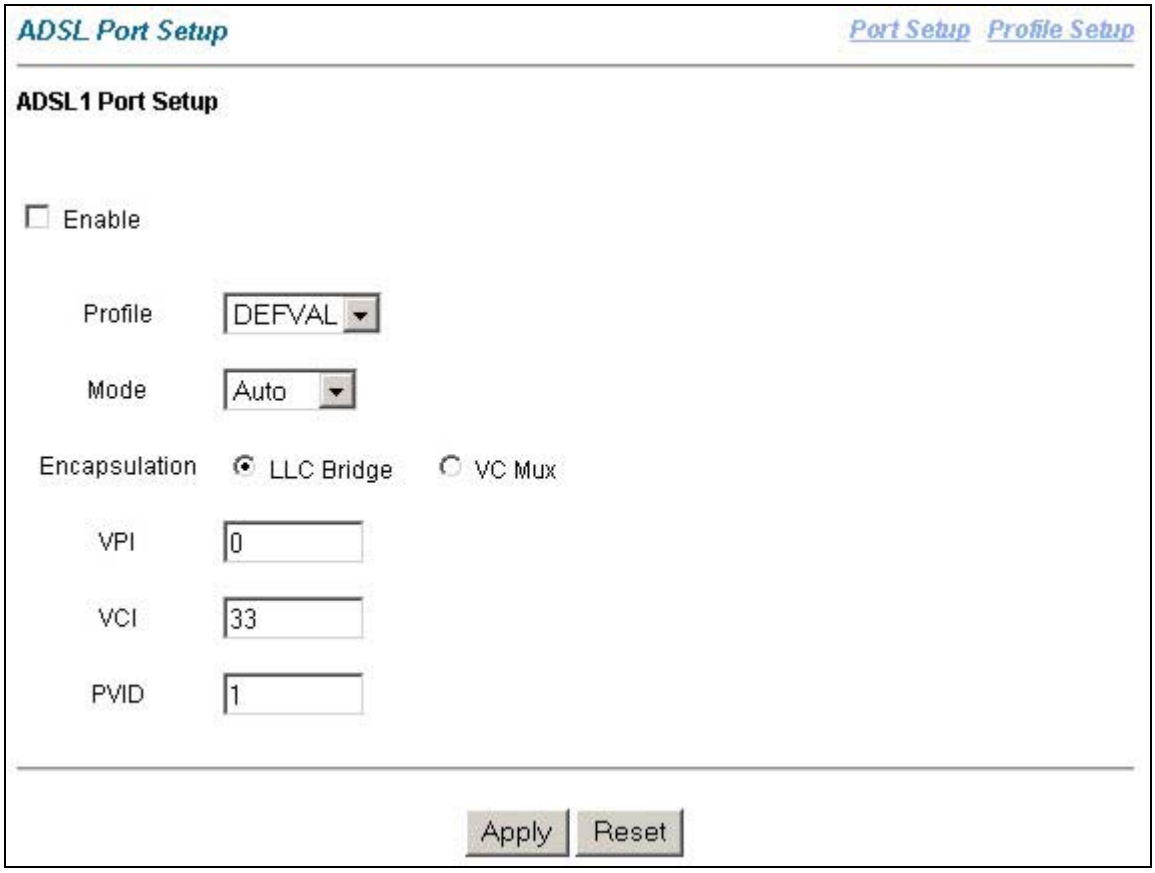


Figure 15-4 ADSL Port Setup Example

Chapter 16
Initial Configuration

This chapter covers the basic configuration needed to set up and use the line card. Refer to the other parts for details about individual fields within screens.

16.1 Initial Configuration Overview

This chapter describes the procedure for the initial configuration of the ADSL line card when used with the Ethernet Extension Card (EEC). Refer to the relevant chapters in this *User's Guide* for descriptions of the fields and buttons within individual screens.

16.2 General Configuration

The ALC leaves the factory with a default IP address of 192.168.1.1 and a subnet mask of 255.255.255.0.

Refer to the directions in *section 15.2* to access the web configurator.

Step 1. Configure the line card's IP address. Click **IP Setup** on the navigation panel. In the **IP Setup** screen, type a new IP address, subnet mask and the default gateway in dot-decimal format and click the **Apply** button.

Step 2. Close the current browser window and launch your web browser again. Enter the new IP address in the **Location** or **Address** field. Press [ENTER].

Step 3. Click **Bridge Setup** on the navigation panel to view the default bridge settings.

Step 4. Modify the Bridge Mode, Ether Type Filter, Port Filter, MAC Filter, and IGMP snooping default settings (see the web configurator help and this *User's Guide* for descriptions) that do not match your network and click **Apply**.

16.3 ADSL Configuration

The following is a procedure for the essential configuration of the line card. It only lists the critical parameters that must be set for the card to be operational; the unit should work fine with the rest of the parameters taking the default values.

The line card allows you to define tables of specific ADSL settings (called profiles) and then use those profiles when configuring individual DSL ports. This makes individual DSL port configuration easier because you assign the port a pre-defined profile of settings instead of having to retype those settings for each port that you configure.

First, configure a different profile for each desired group of port settings on the ALC.

Procedure:

Step 1. Go to the **Port Setup** screen by clicking the **Port Setup** link on the navigation panel.

Step 2. Click the **Profile Setup** link in the **Port Setup** screen.

Step 3. Specify the name for the profile.

Step 4. Configure the upstream and downstream maximum and minimum rates, and the maximum, minimum and target signal to noise margins.

Step 5. Click the **Add** button in the **Profile Setup** screen.

Step 6. Click **Apply** to save the profile.

Step 7. Repeat from step 1 until you have all the necessary profiles.

Second, configure the individual DSL ports on the Line Card or SLC.

Step 1. From the **Profile Setup** screen, click the **Port Setup** link to return to the **Port Setup** screen.

Step 2. Click a port number for a DSL port in the **Index** column to go to the individual port setup screen.

Step 3. On the individual port setup screen, select the **Enable** check box to enable the port.

Step 4. Select a profile from the drop-down list box.

Step 5. Select an encapsulation type.

Step 6. Enter the VPI/VCI.

Step 7. Enter a PVID to assign to untagged frames received on this port.

Step 8. Click **Apply** to save the port settings.

Step 9. Repeat from step 1 until you have all the necessary ports configured.

16.4 VLAN Setup

In a typical setup, each DSL port uses a different VLAN ID (VID) in order to isolate the subscribers. Configure a management VLAN ID for the Ethernet port.

16.4.1 ALC VLAN Setup

Procedure:

Step 1. To configure tag-based VLAN on the ALC ports, click **VLAN Setup** on the navigation panel.

Do not alter VLAN ID 1 or the Management VLAN ID **yet.**

Step 2. Click an index number to open the **Add VLAN Static Entry** screen.

Step 3. Fill in the VLAN ID for the port in the **VLAN ID** textbox.

Step 4. For a typical setup, select **Fixed** in the **Port Type** field; select **TX Tagging** for the uplink port; and select **Forbidden** for all the other ports.

Step 5. Click the **Apply** button.

Step 6. Repeat these steps for the rest of the ports.

16.4.2 Management VLAN Setup

Procedure:

Step 1. To configure the management VLAN, click the **VLAN Setup** link on the navigation panel.

Step 2. Select an index number in the **Static VLAN Setup** screen to open the **Add VLAN Static Entry** screen.

Step 3. Fill in the management VID in the **VLAN ID** textbox.

Step 4. Select the **Forbidden** radio button of every DSL port to prevent the subscribers from modifying the configuration; select the **Fixed** for the Ethernet port and then select the **TX Tagging** check box.

Step 5. Click the **Apply** button. This will bring you back to the **VLAN Static Entry Setup** screen.

Step 6. In the **VLAN Static Entry Setup** screen, fill in the **CPU VLAN ID** textbox and click **Apply**.

Step 7. In the **VLAN Static Entry Setup** screen, click **Index 1** to open the **Edit VLAN Static Entry** screen.

Step 8. Select the **Delete** check box and click **Apply** to deactivate the entry.

Chapter 17
Getting Started Screens

This chapter explains the General Setup and Bridge Setup screens.

17.1 Getting Started Overview

The web configurator allows you to configure basic settings using the Getting Started screens.

17.2 General Setup Screen

Click **General Setup** in the navigation panel to open this screen.

Use this screen to set up general identification information for the line card.

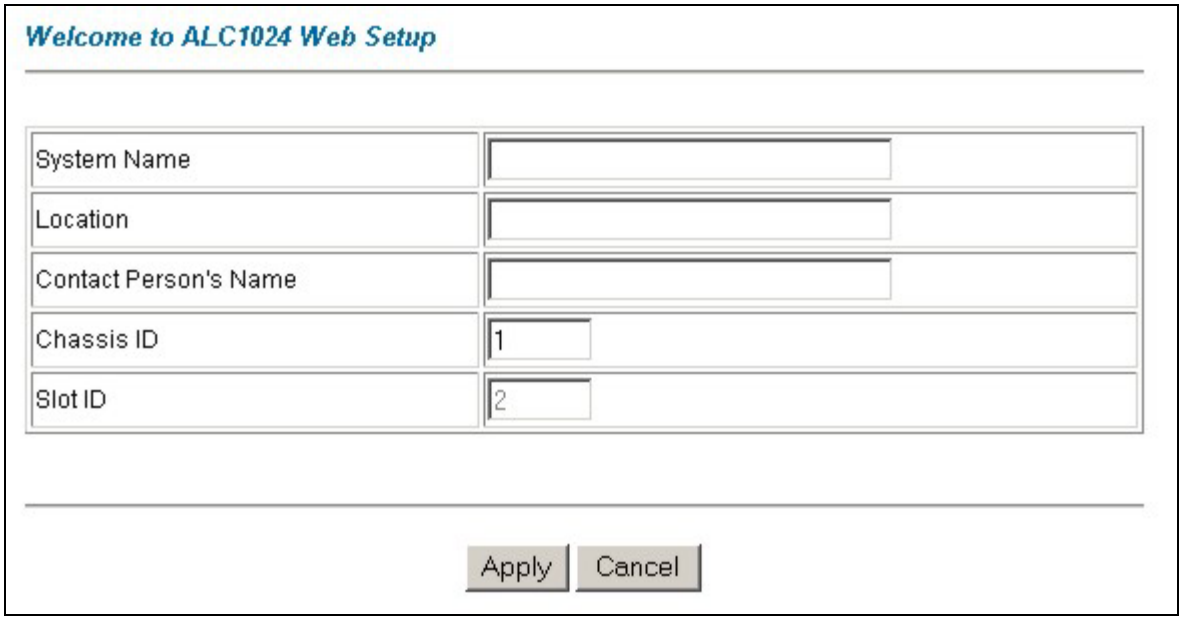


Figure 17-1 General Setup

The following table describes this screen.

Table 17-1 General Setup

System Name	Type a descriptive name for identification purposes. This name can be up to 30 alphanumeric characters long.
Location	Type the geographic location (up to 30 characters) of your line card.
Contact Person's Name	Type the name (up to 30 characters) of the person in charge of this line card.
Chassis ID	Type a chassis ID number from 1 to 64. The chassis ID helps to keep track of this individual unit in a multiple unit application.

Slot ID	The slot ID helps keep track of this individual network module. This field is read only.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click **Cancel** to begin configuring this screen afresh.

17.3 Bridge Setup Screen

Click **Bridge Setup** in the navigation panel to open this screen.

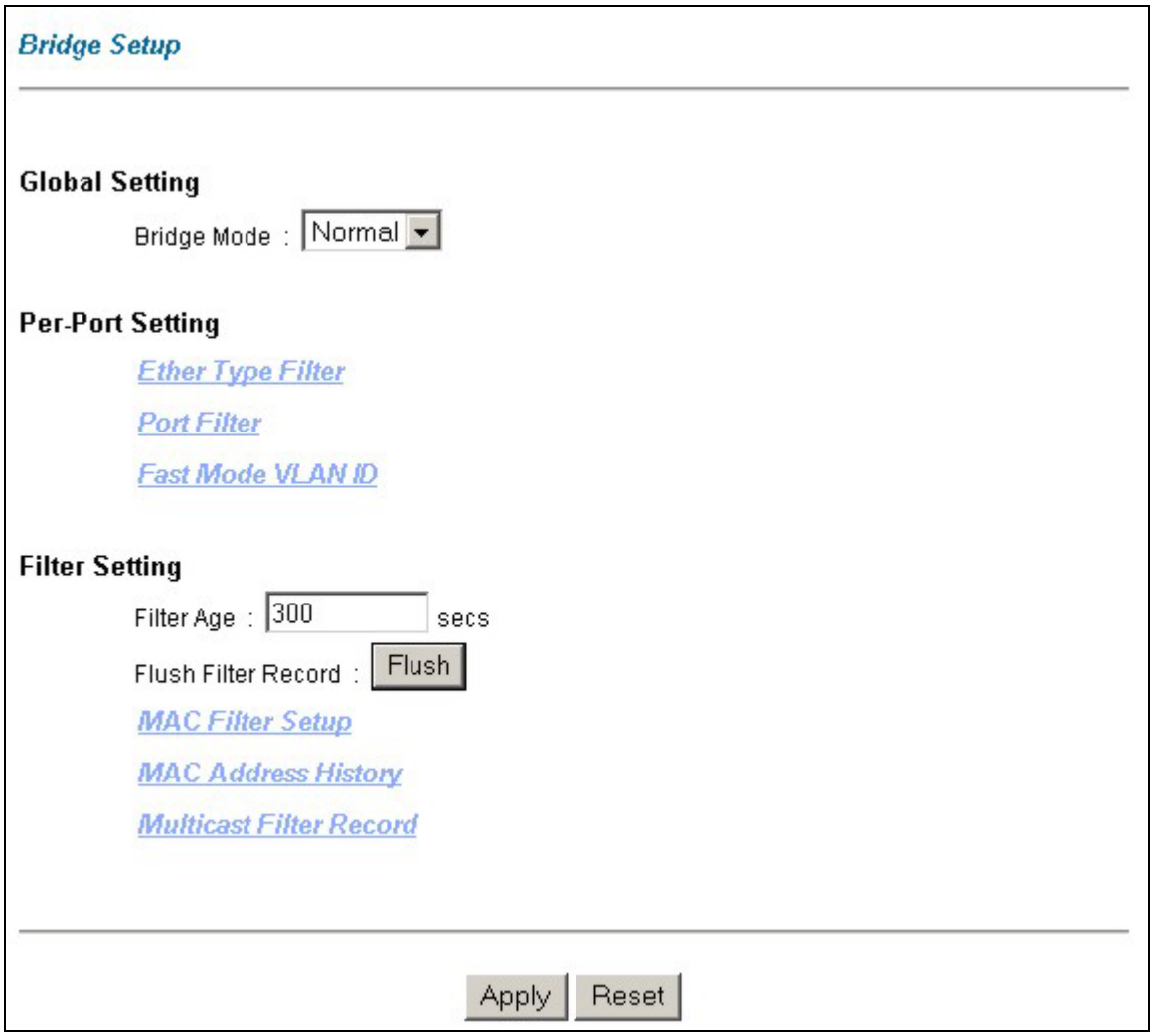


Figure 17-2 Bridge Setup

The following table describes this screen.

Table 17-2 Bridge Setup

LABEL	DESCRIPTION
Global Setting	
Bridge Mode	Choose **Normal** or **Fast** from the drop-down list box. The **Normal** mode supports 802.1Q tagged VLAN (enabled in VLAN Setup), which allows tagged/untagged frames to and from all ports. The **Fast** mode allows tagged frames on the LAN port and untagged frames on the ADSL ports.
Per Port Setting	
Ether Type Filter	Click this link to go to a screen for editing the Ethernet Type for each port.
Port Filter	Click this link to go to a screen for editing each port's egress (outgoing) ports.
Fast Mode VLAN ID	Click this link to go to a screen for editing each port's VLAN ID (only in Fast Mode).
Filter Setting	
Filter Age	This box sets or shows the aging out timer period of the filtering database.
Flush Filter Record	Click this button to clear the filtering database for all ports.
MAC Filter Setup	Click this link to go to a screen for editing the MAC filtering for each port.
MAC Address History	Click this link to show the filtering database for each port.
Multicast Filter Record	Click this link to show received multicast information for each port.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.
Reset	Click **Reset** to begin configuring this screen afresh.

17.3.1 Ethernet Type Filter Setup Screen

Click **Ethernet Type Filter** in the **Bridge Setup** screen to open this screen.

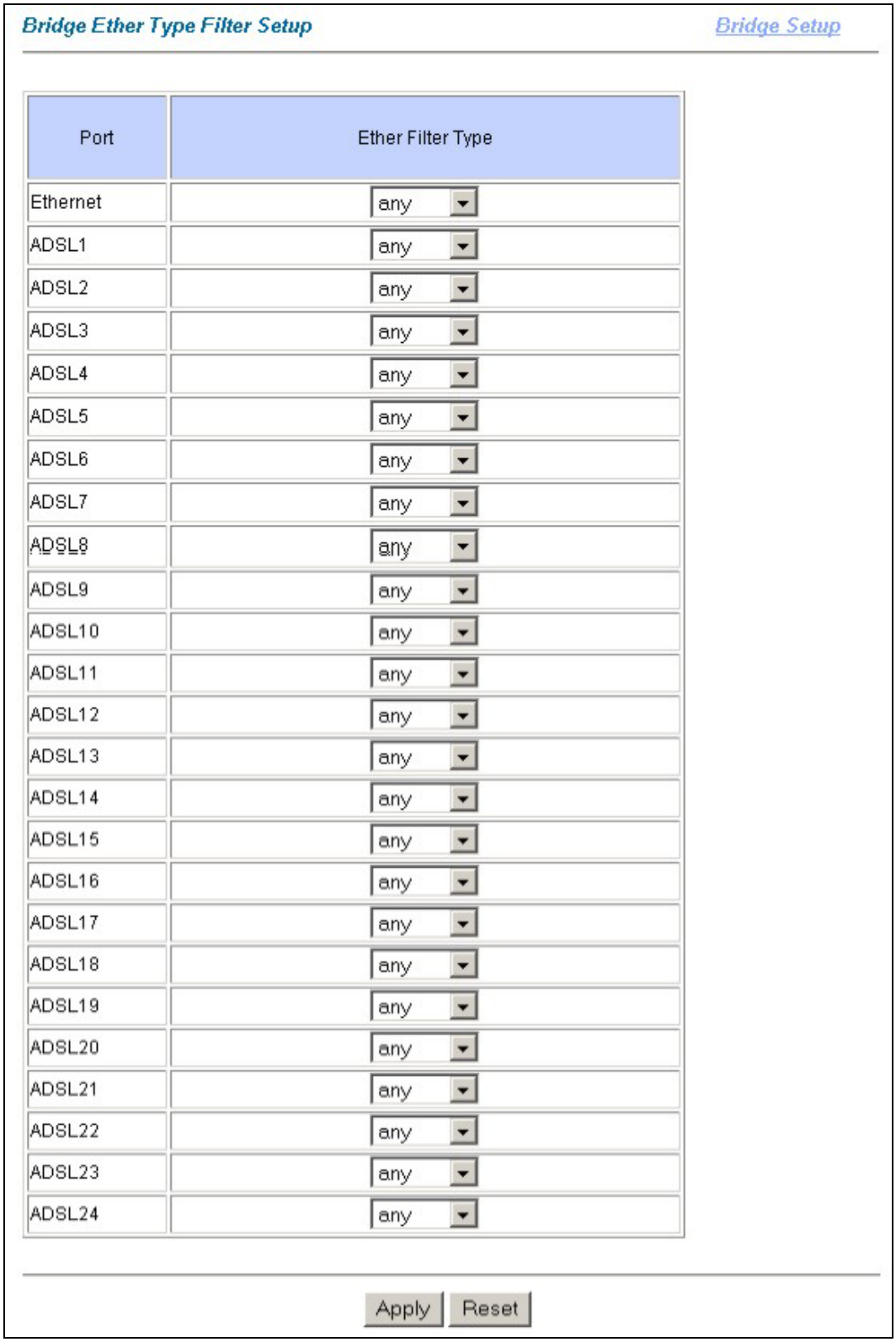


Figure 17-3 Bridge Ether Type Filter Setup

The following table describes this screen.

Table 17-3 Bridge Ether Type Filter Setup

LABEL	DESCRIPTION
Bridge Setup	Click this link to go to the **Bridge Setup** screen.
Port	Click an entry to go to a screen to edit the egress ports for that port.
Ethernet Filter Type	Choose **Any** or **IP** or **PPPoE** from the drop-down list. Choose **Any** to allow all kinds of packets, **IP** to allow IP packets only or **PPPoE** to allow PPPoE packets only.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.
Reset	Click **Reset** to begin configuring this screen afresh.

17.3.2 Port Filter Setup Screen

Click **Port Filter** in the **Bridge Setup** screen to open this screen.

Figure 17-4 Bridge Port Filter Setup

The following table describes this screen.

Table 17-4 Bridge Port Filter Setup

LABEL	DESCRIPTION
Bridge Setup	Click this link to go to the **Bridge Setup** screen.
Port	Click an entry to go to a screen to edit the egress ports for that port.

Table 17-4 Bridge Port Filter Setup

LABEL	DESCRIPTION
Egress Port	This field displays the forwarding ports for this port.

Edit Bridge Port Filter Setup Screen

Click a port link in the **Bridge Port Filter Setup** screen to open this screen.

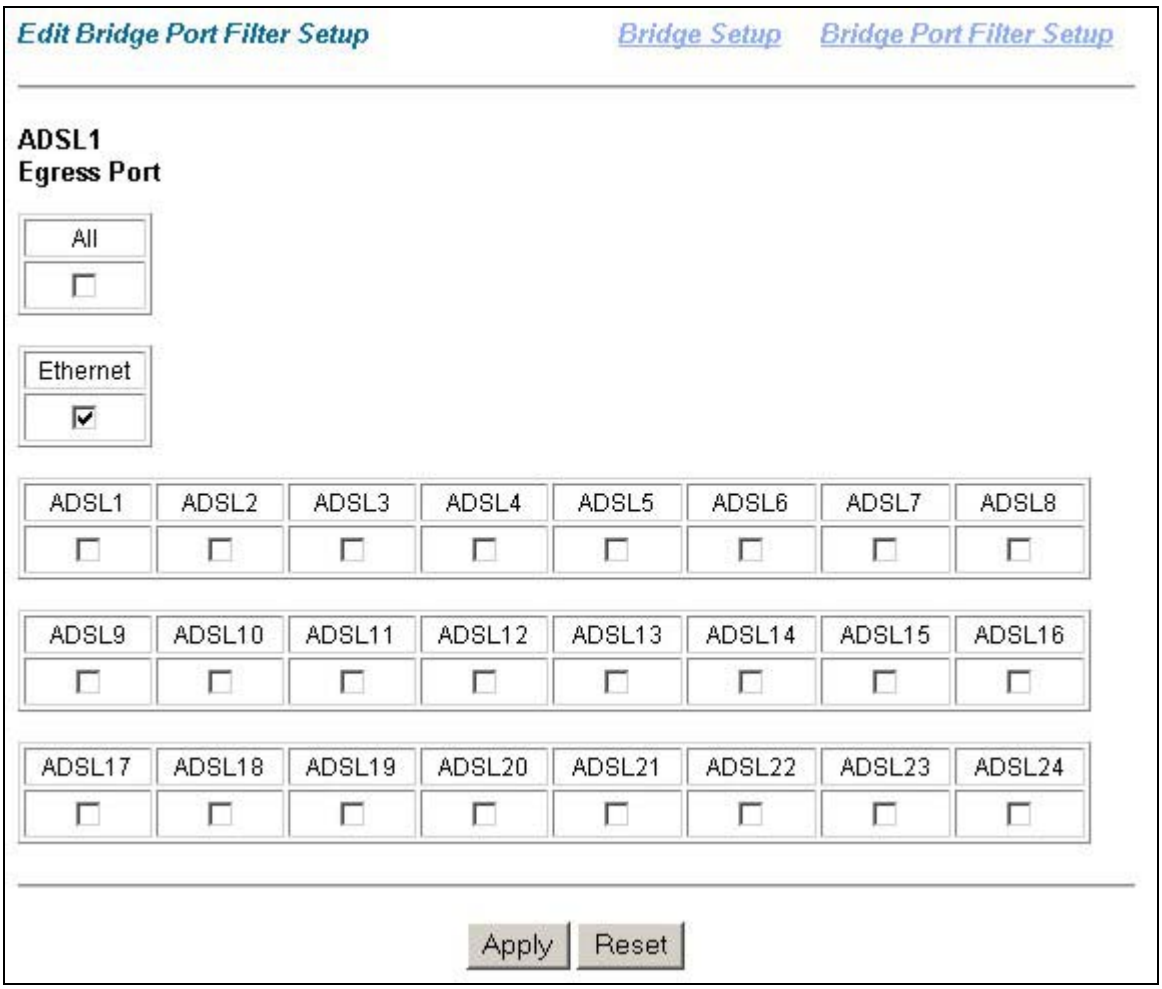


Figure 17-5 Edit Bridge Port Filter Setup

The following table describes this screen.

Table 17-5 Edit Bridge Port Filter Setup

LABEL	DESCRIPTION
Bridge Setup	Click this link to go to the **Bridge Setup** screen.
Bridge Port Filter Setup	Click this link to go to the **Bridge Port Filter Setup** screen.
All	Select this check box to forward packets to all ports.
Ethernet	Select this check box to forward packets to the Ethernet port.

Table 17-5 Edit Bridge Port Filter Setup

LABEL	DESCRIPTION
ADSL1-ADSLn	Select one or more of these check boxes in order to forward packets to specific ADSL ports.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.
Reset	Click **Reset** to begin configuring this screen afresh.

17.3.3 Fast Mode VLAN ID Setup Screen

Click **Fast Mode VLAN ID** in the **Bridge Setup** screen to open this screen.

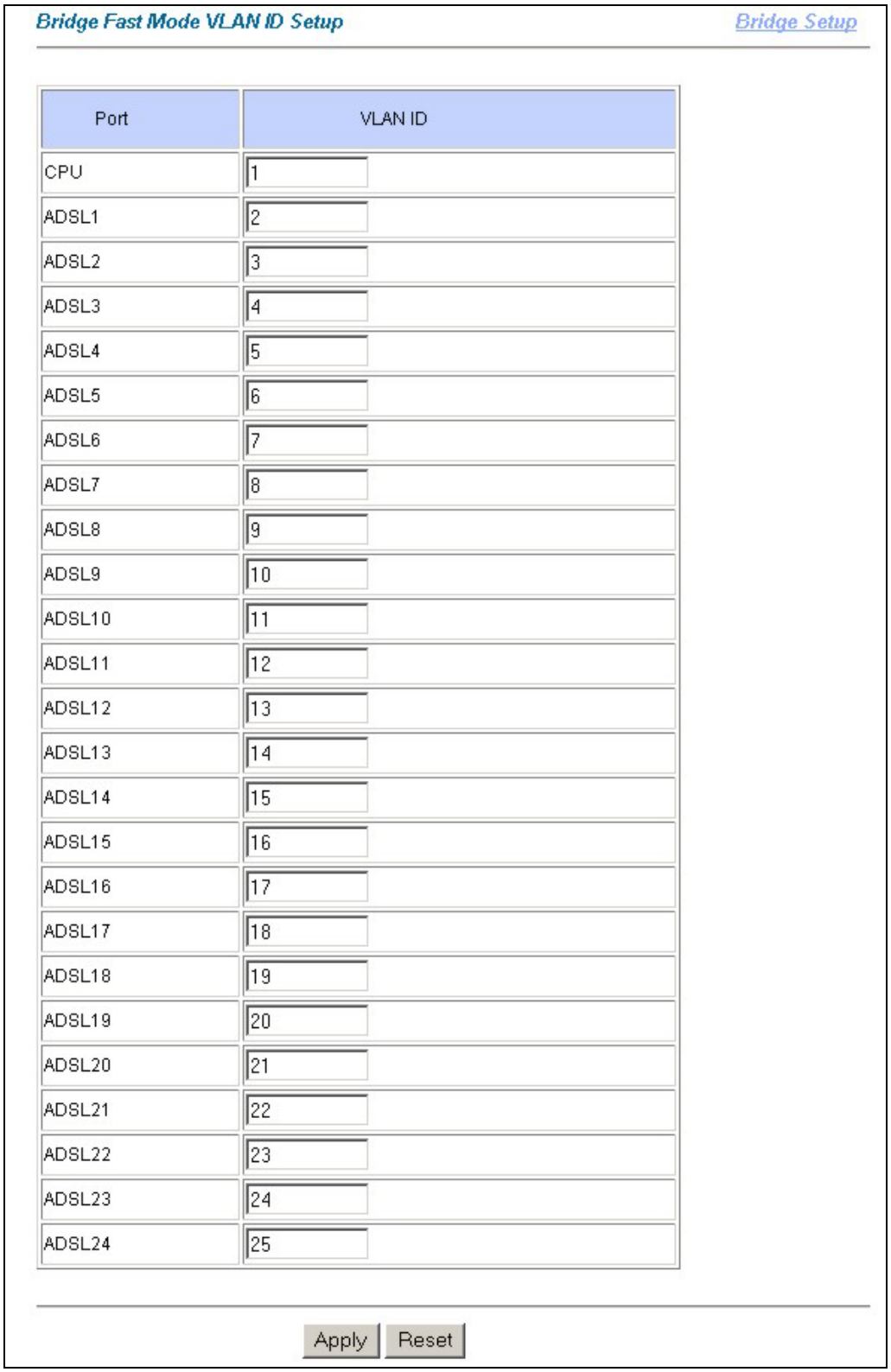


Figure 17-6 Bridge Fast Mode VLAN ID Setup

The following table describes this screen.

Table 17-6 Bridge Fast Mode VLAN ID Setup

LABEL	DESCRIPTION
Bridge Setup	Click this link to go to the **Bridge Setup** screen.
Port	This is the port's name.
VLAN ID	Enter a VLAN ID number for the port.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.
Reset	Click **Reset** to begin configuring this screen afresh.

17.3.4 MAC Filter Setup Screen

Click **MAC Filter Setup** in the **Bridge Setup** screen to open this screen.

Figure 17-7 Bridge MAC Filter Setup

The following table describes this screen.

Table 17-7 Bridge MAC Filter Setup

LABEL	DESCRIPTION
Bridge Setup	Click this link to go to the **Bridge Setup** screen.
Port	Click the port name to edit that port's MAC filter setup.
Filtering Enabled	This field tells whether or not filtering has been enabled for that port.

Edit Bridge MAC Filter Setup Screen

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

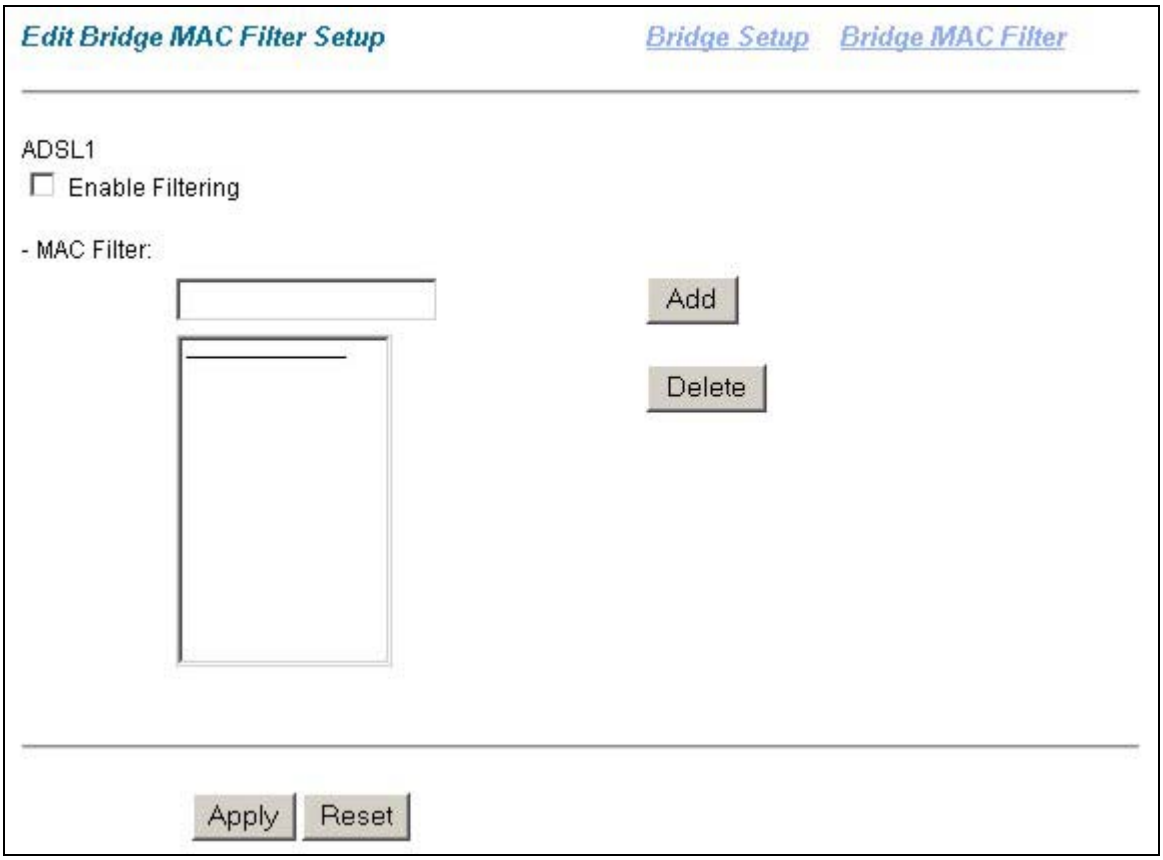


Figure 17-8 Edit Bridge MAC Filter Setup

The following table describes this screen.

Table 17-8 Edit Bridge MAC Filter Setup

LABEL	DESCRIPTION
Bridge Setup	Click this link to go to the **Bridge Setup** screen.
Bridge MAC Filter	Click this link to go to the **Bridge MAC Filter** screen.
Enable Filtering	Select this check box to enable MAC filtering on this port.
Edit Box	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 **Add**.
MAC Filter	This box lists the MAC addresses that are set for this port. All of the MAC addresses in this list are applied to the volatile memory when you click the **Apply** button.
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.

Table 17-8 Edit Bridge MAC Filter Setup

LABEL	DESCRIPTION
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.
Reset	Click **Reset** to begin configuring this screen afresh.

17.3.5 MAC Address History Screen

Click **MAC Address History** in the **Bridge Setup** screen to open this screen.

This screen displays a list of the MAC addresses that have connected to each individual port on the network module. The listing includes MAC addresses and the connected time (measured in seconds) for each port.

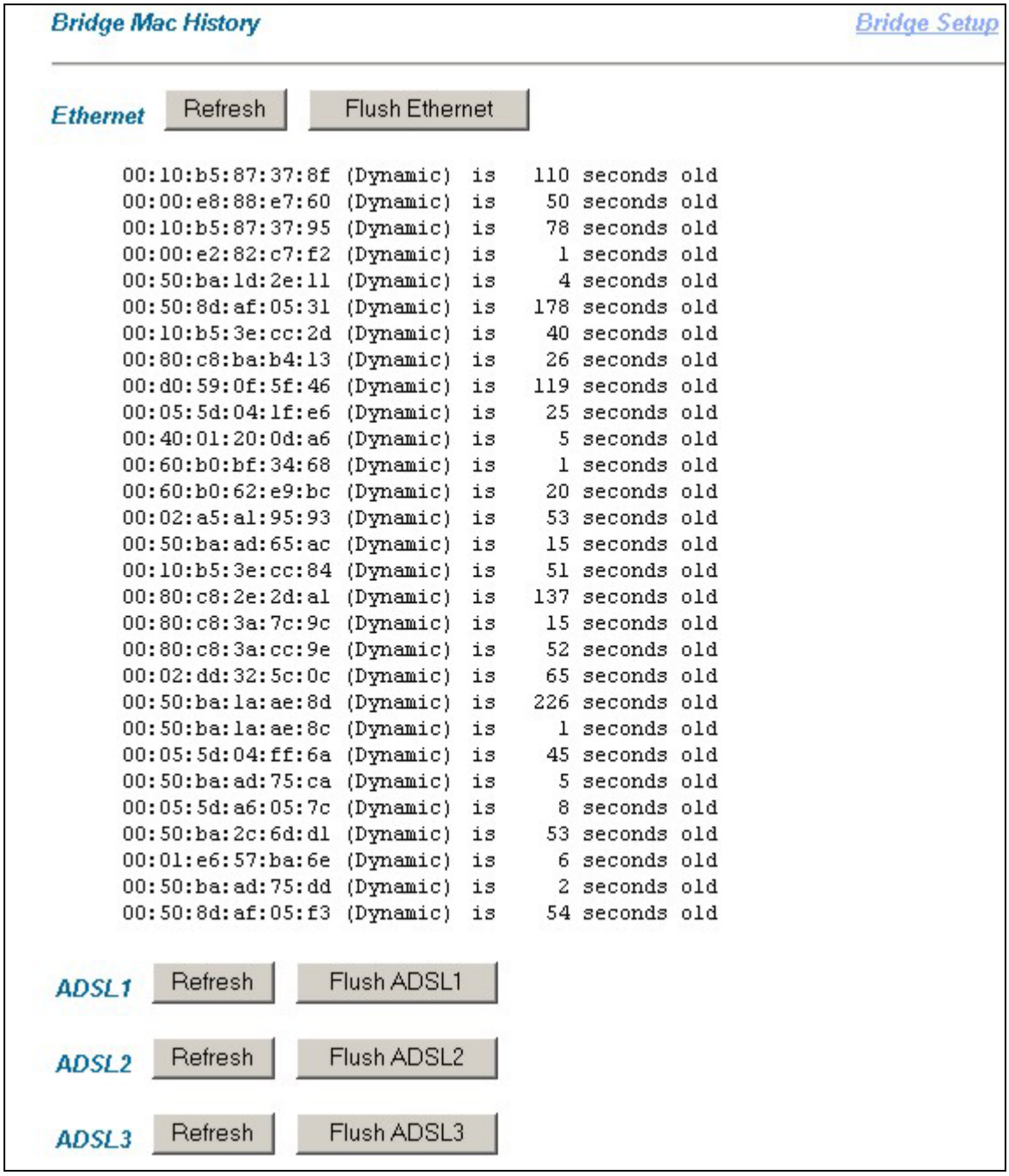


Figure 17-9 Bridge MAC History

The following table describes this screen.

Table 17-9 Bridge MAC History

LABEL	DESCRIPTION
Bridge Setup	Click this link to go to the **Bridge Setup** screen.
Refresh	Click this button to update the MAC address listings.
Flush Ethernet	Click this button to clear the MAC address listings for the Ethernet port.

Table 17-9 Bridge MAC History

LABEL	DESCRIPTION
Flush ADSL1~n	Click this button to clear the MAC address listings for xDSL ports 1-n. Where n is the maximum port number.

17.3.6 Multicast Filter Record Screen

Click **Multicast Filter Record** in the **Bridge Setup** screen to open this screen.

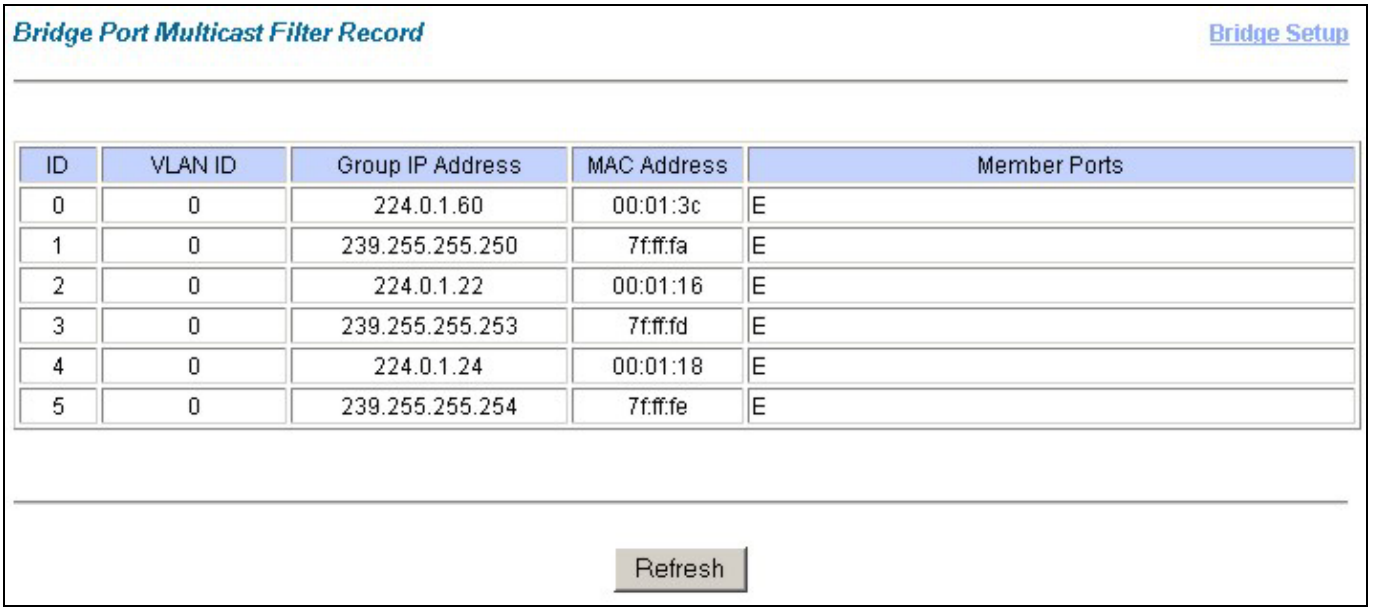


Figure 17-10 Bridge Port Multicast Filter Record

The following table describes this screen.

Table 17-10 Bridge Port Multicast Filter Record

LABEL	DESCRIPTION
Bridge Setup	Click this link to go to the **Bridge Setup** screen.
ID	This field displays the location of the entry in the multicast filtering database.
VLAN ID	This is the VLAN ID (Virtual LAN ID) for the multicast group.
Group IP Address	This field displays the destination IP address of a multicast group.
MAC Address	This field displays the last three bytes of the MAC address to which the multicast group is mapped.
Member Ports	This field displays the ports that belong to this multicast group, E=Ethernet, 1~24 = ADSL ports 1 through 24.
Refresh	Click this button to update the bridge port multicast record.

17.4 IP Setup Screen

The line card needs an IP address for it to be managed over the network. The factory default IP address is 192.168.1.1. The subnet mask specifies the network number portion of an IP address. The factory default subnet mask is 255.255.255.0. The default gateway specifies the IP address of the default gateway (next hop) for outgoing traffic. The default gateway is specified as 192.168.1.254.

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

Use this screen to configure the IP address of the line card.

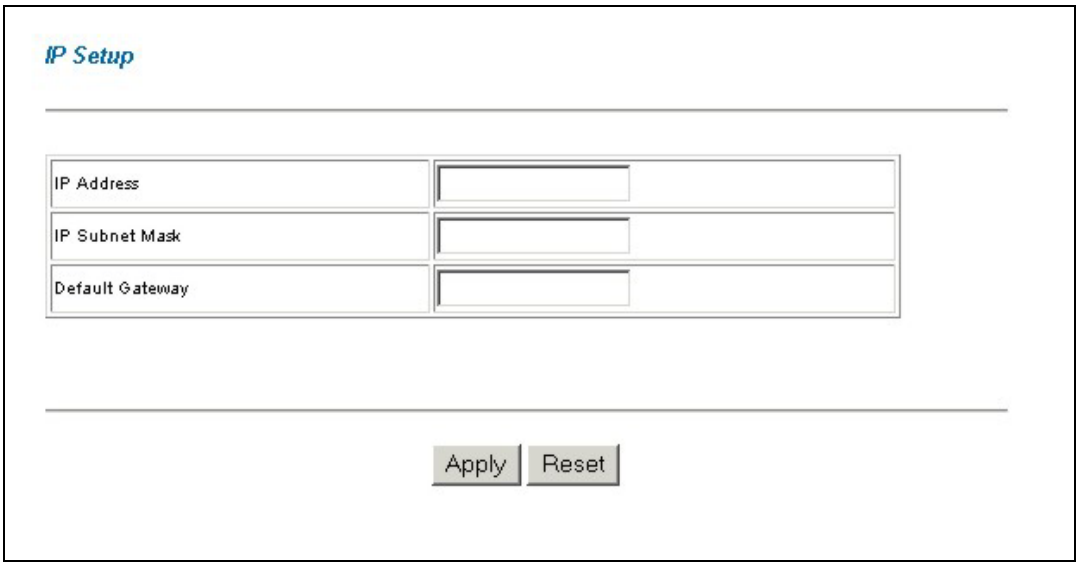


Figure 17-11 IP Setup

The following table describes this screen.

Table 17-11 IP Setup

LABEL	DESCRIPTION
IP Address	Enter the IP address of the line card in dotted decimal notation, for example 192.168.1.1.
IP Subnet Mask	Enter the IP subnet mask of your line card in dotted decimal notation, for example 255.255.255.0.
Default Gateway	Enter the IP address of the default-outgoing gateway in dotted decimal notation, for example 192.168.1.254.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.
Reset	Click **Reset** to begin configuring this screen afresh.

Chapter 18
Port Setup

This chapter explains how to configure individual ports on the line card.

18.1 Port Setup Overview

The web configurator allows you to configure settings for the ADSL line.

18.2 LLC Bridge

LLC Bridge is a type of encapsulation where one VC (Virtual Circuit) carries multiple protocols with protocol identifying information being contained in each packet header. 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.

18.3 VC Mux

VC Mux is a type of encapsulation where, by prior mutual agreement, each protocol is assigned to a specific virtual circuit, for example, 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.

18.4 Flow Control

IEEE802.3 flow control manages the sending of traffic so the sending line card does not transmit more than the receiving line card can process. This helps prevent traffic from being dropped and having to be resent.

18.5 Default Settings

The default profile always exists and all of the ADSL ports use the default profile settings when the 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.

18.5.1 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

18.5.2 Other Default Settings

The factory default settings for all ADSL ports of the line card are

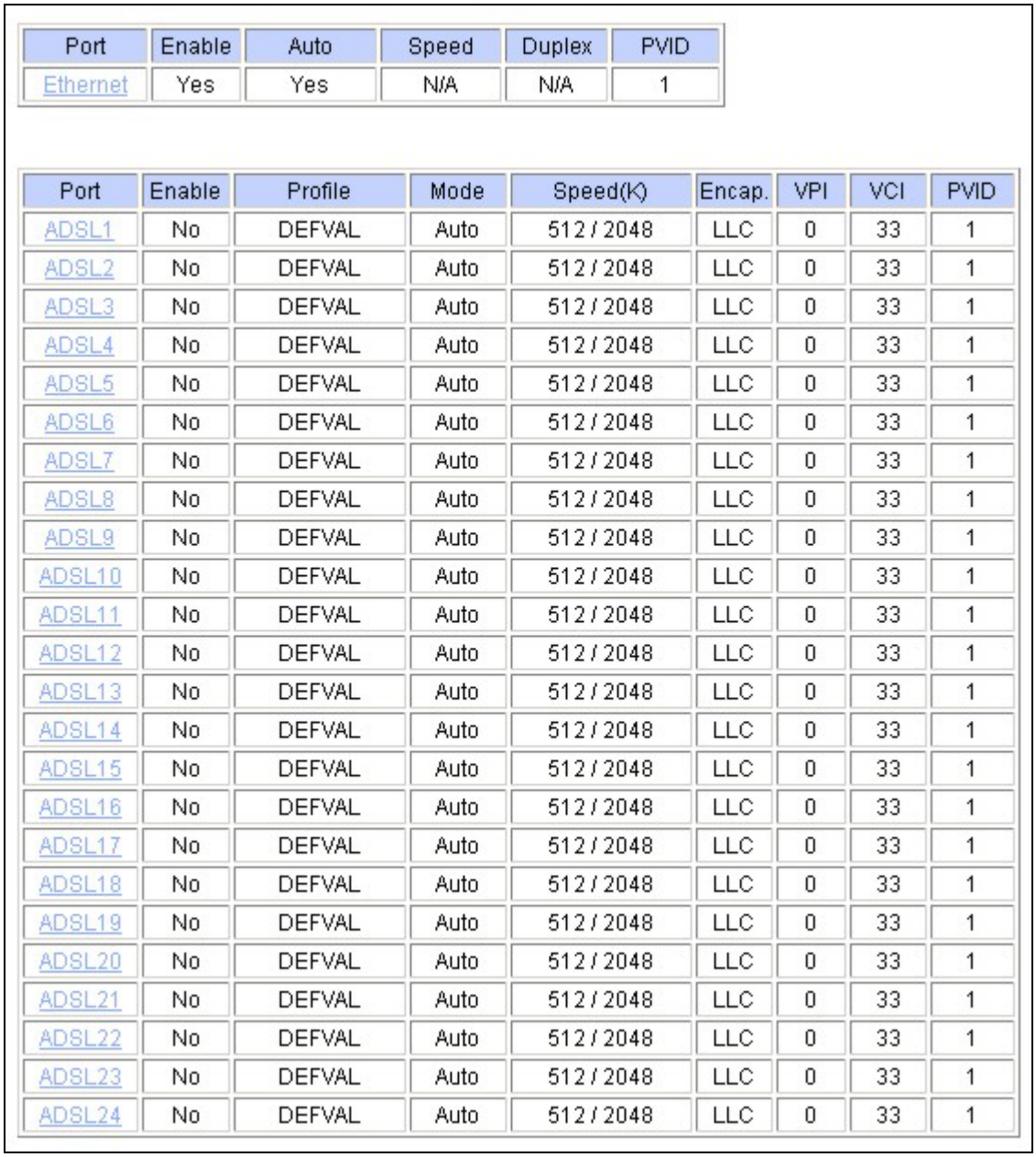
- Encapsulation: RFC 1483
- Multiplexing: LLC-based
- VPI: 0
- VCI: 33
- Enable/Disable State: disabled

Operational mode: auto

18.6 Line Card Port Setup Screen

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

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



Port	Enable	Auto	Speed	Duplex	PVID
Ethernet	Yes	Yes	N/A	N/A	1

Port	Enable	Profile	Mode	Speed(K)	Encap.	VPI	VCI	PVID
ADSL1	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL2	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL3	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL4	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL5	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL6	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL7	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL8	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL9	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL10	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL11	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL12	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL13	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL14	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL15	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL16	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL17	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL18	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL19	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL20	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL21	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL22	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL23	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1
ADSL24	No	DEFVAL	Auto	512 / 2048	LLC	0	33	1

Figure 18-1 Line Card Port Setup

The following table describes this screen.

Table 18-1 Line Card Port Setup

LABEL	DESCRIPTION
Ethernet	
Port	This field shows the port's name "Ethernet".
Enable	This field shows whether or not this port is enabled (the Ethernet port is always enabled).
Auto	This field shows whether auto-negotiation is turned on (Yes) or not (No). The **Speed** and **Duplex** fields display N/A when the auto-negotiation is turned on.
Speed	This is the speed of the Ethernet connection.

Table 18-1 Line Card Port Setup

LABEL	DESCRIPTION
Duplex	The duplex mode can be half (meaning traffic is transmitted in one direction at a time) or full (meaning traffic is simultaneously transmitted in both directions).
PVID	This is the VLAN ID that the line card assigns to untagged packets that come in through this port.
ADSL	
Port	This field identifies the port's index number.
Enable	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 line card is set to.
Speed (K)	This field displays this port's encapsulation type.
Encap	This field displays this port's encapsulation type.
VPI	This field displays this port's Virtual Path ID.
VCI	This field displays this port's Virtual Circuit ID.
PVID	This is the VLAN ID that the line card assigns to untagged packets that come in through this port.

18.6.1 Ethernet Port Setup Screen

Click **Ethernet** in the **Port Setup** screen to open this screen.

Figure 18-2 Ethernet Port Setup

The following table describes this screen.

Table 18-2 Ethernet Port Setup

LABEL	DESCRIPTION
Port Setup	Click this link to go to the **Port Setup** screen.
Speed	Use the drop-down list box to select a speed and duplex setting for the Ethernet port. In 10/100Mbps Fast Ethernet, the speed can be 10Mbps or 100Mbps. The duplex mode can be Half (meaning traffic is transmitted in one direction at a time) or Full (meaning traffic is simultaneously transmitted in both directions). Select **Auto** to have the Ethernet port auto-negotiate with a peer to obtain the connection speed and duplex mode.
PVID	Type the Port VLAN ID from 1 to 4094. The PVID tells the line card what VLAN ID to assign to untagged packets that come in through this port.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link in the navigation panel on the left to save your changes to the non-volatile memory when you are done configuring. Click **Cancel** to begin configuring this screen afresh
Reset	Click **Reset** to begin configuring this screen afresh.

18.6.2 ADSL Port Setup Screen

Click an ADSL port in the **Port Setup** screen to open this screen.

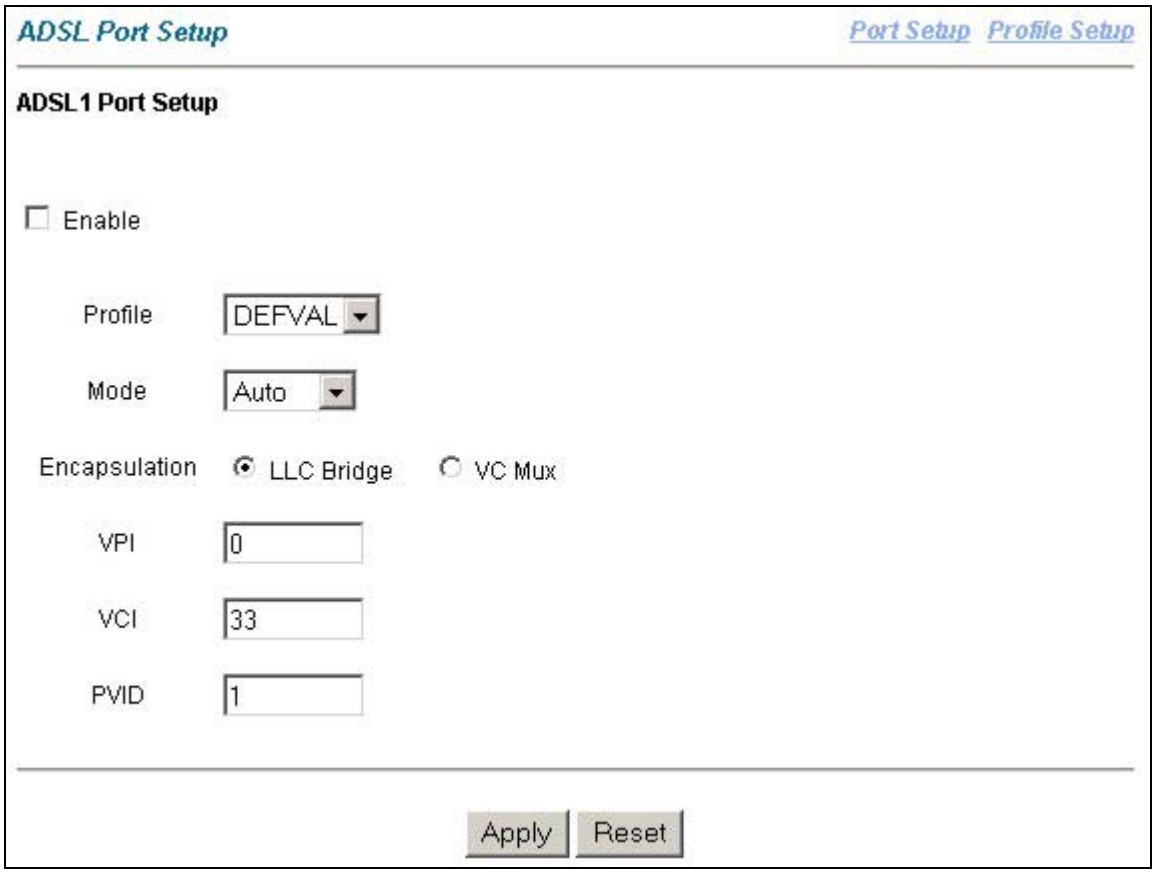


Figure 18-3 ADSL Port Setup

The following table describes this screen.

Table 18-3 ADSL Port Setup

LABEL	DESCRIPTION
Port Setup	Click this link to go to the **Port Setup** screen.
Profile Setup	Click this link to go to the **Profile Setup** screen.
Enable	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.
Profile	Use the drop-down list box to select a profile to assign to this port.
Mode	Use the drop-down list box to select the ADSL operational mode for this port.
Encapsulation	Use the option buttons to select the encapsulation type for this port.
VPI	Type the Virtual Path ID for this port.
VCI	Type the Virtual Circuit ID for this port.
PVID	Type the Port VLAN ID from 1 to 4094. The PVID tells the line card what VLAN ID to assign to untagged packets that come in through this port.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link in the navigation panel on the left to save your changes to the non-volatile memory when you are done configuring. Click **Cancel** to begin configuring this screen afresh
Reset	Click **Reset** to begin configuring this screen afresh.

18.6.3 Line Card Profile Setup Screen

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

Click **Port Setup** in the navigation panel to open the line card’s **Port Setup** screen.

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

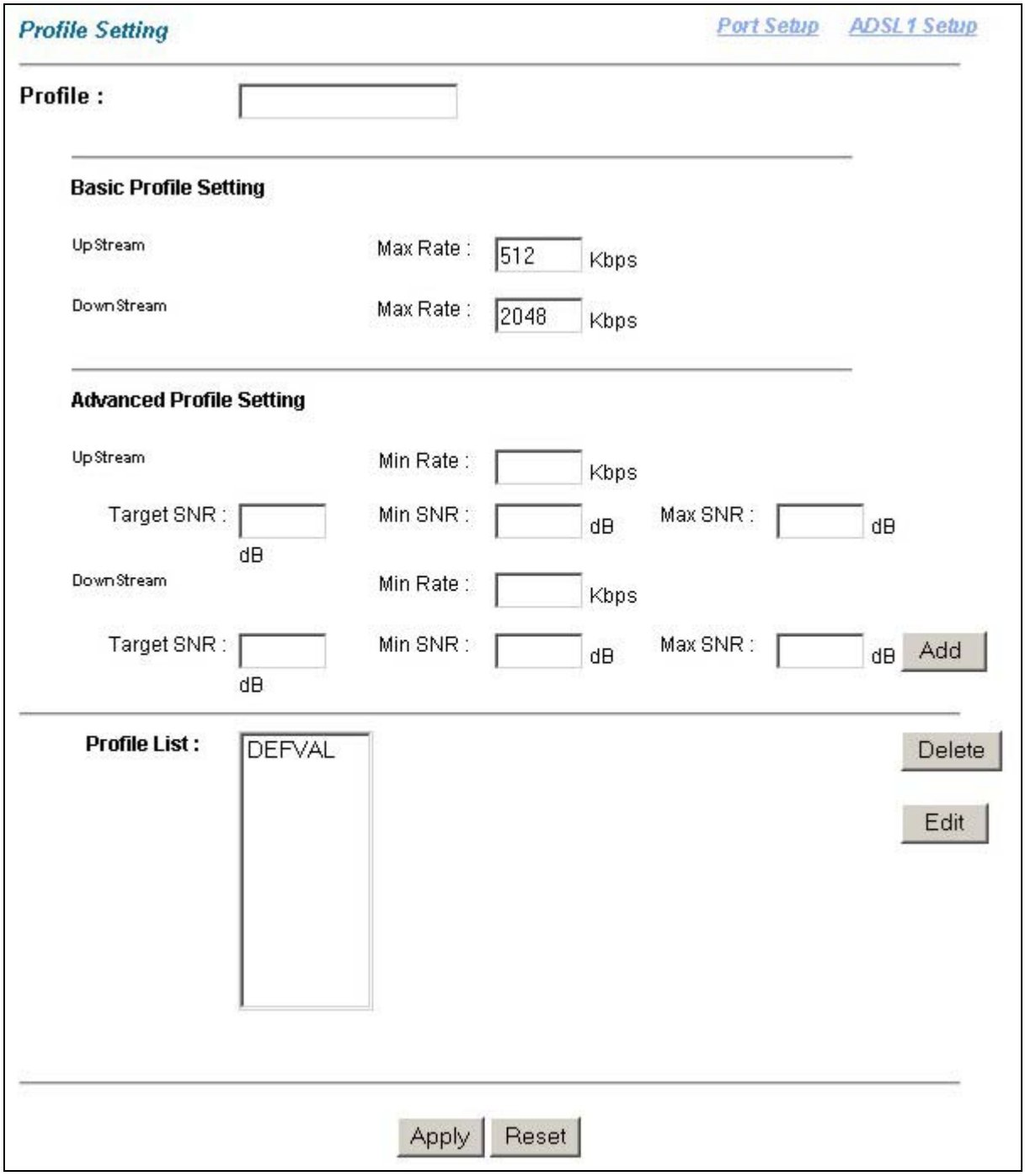


Figure 18-4 Profile Setting

The following table describes this screen.

Table 18-4 Profile Setting

LABEL	DESCRIPTION
Port Setup	This is the card's slot number.
ADSL1 Setup	Click this link to go to the port's setup screen.
Profile	This is the name of an individual profile. The DEFVAL profile always exists and all of the ADSL ports have it assigned to them by default.

Table 18-4 Profile Setting

Basic Profile Setting	
Upstream Max Rate: Kbps	This is the maximum upstream transfer rate for this port. Speeds from 32 to 1024 kilobits per second (Kbps) are supported.
Downstream Max Rate: Kbps	This is the maximum downstream transfer rate for this port. Speeds from 32 to 8160 (Kbps) are supported.
Advanced Profile Setting	
Upstream	
Target SNR	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.
Min Rate	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.
Min SNR	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.
Max SNR	Type the maximum upstream signal to noise margin (0-31 db).
Downstream	
Target SNR	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.
Min Rate	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.
Min SNR	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.
Max SNR	Type the maximum downstream signal to noise margin (0-31 db).
Add	Click this button to add a newly created profile to the profile list or modify an existing profile (see the **Edit** button), this saves the changes to the volatile memory, see below for directions on saving to the non-volatile memory.
Profile List	This list box displays the names of all the configured profiles. All of the profiles in this list are applied to the volatile memory when you click the **Apply** button.
Delete	Select a profile in the list box and click this button to delete the profile from the list.
Edit	Select a profile in the list box and click this button to display the profile and its settings in the fields above for editing.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link in the navigation panel on the left to save your changes to the non-volatile memory when you are done configuring.
Reset	Click **Reset** to begin configuring this screen afresh.

Part IV:

Web Configurator with EEC 2

This part describes the Advanced Applications and Advanced Management web configurator screens when you use the ADSL line card with the Ethernet extension card.

Chapter 18 Static Route

This chapter explains how to configure static routes for the line card.

18.1 Static Route Overview

The web configurator allows you to set up static routes that tell the line card how to forward management traffic when you configure the TCP/IP parameters manually.

18.2 Static Route Setup Screen

Click **Static Route Setup** in the navigation panel to open this screen.

Static Route Setup is a static route summary table.

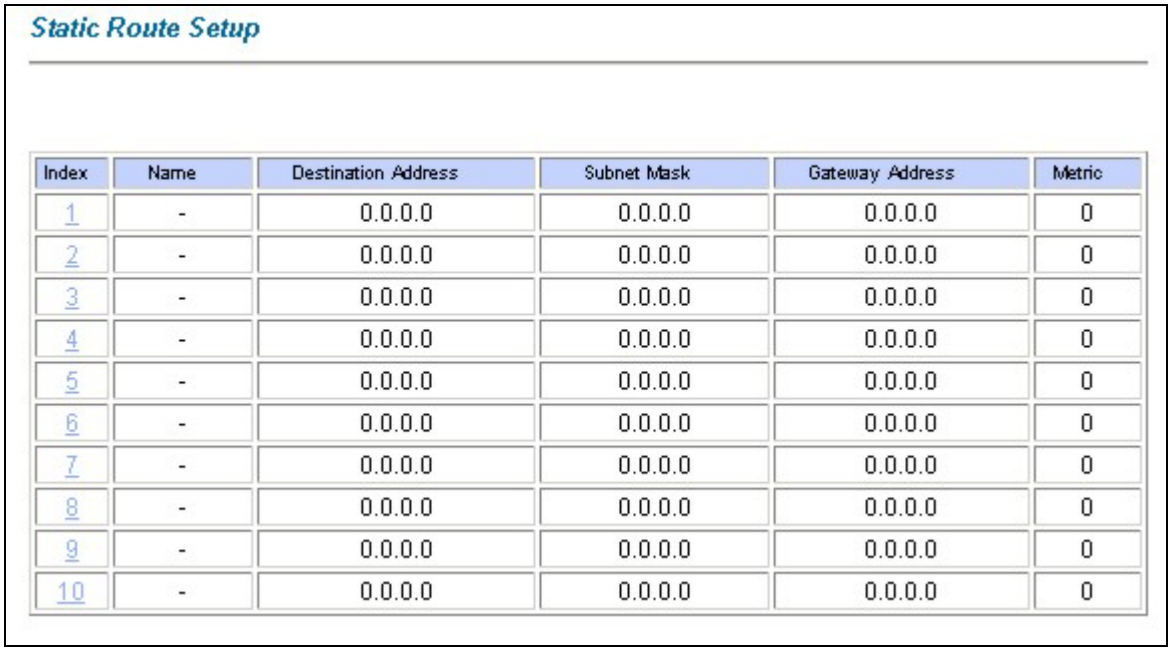


Figure 18-1 Static Route Setup

The following table describes this screen.

Table 18-1 Static Route Setup

LABEL	DESCRIPTION
Index	This field displays the index number of a static route. Click a static route index number to set up a static route on the line card.
Name	This field displays the descriptive name (maximum 10 alphanumeric characters) for this route. This is for identification purpose only.

Table 18-1 Static Route Setup

LABEL	DESCRIPTION
Destination Address	This field displays the IP network address of the final destination.
Subnet Mask	This field displays the subnet mask for this destination.
Gateway Address	This field displays the IP address of the gateway. The gateway is an immediate neighbor of your line card that will forward the packet to the destination.
Metric	This field displays the cost of transmission for routing purposes.

18.2.1 Edit Static Route Screen

Click **Static Route Setup** in the navigation panel and then a static route index number in the **Static Route** screen to open this screen.

Use this menu to configure a static route.

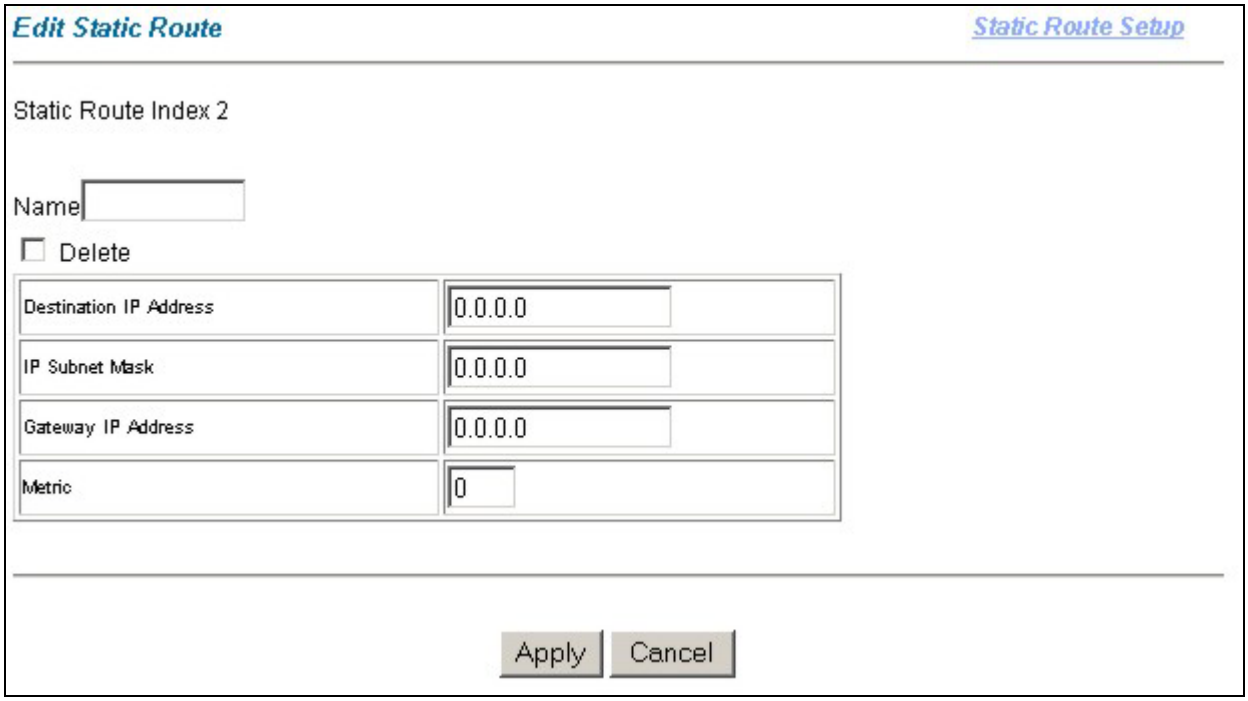


Figure 18-2 Edit Static Route

The following table describes this screen.

Table 18-2 Edit Static Route

LABEL	DESCRIPTION
Static Route Setup	Click this link to go to the **Static Route Setup** page.
Name	The name of the static route.
Delete	Select this check box and click **Apply** to delete this static route.

Table 18-2 Edit Static Route

LABEL	DESCRIPTION
Destination IP Address	This parameter specifies the IP network address of the final destination. Routing is always based on network number. If you need to specify a route to a single host, use a subnet mask of 255.255.255.255 in the subnet mask field to force the network number to be identical to the host ID.
IP Subnet Mask	Enter the subnet mask for this destination.
Gateway IP Address	Enter the IP address of the gateway. The gateway is an immediate neighbor of your line card that will forward the packet to the destination. The gateway must be a router on the same segment as your line card.
Metric	The metric represents the cost of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 0 for directly connected networks. Enter a number that approximates the cost for this link. The number need not be precise, but it must be between 0 and 15. In practice, 2 or 3 is usually a good number.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.
Reset	Click **Reset** to begin configuring this page afresh

Chapter 19 VLAN

This chapter explains how to configure VLANs on the line card.

19.1 VLAN Overview

A VLAN (Virtual Local Area Network) allows a physical network to be partitioned 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.

In MTU applications, VLAN is vital in providing isolation and security among the subscribers. When properly configured, VLAN prevents one subscriber from accessing the network resources of another on the same LAN, thus a user will not see the printers and hard disks of another user in the same building.

VLANs also increase network performance by limiting broadcasts to a smaller and more manageable logical broadcast domain. In traditional switched environments, all broadcast packets go to each and every individual port. With VLAN, all broadcasts are confined to a specific broadcast domain.

Note that VLANs are unidirectional- they only govern outgoing traffic.

19.2 Tagged VLANs (IEEE 802.1Q)

Tagged VLAN uses an explicit tag (VLAN ID) in the MAC header to identify the VLAN membership of a frame across bridges - tagged VLANs are not confined to the switch on which they were created. The VLANs can be created statically by hand or dynamically through GVRP. The VLAN ID associates a frame with a specific VLAN and provides the information that switches need to process the frame across the network. A tagged frame is four bytes longer than an untagged frame and contains two bytes of TPID (Tag Protocol Identifier, residing within the type/length field of the Ethernet frame) and two bytes of TCI (Tag Control Information, a tagged header starts after the source address field of the Ethernet frame).

TPID 2 Bytes	User Priority 3 Bits	CFI 1 Bit	VLAN ID 12 bits

TPID has a defined value of 8100 (hex). The first three bits of the TCI define user priority (giving eight priority levels). The CFI (Canonical Format Indicator) is a single-bit flag, always set to zero for Ethernet switches. The remaining twelve bits define the VLAN ID, giving a possible maximum number of 4,096 (212) VLANs. Note that user priority and VLAN ID are independent of each other. A frame with VID (VLAN Identifier) of null (0) is called a priority frame, meaning that only the priority level is significant and the default VID of the ingress port is given as the VID of the frame. Of the 4096 possible VIDs, a VID of 0 is used to identify priority frames and value 4095 (FFF) is reserved, so the maximum possible VLAN configurations are 4,094.

19.3 Forwarding Tagged and Untagged Frames

Each port on the switch is capable of receiving tagged or untagged frames. You can configure a card to receive only tagged or all frames on a port-by-port basis. If it is set to tagged-only on a port, then only tagged frames are allowed to enter from that port and untagged frames are dropped; if set to all, then both tagged and untagged frames are allowed to enter the switch. The card does not alter the VID of a frame if it is already tagged; however, when an untagged frame enters the switch, it is assigned the default port VID (PVID) of the ingress (incoming) port. Thus a frame always has a VID inside the switch, regardless of whether it is tagged or not on the wire. The default PVID is 1 for all ports, but this can be changed.

The egress (outgoing) port(s) of a frame is determined on the combination of the destination MAC address and the VID of the frame. For a unicast frame, the egress port based by the destination address must be a member of the VID, also; otherwise, the frame is blocked. For a broadcast (or multicast without IGMP snooping) frame, it is duplicated only on ports (except the ingress port itself) that are members of the VID, thus confining the broadcast to a specific domain.

Whether to tag an outgoing frame depends on the setting of the egress port on a per VLAN, per port basis (recall that a port can be members of multiple VID). If the tagging on the egress port is enabled for the VID of a frame, then the frame is transmitted as a tagged frame; otherwise, it is transmitted as an untagged frame.

19.4 Automatic VLAN Registration

GARP and GVRP are the protocols used to automatically register VLAN membership across switches.

19.5 GARP

GARP (Generic Attribute Registration Protocol) allows network devices to register and de-register attribute values with other GARP participants within a bridged LAN. GARP is a protocol that provides a generic mechanism for protocols that serve a more specific application, for example, GVRP.

19.5.1 GARP Timers

Switches join VLANs by making a declaration. A declaration is made by issuing a Join message using GARP. Declarations are withdrawn by issuing a Leave message. A Leave All message terminates all registrations. GARP timers set declaration timeout values.

19.5.2 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. Enable this function to permit VLANs groups beyond the local switch.

Please refer to the following table for common GARP terminology.

Table 19-1 GARP Terminology

VLAN Type	Permanent VLAN	This is a static VLAN created manually.
	Dynamic VLAN	This is a VLAN configured by a GVRP registration/deregistration process.
VLAN Administrative Control	Registration Fixed	Fixed registration ports are permanent VLAN members.
	Registration Forbidden	Ports with registration forbidden are not allowed to register (join) this VLAN.
	Normal Registration	Ports join a VLAN using GVRP.
VLAN Tag Control	Tagged	Ports tag all (VLAN member) egress frames transmitted.
	Untagged	Ports do not tag all (VLAN member) egress frames transmitted.
VLAN Port	Port VID	This is the VLAN ID assigned to untagged frames that this port received (in Port Setup).
	Acceptable Frame Type	Whether tagged only or both untagged frames are accepted on this port.
	Port Filtering	If set, the line card discards incoming frames for VLANs which do not include this port in its member set.

19.6 VLAN Setup

The web configurator allows you to configure VLAN settings for the individual cards.

19.7 Static VLAN Setup Screen

Click **VLAN Setup** in the navigation panel to open this screen.

This menu displays IEEE 802.1Q VLAN parameters for the line card.

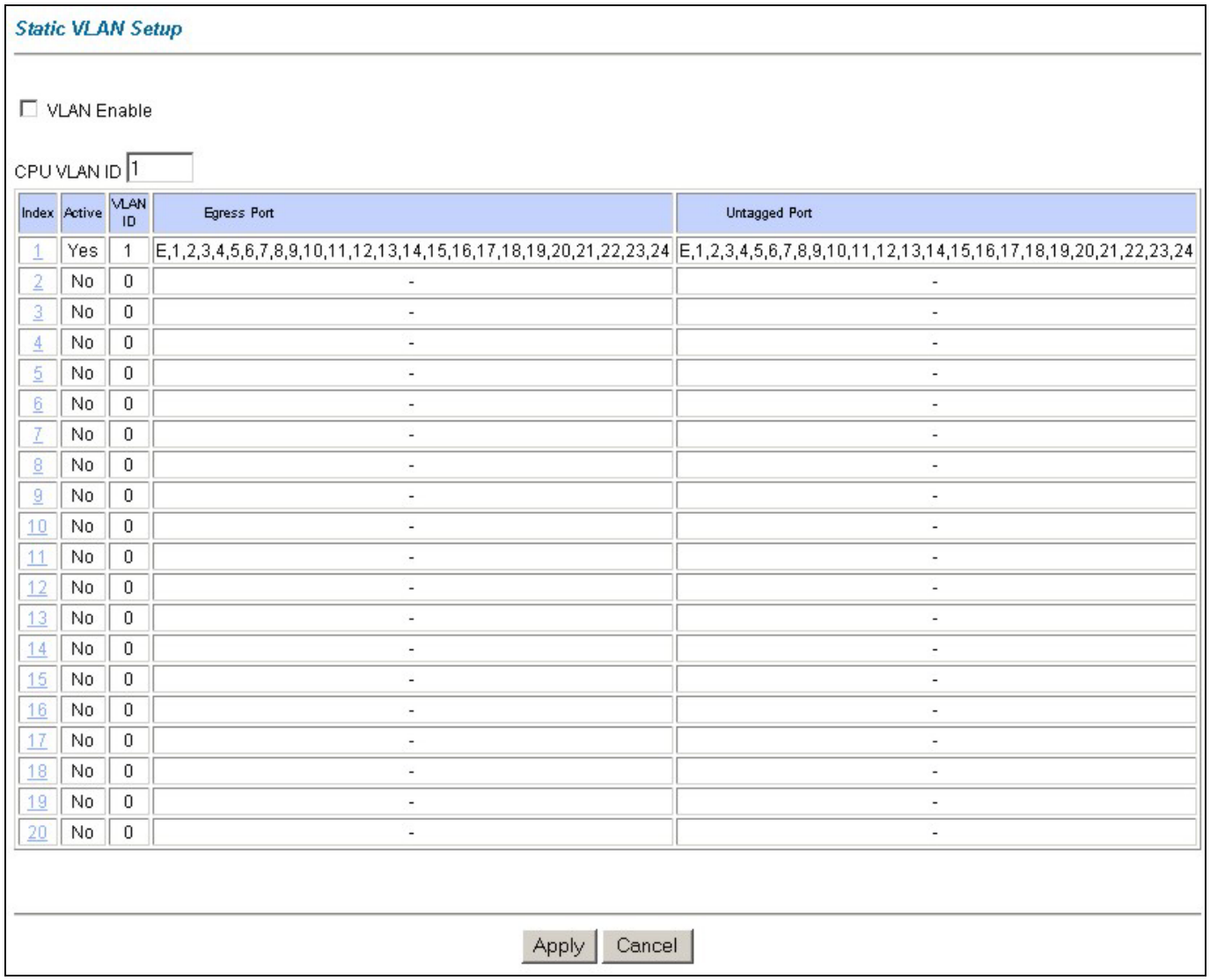


Figure 19-1 Static VLAN Setup

The following table describes this screen.

Table 19-2 Static VLAN Setup

LABEL	DESCRIPTION
VLAN Enable	Select this check box to enable the VLAN and permit VLANs groups beyond the local switch.
CPU VLAN ID	The CPU VLAN ID is the number of the VLAN through which you manage the line card. The CPU VLAN defines which ports you can use to manage the line card. You cannot manage the line card via a port that is not a member of the management VLAN.
Index	This field displays the index number of this VLAN.
Active	This field displays **Yes** when the entry is activated and **No** when the entry is empty.
VLAN ID	This field displays the ID number of the VLAN.
Egress Port	Ports that have been added to this VLAN are listed here in numerical order, separated by commas. A "-" means no egress ports are configured.

Table 19-2 Static VLAN Setup

LABEL	DESCRIPTION
Untagged Port	Untagged ports that have been added to this VLAN are listed here in numerical order, separated by commas. A "-" means no untagged ports are configured.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.
Reset	Click **Reset** to begin configuring this page afresh.

19.7.1 Edit 802.1Q VLAN Static Entry Screen

Click **VLAN Setup** in the navigation panel and then an index number in the **VLAN Setup** screen.

Use this menu to set up IEEE 802.1Q VLAN parameters for the switch.

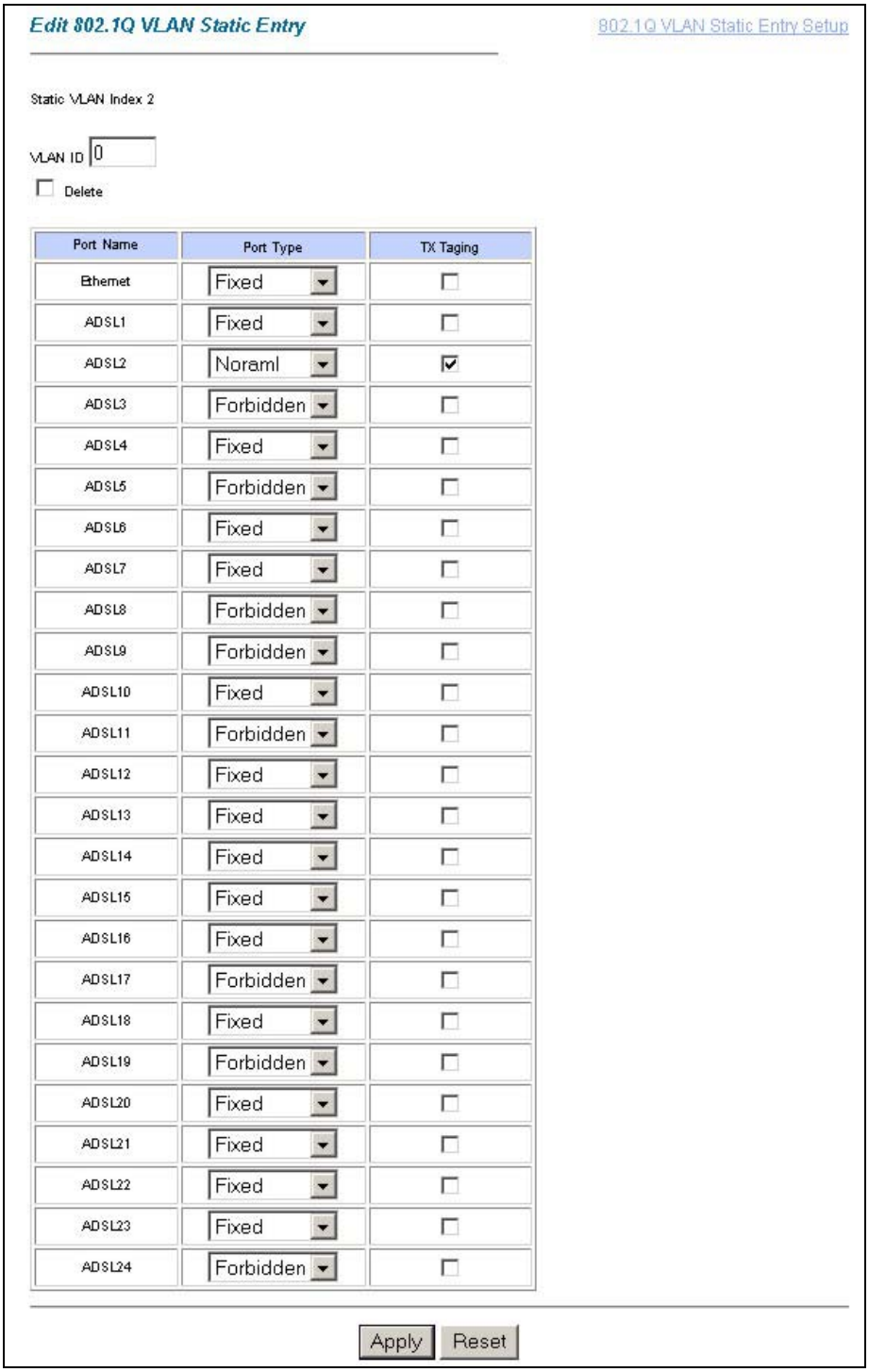


Figure 19-2 Edit 802.1Q VLAN Static Entry

The following table describes this screen.

Table 19-3 Edit 802.1Q VLAN Static Entry

LABEL	DESCRIPTION
802.1Q VLAN Static Entry Setup	Click this link to go to the **Static VLAN Setup** page.
VLAN ID	This is the ID number of VLAN group index number you clicked in the Static VLAN Setup page.
Delete	Select this check box to delete this VLAN.
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 ADSL modem or router supports IEEE 802.1Q VLAN.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring.
Reset	Click **Reset** to begin configuring this page afresh.

Chapter 20 SNMP

This chapter explains how to configure Simple Network Management Protocol (SNMP).

20.1 SNMP General Commands Overview

Table 20-1 SNMP

COMMAND	DESCRIPTION
Get	Allows the manager to retrieve an object variable from the agent.
GetNext	Allows the manager to retrieve the next object variable from a table or list within an agent. In SNMPv1, when a manager wants to retrieve all elements of a table from an agent, it initiates a Get operation, followed by a series of GetNext operations.
Set	Allows the manager to set values for object variables within an agent.
Trap	Used by the agent to inform the manager of some events.

20.1.1 Supported MIBs

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

20.2 SNMP Setup Screen

Click **SNMP** in the navigation panel to open the **SNMP** screen.

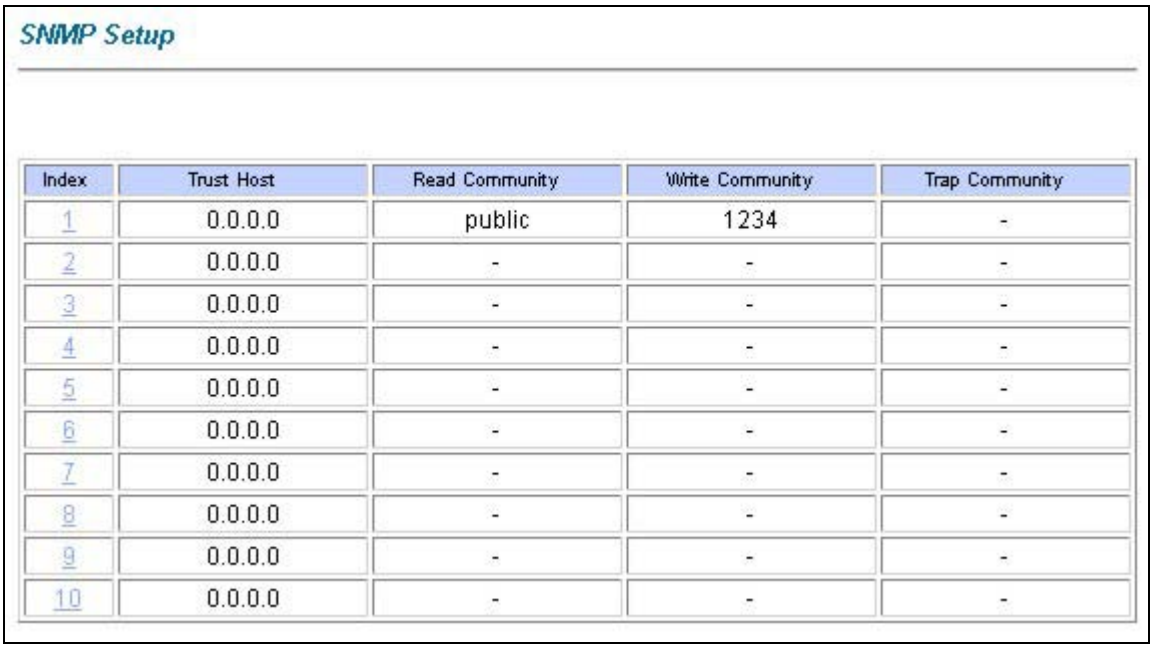


Figure 20-1 SNMP Setup

The following table describes this screen.

Table 20-2 SNMP Setup

LABEL	DESCRIPTION
Index	This read-only field displays the SNMP index number. Click the index number to go to the "Edit SNMP Setup" menu.
Trust Host	The trusted host, your line card will only respond to SNMP messages from this address. If you leave the field set to 0.0.0.0 (default), your line card will respond to all SNMP messages it receives, regardless of source.
Read Community	If the read community is set, which is the password for the incoming Get and GetNext-requests from the management station. If the read community is not set, a '-' is in the entry.
Write Community	If the write community is set, which is the password for incoming Set requests from the management station. If the write community is not set, a '-' is in the entry.
Trap Community	If the trap community is set, which is the password sent with each trap to the SNMP manager. If the trap community is not set, a '-' is in the entry.

20.2.1 Edit SNMP Setup Screen

Click an index number in the **SNMP Setup** screen to open this screen.

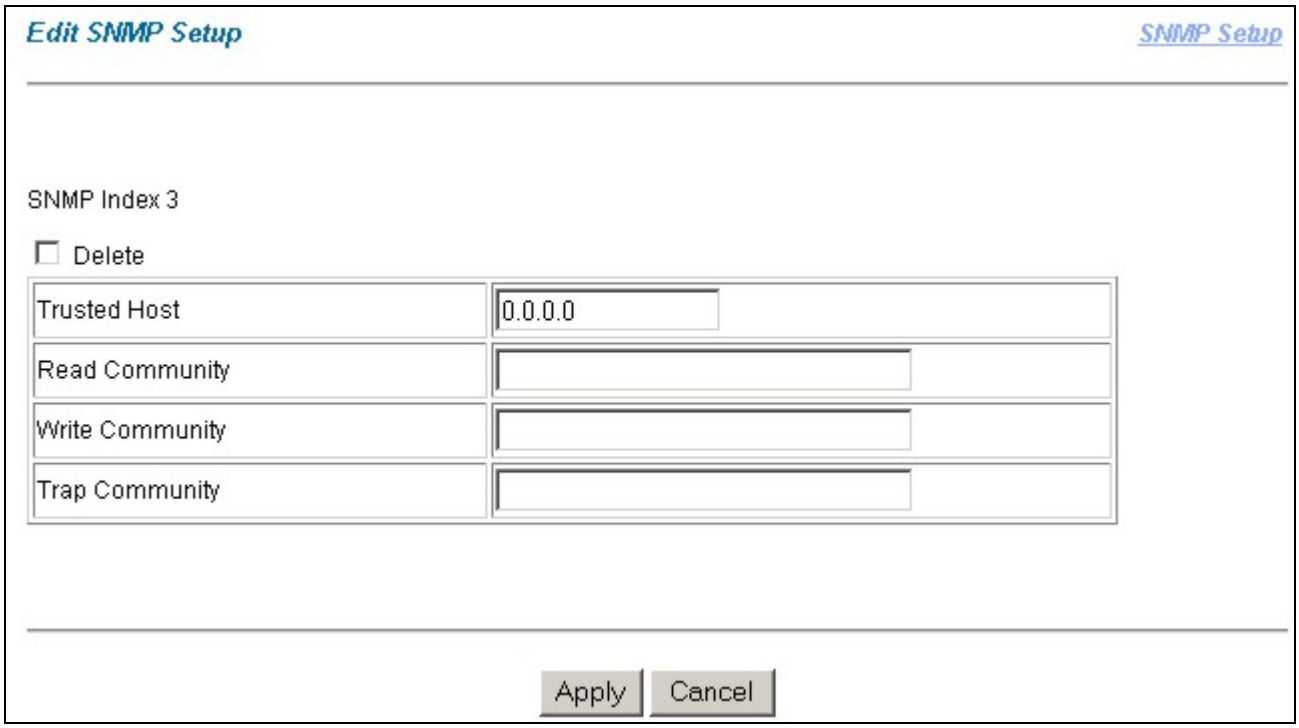


Figure 20-2 Edit SNMP Setup

The following table describes this screen.

Table 20-3 Edit SNMP Setup

LABEL	DESCRIPTION
SNMP Setup	Click this link to go to the **SNMP Setup** page.
Delete	Select this check box to delete this set of SNMP access parameters.
Trusted Host	If you enter a trusted host, your line card will only respond to SNMP messages from this address. If you leave the field set to 0.0.0.0 (default), your line card will respond to all SNMP messages it receives, regardless of source.
Read Community	Enter the read community, which is the password for the incoming Get and GetNext-requests from the management station. Public is the default.
Write Community	Enter the write community, which is the password for incoming Set requests from the management station. 1234 is the default.
Trap Community	Enter the trap community, which is the password sent with each trap to the SNMP manager.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link in the navigation panel on the left to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click **Cancel** to begin configuring this page afresh.

Chapter 21 Logins

This chapter explains how to change the line card's passwords.

21.1 Logins Overview

The **Logins** screen allows you to configure the administrator password.

21.2 Logins Screen

Click **Logins** in the navigation panel to open the **Logins** screen.

Use the **Logins** screen to set administrator passwords for the line card.

It is highly recommended that you change the default password ("1234").

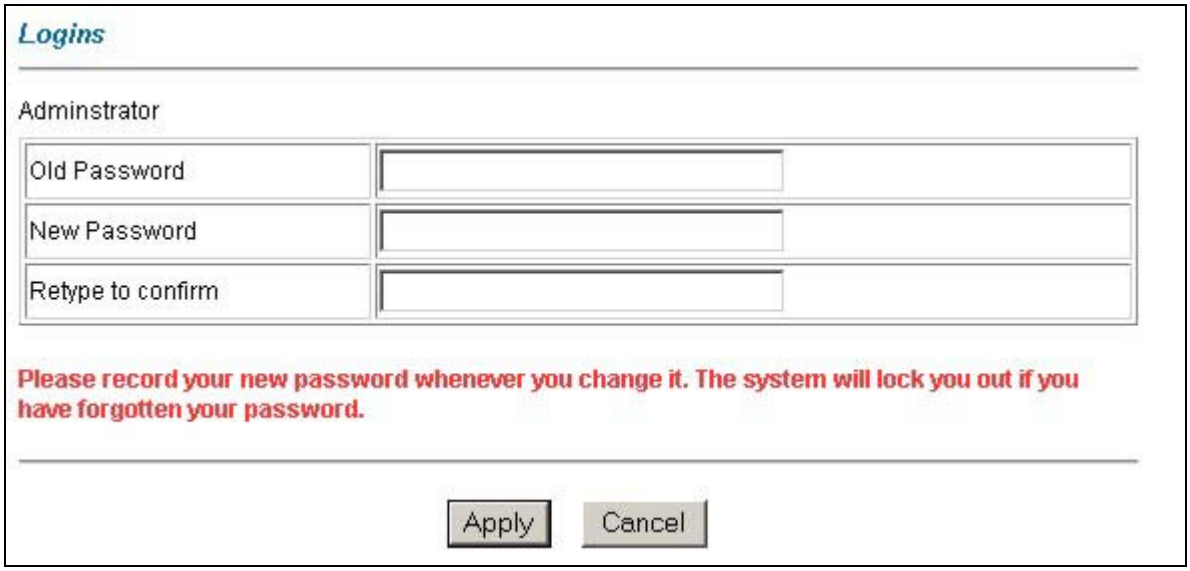


Figure 21-1 Logins

The following table describes this screen.

Table 21-1 Logins

LABEL	DESCRIPTION
Old Password	Type the existing system password ("1234" is the default password when shipped).
New Password	Type your new system password.
Retype to confirm	Retype your new system password for confirmation.

Table 21-1 Logins

LABEL	DESCRIPTION
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link in the navigation panel on the left to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click **Cancel** to begin configuring this page afresh.

Chapter 22 Maintenance

This chapter explains how to use the maintenance screens to set the Unix syslog parameters, time and date and remote management; as well as perform firmware and configuration file maintenance.

22.1 Maintenance Overview

The Maintenance screen allows you to set UNIX syslog parameters and the time and date. It also provides links to the **Secured Client**, **Firmware Upgrade**, **Restore Configuration** and **Configuration Backup** screens.

22.2 Maintenance Screen

Click **Maintenance** in the navigation panel to open the **Maintenance** screen.

Use the **Maintenance** screen to set UNIX syslog parameters.

Figure 22-1 Maintenance

The following table describes this screen.

Table 22-1 Maintenance

LABEL	DESCRIPTION
Secured Client	Click the **Secured Client** link to configure clients for secure remote line card access via Telnet, FTP and Web.
Upgrade	Click the **Upgrade** link to upgrade firmware.
Restore	Use the **Restore** link to restore a previously saved configuration file.

Table 22-1 Maintenance

LABEL	DESCRIPTION
Backup	Use the **Backup** link to save your current configuration to a computer.
UNIX Syslog	Select this check box to activate syslog (UNIX system logging) and then configure the UNIX syslog parameters described in the following fields.
Syslog Server IP Address	Enter the IP address of the syslog server.
Log Facility	Select one of 7 different options from the drop-down list box. The log facility allows you to log the message to different files in the server. Please refer to your UNIX manual for more details.
Apply	Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link in the navigation panel on the left to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click **Cancel** to begin configuring this page afresh.

22.2.1 Secured Client Screen

Click **Maintenance** in the navigation panel and then **Secured Client** in the **Maintenance** screen to open the **Secured Client Setup** screen.

The **Secured Client Setup** screen configures trusted computers that may manage the line card.

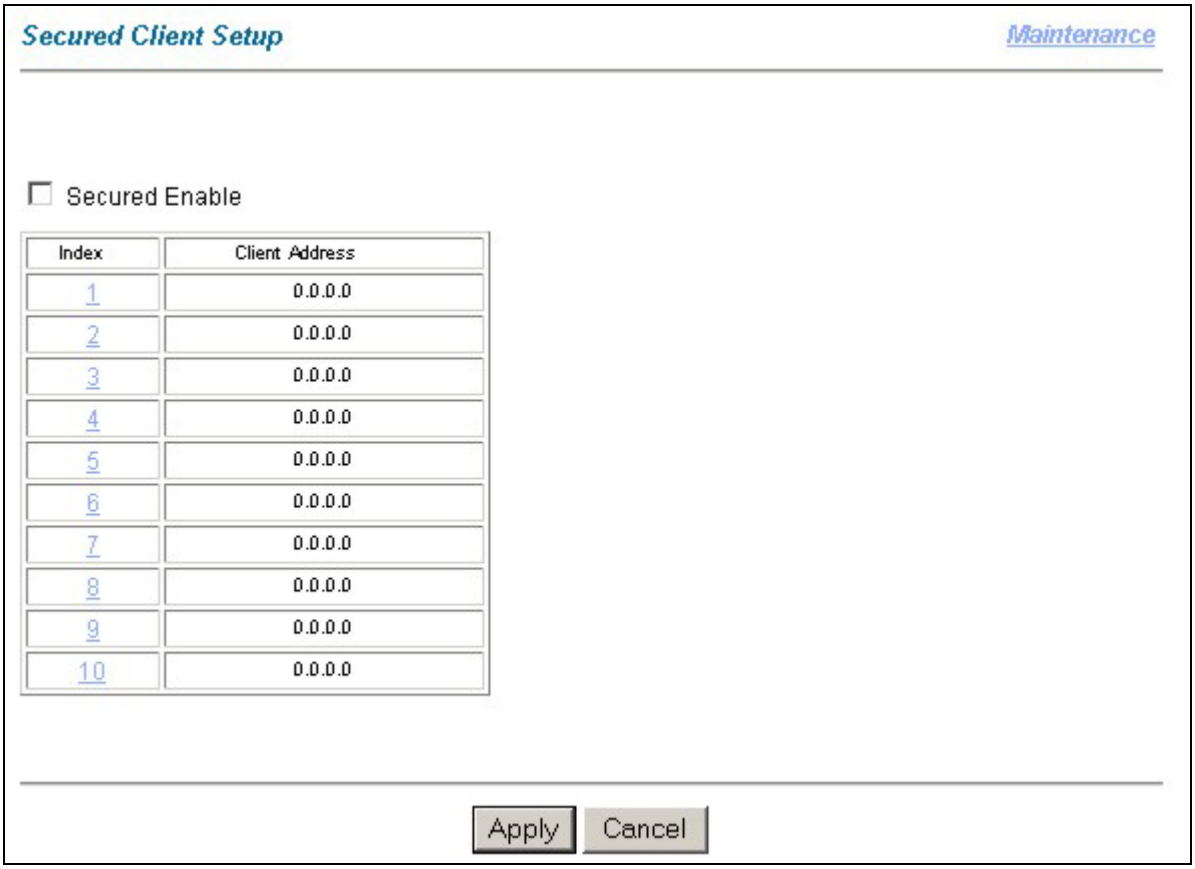


Figure 22-2 Secured Client Setup

The following table describes this screen.

Table 22-2 Secured Client Setup

LABEL	DESCRIPTION
Maintenance	Click **Maintenance** to return to the main maintenance screen.
Secured Enable	Select this check box to allow these secured clients to manage the line card. Do not select this check box unless the IP address that you are using to manage the line card is already configured as one of the client addresses below. The line card blocks your access if you apply this page with this check box selected and your IP address is not one of the configured client addresses.
Index	This is the client index number. Click a client's index number to go to a page where you can edit it.
Client Address	The address of a client that is permitted to use a service (Telnet, FTP, Web) to manage the line card. For example, 192.168.1.100.
Apply	Click **Apply** to save your changes back to the line card 's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link in the navigation panel on the left to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click **Cancel** to begin configuring this page afresh.

Edit Secured Client Screen

Click **Maintenance** in the navigation panel and then **Secured Client** in the **Maintenance** screen.

Click an index number in the **Secured Client Setup** screen to open the **Edit Secured Client** screen.

Use the **Edit Secured Client** screen to configure the IP addresses that an administrator can use to manage the line card.

Figure 22-3 Edit Secured Client

The following table describes this screen.

Table 22-3 Edit Secured Client

LABEL	DESCRIPTION
Maintenance	Click this link to go to the **Maintenance** screen.
Secured Client Setup	Click this link to go to the **Secured Client Setup** screen.
Delete	Select this check box to remove this client from the list of secured clients.
Client Address	Set the IP address of a computer that you want to allow to use Telnet, FTP or Web services to manage this line card. If you enter an IP address in this field, the line card checks if the client IP address of a computer requesting a service matches the value here. The line card immediately disconnects the session if it does not match.
Apply	Click **Apply** to save your changes back to the line card 's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link in the navigation panel on the left to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click **Cancel** to begin configuring this page afresh.

22.2.2 Firmware Upgrade Screen

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

Use the **Firmware Upgrade** screen to upgrade the card's firmware.

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 **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**.

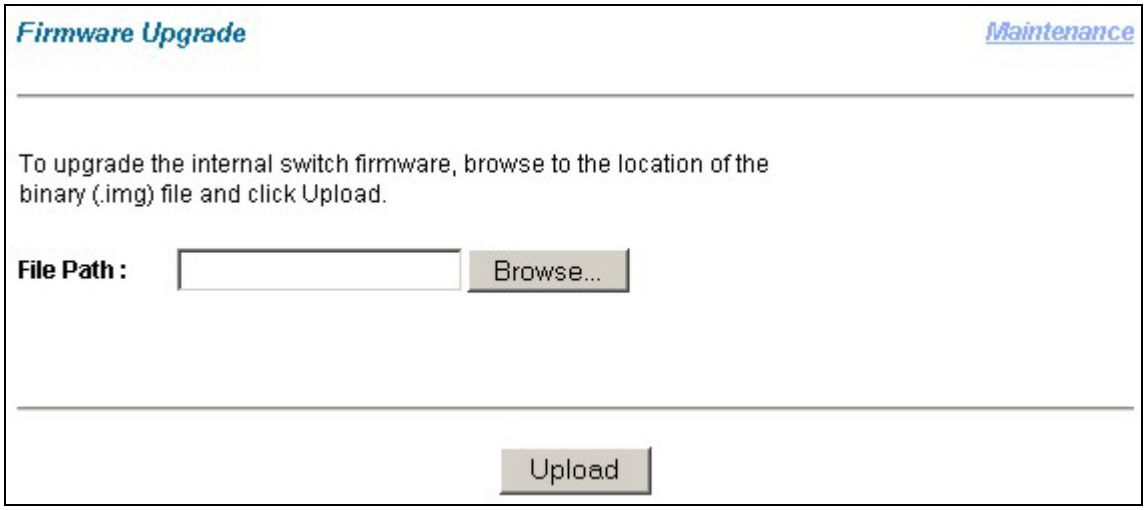


Figure 22-4 Firmware Upgrade

22.2.3 Restore Configuration Screen

Click **Maintenance** in the navigation panel and then **Restore** to open the **Restore Configuration** screen.

Use the **Restore Configuration** screen to restore a previously saved configuration from your computer to the line card. Click **Maintenance** to return to the main maintenance screen.

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

The line card automatically restarts when the restore process is complete.

Type the path and file name of the configuration file you wish to restore 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 **Restore**.

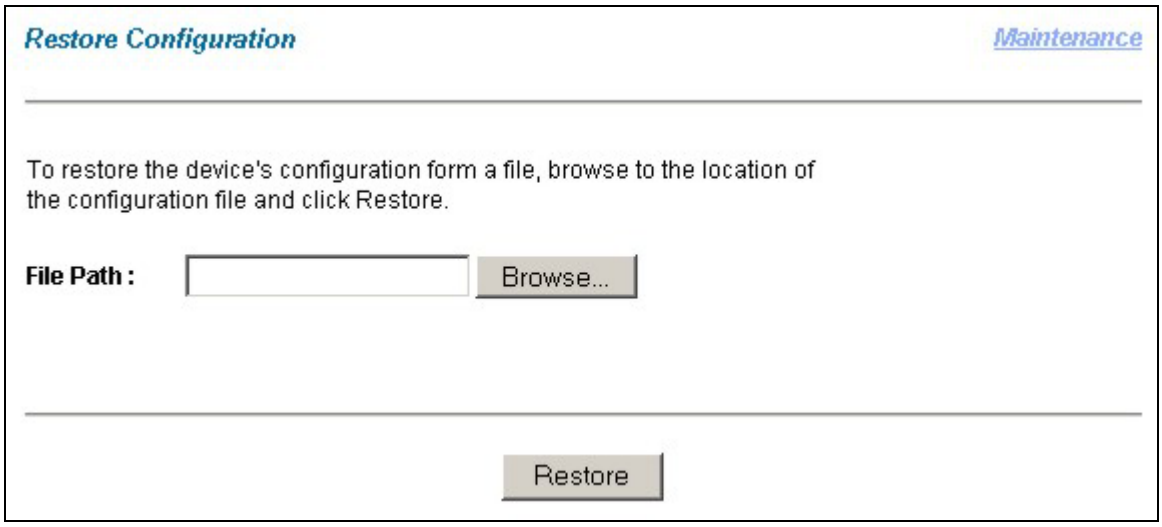


Figure 22-5 Restore Configuration

22.2.4 Configuration Backup Screen

Click **Maintenance** in the navigation panel and then **Backup** to open the **Configuration Backup** screen.

Use the **Configuration Backup** screen to save the current configuration of the line card to a computer. Click **Maintenance** to return to the main maintenance screen.

Step 1. Click **Backup** to display the **File Download** screen.

Step 2. Select **Save this file to disk** to display the **Save As** screen.

Step 3. Choose a location to save the file on your computer from the **Save in** drop-down list box and type a name for it in the **File name** field.

Step 4. Click **Save** to save the configuration file to your computer.

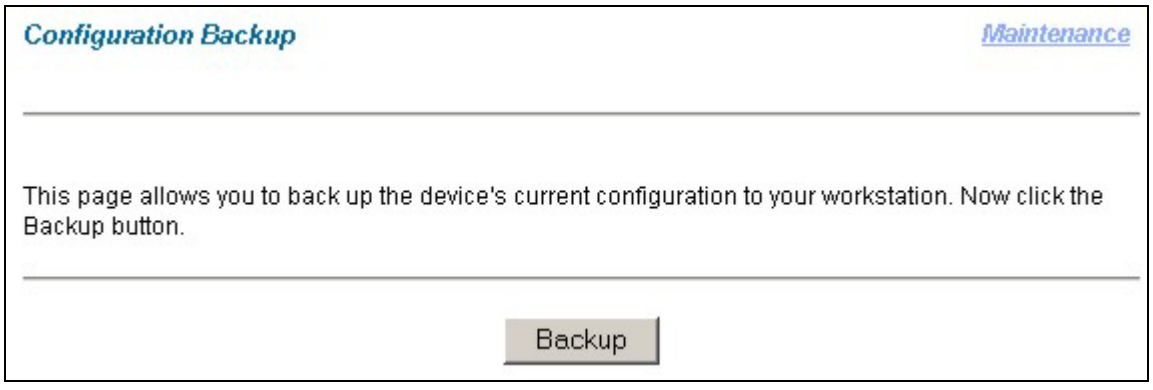


Figure 22-6 Configuration Backup

Chapter 23 Statistics

This chapter explains the Advanced Management Statistics screens.

23.1 Statistics Overview

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

23.2 Statistics Screen

Click **Statistics** in the navigation panel to open this screen.

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

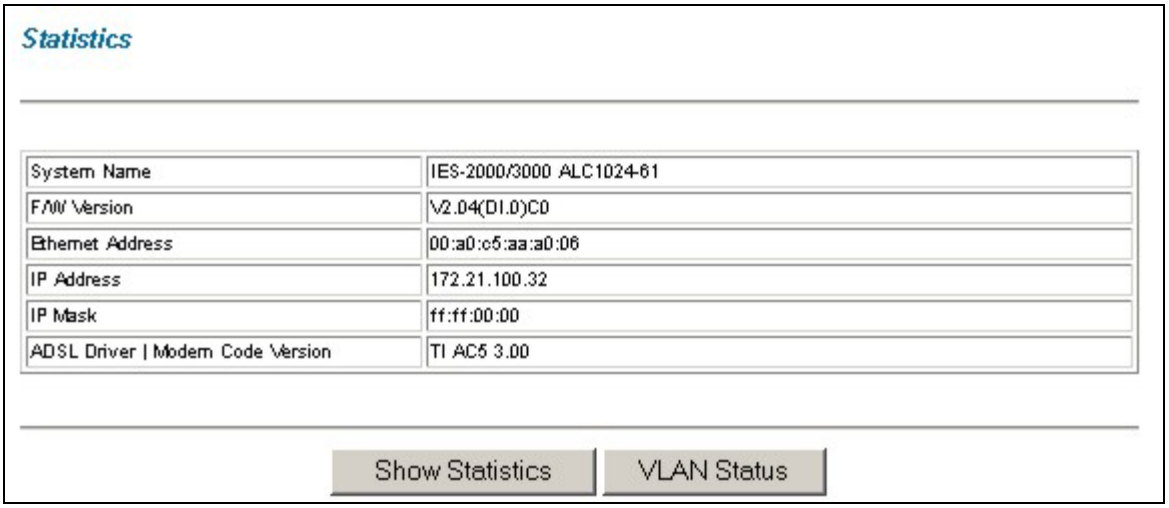


Figure 23-1 Statistics

The following table describes this screen.

Table 23-1 Statistics

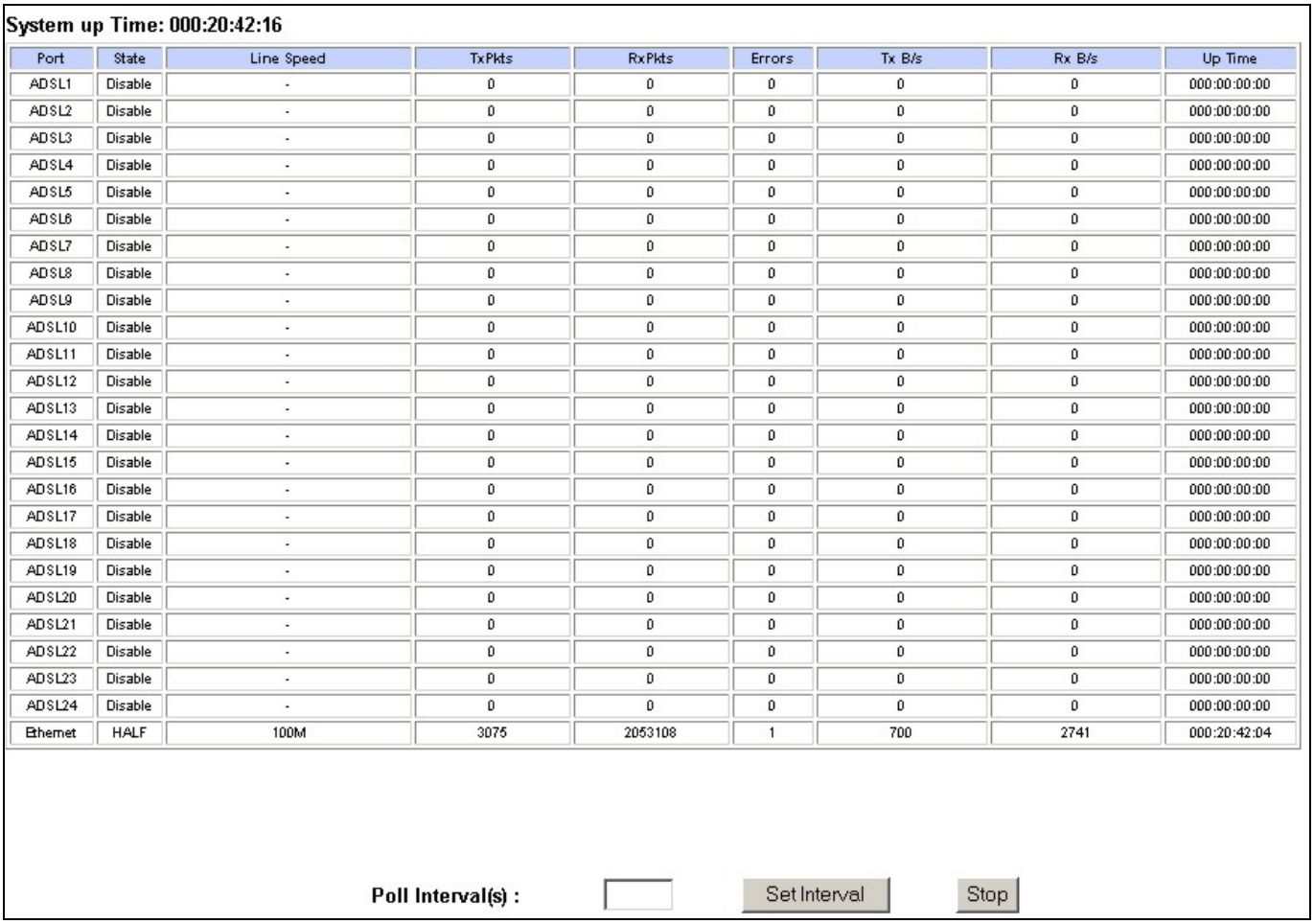
LABEL	DESCRIPTION
System Name	This is the line card system name assigned in General Setup.
F/W Version	This field refers to the version of ZyXEL's Network Operating System.
Ethernet Address	This field refers to the Ethernet MAC (Media Access Control) address of the line card.
IP Address	This is the IP address of the line card in dotted decimal notation.
IP Mask	This shows the IP mask of the line card.

Table 23-1 Statistics

LABEL	DESCRIPTION
ADSL Driver/ Modem Code Conversion	This field displays the version of ADSL driver and modem code.
Show Statistics	Click here to display ports, temperature and CPU usage statistics.
VLAN Status	Click here to display 802.1Q VLAN statistics.

23.2.1 Show Statistics Screen

Click **Statistics** in the navigation panel and then the **Show Statistics** button to open this screen.



System up Time: 000:20:42:16

Port	State	Line Speed	TxPkts	RxPkts	Errors	Tx B/s	Rx B/s	Up Time
ADSL1	Disable	-	0	0	0	0	0	000:00:00:00
ADSL2	Disable	-	0	0	0	0	0	000:00:00:00
ADSL3	Disable	-	0	0	0	0	0	000:00:00:00
ADSL4	Disable	-	0	0	0	0	0	000:00:00:00
ADSL5	Disable	-	0	0	0	0	0	000:00:00:00
ADSL6	Disable	-	0	0	0	0	0	000:00:00:00
ADSL7	Disable	-	0	0	0	0	0	000:00:00:00
ADSL8	Disable	-	0	0	0	0	0	000:00:00:00
ADSL9	Disable	-	0	0	0	0	0	000:00:00:00
ADSL10	Disable	-	0	0	0	0	0	000:00:00:00
ADSL11	Disable	-	0	0	0	0	0	000:00:00:00
ADSL12	Disable	-	0	0	0	0	0	000:00:00:00
ADSL13	Disable	-	0	0	0	0	0	000:00:00:00
ADSL14	Disable	-	0	0	0	0	0	000:00:00:00
ADSL15	Disable	-	0	0	0	0	0	000:00:00:00
ADSL16	Disable	-	0	0	0	0	0	000:00:00:00
ADSL17	Disable	-	0	0	0	0	0	000:00:00:00
ADSL18	Disable	-	0	0	0	0	0	000:00:00:00
ADSL19	Disable	-	0	0	0	0	0	000:00:00:00
ADSL20	Disable	-	0	0	0	0	0	000:00:00:00
ADSL21	Disable	-	0	0	0	0	0	000:00:00:00
ADSL22	Disable	-	0	0	0	0	0	000:00:00:00
ADSL23	Disable	-	0	0	0	0	0	000:00:00:00
ADSL24	Disable	-	0	0	0	0	0	000:00:00:00
Ethernet	HALF	100M	3075	2053108	1	700	2741	000:20:42:04

Poll Interval(s) : Set Interval Stop

Figure 23-2 Show Statistics Screen

The following table describes this screen.

Table 23-2 Show Statistics Screen

LABEL	DESCRIPTION
System up Time	This field shows how long the system has been running since the last time it was restarted.

Table 23-2 Show Statistics Screen

LABEL	DESCRIPTION
Port	This refers to the DSL port number or the Ethernet port (labeled LAN).
State	This field displays "Disable" when the port is turned off or "Down" when the port is turned on, but not connected. This field displays the ADSL operation mode when the port is active and connected. The field for the Ethernet port displays either "FULL" or "HALF" for duplex.
Line Speed	This field shows the actual upstream and downstream transfer rates (in Kbps) of the xDSL ports. The field for the Ethernet port displays either 10M for 10Mbps or 100M for 100Mbps.
TxPkts	This field shows the number of transmitted packets on this port.
RxPkts	This field shows the number of received packets on this port
Errors	This field shows the number of received errors on this port.
Tx B/s	This field shows the number of bytes transmitted on a per-second basis in bytes per second on this port.
Rx B/s	This field shows the number of bytes received on a per-second basis in bytes per second on this port.
Up Time	This field shows the total amount of time the line has been up.
Poll Interval(s)	The text box displays how often (in seconds) this screen refreshes.
Set Interval	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.

23.2.2 VLAN Status Screen

These fields describe the status of the IEEE 802.1Q VLAN.

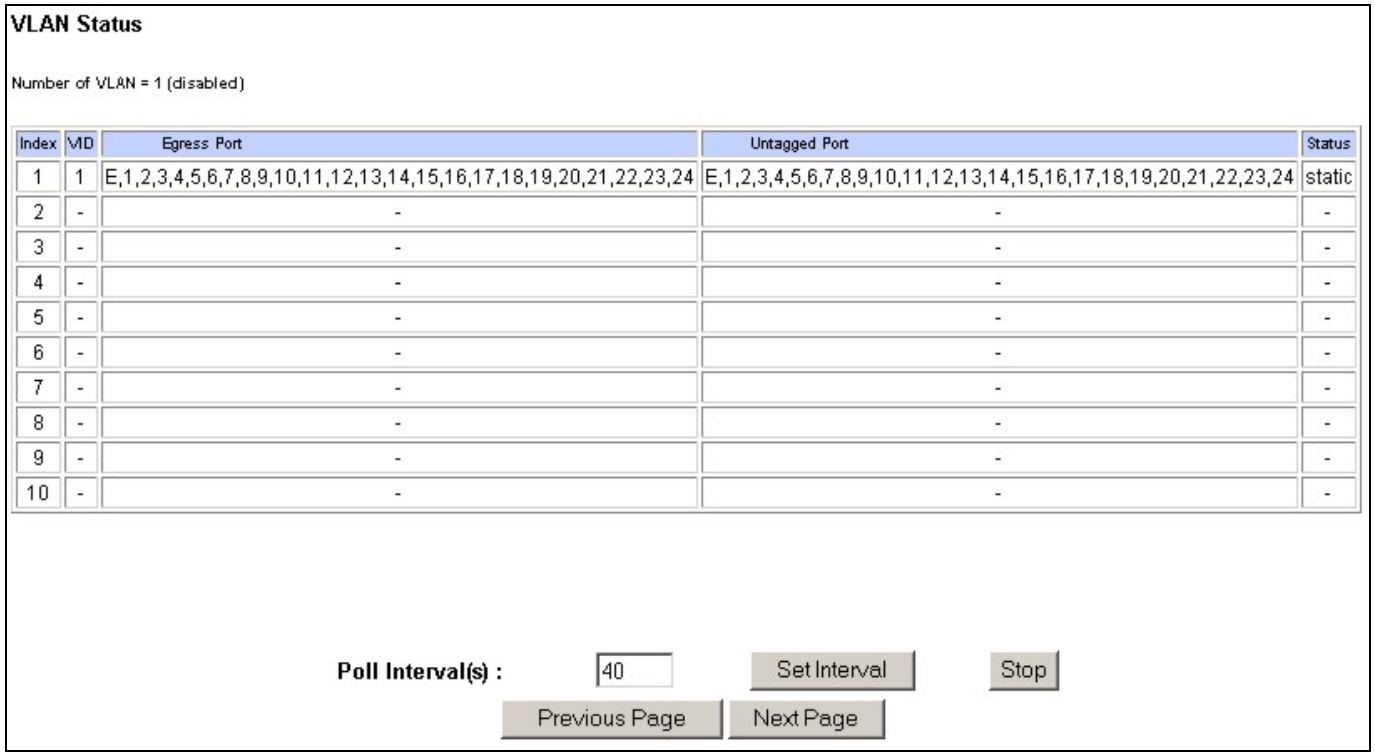


Figure 23-3 VLAN Status

The following table describes this screen.

Table 23-3 VLAN Status

LABEL	DESCRIPTION
Index	This is the VLAN index number.
VID	This is the VLAN ID number configured in the Edit Static VLAN page.
Egress Port	Ports that have been added to this VLAN are listed here in numerical order, separated by commas.
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**.
Set Interval	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.
Previous Page	Click **Previous Page** to show the preceding screen of VLAN status information (if there is more than one screen of VLAN statistics).
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 24 Diagnostic

This chapter explains the Advanced Management Diagnostic screens.

24.1 Diagnostic Overview

The line card provides diagnostic screens to aid in troubleshooting.

24.2 Line Card Diagnostic Screen

Click **Diagnostic** in the navigation panel to open the **General** Diagnostics screen.

Use this screen to check system logs, reset the system or ping IP addresses.

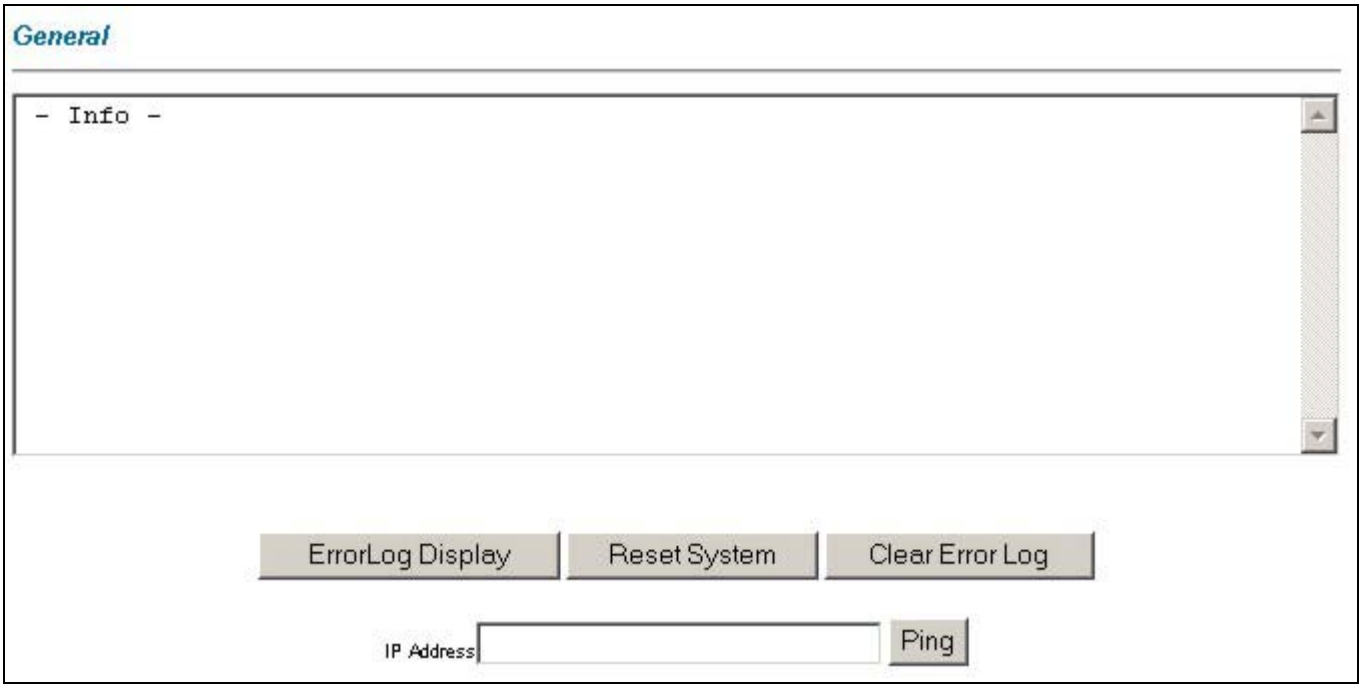


Figure 24-1 General Diagnostic

The following table describes this screen.

Table 24-1 General Diagnostic

LABEL	DESCRIPTION
Error Log Display	Click this button to display a log or errors in the multi-line text box.
Reset System	Click this button to restart the line card. A warning dialog box displays asking if you're sure you want to restart the system. Click **OK** to proceed.

Table 24-1 General Diagnostic

LABEL	DESCRIPTION
Clear Error Log	Click this button to clear the log of events in the multi-line text box.
IP Address	Type the IP address of a device that you want to ping in order to test a connection.
Ping	Click this button to have the line card ping the IP address (in the field to the left) 5 times.

24.2.1 Reset System

Click **Diagnostic** in the navigation panel and then click the **Reset System** button and click **OK** to erase the error log.

Figure 24-2 Reboot System Confirmation

24.3 Logout Screen

Click **Logout** in the navigation panel to open this screen and exit the web configurator.

Figure 24-3 Logout

Chapter 25 Troubleshooting

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

25.1 DSL LED(s)

A DSL LED is not on.

Table 25-1 Troubleshooting the DSL LED(s)

STEPS	CORRECTIVE ACTION
1	Make sure the DSL port is enabled (refer to the sections on the edit port setup screens).
2	Connect a DSL modem directly to the DSL port of the line card using a different telephone wire. If the LED turns on, go to step 4.
3	Check to see that the settings in the DSL modem or router match those of the DSL port (refer to the sections on the edit port setup screens). If the DSL LED stays off, there may be a problem with the port. Contact the distributor.
4	Take the DSL modem to the subscriber's location. If the DSL LED stays off, check for a problem with the telephone wiring that connects to the subscriber.

25.2 Data Transmission

The DSL LED is on, but data cannot be transmitted.

Table 25-2 Troubleshooting Data Transmission

STEPS	CORRECTIVE ACTION
1	Check to see that the VPI/VCI settings in the 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 ADSL or SHDSL modem or router is using RFC 1483 encapsulation.
2	Check the line card's VLAN configuration (see the *VLAN chapter*).
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.

25.3 DSL LED(s) Turn On and Off

A DSL LED turns on and off intermittently.

Table 25-3 Troubleshooting a Non-Constant DSL LED

STEPS	CORRECTIVE ACTION
1	Check the line card's diagnostic screen.
2	Connect a DSL modem directly to the DSL port of the line card using a different telephone wire. If the DSL LED still turns on and off repeatedly, contact the distributor.

25.4 Data Rate

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

Table 25-4 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.

25.5 Configured Settings

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

Table 25-5 Troubleshooting the Line card's Configured Settings

CORRECTIVE ACTION
Click **Apply** to save your changes back to the line card's volatile memory. The line card loses these changes if it is turned off or loses power, so use the **Config Save** link on the navigation panel to the left to save your changes to the non-volatile memory when you are done configuring. If this does not work, contact the distributor.

25.6 Password

I forgot the password to my line card.

Table 25-6 Troubleshooting the Password

CORRECTIVE ACTION
See the chapter on firmware upload and recovery in the *Commands with EEC* part.

25.7 Local Server

The computer behind a DSL modem or router cannot access a local server connected to the line card.

Table 25-7 Troubleshooting a Local Server

STEPS	CORRECTIVE ACTION
1	Refer to *section 25.2* to make sure that the subscriber is able to transmit to the line card.
2	Make sure the computer behind the DSL device has the correct gateway IP address configured.
3	Check the line card's VLAN configuration (see the *VLAN chapter*).
4	Check the cable and connections between the line card and the local server.
5	Try to access another local server. If data can be transmitted to a different local server, the original local server (that could not be accessed) may have a problem.

25.8 SNMP

The SNMP manager server cannot get information from the line card.

Table 25-8 Troubleshooting the SNMP Server

STEPS	CORRECTIVE ACTION
1	Ping the IES from the SNMP server. If you cannot, check the cable, connections and IP configuration.
2	Check to see that the community (or trusted host) in the IES matches the SNMP server's community. If these steps fail to correct the problem, contact the distributor.

25.9 Telnet

I cannot telnet into the line card.

Table 25-9 Troubleshooting Telnet

STEPS	CORRECTIVE ACTION
1	Make sure that a telnet session is not already operating. The line card only accepts one telnet session at a time.
2	Make sure that the IP address of the computer you are using matches a range of secured hosts configured in **Remote Management** under **Maintenance** in the IES. The IES immediately disconnects the telnet session if they do not match.
3	Ping the IES from your computer. If you are able to ping the IES but are still unable to telnet, contact the distributor. If you cannot ping, check the cable, connections and IP configuration.
4	If you are attempting to telnet from a DSL port, refer to *section 25.2* to make sure that you can transmit data to the DSL port.

Part V:

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 27
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.

27.1 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".

27.1.1 Command Structure with MSC

The card uses a one-level command structure with the management switch card. Specify the line card that you want to configure followed by the full command. You must type the full command every time. The syntax is as follows.

```
192.168.1.1> lcman command <slotid> <command>
```

For instance, the following example shows how to enable ADSL port 2 on the line card in slot 3.

```
192.168.1.1> lcman command 3 adsl enable port 2
```

27.1.2 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.

27.2 Commands with MSC

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

Refer to the chapters on commands with the Ethernet extension card for descriptions of commonly used 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.

Table 27-1 Commands with MSC

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

Table 27-1 Commands with MSC

COMMANDS			DESCRIPTION
		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.
		bonding set <slot-port> <name> <'c'|'r'>	Sets G.SHDSL port bonding. This only applies to the SLC card.
		bonding delete <slot> <name>	Removes G.SHDSL port bonding. This only applies to the SLC card.
		bonding list <slot>	Displays G.SHDSL port bonding settings. This only applies to the SLC card.
		isolate [enable/disable]	Enables/disables port isolation.
	config	convert	Backward compatibility command.
	maccount	active <slot>	Turns on a line card's MAC address count filter.
		inactive <slot>	Turns off a line card's MAC address count filter.
		set <slot> <count>	Sets a line card's MAC address count filter.
		list	Displays the system's current MAC address count settings.
	Command <slot>	<subcommands>	Sends commands to the line card in the specified slot.
		lineinfo <port>	This command shows the statistics of the specified DSL ports.
		lineperf <port>	This command shows the line quality of the specified DSL port.
		loopback <port> <mode>	Performs loopback test. <mode> = "local" or "f5"
		list port <port>	Displays line settings.
		list ports	Displays line settings on all ports.

Table 27-1 Commands with MSC

COMMANDS			DESCRIPTION
		`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.

Chapter 28
Command Examples

This chapter gives some command examples

28.1 Command Examples Overview

These are commands that you may use frequently in configuring and maintaining your line cards.

28.2 Sys Commands

Theses are the commonly used commands that belong to the sys (system) group of commands.

28.2.1 Log Disp Command

Syntax:

```
sys log disp
```

This command displays the system logs.

An example is shown below.

```
ras> sys log disp
   0 Feb 26 16:22:21 lcman    -WARN  SNMP SPECTRAP 14: module 06 plug in
   1 Feb 26 16:22:22 Config   -WARN  SNMP TRAP 4: if 7 link up
   2 Feb 26 16:22:22 Config   -WARN  SNMP TRAP 4: if 11 link up
   3 Feb 26 16:22:22 Config   -WARN  SNMP TRAP 4: if 15 link up
   4 Feb 26 16:22:22 Config   -WARN  SNMP TRAP 4: if 19 link up
   5 Feb 26 16:22:22 Config   -WARN  SNMP TRAP 4: if 23 link up
   6 Feb 26 16:22:24 adjtime   INFO  adjtime task pause 1 day
Clear Error Log (y/n):
```

Figure 28-1 Log Disp Command Example

28.2.2 Log Clear Command

Syntax:

```
sys log clear
```

This command clears the system logs.

If you clear a log (using the `sys log clear` command), you cannot view it again.

28.2.3 Version Command

Syntax:

```
sys version
```

This command shows the RAS code, firmware version, system uptime and bootbase version.

An example is shown next.

```
ras> sys version

 ZyNOS version: V3.50(DS.4)b16 | 01/30/2003
 romRasSize: 1638380
 system up time:    29:15:35 (a0baac ticks)
 bootbase version: V1.02(MSC1000) | 09/26/2002
```

Figure 28-2 Version Command Example

28.2.4 Monitor Status Command

Syntax:

```
sys monitor status
```

This command shows the hardware monitor's status.

An example is shown next.

```
ras> sys monitor status
   Time    V0    V1    V2    V3    V4    T0    T1    T2   F10   F11   Error
-------- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- --------
   16515 2.464 1.776 3.232 4.945 4.892  53.0  52.0  38.5     0      0 18000000
```

Figure 28-3 Monitor Status Command Example

28.3 Lcman Commands

These are commonly used lcman (line card manager) commands. Refer to the MSC user's guide for examples of `lcman svlan` commands.

28.3.1 Lcman Port List Command

Syntax:

```
lcman port list
```

This command displays the current setting of a port on the line card.

An example is shown next.

```
ras> lcman port list 2
slot-port  status     type     mode   profile
--------- -------- ---------- ------ ---------
   2-1     disable  adsl_anxa   auto DEFVAL
   2-2     disable  adsl_anxa   auto DEFVAL
   2-3     disable  adsl_anxa   auto DEFVAL
   2-4     disable  adsl_anxa   auto DEFVAL
   2-5     disable  adsl_anxa   auto DEFVAL
   2-6     disable  adsl_anxa   auto DEFVAL
   2-7     disable  adsl_anxa   auto DEFVAL
   2-8     disable  adsl_anxa   auto DEFVAL
   2-9     disable  adsl_anxa   auto DEFVAL
   2-10    disable  adsl_anxa   auto DEFVAL
   2-11    disable  adsl_anxa   auto DEFVAL
   2-12    disable  adsl_anxa   auto DEFVAL
   2-13    disable  adsl_anxa   auto DEFVAL
   2-14    disable  adsl_anxa   auto DEFVAL
   2-15    disable  adsl_anxa   auto DEFVAL
   2-16    disable  adsl_anxa   auto DEFVAL
   2-17    disable  adsl_anxa   auto DEFVAL
   2-18    disable  adsl_anxa   auto DEFVAL
   2-19    disable  adsl_anxa   auto DEFVAL
   2-20    disable  adsl_anxa   auto DEFVAL
   2-21    disable  adsl_anxa   auto DEFVAL
   2-22    disable  adsl_anxa   auto DEFVAL
   2-23    disable  adsl_anxa   auto DEFVAL
   2-24    disable  adsl_anxa   auto DEFVAL
ras>
```

Figure 28-4 lcman Port List Command

28.3.2 Lcman Port Isolate Command

Syntax:

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

This command turns the Integrated Ethernet Switch (IES) isolation feature on or off. Enable the Integrated Ethernet Switch isolation to block communications between subscriber ports. When you enable the Integrated Ethernet Switch isolation feature, you do not need to configure the VLAN to isolate subscribers. This leaves you free to use the VLAN to provide different priorities for different services or subscribers.

28.3.3 Lcman Command Command

Syntax:

```
lcman command <slot> <subcommand>
```

This command allows you to use commands for the individual DSL line cards. Specify the line card followed by the full command.

The following example shows line performance statistics for port 2 on a line card in slot 3.

```
ras> lcman command 3 lineperf 2


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 28-5 Lcman Command Command Example

28.3.4 Lcman Maccount List Command

Syntax:

```
lcman maccount list
```

This command displays the current status of the MAC address filter on the line card(s).

An example is shown below.

```
ras> lcman maccount list
slot  maccount  status
====  ========  ========
2            5  inactive
3            5  inactive
4            5  inactive
5            5  inactive
6            5  inactive
ras>
```

Figure 28-6 Lcman Maccount List Command

28.3.5 Lcman Maccount Active Command

Syntax:

```
lcman maccount active <slot>
```

This command enables the MAC address count filter for an individual line card on the IES.

The following example enables the MAC address count filter of the line card on slot 2.

```
ras> lcman maccount active 2
ras> lcman maccount list
slot  maccount  status
====  ========  ========
2            5  active
3            5  inactive
4            5  inactive
5            5  inactive
6            5  inactive
ras>
```

Figure 28-7 Lcman Maccount Active Command

28.3.6 Lcman Status Command

Syntax:

```
lcman status
```

This command shows information about the line card manager. This information includes how many slots are under management, the slot mask and the type of line card it is managing in each slot (if any), as well as the line card's IP address and driver version.

An example is shown next.

```
ras> lcman status
Slot ID: 2 to 6 (5 slots)
Slot Mask: 00004005 (previous 00000000)
 ID    State      Name       IP addr      Driver
----- --------- --------- --------------- --------
    2 ACTIVE    alc-61     127.0.0.101     803b35f8
    3 EMPTY                127.0.0.102     0
    4 EMPTY                127.0.0.103     0
    5 ACTIVE    alc-61     127.0.0.104     803b35f8
    6 ACTIVE    alc-61     127.0.0.105     803b35f8
```

Figure 28-8 Lcman Status Command Example

Part VI:

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 28
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.

28.1 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 give basic descriptions of the ADSL line card screens.

28.2 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.

28.2.1 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 28-1 Login Screen

28.2.2 Change Password

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

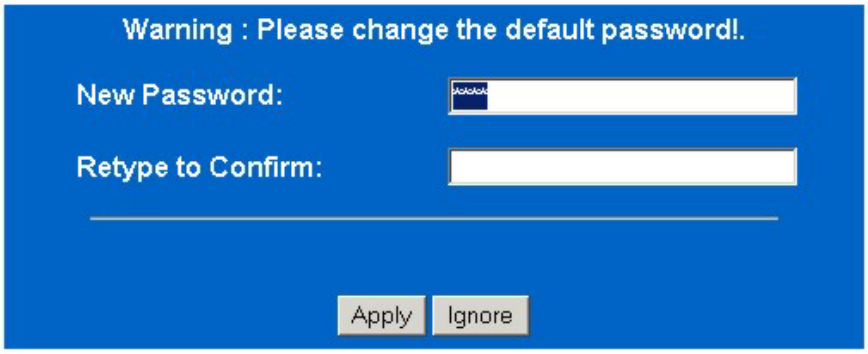


Figure 28-2 Change Password Screen

28.3 Home Screen

Figure 28-3 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 28-1 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.

28.4 Screens Overview

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

Table 28-2 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 Edit Port Setup		ALC Statistics
		ALC Hardware Monitor
		ALC Port Statistics
		ALC 802.1Q VLAN Statistics
		Diagnostic
		ALC Diagnostic

28.5 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.

28.6 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 28-4*) to open the configuration screen.

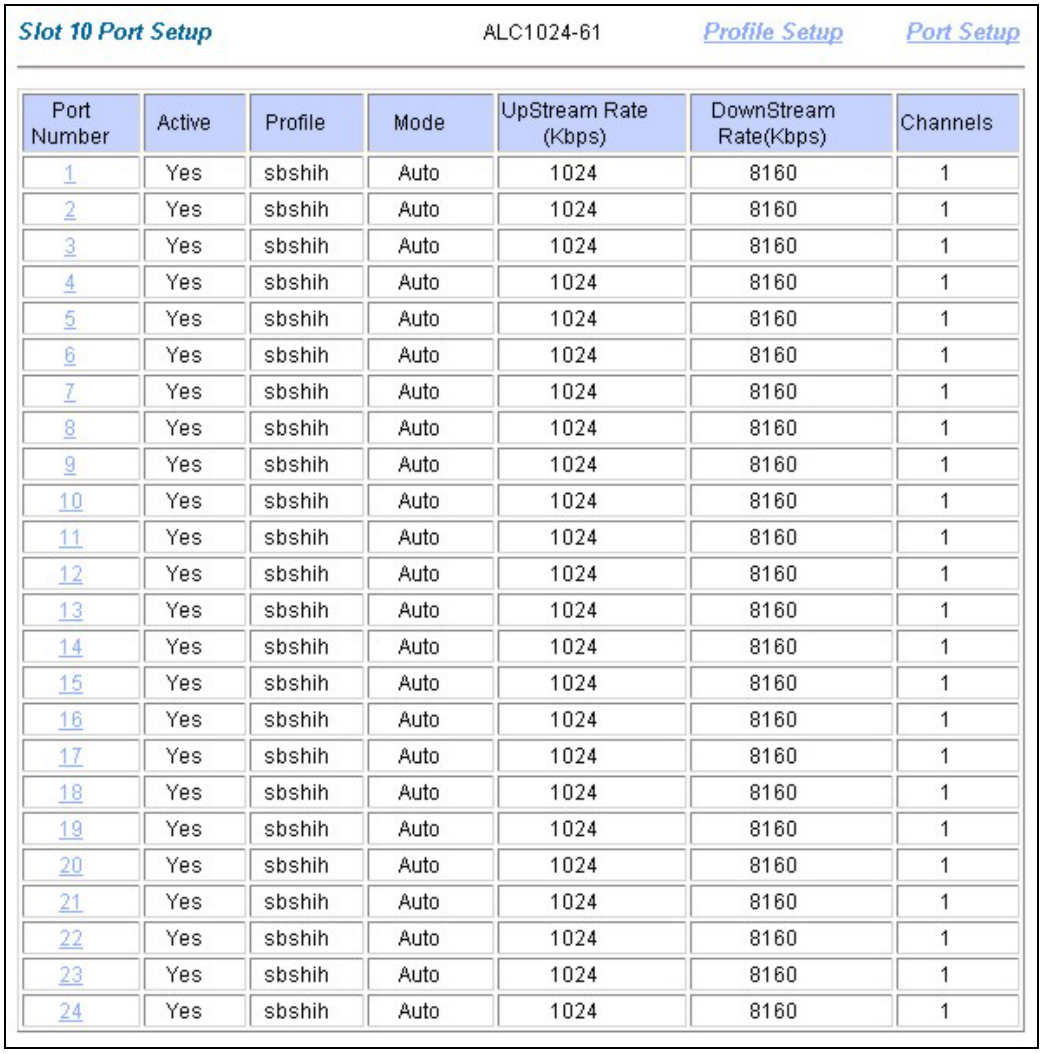
Figure 28-4 Select a Line Card

Table 28-3 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.

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 28-5*) to go to the general **Port Setup** screen (see *Figure 28-4*).



Slot 10 Port Setup ALC1024-61 Profile Setup Port Setup

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

Figure 28-5 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 28-6*) to go to the **ALC Port Setup** screen (see *Figure 28-5*).

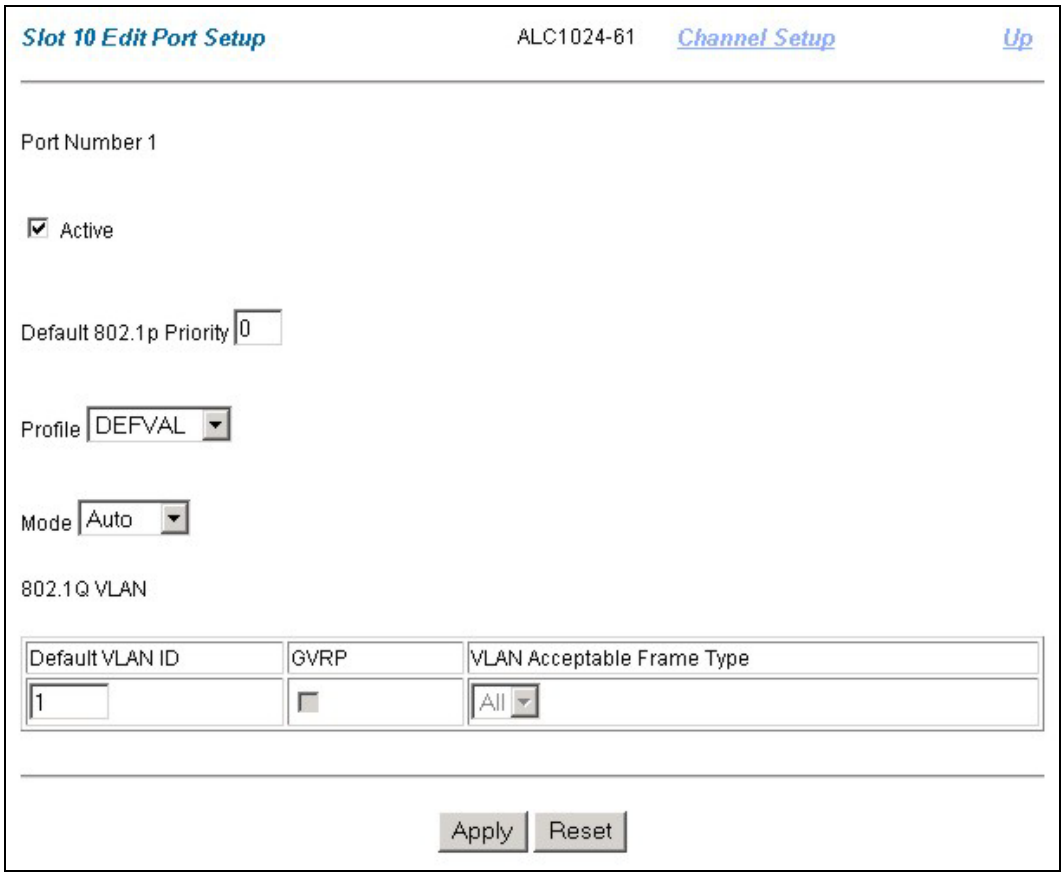


Figure 28-6 ALC Edit Port Setup Screen

Chapter 29
ADSL Port Setup

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

29.1 ADSL Port Setup Overview

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

29.2 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 29-1 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

27.3 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.

29.3 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.

29.4 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.

29.4.1 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.

29.5 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.

29.6 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.

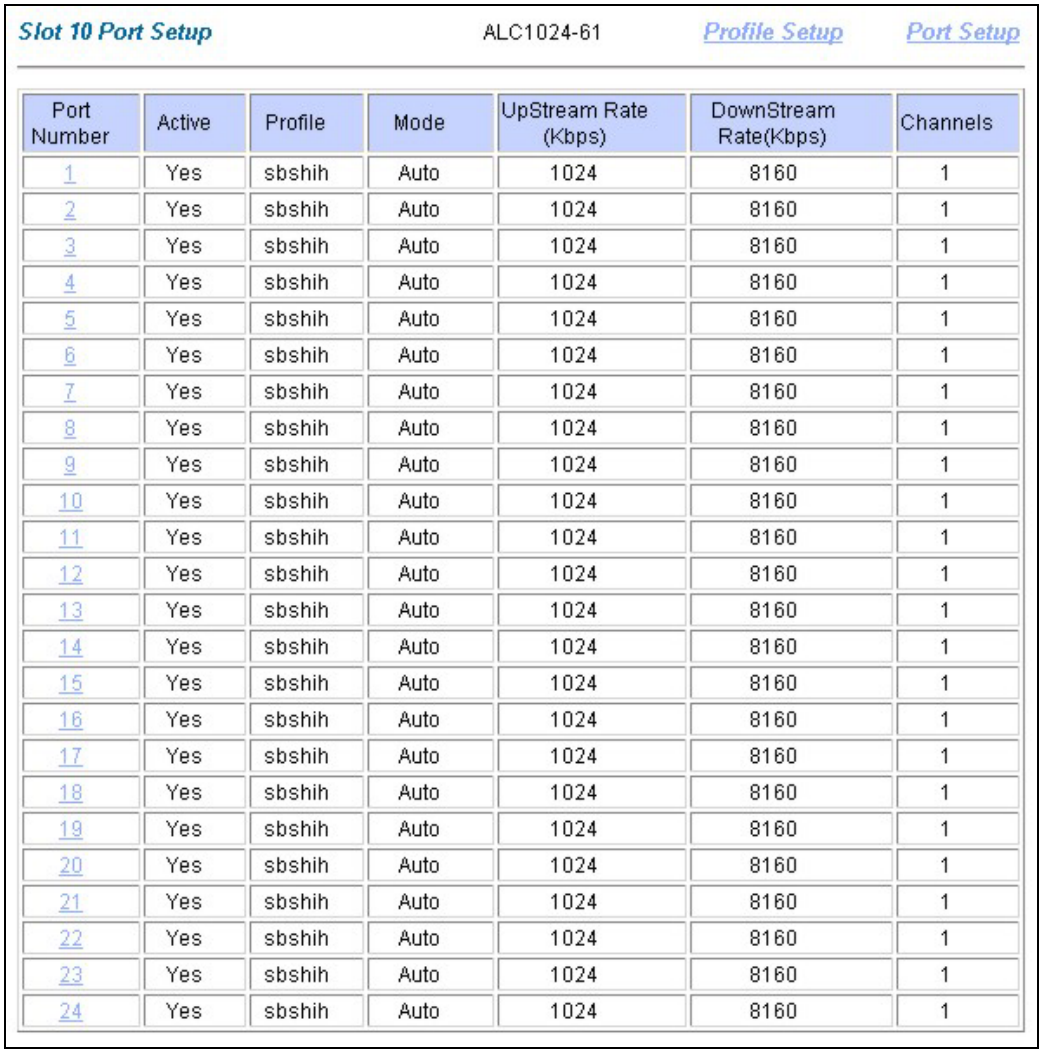
Refer to the *ALC1024 Overview* chapter for the settings of the default profile and ADSL port default settings.

29.7 ALC Port Setup Screen

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

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

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



Slot 10 Port Setup ALC1024-61 Profile Setup Port Setup

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

Figure 29-1 ALC Port Setup Screen

Table 29-2 ALC Port Setup

LABEL	DESCRIPTION
Slot (N) Port Setup	This is the card's slot number.
Profile Setup	Click this link to go to the card's **Profile Setup** screen.
Port Setup	Click this link to go to the general **Port Setup** screen.
Port Number	Click a port's index number to go to that port's **Edit Port Setup** screen.
Active	This field shows whether the port is turned on (**Yes**) or not (**No**). The factory default of all ADSL ports is disabled. A port must be enabled for data transmission to occur.
Profile	This field shows which profile is assigned to this port.

Table 29-2 ALC Port Setup

LABEL	DESCRIPTION
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.

29.7.1 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.

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

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

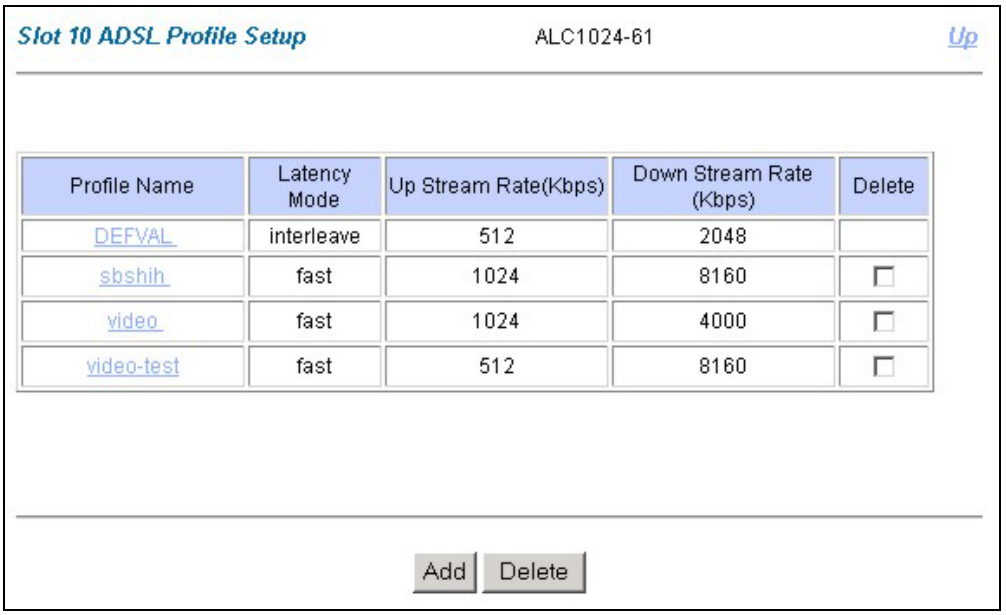


Figure 29-2 ALC Profile Setup Screen

Table 29-3 ALC Profile Setup

LABEL	DESCRIPTION
Slot (N) Profile Setup	This is the card's slot number.
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.

Table 29-3 ALC Profile Setup

LABEL	DESCRIPTION
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

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

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

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

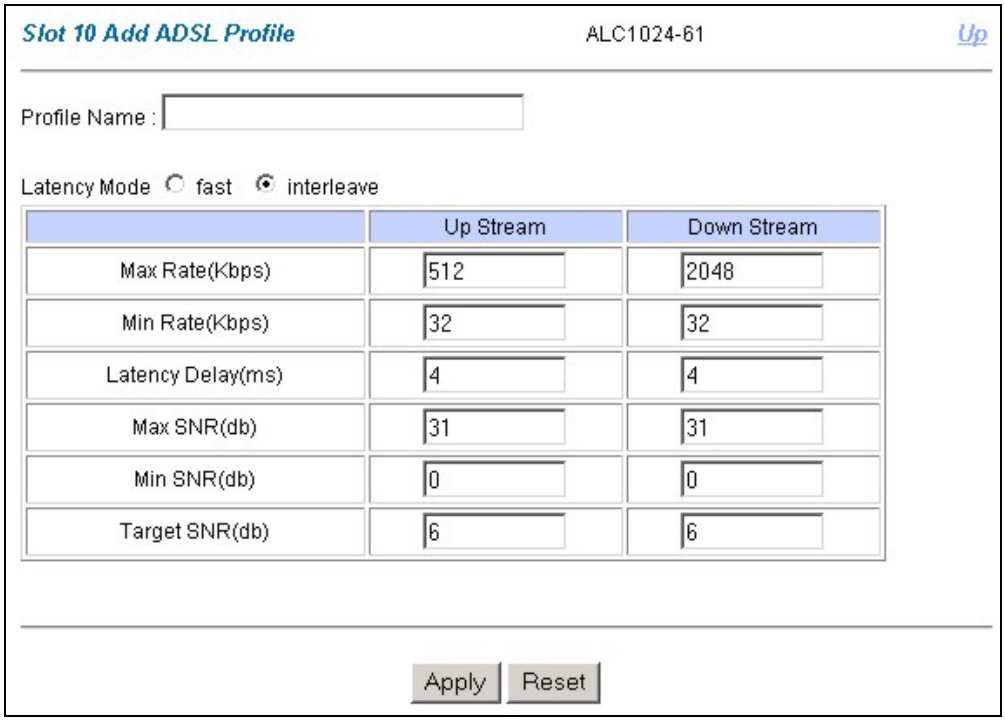


Figure 29-3 ALC Edit Profile Screen

Table 29-4 ALC Edit Profile

LABEL	DESCRIPTION
Slot (N) Edit Profile	This is the card's slot number.
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.
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.

Table 29-4 ALC Edit Profile

LABEL	DESCRIPTION
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.	

29.7.2 ALC Port Edit Screen

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

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

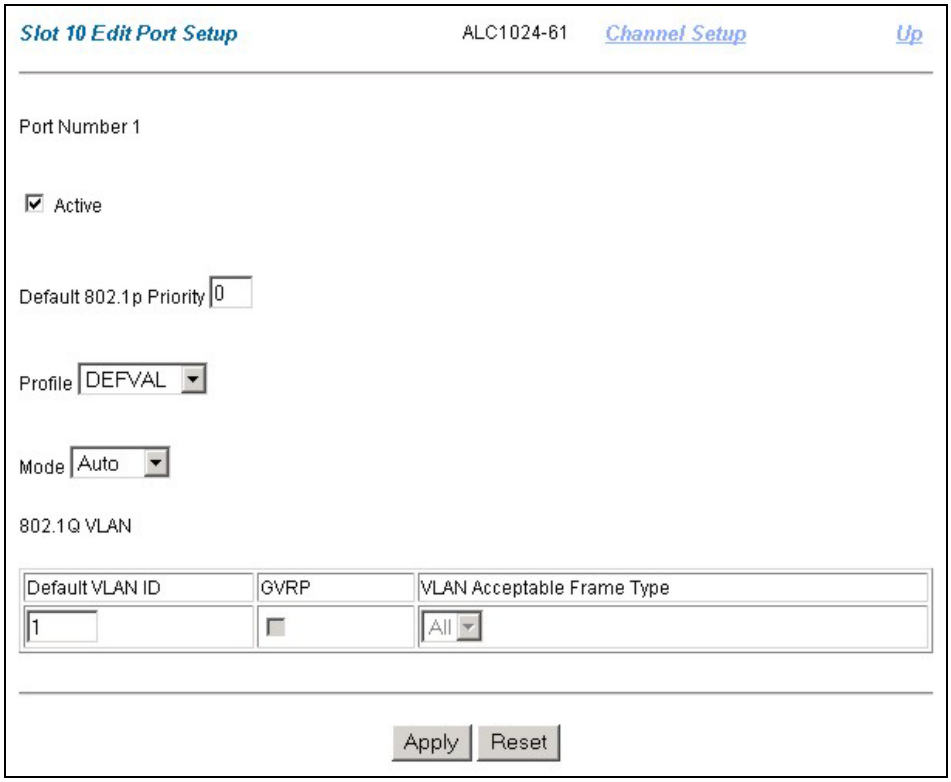


Figure 29-4 ALC Edit Port Setup Screen

Table 29-5 ALC Edit Port Setup

LABEL	DESCRIPTION
Slot (N) Edit Port Setup	This is the card's slot number.
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 *29.7.1* and *29.7.2*).
Mode	Use the drop-down list box to select the ADSL operational mode for this port (see *Table 29-1*).
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.
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.	

29.8 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.

29.8.1 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.

29.8.2 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.

29.9 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.

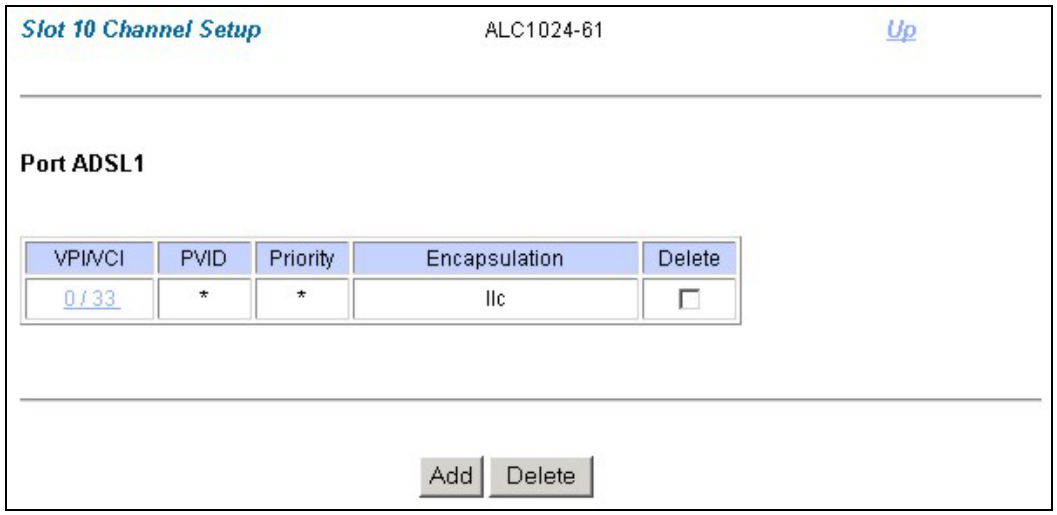


Figure 29-5 ALC Port Channel Setup Screen

Table 29-6 ALC Port Channel Setup

LABEL	DESCRIPTION

Table 29-6 ALC Port Channel Setup

LABEL	DESCRIPTION
Slot (N) Channel Setup	This is the card's slot number.
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.
Default 802.1p 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.

29.9.1 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.

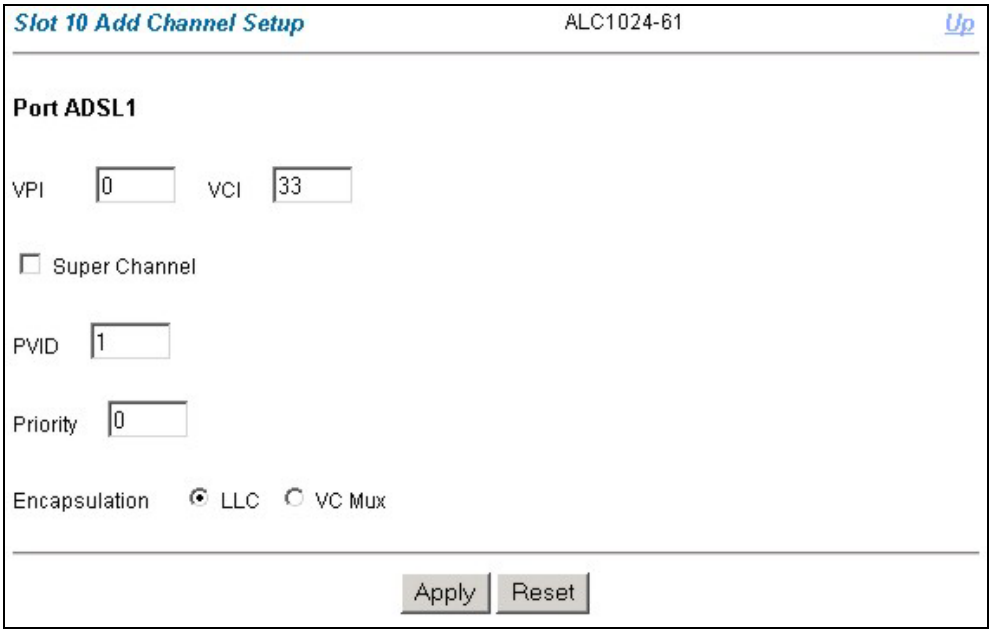


Figure 29-6 ALC Edit Port Channel Setup Screen

Table 29-7 ALC Edit Port Channel Setup

LABEL	DESCRIPTION
Slot (N) Add Channel Setup	This is the card's slot number.
Up	Click this link to go to the port's **Channel Setup** screen.
VPI	Type the Virtual Path Identifier for this port.
VCI	Type the Virtual Circuit Identifier for this port.
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.	

Chapter 30
IEEE 802.1Q VLAN

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

30.1 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.

30.2 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.

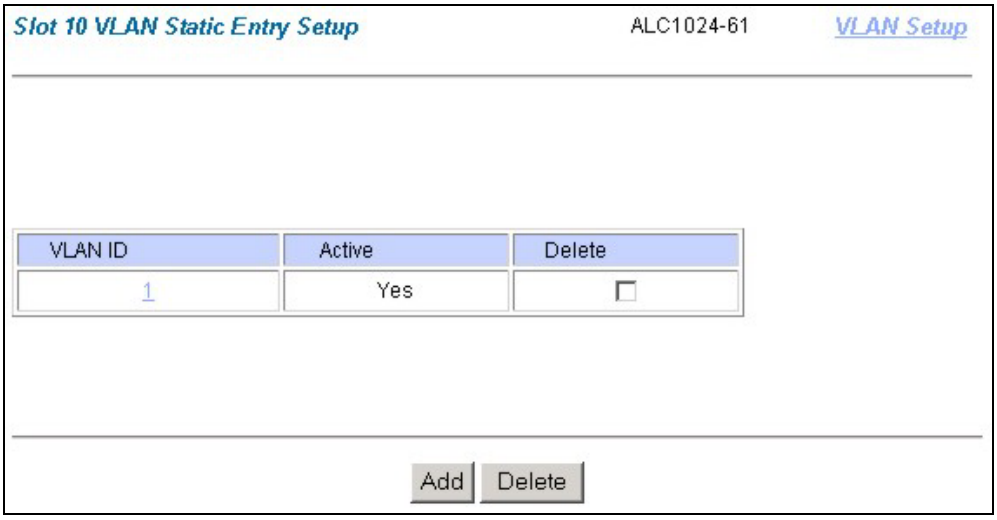


Figure 30-1 ALC Static VLAN Setup Screen

Table 30-1 ALC Static VLAN Setup

LABEL	DESCRIPTION
Slot (N) VLAN Static Entry Setup	This is the card's slot number.
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.

Table 30-1 ALC Static VLAN Setup

LABEL	DESCRIPTION
Active	This field displays whether the VLAN is currently enabled **Yes** or disabled **No**.
Add	Click this button to add a new VLAN ID.
Delete	Select a channel's **Delete** check box and click the **Delete** button to remove the channel.

30.3 ALC Static VLAN Entry Add or Edit Screen

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

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

Use this menu to set up 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.

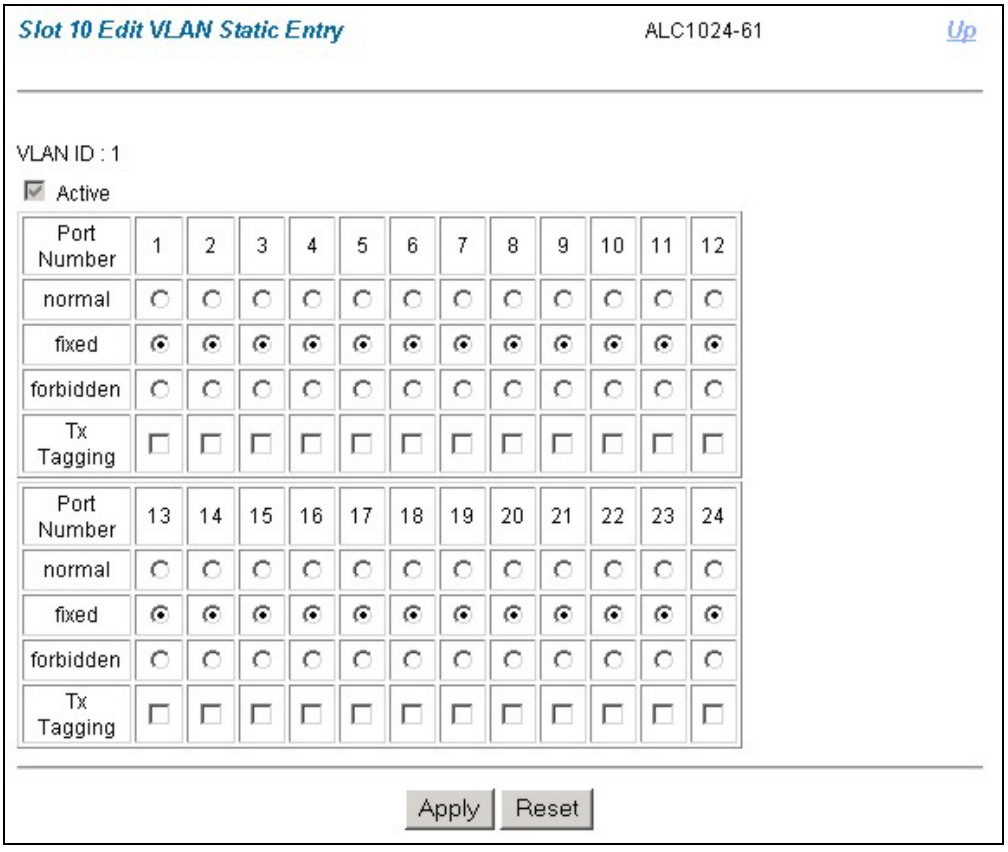


Figure 30-2 ALC Edit Static VLAN Screen

Table 30-2 ALC Edit Static VLAN

LABEL	DESCRIPTION

Table 30-2 ALC Edit Static VLAN

LABEL	DESCRIPTION
Slot (N) Edit VLAN Static Entry	This is the card's slot number.
Up	Click this link to go to the **Static VLAN Setup** screen.
VLAN ID	This is the number that identifies the VLAN group. When you add a static VLAN, type a number (1-4094) to identify the VLAN. When you edit a static VLAN, you cannot change this number.
Active	Select this check box to enable this VLAN when you click **Apply** below. Clear this check box and click **Apply** below to disable this VLAN without having to delete it.
Port Number	This field displays the port number.
Normal	Select **Normal** registration for the associated port if you want that port to join this VLAN group using GVRP.
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.	

30.4 ALC Management VLAN Edit Screen

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

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

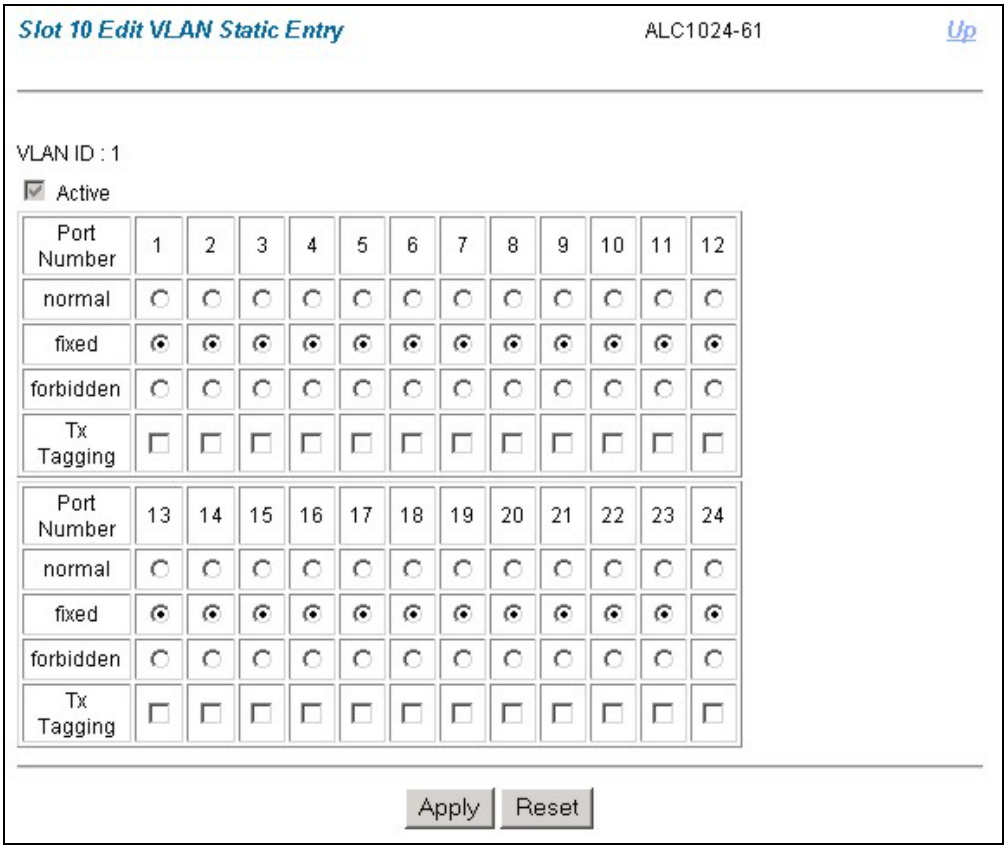


Figure 30-3 ALC Management VLAN Edit Screen

Table 30-3 ALC Management VLAN Edit

LABEL	DESCRIPTION
Slot (N) Edit VLAN Static Entry	This is the card's slot number.
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 31 Maintenance

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

31.1 Maintenance Overview

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

31.1.1 Firmware Upgrade Screen

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

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

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

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

The card automatically restarts when the upgrade process is complete.

Procedure to upgrade your firmware:

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

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**.

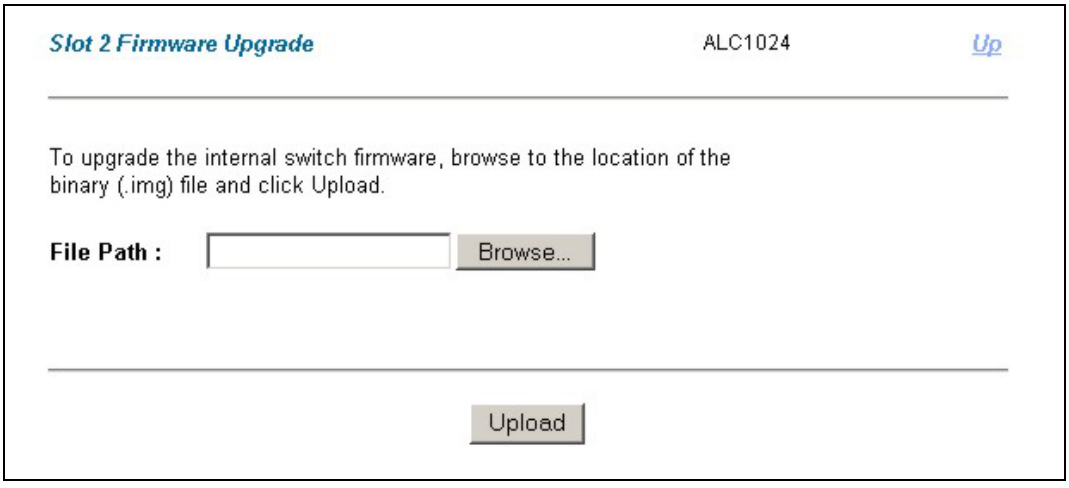


Figure 31-1 Card Firmware Upgrade

Chapter 32 Statistics

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

32.1 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.

32.2 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.

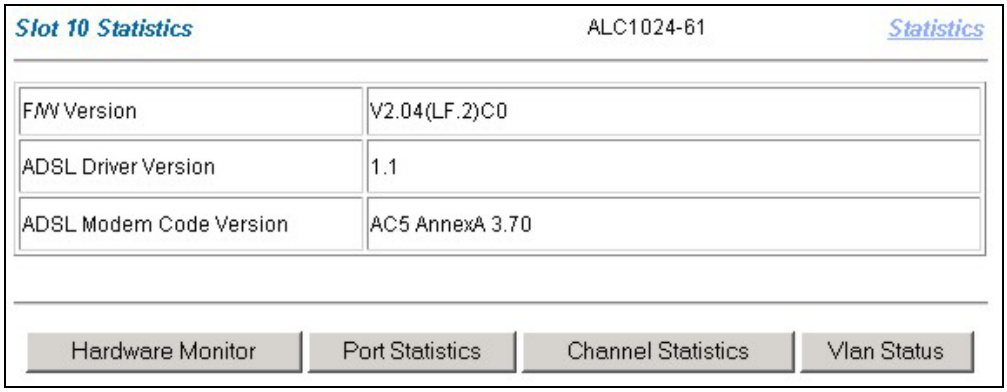


Figure 32-1 ALC Statistics Screen

Table 32-1 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 32-1 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.

32.2.1 Hardware Monitor Screen

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

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

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

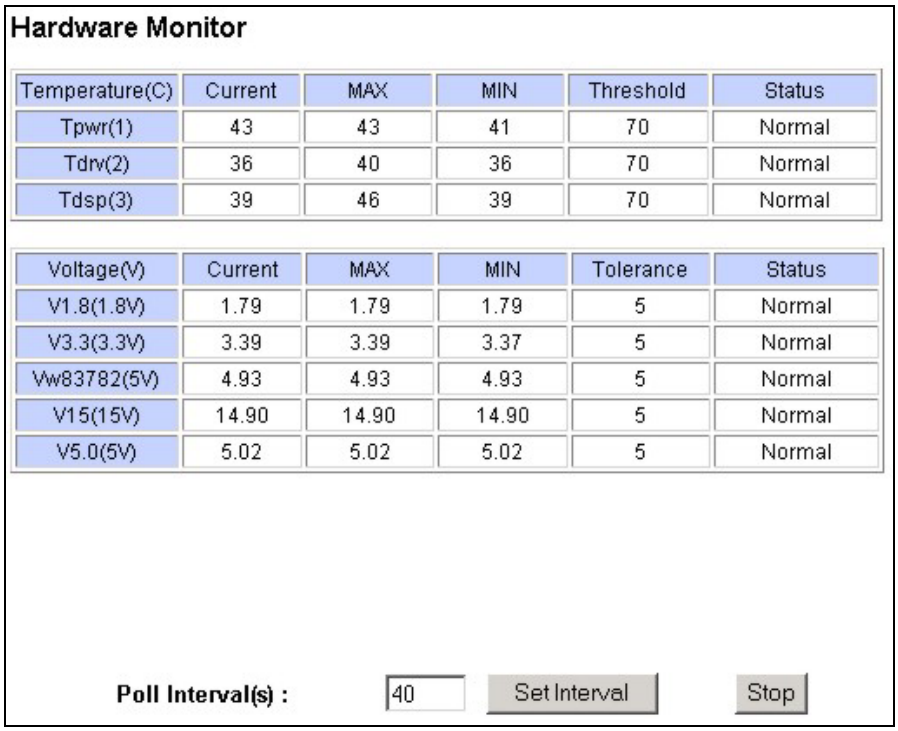


Figure 32-2 ALC Hardware Monitor Screen

Table 32-2 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 32-2 ALC Hardware Monitor

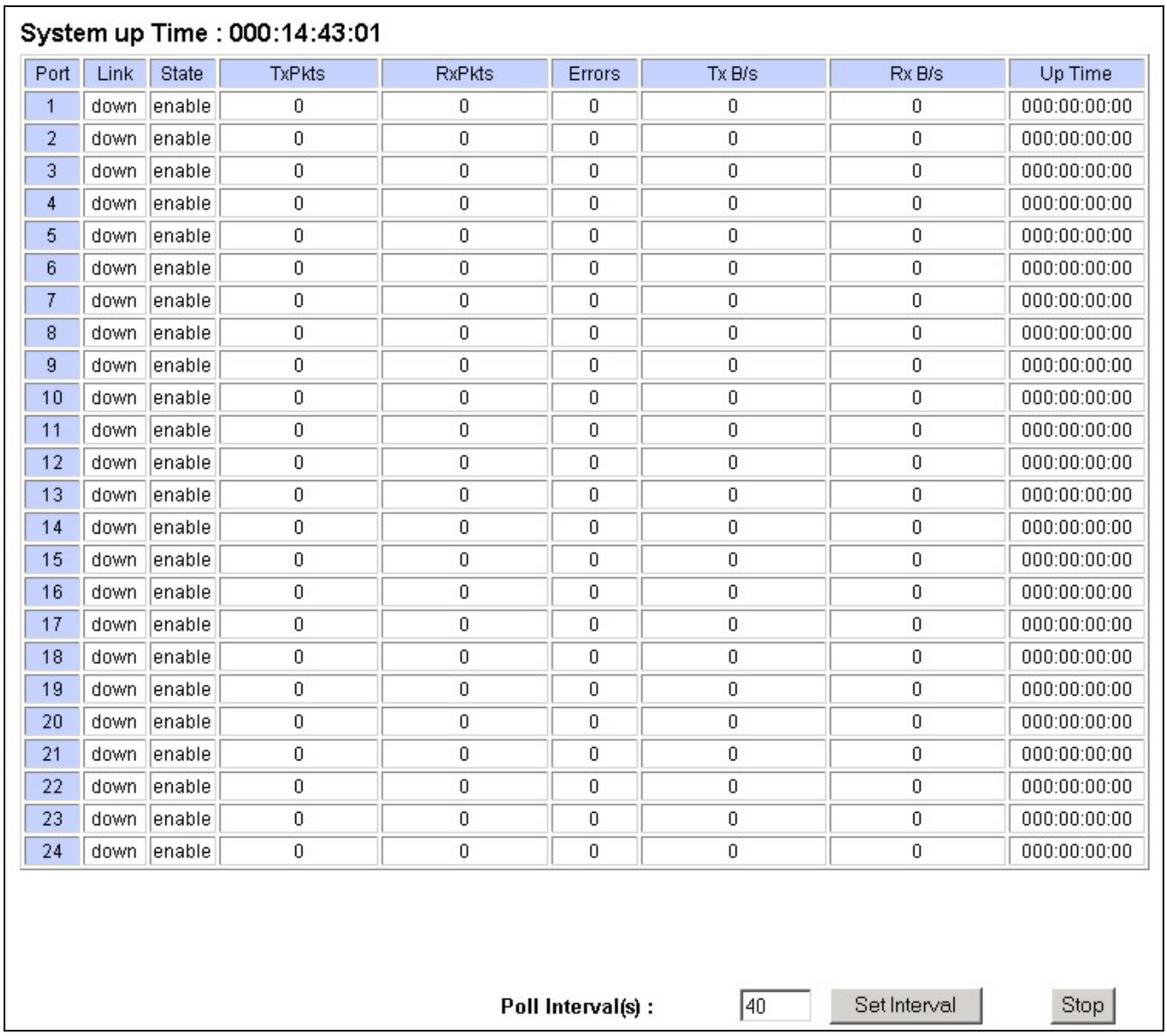
LABEL	DESCRIPTION
Current	This shows the current temperature at this sensor.
Max	This field displays the maximum temperature measured at this sensor.
Min	This field displays the minimum temperature measured at this sensor.
Threshold	This field displays the upper temperature limit at this sensor.
Status	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.

32.2.2 Port Statistics Screen

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

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

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



System up Time : 000:14:43:01

Port	Link	State	TxPkts	RxPkts	Errors	Tx B/s	Rx B/s	Up Time
1	down	enable	0	0	0	0	0	000:00:00:00
2	down	enable	0	0	0	0	0	000:00:00:00
3	down	enable	0	0	0	0	0	000:00:00:00
4	down	enable	0	0	0	0	0	000:00:00:00
5	down	enable	0	0	0	0	0	000:00:00:00
6	down	enable	0	0	0	0	0	000:00:00:00
7	down	enable	0	0	0	0	0	000:00:00:00
8	down	enable	0	0	0	0	0	000:00:00:00
9	down	enable	0	0	0	0	0	000:00:00:00
10	down	enable	0	0	0	0	0	000:00:00:00
11	down	enable	0	0	0	0	0	000:00:00:00
12	down	enable	0	0	0	0	0	000:00:00:00
13	down	enable	0	0	0	0	0	000:00:00:00
14	down	enable	0	0	0	0	0	000:00:00:00
15	down	enable	0	0	0	0	0	000:00:00:00
16	down	enable	0	0	0	0	0	000:00:00:00
17	down	enable	0	0	0	0	0	000:00:00:00
18	down	enable	0	0	0	0	0	000:00:00:00
19	down	enable	0	0	0	0	0	000:00:00:00
20	down	enable	0	0	0	0	0	000:00:00:00
21	down	enable	0	0	0	0	0	000:00:00:00
22	down	enable	0	0	0	0	0	000:00:00:00
23	down	enable	0	0	0	0	0	000:00:00:00
24	down	enable	0	0	0	0	0	000:00:00:00

Figure 32-3 ALC Port Statistics Screen

Table 32-3 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.
RxPkts	This field shows the number of packets received by this port.

Table 32-3 ALC Port Statistics

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

32.2.3 Channel Statistics

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

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

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

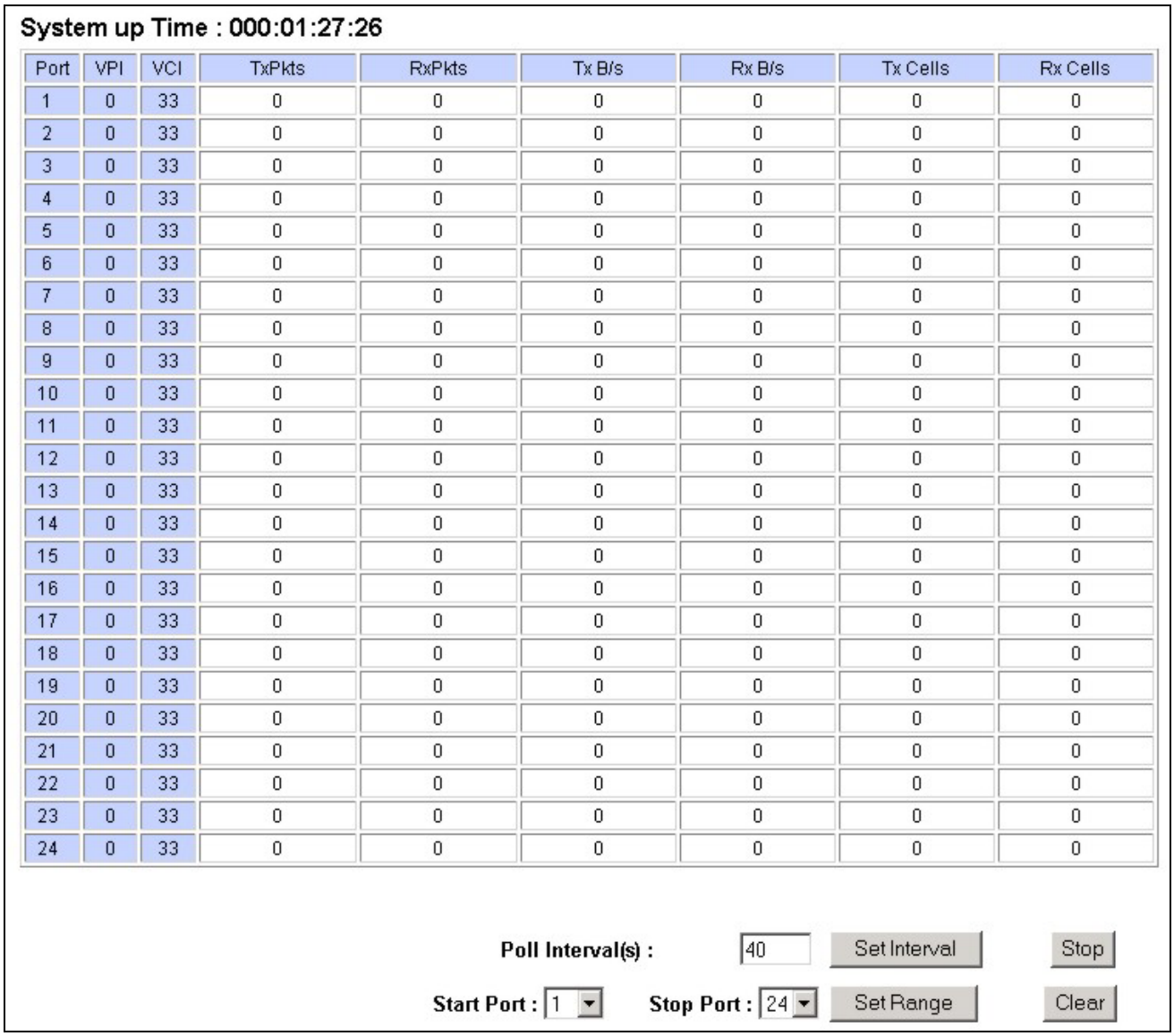


Figure 32-4 ALC Channel Statistics Screen

Table 32-4 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.

Table 32-4 ALC Channel Statistics

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

32.2.4 VLAN Status Screen

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

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

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

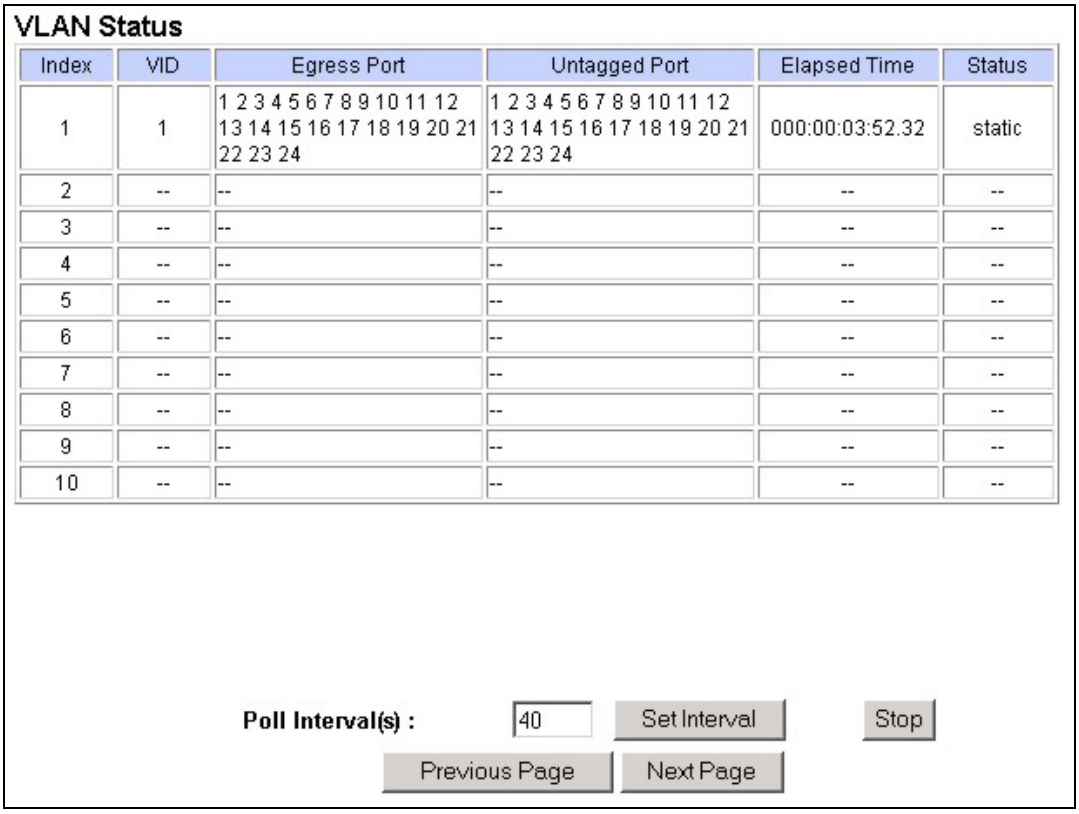


Figure 32-5 ALC 802.1Q VLAN Status Screen

Table 32-5 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 32-5 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 33 Diagnostics

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

33.1 Diagnostic Overview

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

33.2 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.

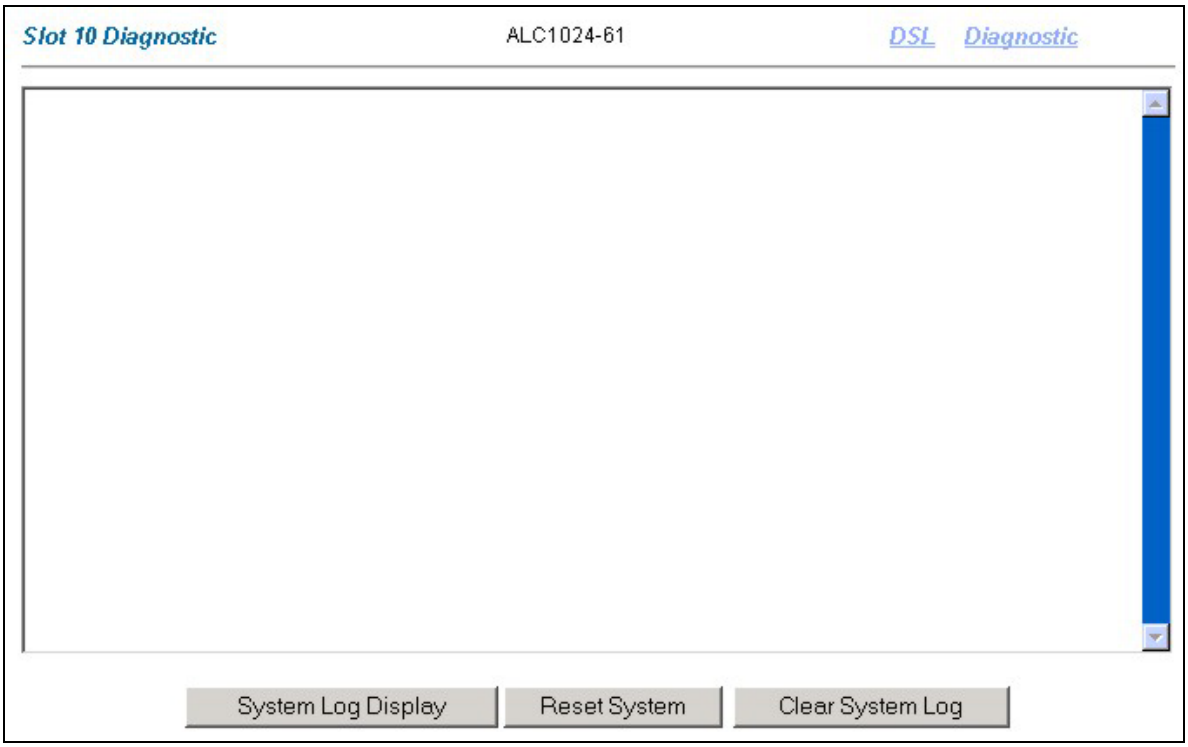


Figure 33-1 Diagnostic Screen

Table 33-1 Diagnostic

LABEL	DESCRIPTION
Slot (N) Diagnostic	This is the card's slot number.

Table 33-1 Diagnostic

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

33.2.1 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.

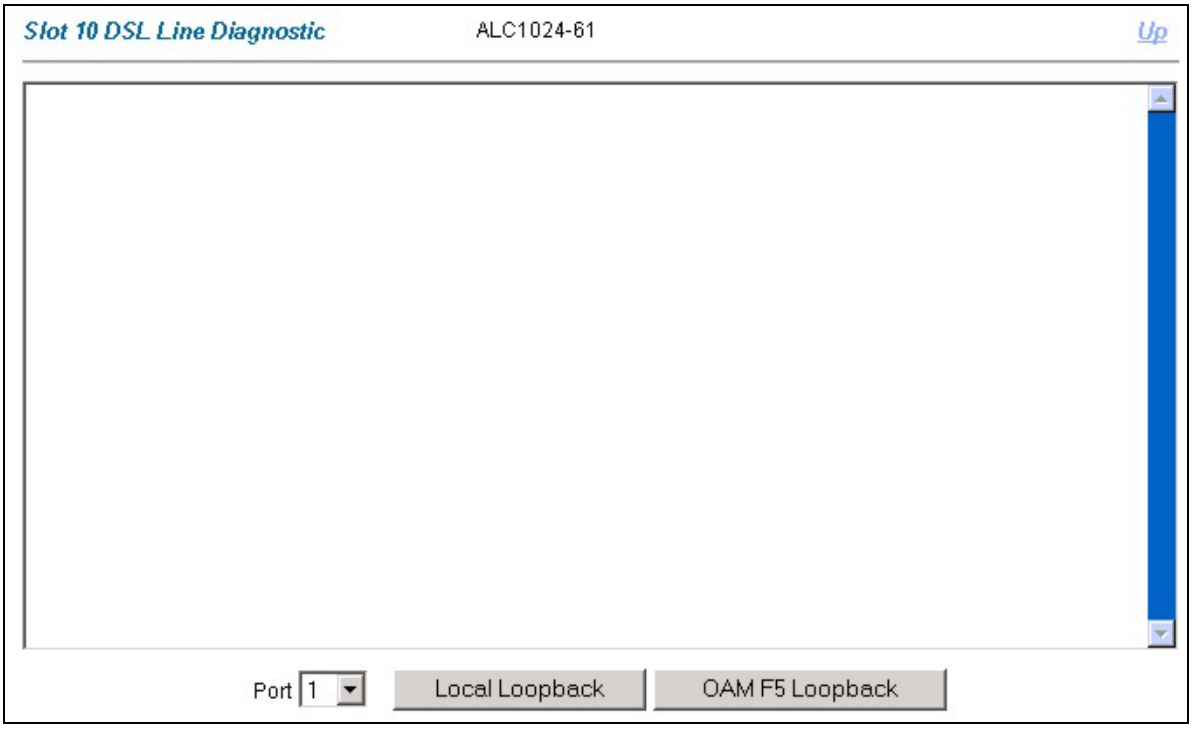


Figure 33-2 ALC Diagnostic DSL Screen

Table 33-2 ALC Diagnostic DSL

LABEL	DESCRIPTION
Slot (N) DSL Line Diagnostic	This is the card's slot number.

Table 33-2 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 G.SHDSL 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.SHDSL 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 34 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.

34.1 Troubleshooting Overview

See Chapter 25 for additional troubleshooting tips.

34.2 Configured Settings

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

Table 34-1 Troubleshooting the Line card's Configured Settings

CORRECTIVE ACTION
Click **Apply** after you finish configuring to save your settings to the line card. If this does not work, contact the distributor.

Part VII:

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This part provides an index of important terms.

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