



***PacketStar*[®] PSAX**
8-Port HDSL-2 Module
User Guide

Model 23N69

for the *PacketStar*[®] PSAX Multiservice Media Gateways

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Warranty Information

Software and Hardware Limited Warranties

Lucent Technologies provides a 90-day limited software warranty, and a one-year limited hardware warranty on this product. Refer to the *Software License and Limited Warranty Agreement* and the *Lucent Technologies InterNetworking Systems Global Warranty* that accompanied your package for more information.

Warranty Warnings

▲ WARNING:

When inserting modules into the chassis, slide them gently, not forcefully. Excessive force may cause the modules to be seated improperly in the chassis, and result in possible damage to the module or the chassis. Install or remove modules one at a time. Doing this aids in preventing the PSAX system from indicating any erroneous failure messages, and allows the PSAX system time to reinitialize and display the accurate configuration of the module that is inserted.

▲ CAUTION:

Modifying or tampering with PSAX chassis components may void your warranty. Any modification to this equipment not expressly authorized by Lucent Technologies may void your granted authority to operate such equipment.

▲ CAUTION:

Shipping the chassis with removable I/O, server, or CPU modules installed may cause damage to the chassis and the modules. Damage to any of the components in the system resulting from shipping the chassis with removable modules installed will void your warranty.

Safety Warnings and Information

When installing and operating the 8-Port HDSL-2 module, follow the safety guidelines provided in the *PacketStar® PSAX Multiservice Media Gateway Safety Guidelines*, which accompanies this product, to help prevent serious personal injury and damage to the module. Please read all warnings and instructions supplied before beginning installation or configuration of this module. In addition to the general safety information provided, you should also refer to the appropriate PSAX installation guide for other important safety information and procedures.

Regulatory Standards Compliance

Safety and Electromagnetic Compatibility (EMC)

The following *PacketStar* PSAX systems are compliant with applicable safety and EMC standards when configured with the 8-Port HDSL-2 module (model 23N69):

- PSAX 1000 system
- PSAX 1250 system
- PSAX 2300 system
- PSAX 4500 system

Refer to the *PacketStar* PSAX 1000, PSAX 1250, PSAX 2300, or PSAX 4500 installation guide for details on safety and EMC standards compliance.

Telecommunications

The 8-Port HDSL-2 module (model 23N69) is compliant with the following applicable telecommunications standards:

- FCC Part 68 (USA)
- CS-03 Issue 8 (Canada)

USA Regulatory Statement

FCC Part 68

This equipment complies with Part 68 of the FCC rules. On the back of the PSAX chassis is a label that contains the FCC registration number, in addition to other information. You must provide this information to the telephone company, if they request it. The FCC requires Lucent Technologies to provide you with the following information:

1. This equipment has digital service interface capabilities using RJ-48C and RJ-48H connectors. The facility interface codes with which this equipment complies for digital services are as follows: 04DU9-BN, 04DU9-DN, 04DU9-1KN, and 04DU9-1SN. This equipment has loop start interface capabilities using an RJ-11C connector. The facility interface code with which this equipment complies for service is 02LS2. The service order codes for this equipment are 6.0F for the T1 interface and 9.0Y for the loop start interface.
2. An FCC-compliant telephone network interface jack is built into this equipment and is compatible with interconnections that are Part 68 compliant.
3. The REN for the 4-Port Voice 2-Wire Office module when used in this equipment is 0.7B.
4. If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service might be required. But if advance notice is not practical, the tele-

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phone company will notify you as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe this is necessary.

5. The telephone company might make changes in its facilities, equipment, operations, or procedures that could affect the operation of this equipment. If this happens, the telephone company will provide advance notice for you to make necessary modifications to maintain uninterrupted service.
6. If you experience trouble with this equipment, or need repairs or warranty information, please refer to the *Lucent Technologies InterNetworking Systems Global Warranty* that accompanied your PSAX product shipment for instructions on obtaining technical support in your area.

If this equipment is causing harm to the telephone network, the telephone company might request that you disconnect the equipment until the problem is resolved.

7. This equipment has no user-serviceable parts.

This equipment cannot be used on public coin telephone service provided by the telephone company. Connection to party line service is subject to state tariffs. Contact your state public utility commission, public service commission, or corporation commission for information.

Canadian Regulatory Statements

CS-03 Issue 8

NOTICE: This equipment meets applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

The Ringer Equivalence Number (REN) assigned to the 4-Port Voice 2-Wire Office module denotes the percentage of the total load to be connected to a telephone loop, which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the REN of all devices does not exceed 5.

The REN for the 4-Port Voice 2-Wire Office module when used in the PSAX system is 0.7B.

SH-03 Version 8

AVIS: Le présent matériel est conforme aux spécifications techniques d'Industrie Canada applicables au matériel terminal. Cette conformité est confirmée par le numéro d'enregistrement. Le sigle, IC, placé devant le numéro d'enregistrement, signifie que l'enregistrement s'est effectué conformément à une déclaration de conformité

et indique que les spécifications techniques d'Industrie Canada ont été respectées. Il n'implique pas qu'Industrie Canada a approuvé le matériel.

Le nombre équivalent de sonnerie (REN) attribué au module central bifilaire (Voice 2-Wire Office) correspond au pourcentage de la charge totale à connecter à un circuit téléphonique bifilaire; il est utilisé par l'appareil pour prévenir la surcharge. Le circuit peut être terminé par n'importe quelle combinaison d'appareils, à la seule condition que le total des REN de ces derniers ne dépasse pas cinq.

Lorsqu'il est utilisé dans le système PSAX, le module central bifilaire possède un REN de 0,7 B.

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1 Getting Started



Purpose of This Guide

The *PacketStar® PSAX 8-Port HDSL-2 Module User Guide* provides a description of the 8-Port HDSL-2 module. It also provides information on how to configure the module ports and channels.

For information on configuring interfaces and provisioning connections through the PSAX console interface, see the *PacketStar® PSAX Connections Provisioning Guide*. If the *Navis® EMS-PSAX* interface is being used, see the *Navis® EMS-PSAX Interface and Connection Provisioning Guide*.

Note: If you are using this module for the first time, you should read through this guide in its entirety before beginning the configuration process. The chapters in this guide are arranged in the logical order of normal configuration and should be performed in that order for the module to operate successfully.

Audience for This Guide

The information in this guide is intended for users who will configure ports and channels for the 8-Port HDSL-2 module in the PSAX Multiservice Media Gateway system.

What You Should Know

Before you use this document or operate a PSAX system, you should already understand and have experience with the following:

- Ethernet network capabilities
- Internet Protocol capabilities
- Data network design
- Telephony network design

Related Reading

Lucent Technologies Information Products

Product Information Library

To install, operate, and configure your PSAX system and I/O and server modules, read the PSAX publications provided on your Lucent Technologies *PacketStar*[®] PSAX Multiservice Media Gateways Product Information Library CD-ROM.

Printed Documents

For your convenience, many of the documents included on the *PacketStar*[®] PSAX Multiservice Media Gateways Product Information Library CD-ROM are also available in printed form. You can order these documents through the Lucent Technologies Customer Information Center Web site at:
<http://www.lucentdocs.com>.

Other Publications

Numerous books are currently available on the subject of basic telecommunications technology and specific protocols. In addition to such general reading, you should also be familiar with the specifications identified in the appendix entitled Reference Tables at the back of the guide.

About Lucent Technologies

Lucent Technologies is the communications systems and technology company formed through the restructuring of AT&T. We bring with us a tradition of more than 125 years of experience and a dedication to superior customer service.

Lucent Technologies manufactures, sells, and services a complete line of customer premises communications units, and commercial and multimedia communications and messaging systems designed and supported by our research and development unit, Bell Laboratories.

Our legacy and our spirit of innovation allow Lucent to provide our customers with the tools needed to communicate effectively, any time and anywhere, and to integrate the latest technologies into real-life solutions that help make business work.

About the *PacketStar* PSAX Product Family

Lucent Technologies provides a complete range of PSAX Multiservice Media Gateways in the *PacketStar* PSAX family.

PSAX 1000 Multiservice Media Gateway

The *PacketStar* PSAX 1000 Multiservice Media Gateway is designed to provide a full range of central office-based multiservice media gateway functions in a small, competitively-priced package suitable for customer premise deployment. Ideal for central office, large enterprise, or wireless cell site multiservice media gateway applications, the PSAX 1000 system provides highly reliable network access for time-division multiplex voice, frame relay, 10/100BASE-T Ethernet, and ATM data applications.

When it is functioning in a redundant operating mode and after it has experienced a single-point failure, the PSAX 1000 system provides up to 630 Mbps of ATM cell bus capacity. The total ATM cell bus capacity of the system may also be scaled to provide nonblocking, nonredundant chassis bandwidths beyond 630 Mbps.

Supporting up to five slots (19-inch chassis) for I/O and server modules—with a full range of interfaces such as DS0A, DS1/E1, DS3/E3, OC-3, OC-3c/STM-1, OC-12c/STM-4c, 10/100BASE-T Ethernet, and serial—the PSAX 1000 system is a cost-effective access switch solution for connecting to legacy equipment.

PSAX 1250 Multiservice Media Gateway

The *PacketStar* PSAX 1250 Multiservice Media Gateway is designed to provide a full range of central office-based multiservice ATM access functions. Ideal for the central office or a large enterprise's multiservice media gateway, the PSAX 1250 system provides highly reliable network access for time-division multiplex voice, frame relay, 10/100BASE-T Ethernet, and ATM data applications.

When it is functioning in a redundant operating mode and after it has experienced a single-point failure, the PSAX 1250 system provides up to 600 Mbps of ATM cell bus capacity. The total ATM cell bus capacity of the system may also be scaled to provide nonblocking, nonredundant chassis bandwidths beyond 600 Mbps.

Supporting 10 slots (19-inch chassis) or 14 slots (23-inch chassis) for I/O and server modules—with a full range of interfaces such as DS0A, DS1/E1, DS3/E3, OC-3, OC-3c/STM-1, OC-12c/STM-4c, 10/100BASE-T Ethernet, and serial—the PSAX 1250 system is a cost-effective access switch solution for interworking with legacy equipment.

PSAX 2300 Multiservice Media Gateway

The *PacketStar* PSAX 2300 Multiservice Media Gateway offers carrier-grade, high-density multiservice ATM access functions. Designed as the multiservice media gateway for the central office or for a large enterprise customer, the PSAX 2300 system provides network access for time-division multiplex voice, frame relay, 10/100BASE-T Ethernet, and ATM data applications.

Chapter 1 Getting Started

About the PacketStar PSAX Product Family

When it is functioning in a redundant operating mode and after it has experienced a single-point failure, the PSAX 2300 system provides up to 1.9 Gbps of ATM cell bus capacity. The total ATM cell bus capacity of the system may also be scaled to provide nonblocking, nonredundant chassis bandwidths beyond 1.9 Gbps.

Supporting 15 slots for I/O and server modules—with provisions for OC-3, OC-3c/STM-1, and OC-12c/STM-4c interfaces with 1:1 protection, 1:1 DS1 module protection switching, and a full range of interfaces such as DS0A, DS1/E1, DS3/E3, 10/100BASE-T Ethernet, and serial—the PSAX 2300 system solves demanding and diverse network design challenges with ease.

PSAX 4500 Multiservice Media Gateway

The *PacketStar* PSAX 4500 Multiservice Media Gateway provides carrier-class reliability, with an unmatched range of service capabilities, end-to-end traffic prioritization, “any-service, any-channel” flexibility, and breakthrough voice technology. Ideal for the central office or a large enterprise multiservice media gateway, the PSAX 4500 system provides highly reliable network access for time-division multiplex voice, frame relay, 10/100BASE-T Ethernet, and ATM data applications.

When it is functioning in a redundant operating mode and after it has experienced a single-point failure, the PSAX 4500 system provides up to 4.2 Gbps of ATM cell bus capacity. The total ATM cell bus capacity of the system may also be scaled to provide nonblocking, nonredundant chassis bandwidths beyond 4.2 Gbps.

The high-performance midplane design supports 15 interface slots. Module protection for two groups of four or six multiport DS3, STS-1e, or E3 modules is provided via an N:1 protection scheme using rear access line interface modules. The protection module provides backup so that on the failure of any one of the modules in a group, traffic is maintained. A single PSAX 4500 system at the edge of the carrier network can transition traffic from a large number of network customers over high-speed DS1/E1 IMA, DS3/E3, OC-3, OC-3c/STM-4c, and OC-12c/STM-4c trunks into the ATM core, managing the whole quickly and efficiently, down to the individual permanent virtual circuit.

Through the use of the latest DSP voice technology, the PSAX 4500 system supports advanced voice traffic over ATM (VToA) services for up to 6048 DS0 channels. As a multiservice media gateway—with H.248 call control, CAS, PRI, GR-303, and V5.2 protocols, 3-Port DS3/STS-1e, 1-Port OC-3/STM-1 CES, and Tones and Announcements modules—the PSAX 4500 system provides packet solutions for voice over xDSL, trunking, tandem, and PRI offload switching.

Conventions

Text Types Used in This Document

This guide uses a different typeface to denote text displayed on console interface windows and equipment, as well as data you enter. Table 1-1 shows how each typographical convention is used.

Table 1-1. Text Conventions

Appearance	How it is used
SANS SERIF BOLD, ALL CAPS	Labels on module panels, chassis faceplates, or other hardware
Fixed-width normal	Message text displayed on the user interface window
Serif bold	<ul style="list-style-type: none"> • Button name (GUI interface) or command name (console interface) on the user interface window • Literal text for values that the user types or selects from predefined sets of values for fields • Commands or literal argument values
Fixed-width bold	System prompts displayed on the user interface window
<i>Serif italics</i>	<ul style="list-style-type: none"> • A variable name or string for which you will substitute your own information • An argument or parameter on a command line for which you will substitute your own information

Icons and Symbols

Refer to the procedures within this guide for important safety information and proper procedures.

Standard icons and symbols to alert you to dangers, warnings, cautions, and notes are described as follows:



DANGER:

Warnings for a personal injury hazard are identified by this format.



WARNING:

Warnings relating to risk of equipment damage or failure are identified by this format.



CAUTION:

Warnings relating to risk of data loss or other general precautionary notes are identified by this format.

Note: Identifies additional information pertinent to the text preceding this note.

Use of Command Description Tables

All illustrations for configuration windows in this guide for the PSAX system console interface are followed by a command description table describing the command functions displayed on the window (near the bottom of the window). You should read all the information in the command description table, especially when first using a window, because these descriptions may have special instructions or configuration constraints provided in the Function column by use of the **Note:** text convention (see Table 1-2).

Table 1-2. Command Description Table Example

Command	Function
Bring All Interfaces Into Service	Brings the out-of-service configured interfaces to in-service status. Note: In GR-303 configuration, it is critical to bring into service only those channels actively configured with DS1 ports.

Use of Field Description Tables

For all illustrations for configuration windows in this guide for both the PSAX system console interface and the EMS-PSAX, the field description tables normally follow the command description tables. Field description tables define the editable and the display-only fields, their functions, valid values, and constraints, if applicable. As in the command description tables, the **Note:** text convention is also used, where appropriate, in the field description tables to alert the user to special instructions or configuration constraints (see Figure 1-1).

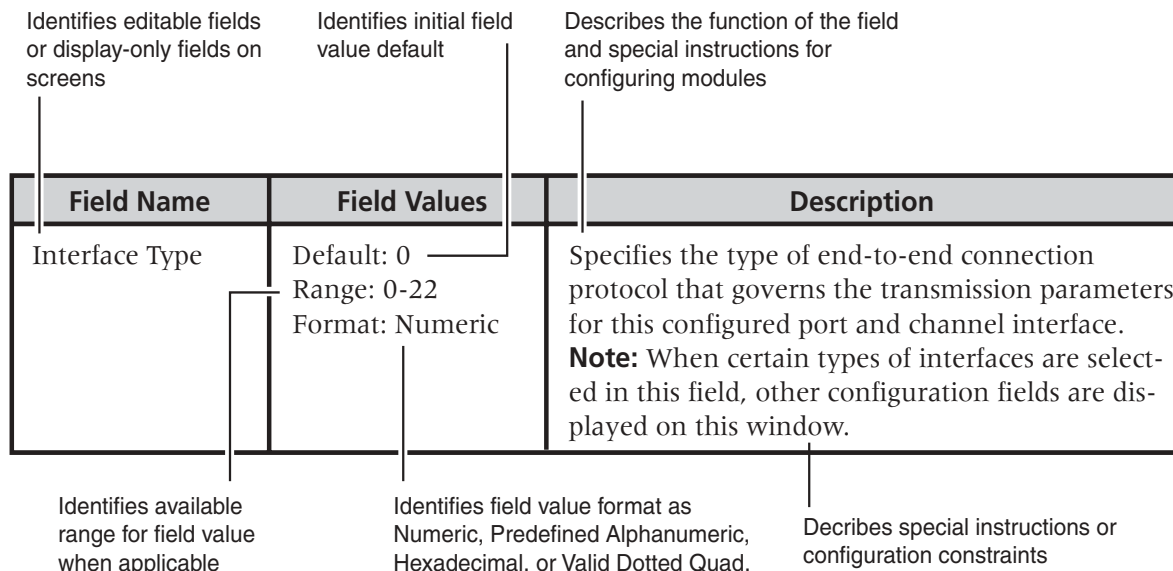


Figure 1-1. Field Description Table Example

General Navigational Guidelines

Selecting Options, Fields, and Commands Using the Console Interface

Follow these guidelines to select an option, field, or command on the PSAX console interface windows and to navigate through the windows:

- **To select an option, field, or command**, do one of the following:
 - ~ Press the Up, Down, Left, or Right Arrow to highlight (reverse video image) the option name, field name, or command you want to select and press Enter as many times as necessary until the field choice you want is displayed.
 - ~ Use the alternate keys, K=UP, H=LEFT, L=RIGHT to highlight (reverse video image) the option name, field name, or command you want to select and press Enter. (You can optionally redefine these alternate keys from the User Options window, which is accessible from the Console Interface Main Menu window.)
 - ~ To quickly select a command, you can also simultaneously press Ctrl and the letter underlined in the command.

Once an option name, field, or command is selected, the system responds as described in Table 1-3.

Table 1-3. System Responses to Selecting Options, Fields, or Commands

For a selected...	the following occurs:
option name	The window corresponding to the option name is displayed.
field	<p>The following variations occur:</p> <ul style="list-style-type: none"> • The field entry area is blank or contains the default or previously entered value. Press Enter to enter or change data in this field. Press Enter again to exit edit mode. • The field entry area, like the field name, is displayed in reverse video image and contains a predefined set of values, which you can view or select by pressing Enter to navigate forward through these values. To navigate backward through these field values, press Ctrl+H or the Backspace key. <p>Read-only fields, which you cannot change, are enclosed in square brackets (example: [LineStyle]).</p>
command	<p>The following variations occur:</p> <ul style="list-style-type: none"> • A message in the information line indicating an error or successful completion of the command is displayed. • The next higher level or previous window (<i>window name</i>) is displayed. • The next lower level or succeeding window (<i>window name</i>) is displayed.

- **To navigate through the Console windows**, use the shortcuts listed in Table 1-4.

Table 1-4. Shortcut Keys for Navigating Console Interface Windows

If you want to...	press...
redisplay the previous window	Ctrl+B on the window.
redisplay the Console Interface Main Menu window	Ctrl+G on the window.
refresh the window	Ctrl+R on the window.

On all the PSAX system windows, each command or menu option has an underlined letter. The control key plus an underlined letter is a shortcut to that command or menu option. You can use the navigation keys and hotkeys with the Caps Lock key on or off. Always observe the status line at the bottom of the window for instructions and information.

Help Information

The Help windows are accessible from any window in the PSAX system console interface. To access the Help windows, press the ? (Question Mark) key on any window. In addition to the Help windows, the Console Interface windows display contextual help in the information line at the bottom of each window. Contextual help provides information about the command or field currently highlighted on that window. The information line also displays error codes and responses to commands. All responses and notifications are recorded in a trap log. See the *PacketStar® PSAX Simple Network Management Protocol (SNMP) Trap Reference Guide* for details on displaying the trap log and obtaining explanations of the trap messages.

To view the Help windows from the Console Interface Main Menu window, perform the following procedure.

Begin

- 1** On the window for which help is desired, press the ? (question mark) key.

The Help window for the current console window is displayed (see Figure 1-2).



Your site name appears here
 after initial configuration

```

Console Interface Main Menu [YourSiteName]
-----
|                               : windows.                               |
|-----|
| Connection Configuration   : Manages all connection and routing   |
|                               : tables, and enables you to create,   |
|                               : view, delete, and monitor           |
|                               : connections and connection           |
|                               : statistics, and to create, modify,    |
|                               : and delete routing table entries.    |
|-----|
| Software Version Configuration : Performs software upgrades and   |
|                               : firmware downloads.                   |
|-----|
| Trap Log Display           : Scrolls through and searches the   |
|                               : history of SNMP network traps         |
|                               : generated by the system.              |
|-----|
| User Options               : Manages user specific options, and   |
|                               : enables you to change the password,   |
|                               : turn the trap display on or off,      |
|                               : turn the bell on or off, change the   |
|-----|
| Go Back to Interface: RETURN | Page Down: DOWN ARROW | Page Up: UP ARROW |
  
```

Information Line

Figure 1-2. Main Menu Help Window

- 2 To display the remaining Help windows for the current console window, press the Down Arrow key.
- 3 To scroll backward through the Help windows for the current console window, press the Up Arrow key.
- 4 To exit Help and return to the current console window, press the Enter key.

End

Technical Support

If you experience a problem with the 8-Port HDSL-2 module, refer to the *Lucent Technologies Product Warranty Registration Information*, which accompanied your shipment, for instructions on obtaining support in your area.

Before You Begin

Before you start configuring and using your new 8-Port HDSL-2 module, be sure you:

- Record your site-specific specifications such as the IP addresses you will use, and the connections and interfaces you will need. Decide which user names and passwords you will assign.
- Make sure you have IP connectivity to all PSAX devices to be managed
- Determine the numbering scheme for any in-band management connections you will be using

Comments on This Guide

To comment on the *PacketStar® PSAX 8-Port HDSL-2 Module User Guide*, please complete the comment card at the following web address:

<http://www.lucent-info.com/comments/>

You can also email your comments to comments@lucent.com.

Include the following information:

PacketStar® PSAX 8-Port HDSL-2 Module User Guide

Release number: Release 10.0.0

Document number: 255-700-573

Issue number: Issue 1

Publication date: December 2004

2 Module Description



Overview of This Module

The 8-Port HDSL-2 module (see Figure 2-1) provides a line rate of 1.552 Mbps per port for full duplex, symmetric connections. Each port can be independently configured to provide for channelized and unchannelized circuit emulation service (CES) and ATM services. Typical applications for this module include PBX network connections, cellular antenna stations, digital loop carrier systems, interchange POPs, Internet servers, and private data networks.

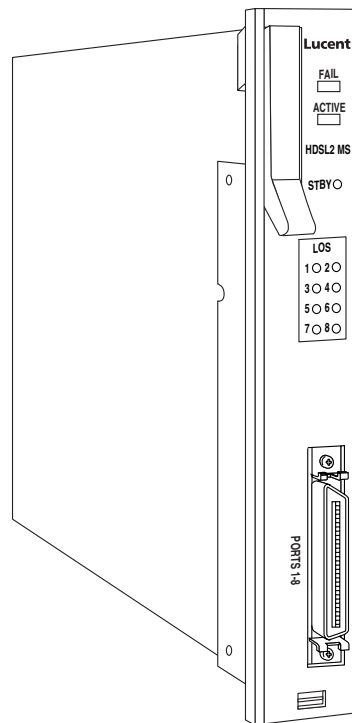


Figure 2-1. 8-Port HDSL2 Multiservice Module

You can configure each port on the 8-Port HDSL2 module to provide N x 64 Kbps (fractional T1) structured circuit emulation service. When configured for DS1 circuit emulation service, the module interfaces with TDM channelized DS1 circuits. It converts channelized data (usually voice data) to ATM virtual channels. By using structured (channelized) circuit emulation, this module can adapt a maximum of 24 DS0 channels per port to ATM virtual channels with individual virtual path identifiers (VPIs) and virtual channel identifiers (VCIs). Signaling bit transport is also provided, based on ATM Forum standards for channel-associated signalling (CAS). With the 64 Kbps "clear channel" capability, this module can connect to a device using an ISDN

Chapter 2 Module Description

Overview of This Module

PRI service. Because this structured circuit emulation service can be configured to use only a fraction of the time slots, you can configure several independent emulated circuits to share one service interface.

The 8-Port HDSL2 module uses ATM Forum Specifications UNI 3.0, 3.1 or 4.0, which allow any DS1 port to act as a user network interface (UNI), an interim inter-switch protocol (IISP) user or network interface to an ATM network.

Connection Options

The 8-Port HDSL-2 module connects to user equipment via a standard Lucent cable (COMCODE 300550639) with an RJ-48H connector. Typically, this cable is used to connect the module to one of the following PSAX Patch Panels within the same or an adjacent Telco frame:

- PSAX 24-Port RJ Patch Panel (impedance 100 ohms)
- PSAX 48-Port RJ Patch Panel (impedance 100 ohms).

The Lucent cable can be extended for short-haul links of up to 500 feet (with 6 dB cable loss) by connecting the Lucent cable to an Avaya cable (p/n 1010025AGY CUSTL, at -1.2 dB per 100 feet), or equivalent. Use RJ-48H connectors (for example, Cinch p/n 57-10500-271A and Cinch p/n 57-20500-7A) on the extension cable to link the Lucent cable to the PSAX Patch Panels.

Figure 2-2 and Figure 2-3 show the connectors of two modules connected to a PSAX 24-Port RJ Patch Panel (COMCODE 300298551). This component is separately orderable.

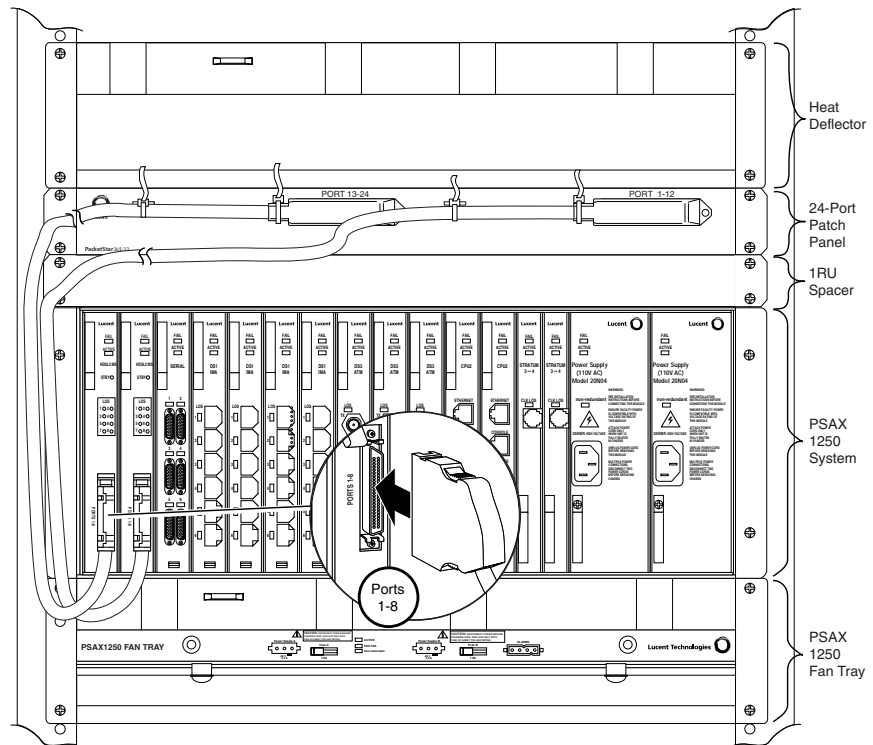


Figure 2-2. 8-Port HDLSL-2 Modules Connected to the PSAX 24-Port RJ Patch Panel (Front View)

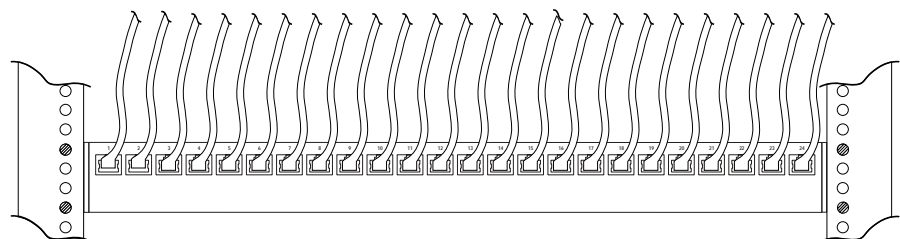


Figure 2-3. 8-Port HDLSL-2 Modules Connected to the PSAX 24-Port RJ Patch Panel (Back View)

You may also connect four 8-Port HDLSL-2 modules to a PSAX 48-Port RJ Patch Panel (COMCODE 300298544). See the *Packetstar® PSAX Patch Panels for PSAX Multiservice Media Gateways Installation Guide* for instructions.

Further connections to user equipment may be made per the specifications outlined in ANSI T1.403-1999. See Appendix A, "Pin Configurations," for more details.

Software Features

The 8-Port HDSL-2 module supports the following services:

- ATM: ATM UNI 3.0, 3.1, and 4.0; Interim inter-switch signaling protocol (IISP) user, IISP network; PNNI 1.0
- CE: Circuit emulation service (CES) with ISDN PRI using 64 Kbps clear channel; 1x64 Kbps structured CAS; Nx64 Kbps structured CCS; unstructured CES

Hardware Features

The 8-Port HDSL-2 module provides the following hardware features:

- Number of ports: 8
- Connector type: one, 50-pin Mini-Champ connector
- Line rate: 1.552 Mbps
- Physical interfaces supported: ANSI-T1.418-2000
- Loopback capabilities on DS1 port: local loopback, line loopback

Hardware Specifications

Table 2-1 provides the general physical hardware and environmental specifications for the PSAX I/O module.

Table 2-1. Physical Hardware Specifications for the PSAX I/O Module

Specification	Description
Dimensions	17.3 cm H x 2.41 cm W x 24.1 cm D (6.8 in. H x 0.95 in. W x 9.5 in. D)
Weight	0.56 kg (1.24 lb.)
Operating temperature range for all the PSAX 1250, PSAX 2300, and PSAX 4500 systems	0° to 50° C (32° to 122° F)
Operating temperature range for the PSAX 1000 systems	For AC-powered PSAX 1000 systems: 0° to 50° C (32° to 122° F) For DC-powered PSAX 1000 systems: -20° to 60° C (-4° to 140° F) with a cold start minimum of 0° C (32° F)
Operating humidity range for all chassis	5% to 85% relative humidity
Operating altitude range for all chassis	60 meters (197 feet) below sea level to 4,000 meters (13,123 feet) above sea level
Storage temperature range for all chassis	-40° to 70° C (-40° to 158° F)
Storage humidity range for all chassis	0% to 90% noncondensing

Performance and Power Consumption

Table 2-2 provides the chassis speed, power consumption, and memory allocation specifications for this PSAX module.

Table 2-2. Performance and Power Specifications for the PSAX Module

Module	Total Amount of SDRAM	Module Program and Data Space	Maximum Input Buffer*	Output Buffer†	Chassis Speed‡	Maximum Power Consumption
23N69 8-Port HDSL-2	24 MB	7 MB	4 MB	13 MB (212,992)	Low Speed	20.5 W

* The I/O buffers carry 16,384 cells per megabyte.

† Indicates the size of the output buffer followed by the maximum number of 64-byte cells in the output buffer.

‡ This column relates only to the speed at which the module communicates within the chassis. A high-speed module will communicate at high speed (1.2 Gbps) in a chassis that has a high-speed bus (PSAX 4500 chassis). High-speed modules will communicate at 600 Mbps in any other chassis. Low-speed modules will always communicate at 600 Mbps in any chassis.

Module Placement

The 8-Port HDSL-2 module is installed in any PSAX chassis slot intended to contain an I/O or server module. If you are installing the module in a newly installed PSAX chassis, be sure to follow your facility site plan for placing this module in the correct location in the chassis.

LED Indicators

Table 2-3 describes how the light-emitting diode (LED) indicators on the 8-Port HDSL2 Multiservice module faceplate respond to different module conditions. These LEDs indicate if the module has been installed properly.

Chapter 2 Module Description

Hardware Features

Table 2-3. LED Indicators for the 8-Port HDSL-2 Module

Module Status LED	Initial Power-On	No Configured Ports	One or More Configured Ports	No Cable on Port	Cable on Port
FAIL (red)	Lights briefly*	Not lit	Lights only when the module is not functioning	N/A	N/A
ACTIVE (green)	Lights briefly*	Not lit	Lights only when the module is active	N/A	N/A
STBY (green)	Lights briefly*	Not lit	Lights only when the configured protection module is passive and on standby	N/A	N/A
LOS 1 (yellow) LOS 2 (yellow) LOS 3 (yellow) LOS 4 (yellow) LOS 5 (yellow) LOS 6 (yellow) LOS 7 (yellow) LOS 8 (yellow)	Lights briefly†	N/A	N/A	Lights	Lights only if configured Active port has loss of signal, or when HDSL2 training is in progress for that port

* After power is initially applied to the system and the system boot is complete, the FAIL LED indicates whether the module hardware has failed (red), the ACTIVE LED indicates whether the module has one or more ports configured (green), and the STBY LED indicates whether the module is in STANDBY mode (green). The ACTIVE and STBY LEDs are never on at the same time during normal operations.

† After power is initially applied to the system and the system boot is complete, this loss of signal LED indicates whether the port has a cable connected to the patch panel. The LOS LED is only active when ports are configured. This description applies only to modules in ACTIVE mode.

Loopback Configuration Options

To aid network troubleshooting and testing, loopback capability is provided for the 8-Port HDSL-2 module. The loopback option on the module DS1 port and channel configuration window enables you to verify the integrity of a port by transmitting a received signal back to the source. Selecting a loopback option is described in the module configuration procedure provided in Chapter 3.

Figure 2-4 illustrates the line loop and local loop options on virtual DS1 ports.

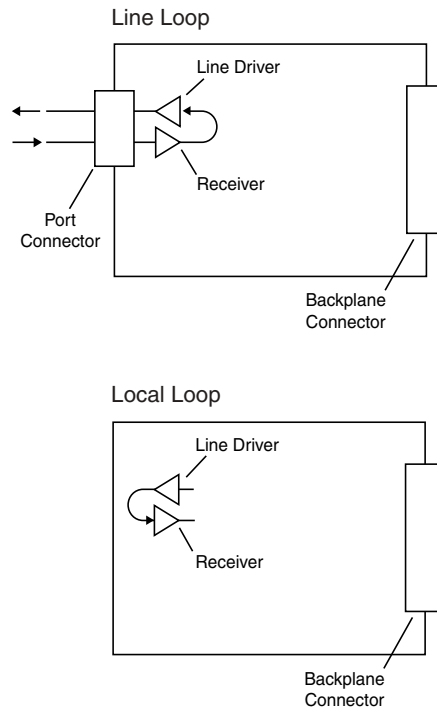


Figure 2-4. Loopback Configuration Options

Chapter 2 Module Description

Hardware Features

3 Configuring and Operating Ports and Channels Using the Console Interface



Overview of This Chapter

This chapter describes how to use the console interface to perform the following tasks on the 8-Port HDSL-2 module:

- “Obtaining General Module Data and Accessing Ports and Channels”
- “Configuring the Module Profiles, Ports, and Channels”
- “Saving the Equipment Configuration and Logging Off”
- “Viewing Port Statistics”

Before You Begin

Be sure to complete the following tasks first before configuring the 8-Port HDSL-2 module:

- Configure your basic system (see “Configuring the System for Your Site” in the *PacketStar® PSAX Multiservice Media Gateway User Guide*).
- Configure the Stratum 3–4 module (see “Configuring the Stratum 3–4 Module” in the *PacketStar® PSAX Multiservice Media Gateway User Guide*).

When configuring the 8-Port HDSL-2 module using the console interface, display-only fields are displayed in square brackets ([]).

Obtaining General Module Data and Accessing Ports and Channels

This section describes how to obtain product, model, version, and serial number data about a module from the Equipment Configuration window. In addition, the window provides operational status and alarm conditions on each installed module. You also use this window to access the port and channel configuration windows for the PSAX modules.

Accessing the Equipment Configuration Window

Perform the following procedure to access the Equipment Configuration window.

Begin

- 1 On the Console Interface Main Menu window, select the Equipment Configuration option.

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

Obtaining General Module Data and Accessing Ports and Channels

The Equipment Configuration window is displayed (see Figure 3-1 through Figure 3-5).

- 2 View the operational and alarm status, software version, PEC, and serial number data of the installed modules.
- 3 When you are ready to begin configuring the ports and channels of the module, select the line displaying the name of the module you want to configure.

Note: The sample Equipment Configuration windows in the following figures may not show the actual module you are configuring. These figures illustrate the variations of slot configurations for the different PSAX chassis displayed on the Equipment Configuration window.

End

Equipment Configuration						[YourSiteName]
Slot	Card Type	Status	Alarm Status	SW Version	PEC	Serial #
1	CH-DS3	Unknown	NoAlarm	V07.00	NS23N610CB	001000178772
2	CH-STS1	Unknown	NoAlarm	V07.00	NS23N620BC	001000158839
3	0C-3cMMAQ	Primary	1	V08.00	YS20N120BC	001000011644
4	0C12c-STM4-SM	Unknown	CardRemoved	V08.00	NS23N732AB	061000049831
5	HD-DS1	Unknown	NoAlarm	V08.01	NS23N353AA	024804003415
6	HD-DS1	Unknown	NoAlarm	V08.01	NS23N353AA	024804003415
7	None					
8	None					
9	None					
10	None					
11	None					
12	None					
13	None					
14	None					
15	CPU 2	Primary	NoAlarm	V08.00	NS20N201EA	061000125395
16	CPU 2	Standby	NoAlarm	V08.00	NS20N201EA	061000125422
17	None					

Update Display Page Down Interface By Name(r)-> Go Back to Main Menu ->

Press RETURN to configure the equipment in slot 2.

Figure 3-1. Sample Equipment Configuration Window on a PSAX 1000 System (Page 1)

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

Obtaining General Module Data and Accessing Ports and Channels

Equipment Configuration						[YourSiteName]
Slot	Card Type	Status	Alarm Status	SW Version	PEC	Serial #
1	UnstDS3E3-3P	Unknown	NoAlarm	V07.00	NS23N020AB	001002003004
2	None					
3	MSerial	Unknown	NoAlarm	V06.00	NS20N071DA	001000017181
4	None					
5	HD-E1	Primary	NoAlarm	V08.00	NS23N660AA	001000212424
6	HD-E1	Primary	NoAlarm	V08.00	NS23N660AA	001000212290
7	EnhE1	Unknown	NoAlarm	V06.00	NS20N560HD	001000045364
8	None					
9	HD-E1-DMA	Primary	NoAlarm	V07.01	NS23N340AB	001000333730
10	E1-DMA	Primary	NoAlarm	V06.00	NS20N340CB	001000045344
11	CPU 2	Primary	NoAlarm	V08.00	NS20N201EA	061000125395
12	CPU 2	Standby	NoAlarm	V08.00	NS20N201EA	061000125395
13	None					
14	None					
15	None					
16	None					
17	None					

Update Display Page Down Interface By Name(r)-> Go Back to Main Menu ->

Press RETURN to configure the equipment in slot 9.

Figure 3-2. Sample Equipment Configuration Window on a PSAX 1250 System (Page 1)

Equipment Configuration						[YourSiteName]
Slot	Card Type	Status	Alarm Status	SW Version	PEC	Serial #
1	None					
2	DSP2D	Primary	NoAlarm	V07.01	NS23N290AA	345678901234
3	ChDS3STS1-3P	Primary	NoAlarm	V07.01	NS23N123AA	123456789012
4	ChDS3STS1-3P	Primary	NoAlarm	V07.01	NS23N123AA	123456789013
5	DSP2D	Primary	NoAlarm	V07.01	NS23N290AA	345678901235
6	DSP2D	Primary	NoAlarm	V07.01	NS23N290AA	345678901236
7	0C12c-STM4-SM	Primary	NoAlarm	V07.01	NS23N730AA	567890123456
8	0C12c-STM4-SM	Primary	NoAlarm	V07.01	NS23N730AA	567890123457
9	DSP2D	Primary	NoAlarm	V07.01	NS23N290AA	345678901237
10	DSP2D	Primary	NoAlarm	V07.01	NS23N290AA	345678901238
11	DSP2D	Primary	NoAlarm	V07.01	NS23N290AA	345678901239
12	DSP2D	Primary	NoAlarm	V07.01	NS23N290AA	345678901230
13	Tasm	Primary	NoAlarm	V07.01	NS23N280AA	890123456789
14	Tasm	Primary	NoAlarm	V07.01	NS23N280AA	890123456780
15	ChDS3STS1-3P	Primary	NoAlarm	V07.01	NS23N123AA	123456789014
16	CPU 2	Primary	NoAlarm	V08.00	NS20N201EA	061000125395
17	CPU 2	Primary	NoAlarm	V08.00	NS20N201EA	061000125396

Update Display Page Down Interface By Name(r)-> Go Back to Main Menu ->

Press RETURN to configure the equipment in slot 6.

Figure 3-3. Sample Equipment Configuration Window on a PSAX 2300 or PSAX 4500 System (Page 1)

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

Obtaining General Module Data and Accessing Ports and Channels

Equipment Configuration						[YourSiteName]
Slot	Module Type	Status	Alarm Status	SW Version	PEC	Serial #
21A	Stratum	Primary	NoAlarm	V08.00	NS23N050CA	001000322180
22B	Stratum	Standby	NoAlarm	V08.00	NS23N050CA	001000986514
23	PwrSupply	Primary	NoAlarm		NS23N110AC	004801000164
24	PwrSupply	Primary	NoAlarm		NS23N110AC	004801000194
25	Alarm	Primary	NoAlarm		NS20N790AC	013605000623

Update Display Page Up Interface By Name(r)-> Go Back to Main Menu ->

Press RETURN to view the second equipment configuration page.

Figure 3-4. Sample Equipment Configuration Window on a PSAX 1000, PSAX 2300, or PSAX 4500 System (Page 2)

Equipment Configuration						[YourSiteName]
Slot	Card Type	Status	Alarm Status	SW Version	PEC	Serial #
21	Stratum	Primary	NoAlarm	V00.00	NS21N051BA	001000185143
22	Stratum	Standby	NoAlarm	V00.00	NS21N051BA	001000091833
23	PwrSupply	Primary	NoAlarm		NS20N042AC	001000145623
24	PwrSupply	Primary	NoAlarm		NS20N041AD	001000022459
25	None					

Update Display Page Up Interface By Name(r)-> Go Back to Main Menu ->

Press RETURN to view the second equipment configuration page.

Figure 3-5. Sample Equipment Configuration Window on a PSAX 1250 System (Page 2)

Commands

The commands in this window have the following functions.

Command	Function
Update Display	Refreshes the current status of the modules in the PSAX chassis.
Page Down	Displays the second page of the Equipment Configuration window. This command toggles with Page Up .
Page Up	Displays the first page of the Equipment Configuration window. This command toggles with Page Down .
Interface by Name	Displays the Interface Name Table window on which you can view all the interface names in the PSAX system.
Go Back to Main Menu	Redisplays the Console Interface Main Menu window.

Field Description The display-only fields on this window are described in Table 3-1.

Table 3-1. Equipment Configuration Window Field Descriptions

Field Name	Field Value	Description
Slot	Default: N/A Range: 1–25, depends on chassis type Format: Numeric	Displays the slot number in the PSAX chassis.
Module Type	Default: N/A Range: N/A Format: Predefined	Displays the type of the module in the slot. When a module is inserted into the chassis, its name is displayed in the Module Type field next to the slot number. When the module is removed from the chassis, its name is no longer displayed in the Module Type field and is replaced with None .
Status	Default: Unknown Range: N/A Format: Predefined	Displays the operational status of the module.
	Unknown	Indicates that the module has not been configured.
	Primary	Indicates one of the following: <ul style="list-style-type: none"> • at least one port or channel on an I/O module has been configured. • a CPU module is functioning as the primary CPU module.
	Standby	Indicates one of the following: <ul style="list-style-type: none"> • a module in redundant systems is operating as the standby (backup) module to the primary (active) module. • a CPU module in redundant systems is functioning as the standby (backup) CPU module.
Alarm Status	Default: No Alarm Range: N/A Format: Predefined	Displays the present alarm condition of the module. For the alarm status conditions, see the table “Alarm Status Descriptions for Modules” following this table.

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

Obtaining General Module Data and Accessing Ports and Channels

Table 3-1. Equipment Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
SW #	Default: N/A Range: N/A Format: Predefined	Displays the version of PSAX system software with which the modules' firmware was released. The software version is encoded in the module firmware. Because not all modules require firmware upgrades with every new PSAX system software release, the software version that is displayed in this window may be lower than the CPU system software that is currently running on the PSAX system. See the most recent Release Note document for the latest software and firmware lineup information.
PEC	Default: N/A Range: N/A Format: Predefined	Displays the product element code (PEC) used to identify and order this type of module. The PEC is encoded in the module bootloader.
Serial #	Default: N/A Range: N/A Format: Predefined	Displays the unique serial number of the individual module. The product serial number is encoded in the module firmware. The format of this field is the following: PSAX System Rel. 6.5.0 and later: 12-digit number in the format: <i>YYVVDDnnnnnnn</i> , where <i>YY</i> = year of manufacture <i>VV</i> = vendor ID code (manufacturer and location) <i>DD</i> = date code of manufacture (either month or week depending on vendor's preference) <i>nnnnnnn</i> = sequential number, which in conjunction with <i>YY</i> , <i>VV</i> , and <i>DD</i> , creates a unique number for each hardware component in the PSAX product line For existing products with the 10-digit serial number used in Rel. 6.5.0 or later systems, this number is displayed with two preceding zeros. PSAX Rel. 6.3.0 and earlier: 10-digit number. For products with 12-digit serial numbers used in Rel 6.3.0 or earlier systems, the first two digits (<i>YY</i>) are not displayed.

Alarm Status Values

The Alarm Status field on the Equipment Configuration window is described in Table 3-2.

Table 3-2. Module Alarm Status Descriptions on the Equipment Configuration Window

Alarm Status	Module Type Affected	Description
NoAlarm	I/O and Server	Indicates that no alarms have been detected for the module in this slot.
WrongCardType	I/O and Server	Indicates that one type of module was configured in this slot in the chassis, but a now different module occupies this slot.
LineFailed	All	Indicates that the module in this slot is no longer receiving or transmitting signals because the line failed.
Hexadecimal format, Example: 12345678ABC	I/O and Server	Indicates that one or more ports on the module in this slot currently have a loss of signal. The numbers indicate which ports have a loss of signal. For modules that have more than eight ports not receiving signals, the value in this field is in hexadecimal format.
CardRemoved	All	Indicates that one of the following events occurred: <ul style="list-style-type: none"> The module in this slot was configured and then removed from the slot. Connections on the OC-3, OC-12, STM-1, or STM-4 APS/MSP primary module in this slot were transferred to the standby module. After the transfer occurs, the former primary module then displays CardRemoved in the Alarm Status field; the former standby module then displays Primary in the Status field.
ReferenceClockFailed	Stratum 3–4	Indicates that the timing reference clock on the Stratum module in this slot failed.
CompositeClockFailed	Stratum 3–4	Indicates that the timing composite clock on the Stratum module in this slot failed.
Overload	Power Supply	Indicates that the Power Supply module is operating under an overload condition.
PowerFailed	Power Supply	Indicates that the power has failed.
Minus48vFailed	Power Supply	Indicates that the -48 V dc Power Supply module output failed.
UnknownAlarm	I/O and Server	Indicates that the reason for failure is not known.
CompleteClockFailed	Stratum 3–4	Indicates that the backplane detected a clock error.
PowerFailed	Power Supply	Indicates that no power is coming into the PSAX chassis.

HDSL2 Theory of Operation

An HDSL2 line consists of a minimum of two units: the xtuC (the central termination unit) and the xtuR (the remote termination unit), or the network (near end) and customer (far end) sides of a connection. The line may be extended by up to eight repeater/regenerator units (xru1-xru8). The cable connection between units is called a segment. An HDSL2 segment is delimit-

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

HDSL2 Theory of Operation

ited by its two end points, known as segment terminations. The endpoint is the transceiver of a unit where a connection is made. The aggregate twisted pair copper connection between the xtuC and the xtuR is called a span. This HDSL2 line topology is illustrated in Figure 3-6.

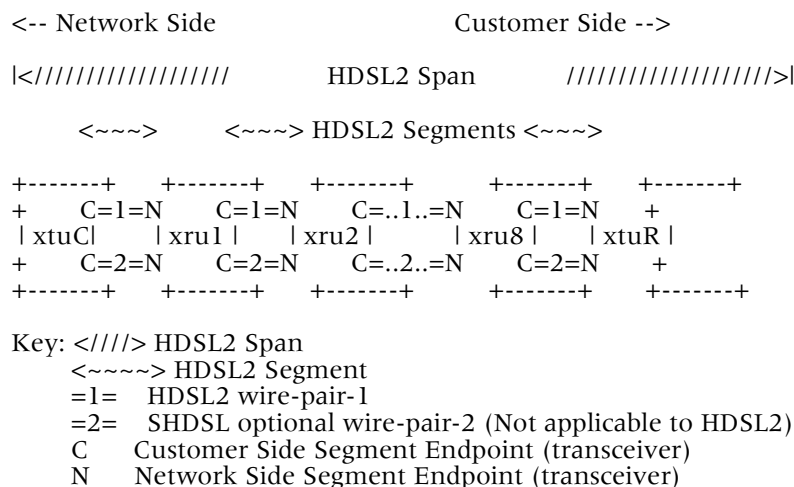


Figure 3-6. HDSL2 Line Topology

Profile Configurations

An HDSL2 line has Span Profile and Endpoint Alarm Profile configurations. A profile is a set of parameters that can be shared by multiple lines using the same configuration. Profiles are created, assigned, and deleted dynamically using the profile name and profile row status in each profile table. Default Span Profile and Endpoint alarm Profile configurations are available to the user on startup. Span Profiles are only applicable to SHDSL lines, which are not supported at this time. Endpoint Alarm Profile configurations can be created and used in the HDSL2 mode.

Embedded Operations Channel

The embedded operations channel (EOC) allows termination units to maintain information about the span. There are two basic flows of data: from the central termination unit or from the remote termination unit. The termination unit initiates data flow and all units in a span respond to requests in either direction of data flow. To accommodate the dual data flows, the HDSL2 repeater/regenerator units have dual addresses: one for communications with the central termination unit and one for communications with the remote termination unit.

Initialization Phases

At startup, after the HDSL2 line has been activated, the HDSL2 EOC goes through three initialization phases: Discovery, Inventory, and Configuration. During Discovery, the initiating termination unit sends probe messages which propagate across the span and allow repeater/regenerator units to be numbered. At this time, the termination unit learns if any mid-span repeater/regenerator units exist and determines their addresses. After the initiating termination unit has received a Discovery Response message from a unit, the initiating termination unit starts the Inventory phase for that particular unit.

During Inventory, the initiating termination unit polls each repeater/regenerator unit and the opposite termination unit to establish inventory information on each unit for the initiating termination unit's database. Either the central termination unit or the remote termination unit performs this phase in the same way. After the initiating termination unit has received the inventory information for a unit, the initiating termination unit starts the Configuration phase for that unit.

During Configuration, the initiating termination unit configures the opposite termination unit and any repeater/regenerator units for alarm thresholds, signal characteristics, and other parameters. The Inventory and Configuration phases operate independently for each responding unit.

Configuring the Module Profiles, Ports, and Channels

You must first configure the 8-Port HDSL-2 module before you can set up connection provisioning. To configure the 8-Port HDSL-2 module, perform the following procedures:

- Creating Profile Configurations
- Configuring HDSL-2 Ports
- Viewing Inventory Tables
- Configuring HDSL-2 DS1 Ports
- Configuring a Port with One Channel
- Configuring a Port with Several Channels

Creating Profile Configurations

The 8-Port HDSL-2 module provides Span Profile and Endpoint Alarm Profile Configurations. A profile is a set of parameters that can be shared by multiple lines using the same configuration. Profiles are created, assigned, and deleted dynamically using the profile name and profile row status in each profile table. A default profile is always available regardless of whether the user creates new profiles. Span Profiles are only applicable to the SHDSL mode which is not supported at this time. Perform the following procedure to create profile configurations on the module.

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

Configuring the Module Profiles, Ports, and Channels

Begin

- 1 On the Console Interface Main Menu window (see Figure 3-7), select the Equipment Configuration option and press Enter.

```
Console Interface Main Menu                                     [YourSiteName]

Site-Specific Configuration
Equipment Configuration
Connection Configuration
Software Version Configuration
Trap Log Display
User Options
Diagnostics
Remote Database Operation

Save Configuration
Leave Console Interface

* Use the underlined letter with the control key as a hotkey.
* Press Ctrl-G at any time to go back to the Main Menu.
* Press ? at any time for help.

Configure the site name, IP address, and date and time for this system.
```

Figure 3-7. Console Interface Main Menu (Equipment Configuration Selected)

The Equipment Configuration window (see Figure 3-8) is displayed.

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

Configuring the Module Profiles, Ports, and Channels

Equipment Configuration							[YourSiteName]
Slot	Module Type	Status	Alarm Status	SW #	PEC	Serial #	
1	ChDS3STS1-3P	Primary	NoAlarm	V09.00	NS23N123AA	123456789012	
2	ChDS3STS1-3P-Prot	Primary	123	V09.00	NS45N030AA	024806018358	
3	UnstDS3E3-3P	Primary	NoAlarm	V09.00	NS23N020BB	108457621020	
4	ChDS3STS1-3P-Prot-M	Primary	123	V09.00	NS45N63100	101133362746	
5	HD-DS1	Primary	NoAlarm	V09.00	NS23N660AA	001000212424	
6	MD-DS1	Primary	NoAlarm	V09.00	NS23N640AA	006666666666	
7	MD-DS1-IMA	Primary	NoAlarm	V09.00	NS23N640AA	001000328975	
8	MD-DS1E1DS0A-CES	Primary	NoAlarm	V09.00	NS24N642AB	107634521084	
9	HD-DS1	Primary	NoAlarm	V09.00	NS23N660AA	001000333730	
10	HDSL2-SHDSL	Primary	NoAlarm	V09.00	NS23N690AA	108634934901	
11	HDSL2-SHDSL	Primary	NoAlarm	V09.00	NS23N690AA	108634938019	
12	HD-DS1	Primary	NoAlarm	V09.00	NS23N660AA	001000212432	
13	HD-DS1	Primary	NoAlarm	V09.00	NS23N660AA	001000212449	
14	Alarm	Primary	NoAlarm	V09.00	NS45N790AA	102056907832	
15	HD-DS1	Primary	NoAlarm	V09.00	NS23N660AA	001000212458	
16	CPU4	Primary	NoAlarm	V09.00	NS20N201EA	061000124489	
17	CPU4	Standby	NoAlarm	V09.00	NS20N201EA	061000124143	

Update Display Page Down Interface By Name(r)-> Go Back to Main Menu ->

Press RETURN to configure the HDSL2-SHDSL module in slot 10.

Figure 3-8. Equipment Configuration Window (As Displayed on the PSAX 1250, PSAX 2300, and PSAX 4500 Console)

- On the Equipment Configuration window, select the **HDSL2-SHDSL** module in the list and press Enter. The HDSL-2 Configuration window (see Figure 3-9) is displayed.

HDSL2 Configuration		[YourSiteName]
Slot:	10	
Phys-Port	Port	
1	9	
2	10	
3	11	
4	12	
5	13	
6	14	
7	15	
8	16	
Go to Span Profile Table->		Go to H.248 TID Configuration ->
Go to EP Alarm Profile Table ->		Go Back to Equipment Configuration ->
Press RETURN and enter a new slot number to configure a different module.		

Figure 3-9. HDSL2 Configuration Window

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Configuring the Module Profiles, Ports, and Channels

Commands

The commands in this window have the following functions:

Command	Function
Go to Span Profile Table	Displays the HDSL2-SHDSL Span Profile Table window.
Go to EP Alarm Profile Table	Displays the HDSL2-SHDSL Endpoint Alarm Profile Table window.
Go to H.248 TID Configuration	Displays the Termination ID Configuration window. This command appears only when H.248 Configuration is enabled. Refer to the <i>Packetstar H.248 Media Gateway Control User Guide</i> .
Go Back to Equipment Configuration	Redisplays the Equipment Configuration window.

Field Description

The fields in this window are described in Table 3-3.

Table 3-3. HDSL2 Configuration Window Field Descriptions

Field Name	Field Value	Description
Slot: nn	Default: N/A Range: Variable Format: Numeric	The PSAX chassis slot that the selected module occupies.
Phys-Port (display only)	Default: N/A Range: 1-8 Format: Numeric	The physical port on the module.
Port (display only)	Default: N/A Range: 9-16 Format: Numeric	The virtual port associated with the physical port on the module.

Creating Span Profile Configurations

Span Profiles are not supported. Only the default (**DEFVAL**) Span Profile is available. The following procedure is provided for illustrative purposes only.

Begin

- 1 Select the **Go to Span Profile Table** command. The HDSL2-SHDSL Span Profile Table window is displayed (Figure 3-10).

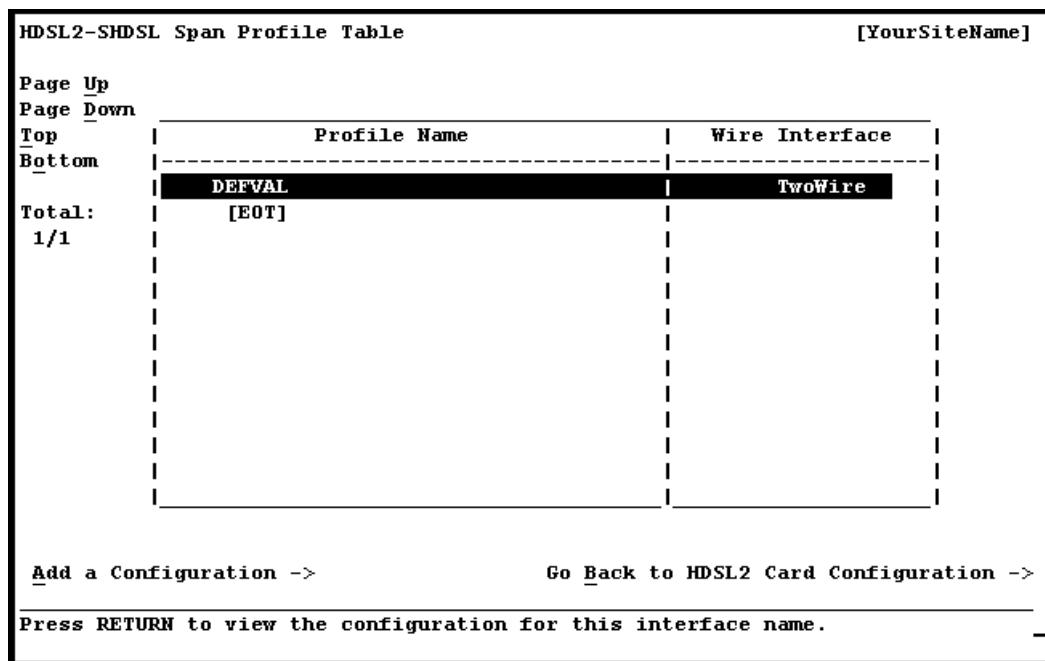


Figure 3-10. HDSL2-SHDSL Span Profile Table Window

This table supports the overall configuration of HDSL2/SHDSL spans. Each entry represents the complete span in a single HDSL2/SHDSL line.

Commands

The commands in this window have the following functions:

Command	Function
Page Up	Scrolls up one page.
Page Down	Scrolls down one page.
Top	Displays entries at the top of the table.
Bottom	Displays entries at the bottom of the table.
Add a Configuration	Displays the HDSL2-SHDSL Span Profile Configuration window.
Go Back to HDSL2 Card Configuration	Redisplays the HDSL2 Configuration window.

Field Descriptions

The display-only fields in this window are described in Table 3-4.

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

Configuring the Module Profiles, Ports, and Channels

Table 3-4. HDSL2-SHDSL Span Profile Table Window Field Descriptions

Field Name	Field Value	Description
Profile Name	Default: DEFVAL Range: N/A Format: Predefined	Displays the span configuration profile name. A default profile name, DEFVAL , is reserved and automatically used by the module until other line profiles are set. Note: The DEFVAL cannot be modified. Only user-created profiles can be modified.
Wire Interface	Default: TwoWire Range: N/A Format: Predefined	Displays the operation line option for the span.
	TwoWire	Indicates that the operation line option for the span is a single pair.
	FourWire	Indicates that the operation line option for the span is a double pair. Note: Not supported for HDSL2.
Total: 1/1	Default: 1/1 Range: N/A Format: Numeric	The first number in this field indicates the identification number of the span profile table entry on the selected line of the currently displayed window. The second number indicates the total number of span profile table entries for this module.

- 2 Select the **Add a Configuration** command. The HDSL2-SHDSL Span Profile Configuration window (see Figure 3-11) is displayed.

```

HDSL2-SHDSL Span Profile Configuration [YourSiteName]
-----
Profile Name... default
-----
Wire Interface.. TwoWire           | CurrCondTargetMarginDown. 0
Min Line Rate... 155200           | WorstCaseTargetMarginDown 0
Max Line Rate... 155200           | CurrCondTargetMarginUp... 0
PSD..... Symmetric               | WorstCaseTargetMarginUp.. 0
Trans Mode..... Region2          | UsedTargetMargins..... WorstCaseDown
Remote..... Enabled               | Reference Clock..... LocalClk
Power Feeding... NoPower          | Line Probe..... Disable
-----
Apply Span Profile Configuration |
Delete Span Profile Configuration |
Go Back to Previous Window ->
-----
Press RETURN to edit the HDSL2-SHDSL span configuration profile name

```

Figure 3-11. HDSL2-SHDSL Span Profile Configuration Window

This table supports definitions of span configuration profiles. Each profile contains a set of span configuration parameters.

Commands

The commands in this window have the following functions:

Command	Function
Apply Span Profile Configuration	Applies the span profile configuration values selected.
Delete Span Profile Configuration	Deletes the span profile configuration values selected.
Go Back to Previous Window	Redisplays the HDSL2-SHDSL Span Profile Table window.

Field Descriptions

- Enter values in the fields on this window according to the information provided in Table 3-5.

Table 3-5. HDSL2 Span Profile Configuration Window Field Descriptions

Field Name	Field Value	Description
Profile Name	Default: default Range: N/A Format: Alphanumeric	Displays the selected span configuration profile name. Each span configuration profile you create is indexed by the name you ascribe in this field. Note: Only the DEFVAL profile, which cannot be modified, is supported at this time.
Wire Interface	Default: TwoWire Range: N/A Format: Predefined	Identifies the operation line option for the span.
	TwoWire	Indicates that the operation line option for the span is a single pair.
	FourWire	Indicates that the operation line option for the span is a double pair. Note: Not supported for HDSL2.
Min Line Rate	Default: 1552000 Range: 0-4112000 Format: Numeric	Indicates the minimum transmission rate for the associated SHDSL line rate in bits-per-second (bps). If the minimum line rate equals the maximum line rate, the line rate is considered fixed. If the minimum line rate is less than the maximum line rate, the line rate is considered rate-adaptive. Note: The HDSL2 line rate is fixed at 1552 Mbps.
Max Line Rate	Default: 1552000 Range: 0-4112000 Format: Numeric	Indicates the maximum transmission rate for the associated SHDSL line rate in bits-per-second (bps). If the minimum line rate equals the maximum line rate, the line rate is considered fixed. If the minimum line rate is less than the maximum line rate, the line rate is considered rate-adaptive. Note: The HDSL2 line rate is fixed at 1552 Mbps.

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Table 3-5. HDSL2 Span Profile Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
PSD	Default: Symmetric Range: N/A Format: Predefined	Displays the power spectral density (PSD) option for the associated HDSL2 line. Support for symmetric PSD is mandatory for all supported data rates. Support for asymmetric PSD is optional.
	Symmetric	Indicates that the PSD is symmetric.
	Asymmetric	Indicates that the PSD is asymmetric. Note: Not supported for HDSL2.
Trans Mode	Default: Region1 Range: N/A Format: Predefined	Displays the setting that represents the ITU standard for the SHDSL line transmission mode. Note: Not supported for HDSL2.
	Region1	Indicates that the transmission mode is in accordance with ITU-T G.991.2 Annex A.
	Region2	Indicates that the transmission mode is in accordance with ITU-T G.991.2 Annex B.
Remote	Default: Enabled Range: N/A Format: Predefined	Indicates whether remote management of the HDSL2 line is supported.
	Enabled	Indicates that remote management of the HDSL2 line is supported.
	Disabled	Indicates that remote management of the HDSL2 line is not supported.
Power Feeding	Default: NoPower Range: N/A Format: Predefined	Indicates whether optional power feeding of the HDSL2 line is supported.
	NoPower	Indicates that no optional power feeding of the HDSL2 line is supported.
	PowerFeed	Indicates that power feeding of the HDSL2 line is supported. Note: Not supported for HDSL2.
	WettingCurrent	Indicates that wetting current of the HDSL2 line is supported. Wetting current is the current that is present in a local circuit waiting for a contact closure to pick up a relay. Note: Not supported for HDSL2.
CurrentCondTargetMarginDown	Default: 0 Range: -10—+21 Format: Numeric	Specifies downstream current condition target signal-to-noise ratio (SNR) margin for an HDSL2 line. The SNR margin is the difference between the desired SNR and the actual SNR. Target SNR is the desired SNR margin for a unit.

Table 3-5. HDSL2 Span Profile Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
WorstCaseTargetMarginDown	Default: 0 Range: -10—+21 Format: Numeric	Specifies the downstream worst case target signal-to-noise ratio (SNR) margin for an HDSL2 line. The SNR margin is the difference between the desired SNR and the actual SNR. Target SNR is the desired SNR margin for a unit.
CurrentCondTargetMarginUp	Default: 0 Range: -10—+21 Format: Numeric	Specifies the upstream current condition target signal-to-noise ratio (SNR) margin for an HDSL2 line. The SNR margin is the difference between the desired SNR and the actual SNR. Target SNR is the desired SNR margin for a unit.
WorstCaseTargetMarginUp	Default: 0 Range: -10—+21 Format: Numeric	Specifies the upstream worst case target signal-to-noise ratio (SNR) margin for an HDSL2 line. The SNR margin is the difference between the desired SNR and the actual SNR. Target SNR is the desired SNR margin for a unit.
UsedTargetMargins	Default: CurrCondDown Range: N/A Format: Predefined	Indicates which target signal-to-noise ratio (SNR) margin for an HDSL2 line has been enabled.
	currCondDown	Indicates that the downstream current condition target signal-to-noise ratio (SNR) margin for an HDSL2 line is enabled.
	worstCaseDown	Indicates that the downstream worst case target signal-to-noise ratio (SNR) margin for an HDSL2 line is enabled.
	currCondUp	Indicates that the upstream current condition target signal-to-noise ratio (SNR) margin for an HDSL2 line is enabled.
	worstCaseUp	Indicates that the upstream worst case target signal-to-noise ratio (SNR) margin for an HDSL2 line is enabled.
Reference Clock	Default: LocalClk Range: N/A Format: Predefined	Displays the clock reference for an HDSL2 line.
	LocalClk	Indicates that the clock reference is local.
	NetworkClk	Indicates that the clock reference is network. Note: Not supported for HDSL2.
	DataOrNetworkClk	Indicates that the clock reference is data or network. Note: Not supported for HDSL2.
	DataClk	Indicates that the clock reference is data. Note: Not supported for HDSL2.

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

Configuring the Module Profiles, Ports, and Channels

Table 3-5. HDSL2 Span Profile Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
Line Probe	Default: Disabled Range: N/A Format: Predefined	Indicates whether line probe of the units in an SHDSL line is supported. Note: Not supported for HDSL2.
	Enabled	Indicates that line probe of the units in an SHDSL line is supported. The system finds the best possible rate.
	Disabled	Indicates that line probe of the units in an SHDSL line is not supported. The rate adaptation phase is skipped to shorten set up time.

- 4 Select the **Apply Span Profile Configuration** command. The values you entered are applied. If you created a new span profile configuration, a new entry is added to the HDSL2-SHDSL Span Profile Table window (Figure 3-10).
- 5 Repeat Step 1 through Step 4 for each additional span profile configuration you want to create.

End

Creating Endpoint Alarm Profile Configurations

To create Endpoint Alarm Profile configurations, perform the following procedure.

Begin

- 1 Return to the HDSL2 Configuration window (Figure 3-9) and select the **Go to EP Alarm Profile Table** command. The HDSL2-SHDSL Endpoint Alarm Profile Table window is displayed (Figure 3-12).

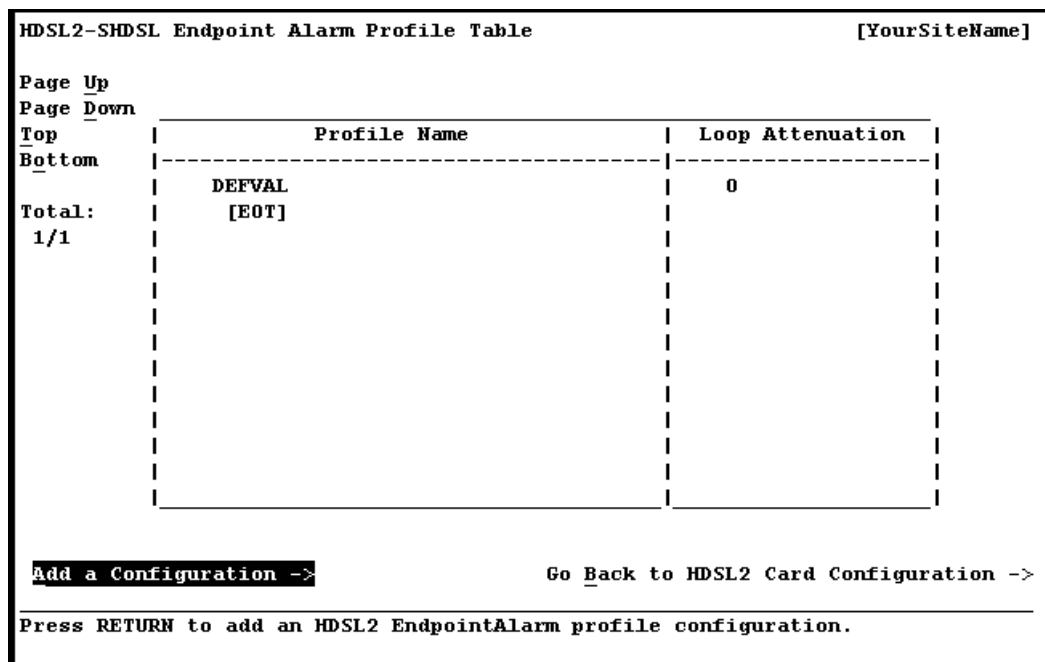


Figure 3-12. HDSL2-SHDSL Endpoint Alarm Profile Table Window

This table supports definitions of alarm configuration profiles for HDSL2/SHDSL segment endpoints.

Commands

The commands in this window have the following functions:

Command	Function
Page Up	Scrolls up one page.
Page Down	Scrolls down one page.
Top	Displays entries at the top of the table.
Bottom	Displays entries at the bottom of the table.
Add a Configuration	Displays the HDSL2-SHDSL Endpoint Alarm Profile Configuration window.
Go Back to HDSL2 Card Configuration	Redisplays the HDSL2 Configuration window.

Field Descriptions

The display-only fields in this window are described in Table 3-6.

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Configuring the Module Profiles, Ports, and Channels

Table 3-6. HDLSL2-SHDSL Endpoint Alarm Profile Table Window Field Descriptions

Field Name	Field Value	Description
Profile Name	Default: DEFVAL Range: N/A Format: Predefined	Displays the endpoint alarm configuration profile name. A default profile name, DEFVAL , is reserved and automatically used by the module until other line profiles are set. Note: The DEFVAL cannot be modified. Only user-created profiles can be modified.
Loop Attenuation	Default: 0 Range: N/A Format: Predefined	Displays the loop attenuation alarm threshold selected for the endpoint alarm configuration profile.
Total: 1/1	Default: 1/1 Range: N/A Format: Numeric	The first number in this field indicates the identification number of the endpoint alarm profile table entry on the selected line of the currently displayed window. The second number indicates the total number of endpoint alarm profile table entries for this module.

- 2 Select the **Add a Configuration** command. The HDLSL2-SHDSL Endpoint Alarm Profile Configuration window (see Figure 3-11) is displayed.

```

HDLSL2-SHDSL Endpoint Alarm Profile Configuration [YourSiteName]
-----
Profile Name..... default
Threshold Loop Attenuation 0
Threshold SNR Margin..... 0
Threshold ES..... 0
Threshold SES..... 0
Threshold CRC Anomalies... 0
Threshold LOSW Seconds... 0
Threshold UA Seconds..... 0
-----
Apply EP Alarm Profile Configuration |
Delete EP Alarm Profile Configuration | Go Back to Previous Window ->
-----
Press RETURN to edit the HDLSL2-SHDSL endpoint alarm configuration profile name _

```

Figure 3-13. HDLSL2-SHDSL Endpoint Alarm Profile Configuration Window

This table supports definitions of alarm configuration profiles for HDLSL2/SHDSL segment endpoints.

Commands

The commands in this window have the following functions:

Command	Function
Apply EP Alarm Profile Configuration	Applies the endpoint alarm profile configuration values selected.
Delete EP Alarm Profile Configuration	Deletes the endpoint alarm profile configuration values selected.
Go Back to Previous Window	Redisplays the HDSL2-SHDSL Endpoint Alarm Profile Table window.

Field Descriptions **3** Enter values in the fields on this window according to the information provided in Table 3-7.

Table 3-7. HDSL2-SHDSL Endpoint Alarm Profile Configuration Window Field Descriptions

Field Name	Field Value	Description
Profile Name	Default: default Range: N/A Format: Alphanumeric	Displays the selected endpoint alarm configuration profile name. Each endpoint alarm configuration profile you create is indexed by the name you ascribe in this field. Note: The DEFVAL profile, if selected, cannot be modified.
Threshold Loop Attenuation	Default: 0 Range: -127—+128 Format: Numeric	Indicates the loop attenuation alarm threshold. When the current value of the endpoint current attenuation reaches or exceeds this threshold, a loop attenuation crossing may be generated.
Threshold SNR Margin	Default: 0 Range: -127—+128 Format: Numeric	Indicates the signal-to-noise ratio (SNR) alarm threshold. When the current value of the endpoint current SNR margin reaches or drops below this threshold, an SNR margin crossing may be generated.
Threshold ES	Default: 0 Range: 0-899 Format: Numeric	Indicates the threshold for the number of errored seconds (ES) within any given 15-minute performance data collection interval. If the value of errored seconds within a particular 15-minute collection interval reaches or exceeds this value, a performance ES threshold may be generated. At most, one notification will be sent per interval per endpoint.
Threshold SES	Default: 0 Range: 0-899 Format: Numeric	Indicates the threshold for the number of severely errored seconds (SES) within any given 15-minute performance data collection interval. If the value of severely errored seconds within a particular 15-minute collection interval reaches or exceeds this value, a performance SES threshold may be generated. At most, one notification will be sent per interval per endpoint.

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Configuring the Module Profiles, Ports, and Channels

Table 3-7. HDSL2-SHDSL Endpoint Alarm Profile Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
Threshold CRC Anomalies	Default: 0 Range: 0-899 Format: Numeric	Indicates the threshold for the number of cyclic redundancy check (CRC) anomalies within any given 15-minute performance data collection interval. If the value of CRC anomalies within a particular 15-minute collection interval reaches or exceeds this value, a performance CRC anomalies threshold may be generated. At most, one notification will be sent per interval per endpoint.
Threshold LOSW Seconds	Default: 0 Range: 0-899 Format: Numeric	Indicates the threshold for the number of loss of sync word (LOSW) seconds within any given 15-minute performance data collection interval. If the value of LOSW seconds within a particular 15-minute collection interval reaches or exceeds this value, a performance LOSWS threshold may be generated. At most, one notification will be sent per interval per endpoint.
Threshold UA Seconds	Default: 0 Range: 0-899 Format: Numeric	Indicates the threshold for the number of unavailable (UA) seconds within any given 15-minute performance data collection interval. If the value of UA seconds within a particular 15-minute collection interval reaches or exceeds this value, a performance UAS threshold may be generated. At most, one notification will be sent per interval per endpoint.

- 4 Select the **Apply Endpoint Alarm Profile Configuration** command. The values you entered are applied. If you created a new endpoint alarm profile configuration, a new entry is added to the HDSL2-SHDSL Endpoint Alarm Profile Table window (Figure 3-12).
- 5 Repeat Step 1 through Step 4 for each additional endpoint alarm profile configuration you want to create.

End

Configuring HDSL-2 Ports

To configure HDSL-2 ports, proceed as follows:

Begin

- 1 From the HDSL2 Configuration window (Figure 3-9), select one of the lines with the port you want to configure and press Enter. The HDSL2 Port Configuration window (see Figure 3-19) is displayed.

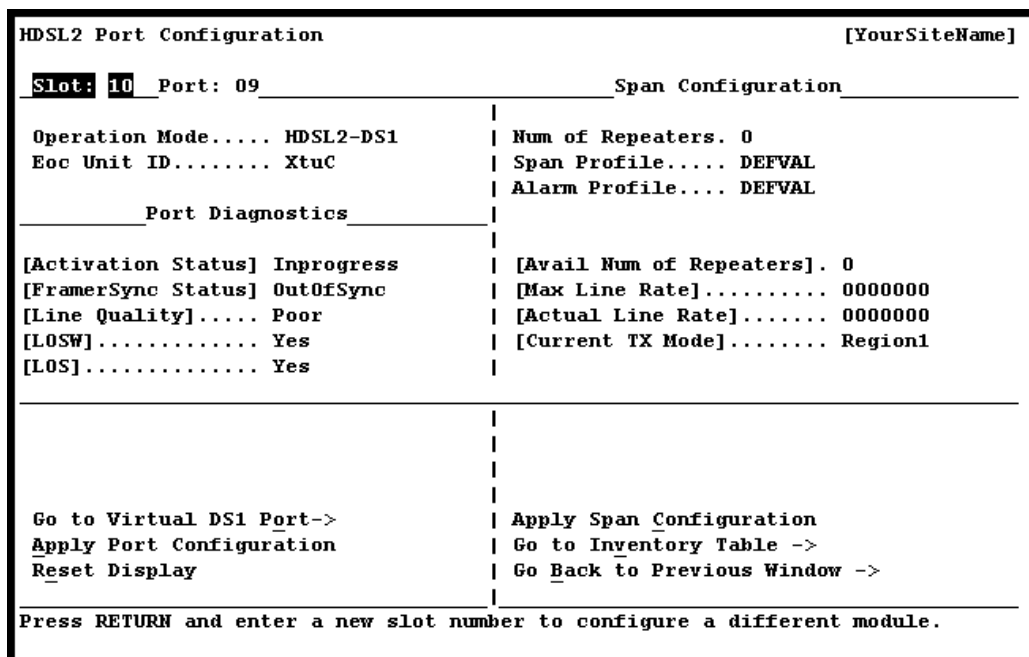


Figure 3-14. HDSL2 Port Configuration Window

Commands

The commands in this window have the following functions:

Command	Function
Go to Virtual DS1 Port	Displays the HDSL2 DS1 Port Configuration window.
Apply Port Configuration	For a specified port number value, applies the port configuration field values you set.
Reset Display	Resets the port configuration fields to the last set of saved values.
Apply Span Configuration	For a specified port number value, applies the span configuration field values you set.
Go to Inventory Table	Displays the HDSL2 Inventory Table window.
Go Back to Previous Window	Redisplays the HDSL2 Configuration window.

Field Descriptions

- 2 Enter values in the fields on this window according to the information provided in Table 3-13.

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Configuring the Module Profiles, Ports, and Channels

Table 3-8. HDSL2 Port Configuration Window Field Descriptions

Field Name	Field Value	Description
Operation Mode	Default: HDSL2-DS1 Range: N/A Format: Predefined	Displays the selected signaling mode for the port.
	HDSL2-DS1	Indicates that the HDSL2-DS1 signaling mode has been selected
Eoc Unit ID	Default: Xtuc Range: N/A Format: Predefined	Identifies the Embedded Operations Channel (EOC) unit selected for the HDSL2 line. The HDSL2 line consists of a minimum of two units: xtuc (the central termination unit) and xtur (the remote termination unit).
	Xtuc	Indicates that the unit ID is the central termination unit.
	Xtur	Indicates that the unit ID is the remote termination unit.
Port Diagnostics		
[Activation Status]	Default: InProgress Range: N/A Format: Predefined	Indicates the link activation status of this port.
	Idle	Indicates the link is idle, not in use, on this port, when the unit ID is changing or the framer is not configured properly.
	Normal	Indicates the link is operating normally on this port.
	Deactivated	Indicates the link has been deactivated and is no longer available on this port.
	InProgress	Indicates the link is in the process of being activated on this port.
[FramerSync Status]	Default: OutOfSync Range: N/A Format: Predefined	Indicates the framer sync status of this port.
	OutOfSync	Indicates that the framer is not operating—out of sync—on this port.
	AcquiringSync	Indicates that the framer is establishing synchronization on this port.
	InSync	Indicates that the framer has synchronized operations on this port.
	LosingSync	Indicates that the framer is losing synchronization on this port.

Table 3-8. HDSL2 Port Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
[Line Quality]	Default: Poor Range: N/A Format: Predefined	Indicates the line quality status of this port. The quality of the line is determined using the end-point current signal-to-noise ratio (SNR) margin. When the SNR margin is below the endpoint threshold SNR margin, the link is dropped and an attempt to retrain is made.
	Poor	Indicates that the SNR margin is below the end-point threshold SNR margin.
	Good	Indicates that the SNR margin is at or above the endpoint threshold SNR margin.
[LOSW]	Default: No Range: N/A Format: Predefined	Indicates the loss of sync word status of this port.
	No	Indicates there is no loss of sync word on this port.
	Yes	Indicates there is loss of sync word on this port.
[LOS]	Default: No Range: N/A Format: Predefined	Indicates the loss of signal status of this port.
	No	Indicates there is no loss of signal on this port.
	Yes	Indicates there is loss of signal on this port.
Span Configuration		
Num of Repeaters.	Default: 0 Range: 0-8 Format: Numeric	Indicates the number of repeaters in this HDSL2 span.
Span Profile	Default: DEFVAL Range: Format: Alphanumeric	The index of the span configuration profile in the HDSL2-SHDSL Span Profile Table window. Note: Span configuration profiles are only applicable to SHDSL lines.
Alarm Profile	Default: DEFVAL Range: Format: Alphanumeric	The index of the alarm configuration profile in the HDSL2-SHDSL Endpoint Alarm Profile Table window.
[Avail Num of repeaters]	Default: 0 Range: 0-8 Format: Numeric	Contains the actual number of repeaters discovered in this HDSL2 span.
[Max Line rate]	Default: 0 Range: 0-4112000 Format: Numeric	Contains the maximum attainable line rate in this HDSL2 span. This rate is fixed at 1.552 Mbps.

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Table 3-8. HDSL2 Port Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
[Actual Line rate]	Default: 0 Range: 0-4112000 Format: Numeric	Contains the actual line rate in this HDSL2 span. This rate is fixed at 1.552 Mbps.
[Current Tx Mode]	Default: Region1 Range: N/A Format: Predefined	Displays the setting that represents the ITU standard for the SHDSL line transmission mode.
	Region1	Indicates that the transmission mode is in accordance with the SHDSL standard, ITU-T G.991.2 Annex A.

- 3 Select the **Apply Port Configuration** command. The port configuration field values you set are applied.
- 4 Select the **Apply Span Configuration** command. The span configuration field values you set are applied.

End

Viewing Inventory Tables

To view inventory tables for the 8-Port HDSL-2 module, proceed as follows:

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Configuring the Module Profiles, Ports, and Channels

Table 3-9. HDSL2 Inventory Table Window Field Descriptions

Field Name	Field Value	Description
IffIndex	Default: N/A Range: 1009-1016 Format: Numeric	Displays the interface index for a single unit in an HDSL2 line. The last two digits of the number correspond to the port selected on the HDSL2 Port Configuration screen.
Inventory Index	Default: 1 Range: 1-2 Format: Numeric	Displays the sequential numerical index for a single unit in an HDSL2 line.
	1	Indicates the numerical index for the central termination unit (XtuC) in an HDSL2 line.
	2	Indicates the numerical index for the remote termination unit (XtuR) in an HDSL2 line.
Total: 1/2	Default: 1/2 Range: N/A Format: Numeric	The first number in this field indicates the identification number of the inventory table entry on the selected line of the currently displayed window. The second number indicates the total number of inventory table entries for this module.

- 2 Select one of the lines with the unit inventory configuration (for example, **XtuC**) you want to view and press Enter. The HDSL2 Inventory Configuration window is displayed (Figure 3-16).

```

HDSL2 Inventory Configuration [YourSiteName]
-----

[Index]..... XtuC
[Vendor ID].....
[Vendor Model Num]....
[Vendor Serial Num]...
[Vendor EOC SW VERSION] 0
[STD Version]..... 0
[Vendor List Num].....
[Vendor Issue Num]....
[Vendor SW Version]...
[Equipment Code].....
[Vendor Other].....
[Trans Mode Capability] Region1

Go To Endpoint Current Table ->
Go Back to Hdsl2 Inventory Table ->

Press RETURN to go to the Endpoint Current Table screen.
    
```

Figure 3-16. HDSL2 Inventory Configuration Window

Commands

The commands in this window have the following functions:

Command	Function
Go Back to Endpoint Current Table	Displays the HDSL2 Endpoint Current Table window.
Go Back to HDSL2 Inventory Table	Redisplays the HDSL2 Inventory Table window.

Field Descriptions The display-only fields in this window are described in Table 3-10.

Table 3-10. HDSL2 Inventory Configuration Window Field Descriptions

Field Name	Field Value	Description
[Index]	Default: N/A Range: N/A Format: Alphanumeric	Identifies the physical element in an HDSL2 line. It is based on the EOC unit addressing scheme with reference to the xtuC.
[Vendor ID]	Default: N/A Range: N/A Format: Alphanumeric	Identifies the vendor ID as reported in an Inventory Response message.
[Vendor Model Num]	Default: N/A Range: N/A Format: Numeric	Identifies the vendor model number as reported in an Inventory Response message.
[Vendor Serial Num]	Default: N/A Range: N/A Format: Numeric	Identifies the vendor serial number as reported in an Inventory Response message.
[Vendor EOC SW VERSION]	Default: N/A Range: N/A Format: Numeric	Identifies the vendor EOC software version as reported in an Discovery Response message.
[STD Version]	Default: N/A Range: N/A Format: Alphanumeric	Identifies the version of the HDSL2 standard implemented, as reported in an Inventory Response message.
[Vendor List Num]	Default: N/A Range: N/A Format: Numeric	Identifies the list number as reported in an Inventory Response message.
[Vendor Issue Num]	Default: N/A Range: N/A Format: Numeric	Identifies the vendor issue number as reported in an Inventory Response message.
[Vendor SW Version]	Default: N/A Range: N/A Format: Numeric	Identifies the vendor software version as reported in an Inventory Response message.

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Table 3-10. HDSL2 Inventory Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
[Equipment Code]	Default: N/A Range: N/A Format: Alphanumeric	Identifies the equipment code conforming to ANSI T1.213, <i>Coded Identification of Equipment Entities</i> .
[Vendor Other]	Default: N/A Range: N/A Format: Alphanumeric	Identifies other vendor information as reported in an Inventory Response message.
[Trans Mode Capability]	Default: Region1 Range: N/A Format: Predefined	Displays the transmission mode capability of the HDSL2 unit.
	Region1	Indicates that the transmission mode is in accordance with ITU-T G.991.2 Annex A.

- 3 Select the **Go to Endpoint Current Table** command. The HDSL2 Endpoint Current Table is displayed (Figure 3-17).

```

HDSL2 Endpoint Current Table [YourSiteName]
Page Up
Page Down
Top
Bottom
-----
| IfIndex | Inventory Index | EP Side | Ep WirePair |
-----
| 1009 | XtuC | CustomerSide | WirePair1 |
-----
Total:
1/1
-----
Go Back to HDSL2 Inventory Configuration ->
Press RETURN to view the previous page of configurations.
    
```

Figure 3-17. HDSL2 Endpoint Current Table Window

This table supports configuration parameters for segment endpoints in an HDSL2 line. Each entry represents a single segment endpoint in an HDSL2 line. Each entry is indexed by the interface index of the HDSL2 line, the unit ID of the associated unit, the side of the unit, and the wire-pair of the associated transceiver.

Commands

The commands in this window have the following functions:

Command	Function
Page Up	Scrolls up one page.
Page Down	Scrolls down one page.
Top	Displays entries at the top of the table.
Bottom	Displays entries at the bottom of the table.
Go Back to HDSL2 Port Configuration	Redisplays the HDSL2 Inventory Configuration window.

Field Descriptions

The display-only fields in this window are described in Table 3-11.

Table 3-11. HDSL2 Endpoint Current Table Window Field Descriptions

Field Name	Field Value	Description
IfIndex	Default: N/A Range: 1009-1016 Format: Numeric	Displays the interface index for a single unit in an HDSL2 line. The last two digits of the number correspond to the port selected on the HDSL2 Port Configuration screen.
Inventory Index	Default: XtuC Range: N/A Format: Predefined	Displays the associated unit ID for a single segment endpoint in an HDSL2 line.
	XtuC	Indicates the unit ID for the central termination unit (XtuC) in an HDSL2 line.
	XtuR	Indicates the unit ID for the remote termination unit (XtuR) in an HDSL2 line.
EP Side	Default: CustomerSide Range: N/A Format: Predefined	Displays the side of the unit—customer or network—associated with this segment endpoint.
	CustomerSide	Indicates that the customer side of the unit is associated with this segment endpoint.
	NetworkSide	Indicates that the network side of the unit is associated with this segment endpoint.
EP Wire Pair	Default: WirePair1 Range: N/A Format: Predefined	Displays the wire-pair of the transceiver associated with this segment endpoint. Note: Only WirePair1 , a single wire pair is supported on the HDSL2.
Total: 1/1	Default: 1/1 Range: N/A Format: Numeric	The first number in this field indicates the identification number of the endpoint current table entry on the selected line of the currently displayed window. The second number indicates the total number of endpoint current table entries for this module.

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- 4 Select one of the lines with the endpoint current configuration (for example, **WirePair1**) you want to view and press Enter. The HDSL2 Endpoint Current window is displayed (Figure 3-18).

```

HDSL2 Endpoint Current                                     [YourSiteName]

[Slot: 10] [Port: 09]      [Inventory Index]... XtuC
[EP Side]... CustomerSide [EP WirePair].. WirePair1

-----
[Current Loop Attenuation] 0          | [Curr15Min Time Elapsed]. 0
[Current SNR Margin]..... 0          | [Curr15Min ES]..... 0
[Current Status]..... NoDefect      | [Curr15Min SES]..... 0
[ES]..... 0                        | [Curr15Min CRC Anomalies] 0
[SES]..... 0                        | [Curr15Min LOSW Seconds]. 0
[CRC Anomalies]..... 0              | [Curr15Min UA Seconds]... 0
[LOSW Seconds]..... 0                | [Curr1day Time Elapsed].. 0
[UA Seconds]..... 0                  | [Curr1Day ES]..... 0
                                     | [Curr1Day SES]..... 0
                                     | [Curr1Day CRC Anomalies]. 0
                                     | [Curr1Day LOSW Seconds].. 0
                                     | [Curr1Day UA Seconds].... 0
-----
                                     | Reset Display
                                     | Go Back to Previous Window ->
-----
Press RETURN to reset this display to the last applied settings.
    
```

Figure 3-18. HDSL2 Endpoint Current Window

This table contains current status and performance information for segment endpoints in an HDSL2 line.

Commands

The commands in this window have the following functions:

Command	Function
Reset Display	Resets the endpoint current fields to the last set of applied values.
Go Back to Previous Window	Redisplays the HDSL2 Endpoint Current Table window.

Field Descriptions

The display-only fields in this window are described in Table 3-12.

Table 3-12. HDSL2 Endpoint Current Window Field Descriptions

Field Name	Field Value	Description
[Slot: nn]	Default: N/A Range: Variable Format: Numeric	Indicates the PSAX chassis slot that the selected module occupies.
Port: nn]	Default: N/A Range: 9-16 Format: Numeric	Indicates the virtual port associated with the physical port on the module.
[Inventory Index]	Default: N/A Range: N/A Format: Predefined	Displays the unit ID for a single segment endpoint in an HDSL2 line.
	XtuC	Indicates the unit ID for the central termination unit (XtuC) in an HDSL2 line.
	XtuR	Indicates the unit ID for the remote termination unit (XtuR) in an HDSL2 line.
[EP Side]	Default: N/A Range: N/A Format: Predefined	Displays the side of the unit—customer or network—associated with this segment endpoint.
	CustomerSide	Indicates that the customer side of the unit is associated with this segment endpoint.
	NetworkSide	Indicates that the network side of the unit is associated with this segment endpoint.
[EP WirePair	Default: WirePair1 Range: N/A Format: Predefined	Displays the wire-pair of the transceiver associated with this segment endpoint. Note: Only WirePair1 , a single wire pair is supported on the HDSL2.
[Current Loop Attenuation]	Default: 0 Range: -127—+128 Format: Numeric	Indicates the current loop attenuation for this endpoint as reported in a Customer Side Performance Status message.
[Current SNR Margin]	Default: 0 Range: -127—+128 Format: Numeric	Indicates the current signal-to-noise ratio (SNR) Margin for this endpoint as reported in a Status Response/SNR message.

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Table 3-12. HDSL2 Endpoint Current Window Field Descriptions (Continued)

Field Name	Field Value	Description
[Current Status]	Default: NoDefect Range: N/A Format: Predefined	Indicates the current state of the endpoint.
	NoDefect	Indicates that there are no defects on the line.
	powerBackoff	Indicates enhanced power backoff.
	deviceFault	Indicates a vendor-dependent diagnostic or self-test fault has been detected.
	dcContinuityFault	Indicates vendor-dependent conditions that interfere with span powering such as short and open circuits.
	snrMarginAlarm	Indicates that the SNR margin has dropped below the alarm threshold.
	loopAttenuation-Alarm	Indicates that the loop attenuation has exceeded the alarm threshold.
	loswFailureAlarm	Indicates a forward LOSW alarm.
	configInitFailure	Indicates endpoint failure during initialization due to paired endpoint not able to support requested configuration.
	protocolInitFailure	Indicates endpoint failure during initialization due to incompatible protocol used by the paired endpoint.
	noNeighborPresent	Indicates endpoint failure during initialization due to no activation sequence detected from paired endpoint.
	loopbackActive	Indicates that a loopback is currently active at this segment endpoint.
[ES]	Default: 0 Range: 0—42949672 95 Format: Numeric	Indicates the count of errored seconds (ES) on this endpoint since the unit was last restarted.
[SES]	Default: 0 Range: 0—42949672 95 Format: Numeric	Indicates the count of severely errored seconds (SES) on this endpoint since the unit was last restarted.
[CRC Anomalies]	Default: 0 Range: 0—42949672 95 Format: Numeric	Indicates the count of CRC anomalies on this endpoint since the unit was last restarted.
[LOSW Seconds]	Default: 0 Range: 0—42949672 95 Format: Numeric	Indicates the count of loss of sync word seconds (LOSW) on this endpoint since the unit was last restarted.

Table 3-12. HDSL2 Endpoint Current Window Field Descriptions (Continued)

Field Name	Field Value	Description
[UA Seconds]	Default: 0 Range: 0—4294967295 Format: Numeric	Indicates the count of unavailable seconds (UAS) on this endpoint since the unit was last restarted.
[Curr15Min Time Elapsed]	Default: 0 Range: 0—0899 Format: Numeric	Indicates the total elapsed seconds in the current 15-minute interval.
[Curr15Min ES]	Default: 0 Range: 0—0899 Format: Numeric	Indicates the count of errored seconds (ES) in the current 15-minute interval.
[Curr15Min SES]	Default: 0 Range: 0—0899 Format: Numeric	Indicates the count of severely errored seconds (SES) in the current 15-minute interval.
[Curr15Min CRC Anomalies]	Default: 0 Range: 0—0899 Format: Numeric	Indicates the count of CRC anomalies in the current 15-minute interval.
[Curr15Min LOSW Seconds]	Default: 0 Range: 0—0899 Format: Numeric	Indicates the count of loss of sync word seconds (LOSW) in the current 15-minute interval.
[Curr15Min UA Seconds]	Default: 0 Range: 0—0899 Format: Numeric	Indicates the count of unavailable seconds (UAS) in the current 15-minute interval.
[Curr1day Time Elapsed]	Default: 0 Range: 0—086399 Format: Numeric	Indicates the number of seconds that have elapsed since the beginning of the current 1-day interval.
[Curr1day ES]	Default: 0 Range: 0—086399 Format: Numeric	Indicates the count of errored seconds (ES) during the current day as measured by the Curr1day Time Elapsed field.
[Curr1day CRC Anomalies]	Default: 0 Range: 0—086399 Format: Numeric	Indicates the count of CRC anomalies during the current day as measured by the Curr1day Time Elapsed field.
[Curr1day LOSW Seconds]	Default: 0 Range: 0—086399 Format: Numeric	Indicates the count of loss of sync word seconds (LOSW) during the current day as measured by the Curr1day Time Elapsed field.
[Curr1day UA Seconds]	Default: 0 Range: 0—086399 Format: Numeric	Indicates the count of unavailable seconds (UAS) during the current day as measured by the Curr1day Time Elapsed field.

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Configuring HDSL2 DS1 Ports

To configure HDSL2 DS1 ports, proceed as follows:

Begin

- 1 From the HDSL2 Port Configuration window (Figure 3-14), select the **Go to Virtual DS1 Port** command. The HDSL2 DS1 Port Configuration window is displayed (Figure 3-19).

```

HDSL2 DS1 Port Configuration [YourSiteName]
Slot: 10 Port: 01
Line Type..... Esf          Chnl_OperStatus   Chnl_OperStatus
1 Unconfigured
Loopback..... NoLoop
Transmit Clock... LocalTiming
Data Tx Type... Structured
Channelization... Disabled
UpStrmIntrworking. TrunkCond
SG Feature..... Disabled
CT Mode..... Four-wire
[Line Status].... LossOfFrame
* Channel that is not in service.
Go to H.248 TID Configuration ->
Delete All Interfaces On This Port
Bring All Interfaces Into Service
Take All Interfaces Out Of Service
View Port Statistics ->      Go Back to Previous Window ->
Press RETURN and enter a new slot number to configure a different module.
  
```

Figure 3-19. HDSL2 DS1 Port Configuration Window

Commands

The commands in this window have the following functions:

Command	Function
Delete Interfaces: through	Deletes a selected range of configured interfaces when channelization has been enabled. Select the command and follow the prompts to enter the channel numbers and delete the selection. Note: This command is not displayed when channelization has been disabled. Note: You must first take the configured interfaces that are in-service to out-of-service (using the Take All Interfaces Out Of Service command) before you can use this command.
Show Straps	Displays the HDSL2 DS1 DS0s Strap Display window.
Apply Port Configuration	For a specified port number value, applies the port configuration field values you set.

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Command	Function
Reset Display	Resets the port configuration fields to the last set of applied values.
View Port Statistics	Displays the HDSL2 DS1Port Statistics window.
Go to H.248 TID Configuration	Displays the Termination ID Configuration window. This command appears only when H.248 Configuration is enabled. Refer to the <i>Packetstar H.248 Media Gateway Control User Guide</i> .
Delete All Interfaces On This Port	Deletes the configured interface and sets the channel to unconfigured status. The value Unconfigured is displayed in the Chnl Status field. Note: You must first take the interface that is in-service to out-of-service (using the Take All Interfaces Out Of Service command) before you can use this command.
Bring All Interfaces Into Service	Brings the out-of-service configured interface for the channel to in-service status. An asterisk is displayed beside all the configured channels indicating that they are in service. Note: You must first configure the interface before you can use this command.
Take All Interfaces Out Of Service	Takes the in-service configured interface to out-of-service status. The displayed asterisk is removed from all configured channels indicating that they are out of service. Note: You must use this command first before using the Delete All interfaces On This Port command.
Go Back to Card Configuration	Redisplays the HDSL2 Port Configuration window.

Field Descriptions 2 Enter values in the fields on this window according to the information provided in Table 3-13.

Table 3-13. HDSL2 DS1 Port Configuration Window Field Descriptions

Field Name	Field Value	Description
Line Type	Default: Esf Range: N/A Format: Predefined	Displays the framing mode to be used on this port.
	Esf	Indicates the framing mode is Extended Super Frame DS1 format.
	D4	Indicates the framing mode is D4 format. Channels are assigned sequentially.

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Table 3-13. HDSL2 DS1 Port Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
Loopback	Default: NoLoop Range: N/A Format: Predefined	Indicates whether the port is to be used for loopback testing and, if so, the type of loopback to be performed.
	NoLoop	Indicates that the port will not be used for loopback.
	LocalLoop	Indicates that local loopback will be used on this port. The signal will be received from another module in the chassis, sent through the module circuitry (including the segmentation and reassembly (SAR) function) and the chassis backplane to the originating module.
	LineLoop	Indicates that line loop will be used on this port. The received signal will be sent through the receiver and the line driver, and then back out to the originating point.
	PayloadLoop	Not supported.
	TestMode	Not supported.
Transmit Clock	Default: LocalTiming Range: N/A Format: Predefined	Indicates what type of synchronization is used by the interface to maintain proper data flow through the PSAX system and the remote devices connected to the system.
	LocalTiming	Selects a synchronization source (Composite-Clock, T1BITS, E1ETSI, CompositeClockDS0A, Freerun, or LineTiming) that is provided through the Stratum 3–4 module.
	LoopTiming	Selects the recovered clock from the received data and is used as the transmit clock on the selected interface.
	Adaptive Timing	Selects an interface buffer to allow different data rates to pass through the PSAX system and prevent overruns or underruns in the traffic. This option is displayed only when the port is configured as Unstructured in the Data Transfer Type field.
	SRTS	This field value is not currently supported on this module.

Table 3-13. HDSL2 DS1 Port Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
Data Tx Type (Data Transfer Type)	Default: Structured Range: N/A Format: Predefined	Indicates whether this port has structured or unstructured interfaces.
	Structured	Indicates that this port has structured unchannelized and channelized interfaces.
	Unstructured	Indicates that this port has unstructured (and unchannelized) interfaces. Note: The unstructured data transfer type supports only the circuit emulation interface. Note: When you select this value, the Line Type, Channelization, and UpStrmIntrworking fields are not displayed.
Channelization	Default: Disabled Range: N/A Format: Predefined	Indicates whether the DS1 port is divided into 24 channels. Note: When you select the value Unstructured in the Data Tx Type field, the Channelization field is not displayed.
	Disabled	Indicates that the division of the DS1 port into 24 channels is disabled. Use this setting if you want to set up only one channel for the port. When you select the Apply Port Configuration command, only channel 1 displays the value Unconfigured .
	Enabled	Indicates that the division of the DS1 port into 24 channels is enabled. Use this setting if you want to set up more than one channel for the port.
UpStrmIntrworking	Default: TrunkCond Range: N/A Format: Predefined	This field is not currently supported.
SG Feature	Default: Disabled Range: N/A Format: Predefined	Displays the status of the connection gateway feature.
	Disabled	Indicates that the connection gateway feature is disabled. See the <i>PacketStar® Connection Gateway API Specification</i> for more details.
	Enabled	Indicates that the connection gateway feature is enabled.

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Table 3-13. HDSL2 DS1 Port Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
CT Mode	Default: Four-Wire Range: N/A Format: Predefined	H.248 Applications, Continuity Test Mode: The SG Feature field must be set to Enabled to use any setting in this field. The CT Mode specifies the remote continuity test mode, where you can select Four-Wire or Two-Wire . This parameter supports the H.248 Basic Continuity Package. In a local- and remote-end PSAX System configuration, either with other PSAX Systems or non-PSAX switches, the PSAX can act as either the tester* or testee. See Table 3-14 and Table 3-15 for a summary of signal strengths that are exchanged in the above configurations, and other pertinent information. Note: This feature is supported in the SHDSL mode only.
	Four-Wire	Indicates that the remote end uses a four-wire termination. As the tester, the PSAX transmits a 2010Hz signal if the other termination is 4-wire. As the testee, the PSAX acts in loopback mode if the other termination is 4-wire.
	Two-Wire	As the tester, the PSAX transmits a 1780Hz signal if the other termination is 2-wire. As the testee, the PSAX acts in transponder mode if the other termination is 2-wire.
[Line Status]	Default: NoAlarm Range: N/A Format: Predefined	Indicates the status of the line: one of several alarms. See the line status alarms table for the DS1 below.

* The PSAX System side of a local/remote configuration can function as the tester or the testee in configuration with another PSAX, a non-PSAX switch, and a media gateway controller (MGC). Regardless of tester or testee status, the PSAX system side is always 4-wire. When interfacing with a 2-wire device, the PSAX converts its 4-wire signal (2010-Hz) to a 2-wire (1780-Hz) signal when replying to a 2-wire device, thus operating in transponder mode. As the testee, the PSAX system can act in loopback mode if the remote end is 4-wire. The loopback mode is configured on the Media Gateway Controller configured with the PSAX system. The signaling call progress tones (dial, ringing, busy, congestion, special information, caller waiting) are generated from the TAS module in CAS mode in configuration with the MGC. All other signals, such as continuity check and the 10x tests (102, 105, and 108) are generated from the TAS module in TAS mode. See the Tones and Announcements Server Module User Guide for more information.

Table 3-14. PSAX System as Tester (ct/ct)

If the testee is...	then the PSAX system transmits...	and the PSAX system expects to receive...
4-wire	a 2010-Hz signal	a 2010-Hz signal
2-wire	a 1780-Hz signal	a 2010-Hz signal

Table 3-15. PSAX System as Testee (ct/rsp)

If the tester is...	then the PSAX system expects to receive...	and the PSAX system returns...
4-wire	a 2010-Hz signal	a 2010-Hz signal
2-wire	a 2010-Hz signal	a 1780-Hz signal

Table 3-16 shows DS1 line status alarm descriptions for the 8-Port HDSL-2 module. This alarm is displayed in the Line Status field on the HDSL2 DS1 Port Configuration window.

Table 3-16. 8-Port HDSL-2 Module—DS1 Line Status Alarm Descriptions

Alarm	Description
NoAlarm	No alarm present
RcvFarEndLOF	PSAX is receiving an RAI alarm. The RAI (yellow) alarm is usually sent by the far-end device when an LOS, AIS, or LOF condition is detected on its receive port.
XmtFarEndLOF	Near-end sending LOF indication
RcvAIS	Far-end sending AIS (red alarm)
XmtAIS	Near-end sending AIS
LossOfFrame	Near-end LOF
LossOfSignal	Near-end loss of signal
LoopbackState	Near-end is looped
T16AIS	E1 TS16 AIS (not valid for DS1)
RcvFarEndLOMF	Far-end sending TS16 LOMF (not valid for DS1)
XmtFarEndLOMF	Near-end sending TS16 LOMF (not valid for DS1)
RcvTestCode	Near-end detects a test code
OtherFailure	Any other line status not shown in this table
RmtLoopback	Far-end loopback

- 3** To configure channels, perform one of the following procedures:
 - a. To configure the port as one channel, you must have selected the value **Disabled** in the Channelization field (see Table 3-13). Continue with instructions in “Configuring a Port with One Channel” on page 3-42.
 - b. To configure several channels for a port, you must have selected the value **Enabled** in the Channelization field (see Table 3-13). Continue with instructions in “Configuring a Port with Several Channels” on page 3-46.

End

Configuring a Port with One Channel

Perform the following procedure to configure the DS1 port with one channel.

Begin

To configure one or more ports on the 8-Port HDSL-2 module with only one channel for a port, use the following procedure:

- 1 Select Chnl **1 Unconfigured** on the HDSL2 DS1Port Configuration window (see Figure 3-19), and press Enter.

Note: You must have selected the value **Disabled** in the Channelization field on the HDSL2 DS1 Port Configuration window (see Figure 3-19).

The HDSL2 DS1 Channel Configuration window (see Figure 3-20) is displayed.

```

HDSL2 DS1 Channel Configuration [YourSiteName]
_ [Slot: 10] Port: 01 Channel: 001 _
-----
Interface Type..... Unconfigured      [Admin Status]..... Unconfigured
                                         [Oper Status]..... Unconfigured

[Available DS0s]:

[DS0s Strapped]:
 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

-----
Apply Configuration      Go to H.248 TID Configuration ->
Reset Display            Bring Interface Into Service
                        Configure Interface ->
                        Go Back to Port Configuration ->

Press RETURN and enter a new port number to configure another port.
    
```

Figure 3-20. HDSL2 DS1 Channel Configuration Window (One Channel per Port)

Commands

The commands in this window have the following functions:

Command	Function
Apply Configuration	For a specified port and channel number value, applies the interface configuration you selected.
Reset Display	Resets the fields to the last set of saved values.
Go to H.248 TID Configuration	Displays the Termination ID Configuration window. This command appears only when H.248 Configuration is enabled. Refer to the <i>Packetstar H.248 Media Gateway Control User Guide</i> .

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Command	Function
Bring Interface Into Service	Brings the out-of-service configured interface to in-service status. The value InService is displayed in the [Oper Status] and the [Admin Status] fields.
Take Interface Out Of Service	Takes the in-service configured interface to out-of-service status. The value OutOfService is displayed in the [Oper Status] and the [Admin Status] fields.
Configure Interface	Displays an interface configuration window for the selected interface.
Go Back to Port Configuration	Redisplays the HDSL2 DS1 Port Configuration window.

Field Descriptions 2 Enter values in the fields on this window according to the information provided in Table 3-17.

Table 3-17. HDSL2 DS1 Channel Configuration Window Field Descriptions

Field Name	Field Value	Description
[Slot: nn]	Default: N/A Range: Variable Format: Numeric	The PSAX chassis slot that the selected module occupies.
Port: nn	Default: N/A Range: 1-24 Format: Numeric	The physical port on the module.
Channel: nnn	Default: 001 Range: 001-024 Format: Numeric	Indicates the channel selected. Note: Only channel 001 is available when channelization is disabled.

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Table 3-17. HDSL2 DS1 Channel Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
Interface Type	Default: Unconfigured Range: N/A Format: Predefined	Indicates the type of end-to-end connection protocol that governs the transmission parameters of the configured channel interface.
	Unconfigured	Indicates this channel is not configured.
	AtmUni3-0	Indicates this channel is configured for the ATM UNI 3.0 interface type.
	AtmUni3-1	Indicates this channel is configured for the ATM UNI 3.1 interface type.
	AtmUni4-0	Indicates this channel is configured for the ATM UNI 4.0 interface type.
	IispUser	Indicates this channel is configured for the IISP user interface type.
	IispNetwork	Indicates this channel is configured for the IISP network interface type
	CircuitEmulation	Indicates this channel is configured for the circuit emulation interface type.
	AtmPnni1-0	Indicates this channel is configured for the ATM PNNI 1.0 interface type.
Cell Scramble	Default: Disabled Range: N/A Format: Predefined	Indicates cell scrambling status on the configured interface. This field is displayed for the following interface types: <ul style="list-style-type: none"> • AtmUni3-0 • AtmUni3-1 • AtmUni4-0 • AtmPnni1-0
	Disabled	Indicates that cell scrambling is disabled.
	Enabled	Indicates that cell scrambling is enabled
Signaling	Default: Disabled Range: N/A Format: Predefined	Indicates signaling status on the configured interface. This field is displayed for the CircuitEmulation following interface types.
	Disabled	Indicates that signaling is to be disabled. The interface will use common channel signaling (CCS).
	Enabled	Indicates that signaling is to be enabled. The interface will use channel-associated signaling (CAS).

Table 3-17. HDSL2 DS1 Channel Configuration Window Field Descriptions (Continued)

Field Name	Field Value	Description
[Admin Status]	Default: Unconfigured Range: N/A Format: Predefined	Displays the administrative status of the channel.
	Unconfigured	The interface for the channel is not configured.
	InService	The interface has been brought into service with the Bring Interface Into Service command.
	OutOfService	The interface has not yet been brought into service, or its in-service interface has been set to out of service with the Take Interface Out of Service command.
[Oper Status]	Default: Unconfigured Range: N/A Format: Predefined	Displays the operational status of the channel and whether the channel is exchanging a valid signal.
	Unconfigured	This channel is not operational because the interface is not configured.
	InService	The configured interface is currently operational (that is, capable of receiving and sending signals).
	OutOfService	The configured interface is not currently operational (that is, not capable of receiving and sending signals) because there is no connection.
[Available DS0s]:	Default: N/A Range: 01-24 Format: Numeric	Indicates the number of DS0s available to be strapped to a particular channel. DS0s are only available when channelization is enabled. Select a DS0 and press Enter to place an X below each DS0 to be strapped. Note: This field is not displayed when signaling is Enabled for the CircuitEmulation interface type.
[DS0s Strapped]	Default: N/A Range: 01-24 Format: Numeric	Indicates the number of checked DS0s strapped to a particular channel. When channelization is disabled, all 24 DS0s are strapped to channel 001 .

- 3 In the Interface Type field, press Enter to select an interface type. Another field appears when you make the following selections:

Interface Type	Field
AtmUni3-0	Cell Scramble
AtmUni3-1	Cell Scramble

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Configuring the Module Profiles, Ports, and Channels

Interface Type	Field
AtmUni4-0	Cell Scramble
AtmPnni1-0	Cell Scramble
CircuitEmulation	Signaling

- 4 In the Signaling or Cell Scramble field, press Enter to select either **Disabled** (default) or **Enabled**.
 - 5 Select the **Apply Configuration** command and press Enter. The selected interface type and Signaling field values are applied. For example, a trap message in the status bar reads: T-InterfaceCreated: interfaceIndex=701001 interfaceType=AtmUni3_0.
 - 6 Select the **Bring Interface Into Service** command and press Enter. The selected interface type is brought into service.
- Note:** Use this command only if you want to accept the default field values on the interface configuration window. Otherwise, skip this step. To select and apply field values on the interface configuration window, the interface must be out of service.
- 7 Select the **Configure Interface** command and press Enter. An interface configuration window is displayed for the interface type selected.
- See the *PacketStar® PSAX Connections Provisioning Guide* for a description of this window.
- 8 Repeat steps 1-7 under “Configuring a Port with One Channel” for the remainder of the ports, as needed.

Note: Be sure to complete the module port and channel configuration and then the interface configuration for each port before beginning the configuration of a new port.

You can save the values permanently to the Multiservice Media Gateway system database now, or before you exit the current session of the Multiservice Media Gateway system console interface. See “Saving the Equipment Configuration and Logging Off” on page 3-50.

End

Configuring a Port with Several Channels

Perform the following procedure to configure the DS1 port with several channels.

Begin

To configure one or more ports on the 8-Port HDSL-2 module with several DS0s strapped together in one channel and several channels for a port, use the following procedure:

- 1 Select **Chnl 1 Unconfigured** on the HDSL2 DS1 Port Configuration window (see Figure 3-19), and press Enter.

Note: You must have selected the value **Enabled** in the Channelization field on the HDSL2 DS1 Port Configuration window (see Figure 3-19).

The HDSL2 DS1 Channel Configuration window (see Figure 3-21) is displayed.

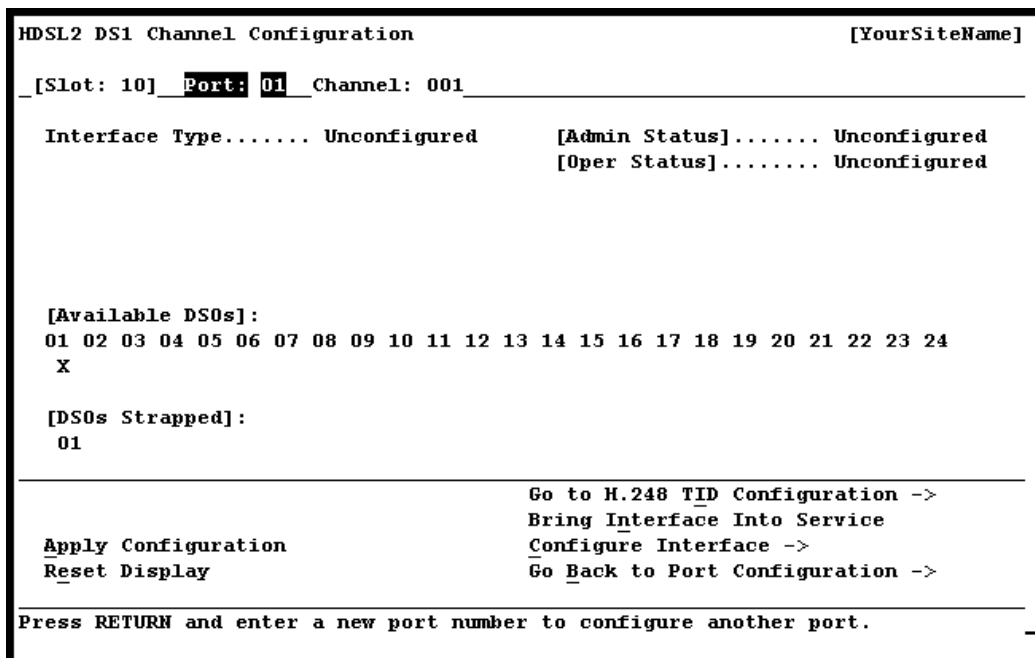


Figure 3-21. HDSL2 DS1 Channel Configuration Window (Several Channels per Port)

See page 3-42 for a description of the commands and fields in this window.

- 2 In the Interface Type field, press Enter to select an interface type. Another field appears when you make the following selections:

Interface Type	Field
AtmUni3-0	Cell Scramble
AtmUni3-1	Cell Scramble
AtmUni4-0	Cell Scramble
AtmPnni1-0	Cell Scramble
CircuitEmulation	Signaling

- 3 In the Signaling or Cell Scramble field, press Enter to select either **Disabled** (default) or **Enabled**.
- 4 In the [Available DS0s] field, move the cursor to value **01** (indicates DS0 1) and press Enter to display **x** below DS0 **01**.
- 5 Move the cursor to the next DS0 value and press Enter to display **x** below the DS0 value. Select as many DS0s as you want to strap together for the selected channel.

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Configuring the Module Profiles, Ports, and Channels

- 6 Select the **Apply Configuration** command and press Enter. The selected interface type and Signaling fields values are applied. For example, a trap message in the status bar reads: T-InterfaceCreated: interfaceIndex=701001 interfaceType=AtmUni3_0.

In the [DSOs Strapped] field (display only), the values for the DSOs you just selected are displayed. This first group of strapped DSOs are now shown as Channel 1 on the Port and Channel Configuration window, which you can view at any time.

- 7 To strap together more DSOs for another channel in the selected port, reselect the Channel field and enter the next channel number, for example, **002**, and repeat steps 2-6 from the DSOs available.
- 8 Select the **Bring Interface Into Service** command and press Enter. The selected interface type is brought into service.

Note: Use this command only if you want to accept the default field values on the interface configuration window. Otherwise, skip this step. To select and apply field values on the interface configuration window, the interface must be out of service.

- 9 Select the **Configure Interface** command and press Enter. An interface configuration window is displayed for the interface type selected.

See the *PacketStar® PSAX Connections Provisioning Guide* for a description of this window.

- 10 Repeat steps 2-9 for the rest of the available DSOs (or as many as you want to use).

Note: Be sure to complete the module port and channel configuration and then the interface configuration for each port before beginning the configuration of a new port.

- 11 To view the strapped DS0s and their associated channels at any time, select the **Show Straps** command on the HDSL2 DS1 Port Configuration window (see Figure 3-19). The HDSL2 DS1 DS0s Strap Display window (see Figure 3-22) is displayed.

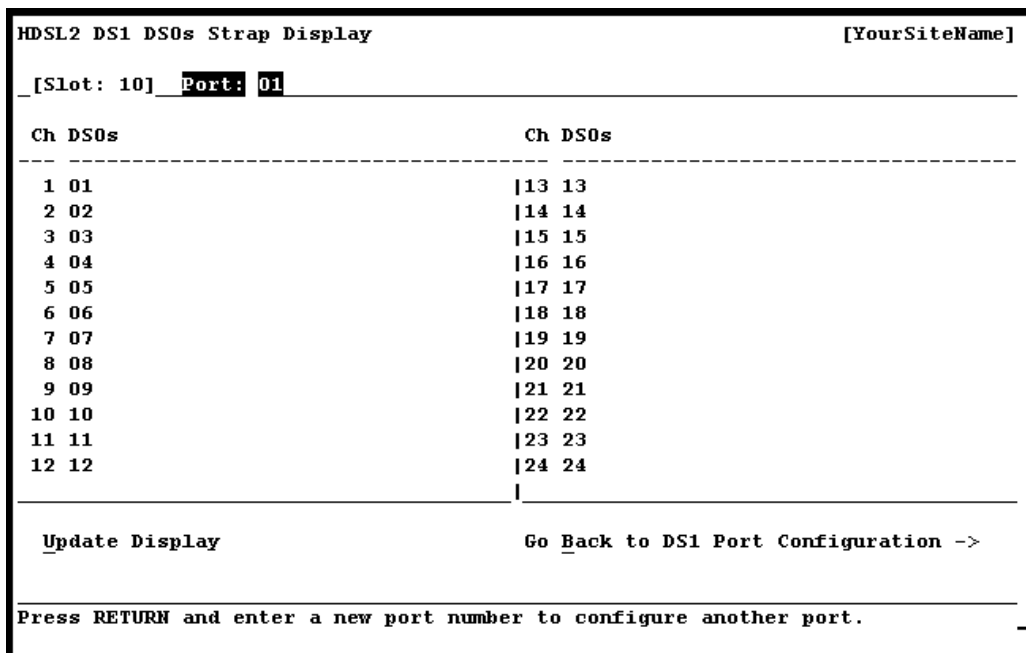


Figure 3-22. HDSL2 DS1 DS0s Strap Display Window

The strapped DS0s you set up are displayed next to their associated channels.

Commands

The commands in this window have the following functions:

Command	Function
Update Display	Resets the fields to the last set of saved values.
Go Back to DS1 Port Configuration	Redisplays the HDSL2 DS1 Port Configuration window.

Field Descriptions

The display-only fields in this window are described in Table 3-18.

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

Saving the Equipment Configuration and Logging Off

Table 3-18. HDSL2 DS1 DS0s Strap Display Window Field Descriptions

Field Name	Field Value	Description
[Slot: nn]	Default: N/A Range: Variable Format: Numeric	Displays the chassis slot that the selected module occupies.
Port: nn	Default: N/A Range: 1-24 Format: Numeric	Displays the port selected.
Ch (display only)	Default: N/A Range: 1-24 Format: Numeric	Displays the channels available. Note: Only channel 1 is available when channelization is disabled.
DS0s (display only)	Default: N/A Range: 1-24 Format: Numeric	Displays the DS0s strapped to a particular channel. When channelization is disabled, all 24 DS0s are strapped to channel 1 .

End

Saving the Equipment Configuration and Logging Off

Perform the following procedure to permanently save the values for your system.

 **CAUTION:**

If your system loses power or if you reboot the chassis, and you have not yet saved the values permanently, you will lose all unsaved values you have applied on the various windows.

Begin

- 1 Press Ctrl+G, to return to the Console Interface Main Menu window.

On the Console Interface Main Menu window, **[Modified]** is displayed next to the **Save Configuration** command, indicating you have made changes to the system that are not yet saved to the PSAX system database (see Figure 3-23).

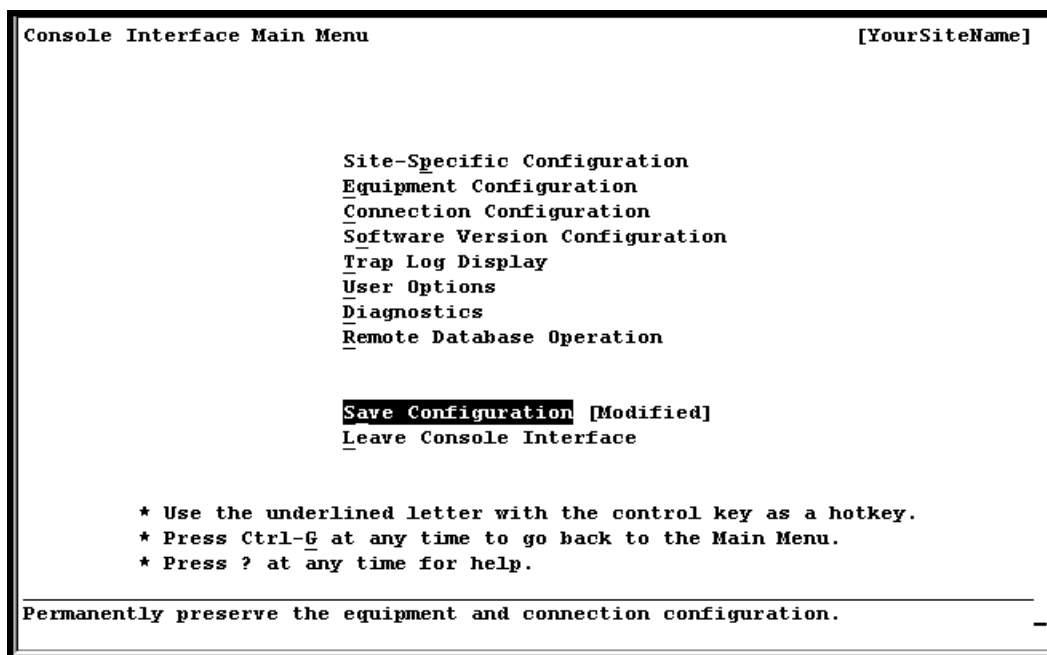


Figure 3-23. Save Configuration [Modified] (Before Saving)

- 2 Select the **Save Configuration** command or press Ctrl+A.

Wait a few seconds while the system writes the values to the PSAX system database. The system displays the following message while it is executing this command:

Saving the equipment and connection information

Note: In PSAX systems with redundant CPU n modules, the standby CPU n module reboots every time you save the configuration on the primary CPU n module. This event is a function of the SVC retention feature and the result of saving the configuration changes you have made.

When the save configuration function is completed, the system displays an appropriate message as described in Table 3-19.

Table 3-19. Messages Generated after the Save Configuration Process

When a PSAX system is...	the system displays...
nonredundant	T-SaveConfiguration: saveConfigurationReasonCode=All-OK
redundant	T-SaveConfiguration: saveConfigurationReasonCode = Expect2ndCPUCardFailedOrRemoved* The standby CPU n module is rebooted when the save command is issued. After the standby CPU n module reboots, the system displays the following message: T-SaveConfiguration: saveConfigurationReasonCode=FileTransferCompleted

* This message indicates that while the standby CPU n module reboots after you select the **Save Configuration** command, the standby CPU n module is temporarily unavailable.

After saving the configuration values, the indicator **[Modified]** is no longer displayed next to the **Save Configuration** command.

End

Viewing Port Statistics

Port statistics can be monitored at any time after the ports and channels are configured as described in “Configuring the Module Profiles, Ports, and Channels” on page 3-9.

Begin

To view statistics for this port, select the **View Port Statistics** command on the HDSL2 Virtual DS1 Port Configuration window (see Figure 3-19) and press Enter. The HDSL2 Virtual DS1 Port Statistics window (see Figure 3-24) is displayed.

```

HDSL2 Virtual DS1 Port Statistics [YourSiteName]
Slot: 10 Port: 01
-----
Errored Seconds..... 0000000010
Severely Errored Seconds..... 0000000010
Severely Errored Framing Seconds... 0000000010
Unavailable Seconds..... 0000001511
Controlled Slip Seconds..... 0000000000
Path Coding Violations..... 0000000000
Line Errored Seconds..... 0000000000
Bursty Errored Seconds..... 0000000000
Line Coding Violations..... 0000217856

          Continuous Update
          Reset Statistics
          Go Back to Port Configuration ->

Press RETURN and enter a slot number to view statistics for another slot.
    
```

Figure 3-24. HDSL2 Virtual DS1 Port Statistics Window

Commands

The commands in this window have the following functions:

Command	Function
Continuous Update	Updates the values in the fields every second.

Command	Function
Reset Statistics	Sets all field values to 0.
Go Back to Port Configuration	Redisplays the HDSL2 DS1 Port Configuration window.

Field Descriptions The display-only fields for this window are described in Table 3-20

Table 3-20. HDSL2 Virtual DS1 Port Statistics Window Field Descriptions

Field Name	Field Value	Description
Errored Seconds	Default: 000000000 Range: N/A Format: Numeric	Displays the number of errored seconds that have occurred on the DS1 port since the last time statistics were reset. For ESF signals, an errored second contains at least one of the following: <ul style="list-style-type: none"> • Path coding violation • Controlled slip event • Detected alarm indication signal (AIS) defect • Out-of-frame (OOF) defect For D4 signals, this field indicates the presence of bipolar violations
Severely Errored Seconds	Default: 000000000 Range: N/A Format: Numeric	Displays the number of severely errored seconds that have occurred on the DS1 port since the last time statistics were reset. For ESF signals, a severely errored second contains at least one of the following: <ul style="list-style-type: none"> • 320 or more path coding violation error events • OOF defect • Detected AIS defect For D4 signals, a severely errored second contains at least one of the following: <ul style="list-style-type: none"> • one-second intervals with framing error events • OOF defect • 1,544 or more line coding violations (LCVs)
Severely Errored Framing Seconds	Default: 000000000 Range: N/A Format: Numeric	Displays the number of severely errored framing seconds encountered by the DS1 port in one of the previous 96 individual 15-minute intervals. A severely errored framing second has one or more out-of-frame defects or a detected AIS defect.
Unavailable Seconds	Default: 000000000 Range: N/A Format: Numeric	Displays the number of unavailable seconds encountered by the DS1 port in one of the previous 96 individual 15-minute intervals. Unavailable seconds (UAS) are calculated by the number of seconds that the interface is unavailable.

Table 3-20. HDSL2 Virtual DS1 Port Statistics Window Field Descriptions (Continued)

Field Name	Field Value	Description
Controlled Slip Seconds	Default: 000000000 Range: N/A Format: Numeric	Displays the number of controlled slip seconds encountered by the DS1 port in the previous 24-hour period. A controlled slip second is a one-second interval containing one or more controlled slip events.
Path Coding Violations	Default: 000000000 Range: N/A Format: Numeric	Displays the number of path coding violations encountered by the DS1 port in the previous 24-hour period. A path coding violation is a frame synchronization bit error in the D4 and DS1-no-CRC formats, or a CRC error in the ESF and DS1-CRC formats.
Line Errored Seconds	Default: 000000000 Range: N/A Format: Numeric	Not supported.
Bursty Errored Seconds	Default: 000000000 Range: N/A Format: Numeric	Displays the number of bursty errored seconds encountered by the DS1 port in the previous 24-hour period. A bursty errored second has fewer than 320 and more than 1 path coding violation error events, no severely errored frame defects, and no detected incoming AIS defects.
Line Coding Violations	Default: 000000000 Range: N/A Format: Numeric	Not supported.

End

Provisioning Connections

For instructions on configuring interfaces and provisioning connections, see your *PacketStar® PSAX Connections Provisioning Guide for PacketStar® PSAX Multiservice Media Gateways*. In using that guide, keep in mind that the following connection types are supported by the 8-Port HDSL-2 module:

- PVC connections:
 - ~ ATM-to-ATM virtual channel connection (VCC)
 - ~ ATM-to-ATM virtual path connection (VPC)
 - ~ Bridge-to-ATM virtual channel connection (VCC) (z)
 - ~ Circuit Emulation-to ATM virtual channel connection (VCC)
 - ~ Circuit Emulation-to Circuit Emulation
 - ~ Frame relay-to-ATM virtual channel connection (VCC) connection
 - ~ In-band management IP PVC connection
 - ~ Variable bit rate (VBR)-to-ATM virtual channel connection (VCC)
 - ~ AAL2 Trunk Connection (w)

- SVC connections:
 - ~ ATM-to-ATM virtual channel connection VCC (n)
 - ~ ATM IISP CBR connection
 - ~ ATM IISP VBR connection
- SPVC connections:
 - ~ ATM-to-ATM virtual channel connection (VCC) (z)
 - ~ Circuit Emulation-to-ATM virtual channel connection (VCC) (y)
 - ~ Circuit Emulation-to-ATM Std AAL2 virtual channel connection (VCC)
 - ~ Frame relay-to-ATM virtual channel connection (VCC) SPVC connection
 - ~ Variable bit rate (VBR)-to-ATM virtual channel connection (VCC) (w)

Chapter 3 Configuring and Operating Ports and Channels Using the Console Interface

Provisioning Connections

A Pin Configurations



Overview of This Appendix

This appendix describes the pin assignments for the connectors on the 8-Port HDSL-2 module. Use the following information to connect correctly configured cables to this module.

Connector Pin Assignments

The 8-Port HDSL-2 module has one port connector that mates with the standard Lucent cable (COMCODE 300550639), a Tyco/AMP p/n 1653321-1, or equivalent for non-protection patch panel connections (see Chapter 2, "Module Description," and Figure A-1). The connector is identified by the port numbers (**PORTS 1–8**) on the module faceplate. The user may make connections to this cable per the specifications outlined in ANSI T1.403-1999.

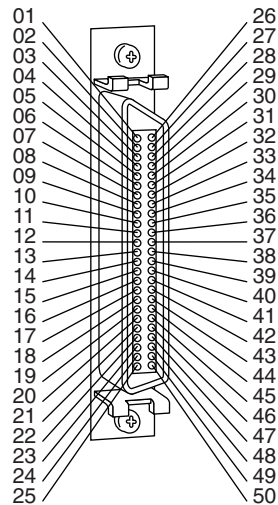


Figure A-1. Pin Locations on the Mini-Champ Port Connector

To the PSAX 24-Port RJ Patch Panel

Table A-1 lists the pin assignments between the 8-Port HDSL-2 module connectors, the Lucent cable, and the PSAX 24-Port RJ Patch Panel connectors, two 50-pin Cinch plugs and the 24 RJ-48C sockets.

Note: The transmit and receive—tip and ring—pairs of the patch panel RJ-48C sockets are **reversed** from the standard RJ-48C pin assignments described in the ANSI T1.403 standard (Pin 1 R1, Pin 2 T1, Pin 4 R, and Pin 5 T).

Appendix A Pin Configurations

Connector Pin Assignments

Table A-1. 8-Port HDSL-2 Module Connector, Cable, and PSAX 24-Port RJ Patch Panel Pin Assignments

Module Connectors *			Lucent Cable (COMCODE 300550639)		PSAX 24-Port RJ Patch Panel	
Port [†]	Signal Name	Socket Pin # [‡]	Mini Champ Plug P1	RJ-48H Socket P2	Cinch Plug Pin #	RJ-48C Socket Pin # (CPE)
1/13	T	27	27	26	26	4 (T)
	R	2	2	1	1	5 (R)
2/14	T	29	29	27	27	4 (T)
	R	4	4	2	2	5 (R)
3/15	T	31	31	28	28	4 (T)
	R	6	6	3	3	5 (R)
4/16	T	33	33	29	29	4 (T)
	R	8	8	4	4	5 (R)
5/17	T	35	35	30	30	4 (T)
	R	10	10	5	5	5 (R)
6/18	T	37	37	31	31	4 (T)
	R	12	12	6	6	5 (R)
7/19	T	40	40	32	32	4 (T)
	R	15	15	7	7	5 (R)
8/20	T	42	42	33	33	4 (T)
	R	17	17	8	8	5 (R)

* Up to two modules can be connected to the patch panel.

† Indicates port numbers from the module connectors and through the patch panel.

‡ On the patch panel, the two Cinch sockets are labeled **PORT 1–12**, and **PORT 13–24** and match with the RJ-48C connectors labeled **1–24**. The pin assignments are the same for each connector.

To the PSAX 48-Port RJ Patch Panel

Table A-1 lists the pin assignments between the 8-Port HDSL-2 module connectors, the Lucent cable, and the PSAX 48-Port RJ Patch Panel connectors, four 50-pin Cinch plugs and the 48 RJ-48C sockets.

Note: The transmit and receive—tip and ring—pairs of the patch panel RJ-48C sockets are **reversed** from the standard RJ-48C pin assignments described in the ANSI T1.403 standard (Pin 4 R and Pin 5 T).

Table A-2. 8-Port HDSL-2 Module Connector, Cable, and PSAX 48-Port RJ Patch Panel Pin Assignments

Module Connectors *			Lucent Cable (COMCODE 300550639)		PSAX 48-Port RJ Patch Panel	
Port†	Signal Name	Socket Pin #‡	Mini Champ Plug P1	RJ-48H Socket P2	Cinch Plug Pin #	RJ-48C Socket Pin # (CPE)
1/13/25/37	T	27	27	26	26	4 (T)
	R	2	2	1	1	5 (R)
2/14/26/38	T	29	29	27	27	4 (T)
	R	4	4	2	2	5 (R)
3/15/27/39	T	31	31	28	28	4 (T)
	R	6	6	3	3	5 (R)
4/16/28/40	T	33	33	29	29	4 (T)
	R	8	8	4	4	5 (R)
5/17/29/41	T	35	35	30	30	4 (T)
	R	10	10	5	5	5 (R)
6/18/30/42	T	37	37	31	31	4 (T)
	R	12	12	6	6	5 (R)
7/19/31/43	T	40	40	32	32	4 (T)
	R	15	15	7	7	5 (R)
8/20/32/44	T	42	42	33	33	4 (T)
	R	17	17	8	8	5 (R)

* Up to four modules can be connected to the patch panel.

† Indicates port numbers from the module connectors and through the patch panel.

‡ On the patch panel, the four Cinch sockets are labeled **PORT 1–12**, **PORT 13–24**, **PORT 25–36**, and **PORT 37–48** and match with the RJ-48C connectors labeled **1–48**. The pin assignments are the same for each connector.

Appendix A Pin Configurations

Connector Pin Assignments

B Reference Information



Overview of This Appendix

This appendix contains reference information that is helpful while configuring your PSAX system. The following types of information are provided:

- “Avoiding Common Errors When Configuring Interfaces”
- “Optimizing SVC Call Performance”
- “DSP Tone Detection Modes”
- “Connection Type by Interface Type”
- “Interface Type by I/O Module Type”
- “Minimum AAL2 Trunk Size Requirements Tables”
- “Module Alarm Status Descriptions”
- “ATM Service Categories in the PSAX System”

Avoiding Common Errors When Configuring Interfaces

An error may occur when you apply an interface to a channel. If an error condition occurs, the PSAX system sends an SNMP trap that is usually displayed in the console Trap Log Display window (accessible from the Console Interface Main Menu window). The list below includes the most common interface errors that cause the PSAX system to display a message. (See the *PacketStar® PSAX Simple Network Management Protocol (SNMP) Trap Reference Guide* for more information about the SNMP traps related to interface errors).

- Entering field values that are outside of the configurable range of values
- Attempting to configure an interface for a port or channel that has already been configured
- Attempting to configure an interface that is already in service (must be out of service to be configured or change field values)
- Entering field values that are not recognized by the PSAX system software

Optimizing SVC Call Performance

The information in this section provides guidance on optimizing call performance when configuring SVCs on the PNNI interface. The service-specific connection-oriented protocol (SSCOP) parameter is set on these interface configuration windows: ATM IISP network or IISP user, ATM UNI 3.0 or UNI 3.1, or ATM PNNI 1.0.

Note: These settings are suggested for connecting to a PSAX system from a remote site only. The PSAX system configures these settings internally in its own ATM switch.

Appendix B Reference Information

DSP Tone Detection Modes

When unacknowledged protocol data units (PDUs), the MaxPD field on the remote end peer (such as the *NavisCore™ CBX 500™*) shows the maximum number of SSCOP packets transmitted since the last PSAX polling of the peer. To optimize call performance, the SSCOP Rx Window Size field of the local ATM interface should be less than the maximum value displayed in the MaxPD credit window at the remote end of the ATM interface. Otherwise, the rate at which switched calls can be set and released may be degraded.

On the ATM IISP Interface Configuration window, the maximum credit window (the SSCOP Rx Window Size field) is configurable with a value up to 32 for all ATM interfaces on the PSAX system. The interfaces of the ATM switches that are connected to the PSAX system should be configured with the same values. This method results in 100 percent call completion at a call setup rate of 60 calls per second using even distribution. If these values are not configured in this way, calls will be set up at a rate of less than 60 calls per second.

Note: Various SSCOP parameter settings determine the maximum credit window. As a result, you may not be able to directly use these settings.

For more information on the SSCOP parameter, see the Application Note entitled *Connecting a CBX or GX Switch to a PacketStar® PSAX Multiservice Media Gateway via an ATM Port*.

DSP Tone Detection Modes

DSP tone detection modes are selected through the Circuit Emulation-to-ATM VCC PVC Connection window. These modes are described in Table B-1.

Table B-1. DSP Tone Detection Modes¹ and Associated Processing Performed

Tone Mode	Processing Performed
Disabled	Ignores fax tones and modem tones
Bypass	If a fax tone or modem tone is received, the firmware switches to G.711 mode (64 Kbps) and bypasses echo cancellation, if enough bandwidth is available.
Fax Relay	If a fax tone is received, the firmware switches to a channel configured for FaxRelayMode and performs fax demodulation / remodulation. If a modem tone is received, the firmware ignores it
Fax Relay/Modem Bypass	If a fax tone is received, the firmware switches to a channel configured for FaxRelayMode and performs fax demodulation/remodulation. If a modem tone is received, the firmware switches to G.711 mode (64 Kbps) and bypasses echo cancellation, if enough bandwidth is available.

¹ Modes selected on the Circuit Emulation-to-ATM VCC PVC Connection window.

Connection Type by Interface Type

The *PacketStar*® PSAX Multiservice Media Gateways provide a number of connection types and interface types to the network as described in Table B-2. Configuring interfaces and connections are described in the *PacketStar*® PSAX Connections Provisioning Guide that can be found on the *PacketStar*® PSAX Multiservice Media Gateways Product Information Library CD-ROM.

Table B-2. Connection Type by Interface Type

Interface Type	ATM IISP (Network/User)	ATM IMA	ATM PNNI 1.0	ATM PNNI over VPC	ATM UNI 3.0/3.1/4.0	ATM Virtual Interface	Bridge	CAS TrunkLine	Circuit Emulation	Frame Relay (UNI, NNI)	GR-303	HDLC Pass-through	PRI ISDN (Network/User)	Terminal Emulation
Connection Type														
AAL2 PVC Trunk	X	X	X	X	X	X								
AAL2 Channel PVC VCC Connection	X	X	X	X	X	X								
ATM-to-ATM virtual channel connection (VCC) PVC	X	X	X	X	X	X								
ATM-to-ATM virtual path connection (VPC) PVC	X	X	X		X									
Bridge-to-ATM VCC PVC	X	X	X	X	X	X	X							
Bridge-to-bridge PVC							X							
Circuit emulation-to ATM VCC PVC	X	X	X	X	X	X			X					
Circuit emulation-to circuit emulation PVC									X					
CPU Ethernet Bridge PVC	X	X	X	X	X	X								
Frame relay-to-ATM VCC PVC	X	X	X	X	X	X				X				
Frame relay-to-frame relay PVC										X				
GR-303-to-AAL2 VCC PVC ¹	X	X	X	X	X	X					X ²			
In-band management ATM PVC	X	X	X	X	X	X								
Variable bit rate (VBR)-to-ATM VCC PVC	X	X	X	X	X	X						X		X
VBR-to-VBR PVC												X		X
In-Band Management SVC	X	X	X	X	X	X								
ATM-to-ATM VCC SPVC	X	X	X	X	X									
ATM-to-ATM VPC SPVC	X	X	X		X									
Circuit emulation-to-ATM VCC SPVC	X	X	X	X	X	X			X					
CE-to-ATM Std AAL2 VCC SPVC	X	X	X	X	X				X					
Enhanced Router Module to ATM VCC SPVC	X		X	X	X									

Appendix B Reference Information

Interface Type by I/O Module Type

Table B-2. Connection Type by Interface Type (Continued)

Interface Type	ATM IISP (Network/User)	ATM IMA	ATM PNNI 1.0	ATM PNNI over VPC	ATM UNI 3.0/3.1/4.0	ATM Virtual Interface	Bridge	CAS TrunkLine	Circuit Emulation	Frame Relay (UNI, NNI)	GR-303	HDLC Pass-through	PRI ISDN (Network/User)	Terminal Emulation
	Connection Type													
Frame relay-ATM VCC SPVC	X	X	X	X	X					X				
VBR-to-ATM VCC SPVC	X	X	X	X	X		X					X		X
VBR-to-ATM Std AAL2 VCC SPVC	X	X	X	X	X							X		X

- 1 AAL2 PVCs must be configured before GR-303 connections can be configured.
- 2 A GR-303 Interface Group (IG) must be configured before GR-303 connections can be configured.

Interface Type by I/O Module Type

Table B-3 shows the available interface types for each *PacketStar* PSAX I/O module used in the *PacketStar*® PSAX Multiservice Media Gateways. This table does not include other PSAX modules that are not I/O modules, which include: the Alarm module, the DSP2x modules, the Enhanced Router module, the Route Server module, and the Tones and Announcements Server module

Table B-3. Interface Type by I/O Module Type

Interface	ATM IISP (Network/User)	ATM IMA	ATM PNNI 1.0	ATM PNNI over VPC	ATM UNI 4.0	ATM UNI 3.0/3.1	ATM Virtual Interface	Bridge	CAS Trunkline	Circuit Emulation	Frame Relay (UNI, NNI)	GR-303	HDLC Pass-through	PRI ISDN (Network/User)	Routing	Terminal Emulation	V5.2
	DS1/T1 Interface Modules																
6-Port DS1 IMA	X	X	X		X	X											
6-Port Enhanced DS1/T1 Multiservice	X		X			X			X	X	X	X	X	X			
12-Port Medium-Density DS1 Multiservice	X		X		X	X			X	X	X	X	X	X			
12-Port Medium-Density DS1 IMA	X	X	X		X	X											

Table B-3. Interface Type by I/O Module Type (Continued)

Interface	ATM ISP (Network/User)	ATM IMA	ATM PNNI 1.0	ATM PNNI over VPC	ATM UNI 4.0	ATM UNI 3.0/3.1	ATM Virtual Interface	Bridge	CAS Trunkline	Circuit Emulation	Frame Relay (UNI, NNI)	GR-303	HDLC Pass-through	PRI ISDN (Network/User)	Routing	Terminal Emulation	V5.2
Module																	
12-Port Medium-Density DS1/E1/DS0A CES									X ¹	X ²		X ³		X ⁴			
23N35 24-Port High-Density DS1 Multiservice	X		X		X	X			X	X	X	X	X	X			
23N69 8-Port HDSL-2	X		X		X	X				X							
DS3, E3, and STS-1e Interface Modules																	
1-Port Channelized DS3 Multiservice	X		X		X	X			X	X	X	X	X	X			
1-Port DS3 IMA	X	X	X		X	X											
1-Port Unchannelized DS3 Frame Relay											X						
1-Port Channelized STS-1e, T1 Format	X		X		X	X				X	X	X	X	X			
2-Port DS3 ATM	X		X		X	X											
2-Port E3 ATM	X		X		X	X											
3-Port Channelized DS3/STS-1e CES									X	X		X		X			
3-Port Channelized DS3/STS-1e CES Protection									X	X		X		X			
3-Port Channelized DS3/STS-1e Multiservice Protection						X				X							
3-Port DS3/E3 ATM	X		X		X	X	X										
3-Port DS3/E3 ATM Protection	X		X		X	X	X										
3-Port Unstructured DS3/E3 CES										X							
3-Port Unstructured DS3/E3 CES Protection										X							
E1 Interface Modules																	
6-Port E1 IMA	X	X	X		X	X											

Appendix B Reference Information

Interface Type by I/O Module Type

Table B-3. Interface Type by I/O Module Type (Continued)

Interface	ATM IIS (Network/User)	ATM IMA	ATM PNNI 1.0	ATM PNNI over VPC	ATM UNI 4.0	ATM UNI 3.0/3.1	ATM Virtual Interface	Bridge	CAS Trunkline	Circuit Emulation	Frame Relay (UNI, NNI)	GR-303	HDLC Pass-through	PRI ISDN (Network/User)	Routing	Terminal Emulation	V5.2
	Module																
6-Port Enhanced E1 Multiservice	X		X		X	X			X	X	X		X	X			
21-Port High-Density E1 Multiservice	X		X		X	X			X	X	X		X	X			X
21-Port High-Density E1 IMA	X	X	X		X	X											
Ethernet Interface Modules																	
Ethernet								X								X	
4-Port Ethernet								X								X	
Fiber-Optic Interface Modules																	
1-Port Channelized OC-3/STM-1 CES Multimode										X		X					
1-Port Channelized OC-3/STM-1 CES Single-mode										X		X					X
1-Port Channelized OC-3/STM-1 Unstructured CES/ATM Single-Mode	X ⁵		X ⁵		X ⁵	X ⁵				X ⁶							
1-Port Channelized OC-3/STM-1 Unstructured CES/ATM Multimode	X ⁵		X ⁵		X ⁵	X ⁵				X ⁶							
2-Port OC-3c/STM-1 ATM Multimode	X		X		X	X											
2-Port OC-3c/STM-1 ATM Single-Mode	X		X		X	X											
4-Port OC-3c/STM-1 Multimode	X		X		X	X											
4-Port OC-3c/STM-1 Single-Mode	X		X		X	X											
1-Port OC-3c 1+1 APS Multimode	X		X		X	X	X										

Table B-3. Interface Type by I/O Module Type (Continued)

Interface	ATM IISP (Network/User)	ATM IMA	ATM PNNI 1.0	ATM PNNI over VPC	ATM UNI 4.0	ATM UNI 3.0/3.1	ATM Virtual Interface	Bridge	CAS Trunkline	Circuit Emulation	Frame Relay (UNI, NNI)	GR-303	HDLC Pass-through	PRI ISDN (Network/User)	Routing	Terminal Emulation	V5.2
Module																	
1-Port OC-3c 1+1 APS Single-Mode	X		X		X	X	X										
1-Port STM-1 1+1 MSP Multimode	X		X		X	X	X										
1-Port STM-1 1+1 MSP Single-Mode	X		X		X	X	X										
1-Port OC-12c/STM-4c Multimode	X		X		X	X	X										
1-Port OC-12c/STM-4c Single-Mode	X		X		X	X	X										
2-Port OC-3c/STM-1 Enhanced ATM Multimode	X		X		X	X											
2-Port OC-3c/STM-1 Enhanced ATM Single-Mode	X		X		X	X											
Serial Interface Modules																	
Quadserial	X		X		X	X				X	X		X			X	
6-Port Multiserial					X	X				X	X		X			X	
Voice 2-Wire Interface Modules																	
4-Port Voice 2-Wire Office										X ⁷							
8-Port Voice 2-Wire Station										X ⁷							

- 1 The module supports CAS Trunkline in DS1 and E1 modes only.
- 2 The module supports Circuit Emulation in DS1, E1, and DS0A modes.
- 3 The module supports GR-303 in DS1 mode only.
- 4 The module supports PRI ISDN in DS1 and E1 modes only.
- 5 The module supports ATM services in the STM-ATM mode only.
- 6 The module supports CE in the OC3-UCB mode only.
- 7 European modules do not support this interface with the 8-Port Voice 2-Wire Station module or the 4-Port Voice 2-Wire Office module.

Appendix B Reference Information

Minimum AAL2 Trunk Size Requirements Tables

Minimum AAL2 Trunk Size Requirements Tables

Setting up channels with standard AAL2 multiplexing helps reduce traffic delay, as voice samples from at two channels or more are multiplexed into one VC, decreasing the amount of time necessary to fill one ATM cell before it is transmitted. (Without multiplexing, only one VC is allowed per ATM cell. The cell must wait to fill with samples from one channel before transmission). If a trunk is configured to have at least one active channel, one cell must be sent out every 20 ms; thus, the minimum trunk size is 50 cps. At 8 Kbps, Lucent recommends two multiplexed channels. On the DSP2C module, you can configure up to 64 AAL2 trunk groups, so that if you want to use all 128 channels (or 224 for echo cancel mode), you must use multiplexing. Enabling silence detection further enhances bandwidth savings by a factor of approximately half on the value in the cells/sec column in Table B-4.

Table B-4 summarizes bandwidth savings at different compression rates with standard AAL2 multiplexing.

Table B-4. Standard (Multiplexed) AAL2 Bandwidth Calculation¹

Compression Rate (in Kbps)	Data Bytes /sec	Data + Overhead Calculation	Data + Overhead /sec	Cells/sec calculation	Cells /sec	Average Expected cells/sec with silence detection enabled
64	8000	$(8000/40)*43$	8600	$8600/47$	183	92
40	5000	$(5000/25)*28$	5600	$5600/47$	120	60
32	4000	$(4000/20)*23$	4600	$4600/47$	98	49
24	3000	$(3000/15)*18$	3600	$3600/47$	77	39
16	2000	$(2000/10)*13$	2600	$2600/47$	56	28
8	1000	$(1000/5/2)*13$	1300	$1300/47$	28	14

¹ If a trunk has at least one active channel, a cell must be sent out every 20 msec; therefore, the minimum AAL2 trunk size is 50 cps.

Standard AAL2 Calculation Example

The following calculation computes the compression rate for 32 Kbps (see Table B-4). This calculation includes the AAL2 header in cells per second (cps):

$4,000 \text{ samples} / 20 \text{ samples received from DSP} * 23 \text{ bytes to be packed into an AAL2 cell, where } 23 \text{ bytes} = 20 \text{ bytes of data in the cps packet and } 3 \text{ bytes for the cps header.}$

With 47 data bytes in the AAL2 cell, the cell rate = $4600/47 \approx 98$

The expected cell rate with silence detection is: $98/2 = 49$.

See Table B-5 for the cell rates for Lucent nonmultiplexed AAL2.

Table B-5. Non-Multiplexed AAL2 Transmission Rates

Compression Rate (in Kbps)	Cell/sec
64	200
40	200
32	100
24	100
16	50
8	25

Fax Relay Using AAL2 Requirements

Table B-6 shows the cell rate for fax relay modulation/demodulation using AlgoSets 4 or 6 on the DSP2C or DSP2D Voice Server modules.

- Changing rates of 8 Kbps to 14.4 Kbps fax requires an additional 14 cells/sec.
- Changing rates of 8 Kbps to 12.0 Kbps fax requires an additional 8 cells/sec.
- Changing rates of 8 Kbps to 9.6 Kbps fax requires an additional 1 cell/sec.

Fax relay mode contains 20 msec of data for every cps packet, so the cell rate is more efficient than for voice codec.

The change in bandwidth is controlled by the DSP host code. If insufficient bandwidth is available on the AAL2 trunk, the fax will be forced to a lower rate. DSP resources must be available or the fax will fail. In addition, fax modem bypass or fax relay/modem bypass is supported if enough bandwidth is available on the AAL2 trunk.

Table B-6. Standard AAL2 Bandwidth Calculation for Fax Relay Mode Using DSP AlgoSets 4 or 6

Compression Rate (in Kbps)	Data Bytes /sec	Data + Overhead Calculation	Data + Overhead /sec	Cells/sec calculation	Cells /sec	Average Expected cells/sec with silence enabled
14.4	1800	$1800/(36*39)$	1950	$1950/47$	42	N/A
12.0	1500	$1500/(30*33)$	1650	$1850/47$	36	N/A
9.6	1200	$1200/(24*27)$	1350	1350	29	N/A

Appendix B Reference Information

Module Alarm Status Descriptions

Module Alarm Status Descriptions

The Alarm Status field on the Equipment Configuration window is described in Table B-7.

Table B-7. Module Alarm Status Descriptions on the Equipment Configuration Window

Alarm Status	Module Type Affected	Description
NoAlarm	I/O and Server	Indicates that no alarms have been detected for the module in this slot.
WrongCardType	I/O and Server	Indicates that one type of module was configured in this slot in the chassis, but a now different module occupies this slot.
LineFailed	All	Indicates that the module in this slot is no longer receiving or transmitting signals because the line failed.
Hexadecimal format, Example: 12345678ABC	I/O and Server	Indicates that one or more ports on the module in this slot currently have a loss of signal. The numbers indicate which ports have a loss of signal. For modules that have more than eight ports not receiving signals, the value in this field is in hexadecimal format.
CardRemoved	All	Indicates that one of the following events occurred: <ul style="list-style-type: none">• The module in this slot was configured and then removed from the slot.• Connections on the OC-3, OC-12, STM-1, or STM-4 APS/MSP primary module in this slot were transferred to the standby module. After the transfer occurs, the former primary module then displays CardRemoved in the Alarm Status field; the former standby module then displays Primary in the Status field.
ReferenceClockFailed	Stratum 3–4	Indicates that the timing reference clock on the Stratum module in this slot failed.
CompositeClockFailed	Stratum 3–4	Indicates that the timing composite clock on the Stratum module in this slot failed.
Overload	Power Supply	Indicates that the Power Supply module is operating under an overload condition.
PowerFailed	Power Supply	Indicates that the power has failed.
Minus48vFailed	Power Supply	Indicates that the -48 V dc Power Supply module output failed.
UnknownAlarm	I/O and Server	Indicates that the reason for failure is not known.
CompleteClockFailed	Stratum 3–4	Indicates that the backplane detected a clock error.
PowerFailed	Power Supply	Indicates that no power is coming into the PSAX chassis.

ATM Service Categories in the PSAX System

ATM Service Category Descriptions

The PSAX system support of defined ATM quality of service (QoS) categories is described in Table B-8.

Table B-8. PSAX System-Supported Quality of Service Categories

ATM Service Category	Description
Constant Bit Rate (CBR)	This service offers consistent delay predictability. CBR is used for applications such as circuit emulation, voice, and video.
Real Time Variable Bit Rate (VBR-rt)	This service offers low delay variance, but requires access to a variable amount of network bandwidth. VBR-rt is used for applications such as packet video and voice.
Non-Real Time Variable Bit Rate (VBR-nrt)	This service allows delay variance between the delivery of cells. VBR-nrt is used for data applications that have potentially bursty traffic characteristics.
Guaranteed Frame Rate (GFR)	This service allows delay variance and offers a minimum cell rate guarantee. When used with frame-based data encapsulated in AAL5 PDUs, it provides frame-based cell discard. GFR is used for frame relay or ethernet over ATM.
Unspecified Bit Rate (UBR)	This service allows for best-effort transport by the network. Cells are transported by the network whenever bandwidth is available and the user presents traffic.

Priority of ATM Service Categories in the PSAX System

The attributes of the categories of service supported by the PSAX system software are identified in Table B-9. The service examples in this table are intended simply as illustrations; you should choose your service category based on your network applications supported by the PSAX system. The flexibility of the PSAX system allows you to tailor the system based on the required service applications by selecting the appropriate connection configuration selection field value.

Table B-9. Mapping ATM Service Categories to PSAX System Priority Levels

ATM Service Category	Connection Configuration Field Value	AQueMan Priority (Legacy Implementation)	ATM Forum Traffic Management 4.1 Priority (Current Implementation)	Service Examples
Constant Bit Rate (CBR)	CBR1	Highest	Highest	911 calls
	CBR2	Lower than CBR1		Preferred customers
	CBR3	Lower than CBR2		Standard
	CBR4	Lower than CBR3		Cellular

Appendix B Reference Information

ATM Service Categories in the PSAX System

Table B-9. Mapping ATM Service Categories to PSAX System Priority Levels (Continued)

ATM Service Category	Connection Configuration Field Value	AQueMan Priority (Legacy Implementation)	ATM Forum Traffic Management 4.1 Priority (Current Implementation)	Service Examples
Real Time Variable Bit Rate (VBR-rt)	VBR-express	Lower than CBR4	Lower than CBR	Network management
	VBR-rt1	Lower than VBR-express		Real-time video
	VBR-rt2	Lower than VBR-rt1		MPEG 1-2/JPEG
Non-Real Time Variable Bit Rate (VBR-nrt)	VBR-nrt1	Lower than VBR-rt2	Lower than VBR-rt	Data
	VBR-nrt2	Lower than VBR-nrt1		Data
Guaranteed Frame Rate (GFR)	GFR2	Lowest (shares queue with UBR)	Lower than VBR-nrt	Frame relay, Ethernet, TCP
Unspecified Bit Rate (UBR)	UBR	Lowest	Lowest	UDP

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