Volume

6

The Speedlink™ System

DiamondView® Software

Document Number: 17-0006
Rev. 3.0
Date: 9/7/98

TABLE of CONTENTS

Chapter 1:	**Principles of Operation**	7
	DiamondView, EMS, and TMN	7
	EMS's Relationship to the User Interface	8
	DiamondView & Legacy Network Management Systems	8
	Installing DiamondView	9
	Installing DiamondView on an HP-UX Workstation	9
	Installing DiamondView on a SUN Workstation	10
	Motif: The GUI Window Manager	11
	Graphical Windows and Objects	11
	Dialog Windows	13
	Dialog Window Control Buttons	13
	Command Caching	13
	Events & Conditions	14
	Objects	14
	Dialog Windows and Objects	15
	Address Groups	16
	Selecting Multiple Objects	16
	Multiple Selection Control Buttons	16
	Modal vs. Modeless Dialog Windows	17
	Displaying and Accepting Data	17
	Dialog Windows – Common Elements	18
	Address Groups	19
	Identification Group	19
	Control Buttons	19
	Events Group	20
	Conditions List Box	20
	Operational State Group	21

	Administration State Group	21
	Availability Status Group	21
	DiamondView Online Help System	22
	General Help	23
	Topic Hierarchy	24
	Context-Sensitive Help	24
Chapter 2:	**The DiamondView Reference Manual**	25
	Multiplexer Graphical Window	25
	MCS Graphical Window	26
	LCS Graphical Window	27
	File Menu – Graphical Windows	28
	Dialog Windows	28
	Multiplexer Shelf	29
	DS3T Port	35
	DS3T Card Protection	42
	OC3 Trunk Card	44
	OC3T Card Protection	45
	OC3T Port	47
	MLA Card	60
	MLA Congestion Performance Monitoring	60
	Line Cards	61
	LCS Card Details	64
	Port Details – CAP2	65
	DSL Performance – CAP2	70
	Port Details – CAP4	72
	Port Details – SDSL	81
	SDSL Performance Monitoring	89
	Port Details – IDSL	91
	DMT Port	98
	LSM Card Details	109
	LSM Port Settings	112
	System Connections	113

Data Generation Options 114
System Events 115
System Options 116
Event Severity 119
Transaction Errors 120
Environmental Alarms 120
Trap Suppression 121
Add PVCs and Connections 124
Edit PVCs and Connections 127
Connection Details 130
Port Connections 131

GLOSSARY AND ACRONYMS 133

INDEX 143

Speedlink Documentation

Introduction

Speedlink documentation provides complete detailed instructions on how to install, test, and turn up a Speedlink System. This documentation complies with all requirements in Bellcore Technical Reference TR-TSY-000454 *Supplier Documentation for Network Elements* and IP 0260 *Standards for Task Oriented Practices (TOPS)* requirements.

Target Audience

Speedlink documentation volumes are written at different levels of detail based on the reader's needs. Below is a list of the various volumes and the intended target audience for each.

VOLUME	TITLE	TARGET AUDIENCE
Volume 1	General	Anyone with a need to understand more about the Speedlink System and planning requirements.
Volume 2	Installation	Installation and Testing Technicians, and Engineers (Detailed Level Procedures)
Volume 3	Acceptance Testing	Testing Technicians and Engineers (Detailed Level Procedures)
Volume 4	Provisioning	Provisioning Technicians and Engineers (Detailed Level Procedures)
Volume 5	Maintenance and Testing	Maintenance and Testing Technicians and Engineers (Detailed Level Procedures)
Volume 6	DiamondView	Network Management Technicians (Tutorial and Reference Manual for DiamondView)
Volume 7	DiamondCraft	Testing and Installation Technicians and Engineers (Tutorial and Reference Manual for DiamondCraft)

Information Mapping Style

All documents are written in Information Mapping style, which presents information in small units or blocks. Each information block is identified by a "subject label" in the left margin and is separated from the next information block by a horizontal line. "Subject labels" make the document easy for the reader to scan and to find information.

Each Detailed Level Procedure states the required equipment and tools to perform the job, provides step by step instructions, with integrated graphics, to help the reader perform each task.

Chapter 1

Chapter 1 Principles of Operation

DiamondView, EMS, and TMN

DiamondView's Purpose

DiamondView is an Element Management System (EMS). An EMS is one layer of an emerging architecture — the Telecommunications Management Network (TMN).

The goal of the TMN architecture is to standardize the relationships between Network Elements (NE) like the Speedlink Multiplexer, network management software, and the computers that interface to **Operational Support Systems (OSS),** the network management systems. The following simplified drawing shows the goal of TMN:

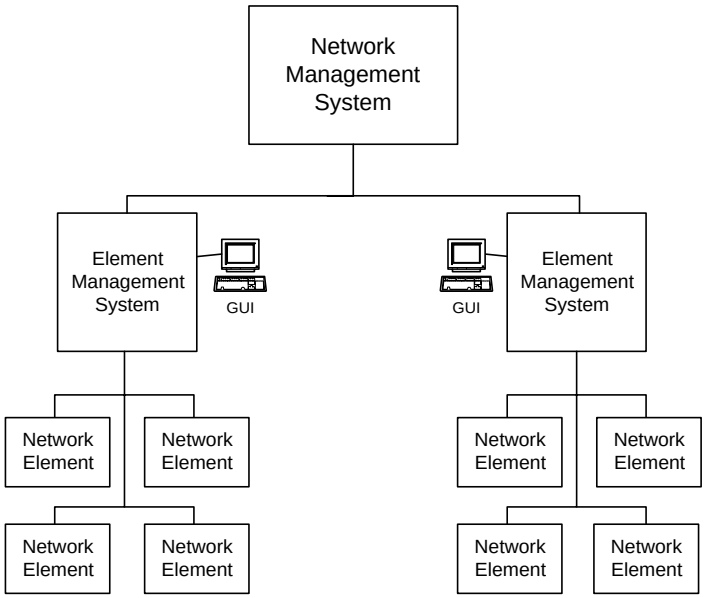


Figure 1: Telecommunication Management Network

In the TMN model, the Network Management System (NMS) manages an entire network. The NMS does not know the details of each and every NE. Instead, the NMS talks to an EMS responsible for managing one or more NEs. The NMS makes a request, and the EMS performs it.

EMS's Relationship to the User Interface

Most Element Management Systems provide a user interface. However, the PC or workstation on which the EMS runs can have a user interface program that allows a user to request NE operations — much like the NMS does.

This way, a new NE only requires the manufacturer to produce an EMS. As long as the EMS knows how to respond to instructions that conform to the TMN model, there is no need for the NMS to know the details of the NE communications medium or protocols. The manufacturer can conceal all the details of the NE from the NMS.

DiamondView & Legacy Network Management Systems

Network Service providers have Operations Support Systems that need to communicate with Speedlink Systems. Those legacy systems talk to HP OpenView, and DiamondView talks to the Speedlink System and Network Elements:

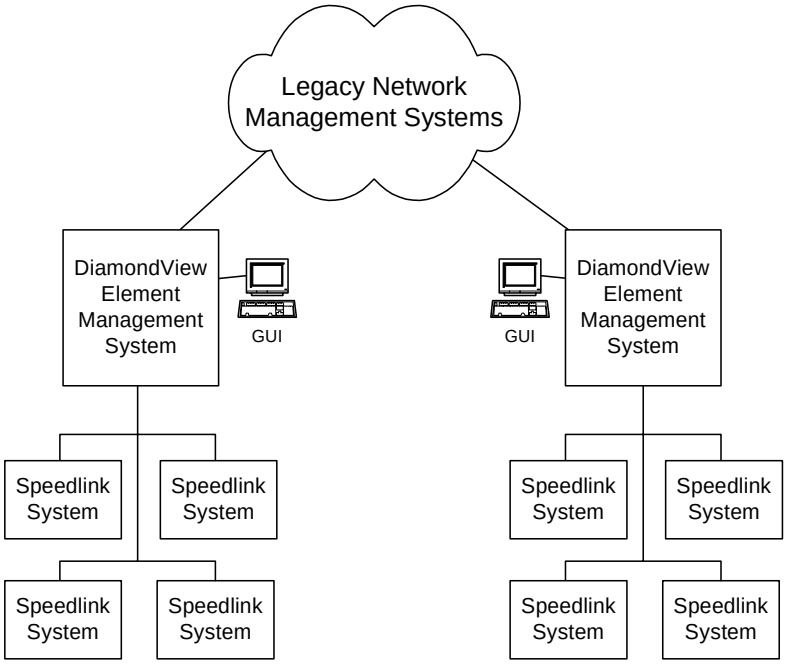


Figure 2: DiamondView EMS & Legacy Network Management Systems

This chapter teaches you:

- How DiamondView operates.
- How DiamondView's user interface works.
- How to use the DiamondView online help system.

Installing DiamondView

DiamondView can be installed as part of HP OpenView, or DiamondView can be installed by itself. Installing DiamondView as part of OpenView is a very complex process, specific to each customer's requirements, and one that requires a knowledgeable OpenView system administrator. A procedure that described this installation adequately would duplicate the existing OpenView manuals – especially there are substantial differences between different releases of OpenView. Accordingly, this document only explains how to install DiamondView as a standalone application.

Two HP documents that provide a good starting point for understanding installation of DiamondView as part of OpenView are:

- Hewlett-Packard, *Network Node Manager Products Installation Guide: HP OpenView*, #J1136-90000.
- Hewlett-Packard, *Using Network Node Manager: HP OpenView*, #J1136-90002.

These documents, and many others, can be browsed at: **http://www.hp.com/openview**.

There are minor differences between how DiamondView installed on an HP-UX workstation and on a Sun workstation. This procedure is therefore divided into HP and Sun sections. The DiamondView distribution tape is identical for both.

Installing DiamondView on an HP-UX Workstation

1. The HP OpenView and Motif executables must be in the default path.
2. You must install the PEX graphics libraries option from the standard HP distribution media, if they are not already installed. You can quickly find out if PEX is installed by running the command **which pexd_init** in a UNIX shell. If the **which** command finds **pexd_init**, it is a good assumption that PexLibs is already installed on this system.
3. Go to the directory in which you want to install DiamondView.
4. Put the DiamondView distribution tape in the tape drive.
5. Run the **tar** command to extract the DiamondView archive from the tape.
6. The DiamondView archive contains a **Readme** file and four directories: **help**, **bin**, **OV_icons**, and **OV_script**. The **Readme** file contains late breaking changes and information. The **help** directory contains DiamondView's help files. To make the help available to DiamondView, you must put a symbolic link from **/etc/vhelp/volumes/C** to **help/dvhelp.hv**. The UNIX commands are:

cd /etc/vhelp/volumes/C

ln –s *DiamondViewDirectory*/help/dvhelp.hv DiamondView

7. The **help** directory also contains **dvhelp.sdl**, the Sun help file for DiamondView. Delete this file.
8. The **bin** directory contains two DiamondView executables, one for the Sun, and one for HP-UX. The Sun executable will have the word "sun" in it its name. Delete the Sun executable.
9. The **OV_icons** directory contains OpenView icons for representing DiamondView. The **OV_script** directory contains a sample OpenView script for accessing DiamondView.

Installing DiamondView on a SUN Workstation

1. The OpenView and Motif executables must be in the default path.
2. You must install the PEX graphics libraries option from the standard HP distribution media, if they are not already installed. You can quickly find out if PEX is installed by running the command **which pexd_init** in a UNIX shell. If the **which** command finds **pexd_init**, it is a good assumption that PEX is already installed on this system.
3. Go to the directory in which you want to install DiamondView.
4. Put the DiamondView distribution tape in the tape drive.
5. Run the **tar** command to extract the DiamondView archive from the tape.
6. The DiamondView archive contains a **Readme** file and four directories: **help**, **bin**, **OV_icons**, and **OV_script**. The **Readme** file contains late breaking changes and information. The **help** directory contains DiamondView's help files. To make the help available to DiamondView, you must put a symbolic link from: /**usr/dt/appconfig/help/C/DiamondView** to **help/dvhelp.sdl**. The UNIX commands are:

   cd /usr/dt/appconfig/help/C

   ln –s *DiamondViewDirectory*/help/dvhelp.sdl DiamondView
7. The **bin** directory contains the DiamondView executable.
8. The **OV_icons** directory contains OpenView icons for representing DiamondView. The **OV_script** directory contains a sample OpenView script for accessing DiamondView.

Motif: The GUI Window Manager

How DiamondView Works

DiamondView is an HP OpenView based Element Management System (EMS) that provides fault, configuration, security, performance, and accounting management functions for the Speedlink System.

The DiamondView EMS operates at the element management layer of the TMN architecture and is fully compliant with the five management functional areas described above.

DiamondView uses the OSF/Motif window manager. There are a number of books that describe Motif. One is Valerie Quercia and Tim O'Reilly, *X Window System User's Guide: OSF/Motif 1.2 Edition*, Vol. 3, (O'Reilly & Associates, Inc., 1993).

Graphical Windows and Objects

The DiamondView Model of the Speedlink Multiplexer

DiamondView uses a combination of *graphical* windows and *dialog* windows. The graphical windows display a view of the Speedlink Multiplexer (or its components) that looks similar to the actual system. Just as you can disassemble the real equipment into smaller and smaller assemblies, DiamondView lets you examine the Multiplexer's components in progressively greater detail, by clicking the left mouse button on each component. Card shelves, individual cards, circuits, and facilities are treated as *objects* to DiamondView. In DiamondView, an *object* is any item that DiamondView can manipulate or display. Below is a graphical window showing the Master Control Shelf:

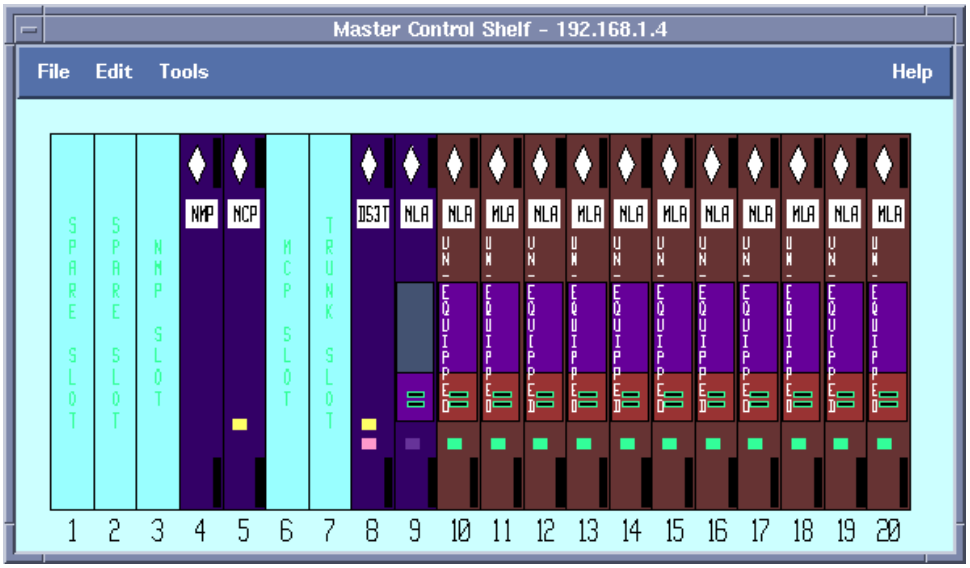


Figure 3: Master Control Shelf Graphical Window

In addition to color frames that indicate which objects the user has selected, DiamondView uses color and patterns to indicate the status of objects:

Table 1: Color and Object Status

Color	Meaning
gray	The object is not installed or configured.
light blue	The object is configured, but not installed.
blue	The object is configured and installed.
red	Alarms are active for this object.
orange	This object is still operational, but its performance is degraded (for a Port only).

In addition to the colors of cards, color rectangles in the card pictures correspond to the LEDs that appear in each card's front panel.

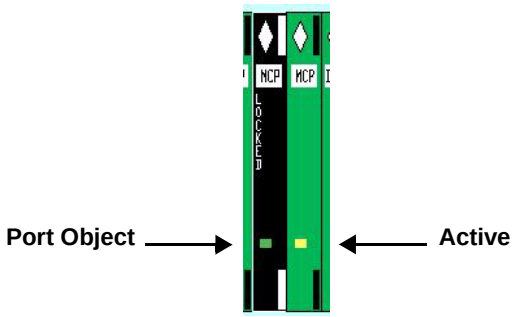


Figure 4: Indicators in Cards

Because the graphical windows use colors to display the status of equipment or facilities, the user can immediately see the state of the multiplexer, a shelf, a card, or a port in a graphical window. Graphical windows are useful for monitoring the state of the system at a glance; dialog windows are useful for altering the state of an object.

Dialog Windows

Dialog windows display and accept information from the user as a series of text boxes, arrow buttons, command buttons, and radio buttons. Here is a sample dialog window:

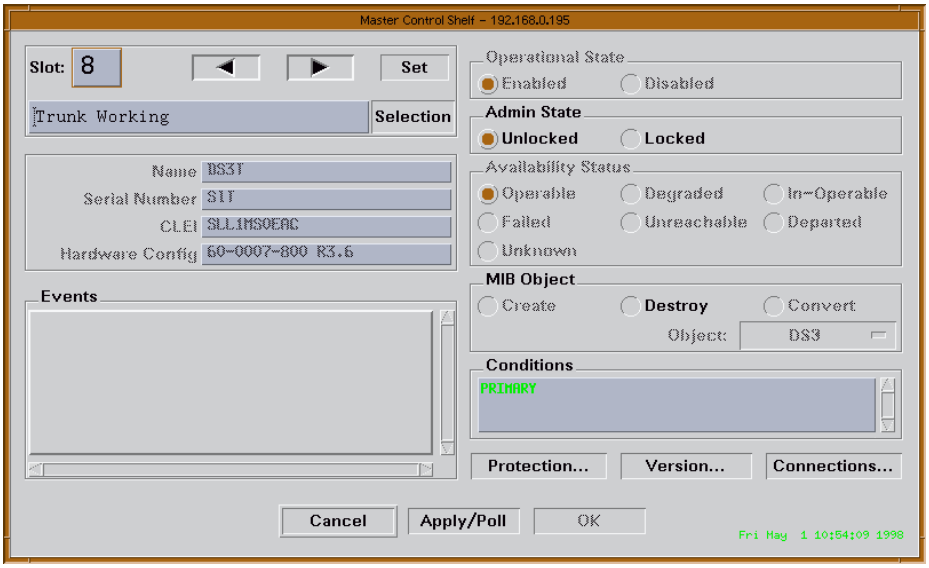


Figure 5: Master Control Shelf Dialog Window

Dialog Window Control Buttons

Dialog windows usually have three buttons at the bottom: CANCEL, APPLY/POLL, and OK. Most dialog windows have these three control buttons:

- CANCEL exits this window without applying any of the user's changes to the Speedlink System.
- APPLY/POLL applies any changes the user has made to the Speedlink System. It also updates any information in this dialog window with information that DiamondView has requested from the Speedlink System.
- OK applies any changes the user has made to the Speedlink System, and closes this window.

Command Caching

NOTE: Command Caching is not available in Release 2.0.

When the user instructs DiamondView to perform some operation on the Speedlink Multiplexer (either by selecting the OK button to complete a dialog window, or the APPLY/POLL button within a dialog window), DiamondView can perform the transaction immediately, or it can cache the command, depending on how the user configures it. The command application options are set in the **System Options** dialog window, described on page 116.

If DiamondView has been configured so that it performs the transaction immediately, the dialog window will stay on the screen until DiamondView receives the multiplexer's response. You do *not* need to wait for the dialog window to disappear before you start working in another DiamondView window.

If you have configured DiamondView to cache transactions, it stores the commands associated with your dialog windows. You can either have DiamondView hold the commands until you instruct DiamondView to send them to the Speedlink Multiplexer or send them the next time that DiamondView polls this class of object.

DiamondView allows this level of control over when it sends commands to the Speedlink Multiplexer because there are many variables that determine how long a command may take to complete. Because DiamondView talks to the Speedlink Multiplexer over a local area network, congestion may delay sending the command, or receiving the response. Thus, you may decide to cache commands on a congested network, or wait for DiamondView to complete each transaction before starting the next if response time is reasonably quick.

Events & Conditions

The Speedlink System has both **events** and **conditions**.

Events are abnormal, transient states for an object. Some examples: performance monitoring threshold crossing; recoverable non-volatile memory write errors; software errors.

A **condition** is an unusual or abnormal non-transient state for an object. A condition is binary — either on or off. Examples of conditions: loss of signal; framing errors.

Objects

Every object is a composite of other objects, or is an atomic object. (An atomic object is at the lowest level of detail, and cannot be divided further.) If an object is a composite, double-left clicking it brings up a new window that shows the components that make up the object. As an example, double-left clicking the LCS-1 object in the Multiplexer graphical window displays the LCS graphical window shown below.

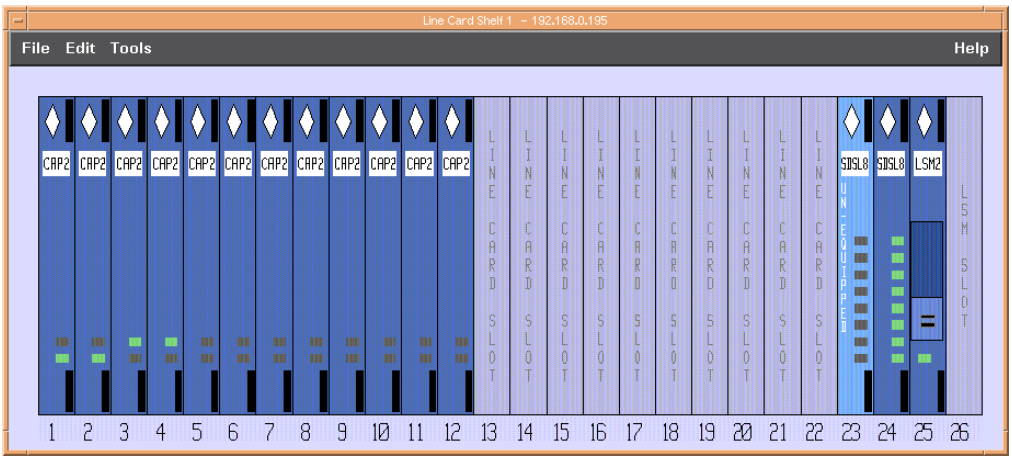


Figure 6: LCS Graphical Window (Line Card Shelf 1)

Dialog Windows and Objects

If you right click an object in a graphical window, DiamondView brings up the corresponding dialog window. A dialog window shows information about this object, and in most cases, provides an opportunity to alter the object's characteristics. Shown on the next page is the dialog window that appears if you right click a line card port.

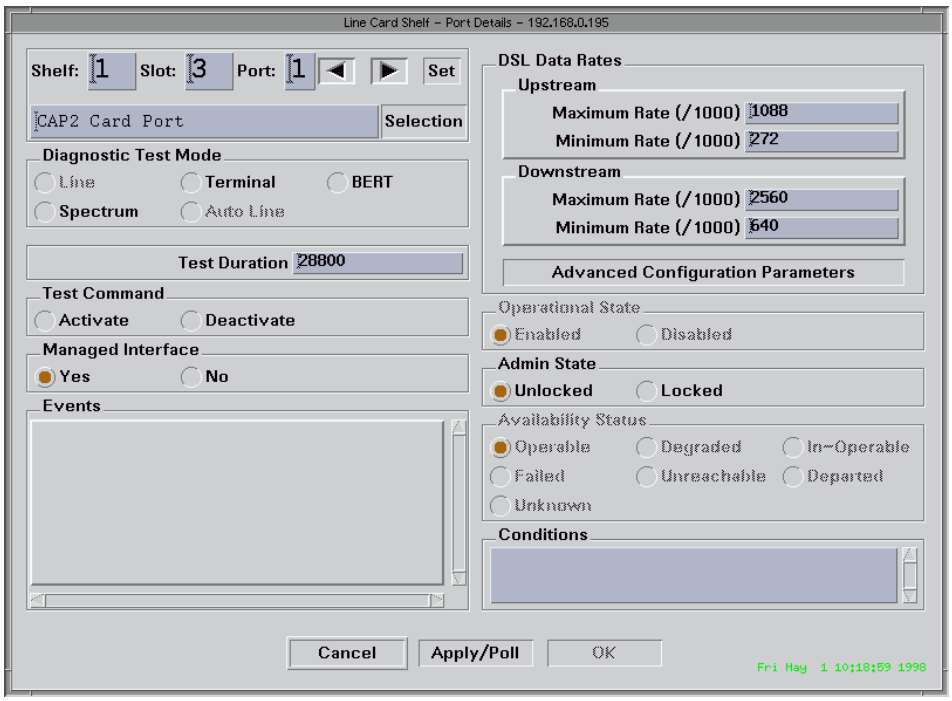
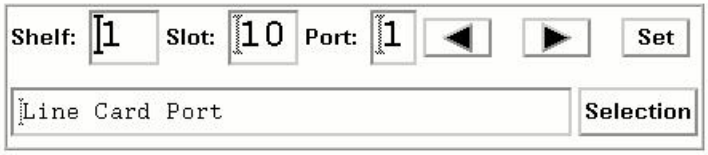


Figure 7: Line Card Shelf – Port Details Dialog Window

Address Groups

There is an address group in the upper left corner of certain dialog windows:



This includes shelf number, slot number, and port number. Immediately to the right of the port number are two arrow keys. To the right of the right arrow is the SET button, and below it, the SELECTION button. The SELECTION button switches from single selection to multiple selection mode. (See page 16 for a discussion of multiple selection.) The SET updates the window with data for the currently specified address.

Arrow buttons are used in address groups. The left arrow button (if it is enabled) moves the port number down one; the right arrow button moves the port number up one. This is true for any object – the left and right arrow buttons move you logically one down or one up through the list of objects.

Selecting Multiple Objects

You can also select multiple objects in a graphical window by selecting the first card or facility, then holding down the SHIFT or CTRL key as you select additional objects. The SHIFT key selects a range of objects, from the first object selected to the last object selected. The CTRL key adds individual objects to the selection. Once you have selected a set of objects, clicking the right mouse button brings up the dialog window for this group of objects.

Multiple Selection Control Buttons

In a multiple selection window, instead of an address in the upper left corner of the dialog window, you get a list of selected objects, and the three buttons SINGLE, REMOVE, and REBUILD:

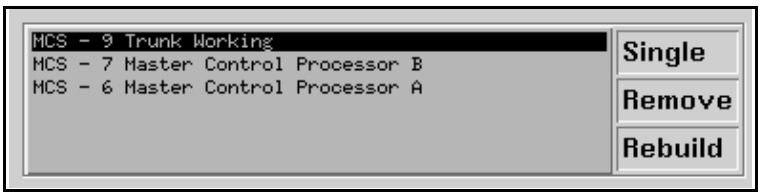


Figure 8: Multiple Selection Address Group

The SINGLE button switches from multiple selection to single selection. Whatever entry in the list box is currently selected becomes the selected object. The dialog window redraws itself as a single selection window. (Double left-clicking one of the list entries does the same thing, making the selected list entry the single selection.)

If you have selected an item from the selected objects list, the REMOVE button removes it from the multiple selection list box.

The REBUILD button rebuilds the selected objects list from the multiple selection now in effect in the graphical window from which you started this dialog window. If you change the multiple selection in the parent window, the selected objects list will not change until you click this button.

The REMOVE and SINGLE buttons affect the multiple selection list only within the dialog window. These changes do not affect the multiple selection of objects in the parent window.

Modal vs. Modeless Dialog Windows

Dialog windows can be either "modal" or "modeless." You must complete a modal dialog window (with the OK or CANCEL buttons) before you can do anything in any other window. A modeless dialog window can stay open while other dialog windows are opened, altered, and closed.

Modal dialog windows contain information that might change (or need to change) if you make changes in other dialog windows at the same time.

Displaying and Accepting Data

Dialog windows have several methods for displaying and accepting data. For each of these methods, a dialog window initially displays the current value of the selected object's parameter. If a particular parameter is undefined for this dialog window, or the user is not allowed to alter it, the parameter's name will be "grayed out" in the dialog window. If the user changes the parameter, and completes the dialog window with OK, DiamondView will apply that changed parameter to the object on the Speedlink. Listed below are the different methods for displaying and accepting data, and how each is used.

Text boxes are boxes where the user can type numbers or alphanumeric text appropriate to this data type. DiamondView validates these fields when the OK command button is selected.

Radio option buttons are a collection of round-shaped buttons within a frame/ group box. Use radio option buttons to select from a group of options that are mutually exclusive. The user may select *one* button from the group to specify this parameter:

Figure 9: Radio Option Button Example

Check boxes are a collection of square buttons within a frame/group box. The user may click as many of these **on** or **off** as needed. (Some combinations of check boxes may not be valid, for some commands. DiamondView will advise the user if an invalid combination of check boxes is selected.)

Check boxes example:

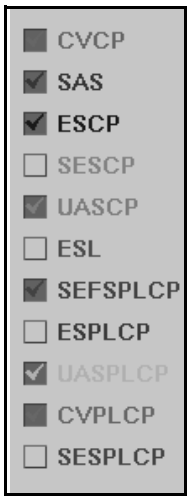


Figure 10: Check Boxes Example

Menus buttons, when selected, let the user make a choice from a list. They look like this before selected:

Figure 11: Menu Box Example

Pop-up buttons are rectangles in a dialog window that bring up modal dialog windows. These modal dialog windows display additional data and settings for this object.

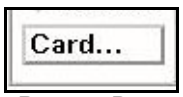


Figure 12: Pop-up Button Example

Dialog Windows – Common Elements

The following are common elements present in many different dialog windows:

- Address Group
- Identification Group
- Control Buttons
- Events Group

- Conditions List Box
- Operational State Group
- Administration State Group
- Availability Status Group

These are described in the information blocks below.

Address Groups

There are two types of address groups: single selection and multiple selection (described on page 16). Certain dialog windows have an address group in the upper left corner. The address group defines which objects this dialog window applies.

Identification Group

The identification group is in the dialog window's middle left:

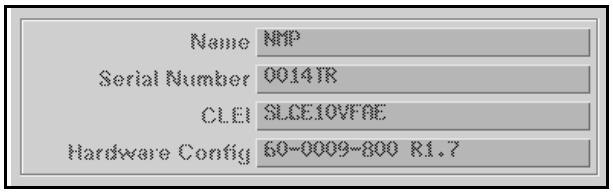


Figure 13: Identification Group

This group contains the following read-only fields:

- **Name** physical hardware name
- **Serial Number** hardware serial number
- **CLEI** Common Language Equipment Identifier
- **Hardware Config** physical hardware version number

Control Buttons

The **Cancel**, **Apply/Poll**, or **OK** buttons are always at the bottom of the dialog window:

Figure 14: Control Buttons

Cancel closes the current dialog window without applying any of the changes that the user has entered in this dialog window.

Apply/Poll applies any changes the user has entered to the object, and updates the information displayed within the dialog window, depending on the state of the multiplexer's MIB (Management Information Base). The dialog window remains

open. In a few dialog windows, DiamondView may label this button as **Apply**, not **Apply/Poll**, because there is no need to gather information from the MIB.

OK applies any changes to the object that the user has specified in this dialog window, and closes the dialog window. Until at least one parameter has changed in the dialog window, this button will usually be "grayed out," since there is no new data to send to the Speedlink Multiplexer.

In addition to these three standard control buttons, some dialog windows have other control buttons; a few may have only the **Cancel** button. Details of any dialog window control buttons that are unique to a particular dialog window will be described in this manual. Any dialog window has at least one of the above control buttons within it.

Events Group

The **events group** includes an events list box. The events list box shows all events currently outstanding for this object. For an explanation of **Events** see page 14.

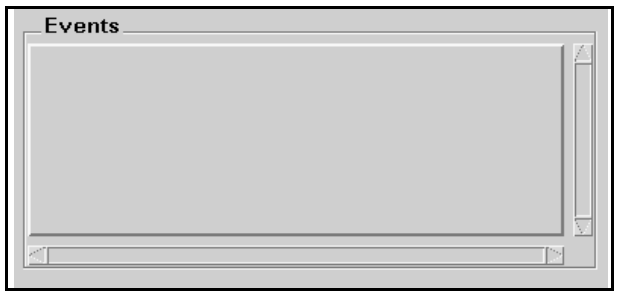


Figure 15: Events Group

Conditions List Box

The conditions list box is a scrollable box usually at the middle right of a dialog window. It shows all conditions currently outstanding against this object:

Figure 16: Conditions List Box

For a definition of **Conditions**, see page 14.

Operational State Group

The Operational State group is a read-only set of radio option buttons describing whether this object is operational or not:

Figure 17: Operational State Group

- **Enabled** The object is Unlocked and either Operable or Degraded.
- **Disabled** The object is Locked, or is otherwise unable to operate. See the **Availability Status** group (page 21) for more information.

Administration State Group

The Administration State radio option buttons are user inputs that control whether an object is available for service or not:

Figure 18: Administration State Group

- **Unlocked** Makes the object usable if there are no other conditions blocking use of this object.
- **Locked** Makes the object unusable.

Availability Status Group

The Availability Status group is a read-only set of radio option buttons that displays information about the status of this object:

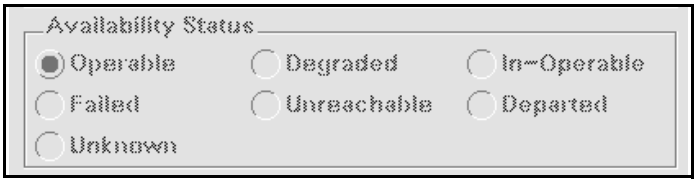


Figure 19: Availability Status Group

- **Operable** The object is working.
- **Degraded** Conditions exist that do not prohibit this object's use, but degrade the reliability or speed of data transmission.
- **In-Operable** The object is not working.
- **Failed** An object has failed diagnostics (either hardware or software). This might include a non-volatile storage failure.

- **Unreachable** The object is inoperable because it is dependent on some failed resource.
- **Departed** The card has been physically removed.
- **Unknown** If displayed, it indicates that the system cannot determine the object's availability status.

DiamondView Online Help System

This manual includes sufficient information to use the DiamondView online help system. Instead of providing a detailed description of every possible value for every field in every window, this reference manual will list:

- all the different windows that DiamondView displays;
- the *general* information that you will find in them; and
- their purpose.

The online help system should provide sufficient detailed information necessary for any task.

DiamondView's online help system always contains the most recent information about a field, a window, or a function. The DiamondView help system consists of three parts:

- general help
- keyword help
- context-sensitive help (Not supported in Release 2.0.)

General Help

The **About DiamondView** choice shows the current version of DiamondView. **DiamondView Overview** brings up the following window:

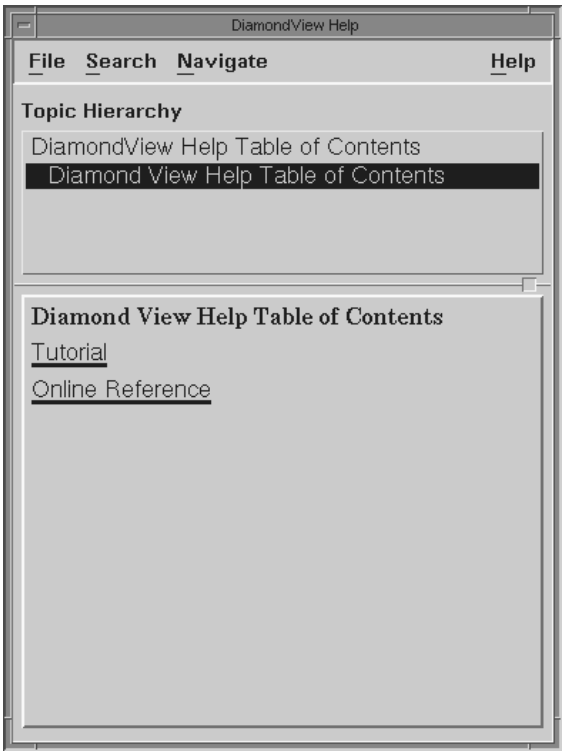


Figure 20: DiamondView Help Window – Top Level

The general help window has three sections:

- a menu bar;
- a Topic Hierarchy list box;
- a help text list box.

The menu bar has four choices: **File**, **Search**, **Navigate**, and **Help**. For each of these menus, here are the commands and what they do:

Table 2: Menu Bar Commands and Functions

Menu	Commands	Funtion
FILE	Print	Prints the current help window's contents
	Close	Close the general help window
SEARCH	Keyword	Searches through the index for whatever keyword the user wants to find
	History	Displays a list of previous help topics displayed, which the user may double-click to display
NAVIGATE	Backtrack	Moves back one level in the help
	Up	Moves up one level in the help hierarchy
	Home	Moves to the root of the help system
HELP	Using Help	Help about using help
	Version	Version of DiamondView help file

Topic Hierarchy

DiamondView's help system is hierarchical. At the top of the structure is the **DiamondView Help Table of Contents**. Below this are the **Tutorial** and the **Online Reference**.

The **Tutorial** provides a quick refresher course in how DiamondView works.

The **On-Line Reference** describes all the graphical windows, dialog windows, and their individual components.

Context-Sensitive Help

NOTE: Context Sensitive Help will be included in a future release.

In addition to the general help facility, DiamondView has context-sensitive help. In any window, you can press the F1 key, and DiamondView will provide help about this window, object, or field. The help text is identical to that which the general help facility displays, but you do not have to navigate your way through the hierarchy to find it.

Chapter 2

Chapter 2 The DiamondView Reference Manual

This chapter covers the Speedlink System's graphical and dialog windows. For each window, a description is provided as to what the window displays, which fields are user inputs, and which are read-only (displaying information that the user cannot change).

Graphical Windows

Descriptions of DiamondView's graphical windows and their contents are reviewed in the following information blocks.

Multiplexer Graphical Window

Multiplexer

This graphical window displays all the shelves that make up a Speedlink Multiplexer:

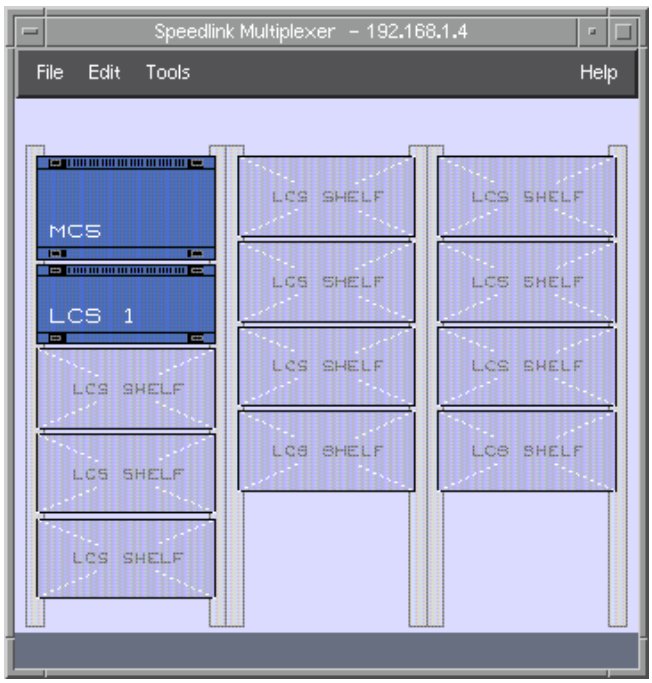


Figure 21: Speedlink Multiplexer Graphical Window

DiamondView displays uninstalled shelves in gray, and shelves with events outstanding against them in red.

Double left-clicking any shelf brings up the MCS or LCS graphical window, as appropriate. This manual describes these graphical windows starting on pages MCS Graphical Window and LCS Graphical Window, respectively.

Right clicking any shelf brings up the Multiplexer Shelf dialog window, described on page 32.

At the top of any graphical window is the IP address of the multiplexer with which DiamondView is currently communicating.

MCS Graphical Window

Master Control Shelf

The Master Control Shelf (MCS) contains the central control and communication functions for the Speedlink System and serves as the ATM network interface.

Double-clicking the MCS object in the Multiplexer Graphical Window displays the following graphical window that shows the contents of the MCS:

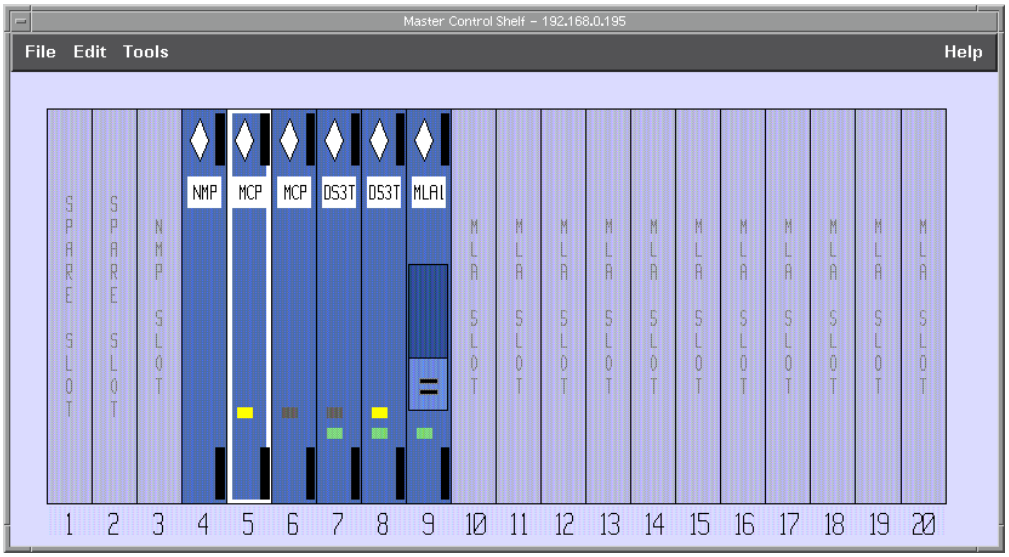


Figure 22: Master Control Shelf Graphical Window

Slots with no installed cards are “grayed out.” DiamondView displays cards with events outstanding against them in red, with the word “ALARMED” visible on the front.

Right-clicking any card brings up the Master Control Shelf (MCS) Card dialog window, described on page 35.

LCS Graphical Window

Line Card Shelf

The Speedlink System is made up of one Master Control Shelf and up to twelve Line Card Shelves. Each Line Card Shelf (LCS) has 24 mounting slots for line cards and a 25th mounting slot for a Line Card Shelf Multiplexer (LSM) card.

Double-clicking a LCS object in the Multiplexer Graphical Window displays the following dialog box which shows the contents of the LCS:

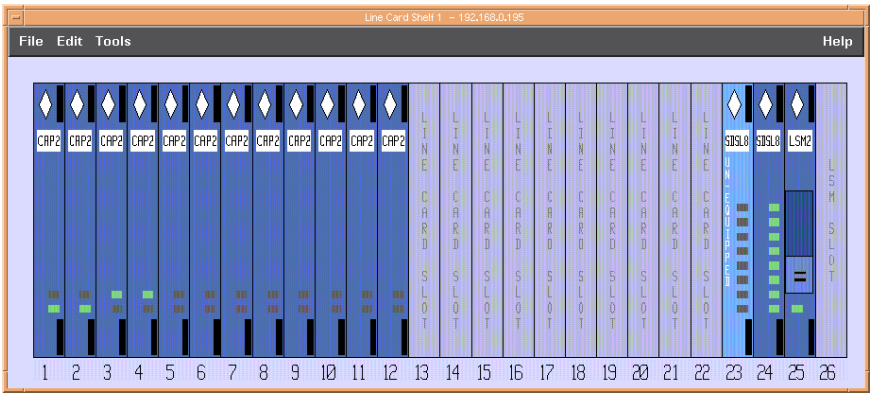


Figure 23: Line Card Shelf Graphical Window

Slots with no installed cards are “grayed out.” DiamondView displays cards with events outstanding against them in red, with the word “ALARMED” visible on the front.

Right-clicking any card brings up the **LCS Card** dialog window described on page 27.

Right-clicking the port indicator of a line card brings up the **Port** dialog window described on page 112.

Right-clicking a LSM’s indicator brings up the **LSM Port** dialog window described on page 112.

File Menu – Graphical Windows

File Menu

The Speedlink Multiplexer, MCS, and LCS graphical windows have the following options available through the File menu:

New	Create a new disk file containing the current Speedlink MIB.
Open	Opens an existing disk file containing a Speedlink MIB.
Save	Saves the current Speedlink MIB to disk.
Save As	Saves the current Speedlink MIB to disk with a user-specified file name.
Download	Downloads a software release from disk to this Speedlink Multiplexer.
Exit	Exits from DiamondView.

The File menu for the Multiplexer graphical window also has these options:

Node Settings	Selecting Node Settings brings up the Speedlink dialog window. See page 29 for additional information.
Commit Changes	Commit any changes to the flash memory of the Speedlink System that have been made in this DiamondView session to the Speedlink MIB.

Dialog Windows

Dialog windows display and accept information from the user as a series of text boxes, arrow buttons, command buttons, and radio buttons. Descriptions of DiamondView's dialog windows and their contents are reviewed in the following information blocks.

Multiplexer Shelf

This dialog window contains information about the multiplexer shelf. To obtain this dialog box, from the MCS Graphical window, choose **File** | **Node Settings…** (or right click in a non-active area of the Multiplexer graphical window – shown on page 25:

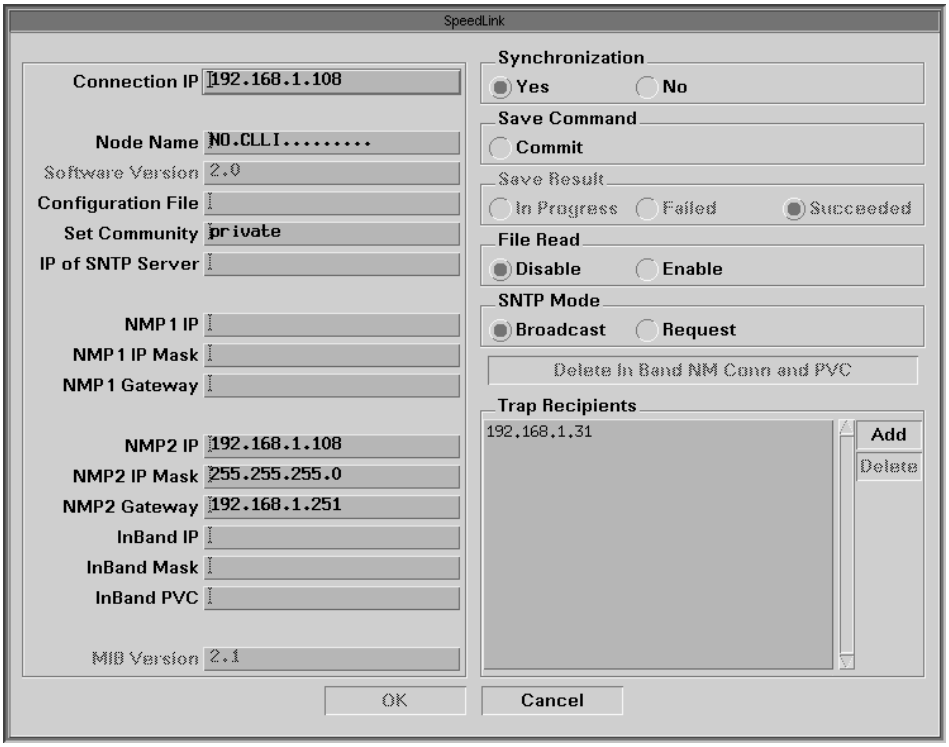


Figure 24: Main Speedlink System Dialog Window

Connection IP IP address of the current connection.

Node Name The Speedlink Systems's name (user assignable). Note: The Node Name for a Speedlink System must be limited to a total of 5 characters. The system serial number may be reported incorrectly if a Node Name of more than 5 characters in length is entered.

Software Version The Speedlink System's software version.

Configuration File The name of the file to which data is written.

Set Community The default value is "private", but can be changed by the user. This field is similar to a password – the user must know the value to save any changes to the Speedlink System.

IP of SNTP Server The address of the "time" server.

NMP1 IP	The IP address of this Network Management Processor card (NMP). Planned for a future release.
NMP1 IP Mask	The IP Mask address for this Network Management Processor card.
NMP1 Gateway	The Gateway address for this Network Management Processor card.
NMP2 IP	The IP address of this Network Management Processor card.
NMP2 IP Mask	The IP Mask address for this Network Management Processor card.
NMP2 Gateway	The Gateway address for this Network Management Processor card.
InBand IP	The IP address of the NMP to which the in-band network management channel communicates.
InBand Mask	The IP mask of the NMP to which the in-band network management channel communicates.
InBand PVC	The Permanent Virtual Circuit (PVC) over which the in-band network management channel communicates through the trunk. The PVC must be established with the in-band network management channel attribute before setting it here. For example, 40, 70.
MIB Version	The version of Management Information Base used by this version of Speedlink software.
Synchronization	Setting **Yes** enables synchronization. The Speedlink Multiplexer has two Master Control Processors (MCPs). One is active; the other is standby. The **Synchronization** radio option button controls whether MIB changes in the active MCP are also written to the standby MCP. **Yes** means changes that DiamondView sends to the active MCP are also written to the standby MCP.
Save Command	Clicking the **Commit** button will save the changes. The SAVE command saves all transactions in the MIB in case the NMP or MCP cards fail or in case of a power failure. However, this is time consuming and the Speedlink System does not respond during this process.
Save Result	This read-only field informs the user if the save command has Failed, Succeeded, or is In Progress.
File Read	This controls reading a saved MIB from a file. Planned for a future release.

SNTP Mode Provisions the option for Simple Network Time Protocol. Planned for a

Trap Recipients This is a list box of IP addresses and Trap Community Names of Speedlink Systems that are setup for trapping events. To add a new trap receiver click the **Add** command button. To remove an existing trap receiver, select the IP address and click the **Delete** command button. Please note that *Trap Community Name* is user assignable.

InBand Network Management: The function of the In-Band Network Management is to provide a communications interface between DiamondCraft and/or DiamondView EMS and the Speedlink System. This interface is defined as "in-band" because the user communicates with the Speedlink System over a provisioned permanent virtual circuit (PVC) terminated at the trunk interface (DS3T or OC3T). Set-up for In-Band Network Management requires entry of IP Address information, plus VPI/VCI information. For example, 40, 70.

IMPORTANT: The IP Address must be established via DiamondCraft so DiamondView can communicate with the Speedlink System over a TCP/IP data network. IP address information is provided by the local Network Administrator. Before setting up the InBand Network Management connection, the user must verify with their Network Administrator that the network router or switch has been provisioned as follows:

- The VPI/VCI information matches the In-band settings to be entered through DiamondCraft.
- The VPI/VCI bandwidth configuration does not exceed a maximum of 128 Kbps.

This dialog window contains information about any Speedlink Multiplexer shelf (obtain this window by right clicking any shelf object in the Master Control Shelf graphical window):

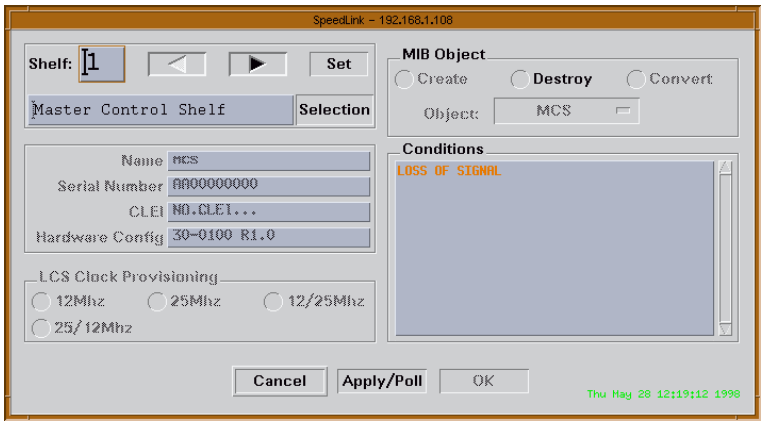


Figure 25: Multiplexer Shelf Dialog Window

LCS Clock Provisioning: Both LSM and LSM2 card types are supported. The LSM2 supports the CAP2 line card, and is **required** to operate the SDSL8, CAP4, IDSL8, and DMT4 line cards.

The LSM2 will support any line card mix in the LCS, as long as the line cards are compatible with the configured clock provisioning. For example, CAP2 line cards **must** operate in a slot configured for 12.5 MHz operation. If a CAP2 card is inserted in a 25 MHz slot, the system will **not** enable the card (the card's green enable light will blink indicating that the card is not enabled).

DMT4 and CAP4 line cards will operate in either 12.5 MHz or 25 MHz slots. However, 25 MHz DMT4 and CAP4 line cards operating in 12.5 MHz slots will **not** operate at full bandwidth—performance is degraded.

SDSL8 and IDSL8 line cards **must** operate in a slot configured for 25 MHz operation. If an SDSL8 or IDSL8 card is inserted in a 12.5 MHz slot, the system will **not** enable the card (the card's green enable light will blink indicating that the card is not enabled).

NOTE: The **default** LCS clock speed is 25 MHz.

For systems with CAP2 cards installed, the user **must** provision the LCS shelf appropriately. The system does **not** automatically provision the LCS clock speed.

The LCS backplane design requires that line cards be organized in four groups of six cards each (six-packs), with each group including only cards of the same type.

The requirements for mixing various card types on the same LCS are described in the following sections.

NOTE: The backplane clock rate for CAP2 cards must be set to 12.5 MHz (the default clock rate for Release 3.0 is 25 MHz).

CAP2 cards can share an LCS with other line cards if the CAP2 cards are placed in two adjacent six-packs.

The following diagram shows a sample configuration of CAP2 cards with CAP4 and DMT4 cards.

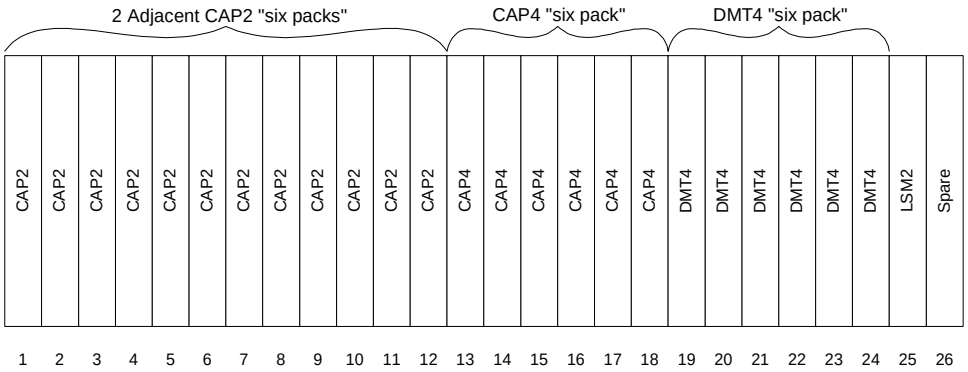


Figure 26: Sample LCS layout with CAP2, CAP4, and DMT4 Line Cards

CAP2 cards can share an LCS with CAP4, DMT4, SDSL8, and IDSL8 cards in one of the following configurations:

- All CAP2 cards in slots 1-12, and all CAP4, DMT4, SDSL8, or IDSL8 cards in slots 13-24
  or
- All CAP4, DMT4, SDSL8, or IDSL8 cards in slots 1-12, and all CAP2 cards in slots 13-24

The following diagram shows a sample configuration of CAP2 cards with SDSL8 and IDSL8 cards.

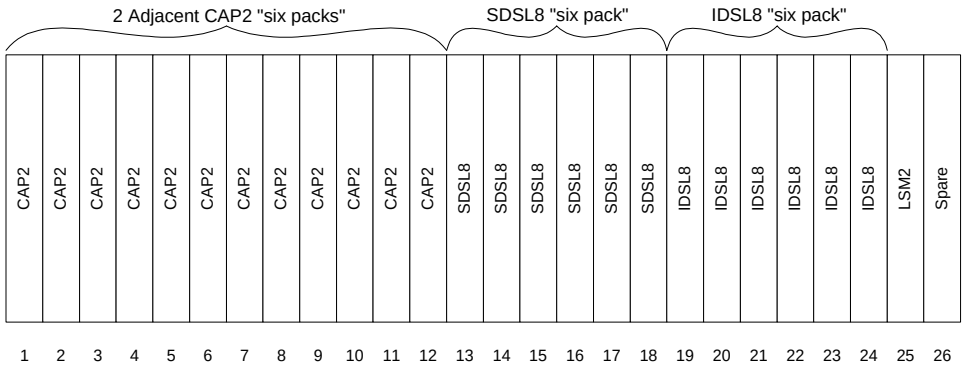


Figure 27: Sample LCS layout with CAP2, SDSL8, and IDSL8 cards

SDSL8 and IDSL8 cards can be supported on the same LCS with CAP4 and DMT4 cards if each card type is placed within its own six-pack—for example, all SDSL8 cards in one six-pack, all DMT4 cards in one six-pack, etc.

The following diagram shows a sample configuration of CAP4 cards with SDSL8, IDSL8, and DMT4 cards.

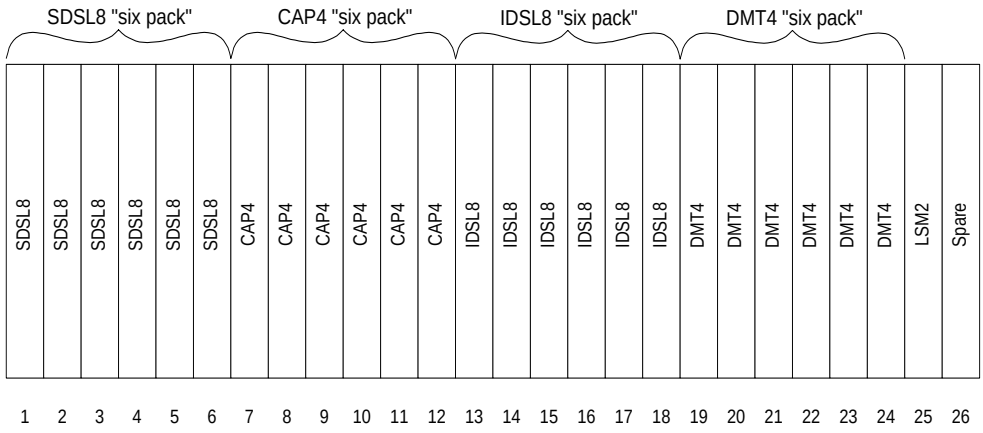


Figure 28: Sample LCS layout with SDSL8, CAP4, IDSL8, and DMT4 cards

Use the LCS Clock Provisioning radio option buttons (see Figure 25, Multiplexer Shelf Dialog Window on page 32) to set the clock speeds as appropriate with the physical placement of the line cards. For example:

- Select **12MHz** if all line cards are CAP2.
- Select **25MHz** if all line cards are CAP4, DMT4, SDSL8, or IDSL8.

- Select **12/25MHz** if CAP2 line cards are placed in slots 1–12 and CAP4, DMT4, SDSL8 or IDSL8 line cards are placed in slots 13–24.
- Select **25/12MHz** if CAP4, DMT4, SDSL8 or IDSL8 line cards are installed in slots 1–12 and CAP2 line cards are installed in slots 13–24.

This dialog window contains information about any MCS card:

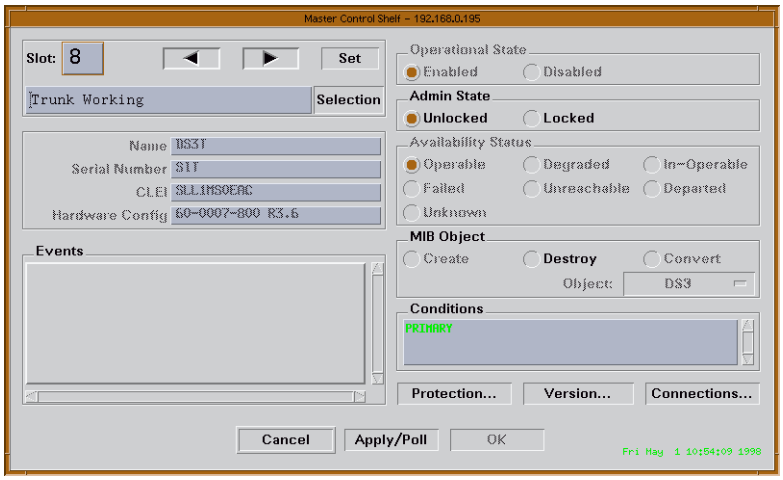


Figure 29: Master Control Shelf (MCS) Card Dialog Window

The **MIB Object** radio buttons allow you to **Create, Destroy** or **Convert** an entry for this MCS card in the MIB.

Clicking the **Protection...** command button brings up the **DS3T Protection** dialog window, described on page 42. This button is only valid for trunk cards; it is "grayed-out" for all other MCS cards.

Clicking the **Version…** command button brings up the Software Versions dialog box. The Software Versions dialog box lists the various software modules for the card selected.

Clicking the **Connections...** command button brings up the **System Connections** dialog window described on page 113, except that only the PVCs that this trunk card carries will appear in the connections list. (For example, DiamondView will not list "hairpin" PVCs between two line cards on the same multiplexer because they do not connect to the trunk card.) This button is only valid for trunk cards; it is "grayed-out" for all other MCS cards.

DS3T Port

Clicking the Port indicator on the DS3T card in the MCS graphical window brings up the Master Control Shelf dialog box as shown below:

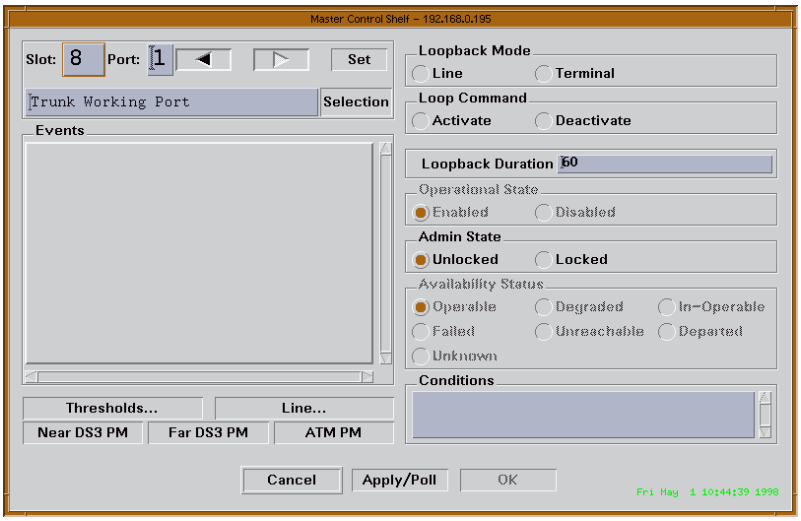


Figure 30: Master Control Shelf (MCS) Card Dialog Window – DS3T Port

Clicking the **Thresholds…** command button brings up the Thresholds dialog window:

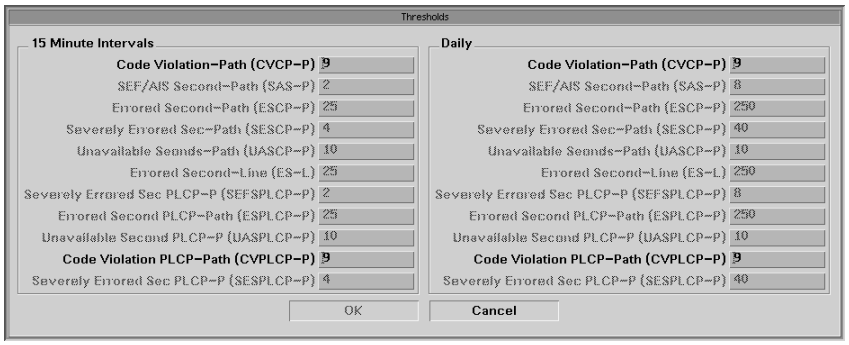


Figure 31: Thresholds Dialog Window

The **Thresholds** Intervals Performance Parameter BER acronyms, their respective meanings and default counts for Daily and 15 Minute Intervals are described in the table below.

Table 3: Performance Parameter BER Acronyms:

Acronym	Meaning	Daily Interval	15 Minute Interval
CVCP-P	**Code Violation-Path:** Count of CP-Bit parity errors occurring in the accumulation period.	3820 **Provisionable**	382 **Provisionable**
ESCP-P	**Errored Second-Path:** Count of seconds containing one or more CP-Bit parity errors, one or more SEF defects, or one or more AIS defects.	250 Fixed Value	25 Fixed Value
SESCP-P	**Severely Errored Second-Path:** Count of seconds containing more than 44 (equates to a BER of 10-6) CP-Bit parity errors, one or more SEF defects, or one or more AIS defects.	40 Fixed Value	4 Fixed Value
SAS-P	**SEF/AIS Second-Path:** Count of seconds containing one or more SEF defects or one or more AIS defects.	8 Fixed Value	2 Fixed Value
UASCP-P	**Unavailable Second-Path:** Count of one second intervals during which the DS3 path is unavailable.	10 Fixed Value	10 Fixed Value
ES-L	**Errored Second-Line:** Count of seconds containing one or more BPVs (which are not part of a zero substitution code), one or more Excessive Zeros (EXZ), or one or more LOS defects.	250 Fixed Value	25 Fixed Value
CVPLCP-P	**Code Violation PLCP:** Count of BIP-8 code errors in the accumulation period.	3584 **Provisionable**	359 **Provisionable**
ESPLCP-P	**Errored Second PLCP:** Count of seconds containing one or more BIP-8 coding errors, or one or more SEF defects.	250 Fixed Value	25 Fixed Value
SESPLCP-P	**Severely Errored Second PLCP:** Count of seconds containing more than 4 (equates to a BER of 10-7) BIP-8 coding errors, or one or more SEF defects.	40 Fixed Value	4 Fixed Value

Table 3: Performance Parameter BER Acronyms: (continued)

Acronym	Meaning	Daily Interval	15 Minute Interval
SEFSPLCP-P	**Severely Errored Framing Second PLCP:** Count of seconds containing one or more SEF defects. A SEF defect is declared when an error in the A1 octet and an error in the A2 octet of a framing octet pair or two consecutive invalid or nonsequential Path Overhead Identifier octets are detected.	8 Fixed Value	2 Fixed Value
UASPLCP-P	**Unavailable Second PLCP:** Count of one second intervals during which the DS3 PLCP path is unavailable.	10 Fixed Value	10 Fixed Value

CVCP-P Provisionable Thresholds:

The default setting is 9 (10^{-9}) BER.

Table 4: CVCP-P Provisionable Thresholds

BER	Thresholds / Daily	Thresholds / 15 Minute
10^{-10}	382	38
10^{-9}	3820	382
10^{-8}	38196	3820
10^{-7}	381799	38180
10^{-6}	3801881	380188

CVPLCP-P Provisionable Thresholds:

The default setting is 9 (10^{-9}) BER.

Table 5: CVPLCP-P Provisionable Thresholds

BER	Thresholds / Daily	Thresholds / 15 Minute
10^{-10}	358	36
10^{-9}	3584	359
10^{-8}	35830	3583
10^{-7}	358132	35813
10^{-6}	3564673	356467

Clicking the **Line…** command button in the MCS Card dialog window for the DS3T Port brings up the DS3 Line Parameters dialog window as shown below.

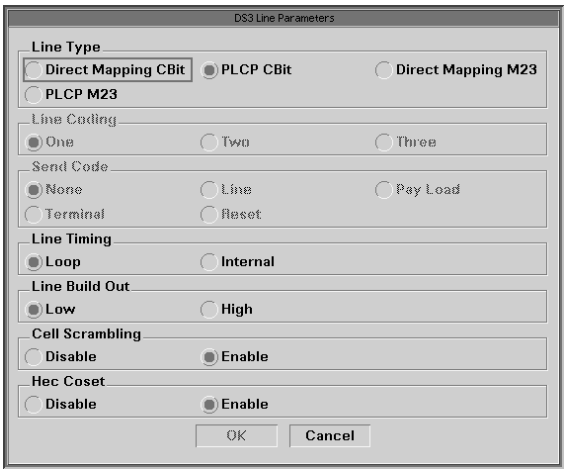


Figure 32: DS3 Line Parameters Dialog Window

These parameters provision the DS3 signal on the DS3T's port and must match the DS3/ATM router or switch. The **Line Type** radio option buttons allow the user to select **Direct Mapping CBit, Direct Mapping M23, PLCP CBit** or **PLCP M23** DS3 framing formats. Direct Mapping is the most efficient mode to use as there is no PLCP frame overhead and there is more bandwidth available for data. Please note that some equipment does not support this mode and PLCP mode must be selected in such cases.

Direct Mapping CBit is the preferred operating mode as it provides the most data throughput. Cell Scrambling and HEC Coset should be enabled when this mode is selected.

Direct Mapping M23 is usually not used (it might be used with older equipment). Cell Scrambling and HEC Coset should be enabled when this mode is selected.

PLCP CBit is the preferable mode of the two PLCP options as it provides better PM information. Cell Scrambling should be disabled and HEC Coset should be enabled when this mode is selected. PLCP CBit is the default configuration setting.

PLCP M23 would typically be used with older equipment. Cell Scrambling should be disabled and HEC Coset should be enabled when this mode is selected.

The **Zero Code Suppression** option is not available in this Release.

The **Send Code** radio option buttons (**None**, **Line**, and **Reset**) allow the user to specify various loopback options to the far end receiver of the DS3 signal. This feature is not supported in this Release.

The **Line Timing** radio option buttons are **Loop** (indicating that the Speedlink System will extract timing from the DS3 signal) or **Internal** (indicating that the Speedlink System will supply the timing from an internal source).

Line Build Out choices are **Low** and **High**, adjusting equalization to reflect the length of the DS3 cable. The DS3 trunk Line Interface Unit (LIU) supports two levels of line build out (this is the length of the coax cable from the MCS backplane to the other end of the DS3 connection, the router or ATM switch):

- Low = Coax cables shorter than 50 feet – this is the default setting.
- High = Coax cables between 50 and 450 feet.

The **Cell Scrambling** radio option buttons disable or enable a feature that prevents false error detection on the cell payload. Since direct mapping uses the HEC for cell delineation, it is possible that a five-byte pattern with valid ATM cell overhead will appear in the payload. Scrambling reduces the possibility of false lock.

The **HEC Coset** radio option buttons disable or enable a feature that ensures non-zero values for HECs (Header Error Check) in idle ATM cells. HEC is an 8-bit field (the last byte) of the ATM-cell header, whose purpose is to allow a receiver to detect, and possibly correct, transmission errors in the cell header. It is used for checking integrity only and counts uncorrectable HEC errors only.

Clicking the **Near DS3 PM…** or **Far DS3 PM…** command button in the MCS Card dialog window for the DS3T Port brings up the DS3 Performance dialog window (Far DS3 Performance dialog window is shown below).

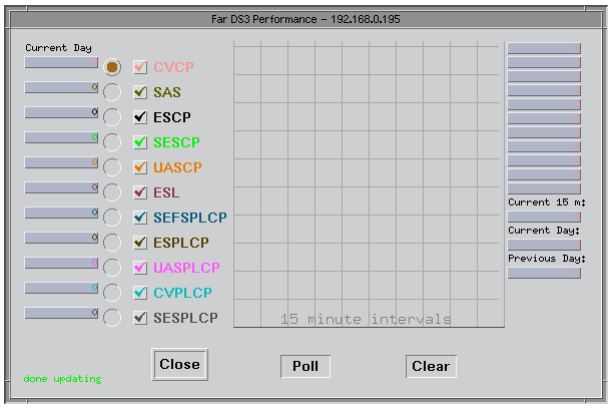


Figure 33: Far DS3 Performance Dialog Window

The DS3 Performance dialog window displays DS3 errors for:

- **Current 15 minutes** (the performance monitoring period)
- Current day
- Previous day

- **Previous 11 performance monitoring periods**.

For each type of error, there is a radio option button and a check box next to the error name. (See page 37 for more information on Performance Parameter BER acronyms). The check boxes control which performance monitoring data DiamondView displays in the window.

The radio option buttons control the type of error DiamondView displays in the performance monitoring bins on the right side of the window. The performance monitoring bins show error counts from oldest to most recent in the top 11 boxes. At the bottom of the right side this window displays the error number for: the current 15 minutes; the current day; the previous day.

DiamondView dynamically scales the error count graphs to show you relative error rates, and changes in counts by error category over time.

The user can change which DS3 errors to display by clicking the check box for that error, and DiamondView will update the graph as well.

Clicking the **ATM PM…** command button in the MCS Card dialog window for the DS3T Port brings up the DS3 ATM Performance dialog window as shown below.

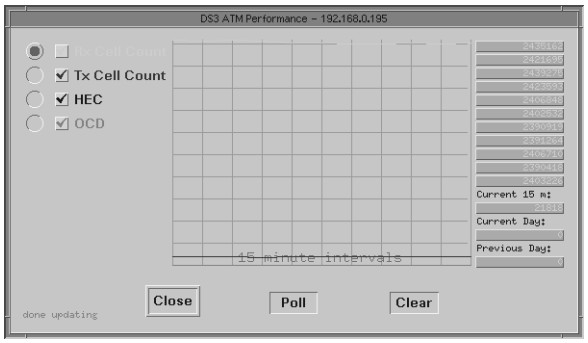


Figure 34: DS3 ATM Performance Dialog Window

The **Rx Cell Count** (Valid HEC) is the aggregate numbers of error-free, assigned cells that have been received by the DS3 Trunk card in the 15 minute Interval. The **Tx Cell Count** is the aggregate number of assigned cells that have been transmitted by the DS3 Trunk card in the 15 minute interval.

HEC is Header Error Checksum in idle ATM cells. This is the number of cells discarded due to HEC violations. (This counts uncorrectable HEC errors only.)

OCD is Out of Cell Delineation (OCD anomalies): Seven consecutive ATM cells with HEC violations.

The radio option buttons control which type of data DiamondView displays in the performance monitoring bins on the right side of the window. The performance monitoring bins show counts from oldest to most recent in the top 11 boxes. At the bottom of the right side this window displays the count for: the current 15 minutes; the current day; the previous day.

The user can change which counts to display by clicking the check box for that type, and DiamondView will update the graph as well.

DS3T Card Protection

This dialog window controls how the DS3T card will do protection switching (obtain this dialog window by clicking the **Protection...** command button in the MCS Card dialog window):

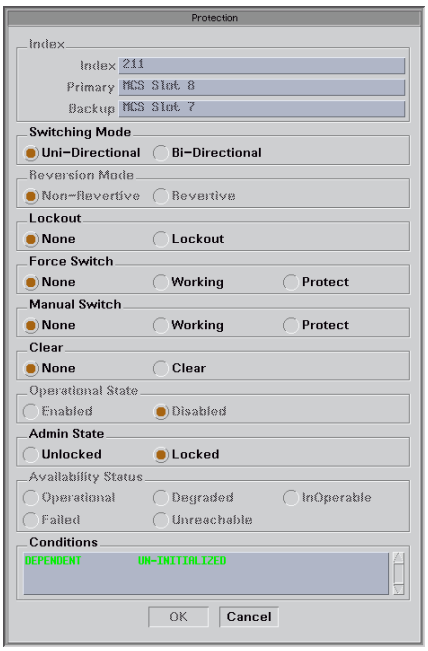


Figure 35: DS3T Protection Dialog Window

The **Index** group box displays read-only information that pertains to internal tracking of the port number for the trunk card.

The **Switching Mode** radio buttons control whether DS3T protection switching is entirely controlled by the multiplexer (**Uni-Directional**) or coordinated with the far end of the trunk (**Bi-Directional**).

Reversion Mode controls whether a protection switch will attempt to revert to the original working DS3T or not. The MCS makes this decision based on whether the error condition that caused the protection switch clears itself or not. **Revertive**

switches back to the original working DS3T if the error condition clears itself; **Non-Revertive** does not switch back, even if the error condition clears itself.

The terms **working** and **protection** refer to slot provisioning—**not** to which card is currently in active or standby status. The leftmost slot (Slot 7) is designated the protection slot, and the rightmost slot (Slot 8) is designated the working slot.

Lockout radio option buttons control whether trunk card protection switching is enabled.

- **None** Enables protection switching (default).
- **Lockout** Disables protection switching.

Forced switching causes protection switching regardless of trunk conditions and/or pending requests from the far end. The **Force Switch** radio buttons allow you to select which trunk slot becomes active upon a forced switch.

- **None** Disables forced protection switching (default). **Always** select this option after selecting either **Working** or **Protect** in order to allow future changes to the switching options.
- **Working** Causes switching to the working trunk slot (Slot 8).
- **Protect** Causes switching to the protection trunk slot (Slot 7).

Manual switching causes protection switching, but is dependent on trunk conditions and/or pending requests from the far end (provided that the switching mode is set to Bi-directional). The **Manual Switch** radio buttons allow you to select which trunk slot becomes active upon a manual switch.

- **None** Disables manual protection switching (default). **Always** select this option after selecting either **Working** or **Protect** in order to allow future changes to the switching options.
- **Working** Causes switching to the working trunk slot (Slot 8), based on trunk conditions.
- **Protect** Causes switching to the protection trunk slot (Slot 7), based on trunk conditions.

The **Clear** group allows you to clear the state of the protection switching software. Click the **Clear** radio button to clear the state of the software, then click the **None** radio button to enable the protection switching. You can then proceed with a manual or forced switch selection. This procedure is useful if the system does not seem to be responding to selecting protection switching options.

The Protection Switching Availability Status group radio option buttons display information about the status of this object:

- **Operational** The connection is working.
- **Degraded** Conditions exist that do not prohibit its use, but degrade the reliability or speed of data transmission.
- **In-Operable** The object is not working, for one of many possible reasons.
- **Failed** An object has failed diagnostics (either hardware or software). This might include a non-volatile storage failure.
- **Unreachable** The object is inoperable because it is dependent on some failed resource.
- **Departed** The card has been physically removed.

OC3 Trunk Card

Right-clicking with the mouse on an OC3T card brings up the OC3T Detail dialog window.

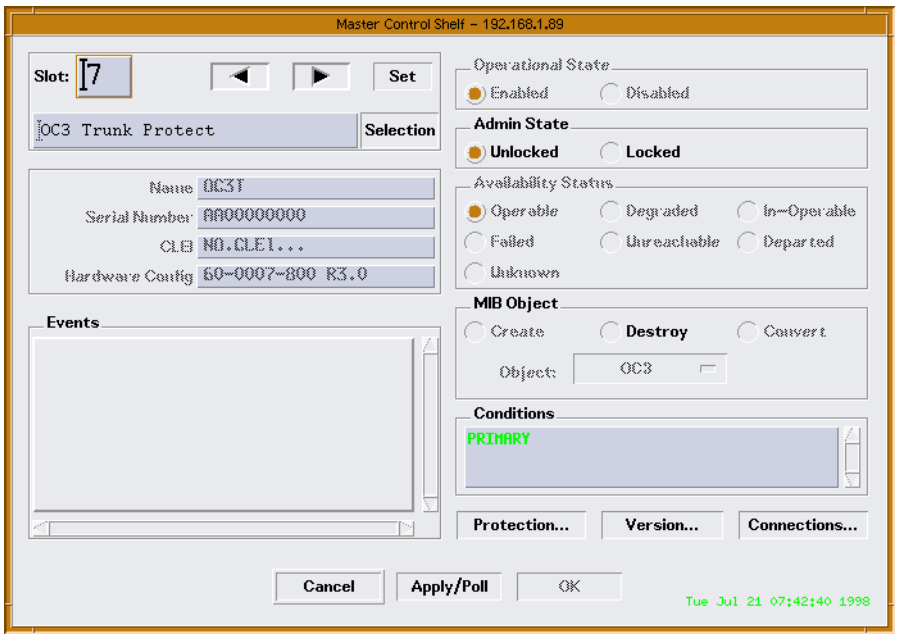


Figure 36: OC3T Detail Dialog Window

The OC3T Detail dialog window displays the following information for the OC3T trunk card:

Address Group. This group includes the following parameters:

- MCS slot number.
- Left and right arrow buttons, for clicking through the slot numbers with the mouse.

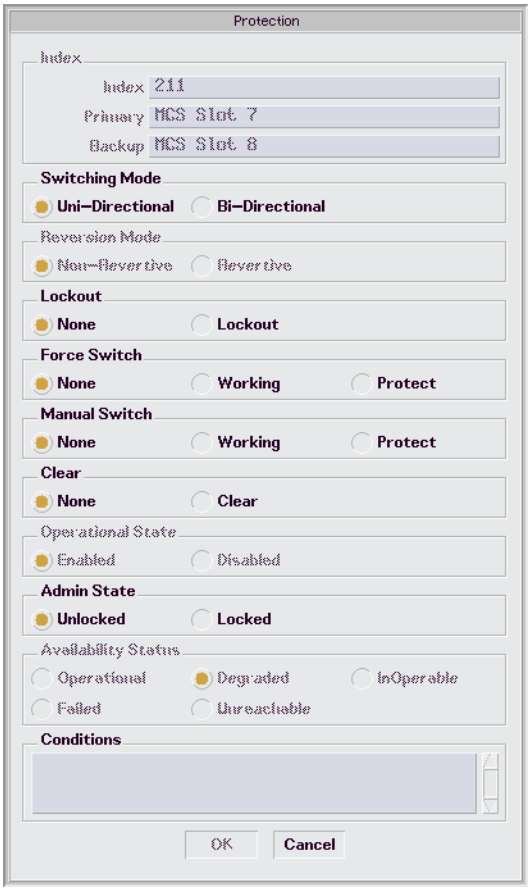
- Name of the currently selected card slot.
- **Selection** button—switches the group to multiple selection mode.
- **Set** button—switches the group to single selection mode.

Admin State group. This group allows you to set the administrative state of the card to either locked or unlocked.

MIB Object group. The radio buttons in this group allow you to either **Create, Destroy,** or **Convert** an entry for this object in the MIB.

OC3T Card Protection

Clicking the **Protection** command button brings up the Protection dialog window for the OC3 trunk card.



This dialog window allows you to select protection switching options for OC3 trunk cards installed in a 1:1 protection group.

The **Switching Mode** radio buttons determine whether protection switching is controlled by the multiplexer only (**Uni-Directional**)) or coordinated between the multiplexer and the far end of the trunk (**Bi-Directional**).

If the Switching Mode is set to Uni-Directional, protection switching will **not** consider far-end requests when determine whether to perform a manual switch. If set to Bi-directional, far-end requests are considered when determining whether to perform a manual switch.

Reversion Mode controls whether or not the system reverts to the originally active trunk card after protection switch has occurred. **Revertive** switches back to the original active trunk card if the error condition is cleared. **Non-Revertive** does not switch back, even if the error condition is cleared. This functionality is planned for a future release.

Force Switch, Manual Switch, **Lockout,** and **Clear** protection switching involve both the multiplexer (near-end) and the ATM network (far-end) of the trunk.

The terms **working** and **protection** refer to slot provisioning—**not** to which card is currently in active or standby status. The leftmost slot (Slot 7) is designated the protection slot, and the rightmost slot (Slot 8) is designated the working slot.

Forced switching causes protection switching regardless of trunk conditions and/or pending requests from the far end. The **Force Switch** radio buttons allow you to select which trunk slot becomes active upon a forced switch.

- **None** Disables forced protection switching (default). **Always** select this option after selecting either **Working** or **Protect** in order to allow future changes to the switching options.
- **Working** Causes switching to the working trunk slot (Slot 8).
- **Protect** Causes switching to the protection trunk slot (Slot 7).

Manual switching causes protection switching, but is dependent on trunk conditions and/or pending requests from the far end (provided that the switching mode is set to Bi-directional). The **Manual Switch** radio buttons allow you to select which trunk slot becomes active upon a manual switch.

- **None** Disables manual protection switching (default). **Always** select this option after selecting either **Working** or **Protect** in order to allow future changes to the switching options.
- **Working** Causes switching to the working trunk slot (Slot 8), based on trunk conditions.
- **Protect** Causes switching to the protection trunk slot (Slot 7), based on trunk conditions.

Lockout radio option buttons control whether trunk card protection switching is enabled.

- **None** Enables protection switching (default).
- **Lockout** Disables protection switching.

The **Clear** group allows you to clear the state of the protection switching software. Click the **Clear** radio button to clear the state of the software, then click the **None** radio button to enable the protection switching. You can then proceed with a manual or forced switch selection. This procedure is useful if the system does not seem to be responding to selecting protection switching options.

The **Admin State** radio buttons allow you to place the OC3 trunk card in either a locked or an unlocked state. Provisioning should **only** be performed if the card is locked.

OC3T Port

Right-clicking with the mouse on an OC3T card port brings up the OC3T Port Detail dialog window.

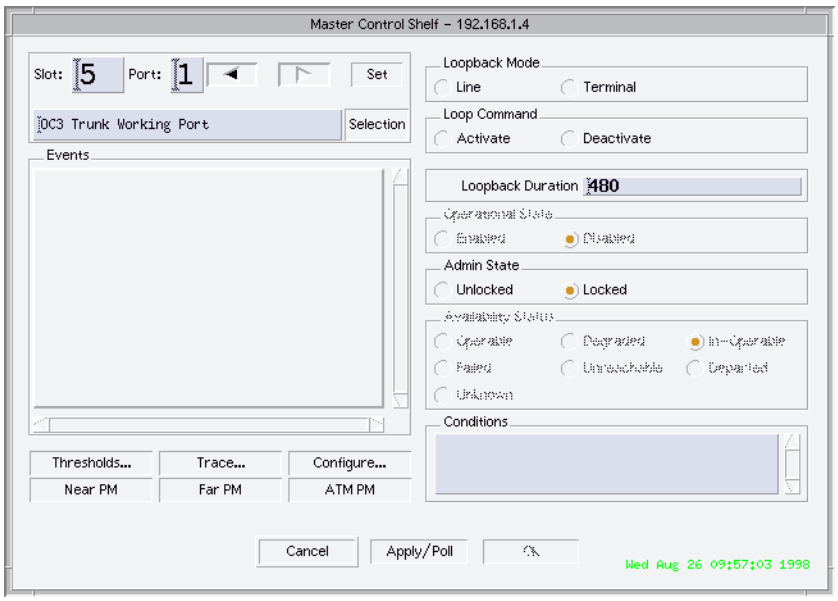


Figure 37: OC3 Port Detail Dialog Window

The OC3T Port Detail dialog window displays the following information for the OC3T port:

- Address group
- Events list
- Loopback Mode group

- Loop Command group
- Loopback Duration
- Operational State group
- Admin State group
- Availability Status group
- Conditions list

Address Group. This group includes the following parameters:

- MCS slot number.
- Left and right arrow buttons, for clicking through the slot numbers with the mouse.
- Name of the currently selected card slot.
- **Selection** button—switches the group to multiple selection mode.
- **Set** button—switches the group to single selection mode.

Loopback Mode group. There are two radio button options in this group:

- **Line**—The OC3 will loopback any signal received from the MCS.
- **Terminal**—The OC3 will loopback any signal coming upstream to it.

Loop Command group. These radio buttons start and stop Loopback testing:

- **Activate**—Start loopback testing.
- **Deactivate**—Stop loopback testing

Loopback Duration. Specifies how long (in seconds) to run the loopback test.

Admin State group. This group allows you to set the administrative state of the card to either locked or unlocked.

The command buttons located below the Events list (**Thresholds**, **Trace**, **Configure**, **Near PM**, **Far PM**, and **ATM PM**) each bring up windows that allow you to work with other OC3 parameters in detail. The dialog windows displayed using the command buttons are described in the following sections.

Clicking the **Thresholds...** button brings up the OC3 Thresholds dialog window.

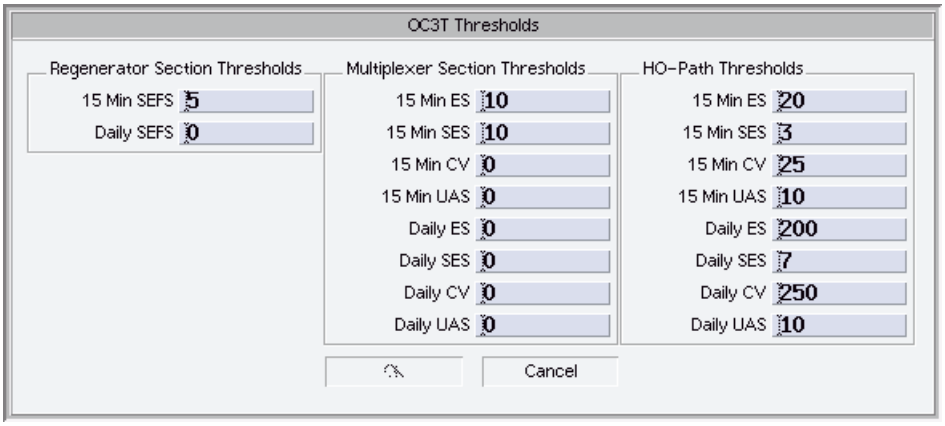


Figure 38: Thresholds Dialog Window

This window allows you to specify thresholds for 15-minute and daily intervals, for a number of parameters. The thresholds are grouped into categories by section, line, and path. The following parameters may be set using this window (not all parameters are used for all categories).

- ES—Errored Seconds. The Bit Error Rate (BER) that defines errored seconds.
- SES—Severely Errored Seconds. The BER that defines severely errored seconds.
- SEFS—Severely Errored Framing Seconds. The BER that defines severely errored framing seconds.
- CV—Coding Violations. The BER for Coding Violations, counted as Cyclic Redundancy Check (CRC) errored frames.
- FC—Failure Count. The BER for Failure Count, defined as either AIS or LOP.

For information on thresholds and ranges, see Table 6, “Near SONET Performance Parameters,” on page 54 and Table 7, “Far SONET Performance Parameters,” on page 57.

Clicking the **Trace** command button brings up the OC3 Trace Configuration dialog window.

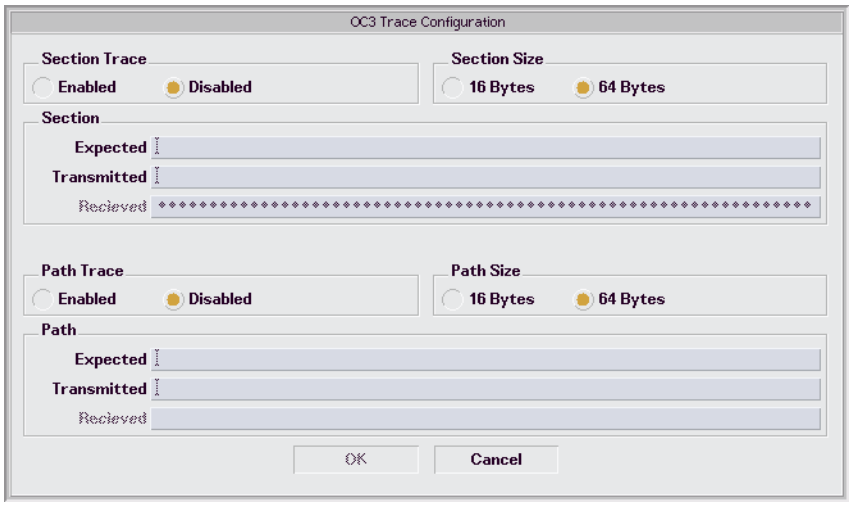


Figure 39: OC3T Trace Configuration Dialog Window

This window controls section and path tracing for the OC3 trunk card. There are radio buttons for enabling or disabling section trace and path trace.

The **Section Size** and **Path Size** radio buttons set the trace message buffer size.

You specify the trace message expected in the **Expected** field, and the trace message to send in the **Transmitted** field. The **Received** field shows the trace message actually received at this end.

Clicking the **Configure...** command button brings up the OC3 Configuration Parameters dialog window.

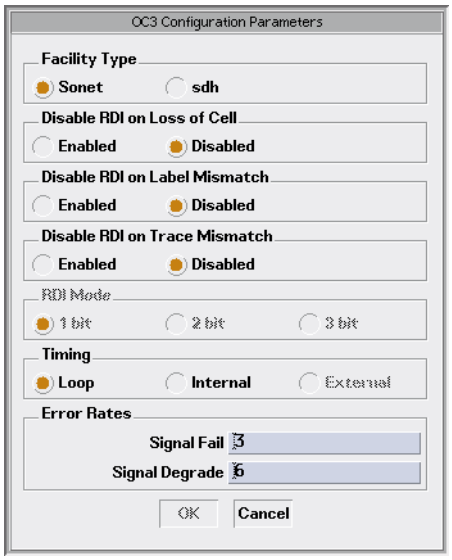


Figure 40: OC3T Configuration Dialog Window

This window allows you to set parameters for the OC3 signal.

The **Facility Type** radio option buttons allow you to select SONET or SDH.

The **Disable RDI on Loss of Cell** radio buttons enable or disable Remote Defect Indication (RDI) for Loss of Cell Delineation (LCD) for the SONET path.

The **Disable RDI on Label Mismatch** radio buttons enable or disable RDI for Payload Label Mismatch (PLM) for the SONET path. The payload label identifies the type of payload that the SONET signal is supposed to be carrying (e.g., ATM concatenated). If the payload label is incorrect and RDI is enabled, the SONET port generates an RDI event to the far end of the OC3 connection.

The **Disable RDI on Trace Mismatch** radio buttons enable or disable RDI for Trace Identifier Mismatch (TIM) for the SONET path. TIM is valid only if trace messages are enabled for testing SONET connectivity. If a TIM condition occurs and RDI is enabled, the SONET port generates an RDI event to the far end of the OC3 connection.

The **RDI Mode** radio buttons set the number of bits used to show path RDI to the far end. This option should be set to 1.

The **Timing** radio buttons are:

- Loop (indicates that the Speedlink will extract timing from the OC3 signal).

- Internal (indicates that the Speedlink will supply timing from an internal source).

The **External** option is planned for a future release.

The **Error Rates** group allows you to set **Signal Fail** and **Signal Degrade** values:

- **Signal Fail** is the bit error rate that identifies a signal fail condition on the SONET. This is an exponent, so a setting of 3 means 10^{-3} failures per bit.
- **Signal Degrade** is the bit error rate that identifies a signal degraded condition on the ONSET. This is an exponent, so a setting of 6 means 10^{-6} failures per bit.

Clicking the **Near PM...** or **Far PM...** command button displays the OC3 errors drop-down list. Selecting one of the parameters from the list brings up either the Near or Far SONET Performance dialog window, depending on which button was clicked.

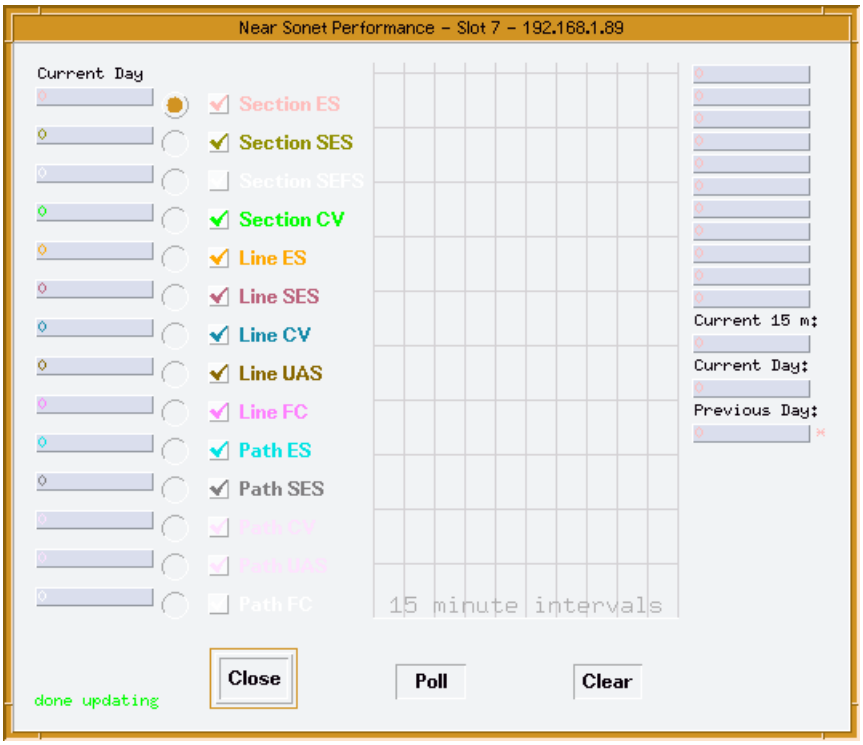


Figure 41: Near-end SONET Performance Dialog Window

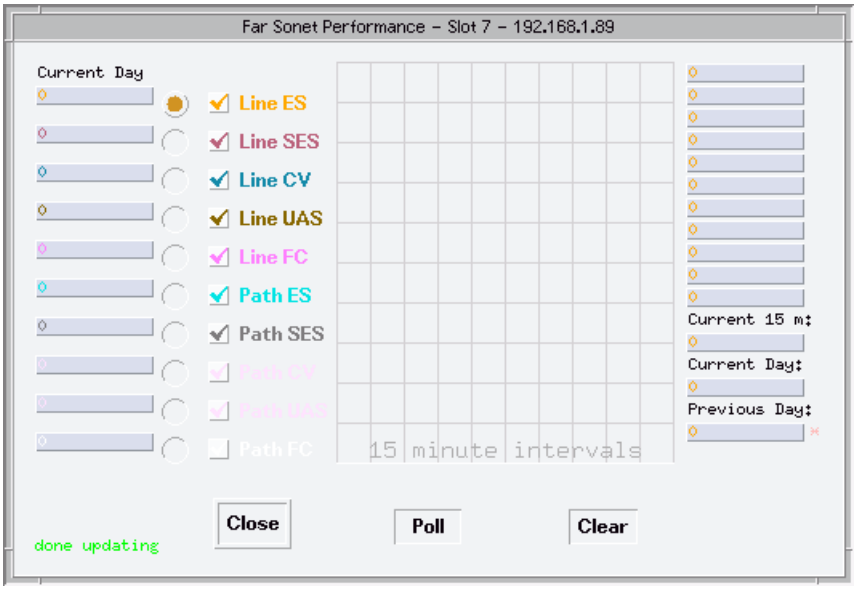


Figure 42: Far-end SONET Performance Dialog Window

The Performance dialog windows initially display data for the parameter(s) selected on the drop-down list in the OC3T Port Detail dialog window. If **All** is selected, data is displayed for all parameters. You can use the options in the Performance dialog windows to select more parameters for display after opening the window.

The information displayed in the Performance dialog windows is described in the following sections.

The bins on the right side of the window display error counts for all the following periods:

- Current 15 minutes (the performance monitoring period)
- Current day
- Previous day
- Previous 11 performance monitoring periods.

On the left side of the window is a column that includes the error types, with a radio button and a check box next to each. The check boxes control which data displays in the grid in the center of the window. Clicking a check box updates the graphical display with data for that error type. The error count graphs are scaled dynamically to show relative error rates and changes over time. The different types of errors are represented by different colors on the graph to allow viewing multipe data sets at once.

The radio buttons control which data displays in the performance monitoring bins on the right side of the window.

The near-end parameters that are available are:

- For section, line, and path—ES, SES, and CV.
- For Line and Path—UAS.
- For Section only—SEFS.
- For Path only—FC.

The far-end parameters that are available are:

- For Line and Path—ES, SES, CV, UAS, and FC.

The near-end performance parameters (for daily and 15-minute intervals), their descriptions, and default counts are described in the table below.

Table 6: Near SONET Performance Parameters

Acronym	Meaning	Daily Interval	15 Minute Interval
SECTION			
SEFS	**Section Severely Errored Framing Second:** Count of seconds containing one or more Severely Errored Framing (SEF) defect (defined as a time at which the incoming signal has a minimum of four consecutive errored framing patterns). A SEF defect is terminated upon detecting two successive error-free framing patterns.	0—65535 Default setting is 0 (inactive)	0—900 Default setting is 0 (inactive)
LINE			
ES	**Line Errored Second**: Count of seconds containing one or more Line Layer BIP errors or an AIS-L defect was present.	0—65535 Default setting is 0 (inactive)	0—900 Default setting is 0 (inactive)
SES	**Line Severely Errored Second**: Count of seconds containing 2,500 or more Line Layer BIP errors or an AIS-L defect was present.	0—65535 Default setting is 0 (inactive)	0—900 Default setting is 0 (inactive)

Table 6: Near SONET Performance Parameters (continued)

Acronym	Meaning	Daily Interval	15 Minute Interval
CV	**Line Code Violation-Path**: Count of BIP errors (using B2 byte) occuring in the accumulation period. Up to 8XN BIP errors can be detected per STS-N frame, with each error incrementing the CV-L current second register.	0—1,048,575 Default setting is 0 (inactive)	0—16383 Default setting is 0 (inactive)
UAS	**Line Unavailable Second**: Count of one second intervals during which the Line is unavailable. The Line is unavailable at the onset of 10 contiguous SES-Ls. The 10 SES-Ls are included in unavailable time and so since it is not known until the tenth second that unavailable time started ten seconds ago the counts for all the parameters must be adjusted back to what they were ten seconds ago. Once unavailable the Line becomes available at the onset of 10 contiguous seconds with no SES-Ls. The ten seconds with no SES-Ls are excluded from available time so the counts of the parameters do not need to be adjusted.	0—65535 Default setting is 0 (inactive)	0—900 Default setting is 0 (inactive)
PATH			
ES	**Path Errored Second**: Count of seconds containing one or more Path Layer BIP errors or an AIS-P or LOP-P defect was present.	0—65535 Default setting is 200	0—900 Default setting is 20
SES	**Path Severely Errored Second**: Count of seconds containing 2,400 or more Line Layer BIP errors or an AIS-P or LOP-P defect was present.	0—65535 Default setting is 7	0—900 Default setting is 3
CV	**Path Code Violation**: Count of BIP errors (using B3 byte) occuring in the accumulation period. Up to 8 BIP errors can be detected per frame, with each error incrementing the CV-P current second register.	0—1,048,575 Default setting is 250	0—16383 Default setting is 25

Table 6: Near SONET Performance Parameters (continued)

Acronym	Meaning	Daily Interval	15 Minute Interval
UAS	**Path Unavailable Second**: Count of one second intervals during which the Path is unavailable. The Path is unavailable at the onset of 10 contiguous SES-Ps. The 10 SES-Ps are included in unavailable time and so since it is not known until the tenth second that unavailable time started ten seconds ago the counts for all the parameters must be adjusted back to what they were ten seconds ago. Once unavailable the Path becomes available at the onset of 10 contiguous seconds with no SES-Ps. The ten seconds with no SES-Ps are excluded from available time so the counts of the parameters do not need to be adjusted.	0—65535 Default setting is 10	0—900 Default setting is 10

The far-end performance parameters (for daily and 15-minute intervals), their descriptions, and default counts are described in the table below.

Table 7: Far SONET Performance Parameters

Acronym	Meaning	Daily Interval	15 Minute Interval
LINE			
ES	**Line Errored Second**: Count of seconds containing one or more Line Layer BIP errors was reported by the far-end LTE (using the REI-L indication) or an RDI-L defect was present.	0—65535 Default setting is 0 (inactive)	0—900 Default setting is 0 (inactive)
SES	**Line Severely Errored Second**: Count of seconds containing 2,500 or more Line Layer BIP errors reported by the far-end LTE (using the REI-L indication) or an RDI-L defect was present.	0—65535 Default setting is 0 (inactive)	0—900 Default setting is 0 (inactive)
CV	**Line Code Violation-Path**: Count of BIP errors (using REI-L indication in the Line Overhead) detected by the far-end LTE. Up to 8XN BIP errors can be indicated by the REI-L, with each error incrementing the CV-LFE current second register.	0—1,048,575 Default setting is 0 (inactive)	0—16383 Default setting is 0 (inactive)
UAS	**Line Unavailable Second**: Count of one second intervals during which the STM-1C Line is unavailable at the far-end. The far-end Line is unavailable at the onset of 10 contiguous SES-LFEs. The 10 SES-LFEs are included in unavailable time and so since it is not known until the tenth second that unavailable time started ten seconds ago the counts for all the parameters must be adjusted back to what they were ten seconds ago. Once unavailable the Line becomes available at the onset of 10 contiguous seconds with no SES-LFEs. The ten seconds with no SES-LFEs are excluded from available time so the counts of the parameters do not need to be adjusted.	0—65535 Default setting is 0 (inactive)	0—900 Default setting is 0 (inactive)

Table 7: Far SONET Performance Parameters

Acronym	Meaning	Daily Interval	15 Minute Interval
PATH			
ES	**Path Errored Second**: Count of seconds containing one or more Path Layer BIP errors was reported by the far-end PTE (using the REI-P indication) or an RDI-P defect was present.	0—65535 Default setting is 200	0—900 Default setting is 20
SES	**Path Severely Errored Second**: Count of seconds containing 2400 or more Path Layer BIP errors reported by the far-end PTE (using the REI-P indication) or an RDI-P defect was present.	0—65535 Default setting is 7	0—900 Default setting is 3
CV	**Path Code Violation-Path**: Count of BIP errors (using REI-P indication in the Path Overhead) detected by the far-end PTE. Up to 8 BIP errors can be indicated by the REI-P, with each error incrementing the CV-PFE current second register.	0—1,048,575 Default setting is 250	0—16383 Default setting is 25
UAS	**Path Unavailable Second**: Count of one second intervals during which the Path is unavailable at the far-end. The Path is unavailable at the onset of 10 contiguous SES-PFEs. The 10 SES-PFEs are included in unavailable time and so since it is not known until the tenth second that unavailable time started ten seconds ago the counts for all the parameters must be adjusted back to what they were ten seconds ago. Once unavailable the Line becomes available at the onset of 10 contiguous seconds with no SES-PFEs. The ten seconds with no SES-PFEs are excluded from available time so the counts of the parameters do not need to be adjusted.	0—65535 Default setting is 10	0—900 Default setting is 10

Table 7: Far SONET Performance Parameters

Acronym	Meaning	Daily Interval	15 Minute Interval
FC	**Path Failure Counts**: Count of the number of far-end OC3 Path failure events. A Failure event begins when the RDI-P failure is declared, and ends when the RDI-P failure is cleared. A failure event that begins in one period and ends in another period is counted only in the period in which it begins.	TBD	TBD

Clicking the **ATM PM** command button brings up the OC3 ATM Performance dialog window.

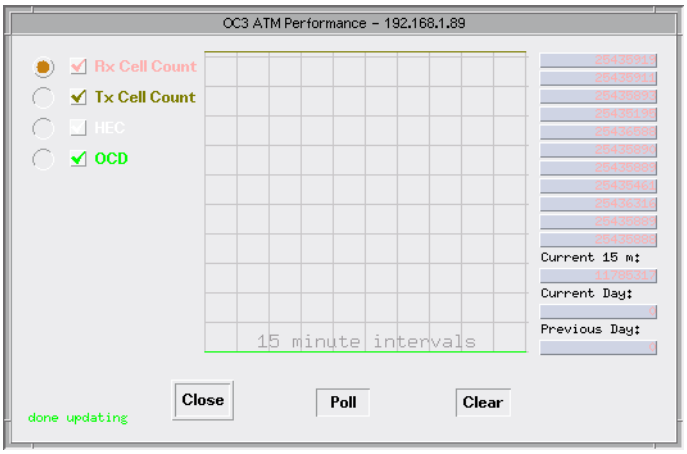


Figure 43: OC3T ATM Performance Dialog Window

This window allows you to view ATM performance data.

The **Rx Cell Count** is the aggregate numbers of error-free, assigned cells that have been received by the OC3 Trunk card in the current Interval.

The **Tx Cell Count** is the aggregate number of assigned cells that have been transmitted by the OC3 Trunk card in the 15 minute interval.

HEC is Header Error Checksum in idle ATM cells—the number of cells discarded due to HEC violations. (This counts uncorrectable HEC errors only.)

OCD is Out of Cell Delineation (OCD) anomalies, each of which indicates seven consecutive ATM cells with HEC violations.

MLA Card

Each MLA card provides the broadband interface to one Line Card Shelf at OC-3 rates over optical fiber. There are up to twelve MLA cards in a Master Control Shelf providing the broadband interface for up to twelve Line Card Shelves and up to 288 line cards.

Right-clicking the port indicator in the MLA object in the Line Card Shelf graphical window will bring up the dialog window shown below:

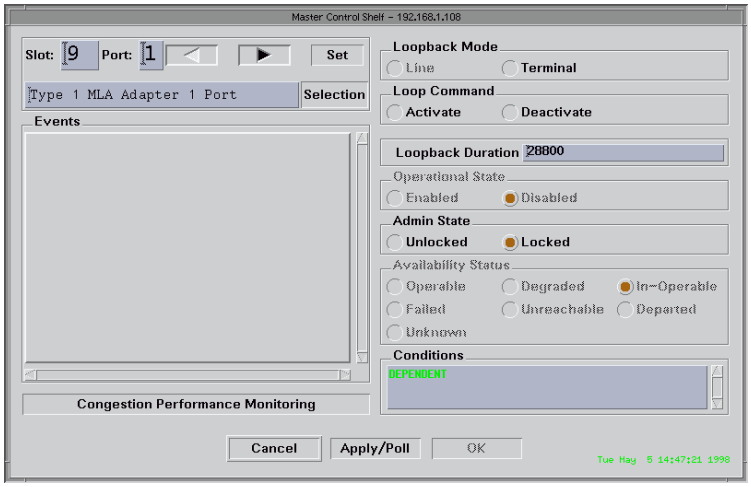


Figure 44: Master Control Shelf – MLA Port Dialog Window

MLA Congestion Performance Monitoring

Clicking the **Congestion Performing Monitoring** command button will bring up the MLA Congestion dialog window:

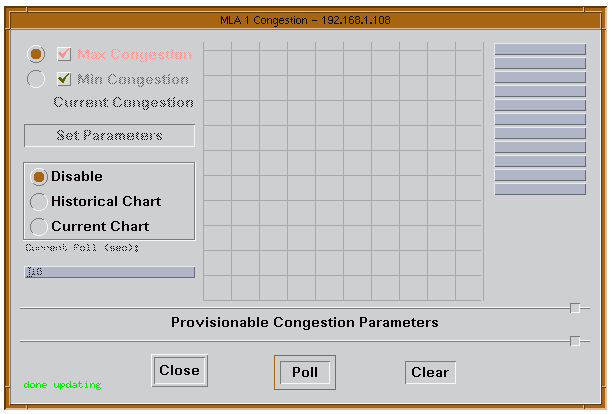


Figure 45: MLA Congestion Monitoring Dialog Window

Listed below are the provisionable parameters for MLA congestion for network traffic management:

NOTE: These parameters are usable only after the screen display is pulled down.

- **Severe Congestion Level (%)** (Range: 1 – 100% Buffer Utilization, Default = 90%)
- **Severe Congestion Abatement Level (%)** (Range: 1 – 100% Buffer Utilization, Default = 70%, Where Severe Congestion is greater than Severe Congestion Abatement Level)
- **Intermediate Congestion Threshold (%)** (Range: 1 – 100% Buffer Utilization, Default = 40%)
- **Severe Congestion Report Active (sec)** (Range: 1 – 60 Seconds, Default = 30 seconds)
- **Severe Congestion Report Clear (sec)** (Range: 1 – 60 Seconds, Default = 30 seconds)
- **Congestion Weighting Factor(/1000)** (In steps of 0.001, Default: 0.300)

Use the **Set Parameters** command button after entering the congestion parameters.

There are two types of displays available for congestion information: Historical and Current. Radio option buttons are used to select a chart for Historical or Current data. The Max and Min Congestion radio option buttons and check boxes control which level is to be displayed.

- **Historical** 5 minute historical PM (performance monitoring) for a 1 hour period (graphical display of the smoothed 5 minute Maximum and Minimum values). This shows the trends and times of peak utilization of the ingress and egress buffers.
- **Current** Real-time display of current smoothed data. This shows a real-time representation of the current ingress and egress buffer utilization of the current ingress and egress buffer utilization used for monitoring in greater detail a specific event or current system operation.

Line Cards

The Speedlink System is made up of one Master Control Shelf and up to twelve Line Card Shelves. Each LCS has 24 mounting slots for line cards. In Release 3.0 there are five line card types: CAP2, CAP4, DMT4, SDSL8, and IDSL8. The 25th mounting slot is reserved for the Line Card Shelf Multiplexer (LSM) card.

Right clicking a card in the LCS graphical window will bring up the Line Card Shelf dialog window.

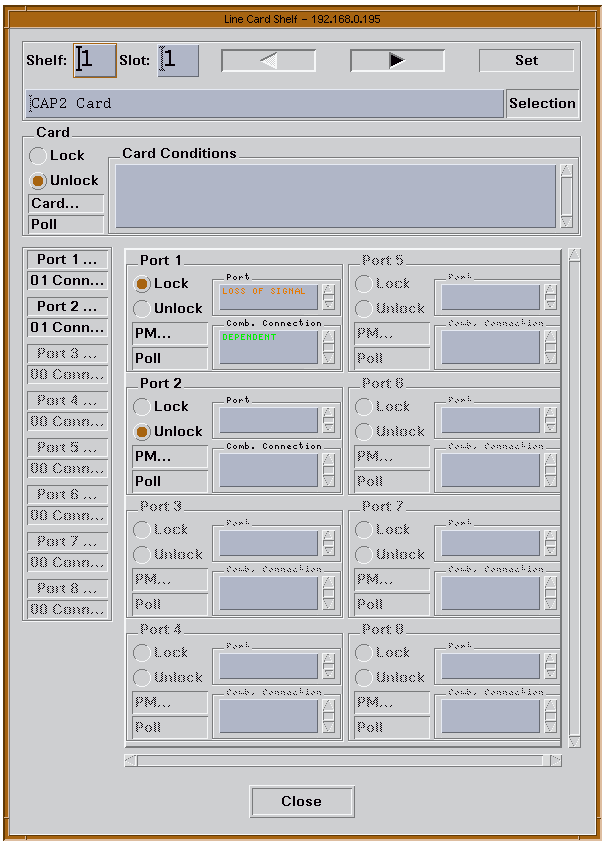


Figure 46: Line Card Shelf Dialog Window

The **Lock** and **Unlock** radio buttons in the **Card** group lock or unlock the card:

Figure 47: Card Group

Clicking the **Card…** command button brings up the Line Card Shelf – Card Details dialog box (described on page 64).

Lock means that the card is not available to carry customer traffic. It also turns off event reporting for this card to DiamondView.

The **Lock** and **Unlock** radio buttons in each **Port** group lock or unlock this port:

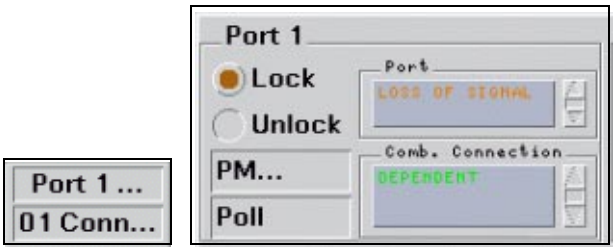


Figure 48: Port Group

Lock means that the port is not available to carry customer traffic. It also turns off event reporting for this port to DiamondView. **Unlock** does the opposite—it makes the port available to carry customer traffic, and tells the multiplexer to report events for this port to DiamondView.

The **Port** button brings up the **Port Details** dialog window for this port (CAP2 Port Details are described on page 65, SDSL Port Details are described on page 81).

The **Conn...** button brings up the **Connections** dialog window associated with this port. (Port Connections are described on page 131.)

The **PM...** button brings up the **DSL Performance Monitoring** graphical window (CAP2 PM is described on page 70, SDSL PM is described on page 89).

The **Poll** button refreshes the displayed information from the Speedlink System.

The example on the previous page shows the LCS Card dialog window for a Dual ADSL card. Cards with different numbers of ports will have a different number of port groups.

LCS Card Details

Clicking the **Card…** command button in the Line Card Shelf dialog window brings up the Line Card Shelf – Card Details dialog box. (Also, right-clicking an LSM object or line card object in the LCS graphical window brings up this dialog box.)

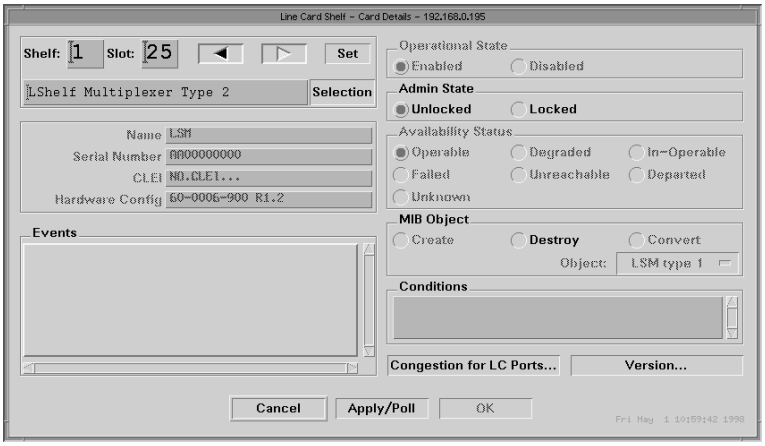


Figure 49: Line Card Shelf – Card Details Dialog Window

The **Administration State** radio option buttons are user inputs that control whether an object is available for service or not.

- **Unlocked** makes the object usable if there are no other conditions blocking use of this object
- **Locked** makes the object unusable

The **MIB Object** radio buttons allow you to **Create, Destroy** or **Convert** an entry for this LCS Port in the MIB.

Click the **Object** menu button to select a line card type if you are creating a new MIB object.

The **Congestion for Selected LC Ports…** command button is only valid if you are displaying information about an LSM card. Selecting this button takes you to the **LSM ATM Congestion** dialog window for the selected port. See page 110 for additional information on LSM ATM Congestion.

Clicking the **Version…** command button brings up the Software Versions dialog box. This dialog box provides you information on the various software components, such as Release and Build number, the date and time when the Release was built.

Port Details – CAP2

Clicking the **Port…** command button in the Line Card Shelf dialog window brings up the Line Card Shelf – Card Details dialog box. (Also, right-clicking a port indicator on the line card object in the LCS graphical window brings up this dialog box.)

This dialog window shows the details about a CAP2 port:

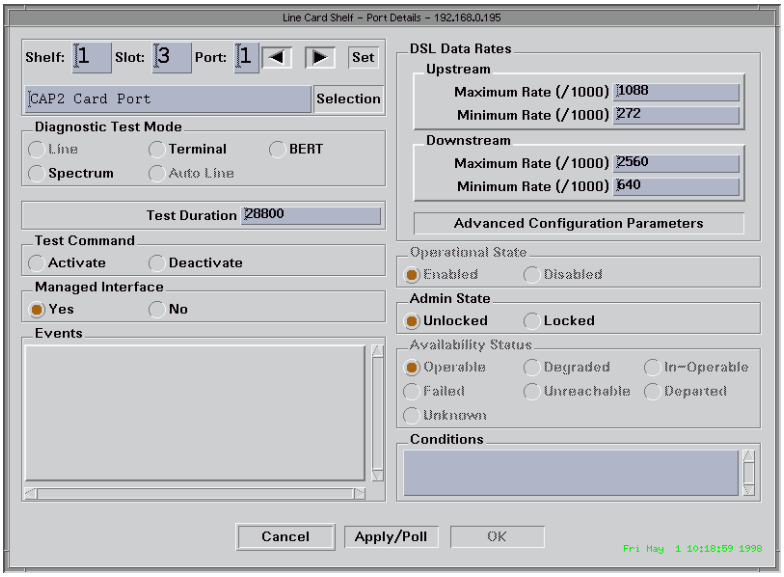


Figure 50: CAP2 Port Details Dialog Window

The **Diagnostic Test Mode** radio buttons select the desired port loopback test mode:

- **Line** Loopback test the line to the subscriber's network interface – no data into the system.
- **Terminal** Loopback test the line to the subscriber's modem – no data out of the system.
- **BERT** Bit Error Rate Test – the ratio of received bits that are in error, relative to the number of bits received.
- **Spectrum** The DSL puts out the same signal (the same frequency spectral composition) that it would if it was linked with a CPE DSL unit – this does not require any CPE on the line.
- **Auto Line** This will cause the CAP2 to automatically test the quality of the line over all available baud rates using BERT. Planned for a future release.

The **Test Command** radio option buttons control the port loopback testing:

- **Activate** start up loopback testing
- **Deactivate** turn off loopback testing

IMPORTANT: All diagnostic tests interrupt data flow through the system. Do not perform on a Speedlink System that is providing service. Only use diagnostic tests during acceptance test and turn-up procedures or in a lab environment to isolate trouble in the system.

Please refer to Volume 5, Chapter 4 for additional information on Diagnostic Test Modes.

The **Managed Interface** radio option buttons enable or disable event trapping for this port. For a DSL port, managed interface indicates to the Speedlink System that any loss of ability to provide service should be treated as an alarm condition. If disabled, alarms will be suppressed.

The **Test Duration** numeric input field specifies how many seconds to run port loopback testing before reporting a result. The default is 28800 seconds (8 hours).

The **Upstream Data Rate Minimum Rate** and **Maximum Rate** numeric fields specify the minimum and maximum upstream data rates for this port in bits per second. The **Current Rate** numeric field specifies the current data rate. (Upstream means from the subscriber to the line card.)

The **Upstream Dynamic Adjustment** radio option buttons control whether the multiplexer does dynamic adjustment on the upstream data rate to compensate for changing loop conditions.

The **Downstream Data Rate Minimum Rate** and **Maximum Rate** numeric fields specify the minimum and maximum downstream data rates for this port in bits per second. The **Current Rate** numeric field specifies the current data rate. (Downstream means from the line card to the subscriber.)

Clicking the **Advanced Configuration Parameters** command button brings up the **Advanced DSL Parameters** dialog window:

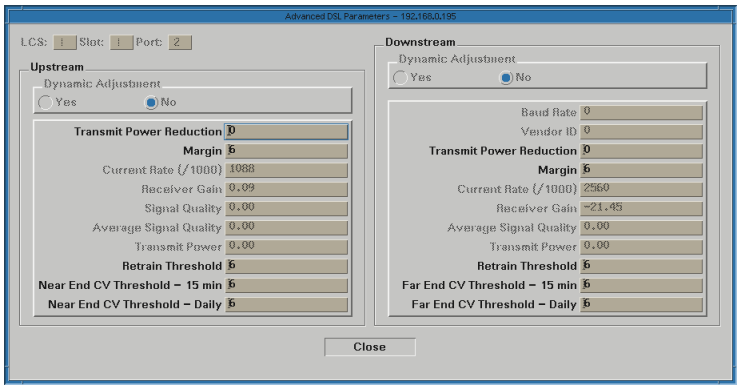


Figure 51: Advanced DSL Parameters

The **Downstream Dynamic Adjustment** radio option buttons control whether the Speedlink Multiplexer does dynamic adjustment on the downstream data rate to compensate for changing loop conditions. This option is planned for a future release.

At the beginning of the CAP training process, the CAP DSL hardware measures the quality of the received signal. This is also referred to as a Signal to Noise Ratio (SNR). Each receiver measures and records the Average Signal Quality for its received signal. This value is a quantification of the quality of the line and is assumed to a measure of the line's ability to carry the CAP signal. This value is used to determine the rate that the CAP DSL hardware will select for operation.

See Volume 4, Chapter 1 for additional information on CAP2 DSL Provisioning.

The Upstream and Downstream **Transmit Power Reduction** causes the CAP chips to use a reduced power for the transmitter. dB values are 0—15 for both Upstream and Downstream. The default is 0.

The Upstream and Downstream **Margin** parameter indicates the desired noise margin to be used during the rate adaptive training process. The larger the margin number, the lower the rate, but the greater the noise immunity that will be achieved for a line of a given quality. A given Average Signal Quality value will dictate the selection of a data rate available within the baud rate. The value of the Margin provisioned parameter is subtracted from the measured Average Signal Quality. This is intended to allow error free operation to continue even if noise is subsequently added to the line. The setting of Margin is the amount of added noise it is desired to be able to survive without errors. Margin dB values are -3 to +9 for both Upstream and Downstream. The default value is 6.

The **Current Rate** is the actual data rate currently operational on the DSL.

Receiver Gain is the gain the receiver is using as a result of the training process. A negative value indicates attenuation.

Average Signal Quality is the averaged signal quality measured during the training process. The greater the value, the "better" the line.

Transmit Power is the level that the transmitter is using as a result of the training process.

The Upstream and Downstream Error **Retrain Threshold** refers to the measured number of frame errors received. If this error rate exceeds a threshold, the DSL will retrain. The greater the number, the more sensitive the rate detector will become. The Retrain Threshold parameter is from 10^{-4} BER to 10^{-7} BER. The default setting is 6 or 10^{-6} BER for both channels.

The Near End and Far End **Code Violation Thresholds** groups contain numeric fields, in which the user may alter the current event threshold values for this port for each of these error categories:

- **Near End Code Violation Threshold – Daily**

A Threshold crossing event is generated when the Current Day Near End Code Violation exceeds this threshold. Range is 5 (10^{-5}) to 9 (10^{-9}) BER. The default setting is 6 or 10^{-6} BER. The actual count values for the various provisioned are listed below:.

Table 8: Near End Code Violation Threshold – Daily

Setting	Count Threshold
5	92414
6	93844
7	9399
8	940
9	94

- **Near End Code Violation Threshold – 15 Min**

A Threshold crossing event is generated when the Current 15 Minute Near End Code Violation exceeds this threshold. Range is 5 (10^{-5}) to 9 (10^{-9}) BER. The default setting is 6 or 10^{-6} BER. The actual count values for the various provisioned are listed below:.

Table 9: Near End Code Violation Threshold – 15 Min

Setting	Count Threshold
5	92414
6	9348
7	940
8	94
9	9

- **Far End Code Violation Threshold – Daily**

A Threshold crossing event is generated when the Current Day Near End FEBE Counter exceeds this threshold. Range is 5 (10^{-5}) to 9 (10^{-9}) BER. The default setting is 6 or 10^{-6} BER. The actual count values for the various provisioned are listed below:

Table 10: Far End Code Violation Threshold – Daily

Setting	Count Threshold
5	2119669
6	220224
7	22107
8	2212
9	221

- **Far End Code Violation Threshold – 15 Min**

A Threshold crossing event is generated when the Current 15 Minute Near End FEBE Counter exceeds this threshold. Range is 5 (10^{-5}) to 9 (10^{-9}) BER. The default setting is 6 or 10^{-6} BER. The actual count values for the various provisioned are listed below:

Table 11: Far End Code Violation Threshold – 15 Min

Setting	Count Threshold
5	211967
6	22022
7	2211
8	221
9	22

Baud Rate is the actual baud rate currently being used in the downstream direction.

Vendor ID is a 16-bit number sent by the CPE as part of the training process. It indicates the manufacturer of the CPE.

DSL Performance – CAP2

CAP2 performance counts are monitored via DiamondView's DSL Performance Monitoring window. Clicking the **PM…** command button (while positioned on a CAP2 line card) in the Line Card Shelf dialog window brings up the DSL Performance dialog window:

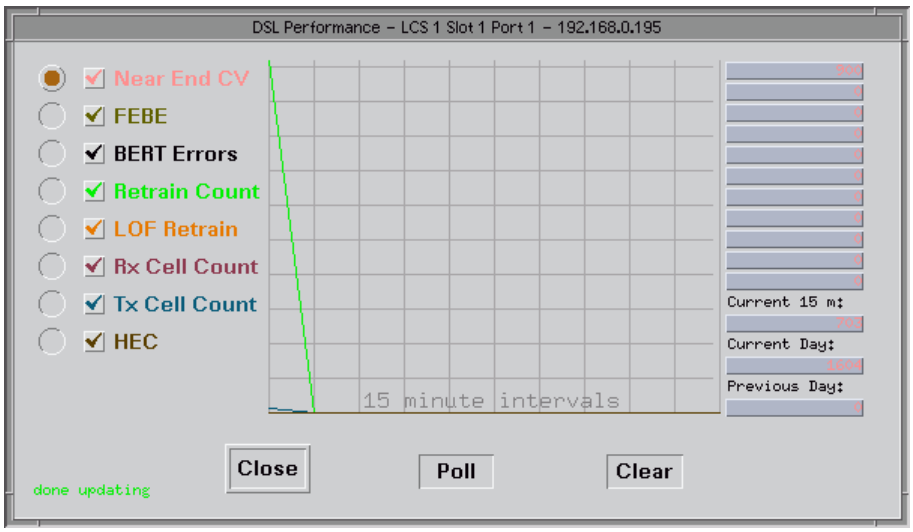


Figure 52: DSL Performance Dialog Window

This dialog window displays an CAP2 line card port's recent performance monitoring history. The radio option buttons control which error's data DiamondView displays in the performance monitoring bins on the right side of the window. The check boxes control which performance monitoring data DiamondView displays in the window.

CAP2 Performance Counts

The line card counts eight DSL Performance items during Data Mode. The CAP2 line card maintains fourteen counters, for each of these performance items, the count begins when the line card powers up:

- Previous Day
- Current Day
- Current 15 Minute Interval
- **Previous 15 Minute Intervals** (up to 11 Previous 15 Minute Intervals)

DiamondView dynamically scales the error count graphs to show relative error rates, and changes in counts by error category over time.

The CAP2 line card counts:

Near End Coding Violation (CV) Errors: The CAP DSL line card counts Near End Coding Violation (CV) Errors for the "Upstream" channel during Data Mode. The Near End Coding Violation parameters have "thresholds" for reporting of an event or "trap" to DiamondView's System Events window, these thresholds do not affect CAP DSL port operation.

Far End Block Error (FEBE) : The number of "received" frames that contain a Far End Block Error (FEBE) bit set. The receiver end sets the FEBE when it "receives" a CRC error frame. The FEBE is cleared in the next frame it transmits. Note: FEBE is used against Far End Coding Violation (15 min. and Daily) threshold settings – provisioned for the "Downstream" channel in the Advanced DSL Parameters window – in Release 1.01 and 2.0.

Bit Error Rate Test (BERT) Errors: The number of received errors during a BER Test.

Retrain Count : Framing errors are monitored during Data Mode. The greater the Retrain Threshold setting the more sensitive the CAP DSL port is to framing errors.

The Retrain Threshold parameter range is from 10^{-4} BER to 10^{-7} BER. The default setting is 6 or 10^{-6} BER for both channels.

Loss of Frame (LOF) Retrain : The CAP DSL port also monitors the frame indicator bit to determine if a Loss of Frame (LOF) condition exists. The port retrains if it detects an LOF condition.

Rx Cell Count: The number of valid, non-idle cells “received” on the line card port from the CPE and sent onto the LSM2 card.

Tx Cell Count: The number of valid, non-idle cells received from the LSM2 card and “transmitted” to the CPE.

Header Error Control (HEC): The number of received cells that have HEC errors detected in their header.

Port Details – CAP4

Click on an CAP4 card port with the right mouse button to display the CAP4 Port Details dialog window.

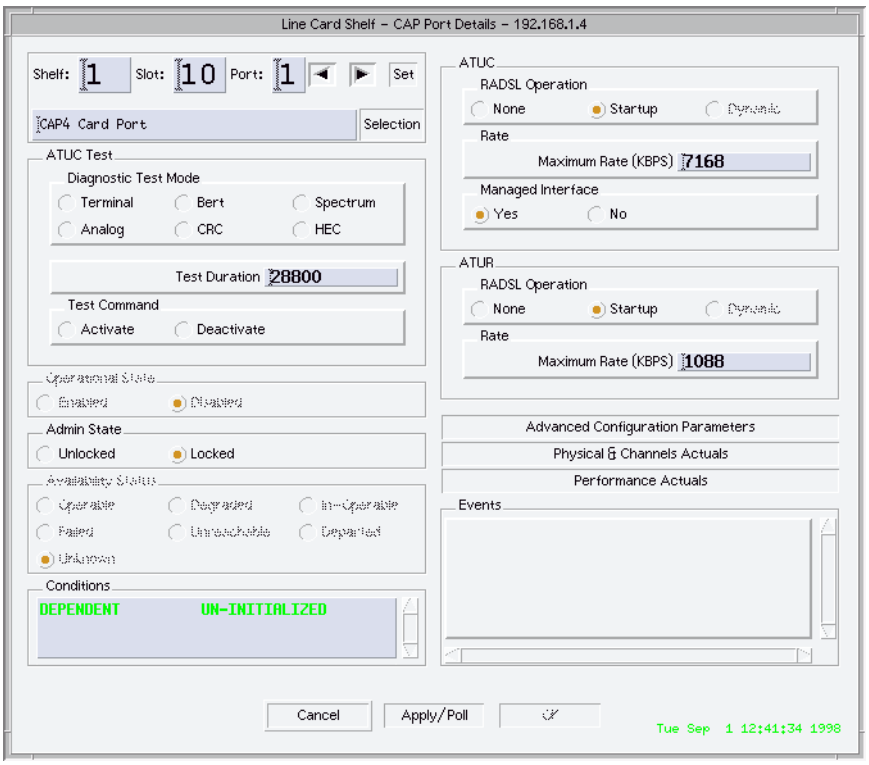


Figure 53: CAP4 Port Details Dialog Window

The CAP4 Port Detail dialog window displays the following information for the selected CAP4 port:

- Address
- ATUC Test

- Operational State
- Admin State
- Availability Status
- Conditions
- ATUC operation (downstream)
- Managed Interface
- ATUR operation (upstream)
- Events

The following address information is displayed at the top of the window:

- LCS shelf number, slot number, and port number.
- Left and right arrow buttons, for clicking through the slot numbers with the mouse. The **Set** button to the right of these buttons allows you to switch to single selection mode.
- Text box that displays the name of the currently selected card slot. The **Selection** button to the right of this text box allows you to switch to multiple selection mode.

The **Diagnostic Test Mode** radio buttons allow you to select the desired port loopback test mode:

- **Terminal**. This test loops back the data from the LSM. This tests only the port's interface to the LSM.
- **BERT** (Bit Error Rate Test) The ratio of received bits that are in error, relative to the number of bits received. This option is planned for a future release.
- **Spectrum**. This test puts out the same signal (the same frequency spectral composition) that it would if linked with a CPE unit—this does not require any CPE on the line.
- **Analog**. This test loops back the data from the LSM, like Terminal, but the data passes through the port's transceiver also, testing the analog components of the port.
- **CRC**. Send CRC errors to the CPE.
- **HEC**. Send HEC errors to the CPE.

Test Duration. This field specifies the length of time to run port loopback testing before reporting a result. The default is 28800 seconds (8 hours).

Test Command group. These radio buttons control the port loopback testing:

- **Activate** to start loopback testing.

- **Deactivate** to turn off loopback testing.

Admin State group. This group allows you to set the administrative state of the card to either locked or unlocked.

Conditions list. This scrollable list includes all conditions currently reported for the port.

RADSL Operation (ATUC and ATUR). This group allows you to select the Rate Adaptive DSL (RADSL) modes for the ATUC and ATUR. The options are **None**, **Startup**, and **Dynamic**.

- **None** Fixed bit rate. An error message is generated if the line/ connection cannot support the data rate entered.
- **Startup** Do rate adaptation during training. There is only training at startup. If there is a Loss of Signal (LOS) condition after startup, the system does not retrain and an error message is generated.
- **Dynamic** This option is planned for a future release.

Maximum Rate (ATUC and ATUR). These groups allow you to set the maximum data rates for the ATUC and ATUR. The values are listed in the following table.

Table 12: CAP4 Provisioning Parameters

Parameter	Values	Units	Defaults
ATUR			
Maximum Rate[a]	272—1088	Kb/s	1088
ATUC			
Maximum Rate	640—7168	Kb/s	7168

[a] All Rate values are set in multiples of 32 Kb/s.

Managed Interface group. These radio buttons enable or disable event trapping for the port. If enabled, this option indicates that any loss of ability to provide service should be treated as an alarm condition. If disabled, alarms will be suppressed.

Events. This scrollable list includes all traps currently reported.

The command buttons located below the ATUR group (**Advanced Configuration Parameters**, **Physical & Channels Actuals**, and **Performance Actuals**) bring up windows that allow you to work with other CAP4 parameters in detail. The dialog

windows displayed using the command buttons are described in the following sections.

Clicking the **Advanced Configuration Parameters** command button from the Port Details dialog window brings up the Advanced Configuration Parameters dialog window for CAP4.

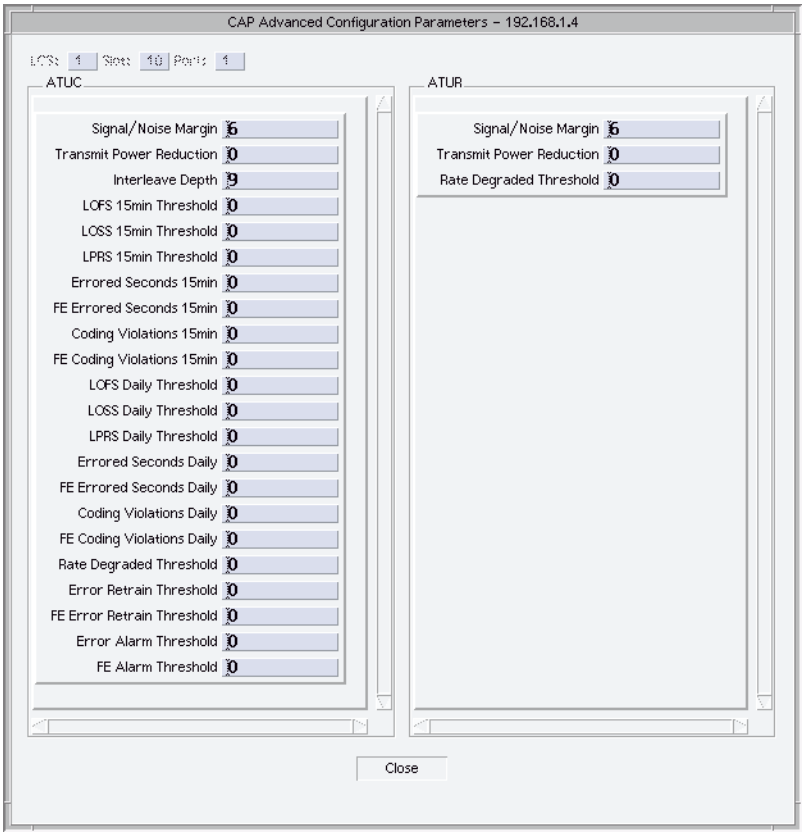


Figure 54: CAP4 Advanced Configuration Parameters Dialog Window

This window allows you to view and work with alarm thresholds for the CAP4 port. The Address fields at the top of the window display the shelf, slot, and port numbers. The window includes two groups—ATUC thresholds and ATUR thresholds. The thresholds specify the point at which the specified condition will be reported. The individual threshold parameters are described in the following sections.

NOTE: See Volume 4, Chapter 2 for additional information on CAP4 DSL Provisioning.

The ATUC parameters include:

- **Signal/Noise Margin**. Sets the desired downstream signal/noise margin in dB.

- **Transmit Power Reduction**. Sets how much to reduce the transmitted upstream power (in dB) below the maximum allowed transmit power to improve downstream performance.
- **Interleave Depth**. Sets the interleave depth setpoint (0 means no interleave).
- **LOFS 15min Threshold**. Sets the threshold for the number of seconds during which the DSL port detects Loss Of Frame (LOF) during the current 15 minute interval.
- **LOSS 15min Threshold**. Sets the threshold for the number of seconds during which the DSL port detects Loss Of Signal (LOS) during the current 15 minute interval.
- **LPRS 15min Threshold**. Sets the threshold for the number of seconds during which the DSL port detects Loss of Power (LPR) during the current 15 minute interval.
- **Errored Seconds 15min**. Sets the threshold for the number of seconds during which the DSL port detects frame CRC errors during the current 15 minute interval.
- **FE Errored Seconds 15min**. Sets the threshold for the number of seconds during which the far end of this DSL loop detects frame CRC errors during the current 15 minute interval.
- **Coding Violations 15min**. Sets the threshold for the number of Coding Violations (CV) for this DSL port during the current daily interval.
- **FE Coding Violations 15min**. Sets the threshold for the number of Coding Violations (CV) which the far end of this DSL port detects during the current 15 minute interval.
- **LOFS Daily Threshold**. Sets the threshold for the number of seconds during which the DSL port detects frame CRC errors during the current daily interval.
- **LOSS Daily Threshold**. Sets the threshold for the number of seconds during which the DSL port detects Loss Of Signal (LOS) during the current daily interval.
- **LPRS Daily Threshold**. Sets the threshold for the number of seconds during which the DSL port detects Loss of Power (LPR) during the current daily interval.
- **Errored Seconds Daily**. Sets the threshold for the number of seconds during which the DSL port detects frame CRC errors during the current daily interval.
- **FE Errored Seconds Daily**. Sets the threshold for the number of seconds during which the far end of this DSL loop detects frame CRC errors during the current day.

- **Coding Violations Daily**. Sets the threshold for the number of Coding Violation (CV) counts which this DSL port detects during the current day.
- **FE Coding Violations Daily**. Sets the threshold for the number of Coding Violation (CV) counts which the far end of this DSL port detects during the current day.
- **Rate Degraded Threshold**. Sets the errors/second rate, expressed as an inverse power of ten, below which the port should report the rate degraded condition.
- **Error Retrain Threshold**. Sets the error rate threshold that starts retraining for this loop, expressed as an inverse power of ten.
- **FE Error Retrain Threshold**. Sets the bit error rate threshold that starts retraining for this loop, expressed as an inverse power of ten. This error rate is for the far end, as calculated by the Far End Bit Error (FEBE) events received from the far end.
- **Error Alarm Threshold**. Sets the errors/second rate, expressed as an inverse power of ten, below which the port should report an error condition.
- **FE Alarm Threshold**. Sets the bit error rate threshold that raises an error condition for this loop, expressed as an inverse power of ten. This error rate is for the far end, as calculated by the Far End Bit Error (FEBE) events received from the far end.

The ATUR parameters include:

- **Signal/Noise Margin**. Sets the desired upstream signal/noise margin in dB.
- **Transmit Power Reduction**. Sets how much to reduce the transmitted power (in dB) below the maximum allowed transmit power to improve downstream performance.
- **Rate Degraded Threshold**. Sets the errors/second rate as an inverse power of ten below which the line card should report the rate degraded condition.

Clicking the **Performance Actuals** command button from the Port Details dialog window brings up the Performance Actuals dialog window for CAP4.

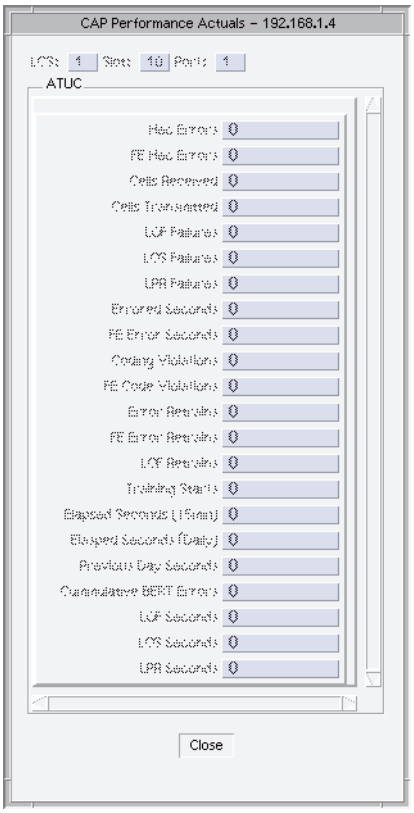


Figure 55: CAP4 Performance Monitoring Actuals Dialog Window

This window displays performance monitoring data for the loop. The Address fields at the top of the window display the shelf, slot, and port numbers. Below the address information, the scrollable ATUC list displays the following information:

- **HEC Errors**. HEC errors received on this DSL port since line card reset, or counter reset.
- **FE HEC Errors**. HEC errors detected at the far end since line card reset, or counter reset.
- **Cells Transmitted**. ATM cells transmitted on this DSL port since line card reset, or counter reset.
- **Cells Received**. ATM cells received on this DSL port since line card reset, or counter reset.
- **LOF Failures**. Loss of Frame (LOF) errors since line card reset, or since the physical performance monitoring data was cleared.

- **LOS Failures**. Loss of Signal (LOS) errors since line card reset, or since the physical performance monitoring data was cleared.
- **LPR Failures**. Loss of Power (LPR) errors since line card reset, or since the physical performance monitoring data was cleared. Loss of Power means that the far end is no long transmitting. The far end generates a distinctive signal as it loses power; this helps the line card distinguish Loss of Power from Loss of Signal. LPR takes precedence over LOS, which in turn takes precedence over LOF.
- **Errored Seconds**. Seconds this port detected frame CRC errors since line card reset, or since the physical performance monitoring data was cleared.
- **FE Error Seconds**. Seconds the far end detected frame CRC errors since line card reset, or since the physical performance monitoring data was cleared.
- **Coding Violations**. Coding Violation (CV) errors since line card reset, or since the physical performance monitoring data was cleared.
- **FE Code Violations**. Coding violations the far end detected since line card reset, or since the physical performance monitoring data was cleared.
- **Error Retrains**. Retrains on this port triggered by errors since line card reset, or since the physical performance monitoring data was cleared.
- **FE Error Retrains**. Retrains initiated by crossing the far end retrain threshold since line card reset, or since the physical performance monitoring data was cleared.
- **LOF Retrains**. Retrains on this DSL port triggered by LOF errors since line card reset, or since the physical performance monitoring data was cleared.
- **Training Starts**. Number of times this port has attempted to train with a CPE. If the port does not find a CPE, it does not attempt to train. You can use this counter to determine if the port sees CPE at the far end
- **Elapsed Seconds (15 min)**. Displays the number of seconds in the current 15 minute performance monitoring data interval.
- **Elapsed Seconds (Daily)**. Displays the number of seconds in the current one day performance monitoring data interval.
- **Previous Day Seconds**. Displays the number of seconds in the previous one day performance monitoring data interval.
- **Cumulative BERT Errors**. Displays the number of BERT receive errors for this port in the current performance monitoring interval.
- **LOF Seconds**. Loss of Frame errored seconds detected at the far end since line card reset, or since the physical performance monitoring data was cleared.
- **LOS Seconds**. Loss of Signal errored seconds detected at the far end since line card reset, or since the physical performance monitoring data was cleared.

- **LPR Seconds**. Loss of Power errored seconds detected at the far end since line card reset, or since the physical performance monitoring data was cleared. Loss of Power means that the far end is no long transmitting. The far end generates a distinctive signal as it loses power; this helps the line card distinguish Loss of Power from Loss of Signal. LPR takes precedence over LOS, which in turn takes precedence over LOF.

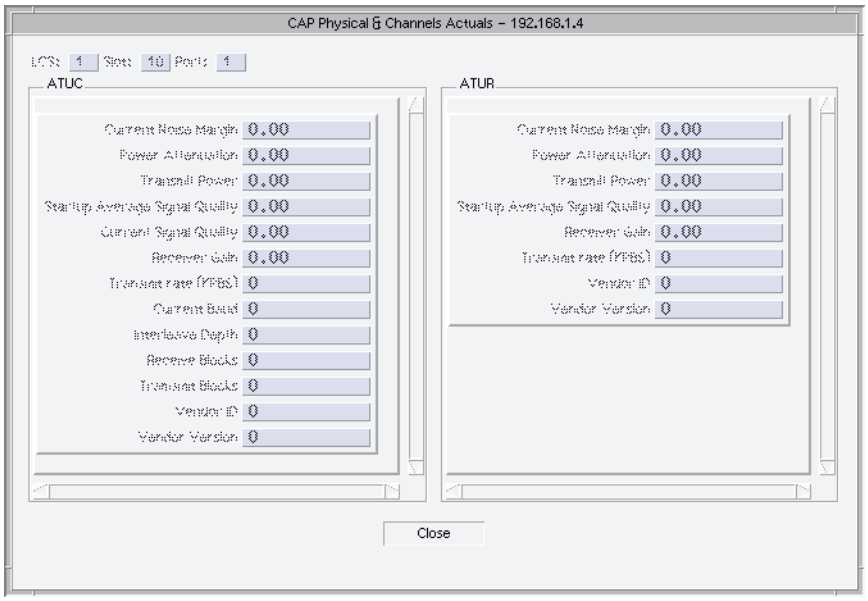


Figure 56: CAP4 Physical & Channel Actuals Dialog Window

This window displays physical layer and channel layer performance data for this loop. The Address fields at the top of the window display the shelf, slot, and port numbers. Below the address information, two scrollable lists display information for the ATUC and ATUR.

The following information is displayed for the ATUC:

- **Current Noise Margin**. The current noise margin of this loop. Noise margin is the number of dB of noise that the loop can tolerate before it impairs the current bit rate.
- **Power Attenuation**. The current measured difference between the transmit power level at the far end of the loop, and the received power level at this end of the loop.
- **Transmit Power**. The transmit power level currently in use at this end of the loop.
- **Startup Average Signal Quality**. The Averaged Signal Quality (in dB) as measured at startup for the received signal.

- **Current Signal Quality**. Returns the current SNR for the received signal (in dB).
- **Receiver Gain**. The current receiver gain (in dB).
- **Transmit Rate (Kb/s)**. The downstream transmission rate set by training for this port.
- **Current Baud**. The current baud rate.
- **Interleave Depth**. Returns the current downstream interleave depth.
- **Receive Blocks**. The total number of blocks received on this channel, since line card reset, or counter reset.
- **Transmit Blocks**. The total number blocks transmitted on this channel, since line card reset, or counter reset.
- **Vendor ID**. The vendor ID of the CPE at the far end of the loop.
- **Vendor Version**. The far end CPE vendor equipment version number.

For the ATUR:

- **Current Noise Margin**. Current noise margin of this loop. Noise margin is the number of dB of noise that the loop can tolerate before it impairs the current bit rate.
- **Power Attenuation**. The current measured difference between the transmit power level at the near end of the loop, and the received power level at the far end of the loop.
- **Transmit Power**. The transmit power level currently in use at the far end of the loop.
- **Startup Average Signal Quality**. The Averaged Signal Quality (in dB) as measured at startup for the received signal at the CPE. This option is planned for a future release.
- **Receiver Gain**. The current receiver gain (in dB) at the CPE. This option is planned for a future release.
- **Transmit Rate (Kb/S)**. The upstream transmission rate set by training for this port.
- **Vendor ID**. The vendor ID of the CPE at the far end of the loop.
- **Vendor Version**. The vendor ID of the near end line card. This option is planned for a future release.

Port Details – SDSL

Right-clicking the port indicator of the SDSL object in the LCS graphical window brings up the Line Card Shelf – SDSL Port Details dialog window:

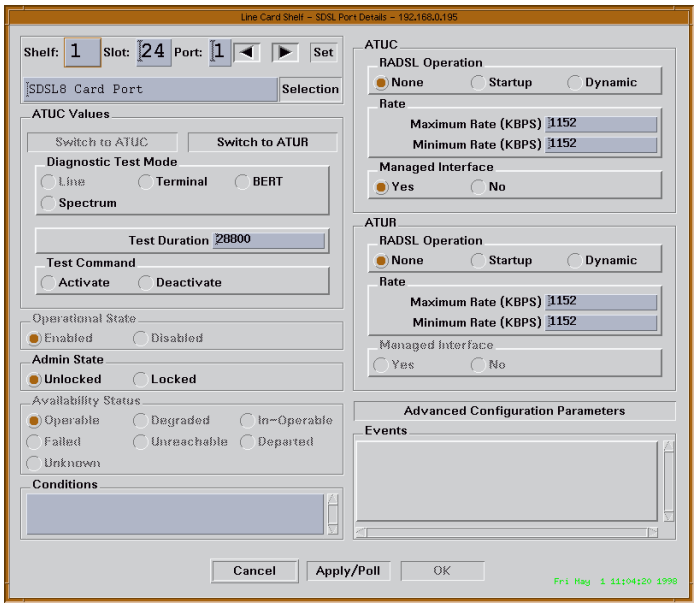


Figure 57: SDSL Port Details Dialog Window

Use the **Switch to ATUC** and **Switch to ATUR** command buttons to toggle between the two units for setting up Diagnostic Test Mode, Test Duration, and Test Command.

The **Diagnostic Test Mode** radio option buttons are used to select port loopback test mode:

- **Line** Loopback test the line to the subscriber's network interface – no data into the system.
- **Terminal** Loopback test the line to the subscriber's modem – no data out of the system.
- **BERT** Bit Error Rate Test – the ratio of received bits that are in error, relative to the number of bits received. The bit rate error depends on the type and length of transmission.
- **Spectrum** The DSL puts out the same signal (the same frequency spectral composition) that it would if it was linked with a CPE DSL unit – this does not require any CPE on the line.

Test Duration sets the interval in seconds that the system should wait before giving up on the loopback test. The ATUC Loopback Duration default is 28800 seconds (8 hours).

The **Test Command** radio option buttons control whether the **Diagnostic Test Mode** controls are effective:

- **Activate** start diagnostic testing
- **Deactivate** stop diagnostic testing

IMPORTANT: All diagnostic tests interrupt data flow through the system. Do not perform on a Speedlink System that is providing service. Only use diagnostic tests during acceptance test and turn-up procedures or in a lab environment to isolate trouble in the system.

Please refer to Volume 5, Chapter 4 for additional information on Diagnostic Test Modes.

There are two provisioning parameters that can be set in DiamondView to affect SDSL port operation:

- ATUC and ATUR Data Rates – Minimum and Maximum provisioning parameters are 192, 384, 768, and 1152 Kb/s. The default ATUC and ATUR rate settings are: minimum = 384 Kb/s, maximum = 384 Kb/s. (The SDSL8 port will not exceed the provisioned ATUC/ATUR maximum rate.)
- Error Retrain Threshold – this parameter determines the amount of "errored frames" allowed during Data Mode before the SDSL port retrains. The Error Retrain Threshold parameter range is from 10^{-4} BER to 10^{-7} BER (Bit Error Rate). The default setting is 6 or 10^{-6} BER for ATUC and ATUR units. The Error Retrain Threshold is fixed at the default setting of 6 or 10^{-6} BER.

The SDSL port operates only at a fixed rate "training" mode. Minimum and Maximum Data Rate parameters are provisioned for both ATUC and ATUR units in Kb/s.

The **ATUC Minimum Rate** and **Maximum Rate** numeric fields specify the minimum and maximum ATUC data rates for this port in kilobits per second.

The **ATUR Minimum Rate** and **Maximum Rate** numeric fields specify the minimum and maximum ATUR data rates for this port in kilobits per second.

The SDSL port operates only at a fixed rate "training" mode. Minimum and Maximum Data Rate parameters are provisioned for both ATUC and ATUR units in Kb/s.

The SDSL8 port trains to the fixed rate provisioned for the ATU-C and ATU-R. The port will continue training to the provisioned fixed rate until it is successful. A Loss of Signal (LOS) condition is displayed for the port via DiamondView until training at the fixed rate is successful.

The following ATUC and ATUR data rate selections are used during the SDSL port training process based on the maximum data rate provisioned for the ATUC unit.

The SDSL8 port trains to a fixed data rate (192, 384, 768,1152 Kb/s) based on the provisioned rate. The SDSL port will train down to the next lower fixed data rate if the provisioned rate is less than the next higher data rate. For example, if the user enters a provisioned data rate of 200 Kb/s the SDSL port will train down to 192 Kb/s.

Table 13: ATU-C and ATU-R Provisioned and Actual Data Rates

Provisioned ATUC/ATUR Data Rates (Kb/s)	Actual ATUC/ATUR Data Rate (Kb/s)
0 – 383	192
384-767	384
768-1151	768
1152-12000	1152

The **Managed Interface** radio option buttons enable or disable event trapping for this port. For a DSL port, managed interface indicates to the Speedlink System that any loss of ability to provide service should be treated as an alarm condition. If disabled, alarms will be suppressed.

ATUC/ATUR RADSL Operation options are:

- **None** Fixed bit rate. An error message will be generated if the line/ connection cannot support the data rate entered.
- **Startup** Do rate adaptation during training. There is only training at startup. If there is a loss of signal (LOS) after startup, the system will not retrain and an error message is generated.
- **Dynamic** Do rate adaptation as the line conditions change. If the data rate of the connection degrades, the system will retrain to obtain a new (obtainable) data rate. Planned for a future release.

Please refer to Volume 4, Chapter 4 for additional information on SDSL Provisioning.

Clicking the **Advanced Configuration Parameters** command button will bring up the Advanced DSL Parameters dialog window:

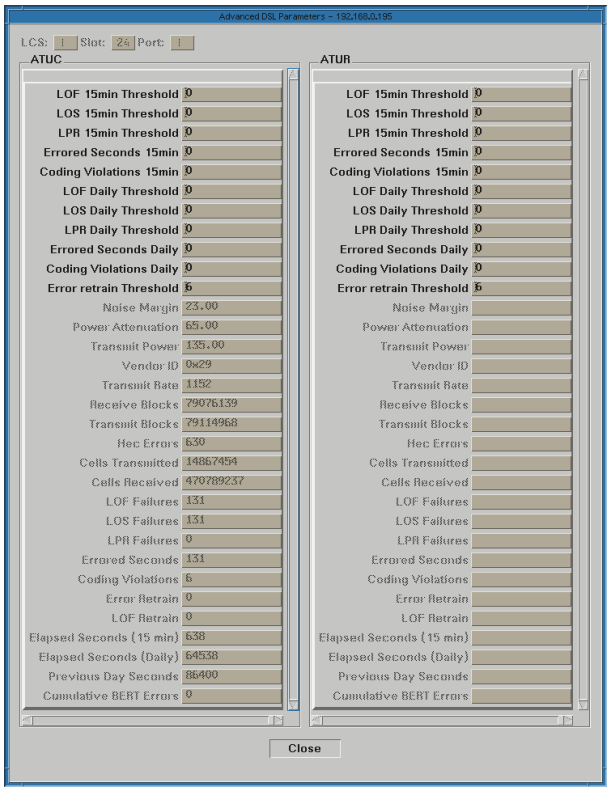


Figure 58: Advanced DSL Parameters Dialog Window

LOF Threshold Setting. Loss of Frame condition is monitored during Data Mode. Daily and 15 minute thresholds can be set for the ATU-C unit. The LOF Threshold setting is the number of seconds during which a LOF condition was present. An event or “trap” is reported to DiamondView when the LOF threshold is crossed. LOF Seconds (LOFS) are viewed on DiamondView’s System Events window. The default threshold setting is “0” (zero) or inactive. The LOF thresholds do not affect SDSL port operation.

LOS Threshold settings: Loss of Signal condition is monitored during Data Mode. Daily and 15 minute thresholds can be set for the ATU-C unit.

The LOS Threshold setting is the number of seconds during which a LOS condition was present. An event or “trap” is reported to DiamondView when the LOS threshold is crossed. LOS Seconds (LOSS) are viewed on DiamondView’s System Events window. The default threshold setting is “0” (zero) or inactive. The LOS thresholds do not affect SDSL port operation.

Loss of Power Signal Threshold: Loss of Power Signal (LPRS) threshold is set to monitor “power shut down” signals at the ATU-R. Planned for a future release.

Errored Seconds: Errored Seconds is the cumulative number of seconds the port is in a LOF, LOS, or CV condition. Errored Seconds are monitored during Data Mode. Daily and 15 minute thresholds can be set for the ATU-C and ATU-R units.

An event or "trap" is reported to DiamondView when the Errored Seconds threshold is crossed. Errored Seconds are viewed on DiamondView's System Events window. The default threshold setting is "0" (zero) or inactive. The Errored Seconds thresholds do not affect SDSL port operation.

Coding Violation Thresholds: The SDSL line card counts Coding Violation (CV) Errors for both the ATU-C and ATU-R units during Data Mode. The Coding Violation parameters have "thresholds" for reporting of an event or "trap" to DiamondView's System Events window. The default threshold setting is "0" (zero) or inactive. The CV thresholds do not affect SDSL port operation.

Coding Violation (CV) Threshold – 15 min. An event or "trap" is reported to DiamondView when the Current 15 Minute CV counter exceeds this threshold. This parameter is a count of Cyclic Redundancy Check (CRC) errored frames received.

Coding Violation (CV) Threshold – Daily. An event or "trap" is reported to DiamondView when the Daily CV counter exceeds this threshold. This parameter is a count of Cyclic Redundancy Check (CRC) errored frames received.

Table 14: Coding Violation Threshold Settings

Data Rate	192	384	768	1152	Sensitivity to CV Errors
Daily Settings	163055	326110	652220	978330	Low
	16560	33120	66241	99361	Medium Low
	1659	3317	6634	9952	Medium
	166	332	664	995	Medium High
	17	33	66	100	High
15 Min Settings	1698	3397	6794	10191	Low
	173	345	690	1035	Medium Low
	17	35	69	104	Medium High
	2	3	7	10	High

Error Retrain Threshold. The Error Retrain Threshold parameter determines the amount of "errored frames" allowed during Data Mode before the SDSL port retrains. The Error Retrain Threshold parameter range is from 10^{-4} BER to 10^{-7} BER (Bit Error Rate). The default setting is 6 or 10^{-6} BER for ATUC and ATUR units. The Error Retrain Threshold is fixed at the default setting of 6 or 10^{-6} BER.

The SDSL port has the functionality to measure channel “quality” established over the existing telephone copper network – the “local loop”. Actuals provided by the SDSL port about its operation are: Transmit Rate and Noise Margin and Power Attenuation.

- Transmit Rate is the actual data rate for the ATU-C unit.
- Noise Margin is the maximum tolerable increase in external noise power allowed on the line for the port to operate at 10^{-7} BER. The Noise Margin is measured in dB — it has a direct affect on the maximum local loop length supported for a provisioned fixed ATU-C/ATU-R data rate.
- Power Attenuation is the overall signal power attenuation or “decrease in power signal” over the local loop. Power Attenuation is expressed in dB.

The following fields are read-only:

Vendor ID	Displays the CPE manufacturer's vendor number. Planned for a future release.
Transmit Rate	Displays the current transmit rate at this end.
Receive Blocks	Displays the number of blocks received since last retrain. Planned for a future release.
Transmit Blocks	Displays the number of blocks transmitted since last retrain. Planned for a future release.
HEC Errors	Displays the number of HEC errors on this port since system reset.
Cells Transmitted	Displays the number of ATM cells transmitted on this port since system reset.
Cells Received	Displays the number of ATM cells received on this port since system reset.
LOF Failures	Displays the number of Loss of Frame errors on this port since physical performance monitoring counts were last cleared.
LOS Failures	Displays the number of Loss of Signal errors on this port since physical performance monitoring counts were last cleared.
LPR Failures	Displays the number of Loss of Power Signal errors on this port since physical performance monitoring counts were last cleared.

Errored Seconds	Displays the number of seconds during which CV frame errors occurred on this port since physical performance monitoring counts were last cleared.
Coding Violations	Displays the number of CV errors on this port since physical performance monitoring counts were last cleared.
Errored Retrain	Displays the number of retrains caused by errors on this port since physical performance monitoring counts were last cleared.
LOF Retrain	Displays the number of retrains caused by LOF errors on this port since physical performance monitoring counts were last cleared.
Elapsed Seconds (15 Minute)	Displays the number of seconds in the current 15 minute performance monitoring data interval.
Elapsed Seconds (Daily)	Displays the number of seconds in the current 15 minute performance monitoring data interval.
Previous Day Seconds	Displays the number of seconds in the previous one day performance monitoring data interval.
Cumulative Bert Errors	Displays the number of BERT receive errors for this port in the current performance monitoring interval.

SDSL Performance Monitoring

SDSL performance counts are monitored via DiamondView's DSL Performance Monitoring window. Clicking the **PM…** command button in the Line Card Shelf dialog window brings up the SDSL Performance dialog window:

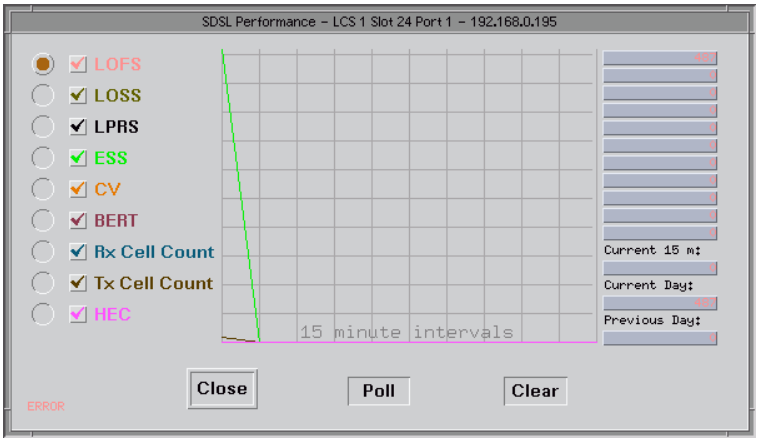


Figure 59: SDSL Performance Dialog Window

This dialog window displays an SDSL line card port's recent performance monitoring history.

SDSL Performance Counts

The line card counts SDSL Performance (LOFS, LOSS, ESS, CV, BERT, Rx Cell Count, Tx Cell Count and HEC) items during Data Mode. The SDSL8 line card maintains fourteen counters, for each of these performance items, the count begins when the line card powers up:

- Previous Day
- Current Day
- Current 15 Minute Interval
- **Previous 15 Minute Intervals** (up to 11 Previous 15 Minute Intervals)

The SDSL8 line card counts:

Loss of Frame Seconds (LOFS): The number of seconds in a Loss of Frame (LOF) condition.

Loss of Signal Seconds (LOSS): The number of seconds in a Loss of Signal (LOS) condition.

Loss of Power Signal (LPRS): The number of power shut down (Loss of Power Signals) at the ATU-R. Planned for a future release.

Errored Seconds (ESS): The cumulative number of seconds the port is in a LOF, LOS, and CV condition.

Coding Violations (CV): Counts the number of Cyclic Redundancy Check (CRC) errored frames received. ATU-R Coding Violations are measured in Far End Block Error (FEBE). FEBE is the number of "received" frames that contain a FEBE bit set. The receiver end sets the FEBE when it "receives" a CRC error frame. The FEBE is cleared in the next frame it transmits.

Bit Error Rate Test (BERT): The number of received errors during a BER Test.

Rx Cell Count: The number of valid, non-idle cells "received" on the line card port from the CPE and sent on to the LSM2 card.

Tx Cell Count: The number of valid, non-idle cells received from the LSM2 card and "transmitted" to the CPE.

Header Error Control (HEC): The number of received cells that have HEC errors detected in their header.

The check boxes control which performance monitoring data DiamondView displays in the window.

The radio option buttons control which error's data DiamondView displays in the performance monitoring bins on the right side of the window. The performance monitoring bins show error counts from oldest to most recent in the top 11 boxes. At the bottom of the right side this window displays the error number for: the current 15 minutes; the current day; the previous day.

DiamondView dynamically scales the error count graphs to show you relative error rates, and changes in counts by category over time.

The user can change which errors and counts to display by clicking the check box for that error / count, and DiamondView will update the graph as well.

Port Details – IDSL

Click on an IDSL card port with the right mouse button to display the IDSL Port Details dialog window.

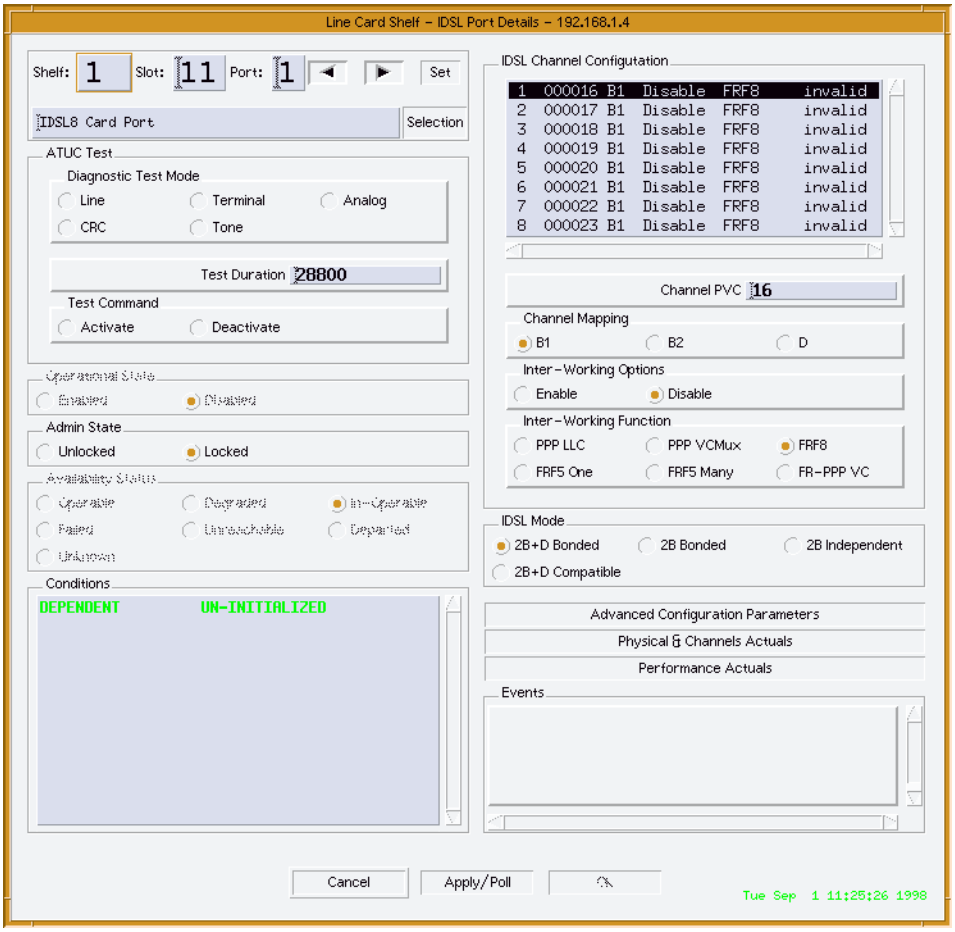


Figure 60: IDSL Port Details Dialog Window

The IDSL Port Detail dialog window displays the following information for the selected IDSL port:

- Address
- ATUC Test
- Operational State
- Admin State
- Availability Status
- Conditions
- IDSL Channel Configurations

- Events

The following address information is displayed at the top of the window:

- LCS shelf number, slot number, and port number.
- Left and right arrow buttons, for clicking through the slot numbers with the mouse. The **Set** button to the right of these buttons allows you to switch to single selection mode.
- Text box that displays the name of the currently selected card slot. The **Selection** button to the right of this text box allows you to switch to multiple selection mode.

The **Diagnostic Test Mode** radio buttons allow you to select the desired port loopback test mode:

- **Line**. This test loops back data from the CPE for testing the subscriber's line. (Not supported in this release.)
- **Terminal**. This test loops back the data from the LSM. This tests only the port's interface to the LSM.
- **Analog**. This test loops back the data from the LSM, like Terminal, but the data passes through the port's transceiver also, testing the analog components of the port.
- **CRC**. Send CRC errors to the CPE.
- **Tone**. Send a port ID tone out the loop to keep the loop active, and help identify to which port the far end is connected.

Test Duration. This field specifies the length of time to run port loopback testing before reporting a result. The default is 28800 seconds (8 hours).

Test Command group. These radio buttons control the port loopback testing:

- **Activate** to start up loopback testing.
- **Deactivate** to turn off loopback testing.

Admin State group. This group allows you to set the administrative state of the card to either locked or unlocked.

Conditions list. This scrollable list includes all conditions currently reported for the port.

IDSL Channel Configuration. This list includes all channels carried on the port. Selecting a channel displays the selected options for that channel in the field listed below:

See Volume 4, Chapter 5, for more information on IDSL provisioning.

Channel PVC. Contains the channel number of the PVC whose data is currently displayed.

Channel Mapping. These radio buttons identify what type of ISDN circuit is being carried by this channel. The options are:

- **B1** (One Bearer channel). Used for any of the four IDSL modes—**2B + D bonded**, **2B bonded**, **2B independent**, or **ISDN compatible**.
- **B2** (Two Bearer channels). Used for IDSL modes **2B independent** or **ISDN compatible**.
- **D** (One Data channel). Used for IDSL mode **ISDN compatible** only.

Inter-Working Options. Enables or disables the network interworking. If the far end is a Frame Relay connection, this option should be disabled. If the far end is an ATM connection, this option should be enabled.

Inter-Working Function. Sets the Frame Relay Inter-Working Function (IWF) protocol for the PVC. The options are:

- **PPPLLC**—PPP (Point-to-Point Protocol) over HDLC (High-Level Data Link Control), LLC (Logical Link Control) encapsulated. For this protocol, there is no equivalent of a VPI/VCI on the IDSL port, so only one connection is supported with a default mapping.
- **PPP VCMux—**PPP over HDLC, VC (Virtual Channel) multiplexed only. For this protocol, there is no equivalent of a VPI/VCI on the IDSL port, so only one connection is supported with a default mapping.
- **FRF8**—Frame Relay FRF.8 translated over HDLC, includes PPP over Frame Relay, LLC encapsulated. Translated protocols are supported for FRF.8 only.
- **FRF5 One**—Frame Relay FRF.5, one-to-one multiplexed over HDLC.
- **FRF5 Many**—Frame Relay FRF.5, many-to-one multiplexed over HDLC.
- **FR-PPP VC**—PPP over Frame Relay, without LLC encapsulation.

For any of the three Frame Relay IWF options, the trunk VPI/VCI is mapped to a specified Frame Relay DLCI on the IDSL port. Multiple connections can be supported by mapping trunk VPI/VCIs to a line card Data Link Connection Identifier (DLCI). The IDSL card can support a maximum of eight frame relay connections per port, and each card can support a maximum of twenty-one connections over all eight ports.

IDSL mode.This group allows you to select the mode the port will use to communicate with the CPE. The mode selected determines the data rate for the

port. The mode option used depends on the option specified in the **Channel Mapping** group, as follows:

- **2B + D Bonded**. 144 Kb/s. Used with mapping option **B1**.
- **2B Bonded**. 128 Kb/s. Used with mapping option **B1**.
- **2B Independent**. 2 B channels, 64 Kb/s each. Use with mapping options **B1** or **B2**.
- **2B + D compatible**. 2 B channels and a D channel operating in an ISDN protocol-compatible manner. Use with any of the three mapping options—**B1**, **B2**, or **D**.

Events. This scrollable list includes all traps currently reported.

The command buttons located below the **IDSL Channel Configuration** group (**Advanced Configuration Parameters**, **Physical & Channels Actuals**, and **Performance Actuals**) bring up windows that allow you to work with other IDSL parameters in detail. The dialog windows displayed using the command buttons are described in the following sections.

Clicking the **Advanced Configuration Parameters** command button from the Port Details dialog window brings up the Advanced Configuration Parameters dialog window for IDSL.

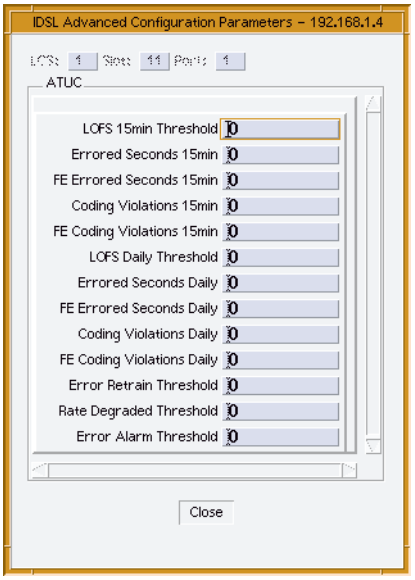


Figure 61: IDSL Advanced Configuration Parameters Dialog Window

This window allows you to view and work with ATUC alarm thresholds for the IDSL port. The Address fields at the top of the window display the shelf, slot, and

port number. The thresholds specify the point at which the specified condition will be reported. The individual threshold parameters are described in the following sections.

LOFS 15min Threshold. Total number of seconds during which the port detects a Loss of Frame (LOF) condition during the current 15-minute interval.

Errored Seconds 15min. Total number of seconds during which the port detects frame CRC errors during the current 15 minute interval.

FE Errored Seconds 15min. Total number of seconds during which the far end of the loop detects frame CRC errors during the current 15 minute interval.

Coding Violations 15min. Total number of Coding Violations (CV) detected by the port during the current 15-minute interval.

FE Coding Violations 15min. Total number of Coding Violations (CV) detected by the far end of this port during the current 15 minute interval.

LOFS Daily Threshold. Total number of seconds during which the port detects an LOFS condition during the current daily interval.

Errored Seconds Daily. Total number of seconds during which the port detects frame CRC errors during the current daily interval.

FE Errored Seconds Daily. Total number of seconds during which the far end of the loop detects frame CRC errors during the current day.

Coding Violations Daily. Total number of CVs that the far end of the loop detects during the current day.

FE Coding Violations Daily. Total number of CVs that the far end of the loop detects during the current day.

Error Retrain Threshold. Error rate at which this loop starts retraining, expressed as an inverse power of ten.

Rate Degraded Threshold. Errors per second rate, expressed as an inverse power of ten, below which the port will report the rate degraded condition.

Error Alarm Threshold. Errors per second rate, expressed as an inverse power of ten, below which the port will report an error condition. For example, a setting of 6 specifies a threshold of 10^{-6} errors per second.

Clicking the **Performance Actuals** command button from the Port Details dialog window brings up the Performance Actuals dialog window for IDSL.

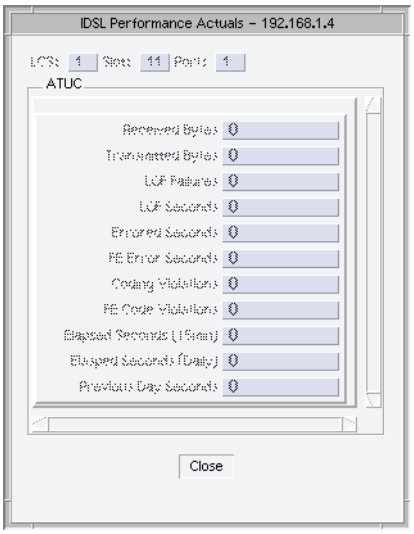


Figure 62: IDSL Performance Actuals Dialog Window

This window displays performance monitoring data for this loop. The Address fields at the top of the window display the shelf, slot, and port number. The rest of the window displays the data for the loop:

- **Received Bytes**. Bytes received on this DSL port since line card reset, or counter reset.
- **Transmitted Bytes**. Bytes transmitted on this DSL port since line card reset, or counter reset.
- **LOF Failures**. Loss of Frame (LOF) errors since line card reset, or since the physical performance monitoring data was cleared.
- **LOF Seconds**. Loss of Frame errored seconds detected at the far end since line card reset, or since the physical performance monitoring data was cleared.
- **Errored Seconds**. Seconds this port detected frame CRC errors since line card reset, or since the physical performance monitoring data was cleared.
- **FE Error Seconds**. Seconds the far end detected frame CRC errors since line card reset, or since the physical performance monitoring data was cleared.
- **Coding Violations**. Coding Violation (CV) errors since line card reset, or since the physical performance monitoring data was cleared.
- **FE Code Violations**. Coding violations the far end detected since line card reset, or since the physical performance monitoring data was cleared.

- **Elapsed Seconds (15 min)**. Displays the number of seconds in the current 15 minute performance monitoring data interval.
- **Elapsed Seconds (Daily)**. Displays the number of seconds in the current one day performance monitoring data interval.
- **Previous Day Seconds**. Displays the number of seconds in the previous one day performance monitoring data interval.

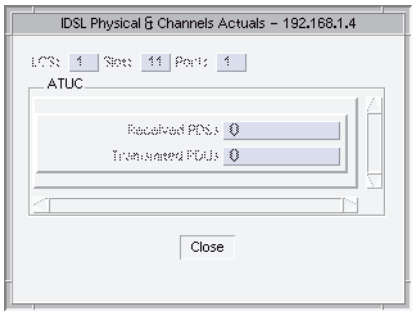


Figure 63: IDSL Physical & Channel Actuals Dialog Window

This window displays physical layer and channel layer performance data for this loop. The Address fields at the top of the window display the shelf, slot, and port number. The rest of the window displays the following information for the ATUC:

- **Received PDUs**. The total number of PDUs received on this channel, since line card reset, or counter reset.
- **Transmitted PDUs**. The total number of PDUs transmitted on this channel, since line card reset, or counter reset.

DMT Port

Click on the DMT card port with the right mouse button to display the DMT4 Port Details dialog window.

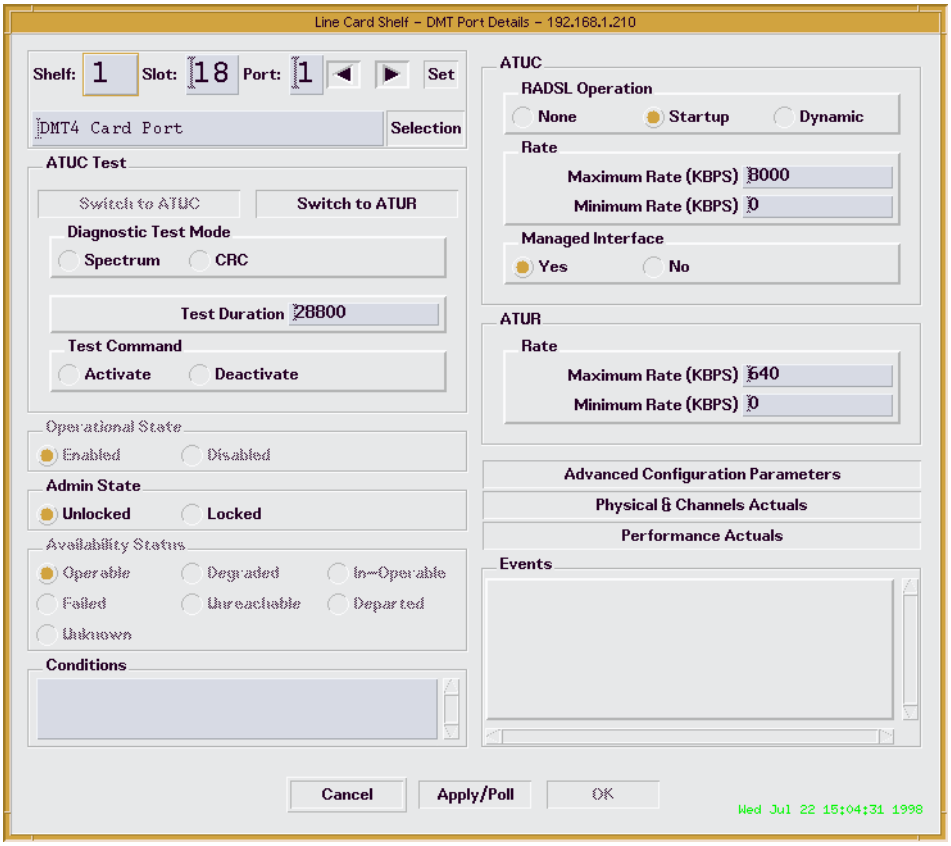


Figure 64: DMT4 Port Detail Dialog Window

The DMT Port Detail dialog window displays the following information for the selected DMT port:

- Address
- ATUC Test
- Operational State
- Admin State
- Availability Status
- Conditions
- ATUC operation (downstream data rate)
- Managed Interface
- ATUR operation (upstream data rate)

- Events

The following address information is displayed at the top of the window:

- LCS shelf number, slot number, and port number.
- Left and right arrow buttons, for clicking through the slot numbers with the mouse. The **Set** button to the right of these buttons allows you to switch to single selection mode.
- Text box that displays the name of the currently selected card slot. The **Selection** button to the right of this text box allows you to switch to multiple selection mode.

The **Diagnostic Test Mode** radio buttons allow you to select the desired port loopback test mode:

- **Spectrum**. The DSL puts out the same signal (the same frequency spectral composition) that it would if linked with a CPE DSL unit—this does not require any CPE on the line.
- **CRC**. Send CRC errors to the CPE.

Test Duration. This field specifies the length of time to run port loopback testing before reporting a result. The default is 28800 seconds (8 hours).

Test Command group. These radio buttons control the port loopback testing:

- **Activate** to start up loopback testing.
- **Deactivate** to turn off loopback testing.

Admin State group. This group allows you to set the administrative state of the card to either locked or unlocked.

Conditions list. This scrollable list includes all conditions currently reported for the DMT port.

RADSL Operation. This group allows you to select the Rate Adaptive DSL (RADSL) mode for the ATUC. The options are **None**, **Startup**, and **Dynamic**.

- **None** Fixed bit rate. An error message is generated if the line/ connection cannot support the data rate entered.
- **Startup** Do rate adaptation during training. There is only training at startup. If there is a Loss of Signal (LOS) condition after startup, the system does not retrain and an error message is generated.

- **Dynamic** Do rate adaptation as the line conditions change. If the data rate of the connection degrades, the system will retrain to obtain a new (obtainable) data rate. Planned for a future release.

ATUC and ATUR Rates. These groups allow you to set the maximum and minimum data rates for the ATUC and ATUR. The values are listed in the following table.

Table 15: DMT Provisioning Parameters

Parameter	Values	Units	Defaults
ATUR			
Maximum Rate[a]	32 through 640	Kb/s	640
Minimum Rate	32 through 640	Kb/s	0
ATUC			
Maximum Rate	32 through 8000	Kb/s	8000
Minimum Rate	32 through 8000	Kb/s	0

[a] All Rate values are set in multiples of 32 Kb/s.

Managed Interface group. These radio buttons enable or disable event trapping for the port. If enabled, this option indicates that any loss of ability to provide service should be treated as an alarm condition. If disabled, alarms will be suppressed.

Events. This scrollable list includes all traps currently reported.

The command buttons located below the ATUR Rate group (**Advanced Configuration Parameters**, **Physical & Channels Actuals**, and **Performance Actuals**) bring up windows that allow you to work with other DMT parameters in detail. The dialog windows displayed using the command buttons are described in the following sections.

See Volume 4, Chapter 3 for more information on DMT provisioning.

Clicking the **Advanced Configuration Parameters** command button from the Port Details dialog window brings up the Advanced Configuration Parameters dialog window for DMT4.

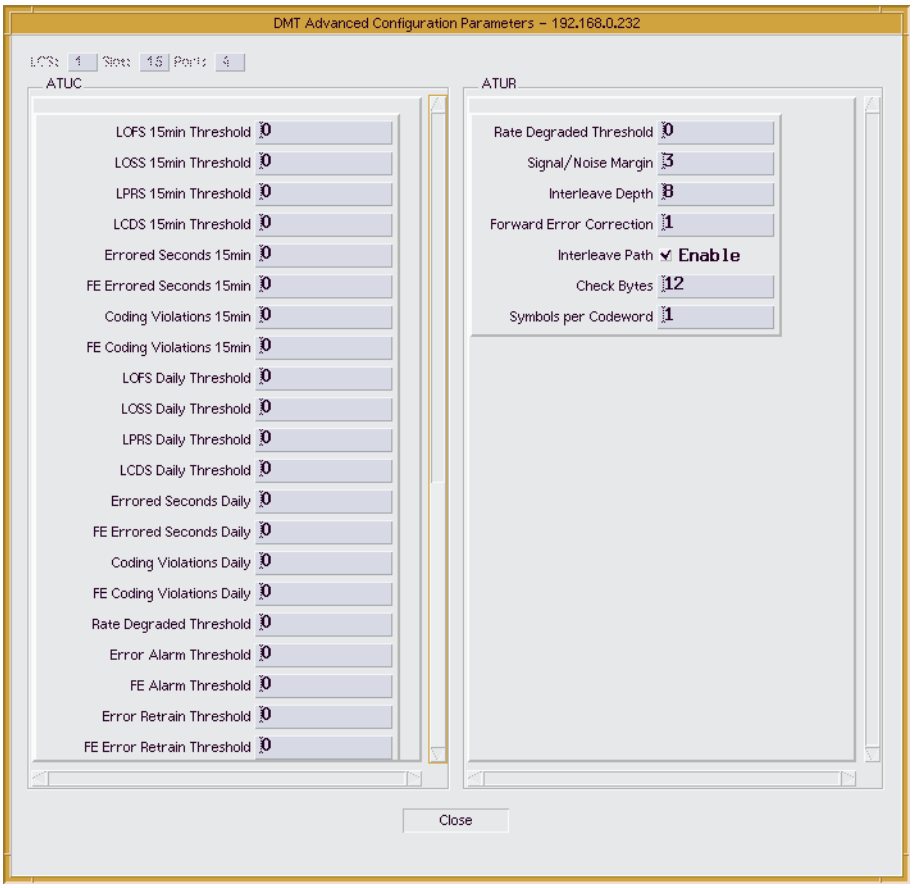


Figure 65: DMT4 Advanced Configuration Parameters Dialog Window

This window allows you to view and work with alarm thresholds for the DMT port. The Address fields at the top of the window display the shelf, slot, and port number. The window includes two groups—ATUC thresholds and ATUR thresholds. The thresholds specify the point at which the specified condition will be reported. The individual threshold parameters are described in the following sections.

The ATUC group allows you to set the following thresholds:

LOFS 15min Threshold. Total number of seconds during which the port detects a Loss of Frame (LOF) condition during the current 15-minute interval.

LOSS 15min Threshold. Total number of seconds during which the port detects a Loss of Signal (LOS) condition during the current 15-minute interval.

LPRS 15 min Threshold. Total number of seconds during which the port detects a Loss of Power (LPR) condition during the current 15-minute interval.

LCDS 15 min Threshold. Total number of seconds during which the port detects a Loss of Cell Delineation (LCD) condition during the current 15-minute interval.

Errored Seconds 15min. Total number of seconds during which the port detects frame CRC errors during the current 15 minute interval.

FE Errored Seconds 15min. Total number of seconds during which the far end of the loop detects frame CRC errors during the current 15 minute interval.

Coding Violations 15min. Total number of Coding Violations (CV) detected by the port during the current 15-minute interval.

FE Coding Violations 15min. Total number of Coding Violations (CV) detected by the far end of this port during the current 15 minute interval.

LOFS Daily Threshold. Total number of seconds during which the port detects an LOFS condition during the current daily interval.

LOSS Daily Threshold. Total number of seconds during which the port detects an LOS condition during the current daily interval.

LPRS Daily Threshold. Total number of seconds during which the port detects an LPR condition during the current daily interval.

LCDS Daily Threshold. Total number of seconds during which the port detects an LCD condition during the current daily interval.

Errored Seconds Daily. Total number of seconds during which the port detects frame CRC errors during the current daily interval.

FE Errored Seconds Daily. Total number of seconds during which the far end of the loop detects frame CRC errors during the current day.

Coding Violations Daily. Total number of CVs that the far end of the loop detects during the current day.

FE Coding Violations Daily. Total number of CVs that the far end of the loop detects during the current day.

Rate Degraded Threshold. Errors per second rate, expressed as an inverse power of ten, below which the port will report the rate degraded condition.

Error Alarm Threshold. Errors per second rate, expressed as an inverse power of ten, below which the port will report an error condition. For example, a setting of 6 specifies a threshold of 10^{-6} errors per second.

FE Alarm Threshold. BER at which an error condition is reported for the far end of the loop, expressed as an inverse power of ten. This rate is based on the number of Far End Bit Error (FEBE) events received from the far end.

Error Retrain Threshold. Error rate at which this loop starts retraining, expressed as an inverse power of ten.

FE Error Retrain Threshold. BER for the far end at which this loop starts retraining, expressed as an inverse power of ten. This rate is based on the number of FEBE events received from the far end.

Signal/Noise Margin. Downstream signal/noise margin, expressed in dB

Max PSD. Maximum Power Spectral Density, expressed in dBm/Hz.

Interleave Depth. Interleave depth setpoint (0 means no interleave). A long interleave depth provides more immunity to noise bursts, but increases latency.

Forward Error Correction. Enables (1) or disables (0) downstream forward error correction.

Interleave Path. Enables or disables interleaving for the port.

If enabled (the default) in conjunction with FEC, this option provides a more error-free connection, but with increased latency.

The interleave path and FEC groups should be disabled if latency is not tolerable—such as video-on-demand. However, if latency is tolerable—as in most internet applications—then the Interleave and FEC should be enabled.

A connection will experience errors if impulse noise corrupts the line when the Interleave is disabled. Set the **PGA Cutback Offset** (located on the DMT **Advanced** tab) to 0 dB if this group is enabled.

Check Bytes. Number of check bytes per codeword used downstream. A codeword is a series of data bytes followed by some number of checkbytes, which provide forward error correction on the data bytes.

Symbols per Codeword. Number of symbols per codeword.

Constant Margin Improvement. Enables or disables Constant Margin Improvement.

If Constant Margin Improvement is enabled (the default), the DMT DSL port identifies when coding gain is less effective and automatically reduces the data rate to provide an effective margin improvement.

If Constant Margin Improvement is disabled, the number of parity bytes is selected to provide a 6 dB coding gain, corresponding to a margin improvement of 6 dB.

RA Fast Path Margin. Enables or disables Rate Adaptive fast path margin. If enabled, the fast path margin is set to 6 dB. If enabled (the default), latency is decreased but there is less protection against noise. Interleave Path must be disabled if this group is enabled.

TCM. Enables or disables Trellis Coded Modulation (TCM). This functionality is planned for a future release.

FDQ. Enables or disables Frequency Domain Equalization (FDQ) adaptation. This functionality is planned for a future release.

PGA Cutback Offset. Programmable Gain Amplifier (PGA) gain, expressed in dB. The PGA Cutback Offset boosts the received signal gain. The default is 0 (zero) dB.

Bit Swap. Enables or disables bit swapping mode. Bit swapping is a DMT technique that exchanges data bins with high SNR for data bins with low SNR.

Bit swap is **not** recommended for rate adaptive loops, because rate adaptive loops have already optimized each data bin's margin to take advantage of the SNR in that frequency range. As a result, a rate adaptive loop should have little margin difference between data bins, and bit swapping should provide little advantage.

Margin Deficit Bitswap Threshold. The margin (in dB) at which a DMT bin's bit allocation should be reduced. If this level of margin is not available, this bin cannot carry a high enough bit rate to reliably transmit its current number of bits, and should be reduced to a lower bit rate.

Margin Excess Bitswap Threshold. The inverse of Margin Deficit Bitswap—sets the margin (in dB) at which a DMT bin's bit allocation should be increased. If more than the specified level of margin is available, the bin can reliably carry a higher bit rate than it currently does, and the line card should increase the bit rate for the bin.

The ATUR group allows you to set the following thresholds for the ATUR. See the descriptions of the ATUC thresholds for details on these parameters:

- Rate Degraded Threshold
- Interleave Depth
- Forward Error Correction

- Interleave Path
- Check Bytes
- Symbols per Codeword

Click the **Performance Actuals** command button on the DMT4 Port Details dialog window to display the DMT Performance Actuals dialog window.

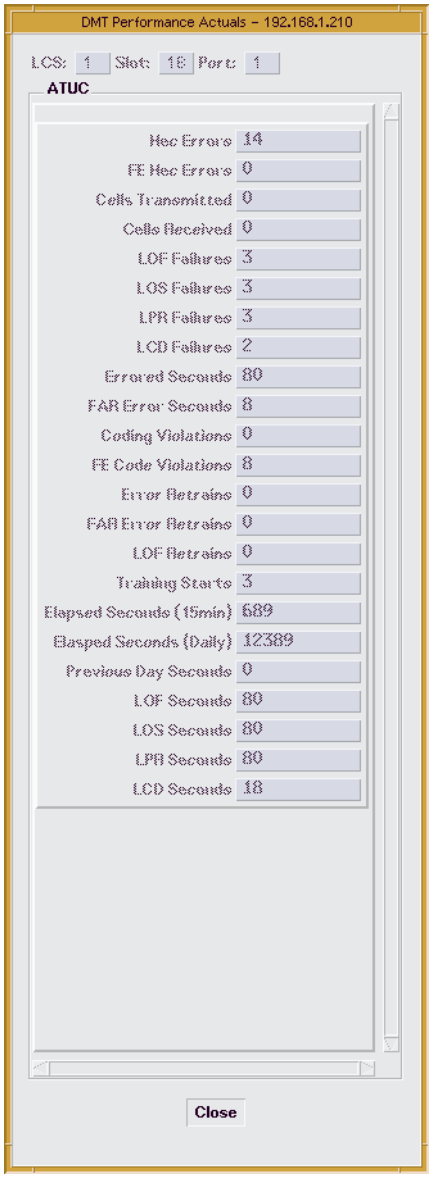


Figure 66: DMT4 Performance Monitoring Actuals Dialog Window

This window displays performance monitoring data for the loop.

The Address fields at the top of the window display the shelf, slot, and port number. Below the address information, a scrollable list displays the following data for the ATUC:

HEC Errors. HEC errors received on this DSL port since line card reset, or counter reset.

FE HEC Errors. HEC errors detected at the far end since line card reset, or counter reset.

Cells Transmitted. ATM cells transmitted on this DSL port since line card reset, or counter reset.

Cells Received. ATM cells received on this DSL port since line card reset, or counter reset.

LOF Failures. Loss of Frame errors since line card reset, or since the physical performance monitoring data was cleared.

LOS Failures. Loss of Signal errors since line card reset, or since the physical performance monitoring data was cleared. An LOS condition takes precedence over an LOF condition.

LPR Failures. Loss of Power errors since line card reset, or since the physical performance monitoring data was cleared. LPR indicates the far end is no longer transmitting.

The far end generates a distinctive signal as it loses power that enables the line card distinguish an LPR condition from an LOS condition. An LPR condition takes precedence over an LOS condition, which in turn takes precedence over LOF.

LCD Failures. Loss of Cell Delineation errors since line card reset, or since the physical performance monitoring data was cleared.

Errored Seconds. Total number of seconds this port detected frame CRC errors since line card reset, or since the physical performance monitoring data was cleared.

FAR Error Seconds. Total number of seconds the far end detected frame CRC errors since line card reset, or since the physical performance monitoring data was cleared.

Coding Violations. Coding Violation (CV) errors since line card reset, or since the physical performance monitoring data was cleared.

FE Code Violations. Coding violations detected by the far end since line card reset, or since the physical performance monitoring data was cleared.

Error Retrains. Retrains on this port triggered by errors since line card reset, or since the physical performance monitoring data was cleared.

FAR Error Retrains. Retrains initiated by crossing the far end retrain threshold since line card reset, or since the physical performance monitoring data was cleared.

LOF Retrains. Retrains on this DSL port triggered by LOF errors since line card reset, or since the physical performance monitoring data was cleared.

Training Starts. Number of times this port has attempted to train with a CPE. If the port does not find a CPE, it does not attempt to train. You can use this counter to determine if the port detects CPE at the far end.

Elapsed Seconds (15 min). Total number of seconds in the current 15-minute performance monitoring interval.

Elapsed Seconds (Daily). Total number of seconds in the current daily performance monitoring interval.

Previous Day Seconds. Total number of seconds in the previous daily performance monitoring interval.

LOF Seconds. Loss of Frame errored seconds detected at the far end since line card reset, or since the physical performance monitoring data was cleared.

LOS Seconds. Loss of Signal errored seconds detected at the far end since line card reset, or since the physical performance monitoring data was cleared.

LPR Seconds. Loss of Power errored seconds detected at the far end since line card reset, or since the physical performance monitoring data was cleared. LPR indicates that the far end is no long transmitting.

The far end generates a distinctive signal as it loses power that enables the line card distinguish an LPR condition from an LOS condition. An LPR condition takes precedence over an LOS condition, which in turn takes precedence over LOF.

LCD Seconds. Loss of Cell Delineation errored seconds detected at the far end since line card reset, or since the physical performance monitoring data was cleared.

Clicking on the **Physical & Channels Actuals** command button in the DMT4 Port Details dialog window displays the DMT Physical & Channels Actuals dialog window.

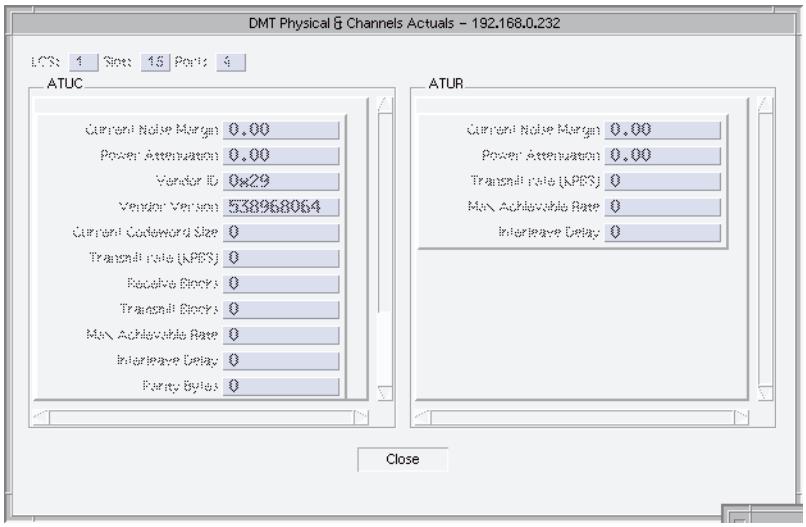


Figure 67: DMT4 Physical & Channel Actuals Dialog Window

This window allows you to view and work with physical layer and channel layer performance data for this loop. The Address fields at the top of the window display the shelf, slot, and port number. Below the address information, a scrollable list displays the data for each end of the connection (ATUC and ATUR).

The ATUC group includes the following parameters:

Current Noise Margin. Current noise margin of this loop, expressed in dB. The number of dB of noise that the loop can tolerate before it impairs the current bit rate.

Power Attenuation. Current measured difference between the transmit power level at the far end of the loop and the received power level at this end of the loop.

Vendor ID. Vendor ID of the CPE at the far end of the loop.

Vendor Version. CPE vendor equipment version number at the far end of the loop.

Current Codeword Size.

Transmit Rate. Downstream transmission rate set by training for the port.

Receive Blocks. Total number of blocks received on the channel, since line card reset, or counter reset.

Transmit Blocks. Total number blocks transmitted on the channel, since line card reset, or counter reset.

Maximum Achievable Rate. The maximum transmit rate for the ATUR and ATUC channels supportable on the line at the selected margin and at a 10^{-7} BER. Maximum Achievable Rate is measured in Kb/s.

Interleave Delay.

Parity Bytes.

Corrected Errors. Corrected errors per block.

Non-Corrected Errors. Detected but uncorrected errors per block.

FE Corrected. Corrected errors per block at the far end.

FE Non-Corrected. Detected but uncorrected errors per block at the far end.

The ATUR group allows you to view and work with the following parameters for the ATUR. See the descriptions for the ATUC group for details on these parameters:

- Current Noise Margin
- Power Attenuation
- Transmit Rate
- Maximum Achievable Rate
- Interleave Delay

LSM Card Details

The LSM card communicates with the Master Line Card Adapter (MLA) card over multi-mode optical cable at OC-3 rates. The LSM multiplexes and demultiplexes ATM cell streams for up to 24 line cards in a Line Card Shelf. The Line Card Shelf Multiplexer (LSM) card is installed in card slot 25.

Right-clicking the LSM object in the Line Card Shelf graphical window brings up the Line Card Shelf – Card Details dialog window (see page 64 for more information on the LCS – Card Details dialog window):

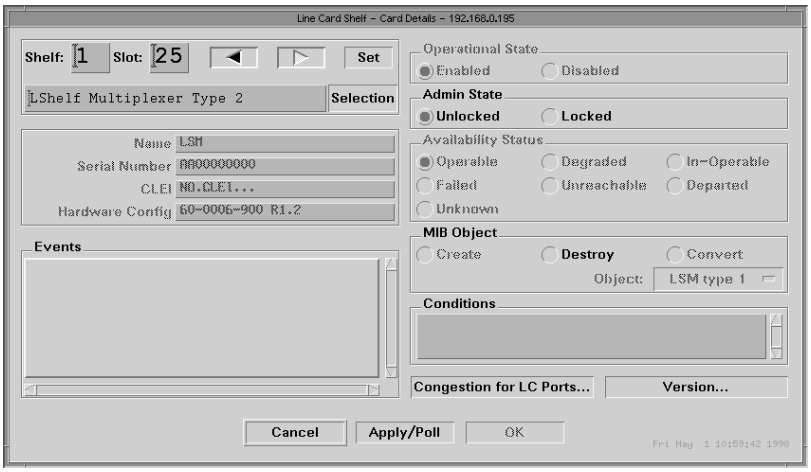


Figure 68: Line Card Shelf – Card Details Dialog Window (LSM)

From the Line Card Shelf graphical window use the mouse to select the port that you wish to monitor. Then click the **Congestion for LC Ports…** command button. This brings up the LSM ATM Congestion dialog window:

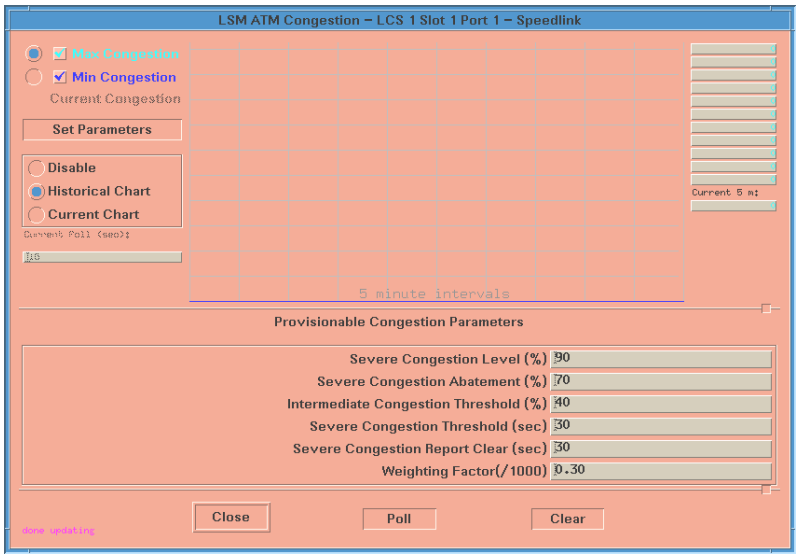


Figure 69: LSM ATM Congestion Dialog Window

Listed below are the provisionable parameters for LSM ATM congestion for network traffic management:

NOTE: These parameters are usable only after the screen display is pulled down.

- **Severe Congestion Level (%)** (Range: 1 – 100% Buffer Utilization, Default = 90%)

- **Severe Congestion Abatement Level (%)** (Range: 1 – 100% Buffer Utilization, Default = 70%, Where Severe Congestion is greater than Severe Congestion Abatement Level)
- **Intermediate Congestion Threshold (%)** (Range: 1 – 100% Buffer Utilization, Default = 40%)
- **Severe Congestion Report Active (sec)** (Range: 1 – 60 Seconds, Default = 30 seconds)
- **Severe Congestion Report Clear (sec)** (Range: 1 – 60 Seconds, Default = 30 seconds)
- **Congestion Weighting Factor(/1000)** (In steps of 0.001, Default: 0.300)

Use the **Set Parameters** command button after entering the congestion parameters.

There are two types of displays available for congestion information: Historical and Current. Radio option buttons are used to select a chart for Historical or Current data. The Max and Min Congestion radio option buttons and check boxes control which level is to be displayed.

- **Historical** 5 minute historical PM (performance monitoring) for a 1 hour period (graphical display of the smoothed 5 minute Maximum and Minimum values). This shows the trends and times of peak utilization of the ingress and egress buffers.
- **Current** Real-time display of current smoothed data. This shows a real-time representation of the current ingress and egress buffer utilization of the current ingress and egress buffer utilization used for monitoring in greater detail a specific event or current system operation.

Clicking the **Version…** command button brings up the Software Versions dialog box. This dialog box provides you information on the various software components, such as Release and Build number, the date and time when the Release was built.

LSM Port Settings

Clicking the port indicator on the LSM card object in the Line Card Shelf graphical window brings up the LSM Port Details dialog window. This dialog window provides more details about the LSM's port settings:

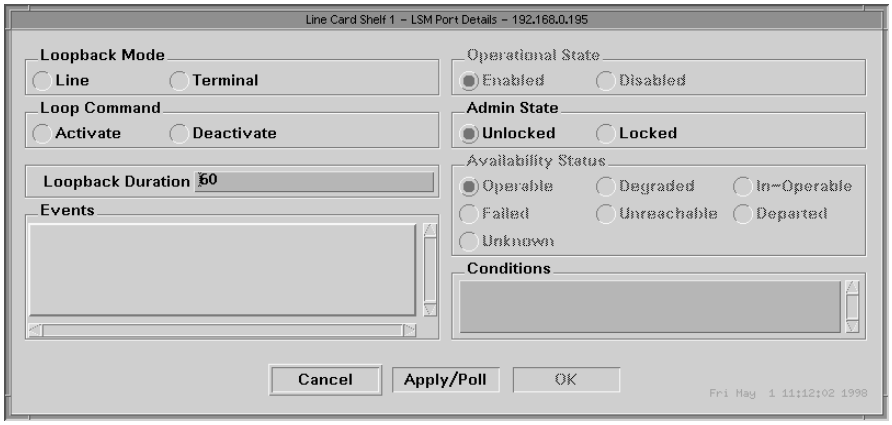


Figure 70: LSM Port Details Dialog Window

The **Loopback Mode** radio buttons control the LSM's loopback mode:

- **Line** The LSM will loopback any signal received from the MCS.
- **Terminal** The LSM will loopback any signal coming upstream to it.

The **Loop Command** radio buttons control whether the **Loopback Mode** controls are effective:

- **Activate** start loopback testing
- **Deactivate** stop loopback testing

The **Loopback Duration** numeric input field specifies how long to run the loopback test. The default duration is 60 seconds.

IMPORTANT: All diagnostic tests interrupt data flow through the system. Do not perform on a Speedlink System that is providing service. Only use diagnostic tests during acceptance test and turn-up procedures or in a lab environment to isolate trouble in the system.

Please refer to Volume 5, Chapter 4 for additional information on Diagnostic Test Modes.

System Connections

To display the System Connections dialog window, from the Multiplexer, MCS, or LCS graphical window, choose **Tools | Connections…**. This dialog window shows all connections currently in effect on this Speedlink System:

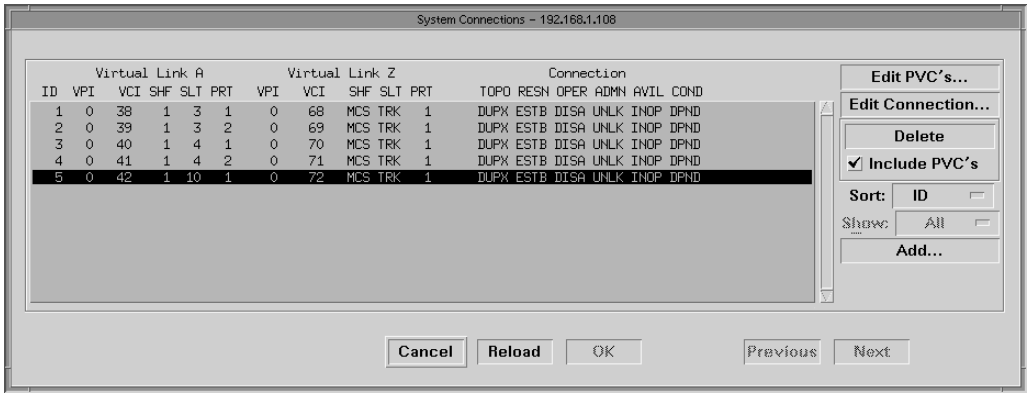


Figure 71: System Connections Dialog Window

The scrollable list box shows all connections carried by this multiplexer. The **ID** column identifies the connection number. Connection numbers go from 1 to 4096, and are assigned sequentially. As connections are unassigned, the multiplexer frees the connection number—but the multiplexer assigns new connection numbers at the top of the range, until the connection ID number wraps around to zero again. The multiplexer assigns available connection ID numbers to new connections.

The VPI, VCI, SHF, SLT, and PRT columns correspond to the VPI, VCI, shelf, slot, and port numbers described in the **Add PVCs** dialog window, starting on page 124.

The **Edit PVCs...** button brings up the **PVCs Details** dialog window, allowing you to edit an existing PVC's endpoints (described on page 127).

The **Edit Connection...** button brings up the **Connection Details** dialog window (described on page 130: allowing you to alter characteristics of this connection, though not its endpoints.

The **Delete** button deletes the currently selected PVC or PVCs.

The **Sort** menu controls the sort order of the connections.

The **Show** menu controls which connections DiamondView displays.

The **Add...** button brings up the **Add PVCs and Connections** dialog window (starting on page 124) to add a new connection.

The **Reload** button refreshes the PVC list from the Speedlink System.

Data Generation Options

To display the System Connections dialog window, from the Multiplexer, MCS, or LCS graphical window, choose **Tools | Generation…**. The Data Generation Options dialog window will appear:

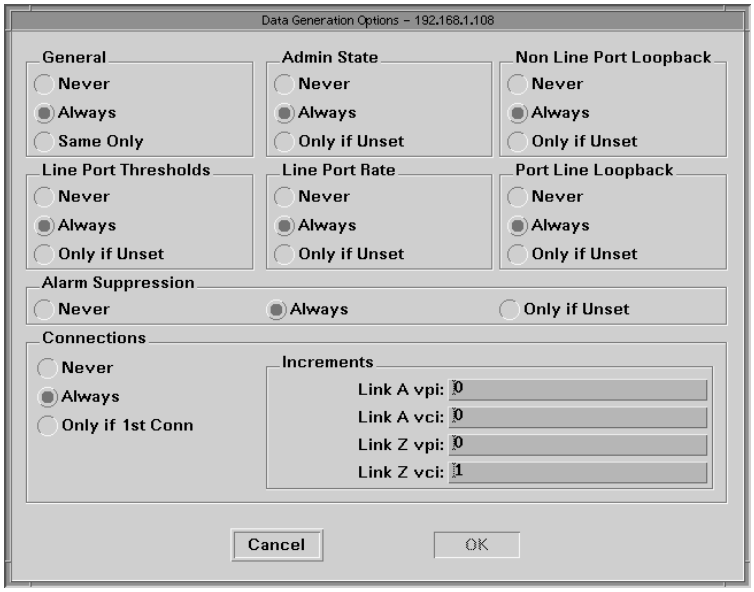


Figure 72: Data Generation Dialog Window

Group Operations: The first six group boxes (General, Admin State, Non Line Port Loopback, Line Port Thresholds, Line Port Rate, and Port Line Loopback) are masks to filter changes from multi-selected objects and control whether group operations apply to the category. The "**Only if Unset**" only applies if the status is not yet set.

The **General** group box is used to override the rest of the group box selections if the user has setup a "multiple" selection. The "**Same Only**" option in the General group box means that only the first card type selected will be applied if there is more than one card type selected in a "multiple" selection.

Alarm Suppression: In the Alarm Suppression group box: **Never** turns off alarm suppression. **Always** (default) turns on alarm suppression. The "**Only if Unset**" only applies if the status is not yet set.

Connections: In the Connections group box: **Never** turns off the ability to generate connections; **Always** generates the connections regardless of connections currently on the port; and the **Only if 1st Conn** specifies that if there is already a connection on the Port, it will not generate another one.

Increments: When you create a group of connections using the Data Generation option, each subsequent VCI increments by one (with the VPI incrementing when

the VCI wraps around). If for any reason this VPI/VCI is already allocated, the Increments group box contains four fields that specify how much to increment the value before trying again.

The default setting for all group boxes in the Data Generation Options dialog window is "**Always**".

System Events

To display the System Events dialog window, from the Multiplexer, MCS, or LCS graphical window, choose **Tools | Events…**. The Events dialog window displays any outstanding events associated with the Speedlink System at the multiplexer level.

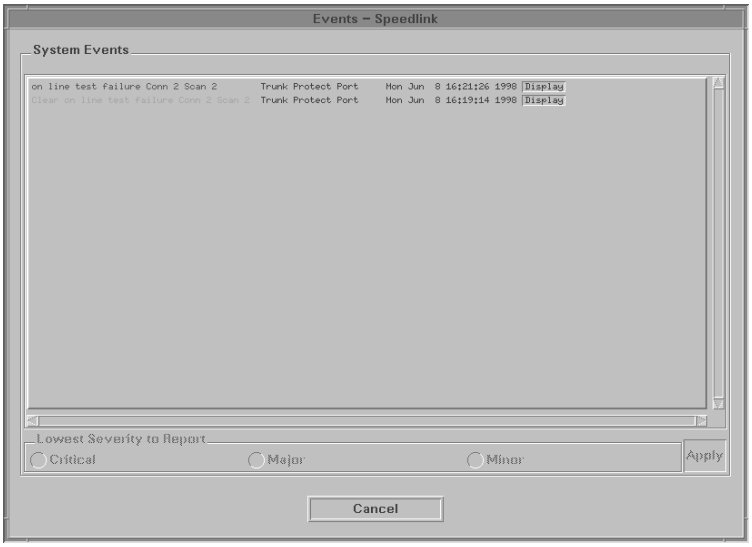


Figure 73: System Events Dialog Window

The **Lowest Severity Report** radio buttons specify the lowest severity of events that DiamondView should report. If there are no events in the dialog window, you may not select a severity level.

The **Apply** button sends this control information to the Speedlink System.

System Options

To display the Options dialog window, from the Multiplexer, MCS, or LCS graphical window, choose **Tools | Options…**. This dialog window controls DiamondView's object polling, command caching, and mouse control options:

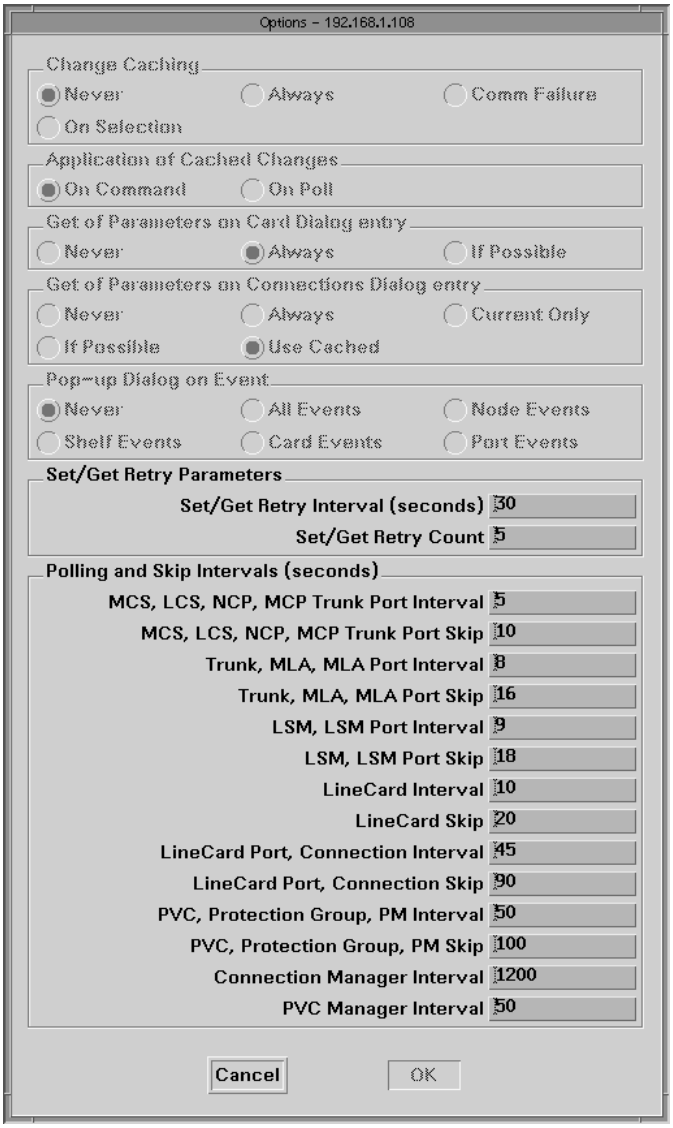


Figure 74: Options Dialog Window

The **Change Caching** radio buttons control whether DiamondView sends commands to the multiplexer immediately, or caches them to send later. Planned for a future release.

The buttons are:

- **Never** DiamondView applies commands when the user hits **OK** or **Apply/Poll**, and waits for a response before proceeding.
- **Always** DiamondView caches commands, and does not send them to the multiplexer until the user says to send them from the Command Application dialog window (not implemented in this Release).
- **Comm Failure** If DiamondView cannot successfully communicate with the multiplexer, it caches commands until the communication failure corrects itself.
- **On Selection** If the user picks the multiple selection mode in a dialog window, DiamondView sends the first command to the multiplexer immediately, but caches the rest of the requests.

The **Application of Cached Changes** radio buttons control when DiamondView sends cached commands:

- **On Command** Do not send the cached commands until you make the request in the **Command Application** dialog window (not implemented in this release).
- **On Poll** Wait until DiamondView next polls the affected object.

The **Get of Parameters on Card Dialog Entry** radio buttons control if DiamondView retrieves data from the multiplexer before bringing up a Card dialog window:

- **Never** Always use DiamondView's current copy of the multiplexer's MIB.
- **Always** Always retrieve fresh information about this card from the multiplexer's MIB.
- **If Possible** Retrieve fresh information about this card from the multiplexer's MIB if the system can do so within the card polling retry interval; otherwise, use DiamondView's copy of the MIB.

The **Get of Parameters on Connections Dialog Entry** radio option buttons control if DiamondView retrieves data from the multiplexer before bringing up a Connections dialog window.

- **Never** Always use DiamondView's current cached copy of the multiplexer's MIB.
- **Complete** Always retrieve fresh information about all system connections from the multiplexer's MIB.

- **Current Only** Always retrieve fresh information from the multiplexer's MIB about connections associated with the currently selected port.
- **If Possible** Retrieve fresh information about this connection from the multiplexer's MIB if the system can do so within the card polling retry interval; otherwise, use DiamondView's copy of the MIB.
- **Use Cached** Poll the multiplexer, but if the multiplexer does not respond before it times out, use the current cached copy of the multiplexer's MIB.

The **Pop-Up Dialog on Event** radio buttons control if an event dialog window pops up when DiamondView receives an event from the multiplexer:

- **Never** Never pop-up an event dialog window.
- **All Events** All events pop-up an event dialog window.
- **Node Events** All events associated with the entire multiplexer pop-up an event dialog window.
- **Shelf Events** All events associated with any shelf pop-up an event dialog window.
- **Card Events** All events associated with any card pop-up an event dialog window.
- **Port Events** All events associated with any port pop-up an event dialog window.

The **Set Retry Parameters** input fields control how often and how many times DiamondView polls the multiplexer.

- **Set/Get Retry Interval** This field specifies the number of seconds before DiamondView makes a retry attempt.
- **Set/Get Retry count** This field specifies the number of times that DiamondView will retry.

The first time during a session that DiamondView exceeds this retry count, it pops up a dialog window to warn you. DiamondView logs subsequent failures during the same session to disk, but it does not report these failures to you through the pop-up dialog window.

The **Polling and Skip Interval** groups all work the same way. Each controls how often DiamondView polls the multiplexer for MIB changes associated with this class of objects. For each group, the two fields perform identical functions for each class of objects:

- **Interval** This is the number of seconds between regular polls for this class of objects.
- **Skip** If DiamondView has retrieved information associated with this class of objects within this many seconds, do not do a regular poll, even if the regular polling interval has expired. Put another way, DiamondView polls a class of object every **Interval** seconds, but if some transaction has caused DiamondView to retrieve information from that class of objects in the last **Skip** seconds, do not bother polling again.

The default settings are those shown in the Options dialog window on page 116.

Event Severity

To display the Events Severity dialog window, from the Multiplexer, MCS, or LCS graphical window, choose **Tools | Event Severity…**. This dialog window controls the severity of events that the Speedlink Multiplexer reports to DiamondView:

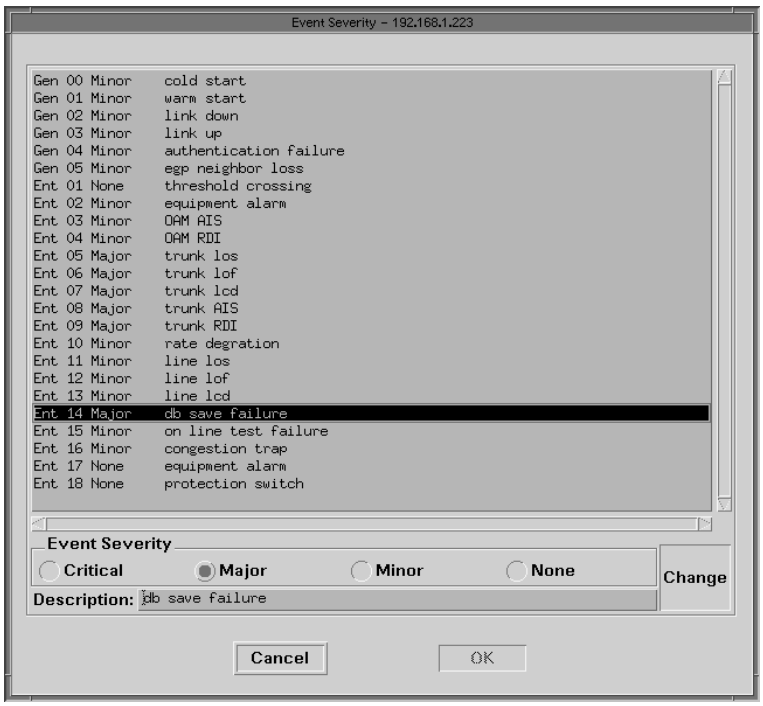


Figure 75: Event Severity Dialog Window

This dialog window displays a list of all the events that the Speedlink Multiplexer can report to DiamondView, and allows you to change (filter) the severity of that class of events. You change the severity of the class of events by selecting an event (or events) from the list, then selecting the **Event Severity** level by using the radio

option buttons. Then select the **Change** button to apply those changes to the multiplexer.

Transaction Errors

To display the Errors dialog window, from the Multiplexer, MCS, or LCS graphical window, choose **Tools | Errors…**. This dialog window shows all of DiamondView's SNMP transactions that failed to complete before they timed out:

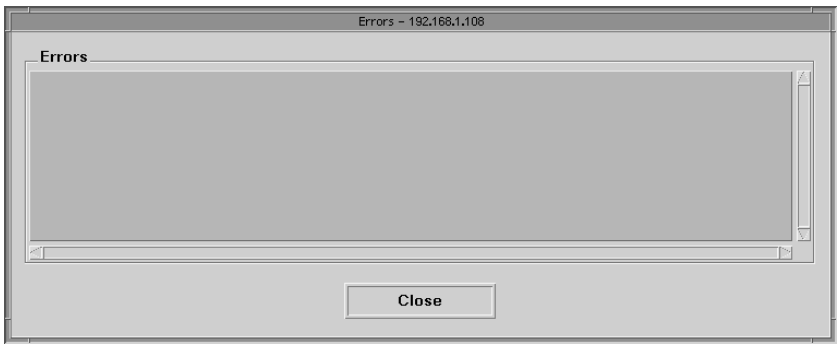


Figure 76: Transaction Errors Dialog Window

Environmental Alarms

To display the Environmental Alarms dialog window, from the Multiplexer, MCS, or LCS graphical window, choose **Tools | Alarms…**.

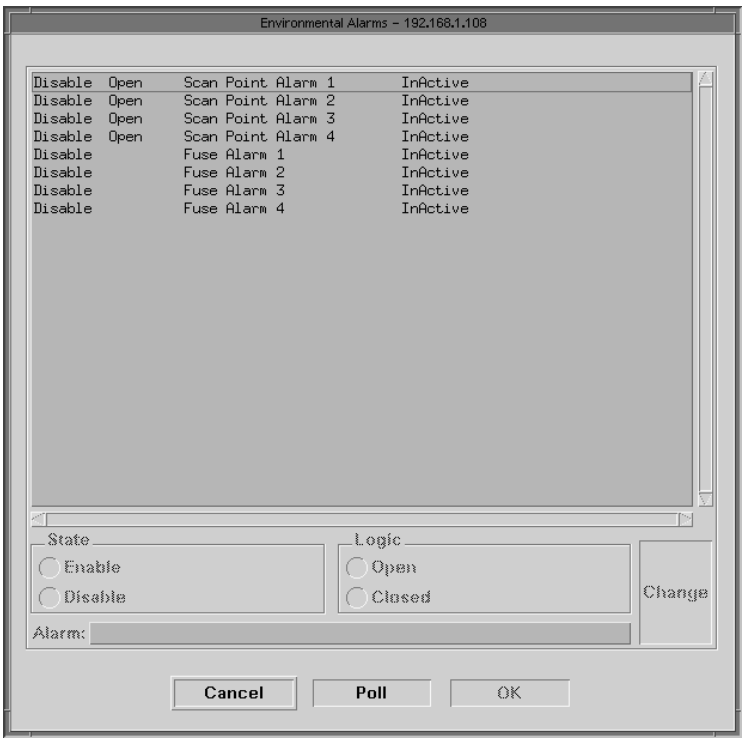


Figure 77: Environmental Alarms Dialog Window

Scanpoint Alarm: There are four Scanpoint Alarms that can be set for auxiliary equipment. Enable or disable Scanpoint Alarms by selecting the Enable/Disable State radio option buttons. If you have used an Active/High connector on your auxiliary equipment, set the Alarm Logic option accordingly.

Fuse fail Alarm: There are four Fuse fail Alarms corresponding to the fuse alarm connections provided for each Relay Rack in the Speedlink System (see Volume 2, Chapter 10 for additional information regarding Fuse Alarm Connections). Enable or disable the Fuse fail Alarm by selecting the Enable/Disable State radio option button. The Alarm Logic Active High/Active Low option buttons for the Fuse fail Alarms are read-only.

Click the **Change** command button to apply any changes.

Trap Suppression

To display the Trap Suppression dialog window, from the Multiplexer, MCS, or LCS graphical window, choose **Tools | Suppression…**. The Trap Suppression dialog window allows the user to suppress particular traps from objects, for severities, for types, and to trap recipients.

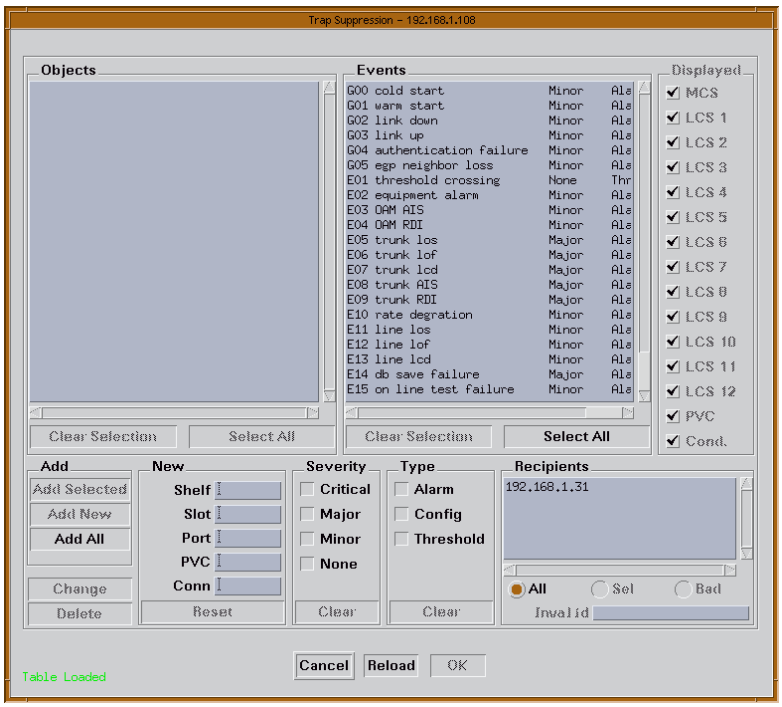


Figure 78: Trap Suppression Dialog Window

When the user selects a particular combination of trap characteristics, by selecting an event, an event severity, event type, and object, all of these characteristics are logically “ANDed”. This means that if the user selects event E11, Critical, Alarm,

Recipient 192.168.1.200 for LCS 1, Slot 1, Port 2, ONLY event E11, of critical severity, alarm type, from LCS 1, Slot 1, Port 2 are suppressed. Any events that do not have all those characteristics will still be reported.

The **Objects** list box shows all the objects that have particular traps suppressed. If there are no objects in the Objects list box, then there are no traps suppressed. The **Clear Selection** command button at the bottom of the Objects list box deselects every object that the user has selected. The **Select All** command button selects all objects in the Objects list box.

The **Events** list box shows all the traps defined for the Speedlink System, their current text string, and their severity. Use the mouse to select particular traps to suppress. Multiple traps can be selected with the SHIFT and CONTROL keys and a left mouse click. To deselect all current traps in the list box, click the **Clear Selection** command button at the bottom of the Events list box. To select all traps, click the **Select All** command button at the bottom of the Events list box.

The **Displayed** group shows which classes the current trap suppression settings are displayed. This information is read-only.

Across the bottom of the Traps Suppression dialog window are several group boxes. The Add group box contains the following command buttons:

- **Add Selected** Not supported in this Release.
- **Add New** Adds the object specified by the New group box to the Objects list box, with the trap characteristics currently selected in the Severity, Type, Events and Recipients groups.
- **Add All** For all objects in the Speedlink System, adds the trap characteristics currently selected in the Severity, Type, Events and Recipients groups.
- **Change** If a particular object (or objects) in the Objects list box has already been selected, and you want to change what traps should be suppressed for that object, make the changes in the Severity, Type, Events and Recipients groups. Then select the Change command button. The previous trap suppression characteristics will be replaced with the new ones.
- **Delete** To completely remove trap suppression for a particular object use the Delete command button.

To select a particular object you want to suppress traps, go to the **New** group box. The fields **Shelf**, **Slot**, **Port**, **PVC** and **Conn** accept numeric inputs for the LCS, slot, port number VPI and VCI, and connection to create a trap suppression entry. For the Master Control Shelf, enter “0” or MCS.

The **Severity** group contains check boxes indicating the severity of trap(s) to suppress. The **Clear** command button clears all of the check boxes.

The **Type** group box contains check boxes that identify what type of trap(s) that you wish to suppress:

Alarm	A standing alarm state change has taken place.
Config	The EEPROM copy of the database has been changed.
Threshold	The object experienced a threshold crossing event.

The **Clear** command button clears all of the check boxes in the Severity group.

The **Recipients** list box shows all valid trap recipients. Select (or multiple select) the IP address of each recipient that should not receive a trap.

The radio option buttons ALL, SEL and BAD identifies which trap recipients in the list box are selected:

ALL	Select all trap recipients.
SEL	Select only the highlighted trap suppression entries.
BAD	Indicates that the IP address selected in the list box is not a valid trap recipients address as defined in the System Options dialog window.

Add PVCs and Connections

To Add PVC's and Connections, select **Connections…** from the Tools on the menu of the LCS graphical window. From the System Connections dialog window click the **Add…** command button. The Add PVC's and Connections dialog window will appear.

Use this dialog window to add PVCs and Connections:

Figure 79: Add PVCs and Connections Dialog Window

Virtual Link A is the line card side of a PVC; **Virtual Link Z** is the trunk side of a PVC. Most of the fields in this window appear for both **A** and **Z**.

The **VPI/VCI** fields at the top of both A and Z's windows specify the ATM circuit address for each end of the connection. The **Select...** button lets you pick from any reserved VPI/VCI that is not yet part of a PVC.

The **shelf**, **slot**, and **port** input fields specify the address where the line card side of the PVC terminates. For a PVC that connects a line card and a trunk, these fields are only meaningful for **Virtual Link A**.

The **Service Category** radio option buttons specify characteristics of the ATM service carried on this PVC:

UBR Unspecified Bit Rate – A UBR connection transmits at variable rates on an ATM network. UBR transmissions are not time-critical – the ATM network will give a UBR connection a “best effort” priority.

CBR Constant Bit Rate – A CBR connection transmits data at a fixed rate on an ATM network. Typical applications are digitized voice, fixed-rate uncompressed video, etc. Planned for a future release.

VBR Variable Bit Rate – A VBR connection transmits in bursts, at variable speeds on an ATM network. Typical applications are interactive video, file transfers, image transfers, etc. Planned for a future release.

ABR Available Bit Rate – ABR is an ATM service class that permits users to dynamically access available bandwidth not being used by other ATM services. ABR does not guarantee a specific amount of bandwidth. Planned for a future release.

UBR-EPD Unspecified Bit Rate-Early Packet Discard – A UBR-EPD connection transmits at variable rates on an ATM network with an early packet discard option. UBR relies on TCP (packet based) to deal with traffic congestion. If a cell is lost, TCP will retransmit the packet. Using the EPD option, if a cell is dropped, the whole packet is dropped except for the very last cell. The last cell is not dropped in order to permit TCP to identify a packet error and request an immediate re-transmission. Planned for a future release.

The **OAM Configuration** radio option buttons control whether **O**perations **A**nd **M**aintenance ATM cells will be sent on this PVC.

The **End Point Configuration** radio option buttons control how this virtual link processes ATM loopback cells:

- **None** This virtual link performs no ATM loopback cell processing.
- **Segment** This virtual link is treated as a segment-type loopback cell node. Segment loopback cells will loop back to the other end of this ATM connection.
- **End to End** This virtual link is treated as an end-to-end-type loopback cell node. End-to-end loopback cells will loop back to the other end of this ATM connection.

- **Both** This virtual link is treated as both a **Segment** and **End-to-End** loopback cell node. Both types of loopback cells will loop back to the other end of this ATM connection.

The **Loopback Cell Type** specifies what type of ATM loopback cell the Speedlink System sends out to the other end of this connection. These cell types will be looped back by another virtual link with a type corresponding to those listed under **End Point Configuration**.

The **Loopback Activate** radio option buttons control whether to send an ATM loopback cell or not. The **None** button sends nothing; the **Activate** button sends one ATM loopback cell.

Loopback Destination ID is a 16-character string indicating where the OAM loopback cell should go. A destination ID is normally identified if the loopback point is not a segment or end-to-end endpoint. If this field is blank, the loopback location will be the end point specified by the **End Point Configuration** parameter.

Please refer to Volume 5, Chapter 5 for additional information on OAM Loopback testing.

The **Topology** radio buttons describes what directions this PVC sends data:

- **Duplex** This connection transmits data both directions through this port.
- **Simplex AZ** This connection transmits data up from the port only.
- **Simplex ZA** This connection transmits data down to the port only.

Generate for Selected Line Ports specifies to apply transactions only to the line ports that were previously selected in the LCS graphical window.

All Ports on Selected LCS Shelves specifies to apply transactions to ALL ports on the LCS shelf.

Select **VP Connection** to setup a Virtual Path (VP) without having to set up individual Virtual Circuits within the VP. For example, if multiple PCs connected to a single ADSL router at the remote end CPE, use the VP Connection option to configure the same parameters for all nodes attached to the router.

Edit PVCs and Connections

To Edit PVC's and Connections click the **Edit PVC's…** command button from the Connections – LCS Port dialog window (or by clicking the Edit PVC's command button on the Systems Connections dialog window, shown below).

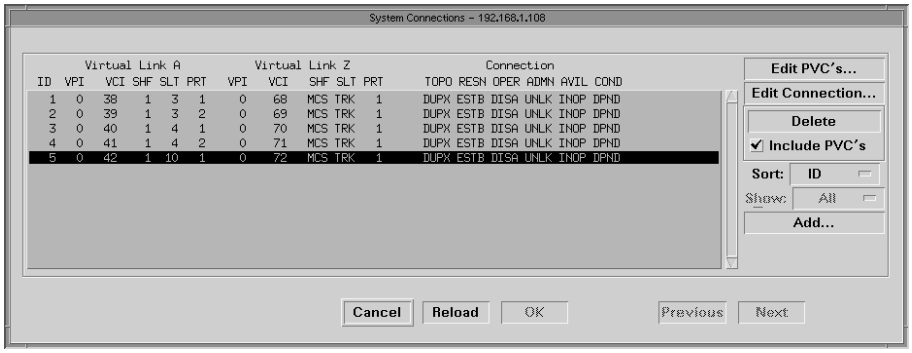


Figure 80: System Connections Dialog Window

This brings up the PVC Details dialog window:

Figure 81: Edit PVC Dialog Window

The VPI/VCI, shelf, slot, and port information for **Virtual Link A** and VPI/VCI information for **Virtual Link Z** is read-only.

The **Service Category** radio option buttons specify characteristics of the ATM service carried on this PVC:

- **UBR** Unspecified Bit Rate – A UBR connection transmits at variable rates on an ATM network. UBR transmissions are not time-critical – the ATM network will give a UBR connection a “best effort” priority.
- **CBR** Constant Bit Rate – A CBR connection transmits data at a fixed rate on an ATM network. Typical applications are digitized voice, fixed-rate uncompressed video, etc. Planned for a future release.
- **VBR** Variable Bit Rate – A VBR connection transmits in bursts, at variable speeds on an ATM network. Typical applications are interactive video, file transfers, image transfers, etc. Planned for a future release.
- **ABR** Available Bit Rate – ABR is an ATM service class that permits users to dynamically access available bandwidth not being used by other ATM services. ABR does not guarantee a specific amount of bandwidth. Planned for a future release.
- **UBR-EPD** Unspecified Bit Rate-Early Packet Discard – A UBR-EPD connection transmits at variable rates on an ATM network with an early packet discard option. UBR relies on TCP (packet based) to deal with traffic congestion. If a cell is lost, TCP will retransmit the packet. Using the EPD option, if a cell is dropped, the whole packet is dropped except for the very last cell. The last cell is not dropped in order to permit TCP to identify a packet error and request an immediate re-transmission. Planned for a future release.

The **OAM Configuration** radio option buttons control whether **O**perations **A**nd **M**aintenance ATM cells will be sent on this PVC.

The **End Point Configuration** radio option buttons control how this virtual link processes ATM loopback cells:

- **None** This virtual link performs no ATM loopback cell processing.
- **Segment** This virtual link is treated as a segment-type loopback cell node. Segment loopback cells will loop back to the other end of this ATM connection.
- **End to End** This virtual link is treated as an end-to-end-type loopback cell node. End-to-end loopback cells will loop back to the other end of this ATM connection.

- **Both** This virtual link is treated as both a **Segment** and **End-to-End** loopback cell node. Both types of loopback cells will loop back to the other end of this ATM connection.

The **Loopback Cell Type** specifies what type of ATM loopback cell the Speedlink System sends out to the other end of this connection. These cell types will be looped back by another virtual link with a type corresponding to those listed under **End Point Configuration**.

The **Loopback Activate** radio option buttons control whether to send an ATM loopback cell or not. The **None** button sends nothing; the **Activate** button sends one ATM loopback cell.

The **Loopback Result** radio option buttons are read-only.

Loopback Destination ID is a 16-character string indicating where the OAM loopback cell should go. A destination ID is normally identified if the loopback point is not a segment or end-to-end endpoint. If this field is blank, the loopback location will be the end point specified by the **End Point Configuration** parameter.

Please refer to Volume 5, Chapter 5 for additional information on OAM Loopback testing.

Connection Details

The Connection Details dialog window displays details about connections associated with a particular line card port (obtain this window by clicking the **Edit Connection…** button in the System Connections dialog window):

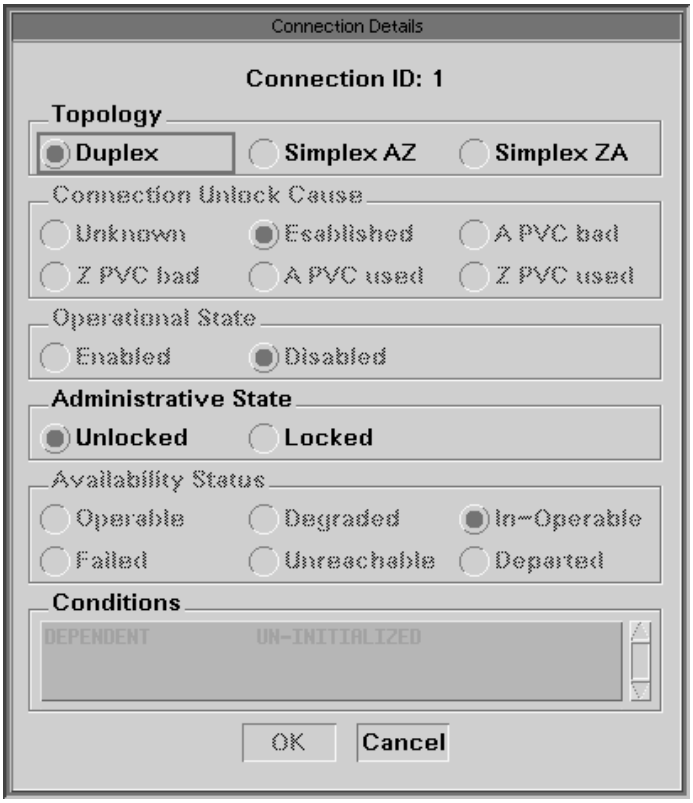


Figure 82: Connection Details Dialog Window

The **Connection ID** string identifies this connection.

The **Topology** radio option buttons describes what directions this PVC sends data:

- **Duplex** This connection transmits data both directions through this port.
- **Simplex AZ** This connection transmits data up from the port only.
- **Simplex ZA** This connection transmits data down to the port only.

The **Connection Unlock Result** radio buttons are read-only, and show what happened when this connection was unlocked:

- **Unknown** The unlock failed, for unresolved reasons.
- **Established** The unlock succeeded.

- **A PVC Bad** The unlock failed because there was some problem with the connection's VPI/VCI address on the trunk side.
- **Z PVC Bad** The unlock failed because there was some problem with the connection's VPI/VCI address on the line card side.
- **A PVC Used** The unlock failed because the connection's trunk VPI/VCI address was already in use by some other PVC.
- **Z PVC Used** The unlock failed because the connection's line card VPI/VCI address was already in use by some other PVC.

The **Availability Status** radio buttons display information about the status of this object:

- **Operable** The connection is working.
- **Degraded** Conditions exist that do not prohibit its use, but degrade the reliability or speed of data transmission.
- **In-Operable** The object is not working, for one of many possible reasons.
- **Failed** An object has failed diagnostics (either hardware or software). This might include a non-volatile storage failure.
- **Unreachable** The object is inoperable because it is dependent on some failed resource.
- **Departed** The card has been physically removed.

Port Connections

To edit line card port connections click the **Conn...** in the Line Card Shelf dialog window (described on page 62). The **Connections** dialog window associated with this port will appear.

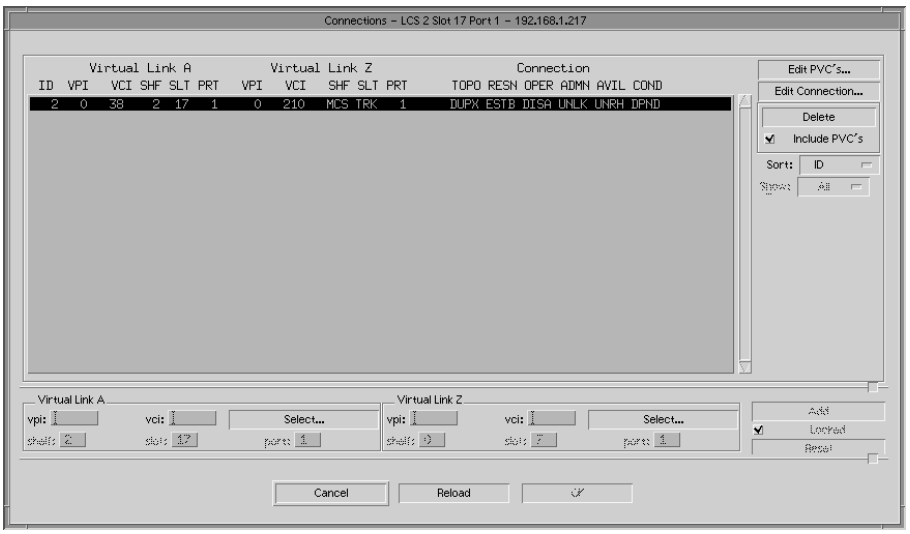


Figure 83: Connections Dialog Window

The scrollable list box shows all connections carried by this multiplexer. The **ID** column identifies the connection number. Connection numbers go from 1 to 4096, and are assigned sequentially. As connections are unassigned, the multiplexer frees the connection number—but the multiplexer assigns new connection numbers at the top of the range, until the connection ID number wraps around to zero again. The multiplexer assigns available connection ID numbers to new connections.

The VPI, VCI, SHF, SLT, and PRT columns correspond to the VPI, VCI, shelf, slot, and port numbers described in the **Add PVCs** dialog window, starting on page 124. Add PVCs and Connections.

The **Edit PVCs...** button brings up the **PVCs Details** dialog window, allowing you to edit an existing PVC's endpoints (described on page 127).

The **Edit Connection...** button brings up the **Connection Details** dialog window (described on page 130: allowing you to alter characteristics of this connection, though not its endpoints.

The **Delete** button deletes the currently selected PVC or PVCs.

The **Sort** menu controls the sort order of the connections.

The **Show** menu controls which connections DiamondView displays.

Virtual Link A is the line card side of a PVC; **Virtual Link Z** is the trunk side of a PVC. The **VPI/VCI** fields for both A and Z specify the ATM circuit address for each end of the connection. The **shelf**, **slot**, and **port** input fields specify the address where the line card side of the PVC terminates.

The **Select...** button lets you pick from any reserved VPI/VCI that is not yet part of a PVC.

Use the **Add...** button to add a PVC to this port.

Generate for Selected Line Ports specifies to apply transactions only to the line ports that were previously selected in the LCS graphical window.

All Ports on Selected LCS Shelves specifies to apply transactions to ALL ports on the LCS shelf.

Select **VP Connection** to setup a Virtual Path (VP) without having to set up individual Virtual Circuits within the VP. For example, if multiple PCs connected to a single ADSL router at the remote end CPE, use the VP Connection option to configure the same parameters for all nodes attached to the router.

The **Reload** button refreshes the PVC list from the Speedlink System.

Glossary and Acronyms

Asymmetric Digital Subscriber Line (ADSL)

Asymmetrical data signals for Internet access that share twisted pairs with POTS and that use modern signal modulation techniques to accomplish the data communications task.

Alarm

A signal used to indicate that an abnormality, a fault, or a failure has been detected. Alarms may be distinguished by type and by the severity of the event that caused the alarm.

Alarm Indication Signal (AIS)

A downstream signal in a digital network that replaces the normal traffic signal when a maintenance alarm indication has been activated (indicating an upstream failure detection – error or alarm on the network). It is used in the OSI network management model.

ATM Adaptation Layer (AAL)

ATM Adaptation Layer is located above ATM and converts non-ATM bit streams into ATM cells. The AAL protocol supports higher-layer service requirements.

Asynchronous Transfer Mode (ATM)

A multiplexed information transfer and switching process (cell-switched technology) in which data is organized into fixed length (53 octet) cells and transmitted according to each application's requirement. ATM is generally deployed in enterprise networks, which often connect LANs over wide areas that require large amounts of data to be transported over great distances.

Auxiliary Common Systems Interface Panel (CSIP)

Each Auxiliary CSIP connects and distributes central office power to up to four Line Card Shelves (LCS). Auxiliary CSIPs are required for Speedlink Systems with over five Line Card Shelves.

Bit Error Rate (BER)

A measurement of transmission quality expressed as a ratio (ratio of error bits to the total number of bits transmitted – erroneous bits per million). The BER indicates how many bits are incorrectly transmitted in a given bit stream. The BER depends on the type and length of transmission.

CAP2

Carrierless Amplitude and Phase (CAP) ADSL line card, 2 ports per line card.

CAP4

Carrierless Amplitude and Phase (CAP) ADSL line card, 4 ports per line card.

CBR (Constant Bit Rate)

Data that are transmitted at a constant rate on an ATM network.

CELL

In general, fast packet-switching technologies—such as ATM (Asynchronous Transfer Mode). The ATM Cell has a 5-byte header and contains 48 bytes of payload.

Central Office (CO)

The Local Exchange switch that terminates individual local telephone subscriber lines for switching and connection to the public network (locally and long distance).

Common Management Information Protocol (CMIP)

An OSI network management/service interface protocol created and standardized by ISO. Based on the basic data storage concept in which management information is collected and stored for subsequent retrieval by a management application. Provides for the transmission of event notifications and the transmission of operations directed toward managed objects.

Common Systems Interface Panel (CSIP) Power and Distribution Board

The CSIP Power and Distribution Board is located in the Master Control Shelf (MCS). Central office power is terminated at the CSIP and is distributed to the Master Control Shelf and up to four Line Card Shelves.

Common Systems Interface Panel (CSIP) Alarm Board

All Speedlink alarm connections are made at the CSIP Alarm Board; central office visual, audible, remote Bay Alarm and remote input alarms. The Alarm Board has LEDs to display Speedlink alarm status.

Constant Bit Rate (CBR)

Applications or services in a digital network that are to be the same bandwidth for the duration of the call.

CPE (Customer Premise Equipment)

Refers to telephone and related equipment located on the customer's premises (office or home).

Customer Network Management (CNM)

A feature of ATM, Frame Relay and SMDS which allows customers to directly view and manage their public data service (communications networks) in the same way they view and manage their local area networks.

Digital Loop Carrier (DLC)

Network transmission equipment used to provide a pair gain function. DLC equipment is deployed in situations in which the cost of the equipment is more than offset by the savings in copper distribution accomplished by eliminating need for as many copper pairs. Digital loop carrier systems consist of two parts—a Central Office Terminal (COT) and a Remote Terminal. The COT provides the multiplexing/demultiplexing function of individual voice signals to the composite multiplexed signal at the interface between the switching equipment and the DLC. The Remote Terminal provides the multiplexing/demultiplexing function at the interface between the individual subscriber pairs and the DLC equipment.

DiamondCraft®

DiamondCraft is the Speedlink's stand-alone craft interface application. It communicates directly with a Speedlink through a serial port connection using Point-to Point Protocol (PPP).

DiamondView®

DiamondView is the Speedlink's Element Management System (EMS). It is a HP Open View® application and operates on a UNIX workstation.

DS1 (Digital Signal Level One)

1.544 Mb/s digital signal.

DS3 (Digital Signal Level Three)

44.736 Mb/s digital signal – equivalent of 28 T-1 channels (also referred to as T-3).

DS3T

The DS3 trunk card provides the interface between ATM backbone facility and the Speedlink. It multiplexes and de-multiplexes up to 12 broadband ATM cell streams from the MLA cards and sends this "payload" out over the ATM network. The Speedlink has two DS3T cards in a 1:1 protection group.

DSLAM (Digital Subscriber Line Access Multiplexer)

An ATM access mux/concentrator that grooms traffic from multiple low rate lines into a high rate trunk (DS1, DS3, OC3, OC12).

Egress

Outgoing direction to a network or network device, as opposed to the ingress (or entrance).

Element Management Systems (EMS)

Software used to manage and monitor components of a telecommunication system at the lower levels of the Telecommunications Management Network.

Graphical User Interface (GUI)

A generic name for the computer interface that substitutes graphics for characters. The GUI permits users to directly manipulate graphical objects displayed on the monitor.

HDSL (High bit rate Digital Subscriber Line)

HDSL provides a DS1 on two copper wire pairs (without the loop engineering and repeaters required for a standard T1 system).

HEC (Header Error Control)

An 8-bit field (the last byte) of the ATM-cell header, whose purpose is to allow a receiver to detect, and possibly correct, transmission errors in the cell header. It is used for checking integrity only.

IEEE (Institute of Electrical and Electronics Engineers)

An international engineering organization that defines standards related to networking and other areas.

IETF (Internet Engineering Task Force)

One of two technical engineering bodies of the Internet Architecture Board. The IETF is responsible for solving short-term engineering needs and standards of the Internet.

Ingress

Incoming direction to a network or network device, as opposed to the egress (or exit).

IP (Internet Protocol)

A component of the TCP/IP protocol suite. IP operates at the Layer 3 of the OSI Reference model.

ISO (International Standards Organization)

The International Standards Organization is an international organization founded in 1946 to facilitate the development of international data communication standards.

ITU (International Telecommunications Union)

An organization established by the United Nations. The ITU sets telecommunications standards and allocates frequencies to various uses worldwide.

LAN (Local Area Network)

A privately owned and administered network for data communications, usually within a building or campus environment, used to connect computers and peripheral devices. Communication is typically accomplished by broadcasting on a connectionless basis over a shared medium.

Line Card

A line card serves as the interface between a line and a communications device.

Line Card Shelf (LCS)

The Speedlink System is made up of one Master Control Shelf and up to twelve Line Card Shelves. Each LCS has 24 mounting slots for line cards, a Line Card Shelf Multiplexer (LSM or LSM2) card, and an optional LSM or LSM2 card for Remote Line Card Shelf protection group application.

Line Card Shelf Multiplexer (LSM or LSM2) card

The LSM or LSM2 card communicates with the Master Line Card Adapter (MLA) card over multi-mode optical cable at OC-3 rates. The LSM or LSM2 multiplexes and demultiplexes ATM cell streams for up to 24 line cards in a Line Card Shelf.

Low Pass Filter Shelf (LPFS)

Data plus voice frequency signals are received from the customer at the Low Pass Filter Shelf. the LPF card “splits” the low frequency voice signal from the high frequency ADSL signal. The voice signal is sent onto the voice switch unimpeded; while data signal is received by the CAP2 line card.

LOF (Loss of Frame)

A condition that can occur in digital transmissions when the receiving equipment loses frame alignment data (used to determine channel assignments and channel boundaries).

LPF2

Low Pass Filter card, 2 ports per card.

LPF4

Low Pass Filter card, 4 ports per card.

Master Control Shelf (MCS)

The MCS contains the central control and communication functions for the Speedlink System and serves as the ATM network interface.

Master Control Processor (MCP) card

The MCP card is the central control and communications for the Speedlink, it stores program and provisioning database information. The Speedlink has two MCP cards in a 1:1 protection group.

Master Line Card Adapter (MLA) card

Each MLA card provides the broadband interface to one Line Card Shelf at OC-3 rates over optical fiber. There are up to twelve MLA cards in a Master Control Shelf providing the broadband interface for up to twelve Line Card Shelves and up to 288 line cards.

Management Information Base (MIB)

The MIB contains all the provisioning information for the Speedlink Multiplexer. (The MIB contains data available to a network management program. The network manager queries the MIB.)

Multiplexer

Equipment that aggregates two or more channels onto a single transmission channel.

NEBS (Network Equipment Building System)

NEBS is the Network Equipment Building System specification authored by Bellcore. NEBS compliance is required by many carrier customers; the Speedlink System shipping today is already NEBS-compliant.

NIC (Network Interface Card)

An electronic circuitry board that usually fits into an expansion slot of a PC whose purpose is to connect to a Local Area Network. A NIC is designed to comply with both a specific LAN Medium Access Control procedure (CSMA/CD for Ethernet) and a specific physical medium (e.g. twisted pair wire, coax, or multi-mode fiber). Associated with the NIC is a unique address called the MAC address. It works with the network software and computer operating system to transmit and receive messages on the network.

NID (Network Interface Device)

The Diamond Lane NID ADSL Splitter divides the ADSL and POTS signals and works in conjunction with the router at the subscriber end. The splitter installs on the outside of a home or building, and is enclosed in a weatherproof wall mount enclosure. It features primary lighting and AC power fault protection, and is a passive device, requiring no power or management from the central office or subscriber.

Network Management Processor (NMP) card

The NMP card controls the Speedlink's network management interfaces and provides the protocol support for communication for DiamondView and DiamondCraft.

OC-1 (Optical Carrier Level-1)

A SONET line rate of 51.840 Mb/s. Direct electrical-to-optical mapping of the STS signal with frame synchronous scrambling.

OC-3 (Optical Carrier Level-3)

A SONET line rate of 155.520 Mb/s. 3 x OC-1. Direct electrical-to-optical mapping of the STS signal with frame synchronous scrambling.

OC-12

Sonet channel of 622.08 Mbps.

OSI (Open System Interconnection Reference Model)

An internationally accepted set of standards for communication between various systems manufactured by different vendors. The OSI Reference Model is a seven-layer model developed by the ISO (International Standardization Organization) to describe how to connect any combination of devices to communicate.

PCI (Peripheral Component Interconnect)

Bus of an Intel PC. PCI transfers data between the PC's main microprocessor and peripherals at up to 132Mbps.

PCR (Peak Cell Rate)

PDR (Protocol Data Unit)

In data communication protocols, a unit of data created by a given protocol layer at one place and logically transferred to the same layer at another place called a peer. This is the OSI terminology for "packet".

PLCP (Physical Layer Convergence Protocol)

The part of the physical layer that adapts the transmission facility to handle DQDB functions as defined in IEEE 802.6-1990.

POP (Point-of-Presence)

The physical place within a LATA (the long distance carrier's local office) where the IEC provides services to the LEC, and perhaps directly to end-users.

POTS (Plain Old Telephone Service)

A term used to describe analog, voice-only basic telephone service. All POTS lines work on loop start signaling.

PPP (Point-to-Point Protocol)

A layer 2 protocol (relative to the OSI reference model) that allows a computer to use TCP/IP with a standard telephone line and a high-speed modem.

PVC (Permanent Virtual Circuit)

A permanent association between two DTEs established by configuration (established administratively via a service order process). A PVC uses a fixed logical channel to maintain a connection between the DTEs. After a PVC is defined, it requires no setup operation before data is

sent and no disconnect operation after. The concept of a PVC is included in Networks supporting X.25, Frame Relay and ATM.

QoS (Quality of Service)

In ATM networks, a set of parameters for describing a transmission. These parameters include values such as allowable cell loss. The parameters apply to virtual channel connections and virtual path connections.

Remote Line Card Shelf (RLCS)

A RLCS allows customers served off of long loops — beyond 18,000 ft from the central office — access to xDSL service. The RLCS is located remotely from the central office in an outside cabinet and connected to the central office Master Control Shelf via fiber optic extensions.

Remote Low Pass Filter (RLPF)

The RLPF is a remote passive low pass filter "splitter" device. It splits the high frequency ADSL data signal from the voice signal at the customer end just like the Low Pass Filter card in the central office. There are two types of RLPF – a retrofit RLPF available a standard Network Interface Device housing and a standalone RLPF.

RFC (Request for Comments)

In the Internet community, a series of documents that contain protocol and model descriptions, experimental results, and reviews. All Internet standard protocols are written up as RFCs.

SDSL (Symmetric Digital Subscriber Line)

Also referred to as Single-Line Digital Subscriber Line, SDSL supports symmetrical T1/E1 transmissions. It uses a single copper-pair wire and has a maximum operating range of 10,000 feet. It is capable of accommodating applications that require identical downstream and upstream speeds, such as video conferencing.

Serial Port

A hardware input/output port in which only one pin is available for data transmission in a given direction – bits are transmitted in sequence (one bit at a time). The wiring for a port is associated with a particular physical interface (i.e., RS-232). A serial port is most commonly used for a modem or a mouse.

Service Provider

A service provider is an organization or individual that provides telephone access to a network or to another service, such as the Internet.

SNMP (Simple Network Management Protocol)

The network management protocol used within TCP/IP-based internets. Defines the protocol for managers (clients) to communicate with agents (servers). The agent interfaces directly with the networking layers on the monitored network device to obtain the network management information. An agent is installed on every network device that will be managed or monitored. A client is a application program that is installed at the network operations center. It communicates with the SNMP agents to collect information in the form of MIB variables. SNMP is a request/reply protocol that uses the operations of Set or Get on data items in a agents MIB.

SNR (Signal-to-Noise Ratio)

In a transmission, SNR is the ratio between the signal and noise levels at a given point, usually at the receiving end of the transmission. The SNR value is generally expressed

in decibels (dB). The SNR can be used to determine how long a cable segment can before the signal loss is unacceptably high. The SNR also helps determine whether a particular type of cable is appropriate for the intended use.

SOHO (Small Office – Home Office)

SONET (Synchronous Optical NETwork)

SONET is a high-speed, fiber-optic system, which provides an interface and mechanism for optical transmission of digital information. At the interface, signals are converted from electrical to optical form (and back to electrical form at the destination). SONET is an ANSI standard. Transmission rates range from 51.84Mbps to 13.22Gbps.

Speedlink™ Multiplexer

The Speedlink Multiplexer is classified as a Digital Subscriber Line Access Multiplexer (DSLAM). The Speedlink Multiplexer uses Digital Subscriber Line (xDSL) and Asynchronous Transfer Mode (ATM) technologies to deliver high speed data rates over the exiting copper network.

SVC (Switched Virtual Circuit)

A virtual connection set up on demand via a signaling protocol connection that is established for a communications session that is terminated after the session is over. This is in contrast to a permanent virtual circuit (PVC), which is a connection that is always established.

T1

DS1 rate electrical signal (two pair). T1 is suited for voice, data and image transmissions. T1 has a bandwidth of 1.544 megabits per second (Mbps), which comes from two dozen 64 kilobit per second (Kbps) channels, together with one 8Kbps framing channel.

TCP/IP (Transmission Control Protocol / Internet Protocol)

TCP/IP is a suite of several networking protocols developed for use on the Internet.

Telnet

Telnet is the terminal-remote host protocol developed for ARPAnet in 1974. On the Internet, it is a service program that allows you to connect to other computers at another site permitting you to interact with applications as if by a local terminal.

Trap

A method used to isolate an abnormal condition or operation.

TMN (Telecommunications Management Network)

A concept where all Operation and Maintenance Centers are linked together to form a network.

UBR (Unspecified Bit Rate)

In ATM networks, a UBR connection transmits at variable rates.

UNI (User-to-Network Interface)

In ATM networks, one of three levels of interface. A UNI specification which defines Layer 1 and Layer 2 protocols required for CPE and carrier equipment to interoperate. UNI specifications provide physical media and line rate implementation options.

VBR (Variable Bit Rate)

In ATM networks, a VBR connection transmits in bursts, at variable speeds.

VDSL (Very-high-speed Digital Subscriber Line)

VDSL provides DSL service at a data rate in excess of 10Mbps (up to 52Mbps). VDSL has a maximum operating range from 1,000 feet to 4,500 feet on 24-gauge wire.

VPI (Virtual Path Identifier)

An identifier (value) in an ATM cell that identifies the data of one Virtual Path connection from the data of another connection.

WAN (Wide Area Network)

A WAN is a network of computers and related communications equipment whose elements may be in dispersed sites with distances great enough to require common carrier provided communication lines.

xDSL (all forms of Digital Subscriber Lines)

The “x” represents the various types of digital subscriber lines: ADSL, RADSL, SDSL, HDSL, or VDSL.

INDEX

A

ABR, 125, 128
Acronyms
    Bit Error Rate Test (BERT), 54
address group, 16, 19
Advanced Configuration Parameters
    CAP2 Port, 67
Advanced DSL Parameters
    dialog window - CAP2, 67
All Events, 118
All Ports on Selected LCS Shelves, 126, 132
Application of Cached Changes, 117
Apply/Poll command button, 19
arrow buttons, 16
ATM loopback, 125, 128
ATM PM
    command - MCS Card dialog window, 41
ATUC
    SDSL - RADSL Mode Options, 84
    SDSL Port - Rates, 83
ATUR
    SDSL - RADSL Mode Options, 84
    SDSL Port - Rates, 83
Auto Line
    CAP2 Port, 65
Average Signal Quality
    CAP2 Port, 68

B

Baud Rate
    CAP2 Port, 70
BERT, 71, 90
    CAP2 Port, 65
    SDSL Performance Monitoring, 90
    SDSL Port Details - Diagnostic Test Mode, 82
Bert Errors
    Cumulative, 88
Bi-Directional
    DS3T Protection, 42
    OC3 Switching Mode, 46
Bit Error Rate Test, 82
Bit Error Rate Test (BERT), 71, 90
    Acronyms, 54

C

Cancel command button, 19
CAP2
    DSL Performance Monitoring, 70
    Performance Counts, 71
CAP2 Performance Counts, 71
CAP2 Port
    Advanced Configuration Parameters, 67
    Advanced DSL Parameters - dialog window, 67
    Auto Line, 65
    Average Signal Quality, 68
    Baud Rate, 70
    BERT, 65
    Code Violation Thresholds, 68
    Current Rate, 68
    Downstream Data Rate, 66
    Downstream Dynamic Adjustment, 67
    Far End Code Violation Threshold – 15 Min, 70
    Far End Code Violation Threshold – Daily, 69
    Line, 65
    Managed Interface, 66
    Margin, 67
    Near End Code Violation Threshold – 15 Min, 69
    Near End Code Violation Threshold – Daily, 68
    Receiver Gain, 68
    Retrain Threshold, 68
    Spectrum, 65
    Terminal, 65
    Test Command, 66
    Test Duration, 66
    Transmit Power, 68
    Upstream Data Rate, 66
    Upstream Dynamic Adjustment, 66
    Vendor ID, 70
Card

command button - LCS, 62
Card Events, 118
CBR, 125, 128
Cell Scrambling
DS3 Port - DS3T, 40
Cells Received, 87
Cells Transmitted, 87
Change Caching, 116
check boxes, 18
clock provisioning, 32
clock speed
setting the LCS clock speed, 32
Code Violation Thresholds
CAP2 Port, 68
Coding Violation (CV) Threshold – 15 min
SDSL Port, 86
Coding Violation (CV) Threshold – Daily
SDSL Port, 86
Coding Violation Thresholds
SDSL Port, 86
Coding Violations, 88
SDSL Performance Monitoring, 90
colors and patterns, 12
Comm Failure, 117
Command Caching, 13
Commit Changes
File menu, 28
composite objects, 14
right button, 15
condition, 14
Configuration File
MCS dialog window, 29
Congestion for Selected LC Ports
command button - LCS Card Details, 64
congestion parameters
MLA, 60, 110
Congestion Weighting Factor
MLA Port, 61, 111
Conn
command button - LCS Card, 63, 131
Connection ID, 130
Connection IP
MCS dialog window, 29
Connection Unlock Result, 130
Connections
MCS Card, 35
control buttons, 13
CRC, 86
Current Rate
CAP2 Port, 68
CVCPLCP-P Provisionable Thresholds
DS3T Port, 38
CVCP-P, 37
CVCP-P Provisionable Thresholds
DS3T Port, 38
CVPLCP-P, 37
CVPLCP-P Provisionable Thresholds
DS3T Port, 38
Cyclic Redundancy Check, 86

D

Degraded
Availability Status, 21
availability status, 44
Departed
Availability Status, 22
availability status, 44
Diagnostic Test Mode
CAP2 Port, 65
SDSL Port Details, 82
dialog window, 11, 15
modal, 17, 18
modeless, 17
Dialog windows, 28
DiamondView help
context-sensitive, 24
general, 23
menu bar, 24
Direct Mapping Cbit
DS3 Port - DS3T, 39
Direct Mapping M23
DS3 Port - DS3T, 39
Download
File menu, 28
Downstream Data Rate
CAP2 Port, 66
Downstream Dynamic Adjustment
CAP2 Port, 67
DS3
BERT Acronyms, 54
DS3 ATM Performance dialog window, 41
DS3 Line Parameters dialog window, 39
DS3 errors, 41, 90
DS3 Performance dialog window, 40
DS3T
Direct Mapping Cbit, 39
DS3T Port

CVCP-P Provisionable Thresholds, 38
CVPLCP-P Provisionable Thresholds, 38
Line Type, 39
Performance Parameter BER Acronyms, 37
Thresholds, 36
DSL Performance Monitoring
CAP2, 70
Duplex, 126, 130

E

Elapsed Seconds, 88
Element Management System, 7
EMS, 7
End Point Configuration, 125, 128
EPD, 125, 128
Error Retrain Threshold
SDSL Port, 86
SDSL Port - Rates tab page, 83
Errored Retrain, 88
Errored Seconds, 88
SDSL Performance Monitoring, 90
SDSL Port, 86
ESCP-P, 37
ES-L, 37
ESPLCP-P, 37
ESS, 90
SDSL Performance Monitoring, 90
event
disabling reporting, 62
Events, 14
Exit
File menu, 28

F

Failed
Availability Status, 21
availability status, 44
Far DS3 ATM PM, 40
Far End Block Error (FEBE), 71
Far End Code Violation Threshold – 15 Min
CAP2 Port, 70
Far End Code Violation Threshold – Daily
CAP2 Port, 69
Far-end performance parameters, OC3 port, 57
FEBE, 71
File menu
graphical windows, 28
File Read
MCS dialog window, 30
Force Switch
DS3T Protection, 43
OC3T Protection, 46
Fuse fail Alarm, 121

G

Generate for Selected Line Ports, 126, 132
Get of Parameters on Card Dialog Entry, 117
Get of Parameters on Connections Dialog Entry, 117
graphical windows, 11, 25

H

hairpin PVCs, 35
Header Error Checksum, 40
Header Error Control
SDSL Performance Monitoring, 90
Header Error Control (HEC), 72
HEC, 40, 72, 90
DS3 ATM Performance, 41
HEC Coset
DS3 Port - DS3T, 40
HEC Errors, 87
help
context-sensitive, 24
general, 23
hierarchy, 24
menu, 24
tutorial, 24
HP OpenView, 9, 11
HP-UX
Installing DiamondView on a HP-UX Workstation, 9

I

ID column, 113, 132
InBand IP
MCS dialog window, 30
InBand Mask
MCS dialog window, 30
InBand Network Management, 31
InBand PVC
MCS dialog window, 30
In-Operable
Availability Status, 21
availability status, 44
Intermediate Congestion Threshold
MLA Port, 61, 111
IP Address

Establishing via DiamondCraft, 31
IP of SNTP Server
MCS dialog window, 29

L

LCS
Clock Provisioning, 32
LCS Clock Provisioning, 32
LED, 12
Line
CAP2 Port, 65
command button - MCS card dialog window, 39
SDSL Port Details - Diagnostic Test Mode, 82
Line Build Out
DS3 Port - DS3T, 40
Line Cards, 27
Line Timing
DS3 Port - DS3T, 40
Line Type
DS3 Port - DS3T, 39
Lock
LCS Card, 62
Locked
Administration State, 21, 64
Lockout
DS3T Protection, 43
OC3T Protection, 47
LOF Failures, 87
LOF Retrain, 88
LOF Threshold Setting
SDSL Port, 85
LOFS, 89
SDSL Performance Monitoring, 89
loopback
ATM, 125, 128
LSM, 112
Loopback Activate, 126, 129
Loopback Cell Type, 126, 129
Loopback Destination ID, 126, 129
Loopback Result, 129
LOS Failures, 87
LOS Threshold
SDSL Port, 85
LOSS, 89
SDSL Performance Monitoring, 89
Loss of Frame
SDSL Port, 85
Loss of Frame (LOF) Retrain, 72
Loss of Frame Seconds
SDSL Performance Monitoring, 89
Loss of Power Signal
SDSL Performance Monitoring, 89
Loss of Power Signal Threshold
SDSL Port, 85
Loss of Signal
SDSL Port, 85
Loss of Signal Seconds
SDSL Performance Monitoring, 89
Lowest Severity Report, 115
LPR Failures, 87
LPRS, 89
SDSL Performance Monitoring, 89

M

Managed Interface
CAP2 Port, 66
Manual Switch
OC3T Protection, 43, 46
Margin
CAP2 Port, 67
MCS Card
Connections, 35
Protection, 35
Versions, 35
menus, 18
MIB, 30
MIB Object
MCS dialog window, 35, 64
OC3 Detail dialog window, 45
MIB Version
MCS dialog window, 30
MLA congestion parameters, 60, 110
MLA Port
Congestion Weighting Factor, 61, 111
Intermediate Congestion Threshold, 61, 111
Severe Congestion Abatement Level, 61, 111
Severe Congestion Level, 61, 110
Severe Congestion Report Active, 61, 111
Severe Congestion Report Clear, 61, 111
modal dialog window, 17
modeless dialog window, 17
Motif, 11

N

Near DS3 ATM PM, 40
Near End Code Violation Threshold – 15 Min

CAP2 Port, 69
Near End Code Violation Threshold – Daily
CAP2 Port, 68
Near End Coding Violation (CV) Errors, 71
Near-end performance parameters, OC3 port, 54
Network Elements, 7
Network Management System, 7
New
File menu, 28
NMP1 Gateway
MCS dialog window, 30
NMP1 IP
MCS dialog window, 30
NMP1 IP Mask
MCS dialog window, 30
NMP2 Gateway
MCS dialog window, 30
NMP2 IP
MCS dialog window, 30
NMP2 IP Mask
MCS dialog window, 30
NMS, 7
Node Events, 118
Node Name
MCS dialog window, 29
Node Settings
File menu, 28
Node Settings…
MCS graphical window, 29
Noise Margin
SDSL Port, 87
Non-Revertive
DS3T Protection, 43

O

OAM Configuration, 125, 128
objects
composite, 14
composite and right button, 15
objects definition, 11
OCD
DS3 ATM Performance, 41
OK command button, 20
On Command, 117
On Selection, 117
Online Help, 22
Open
File menu, 28
Operable
Availability Status, 21
Operational
availability status, 44
Operational Support Systems, 7
OSS, 7

P

Performance Counts
SDSL, 89
Performance Parameter BER Acronyms, 37
Performance Parameters and Thresholds
BER Acronyms, 54
PLCP Cbit
DS3 Port - DS3T, 39
PLCP M23
DS3 Port - DS3, 39
PM
command button - LCS Card, 63
Poll
command button - LCS Card, 63
Polling and Skip Interval, 118
Pop-up buttons, 18
pop-up buttons, 18
Pop-Up Dialog on Event, 118
Port
command button - LCS Card, 63
port connections, 131
Port Events, 118
Port group
LCS Card, 63
Port indicator
DS3T trunk card, 35
Power Attenuation
SDSL Port, 87
Previous Day
Seconds, 88
Protection
MCS Card, 35
protection switching options, OC3, 46
provisioning parameters
SDSL Port, 83
PVCs
, 35

R

radio buttons, 17
Rebuild, 16

Receive Blocks, 87
Receiver Gain
CAP2 Port, 68
Remove, 17
Retrain Count, 71
Retrain Threshold
CAP2 Port, 68
Reversion Mode
DS3T Protection, 42
Revert, 17
Revertive
DS3T Protection, 42
Rx Cell Count, 72, 90
DS3 ATM Performance, 41

S

SAS-P, 37
Save
File menu, 28
Save As
File menu, 28
Save Command
MCS dialog window, 30
Save Result
MCS dialog window, 30
Scanpoint Alarm, 121
SDSL
Performance Counts, 89
SDSL Port
Noise Margin, 87
Power Attenuation, 87
provisioning parameters, 83
Transmit Rate, 87
SDSL Port Details
dialog window, 81
SEFSPLCP-P, 38
Selection button, 16
Send Code
DS3 Port - DS3T, 39
Service Category, 125, 128
SESCP-P, 37
SESPLCP-P, 37
Set button, 16
Set Community
MCS dialog window, 29
Set Retry Parameters, 118
Set/Get Retry count, 118
Set/Get Retry Interval, 118
Severe Congestion Abatement Level
MLA Port, 61, 111
Severe Congestion Level
MLA Port, 61, 110
Severe Congestion Report Active
MLA Port, 61, 111
Severe Congestion Report Clear
MLA Port, 61, 111
Shelf Events, 118
Signal to Noise Ratio
CAP2 Port, 67
Simplex AZ, 126, 130
Simplex ZA, 126, 130
Single, 16
Skip
Interval, 119
SNTP Mode
MCS dialog window, 31
Software Version
MCS dialog window, 29
Software Versions
dialog box, 64, 111
Spectrum
CAP2 Port, 65
SDSL Port Details - Diagnostic Test Mode, 82
SUN
Installing DiamondView on a SUN Workstation, 10
Switch to ATUC
SDSL Port Details, 82
Switch to ATUR
SDSL Port Details, 82
Switching Mode
DS3T Protection, 42
Synchronization
MCP Synchronization, 30
MCS dialog window, 30

T

Telecommunications Management Network, 7
Terminal
CAP2 Port, 65
SDSL Port Details - Diagnostic Test Mode, 82
Test Command
CAP2 Port, 66
SDSL Port Details - Diagnostic Test Mode, 82
Test Duration
CAP2 Port, 66
SDSL Port Details - Diagnostic Test Mode, 82

text boxes, 17
Thresholds
dialog window - DS3T Port, 36
Thresholds Intervals
DS3 Port, 37
TMN, 7
Transmit Blocks, 87
Transmit Power
CAP2 Port, 68
Transmit Power Reduction
CAP2 Port, 67
Transmit Rate, 87
SDSL Port, 87
Trap Community Names, 31
Trap Recipients
MCS dialog window, 31
tutorial help, 24
Tx Cell Count, 72
DS3 ATM Performance, 41
SDSL Performance Monitoring, 90

U

UASCP-P, 37
UASPLCP-P, 38
UBR, 125, 128
UBR-EPD, 125, 128
Uni-Directional
DS3T Protection, 42
OC3 Switching Mode, 46
Unknown
Availability Status, 22
Unlock
LCS Card, 63
Unlocked
Administration State, 21, 64
Unreachable
Availability Status, 22
availability status, 44
Upstream Data Rate
CAP2 Port, 66
Upstream Dynamic Adjustment
CAP2 Port, 66

V

VBR, 125, 128
VCI, 124, 132
Vendor ID, 87
CAP2 Port, 70
Versions
LCS Card Details, 64, 111
MCS Card, 35
Virtual Link A, 124, 132
Virtual Link Z, 124, 132
VP Connection
CAP2 Port Connection, 126, 132
VPI/VCI, 124, 132

W

working and protection slots
OC3, 43, 46