Volume

7

The Speedlink™ System

DiamondCraft Software

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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

Introduction

This chapter describes:

- DiamondCraft's purpose.
- How to install DiamondCraft on your Personal Computer.
- How to remove DiamondCraft from your Personal Computer.
- DiamondCraft software basics.

Chapter Two is a reference manual that describes DiamondCraft's commands in detail. (Volumes 3 and 5 contain detailed procedures that use DiamondCraft for acceptance testing and troubleshooting of the Speedlink System.)

When to Use DiamondCraft

Purpose

DiamondCraft exists to perform these three functions:

- Installation of a Speedlink System.
- Troubleshooting of a Speedlink System that cannot communicate with DiamondView.
- Troubleshooting Speedlink System problems in the field where it is inconvenient to bring the DiamondView Element Management Software (EMS) to the Speedlink Multiplexer.

In the following information blocks, this manual will describe *why* you use DiamondCraft for each of these functions. The Detail Level Procedures (DLPs) of *how* you use DiamondCraft for installing a Speedlink System are found in Volume 3, *Acceptance Testing*, Chapter 6—Using DiamondCraft for Test and Turn-up. The DLPs for troubleshooting a Speedlink System with DiamondCraft are found in Volume 5, *Maintenance and Testing*.

Speedlink System Installation

When you first install a Speedlink System, you will use DiamondCraft to perform two functions:

1. Perform acceptance testing of the Speedlink System.
2. Configure the system so that it can communicate with the DiamondView Element Management Software.

Diamond Lane Communications Corporation makes every effort to make sure that the Speedlink System ships as a reliable, ready to run product. Nonetheless, acceptance testing of the Speedlink System is a necessary step.

DiamondCraft runs on a desktop personal computer or a portable computer (PC Notebook, PC Laptop). DiamondCraft communicates over a serial or Ethernet connection to the Network Management Processor (NMP). DiamondCraft is used to perform acceptance testing. This acceptance testing verifies:

- The Speedlink's Master Control Shelf (MCS) can communicate with all the parts of the multiplexer.
- Correct operation of all cards.

After you complete acceptance testing of the Speedlink System, the primary responsibility for managing the system will fall on the Network Operations Center (NOC), using DiamondView.

Please refer to Volume 3, *Acceptance Testing*, for additional information.

Diagnosing Speedlink Communications Problems

DiamondView EMS is the preferred way of diagnosing problems with a Speedlink System that is already in service. However, using DiamondCraft to troubleshoot a Speedlink System problem may be the appropriate tool in certain situations. Examples of possible circumstances to use DiamondCraft:

1. The Local Area Network (LAN) that connects DiamondView to the Speedlink System multiplexer stops communicating.
2. A technician who is trying to troubleshoot a problematic piece of equipment in the field will usually find it more convenient to query the Speedlink System with DiamondCraft, than calling back to the Network Operations Center (NOC) to coordinate with someone who is using DiamondView EMS.
3. The Speedlink System loses its IP address, losing the ability to communicate over the LAN.
4. Someone inadvertently adds another network element to the LAN with the same IP address as the Speedlink System.
5. The Speedlink's LAN transceiver fails.

Installing DiamondCraft Software

Installing DiamondCraft Software—Microsoft Windows NT

The next four sections provide the instructions for installing DiamondCraft software on a computer running Microsoft Windows NT. You must apply various connectivity parameters in Microsoft Windows NT and you need to install Remote Access Service, Dial-Up networking (for a serial cable connection), and Simple Network Management Protocol (SNMP) services in Windows NT before you install DiamondCraft.

This manual assumes that Microsoft Windows NT has already been successfully installed on your computer. For additional information about completing any options in the Setup and Protocols dialog windows, use Windows NT Help and refer to your Microsoft Windows NT Installation Guide.

NOTE: Setup and configuration for earlier versions of Windows NT may differ to some degree. Refer to your Microsoft Windows NT Installation Guide for installation details.

Before beginning the installation process, make sure that you have the following components:

- DiamondCraft Software program diskettes

- Serial cable for connecting your computer to the Speedlink System (if connecting serially)
- Serial cable adapter (depending on the Speedlink Multiplexer connection interface)
- Microsoft Windows NT Setup Disks (or CD-ROM)

Your computer must meet the following minimum requirements:

- 486 or Pentium class computer capable of running Microsoft Windows NT (Pentium recommended)
- 6 MB of available hard disk space
- 32MB of available system memory (RAM)
- Microsoft Windows NT operating system software (version 4.0 required)
- Pointing device (mouse)

Check Port Settings

Installing DiamondCraft Software—Check Port Settings (Serial connection)

Follow the steps listed below to check the port settings:

1. From the **Start** menu on the taskbar, go to **Settings, Control Panel**.
2. From the **Control Panel** window, click the **Port** icon.
3. Select the port that you plan to use for the DiamondCraft serial port (i.e. COM1) and click the **Settings** button.
4. Insure that the following parameters are set correctly:
   - **Baud rate** set to **38400**
   - **Data bits** set to **8**
   - **Parity** set to **none**
   - **Stops bits** set to **1**
   - **Flow control** set to **none**

Click **OK** and return to the Windows desktop.

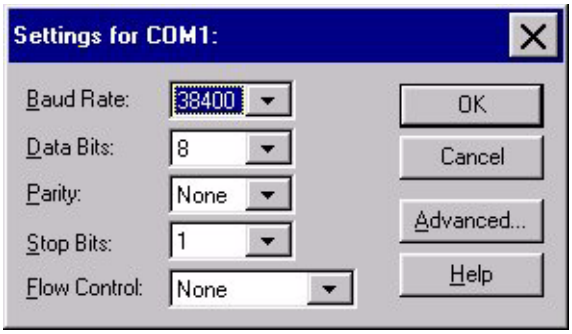


Figure 1: Port Settings Dialog Box

Add a Modem

Installing DiamondCraft Software—Add a Modem (Serial connection)

In order for DiamondCraft to communicate with the Speedlink through a serial port connection, you must set certain parameters in the Modems area of the Windows NT control panel. DiamondCraft communicates with the Speedlink System using PPP over a serial connection. To accomplish this in the Windows NT environment, you need to use Dial-Up Networking. Dial-Up Networking requires that a modem be configured, although you will not actually use a modem to communicate with the Speedlink System.

IMPORTANT: Depending on your computer's Windows NT configuration you may not be presented with all of the screens and dialog boxes that are described in the Installing DiamondCraft Software sections. Please refer to your Microsoft Windows NT Installation Guide and the Windows NT online help files.

From the taskbar, click the **Start** button (usually located at the lower left corner of your PC screen). Point to **Settings,** click **Control Panel**, and double-click the **Modems** icon.

The **Install New Modem** dialog box appears. Click the **Don't detect my modem; I will select it from a list** option, and then click **Next**>.

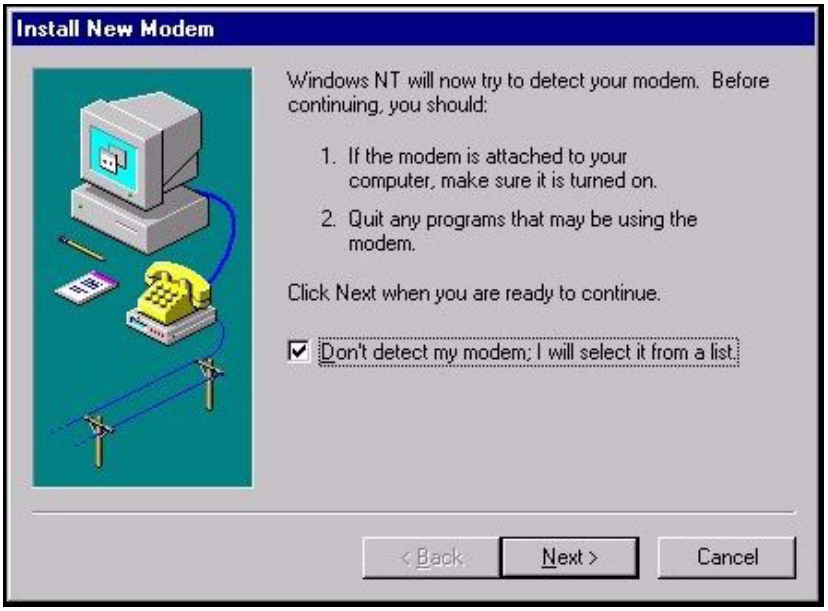


Figure 2: Install New Modem Dialog Box—Initial Display

The next **Install New Modem** dialog box appears. In the **Manufacturers** list box, Select **(Standard Modem Types)**. In the **Models** list box, select **Dial-Up Networking Serial Cable between 2 PCs**. Click the **Next>** command button.

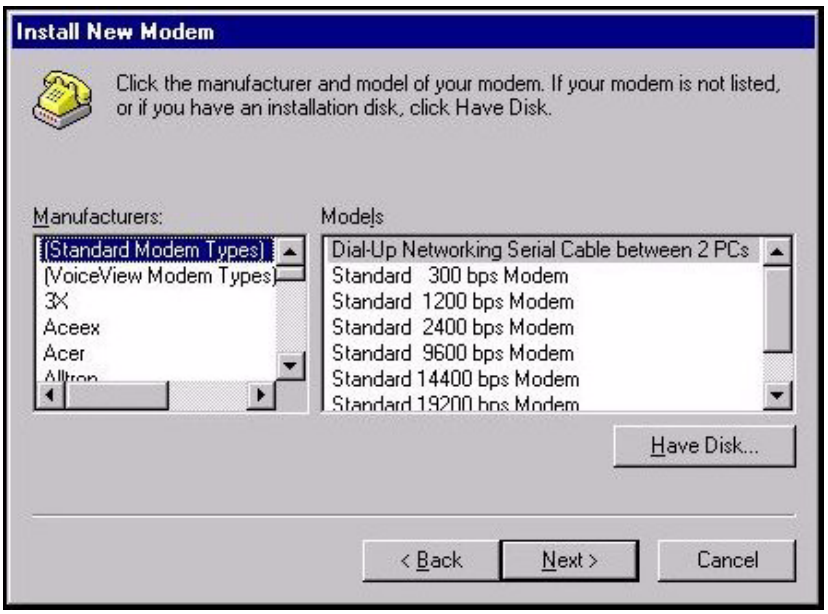


Figure 3: Install New Modem Dialog Box—Modem Selection

The next **Install New Modem** dialog box appears. Select a COM port (dependent upon availability of serial ports on your computer) and click the **Selected Ports** option button. Click **Next**>.

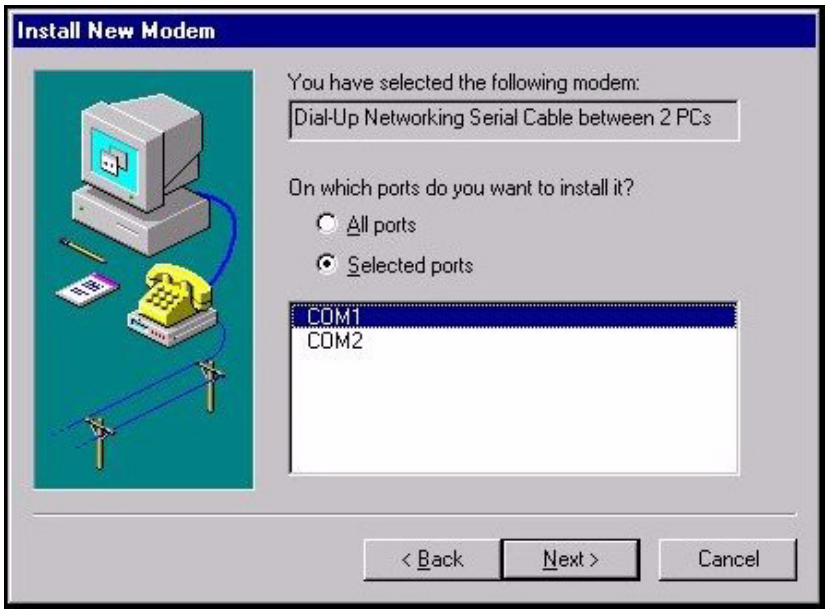


Figure 4: Install New Modem Dialog Box—Com Port Selection

The next **Install New Modem** dialog box appears. Your modem has been set up successfully. Click the **Finish** command button

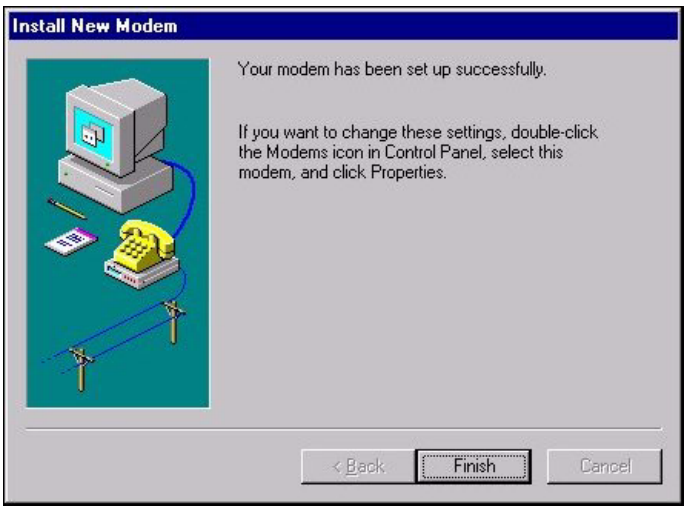


Figure 5: Install New Modem Dialog Box—Finish

After your modem/serial connection has been set up, you must configure the connection speed rate and preferences. From the **Modems Properties** dialog box, click the **Properties** command button.

Figure 6: Modem Properties Dialog Box—General Tab, Initial Display

The **Dial-Up Network Serial Cable between 2 PCs Properties…** dialog box will appear. Within the **General** tabbed page select **38400** as the **Maximum Speed**, then click the **Connection** tab.

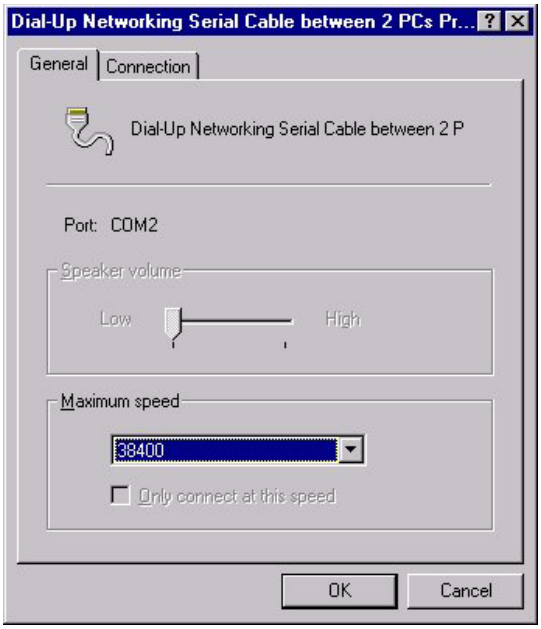


Figure 7: Modem Properties Dialog Box—General Tab, Properties Selection

The **Connection** tabbed page will appear. Set **Data bits** to **8**, **Parity** to **None** and **Stop bits** to **1**. Click **OK**.

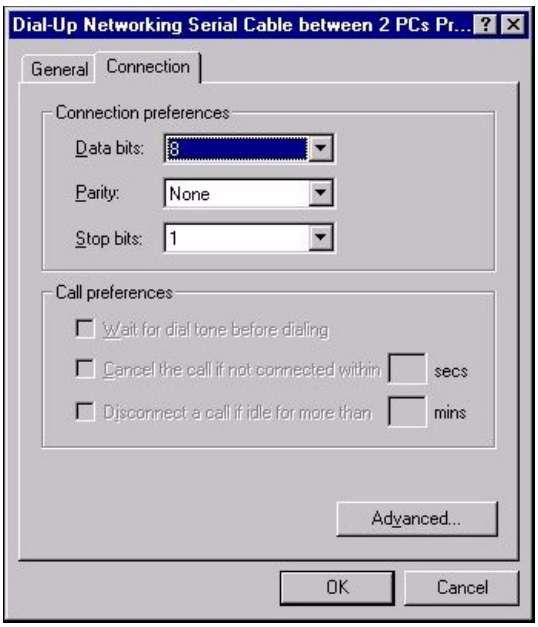


Figure 8: Modem Properties Dialog Box—Connection Tab

Click the **Close** command button in the **Modems Properties** dialog box to finish.

NOTE: The next two dialog boxes will appear if RAS is currently installed.

After you have set up the "Dial-Up Networking Serial Cable between 2 PCs" (Add a Modem), the **Modem Setup** dialog box will appear. Click the **Yes** command button.

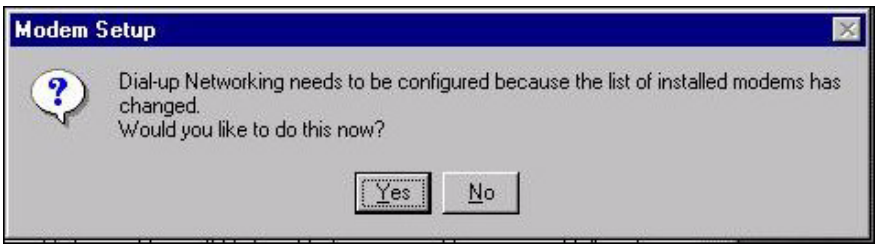


Figure 9: Modem Setup—Confirm Configuration Message

The Remote Access Setup dialog box will appear. Click the **Continue** command button.

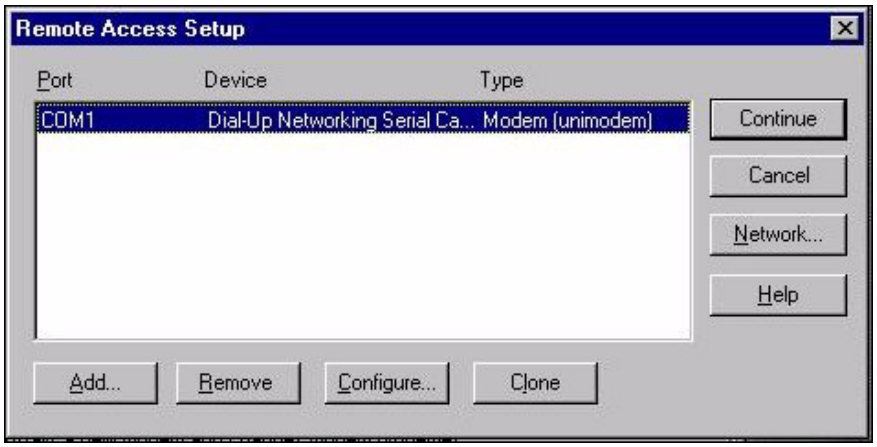


Figure 10: Remote Access Setup Dialog Box

You can now install Remote Access Service (RAS) and SNMP Service.

Add Remote Access Service (RAS)

Installing DiamondCraft Software—Add Remote Access Service (RAS) and SNMP Service

NOTE: If RAS and SNMP services are already installed, you can go to Microsoft SNMP Properties on page 16, set the properties and then go to Add Dial-Up Networking on page 18.

If using the Ethernet connection only, RAS does not need to be installed.

From the taskbar, click the **Start** button (located at the lower left corner of your PC screen). Point to **Settings,** click **Control Panel**, and double-click the **Network** icon.

The **Network** dialog box appears. Click the **Services** tab and the **Services** tabbed page will appear. Click the **Add...** command button.

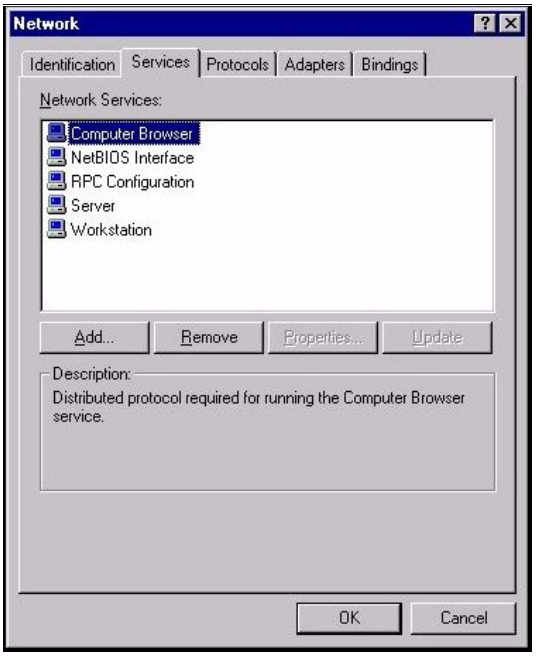


Figure 11: Network Dialog Box—Services Tab

The **Select Network Service** dialog box will appear. Select **Remote Access Service** from the list box and click **OK**.

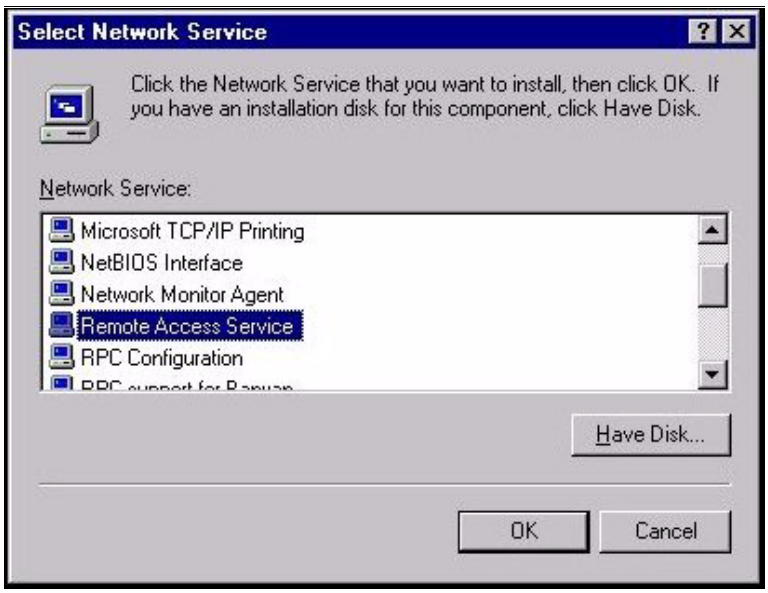


Figure 12: Select Network Service Dialog Box

The **Windows NT Setup** dialog box will appear. Choose the default path, or enter a new path if necessary, and then click **Continue**.

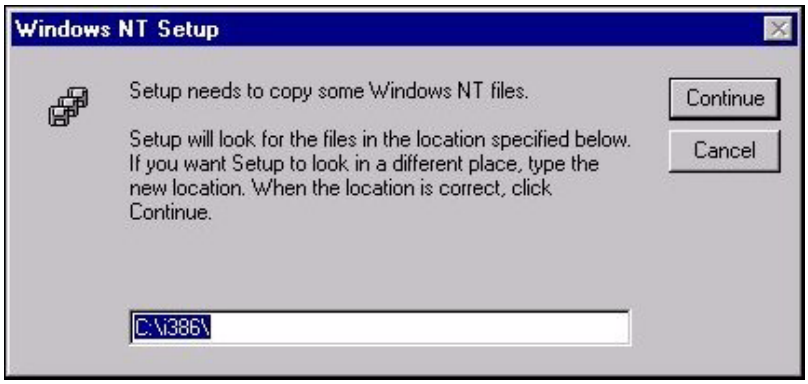


Figure 13: Windows NT Setup Message

The **Add RAS Device** dialog box will appear. Select from the pull-down list box the RAS Capable Device that you configured in the "Add a Modem" section: **Dial-Up Networking Serial Cable between 2 PCs**. Click **OK**.

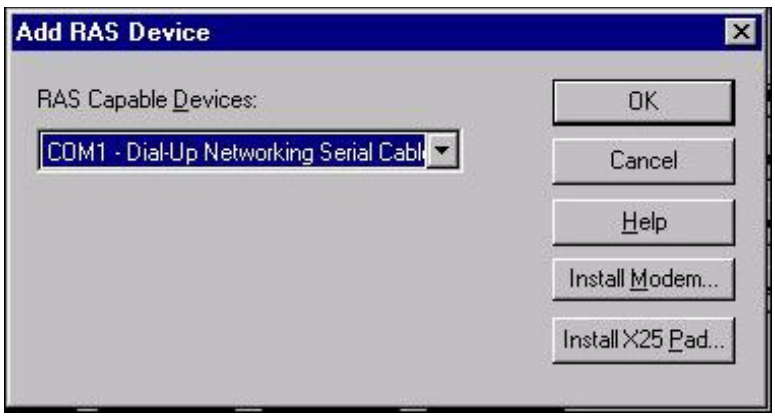


Figure 14: Add RAS Device Dialog Box

The **Remote Access Setup** dialog box will appear. Select the "Port/Device/Type" that you configured in the "Add a Modem" section: **Dial-Up Networking Serial Cable between 2 PCs.** Click **Continue**.

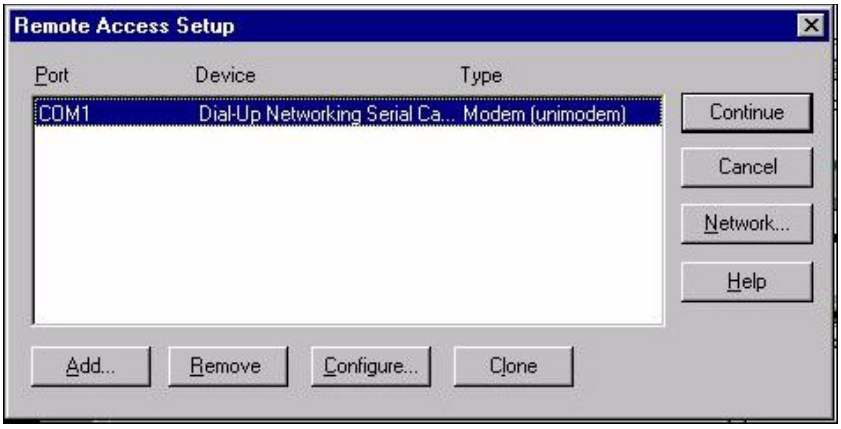


Figure 15: Remote Access Setup (RAS) Dialog Box

Installing SNMP

If SNMP Services appears in the Services tab page (shown below), then SNMP is already installed. (However, you need to check the SNMP Properties to ensure they are set correctly, described on page 16.) Click the **OK** command button and go to "Installing DiamondCraft—Add Dial-Up Networking," starting on page 18.

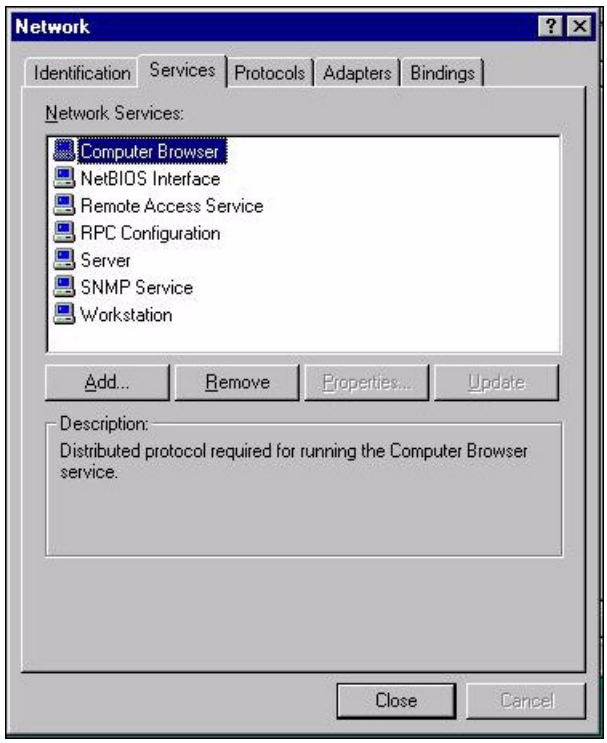


Figure 16: Network Dialog Box—Services Tab

If SNMP Services is not listed, click the **Add...** command button and perform the procedures covered below.

Clicking the **Add…** command button Services tab page brings up a window with a list of available networking services. Scroll down the list until you reach **SNMP Service**:

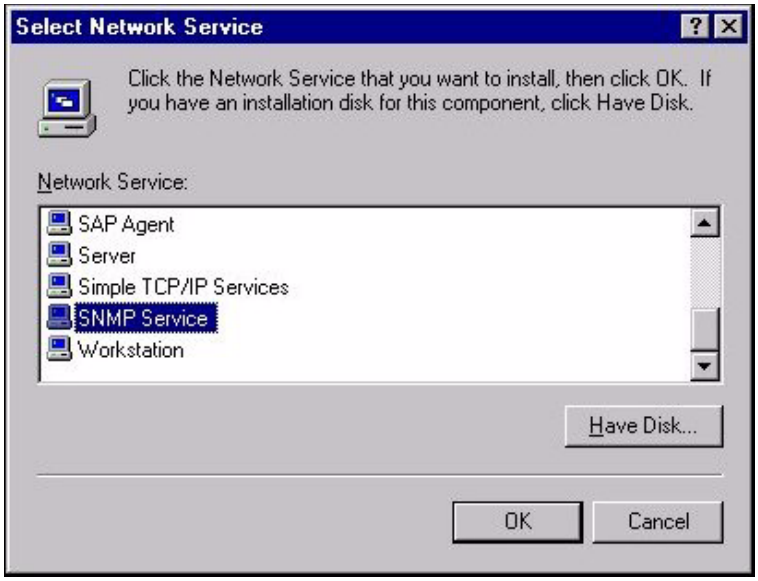


Figure 17: Select Network Service Dialog Box

Click the **OK** button. This will bring up the following window:

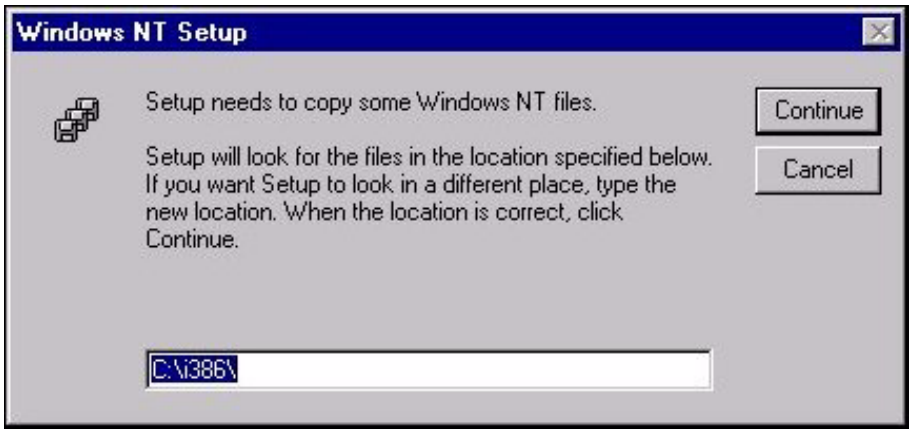


Figure 18: Windows NT Setup Message

You may need to alter the drive letter as appropriate to your installation and computer hardware. After you do so, click **Continue**, and the following window will appear:

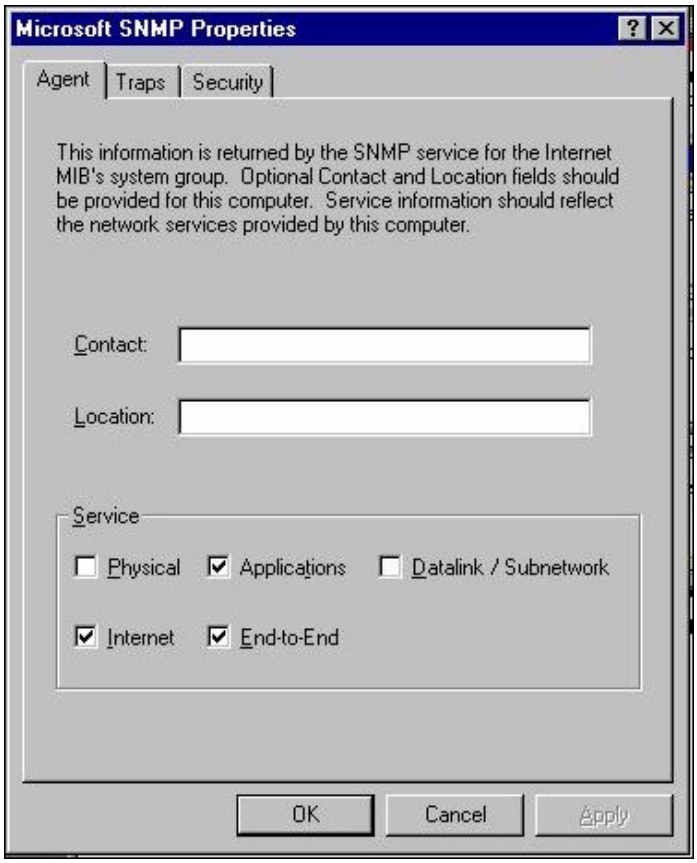


Figure 19: SNMP Properties Dialog Box—Agent Tab

The **Microsoft SNMP Properties** dialog window will appear. Both **Contact** and **Location** text boxes can be left blank. In the **Service** check boxes, select

Applications, **Internet** and **End-to-End**. Click **OK**. This will bring you back to the Network dialog window. Click the **OK** command button.

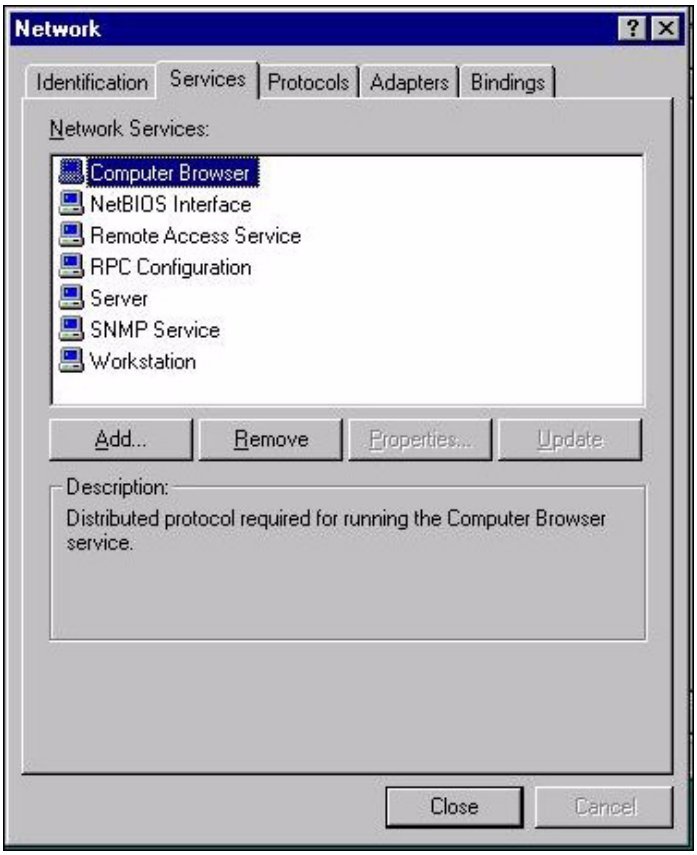


Figure 20: Network Dialog Box—Services Tab

You will then prompted to reboot your computer so that the settings will take effect—click the **Yes** command button to reboot.

Figure 21: RAS/SNMP Services Setup Message

When your computer finishes rebooting, RAS and SNMP Services installation will be complete.

Add Dial-Up Networking

Installing DiamondCraft Software—Add Dial-Up Networking (Serial connection)

Dial-Up Networking provides a simple method for setting up connections in Microsoft Windows NT. From the taskbar, click the **Start** button (usually located at the lower left corner of your PC screen). Point to **Programs**, and then **Accessories**. Choose **Dial-Up Networking**.

If the phonebook is empty or if this is the first time opening this utility, you will see the following screen:

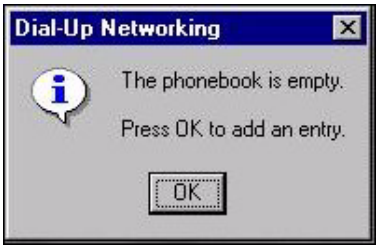


Figure 22: Dial-Up Networking Message

Click **OK** to continue.

If your system does not have entries, Dial-Up Networking automatically opens the **New Network Phonebook Entry Wizard** dialog box for you. However, you should use the single-screen method. Enable the **I know all about phonebook entries and would rather edit the properties directly** check box. (After enabling this option you will not see this Wizard on subsequent entries. If you already have entries, click the **New...** command button from the **Dial-Up Networking** dialog box and go to the next step—**New Phonebook Entry** dialog box.)

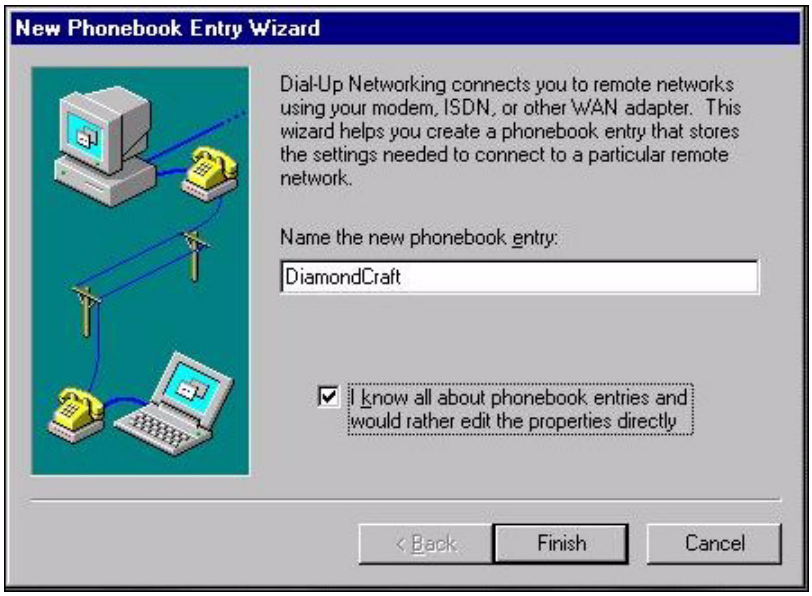


Figure 23: New Phonebook Entry Wizard

The **New Phonebook Entry** dialog box (**Basic** tabbed page) will appear. Enter **DiamondCraft** into the **Entry name** text box. Select **Dial-Up Networking Serial Cable between 2 PCs (COM1)** in the **Dial using** pull-down text box and then click the **Configure** command button.

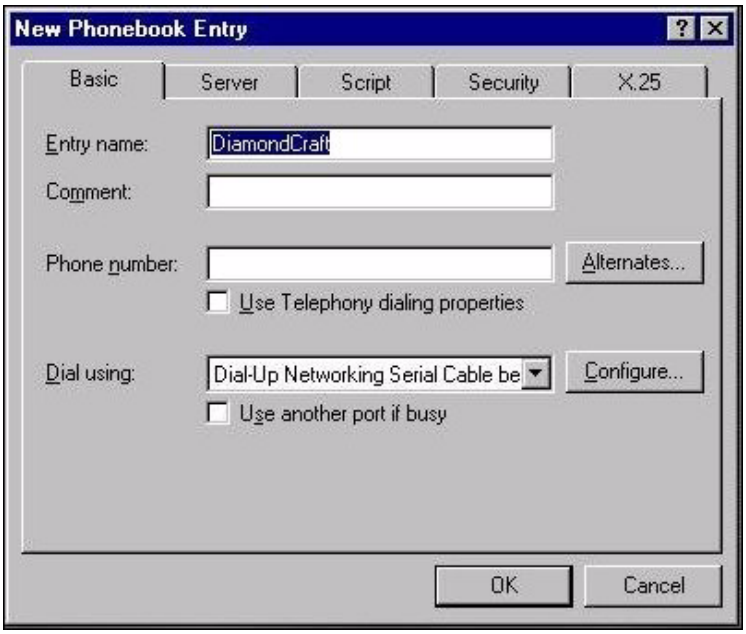


Figure 24: New Phonebook Entry Dialog Box—Basic Tab

The **Modem Configuration** dialog box appears. Select **38400** in the **Initial speed (bps)** pull-down list box. All three **Hardware Features** options should be cleared (turned OFF) as in the example screen below. Click **OK**.

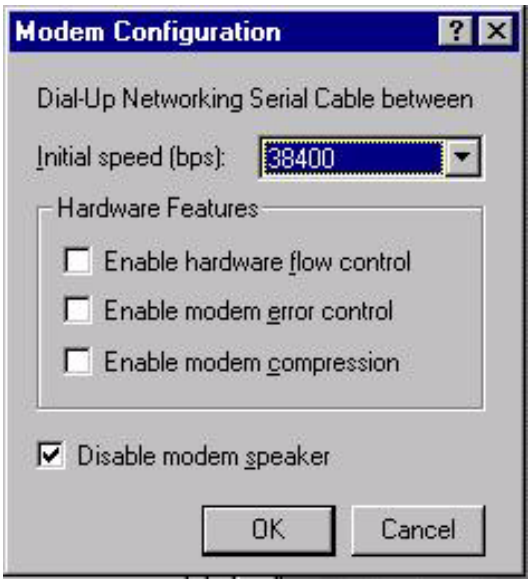


Figure 25: Modem Configuration Dialog Box

Click the **Server** tab. Select **PPP: Windows NT, Windows 95 Plus, Internet** in the **Dial-up server type** pull-down list box, select the **TCP/IP** Network protocols option button. Clear (turn OFF): **IPX/SPX compatible**, **NetBEUI**, **Enable**

software compression, and **Enable PPP LCP extensions** options. Then click the **TCP/IP Settings…** command button.

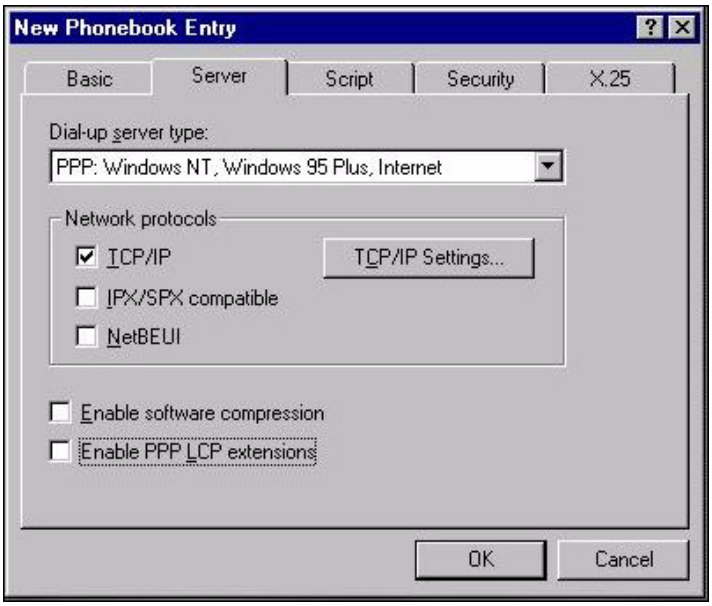


Figure 26: New Phonebook Entry Dialog Box—Server Tab

The **PPP TCP/IP Settings** dialog box appears. Select **Server assigned IP address**, select **Server assigned name server addresses** and select **Use IP header compression**. (Make sure that **Use default gateway on remote network** check box is not selected.) Click **OK**.

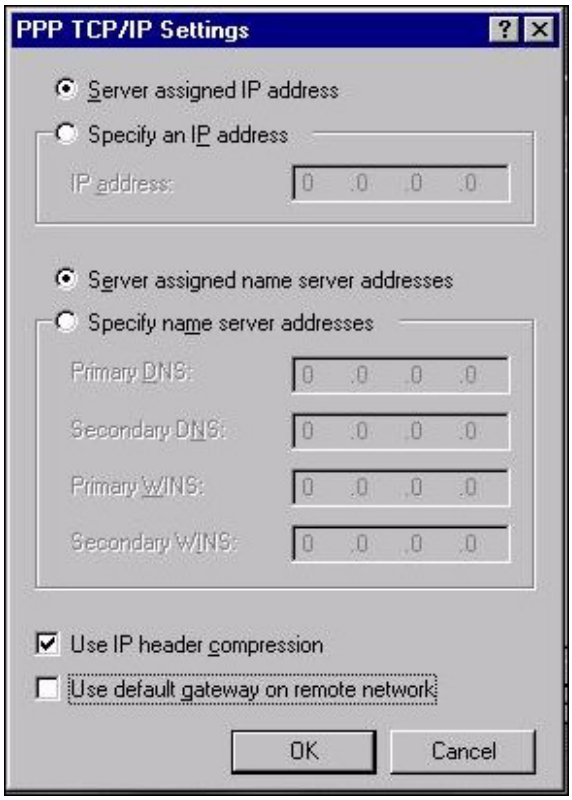


Figure 27: PPP TCP/IP Settings Dialog Box

Click the **Security** tab. Select the **Accept any authentication including clear text** option button and then click **OK**.

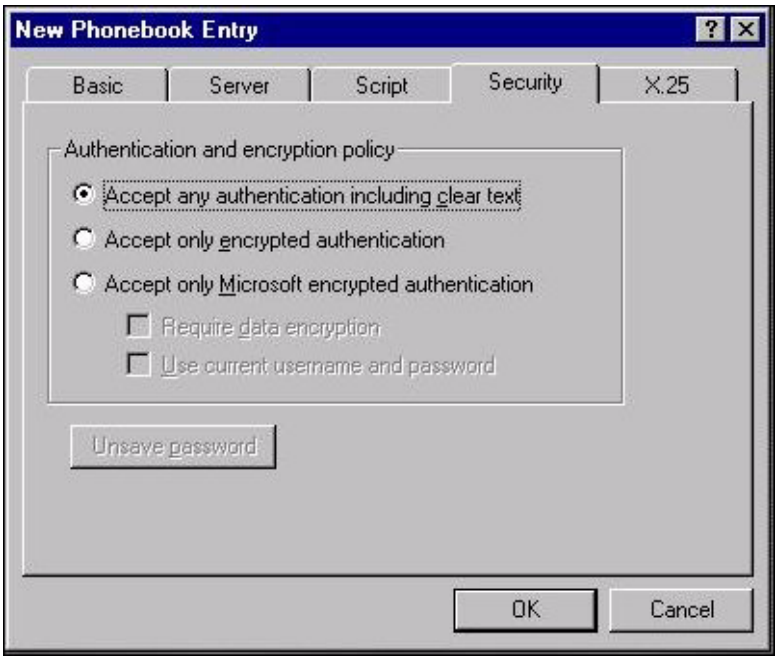


Figure 28: New Phonebook Entry Dialog Box—Security Tab

The **Dial-Up Networking** dialog box will appear. Click the **Close** command button.

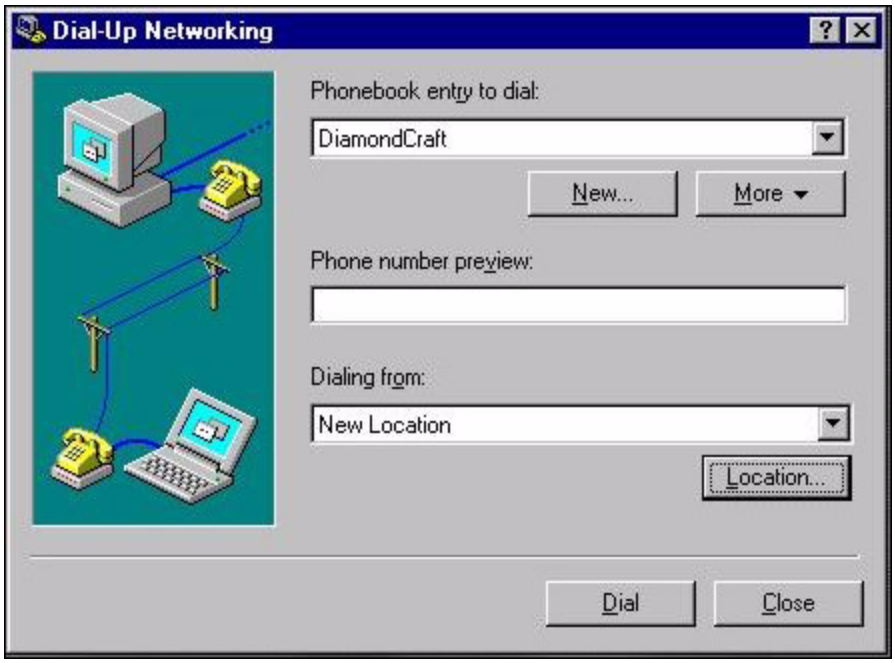


Figure 29: Dial-Up Networking Dialog Box—Confirmation

The setup for Dial-Up networking is complete.

Installing DiamondCraft Application Software

Installing DiamondCraft Application Software

DiamondCraft is a standard Windows application. To install DiamondCraft on a PC (desktop, laptop or notebook):

Close down all software applications before beginning the DiamondCraft installation process.

Put the installation diskette labeled “Disk 1” into the floppy drive.

From the taskbar, click the **Start** button (usually located at the lower left corner of your PC screen). Click **Run…**. The **Run** dialog box appears.

Type in the drive letter of your floppy disk drive and type in SETUP.EXE as in the example below.

Figure 30: Run (Application) Dialog Box

Click **OK**.

When the installation starts the **Setup** dialog box appears. Follow the instructions on the screen. The **SETUP** program will ask a series of questions during the installation process. If installation fails before completion, start the installation process from the beginning.

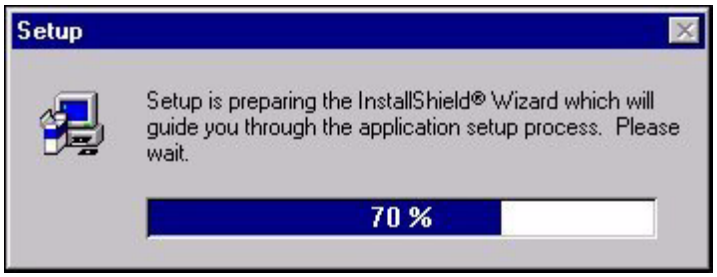


Figure 31: Setup Message

DiamondCraft software is now installed on your hard disk drive. The installation automatically adds DiamondCraft to the Windows programs list (from the taskbar). To start DiamondCraft, select **Start** from the taskbar, select **Programs**, then select **DiamondCraft**.

TIP To install the DiamondCraft program icon on your desktop, do the following:

Open Windows NT Explorer. Locate the DiamondCraft.exe file, which is in the DiamondCraft sub-directory. Select the file (DiamondCraft.exe) and while holding down the left mouse button, drag the file to the Windows desktop. You can now start the DiamondCraft application program by double-clicking the "Shortcut to DiamondCraft" icon.

IMPORTANT: Windows NT service packs that were previously installed will need to be reinstalled at this point.

Trouble Shooting Tips

Refer to Volume 3, Acceptance Testing, Appendix A for DiamondCraft troubleshooting tips.

Removing DiamondCraft

Removing DiamondCraft Application Software

If for any reason you need to remove DiamondCraft from a PC, use Windows NT's **Control Panel Add/Remove Programs** facility.

From the **Control Panel**, click the **Add/Remove Programs** icon.

Open Windows NT Explorer. Locate the DiamondCraft.exe file, which is in the DiamondCraft sub-directory. Select the file (DiamondCraft.exe) and while holding down the left mouse button, drag the file to the Windows desktop. You can now start the DiamondCraft application program by double-clicking the “Shortcut to DiamondCraft” icon.

Select **DiamondCraft** from the list of installed programs in the list box at the bottom of the screen, and click the **Add/Remove** button. Follow the on-screen instructions for removing the application.

The Windows GUI

How DiamondCraft Works

DiamondCraft uses the Microsoft Windows Graphical User Interface (GUI) and Simple Network Management Protocol (SNMP) to provide the interface between the technician and the Speedlink.

Speedlink Addresses / Serial Port Connection

There are two serial ports (located on the left side of the Master Control Shelf), labeled J1 and J2, corresponding to the two Network Management Processor (NMP) slots in the MCS. See Volume 3, Chapter 6 for details of how to connect DiamondCraft to the Speedlink System through a serial port.

Objects

The DiamondCraft GUI (Graphical User Interface) allows you to work with the individual components of the physical multiplexer, by working with the *objects* that represent those components on the screen. Each component—whether a card shelf, an individual card, a circuit, or a facility—is represented as an object in the DiamondCraft GUI.

The types of objects supported in DiamondCraft are listed below.

Speedlink Node. Contains the whole system and support data, for example the name of the node and the save function.

Shelf. Contains basic configuration and status information for the MCS or LCS.

Card. Contains configuration and status information for the card.

Ports. Contain configuration, status, and performance monitoring information for individual ports. The port data is separated from the card data.

Port detail information is accessed by clicking the port indicator on a card. Clicking the port indicator on a line card displays a bar that contains the individual ports—the number of ports displayed depends which type of line card is being viewed (if the card has only one port, clicking on the indicator opens the port object view). The following example shows the port connections for an IDSL8 line card.

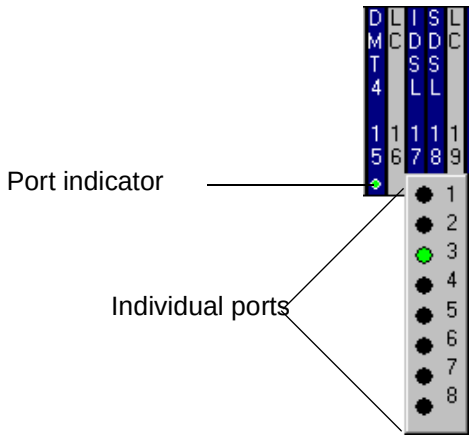


Figure 32: Port Connection and Individual Ports

The color of each individual port indicates its status. For information on the color codes, see “Color Code for Graphical Elements” on page 39. Click any port to view and work with provisioning information for the port.

Information for the selected port is displayed as a *port object view*, with different categories of information presented on separate tab pages. The number of tab pages, and the information included on them, depends on which card is being viewed.

Connection. Contain status and configuration information for the two links of a virtual path set up between a line card and the trunk protection group. Connection data is displayed by selecting **Tools | Show Connections...** and double-clicking a connection ID. A connection may also be displayed by selecting the Connection tab for a line card port and double-clicking a connection ID. A new connection can be created from **Tools** | **New Connection...** or by clicking the **New Connection** command button in the Connection dialog box.

NOTE: A line card must be configured before you can use it to create a connection.

Link. Contain status and configuration information for a connection. Link A is always on a line card and Link Z is always at the trunk. Links are accessed by selecting the **Show A** or **Show Z** command button in the Connection dialog box.

The Opening Window

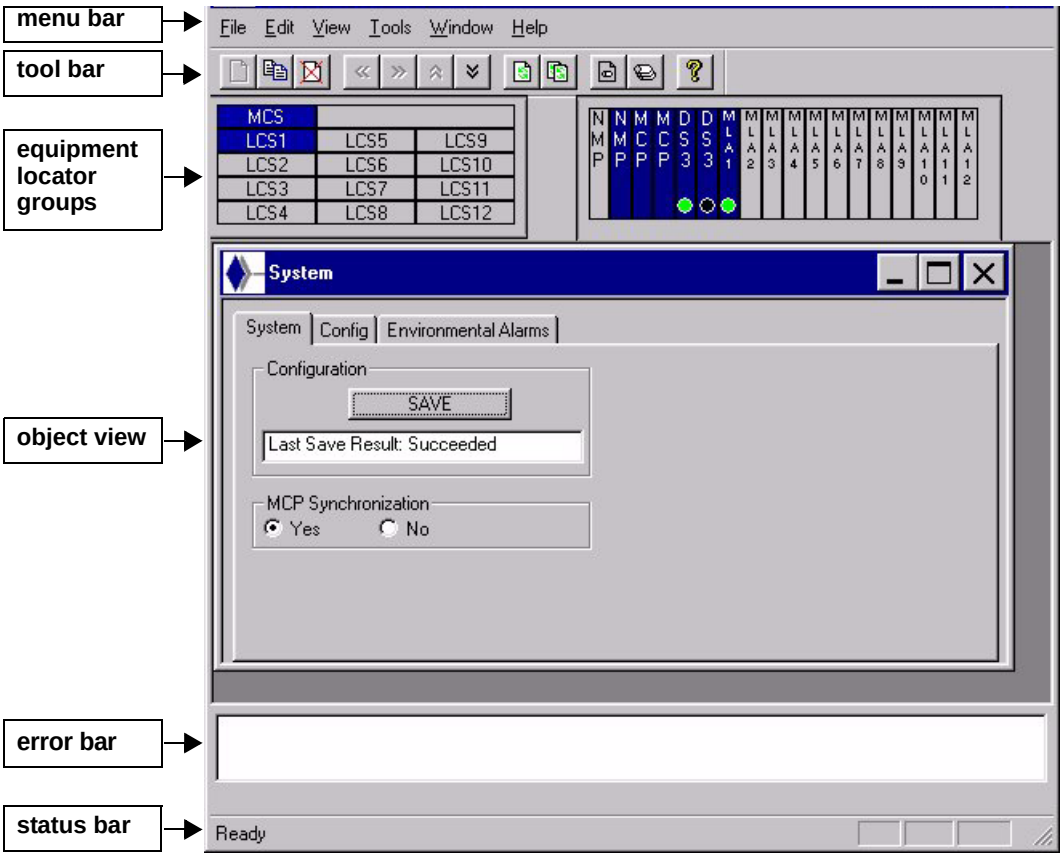


Figure 33: DiamondCraft Window—Initial View

The DiamondCraft window contains a menu bar and a toolbar (at the top), a status bar and error bar (at the bottom), equipment locator groups for graphical navigation, and various *object views*. The object view displays object data.

DiamondCraft gives you some control over the components that make up a DiamondCraft window. You can tell DiamondCraft that you do not want the toolbar or status bar or error bar displayed. You can also size the window by dragging the edges of the window, and any object views, to accommodate the size of your screen. These details will be discussed in the next chapter. This chapter concentrates on how the object views operate.

Graphical Navigation

The graphical navigation is intended to represent the actual look of the Speedlink System. A DiamondCraft window displays information and controls about a Speedlink object. It consists of the following components:

- Equipment locator groups (navigation bars) in the upper section of the DiamondCraft window.

- One or more tabbed data pages in the middle section of the DiamondCraft window.

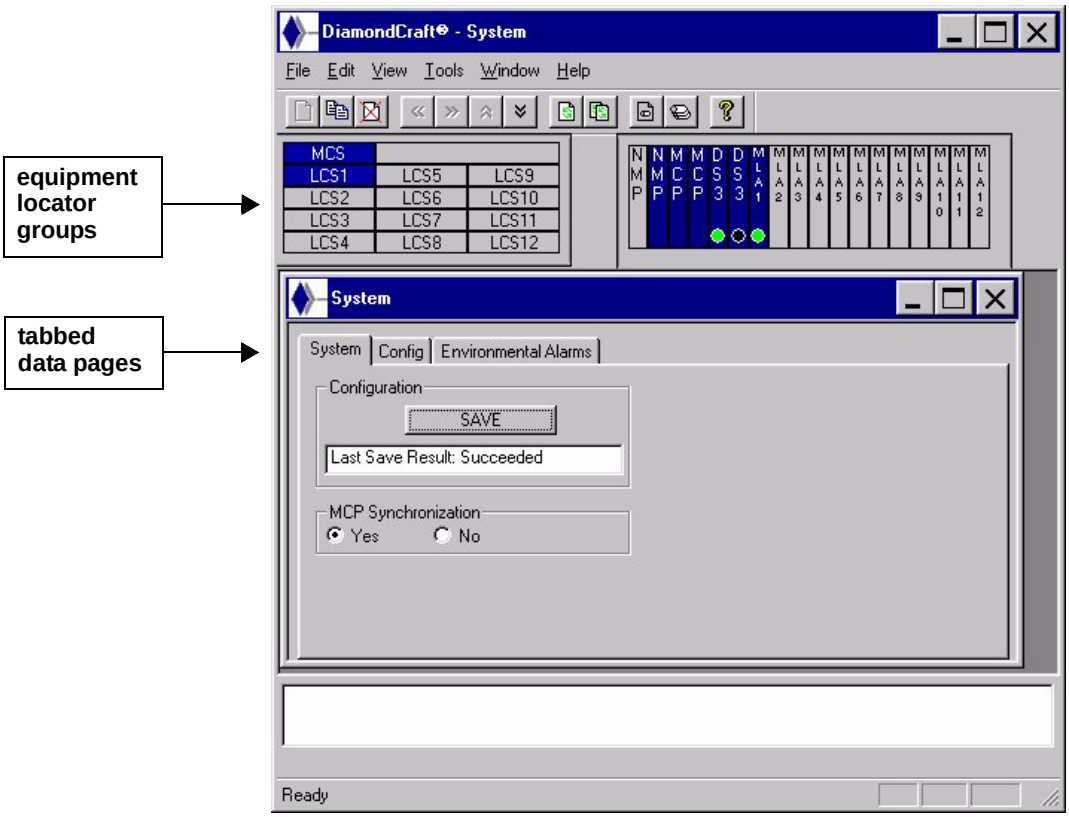


Figure 34: DiamondCraft Window—Initial View

CAUTION: In most cases, any settings that you change in an object view *immediately* affects the Speedlink System.

Equipment Locator Groups

The equipment locator groups by acting as navigation bars allow you to specify the object that you want to display:

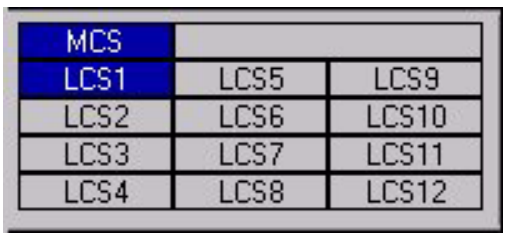


Figure 35: Equipment Locator Group—Speedlink Multiplexer

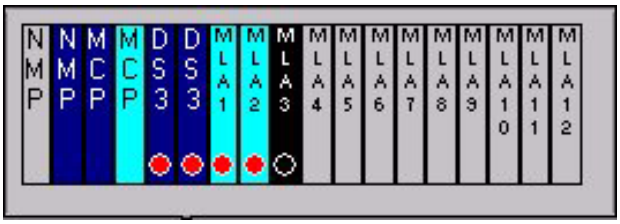


Figure 36: Equipment Locator Group—Master Control Shelf (MCS)

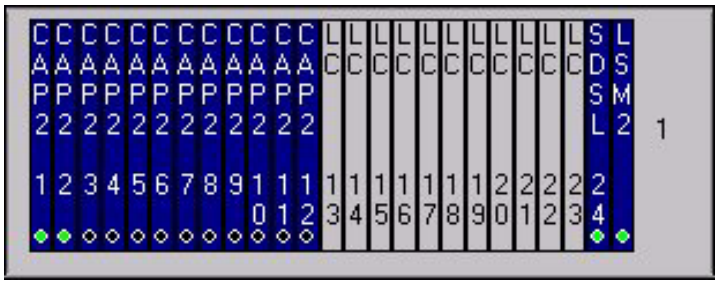


Figure 37: Equipment Locator Group—Line Card Shelf (LCS)

To display the equipment locator groups for the Speedlink Multiplexer rack, the Master Control Shelf, and the Line Card Shelves use the pull down selection from the View option on the toolbar menu as shown in the illustration below:

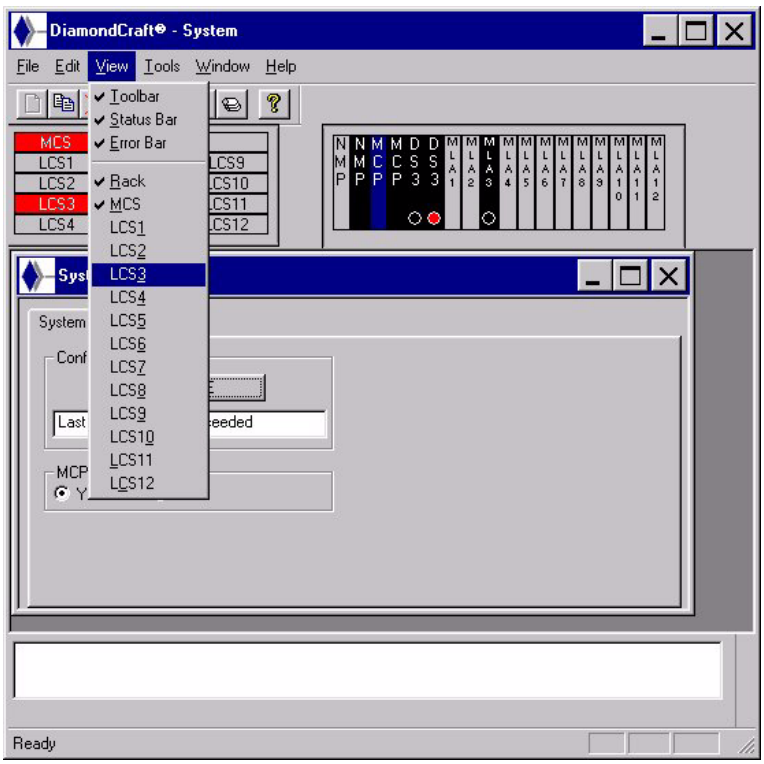


Figure 38: Equipment Locator Group—View Menu

NOTE: Equipment locator group objects can be dragged to most areas of the DiamondCraft window by holding down the left mouse button after positioning the cursor over any edge of an equipment locator group object.

Shelf, **Card**, and **Port** objects, correspond to the multiplexer (MCS or LCS) shelf, card within a shelf, and port on a card. As you select from each of these graphical choices, the graphical representation will change to reflect the current object. For example, selecting the first Line Card Shelf by clicking the LCS1 object in the MCS rack locator group will display the following dialog box:

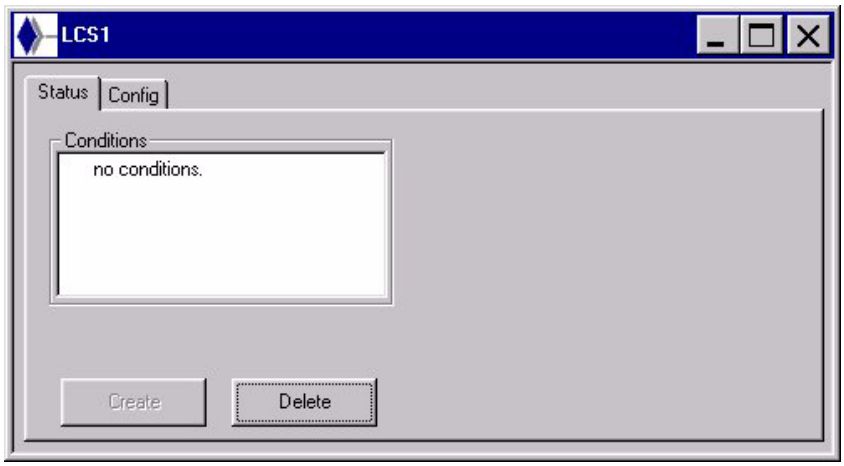


Figure 39: LCS Dialog Box—Status Tab

Selecting the first Line Card by clicking the CAP2—1 object in the LCS 1 equipment locator group will display the following dialog box:

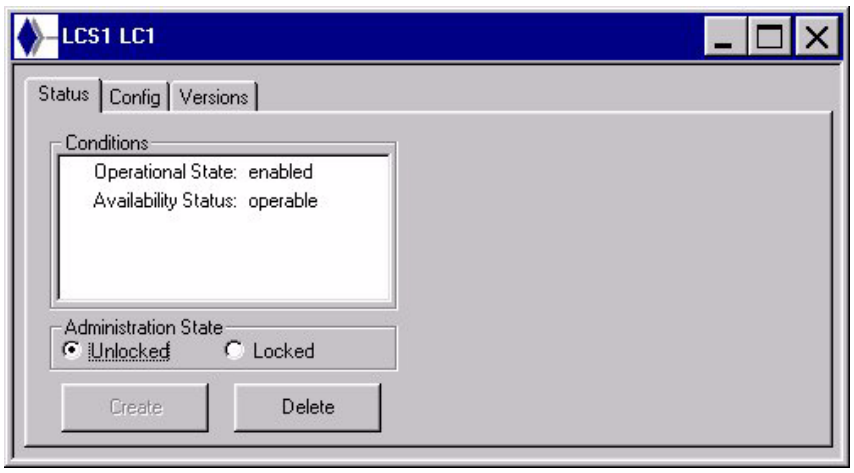


Figure 40: LCS Dialog Box—Status Tab, with Card Selected

To select the port for a Line Card, click the port indicator on the Line Card object as shown below:

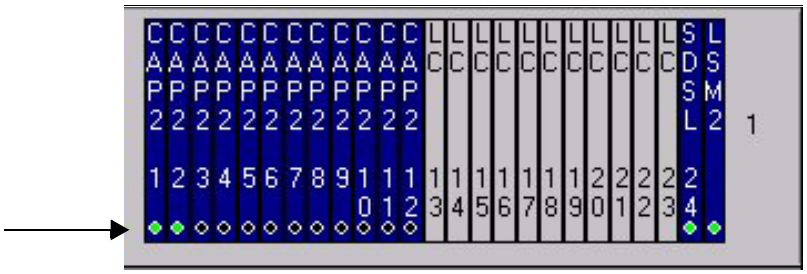


Figure 41: LCS Display—Port Indicators

Clicking on the port indicator brings up the following drop-down option box:

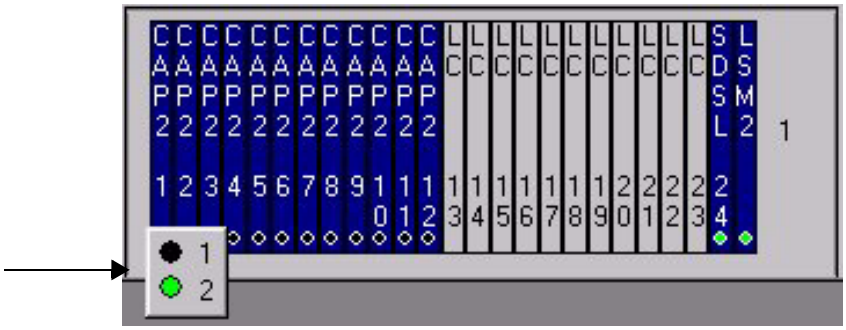


Figure 42: LCS Display—Port Selection Icon

Selecting the port by clicking the port radio option button will display the following dialog box:

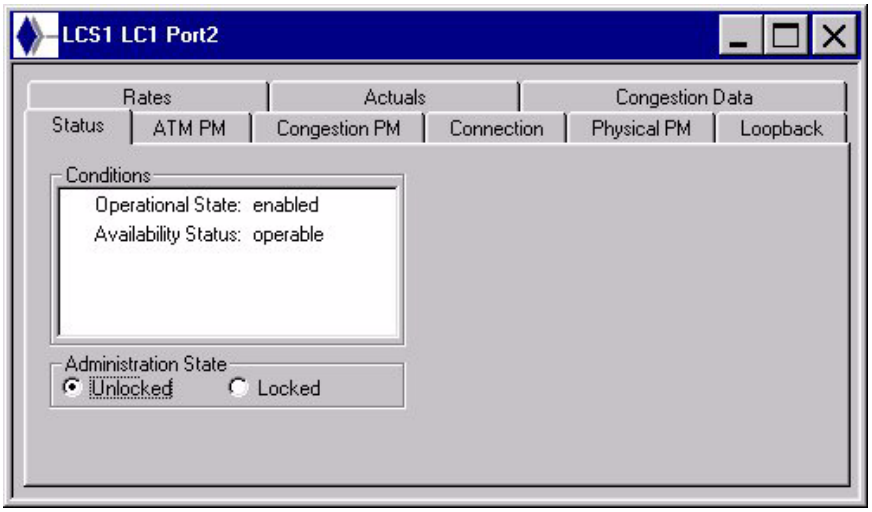


Figure 43: LCS Port Dialog Box—Status Tab

Data Pages

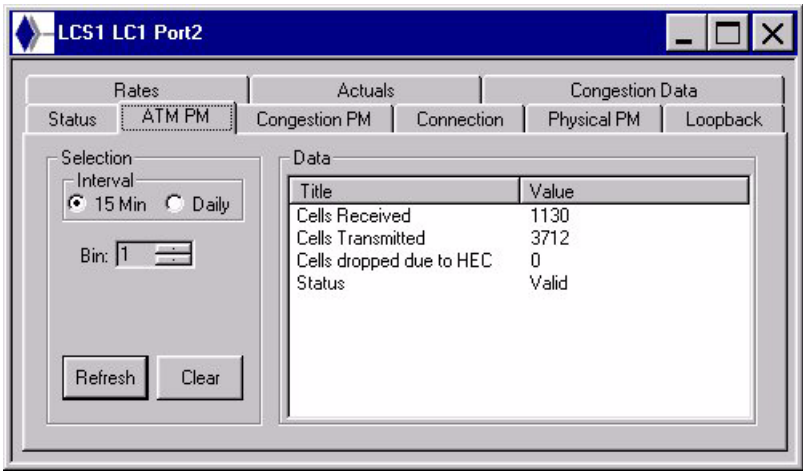


Figure 44: LCS Dialog Box—ATM PM Tab (example)

In DiamondCraft's dialog windows there are individual tabbed pages within object views. In the example above there are tabbed pages for **Status**, **ATM PM, Congestion PM, Congestion Data, Loopback**, **Rates**, **Actuals**, **Connection** and **Physical PM** (Performance Monitoring).

Within each page, DiamondCraft displays data and controls. Some of the data is read-only, which means that you cannot change it; it is strictly informational. Some of the data can be configured by the user. Some of the items are buttons, that you use to perform an operation or to enable or disable a setting.

Table 1: Data Page Controls

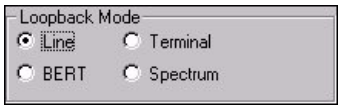
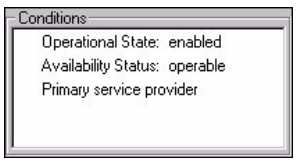
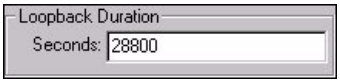
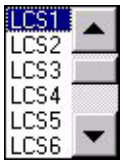
NAMES	PURPOSE	EXAMPLE
radio option button	select one and only one of several choices, displaying the current setting value (mutually exclusive options)	
non-scrolling list box	display information to the user; read-only	
command buttons	select an action, display no information	

Table 1: Data Page Controls (continued)

NAMES	PURPOSE	EXAMPLE
edit box	display and accept a numeric or alphanumeric input	
spin box	text box with up and down arrows that allows the user to move through a set of fixed values	
combo box	select an object (scrollable)	

Chapter 2

Chapter 2 DiamondCraft Reference Manual

The DiamondCraft Command Set

Purpose

This chapter describes the different commands and displays in DiamondCraft. This chapter includes the following categories of information:

- Menus and tool bars
- How to use online help
- All object views (shelves, trunk cards, line cards, and ports)

Menus & Toolbars

DiamondCraft's parent window includes a menu bar and a toolbar located near the top of the window:

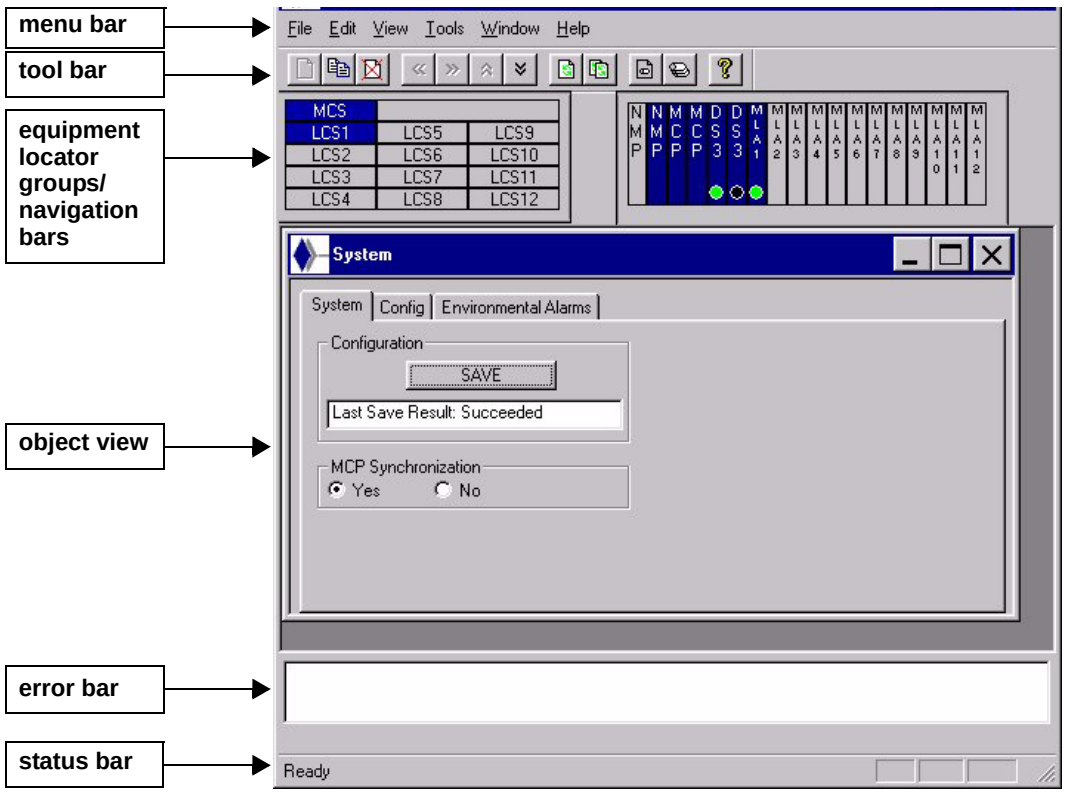


Figure 45: DiamondCraft Opening Window

Equipment locator groups / navigation bars are located below the toolbar. A status bar and an error bar are located near the bottom of DiamondCraft's parent window.

The menu and the toolbar perform equivalent functions. Using the toolbar, status bar and error bar in DiamondCraft are optional and they can be removed if so desired.

The tool bar and the error bar can be docked to any side of the DiamondCraft window and can be placed anywhere on the DiamondCraft screen as desired by the user. Use the cursor to move the tool bar and error bar to the desired screen location.

Table 2: FILE Menu Commands and Functions

Command	Toolbar Icon	Keyboard Shortcut	Function
New	None	Ctrl + N	Planned for future release.
Open Again		Ctrl + O	Opens a new object view addressing the same object as the currently selected object view.
Close		None	Closes the currently selected object view.
Save	None	Ctrl + S	Saves the Speedlink settings to non-volatile memory with the Speedlink System.
Exit	None	None	Exits DiamondCraft.

Table 3: EDIT Menu Commands and Functions

Command	Toolbar Icon	Keyboard Shortcut	Function
Undo	None	Ctrl + Z	Planned for future release.
Cut	None	Ctrl + X	Planned for future release.
Copy	None	Ctrl + C	Planned for future release.
Paste	None	Ctrl + V	Planned for future release.

Table 4: VIEW Menu Commands and Functions

Command	Toolbar Icon	Keyboard Shortcut	Function
Toolbar	None	None	Controls whether DiamondCraft displays the toolbar or not.
Status Bar	None	None	Controls whether DiamondCraft displays the toolbar or not.
Error Bar	None	None	Controls whether DiamondCraft displays the toolbar or not.
Next		Ctrl + Right arrow	View the next object. For example, the next line card (dialog box) in the line card shelf.
Previous		Ctrl + Left arrow	View the previous object. For example, the previous line card (dialog box) in the line card shelf.
Up		Ctrl + Up arrow	View the higher level component's (or object) dialog box.
Down		Ctrl + Down arrow	View the lower level component's (or object) dialog box.
Rack[a]	None		Displays the Multiplexer Rack object view.
MCS	None		Displays the MCS object view.
LCS (1–12)	None		Displays the selected LCS object views.

[a] Right-clicking with the mouse pointer on the MCS or an LCS in the rack view displays the selected item.

Table 5: TOOLS Menu Commands and Functions

Command	Toolbar Icon	Function
Show Connections…		Displays all connections on this multiplexer.
New Connection		Creates a new connection. The new connection defaults to the first LCS, card, and port.
Options…	None	Displays a window that lets you set DiamondCraft's timeout and polling intervals. It also provides the ability to set certain dialog display options.

Table 5: TOOLS Menu Commands and Functions (continued)

Command	Toolbar Icon	Function
Initialize System…	None	Initializes the Speedlink System. Use this command to set the system's IP address, IP Mask and Gateway.
Backup	None	Backs up the Speedlink System's current settings and values.
Restore	None	Restores the Speedlink System from the settings and values stored in the last backup.

Table 6: WINDOW Menu Commands and Functions

Command	Toolbar Icon	Function
Cascade	None	Makes a Windows cascade of DiamondCraft's object views.
Tile	None	Puts all of DiamondCraft's object views on the screen at once, shrinking each of them to a uniform size.
Arrange Icons	None	Arranges all DiamondCraft object view icons on the screen in a regular format.
Refresh		Refreshes the data in the active DiamondCraft dialog box.
Refresh All		Requests an immediate "poll" for all of the currently active objects. The data is refreshed in the active dialog boxes.
Close All	None	Closes all DiamondCraft windows.

Table 7: HELP Menu Commands and Functions

Command	Toolbar Icon	Function
Help Topics	None	Displays the DiamondCraft help system.
About application…		Displays the version of DiamondCraft you are using.

Color Code for Graphical Elements

The graphical elements in the DiamondCraft user interface display in different colors, depending on their status. The colors used to indicate each status are described in the following table.

Table 1: Graphical Element Colors as Status Indicators

Color	Condition/status
Green	Enabled, operable
Red	Alarmed, inoperable[a]
Yellow	Alarmed[b]
Black	Disabled, inoperable (locked)
Gray	Not configured
Orange	Degraded
Dark blue	Configured, unlocked, no alarms
Light blue	Configured, unequipped

[a] For descriptions of alarm conditions, see Appendix B, *Conditions and Recommended Action* in Volume 3, *Acceptance Testing*.

[b] Yellow may be set as an option, instead of red.

Online Help

DiamondCraft online help is application wide and appears when you bring up **Help Topics** on the **Help** menu. This works like any other Microsoft Windows NT help.

If this printed manual does not agree with the online help, you should assume that the online help is more current than the printed manual.

Object Views

In the following information blocks, several of the different object views that DiamondCraft can display will be reviewed. If an object view contains multiple tabbed data pages, those tabbed data pages that are unique to the function will be shown and described.

Common Fields & Groups

Fields and groups are that are displayed for multiple objects are described below.

The **Conditions** list box displays conditions associated with this object:

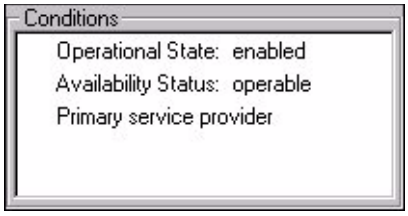


Figure 46: Conditions List Box

Conditions that indicate an error have a small red diamond next to them. Purely informational conditions do not. The status information list box is read-only.

The **Configuration** list box shows such information as location, system name, node name, and version information stored in this backplane or card:

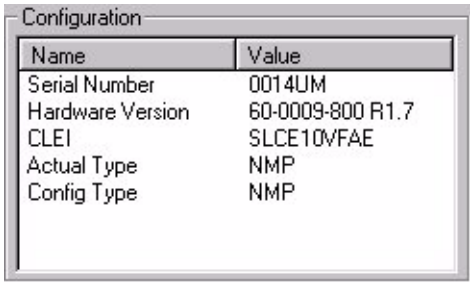


Figure 47: Configuration List Box

This information is read-only.

The **Administrative State** radio option buttons control whether an object is available for service or not:

Figure 48: Administration State Radio Buttons

Unlocked makes the object usable if there are no other conditions blocking use of this object.

Locked makes the object unavailable for service. This is used for configuring an object or when making hardware upgrades.

Multiplexer

This is the object view for the multiplexer:

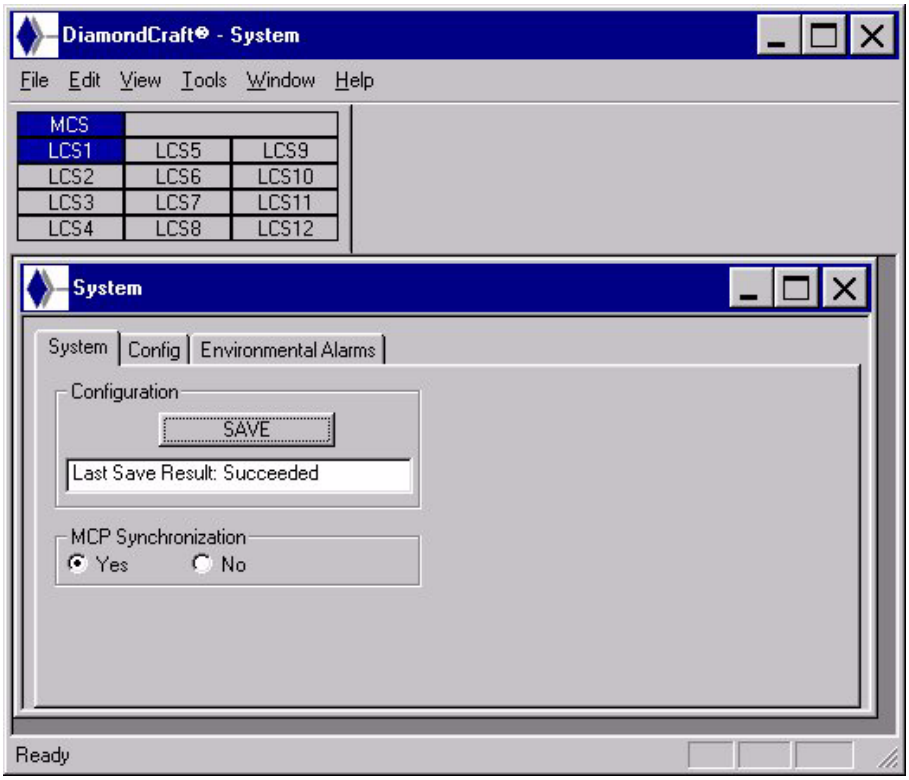


Figure 49: Speedlink System—Multiplexer Object View

IMPORTANT: The multiplexer accepts commands from DiamondCraft on a real-time basis. However, changes are NOT applied to the Speedlink's non-volatile memory until you issue the save command.

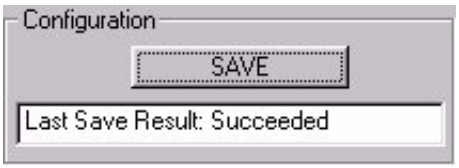


Figure 50: Configuration Save Window

Save. The SAVE command saves all transactions in the MIB in case the NMP or MCP cards fail or in case of a power failure. Use the SAVE command periodically during your DiamondCraft session.

The multiplexer immediately accepts commands from DiamondCraft, but until the transaction is committed by issuing the save command (clicking the **SAVE** command button or choosing **File > Save** from the pull-down menu) these changes to the multiplexer's MIB are not permanently saved. (Permanent changes to the

multiplexer's MIB will reappear after a power failure; settings that have not been saved will not reappear.)

After clicking the **SAVE** command button the following dialog box will appear. Click **Yes** to save the changes to the Speedlink System.

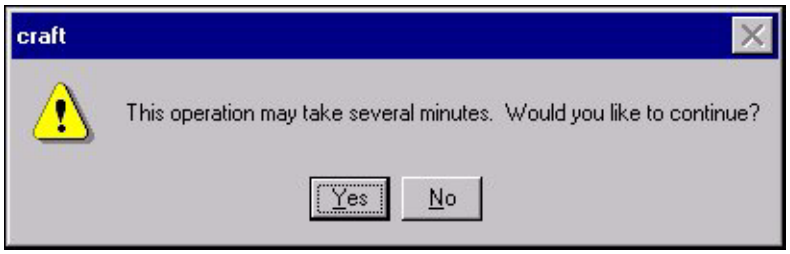


Figure 51: Save Message Window

When you select the **SAVE** command button and click **Yes** in the dialog box shown above, MIB changes are stored in permanent memory. If you exit without saving, you can still re-run DiamondCraft and then save. However, if you exit without saving the changes, and the Speedlink loses power, changes made since the last save will be lost.

Environmental Alarms. To set the Speedlink System's environmental alarms, click the Environmental Alarms tab page shown below:

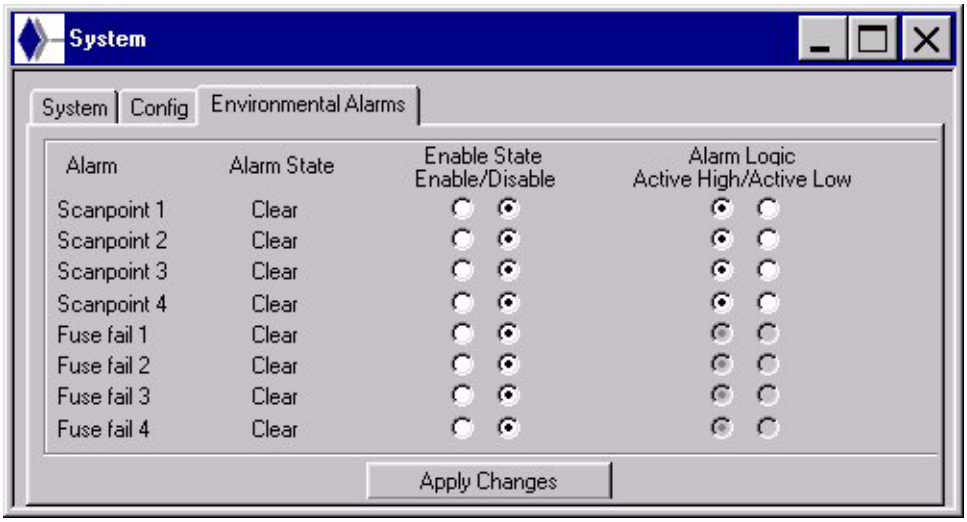


Figure 52: Environmental Alarms Tab Page

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 9 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 **Apply Changes** command button.

Initialize the Speedlink System. To initialize the Speedlink System: from **Tools**, select **Initialize System…**.

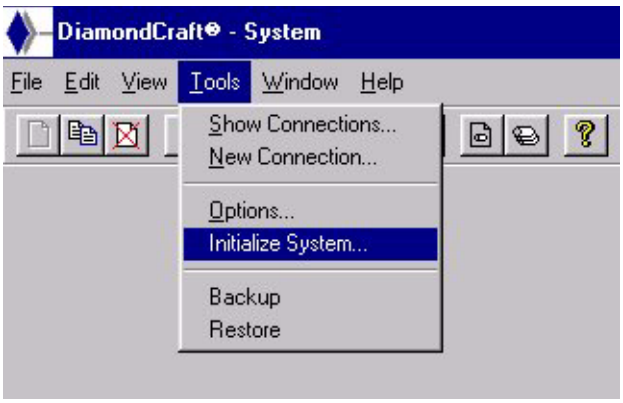


Figure 53: Tools Menu

The following dialog box will appear:

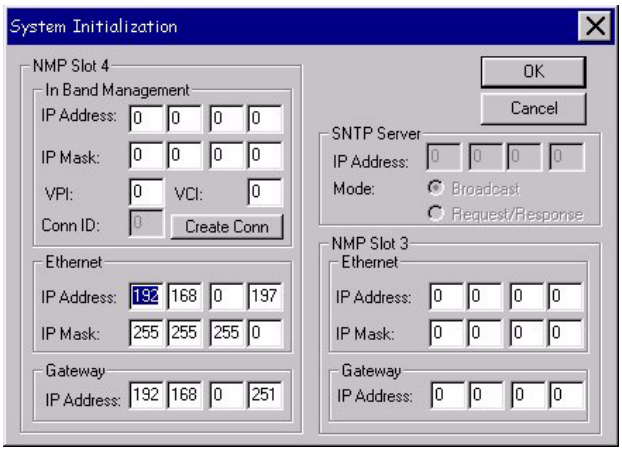


Figure 54: Speedlink Initialization Dialog Box

Network Management. Network management may be set up in either of two ways:

- In-Band Network Management, used with either DiamondView or DiamondCraft.
- Using an Ethernet connection, which can be used with either the DiamondView EMS or DiamondCraft.

When you initially start the system, you specify whether to use a serial cable or Ethernet connection. The Connection dialog window, which displays when you start the system, is shown below.

Figure 55: Connection Dialog

Use the radio buttons to select either serial cable or Ethernet connection, and select an IP address from the drop-down list. You can also enter a new IP address.

Whether you connect using a serial cable connection or an Ethernet connection, you use the System Initialization dialog box to set the In-Band Network Management parameters. Both methods are described in the following sections.

InBand Network Management. In-Band Network Management provides a communications interface between either the DiamondView EMS or DiamondCraft, 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. Setup for In-Band Network Management requires entry of IP Address information, plus VPI/VCI information.

Enter the IP Address, IP Mask, VPI, and VCI in the InBand Network Management section of the System Initialization dialog box. Click the **Create Conn** command button. A number will appear in the Connection ID box. Click **OK**.

Ethernet. To setup Network Management over an Ethernet 10BaseT connection, enter the IP Address, IP Mask, and Gateway IP Address for Ethernet and NMP Slot 4. Click the **OK** command button. Return to the **System** tab page of the **System** dialog window. Click the **Yes** option button in the **MCP Synchronization** dialog

box and click the **SAVE** command button to permanently save the IP address information in the Speedlink's Management Information Base (MIB).

NOTE: The NMP slot 3 card is for a future release. IP Address, IP Mask and Gateway information are not required for slot 3 until the card is installed.

IMPORTANT: The IP Address must be established via DiamondCraft so the DiamondView EMS or DiamondCraft can communicate with the Speedlink System over a TCP/IP data network. IP address information is provided by the local Network Administrator. Before you can set up the InBand Network Management connection, you must verify with your 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.

Options. You can configure the timeout period for requests to the Speedlink. You can also configure the polling interval for refreshing open objects. See individual sections for windows that do not poll, but must be explicitly "refreshed."

To set the Options: from **Tools**, select **Options…**. Enter the Timeout and Polling intervals, set the Dialog Display options and then click the **OK** command button.

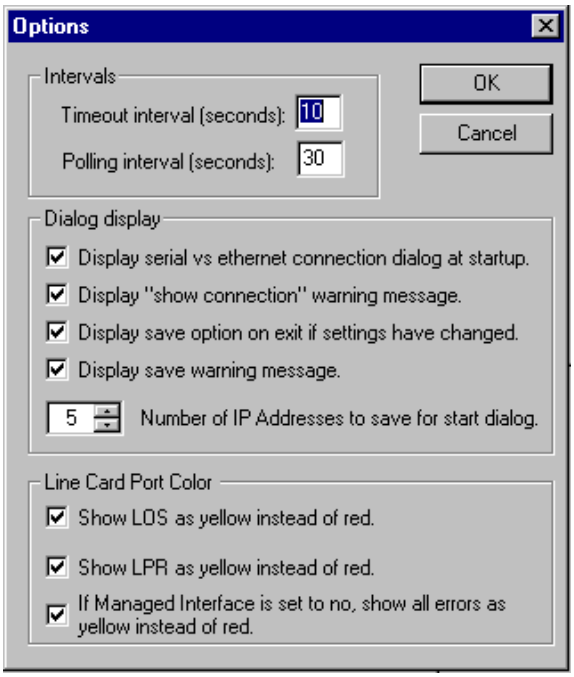


Figure 56: Options Dialog Box

The **Intervals** group allows you to specify timeout and polling intervals for the system. The polling interval can be overridden on individual tabs by clicking the **Refresh** command button. The default for timeout is 10 seconds. The default for polling is 30 seconds.

The **Dialog Display** group allows you to select whether or not to automatically display certain dialog boxes and system messages. By default, all these options are enabled. This group also allows you to select the number of IP addresses to store in the list that displays in the Connection dialog box. Use the spin buttons to select any number between 1 and 50.

NOTE: If you enter more than the specified number of IP addresses in the Connection dialog box, the system deletes existing addresses from the list (starting with the oldest) to make room for new addresses. The system does **not** issue a warning before deleting addresses from the list.

The **Line Card Port Color** group allows you to select options for displaying port conditions. By default all these options are enabled. For information on the Managed Interface option, see page 92.

Master Control Shelf (MCS)

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

Clicking the MCS object in the multiplexer (rack) equipment locator group displays the following dialog box:

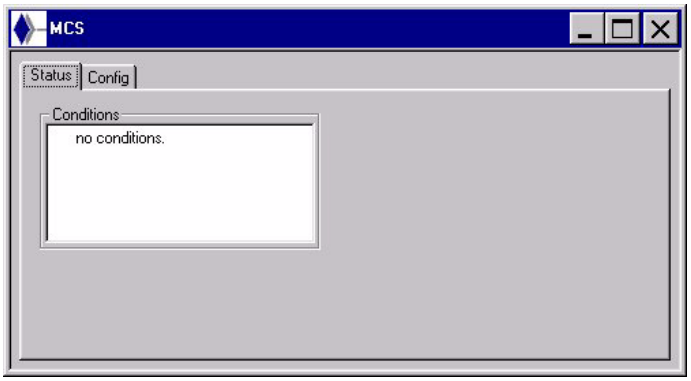


Figure 57: MCS Status Tab Page

MCS Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

MCS Config tab page: The Config tab page has a Configuration list box that shows the Serial Number, Hardware Version, CLEI, and Unit Type for the MCS.

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 and a 25th mounting slot reserved for a Line Card Shelf Multiplexer (LSM) card.

Clicking an LCS object in the multiplexer (rack) equipment locator group displays the following dialog box:

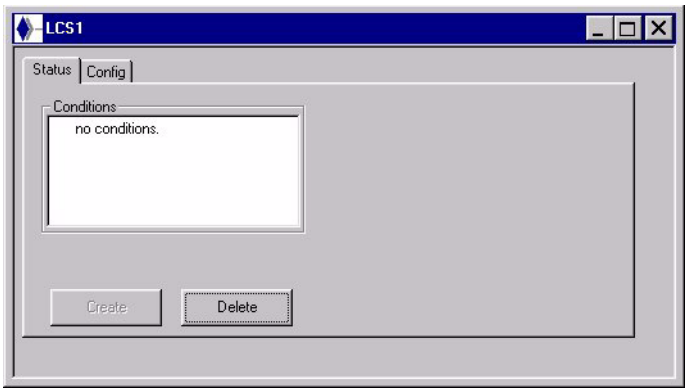


Figure 58: LCS Status Tab Page

LCS Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

LCS Config tab page:

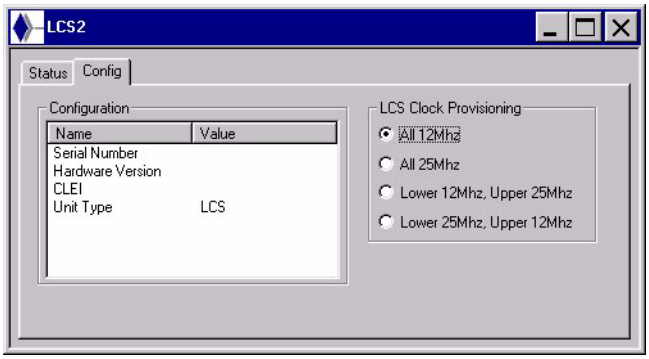


Figure 59: LCS Config Tab Page

The Config tab page has a Configuration list box that shows the Serial Number, Hardware Version, CLEI, and Unit Type for the LCS.

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.

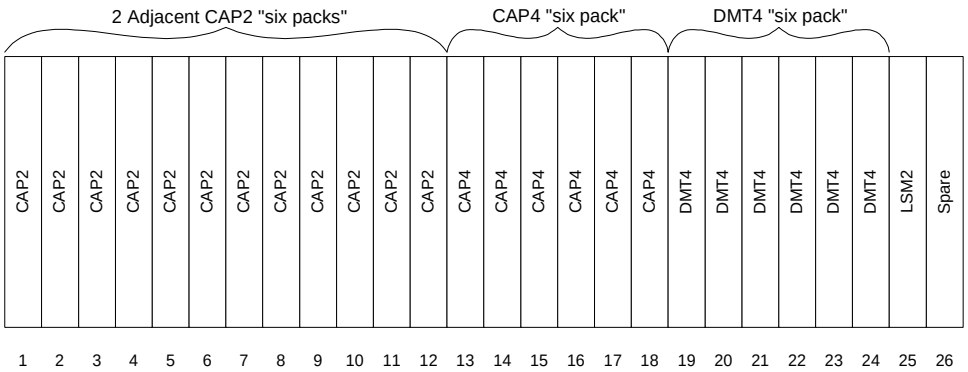


Figure 60: Sample LCS layout with CAP2, CAP4, and DMT4 Line Cards

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, and IDSL8 cards in slots 13-24
  or
- All CAP4, DMT4, SDSL8, and 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.

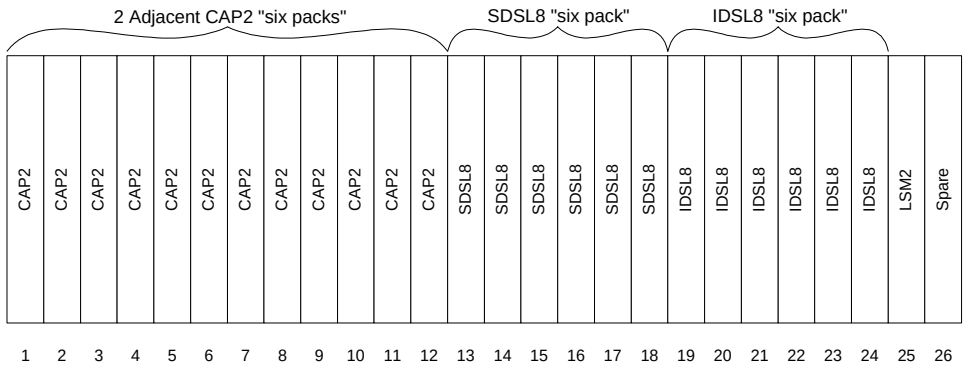


Figure 61: Sample LCS layout with CAP2, SDSL8, and IDSL8 cards

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.

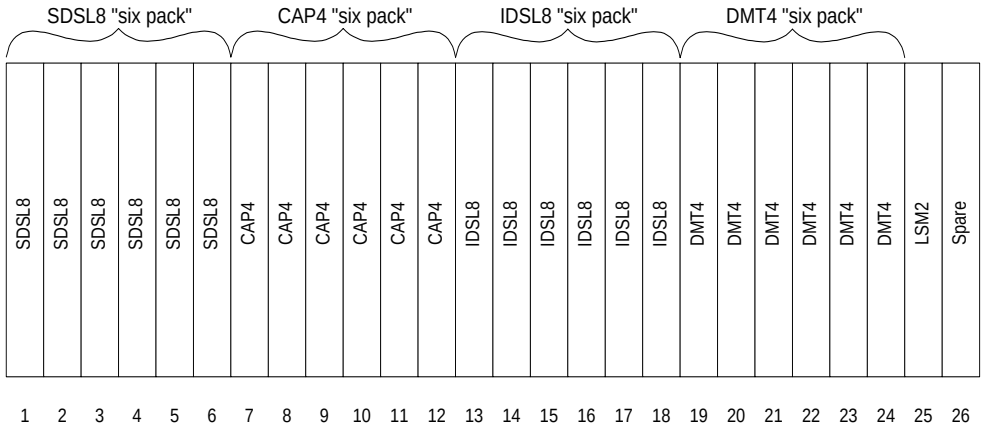


Figure 62: Sample LCS layout with SDSL8, CAP4, IDSL8, and DMT4 cards

Use the LCS Clock Provisioning radio option buttons (see Figure 59, LCS Config Tab Page on page 47) to set the clock speeds as appropriate with the physical placement of the line cards. For example:

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

Network Management Processor (NMP) Card

The NMP card controls the Speedlink System's network management interfaces and provides the protocol support for communication for DiamondView and DiamondCraft.

Clicking the NMP object in the MCS equipment locator group displays the following dialog box:

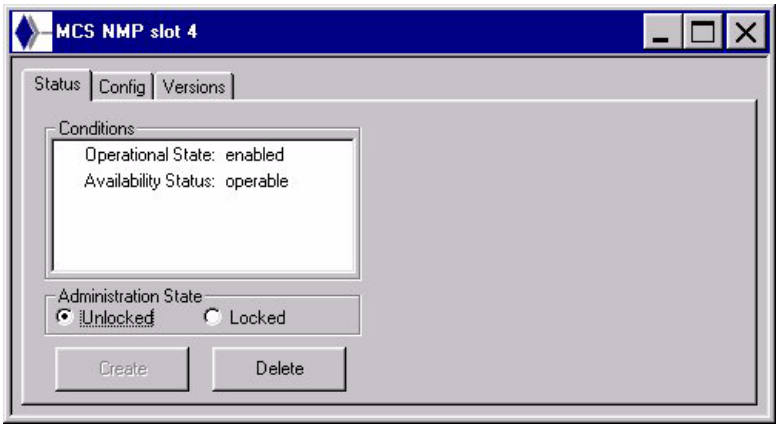


Figure 63: NMP Status Tab Page

The NMP object view contains three tab pages: **Status, Config** and **Versions.**

NMP Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The Status tab page also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

The **Create** and **Delete** command buttons, respectively, add or remove provisioning from the MIB for this NMP.

NMP Config tab page: The Config tab page has a Configuration list box that shows the Serial Number, Hardware Version, CLEI, Name, and Type (Actual and Config) for the NMP.

NMP Versions tab page: The Versions tab page lists the various names and values of the subsystem versions.

Master Control Processor (MCP) Card

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

Clicking the MCP object in the MCS equipment locator group displays the following dialog box:

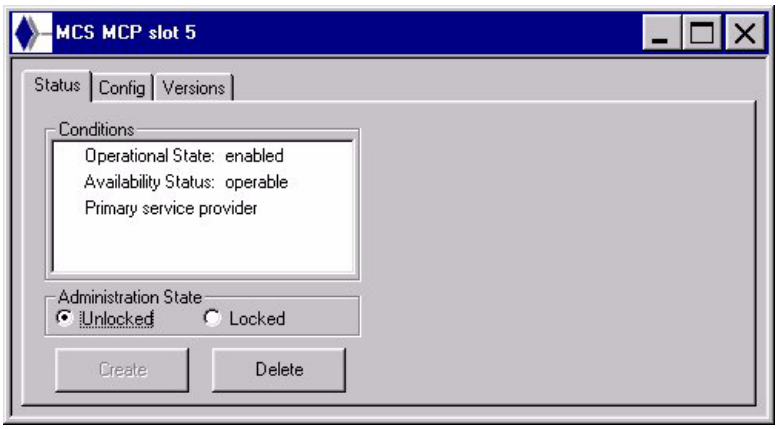


Figure 64: MCP Dialog Box

The MCP object view contains three tab pages: **Status, Config** and **Versions.**

MCP Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The Status tab page also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

The **Create** and **Delete** command buttons, respectively, add or remove provisioning from the MIB for this MCP.

MCP Config tab page: The Config tab page has a Configuration list box that shows the Serial Number, Hardware Version, CLEI, Name, and Type (Actual and Config) for the MCP.

MCP Versions tab page: The Versions tab page lists the various names and values of the subsystem versions.

DS3 Trunk Card

The DS3 trunk card provides the interface between ATM backbone facility and the Speedlink System. 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 system has two DS3 cards in a 1:1 protection group. The DS3 slot 7 card is the “protection” trunk card. The DS3 slot 8 is the “working” trunk card.

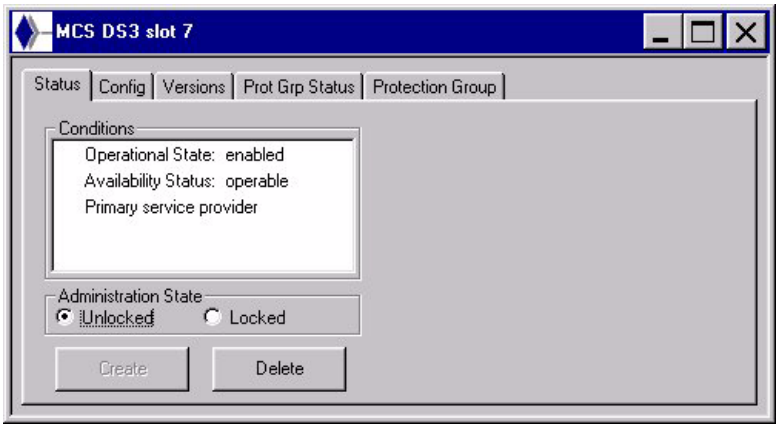


Figure 65: DS3 Dialog Box

The DS3 object view contains five tab pages: **Status, Config, Versions, Prot Grp Status,** and **Protection Group.**

DS3 Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The Status tab page also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

The **Create** and **Delete** command buttons, respectively, add or remove provisioning from the MIB for this DS3 card.

DS3 Config tab page: The Config tab page has a Configuration list box that shows the Serial Number, Hardware Version, CLEI, Name, and Type (Actual and Config) for the DS3 card.

DS3 Versions tab page: The Versions tab page lists the various names and values of the subsystem versions.

DS3 Prot Grp Status tab page: The Prot Grp (Protection Group) Status tab page has a Conditions list box that displays conditions associated with this object. DiamondCraft automatically refreshes the data in the Conditions list box. The Refresh icon (tool bar) forces a “refresh” command; this is an optional step.

The Status tab page also includes **Administration State** radio buttons 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

DS3 Protection Group tab page: The Protection Group tab page is used to set the parameters of the 1:1 protection group for the two trunk cards.

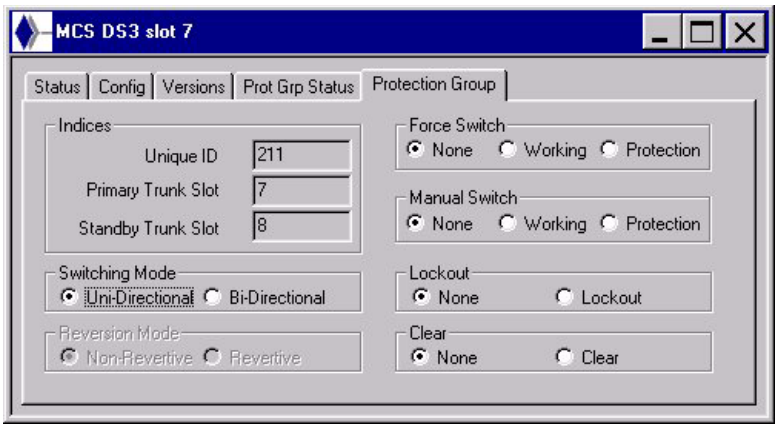


Figure 66: DS3 Protection Group Tab Page

Unique ID is the identifier for the protection group.

Primary Trunk Slot is the Master Control Shelf slot of the currently active trunk card and **Standby Trunk Slot** is the inactive slot. Slots 7 and 8 are reserved for trunk cards (either DS3 or OC3). The leftmost slot (Slot 7) is designated as the protection slot, and the rightmost slot (Slot 8) is designated as the working slot.

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 determining 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.

DS3 Port

This is the DS3 port object view:

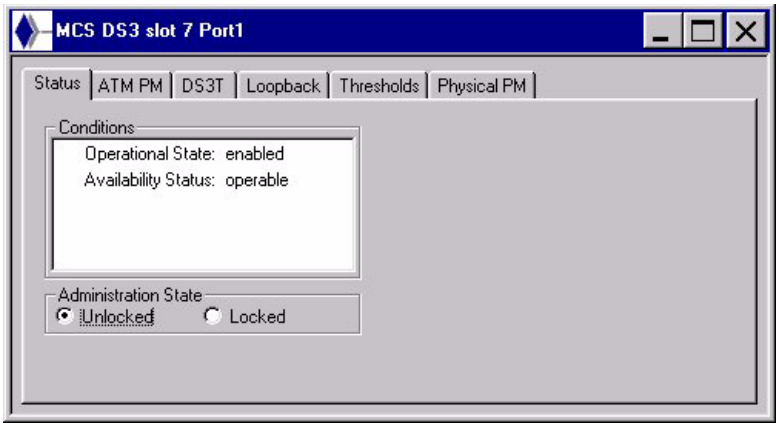


Figure 67: DS3 Port Dialog Window—Status Tab Page

The DS3 Port object view contains six tab pages: **Status, ATM PM, DS3, Loopback, Thresholds,** and **Physical PM.**

DS3 Port Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The Status tab page also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

DS3 Port ATM PM tab page:

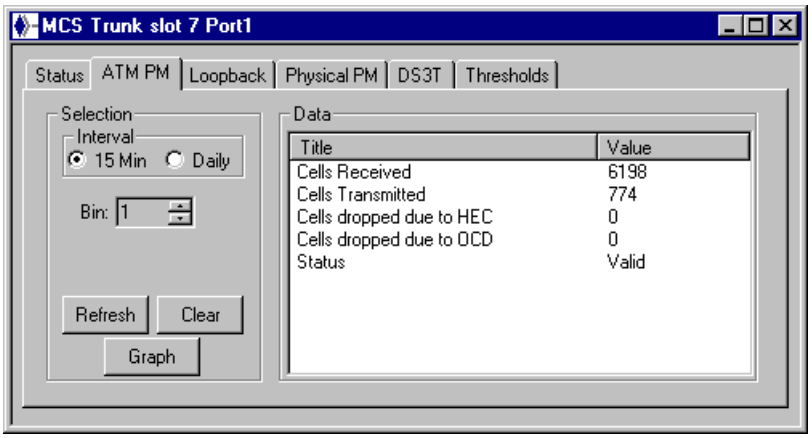


Figure 68: DS3 Port Dialog Window—ATM PM Tab Page

The **ATM PM** (Performance Monitoring) tab page provides information on Cells received, transmitted, dropped and the status. The performance monitoring interval can be set to either 15-minute intervals and/or daily using the radio option buttons.

15-minute Intervals

You can track up to 12 bins of performance data in 15-minute intervals. Bin number 1 always contains the data for the current 15-minute interval. Bin number 2 contains the data for the previous 15-minute interval and so on. In the **Bin** spin box, set the Bin value (1 to 12). Click the **Refresh** command button to display the data for the desired interval. Click the **Clear** command button to clear out the performance data. Click the **Graph** button to display the data in graphical format.

Daily Interval

You can track 2 bins of data in daily intervals. Bin number 1 contains the data for the current day. Bin number 2 contains the data for the previous day. In the **Bin** spin box, set the Bin value (1 or 2). Click the **Refresh** command button to load (display) the data for the desired interval. Click the **Clear** command button to clear out the performance data. Click the **Graph** button to display the data in graphical format.

NOTE: The value of Status in the Data list box will always be “Valid” or “Invalid”. A Status value of “Invalid” indicates that values of cells received, transmitted and dropped should not be used in resolving performance issues. A status value of “Valid” indicates that the data information displayed in this list box can be used in resolving performance issues.

The Graph window displays when you click the **Graph** button from a number of different tab pages. The options included on the Graph window vary slightly depending on the set of data that is being graphed. As an example, the DS3 ATM PM Graph window is shown below.

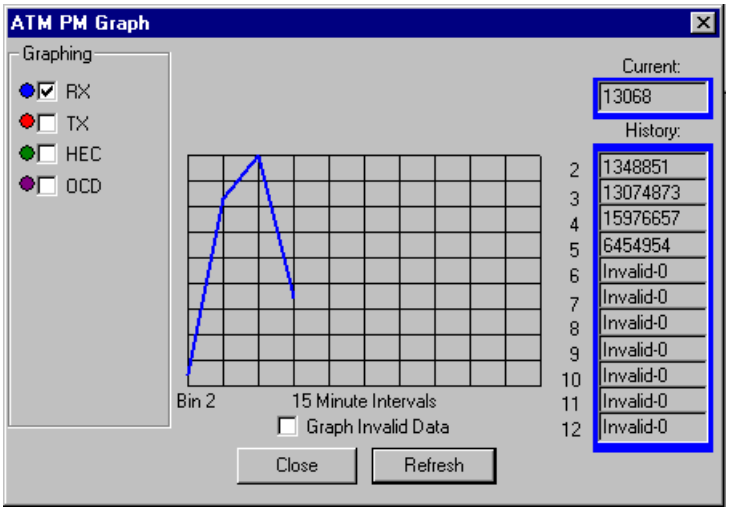


Figure 69: Graph Window—DS3 ATM PM

The information included in the Graph window is described in the following sections.

Graphing group. This group includes a list of parameters that vary depending on the window from which the Graph window was accessed.

The Graph window includes a grid where the line graphs are displayed. The grid can display any combination of the available parameters—each parameter displays in a different color to make it easier to view the information. The grid is divided into 15-minute intervals, and labelled by bin number. The **Graph Invalid Data** check box located below the grid allows you to specify whether or not to display invalid data.

On the right side of the Graph window, numeric data is displayed for the current interval, and historic data is displayed for up to twelve bins.

Click the **Close** command button to close the window, or the **Refresh** command button to refresh the display.

DS3 Port DS3 tab page:

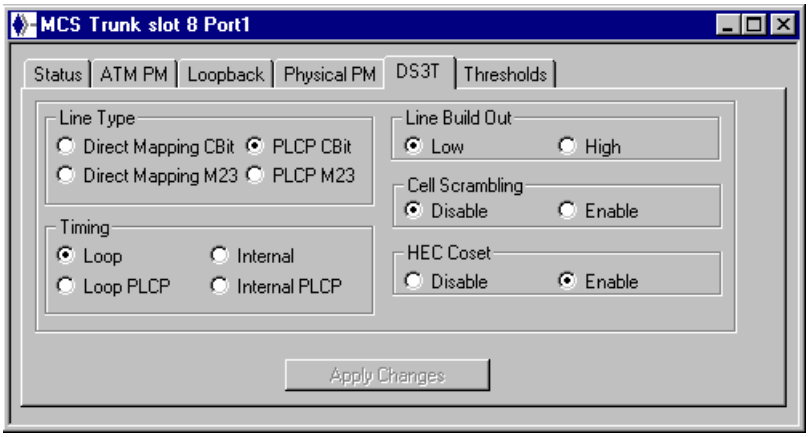


Figure 70: DS3 Port Dialog Window—DS3 Tab Page

These parameters provision the DS3 signal on the DS3's port. The **Line Type** radio option buttons allow you 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 **Line Timing** radio buttons are:

- **Loop—**The Speedlink System will extract timing from the DS3 signal.
- **Internal**—The Speedlink System will supply the timing from an internal source.
- **Loop PLCP**.
- **Internal PLCP**.

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 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 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 only HEC errors that cannot be corrected.

DS3 Port Loopback tab page:

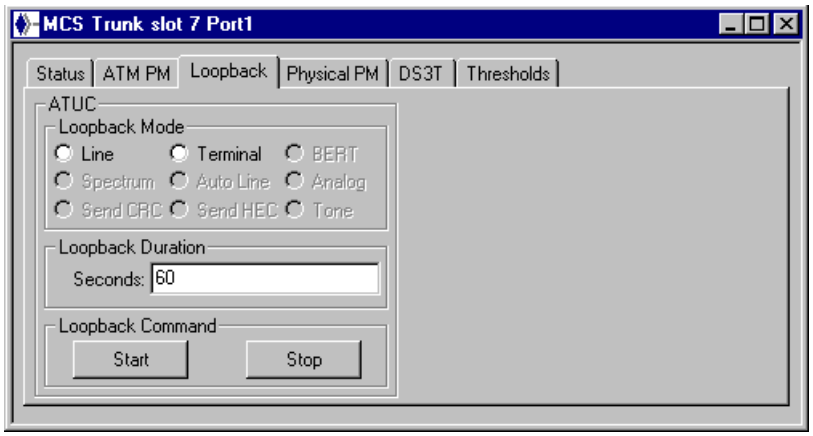


Figure 71: DS3 Port Dialog Window—Loopback Tab Page

The parameters in the **Loopback** tab page control loopback testing for the DS3 trunk card (DS3). **Loopback Mode** sets the DS3 to do line loopback testing, or terminal loopback testing.

Line	The DS3 will loopback any signal received from the MCS.
Terminal	The DS3 will loopback any signal coming upstream to it.

The rest of the loopback mode options are disabled for DS3.

Loopback Duration sets the interval in seconds that the DS3 should wait before giving up on the loopback test. The default Loopback Duration is 60 seconds. The **Loopback Command** buttons **Start** and **Stop** 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.

DS3 Port Thresholds tab page:

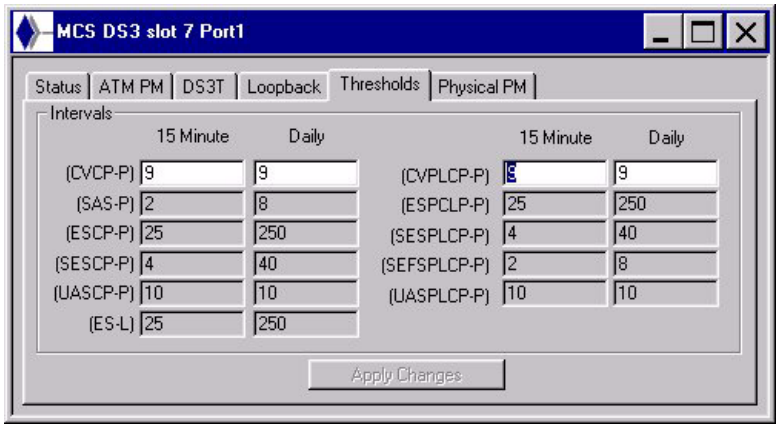


Figure 72: DS3 Port Dialog Window—Thresholds Tab Page

The **Thresholds** tab page contains numeric fields, in which you may alter the current event threshold values for this port for each of these error categories (15-minute and Daily Intervals).

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 8: Performance Parameter BERs

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

Table 8: Performance Parameter BERs (continued)

Acronym	Meaning	Daily Interval	15-minute Interval
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	25
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 8: Performance Parameter BERs (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 non-sequential 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	10

Table 9: CVCP-P Provisionable Thresholds

BER	Daily Thresholds	15-minute Thresholds
10^{-10}	382	38
10^{-9}	3820 (default)	382 (default)
10^{-8}	38196	3820
10^{-7}	381799	38180
10^{-6}	3801881	380188

Table 10: CVPLCP-P Provisionable Thresholds

BER	DAILY THRESHOLDS	15-minute THRESHOLDS
10^{-10}	358	36
10^{-9}	3584 (default)	359 (default)
10^{-8}	35830	3583
10^{-7}	358132	35813
10^{-6}	3564673	356467

Click the **Apply Changes** command button after entering the values.

DS3 Port Physical PM tab page:

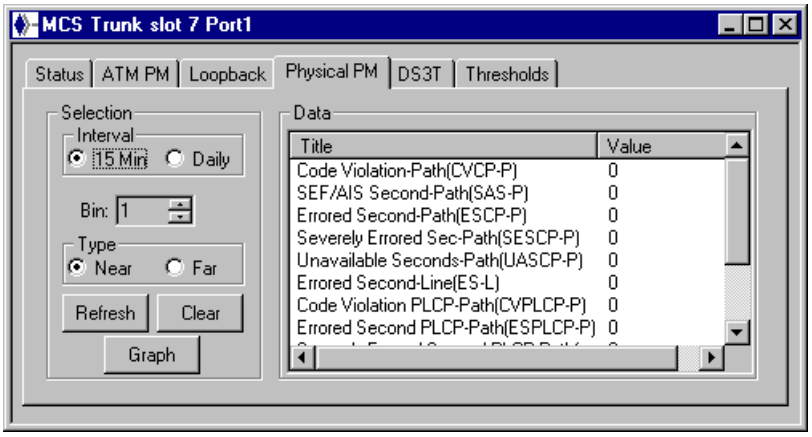


Figure 73: DS3 Port Dialog Window—Physical PM Tab Page

The **Physical PM** (Performance Monitoring) tab page provides information on performance monitoring. The performance monitoring interval can be set to either 15-minute intervals or daily (using the radio option buttons).

15-minute Intervals

You can track up to 12 bins of performance data in 15-minute intervals. Bin number 1 always contains the data for the current 15-minute interval. Bin number 2 contains the data for the previous 15-minute interval and so on. In the **Bin** spin box, set the Bin value (1 to 12). Click the **Refresh** command button for an immediate "poll" of the currently active object. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

Daily Interval

You can track 2 bins of data in daily intervals. Bin number 1 contains the data for the current day. Bin number 2 contains the data for the previous daily interval. In the **Bin** spin box, set the Bin value (1 or 2). Click the **Refresh** command button to load (display) the data for the desired interval. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

NOTE: The value of Status in the Data list box will always be "Valid" or "Invalid." A Status value of "Invalid" indicates that values listed should not be used in resolving performance issues. A status value of "Valid" indicates that the data information displayed in this list box can be used in resolving performance issues.

OC3 Trunk Card

The OC3T card is located in the Master Control Shelf (MCS). The OC3 provides a GR253-compliant optical interface for connecting the Speedlink system to an OC3-based data network. It also provides egress address translation, second level multiplexing, and timing resources.

The OC3 terminates the OC3-formatted ATM data stream to and from the ATM data network. The OC3 supports unidirectional 1:1 nonrevertive circuit pack and facility protection.

If a cell's VPI/VCI address identifies the cell as user data, the VPI portion of the cell header is replaced with an internal multiplexer address to facilitate routing through the Speedlink system. A routing tag is also inserted, which is used by the OC3 card to determine the destination for the cell. The OC3 translator checks for OAM cells and processes them based on associated data. The translator supports Alarm Indication Signal (AIS), Remote Defect Indicator (RDI) and loopback Operations and Maintenance (OAM).

Upstream data is multiplexed into twelve 8-bit parallel ports for the MLA card slots and to a queue connected to the ingress data path. The downstream-to-upstream path is used for routing OAM and Embedded Operations Channel (EOC) cells out of the OC3 trunk and for routing test cells to the microprocessor. There is no flow control feedback across the interface between the trunk card and the MLA card slots downstream. Any line cards designed to plug into an MLA slot must be equipped with adequate cell buffer space to accommodate bursts of data at the OC3 rate. The MLA ports operate at a 25 MHz rate.

Fault information is stored in registers in the multiplexer; this information is used by the OC3 card for performance monitoring purposes.

The OC3 card generates system clocks and references. The system references are frequency locked to the on-board OC3 carrier TCXO (20 PPM stability) on initial power up. The system references may also be frequency locked to the OC3 frame pulse (if available), or to an external office reference. The OC3 card provides an 8 kHz and a 19.44 MHz system reference. It also provides the 25 MHz bus clocks. The bus clock is not locked to the system reference.

The system contains two OC3 cards in a 1:1 protection group, located in Slots 7 and 8 of the MCS. The card in Slot 8 is provisioned as the working card, and the card in Slot 7 is provisioned as the protection card.

To view information about an OC3 card, click one of the OC3 cards in the MCS.

NOTE: In order to view provisioning information for OC3T cards, an OC3T card must be displayed in the MCS equipment locator group—since the provisioning is associated with the slot, not the card, a card does not have to be present in the slot to view the provisioning information.

The OC3 object view contains five tabbed pages: **Status**, **Config**, **Versions**, **Prot Grp Status**, and **Protection Group**.

OC3 Status tab page: The Conditions list box displays the operational state and availability status for the selected card. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

Figure 74: OC3 Status Tab Page

The **Administration State** radio buttons control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

The **Create** and **Delete** command buttons add or remove provisioning from the MIB for this OC3 card.

OC3 Configuration tab page: The Configuration list box displays the serial number, hardware version, CLEI code, name, and type (actual and configured) for the selected OC3 card.

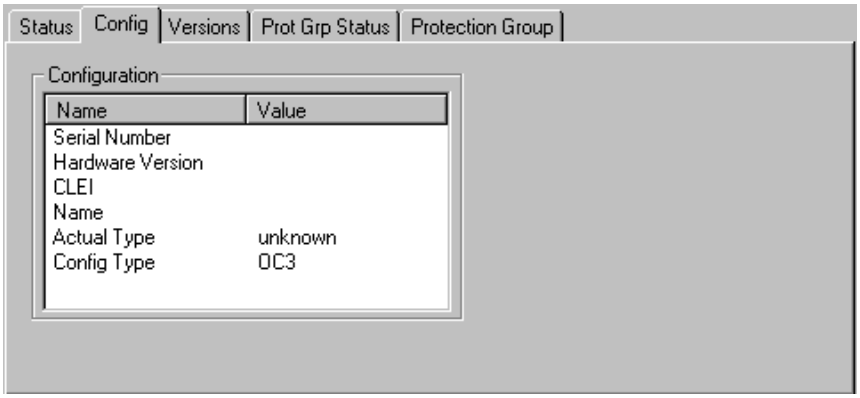


Figure 75: OC3 Configuration Tab Page

OC3 Versions tab page: The scrollable Subsystem versions list displays the names and version numbers for each of the subsystems.

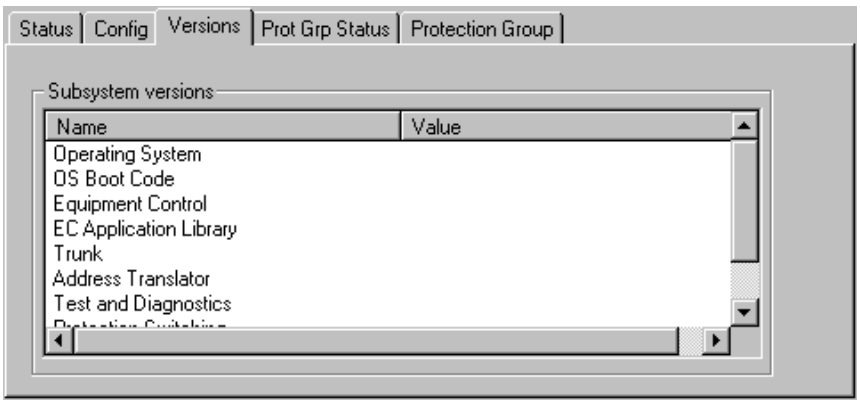


Figure 76: OC3 Versions Tab Page

The OC3 subsystems are:

- Operating system
- OS boot code
- Equipment control
- EC application library
- Trunk
- Address translator
- Test and diagnostics
- Precision switching
- Trunk SAR

OC3 Protection Group Status tab page: The Conditions list displays the operational state and availability status for the 1:1 protection group to which the selected card belongs. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

Figure 77: OC3 Protection Group Status Tab Page

The **Administration State** radio buttons 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

OC3 Protection Group tab page: The Protection Group tab page is used to set the parameters for the 1:1 protection group for the two OC3 trunk cards.

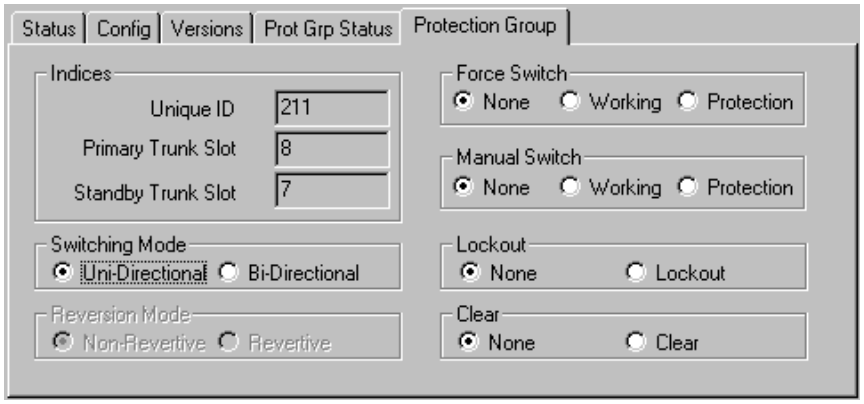


Figure 78: OC3 Protection Group Tab Page

Unique ID is the identifier for the protection group.

Primary Trunk Slot is the Master Control Shelf slot of the currently active trunk card and **Standby Trunk Slot** is the inactive slot. Slots 7 and 8 are reserved for

trunk cards (either DS3 or OC3). The leftmost slot (Slot 7) is designated as the protection slot, and the rightmost slot (Slot 8) is designated as the working slot.

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.

OC3 Port

To display information on the OC3 port, click the port connection on the OC3 card.

NOTE: In order to view provisioning information for an OC3 port, an OC3 card must be displayed in the MCS equipment locator group—since the provisioning is associated with the slot, not the card, a card does not have to be present in the slot to view the provisioning information.

The OC3 port object view contains seven tabbed pages: **Status**, **ATM PM**, **Loopback**, **Physical PM**, **OC3**, **Trace Data**, and **Thresholds**.

Each of the OC3 port tabs are described in the following sections.

OC3 Port Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

Figure 79: OC3 Port Status Tab Page

The **Administration State** radio buttons control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

OC3 Port ATM PM tab page:

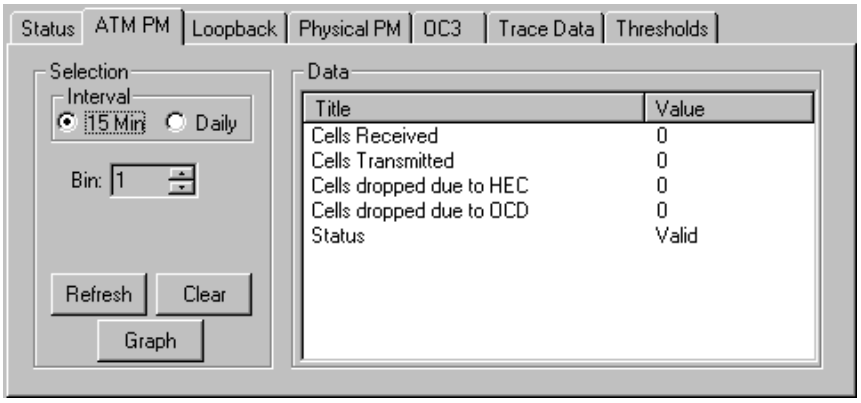


Figure 80: OC3 Port ATM PM Tab Page

The **ATM PM** (Performance Monitoring) tab page provides information on Cells received, transmitted, dropped and the status. The performance monitoring interval can be set to either 15-minute intervals and/or daily using the radio option buttons.

15-minute Intervals

You can track up to 12 bins of performance data in 15-minute intervals. Bin number 1 always contains the data for the current 15-minute interval. Bin number 2 contains the data for the previous 15-minute interval and so on. In the **Bin** spin box, set the Bin value (1 to 12). Click the **Refresh** command button to display the data for the desired interval. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the performance data in graphical format.

Daily Interval

You can track 2 bins of data in daily intervals. Bin number 1 contains the data for the current day. Bin number 2 contains the data for the previous day. In the **Bin** spin box, set the Bin value (1 or 2). Click the **Refresh** command button to load (display) the data for the desired interval. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the performance data in graphical format.

NOTE: The value of Status in the Data list box will always be “Valid” or “Invalid.” A Status value of “Invalid” indicates that values of cells received, transmitted and dropped should not be used in resolving performance issues. A status value of “Valid” indicates that the data information displayed in this list box can be used in resolving performance issues.

OC3 Port Loopback tab page:

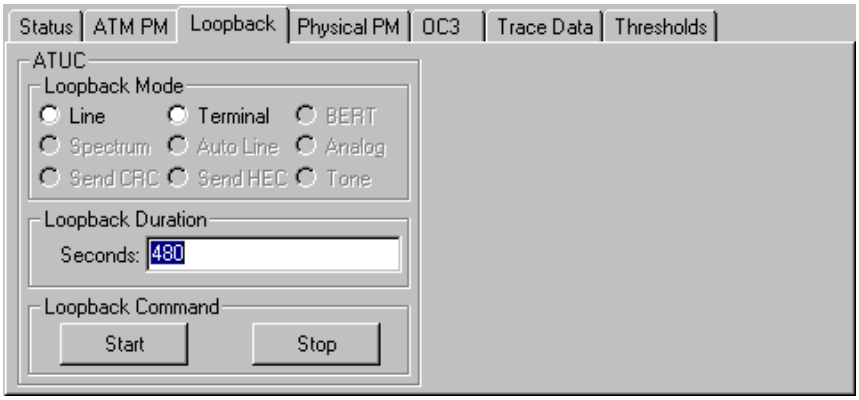


Figure 81: OC3 Port Loopback Tab Page

The parameters in the **Loopback** tab page control loopback testing for the OC3 card. **Loopback Mode** sets the OC3 to do line loopback testing or terminal loopback testing.

Line Any signal received by the OC3 from the MCS will be looped back.

Terminal Any signal coming upstream to the OC3 will be looped back.

The remaining options are not enabled for the OC3.

Loopback Duration sets the interval (in seconds) that the OC3 will wait before giving up on the loopback test. The default value is 60. The **Loopback Command** buttons **Start** and **Stop** 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.

See Volume 5, Chapter 4 for additional information on loopback testing.

OC3 Port Physical PM tab page:

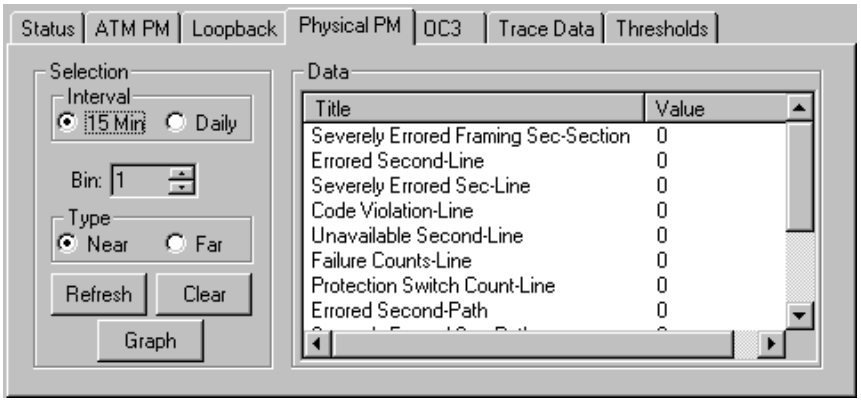


Figure 82: OC3 Port Physical PM Tab Page

The **Physical PM** (Performance Monitoring) tab page displays recorded performance monitoring data for the OC3 port, displaying the various parameters and the recorded values for specified intervals. The data can be recorded at either 15-minute or daily intervals, for near- or far-end performance monitoring, and can be recorded in up to 12 bins (for 15-minute intervals) or 2 bins for daily intervals. The data can then be displayed either numerically or in graphical format.

In the **Interval** group, select the interval for which you want to record performance data, either 15-minute or daily.

For 15-minute intervals, you can track up to 12 bins of data. Bin 1 contains data for the current 15-minute interval, bin 2 contains data for the previous 15-minute interval, and so on. In the **Bin** spin box, set a value from 1 through 12.

For daily intervals, you can track either 1 or 2 bins of data. Bin 1 contains data for the current day, and bin 2 contains the data for the previous day. In the **Bin** spin box, set the value to either 1 or 2.

In the **Type** group, select the type of monitoring to perform, either near-end or far-end.

Click the **Refresh** command button for an immediate “poll” of the currently active port object. Click the **Clear** command button to clear the performance data. Click the **Graph** command button to display the performance data in graphical format.

NOTE: The value of Status in the Data list box will always be either “Valid” or “Invalid.” A Status value of “Invalid” indicates that values listed should not be used in resolving performance issues. A status value of “Valid” indicates that the data information displayed in this list box can be used in resolving performance issues.

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

Table 11: 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)
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)

Table 11: Near SONET Performance Parameters (continued)

Acronym	Meaning	Daily Interval	15 Minute Interval
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 11: 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 12: 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 12: 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

OC3 Port OC3 tab page:

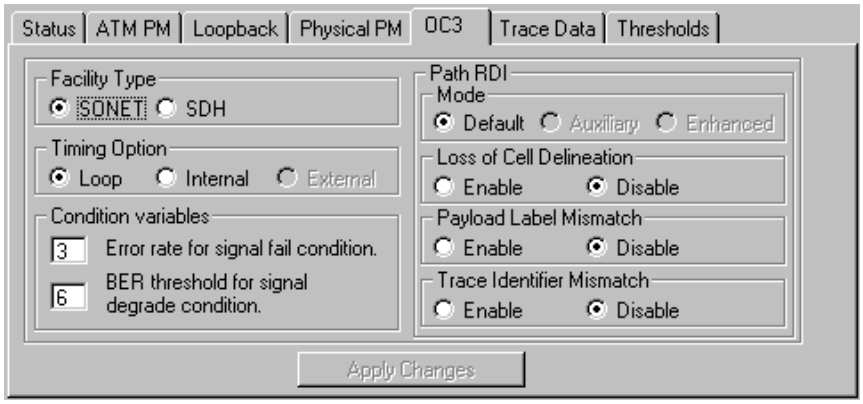


Figure 83: OC3 Port OC3 Tab Page

These parameters provision the OC3 signal on the OC3's port. The **Facility Type** group allows you to specify whether the facility is SONET (Synchronous Optical Network) or SDH (Synchronous Digital Hierarchy). SONET is the ANSI standard, and SDH is the ITU (International Telecommunications Union) standard.

The router/switch side must be configured as the same facility type (SONET or SDH) as the Speedlink, otherwise an LOP (Loss of Pointer) condition occurs.

NOTE: The LOP condition refers to the loss of the pointer byte in the path overhead. The SONET and SDH standard are roughly the same as far as ATM payload is concerned, but there are several differences in the way they handle overhead bytes.

SDH facilities use two (S1 and S0) bits in the H1 (pointer byte) path overhead to identify the payload type (as defined in 3.1.4 ITU G-709). SONET facilities never use S1/S0 bits. If an SDH facility receives a payload containing the H1 byte from the SONET end (this will happen if the router/switch side and the Speedlink are configured as different facility types), it misinterprets the payload type and declares an LOP condition.

The **Timing Option** group allows you to specify whether to use loop timing (indicating that the Speedlink System will extract timing from the OC3 signal) or internal timing (indicating that the Speedlink System will use another internal timing source).

The **External** radio button functionality is planned for a future release.

The **Condition variables** group allows you to specify BER thresholds for declaring Signal Failure and Signal Degrading conditions:

- The **Error rate for signal failure** box can be set to any value in the range 3 through 6, which represents a BER range of 10^{-3} through 10^{-6}

NOTE: A BER of 10^{-3} equals one bit error in a thousand bits—more severe than a BER of 10^{-6}, one bit error in 10^{-6} bits.

If the OC3 facility detects a BER that is more severe than the specified BER threshold, a Signal Failure condition is declared. The Signal Failure condition will be cleared after the BER returns to a value under the specified threshold. The default value is 3 (10^{-3} BER).

- The **BER threshold for signal degrade condition** box can be set to any value in the range 6 through 9, which represents a BER range of 10^{-6} through 10^{-9}. If the OC3 facility detects a BER that is more severe than the specified BER threshold, a Signal Degrading condition is declared.

  The Signal Degrading condition will be cleared after the BER returns to a value under the specified threshold. The default value is 6 (10^{-6} BER).

The Remote Defect Indicator (RDI) is a byte that is sent from one end of a link to the other, to acknowledge the detection or an LOS (Loss of Signal), LOF (Loss of Frame), LOP (Loss of Pointer), or AIS (Alarm Indication Signal) condition at the other end. The RDI can be initiated from either end (the Speedlink or the router). The **Path RDI** group allows you to specify additional conditions for which an RDI will be sent upstream.

You can enable any or all of the following conditions:

- Loss of Cell Delineation (LCD)
- Payload Label Mismatch
- Trace Identifier Mismatch.

LCD, Payload Label Mismatch, and Trace Identifier Mismatch conditions are far less severe than LOS, LOF, LOP, or AIS conditions, so enabling RDI for these conditions is optional. By default, all the **Path RDI** options are disabled. If any of the groups of Path RDI conditions (LCD, Payload Label Mismatch, or Trace Identifier Mismatch) are enabled, an RDI will be sent upstream upon detection of the specified condition.

In the Path RDI **Mode** group, the **Default** radio button is the only currently available option.

Auxiliary and **Enhanced** radio button functionality is planned for a future release.

If you change any of the provisioning parameters, the **Apply Changes** command button is enabled. Click this button to immediately apply the changes to the system.

NOTE: Changes should only be applied on a port that is disabled. To cancel any changes and return the parameters to the original values, close the window without clicking the **Apply Changes** command button.

OC3 Port Trace Data Tab Page:

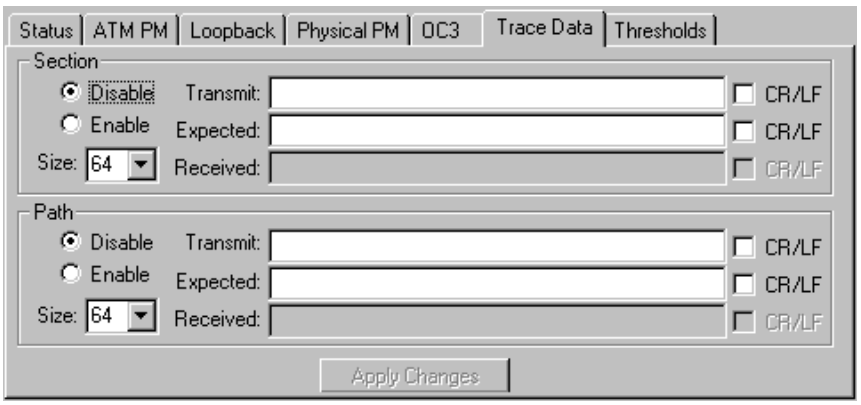


Figure 84: OC3 Port Trace Data Tab Page

The **Trace Data** tab allows you to specify a data pattern to send out to the router/switch. Trace data patterns are typically used to identify the node addresses for each end of a link. You can specify a trace data pattern for the section and the path.

If **Section** group is enabled, you can define trace data patterns for the section. The Speedlink sends the pattern specified in the **Transmit** box out to the router/switch, then compares the received section trace data with the pattern specified in the **Expected** box. If the received data does not match, a Section Trace Mismatch condition is reported.

If the **Section** group is disabled, any mismatch condition is cleared.

The **Size** box allows you to specify the number of bytes (either 16 or 64) to enter for the trace data patterns. If set to 64 bytes, the CR/LF (Carriage Return/Line Feed) should be inserted in byte 63/64 by selecting the **CR/LF** check box. If set to 16 bytes, the pad characters 0x00 are automatically inserted following the input characters, and a CR/LF is automatically inserted in byte 63/64.

The **Path** group options work the same way as the **Section** group options, but are used to set up trace data for the path. If the received data does not match, a Path Trace Mismatch condition is reported.

OC3 Port Thresholds tab page:

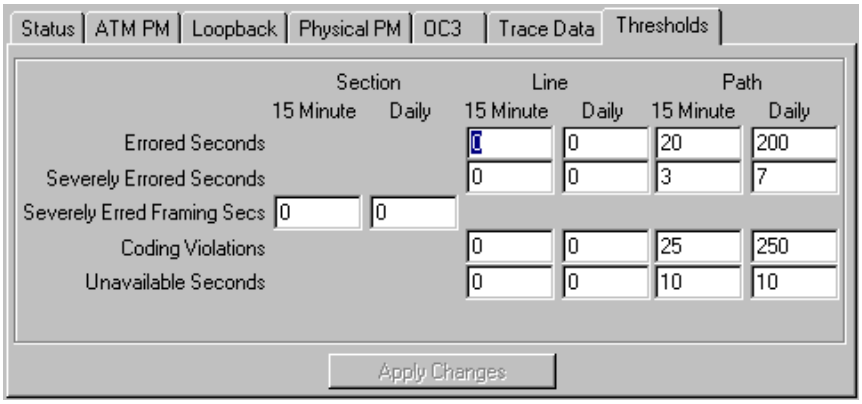


Figure 85: OC3 Port Thresholds Tab Page

The **Thresholds** tab page allows you to specify the event thresholds for the OC3 port for both 15-minute and daily intervals, for the following error categories:

- Section—Severely errored framing seconds
- Line and Path—Errored seconds, Severely errored seconds, Coding violations, and Unavailable seconds

For information on threshold ranges and defaults, see Table 11, “Near SONET Performance Parameters,” on page 76 and Table 12, “Far SONET Performance Parameters,” on page 79.

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.

Clicking the MLA object in the MCS equipment locator group displays the following dialog box:

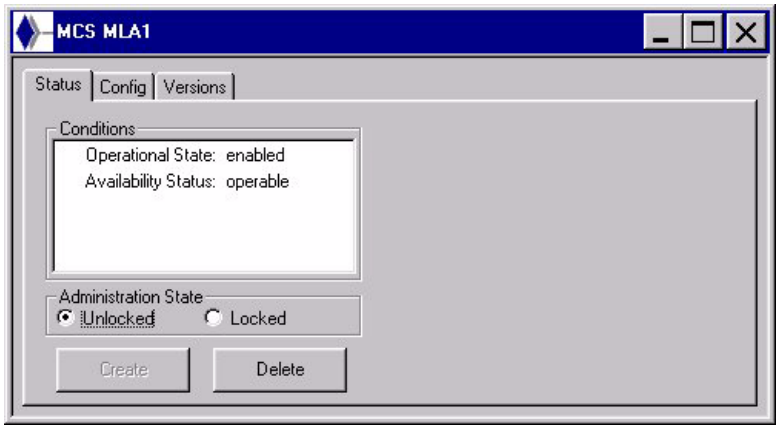


Figure 86: MLA Dialog Box—Status Tab Page

The MLA object view contains three tab pages: **Status, Config** and **Versions.**

MLA Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The Status tab page also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

The **Create** and **Delete** command buttons, respectively, add or remove provisioning from the MIB for this MLA.

MLA Config tab page: The Config tab page has a Configuration list box that shows the Serial Number, Hardware Version, CLEI, Name, and Type (Actual and Config) for the MLA.

MLA Versions tab page: The Versions tab page lists the various names and values of the subsystem versions.

MLA Port

Clicking the MLA Port object in the MCS equipment locator group displays the following dialog box:

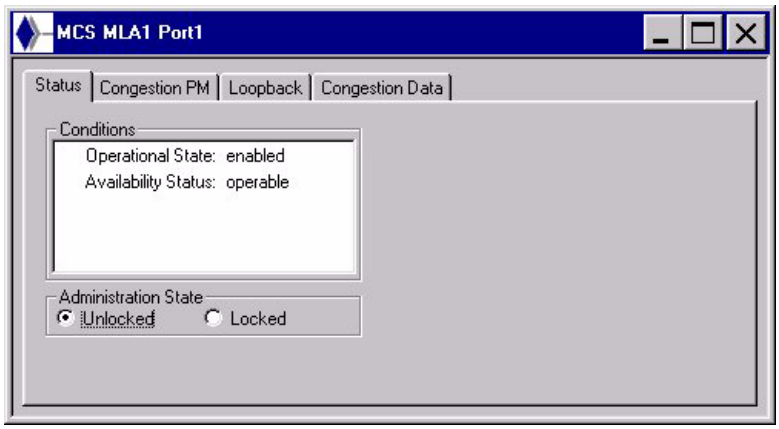


Figure 87: MLA Port Object View

The MLA Port object view contains four tab pages: **Status, Congestion PM, Loopback,** and **Congestion Data.**

MLA Port Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The Status tab page also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

MLA Port Congestion PM tab page:

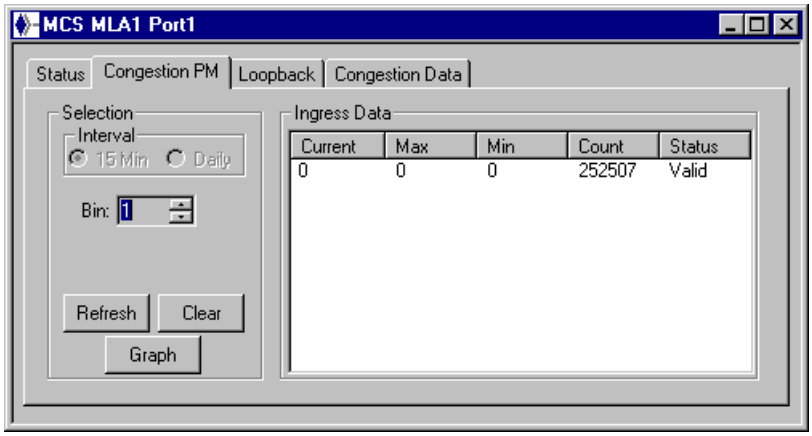


Figure 88: MLA Port—Congestion PM Tab Page

The tab page **Congestion PM** (Performance Monitoring) provides information on ingress data congestion. You can view up to 12 five-minute bins of performance data. The data in the Bin number 1 always contains the data for the current interval. Bin number 2 contains the data for the previous interval and so on. In the **Bin** spin box, set the Bin value (1 to 12). The bin will contain the maximum and minimum smoothed values which occurred in that five- minute period. Click the **Refresh** command button for an immediate “poll” of the currently active object. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

MLA Port Loopback tab page:

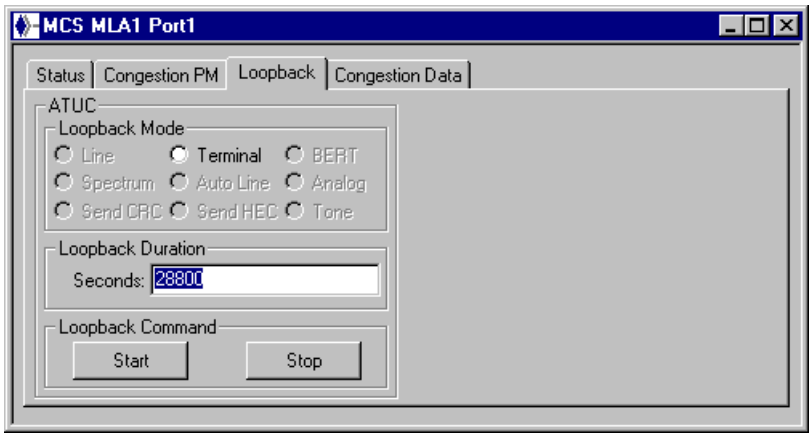


Figure 89: MLA Port—Loopback Tab Page

The parameters in the **Loopback** tab page control loopback testing for the MLA Port. **Loopback Mode** specifies the type of loopback testing to perform.

Terminal The MLA will loopback any signal coming upstream to it.

The other loopback mode options are disabled for this tab.

Loopback Duration sets the interval in seconds that the MLA should wait before giving up on the loopback test. The default Loopback Duration is 28800 seconds (8 hours). The **Loopback Command** buttons **Start** and **Stop** 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.

MLA Port Congestion Data tab page:

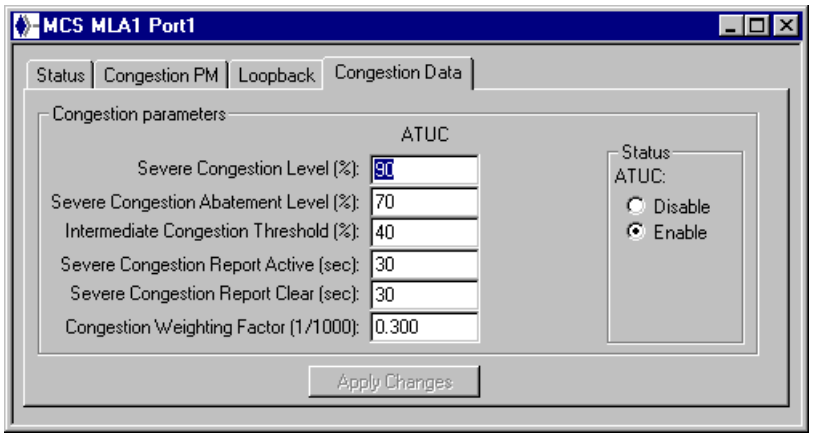


Figure 90: MLA Port—Congestion Data Tab Page

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

- **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 **Status** radio buttons to enable or disable congestion parameters.

Set the **Congestion Data** parameters to their optimum levels and click the **Apply Changes** command button.

Line Cards

The Speedlink System is made up of one Master Control Shelf (MCS) and up to twelve Line Card Shelves (LCS). Each LCS contains 24 slots for line cards. The following cards are currently supported:

- CAP2
- CAP4
- DMT4
- SDSL8
- IDSL8

The 25th mounting slot is reserved for the Line Card Shelf Multiplexer (LSM) card.

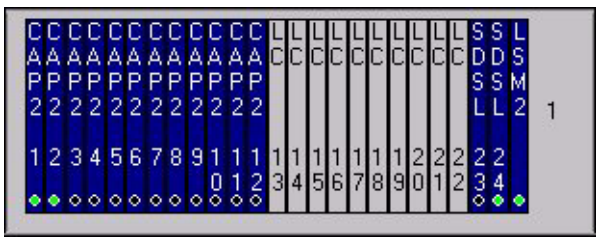


Figure 91: Line Card Shelf (LCS) Equipment Locator Group

Clicking the Line Card object in the LCS equipment locator group displays the following dialog box:

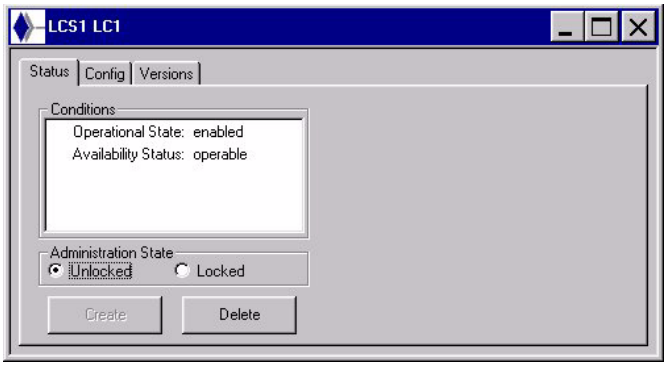


Figure 92: Line Card Status Tab Page

The Line Card object view contains three tab pages: **Status, Config** and **Versions.**

Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The Status tab page also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

The **Create** and **Delete** command buttons, respectively, add or remove provisioning from the MIB for this Line Card.

Config tab page: The Config tab page has a Configuration list box that shows the Serial Number, Hardware Version, CLEI, Name, and Type (Actual and Config) for the Line Card.

Versions tab page: The Versions tab page lists the various names and values of the subsystem versions.

Line Card Ports

To enable data transport using any of the line cards, a connection must be set up between the trunk interface VPI/VCI and the line card port on which data will be sent and received. The line cards have varying numbers of ports, as designated in the card's names:

- CAP2, two ports.
- CAP4 and DMT4, four ports.
- SDSL8 and IDSL8, eight ports.

NOTE: While the card's physical labels include the numeric port designation, the user interface does not include these designations.

Each of the ports on a line card is provisioned separately. To provision a port, first click the port connection on the card.

NOTE: In order to provision a port, the associated line card must be displayed in the LCS equipment locator group. Since provisioning is associated with the **slot**, not the line card, the line card does not have to be physically present in the slot to view and change the provisioning information.

Clicking the port connection on a line card displays a bar that contains the individual ports—the number of ports displayed depends which type of line card is being viewed. The following example shows the port connections for an IDSL8 line card.

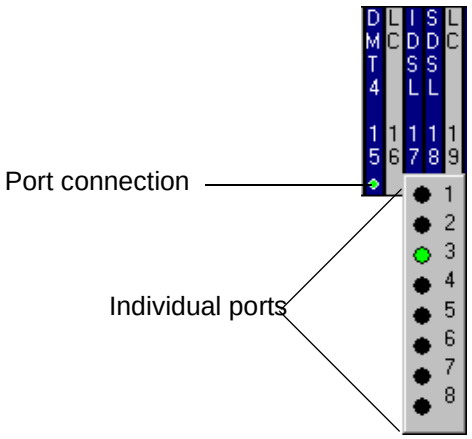


Figure 93: Port Connection and Individual Ports

The color of each individual port indicates its status. For information on the color codes, see "Color Code for Graphical Elements" on page 39. Click any port to view and work with provisioning information for the port.

Information for the selected port is displayed as a *port object view*, with different categories of information presented on separate tab pages. The number of tab pages—and the provisioning information included on them—depends on which line card is being viewed.

CAP2 Port

Clicking the CAP2 Line Card Port object in the LCS equipment locator group displays the following dialog box:

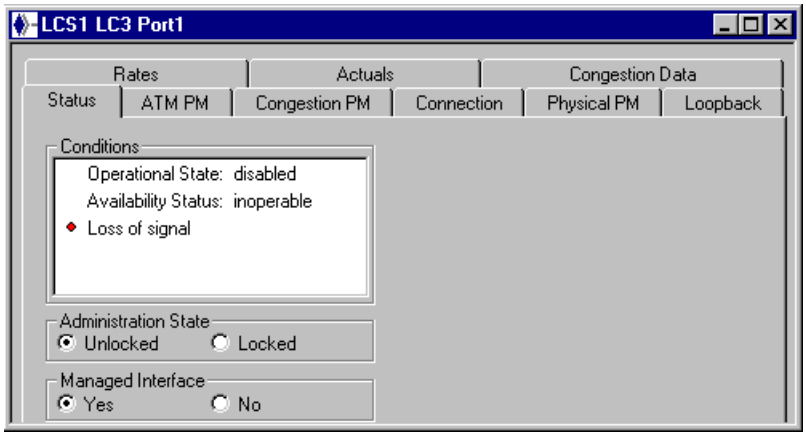


Figure 94: CAP2 Port—Status Tab Page

The CAP2 Port object view contains nine tab pages: **Status, ATM PM, Congestion PM, Connection, Physical PM, Loopback, Rates, Actuals,** and **Congestion Data.**

CAP2 Port Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The **Administration State** radio buttons control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

NOTE: If an alarm condition exists, the unlocked option cannot be selected until the alarm condition is cleared. For descriptions of alarm conditions, see Appendix B, *Conditions and Recommended Action* in Volume 3, *Acceptance Testing*.

The **Managed Interface** buttons control whether the port is being actively managed. If the managed interface option is enabled (the default), conditions on the port (for example, an LOF condition) are reported. If this option is not enabled, conditions on the port will not be reported.

The managed interface option interacts with one of the options in the Options dialog box (see Figure 56, Options Dialog Box on page 45). In the **Line Card Port Color** group of the Options dialog box, one of the options is **If Managed Interface**

is set to no, show all options as yellow instead of red. If this option is enabled, and the managed interface option is disabled, a port for which a condition is reported will display yellow instead of red.

CAP2 Port ATM PM tab page:

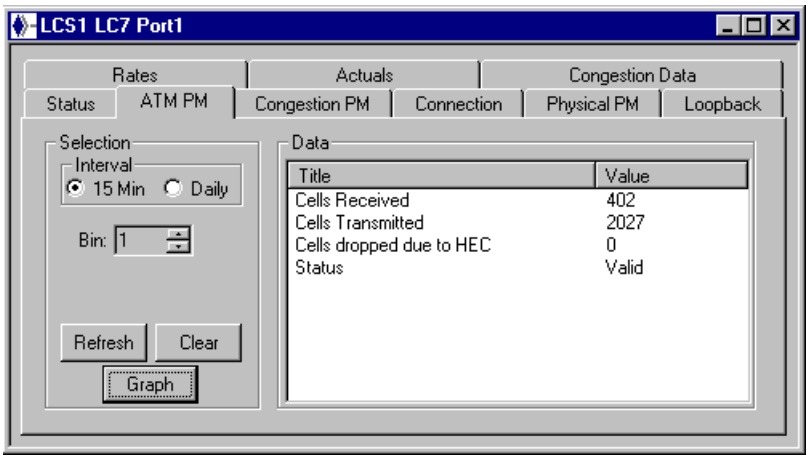


Figure 95: CAP2 Port—ATM PM Tab Page

The **ATM PM** (Performance Monitoring) tab page provides information on Cells received, transmitted, dropped due to HEC and the status. The performance monitoring interval can be set to either 15-minute intervals and/or daily using the radio option buttons.

15-minute Intervals

You can track up to 12 bins of performance data in 15-minute intervals. Bin number 1 always contains the data for the current 15-minute interval. Bin number 2 contains the data for the previous 15-minute interval and so on. In the **Bin** spin box, set the Bin value (1 to 12). Click the **Refresh** command button to display the data for the desired interval. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

Daily Interval

You can track 2 bins of data in daily intervals. Bin number 1 contains the data for the current day. Bin number 2 contains the data for the previous day. In the **Bin** spin box, set the Bin value (1 or 2). Click the **Refresh** command button to load (display) the data for the desired interval. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

NOTE: The value of Status in the Data list box will always be “Valid” or “Invalid”. A Status value of “Invalid” indicates that values of cells received, transmitted and dropped should not be used in resolving performance issues. A status value of “Valid” indicates that the data information displayed in this list box can be used in resolving performance issues.

CAP2 Port Congestion PM tab page:

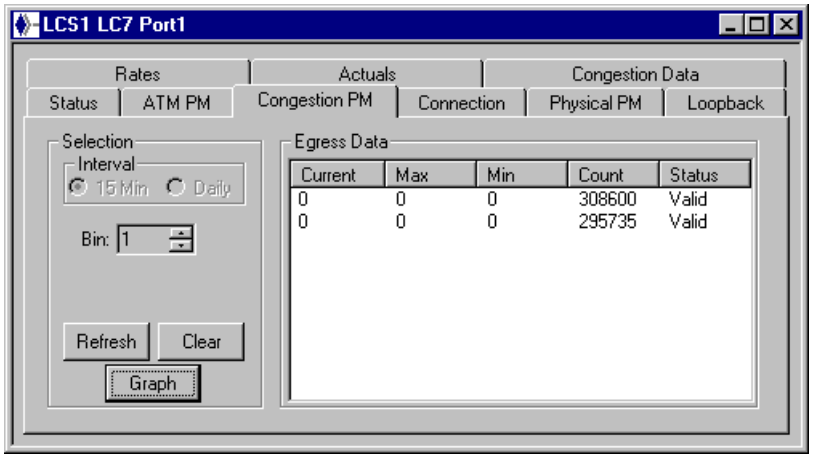


Figure 96: CAP2 Port—Congestion PM Tab Page

The tab page **Congestion PM** (Performance Monitoring) provides information on ingress data congestion. You can view up to 12 five-minute bins of performance data. The data in the Bin number 1 always contains the data for the current interval. Bin number 2 contains the data for the previous interval and so on. In the **Bin** spin box, set the Bin value (1 to 12). The bin will contain the maximum and minimum smoothed values which occurred in that five- minute period. Click the **Refresh** command button for an immediate “poll” of the currently active object. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

CAP2 Port Connection tab page:

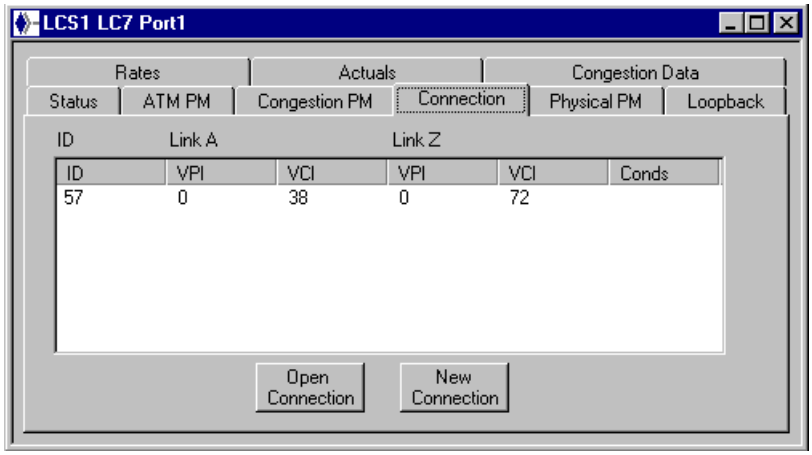


Figure 97: CAP2 Port—Connection Tab Page

This list box shows the connections carried on this port—displaying the connections' ID, and the VPI/VCI for both ends of the PVC, and any conditions for the connection.

For information on the **Open Connection** command button, see page 108. For information on the **New Connection** command button, see page 112.

CAP2 Port Physical PM tab page:

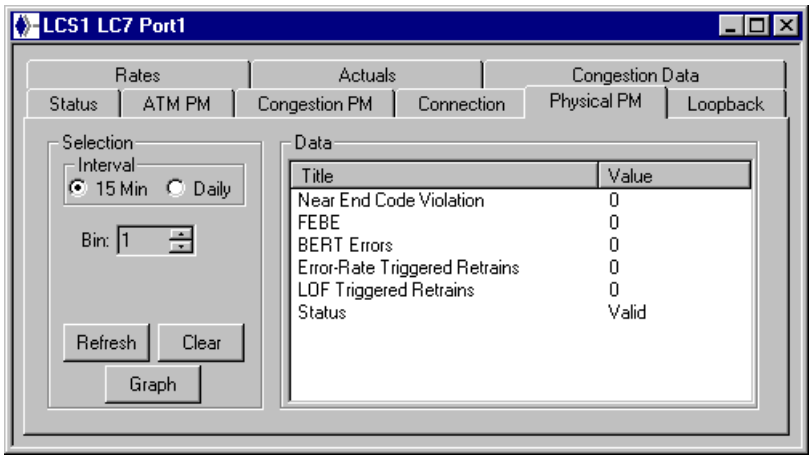


Figure 98: CAP2 Port—Physical PM Tab Page

The **Physical PM** (Performance Monitoring) tab page provides information on performance monitoring. The performance monitoring interval can be set to either 15-minute intervals or daily (using the radio option buttons).

15-minute Intervals

You can track up to 12 bins of performance data in 15-minute intervals. Bin number 1 always contains the data for the current 15-minute interval. Bin number 2 contains the data for the previous 15-minute interval and so on. In the **Bin** spin box, set the Bin value (1 to 12). Click the **Refresh** command button for an immediate "poll" of the currently active object. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

Daily Interval

You can track 2 bins of data in daily intervals. Bin number 1 contains the data for the current day. Bin number 2 contains the data for the previous daily interval. In the **Bin** spin box, set the Bin value (1 or 2). Click the **Refresh** command button to load (display) the data for the desired interval. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

NOTE: The value of Status in the Data list box will always be "Valid" or "Invalid". A Status value of "Invalid" indicates that values listed should not be used in resolving performance issues. A status value of "Valid" indicates that the data information displayed in this list box can be used in resolving performance issues.

CAP2 Port Loopback tab page:

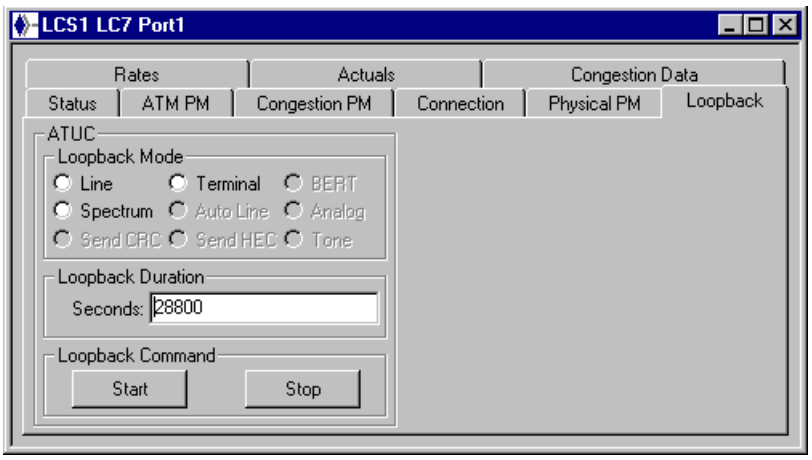


Figure 99: CAP2 Port—Loopback Tab Page

The **ATUC** (ADSL Termination Unit Central Office) **Loopback 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.
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.

The other loopback mode options are disabled for this tab.

Loopback Duration sets the interval in seconds that the system should wait before giving up on the loopback test. The Loopback Duration default is 28800 seconds (8 hours). The **Loopback Command** buttons **Start** and **Stop** 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.

CAP2 Port Rates tab page:

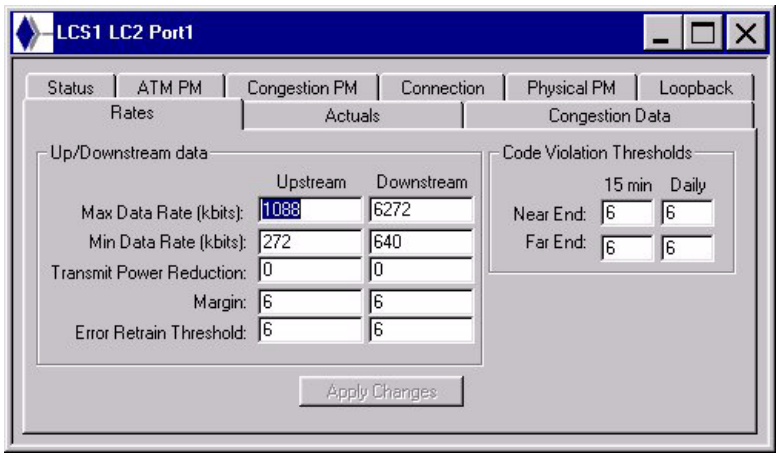


Figure 100: CAP2 Port—Rates Tab Page

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 be a measurement 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. Please refer to Volume 4, Chapter 1 for additional information on CAP DSL Provisioning.

The **Downstream Data Rate Minimum Rate** and **Maximum Rate** numeric fields specify the minimum and maximum downstream data rates for this port in kilobits per second (Kb/s). (Downstream means from the line card to the subscriber.)

The **Upstream Data Rate Minimum Rate** and **Maximum Rate** numeric fields specify the minimum and maximum upstream data rates for this port in Kb/s. (Upstream means from the subscriber to the line card.)

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 (zero).

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 measure 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 dB for both channels.

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 you 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 actual count values for the various provisioned are listed below:

Table 13: 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 actual count values for the various provisioned are listed below:

Table 14: 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 actual count values for the various provisioned are listed below:

Table 15: 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 that 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 actual count values for the various provisioned are listed below:

Table 16: Far End Code Violation Threshold—15 Min

SETTING	COUNT THRESHOLD
5	211967
6	22022
7	2211
8	221
9	22

CAP2 Port Actuals tab page:

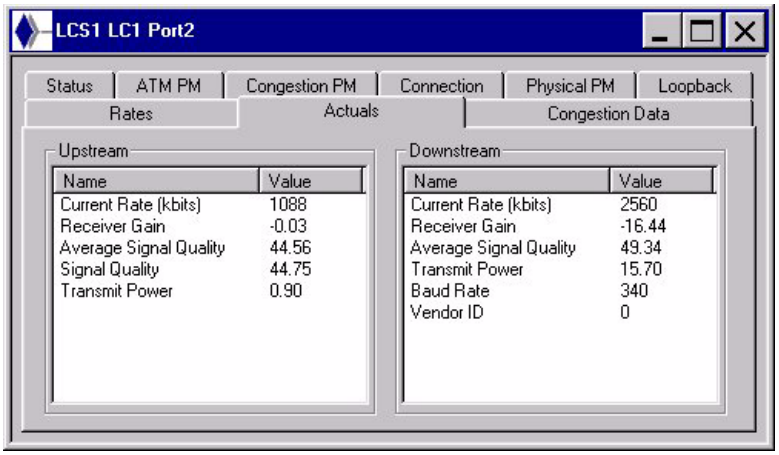


Figure 101: CAP2 Port—Actuals Tab Page

The CAP2 Port **Actuals** tab page displays Downstream and Upstream connectivity data. This information is read-only.

CAP2 Port Congestion Data tab page:

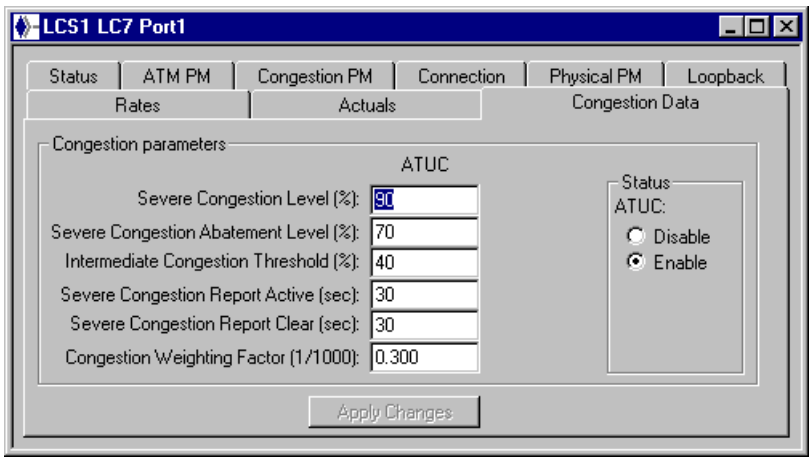


Figure 102: CAP2 Port—Congestion Data Tab Page

Listed below are the provisionable congestion parameters for the ATUC:

- **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 (1/1000)**(In steps of 0.001, Default: 0.300)

Enable or Disable the ATUC Status by clicking the appropriate radio option button.

Set the **Congestion Data** parameters to their optimum levels and click the **Apply Changes** command button.

CAP4 Port

Clicking the CAP4 Line Card Port object in the LCS equipment locator group displays the CAP4 Port object view, which contains ten tab pages: **Actuals**, **Advanced**, **Connection**, **Congestion Data**, **Congestion PM**, **Loopback**, **Physical PM**, **Rates**, **Status**, and **Thresholds**.

CAP4 Port Actuals tab page: The CAP4 Port **Actuals** tab page displays upstream and downstream connectivity data. This information is read-only.

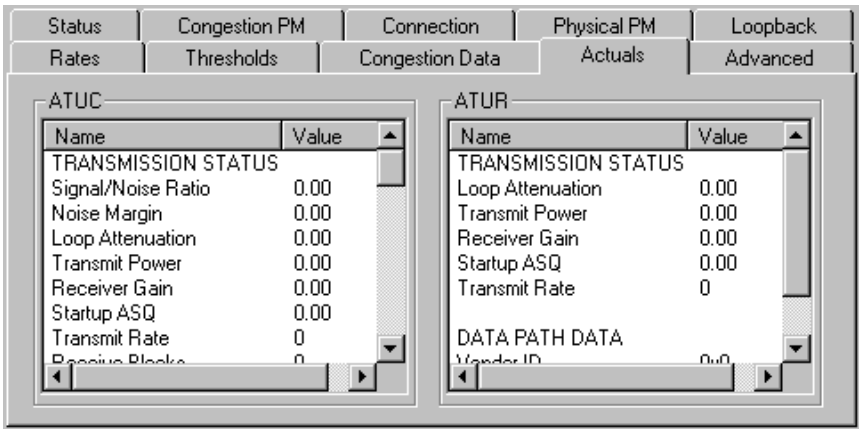


Figure 103: CAP4 Port—Actuals Tab Page

The scrollable lists include all the CAP4 actuals in the following table.

Table 2: CAP4 Actuals

ATUC	ATUR
TRANSMISSION STATUS	

Table 2: CAP4 Actuals **(continued)**

ATUC	ATUR
Signal/Noise Ratio Noise Margin Loop Attenuation Transmit Power Receiver Gain Startup ASQ Transmit Rate Receive Blocks Cells Received Cells Transmitted	Loop Attenuation Transmit Power Receiver Gain Startup ASQ Transmit Rate
DATA PATH DATA	
Baud Rate Vendor ID Vendor Version Serial Number	Vendor ID Vendor Version
ERROR DATA	
LOF Failures LOS Failures LPR Failures LOF Seconds LOS Seconds LPR Seconds Errored Seconds Coding Violations FE Errored Seconds FE Coding Violations HEC Errors Error Retrains FE Error Retrains LOF Retrains Training Starts Cumulative BERT Errors Elapsed Seconds (15 min) Elapsed Seconds (daily) Previous Day Seconds	

CAP4 Port Advanced tab page:

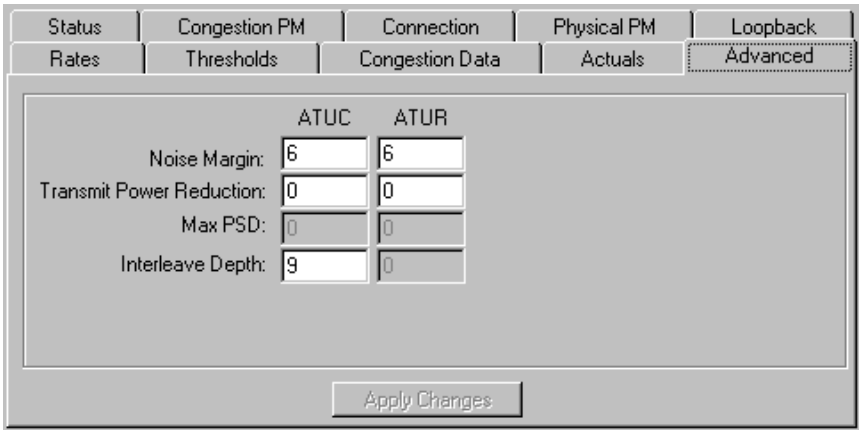


Figure 104: CAP4—Advanced Tab Page

The CAP4 port **Advanced** tab page allows you to view and set the following provisioning information for the CAP4 port:

- **Noise Margin** for the ATUC and ATUR.
- **Transmit Power Reduction** for the ATUC and ATUR.
- **Interleave Depth** for the ATUC only.

The **Max PSD** parameters are not enabled for this tab page.

For information on provisioning the settings on this tab, see Volume 4, Chapter 3.

CAP4 Port Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

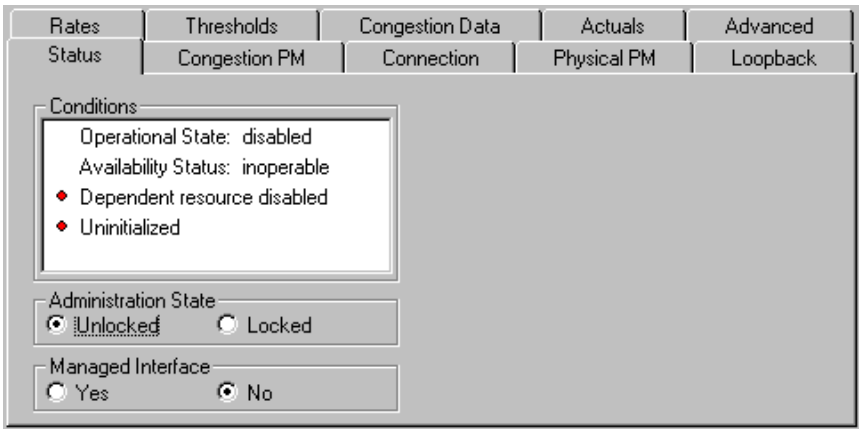


Figure 105: CAP4 Port—Status Tab Page

The **Administration State** radio buttons control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

NOTE: If an alarm condition exists, the unlocked option cannot be selected until the alarm condition is cleared. For descriptions of alarm conditions, see Appendix B, *Conditions and Recommended Action* in Volume 3, *Acceptance Testing*.

The **Managed Interface** buttons control whether the port is being actively managed. If the managed interface option is enabled (the default), conditions on the port (for example, an LOF condition) are reported. If this option is not enabled, conditions on the port will not be reported.

The managed interface option interacts with one of the options in the Options dialog box (see Figure 56, Options Dialog Box on page 45). In the **Line Card Port Color** group of the Options dialog box, one of the options is **If Managed Interface is set to no, show all options as yellow instead of red**. If this option is enabled, and the managed interface option is disabled, a port for which a condition is reported will display yellow instead of red.

CAP4 Port Physical PM tab page:

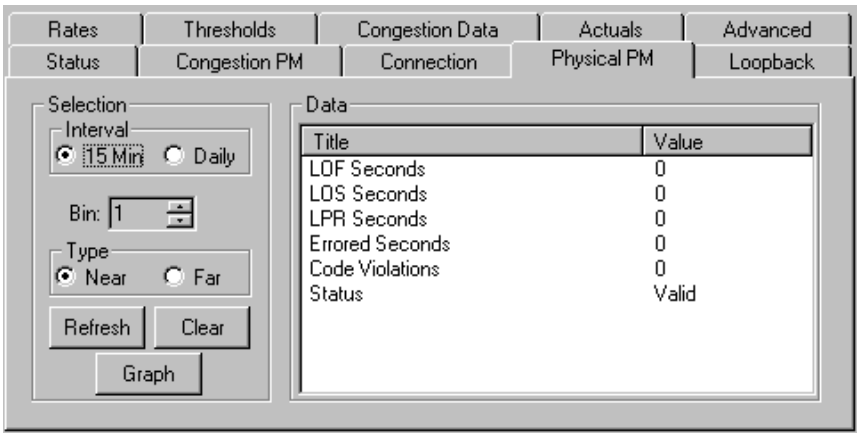


Figure 106: CAP4 Port—Physical PM Tab Page

The **Physical PM** (Performance Monitoring) tab page provides information on LOF seconds, LOS seconds, LPR seconds, errored seconds, code violations, and the status. The performance monitoring interval can be set to either 15-minute intervals and/or daily. Monitoring type can be set to either near-end or far-end.

Click the **Refresh** command button to display the data for the desired interval. Click the **Clear** command button to clear the performance data. Click the **Graph** command button to display the data in graphical format.

15-minute Intervals

You can track up to 12 bins of performance data in 15-minute intervals. Bin number 1 always contains the data for the current 15-minute interval. Bin number 2 contains the data for the previous 15-minute interval and so on. In the **Bin** spin box, set the Bin value (1 to 12).

Daily Interval

You can track 2 bins of data in daily intervals. Bin number 1 contains the data for the current day. Bin number 2 contains the data for the previous day. In the **Bin** spin box, set the Bin value (1 or 2).

Near- and Far-end Monitoring

In the **Type** group, select the **Near** radio button to display near-end performance monitoring data, or the **Far** radio button to display data for the far end. Near-end monitoring includes all the parameters shown in Figure 106, CAP4 Port—Physical PM Tab Page on page 105, but far-end monitoring includes only Errored seconds, Code violations, and Status. Click the **Refresh** command button to update the display after changing your selection.

CAP4 Port Congestion PM tab page:

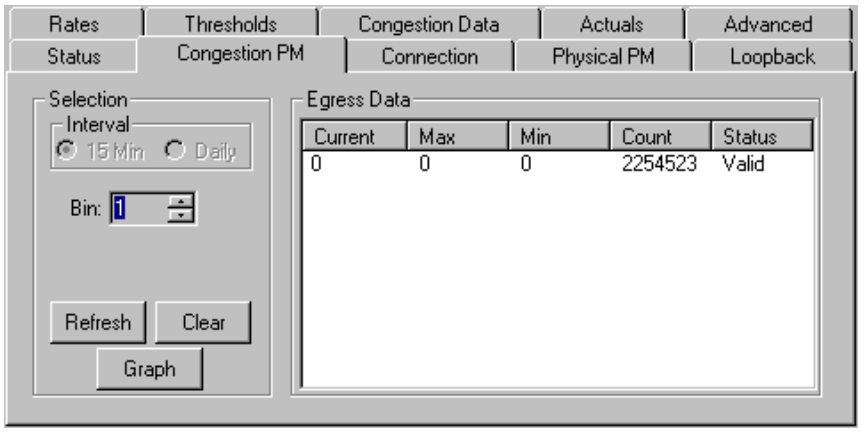


Figure 107: CAP4 Port—Congestion PM Tab Page

The tab page **Congestion PM** (Performance Monitoring) provides information on ingress data congestion. You can view up to 12 five-minute bins of performance data. The data in the Bin number 1 always contains the data for the current interval. Bin number 2 contains the data for the previous interval and so on. In the **Bin** spin

box, set the Bin value (1 to 12). The bin will contain the maximum and minimum smoothed values which occurred in that five- minute period. Click the **Refresh** command button for an immediate poll of the currently active object. Click the **Clear** command button to clear the performance data. Click the **Graph** command button to display the data in graphical format.

The value of Status in the Data list box may be either Valid or Invalid. Invalid indicates that values of cells received, transmitted and dropped should not be used to resolve performance issues. Valid indicates that the data information displayed in this list box may be used to resolve performance issues.

CAP4 Port Connection Tab Page:

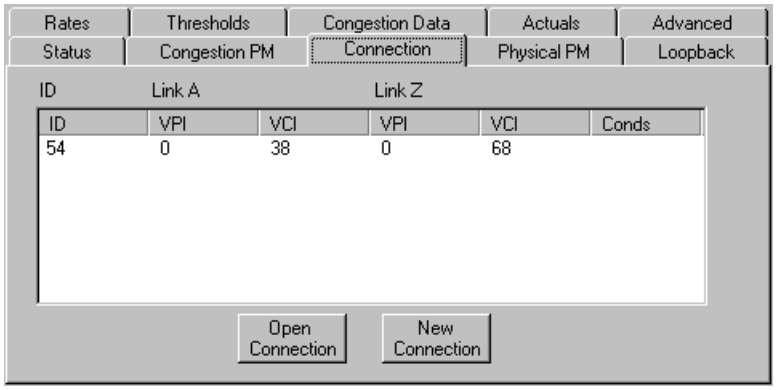


Figure 108: CAP4 Port—Connection Tab Page

This list box shows the IDs for the connections carried on this port, the VPI/VCI for both ends of the PVC, and any conditions for this connection.

Open Connection Dialog Box. To display information about a connection, click on the connection ID in the list box, then click the **Open Connection** command button to display the Open Connection dialog box—you can also double-click on the connection ID with the left mouse button to display this dialog box. The Open Connection dialog box contains two tab pages: **Status** and **Connection**.

Figure 109: Connection Dialog Box—Status Tab Page

Connection Dialog Box—Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

Connection Dialog Box—Connection tab page:

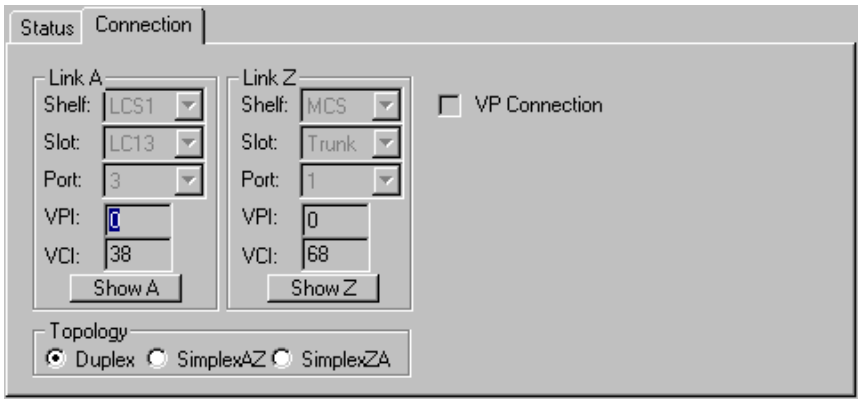


Figure 110: Connection Dialog Box—Connection Tab Page

Link A is the line card side of a PVC; **Link Z** is the trunk side of a PVC. The **VPI/VCI** fields at the bottom of both **Link A** and **Link Z**'s group boxes specify the ATM circuit address for each end of the connection. The VPI (Virtual Path

Identifier) identifies the route to be used by the ATM cell. A virtual path may include multiple virtual channels. The VCI (Virtual Circuit Identifier) identifies the specific virtual channel to which the cell belongs. The VPI and VCI are translated at each ATM switch and are unique only for a given physical link. This information is read-only.

The **shelf**, **slot**, and **port** 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 **Link A**. This information is read-only.

The **Topology** radio buttons specify the direction in which the PVC sends data:

Duplex	Transmits data both directions through this port.
Simplex AZ	Transmits data up from the port only.
Simplex ZA	Transmits data down to the port only.

Port Connection Link Dialog Box. To display information for the Link A or Link Z, click the Show A or the Show Z command button. The Port Connection Link dialog box displays.

Figure 111: Port Connection Link Dialog Box—Status Tab Page

The Port Connection Link dialog box contains three tab pages: **Status**, **Data**, and **Loopback**.

Port Connection Link Dialog Box—Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

Port Connection Link Dialog Box—Data tab page:

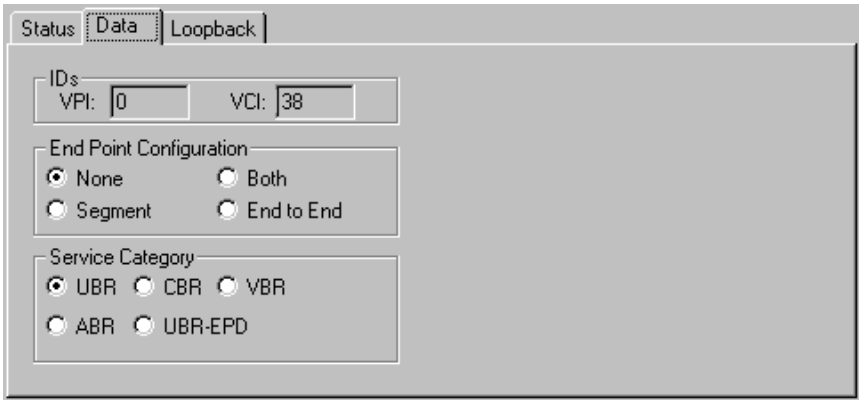


Figure 112: Port Connection Link Dialog Box—Data Tab Page

The VPI and VCI ID fields are dimmed and are read-only. They display the address of this end of the PVC.

The **End Point Configuration** radio buttons specify the type of processing this virtual link applies to ATM loopback cells.

None	Performs no ATM loopback cell processing.
Segment	Functions as a segment-type loopback cell node. Segment loopback cells loop back to the other end of the ATM connection.
End to End	Functions as an end-to-end-type loopback cell node. End-to-end loopback cells loop back to the other end of the ATM connection.
Both	Functions as both a **Segment** and **End-to-End** loopback cell node. Both types of loopback cells loop back to the other end of the ATM connection.

The **Service Category** radio buttons specify characteristics of the ATM service carried by 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 gives 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. CBR is not currently supported.

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. VBR is not currently supported.

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. ABR is not currently supported.

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 retransmits the packet.
If a cell is dropped when using the EPD option, the whole packet is dropped except for the very last cell. The last cell is retained to permit TCP to identify a packet error and request an immediate re-transmission. UBR-EPD is not currently supported.

Connection Dialog Box—Connection Loopback tab page:

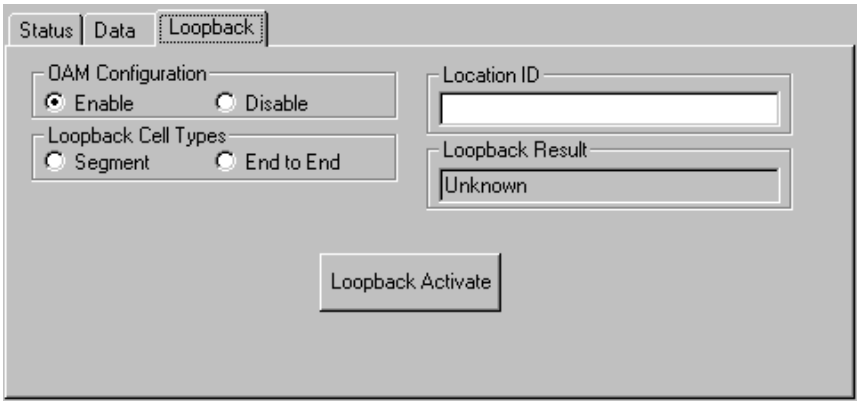


Figure 113: Port Connection Link—Loopback Tab Page

The **OAM Configuration** radio buttons specify whether Operations and Maintenance ATM cells are sent on the PVC connection.

The **Loopback Cell Type** specifies the type of ATM loopback cell that will be sent to the other end of the connection. These cell types are looped back by another virtual link with a type corresponding to those listed under **End Point Configuration**, on page 155.

Location ID is a 16-byte character string indicating where the OAM loopback cell should go. You normally identify a destination ID if the loopback point is not a segment or an end-to-end endpoint.

Loopback Result is a read-only list box that shows the results of the ATM loopback test.

Unknown	Loopback result is not known.
Timeout	Loopback cells were dispatched, but did not return within the timeout interval.
Error	Unknown loopback failure detected.
Succeeded	Loopback cell successfully returned.
Invalid	Invalid destination specified for the loopback cell, or the loopback cell could not reach its intended destination.
Already Active	Loopback is already active, cannot start another one until current loopback completes.
Resources	No more loopbacks available on this multiplexer.
No OAM	OAM cell traffic not enabled for this connection.
Non-Default	This link is an intermediate point, and you are attempting to use a default NEID value for the loopback.

New Connection dialog box: To add a new connection, click the **New Connection** command button.

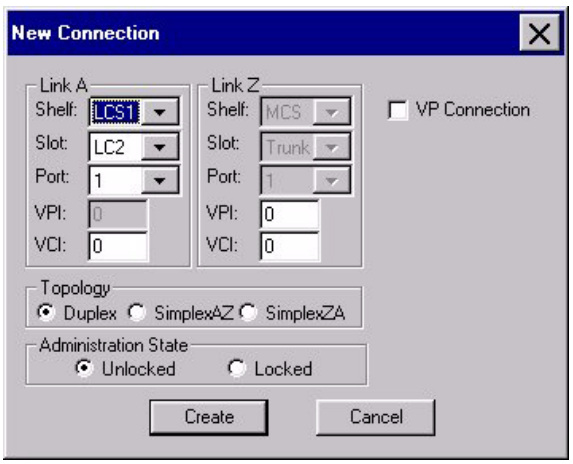


Figure 114: New Connection Dialog Box

Link A is the line card side of a PVC; **Link Z** is the trunk side of a PVC. The **VPI/VCI** fields at the bottom of both **Link A** and **Link Z**'s group boxes specify the ATM circuit address for each end of the connection. The VPI (Virtual Path Identifier) identifies the route to be used by the ATM cell. A virtual path may

include multiple virtual channels.The VCI (Virtual Circuit Identifier) identifies the specific virtual channel to which the cell belongs. The VPI and VCI are translated at each ATM switch and are unique only for a given physical link.

The **shelf**, **slot**, and **port** 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 **Link A**.

The **Topology** radio buttons specify the direction in which the PVC sends data:

Duplex	Transmits data both directions through this port.
Simplex AZ	Transmits data up from the port only.
Simplex ZA	Transmits data down to the port only.

The **Administration State** radio buttons specify whether the object is available for service. **Unlocked** makes the object usable if there are no other conditions blocking its use. **Locked** makes the object unavailable for service. The administration state should be set to **Locked** when configuring an object or deleting a connection.

Select **VP Connection** to set up a Virtual Path (VP) without setting up individual Virtual Circuits within the VP. For example, if you have 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 **Create** and **Delete** command buttons are used to add or remove provisioning from the MIB for the connection.

CAP4 Port Rates tab page:

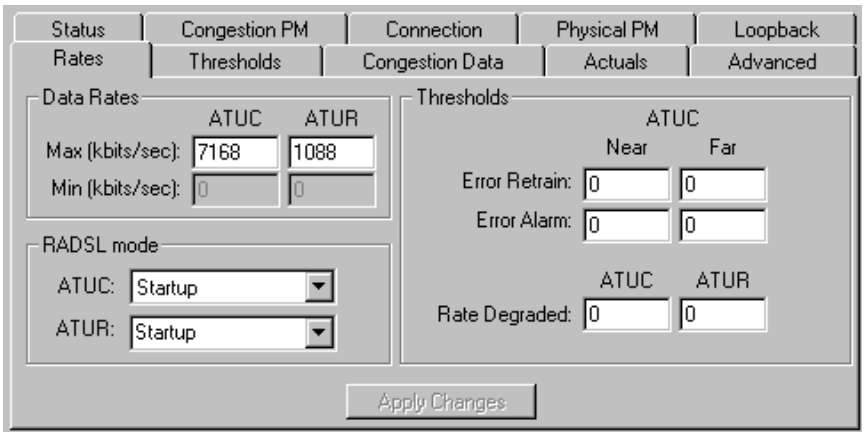


Figure 115: CAP4 Port—Rates Tab Page

The **Rates** tab page allows you to view and set parameters for data rates, modes, and thresholds for the CAP4 card.

Data Rates. This group allows you to set the maximum data rates for the ATUC and ATUR. The values are listed in the following table.

Table 17: CAP4 Provisioning Parameters

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

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

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

- **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) after startup, the system does not retrain and an error message is generated.

For more information on RADSL, see Volume 4, Chapter 2.

Thresholds. This group allows you to view and set the **Error Alarm** and **Error Retrain** thresholds for the near- and far-end ATUC, and **Rate Degraded** thresholds for the ATUC and ATUR. For information on the thresholds, see Volume 4, Chapter 2.

If you make changes to the parameters, click the **Apply Changes** button to update the system using the new parameters.

CAP4 Port Congestion Data tab page:

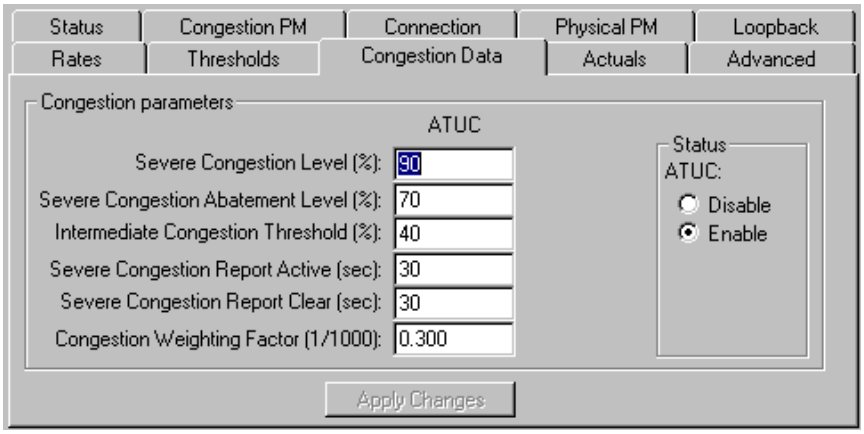


Figure 116: CAP4 Port—Congestion Data Tab Page

The CAP4 **Congestion Data** tab displays data only for the ATUC side. Listed below are the provisionable congestion parameters:

- **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 (1/1000)**(In steps of 0.001, Default: 0.300)

Enable or disable the ATUC Status by clicking the appropriate radio option button.

Set the **Congestion Data** parameters to their optimum levels and click the **Apply Changes** command button.

CAP4 Port Thresholds tab page:

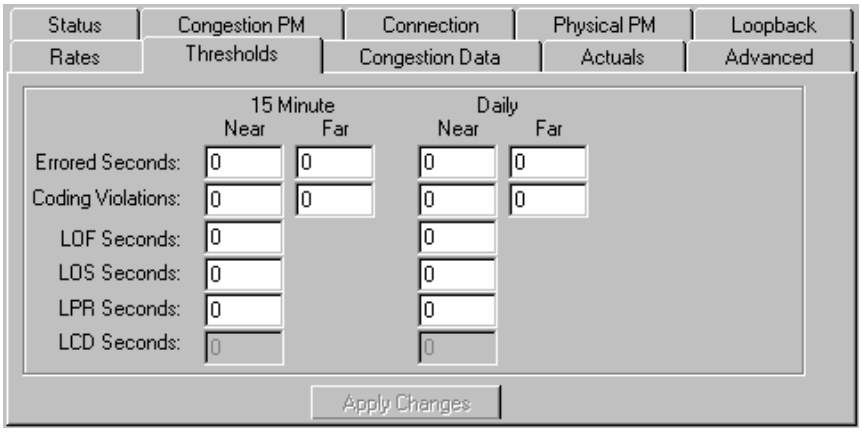


Figure 117: CAP4 Port—Thresholds Tab Page

The CAP4 port **Thresholds** tab page allows you to view and set the following parameters for the CAP4 port, for both 15-minute and daily intervals:

- **Errored Seconds** for near- and far-end
- **Coding Violations** for near- and far-end
- **LOF Seconds** for near-end only
- **LOS Seconds** for near-end only
- **LPR Seconds** for near-end only

The **LCD Seconds** parameters are not enabled for this tab.

For information on setting the thresholds for this tab, see Chapter 4, Chapter 2.

SDSL Port

Clicking the SDSL Line Card Port object in the LCS equipment locator group displays the following dialog box:

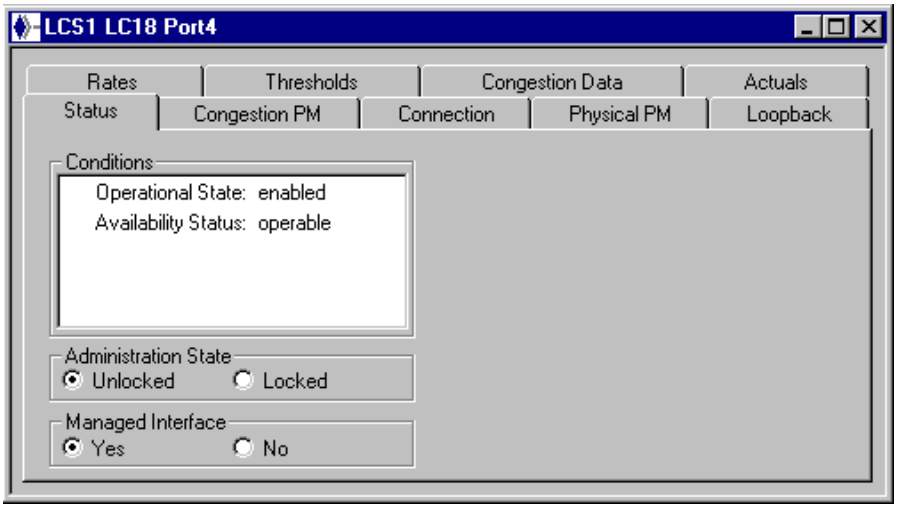


Figure 118: SDSL Port—Status Tab Page

The SDSL Port object view contains nine tab pages: **Status**, **Congestion PM**, **Connection**, **Physical PM**, **Loopback**, **Rates**, **Thresholds**, **Congestion Data**, and **Actuals**.

SDSL Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The **Administration State** radio buttons control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

NOTE: If an alarm condition exists, the unlocked option cannot be selected until the alarm condition is cleared. For descriptions of alarm conditions, see Appendix B, *Conditions and Recommended Action* in Volume 3, *Acceptance Testing*.

The **Managed Interface** buttons control whether the port is being actively managed. If the managed interface option is enabled (the default), conditions on the port (for example, an LOF condition) are reported. If this option is not enabled, conditions on the port will not be reported.

The managed interface option interacts with one of the options in the Options dialog box (see Figure 56, Options Dialog Box on page 45). In the **Line Card Port Color** group of the Options dialog box, one of the options is **If Managed Interface is set to no, show all options as yellow instead of red**. If this option is enabled,

and the managed interface option is disabled, a port for which a condition is reported will display yellow instead of red.

SDSL Port Congestion PM tab page:

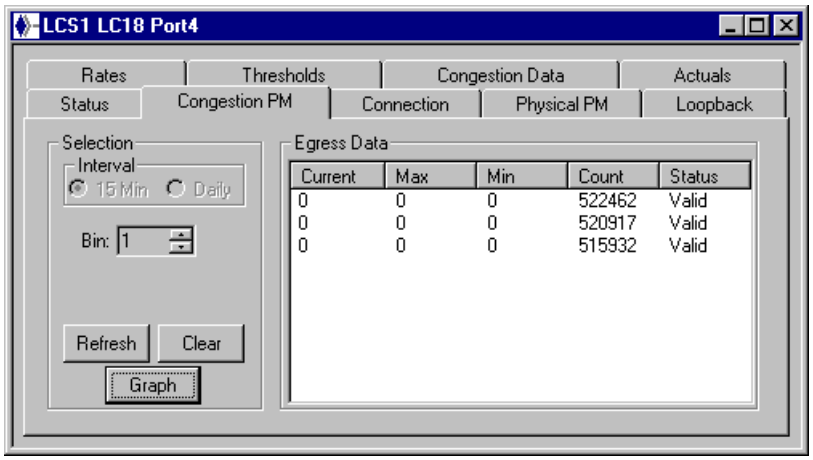


Figure 119: SDSL Port—Congestion PM Tab Page

The tab page **Congestion PM** (Performance Monitoring) provides information on ingress data congestion. You can view up to 12 five-minute bins of performance data. The data in the Bin number 1 always contains the data for the current interval. Bin number 2 contains the data for the previous interval and so on. In the **Bin** spin box, set the Bin value (1 to 12). The bin will contain the maximum and minimum smoothed values that occurred in that five- minute period. Click the **Refresh** command button for an immediate “poll” of the currently active object. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

SDSL Port Connection tab page:

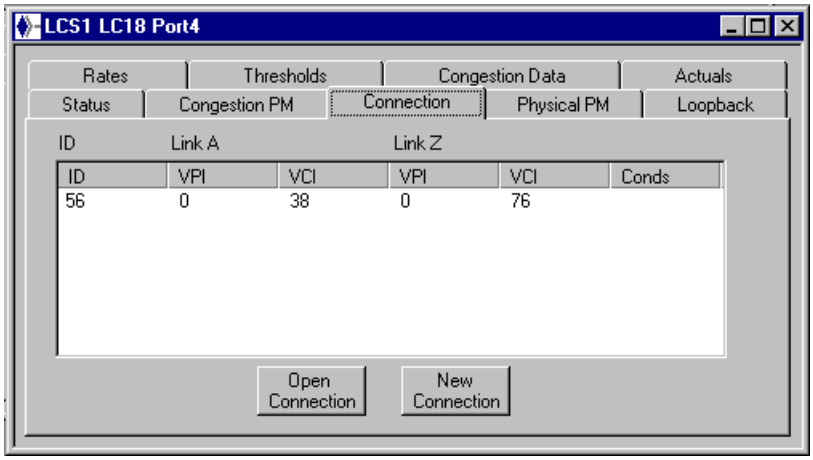


Figure 120: SDSL Port—Connection Tab Page

This list box shows the connections carried on this port—displaying the connection ID, the VPI/VCI for both ends of the PVC, and any conditions for the connection.

For information on the **Open Connection** command button, see page 108. For information on the **New Connection** command button, see page 112.

SDSL Port Physical PM tab page:

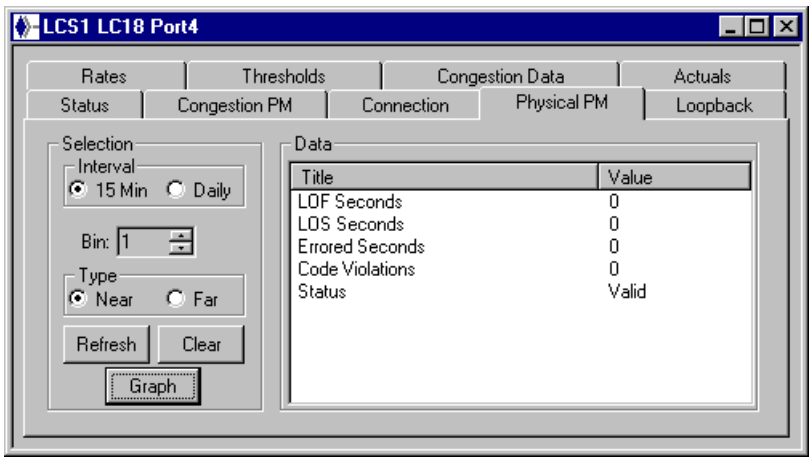


Figure 121: SDSL Port—Physical PM Tab Page

The **Physical PM** (Performance Monitoring) tab page provides information on performance monitoring. The performance monitoring interval can be set to either 15-minute intervals or daily (using the radio option buttons).

15-minute Intervals

You can track up to 12 bins of performance data in 15-minute intervals. Bin number 1 always contains the data for the current 15-minute interval. Bin number 2 contains the data for the previous 15-minute interval and so on. In the **Bin** spin box, set the Bin value (1 to 12). Click the **Refresh** command button for an immediate "poll" of the currently active object. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

Daily Interval

You can track 2 bins of data in daily intervals. Bin number 1 contains the data for the current day. Bin number 2 contains the data for the previous daily interval. In the **Bin** spin box, set the Bin value (1 or 2). Click the **Refresh** command button to load (display) the data for the desired interval. Click the **Clear** command button to clear out the performance data. Click the **Graph** command button to display the data in graphical format.

NOTE: The value of Status in the Data list box will always be "Valid" or "Invalid". A Status value of "Invalid" indicates that values listed should not be used in resolving performance issues. A status value of "Valid" indicates that the data information displayed in this list box can be used in resolving performance issues.

SDSL Port Loopback tab page:

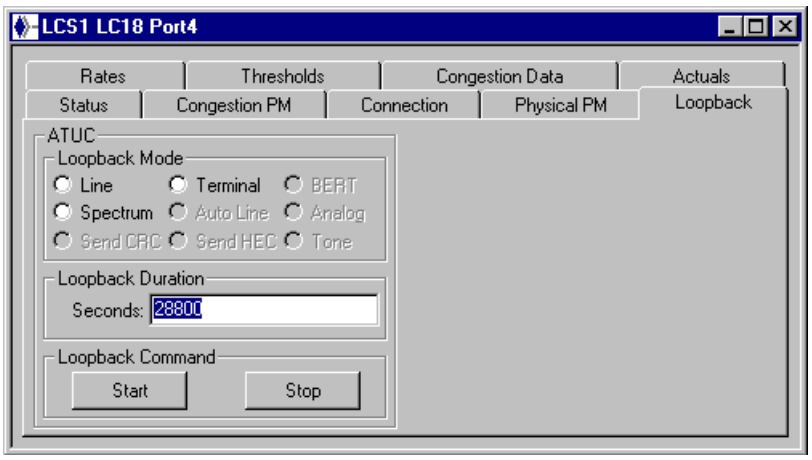


Figure 122: SDSL Port—Loopback Tab Page

The **Loopback 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.
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.

The other loopback mode options are disabled for this tab.

Loopback 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 **Loopback Command** buttons **Start** and **Stop** 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.

SDSL Port Rates tab page:

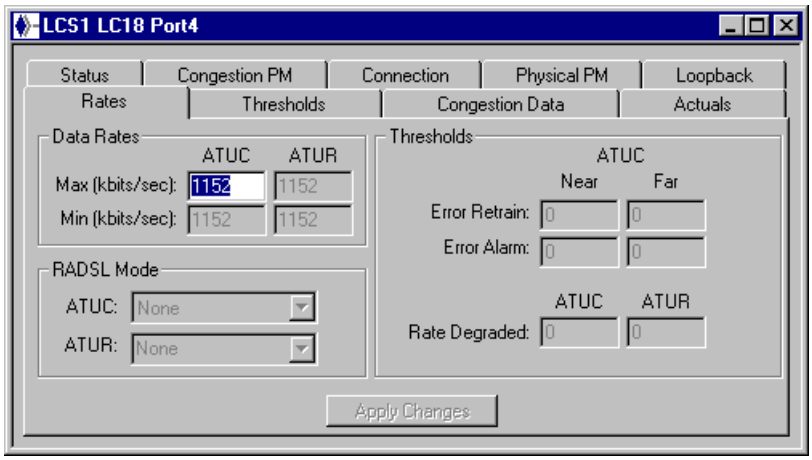


Figure 123: SDSL Port—Rates Tab Page

Only the ATUC maximum data rate is provisionable for the SDSL port. The maximum provisioning parameter may be set to 192, 384, 768, or 1152 Kb/s. The default setting is 384 Kb/s. The SDSL8 port will not exceed the provisioned ATUC maximum rate.

The **ATUC Minimum Rate** and **Maximum Rate** numeric fields specify the minimum and maximum ATUC data rates for this port in Kb/s. ATUC Minimum Rate is read-only.

The **ATUR Minimum Rate** and **Maximum Rate** numeric fields specify the minimum and maximum ATUR data rates for this port in Kb/s. ATUR rates are read-only.

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 maximum data rate entered in DiamondCraft’s SDSL Rates tab page automatically sets the same “fixed” rate in the ATUC minimum data rate and ATUR maximum and minimum data rate fields

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 18: ATUC/ATUR 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

For information on provisioning this tab, see Volume 4, Chapter 4.

SDSL Port Thresholds tab page:

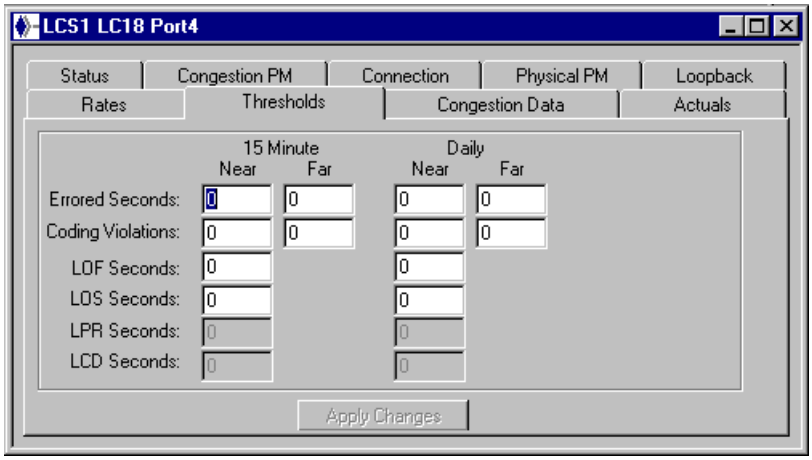


Figure 124: SDSL Port—Thresholds Tab Page

The SDSL port **Thresholds** tab page allows you to view and set the following parameters for the SDSL port, for both 15-minute and daily intervals:

- **Errored Seconds** for both near- and far-end
- **Coding Violations** for both near- and far-end
- **LOF Seconds** for near-end only
- **LOS Seconds** for near-end only

The other threshold parameters are disabled for this tab.

For information on setting the thresholds for this tab, see Volume 4, Chapter 4.

SDSL Port Congestion Data tab page:

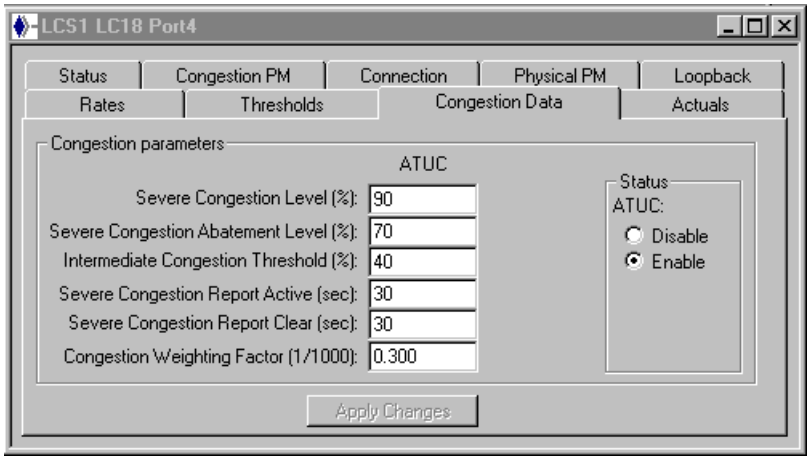


Figure 125: SDSL Port Congestion Data Tab Page

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

- **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 (1/1000)**(In steps of 0.001, Default: 0.300)

Set the **Congestion Data** parameters to their optimum levels and click the **Apply Changes** command button.

SDSL Port Actuals tab page:

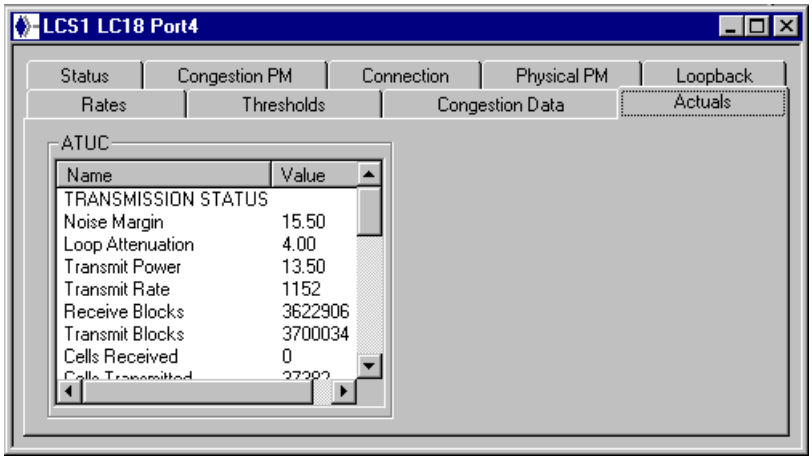


Figure 126: SDSL Port—Actuals Tab Page

The SDSL Port **Actuals** tab page displays ATUC connectivity data. This information is read-only.

IDSL Port

The IDSL line card provides translation between standard frame-based protocols—for example, Frame Relay—and the ATM broadband network.

The Segmentation and Reassembly (SAR) function is located on the IDSL line card rather than on the CPE (as with ATM-based line cards). Since the SAR function is located on the card itself, the IDSL card must implement Inter-Working Functions (IWFs) from the frame-based protocols on the line, translating them to ATM on the backbone.

In the ingress direction, the IDSL card operates on incoming frames using one of the IWF options; the modified frames are then *segmented* and sent as ATM cells across the backplane.

In the egress direction, the ATM cells are *reassembled* into a Protocol Data Unit (PDU), again operated on using the selected IWF, then sent to the CPE.

The PDUs transported through the ATM network are transmitted out the line card line interface over High-Level Data Link Control (HDLC), carried on a transceiver-specific physical layer. The IDSL line card uses standard ISDN transceivers supporting the 2B1Q line encoding.

The IDSL port object view includes the following tab pages: **Actuals**, **Channels**, **Loopback**, **Physical PM**, **Rates**, **Thresholds**, **Connection**, **Congestion Data**, **Congestion PM**, and **Status**.

IDSL Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

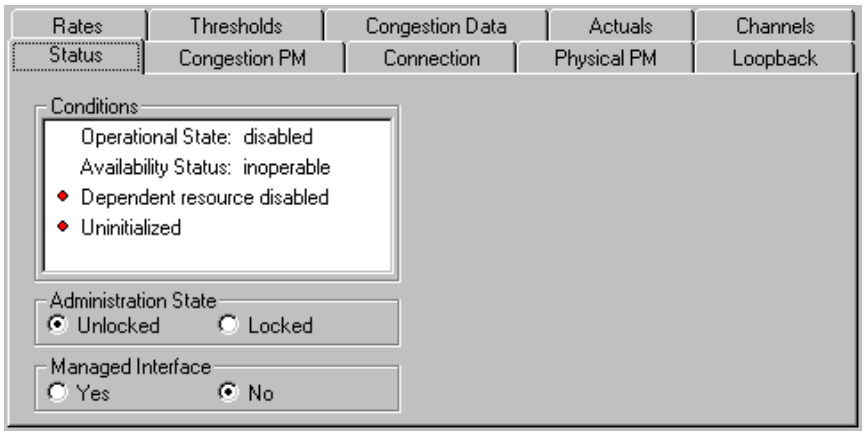


Figure 127: IDSL Port—Status Tab Page

The **Administration State** radio buttons control whether or not the port is available for service. The port should be taken out of service (locked) when it is being configured, or when the software or hardware is being upgraded. Click the **Locked** button to take the port out of service. Click the **Unlocked** button to place the port in service.

NOTE: If an alarm condition exists, the unlocked option cannot be selected until the alarm condition is cleared. For descriptions of alarm conditions, see Appendix B, *Conditions and Recommended Action* in Volume 3, *Acceptance Testing*.

The **Managed Interface** buttons control whether the port is being actively managed. If the managed interface option is enabled (the default), conditions on the port (for example, an LOF condition) are reported. If this option is not enabled, conditions on the port will not be reported.

The managed interface option interacts with one of the options in the Options dialog box (see Figure 56, Options Dialog Box on page 45). In the **Line Card Port Color** group of the Options dialog box, one of the options is **If Managed Interface is set to no, show all options as yellow instead of red**. If this option is enabled, and the managed interface option is disabled, a port for which a condition is reported will display yellow instead of red.

IDSL Port Channels tab page:

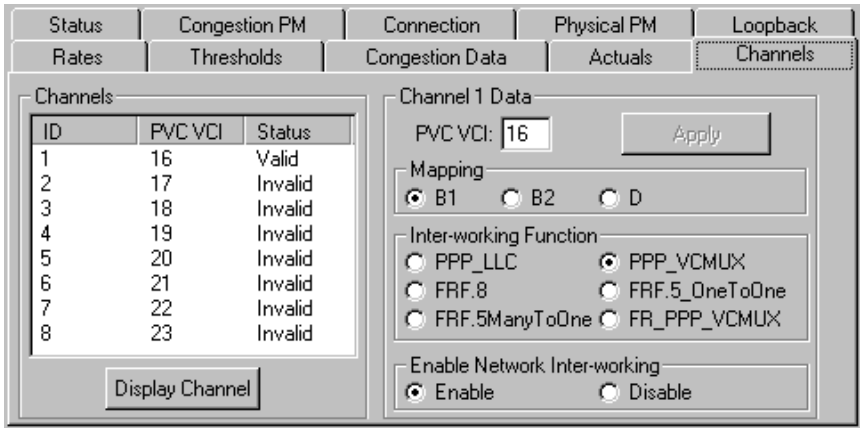


Figure 128: IDSL Port—Channels Tab Page

The **Channels** tab page allows you to provision individual Permanent Virtual Channels (PVCs). The PVCs are listed by ID (1—8), and the Virtual Path Identifier (VPI) and Status are displayed for each. To display and work with detail information for a specific PVC, click the ID, then click the **Display Channel** command button. The title of the **Channel <number> Data** area changes to reflect the ID number for the selected PVC. The following information can be viewed and worked with for the selected PVC:

PVC ID. This box allows you to map the trunk VPI/VCI to the selected PVC. Valid values are 16 through 1023.

Mapping. This group allows you to select a mapping option for the PVC. The mapping option selected depends on the IDSL mode specified on the IDSL port object view **Rates** tab, as follows:

- **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.

For more information on the **Rates** tab, see “IDSL Port Rates tab page:” on page 132.

Inter-networking Function. This group allows you to select an IWF option for the PVC. Each IDSL PVC must be configured to support one of the following types of protocols:

- **PPP_LLC**—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.
- **FRF.8**—Frame Relay translated over HDLC, includes PPP over Frame Relay, LLC encapsulated. Translated protocols are supported for FRF.8 only.
- **FRF.5OneToOne**—Frame Relay one-to-one multiplexed over HDLC.
- **FRF.5ManyToOne**—Frame Relay many-to-one multiplexed over HDLC.
- **FR_PPP_VCMUX**—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.

Enable Network Inter-working. This group allows you to enable or disable network interworking to a PVC. If a port supports Frame Relay PVCs, this option must be enabled. The IWF protocol selected defines the translations that occur between the Frame Relay and ATM environments.

The **Apply** command button becomes active if any of the provisioning parameters are changed.

IMPORTANT NOTE: Clicking this button **immediately** applies the changes to the system. To return the parameters to their original values, close the dialog box without clicking the Apply button. The port status should be set to **Locked** before applying changes to the system.

IDSL Port Congestion PM tab page:

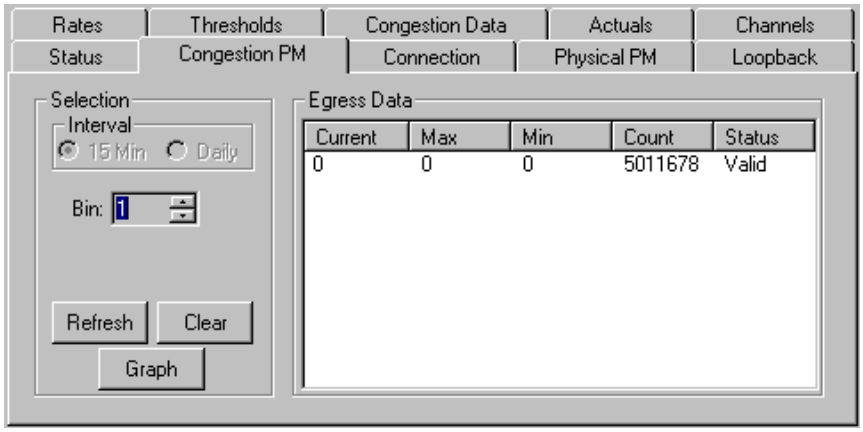


Figure 129: IDSL Port—Congestion PM Tab Page

The **Congestion PM** (Performance Monitoring) tab page provides information on egress data congestion. The data is listed by Current, Maximum, and Minimum values, by actual Count, and Status.

NOTE: The value of Status will always be either “Valid” or “Invalid.” A Status value of “Invalid” indicates that values listed should not be used in resolving performance issues. A status value of “Valid” indicates that the data information displayed in this list box can be used in resolving performance issues.

You can view up to 12 five-minute bins of performance data. Bin 1 contains data for the current interval, Bin 2 contains data for the previous interval, and so on through Bin 12. In the **Bin** spin box, set the value to the number of intervals for which you want to be able to view data (1—12). The bins record the maximum and minimum smoothed values that occur during the selected intervals.

Click the **Refresh** command button immediately poll the active port. Click the **Clear** command button to clear currently displayed performance data. Click the **Graph** command button to display the data in graphical format.

The **Interval** group is disabled for this tab.

IDSL Port Connection tab page:

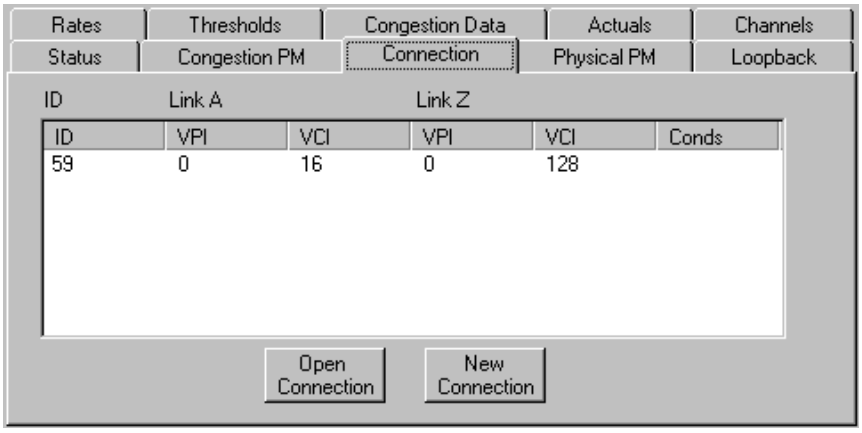


Figure 130: IDSL Port—Connection Tab Page

This Connection tab page lists the connections (PVCs) carried on this port, displaying the ID, VPI/VCI for each connection, and any conditions for the connection, for both ends of the connection.

For information on the **Open Connection** command button, see page 108. For information on the **New Connection** command button, see page 112.

IDSL Port Physical PM tab page:

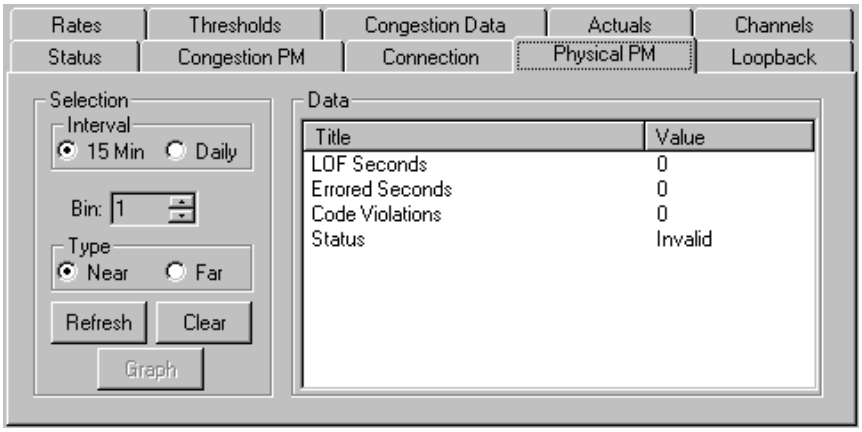


Figure 131: IDSL Port—Physical PM Tab Page

The **Physical PM** (Performance Monitoring) tab page displays recorded performance monitoring data for the IDSL port, displaying the various parameters and the recorded values for specified intervals. The data can be recorded at either 15-minute or daily intervals, for near- or far-end performance monitoring, and can

be recorded in up to 12 bins (for 15-minute intervals) or 2 bins for daily intervals. The data can then be displayed either numerically or in graphical format.

In the **Interval** group, select the interval for which you want to record performance data, either 15-minute or daily.

For 15-minute intervals, you can track up to 12 bins of data. Bin 1 contains data for the current 15-minute interval, bin 2 contains data for the previous 15-minute interval, and so on. In the **Bin** spin box, set a value from 1 through 12.

For daily intervals, you can track either 1 or 2 bins of data. Bin 1 contains data for the current day, and bin 2 contains the data for the previous day. In the **Bin** spin box, set the value to either 1 or 2.

In the **Type** group, select the type of monitoring to perform, either near-end or far-end.

Click the **Refresh** command button for an immediate “poll” of the currently active port object. Click the **Clear** command button to clear the performance data. Click the **Graph** command button to display the performance data in graphical format.

NOTE: The value of Status will always be either “Valid” or “Invalid.” A Status value of “Invalid” indicates that values listed should not be used in resolving performance issues. A status value of “Valid” indicates that the data information displayed in this list box can be used in resolving performance issues.

IDSL Port Loopback tab page:

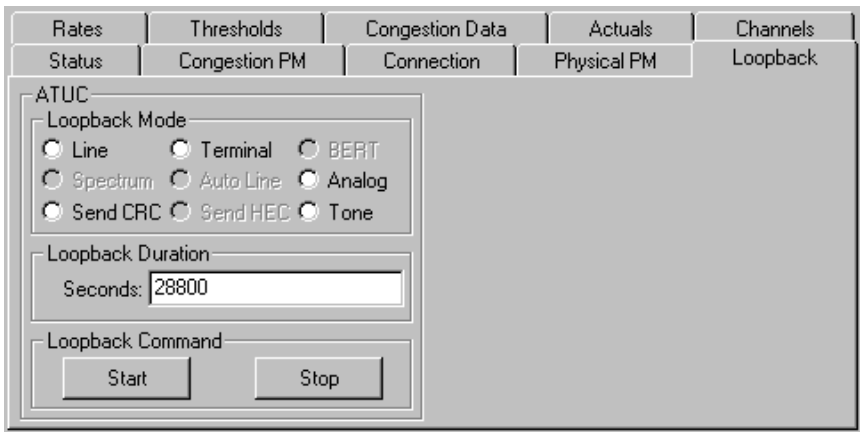


Figure 132: IDSL Port—Loopback Tab Page

Use the **Loopback Mode** radio buttons to select the type of port loopback testing to perform.

Line	Test the line to the subscriber's network interface—no data into the system.
Terminal	Test the line to the subscriber's modem—no data out of the system.
Analog	Test the line by looping a signal out through the transmit side and in through the receive side.
Send CRC	Test the line by forcing a Cyclic Redundancy Check (CRC) test pattern out to the CPE and looking for a CRC test pattern in return.
Tone	Test the line by causing the Link ID tone to be transmitted on the specified port, to allow remote test access to identify a given port.

The other options in the **Loopback mode** group are not enabled for this card.

Loopback 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 (eight hours). The **Loopback Command** buttons **Start** and **Stop** loopback testing.

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

See Volume 5, Chapter 4 for additional information on Diagnostic Test Modes.

IDSL Port Rates tab page:

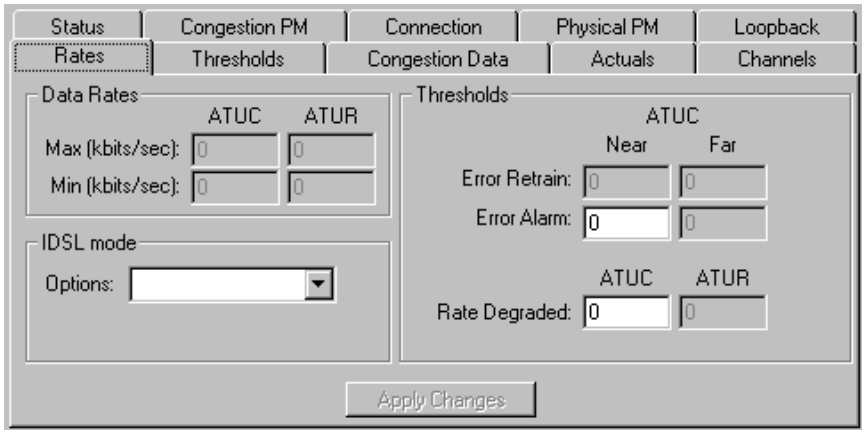


Figure 133: IDSL Port—Rates Tab Page

The **Rates** tab page allows you to view information and provision the data rates for an IDSL port, using the following options:

IDSL mode.This group allows you to select a mode for the port; the mode selected determines the data rate for the port. The mode option used depends on the mapping option specified on the IDSL port object view **Channels** tab, as follows:

- **2 Plus 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**.
- **ISDN 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**.

For more information on the mapping options, see “IDSL Port Channels tab page:” on page 127.

The **Error Alarm** and **Rate Degraded** thresholds are provisionable for the near-end ATUC.

If any of the provisioning parameters are changed, the **Apply Changes** command button is enabled.

NOTE: Clicking this button **immediately** applies the changes to the system. To return the parameters to their original values, close the dialog box without clicking the **Apply Changes** command button. The port status should be set to **Locked** before applying changes to the system.

For information on setting the options and thresholds for this tab, see Chapter 4, Chapter 5.

IDSL Port Thresholds tab page:

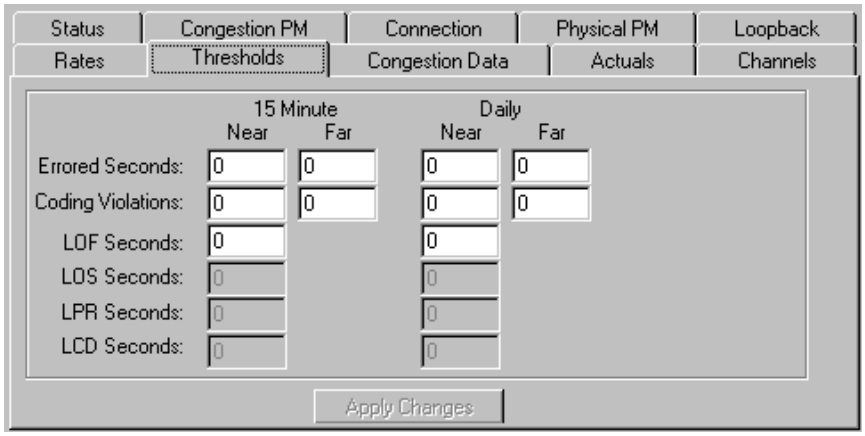


Figure 134: IDSL Port—Thresholds Tab Page

The IDSL port **Thresholds** tab page allows you to view and set the following parameters for the IDSL port, for both 15-minute and daily intervals:

- **Errored Seconds** for near- and far-end
- **Coding Violations** for near- and far-end
- **LOF Seconds** for near-end only

The **LOS Seconds**, **LPR Seconds**, and **LCD Seconds** parameters are not enabled for this tab.

For information on setting the thresholds for this tab, see Chapter 4, Chapter 5.

IDSL Port Congestion Data tab page:

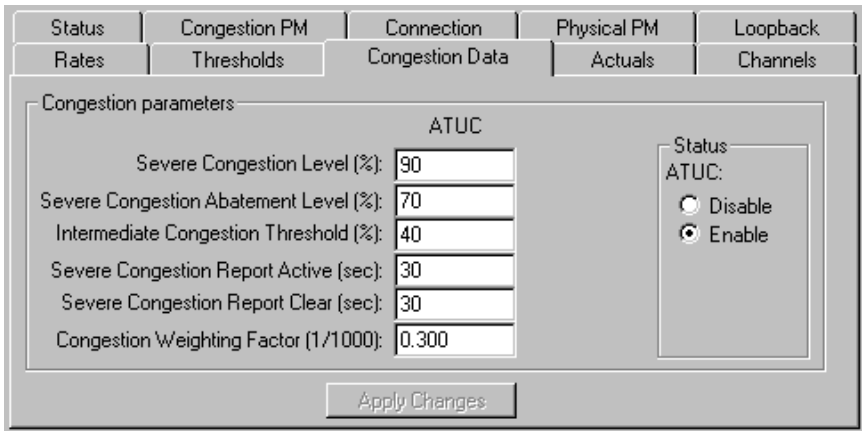


Figure 135: IDSL Port Congestion Data Tab Page

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

- **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 (1/1000)**In steps of 0.001
  Default = 0.300

Set the **Congestion Data** parameters to their optimum levels and click the **Apply Changes** command button.

IDSL Port Actuals tab page:

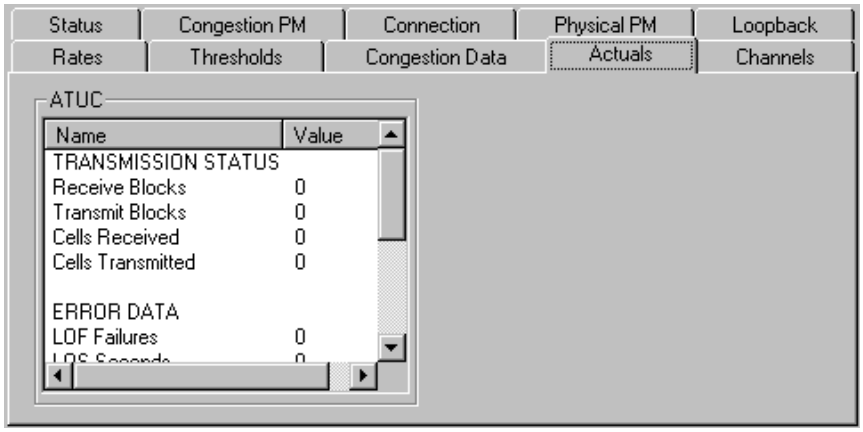


Figure 136: IDSL Port—Actuals Tab Page

The IDSL Port **Actuals** tab page displays ATUC connectivity data. This information is read-only.

The scrollable list includes the following IDSL actuals:

Table 3: IDSL Actuals

(ATUC only)
TRANSMISSION STATUS
Receive Blocks Transmit Blocks Cells Received Cells Transmitted
ERROR DATA
LOF Failures LOS Seconds Errored Seconds Coding Violations FE Errored Seconds FE Coding Violations Elapsed Seconds (15 min) Elapsed Seconds (daily) Previous Day Seconds

DMT4 Port

To display information on the DMT4 Port, click the DMT4 Line Card Port object in the LCS equipment locator group. The DMT4 Port object view displays, which includes the following tab pages: **Status**, **Congestion PM**, **Connection**, **Physical PM**, **Loopback**, **Rates**, **Thresholds**, **Congestion Data**, **Actuals**, **Advanced**, and **DMT**.

DMT4 Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

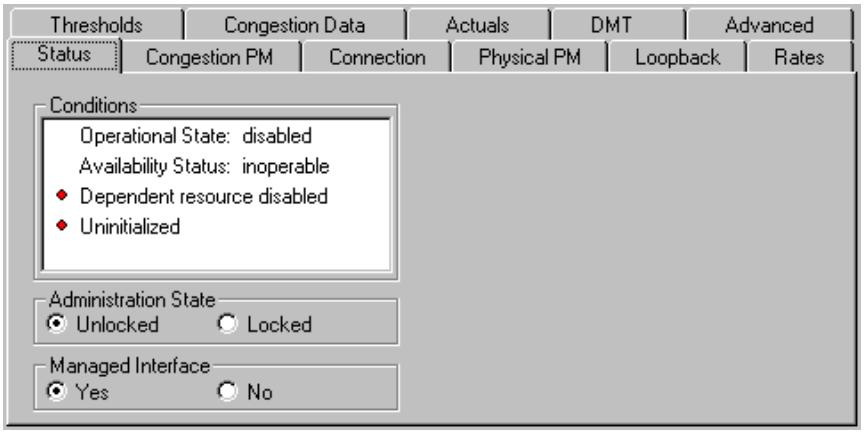


Figure 137: DMT4 Port—Status Tab Page

The **Administration State** radio buttons control whether the 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 unavailable for service. Objects should be locked when they are being configured or when performing upgrades.

NOTE: If an alarm condition exists, the unlocked option cannot be selected until the alarm condition is cleared. For descriptions of alarm conditions, see Appendix B, *Conditions and Recommended Action* in Volume 3, *Acceptance Testing*.

The **Managed Interface** buttons control whether the port is being actively managed. If the managed interface option is enabled (the default), conditions on the port (for example, an LOF condition) are reported. If this option is not enabled, conditions on the port will not be reported.

The managed interface option interacts with one of the options in the Options dialog box (see Figure 56, Options Dialog Box on page 45). In the **Line Card Port Color** group of the Options dialog box, one of the options is **If Managed Interface is set to no, show all options as yellow instead of red**. If this option is enabled, and the managed interface option is disabled, a port for which a condition is reported will display yellow instead of red.

DMT4 Port—Advanced tab page:

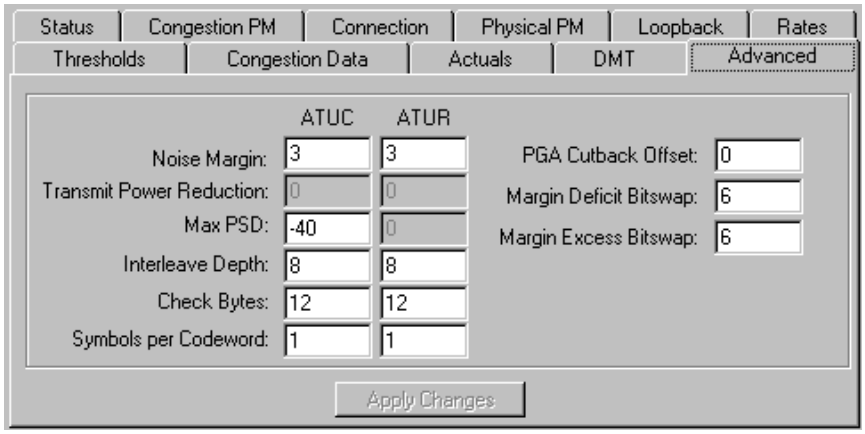


Figure 138: DMT4 Port—Advanced Tab Page

The **Advanced** tab page allows you to view and change provisioning information for Noise Margin, Interleave Depth, Check Bytes, and Symbols per Codeword for the ATUC and ATUR. Maximum PSD (Power Spectural Density) is provided for the ATUC. Information is also provided on the PGA (Programmable Gain Amplifier) Cutback Offset, and Margin Deficit and Excess Bitswap. The Transmit Power Reduction fields are not enabled.

For more information on provisioning for the DMT advanced parameters, see Volume 4, Chapter 3.

If you make changes to the parameters, click the **Apply Changes** button to update the system using the new parameters.

DMT Port—Congestion PM tab page:

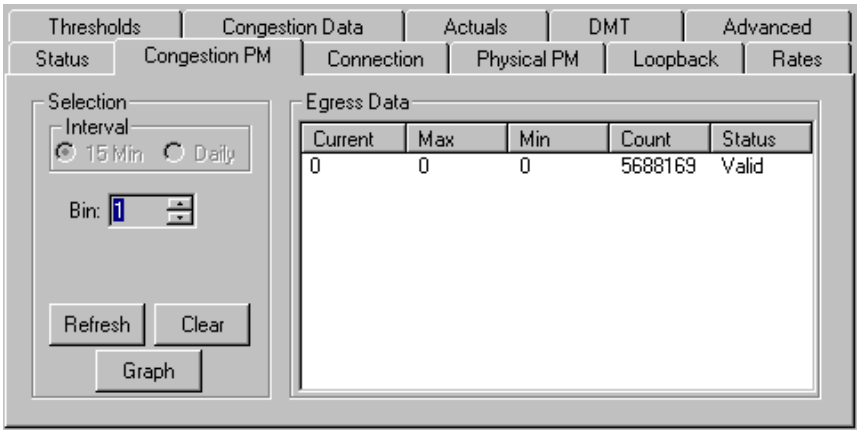


Figure 139: DMT4 Port—Congestion PM Tab Page

The **Congestion PM** (Performance Monitoring) tab page provides information on egress data congestion. The data is listed by Current, Maximum, and Minimum values, by actual Count, and Status.

NOTE: The value of Status will always be either “Valid” or “Invalid.” A Status value of “Invalid” indicates that values listed should not be used in resolving performance issues. A status value of “Valid” indicates that the data information displayed in this list box can be used in resolving performance issues.

You can view up to 12 five-minute bins of performance data. Bin 1 contains data for the current interval, Bin 2 contains data for the previous interval, and so on through Bin 12. In the **Bin** spin box, set the value to the number of intervals for which you want to be able to view data (1—12). The bins record the maximum and minimum smoothed values that occur during the selected intervals.

Click the **Refresh** command button immediately poll the active port. Click the **Clear** command button to clear currently displayed performance data. Click the **Graph** command button to display the data in graphical format.

The **Interval** group is disabled for this tab.

DMT4 Port—Connection tab page:

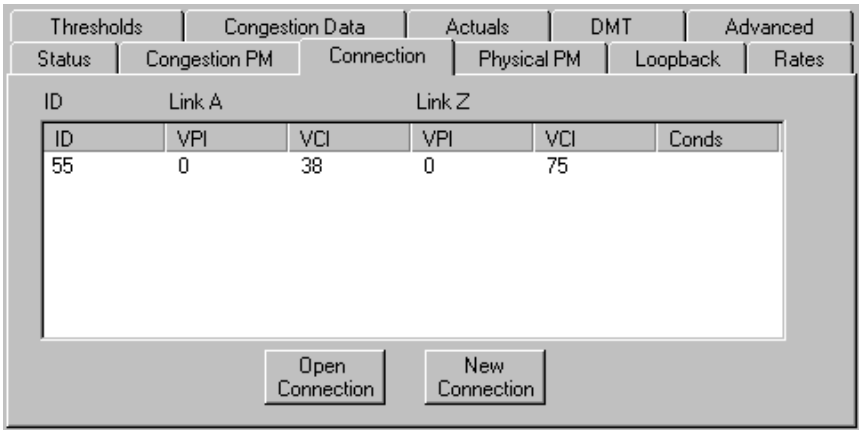


Figure 140: DMT4 Port—Connection Tab Page

This **Connection** tab page lists the connections (PVCs) carried on this port, displaying the ID, VPI/VCI for each connection, and any conditions for the connection, for both ends of the connection.

For a description of the **Open Connection** command button, see page 108. For a description of the **New Connection** command button, see page 112.

DMT4 Port Physical PM tab page:

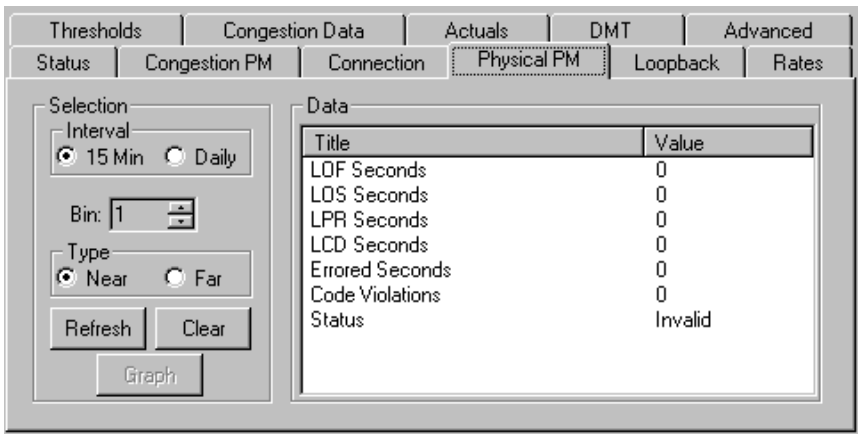


Figure 141: DMT Port—Physical PM Tab Page

The **Physical PM** (Performance Monitoring) tab page displays recorded performance monitoring data for this port, displaying the various parameters and the recorded values for specified intervals. The data can be recorded at either 15-minute or daily intervals, for near- or far-end performance monitoring, and can

be recorded in up to 12 bins (for 15-minute intervals) or 2 bins for daily intervals. The data can then be displayed either numerically or in graphical format.

In the **Interval** group, select the interval for which you want to record performance data, either 15-minute or daily.

For 15-minute intervals, you can track up to 12 bins of data. Bin 1 contains data for the current 15-minute interval, bin 2 contains data for the previous 15-minute interval, and so on. In the **Bin** spin box, set a value from 1 through 12.

For daily intervals, you can track either 1 or 2 bins of data. Bin 1 contains data for the current day, and bin 2 contains the data for the previous day. In the **Bin** spin box, set the value to either 1 or 2.

In the **Type** group, select the type of monitoring to perform, either near-end or far-end.

Click the **Refresh** command button for an immediate “poll” of the currently active port object. Click the **Clear** command button to clear the performance data. Click the **Graph** command button to display the performance data in graphical format.

NOTE: The value of Status will always be either “Valid” or “Invalid.” A Status value of “Invalid” indicates that values listed should not be used in resolving performance issues. A status value of “Valid” indicates that the data information displayed in this list box can be used in resolving performance issues.

DMT4 Port Loopback tab page:

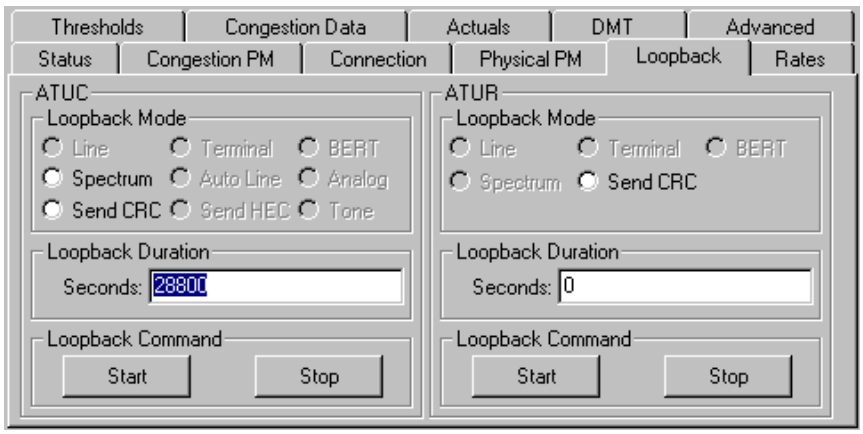


Figure 142: DMT4 Port—Loopback Tab Page

The DMT4 **Loopback** tab allows you to perform loopback testing on both the ATUC and ATUR—the two sides of the tab have similar fields, with differences

only in the options that are enabled and the defaults. The **Loopback Mode** radio option buttons are used to select port loopback test mode for both the ATUC and ATUR.

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. This option is enabled **only** for the ATUC side.

Send CRC Test the line by forcing a Cyclic Redundancy Check (CRC) test pattern out to the CPE and looking for a CRC test pattern in return. This option is enabled for both the ATUC and ATUR sides.

The other options in the **Loopback mode** group are not enabled for this card.

Loopback Duration specifies the interval (in seconds) that the system should wait for a signal before giving up on a loopback test. For the ATUC side, the default is 28800 seconds (eight hours); for the ATUR side, the default is 0 (zero).

Click the **Loopback Command** buttons to start and stop 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.

See Volume 5, Chapter 4 for additional information on Diagnostic Test Modes.

DMT4 Port Rates tab page:

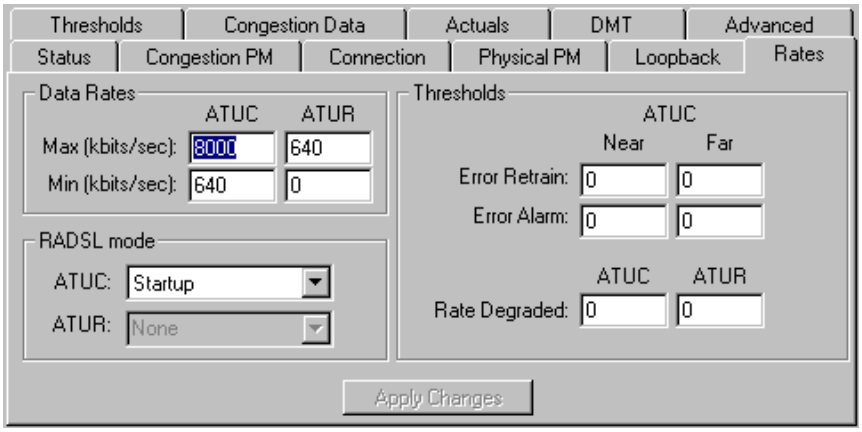


Figure 143: DMT4 Port—Rates Tab Page

The **Rates** tab page allows you to view and set parameters for data rates, modes, and thresholds for the DMT card.

Data Rates. This group allows you to set the maximum and minimum data rates for the ATUC and ATUR. The values are listed in the following table.

Table 19: DMT Provisioning Parameters

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

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

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

- **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) after startup, the system does not retrain and an error message is generated.

Thresholds. This group allows you to view and set the **Error Alarm** and **Error Retrain** thresholds for the near- and far-end ATUC, and **Rate Degraded** thresholds for the ATUC and ATUR.

If you make changes to the parameters, click the **Apply Changes** button to update the system using the new parameters.

For more information on provisioning DMT rates, see Volume 4, Chapter 3.

DMT4 Port Thresholds tab page:

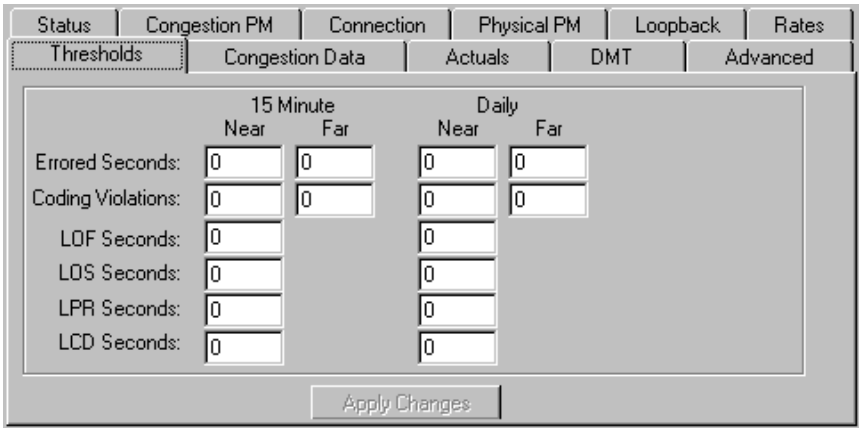


Figure 144: DMT4 Port—Thresholds Tab Page

For information on provisioning thresholds, see Volume 4, Chapter 3.

DMT4 Port Congestion Data tab page:

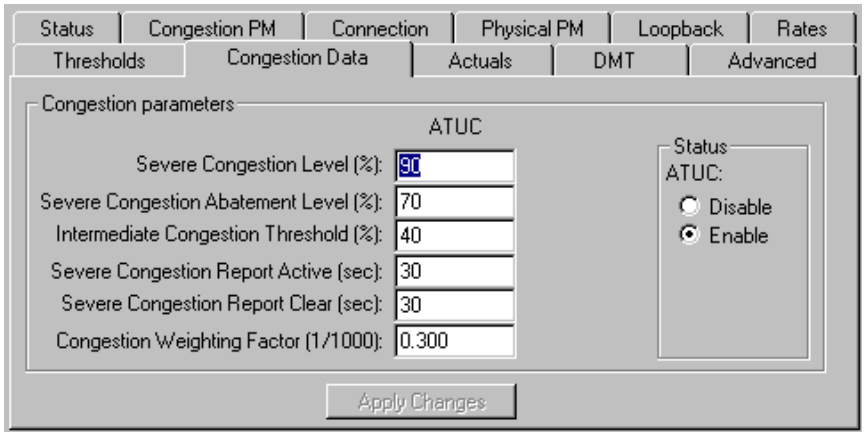


Figure 145: DMT Port Congestion Data Tab Page

Listed below are the provisionable DMT4 congestion parameters for network traffic management:

- **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 (1/1000)**(In steps of 0.001, Default: 0.300)

Set the **Congestion Data** parameters to their optimum levels and click the **Apply Changes** command button.

DMT4 Port Actuals tab page:

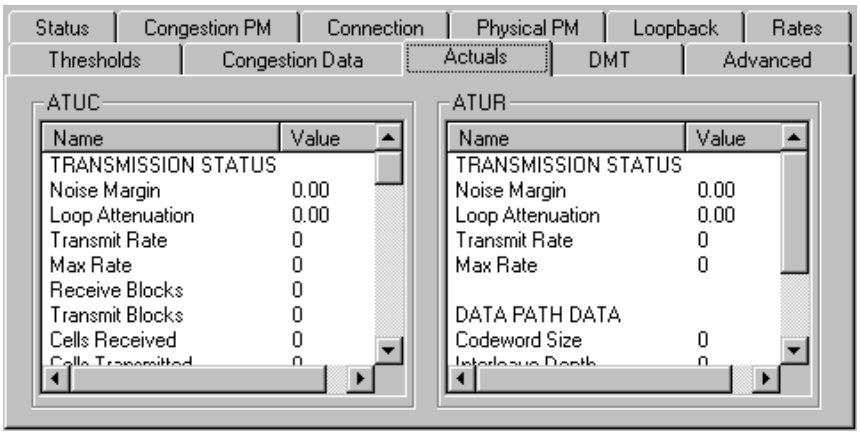


Figure 146: DMT4 Port—Actuals Tab Page

The DMT4 Port **Actuals** tab page displays ATUC and ATUR connectivity data. This information is read-only. The following table lists the DMT4 ATUC and ATUR values.

Table 4: DMT4 Actuals

ATUC	ATUR
TRANSMISSION STATUS	
Noise Margin Loop Attenuation Transmit Rate Max Rate Receive Blocks Transmit Blocks Cells Received Cells Transmitted	Noise Margin Loop Attenuation Transmit Rate Max Rate
DATA PATH DATA	
Codeword Size Interleave Depth Parity Bytes Vendor ID Vendor Version Serial Number	Codeword Size Interleave Depth Vendor ID Vendor Version Serial Number
ERROR DATA	
LOF Failures LOS Failures LPR Failures LCD Failures LOF Seconds LOS Seconds LPR Seconds LCD Seconds Errored Seconds Coding Violations FE Errored Seconds FE Coding Violations HEC Errors FE HEC Errors Error Retrains FE Error Retrains LOF Retrains Training Starts Corrected Errors Uncorrected Errors FE Corrected Errors FE Uncorrected Errors Elapsed Seconds (15 min) Elapsed Seconds (daily) Previous Day Seconds	

For more information on DMT actuals, see Volume 4, Chapter 3.

DMT4 Port DMT tab page:

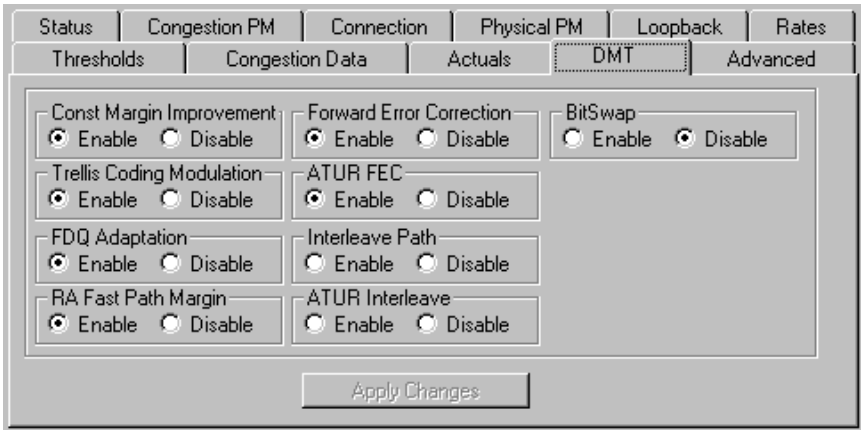


Figure 147: DMT4 Port—DMT Tab Page

The DMT4 **DMT** tab page allows you to enable or disable the following parameters for the DMT4 line card:

Constant Margin Improvement The DMT port uses coding gain to reduce the required margin on a line; therefore, allowing a higher data rate. 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.

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.

Trellis Coding Modulation (TCM) This functionality is planned for a future release.

Frequency Domain Equalization (FDQ) This functionality is planned for a future release.

Rate Adaptive (RA) Fast Path Margin If this group is enabled (the default), latency is decreased but there is less protection against noise. The **Interleave Path** group must be disabled if this group is enabled.

Forward Error Correction (FEC) If this group is enabled (the default), redundant bits generated at the transmit end are used at the receiver to detect, locate and correct transmission errors before delivery to the data communication link. FEC avoids retransmission of information by the transmitter.

FEC is enabled in conjunction with Interleave to provide a more error-free connection, but with increased latency. The FEC and Interleave 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 FEC and Interleave groups should be enabled.

ATUR FEC If enabled (the default), Forward Error Correction is implemented at the ATUR.

Interleave Path If enabled (the default) in conduction 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.

ATUR interleave If enabled (the default), interleave is implemented at the ATUR.

Bitswap If enabled (the default is disable), the DMT port changes bit allocation during the data mode to adapt to changing conditions on the line. The goal is to maintain an acceptable level of noise "margin" for each bin if possible. Bitswapping does not dynamically change the data rate during the data mode—bit allocations are "swapped" from a bin or tone that has a degraded margin to another that has a high margin. This feature should be enabled **only** for Fixed Rate operation (the RADSL mode is set on the DMT **Rates** tab).

For more information on DMT provisioning, see Volume 4, Chapter 3.

Line Card Shelf Multiplexer (LSM) Card

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 de-multiplexes 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 as shown in the equipment locator group below:

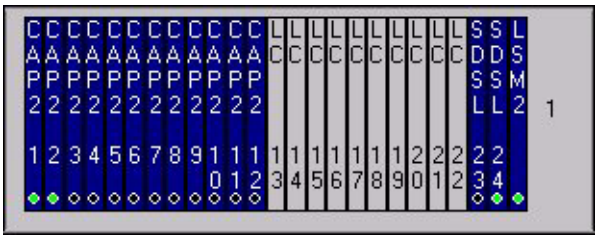


Figure 148: Line Card Shelf (LCS) Equipment Locator Group

Clicking the LSM object in the LCS equipment locator group displays the following dialog box:

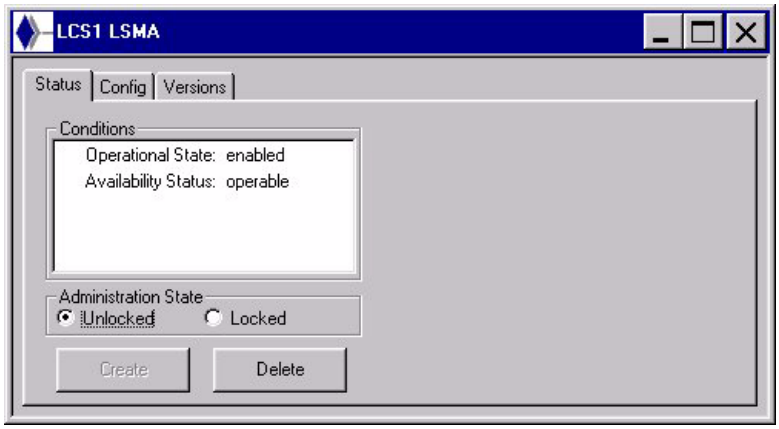


Figure 149: LSM Status Tab Page

The LSM object view contains three tab pages: **Status, Config, and Versions.**

LSM Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The Status tab page also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

The **Create** and **Delete** command buttons, respectively, add or remove provisioning from the MIB for this LSM card.

LSM Config tab page: The Config tab page has a Configuration list box that shows the Serial Number, Hardware Version, CLEI, Name, and Type (Actual and Config) for the LSM card.

LSM Versions tab page: The Versions tab page lists the various names and values of the subsystem versions.

LSM Port

Clicking the LSM Port object in the LCS equipment locator group displays the following dialog box:

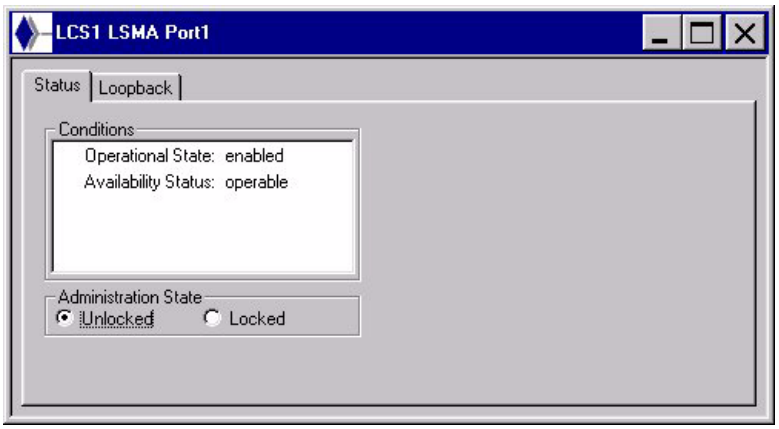


Figure 150: LSM Port Status Tab Page

The LSM Port object view contains two tab pages: **Status** and **Loopback.**

LSM Port Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The Status tab page also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when making hardware upgrades.

LSM Port Loopback tab page:

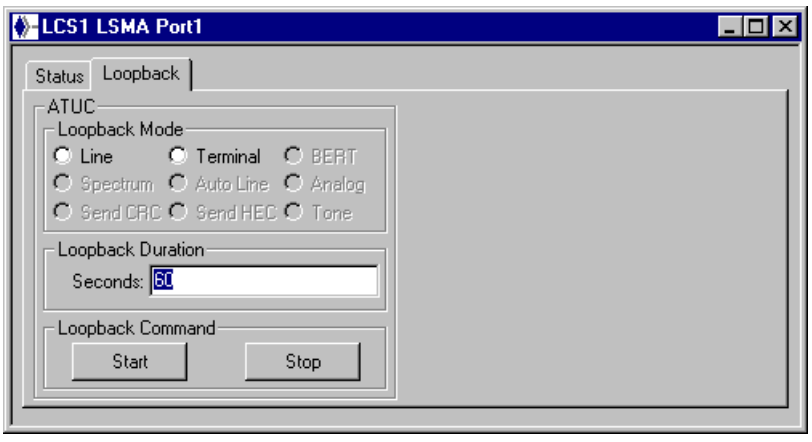


Figure 151: LSM Port—Loopback Tab Page

The parameters in the **Loopback** tab page control loopback testing for the MLA card. **Loopback Mode** sets the LSM to do line loopback testing, or terminal loopback testing.

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

The other loopback mode options are not enabled for this tab.

Loopback Duration sets the interval in seconds that the LSM should wait before giving up on the loopback test. The Loopback Duration default is 60 seconds. The **Loopback Command** buttons **Start** and **Stop** 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.

Show Connections

If you select **Show Connections** from the Tools pull-down menu, the **Connections** dialog box will appear, as shown below:

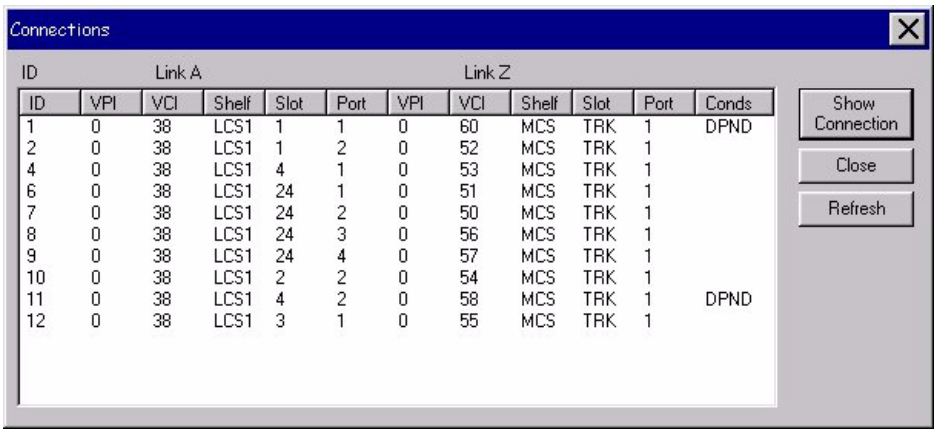


Figure 152: Show Connections Dialog Box

The Connections dialog box lists all connections carried by the entire 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 one again. The multiplexer assigns available connection ID numbers to new connections.

The **VPI**, **VCI**, **Shelf**, **Slot**, and **Port** columns correspond to the VPI, VCI, shelf, slot, and port numbers. (The VPI (Virtual Path Identifier) identifies the route to be used by the ATM cell. A virtual path may comprise multiple virtual channels. The VCI (Virtual Circuit Identifier) identifies an individual virtual channel to which the cell belongs. The VPI and VCI are translated at each ATM switch and are unique only for a given physical link.)

If you double-click on the ID (or select the ID and click the Show Connections command button), it brings up Status and Connection dialog boxes (tab pages) for this connection ID.

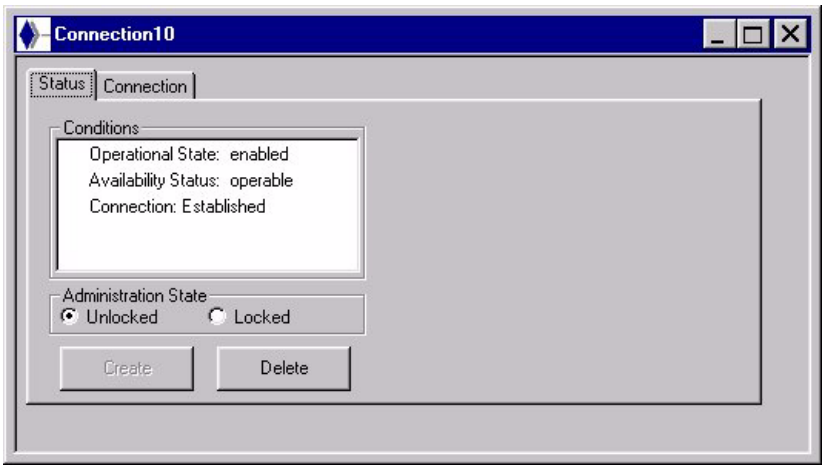


Figure 153: Show Connections—Status Tab Page

Show Connections—Status tab page: The Conditions list box displays conditions associated with the selected object. Data in the Conditions list box is refreshed periodically by the system. The data can also be updated by clicking the Refresh icon on the tool bar.

The Status tab page also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when deleting connections.

The **Create** and **Delete** command buttons, respectively, add or remove provisioning from the MIB.

Show Connections—Connection tab page:

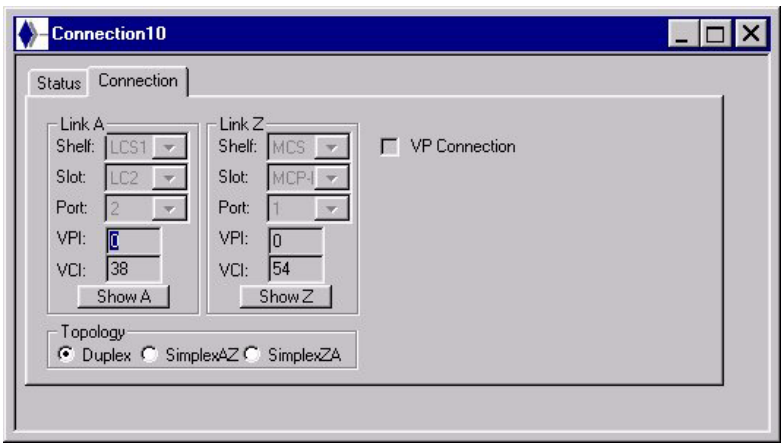


Figure 154: Show Connections—Connection Tab Page

All data elements in the Connections tab page are read-only with the exception of the Topology option buttons.

Link A is the line card side of a PVC; **Link Z** is the trunk side of a PVC. The **VPI/VCI** fields at the bottom of both **Link A** and **Link Z**'s group boxes specify the ATM circuit address for each end of the connection. The VPI (Virtual Path Identifier) identifies the route to be used by the ATM cell. A virtual path may comprise multiple virtual channels. The VCI (Virtual Circuit Identifier) identifies an individual virtual channel to which the cell belongs. The VPI and VCI are translated at each ATM switch and are unique only for a given physical link. This information is read-only.

The **shelf**, **slot**, and **port** 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 **Link A**. This information is read-only.

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.

Clicking the **Show A** or the **Show Z** command button brings up the LCS LC*n* Port Connection Link dialog box for this connection for the Link A or Link Z, respectively:

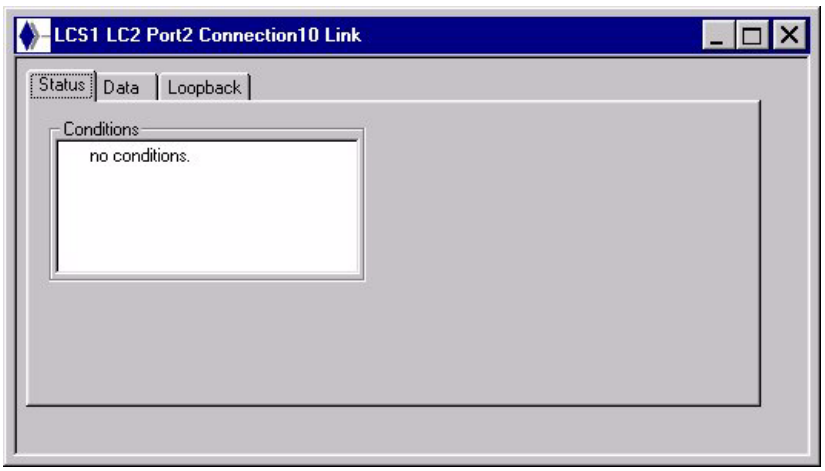


Figure 155: Port Connection Link—Status Tab Page

The Status tab page has a Conditions list box that displays conditions associated with this object. DiamondCraft automatically refreshes the data in the Conditions

list box. The Refresh icon (tool bar) forces a “refresh” command; this is an optional step.

Port Connection Link—Data tab page:

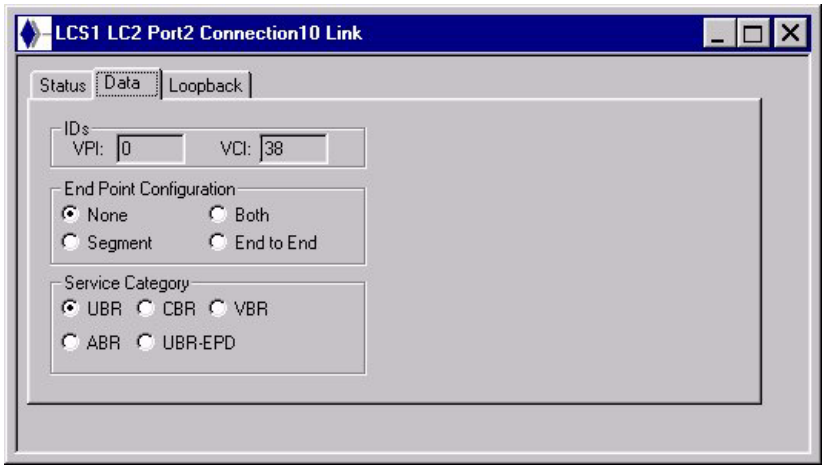


Figure 156: Port Connection Link—Data Tab Page

The VPI and VCI IDs fields are dimmed and are informational only. They display the address of this end of the PVC. The VPI (Virtual Path Identifier) identifies the route to be used by the ATM cell. A virtual path may comprise multiple virtual channels. The VCI (Virtual Circuit Identifier) identifies an individual virtual channel to which the cell belongs. The VPI and VCI are translated at each ATM switch and are unique only for a given physical link.

The **End Point Configuration** radio 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 **Service Category** radio buttons specify characteristics of the ATM service carried by 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. CBR is not currently supported.

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. VBR is not currently supported.

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. ABR is not currently supported.

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.) UBR-EPD is not currently supported.

Port Connection Link—Loopback tab page:

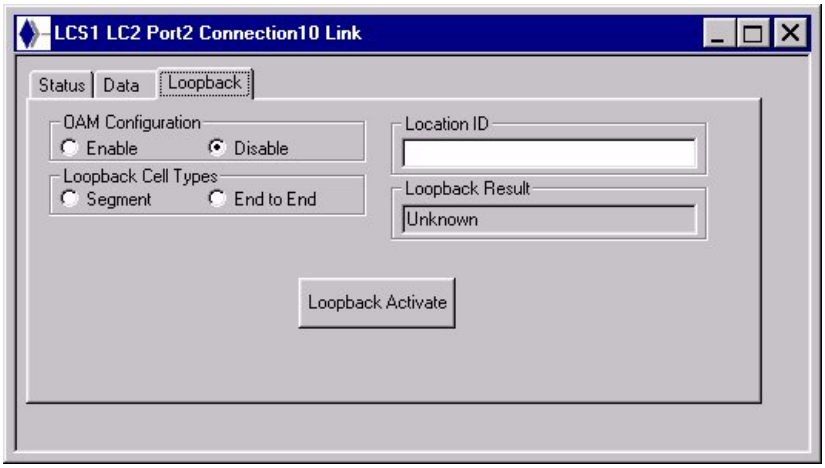


Figure 157: Port Connection Link—Loopback Tab Page

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

The **Loopback Cell Type** specifies what type of ATM loopback cell the Speedlink 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**, on page 155.

Location ID is a 16-byte character string indicating where the OAM loopback cell should go. You normally identify a destination ID if the loopback point is not a segment or an end-to-end endpoint.

Loopback Result is a read-only list box that shows the results of the ATM loopback test:

Unknown	The loopback result is not known.
Timeout	Speedlink dispatched loopback cells, but they did not come back within the timeout interval.
Error	Speedlink detected some unknown loopback failure.
Succeeded	The loopback cell successfully returned.
Invalid	The user specified an invalid destination for the loopback cell or the loopback cell could reach its intended destination.
Already Active	A loopback is already active, so you cannot start another one yet.
Resources	There are no more loopbacks available on this multiplexer.
No OAM	OAM cell traffic is not enabled for this connection.

Non-Default This link is an intermediate point, and you are attempting to use a default NEID value for the loopback.

The **Loopback Activate** button sends one ATM loopback cell.

New Connection

If you select **New Connection** from the Tools pull-down menu, the **New Connection** dialog box will appear.

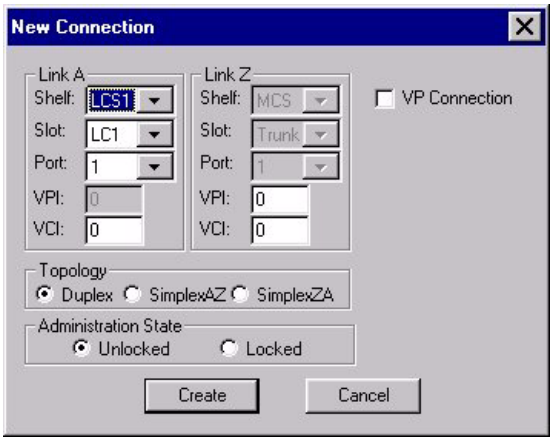


Figure 158: New Connection Dialog Box

Link A is the line card side of a PVC; **Link Z** is the trunk side of a PVC. The **VPI/VCI** fields at the bottom of both **Link A** and **Link Z**'s group boxes specify the ATM circuit address for each end of the connection. The VPI (Virtual Path Identifier) identifies the route to be used by the ATM cell. A virtual path may comprise multiple virtual channels. The VCI (Virtual Circuit Identifier) identifies an individual virtual channel to which the cell belongs. The VPI and VCI are translated at each ATM switch and are unique only for a given physical link.

The **shelf**, **slot**, and **port** 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 **Link A**.

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 transmit data down to the port only.

The dialog box also includes **Administration State** radio buttons that control whether the 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 unavailable for service. This is used for configuring an object or when deleting connections.

The **Create** and **Delete** command buttons, respectively, add or remove provisioning from the MIB.

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.

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