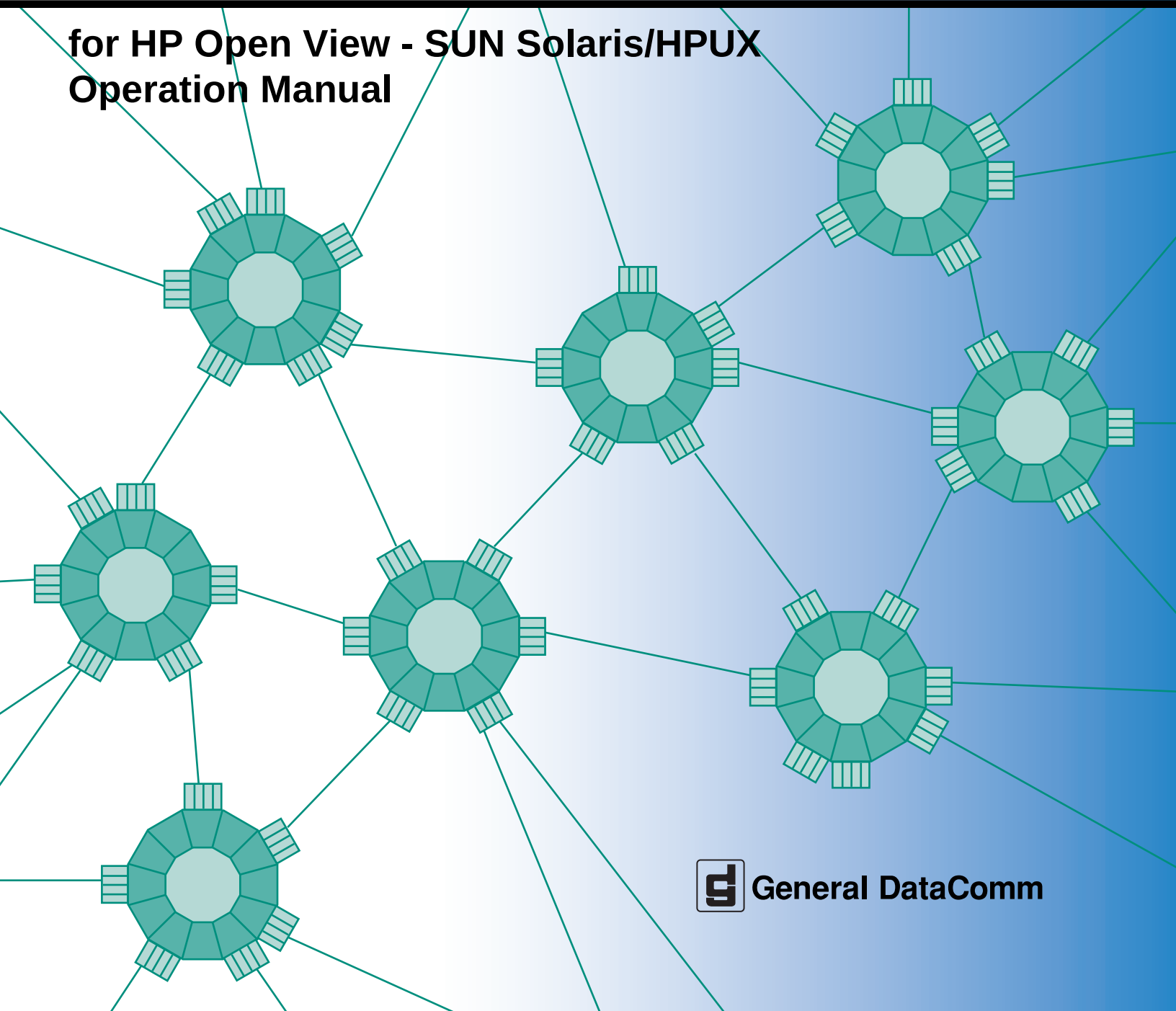
076R154-V400
Issue 1
August 2001

TEAM® 521A Version 4.0.0

for HP Open View - SUN Solaris/HPUX
Operation Manual



General DataComm

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Documentation

TEAM 521A Version 4.00 Revision History

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Related Publications

Description	Part Number
SpectraComm 521A Installation and Operation Manual	076R152-REV
SpectraComm Manager Card Operation Manual	048R303-REV
TEAM Core Operation Manual	058R720-VREF

For publication numbers, the **REV** is the hardware manual revision, e.g., -000, -001, etc. The **VREF** (if listed) is the software revision. For example, -V120 would read "Version 1.2 and corresponds to the most current revision. In addition to these documents, always consult the latest release notes for each product.

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Preface

Scope

This manual describes the operation of the General DataComm TEAM 521A software application. The information contained in this manual has been carefully checked and is believed to be entirely reliable. However, as General DataComm improves the reliability, function, and design of their products, it is possible that information may not be current. Contact General DataComm if you require updated information for this or other General DataComm products.

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Using This Manual

This manual is divided into the following chapters:

- Chapter 1 - System Description
- Chapter 2 - Operation
- Chapter 3 - Configuration
- Chapter 4 - Maintenance and Diagnostics
- Chapter 5 - NMS 520
- Chapter 6 - NMS 510

This manual should be read in its entirety and all procedures completely understood before installing or operating the unit. The notes that appear throughout this manual must be read prior to any installation or operating procedure. Examples of notes are shown below.

Note *A note provides essential operating information not readily apparent which you should be particularly aware of. A note is typically used as a suggestion.*

Important *Indicates an emphasized note. It is something you should be particularly aware of; something not readily apparent. Important is typically used to prevent equipment damage.*

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Chapter 1: System Description

Introduction to TEAM 521A

This manual describes how to operate TEAM 521A software applications for configuring and controlling the operation of SpectraComm 521A and SpectraComm 521A/S Data Service Units (DSUs). Both types of DSUs operate in the same manner with the exception that the SC 521A/S product provides a Sealing/Simplex current. Throughout this document, all information relates to both types of DSUs except where noted. A working knowledge of HP Open View and DSU functioning is assumed.

SpectraCommm 521A DSU Overview

The SC 521A DSU is a DATAPHONE Digital Service (DDS) compatible DSU that is intended to be used in central site or remote applications. It is compatible with remote DDS units from other manufacturers, but supports the greatest range of management capabilities when used in conjunction with any of the following GDC DSUs at the remote site: NMS 520, NMS 510, SC521A or SC 521A/S. A remote SC521A or SC 521A/S DSU is assumed to be in NMS 520 mode unless the switch on the product card is set to NMS 510 mode.

TEAM 521A Overview

The TEAM 521A Unix application is a collection of integrated applications for the HP OpenView Network Management Platform that employs the Simple Network Management Protocol (SNMP) to manage GDC SC 521A or SC 521A/S DSU cards installed in a GDC SpectraComm shelf.

TEAM 521A applications enable you to configure SC 521A and SC 521A/S DSUs, monitor DSU operation through a Front Panel display emulating LEDs on the physical unit, and diagnose suspected problems using local tests, remote loopbacks and self test patterns.

Special Consideration - Master/Remote Communication

- When the link is configured for DDS I or for clear channel, the management communications occupy the same channel that carries user data. Thus, management communication has the effect of briefly interrupting or causing errors in the user data. Error correcting protocols and requests for re-transmission can protect user data against corruption, but the effect does slightly reduce throughput.
- In configurations with communication between two shelves, both with SCMs, only a point-to-point application is allowed. In such configurations, remote management is lost, along with the End-To-End self test and the Delay diagnostic.
- A **`No DTE Poll`** alarm trap or a **`No DSU Response`** trap from a remote will be reported in the HPOV event log. These alarms are not reported in Alarm Detail and are non-maskable.
- **`No DTE Polling`** indicates the DTE connected to the remote DSU does not respond to polling by the master unit (valid only in DDSI operation).
- **`No DSU Response`** indicates the remote DSU does not respond to polling by the master unit (valid only in DDSI operation).

Theory of Operation

All of the TEAM Controller applications use the HP OpenView APIs (Application Programmer Interfaces) to integrate with HP OpenView Windows and other network management applications. Menu items are accessed via pulldown menus from the appropriate HP OpenView submap or from the Front Panel drop-down menu. The TEAM Controller GUI screens met HP OpenView premier partner requirements. Refer to OpenView documentation for more information.

SpectraComm Manager Card

TEAM 521A applications operate in conjunction with a SpectraComm Manager (SCM) card to provide comprehensive network management capabilities using the Simple Network Management Protocol (SNMP). The SCM acts as the SNMP proxy agent through which TEAM management applications communicate with SpectraComm products and other compatible equipment.

All management communications are directed to the SCM card Internet Protocol (IP) address. The SCM card relays commands and responses between management applications and hardware components, using a slot addressing scheme to communicate over the SpectraComm shelf backplane with the other components. The SCM is transparent to the applications, which operate as though they were communicating directly with the hardware units. The SCM card is managed by the TEAM Core application, which is also responsible for the discovery and mapping functions of TEAM Applications within the HP OpenView framework.

Note *Refer to the SpectraComm Card Operation Manual and the TEAM Core Operation Manual and the associated Release Notes for detailed SCM information.*

TEAM 521A Managed Remotes

TEAM 521A provides GDS/DDS full duplex operation for the remote management of its remote units. Through the SC 521A, its remotes are fully network managed by the shelf resident SpectraComm Manager (SCM) and an associated SNMP manager. The following table describes briefly the function and structure of network elements remotely managed by TEAM 521A.

Table 1-1 TEAM 521A-Managed Remote Units

Master Element	Remote Element	Operating Mode
SC 521A or SC 521A/S	NMS 510	GDS/DDS, full duplex, point-to-point or multi-point configuration, conventional and DDS with secondary channel. The SC 521A/S also provides two interface current modes: Source and Sink.
	NMS 520	
	SC 521A	
	SC 521A/S	

Note *In a multi-point configuration, only like units can be added as remotes (i.e., two NMS 520x, two NMS510s, etc.).*

The TEAM 521A Applications

All TEAM 521A applications can be accessed from either of two user interfaces. Table 1-2 lists the applications as they appear in the HPOV menu bar interface. Table 1-3 lists the applications as they appear in each managed unit's Front Panel **`Select`** button.

Access from the HPOV Shelf Map Window Menu

1. Select the DSU you intend to work with by clicking once on its icon in the shelf map.
2. The TEAM 521A application functions are arranged on the menu bar at the top of the HPOV Map window as shown in Table 1-2.
3. From the Map window, open the TEAM 521A application you intend to use.
4. To select multiple icons in a map window, click and drag a box around the desired icons, or click on icons individually while holding down the Control and Shift keys. Up to ten icons for the same device type can be selected at a time.

Table 1-2 TEAM Applications from the HPOV Menus

Menu Selection	TEAM 521A Applications	Description
Performance	Front Panel	Shows the status of the unit's LEDs and provides an interface to the rest of the applications via a Select button menu.
	Alarm Detail...	Displays alarm information in a read-only window
	DTE Status...	Displays the status of signals in the DTE interface
	Line Statistics...	Displays information concerning the functions of the network interface
Configuration	Configuration...	Provides read/write windows for DSU configuration parameters.
	Maintenance...	Provides read/write windows for DSU maintenance parameters.
Fault	Diagnosis	Accesses the Diagnose application which allows you to command the test functions of the DSU and view test results
Misc	Information...	Displays application name and revision level, similar to clicking on the GDC logo
	Front Panel Poll Rate...	Sets a default polling interval to be in effect each time the Front panel display is opened.
	Note Pad	Opens a shell tool (editor, mail tool, etc.) for keeping records on the system.
	Alarm Severity	Changes the severioty of the alarms for a device type.

Note *The Note Pad application is selected only from the Misc menu and not available at the Front Panel menu.*

Note *Your HPOV menu may show additional selections depending on other supported applications.*

Access from the SC521A Front Panel Display

The SC521A Front Panel application summarizes the real-time status of the SC521A DSU by displaying the states of the LED indicators on the unit. A **Select** button on the Front Panel accesses the application menus and their functions.

1. Select the DSU you intend to work with by clicking once on its icon in the shelf map.
2. At the Map window, go to the Performance menu and select the Front Panel application. The Front Panel display for that unit appears.
3. In the Front Panel display, click the **Select** button to access the application menu. *Table 1-3* describes the available applications.

Table 1-3 Team Applications from the Front Panel

Applications	Functions	Description
Performance	DSU Front Panel	Shows the status of the LEDs. Provides an interface to the rest of the applications.
	Alarms	Displays detailed read-only information about alarm state changes.
	DTE Status	Displays status information about signals at the DTE interface.
	Line Status	Displays information about the condition of the Line interface.
Configuration	Configure	Provides read/write windows for reviewing and configuring a selected SC 521A DSU.
	Maintenance	Controls device specific functions that are not part of normal configuration.
Fault	Diagnose	Runs diagnostic tests on a selected SC 521A DSU.
Misc	Information	Displays application name and revision level, similar to clicking on the GDC logo.

Note *You can access the Information function by clicking the GDC logo icon on the Front Panel display. Note that the Front Panel Poll Rate, Note Pad and Alarm Severity applications are only available through the Map Window menu bar.*

Window Features in TEAM Applications

The example screens below describe the window features that are common to all TEAM 521A application windows and their subordinate windows. More information on a specific application and its procedures are found later in subsequent chapters.

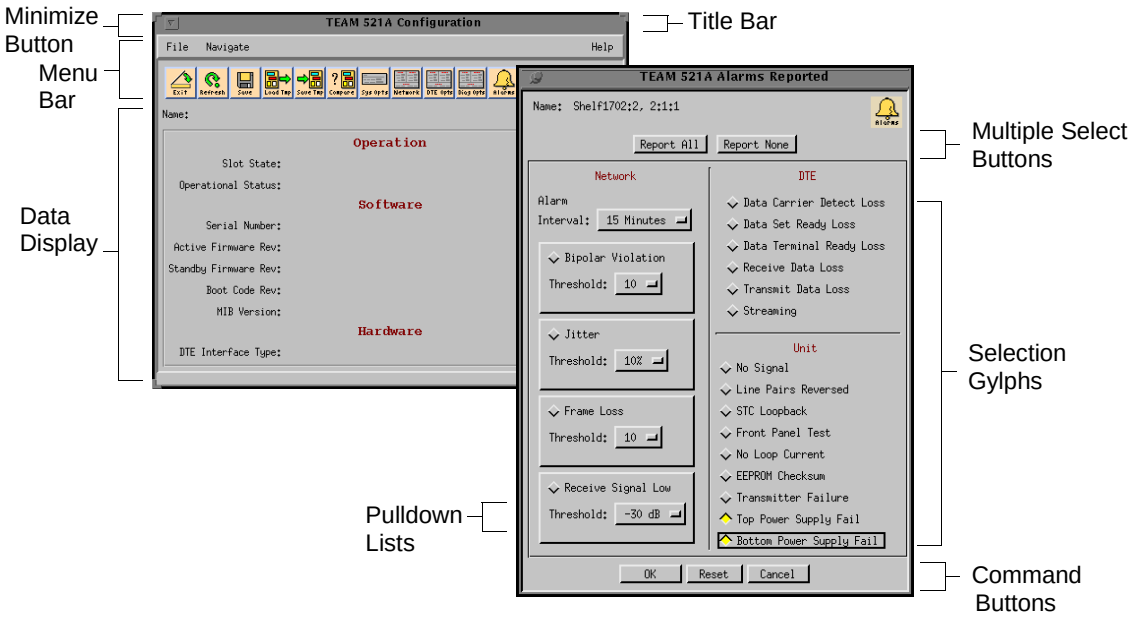


Table 1-4 Typical Application Window Features

Window Feature	Description
Title bar	Identifies the specific TEAM application running in the window, i.e., Configuration, Diagnostics, Alarms Reported, etc.
Minimize button	Available only when TEAM software is running on a SUN workstation in an OpenWindows environment. Click to minimize window to an icon. Double-click icon to restore the window. Located in the Title Bar of each application window.
Menu bars	Provides pulldown menus for common utilities, such as File->Exit and Help. Icon menus provide application-specific options.
Name field	Indentifies the shelf and slot location of the card of interest, followed by the card's slot: line: drop notation.
Command buttons	Click command buttons to execute a command instantly, such as Reset, Cancel or OK.
Pulldown lists	Pulldown and scroll to select options for equipment types, function parameters or operation controls for the application.
Glyphs	Click grayed-out diamond glyphs to select options, click again to deselect.
Entry Fields	Click to activate entry field for user-defined data, such as IP addresses, shelf names, system information.
Multiple Select buttons	Click to globally select and deselect frequently grouped options.
Data Display	A panel displaying read-only information configured by the user or determined by the system.

Note *Grayed-out buttons, fields, or lists represent options that are disabled or not available with the current configuration or DSU type. Refer to Chapter 3 for procedures on setting configuration parameters.*

Chapter 2: Operations

Overview

This chapter describes the operation of the TEAM 521A applications as they are grouped under the Performance menu, Fault menu, and Misc(ellaneous) menu. Note that TEAM 521A applications operate the same for both SC 521A and SC 521A/S DSUs, except where noted.

For other TEAM application menus, refer to *Chapter 3, Configuration* and *Chapter 4, Maintenance and Diagnostics* .

TEAM 521A Performance Menu

The Performance menu accesses the following applications:

- Front Panel application displays a representation of the DSU front panel which shows the status of the unit's LEDs and provides access to the rest of the TEAM applications
- Alarms application displays alarm information in a read-only window
- DTE Status application displays the status of signals in the DTE interface
- Line Statistics application displays information concerning the functions of the network interface

Front Panel Application

The Front Panel display is a graphical interface to a selected SC 521A DSU (*Table 2-1*). You can launch a SC 521A Front Panel display from the HPOV Map (shelf sub-map) window, or by double-clicking on the slot icon of the desired unit.

Each time the Front Panel display is opened, its initial polling rate is determined by the Front Panel Poll Rate selection of the HPOV map window Misc menu. The application polls the DSU to keep the states of the LEDs in the Front Panel display current. The time of the most recent poll appears at the bottom of the Front Panel display, to the left of the Help button.

The **`Select`** button menu provides two Poll selections which determine when the application collects new information from the DSU to update the Front Panel window: Demand Poll and Auto Poll. When Auto Poll is enabled the last poll time appears white on the Front Panel display, and yellow when Auto Poll is disabled. These polling options are described further in later paragraphs.

A **`boxed slot icon`** in the shelf submap will indicate that the DSU ***does not have*** an associated remote. When you double-click on a boxed slot icon, the application launches the Front Panel display of that SC 521A DSU.

An **`un-boxed slot icon`** in the shelf submap indicates that the DSU ***does have*** an associated remote. When you double-click on an un-boxed slot icon, the application opens another submap which displays icons for the selected SC 521A and its remote. A connecting line between them indicates that together they form a link. You can then double-click on the SC 521A icon in the link submap to launch the Front Panel display.

Front Panel Display LEDs and Menus

The LEDs shown in the display reflect the states of the actual indicators on the physical unit. *Table 2-1* describes the appearance and function of the LEDs.

Table 2-1 Performance Applications: The Front Panel Display

Front Panel Display	LEDs	Description
	INS In Service	In Service normally remains lit continuously after the DSU successful completion of its power-on test. The Blink INS menu selection will cause it to blink continually.
	ON	Power ON
	SD Send Data	When lit, Send Data indicates that the DSU is transmitting data. A two-headed arrow on the LED indicate transitions.
	RD Receive Data	When lit, Receive Data indicates that the DSU is receiving data from the remote DSU. A two-headed arrow on the LED indicate transitions.
	RS Request to send	When lit, Request To Send indicates that the DTE has data to transmit. A two-headed arrow on the LED indicate transitions.
	CO Carrier On	When lit, Carrier On indicates that the DSU is receiving a signal. A two-headed arrow on the LED indicate transitions.
	RSP Response	Management Response
	ICC Inactive Condition Code	When lit, Inactive Condition Code indicates when the DSU network interface is experiencing an out of sync (OOS) or out of frame (OOF) condition.
	NS No Signal	No Signal is lit when the DSU is not receiving a signal at its network interface.
	TM TEst Mode	Test Mode is lit red while the DSU performs a diagnostic test. During a test employing Self Test, a two-headed arrow on the LED indicates that errors have been detected.
	ALM Alarm	Alarm, indicates by its color that the DSU has detected an alarm condition. The colors match those of map icons for the unit.
	ST Self Test	Self Test is lit while the internal test pattern generator/checker is active.
	LT Local Test	Local Test is lit while the DSU is in the Local Loopback test condition.
	RL Remote Loop	Remote Loop is lit while the DSU is performing a remote loopback test with the remote DSU.
	DL Digital Loop	Digital Loop is lit while the DSU is performing a digital loopback to direct data back to the remote DSU.
	GDC Icon	Clicking the GDC icon displays the application name and the revision level.
	Select Button	Opens menu list for selecting other TEAM applications. Refer to *Table 2-2*.

Note *The TEAM Front Panel will appear the same for SC 521A and SC 521A/S units. To determine whether you are communicating with an SC 521A/S, check the TEAM Main Configuration screen for DSU identifying information in the* ***Card Type*** *and* ***Interface Current Mode*** *fields.*

The Front Panel Select Menus

The **Select** button, at the bottom of the Front Panel display provides access to menus for the rest of the TEAM 521A application functions. The following table shows the arrangement of the **Select** button menus. Note that it differs slightly from the Map window menu bar arrangement.

Table 2-2 Front Panel Select Button Menus

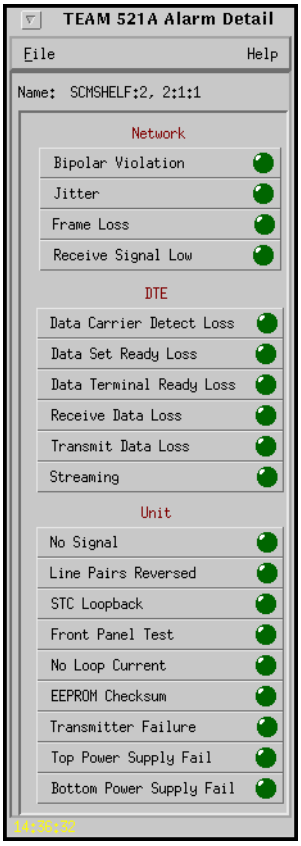
Menu	Selection	Description
Performance	Alarm Detail...	Displays alarm information in a read-only window
	DTE Status...	Displays the status of signals in the DTE interface
	Line Statistics...	Displays information concerning the functions of the network interface
Configuration	Configuration...	Provides read/write windows for DSU configuration parameters.
	Maintenance...	Provides read/write windows for DSU maintenance parameters.
Fault	Diagnosis	Accesses the Diagnose application which allows you to command the test functions of the DSU and view test results.
Demand Poll	Causes an immediate update of the display.	Determines when the application collects new information from the DSU to update the Front Panel window.
Auto Poll	15, 30, or 60 seconds Disable	
LED Test	On or Off	Demonstrates functioning of the Front panel LEDs.
Exit	Dismisses the Front Panel	

Note *If you disable Auto Poll, the Front Panel window displays a static snapshot of the LED states as they were at the last poll, either when the window was launched or a subsequent Demand Poll.*

Alarm Application

The Alarm application gets Network, DTE and Unit alarm indications from the selected DSU by polling the SCM for changes in alarm conditions or by receiving traps that the SCM sends in response to alarm conditions at the DSU. The initial polling rate is determined by the poll rate selected at the HPOV map window Misc menu. The TEAM 521A Alarm Detail window provides a File menu and displays the read-only alarm status of the DSU (*Table 2-3*).

Table 2-3 Performance Applications: The Alarm Detail Window

Alarm Detail Window	Alarm Type	LEDs	Description
	Network Alarms	Bipolar Variation	Failure of consecutive ones to alternate states in the signal being received.
		Jitter	Excessive jitter (phase shift) in the signal being received.
		Frame Loss	Out of frame condition at the network interface.
		Receive Signal Low	Low signal level being received at the network interface.
	DTE Alarms	Data Carrier Detect Loss	Loss of incoming signal or a line idle condition.
		Data Set Ready Loss	DSU is not asserting Data Set Ready to the DTE.
		Data Terminal Ready Loss	DSU is not receiving Data Terminal Ready from the DTE.
		Receive Data Loss	Reception of valid carrier without data (switched receive carrier operation only).
		Transmit Data Loss	No data within transmit polls (switched transmit carrier operation only).
		Streaming	Constant RTS condition.
	Unit Alarms	No Signal	Indicates loss of signal at the network interface.
		Line Pairs Reversed	Indicates the DDS line was incorrectly installed at the network interface.
		STC Loopback	DSU has been commanded into a test by the Telco Serving Test Center (STC)
		Front Panel Test	DSU has been commanded into a test by means of its front panel switches.
		No Loop Current	Absence of DC current at the Line interface
		EEPROM Checksum	Non-volatile memory that stores the DSU configuration has become corrupted
		Transmitter Failure	Failure of the DSU to transmit data.
		Top Power Supply Fail	Top power supply failure in the SpectraComm 2000 enclosure (see note).
		Bottom Power Supply Fail	Bottom power supply failure in the SpectraComm 2000 enclosure (see note).

Alarm Detail File Menu

The Alarm Detail File menu contains the following functions:

- **`Demand Poll`** causes an immediate update of the display.
- **`Auto Poll`** enables you to select updates at 15, 30, or 60 second intervals, or to disable automatic polling.
  If you select **`Disable`**, the Front Panel window displays a static snapshot of the LED states as they were at the last poll, either when the window was launched or a subsequent Demand Poll. The last poll time appears white on the front panel display when Auto Poll is enabled and appears yellow when Auto Poll is disabled.
- **`Exit`** dismisses the window.

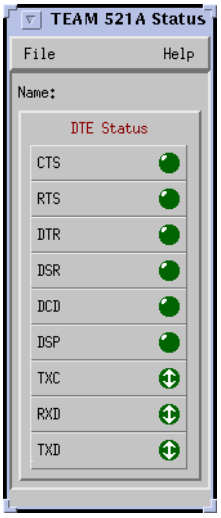
Note *You can change the default alarm severity by means of the Alarm Severity Feature within the TEAM CORE application.*

Note *Alarms for Top and Bottom Power Supply Fail are valid only for SC521A installed in the SpectraComm 2000 enclosure.*

DTE Status Application

The DTE Status application displays the read-only status of the EIA signals at the DTE interface. The initial polling rate is determined by the poll rate selected at the HPOV map window Misc menu. The TEAM 521A DTE Status window provides a File menu and displays the LEDs as dark green, light green, or light green with transition arrows. *Table 2-4* describes the appearance and the function of the LEDs in the DTE Status Window.

Table 2-4 Performance Applications: The DTE Status Window

DTE Status Window	LEDs	Description
	CTS	Clear To Send Bright Green indicates signal is ON.
	RTS	Request To Send Bright Green indicates signal is ON.
	DTR	Data Terminal Ready Bright Green indicates signal is ON.
	DSR	Data Set Ready Bright Green indicates signal is ON.
	DCD	Data Carrier Detect Bright Green indicates signal is ON.
	DSP	Data Set Power Bright Green indicates signal is ON.
	TXC	Transmit Clock Arrow in LED indicates transitions.
	RXD	Receive Data Arrow in LED indicates transitions.
	TXD	Transmit Data Arrow in LED indicates transitions.

DTE Status File Menu

The DTE Status File menu contains the following functions:

- **`Demand Poll`** causes an immediate update of the display.
- **`Auto Poll`** enables you to select updates at 15, 30, or 60 second intervals, or to disable automatic polling. If you select Disable, the Front Panel window displays a static snapshot of the LED states as they were at the last poll, either when the window was launched or a subsequent Demand Poll. The last poll time appears white on the front panel display when Auto Poll is enabled and appears yellow when Auto Poll is disabled.
- **`Exit`** dismisses the window.

Line Statistics Application

The Line Statistics application displays DSU occurances at the network interface during the most recent 15 minutes. The TEAM 521A Line Statistics window is described below..

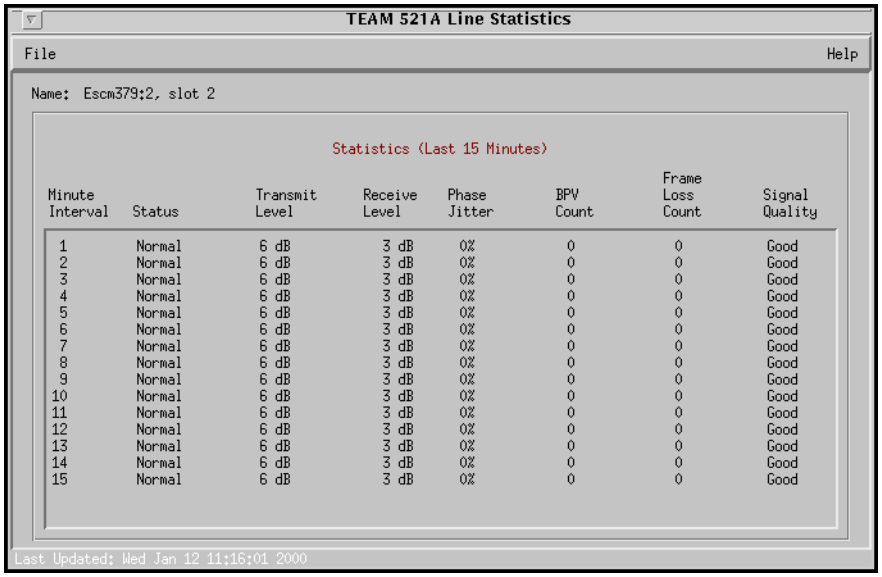


Table 2-5 Performance Applications: Line Statistics Window

Field	Selection	Description
Statistics (Last 15 minutes)	Minute Interval	Identifies the time frame for the other six columns. Each row represents one minute.
	Status	Displays Normal or No Signal.
	Transmit Level	Display the strength (in dB) of the signals being sent by the DSU.
	Receive Level	Display the strength (in dB) of the signals being received by the DSU.
	Phase Jitter	Displays the percentage by which phase shift in the received signal exceeds acceptable levels.
	BPV Count	Displays the number of BiPolar Violations, where consecutive ones in the signal being received did not alternate states.
	Frame Loss	Displays the number of times framing bits could not be identified.

Line Statistics File Menu

The Line Statistics File menu contains the following functions:

- **`Demand Poll`** causes an immediate update of the display.
- **`Save Data To File....`** allows you to save to file the most recent 15 minutes of data in a format similar to the appearance of the Line Statistics display screen. The file type suffix “521ALineStats” is automatically appended if not already present.
- **`Auto Poll`** sets the intervals at which the application polls the unit. Values are 1, 2, and 3 minutes and Disable.
- **`Exit`** dismisses the Line Statistics window

TEAM Diagnose Application

From the HPOV Map Fault Menu or from the Front Panel Fault menu, you can access the TEAM 521A Diagnose application. When you launch the application, it displays one read/write window where you can control a variety of test functions on the DSU.

- The Diagnose File menu provides **Exit**, which dismisses the Configure window.
- The Navigate File menu accesses the **History** screen which displays the test results accumulated during the most recent diagnostic session.

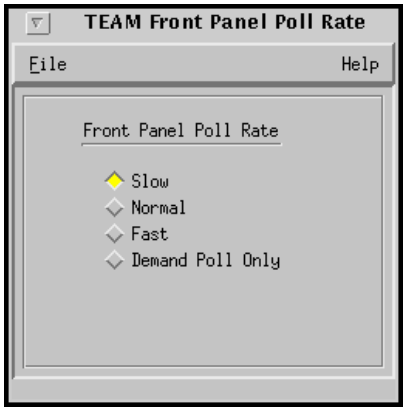
Note *Refer to Chapter 4: Maintenance and Diagnostics for detailed information on these TEAM applications.*

TEAM Miscellaneous Applications

The following applications are available from the shelf map Misc menu.

Front Panel Poll Rate Application

Launch the Front Panel Poll Rate window from the HPOV shelf map Misc menu. The setting you select in this window determines the initial polling rate for Front Panel displays each time they are opened.



The rate selection is a global function. It selects initial polling rate for all front panel displays linked to a TEAM Core application, regardless of which individual application you access it from. The precise polling frequency that results from a setting of Slow, Normal, or Fast depends on a number of factors. The higher the rate, the more communication and processor capacity is devoted to maintaining the display.

Setting a Global Poll Rate

1. Set the a global polling rate for all front panels by clicking an appropriate diamond:
   - Slow
   - Normal
   - Fast
   - Demand Poll Only
2. At the Front Panel Poll Rate File menu, select **Save to File** to store the setting for all front panel displays.
3. From the File menu select **Exit** to dismiss the window.

Setting an Individual Poll Rate

To change the polling rate for an individual front panel, at the unit's Front Panel display, use the **Select** button to set the Auto Poll. The change is only valid for the duration of a session and is not saved when the front panel display for that DSU is closed.

Note Pad Application

Launch the Note Pad application from the shelf submap Misc menu. The application opens a text editor which can be used for keeping records on the system.

TEAM Information Application

Launch the TEAM 521A Information window from the HPOV shelf map Misc menu or by double-clicking on the GDC logo in the Front Panel display. This application displays one read-only window that contains the name of the application, software revision level information, and copyright information. The File menu in the menu bar contains only the selection **`Exit`**, by which you can dismiss the window.

Alarm Severity Application

Launch the TEAM Core Alarm Severity window from the HPOV Map Misc menu. This application displays one read/write window for selecting equipment type and also displays the alarm severity (major, minor, or warning) for each alarm of that equipment type. For more information on Alarm Severity and other TEAM Core-specific applications, consult the TEAM Core Operation Manual and Release Notes.

Alarm Severity File Menu

The Alarm Severity File menu provides the following selections:

- **`Refresh`** re-reads and re-displays the Alarm Severity window.
- **`Save to File`** stores the edits to a file.
- **`Reset All to Defaults`** resets the alarm severity of all equipment types to their default settings.
- **`Reset “equipment type” to Defaults`** resets the alarm severity of the selected equipment type to its default setting.

`Exit` dismisses the Alarm Severity window.

Chapter 3: Configuration

Preparing for DSU Configuration

This chapter describes the TEAM521A Configuration and Maintenance applications which allow you to set all the options in the SC 521A through a convenient group of configuration windows. These TEAM configuration applications operate the same for both the SC 521A and SC 521A/S DSUs, except where noted. Before you begin an initial configuration in a new system, ready the system as follows:

1. Assign an IP address to the SpectraComm Manager (SCM).
   Consult the *SpectraComm Manager Card Installation and Operation* Manual.
2. Ensure the SCM is correctly configured.
   Consult the *SpectraComm Manager Card Installation and Operation* and *TEAM Core Operation* manuals.
3. Consult HP OpenView documentation and make sure that HP OpenView is configured for SNMP management.

TEAM Configuration Applications

TEAM 521A Configure application is launched from the HPOV Map Configuration Menu or from the Front Panel menu. The application initially displays the read-only TEAM 521A Configuration window, which includes a File menu and Navigate menu. Button glyphs appear on the Configuration windows for quick access to the pulldown menu items. Throughout the text descriptions in this chapter, keypresses and default values will be shown in **Bold**. Accompanying screens are representative and may appear differently on your system.

Starting the Configuration Application

You can start the TEAM 521A Configuration application by either of two methods:

- Select a DSU symbol on the shelf submap in OpenView, then select the Configure option from the Configuration menu.
- Click on the Select button of the Front Panel display, then click on Configuration and select Configure from the resulting menu.

The Main Configuration Window

When you launch the configuration application, the current configuration is read from the DSU. The main window appears, as shown below, for either the SC 521A or SC 521A/S DSU. For both types of DSUs, the window displays the same read-only status of the operation and software components of the DSU.

For an SC 521A/S DSU, the TEAM Configuration window will display additional hardware information field concerning the unit's Sealing Current function. *Table 3-1* describes these read-only fields. The application also provides a File menu a Navigate menu, and a button bar for quick access to menu items.

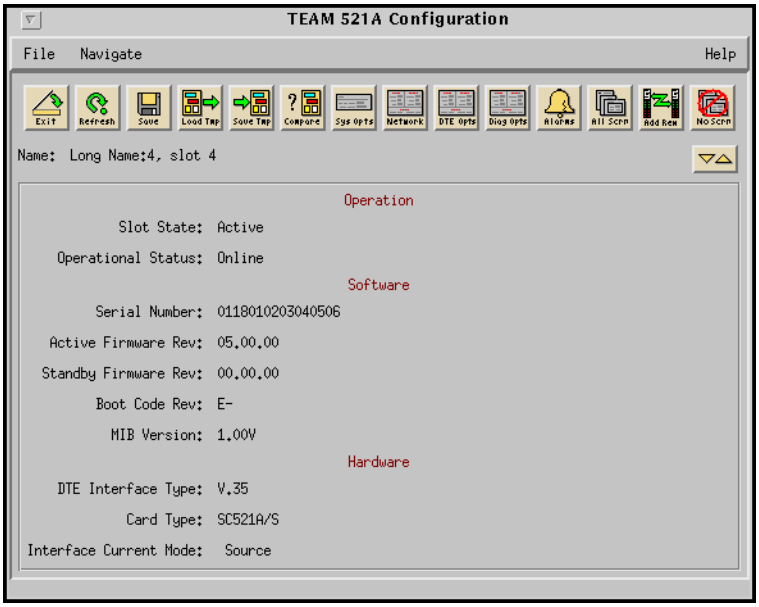


Table 3-1 Main Configuration Window Display

System Component	Field	Description
Identification	Name	Displays shelf and slot identification for the DSU.
Operation	Slot Status	Displays the state of the shelf slot as Active or Inactive.
	Operational Status	Displays the state of the current unit as Up or Down.
Software	Serial Number	Displays the serial number of the DSU.
	Active Firmware Rev	Displays the current level of the DSU operating code.
	Standby Firmware Rev	Displays the backup revision level of the DSU code.
	Boot Code Rev	Displays the Non Volatile memory revision level of the DSU Boot code for downloading firmware.
	MIB Version	Displays the revision level of the MIB files that enable SNMP control.
Hardware	DTE Interface Type	Displays the interface type for the DTE.
	Card Type	Displays the Card Type as SC 521A or SC 521A/S. SC 521A/S must be firmware version (05.00.00 or higher).
	Interface Current Mode	For SC 521A/S units, displays the sealing current mode as Source or Sink. For SC 521A units, the field is grayed-out.

The Main Configuration Window Menus

The Configuration menu provides a File menu for storing and retrieving configuration settings, and a Navigate menu for accessing separate option windows used to configure the DSU. *Table 3-2* describes the menu selections. Basic configuration procedures follow the table. Specific configuration windows and their options are described in later paragraphs.

Table 3-2 Configuration Window Menus and Options

Menu	Selection	Description
File	Refresh	Causes the application to read and apply the current configuration from the DSU. Any changes not saved to template are lost when you select Refresh.
	Save to Unit	Saves a new configuration to the DSU.
	Load Template	Causes the application to display a list of selectable templates containing previously stored configuration settings.
	Save to Template	Saves a new configuration as a template in the workstation.
	Compare to Template	
	Exit	Dismisses the Configuration window.
Navigate	System Options...	Launches the System Options window.
	Network Options.	Launches the Network Options window.
	DTE Options...	Launches the DTE Options window.
	Diagnostic Options...	Launches the Diagnostic Options window.
	Alarms Reported...	Launches the Alarms Reported window.
	All Above Screens...	Launches all of the configuration option windows.
	Add Remotes...	Launches the Add Remotes window.
	No Screens	Closes all of the configuration windows.

Using Configuration Templates

Configuration changes can be made using the current configuration as a starting point, or by retrieving a previously stored configuration template. Either way, the DSU continues to operate using its unchanged current configuration. A template contains a set of configuration options for the operating the DSU in a particular way. You can store as many templates as you need. The desired template can be loaded on the workstation that runs the TEAM 521A application. To load configuration settings from a template into the DSU, perform the following steps:

1. Select **`Load Template`** from the File menu.
2. Select the template from the resulting dialog window. The application retrieves the configuration settings of the selected template.
3. Select **`Save to Unit`** from the File menu. The application makes the template configuration settings the current operating configuration for the DSU.
4. Continue the configuration change process according to the procedure below.

Configuration Change Procedure

To edit the current configuration of the DSU, from the Navigate window select a configuration window in which you intend to make changes. Continue with the procedure below. To edit a template, select **Load Template** from the File menu. Select a template from the list of previously saved templates. A configuration window opens in which you can make changes. Continue with the procedure below.

1. In the selected Configuration window, click on the input field for an option. A window opens to display all the available values for that field.
2. Click and hold down the mouse button on the values list until the highlight is on the value you intend to configure, then release the button. The newly selected value appears in the entry field for the configuration item.

Note *When you change the value or setting of an option, the application displays the option name and the new value in white, rather than black, type. They remain white until you either save the changes to the DSU or a template by means of the Main window File menu, or restore the option to its last stored value or setting.*

3. You can discard changes to a configuration window and return all its fields to their previous values in two ways:
   - Click on the **Reset** button to discard changes while keeping the window open.
   - Click on the **Cancel** button to discard changes and dismiss the window.
4. You can close a configuration window without losing changes by clicking on either the **OK** button, or the **pushpin icon** located in the upper left corner of the window.
5. You can keep multiple configuration windows open on-screen and move between them by clicking the mouse on the one in which you intend to operate. The main Configuration window remains on-screen throughout the configuration process.
6. When you have accessed and made changes on all the desired configuration windows, select **Save to Unit** from the File menu of the main Configuration window. This saves the new configuration in the DSU, with the changed configuration as the current configuration for the unit.
7. Select **Save to Template** to save it as a template in the workstation. A window appears containing a list of existing templates and a field for entering a new template name.
8. Select an existing template to be overwritten with the new configuration, or enter a name to create a new template. This newly stored template is now available for loading by the application to any SC 521A DSU. It can also be retrieved and saved with further modification, if desired.

Configuration Option Windows

From the navigation menu, the following buttons appear which allow you to launch and change the settings of specific configuration windows:

- System Options
- Network options
- DTE Options
- Diagnostics Options
- Alarms Reported
- All Above Screens
- Add Remote

The following paragraphs describe in detail the characteristics of each configuration option window. Refer to the Configuration Change procedure (above) for instructions on selecting, resetting, or cancelling changes made in any of the configuration option windows.

Note *Additional buttons from the Navigate menu allow you to set screen viewing preferences and provide an alternative means of accessing File menu items.*

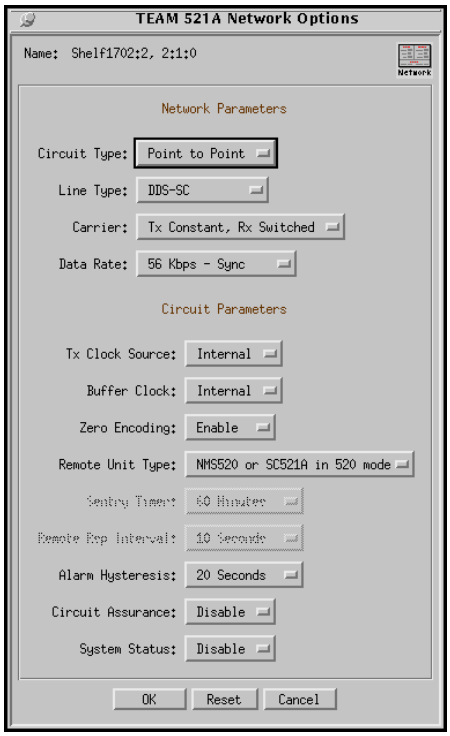
System Options

The System Options window opens when you click the associated button in the **Navigation** menu. The Name field display read-only shelf and slot identification for the DSU. *Table 3-3* describes the configuration options available from the System Options window.

Table 3-3 System Options Window

System Option Window	Option	Description
	Alarm Scan	Configures the alarm scan: Enable - DSU reports alarms to the SCM Disable - DSU does not report alarms to the SCM.
	Front Panel	Allows you to disable front panel switches to avoid accidental interruption of DSU operation: Enable - DSU front panel switches are operational. Disable - DSU front panel switches are disabled.
	Rsp Timeout	Selects the length of time the SCM waits for a response from the DSU before it declares a No Response condition: 2, 4, 6, or 8 seconds

Network Options



The Network Options button launches window shown below. The Name field displays read-only shelf and slot identification for the DSU. The Network and Circuit Parameters are described below.

Network Parameters

Circuit Type selects the type of circuit over which the DSU communicates with its remote unit(s):

- Point to Point
- **MultiPoint**

Line Type defines the line type which may be applied to the circuit:

- Clear Channel specifies a point-to-point 64 kbps circuit.
  When this is selected the Data Rate option is forced to this value and cannot be changed.
- **DDS-I** specifies a DDS-I circuit at any data rate, up to 56 kbps
- DDS-SC specifies a DDS-SC circuit at any data rate up to 56 kbps.

Carrier selects the combination of transmit and receive carrier modes (constant/switched) which will be applied to the DSU:

- Tx Constant, Rx Constant – used on a point-to-point circuit
- Tx Constant, Rx Switched – used when the DSU is the master unit on a multi-point circuit
- Tx Switched, Rx Constant – used when the DSU is a remote unit on a multi-point circuit
- **Tx Switched, Rx Switched** – used when required by specialized applications .

Note *This option affects the Reported/Not reported states of the RxD Loss and TxD Loss alarms in the Alarms Reported configuration screen. When a constant carrier is selected, the corresponding data loss alarm in that screen is forced to Not Reported (unchecked) and appears grayed out. If the alarm had previously been selected to as Reported, the change will not go into effect until the configuration is saved to the unit.*

Data Rate selects the data rate and mode (synchronous/asynchronous) to be applied to the DSU:

- 2.4 Kbps - Async
- 2.4 Kbps - Sync
- 4.8 Kbps - Async
- 4.8 Kbps - Sync
- 9.6 Kbps - Async
- 9.6 Kbps - Sync
- 19.2 Kbps - Async

- **19.2 Kbps - Sync**
- 56 Kbps - Sync
- 64 Kbps - Sync

Note *The 64 Kbps value is displayed when the Data Rate option is forced by selection of Pt to Pt - Clear Channel in the Circuit Type option.*

Circuit Parameters

Tx Clock Source selects the source of transmit timing for the DSU as follows:

- **Receive** – transmit timing is based on receive data timing
- Internal – transmit timing is provided by the DSU internal clock (for wireline only).
- External – transmit timing is provided by the DTE. With this option selected, the Buffer Clock is forced to External and cannot be changed.

Buffer Clock selects the source of timing for the buffer between the DSU and its DTE. The following buffer clock options may be applied to the DSU:

- **Internal** – buffer timing is provided by the selected Tx Clock Source (Default).
- External – buffer timing is provided by the DTE. When the Tx Clock Source is set to *External*, the Buffer Clock cannot be changed.

Zero Encoding selects Zero Encoding, which is sometimes required for 56 kbps DDS-SC (PT-PT) applications in which the primary and secondary channels are not permitted to transmit all spaces (zeros) at the same time. The DSU may be configured to:

- Enable – DSU prevents the all space condition at the expense of reduced secondary channel bandwidth.
- **Disable** – DSU does not prevent the all space condition.

Note *Check with your service provider to determine whether Zero Encoding should be enabled.*

Remote Unit Type specifies the type of remote DSU used with the DSU. This option is only available for configuration when the *Circuit Type* option in the Network Options configuration window is selected as *Multipoint*, and no remote units have yet been added by the Add Remote application. In all other circumstances, the Remote Unit Type is overridden and is grayed out. Under the proper conditions, you can select:

- **NMS 520 or SC521A In 520 Mode**
  When the remote DSUs are specified to be NMS 520 units, SC 521A units in 520 mode or SC 521A/S units in 520 mode, the options Sentry Timer, Rmt Rsp Interval, and Alarm Hysteresis are available for configuring.
- NMS 510 or SC521A In 510 Mode
  When the remote DSUs are specified to be NMS 510 units, SC521A units in 510 mode or SC 521A/S units in 510 mode, the options Sentry Timer, Rmt Rsp Interval, and *Alarm Hysteresis* are not available for configuring.

Sentry Timer selects the time interval between alarm reports from a remote SC521A (configured as a NMS 520) or NMS 520 DSU for a DDS1 or clear channel point-to-point link. You can select:

- Disable
- 1 Minute to 5 Minutes – in one minute increments
- 10 Minutes
- 15 Minutes to 60 Minutes – in 15 minute increments
- **60 minutes**
- 90 Minutes
- 120 Minutes

Rmt Rsp Interval selects the minimum time interval permitted between alarm reports from a remote SC521A (configured as a NMS 520) or NMS 520 DSU in a DDS1 multi-point link.

- Disable
- **10 Seconds**
- 10 Seconds to 120 Seconds – in ten second increments

Note *All remote units on a multi-point link must be set for the same Remote Response Interval value.*

Alarm Hysteresis selects the minimum time between alarm change reporting from a remote SC521A (configured as a NMS 520) or NMS 520. You can select:

- **10 Seconds** to 120 Seconds – in ten second increments

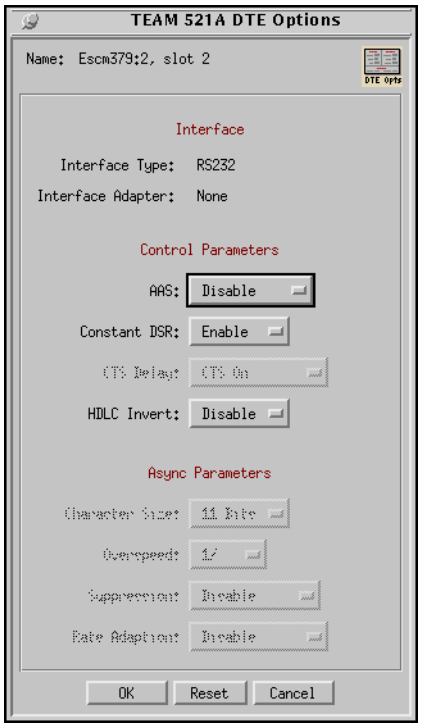
Circuit Assurance
When this option is enabled, the DSU disables *Clear To Send* when it detects any of the following conditions: Idle, Out of Service, Out of Frame, No Signal, Abnormal Station Code, or other inactive channel code. You can select:

- **Disable**
- Enable

System Status
When this option is enabled, the DSU disables *Data Set Ready* when any of the following conditions are detected: Idle, Out of Service, Out of Frame, No Signal, Abnormal Station Code, or other inactive channel code. You can select:

- **Disable**
- Enable

DTE Options



The DTE Options window opens when you click the associated button in the **Navigation** menu. The Name field displays read-only shelf and slot identification for the DSU. Options for Interface, Control Parameters, and Async Parameters are described below.

Interface Displays and Parameters

Interface Type is a read-only field which displays the DTE port type as one of the following:

- RS232 – EIA/TIA-232-E interface
- V.35 – ITU-T V.35 interface

Interface Adapter is a read-only field which reports whether or not the DSU has a Data Rate Adapter (DRA) or EIA 530 card installed. The field displays:

- None
- Installed

Control Parameters

AAS selects whether or not the DSU provides Automatic Anti-Streaming protection, and the time limit it enforces when the feature is enabled. You can select:

- **Disable**
- 5 Seconds
- 10 Seconds
- 30 Seconds
- 45 Seconds

Constant DSR selects the DSU to output either a constant or a controlled Data Set Ready signal to its DTE. You can select:

- Disable – controlled DSR signal controlled by DTR
- **Enable** – constant DSR signal

CTS Delay selects the delay (if any) between the DSU receiving *Request To Send* from the DTE and returning *Clear To Send* to the DTE. You can select:

- CTS ON – no delay; grayed out when multi-point link is selected Circuit Type
- **Fixed 3 Char** – equivalent to three line signal character times
- 0 msec
- 30 msec
- 60 msec
- 90 msec

HDLC Invert selects whether or not the DSU uses inverted channel data from the DTE. Data inversion is used primarily with DDS-SC 56 kbps circuits in order to enhance data quality in a network that does not provide clear channel capability. You can select:

- **Disable** – normal data
- Enable – inverted data

Note: *IMPORTANT: Consider the following factors before changing the HDLC Invert option:*

Set only this option and save the change to the unit. Do not combine it with any other configuration changes. The HDLC option must be set the same at both ends of the link.

Make changes at the remote DSU first, before changing the option setting at the DSE. Changing the option at the remote results in an "SNMP 'Set' Request Failed" error message and causes loss of communication between the remote and master units. Click on OK in the error message box to dismiss the message, then proceed to change the option setting at the master. Communication resumes when the option change goes into effect at the master unit.

Async Parameters

The Async Parameters options are grayed out when the Sync/Async option is selected for synchronous. Otherwise, the parameters described below are available for configuration.

Character Size selects the number of bits per asynchronous character, including start and stop bits. You can select:

- **11 Bits**
- 10 Bits
- 9 Bits
- 8 Bits

Over Speed selects the percentage above its configured normal operating rate at which the DSU can accommodate asynchronous receive data. You can select:

- **1%**
- 2.3%

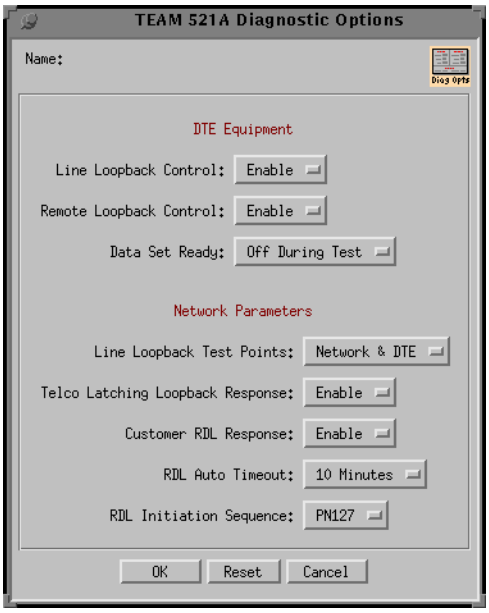
Suppression determines what actions the DSU takes concerning the transmit and receive End of Text (EOT) character. You can select:

- **Disable** – the DSU does not insert EOT at the end of transmissions, and does not delete it from the end of received signals
- Rx EOT – the DSU deletes EOT from the end of received signals.
  It does not insert EOT at the end of transmissions.
- Tx EOT – the DSU inserts EOT at the end of transmissions.
  It does not delete it from the end of received signals.
- Rx + Tx EOT – the DSU inserts EOT at the end of transmissions, and deletes it from the end of received signals.

Rate Adaption specifies the DTE interface operating rate when it is below that of the DDS circuit. This parameter is valid only when *Data Rate* in the Network Options screen is set to 2.4 Kbps Async, and the *Data Type Option* is Async. Under the proper conditions you can select:

- **Disable**
- 600
- 1200
- 1800 to 2400

Diagnostic Options



The Diagnostic Options window opens when you click the associated button in the Navigation menu. The Name field displays read-only shelf and slot identification for the DSU. Two groups of option, DTE Equipment and Network Parameters, are described below.

DTE Equipment

Line Loopback Control determines whether or not the DTE can command the DSU into a Line Loopback (local) test by means of a signal at the interface port on EIA pin 18. You can select:

- Enable
- **Disable**

Remote Loopback Control determines whether or not the DTE can command the DSU into a Remote Loopback test by means of a signal at the interface port on EIA pin 21. You can select:

- Enable
- **Disable**

Data Set Ready determines how the DSU controls the DSR output to the DTE during test modes. You can select:

- Off During Test
- **Normal** – DSR operates in the same way that it is optioned to function during data mode operations

Network Parameters

Line Loopback Test Points determines whether a Line Loopback command causes the DSU only to loop transmitted data back to the DTE, or also to loop received data back to the network. You can select:

- **DTE Only** – Line Loopback command causes DSU to loop data back to DTE only
- Network & DTE – Line Loopback command causes DSU to loop data in both directions

Telco Latching Loopback Response determines whether or not the DSU accepts the latching-type DSU Loopback command code from a Telco Serving Test Center (STC). The latching-type command code places the unit into the test condition, which continues until a second command code is sent by the STC. The DSU always accepts the non-latching DSU loopback command code, which places the unit in the test condition only as long as the code continues to be received.
You can select:

- **Enable** – DSU accepts latching-type DSU Loopback command code
- Disable – DSU does not accept latching-type DSU Loopback command code

Customer RDL Response determines whether or not the DSU accepts a remote loopback command from its remote DSU. You can select:

- **Enable** – DSU accepts the remote loopback command selected by the RDL Initiation Sequence option.
- Disable – DSU does not accept a remote loopback command.

RDL Auto Timeout determines whether or not the DSU ends remote digital loop automatically based on a timeout. you can select:

- 10 Minutes – DSU terminates remote digital loop after ten minutes without need for further operator action. You can end the test manually before the timeout.
- **Disable** – remote digital loop continues until terminated by operator action

RDL Initiation Sequence
This option selects the remote loopback command which the DSU will send when initiating, or accept from its remote DSU when receiving. Depending on the card type, Interface current mode, and circuit type, the selections for the RDL Initiation Sequence will vary as described in *Table 3-4*.

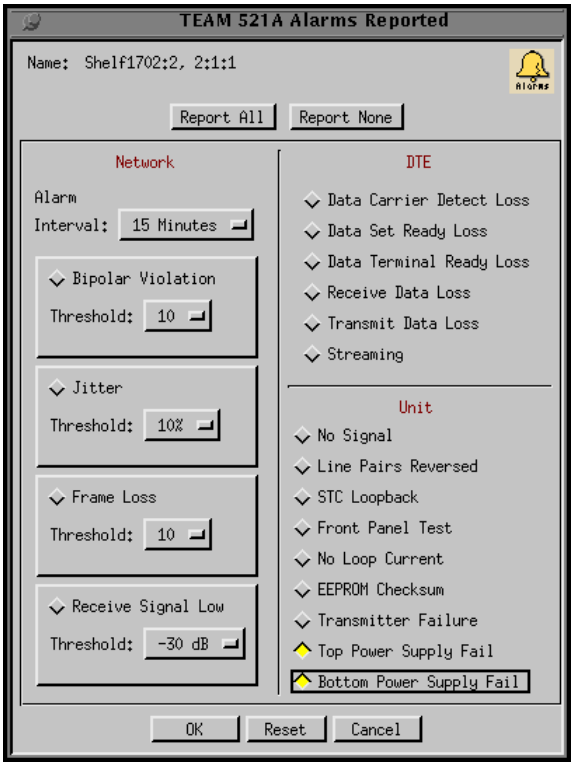
Table 3-4 RDL Initiation Sequence Selections

Card Type	Circuit Type	INTFC Current Mode	RDL Initialization Selections
SC 521A	Point-to-Point Multi-Point	Not Applicable	GDC (NMS510/520) PN 127 V.54 (DEFAULT)
SC 521A/S	Multi-Point Point-to-Point	Sink Mode	
SC 521A/S	Multi-Point	Source Mode	GDC (NMS510/520) PN 127 V.54 (DEFAULT) CSU RL
SC 521A/S	Point-To-Point	Source Mode	

Note *Before running a Data Loop test on a remote, make sure the Customer RDL Response is Disabled at the Diagnostic Option window.*

Note *When the GDC option is selected for the RDL Initialization Sequence, the DSU will only command NMS510 or NMS520 remotes into a remote loopback test.*

Alarms Reported



The Alarms Reported window opens when you click the associated button in the **Navigation** menu. The Name field displays read-only shelf and slot identification for the DSU. Three groups of configurable alarm condition reporting, Network, DTE, and Unit, are described below.

Buttons and Option Selection

Each alarm option in the Alarms Reported configuration window has an associated diamond-shaped selection field.

- Select or de-select individual alarm options by simply clicking the mouse button on the appropriate selection fields. Selected fields will display a highlight. When an alarm option is selected, that alarm will be reported to the DSU. The selection fields without highlights indicate alarm options which will not be reported to the DSU.
- Click the **`Report All`** button to select and highlight all of the alarm option selection fields. Similarly, you can click the **`Report None`** button to de-select and remove the highlights from all of the selection fields. After clicking **`Report All`** or **`Report None`** you can change the state of individual fields as needed.

Network Alarm Options

Each Network alarm, when designated to be reported, requires you to specify a threshold against which it is evaluated. Default for all is Masked; listed default threshold value takes effect when the alarm is set to Reported.

Alarm Interval determines the time span for threshold evaluation. Select:

- 1 min, 5 min, 10 min, **15 min**

Bipolar Violation determines whether or not Bipolar Violation (BPV) alarms are to be reported. A network BPV occurs when the signal the unit receives at its network interface does not alternate between signal levels as required for Bipolar Return to Zero (BRZ) coding. The alarm occurs when the number of Bipolar Violations in the received signal during one Alarm Interval exceeds the selected threshold. Select:

- 1, 2, 5, **10**, 20, 40, 60, 80, 99

Jitter determines whether or not Jitter alarms are to be reported. The alarm occurs when the percent of jitter in the received signal remains above the selected threshold for at least one Alarm Interval. Select:

- 1%, 2%, 5%, **10%**, 20%, 40%, 60%, 80, 99%

Frame Loss determines whether or not Frame Loss alarms are to be reported. The alarm occurs when the number of lost frames in the received signal during one Alarm Interval exceeds the selected threshold. This alarm is for DDS/SC services only. Select:

- 1, 2, 5, **10**, 20, 40, 60, 80, 99

Receive Signal Low determines whether or not Rx Signal Low alarms are to be reported. The alarm occurs when the strength of the received signal remains below the selected threshold for at least one Alarm Interval. Select:

- -50 dB, -40 dB, **-30 dB**, -20 dB, -10 dB, -5 dB, 0 dB, 6 dB

DTE Alarm Options

The Default for all DTE alarm options is **Masked**.

- Data Carrier Detect Loss – indicates loss of Data Carrier Detect.
- Data Set Ready Loss – indicates loss of Data Set Ready.
- Data Terminal Ready Loss – indicates loss of Data Terminal Ready signal from DTE.
- Receive Data Loss – indicates no receive data from the remote DSU.
- Transmit Data Loss – indicates no transmit data from the DTE.
- Streaming – indicates constant RTS condition.

Note *The Receive Data Loss and Transmit Data Loss alarms are dependent on the configuration of the Carrier option in the Network Options screen. That option selects combinations of switched and constant receive and transmit carriers. When a constant carrier is selected, the corresponding data loss alarm in this screen is forced to Not Reported (unchecked) and grayed out. If the alarm had previously been selected to be Reported, the change does not go into effect until the configuration is saved to the unit.*

Unit Alarm Options

The Default for all DTE alarm options is **Masked**.

- No Signal – indicates loss of signal at network interface.
- Line Pairs Reversed – indicates line pairs reversed at network interface.
- STC Loopback – indicates the DSU has been commanded into a test mode by the Telco Serving Test Center (STC) or by a Remote Digital Loop command from its remote DSU.
- Front Panel Test – indicates the DSU has been commanded into a test mode by means of its front panel switches.
- No Loop Current – indicates no current at network interface.
- EEPROM Checksum – indicates detection of an error in the non-volatile memory.
- Transmitter Failure – indicates that the DSU has failed to transmit data.
- Top Power Supply Fail - indicates a top power supply failure in the SpectraComm 2000 enclosure (see note below).
- Bottom Power Supply Fail - indicates a bottom power supply failure in the SpectraComm 2000 enclosure (see note below).

Note *Alarms for Top and Bottom Power Supply Fail are valid only for SC521A installed in the SpectraComm 2000 enclosure.*

Add Remote

The Add Remote window opens when you click the associated button in the **Navigation** menu. This configuration window allows you to add an available SC521A, NMS 520 or NMS510 remote unit to a master SC521A. The appearance of the window depends on whether you selected a Point-to-Point or Multi-Point circuit type, as shown in *Figure 3-1*.

Both types of Add Remote windows display read-only shelf and slot identification for the DSU. Specific selections in each window are described below.

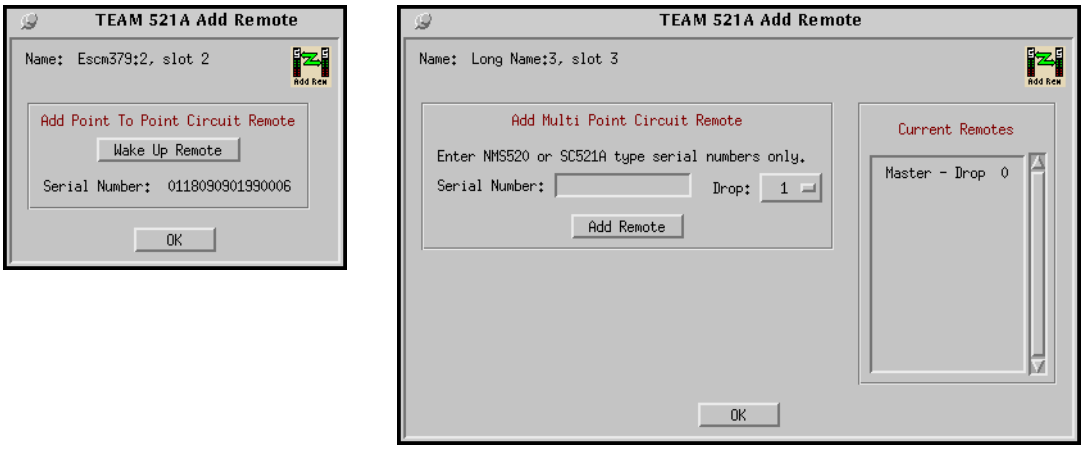


Figure 3-1 Add Remote Window (Point-to-Point and Multi-Point Circuit)

Add Point-to-Point Circuit Remote

The Add Point to Point Circuit Remote window contains a read-only Serial Number field and a Wake Up Remote Button. Perform the following procedure to add the remote DSU in a point-to-point circuit:

1. Select **Add Remote** from Main Configuration window Navigate menu. The Add Remote window appears. The Serial Number field is blank when the window first appears.
2. Click on the **Wake Up Remote** button. This commands the TEAM 521A application to create the software structures required to command and monitor the remote DSU in conjunction with the master DSU.
3. The application indicates a successful Wake Up by displaying the serial number of the associated remote DSU.
4. Click **OK** to dismiss the window.

Add Multi-Point Circuit Remote

The Add Multi Point Circuit Remote panel contains a read-write Serial Number field, a Drop entry field, an Add Remote button and a Current Remotes display. The Serial Number field allows you to specify the serial number of the unit you are adding. A message appears above the Serial Number field as a reminder of the types of remotes allowed, based on the remote unit type specified in Network Options (SC521A or NMS 520 units, SC521A or NMS 510 units).

Note *The Remote Unit Type option in the Network Options window determines which remote type can be added. If you change the setting of that option, you cannot add a remote until the change is saved to the unit.*

1. Select **Add Remote** from Main Configuration window Navigate menu. The Add Remote window appears. The Serial Number field is blank when the window first appears.
2. Enter the 16-digit serial number of the remote you are adding.
3. Click on the **Drop** entry field and from the resulting menu select the drop number you are assigning to unit.
4. Click on the **Add Remote** button. This commands the TEAM 521A application to create the software structures required to command and monitor the remote DSU in conjunction with the master DSU.
5. The application indicates a successfully added remote by making an entry for the new drop number on the Current Remotes list.
6. Click **OK** to dismiss the window.

Note *The remote management feature cannot be used when two master SC521As are used in a link. The Add Remote function can only be used when there is one Master 521A in a link.*

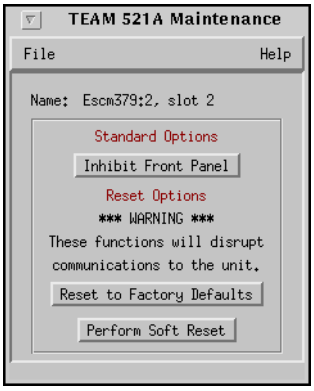
Note *If you change the circuit type, the change will take effect in the appearance of the Add Remote screen when you click the Add Remote button from the Navigate menu.*

Chapter 4: Maintenance and Diagnostics

TEAM 521A Maintenance Application

The TEAM 521A Maintenance application provides a group of functions for controlling some aspects of DSU operation that fall outside the scope of the Configure application. You can launch the TEAM 521A Maintenance application from the HPOV Map Configuration Menu or from the Front Panel menu. The TEAM 521A Maintenance window (Table 4-1) displays the read-only shelf and slot identification for the DSU and Maintenance options as described below.

Table 4-1 TEAM 521A Maintenance Options

The Maintenance Window	Option Buttons	Description
	Front Panel	Enables or Inhibits the hardware switches on the front panel of the SC 521A or SC 521A/S DSU. The text on the button toggles between the two options each time you click on the button. Inhibit Front Panel - switches are enabled Enable Front Panel - switches are disabled.
	Reset to Factory	Resets all DSU options to the factory default settings. When clicked, a warning appears as follows: *"Resetting to factory defaults will disrupt communications to the unit. Do you want to continue?"* Click the OK button to complete the reset, or click the Cancel button to cancel the reset.
	Perform Soft Reset	The DSU performs a reset and resumes operation using its current configuration. when clicked, a warning appears as follows: *"Performing a soft reset will disrupt communications to the unit. Do you want to continue?"* Click the OK button to complete the reset, or click the Cancel button to cancel the reset.

TEAM 521A Diagnostics Application

The TEAM 521A Diagnostics application provides a variety of tests to the SC521A DSU. Tests can involve just the local DSU, or the local and remote DSUs and the telephone lines that connect them.

You can start the TEAM 521A Diagnostics application by either of two methods:

- Select an SC 521A DSU symbol on the shelf submap in OpenView, then select the Diagnose option from the Configuration menu.
- Click on the Select button of the Front Panel display, then click on Fault and select Diagnose from the resulting menu. When the master or remote TEAM 521A Diagnostics window appears (*Figure 4-1*), the read-only Name field displays the shelf and slot identification for the DSU.

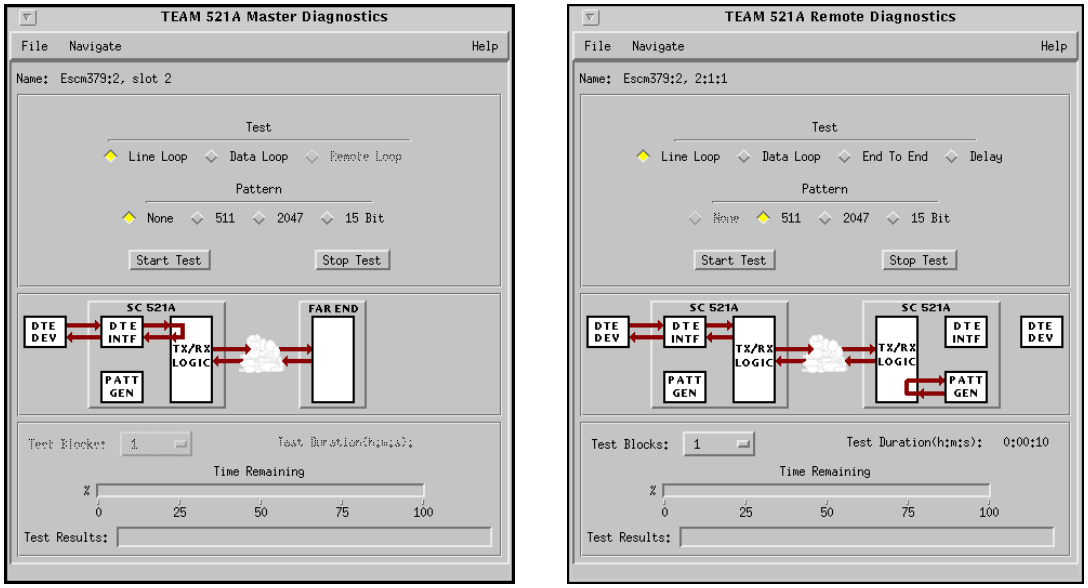


Figure 4-1 SC521A Diagnostics Windows

The Diagnostics Menus and Display

Both the Master and Remote Diagnostics windows contain the following functions:

- A File menu contains **`Exit`** for dismissing the window
- A Navigate menu contains **`History`** for displaying test results accumulated during the current diagnostic session. The History option is described later in this chapter.
- A Selection panel contains buttons and check boxes for selecting, starting, and stopping a test. Three tests and four test pattern options are available. If a pattern cannot be combined with a particular test, it appears grayed-out.
- A Graphic panel depicts the path followed by test data during the current test.
- A Time Blocks input field for specifying the duration of a test that employs the DSU test pattern generator.
- Time Remaining and Results displays.

Master SC521A Tests

The Master SC521A tests are utilized when the SC521A is a local device. *Table 4-2* describes the Master Diagnostics window and the available tests and patterns. Test procedures and diagrams follow the table.

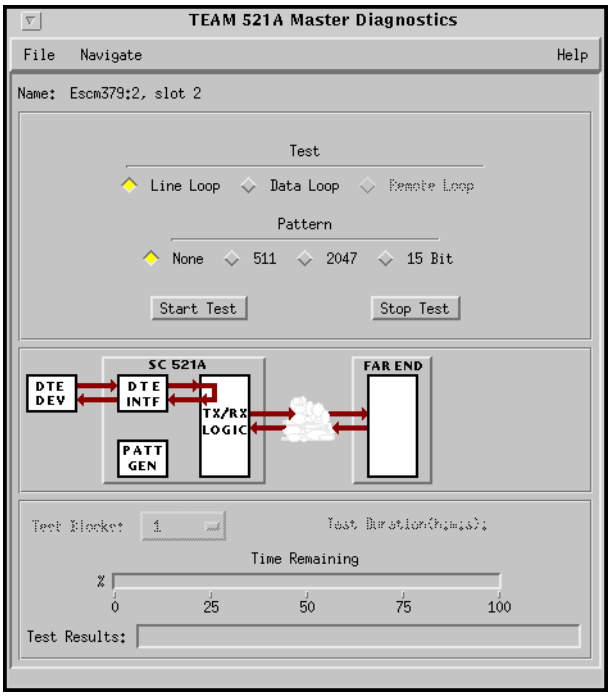


Table 4-2 Master SC521A Diagnostic Tests and Patterns

Test	Description	Patterns
Line Loop (with Pattern)	DSU initiates a local loopback and activates its own test pattern generator/checker.	511 2047 15 bit None
Remote Loop (with Pattern)	Local DSU commands the remote DSU into digital loopback and activates its own test pattern generator/checker (Point to Point circuit only). *See note below.*	
Line Loop (without Pattern)	DSU initiates a local loopback, through which the DTE or external test equipment connected to the DTE interface can direct a test pattern. Must be ended by the Stop Test button.	
Remote Loop (without Pattern)	Local DSU commands the remote DSU to initiate a digital loopback. A test pattern from the local DTE or from external test equipment connected to the local DTE interface can then be directed through the resulting test path. Must be ended by the Stop Test button. *See note below.*	
Data Loop	Local DSU loops data it receives from the remote DSU back to the remote DSU. Must be ended by the Stop Test button.	

Note *The Remote Loop test and the Remote Loop with Test Pattern test are only available in a Point to Point network and are used for unmanaged remote units. They are not compatible with a remote NMS 520 DSU a remote NMS 510 or a remote SC 521A. You can achieve the same functionality with any of those units by directly commanding the remote unit into a digitial loopback.*

Note *The remote DSU must have the* ***RDL Initiation Sequence*** *option the same as the master DSU to be able to accept the initiation sequence.*

Master SC521A Diagnostic Test Procedure

Perform the following steps to select and carry out a test procedure on the selected DSU.

1. Click on the check box next to the desired test.
2. If you have selected **Line Loop** or **Remote Loop**, you can perform the test either with an internally generated test pattern or with externally generated and checked data. Under the Pattern heading, click on 511, 2047, 15 Bit, or None (for external data). Data Loop does not require a test pattern.
3. Select the desired number of blocks (1000 bits/block) to run during the test.
4. For internally generated test patterns, click the **Start Test** button. While the test runs, the graphic panel illustrates the data path employed by the test. The **Time Remaining** field counts down from 100 to 0 percent, and the **Test Duration** field displays how long the test is to run.
5. During a test with an internally generated test pattern, the Test Results field displays the following prompts:

   Running: ### (### designates the number of errors detected)
   In Loop (displayed when external data is in use)
6. During a test using an internally generated test pattern, the **Time Remaining** field counts down from 100 to 0 percent, and the **Test Duration** field displays how long the test is to run before ending automatically.
7. For tests other without internally generated patterns, click on the **Stop Test** button to end the procedure. The Stop Test button can also stop a test with test pattern prior to its automatic Test Time limit.

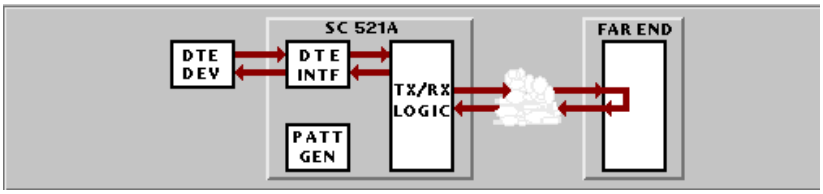
Special Considerations

- With a Master SC 521A, the Remote Loop tests are available for unmanaged units only.
- With a Master SC 521A/S in a Sink mode Point-to-Point circuit, the Remote Loop tests are available for unmanaged units only.
- With a Master SC 521A/S in a Source mode Point-to-Point circuit, the Remote Loop tests are available whether or not the remote unit is managed or unmanaged.
- With a Master SC 521A/S in Source or Sink mode Multi-Point circuit, the Remote Loop tests are not available.

Master SC521A Diagnostic Test Diagrams

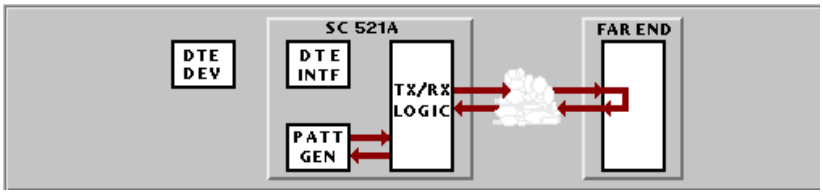
Remote Loop

Only available for unmanaged Point To Point remotes (*see Special Considerations*)

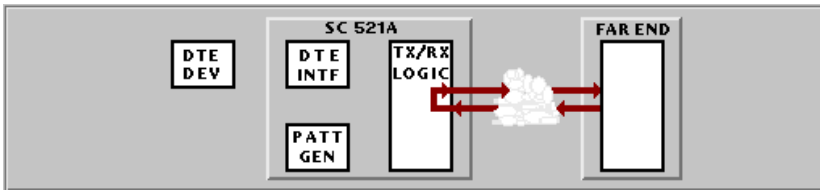


Remote Loop with Pattern

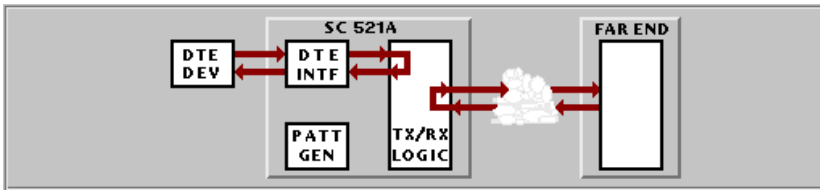
Only available for unmanaged Point To Point remotes (*see Special Considerations*)



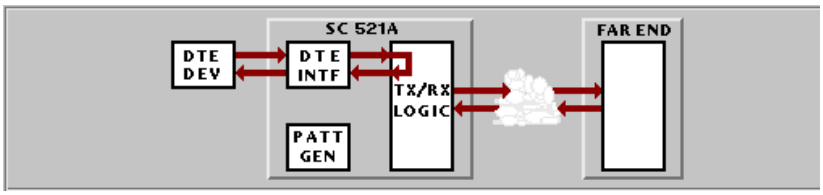
Data Loop



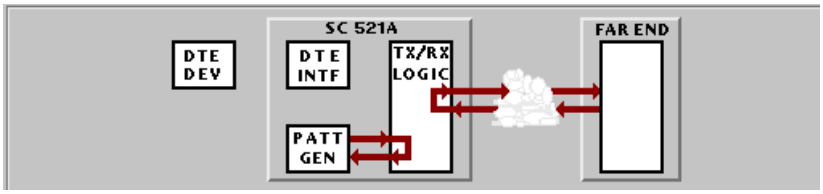
Line Loop DTE and Network



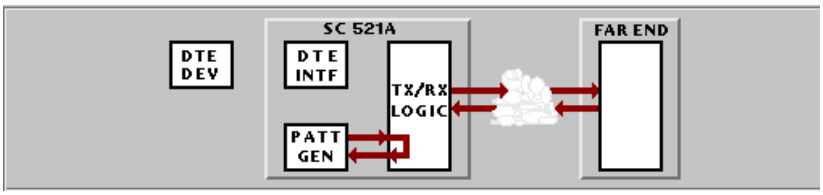
Line Loop DTE only)



Line Loop with Pattern DTE and Network



Line Loop with Pattern DTE only)



Remote SC521A Tests

The Remote SC521A tests are utilized when the SC521A or SC 521A/S is a remote device. *Table 4-3* describes the Master Diagnostics window and the available tests and patterns. Remote test procedures and diagrams follow the table.

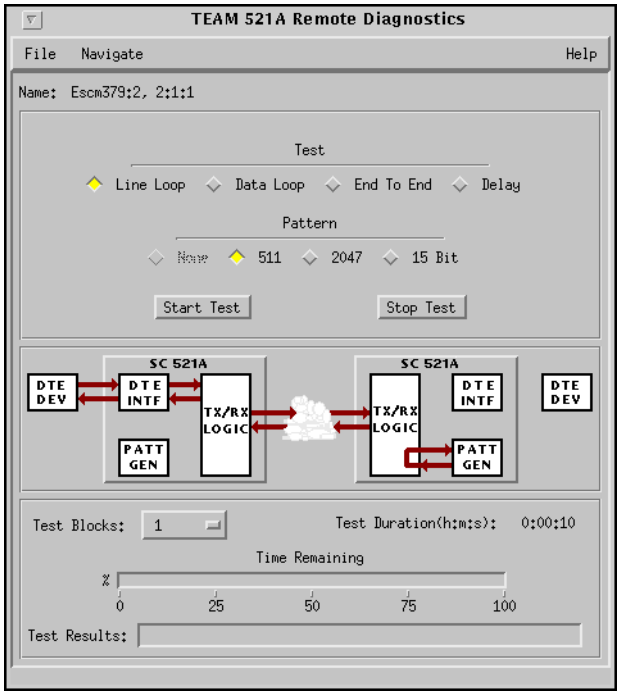


Table 4-3 Remote Diagnostic Window

Test	Description	Patterns
Line Loop (with Pattern)	DSU initiates a local loopback at its network interface and activates its test pattern generator/checker.	511 2047 15 bit None
End To End (with Pattern)	Remote SC521A DSU activates its test pattern generator/checker and transmits the pattern on its link to the master SC 521A DSU. Remote DSU checks for errors in the signal it receives, which is generated by the master DSU.	
Dataloop (with Pattern)	Remote SC521A DSU transmits the loopback command to the master SC 521A DSU, and activates its test pattern generator/ checker to transmit the pattern and check for errors in the signal it receives back.	
Dataloop (without Pattern)	Remote SC521A DSU transmits a command on the link that causes the master SC 521A DSU to loop data back to the Remote DSU; DTE or external test equipment at the remote DSU is responsible for generating and checking a test pattern.	
Delay Test	Not supported.	

Remote SC521A Diagnostic Test Procedure

Perform the following steps to select and carry out a test procedure on the selected DSU.

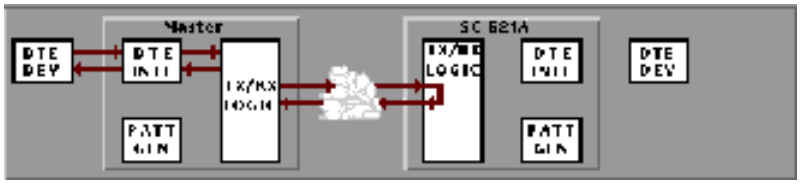
1. Click on the check box next to the desired test.
2. If you have selected **Line Loop** or **End to End**, you can perform the test either with an internally generated test pattern or with externally generated and checked data. Under the Pattern heading, click on 511, 2047, 15 Bit, or None (for external data). Delay Test and dataloop do not require test patterns.
3. Select the desired number of blocks (1000 bits/block) to run during the test.
4. For internally generated test patterns, click the **Start Test** button. While the test runs, the graphic panel illustrates the data path employed by the test. The **Time Remaining** field counts down from 100 to 0 percent, and the **Test Duration** field displays how long the test is to run.
5. During a test with an internally generated test pattern, the Test Results field displays the following prompts:

   Running: ### (### designates the number of errors detected)
   In Loop (displayed when external data is in use)
6. During a test using an internally generated test pattern, the **Time Remaining** field counts down from 100 to 0 percent, and the **Test Duration** field displays how long the test is to run before ending automatically.
7. For tests other without internally generated patterns, click on the **Stop Test** button to end the procedure. The Stop Test button can also stop a test with test pattern prior to its automatic Test Time limit.

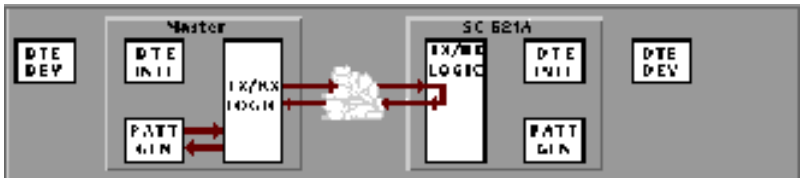
Note *Before running a Data Loop test on a remote, make sure the Remote Rsp Interval is Disabled at the Network Option window.*

Remote SC521A Diagnostic Test Diagrams

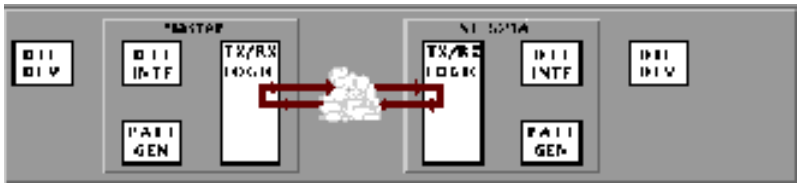
Data Loop



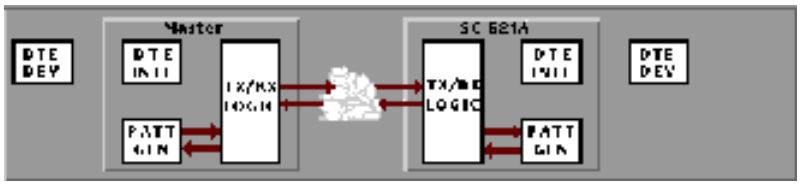
Data Loop with Pattern



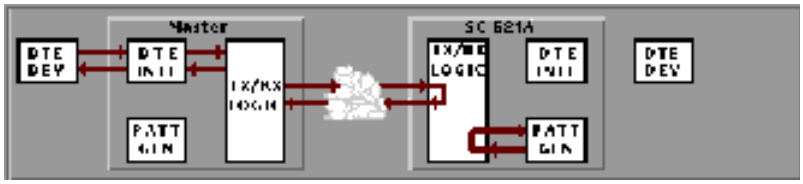
Delay



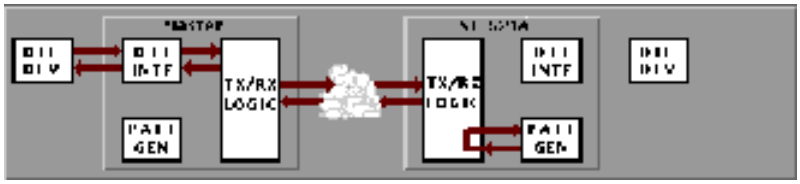
End to End



Line Loop with Pattern DTE and Network



Line Loop with Pattern DTE only



TEAM 521A Diagnostics History

From the Diagnostics Navigate menu, you can select the History option, which displays five columns of test records from all tests run during the current diagnostic session (*Figure 4-2*).

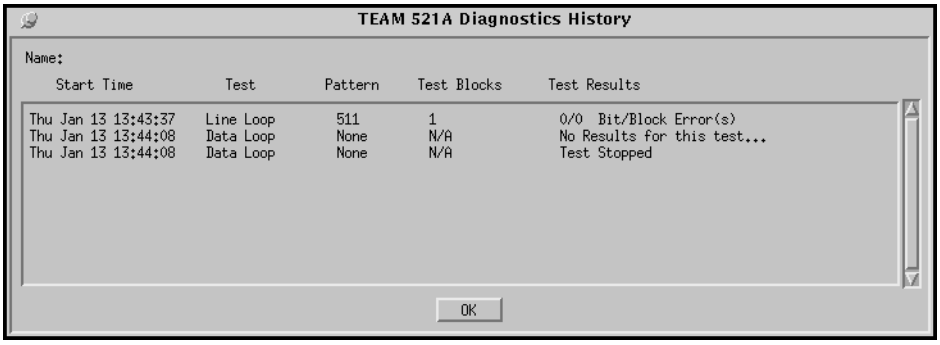


Figure 4-2 Diagnostics History Window

During an on-going diagnostic session you can close and re-open the Diagnostics History window without loss of display data. Test Results can appear as follows:

Test Result	Description
Idle: n/n Bit/Block Errors	Indicates a completed test with test pattern
Not in loop [STOPPED]	Indicates a completed loop test without test pattern
Test Stopped	Indicates any test with test pattern that was ended by the Stop Test button
n ms	Indicates a Delay test

To close the Diagnostics History window, click on either the **OK** button or the pushpin icon in the upper left corner of the window. The application clears the Diagnostics History when you exit from the Diagnostics window.

Chapter 5: NMS 520

Overview

The SC 521A Data Service Unit (DSU) can operate in conjunction with an NMS 520 DSU located at a remote site. The TEAM 521A software supports a full range of functions for the remote NMS 520 DSU, as it does for the SC 521A DSU. This chapter describes NMS 520 functionality and operation. Throughout the text descriptions in this chapter, keypresses and default values will be shown in **Bold**. Accompanying screens are representative and may appear differently on your system.

Access to the NMS 520 Functions

Access to the NMS 520 functions takes place through the icon for the SC 521A DSU that is linked to the NMS 520 DSU that you intend to work with.

1. Display the shelf map. Any DSU that **does not** have an associated remote is identified by a box around its icon symbol. Each DSU that has an associated remote is identified by an icon symbol without a box.

2. Double click on the icon symbol of the DSU that is linked to the DSU you intend to work with. The application responds by opening a submap that displays icons for the two DSUs with a connecting line to indicate that together they form a link.

3. From this submap you can either click once on the DSU icon to select it and then access the functions through the menu bar of the submap window, or double click on the DSU icon to open the NMS 520 Front Panel display window. From the Front Panel display you can access NMS 520 functions through Select button menus.

Master/Remote Communications

Management communications take place on the secondary channel when the link between the master SpectraComm 521A DSU and the remote NMS 520 DSU is configured to be DDS II with secondary channel.

When the link is configured for DDS I or for Clear Channel, the management communications occupy the same channel that carries user data. When that is the case, each management communication has the effect of briefly interrupting or causing errors in the user data. Error correcting protocols and requests for retransmission protect user data against corruption, but the effect does slightly reduce throughput.

Note *Reduction in throughput caused by management communications is most noticeable when the Front Panel display or the Alarm Detail window is open with Auto Poll enabled. The faster the scan rate setting selected for Auto Poll, the greater the effect on user data.*

Submap Window Menu Bar Access

The following table illustrates how the NMS 520 functions of the TEAM 521A application are arranged on the menu bar at the top of the HPOV link submap window. You must click on the DSU icon to select it before you open the menu you intend to use.The table below shows only the menu selections for the NMS 520 functions. The submap window menus include other selections since the window is accesses other applications.

Menu Bar	Menu Selections
Performance	Front Panel...
	Alarms...
	DTE Status...
	Line Statistics...
Configuration	Configure...
	Maintenance...
Fault	Diagnose...
Misc	Front Panel Poll Rate...
	Note Pad

The Performance menu Front Panel selection opens the Front Panel display window, which also provides access to menus through its Select button. All the menu selections shown above appear in the Select button menus except Front Panel in the Performance menu and the two items in the Misc menu.

NMS 520 DSU Front Panel

The NMS 520 Front Panel window (*See Figure 5-1 and Figure 5-2*) provides a graphical interface to a remote NMS 520 DSU. You can launch a Front Panel from the link submap, described above under the heading Access to the NMS 520 Functions, in either of two ways:

- select the NMS 520 icon in the submap window, then select Front Panel from the Performance menu for the window.
- double click the mouse on the NMS 520 icon.

The application responds by displaying a window that depicts the front panel of the selected NMS 520 DSU unit. There are two NMS 520 DSU Front Panel displays, one for the model with Intelligent Front Panel (IFP) and one for the model without IFP.

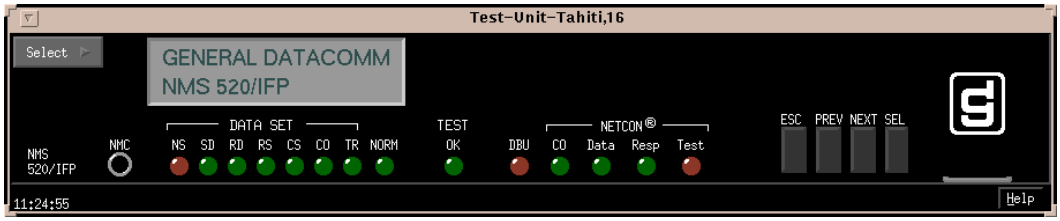


Figure 5-1 NMS 520 IFP DSU Front Panel

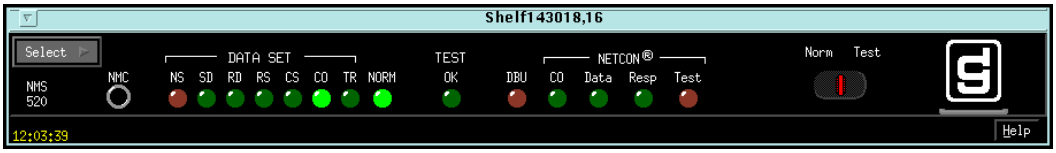


Figure 5-2 NMS 520 Non-IFP DSU Front Panel

The LEDs shown in the display reflect the states of the actual indicators on the physical unit:

- NS – No Signal indicates when lit that there is no signal at the network interface of the remote DSU
- SD – Send Data indicates when lit that the DSU is transmitting data
- RD – Receive Data indicates when lit that the DSU is receiving data
- RS – Request to Send indicates when lit that the DTE has data to transmit
- CS – Clear to Send indicates when lit that the DSU is prepared to transmit data
- CO – Carrier On indicates when lit that the DSU is receiving a carrier signal at its network interface
- TR – Terminal Ready indicates when lit that the DTE is powered on
- NORM – DSU mode indication, when lit indicates DSU in normal mode; when off indicates DSU in diagnostic mode
- TEST/OK – indicates when lit that the DSU is receiving valid test data
- DBU – not a valid indicator in the TEAM application environment
- NETCON CO – not a valid indicator in the TEAM application environment
- NETCON DATA – not a valid indicator in the TEAM application environment
- NETCON RESP – not a valid indicator in the TEAM application environment
- NETCON TEST – not a valid indicator in the TEAM application environment

The application polls the DSU to keep the states of the LEDs in the Front Panel display current. The time of the most recent poll appears in the bottom left corner of the Front Panel display. The time is displayed in white when Auto Poll is enabled, and in yellow when it is disabled.

The Select button on the Front Panel displays provides access to menus for the rest of the NMS 520 functions of the TEAM 521A application. The following table shows the arrangement of the Select button menus. It differs somewhat from the arrangement on the submap window menu bar.

Select Menu Items	Selections
Performance	Alarms...
	DTE Status...
	Line Statistics...
Configuration	Configure...
	Maintenance...
Fault	Diagnose...
Demand Poll	
Auto Poll	15 seconds
	30 seconds
	60 seconds
	Disable
Exit	

The two Poll selections in the Select button menu determine when the application collects new information from the DSU to update the Front Panel window:

- Selecting Demand Poll causes an immediate update of the display.
- Auto Poll enables you to select updates at 15, 30, or 60 second intervals, or to disable automatic polling. If you select Disable, the Front Panel window displays a static snapshot of the LED states as they were at the last poll, either when the window was launched or a subsequent Demand Poll.

Each time the Front Panel display is opened, its initial polling rate is determined by the Front Panel Poll Rate selection of the HPOV map window Misc menu.

The menu selection Exit dismisses the Front Panel window when you click on it.

Performance Functions

Alarms

You can launch the NMS 520 Alarm Detail application from the submap Performance Menu or from the front panel menu. The application displays the read-only Alarm Detail window for the selected DSU *(See Figure 5-3)*. The TEAM 521A application polls the DSU for changes in alarm conditions.

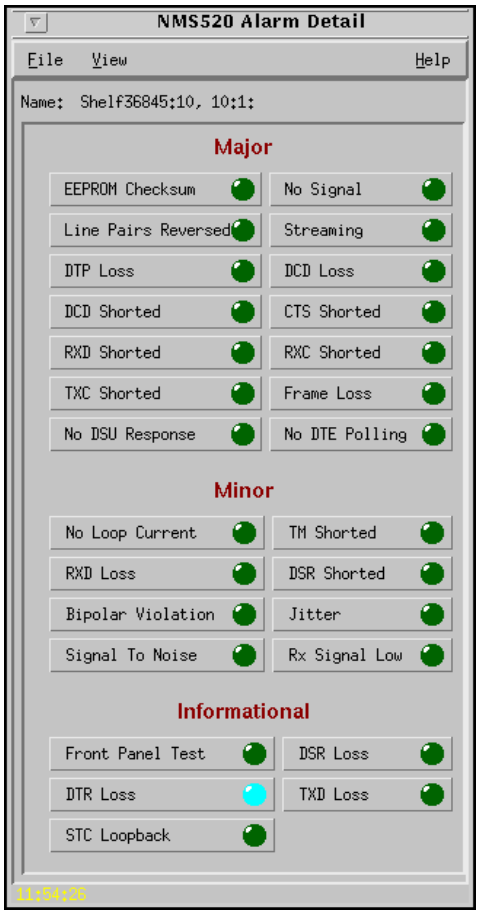


Figure 5-3 Alarm Detail Window

Major Alarms

- EEPROM Checksum – indicates that the non-volatile memory that stores the DSU configuration has become corrupted
- No Signal – indicates no signal at the DSU network interface
- Line Pairs Reversed – indicates line pairs reversed at network interface
- Streaming – indicates constant RTS condition at the DTE interface
- DTP Loss – indicates loss of Data Terminal Power
- DCD Loss – indicates loss of Data Carrier Detect
- DCD Shorted – indicates Data Carrier Detect lead shorted to ground
- CTS Shorted – indicates Clear To Send lead shorted to ground
- RXD Shorted – indicates Receive Data lead shorted to ground
- RXC Shorted – indicates Receive Timing lead shorted to ground
- TXC Shorted – indicates Transmit Timing lead shorted to ground Frame Loss – indicates loss of framing
- No DSU Response – indicates the remote DSU does not respond to polling by the master unit (valid only in DDS I operation)

- No DTE Polling – indicates the DTE connected to the remote DSU does not respond to polling by the master unit (valid only in DDS I operation)

Minor Alarms

- No Loop Current – indicates no current at network interface
- TM Shorted – indicates Test Mode lead shorted to ground
- RXD Loss – indicates loss of Receive Data
- DSR Shorted – indicates Data Set Ready lead shorted to ground
- Bipolar Violation – indicates excessive Bipolar Violations in received signal
- Jitter – indicates excessive Jitter in received signal
- Signal To Noise – indicates poor signal to noise ratio in received signal
- Rx Signal Low – indicates weak received signal

Informational Alarms

- Front Panel Test – indicates the DSU has been commanded into a test mode by means of its front panel switches
- DSR Loss – indicates loss of Data Set Ready
- DTR Loss – indicates loss of Data Terminal Ready
- TXD Loss – indicates no transmit data from the DTE
- STC Loopback – indicates the DSU has been commanded into a test mode by the Telco Serving Test Center (STC)

Alarm Detail Window Menus

The File menu contains the selections Demand Poll, Auto Poll, and Exit. Selecting Demand Poll causes an immediate update of the display.

Auto Poll enables you to select updates at 15, 30, or 60 second intervals, or to disable automatic polling. If you select Disable, the Alarm Detail window displays a static snapshot of conditions as they were at the last poll, either when the window was launched or a subsequent Demand Poll.

The time of the most recent poll appears in the bottom left corner of the window. The time is displayed in white when Auto Poll is enabled, and in yellow when it is disabled.

The View menu consists of three selections: Major, Minor, and Informational, each with a check box beside it. To remove an alarm category from the window display, click on its check box so that it is unchecked. Clicking a box so that it is checked restores the corresponding category to the display.

DTE Status

You can launch the NMS 520 DTE Status application from the submap Performance Menu or from the front panel menu. The application displays the read-only DTE Status window for the selected DSU *(Figure 5-4)*. The window displays indicators for the states of the EIA signals at the DTE interface. Dark green indicates Off, light green indicates On, and light green with a superimposed two-headed arrow indicates transitions.

Status Window Menu

The Status window has a File menu with the selections Demand Poll, Auto Poll, and Exit.

Selecting Demand Poll causes an immediate update of the display.

Auto Poll enables you to select updates at 15, 30, or 60 second intervals, or to disable automatic polling. If you select Disable, the Status window displays a static snapshot of the EIA indicators as they were at the last poll, either when the window was launched or a subsequent Demand Poll.

The time of the most recent poll appears in the bottom left corner of the window. The time is displayed in white when Auto Poll is enabled, and in yellow when it is disabled.

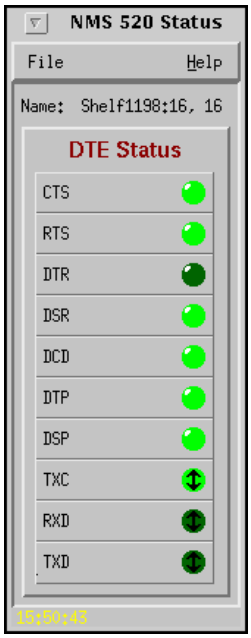


Figure 5-4 DTE Status Window

Line Statistics

You can launch the Line Statistics application from the submap Performance Menu or from the front panel menu. As shown in *Figure 5-5*, the application displays nine categories of line performance statistics accumulated by the unit over the most recent 15 minutes. The statistics are displayed on 15 lines, each representing one minute of the displayed interval. The Minute Interval column simply identifies the time frame for the other eight items in the row.

The Status column can display Normal or No Signal. The Transmit Level and Receive Level columns display the strength, in decibels, of the signals being sent and received by the DSU. The Signal to Noise Ratio column indicates the extent to which useful signal exceeds incidental noise. The Signal Quality column indicates the overall condition of the signal being received during the minute. The Phase Jitter column displays the percentage by which phase shift in the received signal exceeds acceptable levels. BPV Count displays the number of instances that occurred during the minute when consecutive ones in the signal being received did not alternate states, thus constituting a bipolar violation. The Frame Loss column displays the number of times during the minute that framing bits could not be identified.

Line Statistics Window Menus

The Line Statistics window has a File menu that consists of Refresh and Exit selections. The Refresh selection causes the window to display the latest available data. The window is not a dynamic display, so you should use the Refresh selection occasionally when you keep the window open for long periods. The Exit selection dismisses the Line Statistics window.

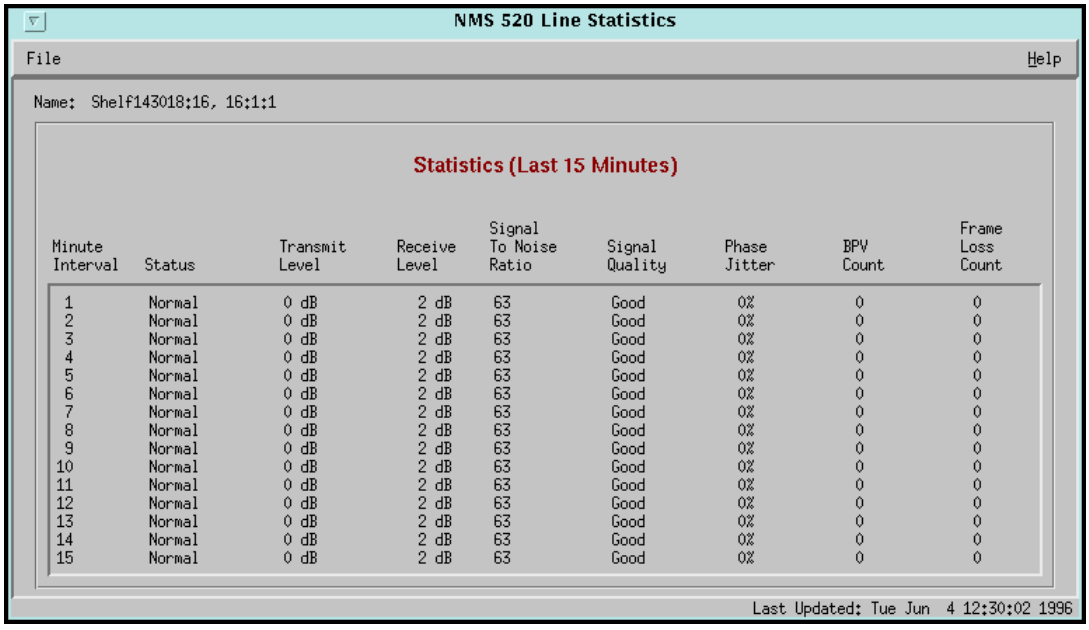


Figure 5-5 Line Statistics Window

Configuration Functions – Configure

You can launch the NMS 520 Configuration function from the submap Configuration Menu or from the front panel menu. When you launch the window, it initially displays the read-only NMS 520 Configuration window, which has a File menu and a Navigate menu in its menu bar.

The File menu contains the selections

- Refresh, which discards all unsaved changes and restores all options in the displayed configuration windows to the values they are assigned by the current operating configuration
- Save to Unit, which puts the new configuration into use by the DSU
- Load Template, by which you can recall a stored configuration template that you can then save to the DSU either with or without modifications
- Save to Template, by which you can store the current configuration on the workstation for future use as a template
- Compare to Template, by which you can identify differences between the configuration displayed on-screen and a selected template
- Exit, by which you can dismiss the window.

The Navigate menu accesses the four read/write windows for configuring DSU operation by means of System Options, Network Options, DTE Options, and Alarms Reported

Main Configuration Window

The Main Configuration window has two pull down menus, File and Navigate. From the **Navigate menu** you select the individual configuration windows in which you make changes. The **File menu** commands the storage and retrieval of configuration settings.

Menu Buttons	Menu Selections	Further Selections
File	Refresh	
	Save to Unit	
	Load Template	dialog window
	Save to Template	dialog window
	Compare to Template	dialog window
	Exit	
Navigate	System Options...	
	Network Options...	
	DTE Options...	
	Alarms Reported...	
	All Screens...	

Main Configuration Window Read-Only Display

Name:	Shelf and slot identification for the master DSU followed by the slot:line:drop address of the remote NMS 520 DSU
Serial Number:	Displays the serial number of the NMS 520 DSU
Firmware Revision:	Displays the revision level of the NMS 520 DSU operating code (minimum required for compatibility: L-)
DDS MIB Version:	Displays the revision level of the MIB files that enable SNMP control
NMS 520 MIB Version:	Displays the revision level of the MIB files that enable SNMP control

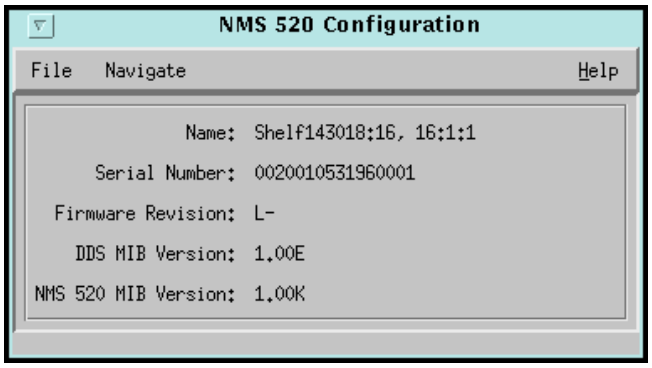
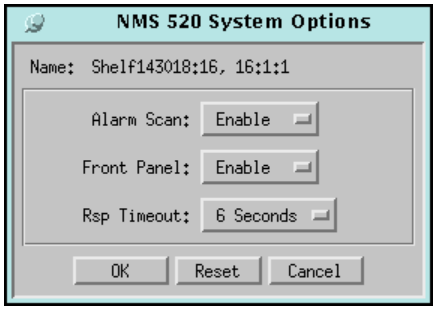


Figure 5-6 Main Configuration Window

System Options



The NMS 520 System Options configuration window contains three options:

Alarm Scan – permits you to **Enable** or Inhibit alarm trap generation by the SCM.

Front Panel – permits you to disable the switches on the front panel of the DSU as protection against any inadvertent interruption of its operation. Options are:

- Enable – DSU front panel switches are operational.
- **Disable** – DSU front panel switches are disabled.

Rsp Timeout – selects the length of time the SCM waits for a response from the DSU before it declares a No Response condition.

- 2, 4, 6, **8** seconds

NMS 520 Network Options

The NMS 520 Network Options configuration window appears when you select Network Options from the Main Configuration window Navigate menu. Network and Circuit Parameters are described below.

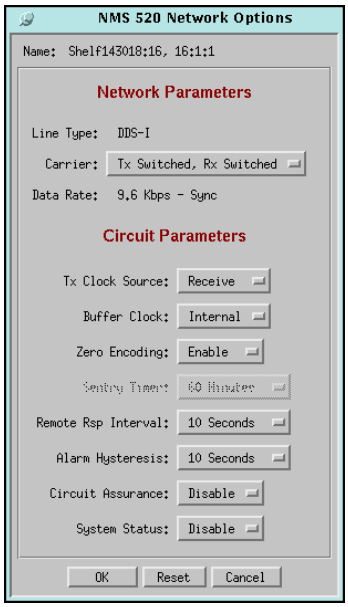


Figure 5-7 NMS 520 Network Options Configuration Window

Network Parameters

Line Type – read-only field displays the type of service to which the DSU is connected. Options are:

- Clear Channel
- **DDS-I**
- DDS-SC

Carrier – selects the combination of transmit and receive carrier modes (constant/switched) to be used by the DSU. Options are:

- Tx Constant, Rx Constant – for use on a point-to-point circuit
- Tx Constant, Rx Switched – for use when the DSU is the master unit on a multi-point circuit
- Tx Switched, Rx Constant – for use when the DSU is a remote unit on a multi-point circuit
- **Tx Switched, Rx Switched** – for use when required by specialized applications

Data Rate – read-only field displays the data rate and mode (synchronous/asynchronous) in use by the DSU. Options are:

- 2.4 Kbps - Async
- 2.4 Kbps - Sync
- 4.8 Kbps - Async

- 4.8 Kbps - Sync
- 9.6 Kbps - Async
- 9.6 Kbps - Sync
- 19.2 Kbps - Async
- **19.2 Kbps - Sync**
- 56 Kbps - Sync
- 64 Kbps - Sync

Circuit Parameters

Tx Clock Source – displays the source of transmit timing for the DSU; this item is read only and grayed out. Options are:

- **Receive** – transmit timing based on receive data timing
- Internal – transmit timing provided by the DSU internal clock
- External – transmit timing provided by the DTE; the Buffer Clock option is forced to External and cannot be changed when this is selected

Buffer Clock – selects the source of timing for the buffer between the DSU and its DTE . Options:

- **Internal** – selects timing provided by the DSU internal clock
- External – selects timing provided by the DTE; when External is selected for Tx Clock Source this selection is forced and cannot be changed

Zero Encoding – selects Zero Encoding, which 56 kbps DDS-SC applications require to ensure that primary and secondary channels do not transmit all spaces (zeros) at the same time. Options:

- **Enable** – DSU prevents the all space condition at the expense of reduced secondary channel bandwidth
- Disable – DSU does not prevent the all space condition

Sentry Timer – selects the minimum time interval permitted between alarm reports in a DDS1 or clear channel point-to-point link; setting configured here must match that in the SC 521A DSU. Options:

- Disable
- 1 Minute to 5 Minutes – in one minute increments
- 10 Minutes
- 15 Minutes to 60 Minutes – in 15 minute increments
- **60 Minutes**
- 90 Minutes
- 120 Minutes

Rmt Rsp Interval – selects the minimum time interval permitted between alarm reports in a DDS1 multi-point link; SC 521A DSU and all remote NMS 520 DSUs must be configured to the same setting. Options:

- Disable
- **10 Seconds**
- 10 Seconds to 120 Seconds – in ten second increments

Alarm Hysteresis – selects the minimum time an alarm condition must persist in order to be reported. Options:

- 10 Seconds to 120 Seconds – in ten second increments
- **10 Seconds**

Circuit Assurance – when this option is enabled the DSU clamps Clear To Send when it detects any of the following conditions: Idle, Out of Service, No Signal, Abnormal Station Code, or Inactive Channel Code. Options:

- **Disable**
- Enable

System Status – when this option is enabled the DSU clamps Data Set Ready when it detects any of the following conditions: Idle, Out of Service, No Signal, Abnormal Station Code, or Inactive Channel Code. Options:

- **Disable**
- Enable

DTE Options

The NMS 520 DTE Options configuration window contains four groups of options: Interface, Control Parameters, Async Parameters, and Diagnostic Parameters.

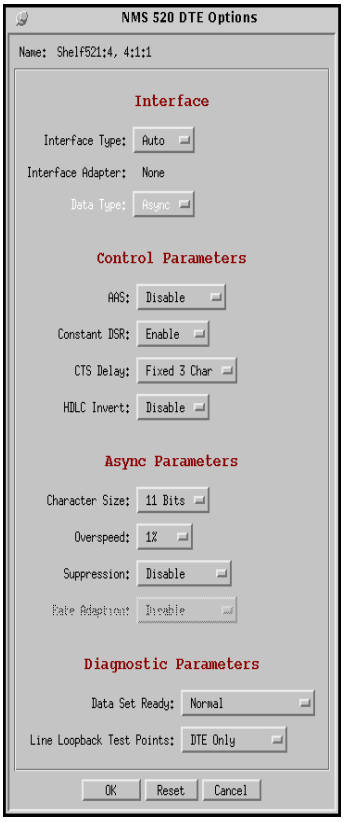


Figure 5-8 DTE Options Configuration Window

Interface

Interface Type – specifies the DTE port type. Options:

- RS232 – EIA/TIA-232-E interface
- V.35 – ITU-T V.35 interface
- **Auto** – the DSU automatically senses the interface type being used by the DTE

Interface Adapter – read-only field displays whether or not the DSU has a Data Rate Adapter (DRA) card installed. Options:

- **None**
- Installed

Data Type – selects the DSU to function with either synchronous or asynchronous data from the DTE; this option is available only for data rates of 19.2 kbps and less. Options:

- **Sync**
- Async

Control Parameters

AAS – selects whether or not the DSU provides Automatic Anti-Streaming protection, and the time limit it enforces when the feature is enabled. Options:

- **Disable**
- 5 Seconds
- 10 Seconds
- 30 Seconds
- 45 Seconds

Constant DSR – selects the DSU to output either a constant or a switched Data Set Ready signal to its DTE. Options:

- Disable – switched DSR signal controlled by DTR
- **Enable** – constant DSR signal

CTS Delay – selects the delay (if any) between the DSU receiving Request To Send from the DTE and returning Clear To Send to the DTE. Options:

- CTS ON – no delay; grayed out when Tx Constant is selected in the Carrier option of the Network Options configuration window
- **Fixed 3 Char** – equivalent to three character times
- 0 msec
- 30 msec
- 60 msec
- 90 msec

HDLC Invert – selects whether or not the DSU uses inverted channel data from the DTE. Data inversion is used primarily with DDS-SC 56 kbps circuits, to enhance data quality in a network that does not provide B8ZS coding. Options are:

- **Disable** – normal data
- Enable – inverted data

Note: *IMPORTANT: Consider the following factors when you change the setting of this option:*

Set only this option and save the change to the unit. Do not combine it with other configuration changes.

The HDLC option must be set the same at both ends of the link. Make changes at the remote DSU first, before you change the option setting at the master DSU. Changing the option at the remote results in an "SNMP 'Set' Request Failed" error message and causes loss of communication between the remote and master units. Click on OK in the error message box to dismiss the message, then proceed to change the option setting at the master. Communication resumes when the option change goes into effect at the master unit.

Async Parameters

The Async Parameters options are grayed out when a synchronous Data Rate is selected in the Network Interface configuration.

Character Size – selects the number of bits per asynchronous character, including start and stop bits. Options:

- **11 Bits**
- 10 Bits
- 9 Bits
- 8 Bits

Overspeed – selects the percentage above its configured normal operating rate at which the DSU can accommodate receive data. It performs the over speed compensation by shaving stop bits. Options:

- **1%**
- 2.3%

Suppression – determines what actions the DSU takes concerning transmit and receive End of Text (EOT). Options:

- **Disable** – the DSU does not insert EOT at the end of transmissions, and does not delete it from the end of received signals
- Rx EOT – the DSU deletes EOT from the end of received signals; it does not insert EOT at the end of transmissions
- Tx EOT – the DSU inserts EOT at the end of transmissions; it does not delete it from the end of received signals
- Rx + Tx EOT – the DSU inserts EOT at the end of transmissions, and deletes it from the end of received signals

Rate Adaption – specifies the DTE interface operating rate when it is below that of the DDS circuit; valid only when Data Rate in the Network Options screen is set to 2.4 Kbps - Async. Options:

- **Disable**
- 600
- 1200
- 1800 to 2400

Diagnostic Parameters

Data Set Ready – selects how the DSU controls the DSR output to the DTE during test modes. Options:

- Off During LL Test
- **Normal** – DSR operates in the same way that it is optioned to function during data mode operations

Line Loopback Test Points – selects whether a Line Loopback command causes the DSU only to loop transmit data back to the DTE, or also to loop receive data back to the network. Options:

- **DTE Only** – Line Loopback command causes DSU to loop data back to DTE only
- Network & DTE – Line Loopback command causes DSU to loop data in both directions

Alarms Reported

The NMS 520 Alarms Reported configuration window lets you configure which alarm conditions are to be reported for the DSU and which are not. Network, DTE, and Unit parameters are shown below.

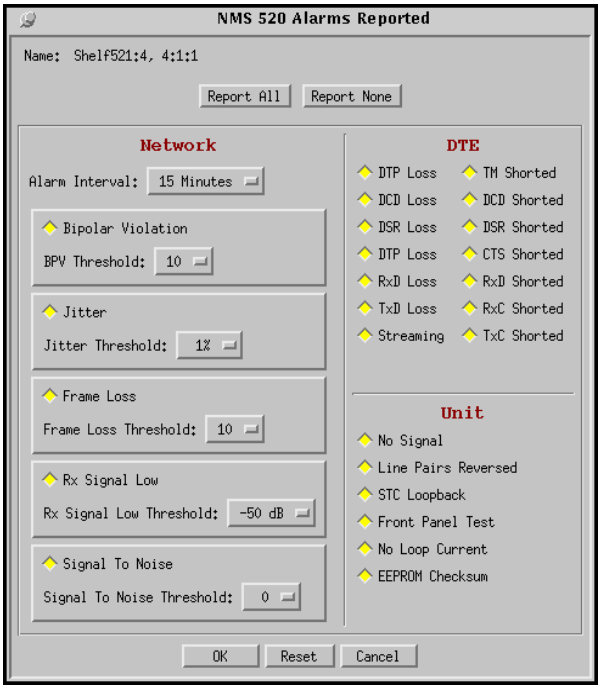


Figure 5-9 Alarms Reported Configuration Window

Buttons and Option Selection

Each of the alarm options has a diamond-shaped selection field. Select or de-select individual alarm options by clicking on the appropriate fields. When selected, the flied is highlighted, indicating an alarm to be reported. Two buttons above the option fields operate as follows:

- Click on **`Report All`** to highlight all the alarm option selection fields.
- Click on **`Report None`** to remove the highlight from all the alarm option selection fields.

Alarms Reported Buttons

Report All – unmasks all alarms.

Report None – masks all alarms.

OK – saves your changes and closes the window.

Reset – replaces the information in the fields with the most recently read information from the DSU. Note that this button does not initiate a read of information from the DSU.

Cancel – cancels your changes and closes the window.

Network Alarms

Each Network alarm, when unmasked, requires you to specify a threshold against which it is evaluated.

Alarm Interval - determines the time span for threshold evaluation. Options:

- 1 min, 5 min, 10 min, **15 min**

Bipolar Violation - lets you mask or unmask Bipolar Violation (BPV) alarms. A network BPV occurs when the signal the unit receives at its network interface does not alternate between signal levels as required for Alternate Mark Inversion (AMI) or Bipolar with 8 Zero Substitution (B8ZS) data encoding. The alarm occurs when the number of Bipolar Violations in the received signal during one Alarm Interval exceeds the selected threshold. Options:

- 1, 2, 5, **10**, 20, 40, 60, 80, 99

Jitter - lets you mask or unmask Jitter alarms. The alarm occurs when the percent of jitter in the received signal remains above the selected threshold for at least one Alarm Interval. Options:

- **1%**, 2%, 5%, 10%, 20%, 40%, 60%, 80%, 99%

Frame Loss - lets you mask or unmask Frame Loss alarms. The alarm occurs when the number of lost frames in the received signal during one Alarm Interval exceeds the selected threshold. Options:

- 1, 2, 5, **10**, 20, 40, 60, 80, 99

Rx Signal Low - lets you mask or unmask Rx Signal Low alarms. The alarm occurs when the strength of the received signal remains below the selected threshold for at least one Alarm Interval. Options:

- **-50 dB**, -40 dB, -30 dB, -20 dB, -10 dB, -5 dB, 0 dB, 6 dB

Signal to Noise - lets you mask or unmask Signal to Noise Ratio alarms. The alarm occurs when the ratio of signal to noise in the received signal remains poorer than the selected threshold for at least one Alarm Interval. Options:

- **0**, 5, 10, 15, 20, 25, 30, 40, 50

DTE

- DTP Loss – indicates loss of Data Terminal Power
- DCD Loss – indicates loss of Data Carrier Detect
- DSR Loss – indicates loss of Data Set Ready
- DTR Loss – indicates loss of Data Terminal Ready
- RxD Loss – indicates no receive data from the remote DSU
- TxD Loss – indicates no transmit data from the DTE
- TM Shorted – indicates a short circuit on the Test Mode interface lead
- Streaming – indicates a streaming condition at the DTE interface
- DCD Shorted – indicates a short circuit on the Data Carrier Detect interface lead
- DSR Shorted – indicates short circuit on the Data Set Ready interface lead
- CTS Shorted – indicates a short circuit on the Clear To Send interface lead
- RxD Shorted – indicates a short circuit on the Receive Data interface lead
- RxC Shorted – indicates a short circuit on the Receive Timing interface lead
- TxC Shorted – indicates a short circuit on the Transmit Timing interface lead

Unit

- No Signal – indicates there is no signal at the DSU network interface
- Line Pairs Reversed – indicates the transmit and receive line pairs are reversed
- STC Loopback – indicates the DSU has been commanded into a test mode by the Telco Serving Test Center (STC)
- Front Panel Test – indicates the DSU has been commanded into a test mode by means of its front panel switches
- No Loop Current – indicates that network sealing current is inadequate or absent
- EEPROM Checksum – indicates Configuration Checksum error

Configuration Functions – Maintenance

You can launch the NMS 520 Maintenance function from the submap Configuration Menu or from the front panel menu. The application displays one read/write window by which you can control some aspects of DSU operation that fall outside the scope of the Configure application.

The window title bar displays the function name, NMS 520 Maintenance. The Name field displays the shelf name and the slot number of the master DSU followed by the slot:line:drop address of the remote DSU. The File menu contains only the selection Exit, by which you can dismiss the window.

Maintenance Window Buttons

Reset to Factory Defaults – causes all options in the DSU to return to their factory default settings. When you click on this button the application displays a warning “Resetting to factory defaults will terminate communications to the unit. Do you want to continue?” Click on the OK button in the warning window to complete the reset, or click on the Cancel button to cancel the reset.

Perform Soft Reset – causes the DSU to perform a reset and resume operation using its current configuration. When you click on this button the application displays a warning “Performing a soft reset will disrupt communications to the unit. Do you want to continue?” Click on the OK button in the warning window to complete the reset, or click on the Cancel button to cancel the reset.

Figure 5-10 Maintenance Window

Diagnostics

You can launch the NMS 520 Diagnostics function from the submap Fault menu or from the front panel menu. The application displays one read/write window by which you can control a variety of test functions on the DSU.

Beneath the menu bar and the Name field the Diagnostics window (*See Figure 5-11*) is divided into three areas:

- Selection panel – contains buttons and check boxes for selecting, starting, and stopping test functions
- Graphic panel – depicts the path followed by test data during the current test
- Duration and results panel – contains an input field for specifying how many blocks of data to use for a test that employs the DSU test pattern generator; displays Test Duration, Time Remaining, and Test Results

The Diagnostics window menu bar contains File and Navigate. The File menu has only the Exit selection by which you dismiss the window. The Navigate menu also has a single selection: History, by which you can access a display of test results (*see Figure 5-12*) accumulated during the current diagnostic session.

Tests

The Diagnostics window selection panel lists three Tests to choose from, and three Patterns you can select for those tests that employ the DSU test pattern generator. The panel also includes an input field for the User Defined test pattern, and two buttons: Start Test and Stop Test.

The following Tests are available:

- Line Loop (performed only with test pattern)
- End To End (performed only with test pattern)
- Dataloop (can be performed with or without test pattern)
- Delay Test

The Patterns are:

- 511 bit
- 2047 bit
- 15 bit

Each Test and Pattern is accompanied by a check box on which you can click to select it. The Pattern check boxes are grayed out when the selected Test cannot be combined with an internal test pattern.

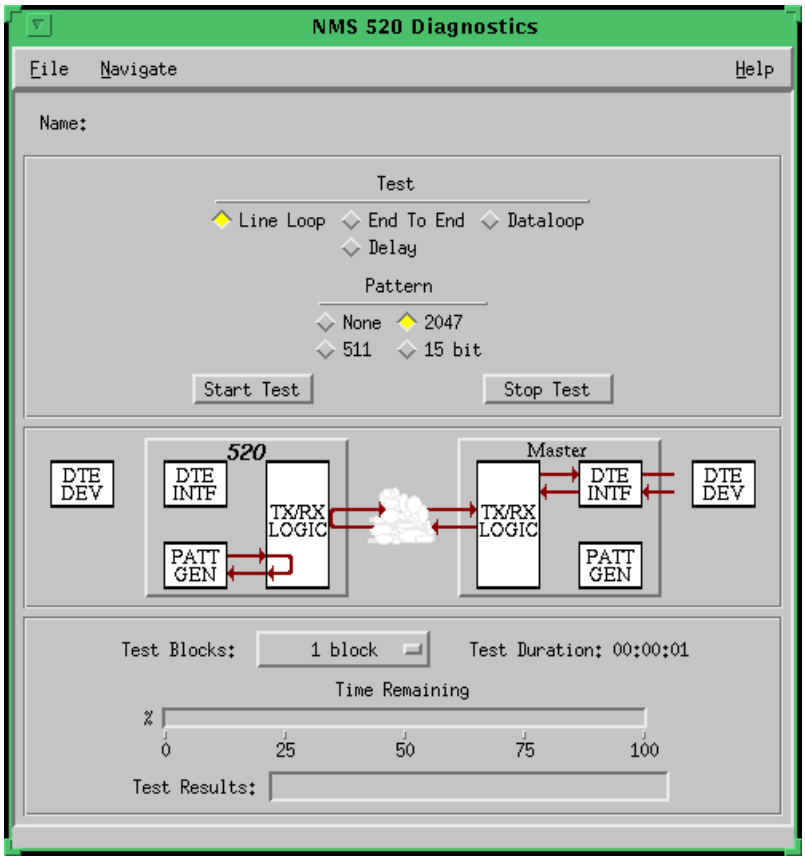


Figure 5-11 NMS 520 Diagnostics Window

Test	Description
Line Loop (with Pattern)	DSU initiates a loopback at its network interface and activates its test pattern generator/checker.
End To End (with Pattern)	Remote NMS 520 DSU activates its test pattern generator/checker and transmits the pattern on its link to the master SC 521A DSU. Remote DSU checks for errors in the signal it receives, which is generated by the master DSU.
Dataloop (without Pattern)	Remote NMS 520 DSU transmits a command on the link that causes the master SC 521A DSU to loop data back to the Remote DSU; DTE or external test equipment at the remote DSU is responsible for generating and checking a test pattern.
Dataloop (with Pattern)	Remote NMS 520 DSU transmits the loopback command to the master SC 521A DSU, and activates its test pattern generator/checker to transmit the pattern and check for errors in the signal it receives back.
Delay Test	Remote NMS 520 DSU transmits and receives a test signal, which is looped back by the master SC 521A DSU; the Remote DSU measures the round trip time (delay).

Diagnostic Test Procedure

Perform the following steps to select and carry out a test procedure on the DSU.

1. Click on the check box next to the selected test. If you are running the Delay Test, go to Step 4.
2. Under the Pattern heading, click on your selected pattern. The Dataloop test also supports the selection None (for external data).
3. If you are using an internally generated test pattern select, in the Test Blocks field, how much data is to run before the test ends automatically.
4. Click on the Start Test button. While the test runs, the graphic panel illustrates the data path employed by the test. If you are using an internally generated test pattern, the Time Remaining field counts down from 100 to 0 percent.
5. During a test that employs an internally generated test pattern the Test Results field displays the number of errors detected; it displays In Loop when external data is in use.
6. If you are using an internally generated test pattern, the test ends automatically when the specified number of data blocks have run. For any other test, click on the Stop Test button to end the procedure.

Note *Following any test except Dataloop a pop up window appears with the message* Network element communication problem. Try again.

The message results from the interruption caused by the test. Normal operation should resume when you click on the OK box to dismiss the pop up.

Note *Before running a Data Loop test on a remote, make sure the Remote Rsp Interval is Disabled at the NMS520 Network options window.*

Diagnostics History

You can view a record of tests performed during the current diagnostic session by selecting History from the Navigate menu in the Diagnostics window. The record appears as a listing in the Diagnostics History window.

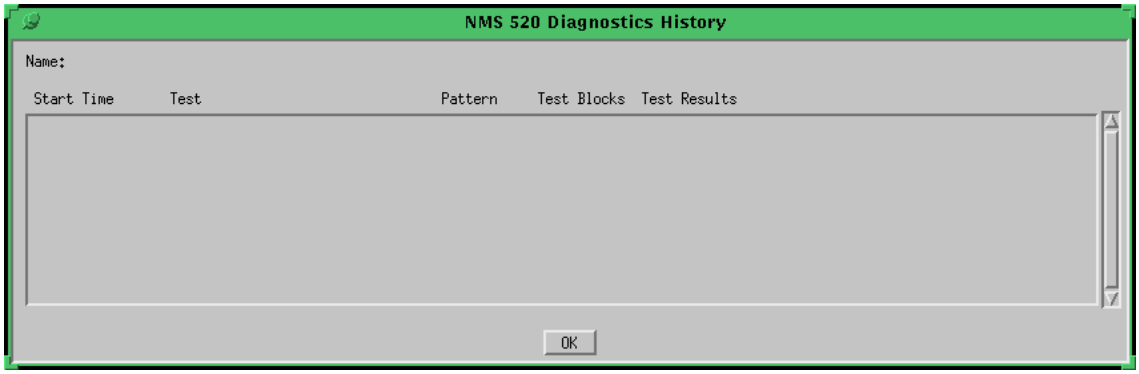


Figure 5-12 Diagnostics History

The Diagnostics History displays information in five columns:

- Start Time – date and time test began
- Test – name of the test
- Pattern – test pattern used for the test; N/A when internally generated pattern is not used
- Test Blocks – number of data blocks sent during the test, applies only to tests with test pattern
- Test Results – "Idle: *n/n* Bit/Block Errors" for a completed test with test pattern; "Not in loop [STOPPED]" for a completed loop test without test pattern; "TEST STOPPED" for any test with test pattern that was ended by the Stop Test button; "*n* ms." for Delay Test

To close the Diagnostics History window, click on either the OK button or the pushpin icon in the upper left corner of the window. During an on-going diagnostic session you can close and re-open the Diagnostics History window without loss of display data. The application clears the Diagnostics History when you exit from the Diagnostics window.

Miscellaneous Functions

The submap Misc Menu has selections for Front Panel Poll Rate and Note Pad. These selections access the same applications that are described in Chapter 2.

Chapter 6: NMS 510

Overview

The SC 521A Data Service Unit (DSU) can operate in conjunction with an NMS 510 DSU located at a remote site. The TEAM 521A software supports a full range of functions for the remote NMS 510 DSU, as it does for the SC 521A DSU. This chapter describes the NMS 510 functionality of the software and provides instructions for its use. Throughout the text descriptions in this chapter, keypresses and default values will be shown in **Bold**. Accompanying screens are representative and may appear differently on your system.

Access to the NMS 510 Functions

Access to the NMS 510 functions takes place through the icon for the SC 521A DSU that is linked to the NMS 510 DSU that you intend to work with.

1. Display the shelf map. Any DSU that **does not** have an associated remote is identified by a box around its icon symbol. Each DSU that has an associated remote is identified by an icon symbol without a box.

2. Double click on the icon symbol of the DSU that is linked to the DSU you intend to work with. The application responds by opening a submap that displays icons for the two DSUs with a connecting line to indicate that together they form a link.

3. From this submap you can either click once on the DSU icon to select it and then access the functions through the menu bar of the submap window, or double click on the DSU icon to open the NMS 510 Front Panel display window. From the Front Panel display you can access NMS 510 functions through Select button menus.

Master/Remote Communications

Management communications take place on the secondary channel when the link between the master SpectraComm 521A DSU and the remote NMS 510 DSU is configured to be DDS II with secondary channel.

When the link is configured for DDS I or for clear channel the management communications occupy the same channel that carries user data. When that is the case, each management communication has the effect of briefly interrupting or causing errors in the user data. Error correcting protocols and requests for retransmission protect user data against corruption, but the effect does slightly reduce throughput.

Note *Reduction in throughput caused by management communications is most noticeable when the Front Panel display or the Alarm Detail window is open with Auto Poll enabled. The faster the scan rate setting selected for Auto Poll, the greater the effect on user data.*

Submap Window Menu Bar Access

The table on the following page illustrates how the NMS 510 functions of the TEAM 521A application are arranged on the menu bar at the top of the HPOV link submap window. The table shows only the menu selections for the NMS 510 functions. The submap window menus will include other selections, since the window is accessible to other applications.

You must click on the DSU icon to select it before you open the menu you intend to use.

Menu Bar	Menu Selections
Performance	Front Panel...
	Alarms...
	DTE Status...
Configuration	Configure...
	Maintenance...
Fault	Diagnose...
Misc	Front Panel Poll Rate...
	Note Pad

The Performance menu Front Panel selection opens the Front Panel display window, which also provides access to menus through its Select button. All the menu selections shown above appear in the Select button menus except Front Panel in the Performance menu and the two items in the Misc menu.

NMS 510 DSU Front Panel

The NMS 510 Front Panel display window (*See Figure 6-1*) provides a graphical interface to a remote NMS 510 DSU. You can launch a Front Panel from the link submap, described above under the heading Access to the NMS 510 Functions, in either of two ways:

- select the NMS 510 icon in the submap window, then select Front Panel from the Performance menu for the window
- double click the mouse on the NMS 510 icon.

The application responds by displaying a window that depicts an NMS 510 DSU. The application employs the same display regardless of whether or not the selected DSU is equipped with an Intelligent Front Panel (IFP).

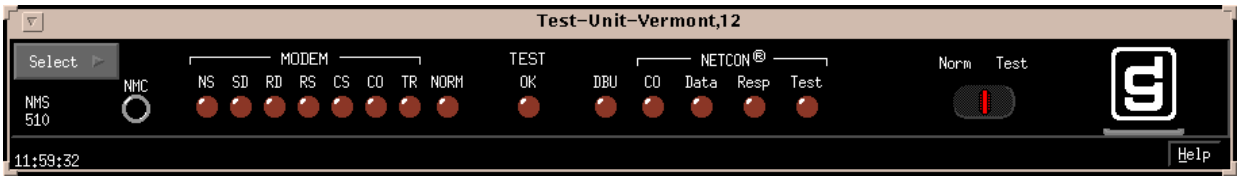


Figure 6-1 NMS 510 DSU Front Panel

The LEDs shown in the display reflect the states of the actual indicators on the physical unit:

- NS – No Signal indicates when lit that there is no signal at the network interface of the remote DSU
- SD – Send Data indicates when lit that the DSU is transmitting data
- RD – Receive Data indicates when lit that the DSU is receiving data
- RS – Request to Send indicates when lit that the DTE has data to transmit
- CS – Clear to Send indicates when lit that the DSU is prepared to transmit data
- CO – Carrier On indicates when lit that the DSU is receiving a carrier signal at its network interface
- TR – Terminal Ready indicates when lit that the DTE is powered on
- NORM – DSU mode indication, when lit indicates DSU in normal mode; when off indicates DSU in diagnostic mode
- TEST/OK – indicates when lit that the DSU is receiving valid test data
- DBU – not a valid indicator in the TEAM application environment
- NETCON CO – not a valid indicator in the TEAM application environment
- NETCON DATA – not a valid indicator in the TEAM application environment
- NETCON RESP – not a valid indicator in the TEAM application environment
- NETCON TEST – not a valid indicator in the TEAM application environment

The application polls the DSU to keep the states of the LEDs in the Front Panel display current. The time of the most recent poll appears in the bottom left corner of the Front Panel display. The time is displayed in white when Auto Poll is enabled, and in yellow when it is disabled.

The Select button on the Front Panel displays provides access to menus for the rest of the NMS 510 functions of the TEAM 521A application. The following table shows the arrangement of the Select button menus. It differs somewhat from the arrangement on the submap window menu bar.

Select Menu Items	Selections
Performance	Alarms...
	DTE Status...
Configuration	Configure...
	Maintenance...
Fault	Diagnose...
Demand Poll	
Auto Poll	15 seconds
	30 seconds
	60 seconds
	Disable
Exit	

The two Poll selections in the Select button menu determine when the application collects new information from the DSU to update the Front Panel window:

- Selecting Demand Poll causes an immediate update of the display.
- Auto Poll enables you to select updates at 15, 30, or 60 second intervals, or to disable automatic polling. If you select Disable, the Front Panel window displays a static snapshot of the LED states as they were at the last poll, either when the window was launched or a subsequent Demand Poll.

Each time the Front Panel display is opened, its initial polling rate is determined by the Front Panel Poll Rate selection of the HPOV map window Misc menu.

The menu selection Exit dismisses the Front Panel window when you click on it.

Performance Functions

Alarms

You can launch the NMS 510 Alarm Detail application from the submap Performance Menu or from the front panel menu. The application displays the read-only Alarms Detail window for the selected DSU *(See Figure 6-2)*. The TEAM 521A application polls the DSU for changes in alarm conditions.

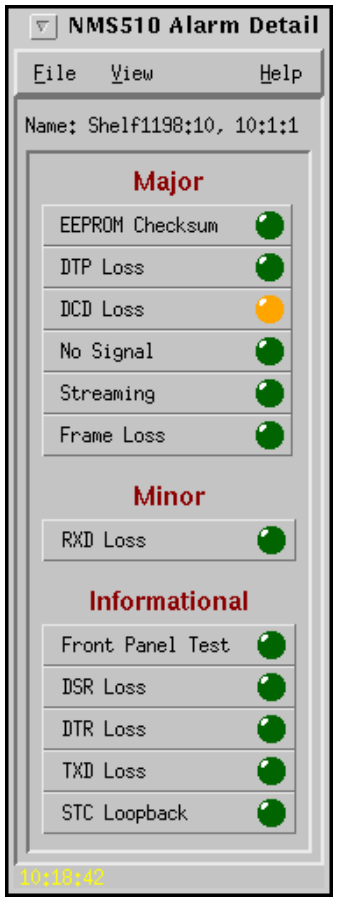


Figure 6-2 Alarm Detail Window

Major Alarms

- EEPROM Checksum – indicates that the non-volatile memory that stores the DSU configuration has become corrupted
- DTP Loss – indicates loss of Data Terminal Power
- DCD Loss – indicates loss of Data Carrier Detect
- No Signal – indicates no signal at the DSU network interface
- Streaming – indicates constant RTS condition at the DTE interface
- Frame Loss – indicates loss of framing

Minor Alarm

- RXD Loss – indicates loss of Receive Data

Informational Alarms

- Front Panel Test – indicates the DSU has been commanded into a test mode by means of its front panel switches
- DSR Loss – indicates loss of Data Set Ready
- DTR Loss – indicates loss of Data Terminal Ready

- TXD Loss – indicates no transmit data from the DTE
- STC Loopback – indicates the DSU has been commanded into a test mode by the Telco Serving Test Center (STC)

Alarm Detail Window Menus

The File menu contains the selections Demand Poll, Auto Poll, and Exit. Selecting Demand Poll causes an immediate update of the display.

Auto Poll enables you to select updates at 15, 30, or 60 second intervals, or to disable automatic polling. If you select Disable, the Alarm Detail window displays a static snapshot of conditions as they were at the last poll, either when the window was launched or a subsequent Demand Poll.

The time of the most recent poll appears in the bottom left corner of the window. The time is displayed in white when Auto Poll is enabled, and in yellow when it is disabled.

The View menu consists of three selections: Major, Minor, and Informational, each with a check box beside it. To remove an alarm category from the window display, click on its check box so that it is unchecked. Clicking a box so that it is checked restores the corresponding category to the display.

DTE Status

You can launch the NMS 510 DTE Status application from the submap Performance Menu or from the front panel menu. The application displays the read-only DTE Status window for the selected DSU *(See Figure 6-3)*. The window displays indicators for the states of the EIA signals at the DTE interface. Dark green indicates Off, light green indicates On, and light green with a superimposed two-headed arrow indicates transitions.

Status Window Menu

The Status window has a File menu in its menu bar with the selections Demand Poll, Auto Poll, and Exit.

Selecting Demand Poll causes an immediate update of the display.

Auto Poll enables you to select updates at 15, 30, or 60 second intervals, or to disable automatic polling. If you select Disable, the Status window displays a static snapshot of the EIA indicators as they were at the last poll, either when the window was launched or a subsequent Demand Poll.

The time of the most recent poll appears in the bottom left corner of the window. The time is displayed in white when Auto Poll is enabled, and in yellow when it is disabled.

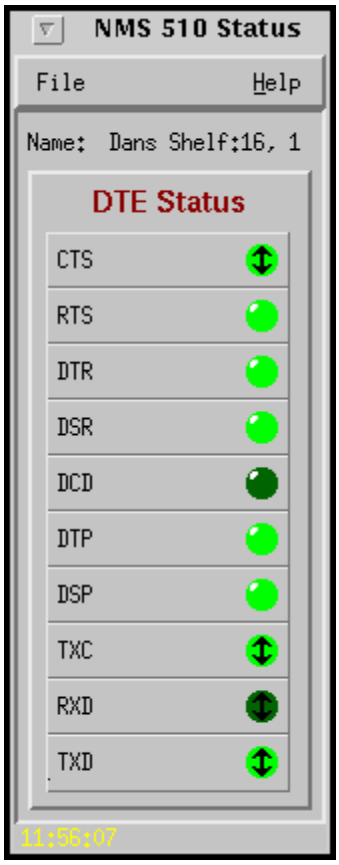


Figure 6-3 DTE Status Window

Configuration Functions – Configure

You can launch the NMS 510 Configure function from the submap Configuration Menu or from the front panel menu. When you launch the window, it initially displays the read-only NMS 510 Configuration window, which has a File menu and a Navigate menu in its menu bar.

The File menu contains the selections

- Refresh, which discards all unsaved changes and restores all options in the displayed configuration windows to the values they are assigned by the current operating configuration
- Save to Unit, which puts the new configuration into use by the DSU
- Load Template, by which you can recall a stored configuration template that you can then save to the DSU either with or without modifications
- Save to Template, by which you can store the current configuration on the workstation for future use as a template
- Compare to Template, by which you can identify differences between the configuration displayed on-screen and a selected template
- Exit, by which you can dismiss the window.

The Navigate menu enables you to access the four read/write windows by which you can configure various aspects of DSU operation:

- System Options
- Network Options
- DTE Options
- Alarms Reported
- All Screens

Main Configuration Window

The Main Configuration window has two pull down menus, File and Navigate, that are the means by which you carry out the actual process of configuring the DSU. From the **Navigate menu** you select the individual configuration windows in which you make changes. The **File menu** commands the storage and retrieval of configuration settings. The contents of the two menus appear below.

Menu Buttons	Menu Selections	Further Selections
File	Refresh	
	Save to Unit	
	Load Template	dialog window
	Save to Template	dialog window
	Compare to Template	dialog window
	Exit	
Navigate	System Options...	
	Network Options...	
	DTE Options...	
	Alarms Reported...	
	All Screens...	

Main Configuration Window Read-Only Display

The Main Configuration window displays the following read-only items:

Name:	shelf and slot identification for the master DSU followed by the slot:line:drop address of the remote NMS 510 DSU
Serial Number:	displays the serial number of the NMS 510 DSU
Firmware Revision:	displays the revision level of the NMS 510 DSU operating code
DDS Version:	displays the revision level of the MIB files that enable SNMP control
NMS 510 MIB Version:	displays the revision level of the MIB files that enable SNMP control

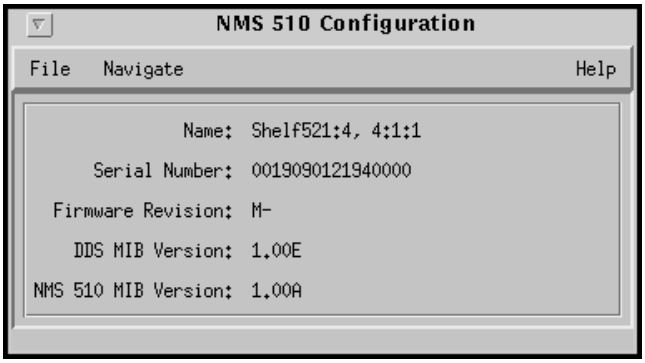


Figure 6-4 Main Configuration Window

System Options

The NMS 510 System Options configuration window contains two options.

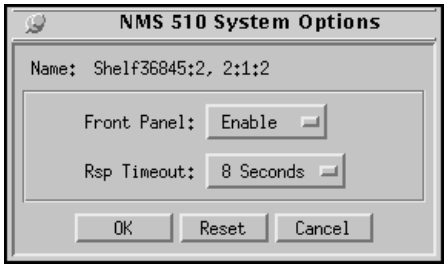


Figure 6-5 NMS 510 System Options Configuration Window

Front Panel – permits you to disable the switches on the front panel of the DSU as protection against any inadvertent interruption of its operation. Options:

- Enable – DSU front panel switches are operational.
- Disable – DSU front panel switches are disabled.

Rsp Timeout – selects the length of time the SCM waits for a response from the DSU before it declares a No Response condition. Options:

- 2, 4, 6, 8 seconds

NMS 510 Network Options

The NMS 510 Network Options configuration window (*Figure 6-6*) appears when you select Network Options from the Main Configuration window Navigate menu. The window contains two panels labeled Network Parameters and Circuit Parameters.

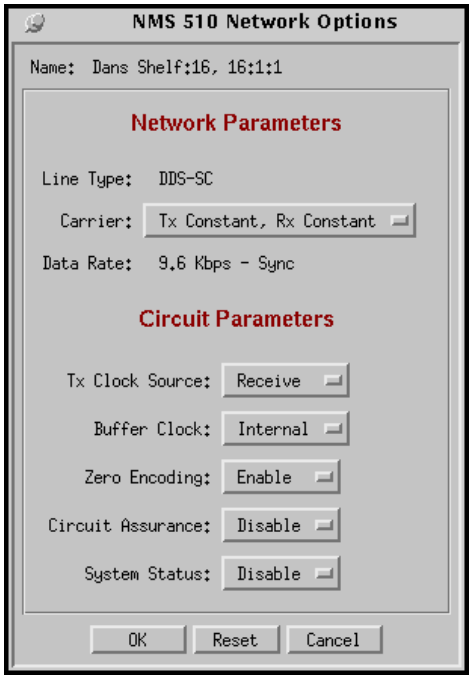


Figure 6-6 NMS 510 Network Options Configuration Window

Network Parameters

Line Type – read-only field displays the type of service to which the DSU is connected. Options:

- Clear Channel
- **DDS-I**
- DDS-SC

Carrier – selects the combination of transmit and receive carrier modes (constant/switched) to be used by the DSU. Options:

- Tx Constant, Rx Constant – for use on a point-to-point circuit
- Tx Constant, Rx Switched – for use when the DSU is the master unit on a multi-point circuit
- Tx Switched, Rx Constant – for use when the DSU is a remote unit on a multi-point circuit
- **Tx Switched, Rx Switched** – for use when required by specialized applications

Data Rate – read-only field displays the data rate and mode (synchronous/asynchronous) in use by the DSU. Options:

- 2.4 Kbps - Async
- 2.4 Kbps - Sync
- 4.8 Kbps - Async
- 4.8 Kbps - Sync
- 9.6 Kbps - Async
- 9.6 Kbps - Sync
- 19.2 Kbps - Async
- **19.2 Kbps - Sync**
- 56 Kbps - Sync
- 64 Kbps - Sync

Circuit Parameters

Tx Clock Source – displays the source of transmit timing for the DSU; this item is read only and grayed out. Options:

- **Receive** – transmit timing based on receive data timing
- Internal – transmit timing provided by the DSU internal clock
- External – transmit timing provided by the DTE; the Buffer Clock option is forced to External and cannot be changed when this is selected

Buffer Clock – selects the source of timing for the buffer between the DSU and its DTE. Options:

- **Internal** – selects timing provided by the DSU internal clock
- External – selects timing provided by the DTE; when External is selected for Tx Clock Source this selection is forced and cannot be changed

Zero Encoding – selects Zero Encoding, required for 56 kbps DDS-SC applications in which the primary and secondary channels are not permitted to transmit all spaces (zeros) at the same time. Options:

- **Enable** – DSU prevents the all space condition at the expense of reduced secondary channel bandwidth
- Disable – DSU does not prevent the all space condition

Circuit Assurance – when this option is enabled the DSU clamps Clear To Send when it detects any of the following conditions: Idle, Out of Service, No Signal, Abnormal Station Code, or Inactive Channel Code. Options:

- **Disable**
- Enable

System Status – when this option is enabled the DSU clamps Data Set Ready when it detects any of the following conditions: Idle, Out of Service, No Signal, Abnormal Station Code, or Inactive Channel Code. Options:

- **Disable**
- Enable

DTE Options

The NMS 510 DTE Options configuration window contains four groups of options: Interface, Control Parameters, Async Parameters, and Diagnostic Parameters.

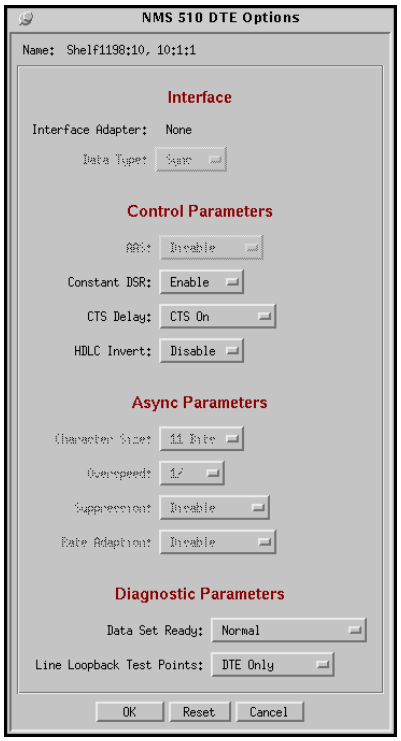


Figure 6-7 DTE Options Configuration Window

Interface

Interface Adapter – read-only field displays whether or not the DSU has a Data Rate Adapter (DRA) card installed. Options:

- **None**
- Installed

Data Type – selects the DSU to function with either synchronous or asynchronous data from the DTE; this option is available only for data rates of 19.2 kbps and less. Options:

- **Sync**
- Async

Control Parameters

AAS – selects whether or not the DSU provides Automatic Anti-Streaming protection, and the time limit it enforces when the feature is enabled. Options:

- **Disable**
- 5, 10, 30, 45 Seconds

Constant DSR – selects the DSU to output either a constant or a switched Data Set Ready signal to its DTE. Options:

- Disable – switched DSR signal controlled by DTR
- **Enable** – constant DSR signal

CTS Delay – selects the delay (if any) between the DSU receiving Request To Send from the DTE and returning Clear To Send to the DTE. Options:

- CTS ON – no delay; grayed out when Tx Constant is selected in the Carrier option of the Network Options configuration window
- **Fixed 3 Char** – equivalent to three character times
- 0, 30, 60, 90 msec

HDLC Invert – selects whether or not the DSU uses inverted channel data from the DTE. Data inversion is used primarily with DDS-SC 56 kbps circuits, to enhance data quality in a network that does not provide B8ZS coding. Options are:

- **Disable** – normal data
- Enable – inverted data.

Note: *IMPORTANT: Consider the following factors when you change the setting of this option:*

Set only this option and save the change to the unit. Do not combine it with any other configuration changes.

The HDLC option must be set the same at both ends of the link. Make changes at the remote DSU first, before you change the option setting at the DSE. Changing the option at the remote results in an "SNMP 'Set' Request Failed" error message and causes loss of communication between the remote and master units. Click on OK in the error message box to dismiss the message, then proceed to change the option setting at the master. Communication resumes when the option change goes into effect at the master unit.

Async Parameters

The Async Parameters options are grayed out when a synchronous Data Rate is selected in the Network Interface configuration.

Character Size – selects the number of bits per asynchronous character, including start and stop bits. Options:

- **11 Bits**
- 10 Bits
- 9 Bits
- 8 Bits

Overspeed – selects the percentage above its configured normal operating rate at which the DSU can accommodate receive data. It performs the over speed compensation by shaving stop bits. Options:

- **1%**
- 2.3%

Suppression – determines what actions the DSU takes concerning transmit and receive End of Text (EOT). Options:

- **Disable** – the DSU does not insert EOT at the end of transmissions, and does not delete it from the end of received signals
- Rx EOT – the DSU deletes EOT from the end of received signals; it does not insert EOT at the end of transmissions
- Tx EOT – the DSU inserts EOT at the end of transmissions; it does not delete it from the end of received signals
- Rx + Tx EOT – the DSU inserts EOT at the end of transmissions, and deletes it from the end of received signals

Rate Adaption – specifies the DTE interface operating rate when it is below that of the DDS circuit; valid only when Data Rate in the Network Options screen is set to 2.4 Kbps - Async. Options:

- **Disable**
- 600
- 1200
- 1800 to 2400

Diagnostic Parameters

Data Set Ready – selects how the DSU controls the DSR output to the DTE during test modes. Options:

- Off During LL Test
- **Normal** – DSR operates in the same way that it is optioned to function during data mode operations

Line Loopback Test Points – selects whether a Line Loopback command causes the DSU only to loop transmit data back to the DTE, or also to loop receive data back to the network. Options:

- **DTE Only** – Line Loopback command causes DSU to loop data back to DTE only
- Network & DTE – Line Loopback command causes DSU to loop data in both directions

Alarms Reported

The NMS 510 Alarms Reported configuration window (*Figure 6-8*) lets you configure which alarm conditions are to be reported for the DSU and which are not. The window contains three panels labeled Network, DTE, and Unit as shown below.

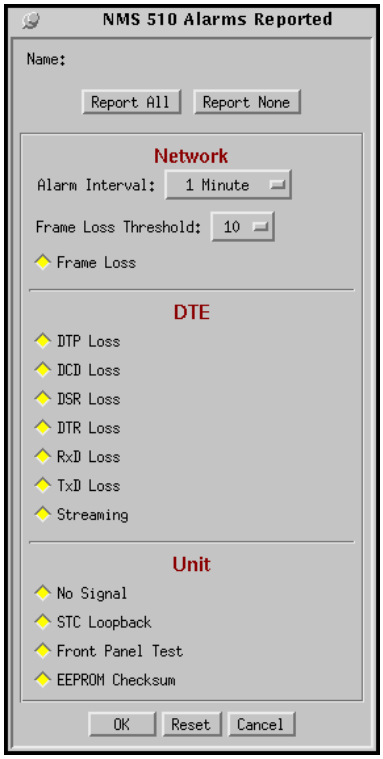


Figure 6-8 Alarms Reported Configuration Window

Buttons and Option Selection

Each of the alarm options in the Alarms Reported configuration window has a small selection field located to its left. You can select or de-select individual alarm options by simply clicking the mouse button on the appropriate selection fields. When an option is selected for its alarm to be reported, its selection field is highlighted. The selection fields next to alarm options that are not to be reported are not highlighted.

The Alarms Reported configuration window has two buttons positioned above the option fields: Report All and Report None:

- Click on Report All to highlight all the alarm option selection fields.
- Click on Report None to remove the highlight from all the alarm option selection fields.

After clicking Report All or Report None you can change the state of individual fields as needed.

Alarms Reported Buttons

Report All – unmasks all alarms.

Report None – masks all alarms.

Reset – replaces the information in the fields with the most recently read information from the DSU. Note that this button does not initiate a read of information from the DSU.

OK – saves your changes and closes the window.

Cancel – cancels your changes and closes the window.

Network

Frame Loss is the one Network alarm. When it is unmasked you must specify a threshold for evaluating the alarm condition.

Alarm Interval - determines the time span for threshold evaluation. Options:

- 1 min, 5 min, 10 min, **15 min**

Frame Loss - lets you mask or unmask Frame Loss alarms. The alarm occurs when the number of lost frames in the received signal during one Alarm Interval exceeds the selected threshold. Options:

- **1**, 2, 5, 10, 20, 40, 60, 80, 99

DTE

- DTP Loss – indicates loss of Data Terminal Power
- DCD Loss – indicates loss of Data Carrier Detect
- DSR Loss – indicates loss of Data Set Ready
- DTR Loss – indicates loss of Data Terminal Ready
- RXD Loss – indicates no receive data from the remote DSU
- TXD Loss – indicates no transmit data from the DTE
- Streaming – indicates a streaming condition at the DTE interface

Unit

- No Signal – indicates no signal at the DSU network interface
- STC Loopback – indicates the DSU has been commanded into a test mode by the Telco Serving Test Center (STC)
- Front Panel Test – indicates the DSU has been commanded into a test mode by means of its front panel switches
- EEPROM Checksum – indicates configuration checksum error

Configuration Functions – Maintenance

You can launch the NMS 510 Maintenance function from the submap Configuration Menu or from the front panel menu. The application displays one read/write window by which you can control some aspects of DSU operation that fall outside the scope of Configuration. See *Figure 6-9*.

The window title bar displays the function name, NMS 510 Maintenance. The Name field displays the shelf name and the slot number of the master DSE followed by the slot:line:drop address of the DSU. The File menu contains only the selection Exit, by which you can dismiss the window.

Maintenance Window Buttons

The Maintenance window provides the following two buttons.

Reset to Factory Defaults – causes all options in the DSU to return to their factory default settings. When you click on this button the application displays a warning “Resetting to factory defaults will terminate communications to the unit. Do you want to continue?” Click on the OK button in the warning window to complete the reset, or click on the Cancel button to cancel the reset.

Perform Soft Reset – causes the DSU to perform a reset and resume operation using its current configuration. When you click on this button the application displays a warning “Performing a soft reset will disrupt communications to the unit. Do you want to continue?” Click on the OK button in the warning window to complete the reset, or click on the Cancel button to cancel the reset.

Figure 6-9 Maintenance Window

Diagnostics

Launch the NMS 510 Diagnostics function from the submap Fault Menu or from the front panel menu. The application displays one read/write window for controlling a variety of test functions on the DSU.

Diagnostics Window

Beneath the menu bar and the Name field the Diagnostics window is divided into three areas:

- Selection panel – contains buttons and check boxes for selecting, starting, and stopping test functions
- Graphic panel – depicts the path followed by test data during the current test
- Duration and results panel – contains an input field for specifying how many blocks of data to use for a test that employs the DSU test pattern generator; displays Test Duration, Time Remaining, and Test Results

The Diagnostics window menu bar contains File and Navigate. The File menu has only the Exit selection by which you dismiss the window. The Navigate menu also has a single selection: History, by which you can access a display of test results (*see* *Figure 6-11*) accumulated during the current diagnostic session.

Tests

The following Tests are available:

- Line Loop (performed only with test pattern)
- End To End (performed only with test pattern)
- Dataloop (can be performed with or without test pattern)
- Delay Test

The Patterns are:

- 511 bit
- 2047 bit
- 15 bit

Each Test and Pattern is accompanied by a check box on which you can click to select it. The Pattern check boxes are grayed out when the selected Test cannot be combined with an internal test pattern.

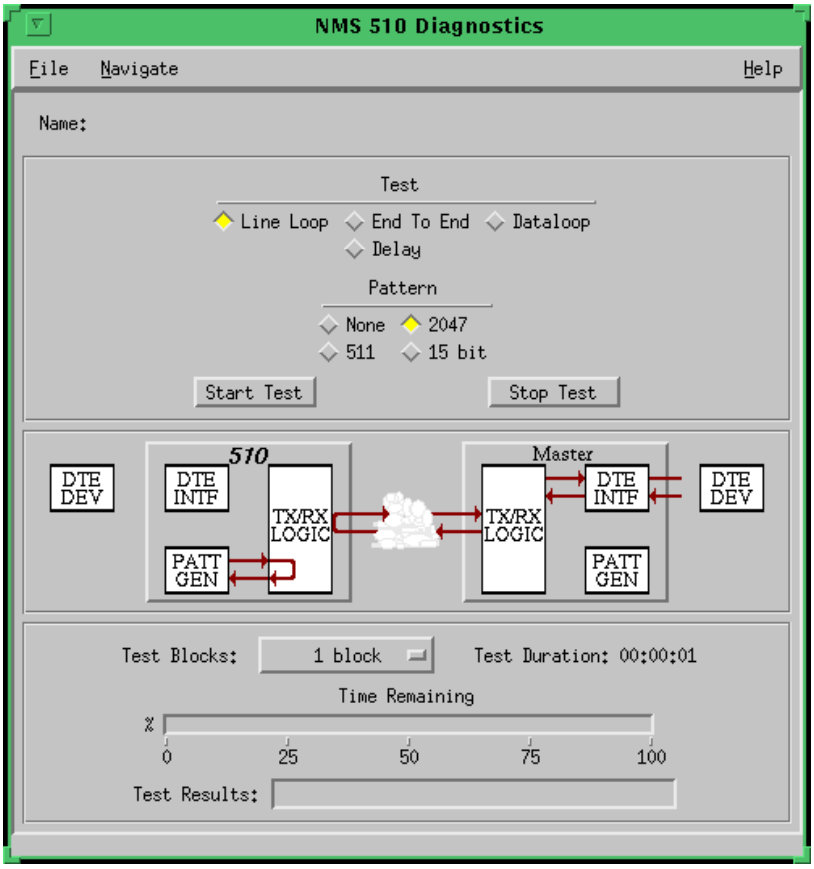


Figure 6-10 NMS 510 Diagnostics Window

Diagnostics Overview

Test	Description
Line Loop (with Pattern)	DSU initiates a loopback at its network interface and activates its test pattern generator/checker.
End To End (with Pattern)	DSU activates its test pattern generator/checker and transmits the pattern on its link to the DSE. DSU checks for errors in the signal it receives, which is generated by the DSE.
Dataloop (without Pattern)	DSU transmits a command on the link that causes the DSE to loop data back to the DSU; DTE or external test equipment at the DSU is responsible for generating and checking a test pattern.
Dataloop (with Pattern)	DSU transmits the loopback command to the DSE, and activates its test pattern generator/checker to transmit the pattern and check for errors in the signal it receives back.
Delay Test	DSU transmits and receives a test signal, which is looped back by the DSE; the DSU measures the round trip time (delay).

Diagnostic Test Procedure

1. Click on the check box next to the selected test. If you are running the Delay Test, go to Step 4.
2. Under the Pattern heading, click on your selected pattern. The Dataloop test also supports the selection None (for external data).
3. If you are using an internally generated test pattern select, in the Test Blocks field, how much data is to run before the test ends automatically.
4. Click on the Start Test button. While the test runs, the graphic panel illustrates the data path employed by the test. If you are using an internally generated test pattern, the Time Remaining field counts down from 100 to 0 percent.
5. During a test that employs an internally generated test pattern the Test Results field displays the number of errors detected; it displays In Loop when external data is in use.
6. If you are using an internally generated test pattern, the test ends automatically when the specified number of data blocks have run. For any other test, click on the Stop Test button to end the procedure.

Note *Following any test except Dataloop a pop up window appears with the message* Network element communication problem. Try again.

The message results from the interruption caused by the test. Normal operation should resume when you click on the OK box to dismiss the pop up.

Diagnostics History

You can view a record of tests performed during the current diagnostic session by selecting History from the Navigate menu in the Diagnostics window. The record appears as a listing in the Diagnostics History window (*see Figure 6-11*).

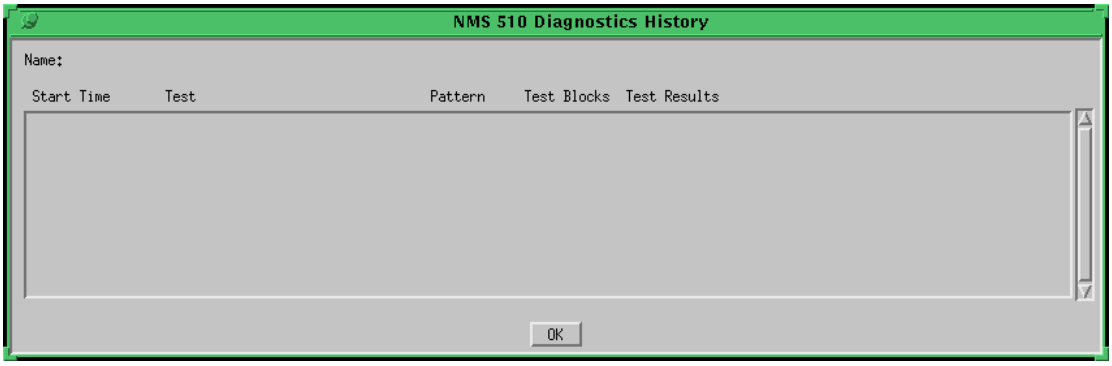


Figure 6-11 Diagnostics History

The Diagnostics History displays information in five columns:

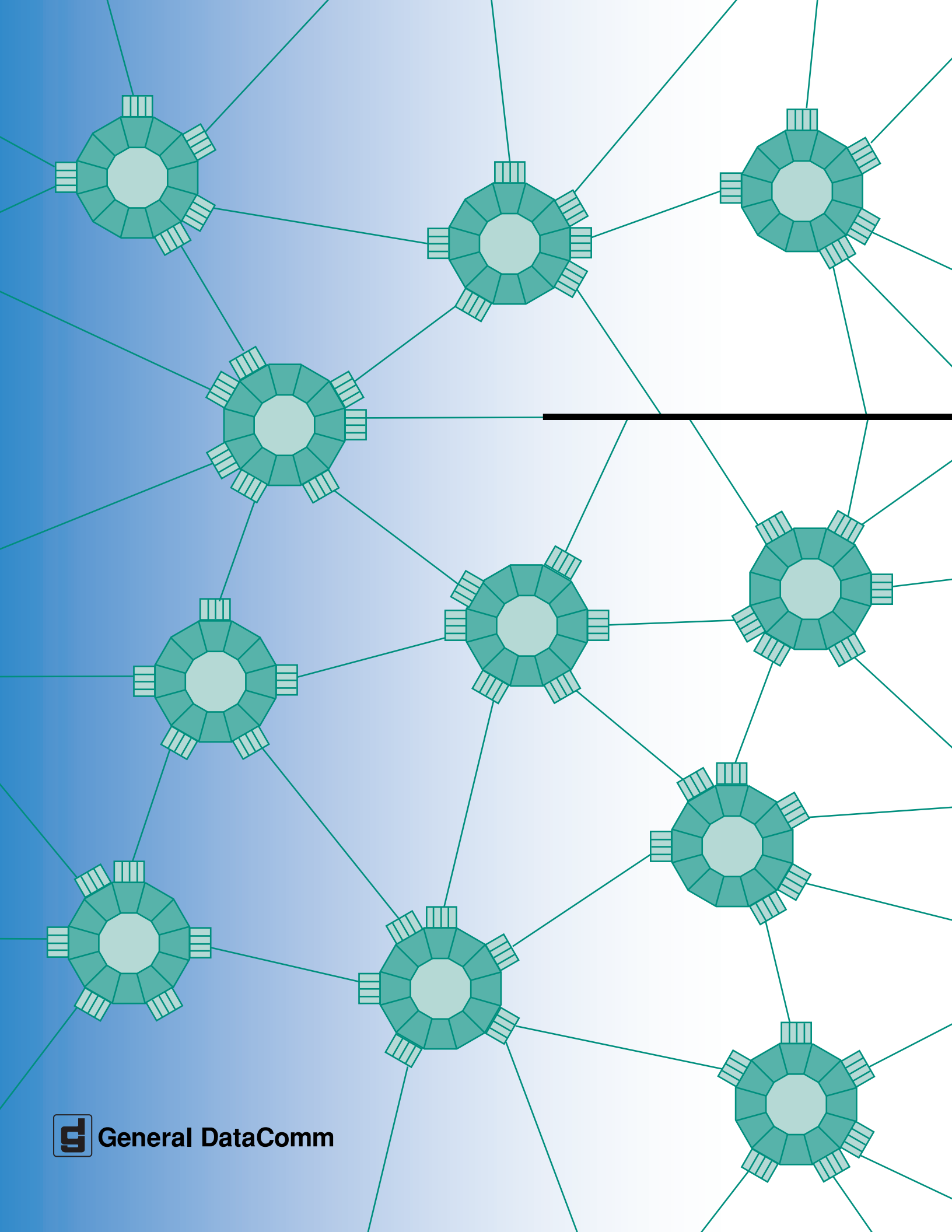
- Start Time – date and time test began
- Test – name of the test
- Pattern – test pattern used for the test; N/A when internally generated pattern is not used
- Test Blocks – number of data blocks sent during the test, applies only to tests with test pattern
- Test Results – "Idle: *n/n* Bit/Block Errors" for a completed test with test pattern; "Not in loop [STOPPED]" for a completed loop test without test pattern; "TEST STOPPED" for any test with test pattern that was ended by the Stop Test button; "*n* ms." for Delay Test

To close the Diagnostics History window, click on either the OK button or the pushpin icon in the upper left corner of the window. During an on-going diagnostic session you can close and re-open the Diagnostics History window without loss of display data.

The application clears the Diagnostics History when you exit from the Diagnostics window.

Miscellaneous Functions

The submap Misc Menu has selections for Front Panel Poll Rate and Note Pad. These selections access the same applications that are described in *Chapter 2, Operations*.


General DataComm