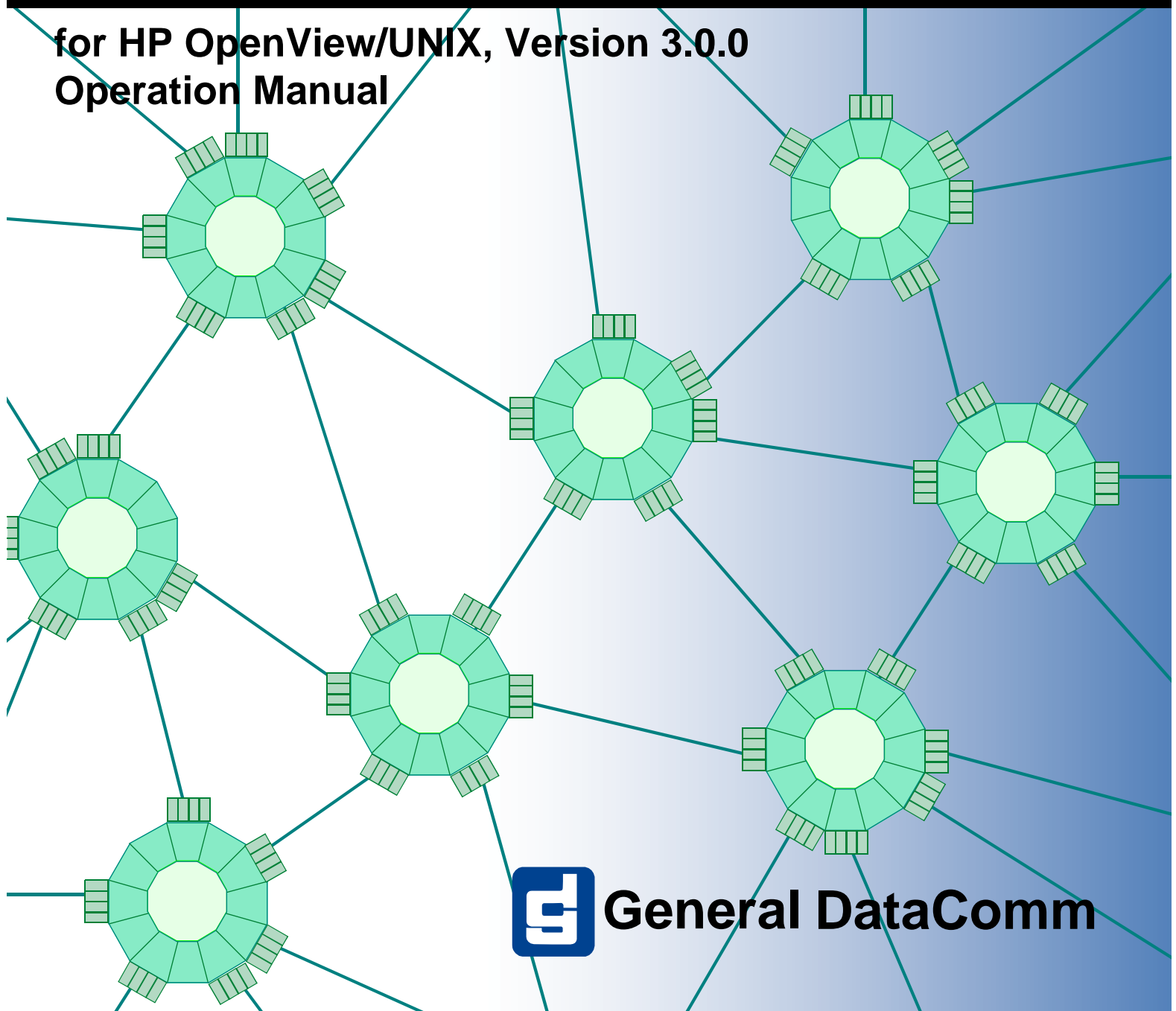


GDC TEAM[®] 521

**for HP OpenView/UNIX, Version 3.0.0
Operation Manual**



General DataComm

GDC TEAM[®] 521

**for HP OpenView/UNIX, Version 3.0.0
Operation Manual**

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Safety Guidelines

Always use the following guidelines when unsafe conditions exist or when potentially hazardous voltages are present:

- Always use caution and common sense.
- Repairs must be performed by qualified service personnel only.
- To reduce the risk of electrical shock, do not operate equipment with the cover removed.
- Never install telephone jacks in a wet location unless the jack is designed for that location.
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
- Never install telephone wiring during an electrical storm.

Antistatic Precautions

Electrostatic discharge (ESD) results from the buildup of static electricity and can cause computer components to fail. Electrostatic discharge occurs when a person whose body contains a static buildup touches a computer component. The Innovx 553 may contain static-sensitive devices that are easily damaged. Proper handling, grounding and precautionary ESD measures are essential when installing parts or cards. Keep parts and cards in antistatic packaging when not in use or during transport. If possible, use antistatic floorpads and workbench pads.

When handling components, always use an antistatic wrist strap connected to a grounded equipment frame or chassis. *If a wrist strap is not available, periodically touch an unpainted metal surface on the equipment.* Never use a conductive tool, like a screwdriver or a paper clip, to set switches.

FCC Part 68 Compliance

Connection of data communications equipment to the public telephone network is regulated by FCC Rules and Regulations. This equipment complies with Part 68 of these regulations which require all of the following:

All connections to the telephone network must be made using standard plugs and telephone company provided jacks or equivalent. Connection of this equipment to party lines and coin telephones is prohibited. A label on the component side of the unit's printed circuit board provides the FCC Registration number for the unit. If requested, give this information to the telephone company. To connect the Innovx 553 to the Public Telephone Network, you are required to give the following information to the telephone company:

- FCC Registration Number: TBD
- Facility Interface Codes: 04DU9-BN, 04DU9-DN, 04DU9-1KN, 04DU9-1SN
- Service Order Code: 6.0Y
- Telephone Company jack type: RJ48C

The telephone company may discontinue your service if the unit causes harm to the telephone network. If possible, you will be notified of such an action in advance. If advance notice is not practical, you will be notified as soon as possible and will be advised of your right to file a complaint with the FCC. The telephone company may change its communication facilities, equipment, operations and procedures where reasonably required for operation. If so, the telephone company will notify you in writing. All repairs or modifications to the equipment must be performed by General DataComm. Any other repair or modification by a user voids the FCC registration and the warranty.

Industry Canada Notification

The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operation and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Electromagnetic Compatibility

This Class A digital apparatus complies with Canadian ICES-003.

Avis D'industrie Canada

L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

Avis: L'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

La Compatibilité d'Électro-magnétique

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Deutschland

Installations Anweisungen: Installieren Sie die Telefonleitungen nicht während eines Gewitters. Installieren Sie die Telefonleitungen nicht in einem feuchten Raum, außer die Dose entspricht den Vorschriften für Feuchträume. Berühren Sie unisolierte Telefonleitungen oder Einrichtungen nicht, außer diese sind vom Telefonnetz getrennt. Vorsicht bei der Installierung oder Änderung von Telefonleitungen. *Achtung:* Es gibt keine durch den Benutzer zu wartende Teile im Gerät. Wartung darf nur durch qualifiziertes Personal erfolgen.

EC Declaration of Conformity

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Wokingham, Berkshire RG41 2QF, United Kingdom

On behalf of: General DataComm Inc.
1579 Straits Turnpike
Middlebury, CT 06762-1299, U.S.A.

The products to which this declaration relates are in conformity with the following relevant harmonized standards, the reference numbers of which have been published in the Official Journal of the European Communities.

Electromagnetic Compatibility

EN55022: 1994

Specification for limits and methods of measurement of radio interference characteristics of information technology equipment.

EN 50082-1: 1992

Generic immunity standard Part 1 Residential, Commercial, and Light Industry.

Safety

EN 60950: 1995 A1 through A3

Low Voltage Directive relating to electrical equipment designed for use within certain voltage limits.

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Preface

Scope

This manual describes how to install and operate version 3.0.0 of the TEAM 521 software application. The TEAM 521 software is an HP Openview application that employs the Simple Network Management Protocol (SNMP) to configure and control the operation of GDC SpectraComm 521 Data Service Units (DSUs).

The SC 521 DSU is a DATAPHONE Digital Service (DDS) compatible DSU that is intended to be used in central site applications. It is compatible with remote DDS units from other manufacturers. It supports the greatest range of management capabilities when used in conjunction with GDC equipment at the remote site: an NMS 520 DSU or an NMS 510 DSU.

The TEAM 521 application communicates with its master SC 521 DSUs through a SpectraComm Manager (SCM) card that occupies the SpectraComm shelf with them. Control by the application can extend also to remote DSUs that are connected to the DSUs under its local control.

Operating instructions for the SCM appear in the TEAM Core Operation manual.

This manual assumes a working knowledge of DSU functions and operation.

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, is possible that information may not be current. Contact General DataComm if you require updated information for this other General DataComm products.

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Revision History

This is the initial issue of TEAM 521 Version 3.0.0. Version 3.0.0 differs from Version 2.1.0 through the addition of tool bar interface features in the configuration screens and Year 2000 compatibility. Version 3.0.0 also fixes a problem which existed with 2.1.0 when configuring a non-flash (non-downloadable) version of SC 521 cards. All features of the product are described in [Chapter 2, Operations](#) of this manual.

Version 2.1.0 differed from Version 2.0.0 through a variety of small enhancements, and the addition of a Save to File capability in the Line Statistics function.

Issue Number	Date	Description of Change
01	July 1998	Never Released (Internal Use Only)
02	April 1999	Initial Release

Related Publications

The following documents have additional information that may be helpful when using this product:

Publication	GDC Number
TEAM Core Operation	GDC 058R720-V300-01
SpectraComm 521 Data Service Unit Installation and Operation	GDC 076R108-000

GDC publication numbers are used to track and order technical manuals. Publication numbers use the following format:

GDC NNNRnnn-000 or GDC NNNRnnn-Vnnn

NNN	identifies the product family (e.g. TEAM)
R	denotes a technical publication
nnn	a number assigned by Technical Publications
000	identifies a hardware product and does not change
Vnnn	the software version associated with a product may be updated periodically

The Issue Number only changes when a manual is revised or when a manual is reprinted for some other reason; it does not automatically change when software version is updated. Other specialized publications such as Release Notes or Addenda may be available.

Manual Organization

This manual is divided into the following chapters:

- *Chapter 1, Introduction* describes the TEAM 521 application, the GDC SC521 DSU that you control with the application, and the TEAM environment in which the application operates, particularly the SCM that enables communication between the application and the DSUs it controls.
- *Chapter 2, Operations* provides directions for accessing the smaller individual applications that are responsible for the TEAM 521 functions. It describes how to access the functions from a shelf map window menu bar, and from the Select menu of a DSU front panel display. The chapter provides full descriptions of the TEAM 521 applications that display read-only windows. It provides access information for the applications that display read/write windows and require greater operator interaction.
- *Chapter 3, Configuration* provides instructions for accessing the Configuration application and using it to set modem channel operating parameters. The chapter covers how to save configuration changes to the DSU or a template at the controller workstation, and defines the parameters you can set.
- *Chapter 4, Maintenance* provides instructions for accessing the Maintenance application and using it to control functions of the DSU.
- *Chapter 5, Diagnostics* provides instructions for accessing the Diagnostics application window and using it to perform test procedures.
- *Chapter 6, NMS 520* provides instructions for use of the NMS 520 applications provided for configuration, control, and diagnosis of remote NMS 520 DSUs.
- *Chapter 7, NMS 510* provides instructions for use of the NMS 510 applications provided for configuration, control, and diagnosis of remote NMS 510 DSUs.

Document Conventions

This typewriter font designates output displayed on the terminal interface screens, input entered by you, or panel indicators.

This bold font designates window names and menu selections .

Note *Indicates a note. It is something you should be particularly aware of; something not readily apparent. 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.*

Safety Information

The CAUTION, WARNING, and DANGER statements that appear throughout this manual are intended to provide critical information for the safety of both the service engineer and operator. These statements also enhance equipment reliability.

The definitions and symbols for CAUTION, WARNING, and DANGER comply with ANSI Z535.2, American National Standard for Environmental and Facility Safety Signs, and ANSI Z535.4, Product Safety Signs and Labels, issued by the American National Standards Institute.

The following examples show the symbols and definitions of CAUTION, WARNING, and DANGER as they are used in this manual.



CAUTION *Indicates a potentially hazardous situation which, if not avoided, may result in minor to moderate injury. It may also be used to alert against unsafe practices.*



WARNING *indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.*



DANGER *indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.*

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Chapter 1: Introduction

Overview

This manual covers the General DataComm TEAM 521 Unix Application for HP OpenView. You should be familiar with HP OpenView and with the operation of digital data service units (DSUs) in order to use this manual effectively.

The TEAM 521 Unix Application is actually a collection of integrated applications for the HP OpenView Network Management Platform. The applications use the Simple Network Management Protocol (SNMP) to manage GDC SC521 Data Service Unit (DSU) cards, which are installed in a GDC SpectraComm shelf.

TEAM 521 applications enable you to:

- **Configure** SC521 DSUs.
- **Monitor** the operation of the DSUs through displays of Alarms and DTE Interface States, and through a Front Panel display that shows LED indicators as they appear on the front panel of the physical unit.
- **Diagnose** suspected problems using local and remote loops (with or without an internally generated test pattern).

It also provides functions for performing the same range of tasks on an NMS 520 or NMS 510 Data Service Unit (DSU) installed as the remote unit with which the SC521 DSU communicates.

Communications between the TEAM 521 application and the DSUs occurs through a GDC SpectraComm Manager (SCM) card installed in the shelf with the DSUs. The workstation that runs the TEAM 521 application must also be running the TEAM Core application for managing the SCM.

SC 521 DSU

The SpectraComm 521 Data Service Unit (DSU) is a multi-rate data service unit capable of operating in standard DATAPHONE Digital Service (DDS), DDS with a secondary channel (DDS/SC), or 64 kbps clear channel mode. It can support DTE data rates of 2.4, 4.8, 9.6, 19.2, 56.0, and 64.0 kbps. When equipped with the optional Data Rate Adapter, it also supports asynchronous data rates below 2400 bps, down to 300 bps.

SpectraComm Manager Card

The DSU operates in conjunction with a GDC SpectraComm Manager (SCM) card to provide comprehensive network management capabilities using the Simple Network Management Protocol (SNMP). The SC acts as the SNMP agent through which TEAM management applications C 521 DSUs 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 by which HP OpenView keeps track of the devices being managed.

TEAM 521 Applications

The applications that make up the TEAM 521 manager are grouped on menus under the headings Performance, Configuration, Fault, and Misc (Miscellaneous). Menus for the applications are available in two ways:

- From the menu bar of the HPOV Map window when a SC 521 DSU is selected in the window
- From the Select button on the SC 521 Front Panel display

SC 521 Front Panel displays current status information on the SC 521 DSU by displaying the states of the LED indicators on the front panel of the unit; provides Select button menus by which you can invoke all other functions of the TEAM 521 manager. Front Panel is a selection on the Performance menu in the HPOV Map window menu bar. You can also launch the Front Panel display from that window by double clicking on the shelf icon of the DSU you need to work with.

The following TEAM 521 applications appear on both the Map window and Select button menus:

Performance:

- Alarms - furnished detailed information about alarm state changes
- DTE Status - displays information on the status of signals in the DTE interface
- Line Statistics - displays information on network interface functions

Configuration:

- Configure - enables you to configure a selected SC 521 DSU
- Maintenance - enables you to set device specific attributes that are not set as configuration options

Fault:

- Diagnose - enables you to run diagnostic tests on a selected SC 521 DSU

The Misc menu in the Map window menu bar contains three selections that do not appear in the Front Panel Select button menu:

- Information - displays application name and revision level; can also be accessed by clicking on the GDC logo in the Front Panel display.
- Front Panel Poll Rate - enables you to set a default polling interval to be in effect each time the Front Panel display is opened.
- Note Pad - opens a shell tool on the workstation running the TEAM software. You can use the shell tool to run a text editor, mail tool, or any other software that resides on the workstation. The Note Pad application provides this access for keeping records on the system.

OpenView Information

For information regarding OpenView, refer to your OpenView documentation.

TEAM 521 supports the OpenView capability of selecting multiple icons in a map window in order to launch the same application window for multiple units simultaneously. You can select multiple icons either by clicking the dragging to “box” the icons you intend to select, or by clicking on icons individually while holding down the Control and Shift keys.

You can select up to ten icons at a time, and they must all be for the same type of device.

Chapter 2: Operations

Introduction

The TEAM 521 controller application consists of a group of smaller applications, each devoted to a specific aspect of controlling or monitoring the SC 521 Data Service Unit. There are two means of access to the TEAM 521 applications: the shelf map menu bar, and the Front Panel window Select button menus. This chapter describes both.

There are four applications in the Performance category: Front Panel displays a representation of the DSU front panel that serves both to show the status of the unit's LEDs and to provide an interface to the rest of the applications; Alarms 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. This chapter fully describes all four of these applications.

There are two applications in the Configuration category: Configure and Maintenance. Each supports read/write windows by which you can review and alter DSU operating parameters. This chapter describes how to access the Configure and Maintenance applications. Instructions for using the two applications appear in subsequent, individual chapters.

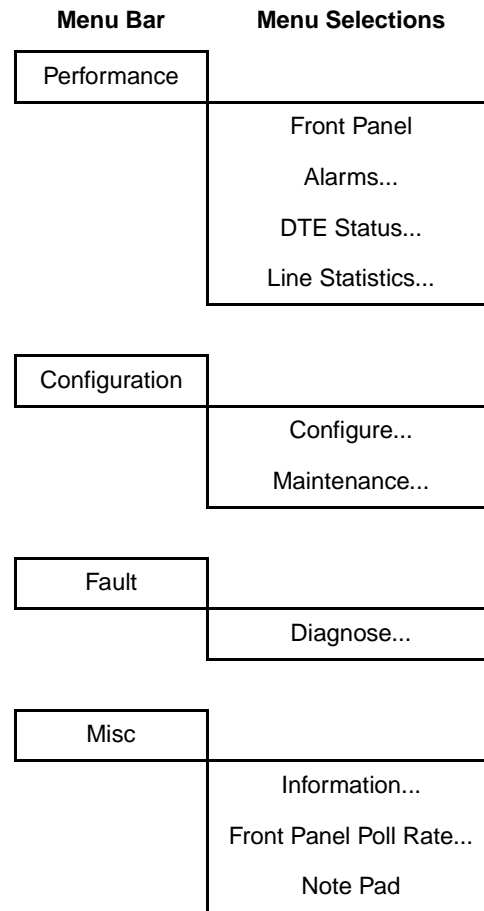
The Fault menu provides access to the Diagnose application by which you can command the test functions of the DSU and view test results. This chapter describes how to access the Diagnose application. Instructions for using the application appear in a subsequent chapter.

Three items appear on the shelf map menu bar as Misc (miscellaneous): Information, Front Panel Poll Rate, and Note Pad. Of the three, only Information can be accessed from the Front Panel display, and that is done by clicking the mouse on the GDC logo of the Front Panel rather than through the menu. This chapter describes all three functions.

Map Window Menu Bar Access

The table on the following page illustrates how the TEAM 521 application functions are arranged on the menu bar at the top of the HPOV Map window. The table shows only the menu selections for the TEAM 521 applications. The map window menus include selections in addition to those that apply to TEAM 521 because the window also provides access to other applications.

You must select the DSU you intend to work with before you open the menu you intend to use. Select the DSU by clicking the mouse once on its icon in the shelf map.



The Performance menu Front Panel selection opens the Front Panel display window. The Select button menus in the Front Panel display window include the selections that appear above, with the exceptions of Front Panel under Performance and the Misc category.

Common Window Features

Each TEAM 521 application you select opens an on-screen window in which to operate. A number of features are common to many of the windows:

- Triangle button – in the title bar; reduces the window to an icon when you click on it. Double clicking on icon restores the window. This button appears on the top level window for each application
- Title bar – identifies the specific TEAM 521 application running in the window; for example TEAM 521 Main Configuration or TEAM 521 Diagnostics
- Menu bar – always contains the selections File, on the far left, and Help, on the far right. File menu always contains the selection Exit, by which you can dismiss the window; some window File menus contain selections special to the window. Help menu provide access to information concerning the window. Some windows have additional Menu bar selections.

The Menu bar appears on the top level window for each application. A Menu bar appears in the Main Configuration window, for example, but not in the windows you access from Main Configuration.

Name field – identifies the SC 521 the application is currently connected to by displaying the user-configured shelf name, followed by the DSU slot number, and the user-configured device name.

Descriptions in this manual of the individual TEAM 521 applications identify window features that are specific to the applications, such as selections in the Menu bar and menus, and buttons.

Performance Functions

SC 521 DSU Front Panel

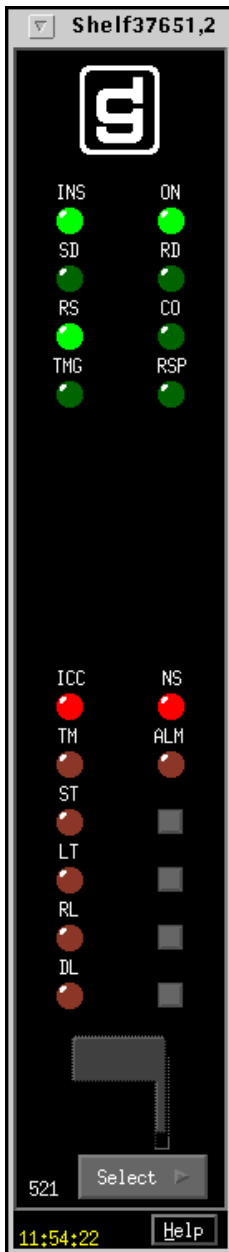
The SC 521 Front Panel display window (*See Figure 2-1*), which you launch from the HPOV Map (shelf sub-map) window, provides a graphical interface to a selected SC 521 DSU.

You can launch a Front Panel display by clicking on the slot icon of the unit you intend to work with to select it, and then selecting Front Panel from the Performance menu in the menu bar at the top of the window. The application responds with the Front Panel display.

You can also launch the display by double clicking on the slot icon. If the DSU **does not** have an associated remote (indicated by a box around the slot icon symbol), the application responds with the Front Panel display.

A DSU that **does have** an associated remote is identified in the shelf sub-map by a slot icon symbol without a box. When you double click on that icon, the application opens another submap which displays icons for the SC 521 and its remote with a connecting line to indicate that together they form a link. Double click on the SC 521 icon in the link submap to reach the Front Panel display.

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



- INS In Service normally remains On continually after the DSU successfully completes its power-on test
- ON Power On
- SD Send Data indicates when lit that the DSU is transmitting data, it displays a two-headed arrow to indicate transitions
- RD Receive Data indicates when lit that the DSU is receiving data from the remote DSU, it displays a two-headed arrow to indicate transitions
- RS Request To Send indicates when lit that the DTE has data to transmit, it displays a two-headed arrow to indicate transitions
- CO Carrier On indicates when lit that the DSU is receiving a signal, it displays a two-headed arrow to indicate transitions
- TMG Provided for future use; no currently supported function
- RSP Management Response
- ICC Inactive Condition Code is lit when the DSU network interface is experiencing an out of sync (OOS) or out of frame (OOF) condition.
- NS No Signal is lit when the DSU is not receiving a signal at its network interface
- TM Test Mode, is lit red while the DSU performs a diagnostic test; during a test employing Self Test a two-headed arrow superimposed on the LED indicates that errors have been detected
- ALM Alarm, indicates by its color, which matches that of map icons for the unit, that the DSU has detected an alarm condition
- ST Self Test is lit while the internal test pattern generator/checker is active
- LT Local Test is lit while the DSU is in the Local Loopback test condition
- RL Remote Loop is lit while the DSU is performing a remote loopback test with the remote DSU
- DL Digital Loop is lit while the DSU is performing a digital loopback to direct data back to the remote DSU

Figure 2-1 SC 521 DSU Front Panel

All front panel indicators are lit when the Select button menu item LED Test is set to On.

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 time is displayed in white when Auto Poll is enabled, and in yellow when it is disabled.

The Select button, at the bottom of the Front Panel display provides access to menus for the rest of the TEAM 521 application functions. The following table shows the arrangement of the Select button menus. It differs somewhat from the arrangement on the Map window menu bar.

Select Menu Items	Menu Selections
Performance	Alarms... DTE Status... Line Statistics...
Configuration	Configure... Maintenance...
Fault	Diagnose...
Demand Poll	
Auto Poll (*) *Displays Off or selected poll interval	15 seconds 30 seconds 60 seconds Disable
LED Test (*) *Displays On or Off	On Off
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.

Alarms

You can launch the TEAM 521 Alarm application from the HPOV Map Performance Menu or from the front panel menu. The application displays the read-only Alarm Detail window for the selected DSU (See Figure 2-2).

The TEAM 521 application gets alarm indications from the DSU in two ways:

- By receiving traps that the SCM sends automatically in response to alarm conditions at the DSU
- By polling the SCM for changes in alarm conditions at the DSU.

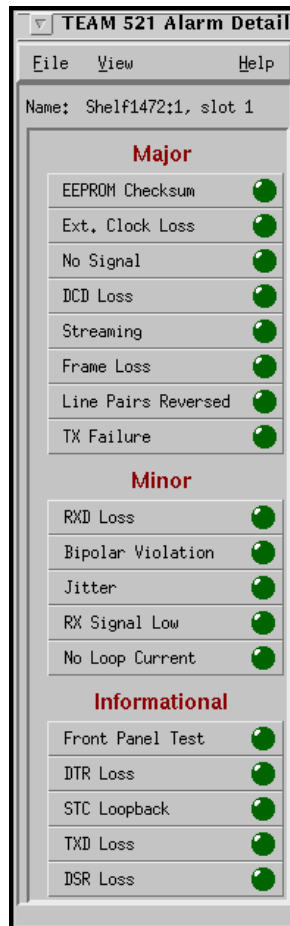


Figure 2-2 Alarm Detail Window

The Alarm Detail window displays alarms grouped into three categories:

- Major
- Minor
- Informational

Major Alarms

EEPROM Checksum – indicates that the non-volatile memory that stores the DSU configuration has become corrupted

Ext. Clock Loss – indicates loss of external clock signal from the DTE

No Signal – indicates loss of signal at the network interface

DCD Loss – indicates loss of incoming signal

Streaming – indicates constant RTS condition

Frame Loss – indicates out of frame condition at the network interface

Line Pairs Reversed – indicates the DDS line was incorrectly installed at the network interface

TX Failure – indicates failure of the DSU to transmit data

Minor Alarms

RXD Loss – indicates reception of valid carrier without data (switched carrier operation only)

Bipolar Violation – indicates failure of consecutive ones to alternate states in the signal being received

Jitter – indicates excessive jitter (phase shift) in the signal being received

RX Signal Low – indicates low signal level being received at the network interface

No Loop Current – indicates absence of dc current at the network interface

Informational Alarms

Front Panel Test – indicates the DSU has been commanded into a test by means of its front panel switches

DTR Loss – indicates the DSU is not receiving Data Terminal Ready from the DTE

STC Loopback – indicates the DSU has been commanded into a test by the Telco Serving Test Center (STC)

TXD Loss – indicates DTE asserted RTS without providing Transmit Data (switched carrier operation only)

DSR Loss – indicates the DSU is not outputting Data Set Ready to the DTE

Alarm Detail Window Menus

The Alarm Detail window has a File menu and a View menu in its menu bar.

The File menu contains the selections Demand Poll, Auto Poll, and Exit:

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 alarm conditions as they were at the last poll, either when the window was launched or a subsequent Demand Poll.

Exit dismisses the window.

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.

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.

DTE Status

You can launch the TEAM 521 DTE Status application from the HPOV Map Performance Menu or from the front panel menu. The application displays the read-only Status window for the selected DSU (See Figure 2-3). 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.

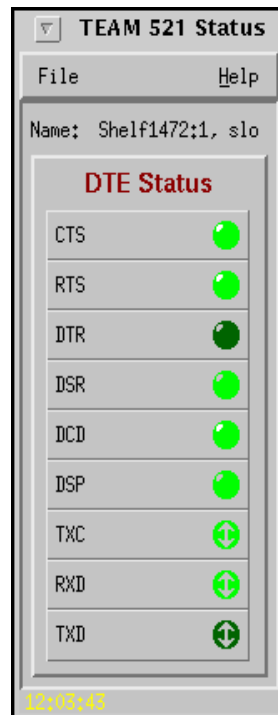


Figure 2-3 DTE Status Window

Line Statistics

You can launch the TEAM 521 Line Statistics application from the HPOV Map Performance Menu or from the front panel menu. The application displays DSU transmission information and reception functions at the network interface during the most recent 15 minutes. You can also save such information to a file. The application displays eight columns, described below.

The Minute Interval column simply identifies the time frame for the other seven items in the row. Each row represents one minute. 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 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. The Signal Quality column indicates the overall condition of the signal being received during the minute.

Minute Interval	Status	Transmit Level	Receive Level	Phase Jitter	BPV Count	Frame Loss Count	Signal Quality
1	Normal	6 dB	4 dB	0%	0	0	Good
2	Normal	6 dB	4 dB	0%	0	0	Good
3	Normal	6 dB	4 dB	0%	0	0	Good
4	Normal	6 dB	4 dB	0%	0	0	Good
5	Normal	6 dB	4 dB	0%	0	0	Good
6	Normal	6 dB	4 dB	0%	0	0	Good
7	Normal	6 dB	4 dB	0%	0	0	Good
8	Normal	6 dB	4 dB	0%	0	0	Good
9	Normal	6 dB	4 dB	0%	0	0	Good
10	Normal	6 dB	4 dB	0%	0	0	Good
11	Normal	6 dB	4 dB	0%	0	0	Good
12	Normal	6 dB	4 dB	0%	0	0	Good
13	Normal	6 dB	4 dB	0%	0	0	Good
14	Normal	6 dB	4 dB	0%	0	0	Good
15	Normal	6 dB	4 dB	0%	0	0	Good

Figure 2-4 Line Statistics Window

Line Statistics Window Menus

The Line Statistics window has a File menu that contains four selections:

Demand Poll	causes an immediate update of the display
Save Data to File...	opens a dialog window in which you can specify the directory path and name of a file for storing formatted Line Statistics data
Auto Poll	selects how often the display updates while the window is open: options are 1, 2 or 3 minute intervals, and Disable. When Disable is selected, the window does not update automatically while it is open; it can be updated by Demand Poll.
Exit	dismisses the Line Statistics window

You can store statistics for later review and record keeping by selecting Save Data to File... from the File menu. The function stores the most recent 15 minutes of data, in a format similar to the appearance of the Line Statistics display screen.

The menu selection opens a dialog window in which you can specify the directory path and file name for storing the data. The application automatically appends the file type suffix .521LineStats to any file name that does not already have that suffix.

Configuration Functions

Configure

You can launch the TEAM 521 Configure application from the HPOV Map Configuration Menu or from the front panel menu.

When you launch the application, it initially displays the read-only TEAM 521 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 six read/write windows by which you can configure various aspects of DSU operation:

- System Options
- Network Options
- DTE Options
- Diagnostic Options
- Alarms Reported
- Add Remotes

The TEAM 521 Configure application is fully described in *Chapter 3, Configuration*.

Maintenance

You can launch the TEAM 521 Maintenance application from the HPOV Map 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 TEAM 521 Maintenance application is fully described in *Chapter 4, Maintenance*.

Diagnostics

You can launch the TEAM 521 Diagnose application from the HPOV Map Fault Menu or from the Front Panel display Select button menu.

The application displays one read/write window by which you can control a variety of test functions on the DSU. The TEAM 521 Diagnose application is fully described in *Chapter 5, Diagnostics*.

Miscellaneous Functions

Information

You can launch the TEAM 521 Information window from the HPOV Map Misc menu or by double clicking on the GDC logo in the Front Panel display.

Information 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.

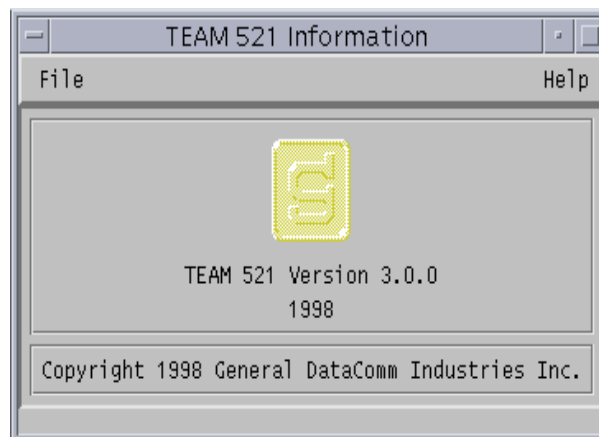


Figure 2-5 TEAM 521 Information Window

Front Panel Poll Rate

You can open the Front Panel Poll Rate window (See *Figure 2-5*) from the 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.

There are four selections, each accompanied by a checkbox:

Slow

Normal

Fast

Demand Poll Only

The File menu in the menu bar contains two selections: Save to File and Exit.

To set the desired polling rate, first click on the appropriate checkbox and then select Save to File from the File menu. 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.

The polling rate for an individual front panel display can be changed for the duration of a session by means of the Auto Poll selection in the Select button menu. Changes you make with that menu selection are not retained when the display is closed.

To dismiss the window, select Exit from the File menu.

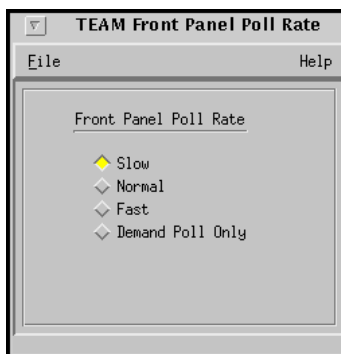


Figure 2-6 Front Panel Poll Rate Window

Note Pad

You can launch the Note Pad application from the shelf submap Misc Menu. The application opens a shell tool on the workstation running the TEAM software. You can use the shell tool to run a text editor, mail tool, or any other software that resides on the workstation. The Note Pad application provides this access for keeping records on the system.

Chapter 3: Configuration

Introduction

The TEAM 521 Configuration application enables you to set all the options in the SC 521 Data Service Unit through a convenient group of configuration windows.

If you are adding an SC 521 DSU to a previously installed shelf with a TEAM 521 application that is already up and running, this chapter contains all the information you need to configure it.

If you are performing initial configuration in a new system, you need to be sure the system is ready before you can configure the DSU. Do the following

- Consult the *SpectraComm Manager Card Installation and Operation* manual, and make sure an IP address is assigned to the SCM.
- Consult the *SpectraComm Manager Card Installation and Operation* and *TEAM Core Operation* manuals, and make sure the SCM is correctly configured.
- Consult HP OpenView documentation, and make sure that OpenView is configured for SNMP management.

To Start TEAM 521 Configuration

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

- Select a DSU symbol on the shelf submap, 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.

Templates

You can store configuration settings as templates on the workstation that runs the TEAM 521 application. A template stores a configuration for the DSU options, and you can store as many templates as you need.

To load configuration settings from a template into the DSU you must perform the following steps:

1. Select Load Template from the File menu and select the template from the resulting dialog window. The application retrieves the configuration settings of the selected template.
2. Select Save to Unit from the File menu. The application makes the template configuration settings the current operating configuration for the DSU.

Configuration Procedure

The following steps describe how to use the configuration application, and illustrate the functions of the Main Configuration window menus.

1. Access the Main Configuration window, either from the submap or from the Front Panel display. The application reads the current Main configuration from the DSU when you open the Main window.

You can select to base your configuration changes on either the current configuration or a stored configuration template. In either case, the DSU continues to operate using its unchanged current configuration.

The **Refresh** selection on the Main window **File menu** causes the application to read the current configuration from the DSU. All changes to all configuration windows that have not previously been saved to a profile or a template are lost when you select Refresh.

2. To edit the current configuration of the DSU, proceed directly to the Navigate menu as described below.

To edit a template, select **Load Template** from the File menu and select a template from the resulting list.

3. Click on the **Navigate button** to display a menu of the configuration windows, and select the one in which you intend to make changes.
4. Make changes as needed in the configuration window. When you click on the input field for an option, a window opens to display all the values the field can be set to. Click the mouse on the value you select. 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.

You can discard changes to a configuration window and return all its fields to their stored 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 close the window.

You can close a configuration window without losing changes by clicking on either the **OK button** or the **pushpin icon**, which is located in the upper left corner of the window.

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.

5. When you have accessed all the configuration windows that you need to and made all of your changes, click on the **File menu button** of the Main Configuration window. From that menu you can select **Save to Unit** to save the new configuration in the DSU, or select **Save to Template** to save it as a template in the workstation.
6. When you select Save to Unit, the changed configuration for the DSU becomes the current configuration.
7. When you select Save to Template, a window appears containing a list of existing templates and a field for entering a new template name. You can select an existing template to be overwritten with the new configuration, or enter a name to create a new template. A stored template is available to be loaded by the application and then saved, with or without further modification, to any SC 521 DSU.

Configuration Option Values

When you click the mouse on the entry field for a configuration item, a window opens containing all the values that are permitted for that configuration item. Hold down the mouse button 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.

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 functions available in the Navigate and File menus can also be invoked by clicking selections in the on-screen tool bar. 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...		
Diagnostic Options...		
Alarms Reported...		
All Above Screens...		
Add Remotes...		

The Main Configuration window title bar displays the application name, TEAM 521 Configuration. The main body of the window contains items arranged under the headings Operation, Software and Hardware that identify the selected unit and provide information about its operations.

The button below the main tool bar, marked with two triangles, toggles display of the window's information panel. Clicking on that button when the full Configuration window is displayed causes the information panel to disappear so that the window consists of just the title, menu, and tool bars. Clicking the button while the window is in its reduced condition restores the full Configuration window.

Main Configuration Window Display

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

Name: name assigned to the selected DSU

Operation

Slot State: Active or Inactive

Operational Status: Online

Software

Serial Number: serial number of the selected unit

Active Firmware Rev: revision level of the operating code the selected unit is currently using

Standby Firmware Rev: revision level of operating code stored by the selected unit but not currently in use

Boot Code Rev: revision level of the boot-up operating code in the selected unit

MIB Version: revision level of the Management Information Base files in the selected unit

Hardware

DTE Interface Type V.35 or RS232

The TEAM 521 application relies on the SCM and SC 521 DSU to indicate when a configuration problem has caused an SNMP set error.



Figure 3-1 Main Configuration Window

System Options

The System Options configuration window contains three configuration options.



Figure 3-2 System Options Configuration Window

Alarm Scan – permits you to enable or inhibit (disable) the alarm scan.

Options:

- *Enable* – DSU reports alarms to the SCM
- *Disable* – DSU does not report alarms to the SCM

Front Panel Switches – 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

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

Options:

- 2, 4, 6, 8 seconds

Network Options

The Network Options configuration window contains two groups of options grouped under the headings Network Parameters and Circuit Parameters.

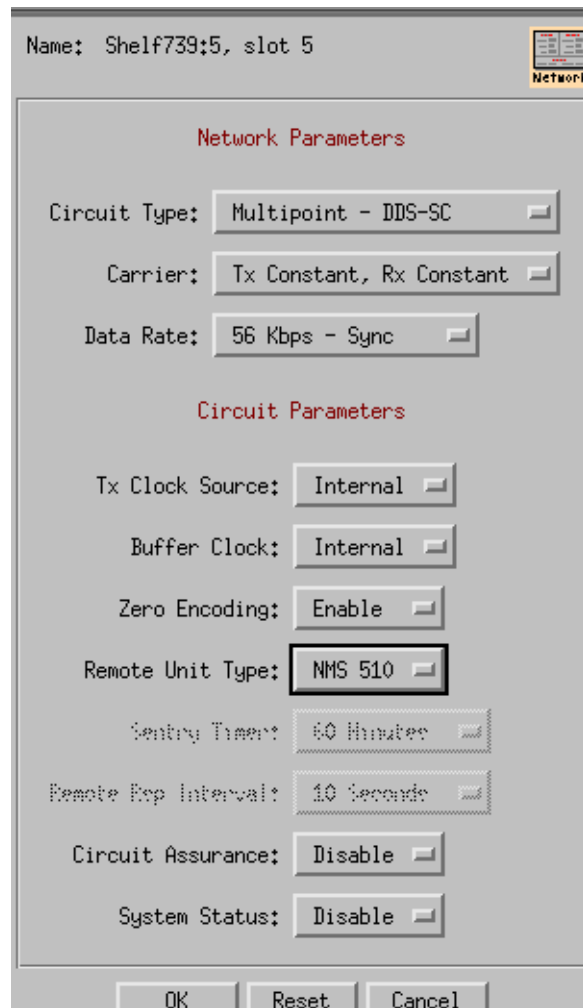


Figure 3-3 Network Options Configuration Window

Network Parameters

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

Options:

- *Pt to Pt - 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
- *Pt to Pt - DDS-I* – specifies a point-to-point DDS-I circuit at any Data Rate up to 56 kbps (Default)
- *Pt to Pt - DDS-SC* – specifies a point-to-point DDS-SC circuit at any Data Rate up to 56 kbps

- *Multipoint - DDS-I* – specifies a multi-point DDS-I circuit at any Data Rate up to 56 kbps
- *Multipoint - DDS-SC* – specifies a multi-point DDS-SC circuit at any Data Rate up to 56 kbps

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 (Default)
- *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

Note *The setting of 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 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.*

Data Rate – selects the data rate and mode (synchronous/asynchronous) to be used 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 (Default)*
- *64 Kbps - Sync* – this 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

Options:

- *Receive* – selects transmit timing based on receive data timing (Default)
- *Internal* – selects transmit timing provided by the DSU internal clock
- *External* – selects 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 selected Tx Clock Source (Default)
- *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 (Default)
- *Disable* – DSU does not prevent the all space condition

Remote Unit Type – specifies the type of remote DSU with which the DSU is to be used. This option is only available to be set 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 function of this option is overridden and the option is grayed out.

Options:

- *NMS 520* – when the remote DSUs are specified to be the NMS 520 unit the options Sentry Timer, Rmt Rsp Interval, and Alarm Hysteresis are available to be configured; this selection enables the NMS 520 DSUs to be added as remotes
- *NMS 510* – when the remote DSUs are specified to be NMS 510 units the options Sentry Timer, Rmt Rsp Interval, and Alarm Hysteresis are grayed out (Default)

Sentry Timer – selects the minimum time interval permitted between alarm reports from a remote NMS 520 DSU operating in a DDS1 or clear channel point-to-point link

Options:

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

Remote Rsp Interval – selects the minimum time interval permitted between alarm reports from a remote NMS 520 DSU in a DDS1 multi-point link

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

Options:

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

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 (Default)
- 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* (Default)
- Enable

DTE Options

The DTE Options configuration window contains three groups of options under the headings Interface, Control Parameters, and Async Parameters.

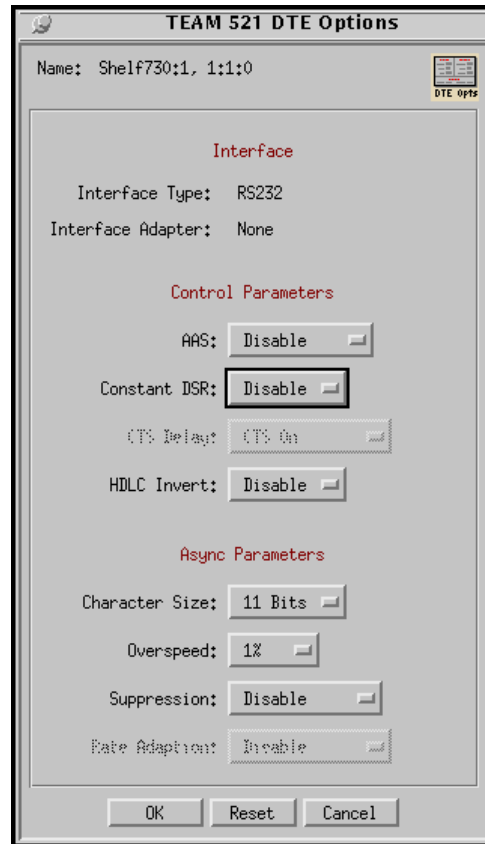


Figure 3-4 DTE Interface Configuration Window

Interface

Interface Type – read-only field displays the DTE port type

Options:

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

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

Options:

- *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

Options:

- Disable (Default)
- 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 (Default)

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 multi-point link is selected Circuit Type (Default)
- *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.

Warning *You must consider the following factors when you change the setting of this option:*

When changing 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 option must be set the same at both ends of the link.

You must 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.

Options:

- Disable – normal data (Default)
- Enable – inverted data

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 (Default)
- 10 Bits
- 9 Bits
- 8 Bits

Over Speed – 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% (Default)
- 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 (Default)
- *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* (Default)
- 600
- 1200
- 1800 to 2400

Diagnostic Options

The Diagnostic Options configuration window contains two groups of options under the headings DTE Equipment and Network Parameters.

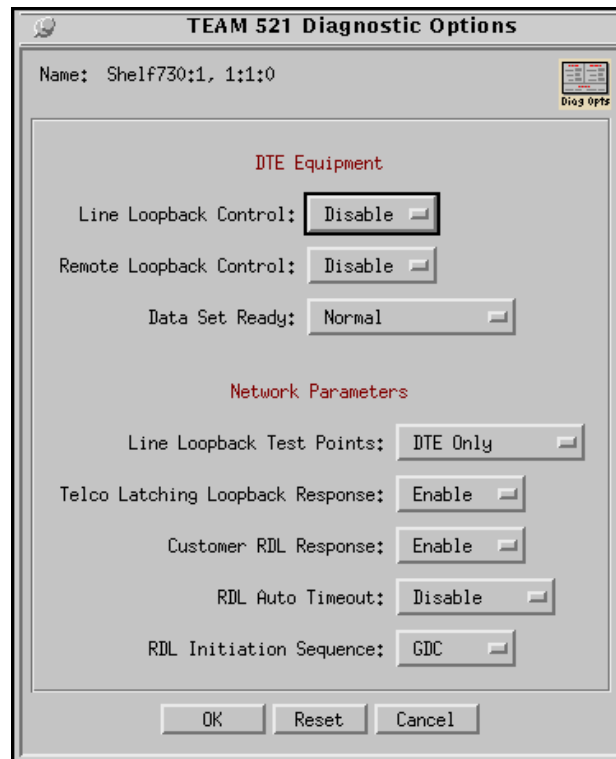


Figure 3-5 Diagnostic Options Configuration Window

DTE Equipment

Line Loopback Control – selects 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

Options:

- Enable
- *Disable* (Default)

Remote Loopback Control – selects 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

Options:

- *Enable*
- *Disable* (Default)

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

Options:

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

Network Parameters

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 (Default)
- *Network & DTE* – Line Loopback command causes DSU to loop data in both directions

Telco Latching Loopback Response – selects 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.

Options:

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

Customer RDL Response – selects whether or not the DSU accepts a remote loopback command from its remote DSU

Options:

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

RDL Auto Timeout – selects whether or not the DSU ends remote digital loop automatically based on a timeout

Options:

- *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 (Default)

RDL Initiation Sequence – selects the remote loopback command the DSU accepts from its remote DSU

Options:

- V.54 (Default)
- PN 127
- GDC

Alarms Reported

The Alarms Reported configuration window (*Figure 3-6*) lets you configure which alarm conditions are to be reported for the DSU and which are not.

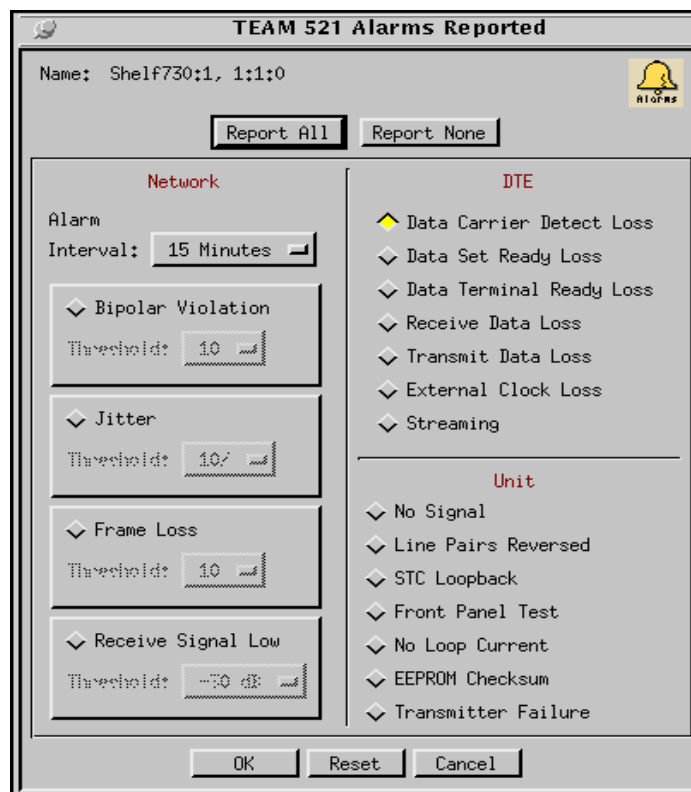


Figure 3-6 Alarms Reported Configuration Window

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 then change the state of individual fields as needed.

Alarm Options – Network

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.

Options:

- 1 min, 5 min, 10 min, 15 min (Default 15)

Bipolar Violation - lets you select 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 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 (Default 10)

Jitter - lets you select 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.

Options:

- 1%, 2%, 5%, 10%, 20%, 40%, 60%, 80%, 99% (Default 10%)

Frame Loss - lets you select 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.

Options:

- 1, 2, 5, 10, 20, 40, 60, 80, 99 (Default 10)

Receive Signal Low - lets you select whether or not Receive 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.

Options:

- -50 dB, -40 dB, -30 dB, -25 dB, -20 dB, -15 dB, -10 dB, -5 dB, 0 dB, 6 dB (Default -30)

Alarm Options – DTE

- Default for all is Masked.
- Data Carrier Detect Loss – indicates loss of DCD
- *Data Set Ready Loss* – indicates loss of DSR
- *Data Terminal Ready Loss* – indicates loss of DTR signal from DTE
- *Receive Data Loss* – indicates no receive data from the remote DSU

- *Transmit Data Loss* – indicates no transmit data from the DTE
- *External Clock Loss* – indicates loss of external clock signal from 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.*

Alarm Options – Unit

Default for all 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 Configuration Checksum

Transmitter Failure – indicates that the DSU has failed to transmit data

Associated Remote

There are two Add Remote configuration windows, one for a single remote in a point-to-point circuit and one for the multiple remotes of a multi-point circuit. The selection made for the Circuit Type option in the Network Options configuration window determines which Add Remotes window is displayed when you select Add Remotes from the Navigate menu in the Main Configuration window.

Note *If you have an Add Remote window open when you change the setting of the Circuit Type option, the application automatically closes the Add Remote window.*

Add Remote, Point-to-Point Circuit

The window is shown in *Figure 3-7* as it appears when the DSU is configured for use in a point-to-point circuit.



Figure 3-7 Add Remote Window (Point-to-Point Circuit)

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 521 application to create the software structures that it requires in order to command and monitor the remote DSU in conjunction with the DSU. The application indicates success by displaying the serial number of the associated remote DSU.
3. Click OK to dismiss the window.

Add Remote, Multi-Point Circuit

The window is shown in *Figure 3-8* as it appears when the DSU is configured for use in a multi-point circuit. The window is divided into two panels labeled Add Remote and Current Remotes. The Add Remote panel contains the two fields and the button by which you perform the process of adding remote units. The Current Remotes panel is a display of units currently on the circuit, identified by their drop numbers.

In this window the Serial Number field is an entry field for you to specify the serial number of the unit you are adding, rather than a display field. One of two messages appears above the Serial Number field, either “Enter NMS510 type serial numbers only,” or “Enter NMS520 type serial numbers only.” The setting of the Remote Unit Type option in the Network Options window determines which of the two messages is displayed. If you change the setting of that option, you cannot add a remote until the change is saved to the unit.

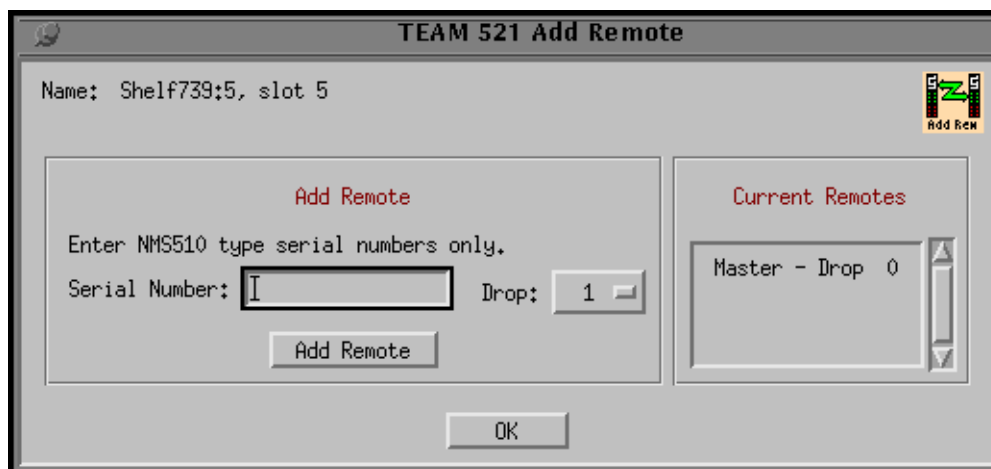


Figure 3-8 Add Remote Window (Multi-Point Circuit)

Perform the following procedure to add a remote DSU in a multi-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. 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 521 application to create the software structures that it requires in order to command and monitor the remote DSU in conjunction with the master DSU. The application indicates success by adding an entry for the new drop number to the list displayed under Current Remotes.
5. Click OK to dismiss the window.

Chapter 4: Maintenance

Introduction

The TEAM 521 Maintenance application provides a group of functions for controlling the operation of an SC 521 Data Service Unit.

To Start TEAM 521 Maintenance

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

- Select an SC 521 DSU symbol on the shelf submap in OpenView, then select the Maintenance option from the Configuration menu.
- Click on the Select button of the Front Panel display, then click on Configuration and select Maintenance from the resulting menu.

The window title bar displays the application name, TEAM 521 Maintenance. The Name field displays the shelf and slot identification for the DSU. See *Figure 4-1*.



Figure 4-1 Maintenance Window

Maintenance Window Buttons

The Maintenance window provides the following three buttons.

Front Panel – permits you to enable or disable the hardware switches on the front panel of the SC 521 DSU. The label on the button appears as either Inhibit Front Panel or Enable Front Panel, and it toggles between the two displays each time you click on the button. The button displays Inhibit Front Panel when the switches are enabled, and it displays Enable Front Panel when they are disabled.

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 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.

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.

Chapter 5: Diagnostics

Introduction

The TEAM 521 Diagnostics application enables you to perform a variety of tests on the SC 521 DSU. Tests can involve just the local DSU, or the local and remote DSUs and the telephone lines that connect them.

Diagnostics Window

Beneath the menu bar and the Name field the Diagnostics window (*See Figure 5-1*) 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
- Time and results panel – contains an input field for specifying the duration of a test that employs the DSU test pattern generator; displays 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 5-6*) 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 two buttons, Start Test and Stop Test.

The following Tests are available:

- Line Loop (can be performed with or without test pattern)
- Remote Loop (can be performed with or without test pattern)
- Data Loop

The three Patterns are:

- 511
- 2047
- 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.

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 selected test: Line Loop, Remote Loop, or Data Loop.
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). No Pattern selection is required for Data Loop.
3. If you are using an internally generated test pattern select, in the Test Time field, how long the test is to run before ending 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 Running: followed by 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 at the end of the specified Test Time. For any other test, click on the Stop Test button to end the procedure. The Stop Test button can also stop a test with test pattern prior to the Test Time limit that would end it automatically.

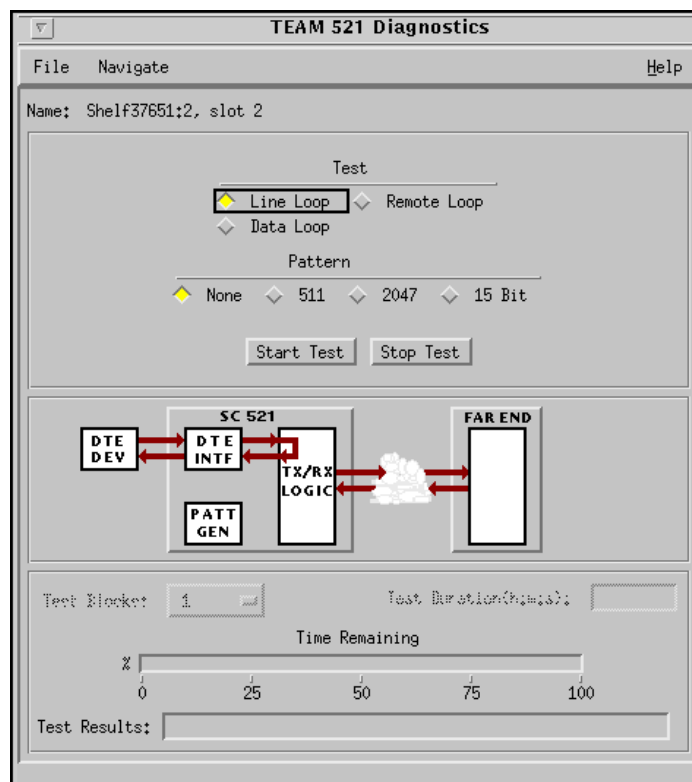


Figure 5-1 Diagnostics Window

Diagnostics Table

The table below briefly describes the available tests. Each test is described more fully and illustrated by a diagram under the headings that follow.

Test	Description
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 means of the Stop Test button.
Line Loop (with Pattern)	DSU initiates a local loopback and activates its own test pattern generator/checker.
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 means of the Stop Test button.
Remote Loop (with Pattern)	Local DSU commands the remote DSU into digital loopback and activates its own test pattern generator/checker.
Data Loop	Local DSU loops data it receives from the remote DSU back to the remote DSU. Must be ended by means of the Stop Test button.

Line Loop

The Line Loop test (See Figure 5-2) lets you isolate problems in the operation of the DSU and the DTE interface.

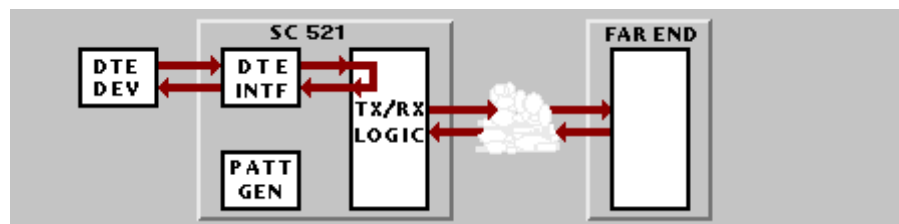


Figure 5-2 Line Loop Test

Line Loop with Test Pattern

Because the pattern generator and checker are internal to the DSU, the DTE interface is not part of the Line Loop test path when you select a test pattern. The use of an internally generated test pattern enables the display of detected errors in the Test Results field.

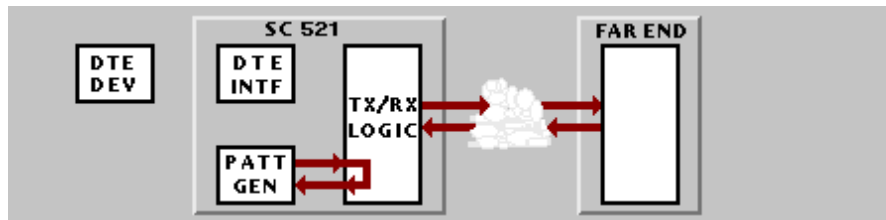


Figure 5-3 Line Loop with Self-Test

Remote Loop

In this test the DSU sends a remote loop command to the remote DSU. The selection of a V.54 or PN 127 remote loop command is made in the Diagnostic Options configuration window. In response the remote DSU couples its receive data to its transmitter input for transmission back to the DSU at the local end (See Figure 5-4).

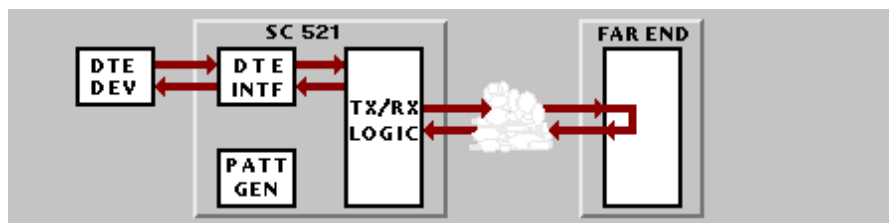


Figure 5-4 Remote Loop

Note The two remote tests, *Remote Loop* and *Remote Loop with Test Pattern*, are only available in a point to point network, and they are not compatible with a remote GDC 520 DSU or GDC 510 DSU.

You can achieve the same functionality with either of those units by directly commanding the remote unit into a loopback.

Remote Loop with Test Pattern

In this test the local DSU sends a Remote Loop command to the remote DSU, then generates a test pattern that it transmits over the network to the remote DSU. The remote DSU loops the received pattern to its transmitter and sends it back to the DSU for analysis (See *Figure 5-5*). This test checks the DSU, the remote DSU, and the link.

The use of an internally generated test pattern enables the display of detected errors in the Test Results field.

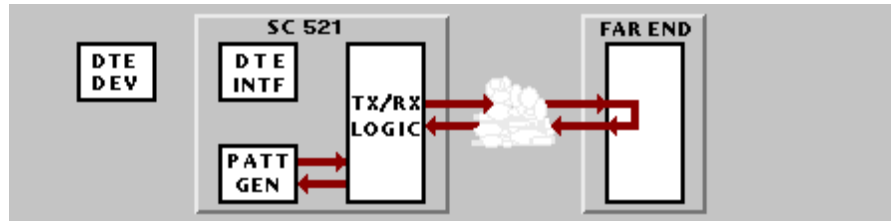


Figure 5-5 Remote Loop with Test Pattern

Data Loop

In Data Loopback (See *Figure 5-6*) local receive data is coupled to the transmitter input so that the remote unit can perform a loopback test without commanding Remote Loopback. The remote DSU site is responsible for test pattern generation and checking in this test.

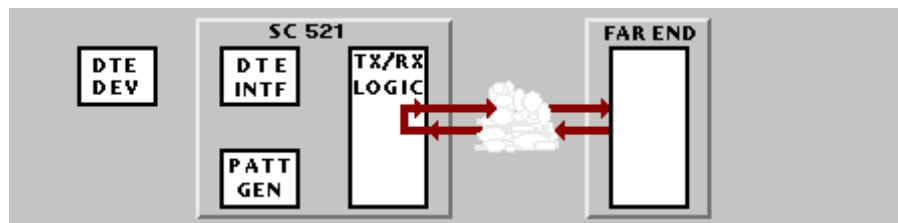


Figure 5-6 Data Loop

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 5-7).

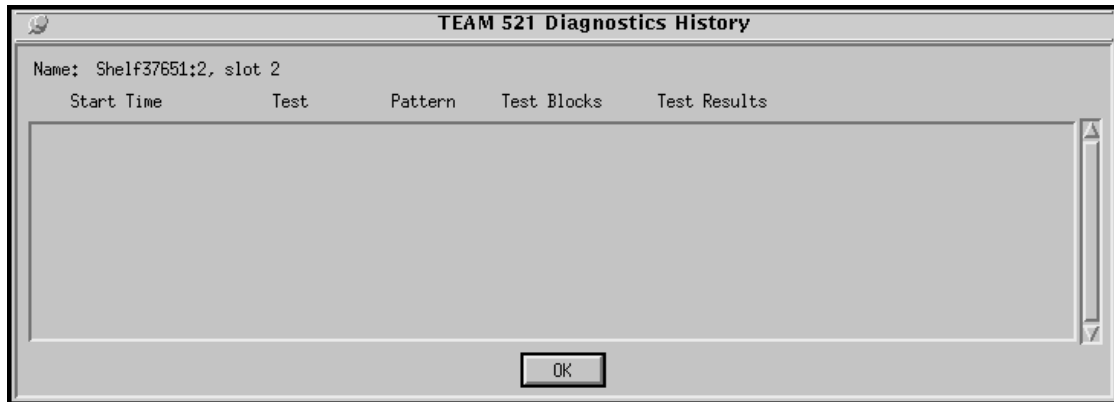


Figure 5-7 Diagnostics History

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 used in the test, applies only to tests with test pattern
- Test Results – “Idle: *n* 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

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.

Chapter 6: NMS 520

Overview

The SC 521 Data Service Unit (DSU) can operate in conjunction with an NMS 520 DSU located at a remote site. The TEAM 521 software supports a full range of functions for the remote NMS 520 DSU, as it does for the SC 521 DSU. This chapter describes the NMS 520 functionality of the software and provides instructions for its use.

Access to the NMS 520 Functions

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

1. 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. 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. 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 521 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 table on the following page illustrates how the NMS 520 functions of the TEAM 521 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 520 functions. The submap window menus include other selections as well because 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... 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 display window (*See Figures 6-1 and 6-2*) 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.

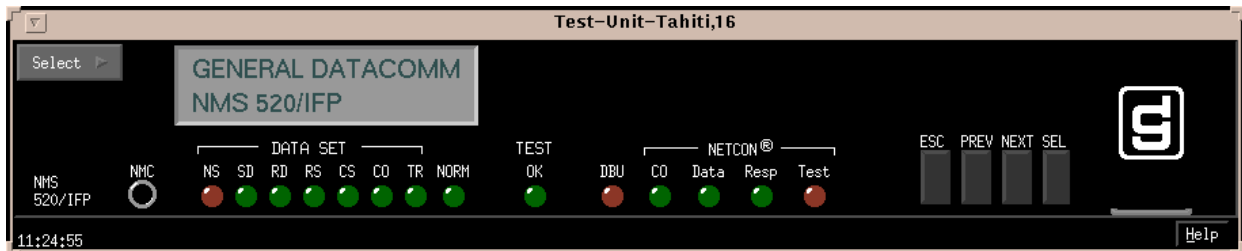


Figure 6-1 NMS 520 IFP DSU Front Panel

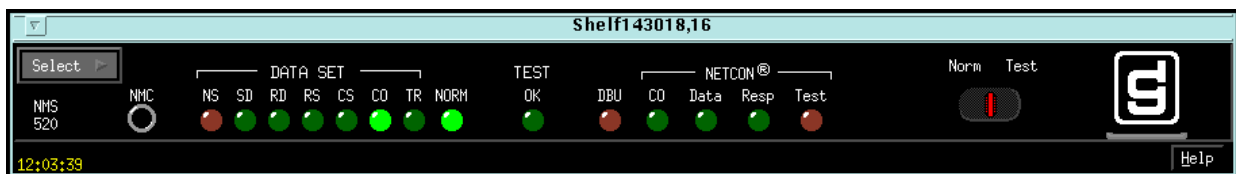


Figure 6-2 NMS 520 Non-IFP DSU Front Panel

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 521 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 6-3).

The TEAM 521 application polls the DSU for changes in alarm conditions.



Figure 6-3 Alarm Detail Window

The Alarm Detail window displays alarms grouped into three categories:

- Major
- Minor
- Informational

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 Alarm Detail window has a File menu and a View menu in its menu bar.

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 (See *Figure 6-4*). 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 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.

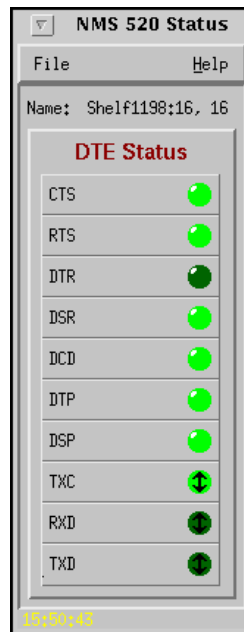


Figure 6-4 DTE Status Window

Line Statistics

You can launch the Line Statistics application from the submap Performance Menu or from the front panel menu. As shown in *Figure 6-5*, 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.

The screenshot shows a window titled "NMS 520 Line Statistics" with a "File" menu and a "Help" button. The window displays the name "Shelf143018;16, 16:1:1" and a table of statistics for the last 15 minutes. The table has the following columns: Minute Interval, Status, Transmit Level, Receive Level, Signal To Noise Ratio, Signal Quality, Phase Jitter, BPV Count, and Frame Loss Count. The data in the table is as follows:

Minute Interval	Status	Transmit Level	Receive Level	Signal To Noise Ratio	Signal Quality	Phase Jitter	BPV Count	Frame Loss Count
1	Normal	0 dB	2 dB	63	Good	0%	0	0
2	Normal	0 dB	2 dB	63	Good	0%	0	0
3	Normal	0 dB	2 dB	63	Good	0%	0	0
4	Normal	0 dB	2 dB	63	Good	0%	0	0
5	Normal	0 dB	2 dB	63	Good	0%	0	0
6	Normal	0 dB	2 dB	63	Good	0%	0	0
7	Normal	0 dB	2 dB	63	Good	0%	0	0
8	Normal	0 dB	2 dB	63	Good	0%	0	0
9	Normal	0 dB	2 dB	63	Good	0%	0	0
10	Normal	0 dB	2 dB	63	Good	0%	0	0
11	Normal	0 dB	2 dB	63	Good	0%	0	0
12	Normal	0 dB	2 dB	63	Good	0%	0	0
13	Normal	0 dB	2 dB	63	Good	0%	0	0
14	Normal	0 dB	2 dB	63	Good	0%	0	0
15	Normal	0 dB	2 dB	63	Good	0%	0	0

At the bottom right of the window, it says "Last Updated: Tue Jun 4 12:30:02 1996".

Figure 6-5 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

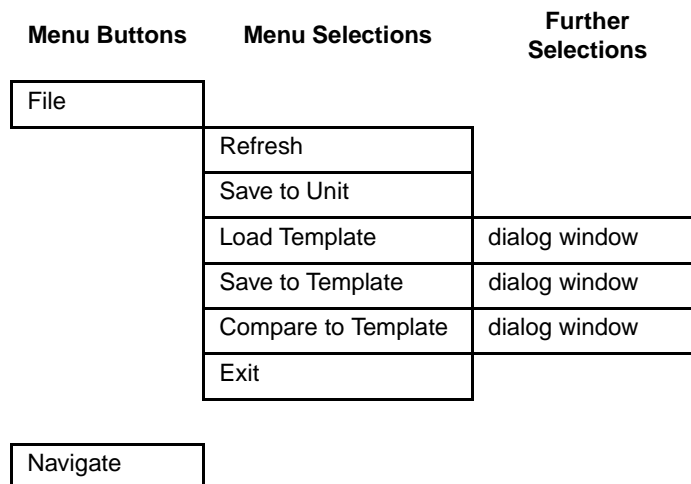
- Refresh, which discards all unsaved changes and restores all options in the displayed configuration windows to the values they are assigned by the current operating configuration
- Save to Unit, which puts the new configuration into use by the DSU
- Load Template, by which you can recall a stored configuration 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 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

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

The Main Configuration window title bar displays the function name, NMS 520 Configuration. The main body of the window contains read-only items that identify the DSU and provide information about its operations.

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 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

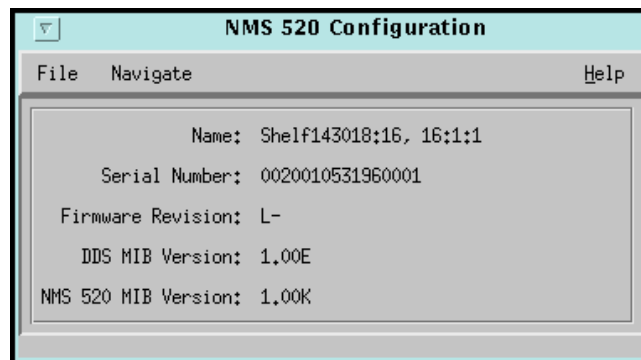


Figure 6-6 Main Configuration Window

System Options

The NMS 520 System Options configuration window contains three options.

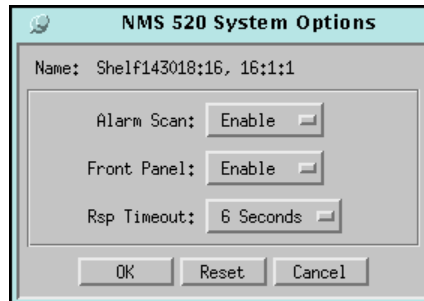


Figure 6-7 NMS 520 System Options Configuration Window

Alarm Scan – permits you to enable or inhibit (disable) alarm trap generation by the SCM.

Options:

- *Enable*
- *Disable*

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 520 Network Options

The NMS 520 Network Options configuration window (*Figure 6-8*) appears when you select Network Options from the Main Configuration window Navigate menu. The window contains two panels labeled Network Parameters and Circuit Parameters.

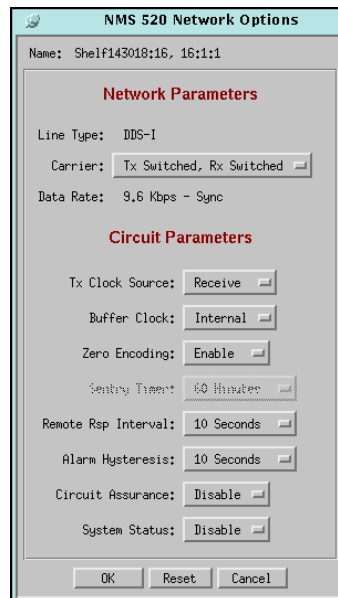


Figure 6-8 NMS 520 Network Options Configuration Window

Network Parameters

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

Options:

- *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, 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 521 DSU

Options:

- Disable
- 1 Minute to 5 Minutes – in one minute increments

- 10 Minutes
- 15 Minutes to 60 Minutes – in 15 minute increments (Default 60)
- 90 Minutes
- 120 Minutes

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

Options:

- Disable
- *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

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 under the headings Interface, Control Parameters, Async Parameters, and Diagnostic Parameters.

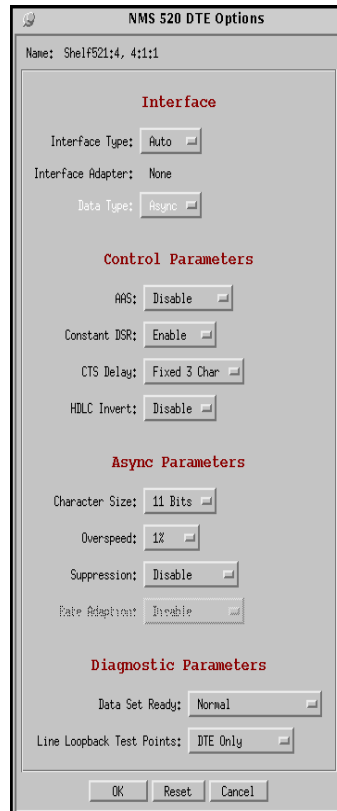


Figure 6-9 DTE Options Configuration Window

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.

Warning *You must consider the following factors when you change the setting of this option:*

- When changing 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 option must be set the same at both ends of the link.*
- You must 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.*

Options:

- Disable – normal data
- Enable – inverted data

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 (*Figure 6-10*) 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.

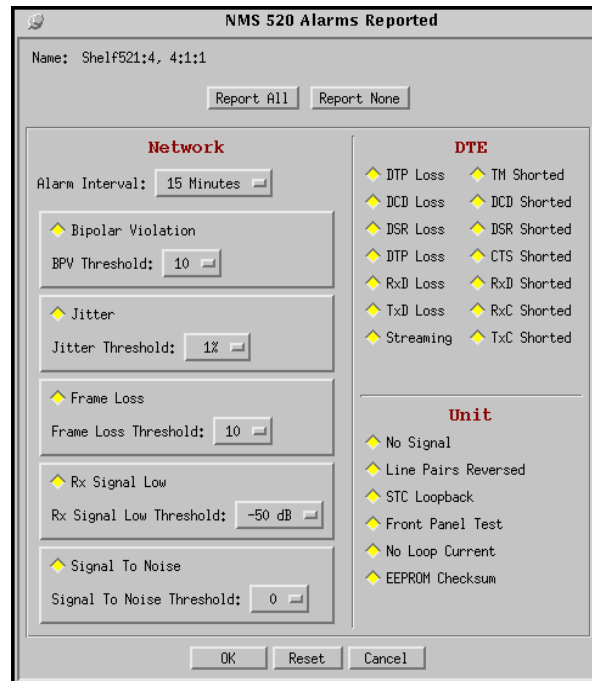


Figure 6-10 Alarms Reported Configuration Window

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 then change the state of individual fields as needed.

Alarms Reported Buttons

Report All – unmask all alarms.

Report None – mask 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. See *Figure 6-11*.

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

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.

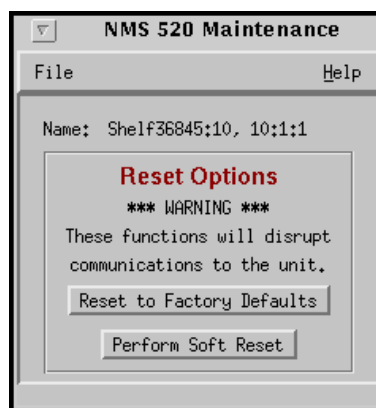


Figure 6-11 Maintenance Window

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.

Diagnostics Window

Beneath the menu bar and the Name field the Diagnostics window (See Figure 6-12) 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 6-13*) 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.

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.

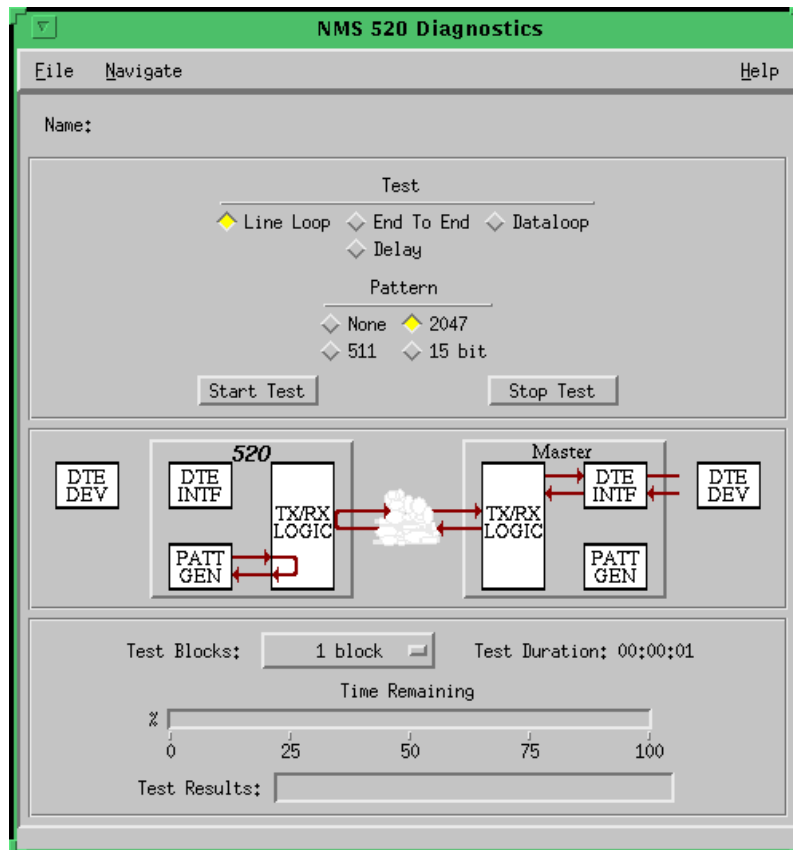


Figure 6-12 NMS 520 Diagnostics Window

Diagnostics Table

The table below briefly describes the available tests.

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 521 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 521 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 521 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 521 DSU; the Remote DSU measures the round trip time (delay).

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 6-13*).

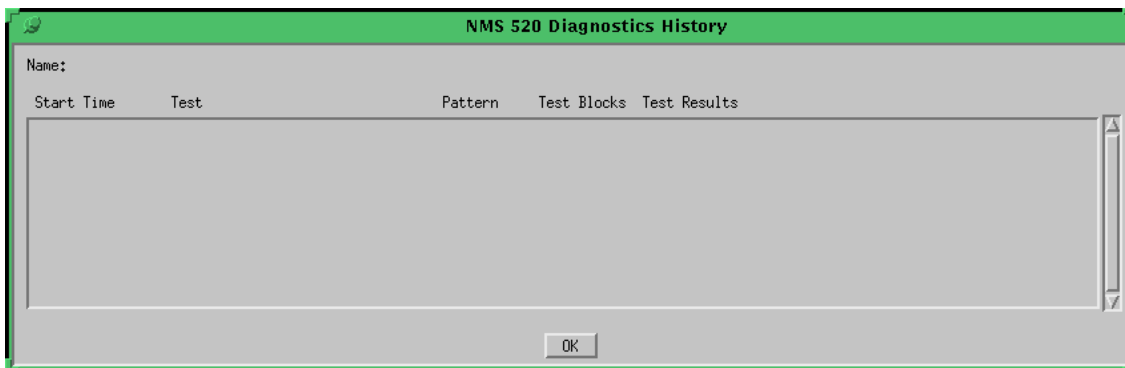


Figure 6-13 Diagnostics History

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 7: NMS 510

Overview

The SC 521 Data Service Unit (DSU) can operate in conjunction with an NMS 510 DSU located at a remote site. The TEAM 521 software supports a full range of functions for the remote NMS 510 DSU, as it does for the SC 521 DSU. This chapter describes the NMS 510 functionality of the software and provides instructions for its use.

Access to the NMS 510 Functions

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

1. 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. 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. 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 521 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 521 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 include other selections as well because 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 7-1) 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).

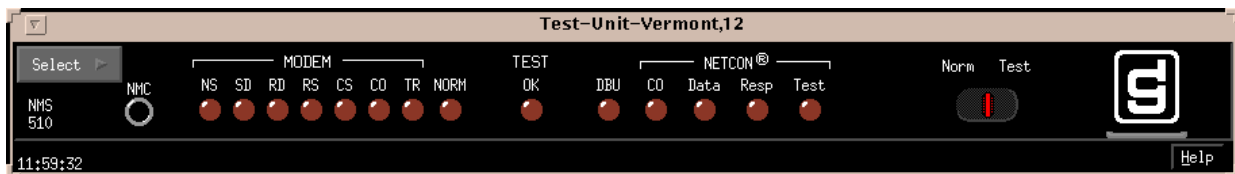


Figure 7-1 NMS 510 DSU Front Panel

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 521 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 7-2).

The TEAM 521 application polls the DSU for changes in alarm conditions.



Figure 7-2 Alarm Detail Window

The Alarm Detail window displays alarms grouped into three categories:

- Major
- Minor
- Informational

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 Alarm Detail window has a File menu and a View menu in its menu bar.

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 7-3*). 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.

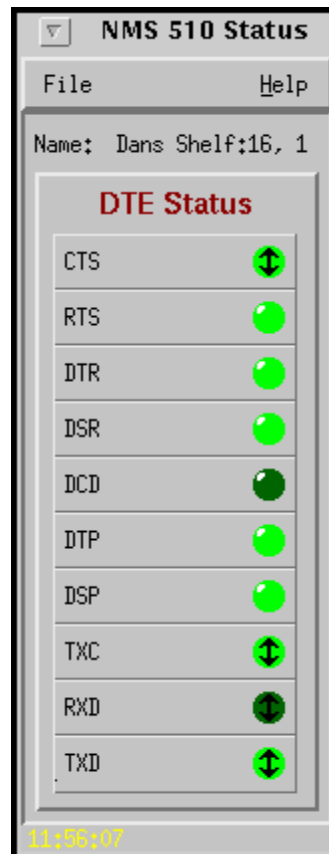


Figure 7-3 DTE Status Window

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

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...	

The Main Configuration window title bar displays the function name, NMS 510 Configuration. The main body of the window contains read-only items that identify the DSU and provide information about its operations.

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

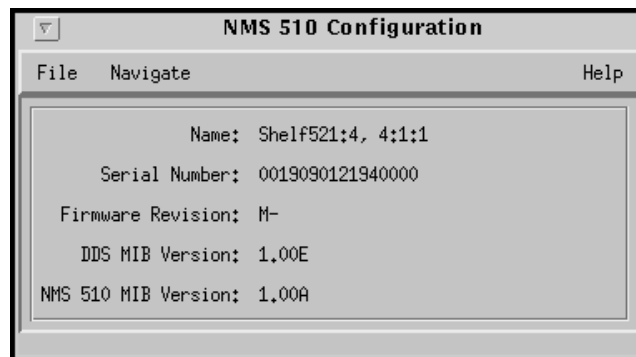


Figure 7-4 Main Configuration Window

System Options

The NMS 510 System Options configuration window contains two options.

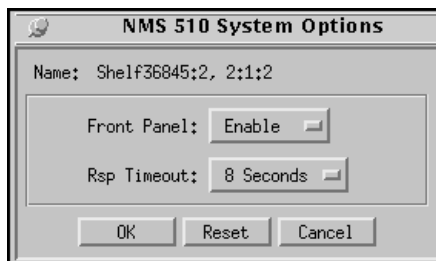


Figure 7-5 Figure 7-5NMS 510 System Options Configuration Window

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 7-6*) appears when you select Network Options from the Main Configuration window Navigate menu. The window contains two panels labeled Network Parameters and Circuit Parameters.

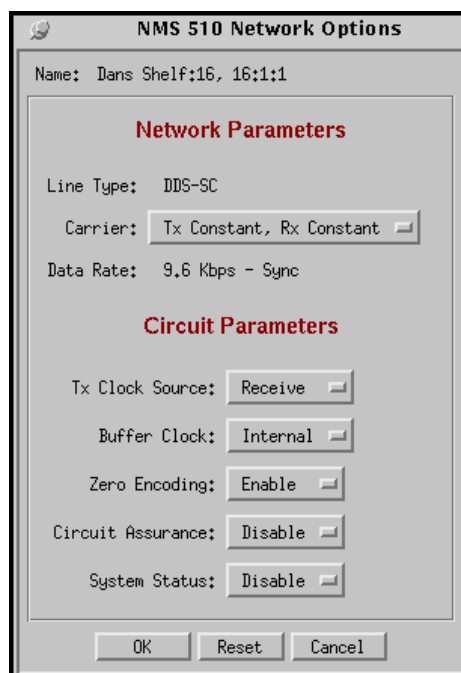


Figure 7-6 NMS 510 Network Options Configuration Window

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 under the headings Interface, Control Parameters, Async Parameters, and Diagnostic Parameters.

The screenshot shows the 'NMS 510 DTE Options' configuration window. The window title is 'NMS 510 DTE Options' and the name is 'Shelf1198:10, 10:1:1'. The window is divided into four sections:

- Interface:**
 - Interface Adapter: None
 - Data Type: Sync
- Control Parameters:**
 - Flow: Disable
 - Constant DSR: Enable
 - CTS Delay: CTS On
 - HDLC Invert: Disable
- Async Parameters:**
 - Character Size: 11 Bits
 - Overhead: 17
 - Suppression: Disable
 - Rate Adaption: Disable
- Diagnostic Parameters:**
 - Data Set Ready: Normal
 - Line Loopback Test Points: DTE Only

At the bottom of the window are three buttons: OK, Reset, and Cancel.

Figure 7-7 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 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.

Warning *You must consider the following factors when you change the setting of this option:*

When changing 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 option must be set the same at both ends of the link.

You must 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.

Options:

- Disable – normal data
- Enable – inverted data

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 7-8*) 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.

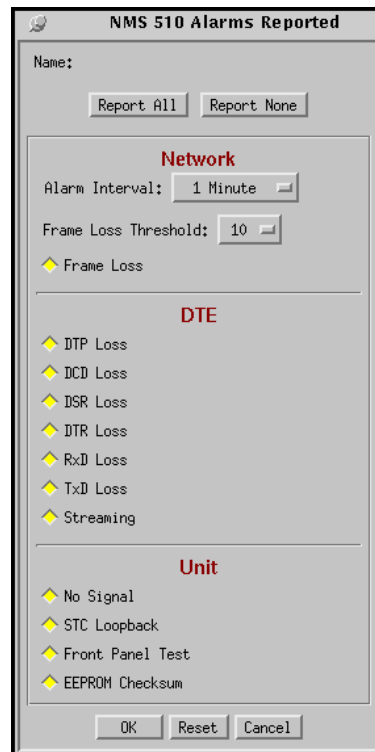


Figure 7-8 Alarms Reported Configuration Window

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 – unmask all alarms.

Report None – mask 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 7-9*.

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.

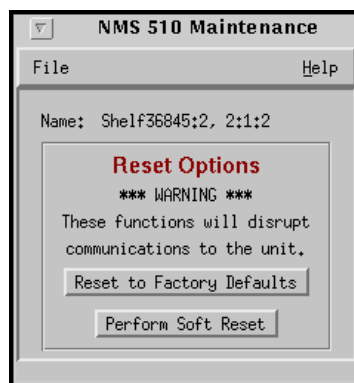


Figure 7-9 Maintenance Window

Diagnostics

You can launch the NMS 510 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.

Diagnostics Window

Beneath the menu bar and the Name field the Diagnostics window (See Figure 7-10) 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 7-11) 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. There are 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.

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.

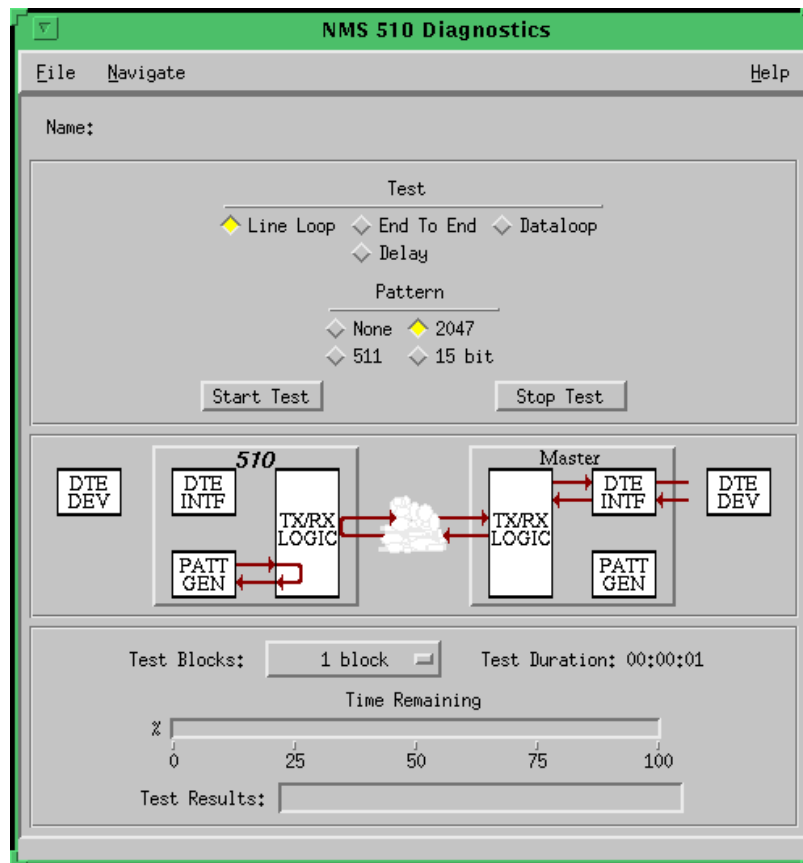


Figure 7-10 NMS 510 Diagnostics Window

Diagnostics Table

The table below briefly describes the available tests.

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).

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 7-11*).

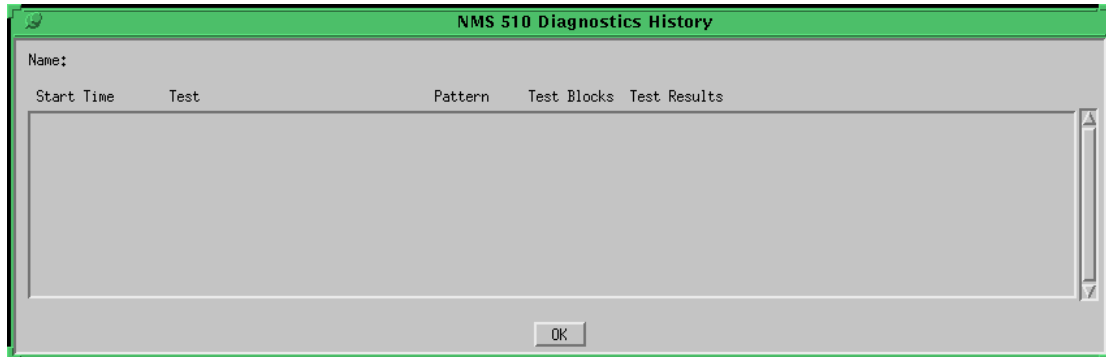


Figure 7-11 Diagnostics History

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*.

Appendix A: **Technical References**

Diagnostics

Alarms

Fault Isolation Tables

Glossary of Terms

A

AAL

Abbreviation for ATM Adaptation Layer

AAL1

ATM Adaptation Layer 1 defined in ITU-T I.363.1. The type of ATM adaptation principally used for circuit emulation services over an ATM network

AAL2

ATM Adaptation Layer 2 defined in ITU-T I.363.2. The type of ATM adaptation used for Variable-Bit-Rate Voice-Over-ATM services

AAL5

ATM Adaptation Layer 5 defined in ITU-T I.363.5. The type of ATM adaptation principally used for frame and packet transport over an ATM network

AC

Alternating Current

ACF

Access Control Field (first byte in ATM header)

A/D

Analog to Digital (typically conversion of voice to digital format)

ADPCM

Adaptive Differential Pulse Code Modulation. A compression algorithm for voice as defined in ITU-T G.726

AFI

Abbreviation for Authority and Format Identifier

ALS

Active Line State

ANSI

Abbreviation for American National Standards Institute

APEX

Abbreviation for Advanced Packet Exchange

API

Abbreviation for Application Programming Interface

ARP

Address Resolution Protocol

ARQ

Automatic Repeat reQuest

ASCII

American Standard Code for Information Interchange

ASIC

Abbreviation for Application Specific Integrated Circuit

asynchronous

A data transmission timing technique that adds extra bits of information to indicate the beginning and end of each transmitted character

Asynchronous Transfer Mode (ATM)

The cell relay service that transfers mixed data types over a common communication medium. The mixed data types include text, sound (voice and music) and graphics (video and still images).

ATM

Abbreviation for Asynchronous Transfer Mode

AUI

Abbreviation for Attachment Unit Interface

AUU

ATM User-User connection (end to end)

B

B8ZS

Binary 8 Zero Substitution

Bc

Committed Burst (amount of data allowed in time $T=Bc/CIR$ without being marked DE)

BCC

Block Check Code

BCD

Abbreviation for Binary Coded Decimal

BCN

Beacon (frames sent downstream when upstream input is lost)

Be

Excess Burst (transient capacity above CIR in Frame Relay network)

BECN

Abbreviation for Backward Explicitly Congestion Notification

B-DCS

Broadband Digital Cross-connect System

BECN

Backward Explicit Congestion Notification

BER

Bit Error Ratio

B-ICI

Broadband Inter Carrier Interface

B-ISDN

Broadband ISDN (generally ATM access at greater than 100 Mbit/s)

B-ISSI

Broadband Inter-Switching System Interface

BITS

Building Integrated Timing System

BIU

Basic Information Unit

bps

Bits Per Second

C**CAC**

Connection Admission Control (process to limit new calls to preserve QoS)

CBR

Constant Bit Rate (service with low variation in cell delay)

CBX

Computerized Branch eXchange

CDV

Cell Delay Variation (ATM UNI traffic parameter)

CE

Circuit Emulation

CES

Circuit Emulation Service

CIR

Committed Information Rate (minimum throughput guaranteed by carrier)

CLP

Cell Loss Priority (signaling bit in ATM cell)

CODEC

COder-DEcoder (converts analog voice to digital and back)

CRC

Cyclic Redundancy Check

CSU

Channel Service Unit (interface to the T1 line that terminates the local loop)

D

DACS

Digital Access and Cross-connect System (digital switching device for routing T1 lines or DS-0s among multiple T1 ports)

dB

Decibel

DCC

Data Communications Channel (overhead connection in D bytes for SONET management)

DCE

Data Communications Equipment

DE

Discard Eligible (bit in header denoting lower priority when exceeding CIR or Bc)

DLCI

Abbreviation for Data Link Connection Identifier (address in Frame)

DDS1, DDS2, DDS3

North American hierarchy for digital transmission signals. The Dataphone Digital Service is a private-line digital service offered intra-LATA by BOCs, inter-LATA by AT&T Communications, with data rates typically at 2.4, 4.8, 9.6, and 56 kbps; now a part of the services listed by AT&T under the Accunet family of offerings.

DNA

Digital Network Architecture

DSL

Digital Subscriber Line

DSP

Abbreviation for Domain Specific Part

DSS1

D-channel Signaling System 1 (access protocol for switched connection signaling)

DSU

Data Service Unit (converts RS-232 or other terminal interface to line coding for local loop transmission)

DTE

Data Terminal Equipment

DXD

Abbreviation for Dual Frame Relay/Frame Transport Daughter board

E**E1, E2, E3**

International hierarchy for digital transmission

EC

Error Correction (process to check packets for errors and re-transmit if necessary)

ECC

Error Checking Code (allows receiver to test for errors)

ECHO

European Clearing House Organization

ECN

Explicit Congestion Notification (network warning to terminals of congestion by setting bits in header)

EFI

Errored Frame Indicator (ATM on fiber channel)

EIA

Abbreviation for Electronic Industries Association.

ESF

Extended Superframe

F**FC**

Frame Control (field to define type of frame)

FCS

Abbreviation for Frame Check Sequence

FECN

Abbreviation for Forward Explicitly Congestion Notification (signaling bit in frame relay header)

Frame Check Sequence (FCS)

The field in a transmitted frame that is used for frame error checking.

FE1

Fractional E1

FIFO

First In First Out (buffer type that delays bit stream)

FPDU

Frame Protocol Data Unit

FR

Frame Relay (interface to simplified packetized switching network)

FT1

Fractional T1

FTP

File Transfer Protocol (TCP/IP)

G

G.703

Abbreviation for ITU recommendation for physical/electrical characteristics of hierarchical digital interfaces

G.804

Abbreviation for ITU recommendation for ATM cell mapping over Plesiochronous Digital Hierarchy (PDH)

Gbit/s (Gbps)

Abbreviation for Gigabits per second

GCRA

Generic Cell Rate Algorithm (how an ATM entity measures / controls negotiated service usage)

GDC

General DataComm

GFC

Generic Flow Control (first half-byte in ATM header at UNI)

GUI

Abbreviation for Graphical User Interface

H

H.261

Abbreviation for ITU recommendation for CODEC (coder/decoder) for audio visual services at N x 64 kbit/s

HCDS

High Capacity Digital Service (Bellcore T1 specification)

HCS

header Check Sequence (CRC on header fields only - HEC for ATM)

HDLC

Abbreviation for High-Level Data Link Control (layer 2 full duplex protocol)

HEC

Header Error Control (ECC in ATM cell for header- not data)

HSSI

Abbreviation for High Speed Serial Interface

I**ICD**

Abbreviation for International Code Identifier

IDI

Abbreviation for Initial Domain Identifier

IEEE

Institute of Electrical and Electronic Engineers

IETF

Abbreviation for Internet Engineering Task Force

ILMI

Interim Local Management Interface (ATM addressing process)

IISP

Interim Interswitch Signaling Protocol

IP

Abbreviation for Internet Protocol

IPX

Internetwork Packet eXchange

ISDN

Integrated Services Digital Network

ITU

Abbreviation for International Telecommunications Union

J

JPEG

Joint Photographic Expert Group (part of ISO that defined digital storage format)

kbit/s (kbps)

Abbreviation for kilobits per second

L

LAN

Abbreviation for Local Area Network.

LED

Light Emitting Diode

LMI

Abbreviation for Local Management Interface

LIM

Abbreviation for Link Interface Module

Local Area Network (LAN)

A type of high-speed data communications arrangement wherein all segments of the transmission medium (typically, coaxial cable, twisted-pair wire, or optical fiber) are under the control of the network operator.

M

MAC

Medium Access Control (lower sublayer of the OSI data link layer)

Mbit/s (Mbps)

Abbreviation for Megabits per second

MBS

Maximum Burst Size (number of cells that may be sent at PCR without exceeding SCR)

MIB

Abbreviation for Management Information Base (OSI defined description of a network for management purposes)

MPEG

Motion Photographic Expert Group (part of ISO that defined digital video storage format)

MS

Abbreviation for APEX Adaptation slot controller (hardware segmentation and reassembly)

MUX

Multiplexer

N**NAU**

Network Addressable Unit (addressable device or process running an SNA protocol)

NEBS

Network Equipment Building Systems

NIC

Network Interface Card (enables workstation to connect to network)

NMS

Abbreviation for General DataComm Network Management System.

NNI

Network to Network Interface (between carriers or carrier to private network)

NTM

Node Timing Module

NSAP

Network Service Access Point (logical address of a “user” within a protocol stack)

O**OAM**

Operations Administration and Maintenance

OC-1

Optical Carrier level-1 (SONET rate of 51.84 Mbit/s, matches STS-1)

OC-3

Optical Carrier level-3 (SONET rate of 155.52 Mbit/s, matches STS-3)

P**PBX**

Private Branch eXchange

PCM

Pulse Code Modulation (standard digital voice format at 64 kbit/s). The basic modulation scheme for transporting voice channels in 64 Kbps timeslots

PCR

Peak Cell Rate (ATM traffic parameter applied per VC, VP or channel)

PDH

Pleisiochronous Digital Hierarchy (multiplexing scheme from T1 to T3 and higher)

PDU

Protocol Data Unit (information packet passed at one level between different protocol stacks)

PHY

PHYSical layer (level-1 of the OSI model)

PLCP

Abbreviation for Physical Layer Convergence Protocol (part of PHY that adapts transmission medium to handle a given protocol sublayer)

PMP

Point-to MultiPoint (broadcast connection)

Postal, Telegraph, and Telephone (PTT)

Government authority or agency that typically operates the public telecommunications network, sets standards and policy, and negotiates communications issues internationally for a particular country; not found in the United States

PRC

Primary Reference Clock (GPS-controlled rubidium oscillator used as stratum 1 source)

PSU

Abbreviation for Power Supply Unit

PTT

Abbreviation for Postal, Telegraph, and Telephone

Permanent Virtual Connection (PVC)

A dedicated logical circuit between two nodes in a point-to-point ATM network.

Q

QED

Abbreviation for Quad Ethernet Daughter board

QoS (QOS)

Quality of Service

R

RFC

Abbreviation for Request For Comment (RFC1212, RFC1215, etc. on Internet Standard)

RTS

Residual Time Stamp (ATM control information to support CBR service)

S**SAAL**

Signaling ATM Adaptation Layer

SAP

Abbreviation for Service Access Point

SCR

Sustained Cell Rate (ATM traffic parameter)

SDH

Abbreviation for Synchronous Digital Hierarchy (Europe)

SDLC

Abbreviation for Synchronous Data Link Control

SDH

Synchronous Digital Hierarchy (digital multiplexing plan where all levels are synched to the same master clock)

SDT

Structured Data Transfer

SDU

Service Data Unit (information packet or segment passed down to become the payload of the adjacent lower layer in a protocol stack.

SLIP

Abbreviation for Serial Line Interface Protocol

SNA

Abbreviation for Systems Network Architecture. In IBM networks, the layered logical structure, formats, protocols, and procedures that govern information transmission

SNMP

Abbreviation for Simple Network Management Protocol

SONET

Abbreviation for Synchronous Optical Network (North America)

Soft Permanent Virtual Connection (SPVC)

Soft Permanent Virtual Circuit. A logical circuit similar to PVCs but set up on a call-by-call basis. A switched connection originating and terminating within the APEX network that appears as a PVC to the endstations.

Switched Virtual Circuit (SVC)

A dynamically signaled logical end-to-end connection between two end-points in a network, established as needed by the end-user device

Synchronous Data Link Control (SDLC)

Bit-oriented IBM version of the HDLC protocol; the mainstay of SNA communications.

T

T1, T2, T3

North American digital transmission hierarchy

TAXI

Abbreviation for Transparent Asynchronous Transmitter/Receiver Interface

TCP/IP

Transmission Control Protocol/Internet Protocol

TDM

Abbreviation for Time-Division Multiplexer/Multiplexing

TFTP

Abbreviation for Trivial File Transfer Protocol

TIA

Abbreviation for Telecommunications Industry Association

U

UNI

Abbreviation for User-Network Interface

UDT

Unstructured Data Transfer

V

VBR

Variable Bit Rate (ATM traffic parameter, packetized bandwidth on demand, not dedicated). ATM Traffic Class offering statistical multiplexing gains for bursty applications in the network.

VC

Virtual Circuit

VCC

Virtual Circuit Connection. An ATM logical connection used to connect end-system devices to each other in a connection oriented network. A VCC may be a PVC, SVC, or an SPVC.

VCI

Abbreviation for Virtual Channel Identifier

Virtual Channel Identifier (VCI)

Logical, link-to-link channels between two ATM nodes

VP

Virtual Path (for many VCCs between concentrators)

VPC

Virtual Path Connection (between switches)

Virtual Path Identifier (VPI)

Groups of logical, link-to-link virtual channels between two ATM nodes

VTOA

Voice Telephony Over ATM

W**WAN**

Wide Area Network

X**X.25**

A CCITT recommendation that specifies the interface between user data terminal equipment (DTE) and packet-switching data circuit-terminating equipment (DCE); the physical and message protocol for packet switched data

XH

APEX 6.4-Gbit/s switching fabric

XM

APEX 1.6-Gbit/s switching fabric

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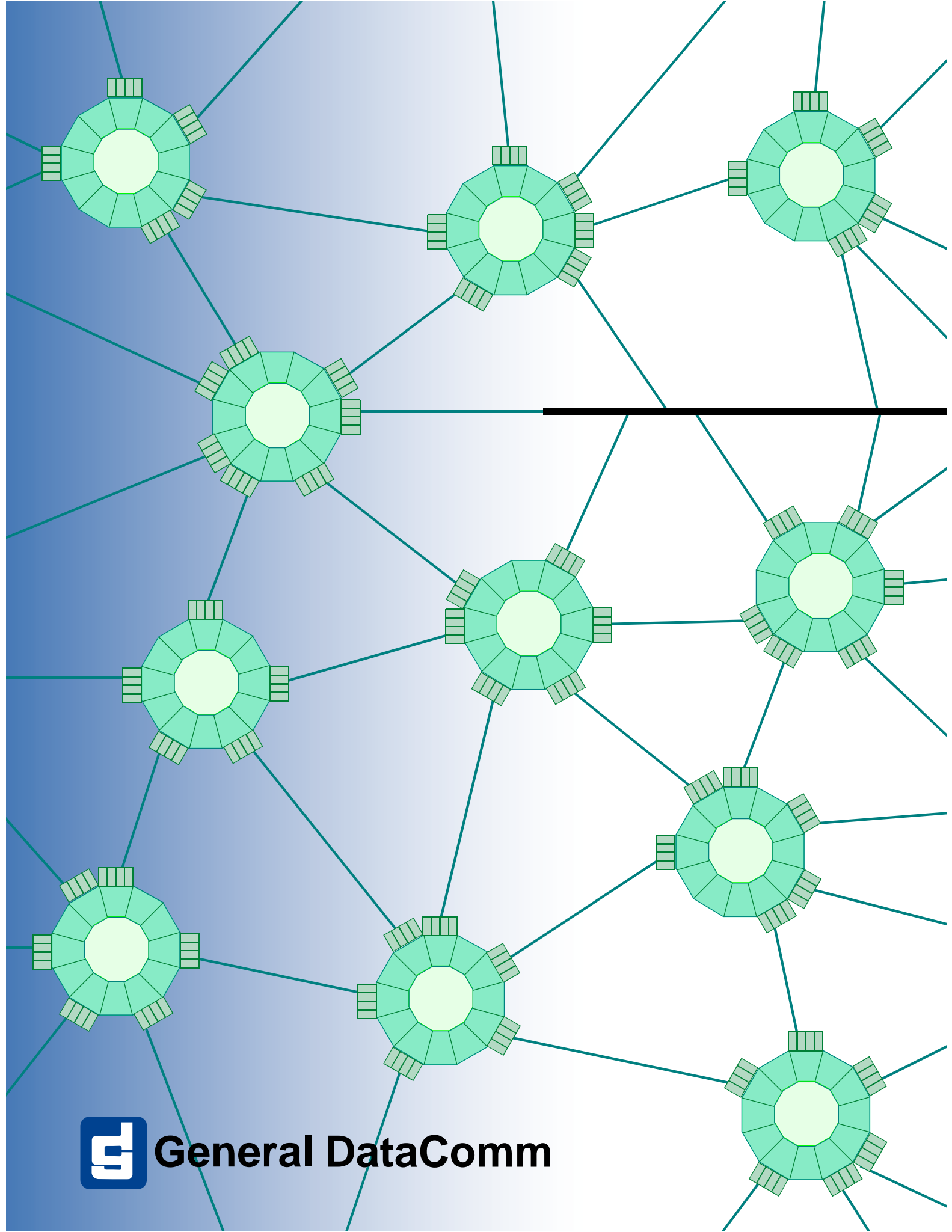
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General DataComm