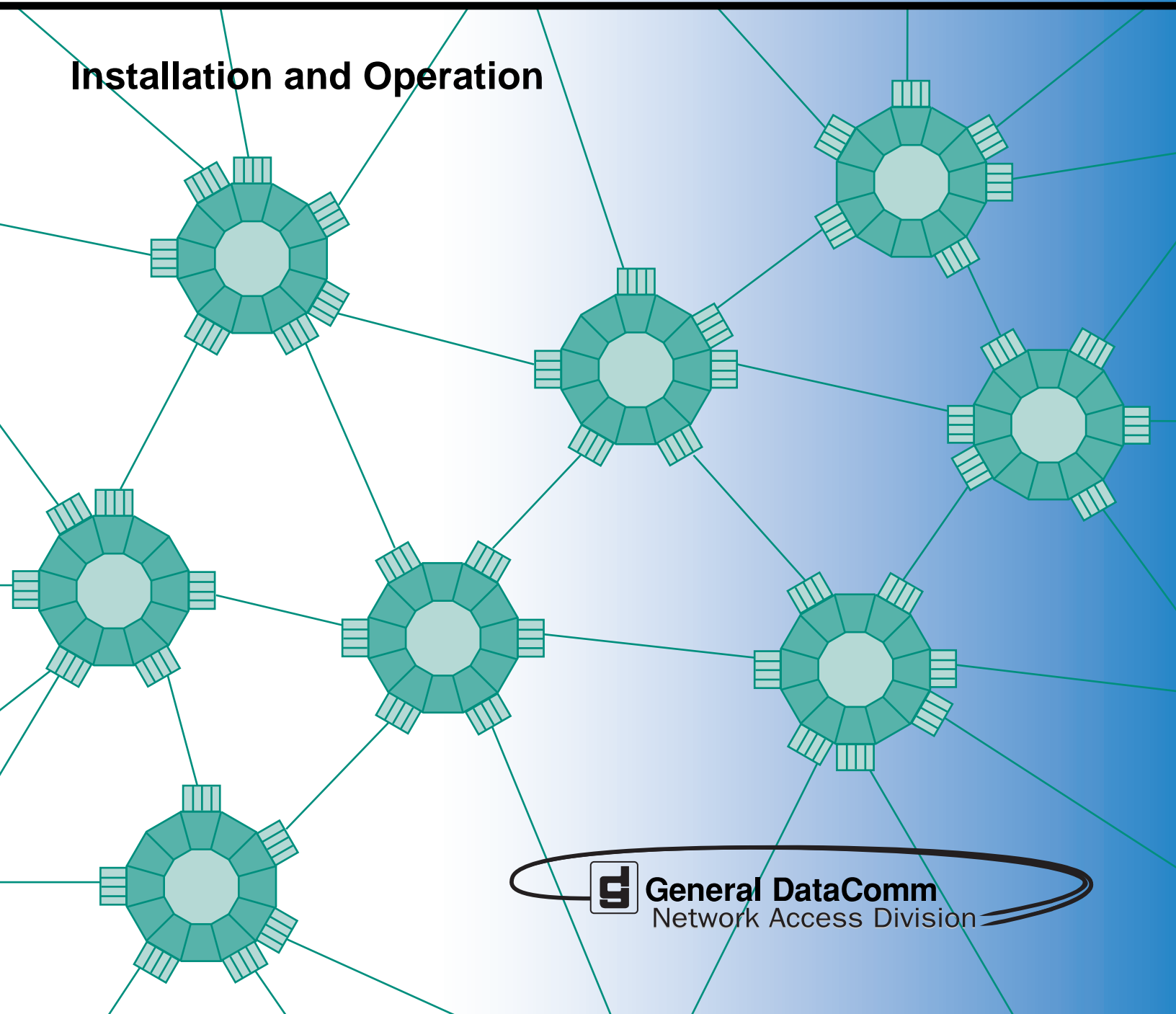


SpectraComm 800 T3 DSU

Installation and Operation





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Installation and Operation

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Documentation

Revision History

Issue Number	Date	Description of Change
01	June 2000	First issue.

Related Publications

A listing of SpectraComm user manuals is provided below. In addition to the hardware and software manuals, always read the software System Release Notes supplied with your GDC product.

Applicable Documents	
Publication Name	Publication Number*
GDC SpectraComm/UAS Installation and Operation Shelf and Enclosure	010R302-REV
GDC SpectraComm 2000 Shelf Installation and Operation	010R358-REV
Installation and Operation SpectraComm Manager Card	048R303-REV

* For publications numbers, **REV** is the hardware manual revision (for example, -000, -001, etc.) **VREF** (if listed) is the software revision (for example, -V120 would read, Version 1.2) and corresponds to the most current revision.

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Preface

Manual Overview

This manual describes how to install and configure a General DataComm SC 800 T3 Data Service Unit. It is written for installers, service technicians, and users. It assumes a working knowledge of data interfaces, and T3 transmission.

Organization

This manual has four chapters and three appendices. The information is arranged as follows:

- [*Chapter 1, Technical Overview*](#) describes the Data Service Unit, its features, and its options. This chapter contains the Equipment List table.
- [*Chapter 2, Installation*](#) provides directions for installing the DSU in a SpectraComm/UAS Shelf and/or a SpectraComm 2000 shelf, and making the cable connections it requires.
- [*Chapter 3, Operation*](#) describes the DSU front panel controls and indicators, and their use; and provides instructions for the use of the terminal interface.
- [*Chapter 4, Tests*](#) describes tests that can be performed on the DSU by means of the network manager, the network, or the DTE via the HSSI port.
- [*Appendix A, Technical Characteristics*](#)
- [*Appendix B, Interface Signals*](#) lists pin and signal assignments for the DSU network, and HSSI interface.
- [*Appendix C, Alarm Definitions*](#) lists and defines the alarms that can be reported by the DSU.

Safety Summary

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

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

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

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 following definitions and symbols for CAUTION, WARNING and DANGER as they are used in this manual 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.



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



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

Safety Guidelines

- Always use the following guidelines when unsafe conditions exist or when potentially hazardous voltages are present:
- Always use caution and common sense.
- To reduce the risk of electrical shock, do not operate equipment with the cover removed.
- Repairs must be performed by qualified service personnel only.
- 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.
- Use caution when installing telephone lines and 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 equipment may contain static-sensitive devices that are easily damaged and proper handling and grounding is essential. Use ESD precautionary measures when installing parts or cards and keep the parts and cards in antistatic packaging when not in use. If possible, use antistatic floorpads and workbench pads.

When handling components, or when setting switch options, 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.

Compliance

FCC Part 15 Compliance

This device complies with Part 15 Class A of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference and
2. This device must accept any interference received, including interference that may cause undesired operation.

Electromagnetic Compatibility

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

La Compatibilité d'Électro-magnétique

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

Service Support and Training

VITAL Network Services, a General DataComm company, is committed to providing the service support and training needed to install, manage, and maintain your GDC equipment.

GDC's VITAL Network Services provides hands-on training courses through **VITAL Network Services Global Technology Training Services**. Courses range from basic data communications, modems and multiplexers, to complex network and ATM systems. Training courses are available at our centers in the US, UK, France, Singapore and Mexico, as well as at a customer's site.

For more information regarding GDC's VITAL Network Services' service programs, training courses, or for assistance with your support requirements, contact GDC's VITAL Network Services at the address or phone number listed below, or visit our website at: <http://www.vitalnetsvc.com>

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Chapter 1: Technical Overview

Description

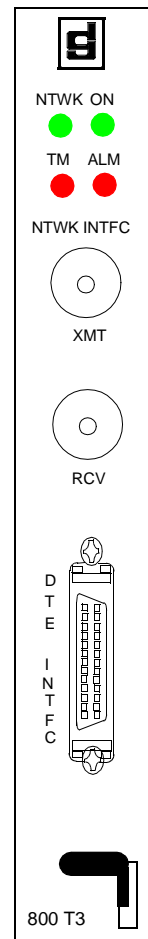
The SpectraComm 800 T3 Data Service Unit (SC 800 T3 DSU) provides a flexible and versatile connection method to T3 telecommunications networks. It converts data from a standard High Speed Serial Interface (HSSI) port, typically connected to a router, running at 44.2 Mbps, to a standard DS-3 port. It is a standard, single-width SpectraComm card that fits in the SpectraComm 5000 Shelf (hereafter referred to as SpectraComm shelf) or the SpectraComm 2000 Shelf. It is managed by SNMP/TELNET. TEAM management is provided by the TEAM 800 SNMP application running under HP OpenView on a Sun or HP/UX controller, via the shelf-resident SCM (SpectraComm Manager) card.

The SC 800 T3 DSU is a 7-inch by 9.5-inch (178 mm by 241 mm) printed circuit (pc) card and up to 16 cards may be housed in a single SpectraComm shelf and up to 32 may be housed in a dual shelf configuration.(refer to Appendix A - “Power Dissipation”). The two-slot SpectraComm 2000 (SC2000) shelf, which can be rack-mounted or wall-mounted, supports central and remote site installation.

Features

The SC 800 T3 DSU provides the following features:

- Provide interface to T3 services. The T3 has two bit rates: T3 network interface is 44.7 Mbps, T3 payload through HSSI port is 44.2 Mbps.
- Is compatible with other T3 DSUs running at full rate.
- Selectable Line Type, 0-100 ft. or 100-450 ft.
- Supports both M13 and C-bit parity framing.
- 75 ohm coax DS3 interface. Two BNC connectors for Transmit and Receive.
- Recovered or internal clock as transmit timing source.
- May be housed in SpectraComm shelf or SpectraComm 2000 shelf. Allows mixing and matching other SpectraComm Data Sets in the same shelf.
- Front-panel LEDs on the SC 800 T3 indicate power and network, test mode, and alarm conditions.
- Provides full network management by means of the shelf-resident SCM and associated SNMP or Telnet manager.
- Remote unit may be network managed from the local unit’s SCM, via an in-band management channel.
- Provides dual image flash memory to allow download of firmware.
- Provides non-volatile memory to maintain configuration after power outages.



Management

As an SNMP controlled device, the SC 800 T3 DSU can receive commands to set its configuration and control its functions in the form of entries in its Management Information Base (MIB) tables. SNMP interface functions between the DSU and its SNMP controller are the responsibility of a SpectraComm Manager (SCM) card installed in the same SpectraComm shelf (or pair of shelves) that holds the DSU.

The SCM card stores and administers MIBs for compatible GDC products in its SpectraComm shelf. The SCM card communicates with an SNMP controller, and passes commands and responses between the controller and the DSU.

You can install the SC 800 T3 DSU in a shelf that holds other types of SCM-compatible products, with a single SCM used for the control of all the devices in the shelf.

Note *One feature of the SCM card is that it stores a copy of the SC 800 T3 DSU's configuration for automatic loading into a replacement DSU. If an SC 800 T3 DSU is removed from an SpectraComm shelf and replaced by another SC 800 T3 DSU in the same slot, the SCM card automatically configures the new DSU with the Network, Channel, and Alarm Configuration option settings that were in effect for the old DSU. Auto Configuration is not available for the remote unit.*

Diagnostic testing performed through SNMP does not require intervention by personnel at remote sites.

You can select Alarm reporting to occur on a wide variety of conditions. Consult Appendix C "Alarm Definitions" for the complete listing of alarm conditions and their definitions.

You can use the loopbacks and tests to isolate system faults to a particular DTE, data set, or line. The DSU facilitates fault isolation in a digital network by providing comprehensive loopback and testing capabilities that include Local Test, Remote Loop, Data Loop, and Self Test.

Equipment List

The Equipment List for the SpectraComm 800 T3 is found in [Table 1-1](#).

Note Network and interface connections are made from the front panel of the SC 800 T3. The following equipment list mentions ‘connector panel’ configurations for each shelf model. This information is provided for your use when other GDC products are installed in the SpectraComm shelf in addition to the SC 800 T3. For their detailed use, refer to the individual product manuals, or the SpectraComm/UAS Shelf manual listed in [Related Publications on page -ii](#) of this manual.

Table 1-1 Equipment List

Description	GDC Part No.
GDC SC 800 T3 Data Service Unit, HSSI interface	076P015-001
Shelves	
SpectraComm Shelf MS-2 Model 1 (100/120 V ac) Includes two 8-slot, dual RJ48 Zone 1 connector panels	010M054-001
SpectraComm Shelf MS-2 Model 2 (-48, -60 V dc) Includes two 8-slot, dual RJ48 Zone 1 connector panels	010M055-001
SpectraComm Shelf MS-2 Model 7 (100/120 V ac) Includes Universal Zone 1 connector panel	010M073-001
SpectraComm Shelf MS-2 Model 8 (220/240 V ac) Includes Universal Zone 1 connector panel	010M074-001
SpectraComm Shelf MS-2 Model 9 (-48, -60 V dc) Includes Universal Zone 1 connector panel	010M075-001
SpectraComm Shelf MS-2 Model 10 (-48, -60 V dc with redundant power supplies) Includes two 8-slot, dual RJ48 Zone 1 connector panels	010M070-001
SpectraComm Shelf MS-2 Model 12 (-48, -60 V dc with redundant power supplies) Includes Universal Zone 1 connector panel	010M076-001
SpectraComm 2000 Shelf, single power supply	010B226-001
SpectraComm 2000 Shelf, redundant power supply	010B226-002
Cables	
HSSI Cable male/male angled 75°	027H625-0xx
Network Interface 75-ohm BNC transmit/receive cable	026H004-xxx
10Base-2 cable (use for SCM card to LAN)	S-125H00x
RJ45 cable (use for SNMP network manager or VT100-compatible terminal when connecting SCM front panel CTRL port)	830-128-8xx
Cable Tray (use to route front panel cables to the rear of the rack)	010B224-001
x represents the digits that indicate cable length in the actual part number.	
Adapters	
Adapter - 10Base-T (twisted pair) (use for SCM to LAN connection)	029H209-001
Adapter - 10Base-2 (coaxial cable) (use for SCM to LAN connection)	058B033-001
Terminal Adapter IBMPC-RS561 DB9F/RJ45	029H211-001
Terminal Adapter RS232-RS561 DB25M	029H210-001
Terminal Adapter DB9 to DB25	209-036-015
Note: x is an additional number or numbers that represents the length of the cable	

Chapter 2: Installation

Overview

This chapter describes the installation of the SC 800 T3 DSU. The DSU can be installed in a 16-slot SpectraComm shelf, or in a 2-slot SpectraComm 2000 shelf (SC2000). [Table 1-1, Equipment List](#), identifies the SpectraComm shelves that can be used with the SC 800 T3 DSU and the differences between them. The SpectraComm shelf is designed to be rack mounted. The SC2000 shelf may be either rack mounted or wall mounted.

Note *Both Network and DTE cable connections are made from the SC 800 T3 front panel and are described in this chapter. For SpectraComm shelf and SC2000 shelf issues refer to their manuals listed in the Preface of this manual.*

Unpacking and Handling

The SC 800 T3 DSU is shipped enclosed in a box and protected by packing material. Inspect the SC 800 T3 DSU when you receive it. Notify the shipper of any damage immediately.

Keep the box and packing material to use if you ever need to reship the SC 800 T3 DSU.

The SC 800 T3 DSU is shipped pre-assembled, tested, and ready to use. The normal procedure after unpacking the unit is to insert it in its intended shelf slot and perform the [Cabling and Powering-Up on page 2-4](#).

Housings

The SC 800 T3 DSU should be installed in a ventilated area where the ambient temperature does not exceed 104°F (40°C). Do not install the DSU above other equipment that generates large amounts of heat (e.g., power supplies).

A rack-mountable SpectraComm shelf can house up to 16 plug-ins and be installed in 19- and 23-inch wide equipment racks. A SpectraComm 2000 shelf can house 2 plug-in pc cards. In any of the two housings the SC 800 T3 DSU can be installed in any card slot.

The SpectraComm shelf includes a backplane that supports a management bus for the transfer of management data between an SCM card and the managed devices in the housing. The SCM card functions as an SNMP agent for the control of a variety of compatible devices. For some devices, including the SC 800 T3 DSU, the SCM card also provides access to terminal interface functionality. A housing can contain a single SCM card, or two SCM cards installed as a primary and a backup.

The backplanes of two SpectraComm shelves can be linked by cables so that a total of 32 card slots function as though connected to the same backplane. In that way, one SCM can be responsible for control functions for up to 31 other devices.

Setting Option Switch and Jumper

[Figure 2-1](#) locates DIP switch S1 and jumper X3.

Jumper X3 allows you to select between the active and the backup versions of downloaded firmware. On power-up, the card will normally run the active firmware. To force the card to run the backup firmware, set the jumper to the opposite position to what it was the last time the card was powered up. The Flash memory can store two versions of firmware. The version in use can be read from the Telnet or VT-100 screens.

The units configure themselves by using the DIP settings to allow the remote unit to communicate with the local unit over the in-band management channel. Once management communications are up, you can further manage the unit via Telnet or SNMP. The line parameters are framing format, short/long cable, and timing (recovered/internal). [Table 2-1](#) describes the options.

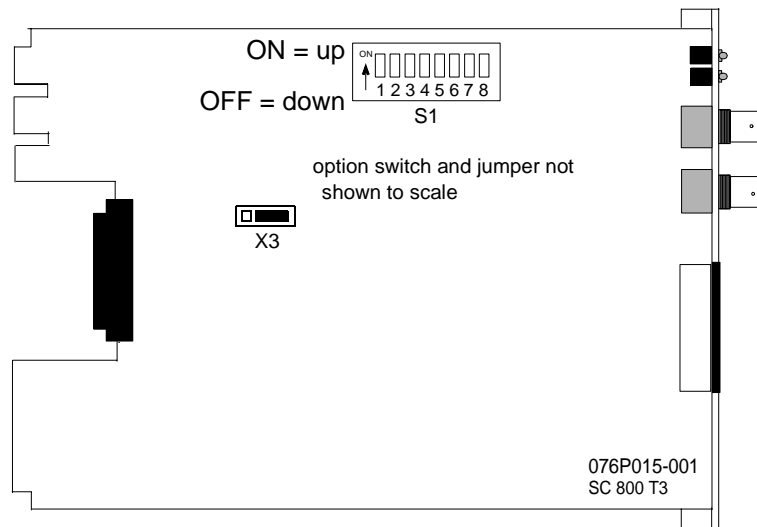
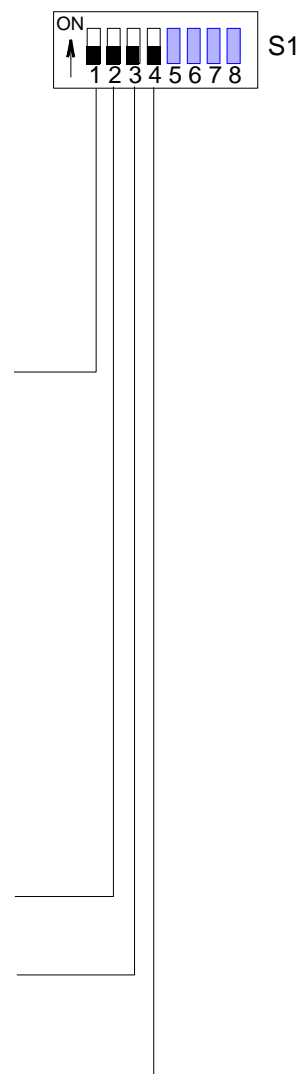


Figure 2-1 SpectraComm 800 T3 Option Switch

Table 2-1 SpectraComm 800 T3 Card Option Setting for S1

S1 Option Settings (Default in bold = OFF)	Description
1 - Remote Only Remote Only Disabled , Remote Only	In SpectraComm Shelf - OFF - The T3 becomes a master when an SCM is detected in the shelf. If an SCM is not detected, the T3 stays in the defaulted remote mode. The T3 does not migrate to remote mode once it has become a master. <ul style="list-style-type: none"> • The backplane is enabled • The Craft port is disabled ON - The T3 stays in it's defaulted remote mode. <ul style="list-style-type: none"> • The backplane is enabled • The Craft port is directed to the DTE connector • The T3 is managed via the inband link In SpectraComm 2000 Shelf - OFF - The T3 becomes a master when an SCM is detected in the shelf. If an SCM is not detected, the T3 stays in the defaulted remote mode. The T3 does not migrate to remote mode once it has become a master. <ul style="list-style-type: none"> • The backplane is enabled • The Craft port is disabled ON - The T3 stays in the defaulted remote mode. <ul style="list-style-type: none"> • The backplane is disabled • The Craft port is enabled. The T3 can be managed via the inband link
2 - Frame Format C-bit Parity , M13	Set for compatibility with the device at the other end of the T3 line. The in-band management channel is not supported when M13 framing is selected.
3 - Long/ Short Cable	Use Short for T3 cables of 0 to 100 feet. Use Long for cables from 100 to 450 feet.
4 - Timing Recovered , Internal	Recovered derives transmit T3 timing from the recovered T3 timing. Use this setting for connections to a T3 network. Internal generates transmit T3 timing from an internal oscillator. Use this setting on one end of a back-to-back link.
5, 6, 7, 8	spares (OFF or ON)



Installing the SC 800 T3

An SC 800 T3 DSU card may be installed in any slot of its housing. To install the DSU:

1. Insert the card into its slot – in a SpectraComm shelf the GDC logo is on top, in an SC2000 shelf the GDC logo is to the right – and slide it in until it makes contact.
2. Pull down the insertion/extraction tab on the front panel and firmly push the card in until it seats in the rear connectors.
3. To remove a card, pull the front panel insertion/extraction tab to unseat the card, then use tab to remove card.

Cabling and Powering-Up

Figure 2-2 shows the cabling of a typical network installation.

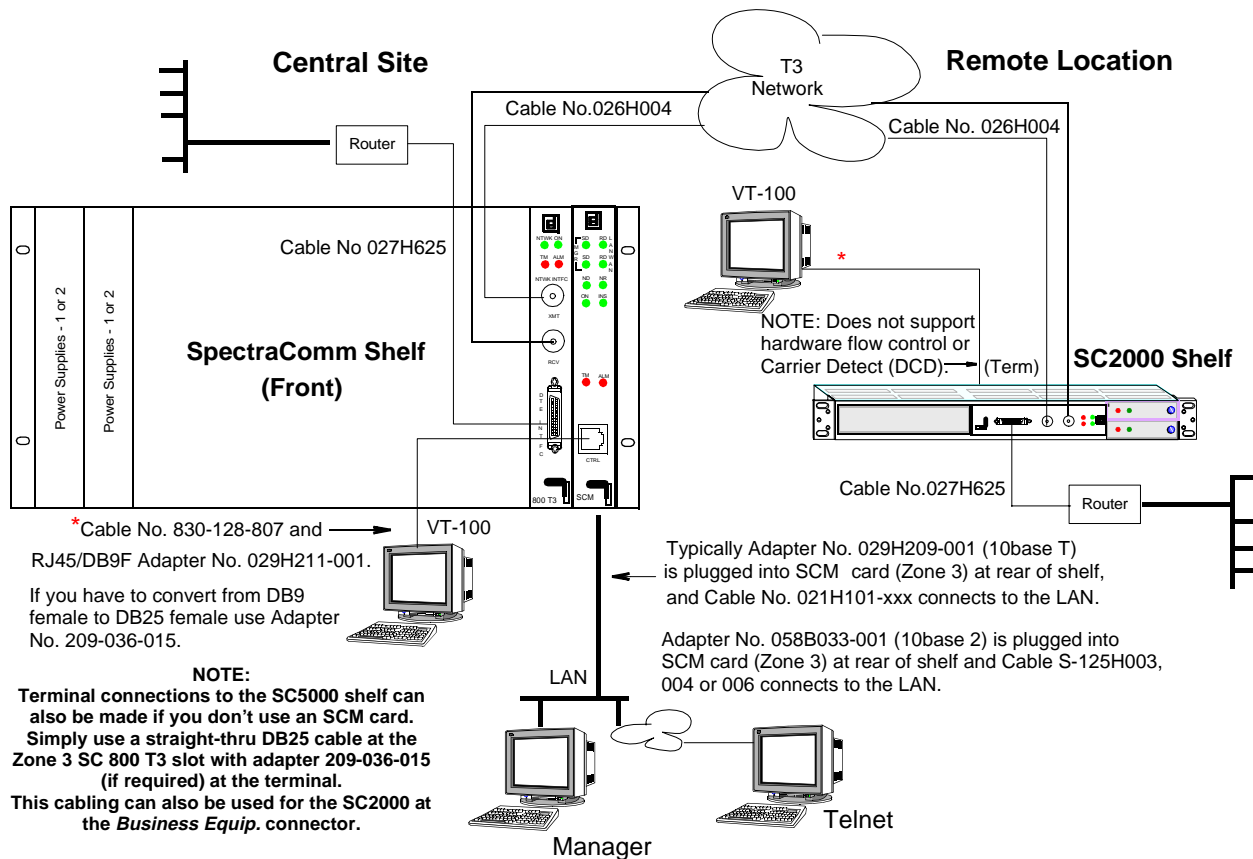


Figure 2-2 Typical SC 800 T3 Cabling

Network Connections

The connection to the DS-3 network is made via the two front panel BNC connectors. The 734A-type 75-ohm coax cable number is GDC No. 026H004-xxx.

Note To meet all DS-3 specifications, GDC recommends using this specific cable

Business Equipment Connections (DTE)

The HSSI interface for the SC 800 T3 DSU is a front panel 50-pin high-density (SCSI-2) connector. Figure 2-3 illustrates the cable - GDC Part No. 027H623-0xx and 027H625-0xx. Appendix B describes the signals exchanged through the front panel connector.

Note To route the front panel cables to the rear of the rack, use the optional cable tray, GDC part number 010B224-001. This tray occupies 1 rack unit or 1.75 inches of rack space below the SpectraComm Shelf.

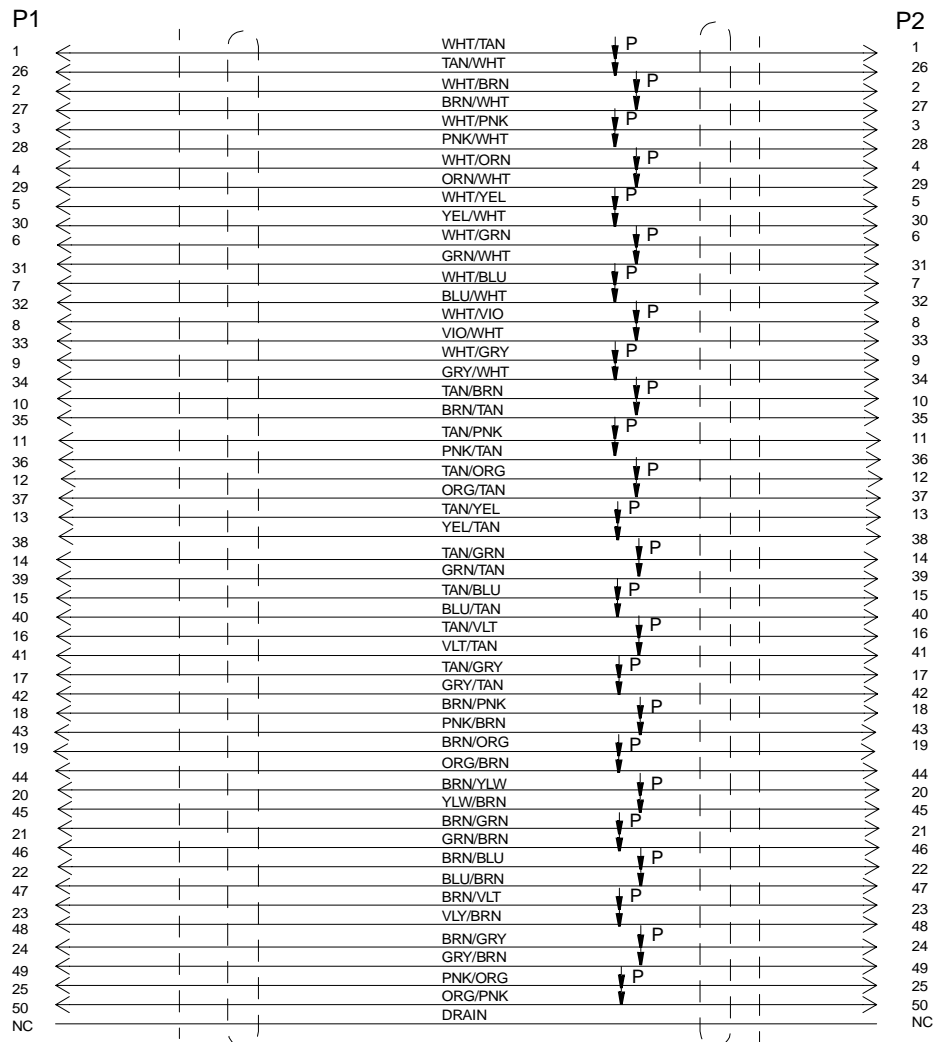
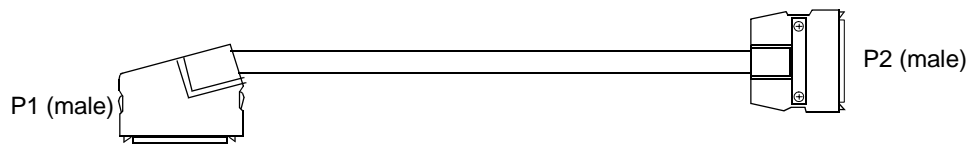


Figure 2-3 HSSI Cable (male-to-male, straight-through 75° angled) GDC No. 027H625-0xx

SpectraComm 2000 Shelf

The SC 800 T3 hardware supports the SC2000 craft port (8-position modular jack) which is used to support a VT-100 terminal for configuration and diagnostics. Since the Zone 3 DB-25 connector (used on the SpectraComm/UAS shelf) is not used, this terminal interface also appears in parallel on the Zone 3 connector, which allows craft port access in any SpectraComm shelf. This craft port is available only if an SCM is not present in the shelf. The table below describes pinouts:

Zone 3 Pin	Signal	Direction
2	TXD	Input. Craft port data from terminal.
3	RXD	Output. Craft port data to terminal.
7	GND	Ground

Electrical Power Connection

The DSU obtains power directly from its shelf. Consult the shelf manuals listed in the [Related Publications on page -ii](#) of this manual for power and grounding instructions.

Power-Up

After cabling you can proceed with power-up. Once you insert the SC 800 T3 into a powered system (or when you first power the system up or reset the system), the card will automatically perform a simple Power-On Self-Test (POST). This test allows you to check the operation of the microprocessor, RAM, code checksum, etc. It will also automatically perform a data path test by implementing a local loopback with self-test pattern. If any errors are detected during this test, it will blink the ALM LED and report a POST failure (card failure).

DSU Addressing

The network management system employs a slot-line-drop method of addressing. The DSU slot address is the number of the slot it occupies in the SpectraComm shelf. Its line address is always 1. The drop address is 0 for the master, and at the far end of the point-to-point circuit the remote DSU drop address is 1.

Timing Options

While the SC 800 T3 DSU can occupy the same shelf as other components of a SpectraComm system and be controlled through an SCM card that is also controlling other SpectraComm system cards, the SC 800 T3 DSU timing is completely independent from the SpectraComm shelf timing.

Timing options determine the clock source for data the SC 800 T3 DSU transmits at its network interface, and for both transmit and receive channel data. The SC 800 T3 DSU supports two timing modes:

- Recovered Timing (default), based on the incoming signal from the network.
- Internal Timing, provided by the oscillator incorporated in the DSU.

Dedicated Remote Wake-up Procedure

A master SC 800 T3 DSU, installed in a SpectraComm shelf together with an SCM card, can establish a Diagnostic Communication Channel (DCC) to a remote SC 800 T3 DSU. The DCC enables you to perform terminal interface management of the remote DSU from the master DSU site.

An SC 800 T3 DSU that is installed in the same shelf as an SCM card with the Remote Only Option OFF, is always a master unit, and one that is not installed together with an SCM card is a remote unit. A DCC can be established between a master unit and a remote unit (Remote Only Option ON or OFF), but not between two master units.

Once the DSUs are physically installed at both ends of the link, use the following procedure to establish the selected type of DCC and "wake up" the far end DSU so that it operates as a dedicated remote unit. The procedure identifies the tasks that you need to perform. *Chapter 3, Operation*, contains the instructions for performing the tasks.

1. Begin a terminal interface session with the master DSU, using either a VT100 terminal or a computer running the Telnet protocol.
2. If the two DSUs are being installed as a local, wire-line connection, set the master DSU's Network Tx Clock Source to Internal (S1-4 to Internal). Leave it set to Receive for a standard Telco network connection.
3. The master DSU automatically initiates the wake up procedure with the remote DSU. The wake up procedure opens the DCC and sets the relevant configuration options at the remote to be compatible with the type of DCC selected at the master.
4. Return to the Shelf Inventory screen. If the wake up procedure has been successful a + sign is now displayed next to the slot number of the master DSU.
5. Access the remote DSU and perform whatever configuration it requires to operate correctly in the system. The wake up procedure only sets options in the remote that apply to DCC operation, not those that apply to passing main channel data.

Chapter 3: Operation

Overview

This chapter describes management features available for performing configuration, monitoring, and diagnostics on the DSU. You can control the DSU either through an SNMP-based Telnet application or through GDC's TEAM (an HP OpenView on a Sun or HPPUX controller) via the resident SCM card.

This chapter provides instructions for using the Telnet interface. This interface enables you to alter the configuration of the DSU, invoke diagnostic test functions, ([Chapter 4, Tests](#) describes the individual tests) view the current status of DTE interface signals and unit alarm conditions, and display information on the unit.

Telnet

When the SC 800 T3 is installed in a SpectraComm shelf with an SCM card, it supports a VT-100 terminal interface via the SCM card. The SCM card uses either the Telnet protocol to send the information to a remote LAN-attached terminal or it sends the information through the SCM's front panel craft (CTRL) port.

When the SC 800 T3 card is in a shelf without an SCM card (Remote Unit Option ON or OFF), it supports Telnet connectivity via the in-band management channel to the master unit. A terminal connected to either the SCM's front panel craft port, or LAN-attached to the SCM can communicate via Telnet to either the master or remote SC 800 T3 unit.

Note *A Telnet session and a craft port session cannot take place simultaneously with a remote. A Telnet session will override a craft port session in progress, or lock out the craft port from use. When the Telnet session is closed, a craft port session can begin.*

SpectraComm 2000 Shelf

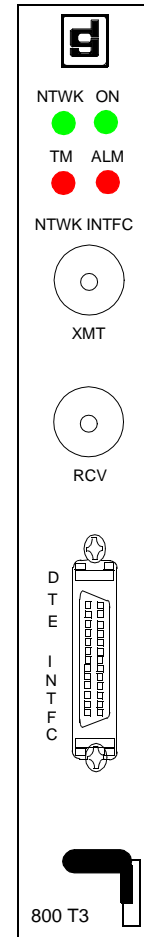
The SpectraComm 2000 shelf (SC2000) is a one rack-unit high horizontal rackmount shelf, which can house two SpectraComm cards. Since an SCM card is typically not used in the SC2000, the shelf provides a craft port to allow the equivalent function of the SCM's craft port. It actually provides two craft ports, (one for each card) via the backplane. The SC 800 T3 only supports the craft port, if it is installed in a SC2000 or similar enclosure without an SCM or if the Remote Only Option is ON or OFF.

Controls and Indicators

[Table 3-1](#) illustrates the SC 800 T3 DSU front panel and explains the functions of the indicators and connectors.

Table 3-1 Front Panel Indicators/Connectors

Indicators	
LED	Use
NTWK	Network Green - This LED will be on to indicate a properly operating network interface. It will go off for any of the following network interface alarm conditions: NS (No Signal) (175±75 consecutive zeros), OOF (Out Of Frame), AIS (Alarm Indication Signal), RAI (Remote Alarm Indication).
ON	Power ON Green - Power is applied to the DSU.
TM	Test Mode. Red - On for any test initiated either by the manager, network or the DTE.
ALM	Alarm Red - On during any alarm condition, including the network interface alarms, NS, OOF, excessive errors, but not for AIS or RAI. While in test, the LED remains lit unless errors are detected, in which case it flashes off periodically.
Connectors	
RCV/XMT	Network Transmit/Receive - 75 ohm BNC coax connectors provides connection to DS3 network.
DTE INTFC	DTE interface - HSSI high-density connector (SCSI-2) 44.2Mbps full T3 bandwidth.



Terminal Interface

Local access to the terminal interface requires an SCM card when the SC 800 T3 DSU is installed in a SpectraComm shelf. The SCM card supports two types of connection for terminal interface functions:

- Connection of a VT100-compatible terminal via the CTRL port on the SCM front panel.
- Telnet connection via the SCM LAN port (from the shelf's rear panel slot associated with the SCM Card - See [Figure 2-2](#) in *Chapter 2*).

When either one or two SC 800 T3 DSU's are installed in a SpectraComm 2000 shelf, (no SCM Card) the shelf supports connection of a VT100-compatible terminal via the rear panel Term 1 or Term 2 connectors.

Initiating a Terminal Interface Session

The first portion of a terminal interface session varies depending on whether or not you're going through an SCM card. If you are using an SCM card, the procedure also varies depending on whether you use a VT100-compatible terminal connected directly to the SCM front panel or a computer with a Telnet connection to the SCM LAN port.

VT100-compatible Terminal Connected to SCM Card Front Panel

When you connect a VT100 terminal to the SCM front panel CTRL jack, and after you enter `Element Access`, the screen displays the Shelf Inventory screen ([Figure 3-1](#)).

Telnet Connection to SCM LAN Port

When you connect a terminal to the SCM LAN port, and after you enter the login password (The default password is `scmadmin`) the screen displays the Shelf Inventory screen that appears in [Figure 3-1](#).

VT100-compatible Terminal Connected to SC2000 Shelf

When the SC 800 T3 DSU is installed in an SC2000 shelf and the other slot is empty, you must connect the terminal to the back panel Term connector for the occupied slot.

When there are cards in both slots of an SC2000 shelf, you can connect the terminal to the appropriate Term 1 or Term 2 connector on the back panel. When you turn on the terminal the first screen to appear is the main menu for the SC 800 T3.

Note *All of the following screens are valid for the SC2000 connection with the exception that you won't see any reference to shelf, for example, [0] Return to Shelf Inventory.*

Shelf Inventory Screen

The Shelf Inventory screen shown in [Figure 3-1](#) is for a two-shelf installation in which both SpectraComm shelves are filled with SC 800 T3 DSUs. The two columns for Slots 17 through 32 do not appear when there is only one SpectraComm shelf.

SHELF INVENTORY			
Slot	Card	Slot	Card

[1]	SCM	[17]	SC 800 T3
[2]	SC 800 T3	[18]	SC 800 T3
[3]	SC 800 T3	[19]	SC 800 T3
[4]	SC 800 T3	[20]	SC 800 T3
[5]	SC 800 T3	[21]	SC 800 T3
[6]	SC 800 T3	[22]	SC 800 T3
[7]	SC 800 T3	[23]	SC 800 T3
[8]	SC 800 T3	[24]	SC 800 T3
[9]	SC 800 T3	[25]	SC 800 T3
[10]	SC 800 T3	[26]	SC 800 T3
[11]	SC 800 T3	[27]	SC 800 T3
[12]	SC 800 T3	[28]	SC 800 T3
[13]	SC 800 T3	[29]	SC 800 T3
+ [14]	SC 800 T3	[30]	SC 800 T3
[15]	SC 800 T3 (alarm)	[31]	SC 800 T3
[16]	SC 800 T3	[32]	SC 800 T3
[0]	Close Session	[C]	Circuit Identification
Enter selection: []			

Figure 3-1 Shelf Inventory Screen

The Shelf Inventory screen displays a + sign next to the slot number of any device that has a remote associated with it. It displays (alarm) next to the name of any device that currently has an active alarm condition.

Type a slot number and press ENTER. If the slot number corresponds to a unit that has a dedicated remote, the SCM displays a Drop Inventory screen ([Figure 3-2](#)) from which you can select either the MASTER (local) or REMOTE DSU. If the slot number corresponds to a unit without a dedicated remote, the selected DSU displays its SC 800 T3 Main Menu see [Figure 3-3](#)

```
SLOT 15: DROP INVENTORY

Drop      Card
-----
[0] MASTER SC 800 T3 (alarm)
[1] REMOTE SC 800 T3 (alarm)

[S] Go To -> Shelf Inventory   [D] Delete Remote

Enter drop:
```

Figure 3-2 Drop Inventory Screen

Main Menu

The SC 800 T3 Main Menu screen, shown in [Figure 3-3](#), is the access point to the individual terminal interface functions.

```
MASTER

MAIN MENU

Shelf Slot = 15

[1] Configuration
[2] Diagnostics
[3] Monitor/Status
[4] Maintenance
[5] Performance

[0] Return to Shelf Inventory

Select: [ ]
```

Figure 3-3 SC 800 T3 Main Menu Screen

Configuration

The Configuration Menu screen shown in [Figure 3-4](#) appears when you type 1 to invoke the Configuration function from the Main Menu.

```
SC 800 T3 Configuration
MASTER
[1] Network Options
[2] DTE Options
[3] Alarm Configuration

[0] Return to Main Menu

Select: [ ]
```

Figure 3-4 Configuration Menu Screen

The procedure for changing configuration option settings involves the following steps:

1. From the Configuration Menu, select the configuration screen you intend to work with by typing 1 (Network Options), 2 (DTE Options), or 3 (Alarm Configuration) and pressing ENTER. The DSU responds by displaying the selected configuration screen.
2. Type the selection number or letter of an option you intend to change. Highlighting appears on the current setting field for the corresponding option.
3. Use the up and down arrow keys to toggle the highlighted field through its potential settings.
4. When the desired setting is displayed, press ENTER. The highlighting disappears and the field displays the new setting.
5. Repeat steps 2 through 4 for each option you need to change.
6. To put the configuration changes you've made into effect, type S (Save/Update Configuration) and press ENTER. You may then select another configuration screen to work with, or select 0 to return to the main menu.
7. The terminal interface will not allow you to exit from the configuration function while there are unsaved configuration changes. If you attempt to do so by typing 0 to return to the main menu while, the screen displays RESTORE (R) or SAVE (S) Configuration? You can then type R and press ENTER to restore the last saved configuration and discard the pending changes, or type S and press ENTER to perform the save. In either case, the terminal interface confirms the selected action and then returns to the Main Menu.

8. After you've made all required changes, type 0 to return to the main menu, or CR(ENTER) to return to the previous menu. The display returns to the Configuration Menu.

Network Options Screen

The Network Options screen shown in [Figure 3-5](#) presents a screen of configuration options that determine operating parameters for the network interface of the DSU. Each option is identified by a selection number, and displays its current setting. [Table 3-2](#), which follows the figure, lists the settings available for each option.

Line Coding displays the fixed (B3ZS) Zero Code Suppression used on the link.

```

                                SC 800 T3 Network Options
MASTER

Line Coding          = B3ZS

The following three items are selected by switches
Framing Mode        = C-Bit Parity
Txmt Clock Source   = Receive
Line Buildout       = Short

[1] AIS Loopdown    : Disable
[2] Inband Loopback : Enabled

[CR] Return to Previous Menu  [S] Save
[0] Return to Main Menu

Select: [ ]

```

Figure 3-5 Network Options Screen

Table 3-2 SC 800 T3 Network Option Settings

Option	Description/Settings
[1] AIS Loopdown	Disable (default) - Alarm Indication Signal (AIS) does not terminate loopbacks 05-60 - Numbers of seconds of AIS that causes termination of loopback test.
[2] Inband Loopback	Enable or Disable (default) inband loopback from Telco Operation System
Frame Mode (read only)	M13 - Configures the network interface to M13 framing. C-Bit Parity (Default) - configures the network interface to C-bit parity.
Txmt Clock Source (read only)	Internal – DSU itself provides the timing source Receive (default) - DSU recovers receive clock from T3 data it receives at the network interface and uses that as its timing source (Default)
Line Buildout (read only)	Long – 100 to 450 ft. DS-3 mode. Short (default) - 0 to 100 ft. DSX-3 mode.

DTE Options Screen

The DTE Options screen shown in [Figure 3-6](#) presents a screen of configuration options that determine operating parameters for the DTE interface of the DSU. Each option is identified by a selection number, and displays its current setting. [Table 3-3](#), which follows the figure, lists the settings available for each option.

```

SC 800 T3 DTE Options
MASTER

[1] DTE Loop Timeout      : Disabled
[2] DTE Test              : Enabled
[3] DCE Ready             : Follows DTE Ready

[CR] Return to previous menu  [S] Save
[0] Return to Main Menu

Select: [ ]
    
```

Figure 3-6 DTE Options Screen

Table 3-3 SC 800 T3 DTE Configuration Option Settings

Option	Description/Settings
[1] DTE Loop Timeout	Enabled or Disabled (default) - When enabled, this option deactivates a remotely generated DTE loop after a ten minute time-out.
[2] DTE Test	Enabled or Disabled (default) the activation of loops generated by the DTE.
[3] DCE Ready	Forces the control lead DCE Ready on regardless of the data-passing mode of the DSU. Follows DTE Ready (default), Forced On.

Alarm Configuration Screen

The Alarm Configuration screen shown in [Figure 3-7](#) appears when you type 3 to invoke the Alarm Configuration function from the Configuration Menu.

The Alarm Configuration function determines which alarms the DSU is to report. The function is divided into two screens: Alarm Masks shown in [Figure 3-8](#) and Alarm Thresholds shown in [Figure 3-9](#). In the Alarm Masks screen you designate which alarms the unit reports (Reported) and which alarms it does not report (Masked). Definitions of the alarm conditions appear in Appendix C - [Alarm Definitions](#).

```
SC 800 T3 Alarm Configuration
MASTER
[1] Alarm Masks
[2] Alarm Thresholds

[CR] Return to Previous Menu
[0] Return to Main Menu

Select: [ ]
```

Figure 3-7 Alarm Configuration Screen

The procedure for masking or reporting an alarm involves the following steps:

1. From the Alarm Configuration Menu screen select 1 and press ENTER. In response the Alarm Mask Configuration screen is displayed.

```

                                SC 800 T3 Alarm Mask Configuration
MASTER
Network Alarms                                Threshold Alarms
[1] Loss of Signal(LOS)      : Reported    [11] Errored Seconds - Line : Reported
[2] Out of Frame(OOF)       : Reported    [12] Errored Seconds        : Reported
[3] Alarm Indication Signal : Reported    [13] Severely Errored Seconds : Reported
[4] Remote Not Responding   : Reported    [14] Severely Err'd Frame/AIS : Reported
[5] Remote Alarm Indication : Reported    [15] Unavailable Seconds     : Reported
[16]Code Violations         : Reported

DTE AlarmsUnit Alarms
[6] DTE Tx Clock Loss       : Reported    [17] Unsolicited Test         : Reported
[7] Tmt Data No Transitions : Reported    [18] Configuration Change    : Reported
[8] Rcv Data No Transitions : Reported    [19] Top PowerSupply         : N/A
[9] DTE Ready Loss          : Reported    [20] Bottom PowerSupply       : N/A
[10]DTE Test                : Reported

[21]All Alarms Control      : Reported

[0] Return to Main Menu     [S]Save      [CR] Return to Previous Menu
Select: [ ]

```

Figure 3-8 Alarm Mask Configuration Screen

2. You may want to begin with the All Alarms Control [22] command, depending on how you intend to set the majority of the alarm options. Select with arrow keys Masked or Reported, then press ENTER.

Go to step 8 if you don't need to change any of the individual alarm options. If you do need to change individual options, follow steps 3 through 7.

3. Type the selection number of the option you intend to change. Highlighting appears on the current setting field for the corresponding option.
4. Use the arrow keys to toggle the highlighted field through its two potential settings, Masked and Reported.
5. When the field displays the desired setting, press ENTER. The highlight returns to the Select field.
6. Repeat steps 3 through 5 for each option you need to change.
7. To save the new configuration and put it into effect in the DSU, type selection S, Save and press ENTER.

If you decide not to put your changes into effect, go to step 9 without selecting Save.

8. After you've made all required changes and you are certain they are correct, type 0 and press ENTER to return to the Alarm Configuration Menu screen.
9. To dismiss the Alarm Configuration menu screen, type selection 0, Return to Main Menu, and ENTER.

In the Alarm Thresholds screen you can enable (alarm is sent every time the event occurs) or disable alarms. The Count Threshold is the number of events required to generate the alarm. Set Threshold as needed press S (Save), then type 0 and press ENTER to return to the Main Menu.

```

                                SC 800 T3 Alarm Threshold Configuration
MASTER
Type                               Time Interval           Count Threshold

Errored Seconds - Line      : [1] Report All       [7]  >10
Errored Seconds             : [2] Report All       [8]  >10
Severely Errored Seconds   : [3] Report All       [9]  >10
Severely Err'd Frame/AIS   : [4] Report All      [10]
Unavailable Seconds        : [5] Report All      [11]
Code Violations             : [6] Report All      [12]

[CR] Return to Previous Menu   [S] Save
[0] Return to Main Menu

Select: [ ]

```

Figure 3-9 Alarm Threshold Configuration Screen

Screen parameters are described below:

Time Interval - A window in time in which a specified number of errors must occur.

Report All - Does not require a time interval. It simply reports an alarm on each occurrence.

Count Threshold - You select the threshold of error events.

Last 1 sec, 1 min., 1 hour - Window of time in which a number of events have occurred.

Diagnostics

All tests that you perform by means of the terminal interface involve similar basic procedures, which are described below.

Employ the following procedure to initiate tests using the terminal interface:

1. If the test requires cooperation with an operator at a remote site, contact that person and make arrangements to perform the test. Tests that must be initiated (and later terminated) at both sites include the End-to-End Self-Test, Network Line and Payload Loopbacks.
2. Select [2] Diagnostics from the terminal interface Main Menu. The DSU responds by displaying the SC 800 T3 Diagnostics screen, as shown in [Figure 3-10](#). [Table 3-4](#) and the following text, describe the diagnostics screen and its use.

```

                                SC 800 T3 Diagnostics
MASTER
[1] Loopback Test      : Stop Test/No Test
[2] Test Time Limit   : 30 Sec

[3] Transmit DS3 Idle : Inactive
[4] Reset Test Results :
[5] Insert 1-bit Error :

Test Status           : Not in Test

Bit Errors            :

Receive DS3 Idle     : Inactive

[0] Return to Main Menu
[S] Save parameters [1]&[2] and thereby Start or Stop a test

Select: [ ]
    
```

Figure 3-10 Diagnostics Screen

Table 3-4 SC 800 T3 Diagnostics Option Settings

Option	Description/Settings
[1] Loopback Test	Selections are: Stop Test/No Test (default), Line Loopback, Payload Loopback, Local Loopback, Local Loopback w/ST, DTE Loopback, Remote Lineloop, Remote Lineloop w/ST, Remote Payldoop, Remote Payldoop wST
[2] Test Time Limit	30 seconds (default) or 1-10 in 1 minute intervals or 10 to 30 minutes in 5 minute intervals, or unlimited.
[3] Transmit DS3 Idle	Active or Inactive (default) - Sends the standard DS3 Idle signal (11001100...) to the network.
[4] Reset Test results	Resets Diagnostic Results and Bit Errors so you can run another test.
[5] Insert 1-Bit Error	You can use this command to insert a single bit error to verify test results.

3. Select the test you intend to perform: Select `1 Loopback Test`. The selection field to the right of the colon is highlighted by reverse video. While highlighted, you may scan through the choices by using either the right or left arrow keys. The choices are:
 - Stop Test/No Test - *default*
 - Line Loopback
 - Payload Loopback
 - Local Loopback
 - Local Loopback with Self-Test
 - DTE Loopback
 - Remote Linelooop (Master Only)
 - Remote Linelooop with Self-Test (Master Only)
 - Remote Payload Loopback (Master Only)
 - Remote Payload Loopback with Self-Test (Master Only)
 - End-to-End Self-Test (Master Only)
4. Once you have selected the desired test, press ENTER. The cursor will return to the `Select` box at the bottom of the screen.
5. To select how long the test is to run, select `Test Time Limit` by typing 3 and press ENTER. Highlighting appears on the `Test Time Limit` selection field. Use the arrow keys to toggle the field through the available choices until it displays the duration you want to select, then press ENTER. The choices are:
 - 30 seconds
 - 1 minute through 10 minutes in 1 minute steps
 - Also 15, 20, 25, and 30 minute choices along with No Limit (infinite time).

Once you make these three selections, start the test by entering `[S] Save parameters [1]&[2]` and thereby Start or Stop a test, followed by ENTER. `Test Status` line reads - `Test About to Start` - for approximately 15 seconds, then `Test in Progress`. The test is now performed. If you selected a test time other than `Infinite`, the loopback test will complete in that period at which time the `Loopback Test` selection automatically returns to `Stop Test/No Test`. `Test Status` line returns to `Not in Test`.

During the loopback tests, `Bit Errors` and `Receive DS3 Idle` status are presented on the screen if they occur. This will not be at real time occurrence, but accumulated over a 10 second period and then displayed on the screen.

6. While the test is in progress, you may command choices from the following choices:

`Reset Test Results` - resets bit errors that were inserted and permits you to re-run another test.

`Insert 1-Bit Error` - generates an error in the pattern in order to confirm transmission and reception.

7. You may stop the test at any time by re-selecting the Loopback Test and scanning to the Stop Test/No Test choice by pressing ENTER and [S] to save. The screen responds, "Test Aborted".

[0] Returns you to the Main Menu.

Descriptions of the diagnostic functions appear in *Chapter 4, Tests*.

Monitor/Status

When you select Monitor/Status from the Main Menu, the resulting screen, shown in [Figure 3-11](#), is presented.

The Monitor/Status screen presents current status information concerning alarm conditions. It displays the current status, INACTIVE or ACTIVE, of the alarm conditions that the DSU can report. It refreshes every 5 seconds. Definitions of the alarm conditions appear in *Appendix C, Alarm Definitions*.

When you are done viewing the screen, type 0 and press ENTER to return to the Main Menu.

```

SC 800 T3 Monitor Alarm Status

MASTER

Network Alarms                                Threshold Alarms
Loss of Signal(LOS)      : ACTIVE             Errored Seconds - Line   :
Out of Frame(OOF)       : INACTIVE            Errored Seconds         :
Alarm Indication Signal : INACTIVE            Severely Errored Seconds :
Remote Not Responding   : INACTIVE            Severely Err'd Frame/AIS :
Remote Alarm Indication : INACTIVE            Unavailable Seconds     :
                                           Code Violations         :

DTE Alarms                                     Unit Alarms
DTE Clock Loss          : ACTIVE             Unsolicited Test        :
Tmt Data No Transitions : ACTIVE             Configuration Change    :
Rcv Data No Transitions : ACTIVE             Top PowerSupply         :
DTE Ready Loss          : ACTIVE             Bottom PowerSupply      :
DTE Test                :

[0] Return to Main Menu

Select: [ ]

```

Figure 3-11 Monitor Alarm Status Screen

Maintenance

The terminal interface SC 800 T3 Maintenance screen, shown in [Figure 3-12](#), has four selections:

[1] What Are You? – Provides access to the What Are You? screen, which is described in the following pages under its own heading.

[2] Soft Reset – commands the DSU to perform a reset without altering its configuration.

[3] `Reset to Factory Defaults` – restores all configuration options in the DSU to their factory default settings and performs a reset.

[4] `Reset Statistics` – commands the DSU to perform a reset of statistics. This screen is described in the following pages under its own heading.

[5] `Firmware Download` – provides access to the Firmware Download Screen, which is described in the following pages under its own heading.

When you are done viewing the Maintenance screen, type 0 and press ENTER to return to the Main Menu.

```
SC 800 T3 MAINTENANCE MENU
MASTER

[1] What Are You
[2] Soft Reset
[3] Reset to Factory Defaults
[4] Reset Statistics
[5] Firmware Download

[0] Return to Main Menu

Select: [ ]
```

Figure 3-12 Maintenance Screen

What Are You?

The terminal interface `What Are You` Submenu screen, shown in [Figure 3-13](#), displays the housing that the SC 800 T3 is installed in.

```
SC 800 T3 What Are You Submenu
MASTER

Serial Number:          0094000516000000332
Firmware Revision:     - -
Shelf Type Card Installedin: 5000 Series Shelf

[CR] Return to Previous Menu
[0] Return to Main Menu

Select: [ ]
```

Figure 3-13 What Are You? Screen

Soft Reset

The terminal interface `Soft Reset` option, displays the following warning:

```
* WARNING - SOFT RESET DISRUPTS COMMUNICATIONS Continue? [ ]Y(es), N(o)
```

Selecting `Y` resets the statistics. Selecting `N` returns to the menu selection.

Reset to Factory Defaults

The terminal interface `Reset to Factory Defaults` screen, displays the following warning:

```
*WARNING - FACTORY DEFAULT DISRUPTS COMMUNICATIONS Continue? [ ] Y(es), N(o).
```

Selecting `Y` resets the factory setting and performs reset. Selecting `N` returns to the menu selection.

Reset Statistics

When you select `Reset Statistics` from the Maintenance Menu, the resulting screen, shown in [Figure 3-14](#), is presented.

```
SC 800 T3 Reset Statistics Selections
MASTER
[1] All Near-End Statistics
[2] All Far-end Statistics

[CR] Return to Previous Menu
[0] Return to Main Menu

Select: [ ]
```

Figure 3-14 Reset Statistics Screen

Select the desired statistic you wish to reset and press ENTER.

Firmware Download

The terminal interface Firmware Download function enables you to load new operating firmware into the DSU. Loading new firmware is typically required when GDC makes changes to improve performance or to include new features.

The SC 800 T3 DSU can store two versions of operating firmware, designated as the `Active Firmware Revision` and the `Standby Firmware Revision`. You can have newly downloaded firmware immediately serve as the `Active Firmware Revision`, or you can store it as the `Standby Firmware Revision`. You can switch between active and standby revisions as needed.

Note *Before downloading firmware to a remote, adjust the timing of your TFTP client in order to prevent timeout during file transfer.*

```
SC 800 T3 Firmware Download Submenu
MASTER

Active Firmware Revision      : 01.00.00
Standby Firmware Revision    : 00.00.00
Standby Firmware Status      : INVALID - CHECKSUM BAD
Download Mode                 : DISABLE ALL DOWNLOADS

[1] Switch to Standby Firmware
[2] Disable All Downloads
[3] Enable Downloads and Store Zipped
[4] Enable Downloads, Unzip and Execute

[CR] Return to Previous Menu
[0] Return to Main Menu

Select: [ ]
```

Figure 3-15 Firmware Download Screen

The Firmware Download screen contains four lines of read-only information display, and four command selections. The following information is displayed:

Active Firmware Revision – Displays the version and revision number of firmware that is currently operating in the DSU.

Standby Firmware Revision – Displays the version and revision number of inactive firmware that the DSU has stored in zipped (compressed) format.

Standby Firmware Status – Displays one of seven status indications:

INVALID- BLANK – new DSU with no standby firmware loaded

VALID- OK – standby firmware loaded and ready for use

INVALID- CHECKSUM FAILED – standby firmware corrupted during download

INVALID- DOWNLOAD ABORTED – download in progress aborted by the SCM

INVALID- UNZIP FAILED – problem occurred during unzip of standby firmware

DOWNLOADING – transfer currently taking place

CALCULATING CHECKSUM – approximately 40 seconds following completion of transfer

Download Mode – Displays the DSU's selected response to a download of new firmware; see the command selections below for the potential modes.

The four command selections are:

[1] `Switch to Standby Firmware` – Commands the DSU to unzip (decompress) the stored, inactive firmware and place it into service as the current operating firmware; at the same time the DSU zips and stores the firmware that it had been operating with.

[2] `Disable All Downloads` – Commands the DSU not to accept download of firmware; displayed as `Download Mode` when selected.

[3] `Enable Downloads and Store Zipped` – Commands the DSU to accept download of firmware, storing the newly downloaded code as the zipped and inactive `Standby Firmware` until it is placed into service by the `Switch to Standby Firmware` command; displayed as `Download Mode` when selected.

[4] `Enable Downloads, Unzip and Execute` – Commands the DSU to accept download of firmware, immediately unzipping the newly downloaded code and placing it into operation, while storing the former operating code as zipped and inactive `Standby Firmware`; displayed as `Download Mode` when selected.

The command selections establish the DSU's response to the downloading of firmware. The Trivial File Transfer Protocol (TFTP) is used to perform the actual firmware download, using the following procedure:

1. From a multi-tasking terminal (VT-100 or Telnet), open a second window to perform a TFTP transfer. Keep the `Firmware Download` screen on display in order to monitor the `Download Status`.
2. Initiate a TFTP session to the SCM.
3. At the TFTP prompt type

`bin`

and press ENTER so that the transfer takes place in binary mode.

4. Type

`trace`

and press ENTER so that activity is displayed during the transfer.

5. Type `verbose`

and press ENTER

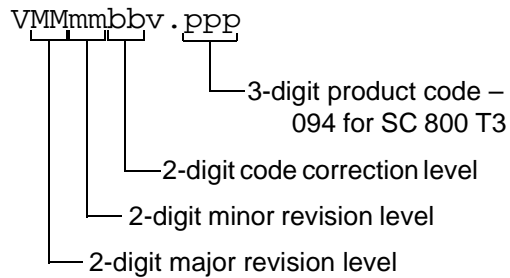
6. Type

`put "firmware filename" "address & product code"`

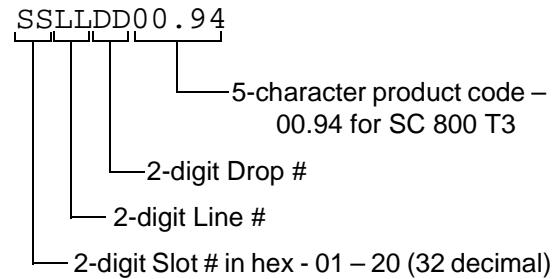
and press ENTER to initiate the actual transfer. The firmware filename is provided with the firmware that is to be downloaded. The address portion of the address and product code is the slot/line/drop address when you are downloading to a single unit. There is also a broadcast code that enables you to send new firmware to all the SC 800 T3 DSUs in a shelf (or pair of shelves) at once. The figure on the following page provides further definitions of the filename and address formats.

Note If the TFTP connection fails during a firmware download, access the destination card on the shelf and manually erase the data in the Flash before repeating the download. Refer to the *TEAM Core Operation Manual (058R720-V302)* for complete firmware download information.

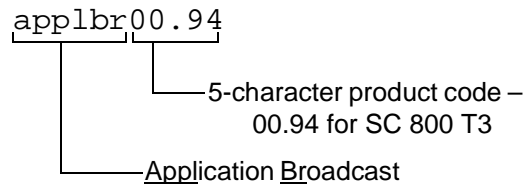
Firmware Filename Format:



Address and Product Code Format, Single Unit:



Address and Product Code Format, All SC 800 T3 Units in Shelf:



Note The Application Broadcast download can only be performed on master units, which occupy the same shelf as the SCM. To download a remote unit you must use the Single Unit download and specify the appropriate Slot/Line/Drop address.

- While the download is taking place the Standby Firmware Status line displays Downloading. That is followed by a period of approximately 40 seconds while it displays Calculating Checksum.

When you are done viewing the screen, type CR (ENTER) to return to the previous menu or press the 0 key then ENTER to return to the Main Menu.

Performance

When you select Performance from the Main Menu, the resulting screen, shown in [Figure 3-16](#), is presented. It contains selections for five near-end displays and five far-end parameter displays.

```

                                SC 800 T3 Performance
MASTER

[1] Near-End Current 15min Table
[2] Near-End Previous 15min Table
[3] Near-End Recent Interval Table
[4] Near-End Current Day Table
[5] Near-End Previous Day Table

[6] Far-End Current 15min Table
[7] Far-End Previous 15min Table
[8] Far-End Recent Interval Table
[9] Far-End Current Day Table
[10]Far-End Previous Day Table

[11]Severely Errored Seconds B.E.R. Threshold: 1 x 10-6

[0] Return to Main Menu
    Select: [ ]

```

Figure 3-16 Performance Screen

Performance data collection refers to the accumulation for each of the defined performance parameters. The following tables are provided for each monitored parameter (The displays differ in the period of time that they cover):

- Current 15 min Table - Displays the impairment count for the parameter during a 15-minute accumulation period.
- Previous 15-min Table - Displays the impairment count for the last 15-minute intervals.
- Recent Interval Table - Displays four hours of information, presented as 16 15-minute intervals.
- Current/Previous Day Table - Displays total counts for the 24-hour period from 0-24 or 24-48 hours ago.
- Severely Errored Seconds B.E.R. Threshold - Sets the threshold for Severely Errored Seconds (SES) to be either 1×10^{-6} (default) or 7.5×10^{-5} .

Each parameter display presents information concerning occurrences of five conditions:

- Code Violations - This event for a coded signal is the occurrence of a received bipolar violation that is not part of a zero-substitution code. This pertains to near-end only.
- Errored Seconds - The count of 1-second intervals containing the occurrence of one or more P-bit parity errors, one or more Severely Errored Frame (SEF) defects, or one or more Alarm Indication Signal (AIS) defects.

- **Severely Errored Seconds** - Defined as a one-second period having greater than or equal to 30% of errored blocks. This is a time period equivalent to four contiguous blocks or 1 ms, whichever is greater; that is, either all the contiguous blocks are affected by an error density greater than or equal to 10^{-2} , or there is a signal loss.
- **Severely Errored Frame/AIS** - Displays the result of the occurrence of a Severely Errored Frame (SEF) or Alarm Indication Signal (AIS) defect. A SEF defect is the occurrence of three or more F-bit errors in 16 consecutive bits. An AIS defect is the occurrence of AIS contiguous M-frames for a time equal to or greater than 1 second. The frame and AIS defects are declared an alarm when the defects persist for 2.5 seconds.
- **Near-End Path Failure Count** - A count of the number of occurrences of near-end path failure events, with the failure event defined as follows: A near-end path failure event begins when either a LOF or AIS failure is declared, or a near-end path failure event ends when both LOF and AIS failures are clear.
- **Unavailable Seconds** - The period of the Unavailable Seconds Signal (UAS) State. UAS state is declared after the detection of 10 contiguous Severely Errored Seconds (SES), and is cleared after a 10-second period with no SES.

When you are done viewing the screen, press the 0 key then ENTER to return to the Main Menu.

[Figure 3-17](#) shows the parameter display for the Near-End Current 15min Table Submenu. The near-end and far-end displays are identical except for the screen title. When you are done viewing the screen, type CR (ENTER) to return to the previous menu or press the 0 key then ENTER to return to the Main Menu.

```

Near-End Current 15min Table Submenu
MASTER

LINE Parameters:

Errored Seconds      :

PATH Parameters:

Code Violations      : 287
Errored Seconds      : 0
Severely Errored Seconds : 0
Severely Errored Frame/AIS : 0
Unavailable Seconds  : 0

Near-End Path Failure Count : 0

[CR] Return to Previous Menu
[0] Return to Main Menu

Select: [ ]

```

Figure 3-17 Parameter Screen-Near-End Current 15 min Table Submenu

[Figure 3-18](#) shows a sample of the Near-End Recent Interval Table screen. You can access this screen (press 3 and ENTER from the Performance screen, or select any of the parameters in the Performance screen in the same manner) The interval threshold values for the performance parameter counts up to 31 recent 15-minute periods.

The source of the statistics on display is identified by the title at the top of the screen. This screen shows the minimum ranges for threshold values. The near-end and far-end displays are identical except for the screen title.

When you are done viewing the screen, type CR (ENTER) to return to the previous menu or press the 0 key then ENTER to return to the Main Menu.

Note *SP and CR (Spacebar and Carriage Return [ENTER]) displays the next interval group (17-31). Pressing Sp, CR again wraps back to 1-16.*

Near-End Recent 15-minute Registers Submenu						
MASTER						
INTERVAL	ES-L	ES	SES	SAS	UAS	CV
1	900	0	0	0	0	54
2	900	0	0	0	0	54
3	900	0	0	0	0	54
4	900	0	0	0	0	54
5	900	0	0	0	0	54
6	900	0	0	0	0	54
7	900	0	0	0	0	54
8	900	0	0	0	0	54
9	900	0	0	0	0	54
10	900	0	0	0	0	54
11	900	0	0	0	0	54
12	900	0	0	0	0	54
13	900	0	0	0	0	54
14	900	0	0	0	0	54
15	900	0	0	0	0	54

[SP+[CR] Display next interval group (1-16,17-31)
 [CR] Return to Previous Menu
 [0] Return to Main Menu

Select: []

Figure 3-18 Parameter Screen-Near-End Recent 15-minute Registers Submenu

Overview

This chapter describes the tests you can perform on the SC 800 T3 DSU that can be initiated by the network manager, the network, or the DTE via the HSSI port. Applicable diagnostic tests are timed. The TM LED will be lit for all tests.

You should test the equipment when it is first installed to verify correct installation. After the equipment is in service you can use the tests to diagnose any problems that occur in the operation of the DSU or the data communications system.

You can perform the following tests on the SC 800 T3:

- Local Loopback with Self Test
- Local Loopback
- Payload Loopback
- Line Loopback
- End-to-End Self Test (Master Only)
- Remote line Loopback (Master Only)
- Remote Payload Loopback (C-bit parity mode only) (Master Only)
- Remote Line Loopback with Self Test (Master Only)
- Remote Payload Loopback with Self Test (C-bit parity mode only) (Master Only)
- DTE Loopback

Complete descriptions of the individual tests appear on the following pages.

T3 Local Loopback Test with Self-Test

This test can be commanded by means of the terminal interface, or by SNMP control.

Local Loopback Test with Self-Test (see Figure 4-1) checks the internal circuits of the local DSU, isolated from both the DTE and the network. The test procedure involves two functions:

- Local Loopback Test — the DSU loops transmit data back as receive data.
- Self-Test — the DSU enables its internal Test Pattern Generator to provide the signal for the Local Test loop and enables its Test Pattern Checker to verify the signal. The DSU is isolated from its DTE while the Test Pattern Generator and Checker are enabled.

The TM indicator is On during the test. The TM indicator remains On as long as the test pattern is received without errors. TM indicator blinks off when an error is detected.

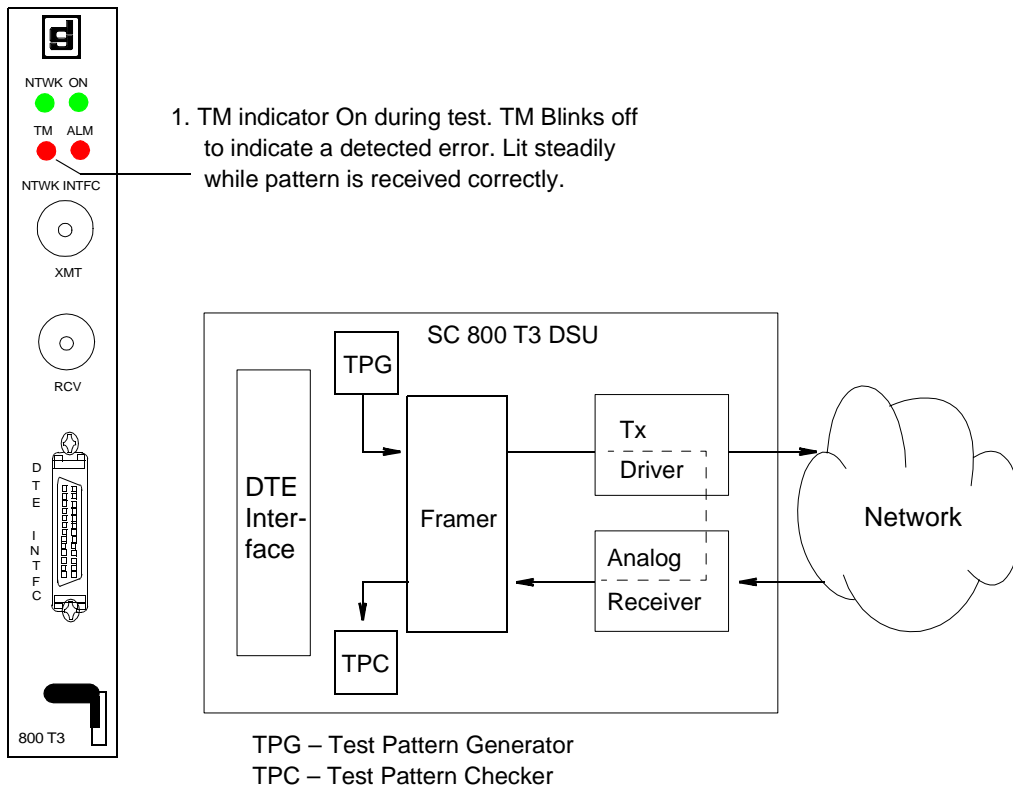


Figure 4-1 T3 Local Loopback Test with Self-Test

T3 Local Loopback Test

This test can be commanded by means of the terminal interface, by SNMP control, or EIA Loop A Loop B leads.

The T3 Local Loopback Test (see Figure 4-2) isolates the DSU from the network by connecting the transmit logic circuits to the receive logic circuits. The loopback provides a path through the DSU for an externally generated test signal.

During Local Loopback Test:

- The DTE interface remains active.
- The DSU loops transmit data from the DTE back as receive data.
- Either the DTE or a bit error rate tester (BERT) connected to the DTE interface can supply and check a test signal.
- The device supplying the test signal is responsible for error detection and reporting.

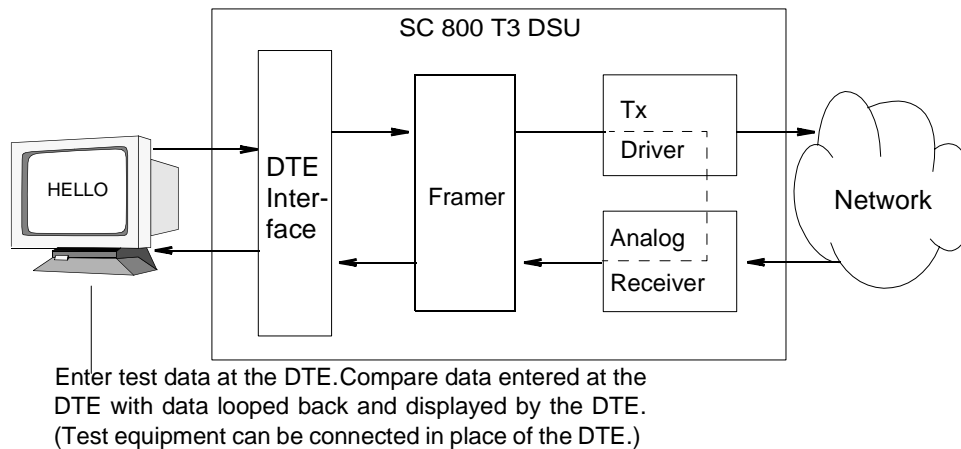


Figure 4-2 T3 Local Test

T3 Payload Loopback and Line Loops

These tests can be initiated from the terminal interface or by SNMP control.

A T3 Payload Loopback commands the DSU to loop the received T3 signal back to the remote after the network framer circuit. The remote site is responsible for test pattern generation and checking. Payload loopback tests everything on the network side up to and including the unit. It re-generates framing and corrects bipolar violations.

A T3 Line Loop commands the DSU to loop the received T3 signal back to the remote at the network interface. The remote site is responsible for test pattern generation and checking. See Figure.

Note Remote units cannot place master units in test.

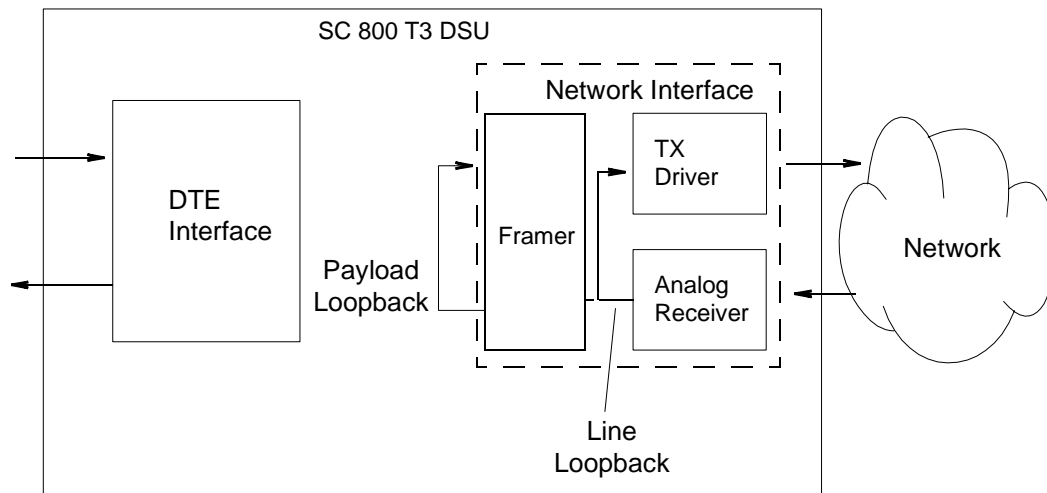


Figure 4-3 T3 Payload and Line Loops

T3 End-to-End Self Test

This test can be initiated from the terminal interface or by SNMP control.

T3 End to End Self Test (see Figure 4-4) turns on the T3-level test pattern generator and checker in the DSU. Use of this test requires coordination with the remote site, either to establish a loopback or to activate a test pattern generator and checker (using the same pattern) for an end-to-end test.

Errors inserted are sent to the remote unit.

Errors counted have been sent by the remote unit.

The illustration shows T3 Self Test in use as an End-to-End Test.

Note You can't use a remote telnet to set a loopback at the remote.

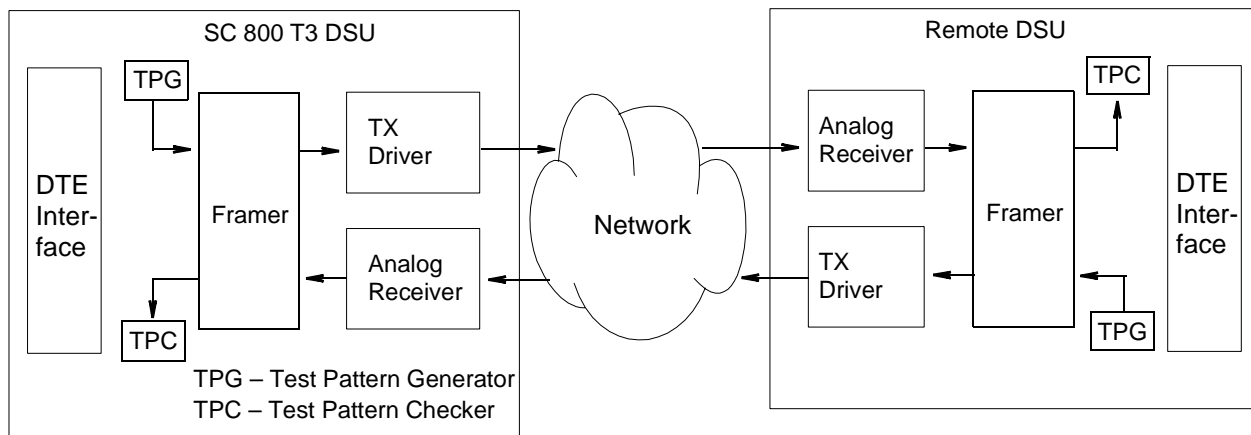


Figure 4-4 T3 End-to-End Self Test

T3 Remote Line Loopback/Remote Payload Loop Test

This test can be commanded by means of the terminal interface, by SNMP control, or DTE Loop A Loop B leads. - *Remote loopbacks are for C-Bit Framing only.*

In the Remote Test function the local DSU transmits an in-band command to its remote DSU, directing the remote to loop received signals back onto the network.

The remote loopback provides a path through the DSU, the network, and the remote DSU for an externally generated test signal. Remote Test checks the local DSU, a portion of the remote unit, and the T3 line.

During Remote Loop:

- The DSU transmits the in-band loop-up command to its remote DSU.
- In response to the command, the remote unit performs a digital loopback and loops the receive signal back to its transmit path.
- The DTE interface of the local DSU remains active.
- A test signal has to be generated and checked externally either by a DTE or by a bit error rate tester (BERT). Connection at the local site can be made through the DTE interface.
- The device supplying the test signal is responsible for error detection and reporting.
- The loopback remains in effect until the DSU transmits a loop down command to the remote unit to release the loopback. See Figure 4-5.

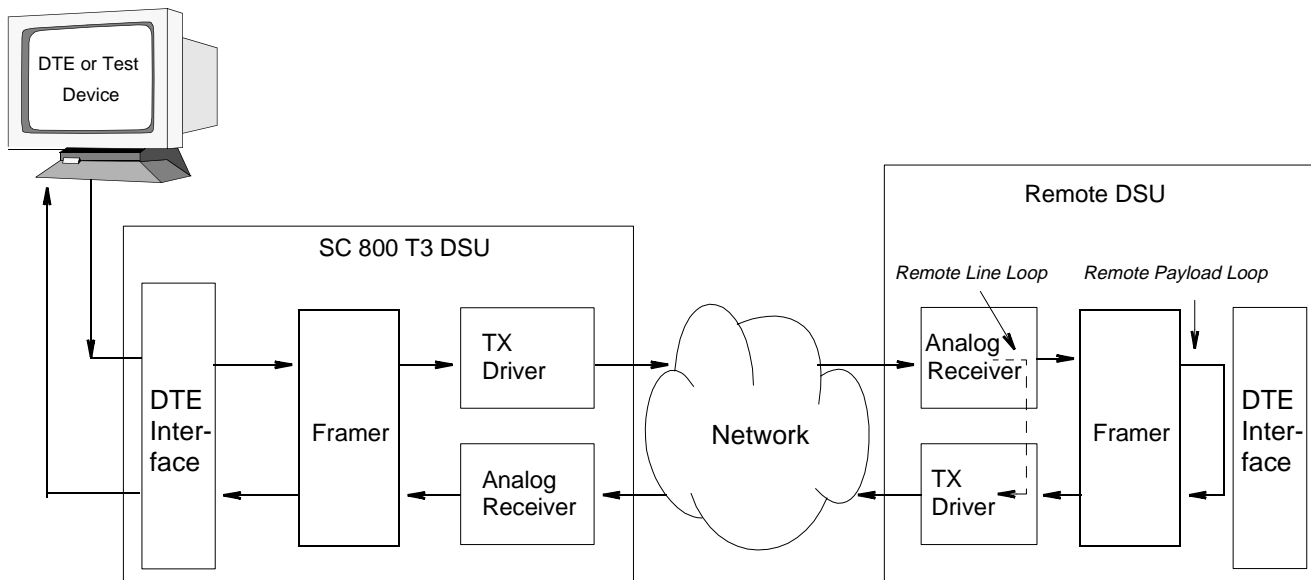


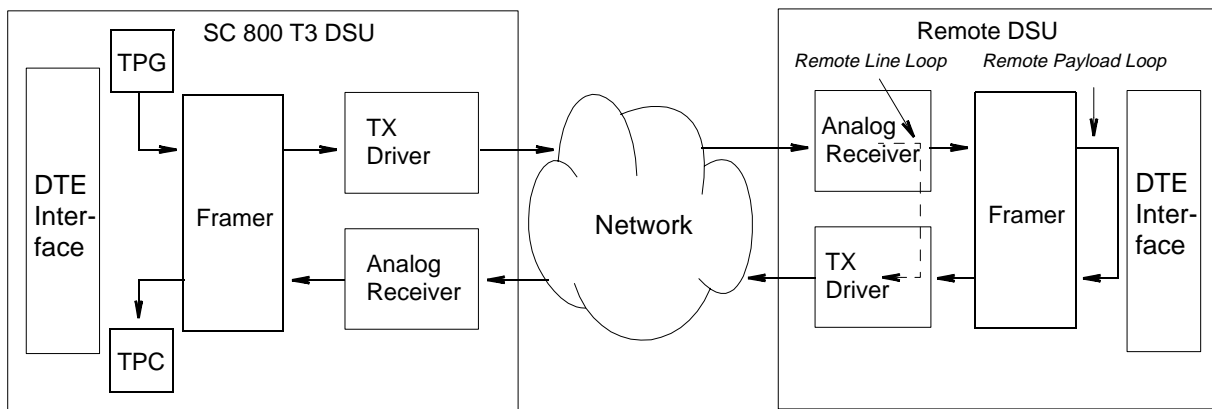
Figure 4-5 T3 Remote Line Loop/Remote Payload Loop Test

T3 Remote Line Loop with Self-Test/T3 Payload Loop with Self-Test

This test can be commanded by means of the terminal interface or by SNMP control.-
Remote loopbacks are for C-Bit Framing only.

Remote Line Loop with Self-Test isolates the local DSU from the DTE and checks the DSU internal circuits, the T3 link, and the remote DSU. The test procedure involves two functions:

- Remote Test — the local DSU transmits an in-band command to its remote DSU, directing the remote to loop received signals back onto the network.
- Self-Test — the DSU enables its internal Test Pattern Generator to provide the signal for the Remote Loop and enables its Test Pattern Checker to verify the signal. The DSU is isolated from its DTE while the Test Pattern Generator and Checker are enabled. See Figure 4-6



TPG – Test Pattern Generator
 TPC – Test Pattern Checker

Figure 4-6 Remote Line Loop Test with Self-Test/ Remote Payload Loop with Self-Test

DTE Loopback

This test can be commanded by means of the terminal interface or DTE Loop A, Loop B signals, or by SNMP control.

DTE Loopback commands the DSU to loop data back to the DTE at the channel interface. DTE Loopback checks everything up to the channel interface.

[Figure 4-7](#) illustrates the test and [Table 4-1](#) describes the TIA 613 specifications of the DTE loopbacks that may be performed.

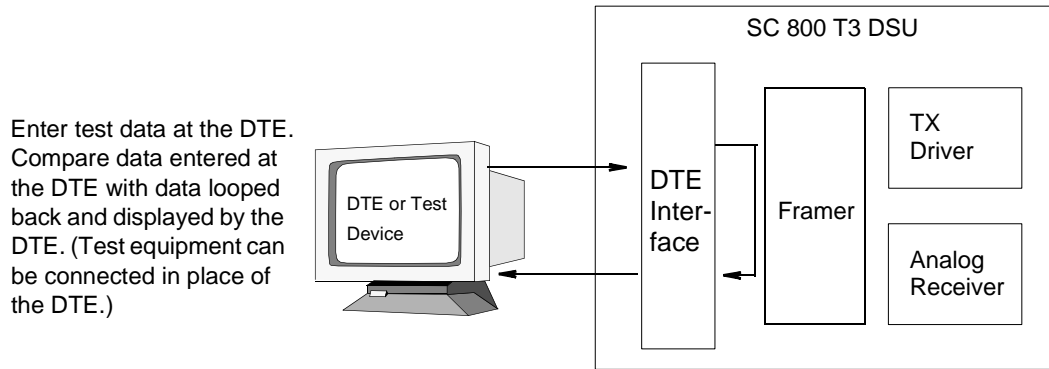


Figure 4-7 DTE Loopback

Table 4-1 DTE- Initiated Loopbacks

TIA-613 Loopback	Loopback A (143) [Through DTE interface (CPLD)]	Loopback B (144 [Through LIU])	Same as
None	Off	Off	-
Local Line (Loop B)	On	Off	Local Loopback
Remote Line (Loop C)	Off	On	Remote Payload Loopback
Local Digital (Loop A)	On	On	DTE Loopback

Appendix A: Technical Characteristics

Table A-1 Technical Characteristics

Item	Specification
Physical	
Width	0.81 in. (21 mm)
Height	7 in. (178 mm)
Depth	9.5 in. (241 mm)
Weight	10 oz (0.28 kg)
Environmental	
Temperature	
Operating	32° to 122°F (0° to 50°C) (Derate by 1°C/1000 ft above sea level)
Non-operating	-40° to 158°F (-40° to 70°C)
Humidity, operating	5% to 95% without condensation
Altitude	
Operating	0 ft to 10,000 ft (0 m to 3,047 m)
Non-operating	0 ft to 40,000 ft (0 m to 12,191 m)
Electrical	
Power dissipation	6.4 Typical W maximum per slot. Load Number = 1.1
Fusing	Two 2.5 A, 125 V (GDC Part No. 215-201-009) One 5 A, 125 V (GDC Part No. 215-201-021)
Network Interface	
Data rates	Line - 44.736 Mbps (DS3) Payload - 44.209694 Mbps
Communication line	T3 Digital Carrier
Line impedance	75 Ohm
Network port physical interface	2 BNC connectors, Transmit and Receive.
Line Code	B3ZS
Electrical Compatibility	ANSI T1.404-1994
DS3 Framing Formats	ANSI T1.107-1995 M23 multiplex or C-bit parity.
Transmit Timing source	Recovered from network timing or internal (44.736 Mbps ±20ppm).

Table A-1 Technical Characteristics (Continued)

Receive Range	Up to 450 feet (137m) of coaxial cable.
In-Service Performance Monitoring	ANSI T1.231-1997 Digital Hierarchy Layer 1 In-Service Digital Transmission Performance Monitoring.
Customer Interface	
Physical Port	HSSI 50-pin connector
Compatibility	TIA/EIA 612 TIA/EIA 613
Data Rate	44.209694 Mbps (44.736 Mbps gapped clock)
Timing Source	Network
Alarms and status conditions	Out of Frame (OOF), Alarm Indication Signal (AIS or Blue alarm), Loss of Signal (LOS), Red alarm, and Yellow alarm

Appendix B: Interface Signals

Table B-1 DTE HSSI Interface Front Panel Connector Pin Out

Pin No.	Circuit Number	Circuit Name	Direction	Description																		
1, 7, 13, 19, 25, 26, 32, 38, 44, 50	102	Signal Ground		Connects the DTE circuit ground to DCE circuit ground providing a path between the DTE and DCE signal commons.																		
11, 36	103	Transmitted Data	To DCE	Signals on this circuit are generated by the DTE and are transferred to the local DCE for transmission of data to remote DCE or for maintenance or control of the local DCE.																		
4, 29	104	Received Data	From DCE	Signals on this circuit are generated by the DCE in response to data signals received from the remote DCE, or for maintenance or control purposes. In all systems, the DCE does not transfer data to the DTE on this circuit unless an ON condition is present on 107 (DCE Ready) and 108/2 (DTE Ready).																		
3, 28	107	DCE Ready	From DCE	Signals on this circuit are used to indicate whether the DCE is ready to operate. The ON condition indicates that the DCE is ready to exchange data with the DTE.																		
8, 33	108/2	DTE Ready	To DCE	Signals on this circuit are used to indicate whether the DTE is ready to operate. The ON condition indicates that the DTE is ready to exchange data with the DCE.																		
10, 35 (A) 12, 37 (B)	143 144	Loopback A Loopback B	To DCE To DCE	Signals on these circuits are used to request the loopback test conditions as described below: <table border="1" data-bbox="889 1356 1390 1528"> <thead> <tr> <th colspan="2">Interchange Circuits</th> <th>Requested Loopback</th> </tr> </thead> <tbody> <tr> <td>143</td> <td>144</td> <td></td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>None</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>Local Line</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>Remote Line</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>Local Digital</td> </tr> </tbody> </table>	Interchange Circuits		Requested Loopback	143	144		OFF	OFF	None	ON	OFF	Local Line	OFF	ON	Remote Line	ON	ON	Local Digital
Interchange Circuits		Requested Loopback																				
143	144																					
OFF	OFF	None																				
ON	OFF	Local Line																				
OFF	ON	Remote Line																				
ON	ON	Local Digital																				
24, 49	142	Test Mode	From DCE	Signals on this circuit indicate whether the local DCE is in a test condition.																		
6, 31	114	Transmitter Timing (DCE)	From DCE	Signals on this circuit are used to provide the DTE with signal element timing information.																		
9, 34	113	Transmitter Timing (DTE)	To DCE																			
2, 27	115	Receive Timing (DCE)	From DCE	Signals on this circuit are used to provide the DTE with received signal element timing information.																		
Note: All other pins are Future Use.																						

Appendix C: Alarm Definitions

Overview

The descriptions of the alarms appear on the following pages. You may mask or unmask all of the alarms except Power Cycle. Refer to *Chapter 3*.

The DSU also accumulates alarm counts, which can be displayed by an SNMP controller.

Network Alarms

Loss Of Signal

A Loss of Signal (LOS) alarm event occurs when the DSU senses an absence of incoming signal at the interface. Absence of signal for a time equivalent to 175 bits (± 75) is considered no signal. A Network LOS alarm, caused by signal loss at the network interface, also turns off the front Network (NTWK) indicator.

Out Of Frame

An Out Of Frame (OOF) alarm event occurs when the DSU misses two out of four framing bits in an incoming T3 signal, a condition that results in loss of synchronization with the signal. A Network OOF alarm, caused by framing loss at the network interface, also turns off the front Network (NTWK) indicator. The count for an OOF alarm increments by one each time framing is lost, regardless of the number of frames affected.

Alarm Indication Signal

An Alarm Indication Signal (AIS) alarm event occurs when the DSU receives an AIS. A Network AIS alarm, caused by reception of AIS at the network interface, also turns off the front Network (NTWK) indicator.

DTE Alarms

TXC Loss

A Transmit Timing Loss alarm event occurs when the DSU stops receiving the transmit clock signal from the network.

TXD Loss

A Transmit Data (TXD) No Transitions alarm event occurs when Transmit Data coming to the DSU from the DTE consists of all ones or all zeros.

Threshold Alarms

Errored Seconds

An Errored Seconds alarm event occurs there is at least one CRC error event.

Severely Errored Seconds

A Severely Errored Seconds alarm event occurs when a one-second period has greater than or equal to 30% of errored blocks.

Severely Errored Frame/AIS

An Severely Errored Frame/AIS alarm event occurs at the occurrence of a Severely Errored Frame (SEF) or Alarm Indication Signal (AIS) defect.

Unavailable Seconds

An Unavailable Seconds alarm event occurs after the detection of 10 contiguous Severely Errored Seconds (SES), and is cleared after a 10-second period with no SES.

Code Violations

A Bipolar Violation (BPV) alarm event occurs when the T3 signal received by the DSU does not alternate between signal levels as required for Alternate Mark Inversion (AMI) or Bipolar with 8 Zero Substitution (B8ZS) data encoding.

Other Alarms

Unsolicited Test

An Unsolicited Test alarm event occurs any time the DSU enters a test mode that is not commanded by an SNMP controller. The DSU generates this alarm when it is commanded to perform a test by a control lead in its DTE interface, an in-band loop code (Remote Test or Remote Digital Loopback).

Configuration Change

A Configuration change alarm event occurs each time there a change in the configuration of the DSU.

Power Supply - Top/Bottom

A Power Supply error alarm event occurs when there is a failure in either the upper or lower power supply module of the SC 2000 shelf. This alarm is not available for the SpectraComm 5000 Shelf.

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