



SpectraComm 5516

DS0-DP

Installation & Operation Manual

076R166-000

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General DataComm
Smart Solutions for Service Providers

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If you have comments or suggestions concerning this manual, please contact:

General DataComm, Inc.
Technical Publications
6 Rubber Avenue
Naugatuck, Connecticut USA 06770

Telephone: 1 203 729 0271

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SC 5516 Documentation

Revision History for P/N 076R166-REV

Issue Number	Date	Description of Change
1	January 2002	Initial Release
2	April 2002	Added pinouts for test port and composite clock interfaces

Related Publications

Description	Part Number
SpectraComm/UAS Shelf & Enclosure Installation and Operation Manual	010R302-REV
SpectraComm Manager Card Installation & Operation Manual	048R303-REV
SpectraComm 5001 Line Terminating Unit	076R100-REV
SpectraComm 5520 Data Set Emulator	076R102-REV
TEAM Core Software Operation Manual	058R720-REV
TEAM 5506/5516 Operation Manual	076R168-VREF

-REV is the hardware revision (**-000**, **-001**, etc.)

-VREF is the most current software version (**-V400** is Version 4.0.0.)

In addition to the publications listed above, always read Release Notes supplied with your products.

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Preface

Scope

This manual describes how to install and operate the GDC SpectraComm 5516 DS0-DP product. 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 or any other General DataComm product.

General DataComm, Inc.
Technical Publicationt
6 Rubber Avenue
Naugatuck, Connecticut, 06770 USA
Tel: 1 203 729-0271

Safety and Precautions

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, and enhance equipment reliability. The definitions and symbols for such statements 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 *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.*

Safety Guidelines

Under proper conditions, this unit will operate reliably and safely in your network. If any component is improperly handled or installed, equipment failure or personnel hazard may occur. Use caution and common sense when installing network wires. Use the following guidelines, especially when unsafe conditions exist or when potentially hazardous voltages are present:

- 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 network jacks in a wet location unless the jack is designed for that location.
- Never touch uninsulated network wires or terminals unless the network line is disconnected at the network interface.
- Never install network wiring during an electrical storm.

Antistatic Precautions

Electrostatic discharge (ESD) results from the buildup of static electricity and can cause computer components to fail. ESD occurs when a person whose body contains a static buildup touches a computer component. The SCM card may contain static-sensitive devices that are easily damaged. Proper handling, grounding and precautionary ESD measures are essential. Keep parts and cards in antistatic packaging during transport or when not in use. When handling always use antistatic floorpads, workbenchpads and 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 screw driver or paper clip to set switches.

Compliance

Part 15 Compliance

This device complies with Part 15 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.

Industry Canada Notification - Pending

Electromagnetic Compatibility

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

Avis D'industrie Canada - Pending

La Compatibilité d' Eléctro-magnetique

Cet appareil numerique de la classe A est conforme a la norme NMB-003 du Canada.

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VITAL Network Services World Headquarters

6 Rubber Avenue
Naugatuck, Connecticut 06770 USA

<http://www.vitalnetsvc.com>

Telephones:	Faxes:
1 800 243 1030	1 203 723 5012
1 888 248 4825	1 203 729 7611
1 203 729 2461	

VITAL Network Services Regional Sales and Service Offices:

<p>North American Region Office 6 Rubber Avenue Naugatuck, Connecticut 06770 USA Telephones: 1 800 243 1030 1 888 248 4825 1 203 729 2461 1 800 361 2552 (French Canadian) Training: 1 203 729 2461 Faxes: 1 203 723 5012 1 203 729 7611</p>	<p>Central America, Latin America VITAL Network Services Periferico Sur 4225, Desp. 306 C.P. 14210, Mexico D.F., Mexico Telephone: 52 5 645 2238 Training: 52 5 645 2238 Fax: 52 5 645 5976</p>
<p>Europe, Middle East, Africa VITAL Network Services Molly Millars Close Molly Millars Lane Wokingham, Berkshire RG41 2QF UK Telephone: 44 1189 657200 Training: 44 1189 657240 Fax: 44 1189 657279</p>	<p>Asia Pacific VITAL Network Services 501 Orchard Road 05-05 Wheelock Place, Singapore 238880 Telephone: 65 735 2123 Training: 65 735 2123 Fax: 65 735 6889</p>

Chapter 1: Introduction and Specifications

System Overview

The SpectraComm 5516 High Density DS0-DP card (Digital Signal Zero Dataport) is a SS7 signal transfer point (STP) network access device designed for installation in a SpectraComm shelf located at a SS7 point of presence. Up to four SC 5516 cards in the shelf serve as a channel bank for one SC 5001 LTU, splitting one T1 line into as many as 24 DS0 channels. A single SpectraComm shelf with a SpectraComm Manager Card may hold up to three SC 5001 LTUs, each interfacing with up to four SC 5516 units. With the SC 5516 and SS7 STP located at the same site, line protection for outdoor loop connections is not required

Theory of Operation

Transmission data occupies 64 kbps time slots on one of four 4.096 Mb/s SpectraComm backplane data highways. The SC 5516 converts the data in the 64 kb/s timeslots (received via the SC 5001) to a DS-0A bipolar NRZ AMI 56/64 kb/s signal for connection to an on-site SS7 STP.

Conversely, the SC 5516 receives DS-0A data from the STP and converts it into 64 kb/s timeslots and sends it (via the SC 5001) on the T1 line ([Figure 1-1](#)).

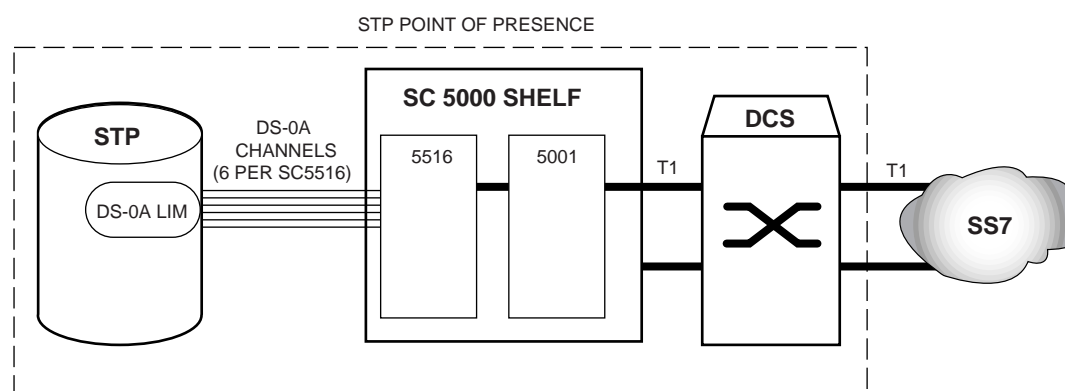


Figure 1-1 A Typical SC 5516 Deployment in a SS7 Environment

SC 5516 Features and Benefits

- Supports standard DS-0A format.
- Designed for NEBS Level III compliance.
- Provides Diagnostic Testing and Latching Loopback.
- DS-0A timing is provided by an external DDS Office Composite Clock. Each shelf accepts two composite clock inputs: one active and one redundant.
- Supports data rates of 56/64Kbps for each DS-0.
- Each SC 5516 provides six DS-0A ports.
- Front Panel LED status indicators evaluate the dataport circuit.
- Front Panel Bantam jacks provide non-intrusive test access. Test signals can be transmitted/received from the DS-0A or the DS-1 directions and may be used to perform manual loopbacks with a bantam-to-bantam patch cord.
- Power requirements are less than 5 Watts per card.
- Configurable through TEAM applications, through a Telnet connection via the SCM, or at the SCM's VT100 craft port.
- Supports auto-configuration via the SCM.
- Downloadable operating code.

Intended Use

The SC 5516 Digital Signal Zero Dataport (DS0-DP) is used in DDS-like SS7 networks. The unit is designed for installation in the SpectraComm system shelf. Along with a SC 5001 and an SCM card, four SC 5516's will aggregate 24 DS-0A's from a SS7 STP into one T1. The SC 5516 provides the interface between 64 kb/s timeslots in four 4.096 Mb/s data highways on the SC 5000 shelf backplane and the DS-0A signal.

Diagnostic Features

The SC 5516 provides DS-1 channel loopback, DS-0A line loopback and STC Latching loopback diagnostic tests which assist in restoring service quickly in the event of problems. A Test Mode LED illuminates on the Front Panel of the unit during loopback tests.

Channel Loopback and Line Loopback tests can be performed in three ways:

- from a terminal connected to the SCM front panel CTRL port
- from a Telnet connection via the SCM
- from an SNMP (TEAM) controller

STC Latching Loopback tests can be performed in two ways:

- with test equipment connected to the SC 5516 front panel test jacks
- initiated from the network



Management Features

SCM Communications

The SpectraComm Manager card occupies one slot in the SpectraComm shelf. It provides configuration, communication and management functions for the SC 5001 and an additional interface to the SC 5516 control port. These functions occur via the SpectraComm backplane with a back panel DB25F connector (LAN port) and two back panel RJ45 jacks (WAN ports) which provide the routine communications with an SNMP network manager. These interfaces are described in detail in the SCM Card Installation and Operation Manual.

SCM Discovery

Network discovery of the SC 5516 is performed by the SCM card. This function identifies compatible network elements located in the SpectraComm shelf (or shelves) stores element information in its local database. This information includes the element type, configuration checksum, serial number, alarm status, and equipment status. The user can access this information by means of the SCM Management Information Base (MIB).

After the initial Discovery, the SCM card polls the active slot addresses for alarms and statistical data on network elements and also polls one inactive slot. By reducing the frequency at which it polls inactive slots, the SCM card can continuously monitor as rapidly as possible and still discover newly installed SCM-compatible equipment.

Note Refer to the *SCM Installation and Operation Manual* for additional information on *SCM Communication and Discovery of network elements*.

SNMP MIBs

The software of the SC 5516 includes Simple Network Management Protocol (SNMP) Management Information Base (MIB) files that enable control by an SNMP network controller. A SpectraComm Manager (SCM) card is required to access the MIBs.

TEAM (Total Enterprise Access Management)

The SC 5516 can be managed through the TEAM application software. TEAM also provides an interface for Discovery and Mapping functions of TEAM Applications within the HP OpenView framework. TEAM applications use Simple Network Management Protocol (SNMP) to configure and control the operation of SpectraComm devices through the SCM card that shares the same shelf.

All of the TEAM application interfaces use the HP OpenView APIs (Application Programmer Interfaces) to integrate with HP OpenView Windows and other network management applications. Menu items are accessed via pulldown menus from the appropriate HP OpenView submap or from a Front Panel toolbar. For detailed information, refer to the GDC TEAM Core documentation and to the TEAM documentation that accompanies the SC 5516.

SpectraComm 5516 Applications

The SC 5516 units are shown below in a typical application with a SpectraComm Manager (SCM) card and SC 5001 cards in a SpectraComm shelf (*Figure 1-2*). The SCM is the shelf controller and network management gateway to all SpectraComm network access elements such as the SC 5001 and the SC 5516.

An SCM card and its corresponding IP address can control up to 15 co-located network elements in a single SpectraComm/UAS shelf. The SCM provides the SNMP management and IP address for the network elements in the shelf. The example below illustrates SC 5516 and SC 5001 units in an SCM-managed shelf, provides a maximum of 72 DS0 channels from the three SC 5001 T1 lines.

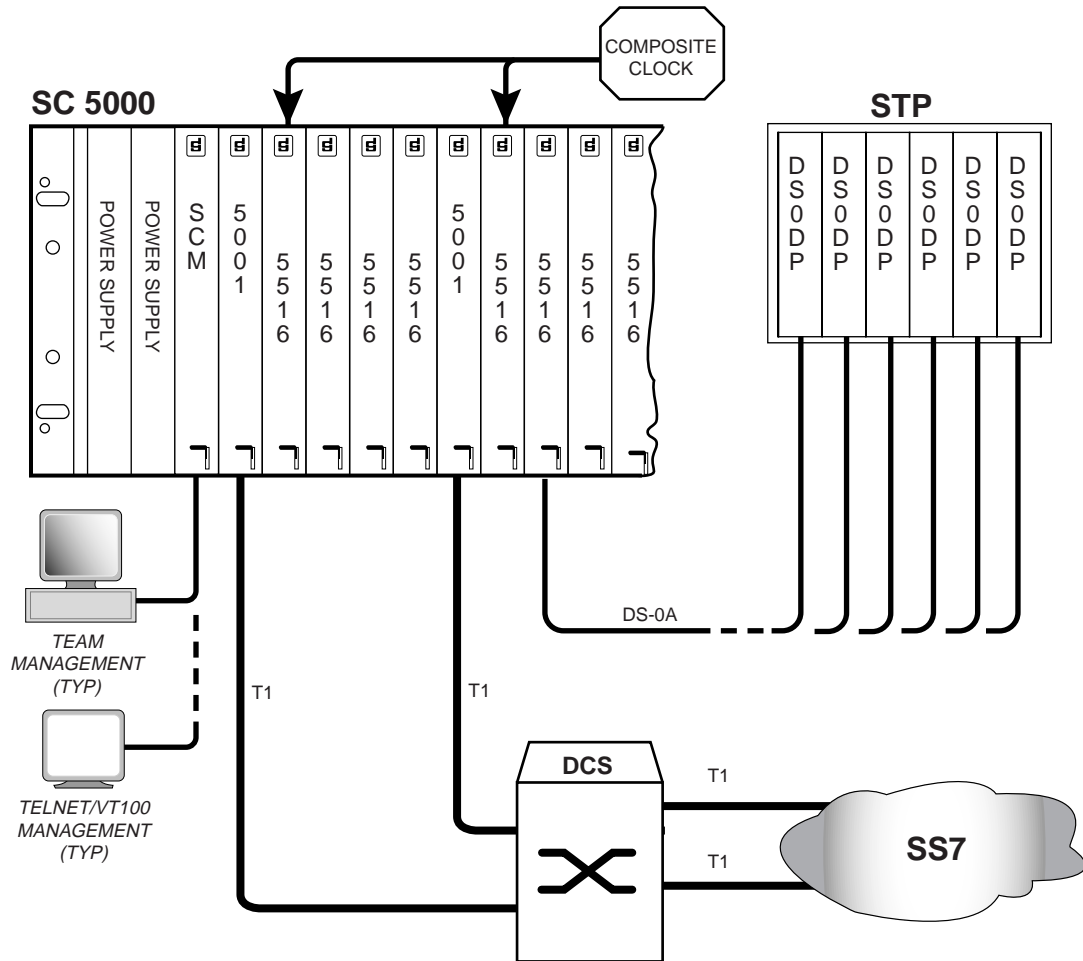


Figure 1-2 A Typical SC 5516 Application

Note For more information on the SCM, SpectraComm shelf systems or any associated network elements, refer to their accompanying product manuals and release notes.

Technical Specifications

The following table describes the physical, operational, and environmental specifications for the SpectraComm 5516 DS0-DP. Conforming to these specifications ensures maximum system performance and reduces the chances of mechanical breakdown and personnel hazard.

Table 1-1 SpectraComm 5516 DS0-DP Card Specifications

Specification	Description
Operating Modes	Point-to-Point, Full Duplex, 4-wire
Data Rates	56Kbps, 64 Kbps
Signal Encoding	Bipolar Non Return to Zero
Network Control Codes	Latching DS0-DP Loopback (56Kbps only)
Diagnostics	DS-0A Line Loopback, DS1 Channel Loopback
Terminating Impedance	135 Ohms nominal
Operating Range	0 to 1500 feet (using 24 AWG, unshielded)
Physical Dimensions	Width: 178 mm (7.0 in.) Height: 21 mm (0.81 in.) Depth: 241 mm (9.5 in.) Weight: 0.28 kg (10 oz.) Shipping weight: 0.74 kg (1 lb 10 oz)
Voltage/Frequency	Refer to the SpectraComm Shelf Manual for requirements
Fusing	Refer to the SpectraComm Shelf Manual for requirements
Power Consumption	Less than 5 Watts
Non-operating Temperature	-40 to 70 degrees C (-40 to 158 degrees F)
Operating Temperature	0 to 50 degrees C (32 to 122 degrees F)
Operating Humidity	5% - 95% Relative Humidity, non-condensing
Non-operating Altitude	0 m to 12,191 m (0 ft. to 40,000 ft.)
Operating Altitude	0 m to 3,047 m (0 ft. to 10,000 ft.) Derate by one degreeC/1000 feet above sea level.
Compliance	Designed for NEBS Level III Compliance

Chapter 2: Installation and Setup

Overview

This chapter describes the installation of the SC 5516 DS0-DP product. The unit is intended for rack-mount installation in a 16-slot SpectraComm shelf. For more information on SpectraComm shelf systems, refer to the SpectraComm Shelf Enclosure Manual listed in the cover pages of this manual.

Unpacking Instructions

The SC 5516 unit is shipped in shock-absorbent packing within a corrugated box. [Table 2-1](#) lists the standard and optional equipment. Some components will not be required/supplied for your network installation. Remove each component from the box and perform a thorough inspection. If any component appears damaged, contact the shipper immediately. All damaged components must be retained until an inspection by the shipper has been completed. If it is necessary to re-package and return the unit, use the original box and packing material.

Installing the Unit in the Shelf

The SC 5516 DS0-DP card may be installed in any slot of the SpectraComm shelf.

1. Insert the card into its slot in a SpectraComm shelf (with the GDC logo on top) until the card makes contact with the backplane.
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. Perform the setups, connections and pre-operation checks in their entirety as described in this chapter.
4. To remove a card, pull the front panel insertion/extraction tab to unseat the card, then use the tab to remove card.

Replacing Units in the Shelf

When replacing a fully configured SC 5516 DS0-DP card with a new or field spare card, the SCM will autoconfigure the replacement card to match the configuration of the replaced card.

Note *Auto configuration will not occur if the replacement card is installed in a slot with no assigned highway.*

Table 2-1 Equipment Checklist

Item	Description	Part Number
SC 5516 DS0-DP	High Density Digital Signal Zero Dataport	076P038-001
Cable Assembly	DB25M to 12 twisted pair wirewrap shielded #24 gauge solid	025H001-025
Cable, Interface	RJ-45 to RJ-45, local control (SCM CTRL port): 7', 14' or 25'	830-128-807
SpectraComm Shelves	MS-2 Mod. 1, Dual Modular 100/120 Vac MS-2 Shelf 100/120 Vac GPS-11 Power Supply Z1-S-16DRJ45, 8-Slot Dual RJ45 (2) Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M054-001 010B150-001 035P034-001 010C342-001 010C339-001 010D727-001
	MS-2 Mod. 2, Dual Modular -48, 60 Vdc MS-2/DC Shelf -48, 60 Vdc DPS-11 Power Supply Z1-S-16DRJ45, 8-Slot Dual RJ45 (2) Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M055-001 010B152-001 041P050-001 010C342-001 010C339-001 010D727-001
	MS-2 Mod. 3, Dual Modular 220/240 Vac MS-2E Ac Export Shelf 220/240 Vac GPS-11E Power Supply Z1-S-16DRJ45, 8-Slot Dual RJ45 (2) Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M056-001 010B151-001 035P034-002 010C342-001 010C339-001 010D727-001
	MS-2 Mod. 7, (Mass Term) 100/120 Vac MS-2 Shelf 100/120 Vac GPS-11 Power Supply UNIV Z1-50-Pin, 16-Slot 50-Pos Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M073-001 010B150-001 035P034-001 010C377-001 010C339-001 010D727-001
	MS-2 Mod. 8, (Mass Term) 220/240 Vac MS-2E AC Export Shelf 220/240 Vac GPS-11E Power Supply UNIV Z1-50-Pin, 16-Slot 50-Pos Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M074-001 010B150-001 035P034-002 010C377-001 010C339-001 010D727-001
	MS-2 Mod. 9, (Mass Term) -48, 60 Vdc MS-2/DC Shelf -48, 60 Vdc DPS-11 Power Supply UNIV Z1-50-Pin, 16-Slot 50-Pos Z3-S-16DB25, 16-Slot DB25 Blank Panel, Power Supply	010M075-001 010B152-001 041P050-001 010C377-001 010C339-001 010D727-001
	MS-2 Mod. 10, Dual Modular -48, 60 Vdc (redundant P.S.) MS-2/DC Shelf -48 - 60 Vdc DPS-11 Power Supply Z1-S-16DRJ45, 8-Slot Dual RJ45 (2) Z3-S-16DB25, 16-Slot DB25	010M070-001 010B152-001 041P050-001 010C342-001 010C339-001
	MS-2 Mod. 12, (Mass Term) -48, -60 Vdc (redundant P.S.) MS-2/DC Export Shelf -48, - 60 Vdc DPS-11 Power Supply (2) Z3-S-16DB25, 16-Slot DB25 (2) UNIV Z1-50 Pin, 16-Slot 50 Pos	010M076-001 010B152-001 041P050-001 010C339-001 010C377-001

Cable Connections

The SC 5516 supports network management connections through the shelf backplane WAN and LAN ports as shown in [Table 2-2](#) and its associated figure, below.

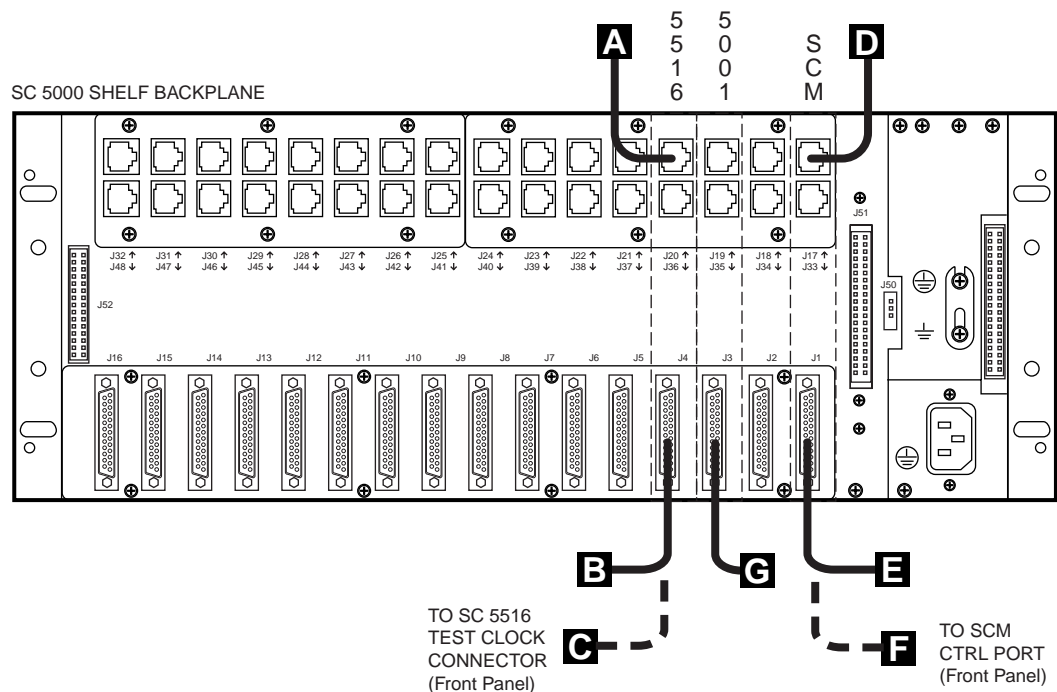


Table 2-2 Typical SC 5516 Card Connections

Cable Ref.	Card/Connectors	Interface	Description	Cable/Adapter Part Number
A	SC 5516 (J17 - J32)	DDS	Composite Clock connector	Customer-supplied
B	SC 5516 (J1 - J16)	DS-0A	DB25M to 12 twisted pair wirewrap shielded #24 gauge solid (See Figure 2-1 for pinouts.)	025H001-025
C	SC 5516 Front Panel	Test Clock	DB9F to test clock (See Table 2-3 for pinouts.)	Customer-supplied
D	SCM (J17 - J32)	WAN	To SNMP Network Manager	830-128-XXX
E	SCM (J1 - J16)	LAN	10-BaseT, twisted pair (with GDC Adapter 029H209-001)	S-078H010-XXX S-078H011-XXX
			10-Base-2, coaxial (with GDC Adapter 058B033-001)	S-125-H003-001 S-125-H004-001 S-125-H005-001
F	SCM Front Panel	CTRL Port	RJ-45 to RJ-45, local control	830-128-807
G	SC 5001 (J1 - J16)	DS-1	DB25 to Station Clock (See Table 2-4 for pinouts.)	Customer-supplied

Note Additional cable and connectivity options for the SCM card are described in the *SCM Installation & Operation Manual* (GDC P/N 048R303-000).

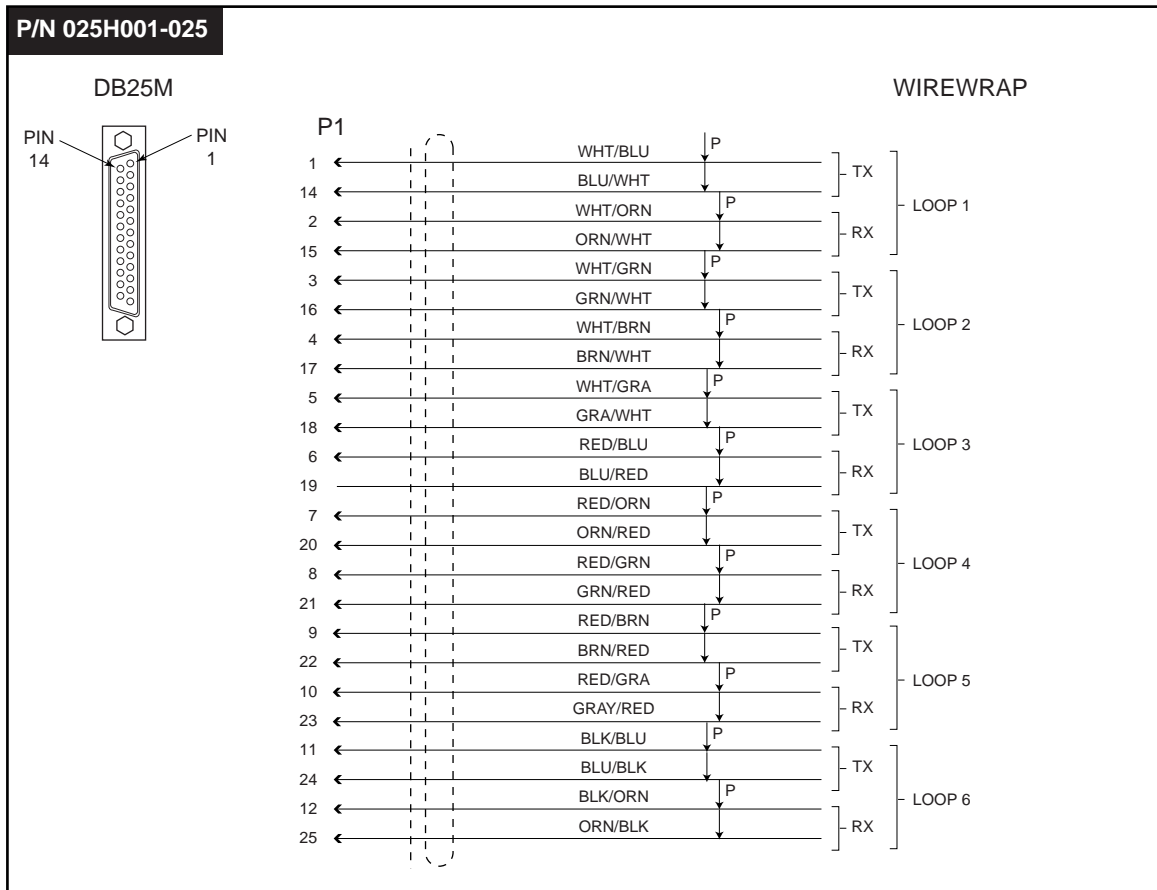


Figure 2-1 SC 5516 DS-0A Cable Pinouts

Table 2-3 Test Clock Interface Pinouts

Type	Pin	Direction	Description
DB9F	1	From SC 5516	+ 5 volts
	2	From SC 5516	Ground
	3	From SC 5516	Bit clock
	4	From SC 5516	Byte Clock

Table 2-4 Composite Clock Interface Pinouts

Type	Pin	Direction	Description
RJ45	4	To SC 5516	Composite Clock (Tip)
	5	To SC 5516	Composite Clock (Ring)

Operational Checks and Guidelines

Power On Self Test Sequence

You should verify that the SC 5516 is in good working order by observing the automatic Power On Self Test performed by the unit on startup. Once the SC 5516 is inserted in the shelf slot, the POST begins. Observe the front panel to verify that the SC 5516 is in good electrical working order:

1. The **INS**, **TM** and **ALM** LEDs flash on and off, indicating the start and stop of a lamp test.
2. The **TM** (Test Mode) LED illuminates, indicating the start of an internal diagnostic test.
3. All LEDs extinguish except for the **ON** and channel **1** LEDs.

If any of the test sequence actions does not occur, there is a problem with the unit. Install a spare unit if one is available. If you require assistance, contact General DataComm Service at the toll-free telephone number listed in the [Preface](#) of this manual. Do not attempt to repair the SC 5516.

Addressing Guidelines

- The network management system employs a slot-line-drop method of addressing network elements:
 - Slot address is the number of the slot it occupies in the SpectraComm Shelf.
 - Line address is always 1, and the network element is drop 0 for its line.
In a point-to-point circuit the single remote unit is drop 1.
In a multi-point circuit the drop numbers of the remote units are selectable.
- If the firmware is ever changed on the SC 5516, the EEPROM retains the user-defined configuration.

Timing Guidelines


- DS-0A timing is provided by an external DDS Office Composite Clock.
- Each shelf accepts two composite clock inputs: one active and one redundant.

Note For more information on the composite clock, refer to [Chapter 3, SC 5516 Operation](#), specifically, the [DDS Configuration Screen](#) guidelines and procedures.

Front Panel Controls and Indicators

The SC 5516 front panel is shown below. [Table 2-5](#) describes the actions of the unit's LED indicators, switches and jacks.

Table 2-5 SC 5516 Front Panel Features

Front Panel	LED / Switch	Description
 <p>The image shows the front panel of the SC 5516 unit. At the top is a logo. Below it are two green LEDs labeled 'INS' and 'ON'. A rotary switch labeled 'LVL' is positioned between 'TX' and 'RX' labels. Below the switch are six green LEDs numbered 1 through 6. Further down are two red LEDs labeled 'TM' and 'ALM', and a square switch labeled 'Test'. At the bottom is a multi-pin connector labeled 'CLK'. The number '5516' is printed at the very bottom of the panel.</p>	ON	Steady GREEN LED indicates the card is getting shelf power.
	INS	Steady GREEN LED indicates the card has been put into service by the SCM.
	1	A steady GREEN LED indicates which DS-0A has been selected for Front Panel test port access.
	2	
	3	
	4	
	5	
	6	
	Chan'l Sel Button	Depressing this button will advance the channel selected by one. If a test is active and CHANL SEL is depressed, the active test on the previous channel will go inactive and Test Mode will turn off.
	TM	Steady RED LED indicates the selected channel is being tested with intrusive TX data.
	ALM	Steady RED LED indicate an alarm condition exists on the selected DS-0A: <i>(For Future Use)</i>
	Test Button	Depressing this button will toggle between TX data presented at the XMT Test jack being intrusive and non-intrusive
	LVL Test Jacks	RCV jack for non-intrusive receive monitor test access to DS-0A and DS-1 transmission directions (Logic Level Near and Far).
		XMT jack for intrusive access to DS-0A and DS-1 transmission directions (Logic Level Near and Far).
CLK Interface	Test clock interface. DIN: +5V, Ground, bit and byte clock outputs	

Front Panel Test Access

The SC 5516 is equipped with front panel bantam jacks to connect the transmitter and receiver of external test sets. The input/output of the test set receiver/transmitter must be set to a Logic Level position (Near or Far). The Near Logic Level position provides test access to the DS-0 direction. Far Logic Level position provides test access to the DS-1 direction.

Note A local SC 5516 will not respond to DS0-DP latching loopback codes sent through its test port.

Accessing the Shelf

Communication with the SC 5516 DS0-DP occurs through a VT100 connection or a password-protected Telnet connection to the SCM terminal interface. The terminal interface accesses the SCM Shelf Inventory screen which allows the user to select the SC 5516 or any compatible network element in the SpectraComm shelf. The user can then identify, configure and control the network element through specialized menus and screens.

Note Refer to the *SCM Installation and Operation Manual* for details on the *Element Access* menu and other *SCM Main Menu* selections.

Configuring a VT-100 Terminal Connection

Access to the terminal interface via a standard (VT-100 or VT-100-compatible) terminal uses a TIA/EIA-232-F communication interface to connect to the SCM. One SCM supports a terminal interface for up to 15 units in a single shelf.

1. Set the terminal communications parameters as follows:
 - data rate = 9600 bps
 - character format: 1 start bit, 8 data bits, 1 stop bit
2. A management session is active as soon as you connect the VT-100 terminal cable to the SCM front panel **CTRL** port.

Initiating a VT100 Terminal Session

1. Connect a terminal to the SCM front panel **CTRL** port. The Main Menu appears, as shown.

```
Main Menu
1. IP Address
2. Security
3. Element Access
4. Test (Factory Only)
Enter Selection:
```

Note Note that Main Menu items **1. IP Address** and **2. Security** are SCM functions documented in the *SCM Installation and Operation Manual*. Note that menu item **4. Test** is for factory use only.

2. Type **3** and press the **Enter** key. The Shelf Inventory screen appears ([Figure 2-2](#)).
3. At the Shelf Inventory screen, select a slot number to access the terminal interface of the desired SC 5516, and then press **Enter**.
4. The Main Menu for that unit appears. Proceed to Chapter 3 for a description of all SC 5516 menus and submenus.

Note There is a 10-minute timeout programmed at the terminal interface. If you allow 10 minutes to pass with no activity, that is without pressing any key on the keyboard, the unit will terminate the session.

Configuring a Telnet Connection

You can access the terminal interface through a Telnet connection via the SCM **LAN** port. One SCM supports a terminal interface for up to 15 units in a single shelf.

1. Set the terminal communications parameters as follows:
 - data rate = 9600 bps
 - character format: 1 start bit, 8 data bits, 1 stop bit
2. A management session is active as soon as a valid login sequence is completed.

Making a Telnet Connection

1. Establish a Telnet connection to the SCM using a PC that is operating in character-at-a-time mode. Refer to the The SpectraComm Manager Card Installation and Operation Manual (GDC Publication Number 048R303-000), as needed.
2. When connection is made, the following screen appears.

```
Copyright (c) 1999 General DataComm Industries Inc.  
All rights reserved  
SCM Application Version 3.32A  
  
login:
```

3. Enter the login password (**scmadmin**).

Note *There is a 10-minute timeout programmed at the terminal interface. If you allow 10 minutes to pass with no activity, that is without pressing any key on the keyboard, the unit will terminate the session.*

4. After the SCM verifies the login password, the Shelf Inventory screen appears ([Figure 2-2](#)).
5. At the Shelf Inventory screen, select a slot number to access the terminal interface of the desired SC 5516, and then press **Enter**. The SC 5516 Main Menu for that unit appears.
6. Proceed to Chapter 3 for a description of all SC 5516 menus and submenus.

Note *The Shelf Inventory screen is the point of access for any network element via its shelf slot number.*

```
      SHELF INVENTORY
Slot      Card      Slot      Card
-----
[1] SCM
[2] SC5001
[3] SC5516
[4] SC5516
[5] SC5516
[6] SC5516
[7] SC5001
[8] SC5516
[9] SC5516
[10] SC5516
[11] SC5516
[12] SC5001
[13] SC5516
[14] SC5516
[15] SC5516
[16] SC5516
[0] Close Session      [C] Circuit Identification
Enter slot number: [ ]
```

Figure 2-2 Shelf Inventory Screen

Note *On Element Access screens a alarm condition detected at an element is displayed as follows: **SC5516 (alarm)**.*

Chapter 3: SC 5516 Operation

Overview

This chapter describes the operation of the SC 5516 DS0-DP through the terminal interface menus screens. In the descriptive tables for each screen, default values are shown in **Bold**. Refer to [Installation and Setup](#) as needed for making Telnet or craftport connections.

Note In addition to the SC 5516 configuration procedures described below, you must also configure a data highway for at least two of the six SC 5516 channels by using the SCM Highway Configuration screens. Otherwise, the SCM will not be able to auto-configure the unit. Refer to the SCM Installation and Operation Manual for detailed Highway Configuration procedures.

Element Access Procedure

1. When you select Element Access from the Main Menu, the Shelf Inventory screen appears. This screen is always the initial point of entry for accessing any element by its slot number.
2. Select a slot number to access the desired SC5516. The SC 5516 Main Menu appears, as shown below.

```
SC5516 Main Menu
General DataComm Ind. Inc.
-----
Serial Number:          0003090122034405
Boot Firmware Revision: A-
Shelf Slot:             3

[1] Configuration
[2] Diagnostics
[3] Maintenance

[0] Return to Shelf Inventory

Select: [ ]
```

3. Select the desired management function from the SC 5516 Main Menu. Each function is described in detail below.
4. To exit the SC 5516 Main Menu, press **0**. The Shelf Inventory screen re-appears.
5. To exit the Shelf Inventory screen, press **0**. In a craftport session, the SCM Main Menu appears. In a Telnet session, the session is terminated.

SC 5516 Configuration Menu

At the SC5516 Main Menu, press **1** and then press **Enter** to access the SC5516 Configuration menu. [Table 3-1](#) describes the menu selections and their associated subcreens.

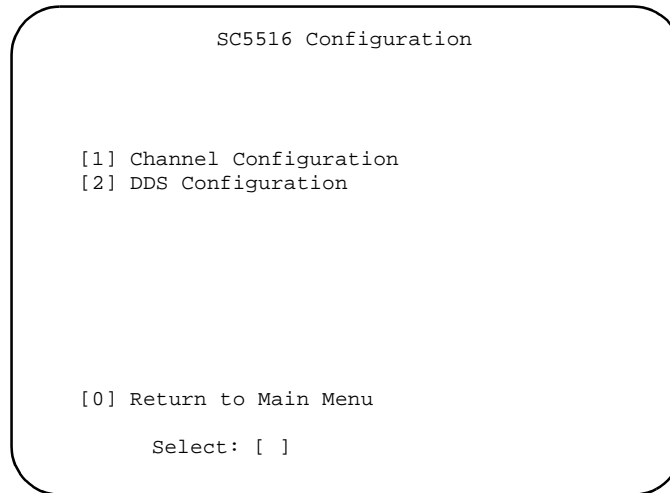


Table 3-1 Configuration Screen Selections

Selection	Description
[1] Channel Configuration	Advances to the Channel Configuration screen.
[2] DDS Configuration	Advances to the DDS Configuration screen.
[0] Return to Main Menu	Exits the Configuration menu and returns to the SC 5516 Main Menu.

Channel Configuration Screen

At the SC5516 Configuration Menu, press **1** and then press **Enter** to access the SC5516 Channel Configuration menu. [Table 3-2](#) describes the screen selections with defaults shown in **Bold**.

```

SC5516 Channel Configuration

[1] Channel Select      :1
[2] DS0 Data Rate      :56k
[3] DS0 Channel Enable  :Enable
[4] DS0 Latching Loopback :Disable

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

Select: [ ]

```

Table 3-2 Channel Configuration Selections

Selection	Description
[1] Channel Select	Selects channels 1 - 6 for configuration. Default: 1
[2] DS0 Data Rate	Sets customer data rate to 56 or 64 Kbps.
[3] DS0 Channel Enable	Sets transmission on the selected channel to Enable or Disable.
[4] DS0 Latching Loopback	Sets latching loopback to Enable or Disable .
[CR] Return to Previous Menu	Returns to the SC5516 Configuration Menu without saving channel configuration changes to the unit.
[S] Save	Saves channel configuration changes to the unit.
[0] Return to Main Menu	Exits the Configuration Menu and returns to the SC 5516 Main Menu.

DDS Configuration Screen

At the SC5516 Configuration menu, press **2** and then press **Enter** to access the DDS Configuration screen, shown below. [Table 3-3](#) describes the screen selections, with defaults shown in **Bold**.

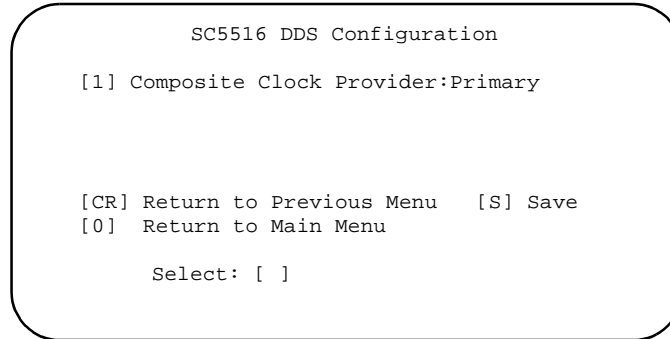


Table 3-3 DDS Configuration Selections

Selection	Description
[1] Composite Clock Provider	Selects the composite clock timing: Primary, Secondary or Shelf .
[CR] Return to Previous Menu	Returns to the SC5516 Configuration screen without saving DDS configuration changes to the unit.
[S] Save	Saves DDS configuration changes to the unit.
[0] Return to Main Menu	Exits the Configuration menu and returns to the SC5516 Main Menu.

Composite Clock Guidelines

- At any given time, only one card in a shelf can be selected as the the **Primary** composite clock provider.
- At any given time, only one card in a shelf can be selected as the **Secondary** composite clock provider.
- At any given time, any card not selected as a **Primary** or **Secondary** must be selected for **Shelf** composite clock timing.

Composite Clock Procedures

1. Determine which SC 5516 card in the shelf will be the **Primary** composite clock provider.
2. Connect the composite clock to the upper RJ-45 connector of this card. This card will provide composite clock to other cards in the shelf.
3. Determine which SC 5516 card in the shelf will be the **Secondary** composite clock provider.
4. Connect a second (redundant) composite clock to the upper RJ-45 connector of this card. This card will provide composite clock to other cards should the primary optioned card become non-functional.
5. For all remaining cards, select **Shelf** for the composite clock provider. These cards will receive their composite clock from the **Primary** or **Secondary** optioned card over the shelf backplane.

SC 5516 Diagnostics

At the SC5516 Main Menu, press **2** and then press **Enter** to access the Diagnostics screen, shown below. [Table 3-4](#) describes the available tests and test settings.

```

SC5516 Diagnostics

[1] Channel Select      :1
[2] Loopback Mode      :Channel

                               No Test In Progress

[S] Start Test
[T] Terminate Test
[0] Return to Main Menu

Select: [ ]

```

Table 3-4 Diagnostics Screen Selections

Selection	Description / Settings
[1] Channel Select	Selects Channel 1 - 6 for the current diagnostic test.
[2] Loopback Mode	Line: sets the DS-0A Line Loopback test, where data is looped back towards DS-0A.
	Channel: sets the DS-1 Channel Loopback test, where data is looped back towards DS1.
[S] Start Test	Starts the selected test.
[T] Terminate Test	Terminates the selected test.
[0] Return to Main Menu	Exits the Diagnostics screen and returns to the SC5516 Main Menu.

Diagnostics Configuration Procedure

1. Select a channel for diagnostics by pressing **1**, then press **Enter**.
A highlight appears at the current channel field.
2. Use the arrow keys to highlight the desired channel number, then press the **Enter**.
3. Select the desired loopback mode by pressing **2**, then press **Enter**.
A highlight appears at the loopback mode field.
4. Use the arrow keys to highlight the desired diagnostic test for the selected channel, then press **Enter**.
5. To initiate the selected test, type **S**.
6. To terminate the test in progress, type **T**. To return to the SC5516 Main Menu, press **0**.

Note For more information on access and loopbacks from remote or local DS0s, refer to Chapter 4: [SC 5516 Tests](#).

SC 5516 Maintenance Screen

At the SC5516 main Menu, press **3** and then press **Enter** to access the Maintenance screen, shown below. [Table 3-5](#) describes the maintenance commands on this screen. [Table 3-6](#) describes the Firmware Download Submenu.

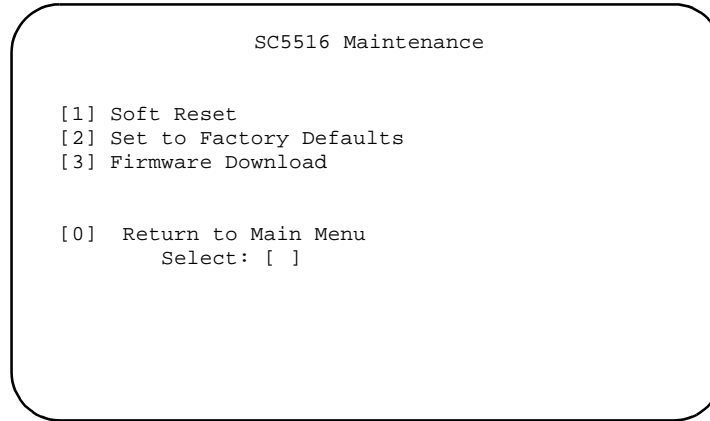


Table 3-5 Maintenance Selections

Selection	Description
[1] Soft Reset	Causes the SC 5516 to perform a reset and resume operation using its current configuration.
[2] Set to Factory Defaults	Causes all options in the SC 5516 to return to their factory default settings.
[3] Firmware Download	Activates the download function, described below.
[0] Return to Main Menu	Exits the Maintenance menu and returns to the SC5516 Main Menu.

Firmware Download Menu

At the SC5516 Maintenance screen, press **3** and then press **Enter** to access the Firmware Download Submenu, shown below. [Table 3-6](#) describes the menu selections, with procedures following the table..

```

SC5516 Firmware Download Submenu

Active Firmware Revision : 10.16.T1
Standby Firmware Revision: 00.00.00
Standby Firmware Status  : VALID - OK
Download Mode            : DISABLE ALL DOWNLOADS

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

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

Select: [ ]

```

Table 3-6 Firmware Download Menu

Display / Selection	Description
Active Firmware Revision	Read-only display of version and revision number of firmware that is currently operating in the unit.
Standby Firmware Version	Read-only display of version and revision number of inactive firmware the unit has stored in zipped (compressed) format.
Standby Firmware Status	Read-only status display: Invalid - [blank] indicates new unit with no standby firmware loaded. Valid - OK indicates standby firmware loaded and ready for use Invalid - Checksum Failed indicates standby firmware corrupted during download. Invalid - Download Aborted indicates download aborted in progress by SCM. Invalid-Unzip Failed indicates problem occurred during unzip of standby firmware.
Download Mode	Read-only display of the unit's response to an imminent firmware download. This Enable/Disable setting remains in effect until changed by the user.
[1] Switch to Standby Firmware	Commands the unit to unzip (decompress) the stored inactive firmware and place it into service as the current operating firmware. Simultaneously zips and stores the previously operating firmware.
[2] Disable All Downloads	Commands the unit to reject any imminent download of firmware.
[3] Clear Flash,Enable Downloads and Store Zipped	Commands the unit to clear the standby firmware, accept an imminent firmware download and then store it as the zipped, inactive Standby Firmware.
[4] Clear Flash, Enable Downloads, Unzip and Execute	Command the unit to clear the standby firmware, accept an imminent firmware download, unzip it and then place it into operation as Active. Simultaneously zips and stores the previously operating firmware as inactive Standby Firmware.
[CR] Return to Previous Menu	Returns to the SC5516 Maintenance screen.
[0] Return to Main Menu	Returns to the SC5516 Main Menu.

Firmware Download Guidelines

- The Firmware Download function performed at the terminal interface allows you to download new operating firmware into the unit. New firmware is typically downloaded when GDC releases a new version of firmware that improves performance or adds new features.
- The SC 5516 accommodates Active and Standby firmware. Newly downloaded firmware is first stored as the Standby Revision. You can switch between Active and Standby Revisions as needed.
- When firmware is changed, the SC 5516 will not need to be reconfigured since the EEPROM saves the configuration.

Firmware Download Procedures

Firmware downloads are performed via Trivial File Transfer Protocol (TFTP). Keep the Firmware Download screen on display in order to monitor progress and any error messages.

1. At the SC 5516 Firmware Download Submenu, select the Download Mode as **[3]** or **[4]**. Either of these selections will automatically enable all downloading to the unit.
2. Initiate a TFTP session using the IP of the SCM.
3. At the TFTP prompt, type **bin** and then press **Enter**. This causes the transfer to take place in binary mode.
4. Type **put** *[firmware filename]* *[address & product code]* and the press **Enter** key to initiate the actual transfer.

The *[firmware filename]* is provided with the firmware that is to be downloaded.
The address portion of *[address & product code]* is the slot/line/drop address when you are downloading to a single unit or broadcasting new firmware simultaneously to all the SC 5516 units in a shelf.

Note Refer to [Figure 3-1](#) for *[firmware filename]* and *[address & product code]* formatting.

5. While downloading to a single unit, its **INS** LED flashes during the download. When downloading all units in a shelf, their **INS** LEDs remain Off.

If the Download Mode is **[3] Clear Flash Enable Downloads and Store Zipped**, the firmware download procedure is complete. The newly downloaded firmware is stored as Standby Firmware until you put it into service (described below).

If Download Mode is **[4] Clear Flash, Enable Downloads, Unzip and Execute**, the unit continues with the process of placing the newly downloading firmware into service (described below).

6. As the unit executes newly downloaded firmware or firmware switched from Standby to Active, the Power On Self Test is performed.
7. When the LEDs return to their normal operating states, the unit has resumed operation using the newly activated firmware.

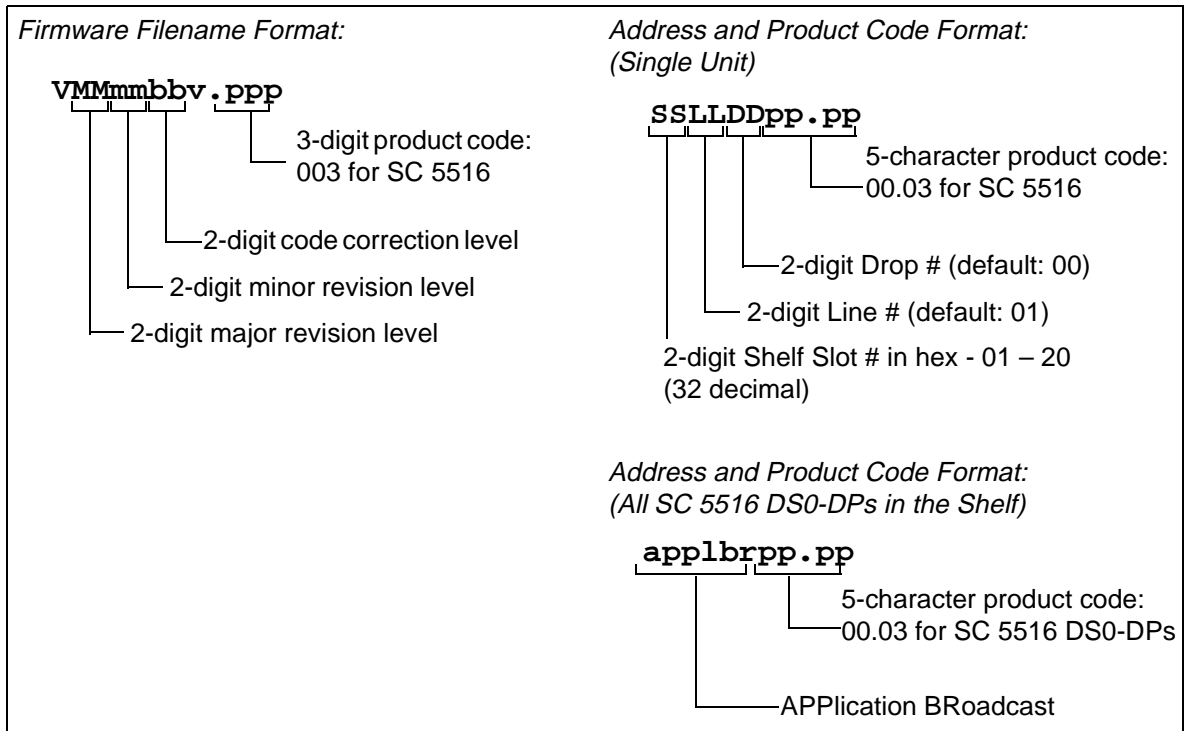


Figure 3-1 Firmware Filename and Address Formats

Chapter 4: SC 5516 Tests

Channel and Line Loopback Tests

This section describes initiating SC 5516 channel loopback and line loopback tests by Telnet or VT100 connection to the SCM. Refer to [Figure 4-1](#) and [Figure 4-2](#).

Channel Loopback Test

Note During the Channel Loopback test, data will be disrupted on the port being tested.

1. Make a Telnet or VT100 connection to the SCM as described in Chapter 2: Installation and Start Up - [Accessing the Shelf](#).
2. At the Shelf Inventory screen, select the desired SC5516 DS0-DP and proceed to the Diagnostics screen.
3. Select the desired Channel (1 - 6) for testing.
4. Select the Loopback Mode as **Channel**.
5. Press **S** to start the test. The test equipment connected to the T1 line will report conditions on that port.
6. To terminate the test, press **T**.

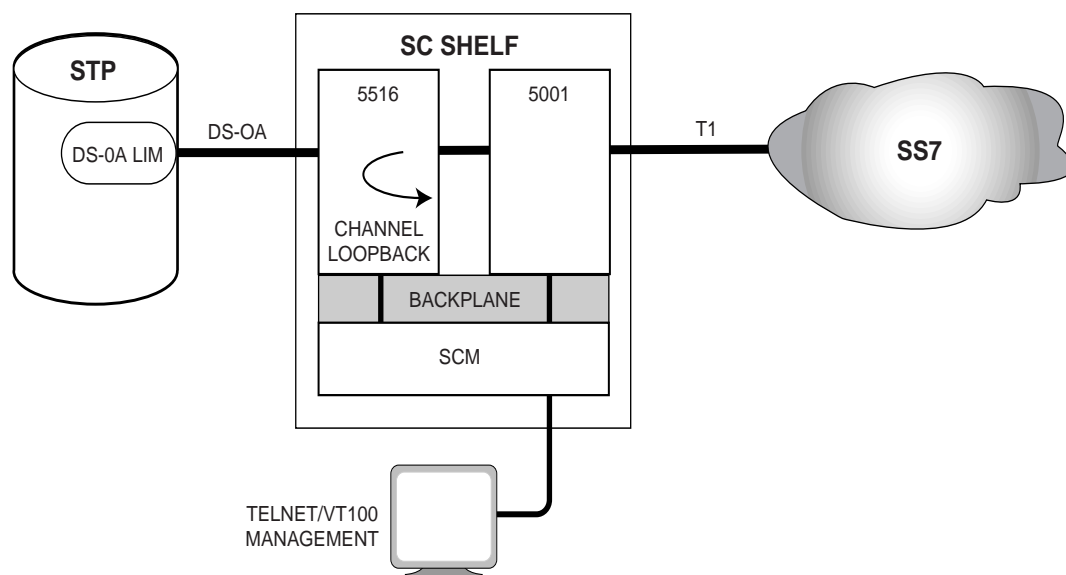


Figure 4-1 Channel Loopback Test

Line Loopback Test

1. Make a Telnet or VT100 connection to the SCM as described in Chapter 2: Installation and Start Up - [Accessing the Shelf](#).
2. At the Shelf Inventory screen, select the desired SC5516 DS0-DP and proceed to the Diagnostics screen.
3. Select the desired channel number for testing.
4. Select the Loopback Mode as **Line**.
5. Press **S** to start the test. The test equipment connected to the DS-0A line will report conditions on that line.
6. To terminate the test, press **T**.

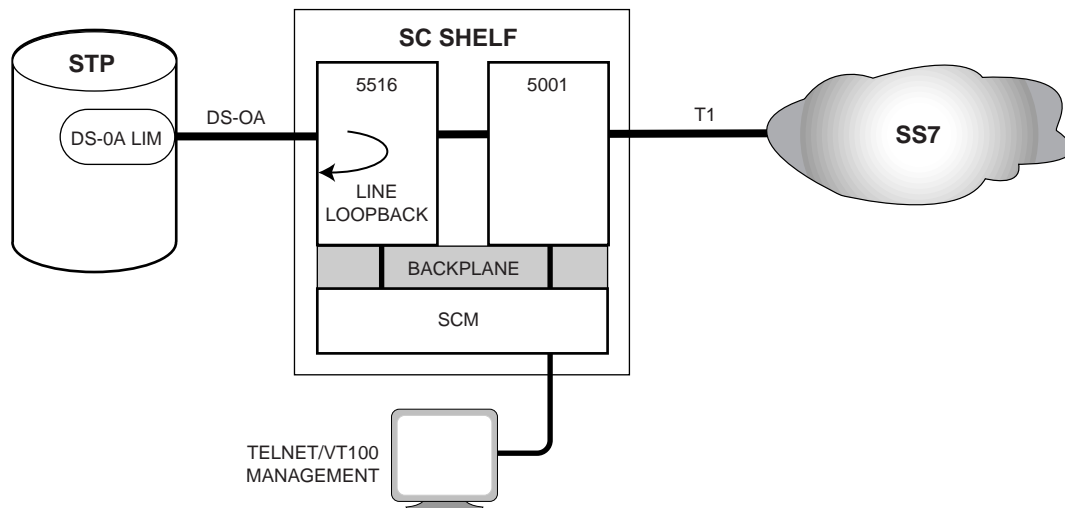


Figure 4-2 Line Loopback Test

Latching Loopback Tests

This section describes initiating or receiving SC 5516 Latching Loopback tests:

- You can *initiate* a Latching Loopback test via the unit's front panel DB-9 clock connector and data Bantam jacks, and the clock interface. Refer to [Figure 4-3](#) and [Figure 4-4](#).
- The SC 5516 can also *receive* loop code from test equipment at the Serving Test Center and engage a Latching Loopback test.

Note Always stop any diagnostic tests running via Telnet, VT100, or SNMP before receiving a Latching Loopback test from the Serving Test Center.

Initiating Latching Loopbacks from Remote DS0

1. Connect the **TX** and **RX** Bantam cables from the test equipment to the **TX** and **RX** Bantam jacks on the front panel of the remote SC 5516 DS0-DP.
2. Connect the test clock DB-9 cable from the test equipment to the DB-9 **CLK** connector on the front panel of the remote SC 5516 DS0-DP.
3. Set the test equipment to **LOGIC-FAR**.
4. Send Location 1 DS0-DP loop-up. Verify loop-up is complete and passing error-free data.
5. Send Location 1 DS0-DP loop-down. Verify loop-down is complete.
6. Send Location 2 DS0-DP loop-up. Verify loop-up is complete and passing error-free data.
7. Send Location 2 DS0-DP loop-down. Verify loop-down is complete.

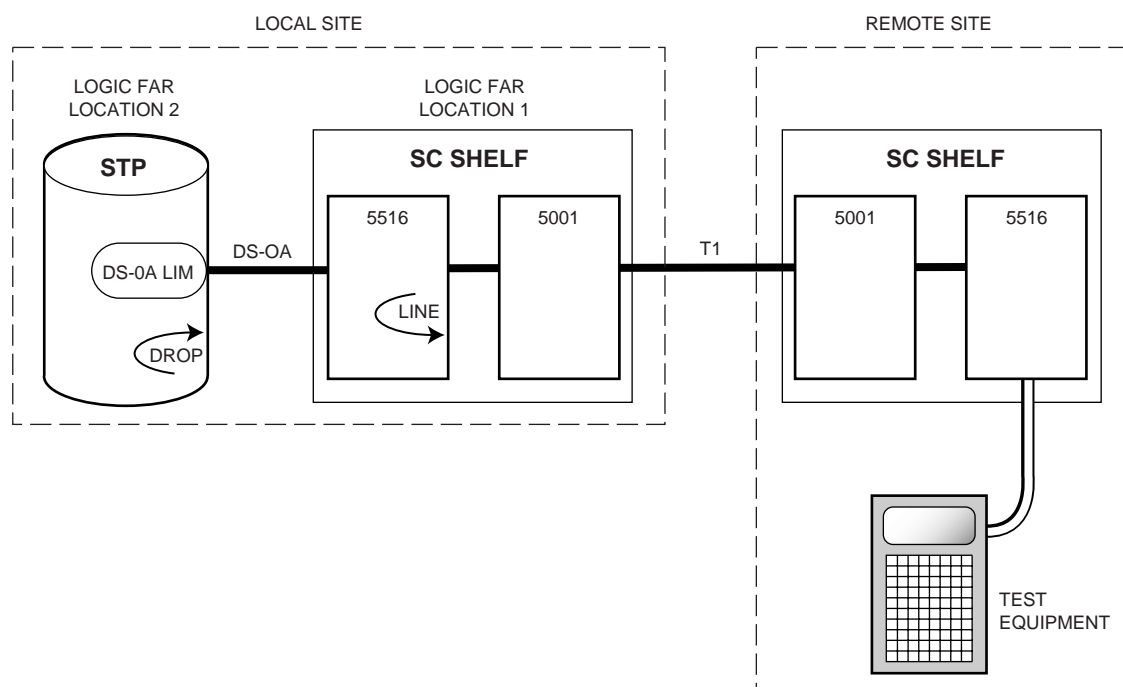


Figure 4-3 Initiating Latching Loopbacks (from Remote DS0)

Initiating Latching Loopbacks from Local DS0

1. Connect the **TX** and **RX** Bantam cables from the test equipment to the **TX** and **RX** Bantam jacks on the front panel of the local SC 5516 DS0-DP.
2. Connect the test clock DB-9 cable from the test equipment to the DB-9 **CLK** connector on the front panel of the local SC 5516 DS0-DP.
3. Set the test equipment to **LOGIC-NEAR**.
4. Send Location 1 DS0-DP loop-up. Verify loop-up is complete and passing error-free data.
5. Send Location 1 DS0-DP loop-down. Verify loop-down is complete.
6. Set the test equipment to **LOGIC-FAR**.
7. Send Location 1 DS0-DP loop-up. Verify loop-up is complete and passing error-free data.
8. Send Location 1 DS0-DP loop-down. Verify loop-down is complete.

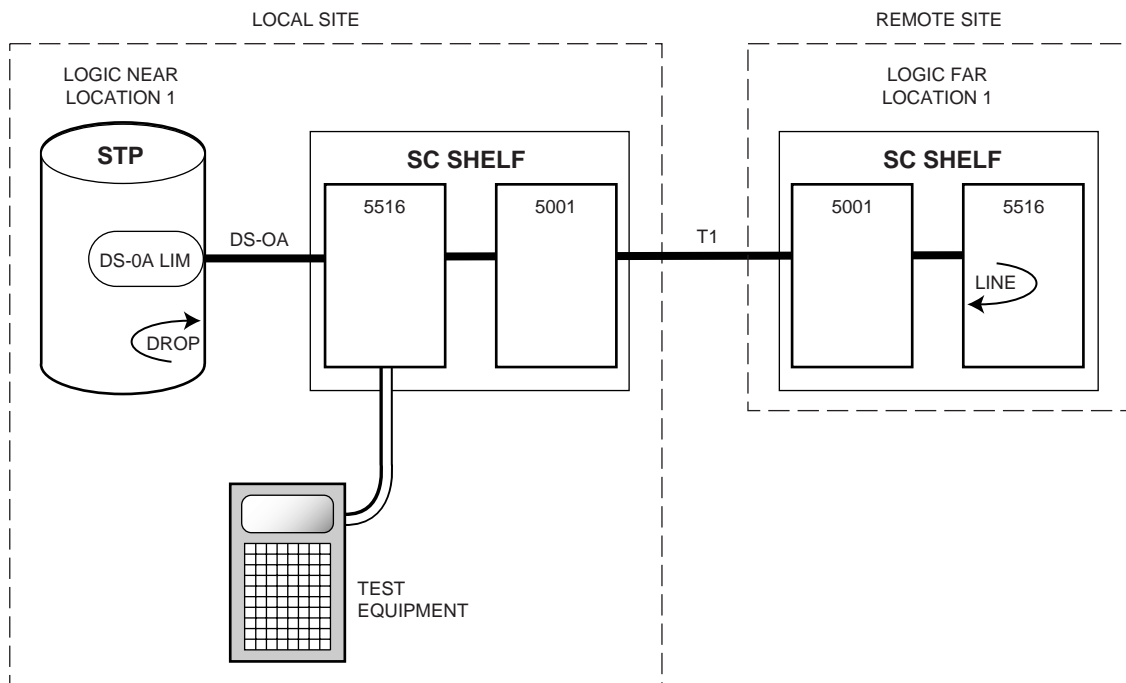


Figure 4-4 Initiating Latching Loopbacks (from Local DS0)



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