

SECURE7™ TERMINAL

GENERAL DESCRIPTION & SPECIFICATIONS

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1. GENERAL

1.01 This practice provides a general description of the SECURE7 Terminal, including specifications.

1.02 This practice has been reissued to add or modify the specifications in Table A for the items listed below. Change bars mark the changed material.

- DX0 DP Card Interface
- DXU DP Card Interface
- OXU DP Card Interface
- Communication Interface
- Power

1.03 The following acronyms/abbreviations are used in this document:

ADM	add/drop multiplexer
CC	composite clock
DS0	digital signal, level zero
DS1	digital signal, level one
DS1L	Quad DS1 Drop
DX0 DP	Digital Signal Zero Dataport with Path Switching
DXU DP	Data Services Unit Dataport with Path Switching
HSE	High Speed Electrical
HSO	High Speed Optical
MPU	Microprocessor Unit
OC3	Optical Carrier 3
OSS	Operations Support System
OXU DP	Office Channel Unit Dataport with Path Switching
PRS	primary reference source
T1	digital transmission (1.544 Mb/s)
TIO	Timing Input/Output

2. INTRODUCTION

2.01 The SECURE7 Terminal provides OC3 and T1 add/drop multiplexer (ADM) functions, OC3 and T1 terminal functions, and network synchronization distribution. Each of these functions are supported by redundant cards in a hot-spare arrangement. If a single card fails, the redundant card switches online while the shelf stays in service.

2.02 The shelf communicates in TL1 language, via RS-232 or RS-422 communication links. All shelf operations are controlled by a remote computer, and all reports from the shelf are given to that remote computer.

3. DESCRIPTION

A. Physical Description

3.01 The shelf contains a display panel and slots for various cards. The slots are for power supply cards, OC-3 and DS1 line cards, DS1 and DS0 drop cards, timing cards, and a processor card. Figure 1 shows the shelf with representative cards.

3.02 The shelf contains slots for one-for-one redundant card sets for all cards except the microprocessor and the TIO cards. A card set consists of an active card and an identical standby card ready to be switched online if the active card fails. The shelf can operate with or without redundant cards.

3.03 Power supply cards are in the slots on either side of the display panel.

3.04 The first four slots on the left side of the shelf are for two sets of line interface cards. The holes beneath the slots allow fiber optic cables to connect to the front of the HSO cards.

3.05 The next 14 slots are for 7 sets of drop cards. Any set of drop cards can be installed in any set of drop card slots.

3.06 The next two slots are for two independent timing cards, and the last slot is for the processor card.

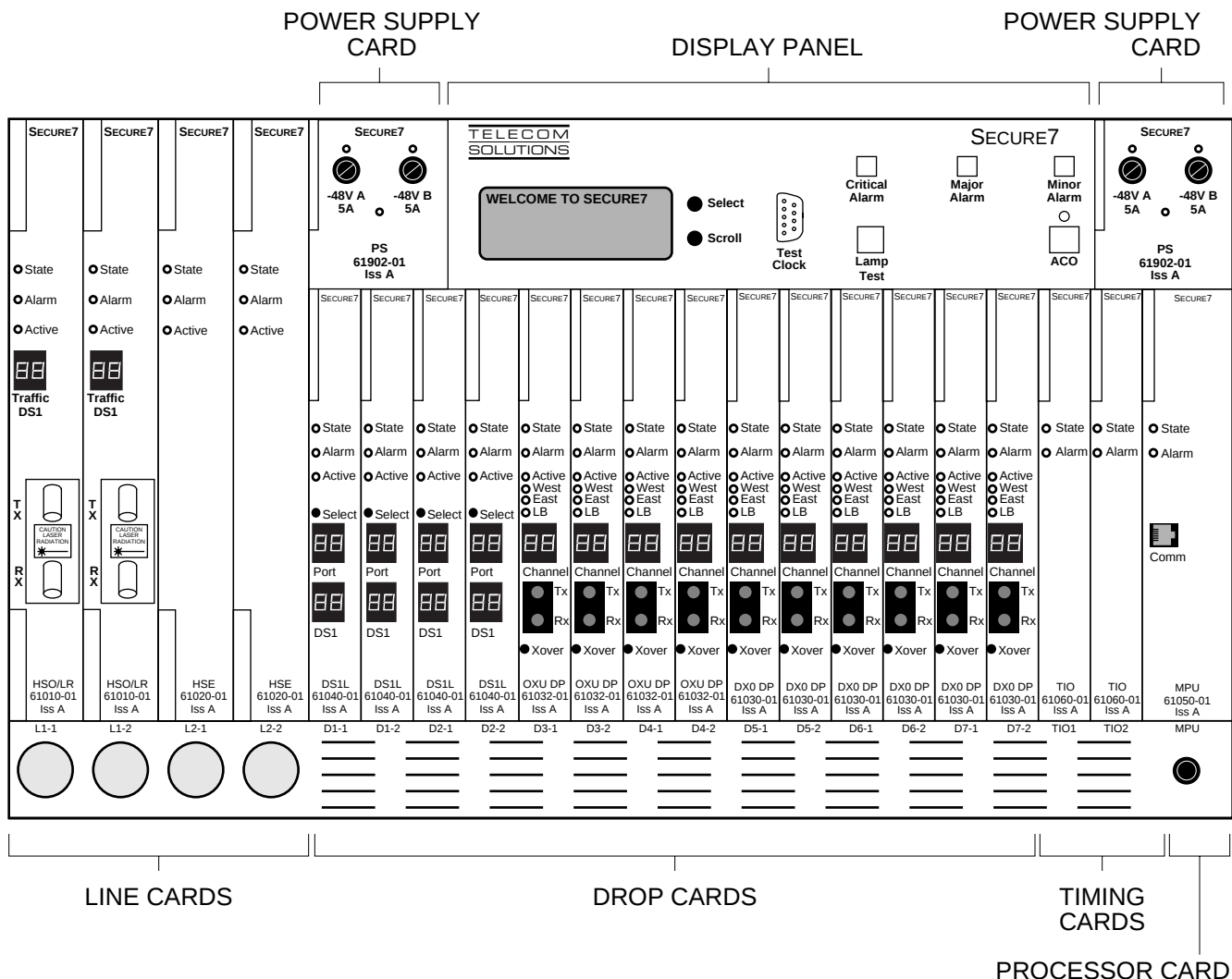


Figure 1. Shelf

B. Electrical Description

3.07 Figure 2 shows a simplified block diagram of the SECURE7 shelf. The shelf may be connected to optical OC3 traffic or electrical DS1 traffic, depending on the line card installed.

3.08 The line slots connect to two data buses inside the shelf. The high-speed bus carries STS-3 traffic, which is the electrical equivalent of optical-fiber OC-3 traffic. The low-speed bus carries one channel of DS1 traffic. The DS1 channel on the low-speed bus can be from exterior DS1 traffic or from one of the DS1 channels on the high-speed bus.

3.09 Each drop slot is connected to both buses. A DS1 drop card can add or drop DS1 channels that are on the high-speed bus. A DS0 drop card can add or drop DS0 channels that are on the low-speed bus.

3.10 Either bus can be configured independently to terminate data traffic at the shelf, or to carry traffic through the shelf.

3.11 The shelf is factory-set to ADM mode, which allows channels to be added, dropped, and passed

through. If both buses are terminated, the shelf must be in terminal mode.

3.12 The timing bus times the shelf from a timing signal synthesized by the line cards from the data stream. The East line cards are clocked by the West data stream, and vice versa, when the shelf is in ADM mode. Internal shelf timing is provided by an external CCK or DS1 signal. When timing cards are used, a timing signal is accepted from a PRS for use on the shelf and for delivery to other shelves downstream.

3.13 Both power supplies (not shown) load-share the A and B battery supplies, and supply power to the shelf redundantly.

3.14 The microprocessor unit (not shown) supplies administrative services for each part of the shelf, and communicates with an external computer.

4. SPECIFICATIONS

4.01 Specifications for the system are in Table A.

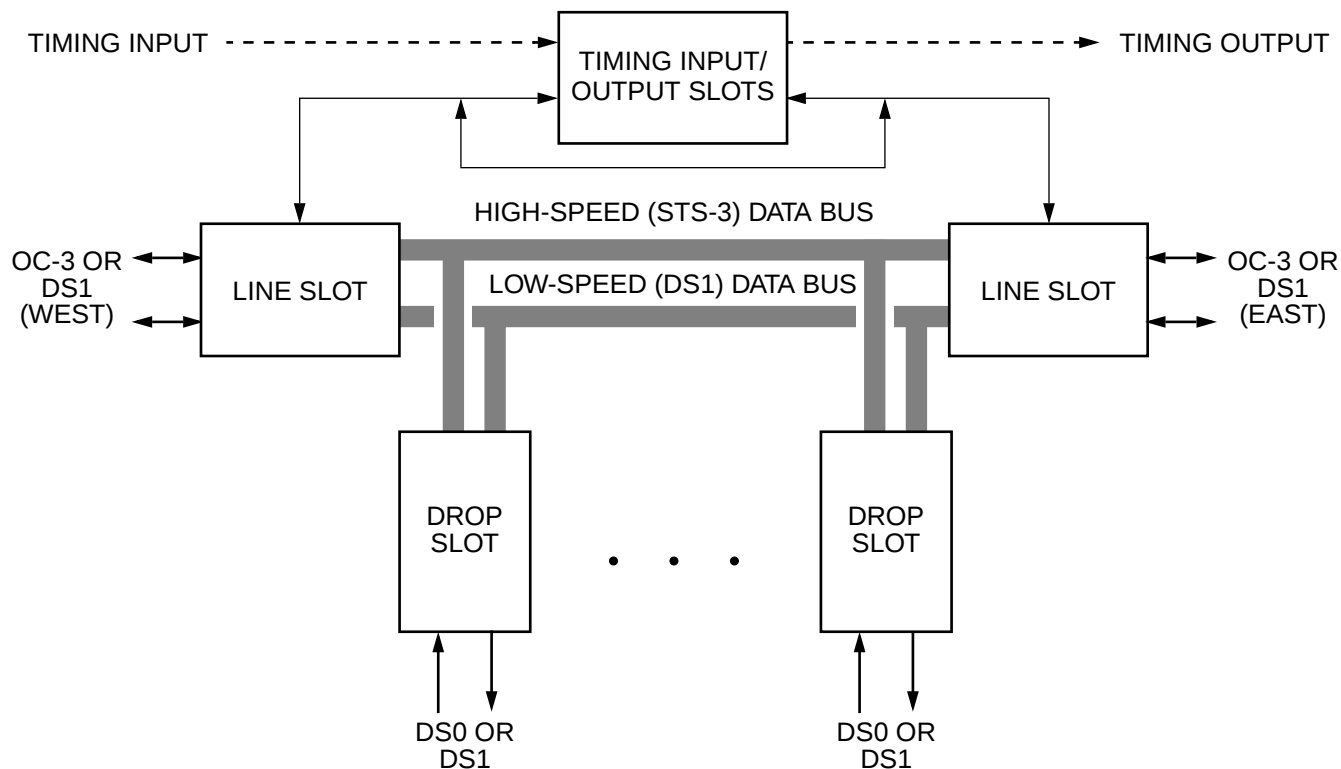


Figure 2. Block Diagram

Table A. Specifications

ITEM	SPECIFICATION
DATA PATH INTERFACE	
DS1 Line Interface	1.544 Mb/s (1:1 protection)
OC-3 Line Interface	155 Mb/s (1+1 protection)
HSO Long Reach Optical Interface: Wavelength (λ_{Tmin} to λ_{Tmax}): Extinction ratio (r_{emin}): Output power (P_{Tmax} to P_{Tmin}): Cable core: Receiver Sensitivity:	1280 nm to 1335 nm 10 dB –5 dBm to 0 dBm 8 μ m to 10 μ m –34 dBm to –10 dBm
HSO Intermediate Reach Optical Interface: Wavelength (λ_{Tmin} to λ_{Tmax}): Extinction ratio (r_{emin}): Output power (P_{Tmax} to P_{Tmin}): Cable core: Receiver Sensitivity:	1260 nm to 1360 nm 8.2 dB –15 dBm to –8 dBm 8 μ m to 10 μ m –28 dBm to –8 dBm
HSO Short Reach Optical Interface: Wavelength (λ_{Tmin} to λ_{Tmax}): Extinction ratio (r_{emin}): Output power (P_{Tmax} to P_{Tmin}): Cable core: Receiver Sensitivity:	1260 nm to 1360 nm 8.2 dB –15 dBm to –8 dBm 8 μ m to 10 μ m –23 dBm to –8 dBm
DX0 DP CARD INTERFACE	
Line	Balanced 4 wire
Data Rate	56 or 64 kb/s
Signal Format	Bipolar, non return-to-zero, 100% duty cycle
Impedance	135 Ω
Range	1500 ft max
Loopback Capability: DS0 DS1	Provides latching loopback towards either DS1 Provides latching loopback towards the DS0
Protection	1:1
Number of Ports	1
Jack Access for Testing	Bantam front-panel jacks provide DS0 access

Table A. Specifications (Contd)

ITEM	SPECIFICATION
DXU DP CARD INTERFACE	
Data & Clock (Transmit & Receive): Line Data Rate Impedance	Balanced (CCITT V.35) 56 kb/s 100 Ω
Control Lead Interface	RS-232
Loopback Capability: DS0	Provides latching loopback towards either DS1
Protection	1:1
Number of Ports	1
OXU DP CARD INTERFACE	
Line	Balanced 4 wire
Data Rate	56 kb/s
Signal Format	Bipolar, return-to-zero, 50% duty cycle
Impedance	135 Ω
Sealing Current	4 mA minimum with polarity-reversal capability
Equalization	Automatic line equalization provides level compensation and equalization on Digital Data Loops
Extended Range	Operation up to a maximum of 45 dB insertion loss for 56 kb/s @ Nyquist rate
Loopback Capability: OCU Loopback DS0 Loopback CSU Loopback	On drop side of OCU, the outgoing drop signal is disconnected from the external drop equipment, and a latching loopback loops the outgoing drop signal back into the drop input Provides latching loopback towards either DS1 Reverses the sealing current polarity toward CSU
Protection	1:1
Number of Ports	1
Jack Access for Testing	Bantam front-panel jacks provide DS0 access

Table A. Specifications (Contd)

ITEM	SPECIFICATION		
COMMUNICATION INTERFACE			
Language	TL1		
Communication Ports	<u>COMM1</u>	<u>COMM2</u>	<u>COMM</u>
DCE/DTE:	DCE	DCE	DCE
Connector Type:	DB25	DB37	RJ14
Gender:	Female	female	female
Physical Standard:	RS-232	RS-449	RJ-14
Electrical Standard:	RS-232	RS-422	RS-232
Link Designation:	Link 1	link 2	link 1
Location:	Shelf rear	shelf rear	MPU card front panel
Distance (max):	50 ft	3000 ft	50 ft
Note: Either the COMM1 or the COMM connector can be used as Link 1, but not both at the same time.			
SYNCHRONIZATION INTERFACE			
Inputs	<u>Rate</u>	<u>Ports per card</u>	
DS1 (T1.102):	1.544 Mb/s	1	
CC (bipolar RTZ):	64 kb/s, 8 kb/s	2 (See Note)	
Note: Composite clock is required for applications using DS0A interfaces. CC inputs are handled by the line interface cards.			
Output	<u>Rate</u>	<u>Ports per card</u>	
DS1 (T1.102):	1.544 Mb/s	2 ports	
ALARM & STATUS INTERFACE			
Alarms and Status	Contact closures, front-panel LEDs, external OSS reporting		
POWER			
Voltage	−48 V dc ±10% (A & B feed)		
Wattage	250 W max		
Shelf Fuses			
Rating:	5 A		
Type:	Fast-blow		
Size:	5 mm x 20 mm		
Recommended Wire Size for Battery Feed	16 AWG		
Battery Feed Fusing	7.5 to 10 A		
MECHANICAL & ENVIRONMENTAL			
Mounting	NEBS 23" rack, flush or recessed		
Dimensions	23" wide, 12.25" high, 12" deep		
Weight	40 lb fully loaded		
Temperature	0°C to +50°C (operational)		