UDS-110

SP101

Unit Data Sheet

PART NUMBER/ MNEMONIC	NAME	STATUS
625640-000-001/ SP101	Load Sharing Power 1603 SM Shelf Assembly	Active

FEATURES AND APPLICATION NOTES

- Designed for 23-inch channel racks and 23-inch unequal flange racks; accommodates either 1-inch or 1.75-inch mounting hole spacing.
- Supports front and rear access (cabling) installations; movable shelf mounting ears permit the shelf's front to mount flush with the frame rails or extend 1 inch, 5 inches, or 6 inches in the front.
- Provides mounting locations for 1603 SM plug-in units.
- Supports load-sharing power supply configuration.
- Vertical height of 10.5 inches (requires six vertical rack spaces [1.75-inch] mounting spaces).
- Overall depth is 12 inches.
- Provides removable protective front and rear covers.
- Built-in fiber tray across lower front of shelf.
- Built-in power source (-48 Vdc) fusing and a fuse failure alarm feature.
- Provides external equipment access connection points for the following:
    - Power and ground distribution (-48 Vdc, -48 Vdc return, signal ground, and frame ground).
    - Network management facilities such as: Orderwire (local and express), parallel E2A alarms, Customer-Defined Alarms and Controls (CDAC), and remote user or Telemetry Byte-Oriented Serial (TBOS) interface.
    - Equipped with a power and ground cable assembly to mate with frame power and ground cable assembly to simplify installation.
- Designed to U.L. and CSA standards (qualification for UL/CSA listing is pending):
    - Equipped with a conduit connector mounting bracket.

DESCRIPTION

The SP101 shelf, 625640-000-001, provides a self-sufficient mechanical assembly into which the 1603 SM system plug-in units are mounted and all external cabling (fiber and wire) is connected. Figure 1 shows a fully loaded SP101 with fiber-optic cables connected to the high speed line group plug-in units.
The SP101 shelf assembly is shipped with a front cover and a rear cover. These covers provide

physical protection for the cabling and wiring connections, as well as enhancing the system's ElectroMagnetic Interference (EMI) and ElectroStatic Discharge (ESD) protection. Figure 2 is an isometric view of the shelf assembly with the front and rear covers removed.
The SP101 shelf requires a vertical height of six rack spaces or 10.5 inches. The SP101 is equipped with frame mounting ears that can accommodate both 1-inch and 1.75-inch mounting hole spacings. In addition, the mounting ears can be adjusted either forward or backward to accommodate a variety of front access and rear access installations. This permits installation in a variety of frame types and accommodates both front and rear access cabling.
NOTE: *The factory supplied default position for the SP101 mounting ears is at the 5-inch setting (5 inches from front edge of shelf).*
Figure 3 is a side view of the SP101 shelf and shows how the mounting ears can be located in different positions to accommodate the following frame types:

- Alcatel (Newton) 7-foot channel frame
- Alcatel 7-foot unequal flange frame
- AT&T 7-foot frame ED-8C500
- AT&T 7-foot frame ED-8C501

All fiber-optic cables are connected to the front side of the various plug-in units. A fiber trough is provided to route the cables to either the left or right sides of the shelf assembly. In flush mount situations or in applications where a large number of fiber cables are used, the shelf permits vertical egress of fibers to customer-supplied fiber management panels.
Figure 1. SP101 Shelf Front View (front cover removed and plug-in units installed)
Figure 2. SP101 Shelf Isometric View (front and rear covers removed)
Figure 3. SP101 Shelf Side View of Movable Mounting Ear Arrangement
All electrical connections are made on the rear of the shelf. Figure 4 is a rear view of the shelf with the rear cover removed and no cables connected. The backplane cover panel protects the backplane from physical damage and avoids situations where cables might be damaged by extruding soldering points.
The SP101 is factory-equipped with a 9-pin connector cable assembly for easy power and ground connection to the PDU113 Power Distribution Unit power and ground frame harness. If local electrical codes require power and ground cables to be encased in 1/2-inch conduit, the SP101 is also factory-equipped with a conduit connector mounting bracket (see Figure 4). If conduit is used, the 9-pin power and ground cable assembly can be easily removed and discarded.
NOTE: *The following must be complied with in order to meet product safety listing requirements of ANSI/UL 1459:*

- This unit must be installed only in restricted access areas (dedicated equipment rooms, equipment closets, or the like) in accordance with articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA No. 70.
- This unit must be configured only with those component assemblies specified in the installation procedures and mounted in locations specified.
- The supply source of this unit must be fused with a 48V, 10A fuse.

As shown in Figure 4, the backplane cover has cutouts to expose customer connection points, and three tie-wrap bars are provided to help organize and restrain cabling. This simplifies cable routing and also simplifies removing and reinstalling the rear cover. Table A lists the front and rear access connection options for the power and housekeeping customer interfaces.
The SP101 shelf is designed to be a self-sufficient assembly and does not require an external fuse and alarm panel. However, the shelf can be connected to an existing fuse and alarm panel, if desired. Figure 5 shows the wiring between an Alcatel Power Distribution Unit (PDU) and the

SP101 shelf. The -48 Vdc power inputs to the shelf are electrically protected by two 10A GMT-type grasshopper fuses (P/N 1AB-01441-0009). The fuses are located on a front access shelf fuse assembly. For ease of access, the fuses protrude through the fuse assembly's front panel. No special tools are required for removal or replacement of the fuses. The fuses are labeled A and B to correspond to the two-feeder -48 Vdc power sources.
If one of the two shelf fuses opens, external power is supplied to the 1603 SM through the remaining fuse. In addition, a -48 Vdc Fuse Alarm voltage is applied to a pin on the COA50x plug-in unit. This results in a relay closure, and an alarm condition is reported to the system's Network Element Processor (NEP) plug-in unit.

Figure 4. SP101 Shelf (Rear View)

Table A. Customer Interfaces (Power and Housekeeping)

SIGNAL	ACCESS	PLUG-IN	COMMENTS
-48 Volts and Grounds	Screw terminals on backplane	PWRA01, converters on HIFs	
SYNC PRI SYNC SEC	WW on backplane or 25-pin conn	CLK20x	
MAINT1 MAINT2	WW on BP or 9-pin conn on BP	NEPxxx	
10BaseT	RJ-45 connector or WW on BP	NEP20x NEP402 NEP602	
10Base2	Coaxial connector on BP	NEP20x NEP402 NEP602	
ALARM SET 1	WW on backplane or ribbon cable	COAxxx	Ribbon cable standard
ALARM SET 2 ACO PROC RESET AUX RM INV	WW on backplane	COAxxx	
CRAFT PORT 1	9-pin conn on COA faceplate	COAxxx	
CRAFT PORT 2	WW on BP	COAxxx	
ORDERWIRE 1 ORDERWIRE 2 RS-232/422	WW on BP	COAxxx	
ALARM INPUTS	WW on BP	COAxxx	
CONTROL OUTPUTS	WW on BP	COAxxx	
X.25	WW on BP	COAxxx	Optional RS-232/X.25 cable stud assembly available; refer to Ordering Guide for additional information

Figure 5. Fuse Panel and SP101 Wiring Diagram (for CCL 'C1' and later shelves)

If both shelf fuses open, the 1603 SM is without power. When the Fuse Alarm relay on the COA50x plug-in unit deenergizes, a relay contact closure can be used to trigger the

customer-supplied alarm equipment.
Figure 6 is an SP101 shelf power distribution block diagram. The external source voltage (-48 Vdc) passes through the shelf fuse assemblies and is applied to the PWRA01 power converter plug-in units and the HIF plug-in units. The Distribution A source voltage is applied to all three PWRA01 power converters. The Distribution B source voltage is also connected to the inputs of all three PWRA01 power converters. This dual feeder connection ensures that if either A or B shelf fuses open, the three power converters will continue to operate using the remaining fuse. The PWRA01 power converter is designed so the outputs of one converter operate connected in parallel with the outputs of the other two power converters. This provides 1-for-2 redundancy with forced load sharing.

Figure 6. Load Sharing Power Distribution (SP101 Shelf with Redundant PWRA01) (for CCL 'C1' and later shelves)

Figure 7 shows the internal (shelf backplane) voltage distribution. The PWRA01 power converter units provide voltage (i.e., +5A/B, +12A/B, and -5.2A/B) to all plug-in units in the shelf except the HIF plug-in units. The HIF plug-in units have on-board power converter circuits; therefore, the HIF units are powered independently of each other and the rest of the plug-in units in the system.

Figure 7. SP101 Power Distribution (for CCL 'C1' and later shelves)

Refer to Table B for SP101 power and environmental specifications.

Table B. Miscellaneous

CATEGORY	PARAMETER	CHARACTERISTIC
Power (load sharing)	Input Voltage Range	-40.0 to -57.0 Vdc
	Transient Input Voltage	-200.0 Vdc @ 1 µs-100.0 Vdc @ 10 µs-75.0 Vdc @ 10 ms
	Physical Interface	Screw lugs w/optional power and ground cable assembly
	Consumption*	100-225 watts (depending on options)
Environmental	Storage Temperature	-40 to +85°C
	Operating Temperature	-40 to +65°C(0 to +50°C when equipped with NEP20x or NEP402)
	Maximum Rate of Change	33°C per hour
	Relative Humidity (operating or storage)	10% to 95% (no condensation)
	Altitude	-200 ft to 13,000 ft maximum
Mechanical Packaging (unloaded SP101 shelf)	Width	23 in. (58.42 cm)
	Height	6 rack spaces (10.5 in.) (26.67 cm)
	Weight	25 lbs (11.34 kg)
** Individual plug-in unit power consumption data is listed in the Heat Dissipation Worksheet, Table O.*		