

6520A Telecom Distribution

User Guide

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About this User Guide

Purpose

The 6520A User Guide describes the procedures for unpacking, installing, using, maintaining, and troubleshooting the 6520A.

Conventions

This guide uses the following conventions:

- **Acronyms and Abbreviations** – Terms are spelled out the first time they appear in text. Thereafter, only the acronym or abbreviation is used.
- **Revision Control** – The title page lists the printing date and versions of the product this guide describes.
- **Typographical Conventions** – This guide uses the typographical conventions described in the table below.

When text appears this way...	... it means:
<i>TimeProvider User's Guide</i>	The title of a document.
SSU CRITICAL	An operating mode, alarm state, status, or chassis label.
Select File , Open ...	Click the Open option on the File menu.
Press Enter Press ;	A named keyboard key. The key name is shown as it appears on the keyboard. An explanation of the key's acronym or function immediately follows the first reference to the key, if required.
6502 Username:	Text in a source file or a system prompt or other text that appears on a screen.
A <i>re-timing</i> application	A word or term being emphasized.
Symmetricom does not recommend...	A word or term given special emphasis.

Special Notices

Warnings, Cautions, Recommendations, and Notes attract attention to essential or critical information in this guide. The types of information included in each are explained in the following examples.



Warning: To avoid serious personal injury or death, *do not* disregard warnings. All warnings use this symbol. Warnings are installation, operation, or maintenance procedures, practices, or statements, that if not strictly observed, may result in serious personal injury or even death.



Caution: To avoid personal injury, *do not* disregard cautions. All cautions use this symbol. Cautions are installation, operation, or maintenance procedures, practices, conditions, or statements, that if not strictly observed, may result in damage to, or destruction of, the equipment. Cautions are also used to indicate a long-term health hazard.



ESD Caution: To avoid personal injury and electrostatic discharge (ESD) damage to equipment, *do not* disregard ESD cautions. All ESD cautions use this symbol. ESD cautions are installation, operation, or maintenance procedures, practices, conditions, or statements that if not strictly observed, may result in possible personal injury, electrostatic discharge damage to, or destruction of, static sensitive components of the equipment.



Electrical Shock Caution: To avoid electrical shock and possible personal injury, do not disregard electrical shock cautions. All electrical shock cautions use this symbol. Electrical shock cautions are practices, procedures, or statements, that if not strictly observed, may result in possible personal injury, electrical shock damage to, or destruction of components of the equipment.



Recommendation: All recommendations use this symbol. Recommendations indicate manufacturer-tested methods or known functionality. Recommendations contain installation, operation, or maintenance procedures, practices, conditions, or statements, that provide important information for optimum performance results.



Note: All notes use this symbol. Notes contain installation, operation, or maintenance procedures, practices, conditions, or statements, that alert you to important information, which may make your task easier or increase your understanding.

Symmetricom Limited Product Warranty

1. Hardware and embedded software - For a period of one (1) year from date of shipment by Symmetricom, Symmetricom warrants that all Products shall be free from defects in design, material, and workmanship; shall conform to and perform in accordance with Symmetricom's published specifications, if any; shall be free and clear of any liens and encumbrances; and shall have good and valid title. This warranty will survive inspection, acceptance, and payment by Buyer. Symmetricom does not warrant that the operation of such Product will be uninterrupted or error free. This warranty does not cover failures caused by acts of God, electrical or environmental conditions; abuse, negligence, accident, loss or damage in transit; or improper site preparation.

This warranty shall be null and void in the event (i) Buyer or any third party attempts repair of the goods without Symmetricom's advance written authorization, or (ii) defects are the result of improper or inadequate maintenance by Buyer or third party; (iii) of damage to said goods by Buyer or third party-supplied software, interfacing or supplies; (iv) of improper use (including termination of non-certified third party equipment on Symmetricom's proprietary interfaces and operation outside of the product's specifications) by Buyer or third party; or (v) the goods are shipped to any country other than that originally specified in the Buyer's purchase order.

Goods not meeting the foregoing warranty will be repaired or replaced, at Symmetricom's option, upon return to Symmetricom's factory freight prepaid; provided, however that Buyer has first obtained a return materials authorization number ("RMA Number") from Symmetricom authorizing such return. The RMA Number shall be placed on the exterior packaging of all returns. Symmetricom will pay shipping costs to return repaired or replacement goods to Buyer.

Symmetricom reserves the right to disallow a warranty claim following an inspection of returned product. When a warranty claim is questioned or disallowed, Symmetricom will contact Buyer by telephone or in writing to resolve the problem.

2. Software - Symmetricom warrants that for a period of ninety (90) days from date of shipment by Symmetricom the accompanying media will be free from defects in materials and workmanship under normal use. The physical media warranty does not apply to defects arising from misuse, theft, vandalism, fire, water, acts of God or other similar perils. Symmetricom will not be liable for any damages caused by the Buyer's failure to fulfill its responsibilities as stated above.

3. THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF TITLE, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE HOWSOEVER ARISING.

4. Limitation of Liability - The remedies provided herein are the Buyer's sole and exclusive remedies. In no event or circumstances will Symmetricom be liable to Buyer for indirect, special, incidental or consequential damages, including without limitation, loss of revenues or profits, business interruption costs, loss of data or software restoration, or damages relating to Buyer's procurement of substitute products or services. Except for liability for personal injury or property damage arising from Symmetricom's negligence or willful misconduct, in no event will Symmetricom's total cumulative liability in connection with any order hereunder or Symmetricom's Goods, from all causes of action of any kind, including tort, contract, negligence, strict liability and breach of warranty, exceed the total amount paid by Buyer hereunder. SOME JURISDICTIONS DO NOT ALLOW CERTAIN LIMITATIONS OR EXCLUSIONS OF LIABILITY, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO ALL BUYERS.

Introduction

Overview

This manual contains the information needed to install, configure and use the Symmetricom 6520A.

The Symmetricom 6520A Telecom Distribution Module takes a single telecom clock signal (either T1 or E1), and provides additional buffered outputs, twelve per module.

Purpose of Equipment

The Symmetricom 6520A uses Symmetricom's high performance distribution technology created for its line of Cesium standards. The 1U (1.75" high) chassis houses a set of very low noise and high isolation amplifiers. Up to ten Symmetricom 6520As may be daisy chained to provide up to 120 independently buffered outputs of the common input. The level of the input signal and all twelve output signals are monitored, providing a visual indicator of signal presence as well as a summary fault (form-C relay) for each module.

A complete list of performance characteristics is provided in "Specifications" on page 13.

Instrument Identification

The model number 6520A may be followed by a slash (/) and a three-digit number to indicate an option that is supplied within the instrument. See "Available Versions" on page 14.

Preparation for Shipment

To turn off the Symmetricom 6520A prior to shipment, remove the AC power from the plug on the rear panel. Package the instrument in its original packing if possible. If the original packing materials are not available, pack in a reinforced cardboard carton using foam to take up any space inside the carton. Do not use foam popcorn or crushed paper for packing.

If the instrument is being returned to Symmetricom, contact the Customer Assistance to advise of the product return.

Installation

Mounting

The Symmetricom 6520A is designed to be mounted in a standard 19-inch equipment rack and takes up 1U of vertical space (1.75"). The chassis depth is 12 inches.

Power Connection/Fuses/Voltage

The Symmetricom 6520A is powered from an AC source by a detachable power supply cord. The power cord is the disconnect device. Refer to "Power" on page 13 for power supply requirements. The AC fuses are located inside the AC connector/filter. The hot and neutral lines are fused separately. To change fuses, refer to [Figure 2-1](#). Open the cover on the AC connector/filter by applying a screwdriver to the cover slot. Once the cover is open, each fuse holder may be removed for inspection or replacement. Replace only with a 0.2A, 250V as specified.

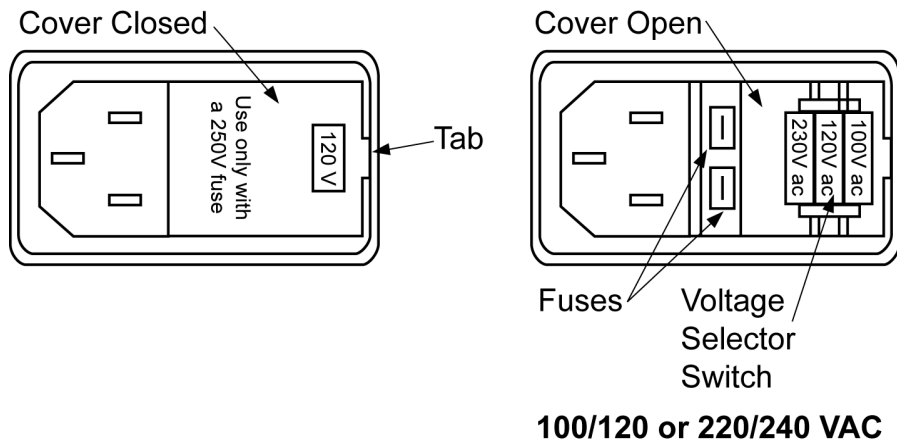


Figure 2-1 AC Input Filter/Fuses/Voltage Selector

The Symmetricom 6520A may be powered from 120 or 240 VAC. To change the AC input between 120 and 240 V, refer to Figure 2-1. Open the cover on the AC input connector by applying a screwdriver to the cover slot. Once the cover is open, a selector switch may be rolled left or right to line up "120" or "240" with the small window in the connector cover. Replace the cover on the AC input connector by snapping it in place.



Caution: Do not use the voltages labeled "100" or "230", as they are not connected.

DC Power Connection

The Symmetricom 6520A (DC version) is powered from a DC source. The connections are made at TB1 as shown in [Figure 2-2](#). The voltage input may be 20 V to 75 V.

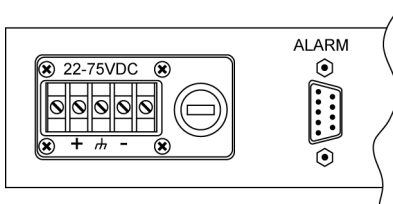


Figure 2-2 DC Power Connection

Signal Connectors

Connect the signal to be distributed to one of the two D connectors labeled INPUT. Set the impedance switch to 50Ω (down) if only one 6520A is used. If multiple 6520A modules are daisy chained to obtain more than twelve outputs, see “Daisy Chaining Multiple Modules” on page 9.

Output cables may be connected to connectors 1 to 12 in any order. Refer to [Figure 2-3](#).

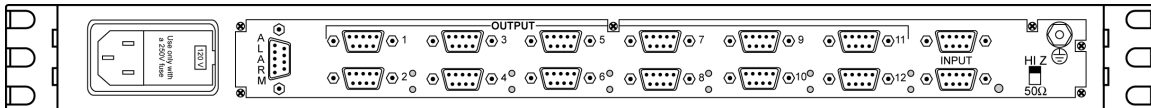


Figure 2-3 Signal Connections

With the 6520A powered, the green power indicator on the front panel will illuminate. The red indicator next to the input signal is off to show that there is a good input signal.

An optional RJ-45 Distribution Rear Panel, shown in [Figure 2-4](#), is also available

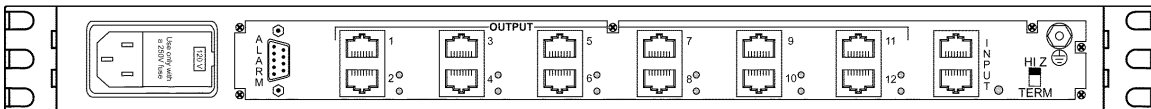


Figure 2-4 RJ-45 Distribution Rear Panel

Connector Pin Assignments

The standard input and output connectors all have same pins used for signal: Pins 2 and 6. The signal inputs and outputs are balanced, so there is no assignment of polarity.

On the optional RJ-45 Distribution Rear Panel, the RJ-45 connector ([Figure 2-5](#)) pin assignments are as follows:

- The two input connectors use pins 3 and 6 for the input signal.
- The twelve output connectors use pins 1 and 2 for the output signals.
- All signals are balanced, so there is no assignment of polarity.

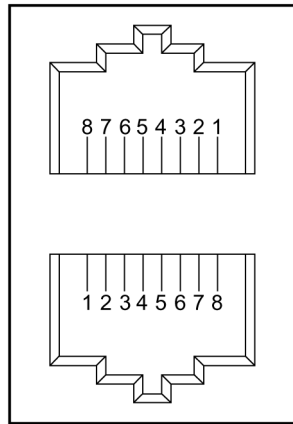


Figure 2-5 RJ-45 Connector Pin Numbers

Daisy Chaining More Than One Module

If more than twelve outputs are required, up to ten Symmetricom 6520A modules can be driven by a common input signal to produce up to 120 outputs. [Figure 2-6](#) illustrates this connection.

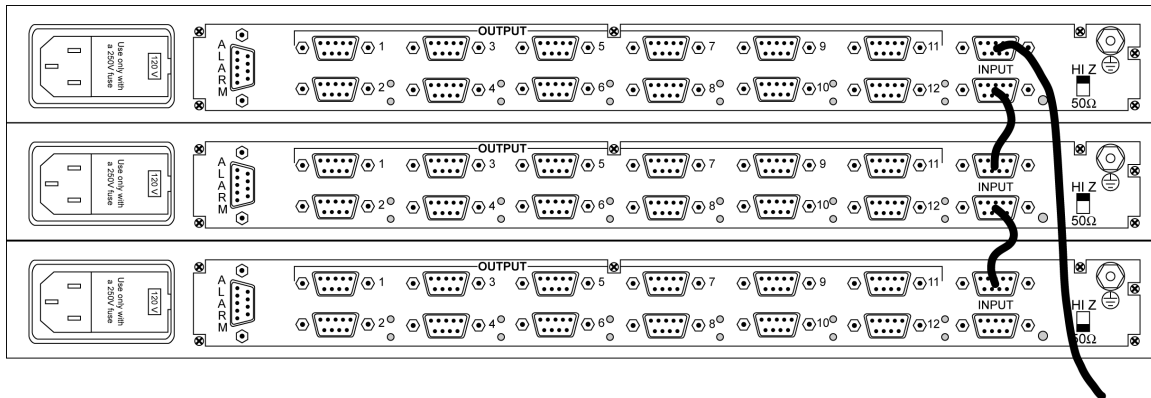
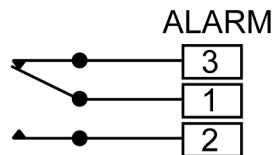


Figure 2-6 Daisy Chaining Multiple Modules

The example in [Figure 2-6](#) shows three units. The original signal from the source is connected to the top IN connector on the right side of the first module. The lower IN connector on the first module is connected to the top IN connector on the second module. The second module is connected to the third module in the same fashion. The impedance switch for the first and second chassis is set to HI Z, while the impedance switch on the third (or last) chassis in the daisy chain is set to 50Ω.

Alarm Connections

The Symmetricom 6520A provides for an alarm to signal the failure of any signal output. One set of form-C relay contacts is provided on the 9-pin D connector labeled ALARMS. For normal operation, pins 1 to 2 are open and pins 1 to 3 are closed. The sense is reversed for a fault condition. Refer to [Figure 2-7](#).



Relay shown in non-faulted condition

Figure 2-7 Alarm Contacts

If the input signal or input buffer fails or falls below the factory-set low-level threshold, the red fault indicator next to the input connector will turn on. Likewise, if any output buffer fails or falls below the low-level threshold, a red fault indicator next to that output will turn on. The ALARM form-C relay is normally energized, indicating no signal failure. If either the input or any output signal fails, the relay is de-energized (short between pins 1 and 2), indicating a fault condition. This is a fail-safe design that will indicate a fault in the event of a power loss.

Operation

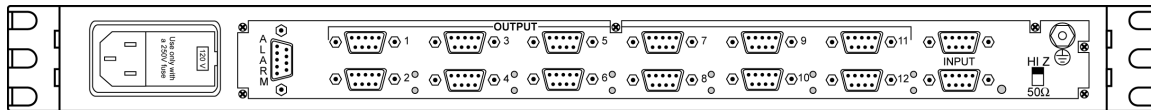
Overview

The Symmetricom 6520A Telecom Distribution Module controls and indicators are described in this chapter.

Figure 3-1. 6520A Telecom Distribution Front Panel



Figure 3-2. 6520A Telecom Distribution Rear Panel



Controls and Indicators

HI Z/50Ω

This slide switch on the rear panel selects either the HI Z input impedance (unterminated) or the 50Ω input impedance. A 6520A installation of two or more (ten maximum) units will set the switch to HI Z position on the module connected to the source of the signal, and on all subsequent modules except the last module, which is switched to the 50Ω position, providing proper termination for the signal.

POWER

LED on the front panel to indicate that power is applied. There is no power switch on the 6520A. When power is connected, power is ON.

ALARM

LED on the front panel to indicate that an ALARM condition exists. An alarm condition exists when the input signal or any output signal fails or falls below the factory preset amplitude.

INPUT FAULT

This LED is located on the rear panel, just to the right of the lower INPUT connectors. If the input signal fails or falls below the factory preset amplitude, this LED will light and stay on until the cause of the fault is remedied.

OUTPUT FAULT

There are twelve LED indicators, located adjacent to the output connectors. By observing Figure 3-2 it can be seen that there are two LED indicators just to the right of each even numbered output connector. The upper LED relates to the odd numbered output connector above, and the lower LED relates to the even numbered output connector. If any output signal fails or falls below the factory preset amplitude, the LED associated with the failed output will light and stay on until the cause of the fault is remedied.

Specifications



Note: All performance is at an ambient temperature of 25°C unless otherwise specified.

Additive SSB Phase Noise (1 Hz BW)

Offset from Carrier	
1 Hz	-120 dB
10 Hz	-135 dB
100 Hz	-145 dB
1,000 Hz	-155 dB
10,000 Hz	-160 dB

T1 Outputs (12)

Frequency	T1 (1.544 MHz) or E1 (2.048 MHz)
Level	per G706/10 or 13 Vrms
Isolation	>60 dB
Connectors	DB9

T1 Input

Frequency	T1 (1.544 MHz) or E1 (2.048 MHz)
Input Impedance	110 Ω (T1) or 120 Ω (E1)

Power

Operating Voltage	120/240 VAC, $\pm 15\%$
Power	< 10W
DC Input (Optional)	22 to 56 VDC, 10 W
AC Fuses	110V (2), 0.2 A, 250 V, fast acting, 5x20 mm
	220V (2), 0.1 A, 250 V, 5x20 mm

Mechanical

Height	1.75" (1 UI)
Width	19" (including rack mount ears)
Depth	12"

Environment

Operating Temperature	0 to 55°C
Relative Humidity	0 to 95%, non-condensing

Alarm Indication

Summary alarm indicates failure of any output signal.

Front Panel	Red LED
Relay	Energized (short pins 1 & 3): No Failure De-energized (short pins 1 & 2): Failure

Controls and Indicators

POWER	Green LED indicates power is connected
ALARM	Red LED indicates a signal output failure
HI Z/50Ω	Slide switch: Unterminated or 50Ω Terminated
INPUT FAULT	Red LED indicates fault with input signal
OUTPUT FAULT	Twelve red LEDs indicate fault with output

See "Controls and Indicators" on page 11 for more information.

Available Versions

- 14265-101 Standard configuration, AC input
- 14265-102 Standard configuration, DC input

Customer Assistance

For additional information about the products described in this guide, please contact your Symmetricom representative or your local sales office.

For Customer Assistance, please contact us by phone, e-mail, or on the web at www.symmetricom.com/support/.

US Assistance Center

(United States and Canada, Latin America including Caribbean, Pacific Rim including Asia, Australia and New Zealand)

Tel +1 888 367 7966 (+1 888 FOR SYMM) or +1 408 428 7907 (Worldwide)

Customer Service

For product quotes, service quotes, installations, order status and scheduling, 7:00 am to 5:00 pm Pacific Time, Monday through Friday, excluding U.S. Holidays.

Technical Support

For technical support, 24 hours a day, 7 days a week, every day of the year: support@symmetricom.com

EMEA Assistance Center

(Europe, Middle East and Africa)

Tel +49 700 32886435 or +1 408 428 7907 (Worldwide)

Customer Service

For product quotes, service quotes, installations, order status and scheduling 8:00 am to 5:00 pm Central European Time, Monday through Friday, excluding Holidays.

Technical Support

For technical support 24 hours a day, 7 days a week, every day of the year : emeasupport@symmetricom.com

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