

**MODEL 7954 Dual Channel RS-530 Mode-S
Switch, DB25 Interface, w/ Remote Control &
Solid-State Auto-Switching**

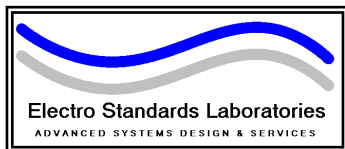
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Electro Standards Laboratories

ADVANCED SYSTEMS DESIGN & SERVICES

INFORMATION



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INTRODUCTION

The Model 7954 Dual Channel RS-530 Mode-S Switch with DB25 Interface, Remote Control and Solid State Auto-Switching Functions allows the user two independent channels of A/B switch function. The A/B function permits data on input MPS ports from either of two devices connected to ports MPSA-IN and MPSB-IN, to stream through to output ports MPSA-OUT and MPSB-OUT, respectively. Only one position, A or B, may stream data at a time for each channel. The Model 7954 is configured to mount in a standard 19 inch equipment rack within 1U of rack space. The dimensions are 19"W x 1.75"H x 8"D and the unit weighs approximately 4.5 lbs.

The switch is controlled remotely from a device connected to its REMOTE port. The Remote port has a custom interface DB25 connector located on the rear of the unit. The various status, monitoring and control signals present on this port allow the switch to be managed by a device capable of interpreting these signals and, based on these signals, issue control commands to be executed by the switch. The details of operation are discussed later in this guide.

The switch position status is displayed on the front panel LEDs. There are no local control buttons on the unit. All position control is managed via the Remote port.

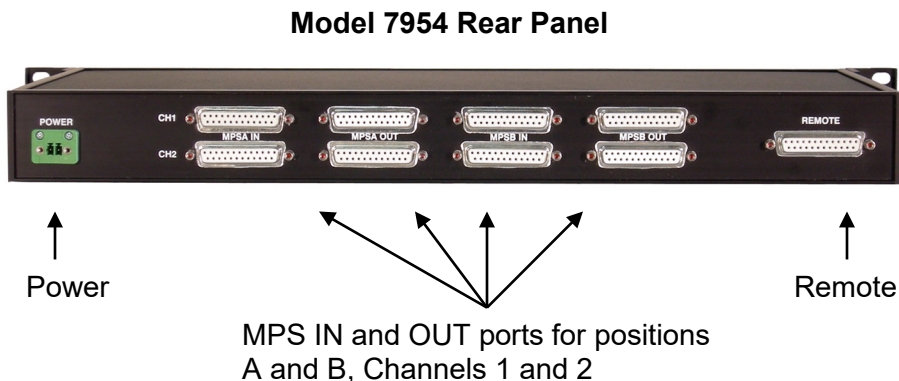


Features:

- The switched ports are transparent to all data.
- The DTR / DCD lines of the RS530 interface are switched based on desired position, TXD, TXC are passed through the unit from IN to OUT at all times.
- Channels 1 & 2 are switched independently.
- Switch data activity may be monitored via the Remote port.
- Switch position can be interpreted / read by status pins that are part of the Remote port.
- Switch position is managed by the device connected to the Remote port.
- Front panel LEDs display the current switch position and power status.
- Switch function is implemented with solid state technology.

INSTALLATION

This section describes the physical connections required to the switched ports, and to the Remote port.



The rear panel view of the Switch System is shown in the above figure.

- **POWER** – External Power Supply Input connector. The Model 7954 accepts 12VDC output from the power supply provided to run the unit.
- **REMOTE** – DB25/F, the remote port supports the management of the unit. This port provides signals that allow the unit position to be monitored, as well as monitoring data activity on the MPSA and MPSB of each channel. Since TXD is hardwire connected from IN to OUT of MPSA and MPSB respectively, the unit reads the status of TXD MPSA IN/OUT as a single status, and MPSB IN/OUT as a single status. This is the same for both channels. The Remote port also has pins to accept commands from the connected device to change the position of each switch channel. Both switch channels are monitored and controlled independently over the one Remote port.

For each Channel:

- **MPSA-IN** – DB25/F, the “A” device input port of the channel.
- **MPSA-OUT** – DB25/F, the “A” device output port of the channel.
- **MPSB-IN** – DB25/F, the “B” device input port of the channel.
- **MPSB-OUT** – DB25/F, the “B” device output port of the channel.

RS530 Port Connections

Connect the required RS530 data cable connections between the Model 7954 and the devices to be switched. Pins 2,14 (TXD), 24,11 (TXC), 20, 23 (DTR on the IN side of both MPSA and MPSB), 8, 10 (DCD on the OUT side of both MPSA and MPSB) of the

DB25 connector interface are passed through the unit depending on the state. Each port, MPSA IN, MPSA OUT, MPSB IN, and MPSB OUT are DB25 female connectors.

If RS530 cables are required, they can be supplied by Electro Standards Laboratories at any length and any pin configuration.

Power Supply

After all the proper RS530 data cable connections have been made, power can be applied to the unit.

Plug the captive cable end from the output of the supply terminated with the green connector into the Model 7954 Power port. The power supply provides 12VDC, 0.5A to the unit. The ESL power supply part number is 516682 should a replacement be required.

Upon power up, the Model 7954 will process its power up routine. When the routine is complete, the front panel LEDs will indicate the current switch position. At this point the unit is ready for operation.

Remote Port Interface

The Remote port is a custom configured port that supports the specific control functions of the Model 7954. It is not an RS232 serial or RS530 port. Improper connection to the Remote port may result in damage to either the device connected to the Remote port, or to the Model 7954. Please read and understand the Remote port description thoroughly to understand how to connect to the unit. If further information is required, contact Electro Standards Laboratories technical support at 877-943-1164.

The Remote DB25 port connects to a device that can interpret the signals present on various pins of the DB25 connector, and provide command signals and connections to specific pins on the same connector, resulting in switch control and management of the unit. The Remote port has individual pins dedicated to monitoring each port of each channel independently, and controlling the position of each channel independently.

Each pin or sets of pins, has a specific function that allows the remote device to perform these functions, thus, connections made to this port must strictly observe the usage of each pin in order to operate properly and not damage the unit or the connected devices. Descriptions of each pin are in Table 1 below.

Pin Number	Description
1	Shield
2	Channel 1 Ground
3	Reserved
4	Channel 1 Contact Input
5	Channel 1 Relay Monitor Contact A
6	Channel 1 Relay Monitor Contact COM (24V)
7	Channel 1 Relay Monitor Contact B
8	Reserved
9	Channel 1 Activity Reference (24V) for pins 11-12
10	n/a

11	Channel 1 Input Activity Contact (MPSA IN & OUT ports)
12	Channel 1 Input Activity Contact (MPSB IN & OUT ports)
13	Reserved
14	Channel 2 Ground
15	Reserved
16	Channel 2 Contact Input
17	Channel 2 Relay Monitor Contact A
18	Channel 2 Relay Monitor Contact COM (24V)
19	Channel 2 Relay Monitor Contact B
20	Reserved
21	Channel 2 Activity Reference (24V) for pins 22-24
22	n/a
23	Channel 2 Input Activity Contact (MPSA IN & OUT ports)
24	Channel 2 Input Activity Contact (MPSB IN & OUT ports)
25	Reserved

Table 1. Remote Port Pins

Refer to the OPERATION section below the detail explanation to understand proper connection to the Remote port.

Switch Position & Signal Pathways During Power Loss

The Model 7954 is implemented with solid state technology and will not maintain connection pathways during power failure. Upon power up each channel of the unit will align with its contact input.

OPERATION

Model 7954 Front Panel



The front panel view of the Switch System is shown in the above figure. On the front of the switch are the following indicators:

- **A, B INDICATOR FOR EACH CHANNEL** - red LED's indicate the switch position and power status. When powered, since either the A or B LED of each channel will be lit, this indicates power is connected to the unit.

Remote Control

The switch position may be controlled remotely via contact closure on the Remote port located on the rear of the unit. Pins 4 and 2 control Channel 1; pins 16 and 14 control Channel 2. The following text explains the pin connections, but for more information, see: **Diagram 1. Pin Connections in the Model 7954.**

A contact OPEN/SHORT connection between specific pins will command the unit to change switch position. The specifics are described in Table 2 below.

Remote Port Pins	Contact State	Description
4 & 2	OPEN	CH1 Command Switch in position A
4 & 2	SHORT	CH1 Command Switch in position B
16 & 14	OPEN	CH2 Command Switch in position A
16 & 14	SHORT	CH2 Command Switch in position B

Table 2. Remote Switch Control pins

Remote Control port pins 4 and 2 are used to control the position of the Channel 1 switch. The switch changes position based on a change of the state of a contact connected across these pins. When the contact between these pins is OPEN, Channel 1 is switched to the "A" position. When the contact between these pins is closed or SHORT, Channel 1 is switched to the "B" position.

Similarly, Channel 2 is controlled by the state of the contact between pins 16 and 14 on the Remote Control port. When the contact between these pins is OPEN, Channel 2 is switched to the "A" position. When the contact between these pins is closed or SHORT, Channel 2 is switched to the "B" position.

Monitoring the Switch Position

The position of the switch can be detected at any time by checking the status of a specific set of Remote port pins. Pins 5, 6, and 7 represent Channel 1. Pins 17, 18, and 19 represent Channel 2.

These pins are a true representation of the switch position relays. If a voltage is applied to the Relay Monitor Contact COM pin, that voltage will be present on the corresponding Relay Monitor Contact A pin or Relay Monitor Contact B pin depending on the switch position. There is a dedicated set of Relay Monitor Contact for both Channel 1 and Channel 2.

Monitoring Channel 1 Position

- The Channel 1 Relay Monitor Contact COM pin (pin 6) of the Remote port must have a voltage applied to it, for example, 24VDC.
- If Channel 1 is in position A, the unit will connect this 24VDC to the Channel 1 Relay Monitor Contact A (pin 5) of the Remote Port.
- If Channel 1 is in position B, the unit will connect the 24VDC to the Channel 1 Relay Monitor Contact B (pin 7) of the Remote Port.
- Both pins 5 & 7 must be monitored to detect Channel 1 position status.

Monitoring Channel 2 Position

- The Channel 2 Relay Monitor Contact COM pin (pin 18) of the Remote port must have a voltage applied to it, for example, 24VDC.
- If Channel 2 is in position A, the unit will connect this 24VDC to the Channel 2 Relay Monitor Contact A (pin 17) of the Remote Port.
- If Channel 2 is in position B, the unit will connect the 24VDC to the Channel 2 Relay Monitor Contact B (pin 19) of the Remote Port.
- Both pins 17 & 19 must be monitored to detect Channel 2 position status.

Table 3 lists the pins, state and status for Position Monitoring on the Remote port.

Remote Port Pins	State	Status	Comment
5 & 6	SHORT	CH1 Switch in position A	Voltage or signal connected to pin 6 is present on pin 5.
7 & 6	SHORT	CH1 Switch in position B	Voltage or signal connected to pin 6 is present on pin 7.
5, 6, & 7	OPEN	Unknown Position – Channel 1	
5, 6, & 7	SHORT	Defective Switch – Channel 1	
17 & 18	SHORT	CH2 Switch in position A	Voltage or signal connected to pin 18 is present on pin 17.
19 & 18	SHORT	CH2 Switch in position B	Voltage or signal connected to pin 18 is present on pin 19.
17, 18, & 19	OPEN	Unknown Position – Channel 2	
17, 18, & 19	SHORT	Defective Switch – Channel 2	

Table 3. Position Monitoring pins on the Remote Port

Monitoring Data Activity

The data activity of the switch can be detected at any time by checking the status voltage or signal of specific pins of the DB25 Remote Control port. Pins 9, 11, and 12 support this function on Channel 1. Pins 21, 23, and 24 support this function for Channel 2.

The Model 7954 monitors data activity passing through MPSA IN/OUT, and MPSB IN/OUT, of both channels 1 and 2. The Model 7954 will pass the Activity Reference signal to the appropriate Output Activity pin(s) and Input Activity pin(s) that reflect data activity.

The Activity Reference signal voltage for Channel 1 must be connected to pin 9. The Activity Reference signal voltage for channel 2 must be connected to pin 21.

Upon detection of data activity on a channel port (MPSA, or MPSB) the Activity Reference signal is connected through to designated pins indicating data presence on each port. These dedicated pins are 11 and 12 for Channel 1, and are 23 and 24 for Channel 2. There is a one second time delay between the loss of data activity on the port and the change from high to low signal of the monitor pins.

Monitoring Channel 1 Data on the Remote Port

- The Channel 1 Activity Reference signal pin (pin 9) of the Remote port must have a status voltage or signal applied to it, for example a 24 volt DC voltage.
- If the Channel 1 switch is in position A, the Model 7954 will pass the DTR signal from the MPSA IN port to the DCD signal of the MPSA OUT port. The signal provided on pin 9 to the Channel 1 Activity Reference pin, will be present on pin 11, the Channel Input Activity Contact for MPSA IN & OUT. MPSA IN & OUT are shown on the same pin because they are hardwired and passed directly through the unit. These pins can be monitored to detect whether or not data is being received on the MPSA IN/OUT ports for Channel 1.
- If the Channel 1 switch is in position B, the Model 7954 will pass the DTR signal from the MPSB IN port to the DCD signal of the MPSB OUT port. The signal provided on pin 9 to the Channel 1 Activity Reference pin, will be present on pin 12, the Channel Input Activity Contact for MPSB IN & OUT. MPSB IN & OUT are shown on the same pin because they are hardwired and passed directly through the unit. These pins can be monitored to detect whether or not data is being received on the MPSB IN/OUT ports for Channel 1.

Monitoring Channel 2 Data on the Remote Port

- The Channel 2 Activity Reference signal pin (pin 21) of the Remote port must have a status voltage or signal applied to it, for example a 24 volt DC voltage.
- If the Channel 2 switch is in position A, the Model 7954 will pass the DTR signal from the MPSA IN port to the DCD signal of the MPSA OUT port. The signal provided on pin 21 to the Channel 2 Activity Reference pin, will be present on pin 23, the Channel Input Activity Contact for MPSA IN & OUT. MPSA IN & OUT are shown on the same pin because they are hardwired and passed directly through the unit. These pins can be monitored to detect

whether or not data is being received on the MPSA IN/OUT ports for Channel 2.

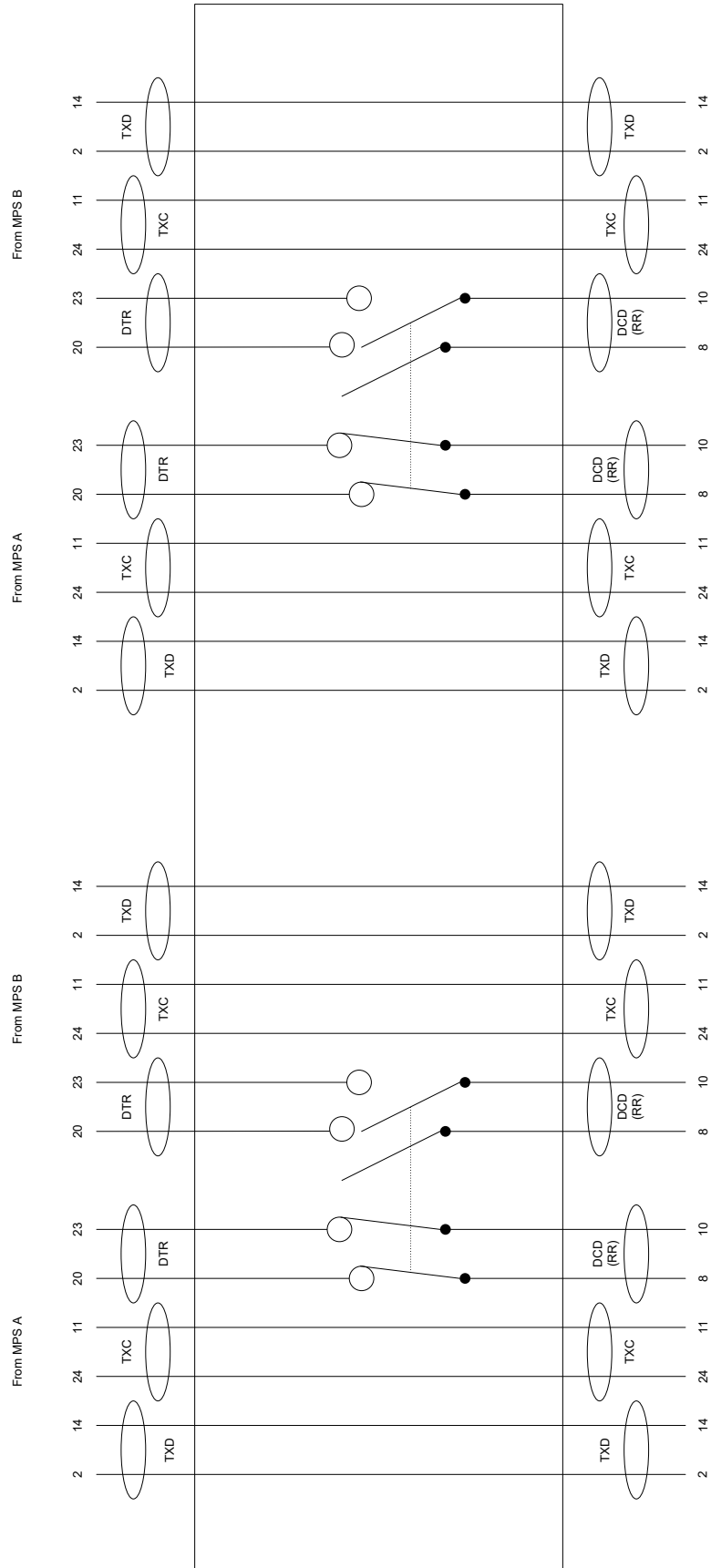
- If the Channel 2 switch is in position B, the Model 7954 will pass the DTR signal from the MPSB IN port to the DCD signal of the MPSB OUT port. The signal provided on pin 21 to the Channel 2 Activity Reference pin, will be present on pin 24, the Channel Input Activity Contact for MPSB IN & OUT. MPSB IN & OUT are shown on the same pin because they are hardwired and passed directly through the unit. These pins can be monitored to detect whether or not data is being received on the MPSB IN/OUT ports for Channel 2.

Table 4 lists the pins, state and status for Data Monitoring on the Remote port.

Remote Port Pins	Contact State	Description	Comment
11 & 9	OPEN	No data activity on Channel 1 port MPSA IN & OUT output	
11 & 9	SHORT	Data activity on channel 1 port MPSA IN & OUT output	Channel 1 Activity Reference signal connected to pin 9 is present on pin 11.
12 & 9	OPEN	No data activity on Channel 1 port MPSB IN & OUT output	
12 & 9	SHORT	Data activity on Channel 1 port MPSB IN & OUT output	Channel 1 Activity Reference signal connected to pin 9 is present on pin 12.
23 & 21	OPEN	No data activity on Channel 2 port MPSA IN & OUT output	
23 & 21	SHORT	Data activity on Channel 2 port MPSA IN & OUT output	Channel 2 Activity Reference signal connected to pin 21 is present on pin 23.
24 & 21	OPEN	No data activity on Channel 2 port MPSB output	
24 & 21	SHORT	Data activity on Channel 2 port MPSB output	Channel 2 Activity Reference signal connected to pin 21 is present on pin 24.

Table 4. Data Monitoring pins on the Remote Port

Diagram 1. Pin Connections in the Model 7954



CUSTOMER & TECHNICAL SUPPORT

Customer Support

For customer assistance, ordering assistance, RS530 communications cable or Remote port cables of any length or configuration, please contact Electro Standards Laboratories, (877) 943-1164 and ask for sales/customer support.

Technical Support

For technical support with unit operation, cable configuration, etc., please contact Electro Standards Laboratories, (877) 943-1164 and ask for technical support. Please have the unit model number and serial number available when you call.