KEITHLEY

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S46 Microwave Switch System
Terminated Teledyne Installation Guide

Introduction

This guide contains information on S46 relay installation and system configuration that is necessary after installing new relays.

WARNING   **The information in this section is only intended for qualified service personnel. Do not attempt to replace parts or otherwise service the equipment unless you are qualified to do so.**

Relay kits

Table 1 summarizes available relay kits and part numbers.

WARNING   **Use only the parts specified in Table 1 of this guide when servicing the equipment. Use of improper parts may expose the operator to hazardous voltages that could result in personal injury or death.**

Table 1
S46 relay kits

Relay location	Description	Relay kit model number	Kit parts summary	Keithley part number
1 to 8	SPDT RF relay	S46-SPDT-KIT-T	SPDT terminated relay (1) Connecting cable (1)	S40-0082 SYS46-311B
A to D	SP4T RF relay	S46-SP4T-KIT-T	4-40 × 1/4 PPHSEM screws (2) SP4T relay (1) Ribbon cable (1)	4-40X1/4 PPHSEM S40-0207 CA-286-1B
A to D	SP6T RF relay	S46-SP6T-KIT-T	4-40 × 1/4 PPHSEM screws (2) SP6T relay (1) Ribbon cable (1)	4-40X1/4 PPHSEM RL-288-1 CA-286-1B

Relay installation

Before installing the relays, remove the screws that secure the S46 top cover, and then remove the cover.

> **WARNING** **Disconnect the line cord and all cables from the S46 before removing the top cover.**

RELAY 1-8 installation

1. Unplug line cord, disconnect all cables, and remove the **Top Cover**.
2. Remove the 6 screws that secure the **SPDT relay mounting bracket** to the S46 chassis (see Figure 1).
3. Remove the 2 screws holding the relay spacers in the new relay column.
4. Replace the spacer with the new relay where the new relay is to be installed.
5. Install the 2 screws removed in step 3 in the new relay column.
6. Referring to Figure 2, solder the two control wires to the terminals of the relay.
7. Install the **SPDT relay mounting bracket** using the screws removed in step 1.
8. Plug the wire connector into the appropriate circuit board connector (see Table 2 and Figure 4 on page 5).
9. Install the **Top Cover**, and then configure the system as covered in "System configuration" on page 5 of this guide.

> **WARNING** **Do not power up the system without reinstalling the top cover. Failure to do so may expose the operator to hazardous voltages that could result in personal injury or death.**
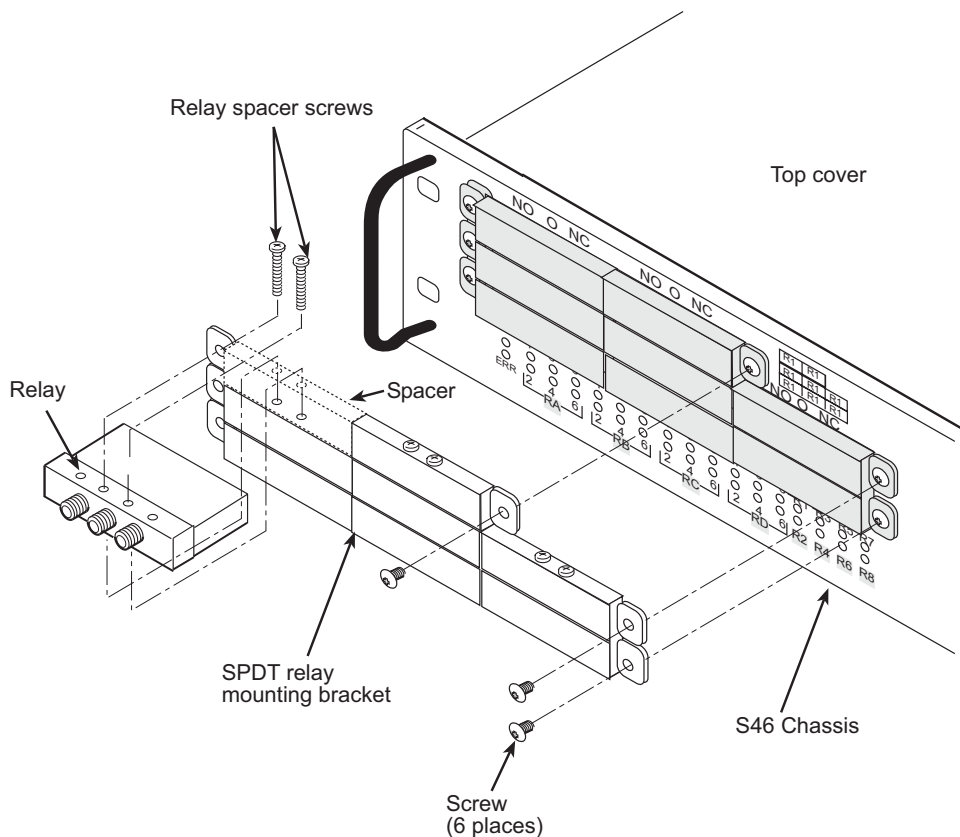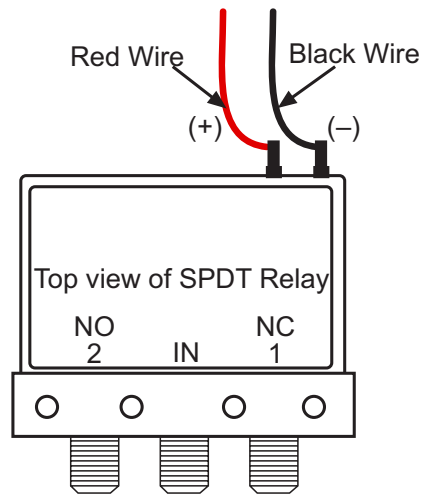
Figure 1
RELAY 1-8 installation

Figure 2
**Connecting control wires
to SPDT relay**

Red Wire   Black Wire

(+)   (−)

Top view of SPDT Relay

NO   NC
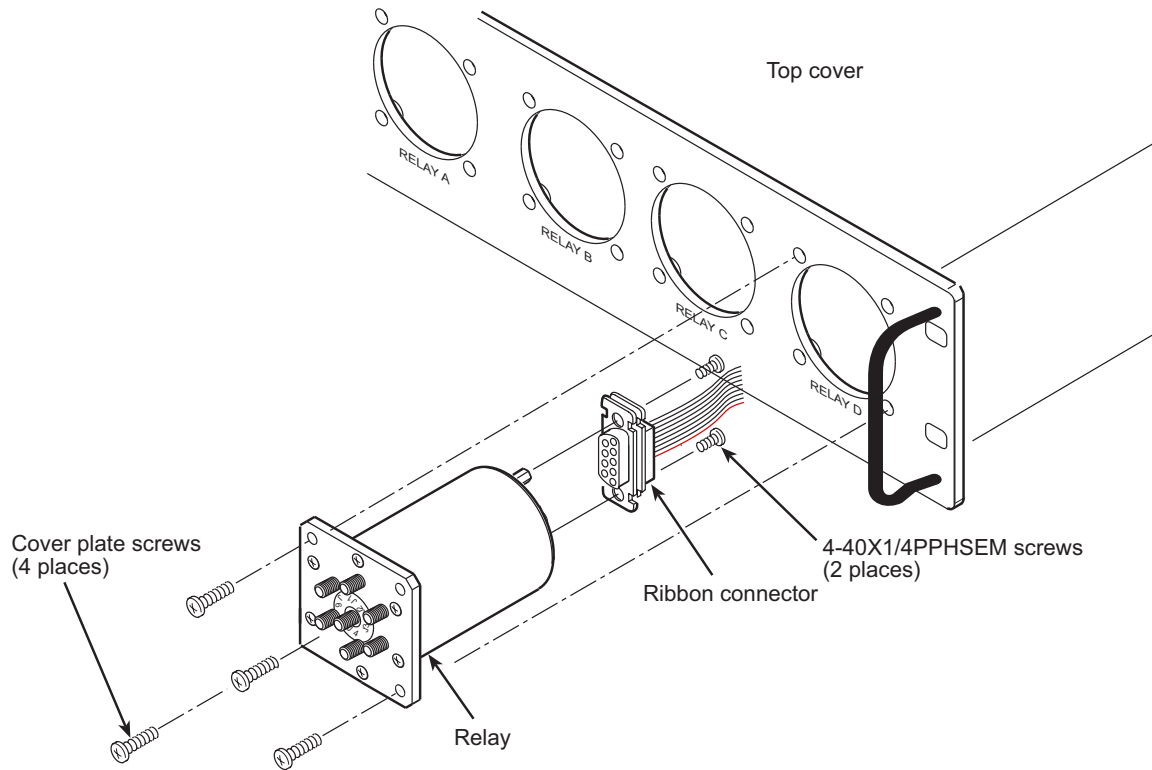2   IN   1

○   ○   ○   ○

RELAY A-D installation

1. Remove the four screws securing the cover plate over the mounting hole where the new relay is to be installed (see Figure 3).

2. Connect the supplied ribbon cable to the relay securing it with the two **4-40X1/4PPHSEM** screws.

3. Insert the relay in the mounting hole, and then secure it with the four screws.

4. Plug the ribbon connector into the appropriate circuit board connector (see Table 2 and Figure 4 on page 5).

5. Install the top cover, and then configure the system as covered in "System configuration" on page 5 of this guide.

    WARNING   **Do not power up the system without reinstalling the top cover. Failure to do so may expose the operator to hazardous voltages that could result in personal injury or death.**
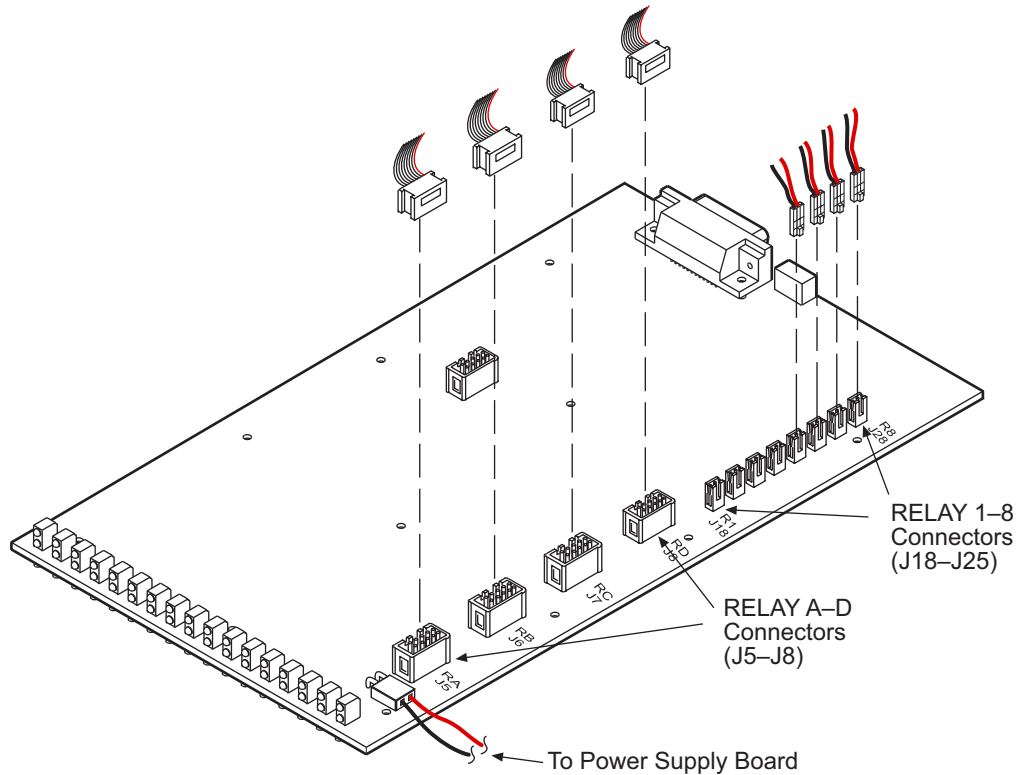
Figure 3
RELAY A-D installation

Top cover

RELAY A

RELAY B

RELAY C

RELAY D

4-40X1/4PPHSEM screws
(2 places)

Ribbon connector

Cover plate screws
(4 places)

Relay

Board connector reference

Table 2
Relay connectors

Relay	Connector	Relay	Connector
A	J5	1	J18
B	J6	2	J19
C	J7	3	J20
D	J8	4	J21
—	—	5	J22
—	—	6	J23
—	—	7	J24
—	—	8	J25

Figure 4
Relay connector locations

RELAY 1–8
Connectors
(J18–J25)

RELAY A–D
Connectors
(J5–J8)

To Power Supply Board

System configuration

After installing the new relays, you must program the S46 for the new relay configuration with the following command:

`:ROUT:CONF:CPOL <clist>`

<clist> is defined as follows:

```
clist = (@0 | 3-6, 0 | 3-6, 0 | 3-6, 0 | 3-6, 0 | 1, ... 0 | 1)
Relay:    A        B        C        D       1   ...  8
```

> **NOTE** *All switch locations must be included in the <clist> whether or not all locations are populated. The numeric value (1 or 3-6) indicates the number of throws, while a value of 0 indicates that a location is not populated.*
>
> *For example, if RELAY A and RELAY B are SP6T, RELAY 1 and RELAY 2 are SPDTs, and all other locations are not populated, the command syntax would be:*
>
> `:ROUT:CONF:CPOL (@6,6,0,0,1,1,0,0,0,0,0,0)`

See Section 3 of the S46 Instruction Manual (document number S46-901-01) for detailed programming information.