KEITHLEY

S46L Microwave Switch System
Relay Installation Guide

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Introduction

This guide contains relay installation and system configuration information for the S46L Microwave Switch System that is necessary after installing new relays. To install a relay, refer to Relay kits for a description of the kits and then follow the applicable installation instructions.

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 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: S46L relay kits

Relay kit model number	Description	Relay location	Kit parts summary (quantity)	Keithley part number	Installation reference
S46L-SPDT-KIT-L	20 GHz SPDT	1 to 4	SPDT terminated relay (1)	RL-360	SPDT relay 1 through 4 installation on page 2
			Connecting cable (1)	S46-350	
S46L-SP6T-KIT-T	18 GHz SP6T	A to D	4-40 ×1/4 PPHSEM screws (2)	4-40X1/4PPHSEM	Relays A through D installation on page 4
			4-40 ×3/8 PFH screws (4)	4-40x3/8PFH	
			SP6T terminated relay (1)	RL-259	
			Ribbon cable (1)	CA-566B	

Installation

Before installing the relays, remove the screws that secure the S46L top cover, and then remove the cover.
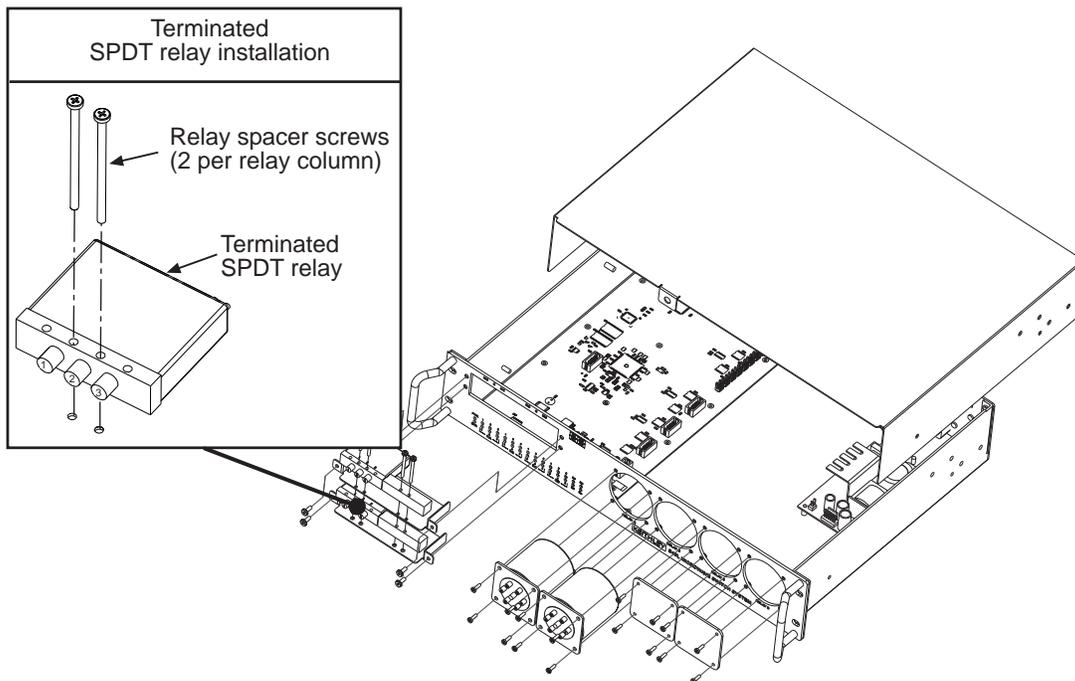
WARNING	Disconnect the power cord and all cables from the S46L before removing the top cover.

To find the applicable installation procedure for your specific kit, refer to the "Installation reference" column in Table 1, and then perform the referenced installation.

SPDT relay 1 through 4 installation

1. Remove the two (2) screws holding relay spacers in the relay column containing the desired relay installation location (see Figure 1).
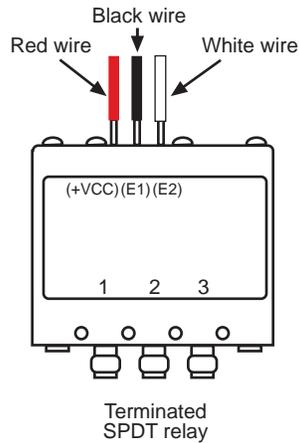
Figure 1: SPDT 1 through 4 relay installation

2. Replace the spacer with the relay in the desired location (refer to the inset in Figure 1 labeled "Terminated SPDT relay installation").
3. Install the two (2) screws removed in step 1 in the new relay column.
4. Thread the red and black wires (from the relay) through the PVC tubing (PVC tubing, part number TX-52-7, is part of S46L-350) (not shown). The PVC tubing may be cut to a length that will allow the relay assembly to be removed without removing the top cover.
5. Referring to Figure 2, solder the three (3) control wires to the terminals of the relay:

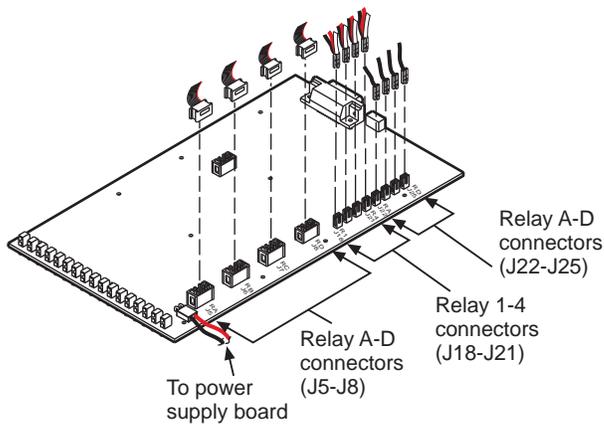| NOTE	The relay is assembled with its label facing up, and therefore, the pins shown in the figure below are on the lower row.

- Solder the red wire to the pin marked +VCC.
- Solder the black wire to the pin marked E1.
- Solder the white wire to the pin marked E2.

Figure 2: Connecting control wires to SPDT relay

Terminated
SPDT relay

6. Install the relay mounting bracket using the screws removed in step 1.
7. Plug the wire connector into the appropriate circuit board connector (see Figure 3).
8. Install the top cover, and then configure the system as described in System configuration.
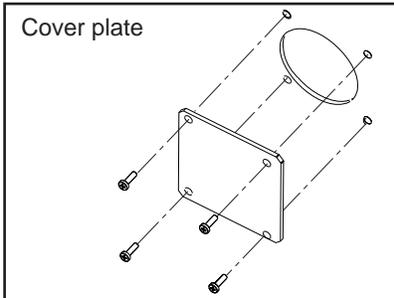
Figure 3: Relay connector locations

Relay	Connector
1	J18
2	J19
3	J20
4	J21

Relay	Connector
A	J5, J22
B	J6. J23
C	J7, J24
D	J8, J25

Relays A through D installation

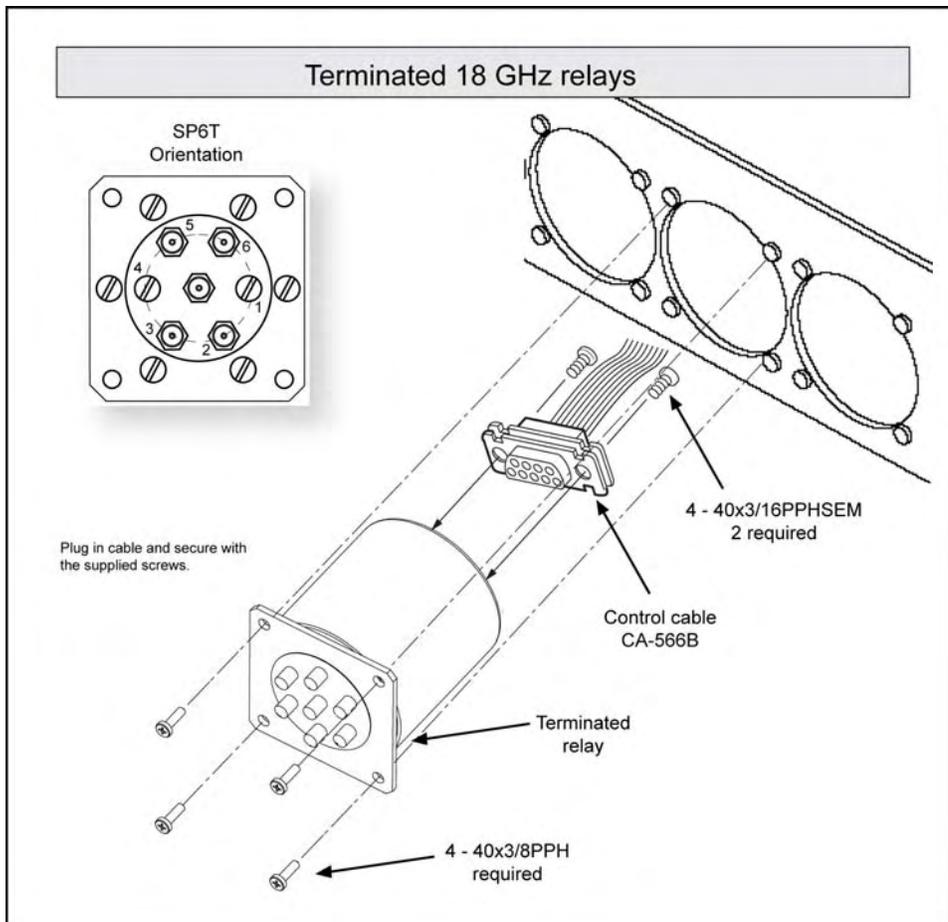1. Remove the four (4) screws securing the cover plate over the mounting hole where the new relay will be installed (see Figure 4).

Figure 4: Remove mounting hole cover plate

2. Assemble the supplied ribbon cable to the relay (use Figure 5 as a guide):
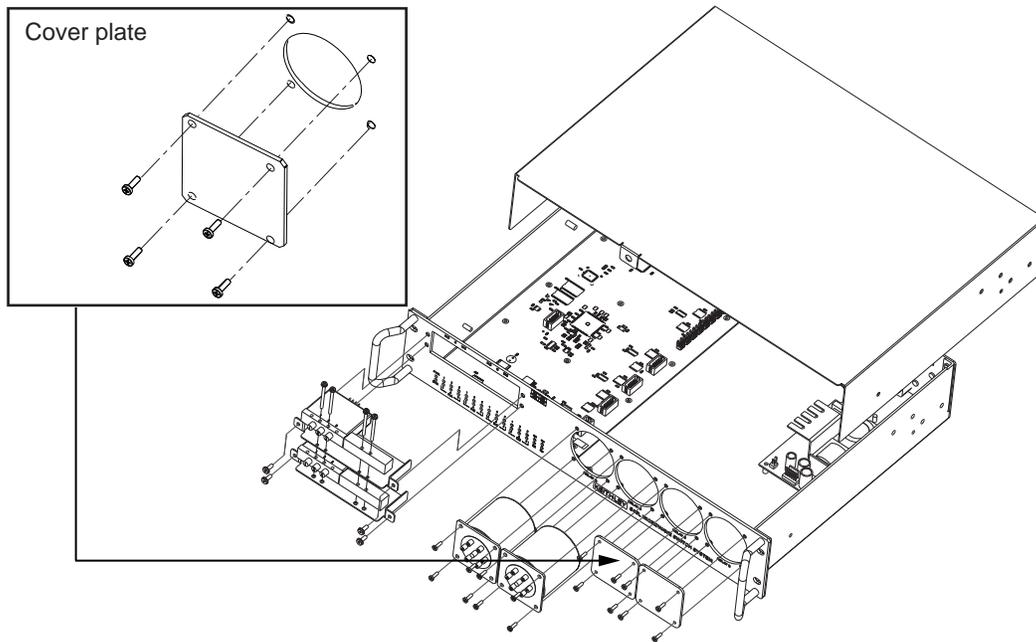
Figure 5: Connecting control wires to relays A through D

3. Install the relay in the mounting hole, and then secure it with the four (4) screws removed in step 1.
4. Plug the ribbon connector into the appropriate circuit board connector (see Figure 3).

5. Install the top cover, and then configure the system as described in <u>System configuration</u>.

Figure 6: A through D relay installation

System configuration

After installing the new relays, you must program the S46L for the new relay configuration using the following command:

```
:ROUT:CONF:CPOL <clist>
```

Where <clist> is defined as:

clist = (@0 | 3-6, 0 | 3-6, 0 | 3-6, 0 | 3-6, 0 | 1, ... 0 | 1)
Relay: A   B   C   D   1 ...   4

NOTE   All switch locations must be included in the <clist> parameter whether or not all locations are populated. The numeric value (1 or 3-6) indicates the number of throws; 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 is:

```
:ROUT:CONF:CPOL (@6,6,0,0,1,1,0,0)
```

See Section 3 of the S46/S46T/S46L Instruction Manual for detailed programming information.