



Proper use of TestStation system Relay Driver Circuits

The TestStation system has a system control board that contains the Relay Driver circuits on it. These are relay driver transistors that the Customer can use to turn on and off relays or lamps in their fixture or on their UUT (Unit under Test).

Note: Some TestStation systems (TS8X and TS12X) have these circuits on the Driver Sensor Reference board.

These relay drivers could be damaged if the suppression diodes are not also wired into the fixture or UUT relay control circuits.

When a relay coil is deenergized the electromagnetic flux field generated collapses back into the coil causing a voltage transient. To protect the transistor relay driver, a diode is supplied to bypass this energy. The decision of whether to use the Teradyne supplied suppression diodes is left to the customer because some relays come with their own suppression diode built into the relay package.

If your fixture or board relay does not have a suppression diode built in or you are not sure, PLEASE follow these directions to connect the relay driver suppression diode and also connect the relay driver return line (different from Fixture ground).

NOTES:

Each bank of Relay drivers has their own Suppression diode connections. It is important to connect to the correct receiver point.

– See Figure 2-19 for typical receiver arrangement.

When using the low power relay drivers (RLY versus HRLY) it is important not to mix different voltages with your control circuits. You should not have one RLY circuit switching a relay using 12 volts and another RLY circuit switching a relay with 24 volts. If you have different control voltages you MUST choose one of the HRLY circuits to separate these.

It is also important to use the relay driver ground or return point (V+Gnd) in your relay control circuit. The typical fixture ground is not the same electrical point as relay driver return.

- See Figure 2-18 for relay connections

Refer to the Test Fixture manual for the particular system you have to see how the relay drivers are arranged.



Typical receiver arrangement for relay driver connections

Taken from the Navigate 5.9.0

Test Fixture Manual for Small Pin Count Test Systems page 2-19

Notice that the diode suppression connection for all low power Relay drivers (RLY 1-16) goes through V+. This means that you need to be careful about using one control voltage for all of these relay drivers used. If multiple control voltages are needed for one fixture or UUT, then you will need to separate these by using one or more of the HRLY drivers.

Figure 2-19 Relay Driver Connections

Connection	Location				
HRLY1	V+A 3-B61	SID 14	73	73	SID 15
HRLY2	V+B 3-59	SID 16	72	72	GND
HRLY3-8	V+C 3-B58	FIXT DNR	71	71	FIXT DNL
RLY1-16	V+ 3-A69	V+ GND	70	70	V+ GND
Relay Ground	3-B53, 3-B57	RLY 1L	69	69	V+
Returns	3-B60, 3-B70	RLY 3L	68	68	RLY 2L
	3-A-53, 3-A57	RLY 5L	67	67	RLY 4L
	3-A60, 3-A70	RLY 7L	66	66	RLY 6L
		RLY 9L	65	65	RLY 8L
		RLY 11L	64	64	RLY 10L
		RLY 13L	63	63	RLY 12L
		RLY 15L	62	62	RLY 14L
		V+ A	61	61	RLY 16L
		V+ GND	60	60	V+ GND
		V+ B	59	59	HRLY 1L
		V+ C	58	58	HRLY 2L
		V+ GND	57	57	V+ GND
		HRLY 4L	56	56	HRLY 3L
		HRLY 6L	55	55	HRLY 5L
		HRLY 8L	54	54	HRLY 7L
		V+ GND	53	53	V+ GND

Typical Relay driver wiring that includes the suppression diode and relay driver return.

The relay driver suppression diode connections (V+A, V+B, V+C, and V+) for the particular relay driver you are using, should be connected to the PLUS (+) side of the UUT power supply. If multiple voltages are used, than the particular relay driver used for that voltage will have it's V+ connection routed to that particular power supply's Plus side.

The relay driver return (V+Gnd or RTN) should be connected to the UUT power supply return (-).

Example: **RLY1** is used to control a relay with +12 volts as the control Voltage.
 Connect **V+** to the 12 Volt UUT power supply Plus side.
 Connect **V+Gnd** to the 12 Volt UUT power supply return side.

HRLY1 is used to control a relay with +24 Volts as the control Voltage.
 Connect **V+A** to the 24 Volt UUT power supply Plus side.
 Connect **V+Gnd** to the 24 Volt UUT power supply return side.



A typical relay-driver circuit interface is shown in Figure 2-18. The relay-driver includes a suppression diode directly across each relay coil to suppress voltage transients produced by the relay coil and protect the driver transistors when the relays are turned off.

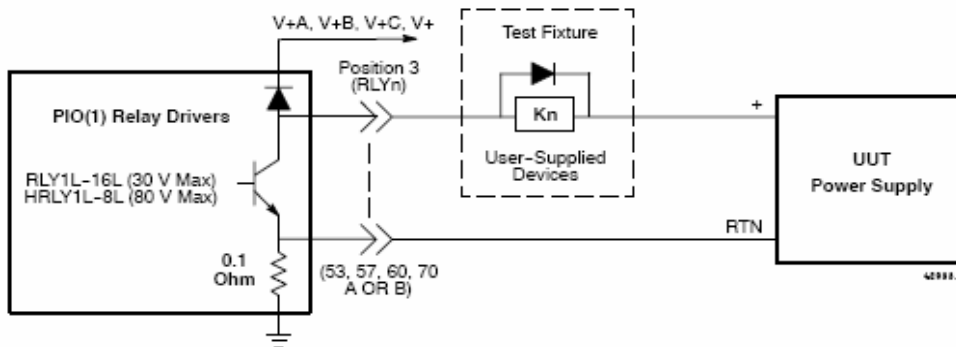


Figure 2-18 Relay-Driver Wiring

- ◆ Kn is the customer-supplied fixture relay.
- ◆ V+A, V+B, V+C are the receiver connections to internally supplied suppression diodes using HRLY1L to 8L. These connect to the power supply side of the relay. See Figure 2-19.
- ◆ V+ are receiver connections to internally supplied suppression diodes using RLY1L to 16L. These connect to power supply side of relay.
- ◆ RTN is the relay driver return that must be connected to the return pins of the power supply for proper operation.

The relay voltage is taken from the a UUT power supply of your choice. Power connection, usually 5 Vdc and 5V Return, is hard-wired within the fixture with the V+GND connected to the fixture ground. If a separate voltage is used, the return can be directly connected to V+GND.