Operating Guide

INTELLI-TOOLS
IT- R4

Switch or Logic Level Controlled Relay Module
Warranty Policy

This product is warranted against failures due to defective parts or faulty workmanship for a period of five years after delivery to the original owner. During this period, FSR will make any necessary repairs or replace the unit without charge for parts or labor. Shipping charges to the factory or repair station must be prepaid by the owner, return-shipping charges, via UPS / FedEx ground, will be paid by FSR.

This warranty applies only to the original owner and is not transferable. In addition, it does not apply to repairs done by other than the FSR factory or Authorized Repair Stations.

This warranty shall be cancelable by FSR at its sole discretion if the unit has been subjected to physical abuse or has been modified in any way without written authorization from FSR. FSR’s liability under this warranty is limited to repair or replacement of the defective unit.

FSR will not be responsible for incidental or consequential damages resulting from the use or misuse of its products. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Warranty claims should be accompanied by a copy of the original purchase invoice showing the purchase date (if a Warranty Registration Card was mailed in at the time of purchase, this is not necessary). Before returning any equipment for repair, please read the important information on service below.

SERVICE

Before returning any equipment for repair, please be sure that it is adequately packed and cushioned against damage in shipment, and that it is insured. We suggest that you save the original packaging and use it to ship the product for servicing. Also, please enclose a note giving your name, address, phone number and a description of the problem.

NOTE: all equipment being returned for repair must have a Return authorization (RMA) Number. To get a RMA Number, please call the FSR Service Department (973-785-4347). Please display your RMA Number prominently on the front of all packages.

CONTACT INFORMATION
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IT-R4 Mechanical

INTELLI-TOOLS
MODEL: IT-R4

POWER
CONTROL
INPUTS

MODE
SWITCH
SEE BOTTOM
FOR DETAILS

INPUTS

11234
ON 1
OFF 0

1 RELAY 2

22
3.00
3.44

4 RELAY 4

22
22

4x .203 DIA.

1.57

4.25

3.81

22
Product Overview

The IT-R4 is a multi-purpose switch or logic level activated Relay Module. Four user configured relays are activated and controlled via five input ports that are designed to accept either a switch contact closure or logic level input. A four position configuration dip switch sets the operating behavior of the relays. Each relay can be set for different operating modes; “On,” “Off”, pulsed for a ¼ of a second or toggled which changes the relay to the opposite state. For a detailed description of operation and settings see the Switch Input Actuation Table.

Features

- One module does the work of many
- Quick easy setup and configuration
- Small footprint
- High quality relays
- Quick connect terminals
- Integral mounting plate

Applications

- Shade and Screen Control (via Relay interface module).
- Logic Level Control
- Relay Contact Closure
- Speaker Muting
- Relay remote Control
Caution:

The IT-R4 and IT-R4S relay interface modules are not intended to directly switch AC line voltages. Connection to lighting and shade and screen systems should be done at the low voltage control interface provided by the manufacturer. If you must interface to AC line voltages, add a relay module designed for this purpose such as the FSR 12 Volt AC-2 or 12 volt AC-2A.
Setup

The four relays can be configured as indicated in the relay configuration portion of this table along with their corresponding relay operation. The label is located on the bottom of the unit. The operation of the relays is accomplished by combining one of the five inputs of either A, B, C, D or E with a selected setting on a four-position configuration dipswitch located on the main PCB. Switches S1 through S3 are used for accomplishing this, while the fourth position is used to control the logic state at which the relays will operate. S4 closed allows active low inputs to turn on the relay while S4 open allows active high inputs to turn on the relay.

Switch Input Actuation Table

<table>
<thead>
<tr>
<th>Relay Config</th>
<th>Relay Operation</th>
<th>Relay Operation Chart</th>
<th>Mode Dipswitch Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Control Inputs (Switch Inputs)</td>
<td>E</td>
</tr>
<tr>
<td>SPDT</td>
<td>Interlock</td>
<td>R1 R2 R3 R4 All Off</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Alternate</td>
<td>R1 R2 R3 R4 All Off</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Momentary</td>
<td>R1 R2 R3 R4 All On</td>
<td>0</td>
</tr>
<tr>
<td>DPDT</td>
<td>Push On, Push Off</td>
<td>R1&amp;R2 On R1&amp;R2 Off R3&amp;R4 On R3&amp;R4 Off All Off</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Alternate</td>
<td>R1&amp;R2</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Alternate Pulse (0.25 Sec)</td>
<td>R1 On R2 Off Edge Trig</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>All Selections</td>
<td>R1 to R4 On R1 to R4 Off</td>
<td>-</td>
</tr>
<tr>
<td>SPECIAL</td>
<td>Special Purpose</td>
<td>R1&amp;R2 On Pulse R3 R1&amp;R2 Off Pulse R4 R1&amp;R2 On/Off Pulse R3 On/Off</td>
<td>-</td>
</tr>
</tbody>
</table>

Dipswitch 4 - 1 = Ground Control Input to Operate, 0 = +V(2-24) to Operate

Configuration / Mode Dipswitches

Switch Inputs A-E

Control Inputs (A-E)

Acceptable Input Level from an external device that is edge triggered.

Switch Possibilities:
1 = Gnd
0 = +V to operate (2-24V)
Mode Switch Label

### Mode Switch Setting 000

**Single Relay Interlock Mode (SPDT)**

This mode provides the ability to control each of the four SPDT relays through switch inputs A through D. When one relay is activated or turned on, the other relays are turned off. For example, if the user turns on Relay #1 using switch input “A”, then Relays 2, 3 and 4 are turned off. Switch input E turns off all Relays.

### Mode Switch Setting 001

**Multiple Relay Activation – Alternate Action**

This mode toggles each individual Relay on or off. The first switch closure turns the relay on and the second switch closure turns the relay off. Any combination of switches may be activated at the same time. Switch input E, when activated, overrides all other switch inputs and turns off all relays.

### Mode Switch Setting 010

**Multiple Relay Activation – Momentary ON**

This mode turns on the corresponding relay for the duration of the switch closure. Switch E turns on all relays for the duration of the closure. Any number of relays can be operated at the same time.

### Mode Switch Setting 011

**Dual Relay Mode (DPDT) - Push On/Push Off**

This mode provides the ability to pair up the Relays for use in a Dual Relay application. Each pair R1/R2 and R3/R4 effectively become DPDT relays when configured in this mode. Switch A turns on relays 1 & 2; Switch B turns off relays 1 & 2. Switch C turns on relays 3 & 4, and switch D turns off relays 3 & 4. Switch E turns off all relays.

### Mode Switch Setting 100

**Dual Relay Modes (DPDT) - Alternate Action**

This mode provides the ability to toggle each pair of Relays. Switch “A”, toggles relay pair R1/R2 and Switch C toggles relay pair R3/R4. Switch D unconditionally turns on both pairs of relays and switch E unconditionally turns off both pairs.

### Mode Switch Setting 101

**Dual Relay Modes (DPDT) Alternate Pulsed 0.25 sec**

This mode provides the ability to pulse each relay for a given application that may require the use of a trigger pulse for turning on some type equipment.

- Switch A the first press sends a ¼ second pulse to relay 1; the second press sends a ¼ second pulse to relay 2.
• Switch B when pressed sends a ¼ second pulse to relay 1 on the leading edge; when released it sends a ¼ second pulse to relay 2 on the trailing edge.
• Switch C the first press sends a ¼ second pulse to relay 3; the second press sends a ¼ second pulse to relay 4.
• Switch D when pressed sends a ¼ second pulse to relay 3 on the leading edge; when released sends a ¼ second pulse to relay 4 on the trailing edge.
• Switch E has no function.

**Quad Relay Mode**

This mode provides the ability to turn on or off all four Relays at once.
Switch A turns on all relays, Switch B turns off all relays, and Switch C toggles all relays. Switch inputs D & E have no functions.

**Special Function Mode**

- Switch A turns relays 1 & 2 on and sends ¼ second pulse to relay 3.
- Switch B turns relays 1 & 2 off, and sends ¼ second pulse to relay 4.
- Switch C first press turns on relays 1 & 2 and pulses relay 3 for ¼ second. The second press turns off 1 & 2, and pulses relay 4 for ¼ second.
- Switch D the leading edge performs Switch A function, trailing edge performs Switch B function.

**Mode Dipswitch 4**

Mode Switch 4 determines the control activation state of the 4 relays.
- S4 set to “1”: Inputs A thru E are active Low. The leading edge is the High to Low transition of the switch input. The trailing edge is the Low to High transition of the switch input.
- S4 set to “0”: Inputs A thru E are active High. The leading edge is the Low to High transition of the switch input. The trailing edge is the High to Low transition of the switch input.
## IT-R4 Specifications

<table>
<thead>
<tr>
<th><strong>Relay Ratings</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay Contact material</td>
<td>Ag alloy</td>
</tr>
<tr>
<td>Max. Switching voltage</td>
<td>50 VAC, 30 VDC</td>
</tr>
<tr>
<td>Max. Switching current</td>
<td>5 A (NO)/3 A (NC)</td>
</tr>
<tr>
<td>Max. Switching capacity</td>
<td>NO: 250 VA (AC), 150 W (DC Resistive) NC: 150 VA (AC), 90 W (DC Resistive)</td>
</tr>
<tr>
<td>Min. permissible load</td>
<td>10 mA @ 5 VDC (for contact cleaning)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Switch Input Characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>Logic High range: 2.0 – 24V</td>
</tr>
<tr>
<td></td>
<td>Logic Low range: -1.0 - +1.0V</td>
</tr>
<tr>
<td>Input Impedance:</td>
<td>7k</td>
</tr>
<tr>
<td>Minimum Actuation Time to recognize a valid switch input</td>
<td>0.1 Sec</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Power</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>12 VDC @ 160mA fully loaded. FSR IT-PS1 #16805 may be ordered separately</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Mechanical and Environmental</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectors</td>
<td>Screw terminals</td>
</tr>
<tr>
<td>Overall dimensions (see drawing for details)</td>
<td>4.25”L x 3.44” W x 1.57” H</td>
</tr>
<tr>
<td>Shipping weight</td>
<td>0.9 lbs.</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 to 50°C</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>5% to 95% non-condensing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Accessories</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12VDC Relay interface module</td>
<td>FSR16981 AC-2 (SPDT) or 16982 AC-2A (DPDT)</td>
</tr>
</tbody>
</table>