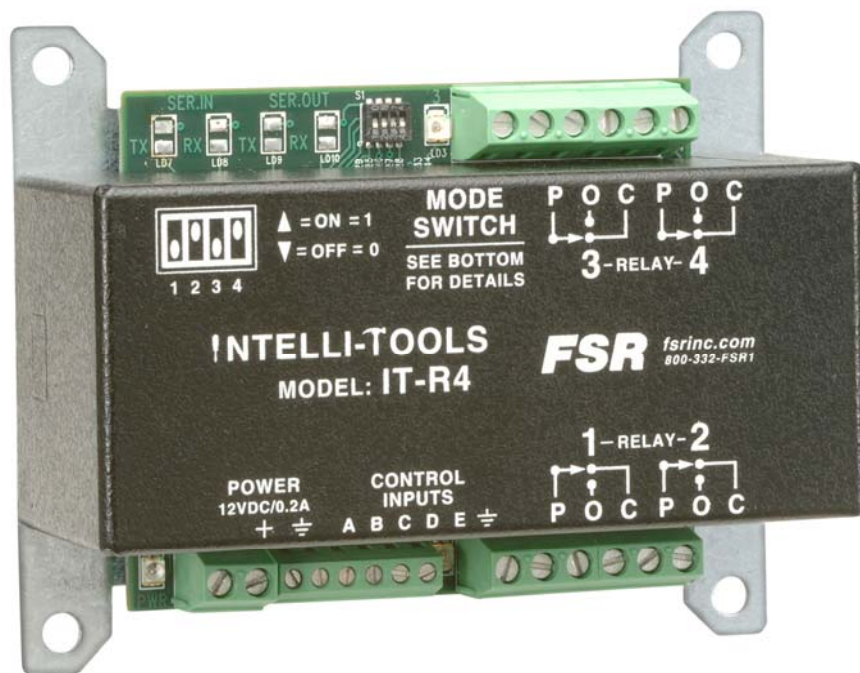




Operating Guide

INTELLI-TOOLS IT- R4

Switch or Logic Level Controlled Relay Module



244 Bergen Blvd West Paterson NJ 07424 1-800-332-FSR1 <http://www.fsrinc.com/>

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

FSR Inc.

244 Bergen Blvd.

West Paterson, NJ 07424

Phone: **(973) 785-4347**

*Order Desk Fax: **(973) 785-4207**

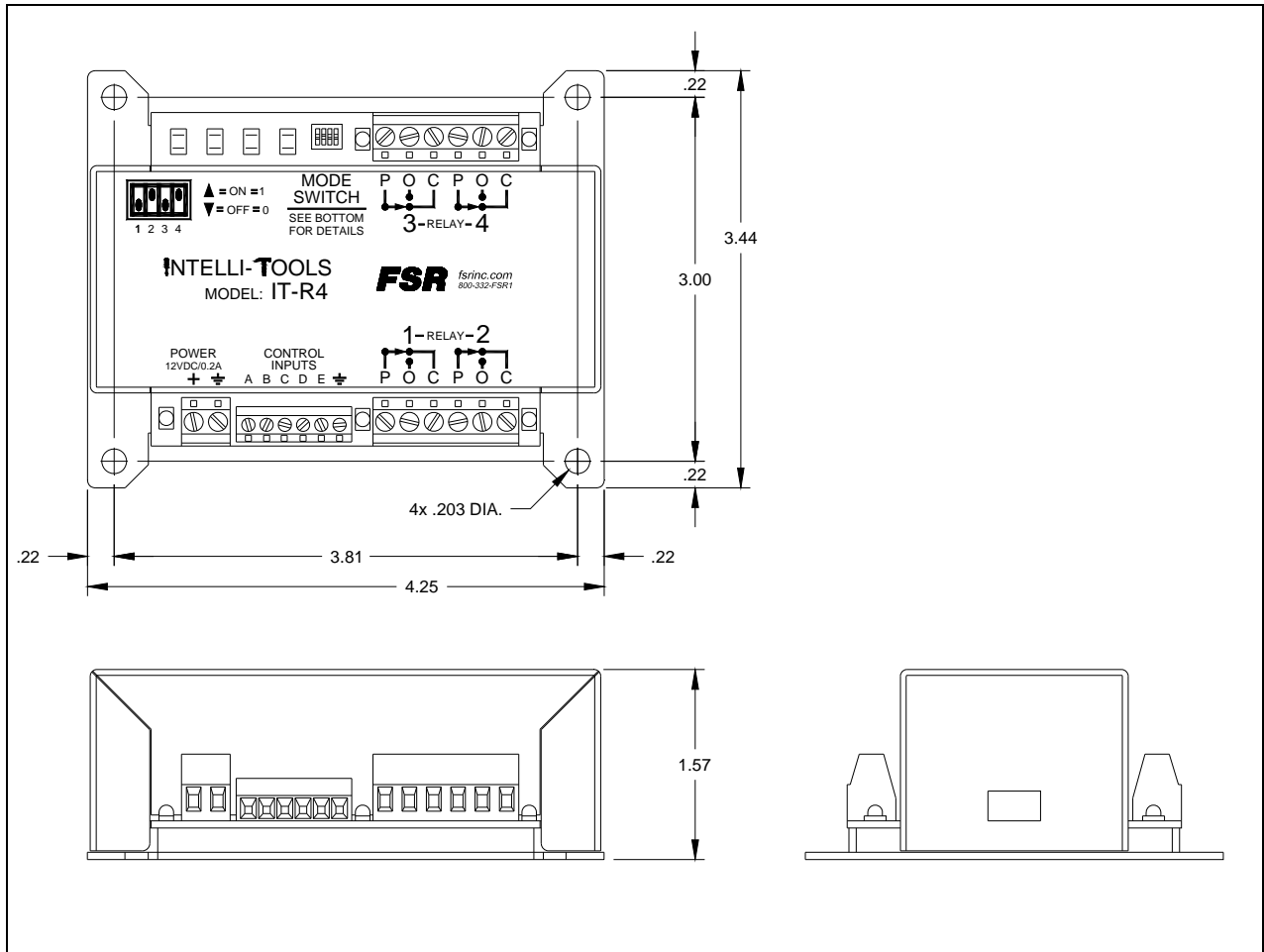
E-mail: sales@fsrinc.com

Web Site: <http://www.fsrinc.com>

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IT-R4 Mechanical



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.

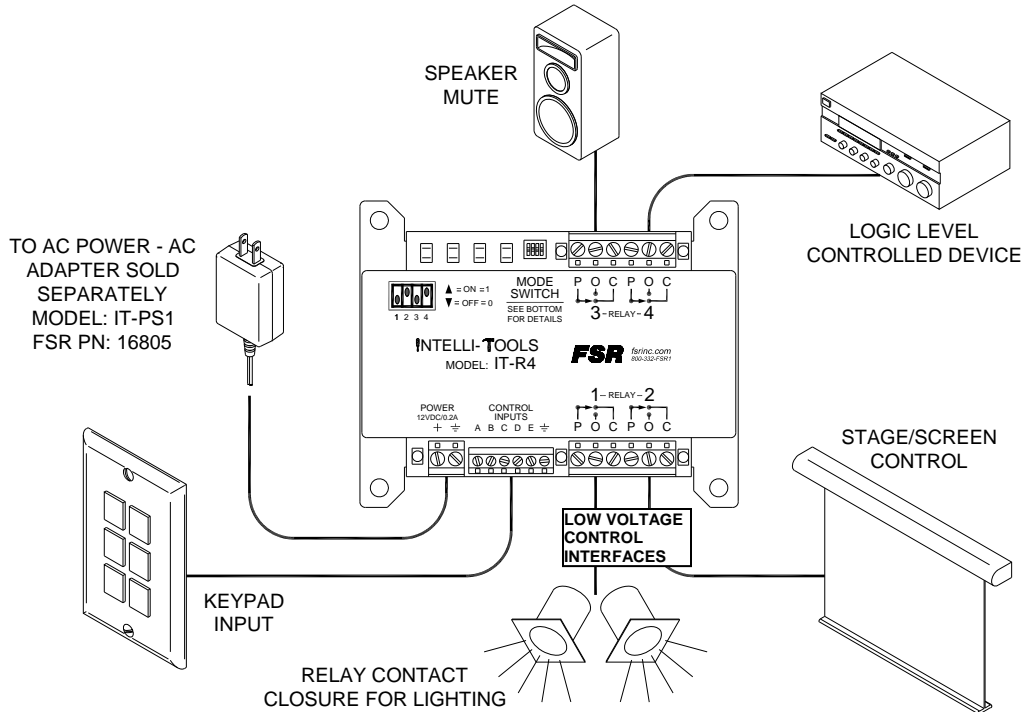
Features

- 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

Typical Application



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

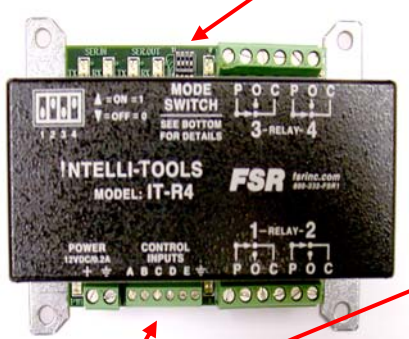
The four relays can be configured as indicated in the *relay configuration* portion of this table along with their corresponding *relay operation*. The label is located on the bottom of the unit. The operation of the relays is accomplished by combining one of the five inputs of either A, B, C, D or E 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

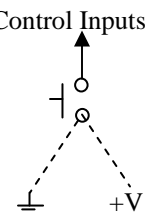
Relay Config	Relay Operation	Relay Operation Chart					Mode Dipswitch Settings			
		Control Inputs (Switch Inputs)					1	2	3	4
		A	B	C	D	E				
SPDT	Interlock	R1	R2	R3	R4	All Off	0	0	0	
	Alternate Action	R1	R2	R3	R4	All Off	0	0	1	
	Momentary	R1	R2	R3	R4	All On	0	1	0	
DPDT	Push On, Push Off	R1&R2 On	R1&R2 Off	R3&R4 On	R3&R4 Off	All Off	0	1	1	
	Alternate Action	R1&R2	-	R3&R4	All On	All Off	1	0	0	
	Alternate Pulse (0.25 Sec)	R1 On R2 Off	Edge Trig ┌=R1 └=R2	R3 On R4 Off	Edge Trig ┌=R3 └=R4	-	1	0	1	
4PDT	All Selections	R1 to R4 On	R1 to R4 Off	R1 to R4 Alt Action	-	-	1	1	0	
SPECIAL	Special Purpose	R1&R2 On Pulse R3	R1&R2 Off Pulse R4	R1&R2 On/Off Pulse R3 On, 4 Off	Edge Trigger ┌= Column A └= Column B	-	1	1	1	

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

Configuration /
Mode Dipswitches



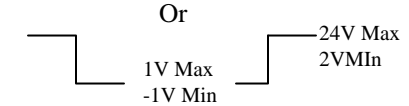
Control Inputs (A-E)



24V Max
2V Min

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

Or



1V Max
-1V Min

Falling Edge Rising Edge

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

Switch Inputs A-E

Mode Switch Label

INTELLI-TOOLS		Relay Operation Chart					Model :IT-4R		
Config	Operation	Control Inputs				E	Mode Sw		
		A	B	C	D		1	2	3
SPDT	Interlock	R(1)	R(2)	R(3)	R(4)	All off	0	0	0
	Alt Action	R(1)	R(2)	R(3)	R(4)	All off	0	0	1
	Momentary	R(1)	R(2)	R(3)	R(4)	All	0	1	0
DPDT	Push on,off	R(1+2)on	R(1+2)off	R(3+4)on	R(3+4)off	All off	0	1	1
	Alt Action	R(1+2)		R(3+4)		All on	1	0	0
	Alt Pulsed	R(1)on(2)off	Edge trig	R(3)on(4)off	Edge trig	All off	1	0	1
4PDT	All Selections	R(1-1=n	R(1-4)off	R(1-4) Alt Act	=		1	1	0
	Special Purpose	R(1+2)on (3)pulse	R(1+2)off (4)pulse	Toggle A/B, on/off	Edge J=A L=B		1	1	1
	Mode Dipswitch 4	1= GND Control inputs to operate; 0= +V(2-24) to operate							

Single Relay Interlock Mode (SPDT)

Mode Switch Setting 000

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.

Multiple Relay Activation – Alternate Action

Mode Switch Setting 001

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.

Multiple Relay Activation – Momentary ON

Mode Switch Setting 010

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.

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

Mode Switch Setting 011

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.

Dual Relay Modes (DPDT) - Alternate Action

Mode Switch Setting 100

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.

Dual Relay Modes (DPDT) Alternate Pulsed 0.25 sec

Mode Switch Setting 101

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

Mode Switch Setting 101

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

Mode Switch Setting 111

- 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

Relay Ratings	
Relay Contact material	Ag alloy
Max. Switching voltage	50 VAC, 30 VDC
Max. Switching current	5 A (NO)/3 A (NC)
Max. Switching capacity	NO: 250 VA (AC), 150 W (DC Resistive) NC: 150 VA (AC), 90 W (DC Resistive)
Min. permissible load	10 mA @ 5 VDC (for contact cleaning)
Switch Input Characteristics	
Input Voltage	Logic High range: 2.0 – 24V
	Logic Low range: -1.0 - +1.0V
Input Impedance:	7k
Minimum Actuation Time to recognize a valid switch input	0.1 Sec
Power	
Power supply	12 VDC @ 160mA fully loaded. FSR IT-PS1 #16805 may be ordered separately
Mechanical and Environmental	
Connectors	Screw terminals
Overall dimensions (see drawing for details)	4.25”L x 3.44” W x 1.57” H
Shipping weight	0.9 lbs.
Ambient temperature	0 to 50°C
Ambient humidity	5% to 95% non-condensing
Accessories	
12VDC Relay interface module	FSR16981 AC-2 (SPDT) or 16982 AC-2A (DPDT)