



Operating Guide

INTELLI-TOOLS IT- R4S

ASCII Controlled Relay Module with Serial Loop Through



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

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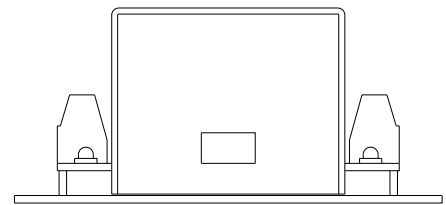
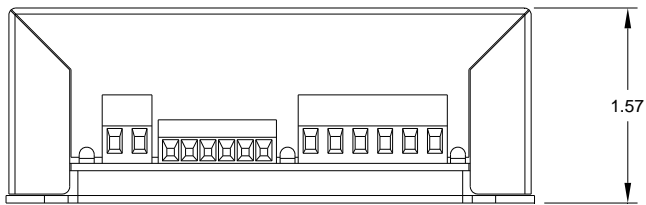
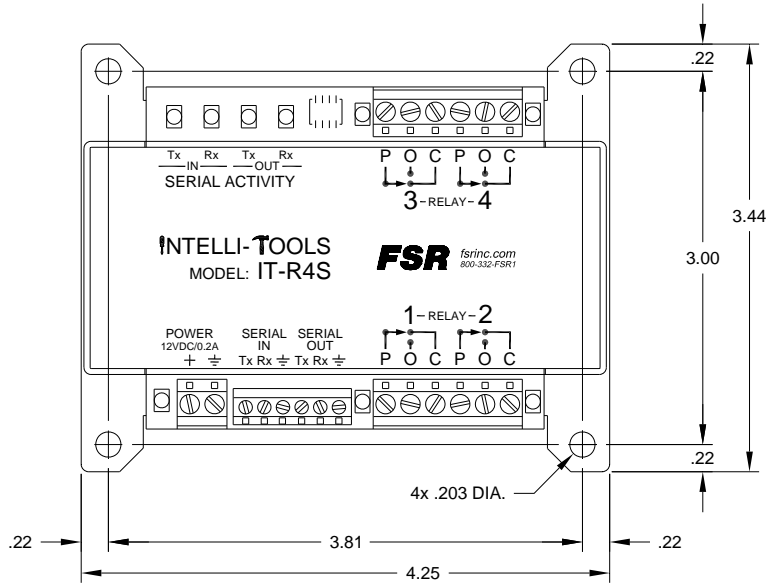
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IT-R4S Mechanical



Product Overview

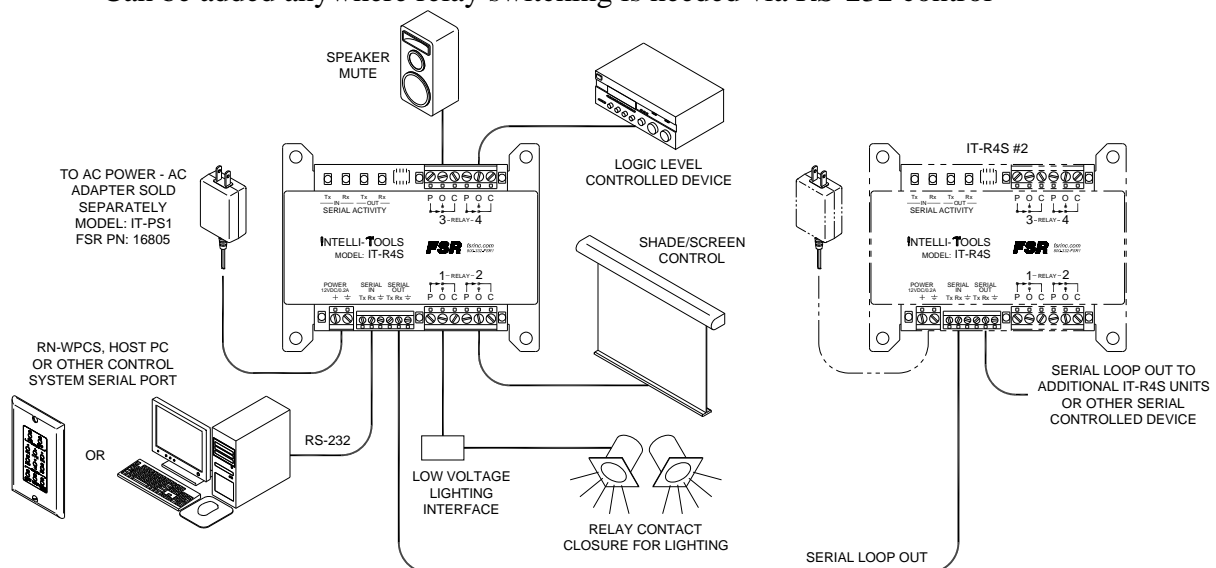
The IntelliTools IT-R4S is a multi-purpose relay module allowing four internal single pole double throw relays to be controlled by an RS-232 port using a simple ASCII control protocol. Additional IT-R4S modules can be “daisy chained” to provide control of additional modules. The IT-R4S passes RS-232 control data out to other RS-232 controlled devices via the unit’s serial output port. The module is powered from a standard 12 VDC power supply (not provided). An integral mounting plate with four holes is provided to easily mount on FSR’s RK-2 rack mount, standard rack rails or standard two RU blank plates. The IT-R4S is capable of supporting a wide variety of relay controlled devices making it an essential tool for AV and Control System installations.

Features

- Configurable for a variety of applications
- Can be easily reconfigured “on the fly”
- Quick, easy setup
- Small footprint
- Four high quality 5 amp relays
- Screw down terminals for fast hookup
- Integral mounting plate with mounting holes
- Simple ASCII command set
- Units can be “daisy chained” through the serial loop port without sacrificing a port on the control system.
- Relay Status and Power LED indicators
- RS-232 I/O Port Status LED Indicators

Applications

- Shade and Screen Control (AC Motor Control).
- Relay Contact Closure
- Speaker Muting
- Relay remote Control
- Can be added anywhere relay switching is needed via RS-232 control



IT- R4S Operation

The IT-R4S is an ASCII controlled serial input Relay Module that functions very similar to the IT-R4 Switch Relay Module but differs in the way in which the operation of the relays are controlled. Control is accomplished through the use of an RS-232 interface using standard ASCII protocol. The four relays, which are designated as Relays “1, 2, 3 & 4”, can be configured through the use of serial input commands generated by a host terminal using standard ASCII format.

NOTE: The Baud Rate for the IT-R4S Serial Port COM1 is fixed at 38,400. IT-R4S Serial Port COM2 pass-through can be change as shown under “Serial 2-Baud Rate Request”.

Serial Protocol

The protocol for the IT-R4S is a pure ASCII protocol. It can handle the relays individually or in combinations. An ASCII space character “ ” is used between fields in the request except for the function, which is immediately followed by a carriage return (<CR>, 0x0D).

Relay Function Request:

The user will be able to send the IT-R4S relay functions to perform. The functions can be on individual, multiple, or all relays.

“R”	Function	Relay numbers	<CR>
-----	----------	---------------	------

Where:

“R”	Relay Request.
Function	the type of function to perform on the relays “O” = Open, Turns relay(s) off. “C” = Closed, Turns relay(s) on. “T” = Toggle, Flips status of relay. “P” = Pulse for ¼ second.
Relay numbers	relays affected by this request “1”, “2”, “3”, “4” Individual Relay “,” Multiple relays, 1,2,3 would be relays 1,2,3 “A” is all relays

Note: the comma and dash do not get spaces between them or the relays they delimitate.

Examples:

- “R C 1”<CR> Turns on relay 1.
- “R T 1,3”<CR> Toggles the status of relays 1 and 3.

The IT-R4S will respond with a status message that reflects the relay’s status after performing the relay message (see below).

Relay Status Request:

The user will also be able to check the status of relays, by sending Relay Status Request.

“RS”	<CR>
------	------

Where:

“RS” Relay Status Request.

Relay Response:

The Relay status response will display only what was requested and the configuration dipswitch 4 status.

“RS”	Ver	Relay Status	Serial 2 baud	<CR>
------	-----	--------------	---------------	------

Where:

“RS” Relay Status Response.
 Ver Version Number
 Relay Status relays current status

Serial2 Baud “1” = 2400
 “2” = 4800
 “3” = 9600
 “4” = 19200
 “5” = 38400
 “6” = 57600 (MAS-6200)

The user sends “RS<CR>” the IT-R4S would respond with “RS R1=O R2=C R3=P R4=O SB=5<CR>”. This response means that relay1 is Open(off), relay2 is on Closed(on), relay3 is currently being (P)ulsed, relay 4 is Open (off), and Serial 2 baud rate is 38400.

Serial 2-Baud Rate Request:

It may be necessary to change the baud rate on the last pass-through device serial port. This may happen if the last device doesn’t have the baud rate at 38400, and doesn’t have a method to change it.

“RB”	Port	Baud rate number	<CR>
------	------	------------------	------

Where:

“B” Change baud rate request
 Port Serial port number (“2” for IT-R4S)
 Baud rate number Which baud rate to change to:
 “1” = 2400
 “2” = 4800
 “3” = 9600
 “4” = 19200
 “5” = 38400
 “6” = 57600 (MAS-6200)

The IT-R4S will respond to this request with a status message.

Help Request

The user can request a help menu if the user forgets the formats of the commands. The format of the request is as follows:

HLP	<CR>
-----	------

OR

"RH"	<CR>
------	------

The IT-R4S will respond with the following:

IT-R4S Help Menu

R # A<CR> - Relay Request

RELAY # = 1 2 3 4 A, or 1,2,3,4, 1-4

ACTION = [O]pen [C]lose [T]oggle [P]ulse

RS<CR> - Status Request Message

RS R1=O, R2=O, R3=O, R4=O, S2B=5

RB 2 X<CR> Only Serial port 2 is allowed on IT-R4S

X = Baud Rate = 1=2400 2=4800 3=9600 4=19200 5=38400 6=57600

Passing Serial Requests

Multiple IT family devices can be present on the same serial port. This type of setup is a multi-drop configuration. The IT-R4S will be capable of passing strings down a drop through the use of a drop preamble that determines the position on the drop of the device for which the serial data is intended.

Passing serial requests down to a device will only work if FSR products that support passing requests are between the RN8200, RN1000, WPCS or other control system and the last device on the drop. Only the last device on the drop can be a non-multidrop FSR product or other manufacturer's product.

The message is made up of two parts, the drop preamble and the string data.

Drop Preamble

The drop preamble contains a skip indicator ('\S') for each device that will pass the string along. The preamble will be enclosed in braces ({}). For example, if the user wished to send a string to the third device on a drop, the preamble would be "{\S\S}".

The first device would, upon detecting the preamble start, strip off the first \S and send the preamble down as "{\S}". The second device, detecting the preamble start would strip off the other \S. It would also sense the close brace "}" and would be responsible for removing it from the string. The second device would also be responsible for converting any ASCII-Hex characters into pure hex, and for sending the complete message to the third device.

If the device on the drop has multiple serial ports, and the user wishes to send the message out to a particular port on that drop, the user needs only to add the port number after the '\S'. If the user wants the serial command to go out the second device's serial port 2 the preamble would be "{\S\S2}"Another test Message <CR>".

String Data

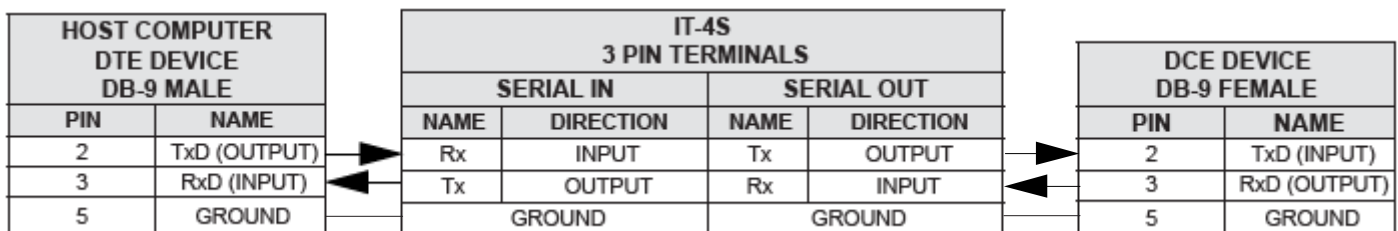
The string data would be enclosed in double quotes; this allows a string of data to be virtually any length. Single Hex characters will be defined as <0D> (which is a carriage return). Multiple hex characters can be sent using the same scheme but with spaces between the two ASCII bytes that represent the hex value (example <0A 0D> which is a carriage return and line feed). A backslash character will be used preceding a “<” or “>” if the “<” or “>” is part of the string but not defining ASCII-Hex characters. An example of this might be “\< is a less than character” or “\> is a greater than character”. If a backslash is part of a string a double backslash will be sent “\\”. A double quote is required in a string it would be sent as “\””.

In order to pass a request to a device connected to the IT-R4S, a pass through sequence must be sent from a RN8200, RN1000, WPCS or other control system. Using “\S” for each device on the drop enclosed in braces ({}). For example {\S\S}”R C 1<0D>” would cause the first device on the drop to skip the request and send “[\S]R C 1<0D>” to the second device on the drop. The second device seeing the “}” would process the request and send the message within the double quotes, with the ASCII hex (<0D>) replaced with the actual hex characters (R 1 C 0D) to the third device. Since the message to the third device hasn’t a drop preamble it would handle the relay request.

Responses

The responses are sent as they are received.

TYPICAL RS-232 DEVICE INTERCONNECTIONS



IT-R4S 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 at 5 VDC (for contact cleaning)
Power	
Power supply	FSR IT-PS1 #16805 may be ordered separately
RS-232 Control Input	
Connectors	Screw down terminals
Format	RS-232
Protocol	ASCII
Serial looping	Via IN/OUT loop ports
Baud Rate	38.4K fixed on COM1
	2400, 4800, 9600, 19200, 38,400, 57,600 baud on COM2 pass-through port
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

