

Series A/Series B Differences

When In	1794-IRT8 Series A	1794-IRT8, 1794-IRT8XT, Series B
Isolation	Between user side and system side	Between user 24V DC and user I/O; Between user side and system side
Common mode range	+4V DC	+15V DC
Thermocouple mode wire-off detection	When an open sensor is detected, data defaults to a maximum value.	When an open sensor is detected, data defaults to a minimum value.



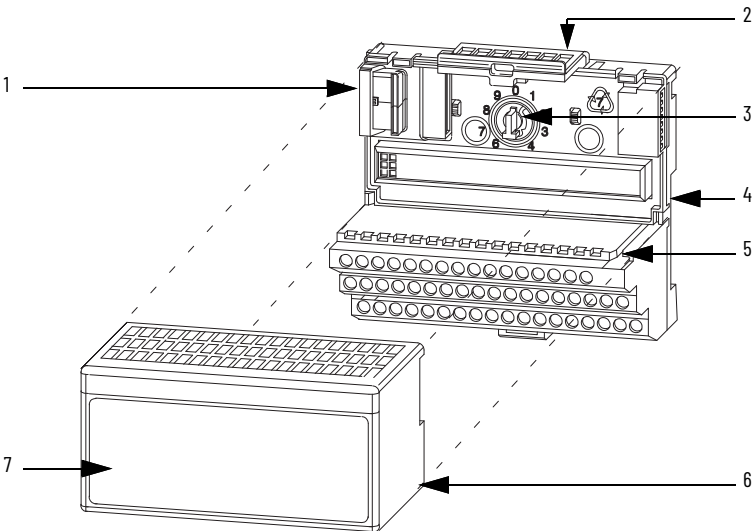
To simulate series A module wire-off detection behavior using a series B module, connect a wire between terminals 39 and 48 on the 1794-TB3G or 1794-TB3GS terminal base unit. If not connected, the series B module will default to series B functionality.



In Studio 5000⁽¹⁾ Logix Designer®, if using a series B product to replace a series A product, the module will be accepted without an electronic keying mismatch warning. This is true for 1794-IRT8 and 1794-IRT8XT modules installed on EtherNet/IP™, ControlNet®, DeviceNet®, or Remote I/O networks.

(1) The Studio 5000 Logix Designer application is the rebranding of RSLogix 5000® software and will continue to be the product to program Logix 5000® controllers for discrete, process, batch, motion, safety, and drive-based solutions.

Install Thermocouple/RTD Input Module



Description		Description
1 Flexbus connectors	5 Groove	
2 Latching mechanism	6 Alignment bar	
3 Keyswitch	7 Module	
4 Terminal base		



ATTENTION: During mounting of all devices, be sure that all debris (for example, metal chips or wire strands) is kept from falling into the module. Debris that falls into the module could cause damage on power-up.

The FLEX™ I/O Thermocouple/RTD input analog module mounts on a 1794-TB3G or 1794-TB3GS terminal base.

1. Rotate the keyswitch (3) on the terminal base (4) clockwise to position 3 as required for this type of module.
2. Make sure that the flexbus connector (1) is pushed all the way to the left to connect with the neighboring terminal base/adaptor. **You cannot install the module unless the connector is fully extended.**
3. Make sure that the pins on the bottom of the module are straight, so that they align properly with the connector in the terminal base.

Table 13 - RTD Offset Select - Write Word 2

Bit	01	00	RTD Offset Select Bits - Channel 0
Bit	03	02	RTD Offset Select Bits - Channel 1
Bit	05	04	RTD Offset Select Bits - Channel 2
Bit	07	06	RTD Offset Select Bits - Channel 3
Bit	09	08	RTD Offset Select Bits - Channel 4
Bit	11	10	RTD Offset Select Bits - Channel 5
Bit	13	12	RTD Offset Select Bits - Channel 6
Bit	15	14	RTD Offset Select Bits - Channel 7
	0	0	Use channel loop compensation value stored during the calibration procedure for 2-wire RTD (default = 0 Ω) - 15 Ω max. Note: Functional up to RTD = 484 Ω max with total lead resistance = 15 Ω .
	0	1	5 Ω (total lead resistance)
	1	0	10 Ω (total lead resistance)
	1	1	15 Ω (total lead resistance)

Specifications

Specifications - 24V DC Analog Modules 1794-IRT8, 1794-IRT8XT

Attribute	Value																														
Number of inputs	8 channels (2 groups of 4)																														
Module location	1794-TB3G, 1794-TB3GS, 1794-TB3GK terminal base units																														
Nominal input voltage ranges	-40...+100 mV DC for thermocouples 0...325 mV for RTDs																														
	mV (default)																														
Supported thermocouple types	<table><thead><tr><th>Type</th><th>Range °C</th><th>(Range °F)</th></tr></thead><tbody><tr><td>B</td><td>300...1800 °C</td><td>(572...3272 °F)</td></tr><tr><td>E</td><td>-270...+1000 °C</td><td>(-454...+1832 °F)</td></tr><tr><td>J</td><td>-210...+1200 °C</td><td>(-346...+2192 °F)</td></tr><tr><td>K</td><td>-270...+1372 °C</td><td>(-454...+2502 °F)</td></tr><tr><td>TXK/XK(L)</td><td>-200...+800 °C</td><td>(-328...+1472 °F)</td></tr><tr><td>N</td><td>-270...+1300 °C</td><td>(-454...+2372 °F)</td></tr><tr><td>R</td><td>-50...+1768 °C</td><td>(-58...+3214 °F)</td></tr><tr><td>S</td><td>-50...+1768 °C</td><td>(-58...+3214 °F)</td></tr><tr><td>T</td><td>-270...+400 °C</td><td>(-454...+752 °F)</td></tr></tbody></table>	Type	Range °C	(Range °F)	B	300...1800 °C	(572...3272 °F)	E	-270...+1000 °C	(-454...+1832 °F)	J	-210...+1200 °C	(-346...+2192 °F)	K	-270...+1372 °C	(-454...+2502 °F)	TXK/XK(L)	-200...+800 °C	(-328...+1472 °F)	N	-270...+1300 °C	(-454...+2372 °F)	R	-50...+1768 °C	(-58...+3214 °F)	S	-50...+1768 °C	(-58...+3214 °F)	T	-270...+400 °C	(-454...+752 °F)
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Supported RTD types	Resistance 100 Ω Pt α = 0.00385 Euro -200...+870 °C (-328...+1598 °F) 200 Ω Pt α = 0.00385 Euro -200...+400 °C (-328...+752 °F) 100 Ω Pt α = 0.003916 U.S. -200...+630 °C (-328...+1166 °F) 100 Ω Pt α = 0.003916 U.S. -200...+400 °C (-328...+752 °F) 100 Ω Nickel -60...+250 °C (-76...+482 °F) 200 Ω Nickel -60...+200 °C (-76...+362 °F) 120 Ω Nickel -80...+320 °C (-112...+608 °F) 10 Ω Copper -200...+260 °C (-328...+470 °F)																														
Resolution	14 bits																														
Accuracy vs. filter cutoff	0.05% of full range in millivolt mode with filtering selected Hardware only = 0.10% of full range in millivolt mode																														
Data format	°C (implied decimal point XXX.X) °F (implied decimal point XXX.X) °K (implied decimal point XXX.X) -32767...+32767 0...65535 0...5000 (ohms mode)(implied decimal point XXX.X) -4000...+10000 (millivolt mode)(implied decimal point XXX.XX)																														
Common mode rejection	-80 dB @ 5V peak-to-peak, 50...60 Hz																														
Common mode input range, min	±15V																														

Specifications - 24V DC Analog Modules 1794-IRT8, 1794-IRT8XT (Continued)

Isolation voltage (continuous voltage withstand rating)	50V (continuous), Basic Insulation Type Type tested at 1365V AC for 60 s, between field side and system No isolation between individual channels
System throughput (8 channels scanned) - Add 0.5 ms if filtering is selected	Typical module timing is shown here. 7.4 ms - millivolt 8.0 ms - Ω - 2-wire RTD 10.0 ms - Ω - 3-wire RTD 10.4 ms - Ω - 4-wire RTD 8.0 ms - 2-wire RTD ($^{\circ}$ F) 10.4 ms - 4-wire RTD ($^{\circ}$ F) 8.8 ms - 2-wire RTD ($^{\circ}$ C), ($^{\circ}$ K) 10.8 ms - 4-wire RTD ($^{\circ}$ C), ($^{\circ}$ K) 9.8 ms - 3-wire RTD ($^{\circ}$ F) 10.0 ms - 3-wire RTD ($^{\circ}$ C), ($^{\circ}$ K) 9.0 ms - Thermocouples ($^{\circ}$ F) 9.4 ms - Thermocouples ($^{\circ}$ C), ($^{\circ}$ K)
Open circuit protection	RTD mode - Open input - Module defaults to max value. TC mode - Open input - Module defaults to min value. To simulate wire-off detection in series A TC mode when using a series B module, attach a jumper from terminal 39...48 on the 1794-TB3G, 1794-TB3GS, or 1794-TB3GK terminal base unit so that an open input defaults to max value.
Open input detection time	Immediate detection (max 2 scans)
Overvoltage capability	15V DC continuous at 25 $^{\circ}$ C
Overall drift with temperature, max	50 ppm/ $^{\circ}$ C of span
Cold junction compensation range	-20...+100 $^{\circ}$ C
Cold junction compensator	1794-CJC2
Indicators	1 green power status indicator 8 red open input indicators
Flexbus	5V DC, 40 mA
Power dissipation, max	3.0 W @ 31.2V DC
Thermal dissipation, max	10.2 BTU/hr @ 31.2V DC
Keyswitch position	3

General Specifications

Attribute	Value
External DC power supply voltage	24V DC nom
Voltage range	19.2...31.2V DC (includes 5% AC ripple)
Supply current	95 mA @ 24V DC
Dimensions (with module installed in base) H x W x D approx.	94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in.)
IECEX temp code	T4
North American temp code	T4A
UKEX/ATEX temp code	T4
Enclosure type rating	None (open-style)
Wire size	Determined by the installed terminal base
Signal conductors Thermocouple Millivolt Wire type	Use an appropriate shielded thermocouple wire ⁽¹⁾ Belden 8761 Shielded on signal ports
Wiring category ⁽²⁾	2 - on signal ports 3 - on power ports
Terminal screw torque for cage-clamp terminal base	Determined by installed terminal base

(1) See the thermocouple manufacturer for proper thermocouple extension.

(2) Use this category information for planning conductor routing as described in the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

Environmental Specifications

Attribute	1794-IRT8	1794-IRT8XT
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20...+55 °C (-4...+131 °F)	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20...+70 °C (-4...+158 °F)
Temperature, surrounding air, max	55 °C (131 °F)	70 °C (158 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Non-operating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Non-operating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Non-operating Thermal Shock): -40...+85 °C (-40...+185 °F)	
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5...95% noncondensing	
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz	
Shock Operating Nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged shock): 30 g 50 g	
Emissions	IEC 61000-6-4	
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges	
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80...6000 MHz	
EFT/B immunity	IEC 61000-4-4: ±2 kV at 5 kHz on power ports ±2 kV at 5 kHz on shielded signal ports	
Surge transient immunity	IEC 61000-4-5: ±2 kV line-earth(CM) on shielded signal ports	
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports	

Certifications

Attribute (when product is marked) ⁽¹⁾	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
UK and CE	UK Statutory Instrument 2016 No. 1091 and European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61131-2; Programmable Controllers EN 61000-6-4; Industrial Emissions UK Statutory Instrument 2012 No. 3032 and European Union 2011/65/EU RoHS, compliant with: EN 63000; Technical documentation
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	UK Statutory Instrument 2016 No. 1107 and European Union 2014/34/EU ATEX Directive, compliant with: EN IEC 60079-0; General Requirements EN IEC 60079-7; Explosive Atmospheres, Protection "e" II 3 G Ex ec IIC T4 Gc DEMKO 14 ATEX 1342501X UL22UKEX2378X
TUV	TÜV Certified for Functional Safety: up to and including SIL 2
IECEX	IECEX System, compliant with: IEC 60079-0; General Requirements IEC 60079-7; Explosive Atmospheres, Protection "e" Ex ec IIC T4 Gc IECEX UL 14.0066X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 29 ramadan 1436
CCC	CNCA-C23-01 强制性产品认证实施规则 防爆电气 CNCA-C23-01 CCC Implementation Rule Explosion-Proof Electrical Products

(1) See the Product Certification link at rok.auto/certifications for Declarations of Conformity, Certificates, and other certification details.

Additional Resources

For more information on the products that are described in this publication, use these resources. You can view or download publications at rok.auto/literature.

Resource	Description
FLEX I/O and FLEX I/O-XT Selection Guide, publication 1794-SG002	Provides specifications for selecting FLEX I/O and FLEX I/O-XT™ products.
FLEX I/O Thermocouple/RTD/Millivolt Input Module User Manual, publication 1794-UM012	Describes how to install, configure, and troubleshoot your FLEX I/O Thermocouple/RTD/Millivolt Input Module.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.