

# 1794 FLEX I/O Analog, TC and RTD Modules Specifications

Standard FLEX I/O Catalog Numbers 1794-IE12, 1794-IE4XOE2, 1794-IE8, 1794-IE8XOE4, 1794-IF2XOF2I, 1794-IF4I, 1794-IR8, 1794-IRT8, 1794-IT8, 1794-OE12, 1794-OE4, 1794-OF4I

FLEX I/O XT Catalog Numbers 1794-IE4XOE2XT, 1794-IE8XT, 1794-IF2XOF2IXT, 1794-IF4IXT, 1794-IRT8XT, 1794-OE4XT, 1794-OF4IXT

Topic	Page
Additional Resources	1
Available 1794 Analog, TC and RTD Modules	2



The FLEX I/O module plugs into the terminal base, connecting to the I/O bus and field devices. Since there is no direct wiring to the I/O module, you can remove and insert modules under backplane power, enabling you to change modules without disturbing field wiring, other I/O modules, or FLEX backplane power.

This flexibility gives you the following choices of I/O signal types:

- Analog: current or voltage
- Temperature: thermocouple or RTD
- Combo modules: combination of input and output capability
- Harsh environments: use FLEX I/O XT in harsh environments

## Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, <a href="http://www.rockwellautomation.com/products/certification/">http://www.rockwellautomation.com/products/certification/</a>	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley® distributor or Rockwell Automation sales representative.



## Available 1794 Analog, TC and RTD Modules

### FLEX I/O Module Types

Type	Description
Analog	FLEX I/O analog input, output and combination modules are block transfer modules that interface analog signals with any Allen-Bradley programmable controllers that have block transfer capability. Block transfer programming moves input from the module's memory to a designated area in the processor data table, and output data words from a designated area in the processor data table to the module's memory. Block transfer programming also moves configuration words from the processor data table to module memory.
Thermocouple /mV	This module type is a temperature/mV measuring module that accepts inputs from a variety of thermocouples and from the mV source in the range of $\pm 76.5$ mV.
Thermocouple/RTD	The module type is a high-speed, high-accuracy temperature/mV measuring module that accepts thermocouple inputs, 2-, 3-, and 4-wire RTD inputs, and mV source inputs.
RTD	The RTD module type is a temperature-measuring module that accepts 2-, 3- and 4-wire RTDs in the range of 1 . . 433 $\Omega$ .

### FLEX I/O Modules

Module Type		Catalog Number	Page
Analog	Input	1794-IE8 1794-IE8XT 1794-IE12	3
		1794-IF4I 1794-IF4IXT	6
	Output	1794-OE4 1794-OE4XT 1794-OE12	9
		1794-OF4I 1794-OF4IXT	11
	Combination	1794-IE4XOE2 1794-IE4XOE2XT 1794-IE8XOE4	14
		1794-IF2XOF2I 1794-IF2XOF2IXT	17
Thermocouple/RTD		1794-IT8 1794-IR8	20
		1794-IRT8 1794-IRT8XT	23

**1794-IE8, 1794-IE8XT, 1794-IE12**

FLEX I/O Analog 8 Input Module, Analog 8 Input Extreme Temperature Module, Analog 12 Input Module

**Technical Specifications**

Attribute		1794-IE8	1794-IE8XT	1794-IE12
Number of Inputs		8 single-ended, nonisolated		12 single-ended, nonisolated
Indicators		1 red/green power/status indicator		
Flexbus current, 5V DC		15 mA	10 mA	80 mA
Power supply	Specification	24V DC nominal, 10.5...31.2V DC (includes 5% AC ripple)		24V DC nominal, 10.5...31.2V DC (includes 5% AC ripple)
	Current:	60 mA @ 24V DC		30 mA @ 24V DC
	Certification	24V DC 60 mA		24V DC 60mA
	Voltage:	10.5...31.2V DC 60 mA		24V DC 60mA
Input voltage terminal	Specification	±10V (user configurable)		±10V (user configurable)
	Certification	0...10V (user configurable)		
Input current terminal	Specification	4...20 mA (user configurable)		
	Certification	0...20 mA (user configurable)		
Input resolution		12 bits – unipolar 11 bits plus sign – bipolar		16 bits
Voltage:		2.56 mV/cnt – unipolar 5.13 mV/cnt – bipolar		320 µV/cnt
Current:		5.13 µA/cnt		0.641 µA/cnt
Data format		Left justified 16-bit		
Input conversion type		Successive approximation		
Input conversion rate		256 µs all channels		8 ms all channels
Input impedance, nom				
Voltage terminal:		100 kΩ		> 1 MΩ
Current terminal:		238 Ω		< 100 Ω <sup>(2)</sup>
Normal mode rejection ratio		Voltage terminal: -3 dB @ 17 Hz; -20 dB/decade -10 dB @ 50 Hz -11.4 dB @ 60 Hz Current terminal: -3 dB @ 9 Hz; -20 dB/decade -15.3 dB @ 50 Hz -16.8 dB @ 60 Hz		Voltage/current terminal: -3 dB @ 0.05 Hz; -20 dB/decade -52 dB @ 50 Hz -54 dB @ 60 Hz Voltage/current terminal with Quick Step: -3 dB @ 1.5 Hz; -20 dB/decade -29 dB @ 50 Hz -31 dB @ 60 Hz
Step response to 63% of full scale				
Voltage input:		9.4 ms		1.3 s (0.09 s with Quick Step - current or voltage input)
Current input:		18.2 ms		
Absolute accuracy <sup>(1)</sup>				
Voltage input:		0.20% full scale @ 25 °C		0.1% full scale @ 25 °C
Current input:		0.20% full scale @ 25 °C		0.1% full scale @ 25 °C
Accuracy drift with temperature <sup>(1)</sup>				
Voltage input:		0.00224 full scale %/°C		0.004 full scale %/°C
Current input:		0.00329 full scale %/°C		0.004 full scale %/°C
Calibration		Factory calibrated		

**Technical Specifications**

Attribute	1794-IE8	1794-IE8XT	1794-IE12
Maximum voltage overload	30V continuous, one channel at a time		
Maximum current overload	32 mA continuous, one channel at a time		
Isolation voltage	50V (continuous), Basic insulation type between field side and system side Tested @ 1000V AC for 60s No isolation between individual channels		50V (continuous), Basic Insulation Type Basic insulation type between field side and system side Tested @ 850V AC for 60 s No isolation between individual channels
Power dissipation, max	3.0W @ 31.2V DC		1.2 W @ 31.2V DC,
Thermal dissipation	10.2 BTU/hr @ 31.2V DC		4.1 BTU/hr @ 31.2V DC
Recommended terminal base	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBKD, 1794-TB37DS		1794-TB3G or 1794-TB3GS
Terminal base screw torque	0.8 Nm (7 lb-in.) 1 Nm (9 lb-in.) for 1794-TBN		
Wire type	Shielded		
Wire size	Determined by installed terminal base		
North american temperature code	T5	T4A	
IEC temperature code	T5	T4	-
Enclosure type rating	None (Open style)		
Dimensions, approx. (HxWxD)	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.)		
Publication, Installation Instructions	<a href="#">1794-IN100</a>	<a href="#">1794-IN125</a>	<a href="#">1794-IN106</a>

(1) Includes offset, gain, nonlinearity, and repeatability error terms.

(2) If 24V DC is removed from the module, input resistance is < 100 Ω. This is also true at 0 mA current input even if there is 24V DC. If there is an input current applied, input impedance is > 1 M Ω.

**Environmental Specifications**

Attribute	1794-IE8	1794-IE8XT	1794-IE12
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)	-20...70 °C (-4...158 °F)	-20...60 °C (-4...140 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock):		
	-40...85 °C (-40...185 °F)		
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5...95% noncondensing		
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz		
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g		
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g		
Emissions	CISPR 11: Group 1, Class A		
ESD immunity	IEC 61000-4-2: 6kV contact discharges 8 kV air discharges		

**Environmental Specifications**

Attribute	1794-IE8	1794-IE8XT	1794-IE12
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 10V/m with 1 kHz sine-wave 80% AM from 2000... 2700 MHz		
EFT/B immunity	IEC 61000-4-4: ±4 kV @ 5 kHz on power ports ±4 kV @ 5 kHz on signal ports		
Surge transient immunity <sup>(1)</sup>	IEC 61000-4-5: ±2 kV line-earth (CM) on shielded ports		-
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz... 80 MHz		

(1) Do not exceed a length of 10 m (33 ft) for input/output signal cabling.

**Certifications**

Certification <sup>(1)</sup> (When marked on product)	1794-IE8	1794-IE8XT	1794-IE12
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.		
CE	European Union 2004/108/IEC EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)		
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions		
Ex	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T5 Gc	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc	-
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2		-
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3		

(1) See the Product Certification link at <http://www.rockwellautomation.com/products/certification/> for Declaration of Conformity, Certificates, and other certification details.

**1794-IF4I, 1794-IF4IXT**

FLEX I/O Isolated Analog 4 Input Module, Isolated Analog 4 Input Extreme Temperature Module

**Technical Specifications**

Attribute		1794-IF4I	1794-IF4IXT
Number of inputs		4 differential ended, isolated	
Indicators		1 red/green power/status indicator	
Flexbus current, 5V DC		50 mA	
Power supply	Specification Voltage: Current:	24V DC nominal, 19.2...31.2V DC (includes 5% AC ripple) 80 mA @ 24V DC	
	Certification Voltage: Current:	24V DC 80 mA	19.2...31.2V DC 80 mA
Input voltage terminal	Specification	±10V (user configurable) 0...10V (user configurable) ±5V (user configurable) 0...5V (user configurable)	
	Certification	±10V (user configurable)	
Input current terminal	Specification	4...20 mA (user configurable) 0...20 mA (user configurable) ±20 mA (user configurable)	
	Certification	0...20 mA (user configurable)	
Input resolution		16 bits – unipolar 15 bits plus sign – bipolar	15 bits plus sign
Voltage:		0.156 mV/cnt unipolar 0.313 mV/cnt bipolar	320 µV/cnt
Current:		0.320 µA/cnt unipolar 0.640 µA/cnt bipolar	0.656 µA/cnt
Data format		2's complement, 2's complement %, binary, offset binary	
Input conversion type		Sigma Delta	
Input conversion rate		2.5/5.0/7.5 ms all channels (see input update rate table in installation publication, <a href="#">1794-IN038</a> )	
Input impedance		>10 MΩ <100 Ω <sup>(2)</sup>	
Normal mode rejection ratio - voltage and current input		-3 dB @ 12 Hz (300 Hz conversion rate) -80 dB @ 50 Hz (300 Hz conversion rate) -3 dB @ 6 Hz (150 Hz conversion rate) -80 dB @ 60 Hz (150 Hz conversion rate)	
Common mode rejection ratio		-120 dB @ 50/60 Hz	
Step response to 63% of full scale		1200 Hz conversion rate = 0.6 ms 600 Hz conversion rate = 6.7 ms 300 Hz conversion rate = 13.4 ms 150 Hz conversion rate = 26.7 ms	
Absolute accuracy <sup>(1)</sup>		0.1% full scale @ 25 °C 0.1% full scale @ 25 °C	
Accuracy drift with temperature <sup>(1)</sup>		0.0028 % full scale/°C 0.0038 % full scale/°C	

**Technical Specifications**

Attribute	1794-IF4I	1794-IF4IXT
Calibration	Factory calibrated. Can be calibrated in field when necessary.	
Maximum voltage overload	30V continuous, one channel at a time	
Maximum current overload	32 mA continuous, one channel at a time	
Isolation voltage	120V (continuous), Basic Insulation Type, channel to channel, channel to user, channel to system, and user power to system when used with 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, or 1794-TB3TS. 250V (continuous), Basic Insulation Type, channel to channel, channel to user, channel to system, and user power to system when used with 1794-TBN. Type tested @ 1370V AC for 60 s	
Power dissipation, max	2.0 W @ 31.2V DC	
Thermal dissipation	6.8 BTU/hr @ 31.2V DC	
Recommended terminal base	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBN, -TBKD, -TB37DS, -TB37EXD4CM8, -TB37EXD4VM8	
Terminal screw torque	0.8 Nm (7 lb-in.) 1 Nm (9 lb-in.) for 1794-TBN	
Wire type	Shielded	
Wire size	Determined by installed terminal base	
North American temperature code	T4A	T4
IEC temperature code	T4	
Enclosure type rating	None (open-style)	
Dimensions, approx. (HxWxD)	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.)	
Publication, Installation Instructions	<a href="#">1794-IN038</a>	<a href="#">1794-IN129</a>

(1) Includes offset, gain, non-linearity and repeatability error terms.

(2) If 24V DC is removed from the module, input resistance = 10 kΩ.

**Environmental Specifications**

Attribute	1794-IF4I	1794-IF4IXT
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)	-20...70 °C (-4...158 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...85 °C (-40...185 °F)	
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5...95 % noncondensing	
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz	
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock) : 30 g	
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g	
Emissions	CISPR 11: Group 1, Class A	
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges	

**Environmental Specifications**

Attribute	1794-IF4I	1794-IF4IXT
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1kHz sine-wave 80% AM from 2000... 2700 MHz	
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on shielded signal ports	
Surge transient immunity <sup>(1)</sup>	IEC 61000-4-5: ±2 kV line-earth(CM) on shielded ports	
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz... 80 MHz	

(1) Do not exceed a length of 10 m (33 ft) for input/output signal cabling.

**Certifications**

Certification <sup>(1)</sup> (When marked on product)	1794-IF4I	1794-IF4IXT
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.	
CE	European Union 2004/108/IEC EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)	
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions	
Ex	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc	
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2	
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3	

(1) See the Product Certification link at <http://www.rockwellautomation.com/products/certification/> for Declaration of Conformity, Certificates, and other certification details.



**1794-0E4, 1794-0E4XT, 1794-0E12**

FLEX I/O Analog 4 Output Module, Analog 4 Output Extreme Temperature Module and Analog 12 Output Module

**Technical Specifications**

Attribute		1794-0E4	1794-0E4XT	1794-0E12
Number of outputs		4 single-ended, nonisolated		12 single-ended, nonisolated
Indicators		1 red/green power/status indicator		
Flexbus current, 5V DC		15 mA		80 mA
Power Supply	Specification	24V DC nominal, 10.5 ... 31.2V DC (includes 5% AC ripple)		24V DC nominal, 10.0 ... 31.2V DC (includes 5% AC ripple)
	Voltage:	150 mA @ 24V DC		320 mA @ 24V DC
	Current:	24V DC		24V DC
	Certification	10.5 ... 31.2V DC		24V DC
Output voltage terminal	Voltage:	150 mA		320 mA
	Current:	0V output until module is configured ±10V (user configurable)		0V output until module is configured ±10V (user configurable)
Output current terminal	Specification	0 mA output until module is configured 4 ... 20 mA (user configurable)		
	Certification	0 ... 20 mA (user configurable)		
Output resolution		12 bits plus sign		16 bit
Voltage:		0.156 mV/cnt		320 µV/cnt
Current:		0.320 µA/cnt		0.641 µA/cnt
Output conversion type		Pulse with modulation		Digital to analog converter
Output conversion rate		1.024 ms all channels		8 ms all channels
Step response to 63% of full scale, output		24 ms		~70% 1st convert; 96% 2nd convert; 100% 3rd convert
Absolute accuracy <sup>(1)</sup>		0.133% full scale @ 25 °C		0.1% full scale @ 25 °C
Voltage:		0.425% full scale @ 25 °C		0.1% full scale @ 25 °C
Current:				
Accuracy drift with temperature <sup>(1)</sup>		0.0045 % full scale/°C		0.004 % full scale/°C
Voltage Terminal:		0.0069 % full scale/°C		0.004 % full scale/°C
Current Terminal:				
Calibration		Factory calibrated		
Load on output voltage		3 mA max		
Load on output current		15 ... 750 Ω		0 ... 750 Ω
Isolation voltage		50V (continuous), Basic Insulation Type, between field side and system Type tested @ 850V AC for 60 s No isolation between individual channels.		
Power dissipation, max		5.62 W @ 31.2V DC		7.68 W @ 24V DC
Thermal dissipation		19.2 BTU/hr @ 31.2V DC		26.2 BTU/hr @ 24V DC
Recommended terminal base		1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBN 1794-TBKD, 1794-TB37DS, 1794-TB37EXD4CM8, 1794-TB37EXD4VM8		1794-TB3G or 1794-TB3GS
Terminal base screw torque		0.8 Nm (7lb-in.) 1.0 Nm (9 lb-in.) for 1794-TBN		
Wire type		Shielded		

**Technical Specifications**

Attribute	1794-0E4	1794-0E4XT	1794-0E12
Wire size, power connections	Determined by installed terminal base		
North American temperature code	T4	T3C	T4A
IEC temperature code	T4	T3	-
Enclosure type rating	None (open-style)		
Dimensions, approx. (HxWxD)	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.)		
Publication, Installation Instructions	<a href="#">1794-IN100</a>	<a href="#">1794-IN125</a>	<a href="#">1794-IN106</a>

(1) Includes offset, gain, non-linearity and repeatability error terms

**Environmental Specifications**

Attribute	1794-0E4	1794-0E4XT	1794-0E12
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)	-20...70°C (-4...158°F)	-20...60°C (-4...140°F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock):		
	-40...85°C (-40...185°F)		
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5...95% noncondensing		
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz		
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g		
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g		
Emissions	CISPR 11: Group 1, Class A		
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...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 10V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz		IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on signal ports		IEC 61000-4-4: ±4 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on signal ports
Surge transient immunity <sup>(1)</sup>	IEC 61000-4-5: ±2kV line-earth (CM) on shielded ports		-
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz		

(1) Do not exceed a length of 10m (33ft) for input/output signal cabling.

## Certifications

Certification <sup>(1)</sup> (When marked on product)	1794-0E4	1794-0E4XT	1794-0E12
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.		
CE	European Union 2004/108/IEC EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)		
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions		
Ex	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T3 Gc	-
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2		-
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3		

(1) See the Product Certification link at <http://www.rockwellautomation.com/products/certification/> for Declaration of Conformity, Certificates, and other certification details.

## 1794-0F4I, 1794-0F4IXT

FLEX I/O Analog 4 Output Module, FLEX I/O Analog 4 Output Extreme Temperature Module

### Technical Specifications

Attribute	1794-0F4I	1794-0F4IXT
Number of outputs	4 differential ended, isolated	
Indicators	1 red/green power/status indicator	
Flexbus current, 5V DC	50 mA	
Power Supply	Specification Voltage: Current:	24V DC nominal, 19.2...31.2V DC (includes 5% AC ripple) 210 mA @ 24V DC
	Certification Voltage: Current:	24V DC 210 mA
Output voltage terminal	Specification	0V output until module is configured ±10V (user configurable) 0...10V (user configurable) ±5V (user configurable) 0...5V (user configurable)
	Certification	0V output until module is configured ±10V (user configurable)

**Technical Specifications**

Attribute		1794-OF4I	1794-OF4IXT
Output current terminal	Specification	0 mA output until module is configured 4...20 mA (user configurable) 0...20 mA (user configurable)	
	Certification	0 mA output until module is configured 0...20 mA (user configurable)	
Output resolution		15 bits plus sign	
Voltage:		320 $\mu$ V/cnt	
Current:		0.656 $\mu$ A/cnt	
Output conversion type		Digital to analog converter	
Output conversion rate		2.5/5.0 ms	
Step response to 63% of full scale		< 25 $\mu$ s	
Absolute accuracy <sup>(1)</sup>			
Voltage terminal:		0.1% full scale @ 25 °C	
Current terminal:		0.1% full scale @ 25 °C	
Accuracy drift with temperature <sup>(1)</sup>			
Voltage terminal		0.0012% full scale/°C	
Current terminal		0.0025% full scale/°C	
Calibration		Factory calibrated. Can be calibrated in field when necessary.	
Maximum voltage overload		30V continuous, one channel at a time	
Maximum current overload		32 mA continuous, one channel at a time	
Isolation voltage		120V (continuous), Basic Insulation Type, channel to channel, channel to user, channel to system, and user power to system when used with 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, or 1794-TB3TS.	
		250V (continuous), Basic Insulation Type, channel to channel, channel to user, channel to system, and user power to system when used with 1794-TBN.	
		Type tested @ 1370V AC for 60 s.	Type tested @ 1500V AC for 60 s.
Power dissipation, max		5 W @ 24V DC	
Thermal dissipation		17.1 BTU/hr @ 24V DC	
Recommended terminal base		1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBN, 1794-TBKD, 1794-TB37DS, 1794-TB37EXD4CM8, 1794-TB37EXD4VM8	
Terminal screw torque		0.8 Nm (7lb-in.) 1.0 Nm (9 lb-in.) for 1794-TBN	
Wire type		Shielded	
Wire size		Determined by installed terminal base	
North American temperature code		T4A	T4
IEC temperature code		T4	
Enclosure type rating		None (open-style)	
Dimensions, approx. (HxWxD)		46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.)	
Publication, Installation Instructions		<a href="#">1794-IN037</a>	<a href="#">1794-IN129</a>

(1) Includes offset, gain, non-linearity and repeatability error terms.

**Environmental Specifications**

<b>Attribute</b>	<b>1794-0F4I</b>	<b>1794-0F4IXT</b>
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)	-20...70 °C (-4...158 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...85 °C (-40...185 °F)	
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5...95% noncondensing	
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz	
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g	
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g	
Emissions	CISPR 11: Group 1, Class A	
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...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz	
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on shielded signal ports	
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports ±2 kV line-earth(CM) on shielded ports	
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz	

**Certifications**

<b>Certification<sup>(1)</sup> (When marked on product)</b>	<b>1794-0F4I</b>	<b>1794-0F4IXT</b>
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.	
CE	European Union 2004/108/IEC EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)	

**Certifications**

C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA II CT4 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) See the Product Certification link at <http://www.rockwellautomation.com/products/certification/> for Declaration of Conformity, Certificates, and other certification details.

**1794-IE4XOE2, 1794-IE4XOE2XT, 1794-IE8XOE4**

FLEX I/O Analog 4 Input/2 Output Module, Analog 4 Input/2 Output Extreme Temperature Module and Analog 8 Input/4 Output Module

**Technical Specifications**

Attribute		1794-IE4XOE2	1794-IE4XOE2XT	1794-IE8XOE4
Number of inputs		4 single-ended, nonisolated		8 single-ended, nonisolated
Number of outputs		2 single-ended, nonisolated		4 single-ended, nonisolated
Indicators		1 red/green power/status indicator		
Flexbus current, 5V DC		15 mA		80 mA
Power Supply	Specification	24V DC nominal, 10.0...31.2V DC (includes 5% AC ripple)		24V DC nominal, 10.0...31.2V DC (includes 5% AC ripple)
	Voltage:	24V DC nominal, 10.0...31.2V DC (includes 5% AC ripple)		24V DC nominal, 10.0...31.2V DC (includes 5% AC ripple)
	Current:	165 mA @ 24V DC; 280 mA @ 10.0V DC		140 mA @ 24V DC; 280 mA @ 10.0V DC
	Certification			
Voltage terminal	Voltage:	24V DC	10.5...31.2V DC	24V DC
	Current:	165 mA	165 mA	140 mA
	Specification	Inputs limited by source to 150VA		Inputs limited by source to 150VA,
	Input:	$\pm 10$ V		$\pm 10$ V (user configurable)
Current terminal, input/output	Output:	0V output until module is configured		0V output until module is configured
	Specification	0 mA output until module is configured		$\pm 10$ V (user configurable)
	Input:	4...20 mA (user configurable)		0V output until module is configured
	Output:	0...20 mA (user configurable)		$\pm 10$ V (user configurable)
Current terminal, input/output	Specification	0 mA output until module is configured		
	Certification	0 mA output until module is configured, inputs limited by source to 150VA,		
		4...20 mA (user configurable)		
		0...20 mA (user configurable)		

## Technical Specifications

Attribute	1794-IE4XOE2	1794-IE4XOE2XT	1794-IE8XOE4
Input resolution	12 bits unipolar 11 bits plus sign bipolar		16 bit
Voltage: Current:	2.56 mV/cnt unipolar; 5.13 mV/cnt bipolar 5.13 $\mu$ A/cnt		320 $\mu$ V/cnt 0.641 $\mu$ A/cnt
Output resolution	12 bits plus sign		16 bit
Voltage: Current:	0.156 mV/cnt 0.320 $\mu$ A/cnt		320 mV/cnt 0.641 $\mu$ A/cnt
Conversion type	Successive approximation		Successive approximation
Input: Output:	Pulse width modulation		Digital to analog converter
Conversion rate	256 ms all channels		8 ms all channels
Input: Output:	1.024 ms all channels		DAC
Normal mode rejection ratio	Voltage terminal: 3dB @ 17Hz; -20db/decade -10 dB @ 50Hz; -11.4db @ 60Hz Current terminal: -3 dB @ 9Hz; -20db/decade -15.3 dB @ 50Hz; -16.8db @ 60Hz		Voltage and current terminal: -3 dB @ 0.05 Hz; -20 dB/decade; -52 dB @ 50 Hz; -54 dB @ 60 Hz Voltage and current terminal with Quickstep: -3 dB @ 1.5 Hz; -20 dB/decade; -29 dB @ 50 Hz; -31 dB @ 60 Hz
Step response to 63% of full scale	24 ms		<25 $\mu$ s
Absolute accuracy <sup>(1)</sup>			
Voltage terminal: Current terminal:	0.1% full scale @ 25 °C 0.1% full scale @ 25 °C	0.133% full scale @ 25 °C 0.425% full scale @ 25 °C	0.1% full scale @ 25 °C 0.1% full scale @ 25 °C
Accuracy drift with Temperature <sup>(1)</sup>			
Voltage Terminal: Current Terminal:	0.004% full scale/°C 0.004% full scale/°C		
Callibration	Factory calibrated		
Isolation voltage	50V continuous between field and system Tested @ 850V AC for 60 s No isolation between individual channels	50V continuous between field and system Tested @ 1000V AC for 60 s No isolation between individual channels	50V continuous between field and system Tested @ 850V DC for 60 s No isolation between individual channels
Power dissipation, max	4.0 W @ 24V DC	5.1 W @ 31.2V DC	3.4 W @ 24V DC
Thermal dissipation	13.6 BTU/hr @ 24V DC	17.4 BTU/hr @ 31.2V DC	11.6 BTU/hr @ 24V DC
Recommended terminal base	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBKD, 1794-TB37DS		1794-TB3G or 1794-TB3GS
Terminal screw torque	0.8 Nm (7lb-in.) 1.0 Nm (9 lb-in.) for 1794-TBN		
Wire type	Shielded		
Wire size	Determined by installed terminal base		
North American temperature code	T4A	T4	T4A
IEC temperature code	T4		-
Enclosure type rating	None (open-style)		
Dimensions, approx. (HxWxD)	46 x 94 x 53 mm (1.8 x 3.7 x 2.7 in.)		
Publication, Installation Instructions	<a href="#">1794-IN037</a>	<a href="#">1794-IN125</a>	<a href="#">1794-IN106</a>

(1) Includes offset, gain, non-linearity and repeatability error terms.

**Environmental Specifications**

Attribute	1794-IE4X0E2	1794-IE4X0E2XT	1794-IE8X0E4
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)	-20...70 °C (-4...158 °F)	-20...60 °C (-4...140 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...85 °C (-40...185 °F)		
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5...95% noncondensing		
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz		
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g		
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g		
Emissions	CISPR 11: Group 1, Class A		
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...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 10V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz		IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on shielded signal ports		IEC 61000-4-4: ±4 kV @ 5 kHz on power ports ±4 kV @ 5 kHz on shielded signal ports
Surge transient immunity <sup>(1)</sup>	IEC 61000-4-5: ±2 kV line-earth(CM) on shielded ports	-	-
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz		

(1) Do not exceed a length of 10 m (33 ft) for input/output signal cabling.

**Certifications**

Certification <sup>(1)</sup> (When marked on product)	1794-IE4X0E2	1794-IE4X0E2XT	1794-IE8X0E4
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.		
CE	European Union 2004/108/IEC EMC Directive, compliant with: EN50082-2; Industrial Immunity EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61326; Meas./Control/Lab., Industrial Requirements		
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions		



**Certifications**

Ex	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements (Zone 2) II 3 G Ex nA IIC T4 Gc		-
TÜV	-	TÜV Certified for Functional Safety up to and including SIL 2	-
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3		

(1) See the Product Certification link at <http://www.rockwellautomation.com/products/certification/> for Declaration of Conformity, Certificates, and other certification details.

**1794-IF2XOF2I, 1794-IF2XOF2IXT**

FLEX I/O Analog 2 Input/2 Output Module, FLEX I/O Analog 2 Input/2 Output Extreme Temperature Module

**Technical Specifications**

Attribute		1794-IF2XOF2I	1794-IF2XOF2IXT
Number of inputs		2 differential ended, isolated	
Number of outputs		2 differential ended, isolated	
Indicators		1 red/green power/status indicator	
Flexbus current		50 mA	55 mA
Power Supply	Specification Voltage: Current:	24V DC nominal; (19.2 ... 31.2V DC)(includes 5% ripple) 150 mA @ 24V DC	
	Certification Voltage: Current:	24V DC 150 mA	19.2 ... 31.2V DC 180 mA
Voltage terminal Input/Output:	Specification	±10V (user configurable) 0 ... 10V (user configurable) ±5V (user configurable) 0 ... 5V (user configurable)	
	Certification	±10V (user configurable)	
Current terminal, Input/output	Specification	0 mA output until module is configured 4 ... 20 mA (user configurable) 0 ... 20 mA (user configurable) ±20 mA (user configurable)	
	Certification	0 mA output until module is configured 0 ... 20 mA (user configurable)	
Input resolution Voltage: Current:		16 bits - unipolar; 15 bits plus sign - bipolar 0.156 mV/cnt unipolar; 0.313 mV/cnt bipolar 0.320 µA/cnt unipolar; 0.640 µA/cnt bipolar	
Output resolution Voltage: Current:		15 bits plus sign 0.320 mV/cnt 0.656 µA/cnt	
Data format		2's complement, 2's complement %, binary, offset binary	
Conversion type Input: Output:		Sigma Delta Digital-to-analog converter	

**Technical Specifications**

Attribute	1794-IF2XOF2I	1794-IF2XOF2IXT
Conversion rate Input: Output:	2.5/5.0/7.5 ms all channels 2.5/5.0 ms all channels	
Normal Mode Rejection Ratio Voltage terminal Current terminal	-3 dB @ 12 Hz (300 Hz conversion rate) -80 dB @ 50 Hz (300 Hz conversion rate) -3 dB @ 6 Hz (150 Hz conversion rate) -80 dB @ 60 Hz (150 Hz conversion rate)	
Step response to 63% of full scale Input: Output:	1200 Hz conversion rate = 0.6 ms 600 Hz conversion rate = 6.7 ms 300 Hz conversion rate = 13.4 ms 150 Hz conversion rate = 26.7 ms < 25 $\mu$ s	
Absolute accuracy <sup>(1)</sup> Voltage terminal: Current terminal:	0.1% full scale @ 25 °C 0.1% full scale @ 25 °C	
Accuracy drift with Temperature <sup>(1)</sup> Voltage terminal: Current terminal:	0.0028% full scale/°C 0.0038% full scale/°C	
Calibration	Factory calibrated. Can be field calibrated when necessary.	
Maximum voltage overload	30V continuous, one channel at a time	
Maximum current overload	32 mA continuous, one channel at a time	
Isolation voltage	120V (continuous), Basic Insulation Type, channel to channel, channel to user, channel to system, and user power to system when used with 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, or 1794-TB3TS. 250V (continuous), Basic Insulation Type, channel to channel, channel to user, channel to system, and user power to system when used with 1794-TBN. Type tested @ 1500V AC for 60 s.	
Power dissipation, max	3.3 W @ 31.2V DC	2.0 W @ 31.2V DC
Thermal dissipation	11.3 BTU/hr @ 31.2V DC	6.8 BTU/hr @ 31.2V DC
Recommended terminal base	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBN, 1794-TBKD, 1794-TB37DS, 1794-TB37EXD4CM8, 1794-TB37EXD4VM8	
Terminal screw torque	0.8 Nm (7lb-in.) 1.0 Nm (9 lb-in.) for 1794-TBN	
Wire type	Shielded	
Wire size	Determined by installed terminal base	
North American temperature code	T4A	T4
IEC temperature code	T4	
Enclosure type rating	None (open-style)	
Dimensions, approx. (HxWxD)	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.)	
Publication, Installation Instructions	<a href="#">1794-IN039</a>	<a href="#">1794-IN129</a>

(1) Includes offset, gain, non-linearity and repeatability error terms.

**Environmental Specifications**

Attribute	1794-IF2XOF2I	1794-IF2XOF2IXT
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)	-20...70 °C (-4...158 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...85 °C (-40...185 °F)	
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5...95% noncondensing	
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz	
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g	
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g	
Emissions	CISPR 11: Group 1, Class A	
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...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz	
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on shielded signal ports	
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports ±2 kV line-earth(CM) on shielded ports	
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz	

**Certifications**

Certification <sup>(1)</sup> (When marked on product)	1794-IF2XOF2I	1794-IF2XOF2IXT
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.	
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.	-
CE	European Union 2004/108/EC EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)	

**Certifications**

C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements (Zone 2) II 3 G Ex nA IIC T4 Gc
TÜV	TÜV Certified for Functional Safety up to and including SIL 2
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) See the Product Certification link at <http://www.rockwellautomation.com/products/certification/> for Declaration of Conformity, Certificates, and other certification details.

**1794-IT8, 1794-IR8**

FLEX I/O 8 Thermocouple Input Module, FLEX I/O 8 RTD Input Module

**Technical Specifications**

Attribute		1794-IT8	1794-IR8
Number of inputs		8 differential ended	
Indicators		1 red/green power/status indicator	
Flexbus current, 5V DC		15 mA	
Power supply	Specification	Voltage: 24V DC nominal 19.2...31.2V DC (includes 5% AC ripple) 19.2...31.2V DC for ambient temperatures < 40 °C 24V DC maximum for ambient temperatures = 55 °C Current: 140 mA @ 24V DC	24V DC nominal 19.2...31.2V DC (includes 5% AC ripple) 19.2...31.2V DC for ambient temperatures < 40 °C 24V DC maximum for ambient temperatures = 55 °C 150 mA @ 24V DC
	Certification	Voltage: 24V DC Current: 140 mA	
Nominal input ranges		-76.5...76.5mV	1...433 Ω
Supported Thermocouple Types		Type B: 300...1800 °C (572...3272 °F) Type C: 0...2315 °C (32...4199 °F) Type E: -270...1000 °C (-454...1832 °F) Type J: -210...1200 °C (-346...2192 °F) Type K: -270...1372 °C (-454...2502 °F) Type N: -270...1300 °C (-454...2372 °F) Type R: -50...1768 °C (-58...3214 °F) Type S: -50...1768 °C (-58...3214 °F) Type T: -270...400 °C (-454...752 °F) Type TXK/XK (L): -200...800 °C (-328...1472 °F)	-
Supported RTDs (Resistance)		-	100Ω Pt α = 0.00385 Euro (-200...870 °C) 100Ω Pt α = 0.003916 U.S. (-200...630 °C) 200Ω Pt α = 0.00385 Euro (-200...400 °C) 500Ω Pt α = 0.00385 Euro (-200...630 °C) 100Ω Nickel α = 0.00618 (-60...250 °C) 120Ω Nickel α = 0.00672 (-60...250 °C) 200Ω Nickel α = 0.00618 (-60...250 °C) 500Ω Nickel α = 0.00618 (-60...250 °C) 10Ω Copper α = 0.00427 (-200...260 °C)
Resolution		16 bits (2.384μV typical)	16 bits across 433Ω

## Technical Specifications

Attribute	1794-IT8	1794-IR8
Accuracy	Refer to "Calculating the Accuracy" section of Appendix A, publication, <a href="#">1794-UM007</a>	Without calibration, at low humidity: Normal mode: 0.05% full scale, max Enhanced mode: 0.01% full scale, typical
Data format	16-bit 2's complement or offset binary (unipolar)	
RTD excitation current	-	718.36 $\mu$ A
Normal mode rejection ratio	-60 dB @ 60Hz	-60 dB @ 60Hz for A/D filter cutoff @ 10Hz
Common mode rejection ratio	-115 dB @ 60Hz; -100 dB @ 50Hz	-120 dB @ 60Hz; -100 dB @ 50Hz with A/D filter cutoff @ 10Hz
Common mode input range	+10V	0V between channels (common return)
Input offset drift with temperature	+6mV/ $^{\circ}$ C max	1.5 m $\Omega$ / $^{\circ}$ C max
Gain drift with temperature	10ppm/ $^{\circ}$ C max	Normal mode: 20ppm/ $^{\circ}$ C max. Enhanced mode: 10ppm/ $^{\circ}$ C max
Overall drift with temperature	50ppm/ $^{\circ}$ C of span (max)	-
Open TC/RTD circuit detection	Out of range reading (upscale)	
Open TC/RTD detection time	Available at system throughput rate	
Channel bandwidth	0 . . 2.62Hz (-3 dB)	
Settling time to 100% of final value	Available at system throughput rate	
System throughput	325 ms (1 channel scanned), programmable to 28 ms 2.6 s (8 channels scanned), programmable to 224 ms	Normal mode - 325 ms (1 channel scanned), programmable to 28 ms 2.6 s (8 channels scanned), programmable to 224 ms Enhanced mode - programmable 56 . . 650 ms/channel - 650 ms (1 channel scanned), 2.925 s (8 channels scanned)
Calibration	Factory calibrated. Can be calibrated in field when necessary.	
Maximum voltage overload	35V DC, 25V AC continuous @ 25 $^{\circ}$ C	
Isolation voltage	Tested @ 707V DC for 60 s from inputs and user power to logic side	
Power dissipation, max	3.0W @ 31.2V DC	
Thermal dissipation	10.2 BTU/hr @ 31.2V DC	
Cold junction compensation	Range: -20 . . 100 $^{\circ}$ C	-
Recommended terminal base	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T and 1794-TB3TS	
Terminal base screw torque	0.8 Nm (7 lb-in.) 1.0 Nm (9 lb-in.) for 1794-TBN	
Signal conductors Thermocouple/RTD	Use appropriate shielded thermocouple wire <sup>(2)</sup>	2-wire - Belden 9501
Millivolt Category <sup>(1)</sup>	Belden 8761 2	3-wire, less than 100ft with normal humidity - Belden 9533 3-wire, greater than 100ft or normal humidity (>55 $^{\circ}$ C for > 8 hrs) - Belden 83503
Power conductors Wire size Category <sup>(1)</sup>	12AWG (4mm <sup>2</sup> ) stranded copper wire rated @ 75 $^{\circ}$ C or higher 3/64 in. (1.2 mm) insulation maximum 2	
North American temperature code	T4A	
IEC temperature code	T4	
Enclosure type rating	None (open-style)	
Dimensions, approx. (HxWxD)	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.)	
Publication, Installation Instructions	<a href="#">1794-IN021</a>	

- (1) Use this category information for planning conductor routing as described in Allen-Bradley publication [1770-4.1](#), Industrial Automation Wiring and Grounding Guidelines.
- (2) Refer to the thermocouple manufacturer for proper thermocouple extension.

### Environmental Specifications

Attribute	1794-IT8	1794-IR8
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)	
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...85 °C (-40...185 °F)	
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5...95% noncondensing	
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz	
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g	
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g	
Emissions	CISPR 11: Group 1, Class A	
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...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz	
EFT/B immunity	IEC 61000-4-4: ±2kV @ 5kHz on power ports ±2kV @ 5kHz on signal ports	
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports +2kV line-earth(CM) on shielded ports	
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz	

### Certifications

Certification <sup>(1)</sup> (When marked on product)	1794-IT8	1794-IR8
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.	
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.	
CE	European Union 2004/108/EC EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)	

**Certifications**

C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements (Zone 2) II 3 G Ex nA IIC T4 Gc
TUV	TÜV Certified for Functional Safety: Capable of SIL 2
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) See the Product Certification link at <http://www.rockwellautomation.com/products/certification/> for Declaration of Conformity, Certificates, and other certification details.

**1794-IRT8, 1794-IRT8XT****FLEX I/O Thermocouple/RTD Input Analog Module/Extreme Temperature Module****Technical Specifications**

Attribute	1794-IRT8	1794-IRT8XT
Number of inputs	8 differential ended	
Indicators	1 green power status indicator 8 red open input indicators	
Flexbus current, 5V DC	40 mA	
Power supply:	Specification Voltage: Current:	24V DC nominal 19.2...31.2V DC (includes 5% AC ripple) 95 mA @ 24V DC
	Certification Voltage: Current:	24V DC 95 mA
Input range	-40...100 mV DC, 0...500Ω	
Supported Thermocouple Types	Type B: 300...1800 °C (572...3272 °F) Type E: -270...1000 °C (-454...1832 °F) Type J: -210...1200 °C (-346...2192 °F) Type K: -270...1372 °C (-454...2502 °F) Type TXK/XK (L): -200...800 °C (-328...1472 °F) Type N: -270...1300 °C (-454...2372 °F) Type R: -50...1768 °C (-58...3214 °F) Type S: -50...1768 °C (-58...3214 °F) Type T: -270...400 °C (-454...752 °F)	
Supported RTDs (Resistance)	100 Ω Pt μ = 0.00385 Euro (-200...870 °C) 100 Ω Pt μ = 0.003916 U.S. (-200...630 °C) 200 Ω Pt μ = 0.00385 Euro (-200...400 °C) 200 Ω Pt μ = 0.003916 U.S. (-200...400 °C) 100 Ω Nickel μ = 0.00618 (-60...250 °C) 120 Ω Nickel μ = 0.00672 (-80...320 °C) 200 Ω Nickel μ = 0.00618 (-60...200 °C) 10 Ω Copper μ = 0.00427 (-200...260 °C)	
Resolution	14 bits	

## Technical Specifications

Attribute	1794-IRT8	1794-IRT8XT
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 ratio	-80 dB @ 5V peak-to-peak, 50...60 Hz	
Common mode input range	+15V min	
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	
Overall drift with temperature	50 ppm/°C of span (max)	
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 to terminal 48 on the 1794-TB3G, 1794-TB3GS, or 1794-TB3GK terminal base unit so that an open input will default to max value.	
Open TC/RTD detection time	Immediate detection (max 2 scans)	
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 (°F) 10.4 ms - 4-wire RTD (°F) 8.8 ms - 2-wire RTD (°C), (°K) 10.8 ms - 4-wire RTD (°C), (°K) 9.8 ms - 3-wire RTD (°F) 10.0 ms - 3-wire RTD (°C), (°K) 9.0 ms - Thermocouples (°F) 9.4 ms - Thermocouples (°C), (°K)	
Calibration	Factory calibrated. Can be calibrated in field when necessary.	
Voltage max overload	15V DC continuous @ 25 °C	
Isolation voltage	50V (continuous), Basic Insulation Type. Type tested @ 1365V AC for 60 s, between field side and system No isolation between individual channels	
Power dissipation, max	3.0W @ 31.2V DC	
Thermal dissipation	10.2 BTU/hr @ 31.2V DC	
Cold junction compensation	Range: -20...100 °C	
Recommended terminal base	1794-TB3G, 1794-TB3GS, 1794-TB3GK	
Terminal base screw torque	0.8 Nm (7 lb-in.) 1.0 Nm (9 lb-in.) for 1794-TBN	
Signal conductors		
Thermocouple	Use appropriate shielded thermocouple wire <sup>(2)</sup>	
Millivolt	Beden 8761	
Category	2	
Wire type	Shielded	
Power conductors		
Wire size	12AWG (4mm <sup>2</sup> ) stranded copper wire rated @ 75 °C or higher 3/64 in. (1.2 mm) insulation maximum	
Category <sup>(1)</sup>	2	
North American temperature code	T4A	
IEC temperature code	T4	



**Technical Specifications**

Attribute	1794-IRT8	1794-IRT8XT
Enclosure type rating	None (open-style)	
Dimensions, approx. (HxWxD)	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.)	
Publication, Installation Instructions	<a href="#">1794-IN050</a>	

- (1) Use this category information for planning conductor routing as described in Allen-Bradley publication [1770-4.1](#), Industrial Automation Wiring and Grounding Guidelines.
- (2) Refer to the thermocouple manufacturer for proper thermocouple extension.

**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)	
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...85 °C (-40...185 °F)	
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5...95% noncondensing	
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz	
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g	
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g	
Emissions	CISPR 11: Group 1, Class A	
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...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz	
EFT/B immunity	IEC 61000-4-4: ±3 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on shielded signal ports	
Surge transient immunity <sup>(1)</sup>	IEC 61000-4-5: +2kV line-earth(CM) on shielded ports	
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz	

- (1) Do not exceed a length of 10 m (33 ft) for input/output signal cabling.

**Certifications**

<b>Certification<sup>(1)</sup> (When marked on product)</b>	<b>1794-IRT8</b>	<b>1794-IRT8XT</b>
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.	
CE	European Union 2004/108/EC EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)	
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions	
Ex	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements (Zone 2) II 3 G Ex nA IIC T4 Gc	
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3	

(1) See the Product Certification link at <http://www.rockwellautomation.com/products/certification/> for Declaration of Conformity, Certificates, and other certification details.

**Notes:**

## Important User Information

Solid-state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication [SGI-1.1](#) available from your local Rockwell Automation sales office or online at <http://www.rockwellautomation.com/literature/>) describes some important differences between solid-state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid-state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this publication are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation, Inc., is prohibited.

## Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication [RA-DU002](#), available at <http://www.rockwellautomation.com/literature/>.

Allen-Bradley, FLEX I/O, RSLogix 5000, Rockwell Software, Rockwell Automation, and LISTEN. THINK. SOLVE are trademarks of Rockwell Automation, Inc.  
Trademarks not belonging to Rockwell Automation are property of their respective companies.

Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

**[www.rockwellautomation.com](http://www.rockwellautomation.com)**

---

### Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444  
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640  
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846