1794 FLEX I/O

Analog, Thermocouple, and RTD I/O Modules

- Individually configurable channels allow the module to be used with a variety of sensors.
- Selectable input filters on many modules allow you to select from several different filter frequencies for each channel that best meets the performance needs of your application. Lower filter settings provide greater noise rejection and resolution. Higher filter settings provide faster performance. *Note: Isolated analog modules have four filter selections; the thermocouple module has ten; and the combined RTD/thermocouple module has eight.*
- Single-ended or differential inputs depending on module. Analog modules have single-ended inputs while isolated analog and temperature modules have differential inputs. Single-ended voltage sensors reduce costs. Differential inputs are typically more noise immune.
- On-board scaling is performed by the temperature modules and is user-configurable for either °C, °F, or mV. This eliminates the need to scale the data in the user program.
- Internal calibration is performed in the analog modules (1794-IE8, 1794-OE4, and 1794-IE4XOE2). User calibration is required for isolated analog and temperature modules. All modules come factory calibrated.
- Extreme environment (XT) versions of standard modules.
- HART (Highway Addressable Remote Transmitter) analog modules (1794-IE8H, 1794-OE8H, 1794-IF8IH and 1794-OF8IH) combine analog and HART connectivity in one module. No external hardware is required to access the HART signal. These modules support FDT-compatible asset management software to HART field devices. Also, HART commands can be transmitted as unscheduled messages.

FLEX Analog Input Modules

- Each channel of the three 1794-IE8 modules and three 1794-IF4I modules is individually configurable for the desired input range. The 1794-IE12 channels are configurable in pairs.
- Use with 2-, 3-, and 4-wire input sensor field devices.
- Input data format:
  - 1794-IE8, -IE8XT:
16-bit 2's complement, left-justified
  - 1794-IE12:16-bit 2's complement
  - 1794-IF4I, -IF4IXT:
2's complement
2's complement percent
binary
offset binary

Cat. No.♠	Number of Inputs	Signal Range	Input Conversion Rate	Input Resolution	Absolute Accuracy	Step Response to 63% of FS	External DC Supply Current, Nom.	Power Dissipation, Max.	Terminal Base Unit
1794-IE8Δ	8 single-ended inputs	4...20 mA 0...20 mA ±10V 0...10V	256 µs all channels	12 bits - Unipolar, 11 bits + sign - Bipolar 5.13 µA/Cnt 2.56 mV/Cnt - Unipolar 5.13 mV/Cnt - Bipolar	Current Input: 0.20% Full Scale at 25 °C Voltage Input: 0.20% Full Scale at 25 °C⋆	Current Input: 18.2 ms Voltage Input: 9.4 ms	60 mA at 24V DC	3.0 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS
1794-IE8XT									1794-TB2, -TB3, -TB3S, -TB3T, -TB3TS
1794-IF4I 1794-IF4IXT	4 Isolated inputs	4...20 mA 0...20 mA ±20 mA ±10V 0...10V ±5V 0...5V	2.5/5.0/7.5 ms all channels	16 bits - Unipolar, 15 bits + sign - Bipolar 0.320 µA/Cnt - Unipolar 0.640 µA/Cnt - Bipolar 0.156 mV/Cnt - Unipolar 0.313 mV/Cnt - Bipolar	Current Input: 0.1% Full Scale at 25 °C Voltage Input: 0.1% Full Scale at 25 °C⋆	Current or Voltage Input: 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	80 mA at 24V DC	2.0 W at 31.2V DC	1794-TB2, 1794-TB 3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBN
1794-IE12	12 single-ended Non-isolated inputs	4...20 mA (user configurable) 0...20 mA (user configurable)	8.0 ms all channels	320 µV/cnt 0.641 µA/cnt	Current Input: 0.1% Full Scale at 25 °C Voltage Input: 0.1% Full Scale at 25 °C⋆	Current or Voltage Input: 1.3 s (0.09 s with Quick Step)	30 mA at 24V DC; 45 mA at 10.0V DC	1.2 W at 31.2V DC; 1.1 W at 24V DC; 0.9 W at 10.0V DC	1794-TB3G or 1794-TB3GS

♠ Catalog numbers ending with (XT) = extreme environment.
Δ Each of the module's channels is individually selectable.
⋆ Includes offset, gain, non-linearity, and repeatability error terms.

FLEX Thermocouple and RTD Input Modules

Cat. No.♠	Number of Inputs	Input Signal Range	Input Resolution	External DC Supply Current, Nom.	Power Dissipation, Max.	Terminal Base Unit
1794-IR8	8 RTD, Strain Gauge	1...433 Ω	16 bits across 435 Ω	140 mA at 24V DC	3 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBKD
	The 1794-IR8 is a temperature-measuring module that accepts 2-, 3-, and 4-wire RTDs. Use the 1794-IR8 in applications where channel fast-update rate is not required. If you need channel fast-update rates, use the 1794-IRT8 module.					
1794-IRT8 1794-IRT8XT	8 RTD, Thermocouple, Millivolt, Strain Gauge	-40...100 mV DC for thermocouples 0...325 mV for RTDs	14 bits	95 mA at 24V DC	3.0 W at 31.2V DC	1794-TB3G, 1794-TB3GS, 1794-TB3GK
	The 1794-IRT8 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. The 1794-IRT8 also offers wire-off, over-range, and under-range detection. Use cold-junction compensators (1794-CJC2) in thermocouple mode. Two cold-junction compensators are shipped with the this module. The 1794-IRT8XT is the extreme environment version, rated for operation at temperatures of -25...70 °C (-13...158 °F).					
1794-IT8	8 Thermocouple, Millivolt	±76.5 mV	16 bits (2.384 µV typical)	150 mA at 24V DC	3 W at 31.2V DC	1794-TB3T, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3TS
	The 1794-IT8 is a temperature/mV measuring module that accepts inputs from a variety of thermocouples and from the mV source in the range of ±76.5 mV. Use cold-junction compensators (1794-CJC2) in thermocouple mode. Two cold-junction compensators are shipped with the 1794-IT8.					

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Thermocouple and RTD Modules—Sensors Supported

1794-IR8	1794-IRT8XT	1794-IT8
RTD		
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...+630 °C) 500 Ω Pt µ = 0.00385 U.S. (-200...+630 °C) 100 Ω Nickel µ = 0.00618 (-60...+250 °C) 120 Ω Nickel µ = 0.00672 (-60...+250 °C) 200 Ω Nickel µ = 0.00618 (-60...+250 °C) 500 Ω Nickel µ = 0.00618 (-60...+250 °C) 10 Ω Copper µ = 0.00427 (-200...+260 °C)	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)	–
Thermocouple		
–	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)	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)

FLEX Analog Combination I/O Modules

- Input data format:
  - 1794-IE4XOE2, -IE4XOE2XT:
16-bit 2's complement, left-justified
  - 1794-IE8XOE4:
16-bit, 2's complement
  - 1794-IF2XOF2I, -IF2XOF2IXT:
2's complement
2's complement percent
binary
offset binary
- Output data format:
  - 1794-IE4XOE2, -IE4XOE2XT:
16-bit 2's complement, left justified
  - 1794-IE8XOE4:
16-bit 2's complement
  - 1794-IF2XOF2I, -IF2XOF2IXT:
2's complement
2's complement percent
binary
offset

Cat. No.♠	Number of Inputs/Outputs	Signal Range	Conversion Rate	Input Resolution	Absolute Accuracy	Step Response to 63% of FS	External DC Supply Current, Nom.	Power Dissipation, Max.	Terminal Base Unit
1794-IE4XOE2	4 inputs/2 single-ended outputs	4...20 mA 0...20 mA ±10V 0...10V	Inputs: 256 µs all channels Outputs: 1.024 ms all channels	12 bits - Unipolar, 11 bits + sign - Bipolar 5.13 µA/Cnt 2.56 mV/Cnt - Unipolar 5.13 mV/Cnt - Bipolar	Current Input: 0.20% Full Scale at 25 °C Voltage Input: 0.20% Full Scale at 25 °C Current Output: 0.425% Full Scale at 25 °C Voltage Output: 0.133% Full Scale at 25 °C⋆	Current Input: 18.2 ms Voltage Input: 9.4 ms	70 mA @ 24V DC	4.0 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS
1794-IE4XOE2XT			Inputs: 256 µs all channels				164 mA @ 10.5V DC		1794-TB2, -TB3, -TB3S, -TB3T, -TB3TS
1794-IE8XOE4	8 single-ended inputs/4 outputs	4...20 mA (user configurable) 0...20 mA (user configurable)	Inputs: 8.0 ms all channels Outputs: DAC	320 µV/cnt 0.641 µA/cnt	Current Input or Output: 0.1% Full Scale at 25 °C Voltage Input or Output: 0.1% Full Scale at 25 °C⋆	Current or Voltage Input: 1.3 s (0.09 s with Quick Step)	140 mA at 24V DC; 280 mA at 10.0V DC	3.0 W at 31.2V DC; 2.3 W at 24V DC; 2.0 W at 10.0V DC	1794-TB3G or 1794-TB3GS
1794-IF2XOF2I	2 isolated inputs/2 outputs	4...20 mA 0...20 mA ±20 mA ±10V 0...10V ±5V 0...5V	Inputs: 2.5/5.0/7.5 ms all channels Outputs: 2.5/5.0 ms	16 bits - unipolar; 15 bits plus sign - bipolar 0.156 mV/cnt unipolar; 0313 mV/cnt bipolar 0.320 µA/cnt unipolar; 0.640 µA/cnt bipolar	Current Terminal: 0.1% Full Scale at 25 °C Voltage Terminal: 0.1% Full Scale at 25 °C	Current or Voltage Terminal: 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	150 mA at 24V DC	3.3 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, and 1794-TBN
1794-IF2XOF2IXT					Current Terminal: 0.1% Full Scale at 25 °C Voltage TerminalIt: 0.1% Full Scale at 25 °C			2.0 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, and 1794-TBN

♠ Catalog numbers ending with (XT) = extreme environment.
⋆ Includes offset, gain, non-linearity, and repeatability error terms.

FLEX Analog Output Modules

- Each channel of the two 1794-OE4 modules and two 1794-OF4I modules is individually configurable for the desired range. The 1794-OE12 channels are configurable in pairs.
- Output data format:
  - 1794-OE4, -OE4XT:
    16-bit 2's complement, left-justified
  - 1794-OE12:
    16-bit 2's complement
  - 1794-OF4I, -OF4IXT:
    2's complement
    2's complement percent binary
    offset binary

Cat. No.♠	Number of Outputs	Signal Range	Output Conversion Rate	Output Resolution	Absolute Accuracy	Step Response to 63% of FS, Output	External DC Supply Current, Nom.	Power Dissipation, Max.	Terminal Base Unit
1794-OE4	4 single-ended outputs	4...20 mA 0...20 mA ±10V 0...10V	1.024 ms all channels	12 bits + sign 5.13 µA/Cnt 2.56 mV/Cnt	Current Output: 0.425% Full Scale at 25 °C Voltage Output: 0.133% Full Scale at 25 °C	Voltage Output: 24 ms	70 mA at 24V DC⋆	4.5 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBN
1794-OE4XT	4 single-ended outputs	4...20 mA 0...20 mA ±10V 0...10V	–	12 bits + sign 0.156 mV/cnt 0.320 µA/cnt	Voltage terminal - 0.133% Full Scale at 25 °C Current terminal - 0.425% Full Scale at 25 °C	24 ms	180 mA at 10.5V DC	4.5 W at 31.2V DC	1794-TB2, -TB3, -TB3S, -TB3T, -TB3TS, and -TBN
1794-OE12	12 single-ended outputs	4...20 mA 0...20 mA	–	320 µV/cnt 0.641 µA/cnt	Current Output: 0.1% Full Scale at 25 °C Voltage Output: 0.1% Full Scale at 25 °C	~70% 1st convert; 96% 2nd convert; 100% 3rd convert	320 mA at 24V DC 720 mA at 10.0V DC	4.0 W at 31.2V DC; 4.3 W at 24V DC; 4.0 W at 10.0V DC	1794-TB3G or 1794-TB3GS
1794-OF4I	4 Isolated outputs	4...20 mA 0...20 mA ±10V 0...10V ±5V 0...5V	2.5/5.0 ms	15 bits + sign 0.656 µA/Cnt 0.320 mV/Cnt	Current Output: 0.1% Full Scale at 25 °C Voltage Output: 0.1% Full Scale at 25 °C	Current or Voltage Output: < 25 µs	210 mA at 24V DC	4.7 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBN
1794-OF4IXT								2.0 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, and 1794-TBN

♠ Catalog numbers ending with (XT) = extreme environment.
⋆ Not including outputs.