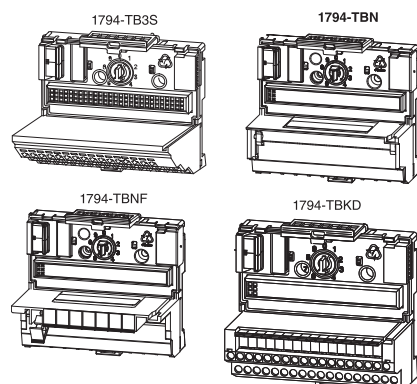


Select a FLEX I/O Terminal Base Unit

Step 3 – Select:

the appropriate terminal base unit for your module and system



Each FLEX I/O module requires a terminal base unit that snaps onto the DIN rail to the right of the I/O adapter. The terminal bases provide terminal connection points for the I/O wiring and plug together to form the backplane. They are available with screw, clamp, or spring terminations.

Common Terminal Base Characteristics

Current Capacity, max	Wire Size	Dimensions (HxWxD)
10	0.34...2.1 mm ² (22...14 AWG) solid or stranded copper wire rated at 75 °C (167 °F) or greater, 1.2 mm (3/64 in.) insulation max	94 x 94 x 69 mm 3.7 x 3.7 x 2.7 in. 1794-TB37DS and 1794-TB62DS* ⁽¹⁾ 127 x 94 x 69 mm 5.0 x 3.7 x 2.7 in

(1) Measured with expansion module installed.

The following table is a comparison of general specifications for each FLEX I/O terminal base unit. For compatibility with FLEX I/O modules, see Table Digital I/O Module Summary on page 16.

General Specification Comparison

Catalog ⁽¹⁾	Termination Type	Connections	Used in Applications	Current Capacity, max	Wiring Category	Purpose
1794-TB2	Cage clamp	16 I/O; 18 common; 2 +V	Up to 132V AC/156V DC	10	2	A generic 2-wire version of the 1794-TB3.
1794-TB3, 1794-TB3K ⁽²⁾		16 I/O; 18 common; 18 +V			Module dependent	Primarily intended for use with input modules when using 3-wire input proximity switches – can also be used with output modules.
1794-TB3S, 1794-TB3SK		Spring clamp				A spring clamp version of the 1794-TB3 – provides faster, simpler wire installation.
1794-TB32	Cage clamp	32 I/O; 8 common; 8 +V	Up to 31.2V DC			A 32-point version of the 1794-TB3 to be used with 32-point digital modules and the 1794-IB16D module.
1794-TB32S	Spring clamp	A spring clamp version of the 1794-TB32.				
1794-TB3G, 1794-TB3GK ⁽²⁾	Grounded screw clamp	36 I/O; 2 common; 2 +V; 10 chassis ground				A screw clamp terminal base unit with individual grounding used with certain analog modules.
1794-TB3GS, 1794-TB3GSK ⁽²⁾	Grounded spring clamp				2	A spring clamp version of the 1794-TB3G.

General Specification Comparison

Catalog ⁽¹⁾	Termination Type	Connections	Used in Applications	Current Capacity, max	Wiring Category	Purpose
1794-TB3T	Cage clamp, temperature	16 I/O; 10 common; 4 +V; 8 chassis ground; 2 sets of CJC for temperature modules	Up to 132V AC/156V DC	10	Module dependent	A cage clamp terminal base to be used with the 1794-IT8 or 1794-IRT8 module (when used in thermocouple mode) – also provides chassis ground connections for the 1794-IR8 and analog modules.
1794-TB3TS, 1794-TB3TSK ⁽²⁾	Spring clamp, temperature	16 I/O; 10 common; 4 +V; 8 chassis ground; 2 sets of CJC for temperature modules	Up to 132V AC/156V DC	10	2	A spring clamp version of the 1794-TB3T.
1794-TBKD	Cage clamp, knife disconnect	16 I/O; 18 common; 2 +V	—		Module dependent	A cage clamp terminal base with 16 knife disconnects.
1794-TBKDS						A spring clamp version of the 1794-TBKD.
1794-TBN, 1794-TBNK ⁽²⁾	Screw clamp, NEMA-style	16 I/O; 2 common; 2 +V	264V AC/DC			A NEMA-style screw clamp terminal base for larger gauge wires with a cover for I/O wiring.
1794-TBNF	Screw clamp, fused NEMA-style					Provides eight 5 x 20 mm fused, screw terminals with a cover for I/O wiring – shipped with fuses for the 1794-OA8 module; can be used to fuse the 1794-OM8 and 1794-OW8 modules with a replacement fuse. ⁽³⁾
1794-TB37DS	D-shell	37 Pin; digital and analog	—		Module dependent	A 37-pin D-shell termination for both digital and analog modules.
1794-TB62DS		62 Point;				A 62-pin D-shell termination for both digital and analog modules.
1794-TB62DSG	Grounded D-shell	62 Point; chassis ground				A grounded version of the 1794-TB62DS – for use with analog modules.
1794-TB62DST	D-shell	16 I/O; 18 common; 2 +V; 2 sets of CJC for temperature modules				A 62-pin D-shell termination to be used with the 1794-IT8 or 1794-IRT8 module (when used in thermocouple mode) – also provides chassis ground connections for analog modules.

(1) Isolation voltage, channel to channel, is determined by the insert module. Use this conductor category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(2) The letter K in the last position of the catalog number, before the series designation, indicates a conformal coated versions of standard modules and can be used with extended temperature modules (modules ending in -XT).

(3) Contains eight 5 x 20 mm fuses (one for each even-numbered terminal – 0...14 on row B). Shipped with 1.6 A, 250V AC Slow Blow fuse suitable for the 1794-OA8 AC output module. Refer to individual installation instructions for fusing recommendations for other modules. Littlefuse PN23901.6 A-B PN94171304, SAN-O PNSD6-1.6A.

120V AC: Input/Output and Isolated Input/Output, 8 and 16 point

220V AC: Input/Output, 8 point

24V DC: Input/Output/Combination, Sink/Source, Protected, Electronically Fused, Diagnostic, 8, 16, and 32 point

48V DC: Sink Input/Source Output, 16 point

Relay: Sink/Source, 8 point

- Isolated inputs and outputs can be used in applications such as motor control centers where individual control transformers are used.
- Protected outputs (P) have electronic protection which acts to shut the output down in reaction to a short circuit, overload, or over-temperature condition.
Recovery from shutdown is automatic upon removal of the output fault. No fault status is provided to the processor.
- Electronic Fused (EP) module acts to open the output when a fault occurs. The fuse can be reset by operating a pushbutton, via software, or by cycling the input power. Fault status is provided to the processor.
- Diagnostic (D) modules detect, indicate, and report to the processor the following faults:
 - open input or output field devices or wiring
 - shorted output field devices
 - shorted input or output wiring
 - reverse polarity of user supply wiring
- Selectable input filter times from <1 to 60 ms.
- LED for each channel indicating status of:
 - corresponding input device
 - output signal

Digital I/O Module Summary

Catalog Number	Inputs	Outputs	Terminal Base Unit	Electrical Range	Module Type
AC Modules					
1794-IA8	8	—	1794-TBN, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBKD, 1794-TB3K, 1794-TB3SK, 1794-TBNK	120V AC	Nonisolated inputs
1794-IA8I					Isolated inputs
1794-IA16	16	—	1794-TB3, 1794-TB3S, 1794-TBN ⁽¹⁾ , 1794-TB3K, 1794-TB3SK, 1794-TBNK	240V AC	Nonisolated inputs
1794-IM8	8		1794-TBN, 1794-TBNK		
1794-IM16	16				
1794-OA8	—	8	1794-TBNF, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBN, 1794-TBKD, 1794-TBNFK, 1794-TB3K, 1794-TB3SK, 1794-TBNK	120V AC	Nonisolated inputs
1794-OA8I					Isolated outputs
1794-OA16			16	1794-TB3, 1794-TB2, 1794-TB3S, 1794-TB3K 1794-TB3SK, 1794-TBN ⁽¹⁾ , 1794-TBKD, 1794-TBNK	120V AC
1794-OM8		8	1794-TBNF, 1794-TBN, 1794-TBNFK, 1794-TBNK	240V AC	
1794-OM16		16			

Digital I/O Module Summary

Catalog Number	Inputs	Outputs	Terminal Base Unit	Electrical Range	Module Type		
DC Modules							
1794-IB8	8	—	1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	24V DC	Nonisolated inputs		
1794-IB16	16	—			1794-TB32, 1794-TB32S	Group isolated inputs Diagnostics	
1794-IB16D						Nonisolated inputs Extended temperatures	
1794-IB16XT			1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK			Nonisolated I/O Extended temperatures	
1794-IB10XOB6	10	6	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK		Nonisolated I/O Extended temperatures		
1794-IB10XOB6XT						Nonisolated I/O Protected outputs	
1794-IB16XOB16P	16	16	1794-TB32, 1794-TB32S		48V DC 5V DC 125V DC 24V DC	Nonisolated inputs	
1794-IC16		—	1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	1794-TB32, 1794-TB32S		Nonisolated inputs with groups	
1794-IG16							
1794-IH16							
1794-IV16							
1794-IB32							32
1794-IV32							
1794-OB8	—	8	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	24V DC	Nonisolated outputs		
1794-OB8EP			1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBN, 1794-TB3K, 1794-TB3SK, 1794-TBNK		Nonisolated, protected outputs		
1794-OB8EPXT					Nonisolated, protected outputs Extended temperatures		
1794-OB16	—	16	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	24V DC	Nonisolated outputs		
1794-OB16D			1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBN, 1794-TB3K, 1794-TB3SK, 1794-TBNK		Group isolated inputs Diagnostics		
1794-OB16P					Nonisolated, protected outputs Conformal coated		
1794-OB16PXT					Nonisolated, protected outputs Extended temperatures		
1794-OB32P		32	1794-TB32, 1794-TB32S		Nonisolated, protected outputs with groups		

Digital I/O Module Summary

Catalog Number	Inputs	Outputs	Terminal Base Unit	Electrical Range	Module Type
1794-OC16	—	16	1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	48V DC	Nonisolated outputs
1794-OG16				5V DC	
1794-OV16				24V DC	
1794-OV16P					Nonisolated, protected outputs
1794-OV32		32	1794-TB32, 1794-TB32S		Nonisolated inputs in groups

Relay Modules

1794-OW8	—	8	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBN, 1794-TBNF, 1794-TB3K, 1794-TB3SK, 1794-TBNK, 1794-TBNFK	24V DC	Isolated outputs Electromagnetic relays
1794-OW8XT					Isolated outputs Electromagnetic relays Extended temperatures

(1) Auxiliary terminal strips are required when using the 1794-TBN.

Select Input Filter Times for Digital Modules

Input filter times can be set to the following values (EtherNet/IP, ControlNet, and DeviceNet only).

Input Filter Times – AC Modules

Filter Times for Inputs	Maximum Times (ms)			
	OFF to ON		ON to OFF	
	1794-IA8, 1794-IA8I	1794-IA16, 1794-IM8	1794-IA8, 1794-IA8I	1794-IA16, 1794-IM8
Filter time 0 (default)	8.4 ⁽¹⁾	7.5	26.4 ⁽²⁾	26.5
1	8.6	8	26.6	27
2	9	9	27	28
3	10	10	28	29
4	12	12	30	31
5	16	16	34	35
6	24	24.5	42	44
7	40	42	58	60.5

(1) OFF to ON filter is 8 ms.

(2) ON to OFF filter is 26 ms.

Modules Specifications

The following section shows more detailed module specifications in comparative groups to facilitate your selection based on your requirements.

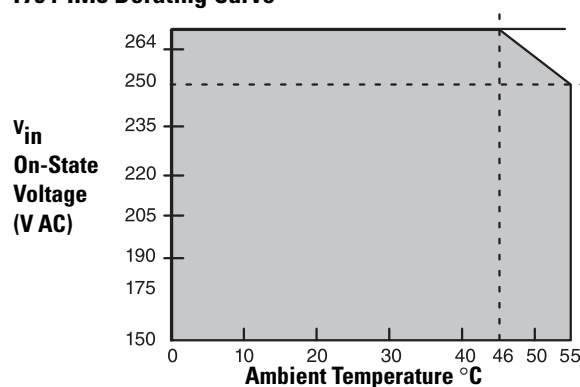
FLEX I/O Digital AC Input Modules

Digital AC Input Comparison

Specification	1794-IA8, 1794-IA8I	1794-IA16	1794-IM8	1794-IM16
Voltage, on-state input, nom	120V AC ⁽¹⁾		240V AC	
Terminal base unit	1794-TBN, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBKD, 1794-TB3K, 1794-TB3SK, 1794-TBNK	1794-TB3, 1794-TB3S, 1794-TBN ⁽²⁾ , 1794-TB3K, 1794-TB3SK, 1794-TBNK	1794-TBN, 1794-TBNK	
Current, on-state input, nom	12 mA @ 120V AC, 60 Hz		10 mA @ 240V AC, 60 Hz	11 mA @ 240V AC, 60 Hz
Input impedance, nom	10.6 k Ω	10 k Ω	22.3 k Ω	22.2 k Ω
Voltage, on-state input, min	65V AC	74V AC	159V AC	
Voltage, off-state input, max	43V AC	20V AC	40V AC	
Current, on-state input, min	7.1 mA	5.5 mA @ 74V AC, 47 Hz	5.3 mA @ 159V AC, 47 Hz	
Current, off-state input, max	2.9 mA		2.6 mA	
Power dissipation, max	4.5 W @ 132V AC	6.4 W @ 132V AC	4.7 W @ 264V AC	6 W @ 264V AC
Thermal dissipation, max	15.3 BTU/hr @ 132V AC	21.8 BTU/hr @ 132V AC	16.2 BTU/hr @ 264V AC	20.47 BTU/hr @ 264V AC
Dimensions (HxWxD)	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.) 94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in.) installed			
Isolation voltage	120V (continuous), Basic Insulation Type Type tested at 1250V AC (1240V for 1794-IA8I) for 60 s, between field side and system No isolation between individual channels Routine tested to 2150V DC for 1 s, between field side and system No isolation between individual channels	120V (continuous), Basic Insulation Type Type tested at 1264V AC for 60 s, between field side and system No isolation between individual channels Routine tested at 2150V DC for 1 s, between field side and system No isolation between individual channels	250V (continuous), Basic Insulation Type, field side to backplane No isolation between individual channels Type tested at 1250V AC for 60 s	

(1) 1794-IA8I – isolated voltage

(2) Auxiliary terminal strips are required when using the 1794-TBN.

1794-IM8 Derating Curve

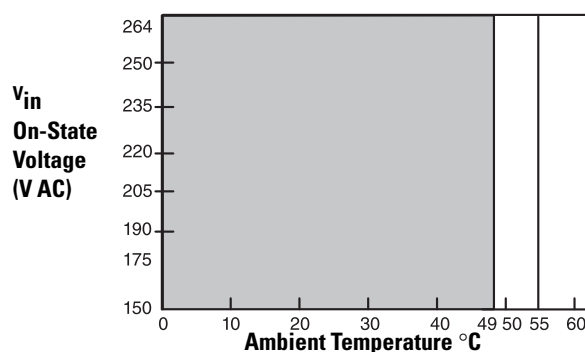
The area within the curve represents the safe operating range for the module under various conditions of user supplied 220V AC supply voltages and ambient temperatures.

 = All mounting positions (including normal horizontal, vertical, inverted horizontal) safe operating range.

FLEX I/O Digital AC Output Modules

Digital AC Output Comparison

Specification	1794-OA8, 1794-OA8I	1794-OA16	1794-OM8	1794-OM16
Voltage, on-state output, nom	120V AC ⁽²⁾		220V AC	240V AC
Terminal base unit	1794-TBN, 1794-TBNF, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBKD, 1794-TBNK, 1794-TBNFK, 1794-TB3K, 1794-TB3SK	1794-TBN ⁽⁴⁾ , 1794-TBNF, 1794-TB2, 1794-TB3S, 1794-TBKD, 1794-TBNK, 1794-TBNFK, 1794-TB3K, 1794-TB3SK	1794-TBN, 1794-TBNF, 1794-TBNK, 1794-TBNFK	
Current, on-state output, min	5 mA per output			
Current, on-state output, max	500 mA pre output @ 55 °C ⁽³⁾ 750 mA per output @ 35 °C 1.0 A on 4 nonadjacent outputs and 500 mA on the remaining 4 outputs @ 30 °C	500 mA per output @ 55 °C ⁽⁵⁾	500 mA @ 55 °C ⁽⁶⁾	
Current, on-state output, per module	4.0 A (8 outputs @ 500 mA)	4.0 A (16 outputs @ 250 mA)	4.0 A (8 outputs @ 500 mA) ⁽⁵⁾	4.0 A (16 outputs @ 250 mA)
Leakage current, off-state output, max	2.25 mA		2.5 mA	
Voltage drop, on-state output, max	1.0V @ 0.5 A	1.5V @ 0.5 A		
Output surge current, max	7 A for 45 ms, repeatable every 8 s	7 A for 40 ms, repeatable every 8 s		
Voltage, on-state output, min ⁽¹⁾	85V AC		159V AC	
Voltage, on-state output, nom	120V AC		240V AC	
Voltage, on-state output, max	132V AC		264V AC	
Power dissipation, max	4.1 W @ 0.5 A 6.3 W @ 0.75 A 6.3 W @ 1.0 A	4.7 W @ 0.5 A	5 W @ 0.5 A	6 W @ 264V AC
Thermal dissipation, max	14.0 BTU/hr @ 0.5 A 21.1 BTU/hr @ 0.75 A 21.4 BTU/hr @ 1.0 A	16.1 BTU/hr @ 0.5 A	17.1 BTU/hr @ 0.5 A	20.47 BTU/hr @ 264V AC

1794-OM8 Derating Curve

The area within the curve represents the safe operating range for the module under various conditions of user supplied 220V AC supply voltages and ambient temperatures.

□ = Normal mounting safe operating range ■ included

■ = Other mounting positions (including inverted horizontal, vertical) safe operating range

FLEX I/O Digital DC Input Modules

Digital DC Input Comparison

Specification	1794-IB8, 1794-IB16, 1794-IB16XT	1794-IV16	1794-IB32	1794-IV32	1794-IC16	1794-IG16	1794-IH16
Voltage, on-state input, min	10V DC, sinking	10V DC, sourcing	19.2V DC, sinking	19.2V DC, sourcing	30V DC, sinking	-0.2V DC, TTL	90V DC, sinking
Voltage, on-state input, nom	24V DC				48V DC	0V DC	125V DC
Voltage, on-state input, max	31.2V DC				60V DC	0.8V DC	146V DC
Voltage, off-state input, max	5V DC				10V DC	2.0...5.5V DC	20V DC
Terminal base unit	1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	1794-TB32, 1794-TB32S		1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK		
Current, on-state input, min	2.0 mA					—	1.0 mA
Current, on-state input, nom	8 mA @ 24V DC		4.1 mA @ 24V DC	4.1 mA	5 mA @ 48V DC	—	2 mA @ 125V DC
Current, on-state input, max	1794-IB16: 12 mA 1794-IB8, 1794-IV16: 11 mA 1794-IB16XT: 5.0 mA		6 mA	6 mA	11 mA	—	3 mA
Current, off-state input, max	1.5 mA					4.1 mA	0.8 mA
Input impedance, max	4.6 kΩ	4.7 kΩ	6 kΩ		11 kΩ	—	60 kΩ
Power dissipation, max	3.5 W @ 31.2V DC ⁽¹⁾	5.7 W @ 31.2V DC	6.0 W @ 31.2V DC		6.4 W @ 60V DC	1.4 W @ 5.5V DC	6 W @ 146V DC
Thermal dissipation, max	11.9 BTU/hr @ 31.2V DC ⁽²⁾	19.4 BTU/hr @ 31.2V DC	20.5 BTU/hr @ 31.2V DC		21.9 BTU/hr @ 60V DC	4.78 BTU/hr @ 5.5V DC	20.47 BTU/hr @ 146V DC

FLEX I/O Digital DC Output Modules

- 1794-OB8 and 1794-OB16 provide 16 sourcing 1/2 Amp outputs (8 for the 1794-OB8) over a wide 10...31.2V DC input voltage range.
- 1794-OV16 is the sinking version of the 1794-OB16.
- 1794-OV32 is the 32 output version of the 1794-OV16.
- 1794-OC16 is the 48V DC version of the 1794-OB16.
- These modules are not fused. External fusing is strongly recommended or use protected output modules. Module outputs are not fused. Fusing of outputs is recommended. If fusing is desired, you must provide external fusing.

For 1794-OB8, 1794-OB16, and 1794-OV16 use SAN-O MQ4-800 mA fuse.

For 1794-OC16 use 2 A, 150V AC MQ2 normal fuse.

Digital DC Output Comparison

Specification	1794-OB8	1794-OB16	1794-OV16	1794-OV32	1794-OG16	1794-OC16
Voltage, on-state output, nom	24V DC, sourcing		24V DC, sinking		0V DC	48V DC, sourcing
Voltage, on-state output, min	10V DC				0V DC	30V DC
Voltage, on-state input, max	31.2V DC				0.4V DC	60V DC @ 45 °C 55V DC @ 55 °C
Voltage drop, on-state output, max	0.5V DC		0.2V DC		—	1.0V DC @ 0.5 A
Terminal base unit	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK		1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK			1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK
Current, on-state output, min	1.0 mA per channel				0.15 mA per channel	2.0 mA per channel
Current, off-state output, max	500 mA per channel 4 A per module	500 mA per channel 8 A per module		500 mA	24.0 mA per channel	500 mA per channel 8 A per module
Leakage current, off-state output, max	0.5 mA				1 mA	1.0 mA
Output surge current, max	2 A for 50 ms, repeatable every 2 s				—	4 A for 10 ms, repeatable every 2 s
Output delay time, OFF to ON, max	0.5 ms				0.25 ms	0.5 ms ⁽¹⁾
Output delay time, ON to OFF, max	1.0 ms				0.5 ms	1.0 ms @ 25 °C 2.0 ms @ 55 °C ⁽²⁾
External DC supply voltage range	10...31.2V DC (5% ripple)				4.5...5.5V DC (includes 50 mV p-p ripple)	30...60V DC (5% ripple)
External DC supply current range	10...35 mA	20...65 mA		50 mA	100 mA @ 5V DC	13...27 mA
Power dissipation, max	3.3 W @ 31.2V DC	5.3 W @ 31.2V DC	4.2 W @ 31.2V DC	4.4 W @ 31.2V DC	0.8 W @ 5.5V DC	3.7 W @ 60V DC

Digital DC Output Comparison

Specification	1794-OB8	1794-OB16	1794-OV16	1794-OV32	1794-OG16	1794-OC16
Thermal dissipation, max	11.2 BTU/hr @31.2V DC	18.1 BTU/hr @31.2V DC	14.3 BTU/hr @ 31.2V DC	8.53 BTU/hr @ 31.2V DC	3.41 BTU/hr @ 5.5V DC	12.6 BTU/hr @ 60V DC
Dimensions (HxWxD), approx	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.) 94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in.) installed					
Isolation voltage	50V continuous, I/O to system Tested to 850V DC for 1 s, I/O to system No isolation between individual channels		50V continuous Tested 1770V DC for 60 s, I/O to system No isolation between individual channels	50V (continuous), Basic Insulation Type, between field side and system Type tested at 707V DC for 60 s, between field side and system No isolation between individual channels		75V continuous, I/O to system Tested to 1900V DC for 1 s, I/O to system (No isolation between individual channels)

(1) OFF to ON delay is the time from a valid output ON signal to output energization. ON to OFF delay is the time from a valid output OFF signal to output de-energization.

FLEX I/O Digital DC Protected Output Modules

- 1794-OB16P provides 16 sourcing 1/2 Amp outputs self-protected against shorts, overloads, and over temperature. The faulted output will automatically return when the fault is removed. No feedback to the processor is provided.
- 1794-OB16PXT is the extended temperature version of the 1794-OB16P module. The module is conformal coated.
- 1794-OB8EP provides 8 sourcing 2 Amp outputs with electronic fuse type of overload protection, which opens when overloaded. The fuse can be 'reset' several ways. Fault status is provided to the processor.
- 1794-OB8EPXT is the extended temperature version of the 1794-OB8EP module. The module is conformal coated.
- 1794-OB32P provides 32 self-protected sourcing 1/2 Amp outputs in 2 groups of 16 outputs. Separate voltage sources can be used with each group.
- 1794-OV16P is the sinking version of the 1794-OB16P.

Digital DC Protected Output Comparison

Specification	1794-OB16P, 1794-OB16PXT	1794-OB8EP, 1794-OB8EPXT	1794-OB32P	1794-OV16P
Voltage, on-state output, nom	24V DC, sourcing			24V DC, sinking
Voltage, on-state output, min	10V DC	19V.2 DC	10V DC	
Voltage, on-state output, max	31.2V DC ⁽¹⁾	31.2V DC		
Voltage drop, on-state output, max	0.5V DC	0.2V DC	0.5V DC	0.2V DC
Terminal base unit	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBN, 1794-TB3K, 1794-TB3SK, 1794-TBNK	1794-TB32, 1794-TB32S	1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK
Current on-state output, min	1.0 mA per channel			

Digital DC Diagnostic Input Module

Specification	1794-IB16D
Current, sensor source, max	50 mA
Dimensions (HxWxD), approx	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.) 94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in.) installed
Isolation voltage	50V continuous, I/O to system Tested to 2121V DC for 1 s, I/O to system No isolation between individual channels

(1) See [1794-IB16D Derating Curves](#).

(2) Module must detect if the reverse polarity external power supply voltage is greater than the value.

Digital DC Diagnostic Output Module

Specification	1794-OB16D
Voltage, on-state output, min	10V DC, sinking
Voltage, on-state output, max	31.2 DC
Voltage drop, on-state output, max	0.5V DC @ 0.5 A
Terminal base unit	1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK
Current, on-state output, min	2.0 mA per channel
Current, on-state output, max	500 mA per channel 8 A per module
Leakage current, off-state output, max	0.5 mA
Output surge current, max	2 A for 50 ms, repeatable every 2 s
External DC supply voltage range	10...31.2V DC (5% AC ripple)
External DC supply current range	56...78 mA
Power dissipation, max	4.8 W @ 31.2V DC
Thermal dissipation, max	16.4 BTU/hr @ 31.2V DC
Short circuit protection	Thermal shutdown (auto reset) ⁽¹⁾
Open wire detection, off-state leakage current	0.1 mA ⁽²⁾
Detect reverse polarity voltage, min	10V ⁽³⁾
Current, sensor source, max	Yes
Dimensions (HxWxD), approx	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.) 94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in.) installed
Isolation voltage	50V continuous, I/O to system Tested to 2121V DC for 1 s, I/O to system No isolation between individual channels

(1) Short circuit protection detection condition: when external power active, output signal active, and output port voltage less than 2V.

(2) When external power active and output signal inactive

(3) Module must detect if the reverse polarity external power supply voltage is greater than the value.

FLEX I/O Digital DC Combination Modules

The 1794-IB16XOB16P module has outputs that are self-protected against shorts, overload, and over temperature similar to the 1794-OB16P module.

The 1794-IB10XOB6 module requires the use of external fusing for individual outputs.

The 1794-IB10XOB6XT module is the extended temperature version of the 1794-IB10XOB6 module.

Digital DC Combination Modules

Specification	1794-IB10XOB6, 1794-IB10XOB6XT ⁽²⁾	1794-IB16XOB16P ⁽³⁾
Terminal base unit	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	1794-TB32, 1794-TB32S
Isolation voltage	50V (continuous), Basic Insulation Type Type tested at 1250V AC for 60 s, between field side and system Routine tested at 2121V DC for 1 s, between field side and system No isolation between individual channels	50V (continuous), Basic Insulation Type Tested at 2121V DC for 1 s, system to I/O and inputs to outputs
Power dissipation, max	6.0 W @ 31.2V DC	7.0 W @ 31.2V DC
Thermal dissipation, max	20.3 BTU/hr @ 31.2V DC	23.9 BTU/hr @ 31.2V DC
Number of inputs	10	16
Voltage, on-state input, min	10V DC	
Voltage, on-state input, nom	24V DC	
Voltage, on-state input, max	31.2V DC	
Current, on-state input, min	2.0 mA	
Current, on-state input, nom	8.0 mA @ 24V DC	
Current, on-state input, max	11.0 mA	12.1 mA
Voltage, off-state input, max	5V DC	
Current, off-state input, max	1.5 mA	
Input impedance, max	4.8 k Ω	2.5 k Ω
Number of outputs	6	16
Voltage, on-state output, min	10V DC	
Voltage, on-state output, nom	24V DC	
Voltage, on-state output, max	31.2V DC	
Voltage drop, on-state output, max	1V DC @ 2 A 0.5V DC @ 1 A	0.5V DC @ 0.5 A
Current, on-state output, min	1.0 mA per channel	
Current, on-state output, max	2.0 A per channel 10 A per module	0.5 A per channel 8 A per module

The 1794-OW8XT module is the extended temperature version of the 1794-OW8 module. The module is conformal coated.

Digital Contact Output Modules

Specification	1794-OW8, 1794-OW8XT
Number of outputs	8
Terminal base unit	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBN, 1794-TBNF, 1794-TB3K, 1794-TB3SK, 1794-TBNKF
External DC supply voltage range	19.2...31.2V DC (includes 5% AC ripple)
External DC supply current, nom	125 mA
Leakage current, off-state output, max	1 mA @ 240V AC (through a snubber)
Output delay time, OFF to ON, max	10 ms ⁽¹⁾
Output delay time, ON to OFF, max	10 ms ⁽²⁾
Relay output current rating, resistive	2.0 A @ 5...30V DC 0.22 A @ 125V DC 2.0 A @ 125V AC 2.0 A @ 250V AC
Relay output current rating, inductive	0.98 A steady state @ 5...30V DC, L/R = 7ms 0.5 A steady state @ 48V DC, L/R = 7ms 0.22 A steady state @ 125V DC, L/R = 7ms 2.0 A steady state, 15 A make @ 120V AC, PF = cos θ = 0.35 2.0 A steady state, 7.5A make @ 240V AC, PF = cos θ = 0.35
Contact resistance, initial	30 m Ω
Switching frequency	0.3 Hz (1 operation every 3 s)
Bounce time, mean	1.2 ms
Contact load, min	100 μ A @ 100 mV DC
Mechanical life	100,000 operations at rated loads
Fusing	3.0 A, 250V AC slow blow fuse (Littelfuse part number 239003).
Power dissipation, max	5.5 W @ 31.2V DC
Thermal dissipation, max	18.8 BTU/hr @ 31.2V DC
Dimensions (HxWxD), approx	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.) 94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in.) installed
Isolation voltage	250V (continuous), Basic Insulation Type, relay to relay, relay to backplane, and relay to power 50V (continuous), Basic Insulation Type, power to backplane Type tested at 1500V AC for 60 s, relay to relay, all combinations. Type tested at 3250V DC for 60 s, relay to backplane and relay to power Type tested at 720V DC for 60 s, power to backplane.

(1) time from valid output on signal to relay energization by module.

(2) time from valid output off signal to relay deenergization by module.

Analog I/O Module Summary

Catalog Number	Inputs	Outputs	Terminal Base Unit	Module Type
1794-IE8	8	—	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TB3K, 1794-TB3SK, 1794-TB3TK, 1794-TB3TSK	Selectable, non-isolated inputs
1794-IE8XT				Selectable, non-isolated inputs, Extended temperatures
1794-IE8H			1794-TB3G, 1794-TB3GS, 1794-TB3GK, 1794-TB3GSK	Single-ended, non-isolated, HART-enabled inputs
1794-IE12	12			Single-ended inputs
1794-IF4I	4	—	1794-TBN, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBNK, 1794-TB3K, 1794-TB3SK, 1794-TB3TK, 1794-TB3TSK	Single-ended, isolated inputs
1794-IF4IXT				Single-ended inputs, Isolated, Extended temperatures
1794-IF8IH	8	—	1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	Single-ended, isolated, HART-enabled inputs
1794-IR8			1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBKD, 1794-TB3K, 1794-TB3SK, 1794-TB3TK, 1794-TB3TSK	Non-isolated relay inputs
1794-IRT8			1794-TB3G, 1794-TB3GS, 1794-TB3GK, 1794-TB3GSK	Non-isolated RTD/Thermocouple inputs
1794-IRT8XT				Non-isolated RTD/Thermocouple inputs, Extended temperatures
1794-IT8			1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TB3K, 1794-TB3SK, 1794-TB3TK, 1794-TB3TSK ⁽³⁾	Non-isolated, Thermocouple, Millivolt inputs
1794-IE4XOE2	4	2		Single-ended, non-isolated I/O
1794-IE4XOE2XT				Single-ended, non-isolated I/O, Extended temperatures
1794-IE8XOE4	8	4	1794-TB3G, 1794-TB3GS, 1794-TB3GK, 1794-TB3GSK	Single-ended, non-isolated I/O
1794-IF2XOF2I	2	2	1794-TBN, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBNK, 1794-TB3K, 1794-TB3SK, 1794-TB3TK, 1794-TB3TSK	Single-ended, non-isolated I/O, Extended temperatures
1794-IF2XOF2IXT				
1794-OE4	—	4		Selectable, non-isolated outputs
1794-OE4XT				Selectable, non-isolated outputs, Extended temperatures
1794-OE8H ⁽¹⁾		8	1794-TB3G, 1794-TB3GS, 1794-TB3GK, 1794-TB3GSK	Single-ended, non-isolated, HART-enabled outputs
1794-OE12 ⁽²⁾		12		Single-ended, non-isolated outputs
1794-OF4I		4	1794-TBN, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, 1794-TB3TS, 1794-TBNK, 1794-TB3K, 1794-TB3SK, 1794-TB3TK, 1794-TB3TSK	Source isolated outputs
1794-OF4IXT				Source isolated outputs, Extended temperatures
1794-OF8IH		8	1794-TB3, 1794-TB3S, 1794-TB3K, 1794-TB3SK	Single-ended, isolated, HART-enabled outputs

(1) Do not exceed length of 30 m (100 ft) for signal cabling.

(2) Not supported by 1747-SN or 1747-BSN for use on RIO with SLC controllers.

(3) 1794-TB2, 1794-TB3, 1794-TB3S for mV inputs only.

4 Input / 2 Output Analog Combination Modules

Specification	1794-IE4XOE2, 1794-IE4XOE2XT
Dimensions (HxWxD), approx	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in.) 94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in.) installed
Temperature, operating	1794-IE4XOE2: 0...55 °C (32...131 °F) 1794-IE4XOE2XT: -20...70 °C (-4...185 °F)

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

1794-IF2XOF2I and 1794-IF2XOF2IXT 2 Input/2 Output Isolated Analog Combination Module

The 1794-IF2XOF2I is a combination module with 2 inputs and 2 outputs with isolated, individually-configurable channels. Inputs accept signals from a variety of input sensors (2-, 3-, and 4-wire) in the range of $\pm 10\text{V}$ or $\pm 20\text{ mA}$. Outputs produce signals in the range of $\pm 10\text{V}$ or $0...20\text{ mA}$.

The 1794-IF2XOF2IXT is the extended temperature version of the 1794-IF2XOF2I module.



ATTENTION: Only connect either a voltage input or a current input per channel, not both.

2 Input/2 Output Isolated Combination Module

Specification	1794-IF2XOF2I, 1794-IF2XOF2IXT
Calibration	Factory calibration ⁽²⁾
Input conversion type	Sigma Delta
Input conversion rate	2.5/5.0/7.5 ms all channels
Input resolution	16 bit – unipolar 15 bit + sign – bipolar 0.156 mV/cnt – unipolar 0.313 mV/cnt – bipolar 0.320 μA /cnt – unipolar 0.640 μA /cnt – bipolar
Isolation voltage	120V continuous (when used with 1794-TB3, 1794-TB3S, 1794-TB2, 1794-TB3T, or 1794-TB3TS) 250V continuous (when used with 1794-TBN) Tested at 1500V AC for 60 s and 2550V DC for 1 s, channel to channel, I/O to system
Data format	16 bits, 2's complement 2's complement percent binary offset binary
Step response to 63% of FS, input	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

Analog 12 Output Module

Specification	1794-0E12
Power dissipation, max	4.0 W @ 31.2V DC 4.3 W @ 24V DC 4.0 W @ 10.0V DC
Thermal dissipation, max	14.7 BTU/hr @ 24V DC
Wire size	0.34... 2.5 mm ² (22...12 AWG) solid or stranded shielded copper wire rated at 75 °C (167 °F) or greater 1.2 mm (3/64 in.) insulation max
Wire category	2 – on signal ports 2 – on power ports ⁽¹⁾
Dimensions (HxWxD), approx	46 x 94 x 53 mm (1.8 x 3.7 x 3.1 in.) 94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in.) installed

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

1794-OF4I and 1794-OF4IXT Isolated Analog 4 Output Module

The 1794-OF4I modules provides 4 isolated outputs for 2-, 3-, and 4-wire output devices that use voltage in the range of $\pm 10V$ or 0...20 mA current.

1794-OF4IXT is the extended temperature version of the 1794-OF4I module.

Isolated Analog 4 Output Module

Specification	1794-OF4I, 1794-OF4IXT
Output resolution	15 bit + sign 0.656 μA /cnt 0.320 mV/cnt
Data format	2's complement 2's complement percent binary offset binary
Output conversion type	Digital to analog converter
Output conversion rate	2.5/5.0 ms
Step response to 63% of FS, output	Current or voltage output: <25 μs
Current load on voltage output, max	3 mA
Output current, resistive load	0...750 Ω
Accuracy	Current input: 0.1% Full Scale @ 25 °C (77 °F) Voltage input: 0.1% Full Scale @ 25 °C (77 °F) ⁽¹⁾
Accuracy drift w/temp	Current input: 0.0025% Full Scale /°C Voltage input: 0.0012% Full Scale/°C
Calibration	Factory calibrated
Isolation voltage	120V (continuous), when used with 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TB3T, or 1794-TB3TS 250V (continuous), when used with 1794-TBN Type tested at 1500V AC for 60 s, and 2550V DC for 1 s, channel to channel, I/O to system