

# 1794 FLEX I/O

## FLEX I/O Modules

FLEX I/O offers all the functions of larger rack-based I/O without the space requirements. Its cost effectiveness, flexibility, modularity, and reliability have made it the most popular distributed I/O platform with over 4 million modules sold.

FLEX I/O helps eliminate multiple long wiring runs, reduces terminations per point, decreases engineering and installation costs and time, and substantially reduces downtime. It complements all processor platforms from Rockwell Automation for a distributed I/O solution.

Your FLEX I/O system can communicate on EtherNet/IP, ControlNet, DeviceNet, and PROFIBUS DP. Independently select the I/O, termination style, and network to meet your application needs. Adapters and other components are available for adding to your system as your requirements change.



Conformally coated, extreme environment FLEX I/O products help to reduce panel costs and the need for additional heating/cooling equipment, resulting in lower installation and maintenance costs.

## Benefits

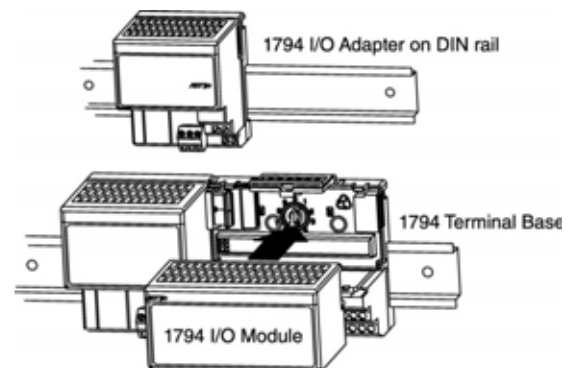
- **Reduced Space:** Wire direct from sensor to terminal base and eliminate terminal strip
- **Functionality:** 4- through 32-point modules offer functions of larger rack-based I/O
- **Increased Productivity:** Easy configuration and setup of I/O modules using wizards speeds engineering and installation
- **Reduced Downtime:** Removal and Insertion Under Power (RIUP) and diagnostics
- **Exceptional Choices:** Over 90 catalog numbers and a breadth of specialty modules meet the needs of a wide variety of applications
- **Operation in Harsh Environments:** Conformal coated and extreme environment rated modules.
- **Network Flexibility:** Communicates on EtherNet/IP, ControlNet, DeviceNet, and PROFIBUS DP
- **Improved Plant Operations:** HART analog modules pass through HART data to asset management software or controller for improved plant operations

## Product Design

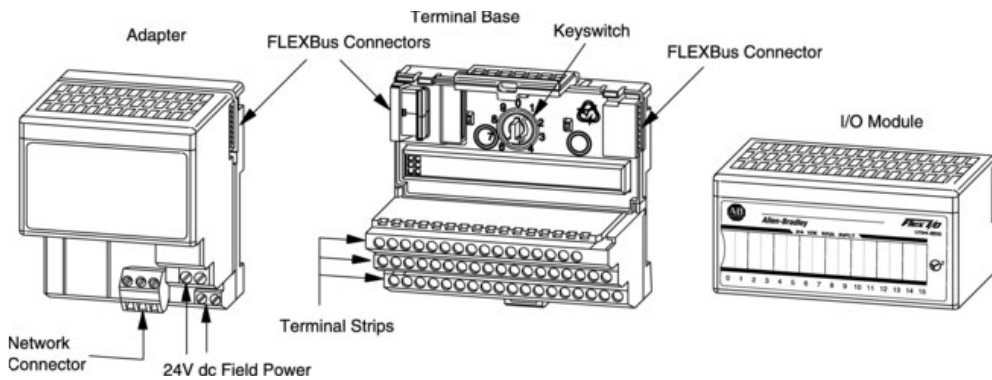
FLEX I/O modules offer 4 through 32 I/O each. You can plug together a maximum of eight I/O modules into a FLEX I/O assembly, for a maximum of 256 I/O per assembly. The I/O modules are interfaced to the I/O link through an I/O adapter module with a built-in 24V DC input power supply. The I/O modules receive power from the adapter/power-supply through the backplane. Two 120/230V AC-to-24V DC power supplies are also available for powering the adapter/power-supply.

The backplane is formed by modular terminal bases that also provide terminal connection points for I/O wiring. I/O circuitry is packaged in separate I/O modules. Each I/O module plugs into an individual terminal base. The I/O adapter module plugs into the end terminal base. You snap the I/O adapter and the terminal bases onto a DIN rail and plug them together. FLEX I/O assemblies can be mounted horizontally or vertically.

The FLEX I/O family consists of modular components that snap together and mount onto a DIN rail to form the FLEX I/O assembly:



- **I/O Adapter.** A FLEX I/O adapter module provides an interface for communication between the I/O modules and a scanner port across an I/O link. Each terminal base provides backplane connections between the I/O adapter module and I/O modules.
- **I/O Module.** FLEX I/O modules plug into a terminal base, and connect to the I/O bus and field devices. Removal and Insertion Under Power (RIUP) makes it possible to replace a failed module without disturbing the field wiring, other I/O modules, or system power.
- **Terminal Base.** Each 1794 FLEX I/O module requires a terminal base that snaps onto the DIN rail to the right of the I/O adapter. The terminal bases provide terminal connection points for I/O wiring and plug together to form the backplane. Available with screw or spring terminations.
- **Accessories.** Choose products such as extender cables or the panel mount kit to provide added application flexibility.
- **Power Supply.** Two 120V-AC-to-24V-DC power supplies are available for powering the adapter/power-supply.



### Extreme Environment Distributed I/O

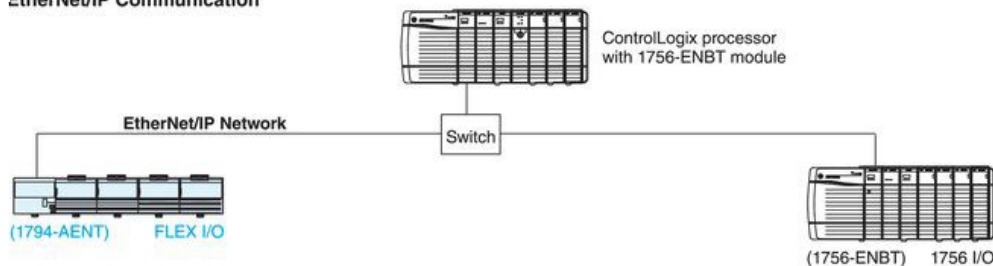
Rockwell Automation extreme environment FLEX I/O operates over a broad temperature spectrum, -25 °C to 70 °C. It is ANSI/ISA2, IEC and EMC-compliant, making it ideal for caustic or extreme environment applications.

### Communication

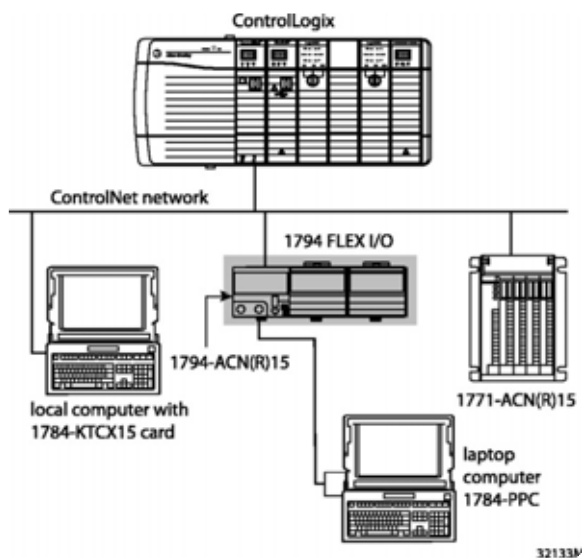
A FLEX I/O adapter module interfaces FLEX I/O modules to an I/O scanner port across a communication network. The FLEX I/O adapter module contains a built-in power supply that converts 24V DC to 5V DC for the backplane to power the FLEX I/O modules. FLEX I/O adapter modules are available for EtherNet/IP (single- or dual-port), ControlNet (single media or redundant), DeviceNet, and PROFIBUS DP.

### Typical Configurations

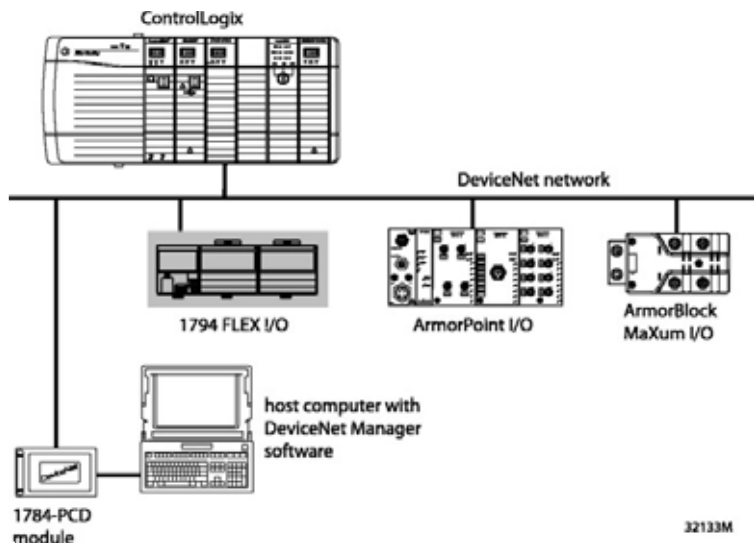
#### EtherNet/IP Communication



#### ControlNet Communication



#### DeviceNet Communication



## Specifications

### General Specifications

Enclosure Type Rating	None (open-style)
Mounting Type	DIN-rail, Panel
Operating Temperature	0...55 °C (32...131 °F) -25/-20...70 °C (-13...158 °F)‡
Nonoperating Temperature	-40...85 °C (-40...185 °F)
Relative Humidity	5...95% noncondensing
Operating Shock*	30 g
Nonoperating Shock*	50 g
Vibration*	5 g at 10...500 Hz

\* To maintain these specifications, you must use DIN rail locks.  
‡ XT (extreme environment) models.

### Certifications\*

UL Listed Industrial Control Equipment
UL Listed for Class I, Division 2 Groups A, B, C, D Hazardous Locations
CE Marked for all applicable directives
CE / ATEX
CSA Certified Process Control Equipment for Class I, Division 2 Group A, B, C, D Hazardous Locations
C-Tick Marked for all applicable acts
Marine Certification
SIL 2 Certification
ODVA

\* When product is marked. See the Product Certification link at [www.ab.com](http://www.ab.com) for declarations of Conformity, Certificates, and other certification details.

### Dimensions and Weights

Cat. No.	Dimensions (HxWxD), Approx.	Weight
I/O Modules	46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in)	0.1 kg (0.3 lb)
I/O Adapters§	87 x 94 x 92 mm (3.4 x 3.7 x 3.6 in)	0.2 kg (0.4 lb)*
Terminal Bases	94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in)‡	0.2 kg (0.5 lb)
Extender Cables		
1794-CE1	0.3 m (1 ft)	0.2 kg (0.5 lb)
1794-CE3	0.9 m (3 ft)	0.2 kg (0.5 lb)
Power Supplies		
1794-PS13	87 x 68 x 69 mm (3.4 x 2.7 x 2.7 in)	0.2 kg (0.5 lb)
1794-PS3	87 x 94 x 69 mm (3.4 x 3.7 x 2.7 in)	0.4 kg (0.8 lb)

\* 1794-FLA: 0.3 kg (0.6 lb).

‡ With module installed in base.

§ 1794-AENT and 1794-ACNR adapters have the following dimensions: 87 x 94 x 69 mm (3.4 x 3.7 x 2.7 in.).  
1794-ACN and 1794-APBDPV1 adapters have the following dimensions: 87 x 68 x 69 mm (3.4 x 2.7 x 2.7 in.).

## Conformal Coated Products

FLEX I/O conformal coated products meet or exceed the following standards:

ANSI / ISA-S71.04-1985, Class G1, G2, and G3 environments
CEI IEC 6065A-4 Class 1 and 2 environments
UL 746E

## I/O Communication Adapters

A FLEX I/O adapter module interfaces FLEX I/O modules to an I/O scanner port across a communication network. The FLEX I/O adapter module contains a built-in power supply that converts 24V DC to 5V DC for the backplane to power the FLEX I/O modules. One adapter communicates with up to eight I/O modules, allowing connection to 256 digital input/output points, or 64 analog input points/32 analog output points, or a mix to meet your needs. Redundant media versions of standard modules have the letter R in the catalog number. Extreme environment versions have the letters XT in the last position of the catalog number, before the series designation. Conformal coated versions of have the letter K in this position.

### EtherNet, ControlNet, and DeviceNet Adapters

	1794-AENT	1794-AENTR §	1794-AENTRXT § ★	1794-ACN15, 1794-ACN15K † ,	1794-ACNR15 § , 1794-ACNR15XT § ★	1794-ADN, 1794-ADNK †
Network	EtherNet/IP	Dual-Port EtherNet/IP	Dual-Port EtherNet/IP	ControlNet		DeviceNet
I/O Module Capacity	8					
Communication Rate	10/100 Mbps		10/100 Mbps	5 Mbps		125 Kbps 250 Kbps 500 Kbps
Thermal Dissipation, Max.	24.9 BTU/hr at 24.0V DC	24.2 BTU/hr at 19.2V DC	20.8 BTU/hr at 24V DC	15.7 BTU/hr at 19.2V DC		26 BTU/hr at 19.2V DC
Power Dissipation, Max.	7.3 W at 19.2V DC	7.1 W at 19.2V DC	6.1 W at 19.2V DC	3.4 W at 19.2V DC		7.6 W at 19.2V DC
Input current at 24V DC	440 mA	400 mA	400 mA	400 mA		400 mA
Power Supply Input Voltage, Nom.	24V DC					
Input Voltage Range	19.2...31.2V DC (includes 5% AC ripple)					

§ Redundant media versions of EtherNet/IP and ControlNet adaptors.

★ XT = Extreme environment version.

† K = Conformal Coated.

### Profibus DP Adapter

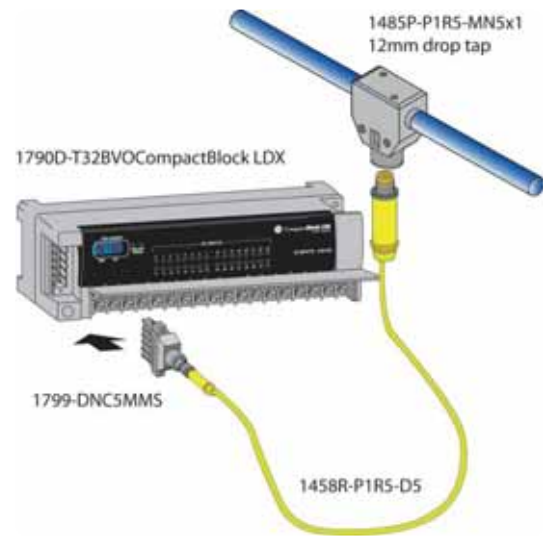
	1794-APBDPV1
Network	PROFIBUS DP
I/O Module Capacity	8
Communication Rate	All rates up to 12.0 Mbps
Thermal Dissipation, Max.	14 BTU/hr at 19.2V DC
Power Dissipation, Max.	4.2 W at 19.2V DC
Input Current at 24V DC	309 mA
Power Supply Input Voltage, Nom.	24V DC
Operating Voltage Range	19.2...31.2V DC (includes 5% AC ripple)

### DeviceNet Straight 5-pin Open Plug to 5-pin Micro Male Connector

The DeviceNet straight 5-pin open plug to 5-pin micro male connector can be used in place of the 5-position open style plugs for DeviceNet, making it easier to connect I/O modules to the network, as well as reducing potential for miswiring and saving wiring time.

The DeviceNet straight 5-pin open plug to 5-pin micro male connector is compatible with:

- 1790 CompactBlock LDX I/O
- 1794-ADN FLEX I/O DeviceNet adapter
- 1799 Embedded I/O



Cat. No.	Description
1799-DNC5MMS	Female Open-style DeviceNet Y Adapter (Qty. 5)
1799-DNC100MMS	DeviceNet straight 5-pin open plug to 5-pin micro male connector (Qty. 100)

## Digital I/O Modules

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 power, enabling you to change modules without disturbing field wiring, other I/O modules, or system power. This eliminates costly downtime and the inefficiencies of restarting a system.

### Features

- Modules are available in densities ranging from 8 to 32 points.
- Digital I/O modules cover a wide electrical range:
  - 120V AC: input, output and isolated input, output modules; 8 and 16 point
  - 220V AC: input and output modules; 8 and 16 point
  - 5V DC: TTL input and output modules, 16 point
  - 24V DC: input, output, and combination modules; sink or source; protected; electronically fused; diagnostic; 8, 16, and 32 point
  - 48V DC: sink input, source output modules; 16 point
  - 125V DC: sink input module; 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 (P) outputs have electronic protection, which acts to shut the module 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 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...60 ms.
- LED for each channel indicating status of:
  - corresponding input device
  - output signal
- Extreme environment (XT) versions of standard modules.

## FLEX Digital AC Input Modules

Cat. No.	Number of Inputs	Voltage, On-State Input, Nom.	Voltage, On-State Input, Min.	Voltage, Off-State Input, Max.	Current, Off-State Input, Max.	Default Input Filter Time	Power Dissipation, Max.	Terminal Base Unit
1794-IA8	8	120V AC	65V AC	43V AC	2.9 mA	Off to On: 8.4 ms On to Off: 26.4 ms	4.5 W at 132V AC	1794-TBN, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBKD
1794-IA8I	8 Isolated							
1794-IA16	16	120V AC	74V AC	20V AC	2.9 mA	Off to On: 7.5 ms On to Off: 26.5 ms	6.4 W at 132V AC	1794-TB3, 1794-TB3S, 1794-TBN*
1794-IM8	8	220V AC	159V AC	40V AC	2.6 mA		4.7 W at 264V AC	1794-TBN
1794-IM16	16	240V AC	159V AC	40V AC	2.6 mA		6 W at 264V AC	1794-TBN

\* Auxiliary terminal strips are required when using the 1794-TBN for the 1794-IA16.

## FLEX Digital AC Output Modules

Cat. No.	Number of Outputs	Voltage, On-State Output, Nom.♣	Voltage Range, On-State Output♣	Current per Output, Max.	Current per Module, Max.	Power Dissipation, Max.	Terminal Base Unit
1794-OA8	8	120V AC	85V AC...132V AC	500 mA at 55 °CΔ (5 mA min)	4.0 A (8 outputs at 500 mA)	4.1 W at 0.5 A 6.3 W at 0.75 A 6.3 W at 1.0 A	1794-TBNF, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBN, 1794-TBKD
1794-OA16	16	120V AC	85V AC...132V AC	500 mA at 55 °C (5 mA min)	4.0 A (16 outputs at 250 mA)	4.7 W at 0.5 A	1794-TB3, 1794-TB2, 1794-TB3S, 1794-TBN, 1794-TBKD*
1794-OM8	8	220V AC	159V AC...264V AC	500 mA at 55 °C 500 mA @ 55 °C (5 mA min)	4.0 A (8 outputs at 500 mA)	5 W at 0.5 A	1794-TBNF, 1794-TBN
1794-OM16	16	240V AC	159V AC...264V AC	500 mA at 55 °C♣ (50 mA min)	4.0 A	6 W at 264V AC	1794-TBNF, 1794-TBN

- ♣ The external AC supply voltage must be capable of a 50 A surge for 1/2 cycle at power-up.  
Δ 750 mA per output @ 35 °C. 1.0 A on 4 nonadjacent outputs and 500 mA on the remaining 4 outputs @ 30 °C.  
♣ If using 500 mA outputs, alternate wiring so that no two 500 mA outputs are next to each other.  
\* Auxiliary terminal strips are required when using the 1794-TBN for the 1794-OA16.

## FLEX Digital DC Input Modules

Cat. No.♣	Number of Inputs	Voltage, On-State Input, Nom.	Voltage Range, On-State Input	Current, Off-State Input	Power Dissipation, Max.	Terminal Base Unit
1794-IG16	16 TTL	0V	-0.2V DC...0.8V DC	4.1 mA at 5V DC (3.7 mA nom) max	1.4 W at 5.5V DC	1794-TB3, 1794-TB3S
1794-IB8	8 current sinking	24V DC	10V DC...31.2V DC	1.5 mA min	3.5 W at 31.2V DC	1794-TB3, 1794-TB3S
1794-IB16	16 current sinking	24V DC	10V DC...31.2V DC	1.5 mA min	6.1 W at 31.2V DC	1794-TB3, 1794-TB3S
1794-IB16XT					2 W at 31.2V DC	1794-TB3, -TB3S, TB3SK
1794-IB16D			10V DC...31.2V DC		8.5 W at 31.2V DC	1794-TB32, 1794-TB32S
1794-IV16	16 current sourcing	24V DC	10V DC...31.2V DC	1.5 mA min	5.7 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBK
1794-IB32	32 current sinking (2 groups of 16)	24V DC	19.2V DC...31.2V DC	1.5 mA min	6.0 W at 31.2V DC	1794-TB32, 1794-TB32S
1794-IV32	32 current sourcing (2 groups of 16)	24V DC	19.2V DC...31.2V DC	1.5 mA min	6.0 W at 31.2V DC	1794-TB32, 1794-TB32S
1794-IC16	16 current sinking	48V DC	30V DC...60V DC	1.5 mA min	6.4 W at 60V DC	1794-TB3, 1794-TB3S
1794-IH16	16 current sinking	125V DC	90V DC...146V DC	0.8 mA min	6 W at 146V DC	1794-TB3, 1794-TB3S

- ♣ Catalog numbers ending with: (D) = includes diagnostics, (XT) = extreme environment.

## FLEX Digital DC Output Modules

Cat. No.♣	Number of Outputs	Voltage, On-State Output, Nom.	Voltage Range, On-State Output	Current, On-State Output, Max.	Output Delay Time, Max.	Power Dissipation, Max.	Terminal Base Unit
1794-OG16	16 TTL	0	0V DC...0.4V DC	24.0 mA per channel	Off to On: 0.25 ms On to Off: 0.5 ms	0.8 W at 5.5V DC	1794-TB3, 1794-TB3S
1794-OB8	8 current sourcing	24V DC	10V DC...31.2V DC	500 mA per channel, 4.0 A per module	Off to On: 0.5 ms On to Off: 1.0 ms	3.3 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBKD
1794-OB8EP	8 current sourcing	24V DC	19.2V DC...31.2V DC	2.0 A per channel, 10.0 A per module	Off to On: 0.1 ms On to Off: 0.1 ms	5.5 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBN, 1794-TBKD
1794-OB8EPXT				2.0 A per channel	Off to On: 0.5 ms On to Off: 1.0 ms	5 W at 31.2V DC	1794-TB2, -TB3, -TB3S, -TBN
1794-OB16	16 current sourcing	24V DC	10V DC...31.2V DC	500 mA per channel, 8.0 A per module	Off to On: 0.5 ms On to Off: 1.0 ms	5.3 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBKD
1794-OB16D					Off to On: 0.1 ms On to Off: 0.1 ms Off to On: 0.1 ms On to Off: 0.1 ms	4.8 W at 31.2V DC	1794-TB3, 1794-TB3S, 1794-TBKD
1794-OB16P	16 current sourcing	24V DC	10V DC...31.2V DC	500 mA per channel, 8.0 A per module	Off to On: 0.5 ms On to Off: 1.0 ms	5.0 W at 31.2V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBKD
1794-OB16PXT							1794-TB2, -TB3, -TB3S
1794-OB32P	32 current sourcing (2 groups of 16)	24V DC	10V DC...31.2V DC	500 mA per channel; 14.0 A per module*	Off to On: 0.5 ms On to Off: 1.0 ms	5.3 W at 31.2V DC	1794-TB32, 1794-TB32S
1794-OV16	16 current sinking	24V DC	10V DC...31.2V DC	500 mA per channel, 8 A per module	Off to On: 0.5 ms On to Off: 1.0 ms	4.2W at 31.2V DC	1794-TB3, 1794-TB3S
1794-OV16P							
1794-OV32	32 current sinking (2 groups of 16)	24V DC	10V DC...31.2V DC	500 mA	Off to On: 0.5 ms On to Off: 1.0 ms	4.4 W at 31.2V DC	1794-TB32, 1794-TB32S
1794-OC16	16 current sourcing	48V DC	30V DC...60V DC @ 45 °C 55V DC @ 55 °C	500 mA per channel, 8 A per module	Off to On: 0.5 ms On to Off: 1.0 ms @ 25 °C; 2.0 ms @ 55 °C	3.7 W at 60V DC	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBKD

- ♣ Catalog Numbers ending with: (P) = Protected Outputs, (EP) = Electronic Fused, (D) = Diagnostic, (XT) = extreme environment.

- \* 6.0 A total for channels 0...15; 8.0 A total for channels 16...31.

## 24V DC External Power - FLEX Digital DC Output Modules

Cat. No.	External DC Supply Voltage Range	External DC Supply Current Range
1794-OB8	10...31.2V DC (5% AC ripple)	10...35 mA
1794-OB8EP	19.2...31.2V DC (5% AC ripple)	20...35 mA
1794-OB8EPXT	19.2...31.2V DC (5% AC ripple)	55 mA
1794-OB16	10...31.2V DC (5% AC ripple)	20...65 mA
1794-OB16D	10...31.2V DC (5% AC ripple)	56...78 mA
1794-OB16P	10...31.2V DC (5% AC ripple)	25...75 mA
1794-OB16PXT	10...31.2V DC	35 mA
1794-OB32P	10...31.2V DC (5% AC ripple)	103...273 mA
1794-OV16	10...31.2V DC (5% AC ripple)	20...65 mA
1794-OV16P	10...31.2V DC (5% AC ripple)	20...65 mA
1794-OV32	10...31.2V DC (5% AC ripple)	50 mA
1794-OC16	30...60V DC (5% AC ripple)	13...27 mA

## FLEX Digital DC Combination Input/Output Modules

Cat. No.♣	Voltage, On-State, Nom.	Voltage, On-State, Range	Inputs			Outputs			Power Dissipation, Max.	Terminal Base Unit
			Number of Inputs	Default Input Delay Time‡	Current, Off-State Input, Max.	Number of Outputs	Output Delay Time♣	Output Currenty, Max.		
1794-IB10XOB6	24V DC	10V DC...31.2V DC	10 current sinking	Off to On: 0.25 ms‡ On to Off: 0.25 ms‡	1.5 mA	6 current sourcing	OFF to ON: 0.5 ms ON to OFF: 1.0 ms	2 A per output 10 A per module	6.0 W at 31.2V DC	1794-TB3, 1794-TB3S
1794-IB10XOB6XT										1794-TB2, 1794-TB3, -TB3S, -TB3SK
1794-IB16XOB16P			16 current sinking			16 current sourcing	0.5 A per output 8 A per module	7.0 W at 31.2V DC	1794-TB32, TB32S	

♣ Catalog numbers ending with (P) = Protected Outputs, (XT) = extreme environment.

‡ Input On to Off delay is the time from the input signal dropping below the valid level to recognition by the module. Input Off to On delay time is the time from a valid input signal to recognition by the module.

§ 0.25 ms (default), 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms. Selectable using configuration word 3. (Not selectable when used with the 1794-ASB adapter.)

♣ Output Off to On or On to Off delay is the time from the module issuing an output on or off until the output actually turns on or off.

## 24V DC External Power - FLEX Digital DC Combination Modules

Cat. No.	External DC Supply Voltage Range	External DC Supply Current Range
1794-IB10XOB6	10...31.2V DC (includes 5% AC ripple)	8 mA at 10V DC
1794-IB10XOB6XT		15 mA at 19.2V DC 19 mA at 24V DC 25 mA at 31.2V DC
1794-IB16XOB16P	10...31.2V DC (includes 5% AC ripple)	78 mA at 10V DC

## FLEX Digital Contact Output Modules

The 1794-OW8 module provides 8 isolated Form A (normally open) contacts capable of switching up to 2.0 A at up to 230V AC and 125V DC. Load power can be obtained from a variety of sources and can range from +5V DC to 240V AC.

Cat. No.♣	Number of Outputs	Relay Contact Rating	Output Delay Time, Max.	Power Dissipation, Max.	External DC Supply Current Range	Terminal Base Unit
1794-OW8	8 Isolated N.O. relay contact	250V AC, 2 A, 50/60 Hz, Resistive; 120/240V AC, 50/60 Hz, 1800 VA Make, 180 VA Break; 5...30V DC, 2 A, Resistive; R150, 5...30V DC, 28 VA not to exceed 1 A below 28V DC	Off to On: 10 ms* On to Off: 10 ms‡	5.5 W	—	1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBN and 1794-TBNF
1794-OW8XT						

♣ Catalog Numbers ending with: (XT) = extreme environment.

\* Time from valid output on signal to relay energization by module.

‡ Time from valid output off signal to relay deenergization by module.

## 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	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-IF4IXT									
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 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.						

▲ Catalog numbers ending with (XT) = extreme environment.

## 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 - Unipolar 2.56 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 ±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; 0.313 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 Terminal: 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.

## Specialty I/O Modules

Extreme environment versions of standard module have the letters XT in the last position of the catalog number.

## FLEX Counter I/O Modules

Cat. No.	Number of Inputs/Outputs	Input Frequency, Max.	External DC Supply Current, Nom.	Power Dissipation, Max.	Terminal Base Unit
1794-IJ2 1794-IJ2XT	<ul style="list-style-type: none"> <li>Inputs: 2 groups of 1 frequency input and 1 gate input</li> <li>Outputs: 2 outputs</li> </ul>	1...32 kHz w/sine wave; 1...32 kHz w/square wave input	180 mA at 24V DC	4.6 W at 31.2V DC	1794-TB3G, 1794-TB3GS
The 24V DC 2 Input Frequency Module performs high-speed frequency algorithms and is capable of reporting frequency, acceleration, and direction. The frequency inputs are capable of accepting frequencies up to 32 kHz. Input devices range from magnetic pickup to flowmeters, to incremental encoders to proximity detectors. The module accepts and returns binary data. Outputs are activated by alarms. Module power is supplied from the external power supply. All power for input devices (24V DC) is supplied by the I/O module.					
1794-VHSCA	<ul style="list-style-type: none"> <li>Inputs: 2 groups of A/A, B/B, and Z/Z pairs with 5V DC or 15...24V DC terminations</li> <li>Outputs: 2 groups of 2</li> </ul>	1.0 MHz counter and encoder X1 (no filters) 500 kHz encoder X2 (no filters) 250 kHz encoder X4 (no filters)	100 mA at 24V DC	5 W at 31.2V DC	1794-TB3G, 1794-TB3GS
The 24V DC 2 Channel Very High Speed Counter Module has two incremental quadrature encoder interfaces each with three inputs (A, B, and Z). Each input module has ±inputs for connection to pulse transmitters with complementary or non-complementary signals. The counter can count pulses of one or two pulse trains for up/down counting and detection of a selectable number of edges (X1, X2, X4). Each of the two counters has an upper limit of 1MHz, a 24-bit counter register, a preset register, and a latch register. Module power is supplied from an external 24V power supply. The 1794-VHSC has two outputs that can be configured for overlapping, multiple windows, and/or pulse width modulation. Use with 1794-ACN15 or 1794-ACNR15 Series B or later ControlNet adapters or 1794-AENT EtherNet/IP adapter.					
1794-ID2	<ul style="list-style-type: none"> <li>Inputs: 2 (2 groups of A, B, Z, G inputs)</li> </ul>	100 kHz	150 mA at 12V DC 75 mA at 24V DC	5 W at 26.4V DC	1794-TB3, 1794-TB3S, 1794-TBN, 1794-TBNF*
The 24V DC 2 Input Pulse Counter Module performs high-speed scaling, calculation operations for various industrial applications including quantity counting, speed calculation, and flow monitoring. All input devices for the pulse counter module should be able to provide the input signal of 6V amplitude.					
1794-IP4	<ul style="list-style-type: none"> <li>Inputs: 4 (2 groups of 2)</li> </ul>	100 kHz	150 mA at 12V DC 75 mA at 24V DC	5 W at 26.4V DC	1794-TB3, 1794-TB3S, 1794-TBN, 1794-TBNF*
The 12/24V DC 4 Input Pulse Counter Module performs high-speed scaling, calculation operations for various industrial applications. Typical applications include quantity counting, speed calculation, and flow monitoring. All the input devices for the pulse counter module should be able to provide the input signal of 6V amplitude. The 1794-IP4 has a 6V minimum threshold for an input On condition and a maximum 3V threshold for an input Off condition. The region between 3V and 6V is a transitional one and therefore requires input signals to pass cleanly through that region, otherwise module operation cannot be guaranteed.					

Δ As of FlexLogix firmware revision 11, you can install the 1794-VHSC module (and any other module that uses extended data transfers) on the local or extended-local DIN rails of a FlexLogix system. Previous revisions of the controller firmware support these modules only as remote ControlNet I/O.

\* Auxiliary terminal strips are required when using the 1794-TBN or 1794-TBNF for this catalog number.

## SCANport Communication Module

The SCANport Communication Module interfaces two SCANport communication ports to the backplane. Each port can interface a SCANport-enabled drive or power product through an I/O adapter module to a ControlNet, DeviceNet, or Universal Remote I/O link. SCANport communication provides data for logic command/feedback, analog reference/feedback, and channel enable/status.

SCANport-enabled products include: 1305 AC Drives, 1336 PLUS AC Drives, 1336 PLUS II AC Drives, 1336 IMPACT AC Drives, 1336 FORCE AC Drives, 1336 SPIDER AC Drives, 1336 REGEN package, 1397 DC Drives, 1557 Medium Voltage AC Drives, 1394 Motion Systems, SMC Dialog Plus, SMP Smart Motor Protector, and 2364 Regenerative DC Bus Supply Unit.

Cat. No.	Communication Ports	Input Voltage Rating	Power Consumption	Terminal Base
1203-FM1	2 SCANport*	5V supplied from flexbus	0.8 W	1203-FB1

The 1203-FM1 SCANport module may require up to twice the adapter power supply current of standard FLEX I/O modules. When installing FLEX I/O modules, a maximum of four 1203-FM1 modules can be used with any FLEX I/O adapter.

### Determining the Number of 1203 and Standard Modules in a System

If you are using this number of standard (1794) modules:	Then, the maximum number of 1203 modules that you can use is:	The number of SCANport connections provided is:
7 or 8	0	0
5 or 6	1	2
3 or 4	2	4
1 or 2	3	6
0	4	8

## SCANport Terminal Base and Cables

For each port, you also need to select a cable kit.

Cat. No.	Description	Length
1203-FB1	Terminal Base	—
1202-C03	0.33 Meters (1.1 Feet)	0.3 m
1202-C10	1 Meter (3.3 Feet)	1 m
1202-C30	3 Meter (9.8 Feet)	3 m
1202-C90	9 Meter (29.5 Feet)	9 m

## HART Smart Instrumentation

HART (Highway Addressable Remote Transmitter) is an open protocol designed to connect analog devices. For HART connectivity, select from products available from

### Select a HART Interface

For Your Application	Select	Description
<ul style="list-style-type: none"> <li>Analog and HART in one module</li> <li>Instrumentation in hazardous locations (FLEX Ex modules)</li> <li>Supports FDT-compatible asset management software to HART devices using provided DTMs</li> <li>HART commands can be transmitted as unscheduled messages</li> </ul>	1794 FLEX I/O 1797 FLEX Ex I/O	FLEX I/O and FLEX Ex modules designed for distributed HART systems.
<ul style="list-style-type: none"> <li>Analog and HART connectivity in one module</li> <li>No external hardware required to access HART signal</li> <li>HART commands can be transmitted as unscheduled messages</li> <li>Supports asset management software to HART device</li> </ul>	1756-IF8H 1756-OF8H	Rockwell Automation analog I/O modules for use in ControlLogix chassis
<ul style="list-style-type: none"> <li>Data acquisition or control application with slow update requirements (such as a tank farm)</li> <li>No external hardware required to access HART signal</li> <li>Does not connect directly to asset management software</li> </ul>	MVI56-HART	Prosoft interface

### HART Interface Modules

FLEX and FLEX Ex HART analog modules are ideal for use in applications that need connection with FDT (Field Device Tool) compatible asset management software, such as the Rockwell Software FieldCare HART Communication bundle or Endress + Hauser Fieldcare. For HART Device Type Management (DTM) programs and drivers, go to the Product Compatibility & Download Center at <http://compatibility.rockwellautomation.com/Pages/MultiProductDownload.aspx?crumb=112>.

- FLEX HART analog modules can be used on ControlNet or EtherNet/IP. The FLEX Ethernet adapter requires firmware v3.1, which is flash upgradeable, to support these modules.
- Each HART field device is wired to its own input or output channel:
  - 8 single-ended channels
  - does not support multi-drop
  - 2- or 3-wire devices
- For use with FlexLogix, the modules must be used on distributed rail with ControlNet adapter and not on local rail.
- HART commands can be transmitted by unscheduled message:
  - sample RLL subroutines available
  - currently limited to one instance of RLL subroutine per module, one channel at a time

### HART Analog Input Module

Cat. No.	Number of Inputs	Signal Range	Input Conversion Rate	Input Resolution	Absolute Accuracy	Step Response to 99%	External DC Supply Current, Nom.	Power Dissipation, Max.	Terminal Base Unit
1794-IE8H	8 single-ended Non-isolated	4...20 mA	10 ms (50 Hz) / 8.33 ms (60 Hz)	16 bits	0.1% Full Scale at 20 °C (68 °F)	80 ms (current terminal)	190 mA at 24V DC	3.9 W at 31.2V DC	1794-TB3G or 1794-TB3GS
1794-IF8IH	8 single-ended Isolated	4...20 mA (user configurable) 0...20 mA (user configurable)	—	16 bits - unipolar; 15 bits + sign - bipolar 0.320 µA/cnt unipolar; 0.640 µA/cnt bipolar	0.1% Full Scale at 25 °C	4.17 Hz conversion rate = 480 ms 10.0 Hz conversion rate = 200 ms 16.7 Hz conversion rate = 120 ms 19.6 Hz conversion rate = 101 ms 62 Hz conversion rate = 32 ms 470 Hz conversion rate = 4 ms	190 mA at 24V DC	4.8 W at 31.2V DC	1794-TB3 or 1794-TB3S

### HART Analog Output Module

Cat. No.	Number of Outputs	Signal Range	Output Conversion Rate	Output Resolution	Absolute Accuracy	Step Response to 99%	External DC Supply Current, Nom.	Power Dissipation, Max.	Terminal Base Unit
1794-OE8H	8 single-ended Non-isolated	4...20 mA 0...20 mA	10 ms for all channels	13 bits	0.1% Full Scale at 20 °C (68 °F)	13 ms to 99% of FS / 115 ms during HART comms	190 mA at 24V DC	6.1 W at 31.2V DC	1794-TB3G or 1794-TB3GS
1794-OF8IH	8 single-ended Isolated	4...20 mA (user configurable) 0...20 mA (user configurable)	10 ms	16 bits - unipolar 0.305 $\mu$ A/cnt unipolar	$\pm$ 0.1% Full Scale at 25 °C $\pm$ 0.35% Full Scale at 0...55 °C	—	450 mA at 24V DC	5.0 W at 31.2V DC	1794-TB3 or 1794-TB3S

## Terminal Bases and Accessories

Conformal coated versions of standard modules have the letter K in the last position of the catalog number, before the series designation.

### Terminal Bases

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 I/O wiring and plug together to form the backplane. They are available with screw or spring terminations.



Cat. No. ♣	Termination Type	Connections	Used in Applications
1794-TB2	Cage-clamp	16 I/O; 18 common; 2 +V	Up to 132V AC/156V DC
1794-TB3 1794-TB3K	Cage-clamp	16 I/O; 18 common; 18 +V	Up to 132V AC/156V DC
1794-TB3S 1794-TB3SK	Spring-clamp		
1794-TB32 1794-TB32S	Cage-clamp Spring-clamp	32 I/O; 8 common; 8 +V	
1794-TB3G 1794-TB3GK	Cage-clamp	36 I/O; 2 common; 2 +V; 10 chassis ground	Up to 31.2V DC
1794-TB3GS 1794-TB3GSK	Spring-clamp		
1794-TB3T 1794-TB3GK	Cage-clamp	16 I/O; 10 common; 4 +V; 8 chassis ground; 2 sets of CJC to be used with temperature modules	
1794-TB3TS 1794-TB3TSK	Spring-clamp		Up to 132V AC/156V DC
1794-TBN 1794-TBNK	Screw-clamp	16 I/O; 2 common; 2 +V	
1794-TBNF			

♣ Catalog numbers ending with (K) = Conformal Coated.

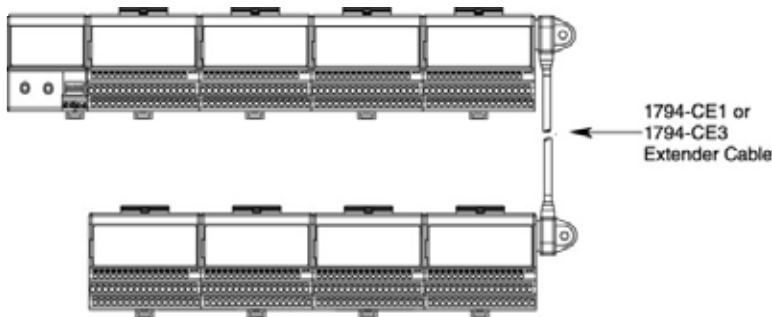
### D-shell Terminal Bases

Cat. No.	Termination Type	Description	Current Capacity, Max.
1794-TB37DS	D-shell	37 Pin D-Shell Termination (digital and analog modules)	5 A per pin 10 A per module
1794-TB62DS	D-shell	62-pin D-Shell Termination (32-point I/O modules)	V2 - 8 A V1 - 8 A 5 A per pin 10 A per module

### 1794 FLEX Extender Cables

Use the optional 1794-CE1 (0.3 m, 1ft) or 1794-CE3 (0.9 m, 3ft) extender cable to arrange your system in two rows or split your system into horizontal and vertical orientation. The cable can be used between any module or adapter.

Cat. No.	Description
1794-CE1	FLEX I/O 1 ft Extender Cable (0.3 m)
1794-CE3	FLEX I/O 3 ft Extender Cable (0.9 m)



## Accessory Products

Cat. No.	Description	
1794-NM1	FLEX I/O Panel Mounting Kit	Use this kit to mount your FLEX I/O system on a panel without a DIN rail.
1794-LBL	FLEX I/O Label Kit	Use this kit to tailor the label on you FLEX I/O terminal base unit. Kit includes a diecut drawing and label sheet with five labels.
1492-EA5	DIN rail locks	Use DIN rail locks for FLEX I/O modules in a high-vibration installation, particularly when mounting the modules vertically.
1794-N2	FLEX Dummy Filler Module - Slot Cover	Use this module to fill a vacant slot, if desired.
1794-CJC2	Cold Junction Compensation Kit (2 Pieces)	Use these as replacements for CJC's supplied with 1794-IT8 and 1794-IRT8.

## Power Supplies

The I/O modules are interfaced to the I/O link through an I/O adapter module with a built-in 24V DC input power supply. The I/O modules receive power from the adapter/power supply through the backplane. The 120V AC to 24V DC power supply (1794-PS13 or 1794-PS3) is also available for powering the adapter/power supply. (When providing power for the 1794-FLA extended-local I/O FlexLogix adapter, treat the adapter as a communication adapter, not as an I/O module.)

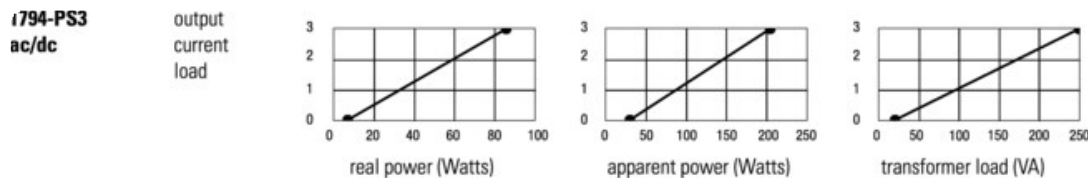
Cat. No.	Power Supply Input Voltage, Nom.	Power Supply Input Power	Apparent Input Power, Max.	Transformer Load, Max.	Output Current, Max.	Output Voltage, Nom.
1794-PS3	120V/220V AC	86 W	205VA	250VA	3.0 A*	24V DC
1794-PS13	120V/220V AC	36 W	53VA	90VA	1.3 A	24V DC

\* Horizontal mount; 2.8 A all other mounting.

## Power Requirements and Transformer Sizing

These graphs display backplane power load.

- Use the real power value in watts for determining the amount of heat dissipation you will have inside the enclosure.
- Use the apparent power value in VA for estimating power distribution sizing.
- Use the transformer load value in VA of each power supply plus all other loads on a transformer to determine the required transformer size.



## Encompass Partner Products

### Encompass referenced products for 1794 FLEX I/O Platform

Through Encompass, our third-party product referencing program, you can quickly locate the products that best solve your application challenges. Use the Encompass search tool to sort and filter products from best-in-industry suppliers in your region that can provide connectivity to the Rockwell Automation architecture, or are used in conjunction with our products.



