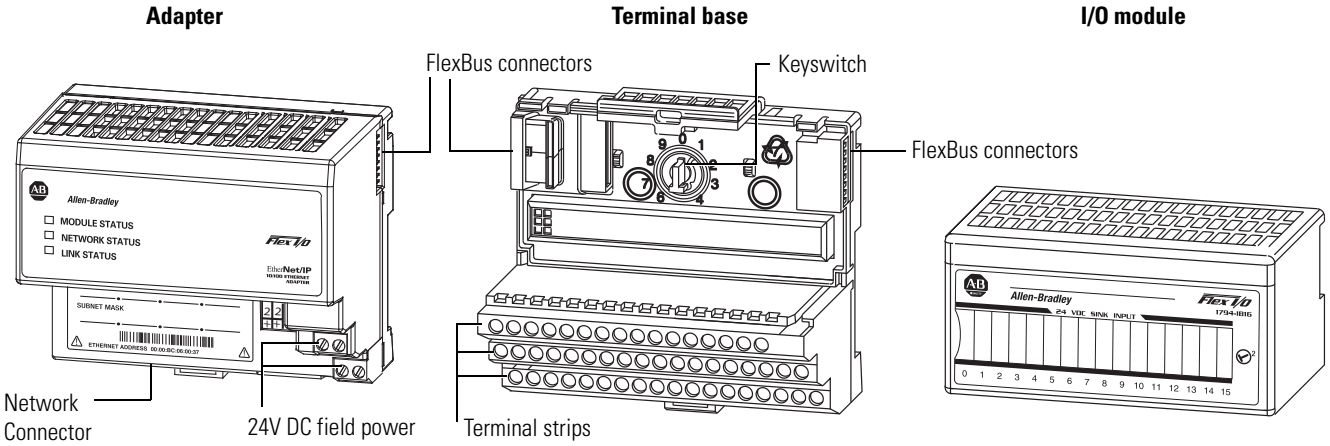
About the FLEX I/O and FLEX Ex I/O Systems

1794 FLEX I/O Overview

FLEX I/O offers:



FLEX I/O is a Distributed I/O System that connects to several Networks including EtherNet/IP, ControlNet and DeviceNet.

Flexible, low-cost, modular I/O for distributed applications. FLEX I/O offers all the functions of larger, rack-based I/O without the space requirements.

Independently select the I/O, termination style, and network to meet your application needs.

Two separate connection terminals for field power let you daisy-chain power connections to adjacent terminal bases.

One adapter communicates with up to eight I/O modules. Allows connection to:

- 256 digital input/output points, or
- 96 analog input/output points, or
- mix of I/O to meet your needs.

Modularity of FLEX I/O system provides choice of network and ease of expansion. The wiring terminations are done almost entirely on the terminal base. Terminal base termination selection includes screw-clamp, spring-clamp, and cage-clamp to wire directly to 2-, 3-, or 4-wire devices. Additional options of D-shell, knife disconnect, and fused terminal bases are available.

Adjustable keyswitch prevents incorrect module insertion into a preconfigured terminal base.

Terminal bases can be exchanged without moving other bases in your system.

If desired, connect individual power supplies to each base to isolate modules. Plug the I/O module into the terminal base to connect the I/O bus and field devices.

Remove and insert modules under power. No direct wiring to the module enables you to change modules without disturbing field wiring or system power.

Mix and match I/O modules. There is a wide variety of digital, analog, and specialty modules.

Each FLEX I/O system contains at least one adapter, one terminal base, and one I/O module.

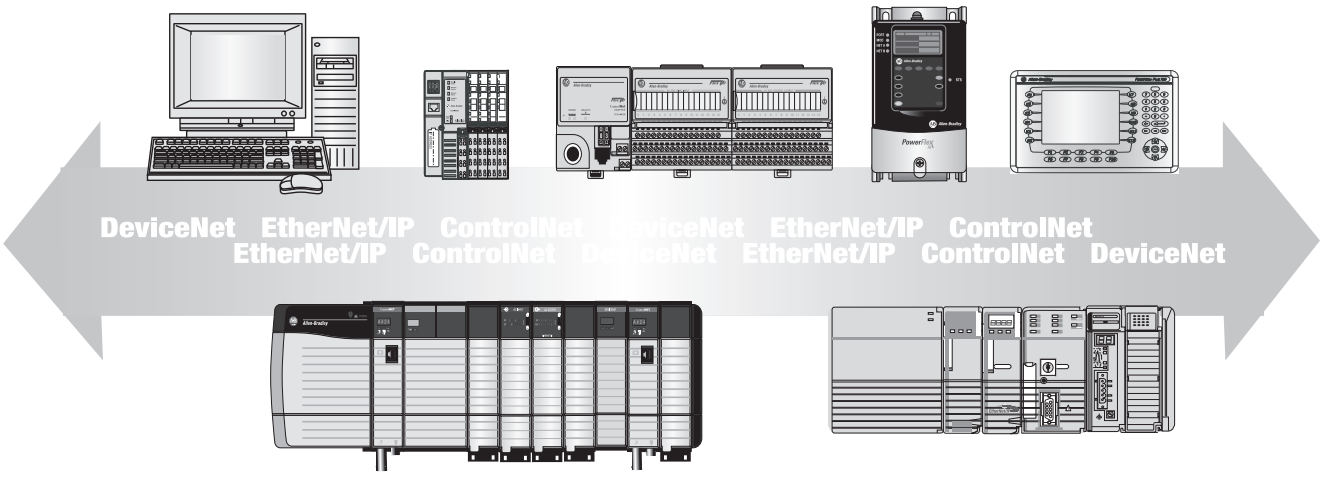
You can power the system with a FLEX power supply (1794-PS13 or -PS3), a 1606 switched mode power supply, or any other compatible power source. Use the terminal block on the terminal base to wire your field devices directly. Wiring directly saves you:

- installation and testing time
- multiple, long wiring runs and external terminal blocks
- control cabinet panel space

FLEX I/O provides additional savings if system problems develop. Combining your field-wiring terminations and the I/O interface into the same location saves you time and money by making your system easier to maintain and troubleshoot. Additionally, the full-featured FLEX I/O system lets you, in non-hazardous location, remove and insert modules under backplane power without disrupting your system.

Your FLEX I/O system can communicate on EtherNet/IP, ControlNet, DeviceNet, and many other open networks including, but not limited, to Remote I/O and PROFIBUS DP.

Adapters and other components are available for adding to your system as your specific application requirements change.



1794 FLEX I/O XT Overview

FLEX I/O XT modules are designated for extreme environment use.

They differ from their non XT counterparts only in operational temperature ranges and conformal coating is standard for FLEX I/O XT products.

FLEX I/O XT modules 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
- MIL-1-46058C to ASTM-G21; (Tropicalization and fungicide)

These standards specify common emissions and classify their concentration levels in a number of industrial processes. Just a few of the common reactive agents that the FLEX I/O XT modules protect against are:

- H2S – Hydrogen sulfide
- SO2, SO3 – Sulfur dioxide
- CnHn – Hydrocarbons
- NOx – Oxides of nitrogen
- CI2 – Wet Chlorine / Dry Chlorine
- NH3 – Ammonia

General FLEX I/O and FLEX I/O XT Specifications

The following table shows the similarities and differences between the FLEX I/O and the FLEX I/O XT specifications.

Specifications Comparison

Attribute[1]	1794 FLEX I/O	1794 FLEX I/O XT
Temperature, operating	0…55 °C (32…131 °F)	-20...70 °C (-4....185 °F)
Temperature, nonoperating	-40…85 °C (-40…185 °F)	-40...85 °C (-40...185 °F)
Relative humidity	5…95% non-condensing	
Shock, operating[2]	30 g peak acceleration, 11(±1) ms pulse width	
Shock, nonoperating[1]	50 g peak acceleration, 11(±1) ms pulse width	
Vibration	Tested 5 g @ 10…500 Hz per IEC 68-2-6	
Wire size	0.34mm^2…2.5 mm^2 (22…12 AWG) stranded copper wire rated at 75 °C or higher 1.2 mm (3/64 in.) insulation max	
Atmospheric protection	non conformal coated	conformal coated to 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 • MIL-1-46058C to ASTM-G21; (Tropicalization and fungicide)

Specifications Comparison

Attribute[1]	1794 FLEX I/O	1794 FLEX I/O XT
Certifications (when product is marked)[3]	• 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 • KCC • Marine Certification • SIL 2 Certification • ODVA • ControlNet	

(1) For all other product-specific specifications, including environmental and certification, see the product sections within this Selection Guide.

(2) To maintain these specifications, you must use DIN rail locks.

(3) See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Specify a FLEX I/O or FLEX I/O XT System

Follow these steps as you specify your FLEX I/O or FLEX I/O XT system:

✓	Step	See	Page
	1 Select a communication adapter Choose the network for your operating system.	CIP Network Infrastructure Select a Network	7 8
	2 Select I/O modules based on field device • location of the device • your application • number of points needed • number of points available per module • number of modules Or use the Integrated Architecture Builder tool at http://www.rockwellautomation.com/en/e-tools/configuration.html	Digital I/O Modules FLEX I/O Analog, Thermocouple and RTD Modules FLEX I/O Counter Modules	15 35 58
	3 Select a terminal base Choose an appropriate terminal base for your modules.	General Specification Comparison	65
	4 Choose appropriate power supplies • Choose appropriate power supply • Ensure sufficient power for the communication adapter and modules	Power Supply Definitions Power Requirements and Transformer Sizing	67 68
	5 Determine mounting requirements and select accessories • Determine whether to panel mount or DIN rail mount the FLEX I/O system and at what orientation (horizontal or vertical) • Choose appropriate optional accessories to enhance your system	panel mount or DIN rail mount 1794-CE1 and 1794-CE3 Extender Cables 1794-NM1 FLEX I/O Mounting Kit 1492-EA35 DIN Rail Locks 1794-LBL FLEX I/O Label Kit	113 115 115 116 116

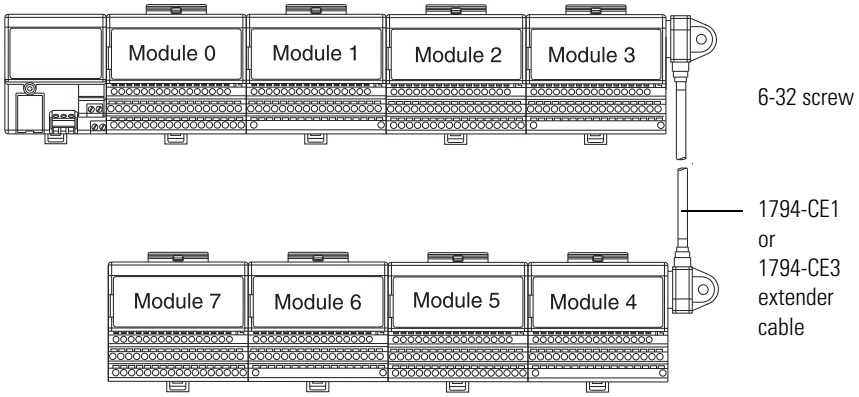
Select Optional Accessories

Step 5 – Select:

optional accessories for FLEX I/O and FLEX I/O XT modules

1794-CE1 and 1794-CE3 Extender Cables

Use one optional 1794-CE1 – 0.3 m (1 ft) or 1794-CE3 – 0.9 m (3 ft) extender cable, per system, 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 between adapters and modules.



1794-NM1 FLEX I/O Mounting Kit

Use the optional 1794-NM1 FLEX I/O mounting kit to mount your FLEX I/O system on a panel without a DIN Rail.

1794-NM1 mounting kit with 18 screws (2 screws for the adapter and 2 screws for each module)