

Installation Instructions

Original Instructions



Allen-Bradley

by ROCKWELL AUTOMATION

FLEX I/O AC Digital Input Modules

Catalog Numbers 1794-IA8, 1794-IA8I, 1794-IA16, 1794-IA16K

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Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

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Install Your Module

The FLEX™ I/O AC digital input module mounts on a 1794 terminal base.



ATTENTION: During mounting of all devices, be sure that all debris (metal chips, wire strands, and so on) are kept from falling into the module. Debris that falls into the module could cause damage on power-up.

1. Rotate the keyswitch (3) on the terminal base (4) clockwise to position 8 as required for this type of module.
2. Make sure that the Flexbus connector (1) is pushed all the way to the left to connect with the neighboring terminal base/adaptor. **You cannot install the module unless the connector is fully extended.**
3. Make sure that the pins on the bottom of the module are straight so they align properly with the connector in the terminal base.



WARNING: If you insert or remove the module while backplane power is on, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

4. Position the module (4) with its alignment bar (5) aligned with the groove (6) on the terminal base.
5. Press firmly and evenly to seat the module in the terminal base. The module is seated when the latching mechanism (2) is locked into the the module.

Wire Your Module

Connect Wiring for the 1794-IA8

1. Connect wiring to the different terminal bases as follows:
For 1794-TB2, 1794-TB3, or 1794-TB3S – Connect individual input wiring to even-numbered terminals on the 0...15 row (A) as indicated in the [Table 1](#).
For 1794-TBN – Connect individual input wiring to numbered terminals on the 16...33 row (B) as indicated in the [Table 1](#).
For 1794-TB2 – Connect the associated 120V AC power lead (L1) of the input device to the corresponding odd-numbered terminals on the 0...15 row A for each input as indicated in the [Table 1](#). Odd-numbered terminals on row A are internally connected to 120V AC L1.
For 1794-TB3 or 1794-TB3S – Connect the associated 120V AC power lead (L1) of the input device to the corresponding odd-numbered terminals on the 34...51 row (C) or to the corresponding terminal on row (C) for each input as indicated in the [Table 1](#). Odd-numbered terminals on row (A) and the terminals of row (C) are internally connected to 120V AC power L1.
For 1794-TBN – Connect the associated 120V AC power lead (L1) of the input device to the corresponding odd-numbered terminal on the 34...51 row (C) for each input as indicated in the [Table 1](#). The 120V AC power terminals of row (C) are internally connected together.
2. Connect 120V AC power (L1) to terminal 34 on the 34...51 row (C).
3. Connect 120V AC common (L2) to terminal 16 on the 16...33 row (B).
4. If daisy chaining power to the next terminal base, connect a jumper from terminal 51 (+120V AC L1) on this terminal base to terminal 34 on the next terminal base.
5. If continuing AC common to the next terminal base, connect a jumper from terminal 33 (120V common L2) on this terminal base to terminal 16 on the next terminal base.

Table 1 - Wiring Connections for 1794-IA8

Input	1794-TB2, 1794-TB3, 1794-TB3S		1794-TBN	
	Input Terminal	120V AC Supply	Input Terminal	120V AC Supply
Input 0	A-0	A-1 ⁽¹⁾ /C-35	B-0	C-1 ⁽²⁾
Input 1	A-2	A-3 ⁽¹⁾ /C-36	B-2	C-3 ⁽²⁾
Input 2	A-4	A-5 ⁽¹⁾ /C-37	B-4	C-5 ⁽²⁾
Input 3	A-6	A-7 ⁽¹⁾ /C-38	B-6	C-7 ⁽²⁾
Input 4	A-8	A-9 ⁽¹⁾ /C-39	B-8	C-9 ⁽²⁾
Input 5	A-10	A-11 ⁽¹⁾ /C-40	B-10	C-11 ⁽²⁾
Input 6	A-12	A-13 ⁽¹⁾ /C-41	B-12	C-13 ⁽²⁾
Input 7	A-14	A-15 ⁽¹⁾ /C-42	B-14	C-15 ⁽²⁾
A = Input terminals (Even-numbered terminals 0...14) B = Common terminals C = Power terminals (C-34 and C-51 on 1794-TB2; C-34 to C-51 on 1794-TB3 and 1794-TB3S)			B = Even-numbered input terminals 0...14, AC common terminals 16 and 33 C = Power terminals C-34 and C-51, and odd-numbered input terminals 1...15	

(1) A-1, 3, 5, 7, 9, 11, 13, and 15 on the 1794-TB2, 1794-TB3, and 1794-TB3S are internally connected in the module to 120V AC L1.
(2) C-1, 3, 5, 7, 9, 11, 13, and 15 on the 1794-TBN are internally connected in the module to 120V AC L1.

Specifications

Specifications – 1794-IA8, 1794-IA8I

Attribute	1794-IA8	1794-IA8I
Number of inputs	8, nonisolated	8, isolated
Recommended terminal base	1794-TBN, 1794-TB2, 1794-TB3, 1794-TB3S, 1794-TBKD, 1794-TB3K, 1794-TB3SK, 1794-TBNK	
On-state voltage, min	65V AC	
On-state voltage, nom	120V AC	
On-state voltage, max	132V AC	
On-state current, min ⁽¹⁾	7.1 mA	
On-state current, max	14.32 mA	
Off-state voltage, max	43V AC	
Off-state current, min	2.9 mA	
Nominal input impedance	10.6 k Ω	
Nominal input current	12 mA @ 120V AC	
Isolation voltage	120V (continuous), Basic Insulation Type Type tested @ 1250V AC for 60 s, between field side and system No isolation between individual channels	120V (continuous), Basic Insulation Type Type tested @ 1240V AC for 60 s, between field side and system Isolation between individual channels.
Input filter time	See Table 6	
Flexbus current	30 mA @ 5V DC	
Power dissipation, max	4.5 W @ 132V AC	
Thermal dissipation, max	15.3 BTU/hr @ 132V AC	

(1) AC inputs compatible with proximity switches with leakage ratings of $I_{leak} < 2.5$ mA and I_{on} minimum = 5 mA

Specifications – 1794-IA16, 1794-IA16K

Attribute	Value
Number of inputs	16, nonisolated
Module location	1794-TB3, 1794-TB3S, 1794-TBN ⁽²⁾ , 1794-TB3K, 1794-TB3SK, 1794-TBNK
On-state voltage, min	74V AC
On-state voltage, nom	120V AC
On-state voltage, max	132V AC
On-state current, min ⁽¹⁾	5.49 mA
On-state current, max	14.81 mA
Off-state voltage, max	20V AC
Off-state current, min	2.9 mA
Nominal input impedance	10 k Ω
Input current, max	13.3 mA @ 120V AC
Isolation voltage	120V (continuous), Basic Insulation Type Type tested @ 1264V AC for 60 s, between field side and system No isolation between individual channels
Input filter time	See Table 6
Flexbus current	20 mA
Power dissipation, max	6.4 W @ 132V AC
Thermal dissipation, max	21.8 BTU/hr @ 132V AC

(1) AC inputs compatible with proximity switches with leakage ratings of $I_{leak} < 2.5$ mA and I_{on} minimum = 5 mA

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

General Specifications

Attribute	1794-IA8, 1794-IA8I	1794-IA16, 1794-IA16K
Terminal base screw torque	Determined by the installed terminal base	
Dimensions, approx. (H x W x D)	94 x 94 x 69 mm (3.7 x 3.7 x 2.7 in.)	
Indicators (field side indication)	8 yellow status indicators	16 yellow status indicators
External AC power supply voltage, nom	120V AC	
External AC power voltage range	65...132V AC	74...132V AC
North American temperature code	T4A	T4

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General Specifications (Continued)

Attribute	1794-IA8, 1794-IA8I	1794-IA16, 1794-IA16K
Keypress position	8	
Enclosure type rating	None (open-style)	
Wire size	Determined by installed terminal base	
Wiring category ⁽¹⁾	2 – on signal ports	

(1) Use this Conductor Category information for planning conductor routing as described in the appropriate System Level Installation Manual. Also refer to Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for more information.

Environmental Specifications

Attribute	1794-IA8, 1794-IA8I	1794-IA16, 1794-IA16K
Operating temperature	IEC 60068-2-1 (Test Ad, operating cold), IEC 60068-2-2 (Test Bd, operating dry heat), IEC 60068-2-14 (Test Nb, operating thermal shock): -20...+55 °C (-4...+131 °F)	IEC 60068-2-1 (Test Ad, operating cold), IEC 60068-2-2 (Test Bd, operating dry heat), IEC 60068-2-14 (Test Nb, operating thermal shock): 0...55 °C (32...131 °F)
Storage temperature	IEC 60068-2-1 (Test Ab, unpackaged nonoperating cold), IEC 60068-2-2 (Test Bb, unpackaged nonoperating dry heat), IEC 60068-2-14 (Test Na, unpackaged nonoperating thermal shock): -40...+85 °C (-40...+185 °F)	
Temperature, surrounding air, max	55 °C (131 °F)	
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5...95% noncondensing	
Vibration	IEC60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz	
Shock, operating	IEC60068-2-27 (Test Ea, Unpackaged shock): 30 g	
Shock, nonoperating	IEC60068-2-27 (Test Ea, Unpackaged shock): 50 g	
Emissions	IEC 61000-6-4	
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges	
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine wave 80% AM from 2000...2700 MHz	
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on signal ports	
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(OM) and ±2 kV line-earth(CM) on signal ports	
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine wave 80% AM from 150 kHz...80 MHz	