FLEX I/O Input, Output and Input/Output Analog Modules

Cat. Nos. 1794-IE8, -IE8K, -OE4, -OE4K, and -IE4XOE2 Series B

(Modules with a K in the last position of the catalog number are conformally coated to meet noxious gas requirements of ISA/ANSI-71.040 1985 Class G3 Environment.)

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls* (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.ab.com/manuals/gi) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual we use notes to make you aware of safety considerations.

| WARNING | Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss. |

| IMPORTANT | Identifies information that is critical for successful application and understanding of the product. |

| ATTENTION | Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you:
• identify a hazard
• avoid a hazard
• recognize the consequence |

| WARNING | When you insert or remove the module while backplane power is on, an electrical 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. |

| WARNING | If you connect or disconnect wiring while the field side power is on, an electrical 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.. |

| ATTENTION | FLEX I/O is grounded through the DIN rail to chassis ground. Use zinc plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials (e.g. aluminum, plastic, etc.) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding. |

| ATTENTION | **Environment and Enclosure**
This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters without derating.
This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.
This equipment is supplied as "open type" equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.
See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. Also, see the appropriate sections in this publication, as well as the Allen-Bradley publication 1770-4.1 ("Industrial Automation Wiring and Grounding Guidelines"), for additional installation requirements pertaining to this equipment. |

| ATTENTION | **Preventing Electrostatic Discharge**
This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:
• Touch a grounded object to discharge potential static.
• Wear an approved grounding wriststrap.
• Do not touch connectors or pins on component boards.
• Do not touch circuit components inside the equipment.
• If available, use a static-safe workstation. |

European Zone 2 Hazardous Location Approval

The following analog input/output modules are European Zone 2 approved: 1794-IE8/B, 1794-IE8K/B, 1794-OE4/B, 1794-OE4K/B and 1794-IE4XOE2/B.

European Zone 2 Certification (The following applies when the product bears the EEx Marking)

This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/EC.

The LCIE (Laboratoire Central des Industries Electriques) certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to this Directive. The examination and test results are recorded in confidential report No. 28 682 010.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 50021.

| IMPORTANT | Observe the following additional Zone 2 certification requirements.
• This equipment is not resistant to sunlight or other sources of UV radiation.
• The secondary of a current transformer shall not be open-circuited when applied in Class I, Zone 2 environments.
• Equipment of lesser Enclosure Type Rating must be installed in an enclosure providing at least IP54 protection when applied in Class I, Zone 2 environments.
• This equipment shall be used within its specified ratings defined by Allen-Bradley.
• Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40% when applied in Class I, Zone 2 environments. |

North American Hazardous Location Approval

The following modules are North American Hazardous Location approved:
1794-IE8/B, 1794-IE8K/B, 1794-OE4/B, 1794-OE4K/B and 1794-IE4XOE2/B.

The following information applies when operating this equipment in hazardous locations:	Informations sur l'utilisation de cet équipement en environnements dangereux :
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.
WARNING ⚠️ **EXPLOSION HAZARD** • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous.	**AVERTISSEMENT** ⚠️ **RISQUE D'EXPLOSION** • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

Installing Your Analog Input/Output Module
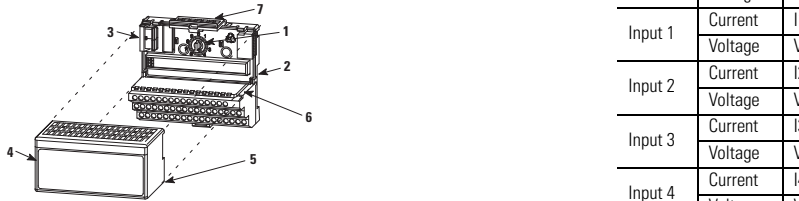
The module mounts on a 1794 terminal base.

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

1. Rotate the keyswitch (1) on the terminal base (2) clockwise to position 3 (1794-IE8), 4 (1794-OE4) or 5 (1794-IE4XOE2) as required.
2. Make certain the flexbus connector (3) is pushed all the way to the left to connect with the neighboring termbase/adapter. **You cannot install the module unless the connector is fully extended.**
3. Make sure the pins on the bottom of the module are straight so they will align properly with the connector in the terminal base.
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 unit. The module is seated when the latching mechanism (7) is locked into the module.

Connecting Wiring for the Analog Inputs and Outputs

1. Connect individual input/output wiring to numbered terminals on the 0-15 row (A) for 1794-TB2, -TB3, -TB3S, -TB3T and -TB3TS, or on row (B) for the 1794-TBN as indicated in the following tables.

IMPORTANT Use Belden 8761 cable for signal wiring.

2. Connect channel common/return to the associated terminal on row (A) or row (B) for the 1794-TB2, -TB3, -TB3S, -TB3T and -TB3TS, or on row C for the 1794-TBN. For input devices requiring terminal base power, connect the channel power wiring to the associated terminal on row (C).

3. Connect any signal wiring shields to functional ground as near as possible to the module.

   1794-TB3T or -TB3TS only: Connect to earth ground terminals C-39 thru C-46.

4. Connect the +V dc power to terminal 34 on the 34-51 row (C) and -V common/return to terminal 16 on the B row.

ATTENTION ⚠️ To reduce susceptibility to noise, power analog modules and digital modules from separate power supplies. Do not exceed a length of 9.8 ft (3m) for dc power cabling.

5. If daisychaining +V power to the next terminal base, connect a jumper from terminal 51 (+V dc) on this base unit to terminal 34 on the next base unit.
6. If continuing dc common (-V) to the next base unit, connect a jumper from terminal 33 (common) on this base unit to terminal 16 on the next base unit.

Wiring Connections for the 1794-IE8/B or -IE8K/B Analog Input Module
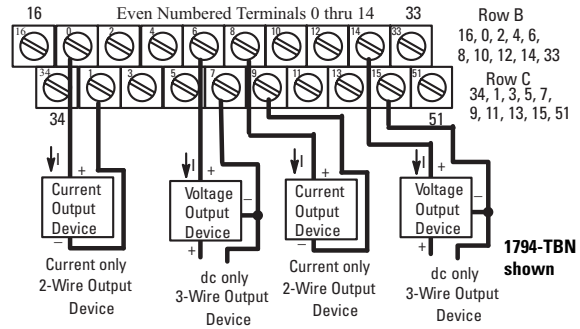
Channel	Signal Type	Label Marking	1794 -TB2, -TB3, -TB3S, -TB3T, -TB3TS,	1794 -TB3, -TB3S	1794 -TB2, TB3, -TB3S	1794-TB3T, -TB3TS	
			Input	Power[1]	Common Terminal		Shield
Input 0	Current	I0	A-0	C-35	B-17	B-17	C-39
	Voltage	V0	A-1	C-36	B-18	B-17	
Input 1	Current	I1	A-2	C-37	B-19	B-19	C-40
	Voltage	V1	A-3	C-38	B-20	B-19	
Input 2	Current	I2	A-4	C-39	B-21	B-21	C-41
	Voltage	V2	A-5	C-40	B-22	B-21	
Input 3	Current	I3	A-6	C-41	B-23	B-23	C-42
	Voltage	V3	A-7	C-42	B-24	B-23	
Input 4	Current	I4	A-8	C-43	B-25	B-25	C-43
	Voltage	V4	A-9	C-44	B-26	B-25	
Input 5	Current	I5	A-10	C-45	B-27	B-27	C-44
	Voltage	V5	A-11	C-46	B-28	B-27	
Input 6	Current	I6	A-12	C-47	B-29	B-29	C-45
	Voltage	V6	A-13	C-48	B-30	B-29	
Input 7	Current	I7	A-14	C-49	B-31	B-31	C-46
	Voltage	V7	A-15	C-50	B-32	B-31	
-V dc Common	1794-TB2, -TB3, -TB3S - Terminals 16 thru 33 are internally connected in the terminal base unit. 1794-TB3T, -TB3TS - Terminals 16, 17, 19, 21, 23, 25, 27, 29, 31 and 33 are internally connected in the terminal base unit.						
+V dc Power	1794-TB3, -TB3S - Terminals 34 thru 51 are internally connected in the terminal base unit. 1794-TB3T, -TB3TS - Terminals 34, 35, 50 and 51 are internally connected in the terminal base unit. 1794-TB2 - Terminals 34 and 51 are internally connected in the terminal base unit.						
Chassis Ground (Shield)	1794-TB3T, -TB3TS - Terminals 39 thru 46 are internally connected to chassis ground.						
1 Use when transmitter requires terminal base power.							

Terminal Base Wiring for the 1794-IE8/B and -IE8K/B

(1794-TB3 base shown)
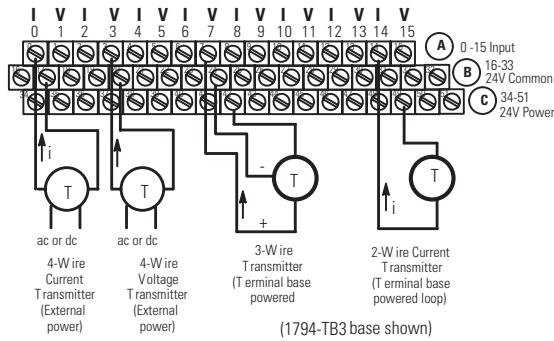
Terminal Base Wiring for the 1794-OE4/B and -OE4K/B

1794-TBN shown

Wiring Connections for the 1794-OE4/B and -OE4K/B Output Module

| Channel	Signal Type	Label Marking	1794-TB2, -TB3, -TB3S, -TB3T, -TB3TS		1794-TBN
			Output Terminal[1]	Shield (1794-TB3T, -TB3TS)	Output Terminal[2]
Output 0	Current	I0	A-0	C-39	B-0
	Current	I0 Ret	A-1		C-1
	Voltage	V0	A-2	C-40	B-2
	Voltage	V0 Ret	A-3		C-3
Output 1	Current	I1	A-4	C-41	B-4
	Current	I1 Ret	A-5		C-5
	Voltage	V1	A-6	C-42	B-6
	Voltage	V1 Ret	A-7		C-7
Output 2	Current	I2	A-8	C-43	B-8
	Current	I2 Ret	A-9		C-9
	Voltage	V2	A-10	C-44	B-10
	Voltage	V2 Ret	A-11		C-11
Output 3	Current	I3	A-12	C-45	B-12
	Current	I3 Ret	A-13		C-13
	Voltage	V3	A-14	C-46	B-14
	Voltage	V3 Ret	A-15		C-15
-V dc Common	1794-TB3, -TB3S - Terminals 16 thru 33 are internally connected in the terminal base unit. 1794-TB3T, -TB3TS - Terminals 16, 17, 19, 21, 23, 25, 27, 29, 31 and 33 are internally connected in the terminal base unit. 1794-TB2 - Terminals 16 and 33 are internally connected in the terminal base unit.				
+V dc Power	1794-TB3, -TB3S - Terminals 34 thru 51 are internally connected in the terminal base unit. 1794-TB3T, -TB3TS - Terminals 34, 35, 50 and 51 are internally connected in the terminal base unit. 1794-TB2 - Terminals 34 and 51 are internally connected in the terminal base unit.				
Chassis Ground (Shield)	1794-TB3T, -TB3TS - Terminals 39 thru 46 are internally connected to chassis ground.				

1 A-1, 3, 5, 7, 9, 11, 13 and 15 are internally connected in the module to 24V dc common.
2 C-1, 3, 5, 7, 9, 11, 13 and 15 are internally connected in the module to 24V dc common

Wiring Connections for the 1794-IE4XOE2/B 4 Analog Input/2 Output Module

Channel	Signal Type	Label Marking	1794-TB2, -TB3,-TB3S, -TB3T, -TB3TS	1794 -TB3, -TB3S	1794 -TB2, -TB3, -TB3S	1794-TB3T, -TB3TS
			Input/Output Terminal[1]	Power Terminal[2]	Common Terminal	Shield
Input 0	Current	I0	A-0	C-35	B-17	B-17	C-39
	Voltage	V0	A-1	C-36	B-18	B-17	
Input 1	Current	I1	A-2	C-37	B-19	B-19	C-40
	Voltage	V1	A-3	C-38	B-20	B-19	
Input 2	Current	I2	A-4	C-39	B-21	B-21	C-41
	Voltage	V2	A-5	C-40	B-22	B-21	
Input 3	Current	I3	A-6	C-41	B-23	B-23	C-42
	Voltage	V3	A-7	C-42	B-24	B-23	
Output 0	Current	I0	A-8			C-43
	Current	RET	A-9			
	Voltage	V0	A-10			C-44
	Voltage	RET	A-11			
Output 1	Current	I1	A-12			C-45
	Current	RET	A-13			
	Voltage	V1	A-14			C-46
	Voltage	RET	A-15			
-V dc Common	1794-TB2, -TB3, -TB3S - Terminals 16 thru 33 are internally connected in the terminal base unit. 1794-TB3T, -TB3TS - Terminals 16, 17, 19, 21, 23, 25, 27, 29, 31 and 33 are internally connected in the terminal base unit.					
+V dc Power	1794-TB3, -TB3S - Terminals 34 thru 51 are internally connected in the terminal base unit. 1794-TB3T, -TB3TS - Terminals 34, 35, 50 and 51 are internally connected in the terminal base unit. 1794-TB2 - Terminals 34 and 51 are internally connected in the terminal base unit.					
Chassis Ground (Shield)	1794-TB3T, -TB3TS - Terminals 39 thru 46 are internally connected to chassis ground.					

1 A-9, 11, 13 and 15 are internally connected in the module to 24V dc common.
2 Use when transmitter requires terminal base power.

Terminal Base Wiring for the 1794-IE4XOE2/B (1794-TB3 Terminal Base shown)
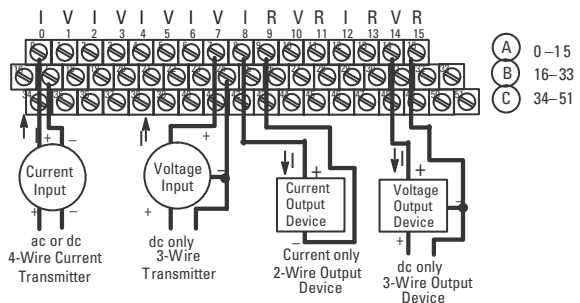
Input Map (Read) - 1794-IE8, -IE8K

Dec.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Oct.	17	16	15	14	13	12	11	10	7	6	5	4	3	2	1	0
Word 0	S	Analog Input Value for Channel 0														
Word 1	S	Analog Input Value for Channel 1														
Word 2	S	Analog Input Value for Channel 2														
Word 3	S	Analog Input Value for Channel 3														
Word 4	S	Analog Input Value for Channel 4														
Word 5	S	Analog Input Value for Channel 5														
Word 6	S	Analog Input Value for Channel 6														
Word 7	S	Analog Input Value for Channel 7														
Word 8	PU	Not used - set to zero							U7	U6	U5	U4	U3	U2	U1	U0

Where : PU = Power up inconfigured
S = Sign bit (in 2's complement)
U = Underrange for specified channel

Output Map (Write) - 1794-IE8, -IE8K

Dec.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Oct.	17	16	15	14	13	12	11	10	7	6	5	4	3	2	1	0
Word 3	C7	C6	C5	C4	C3	C2	C1	C0	F7	F6	F5	F4	F3	F2	F1	F0

Where :
C = Configure select bit
F = Full range bit

Input Map (Read) - 1794-IE4XOE2

Dec.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Oct.	17	16	15	14	13	12	11	10	7	6	5	4	3	2	1	0
Word 0	S	Analog Input Value for Channel 0														
Word 1	S	Analog Input Value for Channel 1														
Word 2	S	Analog Input Value for Channel 2														
Word 3	S	Analog Input Value for Channel 3														
Word 4	PU	Not used - set to zero							W1	W0	U3	U2	U1	U0		

Where : PU = Power up inconfigured
S = Sign bit (in 2's complement)
W1 and W0 = Diagnostic bits for current output. Wire off current loop status for output channels 0 and 1
U = Underrange for specified channel

Output Map (Write) - 1794-IE4XOE2

Dec.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Oct.	17	16	15	14	13	12	11	10	7	6	5	4	3	2	1	0
Word 0	S	Analog Output Data - Channel 0														
Word 1	S	Analog Output Data - Channel 1														
Word 2	Not used - set to 0														M1	M0
Word 3	0	0	C5	C4	C3	C2	C1	C0	0	0	F5	F4	F3	F2	F1	F0
Words 4 and 5	Not used - set to 0															
Word 6	Safe State Value for Channel 0															
Word 7	Safe State Value for Channel 1															

Where :
PU = Power up inconfigured   FP = Field power off
CF = In configuration mode   BD = Bad calibration
DN = Calibration accepted   W1 and W0 = Wire off current loop status for output channels 0 and 1
U = Underrange for specified channel V = Overrange for specified channel
P0 and P1 = Outputs holding in response to Q0 and Q1

Range Selection Bits - 1794-IE8, -IE8K and -IE4XOE2

1794-IE8	In Ch. 0		In Ch. 1		In Ch. 2		In Ch. 3		In Ch. 4		In Ch. 5		In Ch. 6		In Ch. 7	
1794-IE4XOE2	In Ch. 0		In Ch.1		In Ch. 2		In Ch. 3		Out Ch. 0		Out Ch. 1					
	F0	C0	F1	C1	F2	C2	F3	C3	F4	C4	F5	C5	F6	C6	F7	C7
Dec. Bits	00	08	01	09	02	10	03	11	04	12	05	13	06	14	07	15
0-10V dc/ 0-20mA	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
4-20mA	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
-10 to +10V dc	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
OFF[1]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Where: C = Configure Select Bit   F = Full range
1 When configured to Off, individual input channels will return 0000H; output channels will drive 0V/0mA.

Input Map (Read) - 1794-OE4, -OE4K

Dec.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Oct.	17	16	15	14	13	12	11	10	7	6	5	4	3	2	1	0
Word 0	PU	Not used - set to 0											W3	W2	W1	W0

Where : PU = Power up bit
W thru W3 = Wire off current loop status for output channels

Output Map (Write) - 1794-OE4, -OE4K

Dec.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Oct.	17	16	15	14	13	12	11	10	7	6	5	4	3	2	1	0
Word 0	S	Output Data Channel 0														
Word 1	S	Output Data Channel 1														
Word 2	S	Output Data Channel 2														
Word 3	S	Output Data Channel 3														
Word 4	Not used - set to 0												M3	M2	M1	M0
Word 5	Not used - set to 0		C3	C2	C1	C0	Not used - set to 0				F3	F2	F1	F0		
Word 6-9	Not used - set to 0															
Word 10	S	Safe state value for Channel 0														
Word 11	S	Safe state value for Channel 1														
Word 12	S	Safe state value for Channel 2														
Word 13	S	Safe state value for Channel 3														

Where :
S = Sign bit (in 2's complement)
M = Multiplex control bit
C = Configure select bit
F = Full range bit

Range Selection Bits - 1794-OE4, -OE4K

Channel No.	In Ch. 0		In Ch.1		In Ch. 2		In Ch. 3	
	F0	C0	F1	C1	F2	C2	F3	C3
Dec. Bits	00	08	01	09	02	10	03	11
0-10V dc/ 0-20mA	1	0	1	0	1	0	1	0
4-20mA	0	1	0	1	0	1	0	1
-10 to +10V dc	1	1	1	1	1	1	1	1
OFF[1]	0	0	0	0	0	0	0	0

Where: C = Configure Select Bit   F = Full range
1 When configured to Off, individual output channels will drive 0V/0mA.

Specifications

Input Specifications

Input Specifications	
Number of Inputs	**1794-IE8, -IE8K -** 8 single-ended, nonisolated **1794-IE4XOE2 -** 4 single-ended nonisolated

Resolution
    Voltage
    Current
	12 bits unipolar; 11 bits plus sign bipolar
	2.56mV/cnt unipolar; 5.13mV/cnt bipolar
	5.13µA/cnt

Data Format	left justified, 16 bit 2s complement
Conversion Type	successive approximation
Conversion Rate	256µs all channels
Input Current Terminal	4-20mA (user configurable) 0-20mA (user configurable)
Input Voltage Terminal	±10V (user configurable) 0-10V (user configurable)

Normal Mode Rejection Ratio -
    Voltage Terminal
 	
    Current Terminal
	3dB @ 17Hz; -20db/decade
	-10db @ 50Hz;-11.4db @ 60Hz
	-3dB @ 9Hz; -20db/decade
	-15.3db @ 50Hz;-16.8db @ 60Hz

Step Response to 63% -	Voltage Terminal - 9.4ms Current Terminal - 18.2ms
Input Impedance	Voltage Terminal - 100k ohms Current Terminal - 238 ohms
Input Resistance Voltage	Voltage Terminal - 200k ohms Current Terminal - 238 ohms
Absolute Accuracy[1]	0.20% Full Scale @ 25°C
Accuracy Drift with Temperature	Voltage Terminal - 0.00428% Full Scale/°C Current Terminal - 0.00407% Full Scale/°C
Calibration Required	None required
Maximum Overload	30V continuous or 32mA continuous, one channel at a time.
Indicators	1 green power indicator

Output Specifications

Number of Outputs	**1794-OE4, -OE4K -** 4 single-ended, nonisolated **1794-IE4XOE2 -** 2 single-ended, nonisolated
Resolution Voltage Current	 0.156mV/cnt 0.320µA/cnt
Data Format	left justified, 16 bit 2's complement
Conversion Type	Pulse width modulation
Output Current Terminal	0mA output until module is configured 4-20mA (user configurable) 0-20mA (user configurable)
Output Voltage Terminal	0V output until module is configured ±10V (user configurable) 0-10V user configurable)
Step Response to 63% - Voltage or Current Terminal	24ms
Current Load on voltage output	3mA maximum
Absolute Accuracy[1] Voltage Terminal Current Terminal	 0.133% Full Scale @ 25°C 0.425% Full Scale @ 25°C
Accuracy Drift with Temperature Voltage Terminal Current Terminal	 0.0045% Full Scale/°C 0.0069% Full Scale/°C
Resistive Load on mA Output	15-750 ohm @ 24V dc

General Specifications for 1794-IE8, -IE8K, -OE4, -OE4K, and -IE4XOE2

Module Location	**Cat. No. 1794-IE8, -IE8K, -IE4XOE2 -** 1794-TB2, -TB3, -TB3S, -TB3T, -TB3TS Terminal Base Unit **Cat. No. 1794-OE4, -OE4K -** 1794-TB2, -TB3, -TB3S, -TB3T, -TB3TS, and -TBN Terminal Base Unit
Terminal Base Screw Torque	7 pound-inches (0.8Nm) 9 pound-inches (1.0Nm) for 1794-TBN
Isolation Voltage	Tested at 850V dc for 1s between user power to system No isolation between individual channels
External dc Power Supply Voltage Range Supply Current	 24V dc nominal 10.5 to 31.2V dc (includes 5% ac ripple) 1794-IE8, -IB8K - 60mA @ 24V dc; 150mA @ 12V dc 1794-OE4, -OE4K - 70mA @ 24V dc; 150mA @ 12V dc 1794-IE4XOE2 - 70mA @ 24V dc; 150mA @ 12V dc
Dimensions (with module installed)	31.8H x 3.7W x 2.1D inches 45.7H x 94W x 53.3D mm
Flexbus Current	20mA
Power Dissipation	1794-IE8, -IB8K - 3.0W maximum @ 31.2V dc 1794-OE4, -OE4K - 4.5W maximum @ 31.2V dc 1794-IE4XOE2 - 4.0W maximum @ 31.2V dc
Thermal Dissipation	1794-IE8, -IB8K - Maximum 10.2 BTU/hr @ 31.2V dc 1794-OE4, -OE4K - Maximum 13.6 BTU/hr @ 31.2V dc 1794-IE4XOE2 - Maximum 15.3 BTU/hr @ 31.2V d
Keyswitch Position	1794-IE8, -IB8K - 3 1794-OE4, -OE4K - 4 1794-IE4XOE2 - 5
Environmental Conditions 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): 0 to 55°C (32 to 131°F)
Storage Temperature	IEC 60068-2-1 (Test Ab, Un-packaged Non-operating Cold), IEC 60068-2-2 (Test Bb, Un-packaged Non-operating Dry Heat), IEC 60068-2-14 (Test Na, Un-packaged Non-operating Thermal Shock): –40 to 85°C (–40 to 185°F)
Relative Humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5 to 95% non-condensing
Vibration	IEC60068-2-6 (Test Fc, Operating): 5g @ 10-500Hz
Shock	IEC60068-2-27 (Test Ea, Unpackaged shock): Operating 30g Non-operating 50g
Emissions	CISPR 11 Group 1, Class A (with appropriate enclosure)
ESD Immunity	EC 61000-4-2: 4kV contact discharges 8kV air discharges
Radiated RF Immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80%AM from 30MHz to 1000MHz
Conducted RF Immunity	IEC 61000-4-6: 10V rms with with 1kHz sine-wave 80%AM from 150kHz to 30MHz
EFT/B Immunity	IEC 61000-4-4: ±2kV at 5kHz on signal ports
Surge Transient Immunity	IEC 61000-4-5: ±2kV line-earth (CM) on shielded ports
Enclosure Type Rating	None (open-style)
Conductors Wire Size Category[2]	22-12AWG (0.34mm^2-2.5mm^2) stranded copper wire rated at 75°C or higher 3/64 inch (1.2mm) insulation maximum 2
Certifications (when product is marked)[3]	**UL** UL Listed Industrial Control Equipment **UL** UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations **cULus** UL Listed Industrial Control Equipment, certified for US and Canada (1794-IE8, -OE4) **cUL** UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for Canada (1794-IE8, -IE8K, -OE4, -OE4K) **CSA** CSA certified Process Control Equipment **CSA** CSA certified for Class I, Division 2, Groups A, B, C and D Hazardous locations **EEx[3]** European Union 94/9/EEC ATEX Directive, compliant with: EN 50021; Potentially Explosive Atmospheres, Protection "n" (European Zone 2) **CE[3]** European Union 89/336/EEC EMC Directive, compliant with: EN 61000-6-4; Industrial Emissions EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity **C-Tick[3] -** Australian Radiocommunications Act compliant with AS/NZS CISPR 11, Industrial Emissions

1 Includes offset, gain, nonlinearity and repeatability error terms.
2 You use this category information for planning conductor routing as described in Allen-Bradley
   publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines.
3 For the latest up-to-date information, see the Product Certification link at www.ab.com for Declarations of
   Conformity, Certificates and other certification details. For notification of any additional release notes, refer to
   www.ab.com/manuals/.

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