



# Installation Instructions

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

Cat. No. 1794-IE8XT, 1794-OE4XT, and 1794-IE4XOE2XT, 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://literature.rockwellautomation.com>) 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.

 <b>WARNING</b>	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.
 <b>IMPORTANT</b>	Identifies information that is critical for successful application and understanding of the product.
 <b>ATTENTION</b>	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you: <ul style="list-style-type: none"> <li>• identify a hazard</li> <li>• avoid a hazard</li> <li>• recognize the consequence</li> </ul>

### 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 60664-1), at altitudes up to 2000 meters (6562 ft) without derating. This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR 11. Without appropriate precautions, there may be difficulties with electromagnetic compatibility in residential and other environments due to conducted and radiated disturbances.

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 enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA, V2, V1, V0 (or equivalent) if non-metallic. 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.

In addition to this publication, see:

- Industrial Automation Wiring and Grounding Guidelines, for additional installation requirements, Allen-Bradley publication [1770-4.1](#).
- NEMA Standards 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure.

### WARNING



If 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 (for example, aluminum or plastic) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding. Secure DIN rail to mounting surface approximately every 200 mm (7.8 in.) and use end-anchors appropriately.

### 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.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

### ATTENTION



Personnel responsible for the application of safety-related Programmable Electronic Systems (PES) shall be aware of the safety requirements in the application of the system and shall be trained in using the system.

### ATTENTION



Do not remove or replace a Terminal Base unit while power is applied. Interruption of the backplane can result in unintentional operation or machine motion.

### ATTENTION



IE8XT only:  
To comply with UL restrictions, all I/O connections to this equipment must be powered from a source compliant with the following:  
UL Listed supply, limited to 150V A or less with a maximum open circuit voltage of 32V DC.

### ATTENTION



To comply with the CE Low Voltage Directive (LVD), all connections to this equipment must be powered from a source compliant with the following: Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV).

### European Zone 2 Hazardous Location Approval

The following analog input/output modules are European Zone 2 approved: 1794-IE8XT, 1794-OE4XT, and 1794-IE4XOE2XT.

### 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 and 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. Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-15 and EN 60079-0.

**WARNING**



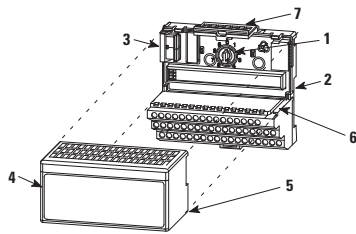
- Observe the following additional Zone 2 certification requirements.
- This equipment is not resistant to sunlight or other sources of UV radiation.
  - This equipment must be installed in an enclosure providing at least IP54 protection when applied in Zone 2 environments.
  - This equipment shall be 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 Zone 2 environments.
  - Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
  - Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.

**North American Hazardous Location Approval**

The following modules are North American Hazardous Location approved: 1794-IE8XT, 1794-OE4XT, and 1794-IE4XOE2XT.

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	AVERTISSEMENT	RISQUE D'EXPLOSION
	<ul style="list-style-type: none"> <li>• Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.</li> <li>• 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.</li> <li>• Substitution of components may impair suitability for Class I, Division 2.</li> <li>• If this product contains batteries, they must only be changed in an area known to be nonhazardous.</li> </ul>		<ul style="list-style-type: none"> <li>• Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.</li> <li>• 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.</li> <li>• La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2.</li> <li>• S'assurer que l'environnement est classé non dangereux avant de changer les piles.</li> </ul>

**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 (for example, metal chips or wire strands) is kept from falling into the module. Debris that falls into the module could cause damage on power up.

**ATTENTION**



Allow 25.4 mm (1 in.) of space between adjacent equipment for adequate ventilation.

1. Rotate the keyswitch (1) on the terminal base (2) clockwise to position 3 (1794-IE8XT), 4 (1794-OE4XT) or 5 (1794-IE4XOE2XT) as required.

2. Make certain the flexbus connector (3) is pushed all the way to the left to connect with the neighboring termbase/adaptor. **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 shielded wire for signal wiring.

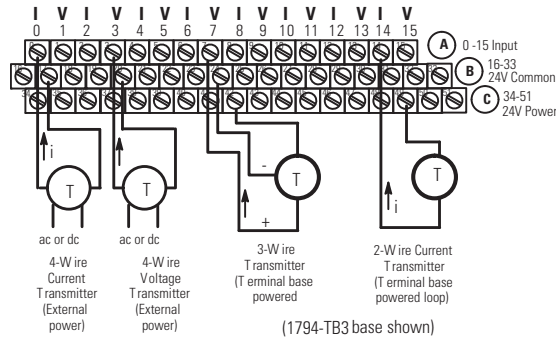
2. Connect channel common/return to the associated terminal on row (A) or row (B) for the 1794-TB2, -TB3, -TB3S, -TB3T and -TB3TS, or on row C for the 1794-TBN. For input devices requiring terminal base power, connect the channel power wiring to the associated terminal on row (C).
3. Connect any signal 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.
5. If daisy chaining +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-IE8XT/B Analog Input Module**

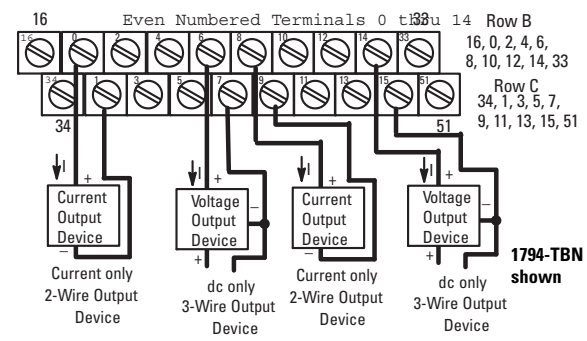
Channel	Signal Type	Label Marking	1794 -TB2, -TB3, -TB3S, -TB3T, -TB3TS	1794 -TB3, -TB3S	1794 -TB2, -TB3, -TB3S	1794-TB3T, -TB3TS	
			Input	Power <sup>(1)</sup>	Common Terminal	Shield	
Input 0	Current	I0	A-0	C-35	B-17	B-17	C-39
	Voltage	V0	A-1	C-36	B-18	B-17	
Input 1	Current	I1	A-2	C-37	B-19	B-19	C-40
	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...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...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...46 are internally connected to chassis ground.				

<sup>(1)</sup> Use when transmitter requires terminal base power.

**Terminal Base Wiring for the 1794-IE8XT/B**



**Terminal Base Wiring for the 1794-OE4XT**



**Wiring Connections for the 1794-OE4XT Output Module**

Channel	Signal Type	Label Marking	1794-TB2, -TB3, -TB3S, -TB3T, -TB3TS		1794-TBN Output Terminal <sup>2</sup>
			Output Terminal <sup>1</sup>	Shield (1794-TB3T, -TB3TS)	
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

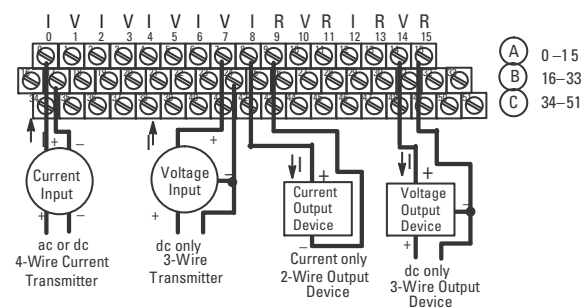
**Wiring Connections for the 1794-IE4XOE2XT/B 4 Analog Input/2 Output Module**

Channel	Signal Type	Label Marking	1794-TB2, -TB3, -TB3S, -TB3T, -TB3TS	1794-TB3, -TB3S	1794-TB2, -TB3, -TB3S	1794-TB3T, -TB3TS	Shield
			Input/Output Terminal <sup>(1)</sup>	Power Terminal <sup>(2)</sup>	Common Terminal		
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	B-12	B-12	C-43
	Current	RET	A-9				
	Voltage	V0	A-10				
	Voltage	RET	A-11				
Output 1	Current	I1	A-12	C-45	B-13	B-13	C-45
	Current	RET	A-13				
	Voltage	V1	A-14				
	Voltage	RET	A-15				
-V DC Common	1794-TB2, -TB3, -TB3S - Terminals 16, 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, 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...46 are internally connected to chassis ground.						

(1) A-9, 11, 13 and 15 are internally connected in the module to 24VDC common.

(2) Use when transmitter requires terminal base power.

**Terminal Base Wiring for the 1794-IE4XOE2XT/B (1794-TB3 Terminal Base shown)**



**Input Map (Read) - 1794-IE8XT**

<b>Dec.</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>			
<b>Oct.</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>			
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 unconfigured  
 S = Sign bit (in 2's complement)  
 U = Underrange for specified channel

**Output Map (Write) - 1794-IE8XT**

<b>Dec.</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>Oct.</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
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) - 1794-0E4XT**

<b>Dec.</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>Oct.</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
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) - 1794-0E4XT**

<b>Dec.</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>Oct.</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
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 - 1794-0E4XT**

Channel No.	In Ch. 0		In Ch. 1		In Ch. 2		In Ch. 3	
	F0	C0	F1	C1	F2	C2	F3	C3
<b>Dec. Bits</b>	<b>00</b>	<b>08</b>	<b>01</b>	<b>09</b>	<b>02</b>	<b>10</b>	<b>03</b>	<b>11</b>
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 <sup>1)</sup>	0	0	0	0	0	0	0	0

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

**Input Map (Read) - 1794-IE4X0E2XT**

<b>Dec.</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>	
<b>Oct.</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>	
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 unconfigured  
 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-IE4X0E2XT**

<b>Dec.</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>Oct.</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
Word 0	S	Analog Output Data - Channel 0														
Word 1	S	Analog Output Data - Channel 1														
Word 2	Not used - set to 0															
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 unconfiguredPP = Field power off  
 CF = In configuration modeBD = Bad calibration  
 DN = Calibration acceptedW1 and W0 = Wire off current loop status for output channels 0 and 1  
 U = Underrange for specified channelV = Overrange for specified channel  
 F0 and F1 = Outputs holding in response to 00 and 01

**Range Selection Bits - 1794-IE8XT, -IE4X0E2XT**

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-IE4X0E2	In Ch. 0	In Ch.1	In Ch. 2	In Ch. 3	Out Ch. 0	Out Ch. 1										
Dec. Bits	F0	C0	F1	C1	F2	C2	F3	C3	F4	C4	F5	C5	F6	C6	F7	C7
0-10V DC /0-20 mA	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
4...20 mA	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 <sup>1)</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Where:  
 C = Configure Select Bit  
 F = Full range

<sup>1)</sup> When configured to Off, individual input channels will return 0000H; output channels will drive 0V/0 mA.

**Specifications**

**Input Specifications**

Attribute	Value
Number of inputs	8 single-ended, nonisolated (1794-IE8XT) 4 single-ended nonisolated (1794-IE4X0E2XT)
Resolution Voltage Current	12 bits unipolar; 11 bits plus sign bipolar 2.56 mV/cnt unipolar; 5.13mV/cnt bipolar 5.13 µA/cnt
Data format	left justified, 16 bit 2s complement
Conversion type	successive approximation
Conversion rate	256 µs all channels
Input current terminal	4...20 mA (user configurable) 0...20 mA (user configurable) limited to 150VA
Input voltage terminal	±10 V (user configurable) 0...10 V (user configurable) limited to 150VA
Normal mode rejection ratio - Voltage terminal Current terminal	3 dB @ 17 Hz; -20 dB/decade -10 dB @ 50 Hz; -11.4 dB @ 60 Hz -3 dB @ 9 Hz; -20 dB/decade -15.3 dB @ 50 Hz; -16.8 dB @ 60 Hz
Step response to 63%	Voltage terminal - 9.4 ms Current terminal - 18.2 ms
Input impedance	Voltage terminal - 100 kΩ Current terminal - 238 Ω
Input resistance voltage	Voltage terminal - 200 kΩ Current terminal - 238 Ω
Absolute accuracy <sup>1)</sup>	0.20% Full Scale @ 25 °C
Accuracy drift with temperature	Voltage terminal - 0.00428% Full Scale/°C Current terminal - 0.00407% Full Scale/°C

**Input Specifications**

Calibration required	None required
Maximum overload	30V continuous or 32 mA continuous, one channel at a time.
Indicators	1 green power indicator

<sup>(1)</sup> Includes offset, gain, nonlinearity and repeatability error terms.

**Output Specifications**

Attribute	Value
Number of outputs	4 single-ended, nonisolated (1794-OE4XT) 2 single-ended, nonisolated (1794-IE4XOE2XT)
Resolution Voltage Current	12 bits plus sign 0.156 mV/cnt 0.320 µA/cnt
Data format	left justified, 16 bit 2's complement
Conversion type	Pulse width modulation
Output current terminal	0 mA output until module is configured 4...20 mA (user configurable) 0...20 mA (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	24 ms
Current load on voltage output	3 mA maximum
Absolute accuracy <sup>(1)</sup> 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 Ω @ 24V DC

<sup>(1)</sup> Includes offset, gain, nonlinearity and repeatability error terms.

**General Specifications**

Attribute	Value
Module location	(1794-IE8XT, -IE4XOE2XT) 1794-TB2, -TB3, -TB3S, -TB3T, -TB3TS Terminal Base Unit  (1794-OE4XT) 1794-TB2, -TB3, -TB3S, -TB3T, -TB3TS, and -TBN Terminal Base Unit
Terminal base screw torque	Determined by installed terminal base
Isolation voltage	(1794-OE4XT) 50V (continuous), Basic Insulation Type, between field side and system No isolation between individual channels Type tested at 850V DC for 60 s  (1794-IE8XT, -IE4XOE2XT) 50V (continuous), Basic Insulation Type Type tested at 1000V AC for 60 s, between field side and system No isolation between individual channels

**General Specifications**

External DC power supply	24V DC nominal 10.5 to 31.2V DC
Voltage range	(1794-IE8XT) 60 mA @ 24V DC  (1794-IE4XOE2XT) 164 mA @ 10.5V DC  (1794-OE4XT) 180 mA @ 10.5V DC
Supply current	
Dimensions (with module installed)	45.7H x 94W x 53.3D mm (31.8H x 3.7W x 2.1D inches)
Flexbus current	15 mA (1794-IE4XOE2XT) 10 mA (1794-IE8XT) 15 mA (1794-OE4XT)
Power dissipation	3.0W maximum @ 31.2V DC (1794-IE8XT) 4.5W maximum @ 31.2V DC (1794-OE4XT) 4.0W maximum @ 31.2V DC (1794-IE4XOE2XT)
Thermal dissipation	Maximum 10.2 BTU/hr @ 31.2V DC (1794-IE8XT) Maximum 13.6 BTU/hr @ 31.2V DC (1794-OE4XT) Maximum 15.3 BTU/hr @ 31.2V DC (1794-IE4XOE2XT)
Keyswitch position	3 (1794-IE8XT) 4 (1794-OE4XT) 5 (1794-IE4XOE2XT)
Enclosure type rating	None (open-style)
Wire size	Determined by installed terminal base
Wiring Category <sup>(1)</sup>	2 - on signal ports
Wire type	Shielded
North American temp code	T4 (1794-IE4XOE2XT) T4A (1794-IE8XT) T3C (1794-OE4XT)
IEC temp code	T4 T3 (1794-OE4XT)

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

**Environmental**

Attribute	Value
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...70 °C (-4...158 °F)
Non-operating temperature	IEC 60068-2-1 (Test Ab, Unpackaged Non-operating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Non-operating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Non-operating Thermal Shock): -40...85 °C (-40...185 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5...95% noncondensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz
Operating shock	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g
Non-operating shock	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g
Emissions	CISPR 11: Group 1, Class A (with appropriate enclosure)
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges

## Environmental

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 at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV at 5 kHz on signal ports
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) 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

## Certification (when product is marked) <sup>(1)</sup>

Attribute	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.  UL Listed for Class 1, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/EC EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: EN 60079-15; Potentially Explosive Atmospheres, Protection "n" (II 3 G Ex nA IIC T4 X) EN 60079-15; Potentially Explosive Atmospheres, Protection "n" (II 3 G Ex nA IIC T3 X) (1794-0E4XT) EN 60079-0; General Requirements (Zone 2)
TÜV	TÜV Certified for Functional Safety up to and including SIL 2

<sup>(1)</sup> See the Product Certification link at <http://www.ab.com> for Declaration of Conformity, Certificates, and other certification details.

**[www.rockwellautomation.com](http://www.rockwellautomation.com)**

### Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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