Installation Instructions

Allen-Bradley

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

Catalog Numbers 1794-IE12, 1794-OE12, and 1794-IE8XOE4

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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.

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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.
	**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, and recognize the consequences.
	**SHOCK HAZARD:** Labels may be located on or inside the equipment (for example, drive or motor) to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be located on or inside the equipment (for example, drive or motor) to alert people that surfaces may be dangerous temperatures.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

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 Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-IN041, for additional installation requirements pertaining to this equipment.

Prevent Electrostatic Discharge

ATTENTION: 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.

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: This product 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 (such as aluminum or plastic) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding.

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).

North American Hazardous Location Approval

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.

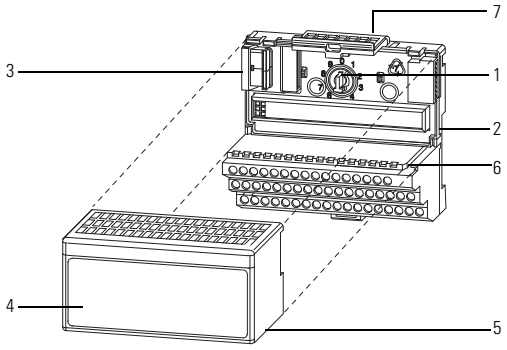
WARNING: EXPLOSION HAZARD

- 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.

WARNING: 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.

Install Your Analog Input/Output Module



	Description		Description
1	Keyswitch	5	Groove
2	Terminal base	6	Alignment bar
3	FLEXBus connector	7	Latching mechanism
4	Module		

These modules mount on a 1794-TB3G or 1794-TB3GS terminal base.

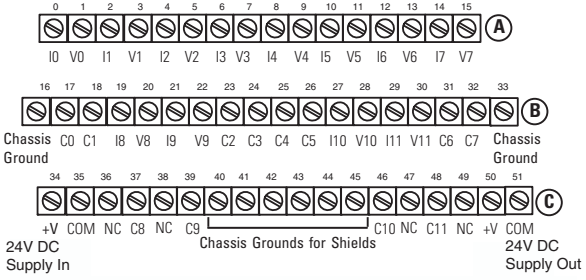
1. Rotate the keyswitch (**1**) on the terminal base (**2**) clockwise to position 3 (1794-IE12), 4 (1794-OE12), or 5 (1794-IE8XOE4) as required.
2. Make certain the FLEXBus connector (**3**) is pushed all the way to the left to connect with the neighboring terminal base/adapter. **You cannot install 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.

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

Connect Wiring

Connect the wiring for the 1794-TB3G and 1794-TB3GS terminal bases as shown in the following figure:

Terminal Base Wiring for the 1794-IE12/A Analog Input Module



I = Current [1794-TB3G shown]
V=Voltage
C-0...C-11 = Returns for I or V connections 0...11
+24V DC = Terminals C-34 and C-50
COM = Terminals C-35 and C-51
Chassis ground (CG) = Terminals B-16, B-33, C-38, C-40...C-45, C-47
NC = No connection
For daisy-chaining: Supply in – C-34 (+) and C-35 (-)
Supply out – C-50 (+) and C-51 (-)

ATTENTION: To reduce susceptibility to noise, power analog modules and digital modules from separate power supplies. Do not exceed a length of 10 m (33 ft) for DC power or analog I/O cabling.

ATTENTION: Do not daisy-chain power or ground from this terminal base unit to any AC or DC digital module terminal base units.

ATTENTION: Do not exceed a length of 10 m (33 ft) for signal cabling.

Wire Connections for the 1794-IE12/A Analog Input Module

Channel	Signal Type	Label Marking	1794-TB3G or 1794-TB3GS	
			Input	Common Terminal
Input 0	Current	I0	A-0	B-17
	Voltage	V0	A-1	
Input 1	Current	I1	A-2	B-18
	Voltage	V1	A-3	
Input 2	Current	I2	A-4	B-23
	Voltage	V2	A-5	
Input 3	Current	I3	A-6	B-24
	Voltage	V3	A-7	
Input 4	Current	I4	A-8	B-25
	Voltage	V4	A-9	
Input 5	Current	I5	A-10	B-26
	Voltage	V5	A-11	
Input 6	Current	I6	A-12	B-31
	Voltage	V6	A-13	
Input 7	Current	I7	A-14	B-32
	Voltage	V7	A-15	
Input 8	Current	I8	B-19	C-37
	Voltage	V8	B-20	
Input 9	Current	I9	B.21	C-39
	Voltage	V9	B-22	
Input 10	Current	I10	B-27	C-46
	Voltage	V10	B-28	
Input 11	Current	I11	B-29	C-48
	Voltage	V11	B-30	
-V DC Common	1794-TB3G and 1794-TB3GS – Terminals C-35 and C-51 are internally connected in the terminal base unit.			
+V DC Power	1794-TB3G and 1794-TB3GS – Terminals C-34 and C-50 are internally connected in the terminal base unit.			
Chassis Ground (Shield)	1794-TB3G and 1794-TB3GS – Terminals B-16, B-33, C-38, C-40...C-45, and C-47 are internally connected to chassis ground.			

ATTENTION: Connect only one current or voltage signal per channel. Do not connect both current and voltage on one channel.

Wire Connections for the 1794-OE12/A Analog Output Module

Channel	Signal Type	Label Marking	1794-TB3G or 1794-TB3GS	
			Output	Common Terminal
Output 0	Current	I0	A-0	B-17
	Voltage	V0	A-1	
Output 1	Current	I1	A-2	B-18
	Voltage	V1	A-3	
Output 2	Current	I2	A-4	B-23
	Voltage	V2	A-5	
Output 3	Current	I3	A-6	B-24
	Voltage	V3	A-7	
Output 4	Current	I4	A-8	B-25
	Voltage	V4	A-9	
Output 5	Current	I5	A-10	B-26
	Voltage	V5	A-11	
Output 6	Current	I6	A-12	B-31
	Voltage	V6	A-13	
Output 7	Current	I7	A-14	B-32
	Voltage	V7	A-15	
Output 8	Current	I8	B-19	C-37
	Voltage	V8	B-20	
Output 9	Current	I9	B.21	C-39
	Voltage	V9	B-22	
Output 10	Current	I10	B-27	C-46
	Voltage	V10	B-28	
Output 11	Current	I11	B-29	C-48
	Voltage	V11	B-30	
-V DC Common	**1794-TB3G** and **1794-TB3GS** – Terminals C-35 and C-51 are internally connected in the terminal base unit.			
+V DC Power	**1794-TB3G** and **1794-TB3GS** – Terminals C-34 and C-50 are internally connected in the terminal base unit.			
Chassis Ground (Shield)	**1794-TB3G** and **1794-TB3GS** – Terminals B-16, B-33, C-38, C-40...C-45, and C-47 are internally connected to chassis ground.			

ATTENTION: Use shielded cable for better noise immunity and easier connection to ground. Connect shield to designated ground points on the terminal base unit. Ground at the terminal base unit only.

Wire Connections for the 1794-IE8XOE4/A Analog 8 Input/4 Output Module

Channel	Signal Type	Label Marking	1794-TB3G or 1794-TB3GS	
			Output	Common Terminal
Output 0	Current	I0	A-0	B-17
	Voltage	V0	A-1	
Output 1	Current	I1	A-2	B-18
	Voltage	V1	A-3	
Output 2	Current	I2	A-4	B-23
	Voltage	V2	A-5	
Output 3	Current	I3	A-6	B-24
	Voltage	V3	A-7	
Output 4	Current	I4	A-8	B-25
	Voltage	V4	A-9	
Output 5	Current	I5	A-10	B-26
	Voltage	V5	A-11	
Output 6	Current	I6	A-12	B-31
	Voltage	V6	A-13	
Output 7	Current	I7	A-14	B-32
	Voltage	V7	A-15	
Output 8	Current	I8	B-19	C-37
	Voltage	V8	B-20	
Output 9	Current	I9	B.21	C-39
	Voltage	V9	B-22	
Output 10	Current	I10	B-27	C-46
	Voltage	V10	B-28	
Output 11	Current	I11	B-29	C-48
	Voltage	V11	B-30	
-V DC Common	**1794-TB3G** and **1794-TB3GS** – Terminals C-35 and C-51 are internally connected in the terminal base unit.			
+V DC Power	**1794-TB3G** and **1794-TB3GS** – Terminals C-34 and C-50 are internally connected in the terminal base unit.			
Chassis Ground (Shield)	**1794-TB3G** and **1794-TB3GS** – Terminals B-16, B-33, C-38, C-40...C-45, and C-47 are internally connected to chassis ground.			

Configuring Your Module

You configure your output/input module by setting bits in the configuration word.

Data Table – 1794-IE12

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**
Read Words																
0 - Input 0	Signed 2's Complement data Value of Channel 0															
1 - Input 1	Signed 2's Complement data Value of Channel 1															
2 - Input 2	Signed 2's Complement data Value of Channel 2															
3 - Input 3	Signed 2's Complement data Value of Channel 3															
4 - Input 4	Signed 2's Complement data Value of Channel 4															
5 - Input 5	Signed 2's Complement data Value of Channel 5															
6 - Input 6	Signed 2's Complement data Value of Channel 6															
7 - Input 7	Signed 2's Complement data Value of Channel 7															
8 - Input 8	Signed 2's Complement data Value of Channel 8															
9 - Input 9	Signed 2's Complement data Value of Channel 9															
10 - Input 10	Signed 2's Complement data Value of Channel 10															
11 - Input 11	Signed 2's Complement data Value of Channel 11															
12 - Status	PU	FP	GF	NU	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1	R0
Write Words																
0 - Reserved	EN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 - Configuration	QS	0	0	0	CAB		C89		C67		C45		C23		C01	

Where:
PU = Power up bit
FP = Field power fault
GF = General fault
NU = Not used
Rx = Out of range (x = associated channel)
EN = Enable
QS = Quick step bit – allows input filter to be reduced during rapid signal changes.
Cxx = Configuration

Range Selection Bits for the 1794-IE12, 1794-OE12, and 1794-IE8XOE4

Range	Out of Range	Range Setting	Cxx[1] Channel Configuration
-10...+10V DC	< -10.0V or > 10.0V	Set bits for each channel pair 00 = off 01 = 0...20 mA 10 = 4...20 mA 11 = ±10V	C01 for channels 0 and 1 C23 for channels 2 and 3 C45 for channels 4 and 5 C67 for channels 6 and 7 C89 for channels 8 and 9 CAB for channels 10 and 11
4...20 mA	< 4.0mA or > 20.0 mA		
0...20 mA	< 0.0 mA or > 20.0 mA		

(1) xx = associated channel pair

Safe State Selection Bits for the 1794-OE12 and 1794-IE8XOE4

When EN = 0, these bits designate the source of the safe state data for all outputs in the module.

S1/S0 Safe State Select Source		Safe State Mode	Safe State Output Behavior
S1	S0		
0	0	Safe State value is in the output words	Outputs will use Safe State value
0	1	Reserved (Safe State value is in the output words)	Reserved (Outputs will use Safe State value)
1	0	Clear/Reset the outputs, based on range selected	±10V range – Output set to 0V 4...20 mA range – Output set to 4 mA 0...20 mA range – Output set to 0 mA
1	1	Hold output at its present level	Outputs will Hold Last State

Data Table – 1794-OE12

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**
Read Words																
0 - Status	PU	FP	GF	NU	W11	W10	W9	W8	W7	W6	W5	W4	W3	W2	W1	W0
Write Words																
0 - Reserved	EN	S1	S0	WR	0	0	0	0	0	0	0	0	0	0	0	0
1 - Output 0	Signed 2's Complement data Value of Channel 0															
2 - Output 1	Signed 2's Complement data Value of Channel 1															
3 - Output 2	Signed 2's Complement data Value of Channel 2															
4 - Output 3	Signed 2's Complement data Value of Channel 3															
5 - Output 4	Signed 2's Complement data Value of Channel 4															
6 - Output 5	Signed 2's Complement data Value of Channel 5															
7 - Output 6	Signed 2's Complement data Value of Channel 6															
8 - Output 7	Signed 2's Complement data Value of Channel 7															
9 - Output 8	Signed 2's Complement data Value of Channel 8															
10 - Output 9	Signed 2's Complement data Value of Channel 9															
11 - Output 10	Signed 2's Complement data Value of Channel 10															
12 - Output 11	Signed 2's Complement data Value of Channel 11															
13 - Configuration	0	0	0	0	CAB		C89		C67		C45		C23		C01	

Where:
PU = Power up bit
FP = Field power fault
GF = General fault
NU = Not used
Wx = Wire off (x = associated channel)
EN = Enable outputs
S1/S0 = Safe state source – When EN = 0, these bits indicate source of safe state output.
WR = Wire-off reset
Cxx = Configuration

Data Table – 1794-IE8XOE4

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**
Read Words																
0 - Input 0	Signed 2's Complement data Value of Channel 0															
1 - Input 1	Signed 2's Complement data Value of Channel 1															
2 - Input 2	Signed 2's Complement data Value of Channel 2															
3 - Input 3	Signed 2's Complement data Value of Channel 3															
4 - Input 4	Signed 2's Complement data Value of Channel 4															
5 - Input 5	Signed 2's Complement data Value of Channel 5															
6 - Input 6	Signed 2's Complement data Value of Channel 6															
7 - Input 7	Signed 2's Complement data Value of Channel 7															
8 - Status	PU	FP	GF	NU	W3	W2	W1	W0	R7	R6	R5	R4	R3	R2	R1	R0
Write Words																
0 - Reserved	EN	S1	S0	WR	0	0	0	0	0	0	0	0	0	0	0	0
1 - Output 0	Signed 2's Complement data Value of Channel 0															
2 - Output 1	Signed 2's Complement data Value of Channel 1															
3 - Output 2	Signed 2's Complement data Value of Channel 2															
4 - Output 3	Signed 2's Complement data Value of Channel 3															
5 - Configuration	QS	0	0	0	CAB		C89		C67		C45		C23		C01	

Where:
PU = Power up bit
FP = Field power fault
GF = General fault
NU = Not used
Wx = Wire off (x = associated channel)
Rx = Out of range (x = associated channel)
EN = Enable outputs
S1/S0 = Safe state source – When EN = 0, these bits indicate source of safe state output.
WR = Wire-off reset
QS = Quick step bit – allows input filter to be reduced during rapid signal changes.
Cxx = Channel Configuration (xx = associated channel pair)

Specifications

General Specifications for the 1794-IE12, 1794-OE12, and 1794-IE8XOE4 Modules

Attribute	1794-IE12	1794-OE12	1794-IE8XOE4
Indicators	1 red/green power/status indicator		
Recommended terminal base	1794-TB3G or 1794-TB3GS		
FLEXBus current	80 mA		
Power supply Voltage, nom.(nom) Specification Certification Voltage, range	 24V DC [2] 24V DC 10.5...31.2V DC	 24V DC [2] 24V DC 10.0...31.2V DC	 24V DC [2] 24V DC 10.0...31.2V DC
Supply current Specification Certification	 30 mA @ 24V DC; 45 mA @ 10.0V DC 60 mA	 320 mA @ 24V DC; 720 mA @ 10.0V DC 320 mA	 140 mA @ 24V DC; 280 mA @ 10.0V DC 140 mA
Calibration	None required – factory calibrated		
Isolation voltage	50V (continuous), Basic Insulation Type, No isolation between individual channels Type tested @ 850V AC for 60 s between field and system		
Power dissipation, max	1.2 W @ 31.2V DC	7.68 W @ 24V DC	3.4 W @ 24V DC
Thermal dissipation	4.1 BTU/hr @ 31.2V DC	26.2 BTU/hr @ 24V DC	11.6 BTU/hr @ 24V DC
Terminal base screw torque	0.8 Nm (7 lb-in.) 1.0 Nm (9 lb-in.) – **1794-TBN only**		
Wire type	Shielded		
Wire size	Determined by installed terminal base		
Wiring category[1]	2 – on signal ports 2 – on power ports		
North American temperature code	T4A		
Dimensions (approx.) (HxWxD)	46 x 94 x 54 mm (1.81 x 3.7 x 2.1 in.)		
Enclosure type rating	None (open-style)		
Keyswitch position	3	4	5

(1) Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication 1770-IN041.

(2) includes 5 % AC ripple

Environmental Specifications

Attribute	1794-IE12	1794-OE12	1794-IE8XOE4
Temperature, operating	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...60 °C (-4...140 °F)		
Temperature, nonoperating	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)		
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating 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	CISPR 11: Group 1, Class A		
ESD immunity	EC 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 10V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz		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 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity	IEC 61000-4-4: ±4 kV @ 5 kHz on power ports ±4 kV @ 5 kHz on shielded signal ports	IEC 61000-4-4: ±4 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on shielded signal ports	IEC 61000-4-4: ±4 kV @ 5 kHz on power ports ±4 kV @ 5 kHz on shielded signal ports
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz		

Output Specifications – 1794-OE12 and 1794-IE8XOE4 Modules

Attribute	1794-OE12	1794-IE8XOE4
Number of outputs	12 single-ended, nonisolated	4 single-ended, nonisolated
Output voltage terminal	0V output until module is configured ±10V (user configurable)	
Output current terminal	0 mA output until module is configured 4...20 mA (user configurable) 0...20 mA (user configurable)	
Output resolution Voltage terminal Current terminal	16 bit 320 µV/cnt 0.641 µA/cnt	
Data format	16 bit	
Output conversion type	Digital-to-analog converter	
Step response to 63% of full scale, output terminal	~70% 1st convert; 96% 2nd convert; 100% 3rd convert	
Absolute accuracy[1] Voltage terminal Current terminal	 0.1% full scale @ 25 °C 0.1% full scale @ 25 °C	
Accuracy drift with temperature Voltage terminal Current terminal	 0.004% full scale/°C 0.004% full scale/°C	
Load on output current	0...750 Ω	
Load on voltage output, max	3.0 mA	

(1) Includes offset, gain, nonlinearity, and repeatability error terms.

Input Specifications – 1794-IE12 and 1794-IE8XOE4 Modules

Attribute	1794-IE12	1794-IE8XOE4
Number of inputs	12 single-ended, nonisolated from channel to channel	8 single-ended, nonisolated from channel to channel
Input resolution Voltage terminal Current terminal	16 bits 320 µV/cnt 0.641 µA/cnt	
Data format	Left-justified 16-bit	
Input conversion type	Successive approximation	
Input conversion rate	8.0 ms all channels	

Input Specifications – 1794-IE12 and 1794-IE8XOE4 Modules

Attribute	1794-IE12	1794-IE8XOE4
Input voltage terminal	±10V (user configurable)	
Input current terminal Specification Certification	 4...20 mA (user configurable) 0...20 mA (user configurable)	
Input impedance, nom. (nom) Voltage terminal Current terminal	 > 1 MΩ < 100 Ω(2)	
Normal mode rejection ratio	Voltage/current terminal: -3 dB @ 0.05 Hz; -20 dB/decade -52 dB @ 50 Hz; -54 dB @ 60 Hz Voltage/current terminal with Quick Step: -3 dB @ 1.5 Hz; -20 dB/decade -29 dB @ 50 Hz; -31 dB @ 60 Hz	
Step response to 63% of full scale	Voltage/current terminal: 1.3 s Voltage/current terminal with Quick Step: 0.09 s	
Absolute accuracy(1) Voltage input Current input	 0.1% full scale @ 25 °C 0.1% full scale @ 25 °C	
Accuracy drift with temperature Voltage terminal Current terminal	 0.004% Full Scale/°C 0.004% Full Scale/°C	
Voltage overload, max	30V continuous, one channel at a time	
Current overload, max	32 mA continuous, one channel at a time	

(1) Includes offset, gain, nonlinearity, and repeatability error terms.

(2) If 24V DC is removed from the module, input resistance is < 100 Ω This is also true at 0 mA current input even if there is 24V DC.
If there is an input current applied, input impedance is > 1 M Ω