

North American Hazardous Location Approval (1791DS-IB12 and 1791DS-IB8X0B8)

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.

North American Zones (1791DS-IB12 and 1791DS-IB8X0B8)

UL 60079-0, 5th Ed, 2009-10-21; UL 60079-15, 3rd Ed, 2009-7-17;
CAN/CSA C22.2 No. 60079-15-12 Ed. 1; CAN/CSA C22.2 No. 60079-0-11 Ed. 2

Environment and Enclosure

**ATTENTION:**

This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in EN/IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.

This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment for indoor use. 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 or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain more information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#), for more installation requirements.
- NEMA Standard 250 and EN/IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

Special Conditions for Safe Use

**WARNING:**

- Use the module within an enclosure with IP54 protection or higher of EN 60529.
- Wire conductors correctly and verify operation of the module before commissioning system in which the module is incorporated. Note that incorrect wiring may lead to loss of safety function.
- Do not apply DC voltages exceeding rated voltages to the module.
- Safety Agency approval requires power to this equipment and all connected I/O must be supplied from a source compliant with the following:
 - Class 2 supply approved to UL1310
- Apply properly specified voltages to the module inputs. Applying inappropriate voltages causes the module to fail to perform its specified function, which leads to loss of safety functions or damage to the module.
- Do not use test outputs as any safety output, noting that test outputs are note safety outputs.
- Do not dismantle, repair, or modify the module. This may lead to loss of its safety function.
- Use only appropriate components or devices complying with relevant safety standards corresponding to the required level of safety categories (safety integrity level). Conformity to requirements of safety category (safety integrity level) is determined as an entire system. We recommend you consult a certification body regarding assessment of conformity to required safety level.
- Disconnect the module from the power supply when wiring.
- Be cautious not to get fingers caught when attaching terminal sockets to the plugs on the module.
- Qualified personnel should confirm installation and conduct test operations and maintenance after installation of the module.
- Personnel familiar with machinery where the module is to be installed should conduct and verify installation.
- The customer is responsible for compliance with applicable standards for the entire system.

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.



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.

Electrical Safety Considerations

**ATTENTION:**

Power to this equipment and all connected I/O must be supplied from a source compliant with the following: Class 2 approved to UL1310.



WARNING: (1791DS-IB12 and 1791DS-IB8X0B8) When you connect or disconnect the removable terminal block (RTB) with field side power applied, 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.



WARNING: (1791DS-IB12 and 1791DS-IB8X0B8) If you connect or disconnect the communications cable with power applied to this module or any device on the network, 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.



WARNING: (1791DS-IB12 and 1791DS-IB8X0B8) When used in a Class I, Division 2, hazardous location, this equipment must be mounted in a suitable enclosure with proper wiring method that complies with the governing electrical codes.



WARNING: (1791DS-IB12 and 1791DS-IB8X0B8) If you connect or disconnect wiring while the field-side 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.

Understand Suitability for Use

Rockwell Automation is not responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product. Take all necessary steps to determine the suitability of the product for the systems, machine, and equipment with which it is used. Know and observe all prohibitions of use applicable to this product.

Never use the products for an application that involves serious risk to life or property without confirming that the system as a whole has been designed to address the risks, and that the Rockwell Automation product is properly rated and installed for the intended use within the overall equipment or system.



WARNING: Do not use the unit in locations subject to the following:

- Direct sunlight
- Temperatures or humidity beyond the ranges noted in the Specifications section
- Condensation as the result of severe changes in temperature
- Corrosive or flammable gases
- Dust (especially iron dust) or salts
- Water, oil, or chemicals

Controlling Devices Requirements

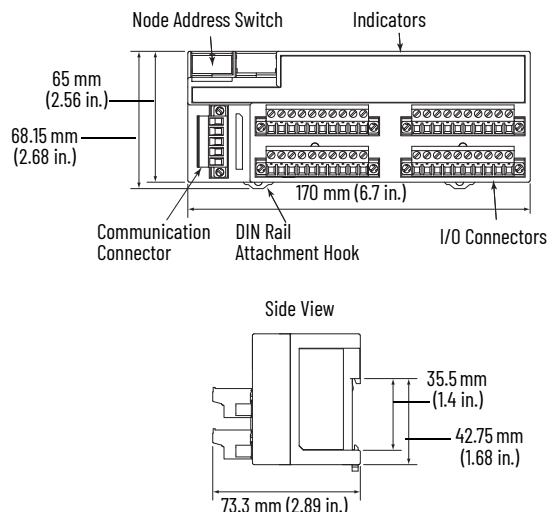
Device	Requirement
Emergency stop switch	Use approved devices with direct opening mechanisms that comply with IEC/EN 60947-5-1.
Door interlocking switch limit switch	Use approved devices with direct opening mechanisms that comply with IEC/EN 60947-5-1 and capable of switching microloads of 24V DC 5 mA.
Safety sensor	Use approved devices that comply with the relevant product standards, regulations, and rules in the country where used.
Relay with forcibly guided contacts	Use approved devices with forcibly guided contacts that comply with EN 50205. For feedback purposes use devices with contacts capable of switching micro loads of 24V DC 5 mA.
Other devices	Evaluate whether devices used are appropriate to satisfy requirements of safety category levels.

Mount the Module

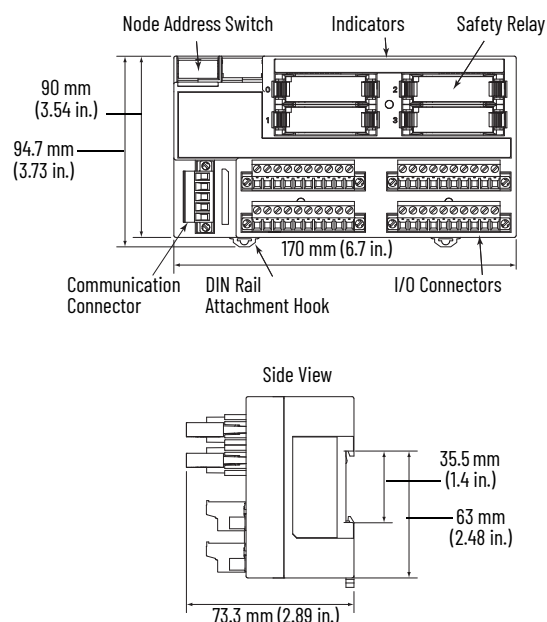
Remember the following when you mount the module.

- Use a DIN rail that is 35 mm (1.38 in.) wide for placing the module in the control panel.
- Mount the module to DIN rails with endcap attachments, so that vibration does not cause it to fall.
- Leave at least 50 mm (1.97 in.) above and below the module to allow adequate ventilation and room for wiring.

Dimensions - 1791DS-IB12 and 1791DS-IB8XOB8



Dimensions - 1791DS-IB4XOW4



Wire the Module

Remember the following when you wire the module:

- Do not share communication lines and input/output lines with high-voltage lines.
- Wire correctly after confirming the signal names of all terminals.
- Do not remove the label from a unit before wiring. Always remove label after completing wiring to achieve proper heat dispersion.
- Before connection, process stranded wire with insulation-covered bar terminal (DIN 46228-4 standard compatible type) at its ends.
- Mount screws for communication and I/O connectors correctly at 0.25 Nm...0.3 Nm (2.21 lb-in...2.65 lb-in).

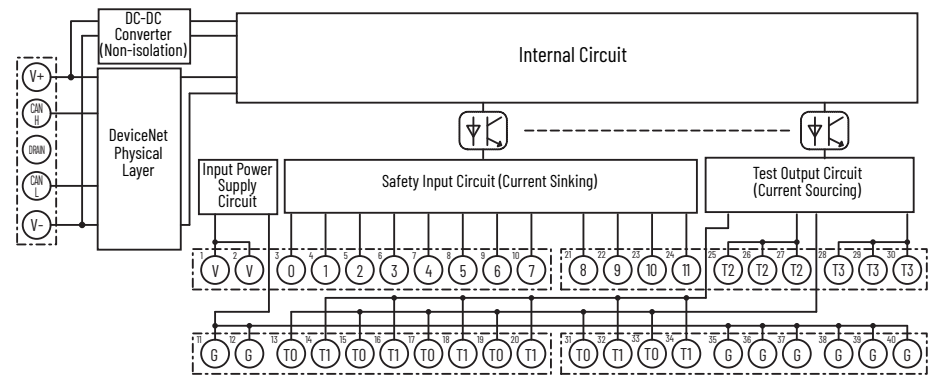


WARNING: Safety state of the module is defined as the off status of safety output and off status of network output.

- Use the module only in applications where the safe status for the module produces the safe status.
- Do not connect loads beyond the rated value of the safety outputs. Serious injury can occur due to breakdown of safety outputs.
- Wire the module properly so that supply voltages or voltages for loads do not touch the safety outputs accidentally or unintentionally. Serious injury can occur due to loss of required safety functions.
- Connect a load across the output terminal and the OV line (PNP output).
- For the 1791DS-IB4XOW4 module, apply only one AC line phase to the relay and insert a fuse at each output terminal whose current rating is less than 3.15 A to protect safety output contacts from welding. Confirm fuse selection with the fuse manufacturer, dependent on the connected load characteristics.
- Use appropriate devices referring to the following Controlling Devices Requirements Table. Serious injury can occur due to loss of safety functions.

Terminal Descriptions

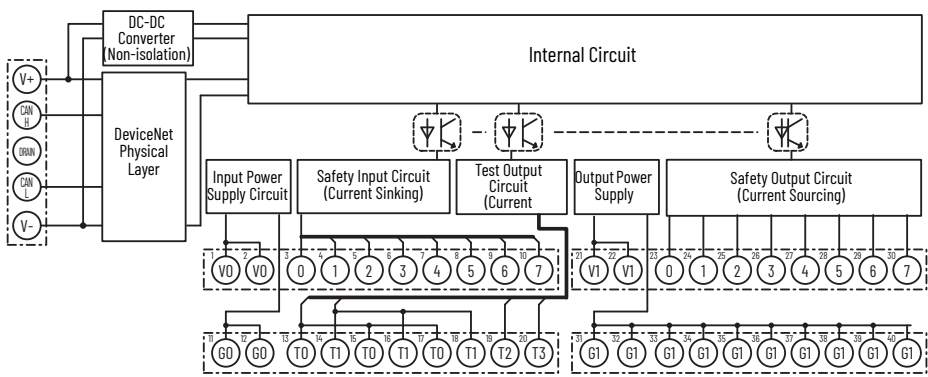
1791DS-IB12



#	Label	Description
1, 2	V	Power terminal for external input devices Wire Plus side (24V)
11, 12 ⁽¹⁾	G	Power terminal for external input devices Wire Minus side (0V)
35...40 ⁽¹⁾	G	Common terminal for external devices
3...10, 21...24	0...11	Terminal for safety input
13...20, 25...30, 31...34	T0...T3	Terminal for test output

(1) Terminals 11, 12 and 35...40 are connected internally.

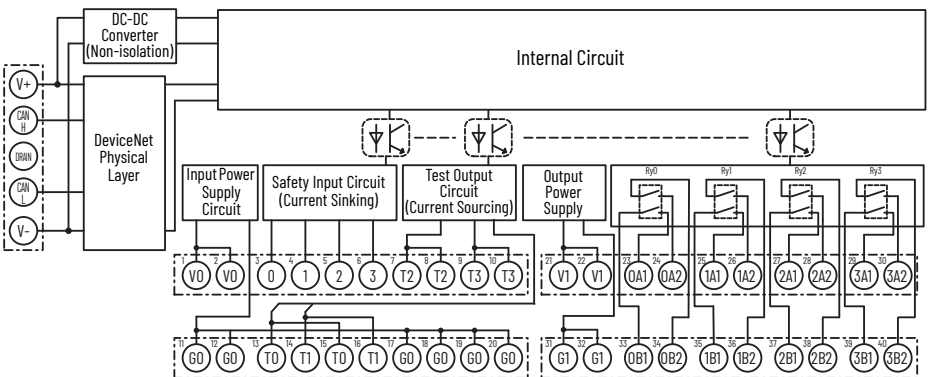
1791DS-IB8X0B8



#	Label	Description
1, 2	V0	Power terminal for external input devices Wire Plus side (24V)
11, 12	G0	Power terminal for external input devices Wire Minus side (0V)
3...10	0...7	Terminal for safety input
13...20	T0...T3	Terminal for test output
21, 22	V1	Power terminal for external output devices Wire Plus side (24V)
31, 32 ⁽¹⁾	G1	Power terminal for external output devices Wire Minus side (0V)
23...30	0...7	Terminal for safety output
33...40 ⁽¹⁾	G1	Common terminal for external devices

(1) Terminals 31...40 are connected internally.

1791DS-IB4X0W4



#	Label	Description
1, 2	V0	Power terminal for external input devices and internal relay feedback monitor. Wire Plus side (24V)
11, 12 ⁽¹⁾	G0	Power terminal for external input devices and internal relay feedback monitor. Wire Minus side (0V)
17...20 ⁽¹⁾	G0	Common terminal for external devices
3...6	0...3	Terminal for safety input
7...10, 13...16	T0...T3	Terminal for test output
21, 22	V1	Power terminal for internal relay drive Wire Plus side (24V)
31, 32	G1	Power terminal for internal relay drive Wire Minus side (0V)
23...30, 33...40	0A1...3A2, 0B1...3B2	Terminal for safety output

(1) Terminal No. 11, 12 and 17...20 are connected internally.

Status Indicators

Indicator	Status	Description
MS	Steady green	Device operational
	Flashing green	Waiting for safety connection
	Steady red	Unrecoverable fault
	Flashing red	Minor fault
	Alternating green and red	Device self-test or configuration
	Off	No power
NS	Steady green	Online/connected
	Flashing green	Online/not connected
	Steady red	Critical link failure
	Flashing red	Connection timed out
	Off	Not powered/not online
LOCK	Steady yellow	Normal configuration data, locked status
	Flashing yellow	Normal configuration data, but not locked status
	Off	Configuration has not been performed
IN PWR OUTPWR	Steady green	Power supply is on
	Off	No power
IN	Steady yellow	Safety input on
	Off	Safety input off
	Steady red	An error occurs in an input circuit part
	Flashing red	When a dual channel is set, an error occurs in the redundant channel
OUT	Steady yellow	Safety output on
	Off	Safety output off
	Steady red	An error occurs in an output circuit part
	Flashing red	When a dual channel is set, an error occurs in the redundant channel

Specifications

Technical Specifications

Attribute	1791DS-IB12, 1791-IB8X0B8	1791DS-IB4X0W4
Communications power supply voltage	11...25V DC (supplied from communications power supply)	
Communications current consumption	110 mA at 24V DC	
I/O power supply voltage	20.4...26.4V DC (24V DC, -15...+10%)	
Weight	420 g (0.93 lb)	600 g (1.32 lb)
Wire category ⁽¹⁾	2 - on signal ports 2 - on power ports 2 - on communications ports	
Wire size	Copper 0.2...2.5 mm ² (AWG 24...12) solid wire 0.34...1.5 mm ² (AWG 22...16) standard (flexible) wire with insulation-covered bar terminal	
Enclosure type	None (open-style)	
North American temperature code	T4	-

(1) Use this Conductor Category information to plan conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

Environmental Specifications

Attribute	1791DS-IB12, 1791-IB8X0B8	1791DS-IB4X0W4
Temperature, operating	-10...+55 °C (14...131 °F)	
Temperature, surrounding air, max	55 °C (131 °F)	
Temperature, nonoperating	-40...+70 °C (-40...+158 °F)	
Relative humidity IEC 60068-2-30 (Test dB, Unpackaged Damp Heat)	10...95% noncondensing	10...85% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz	
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g	10 g
Operating environment	No corrosive gases	
Overvoltage category	II (per IEC 61131-2:4.4.2)	

Reaction Time

Attribute	1791DS-IB12, 1791-IB8X0B8	1791DS-IB4X0W4
Max input reaction time	16.2 ms + set values of on/off delays	
Max output reaction time	-	6.2 ms + (20 ms) relay response time

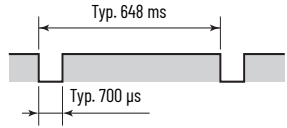
Safety Input Specifications

Attribute	1791DS-IB12, 1791-IB8X0B8, 1791DS-IB4X0W4
Inputs type	Current sinking
ON voltage	11V DC min
OFF voltage	5V DC max
OFF current	1 mA max
Input current	6 mA

Test Output Specifications

Attribute	1791DS-IB12, 1791-IB8X0B8, 1791DS-IB4X0W4
Output type	Current sourcing
Rated output current	0.7 A
Residual voltage	1.2V max
Leakage current	0.1 mA max

Safety Output Specifications

Attribute	1791DS-IB12, 1791-IB8X0B8, 1791DS-IB4X0W4	Signal Sequence
Output type	Current sourcing	 IMPORTANT: While safety outputs are in an On state, this signal sequence is output continuously for fault diagnosis. Confirm the response time of a device that is connected to safety outputs so the device does not malfunction due to this Off pulse.
Rated output current	0.5 A	
Residual voltage	1.2V max	
Leakage current	0.1 mA max	

Safety Output (Relay) Specifications

Attribute	1791DS-IB12, 1791-IB8X0B8, 1791DS-IB4X0W4
Relay type	G7SA-2A2B EN50205 Class A
Minimum permissible load	5V DC, 1 mA
Resistive load	240V AC, 2 A 30V DC, 2 A
Inductive load	240V AC, 2 A (cos φ = 0.3); 24V DC, 1 A
Durability (mechanical)	5,000,000 operations min (at approximately 7200 operations/hr)
Durability (electrical)	100,000 operations min (at approximately 1800 operations/hr)

Certifications

Certification ⁽¹⁾	1791DS-IB12, 1791-IB8X0B8	1791DS-IB4X0W4
c-UL-us	UL Listed Information Technology Equipment, certified for US and Canada	-
	UL Listed Industrial Control Equipment, certified for US and Canada	
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)	
UKCA	European Union 2014/30/EU EMC Directive, compliant with: EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)	
RCM	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions	
TÜV	TÜV Certified for Functional Safety ⁽²⁾ . Compliant with IEC 61508 (SIL 3) and EN 954-1 (Category 4)	
UL	UL Certified for Functional Safety ⁽²⁾	
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3	
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation	
Morocco	Arrêté ministériel n° 6404-15 du 1er muharram 1437	
DeviceNet®	ODVA conformance tested to DeviceNet specifications	

(1) When marked. See the Product Certification link at [rok.auto/certifications](#) for Declarations of Conformity, Certificates, and other certification details.

(2) When used with specified firmware revisions.