Installation 8DI/RO - D
Drawing No. LP1119
Revised 06/2024

DA 8 Digital Input / 8 Relay Output Module

Installation Guide

- Adds I/O capability to the DA70
- Offers complete isolation; inputs, power and Controller
- Inputs independently software selectable for sink or source signals, high or low active states, and high or low frequency signals
- Ideal for data acquisition applications
- Configured using Crimson® software (version 3.1 or later)





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FOR USE IN HAZARDOUS LOCATIONS:
Class I, Division 2, Groups A, B, C, and D
T4

MODULE PACKAGE CHECKLIST

This product package should contain the items listed below. If any items are missing or damaged, contact Red Lion immediately.

- DIN Rail Mount DA 8DI/8RO Module
- Installation Guide

GENERAL DESCRIPTION

The DA 8DI/8RO module is designed for use with the DA70 controllers, that can support up to 10 I/O modules simultaneously. This module features 8 Digital Inputs and 8 Relay Outputs that can be used to monitor contact or sensor inputs and actuate relays, solenoids, PLC inputs, etc.

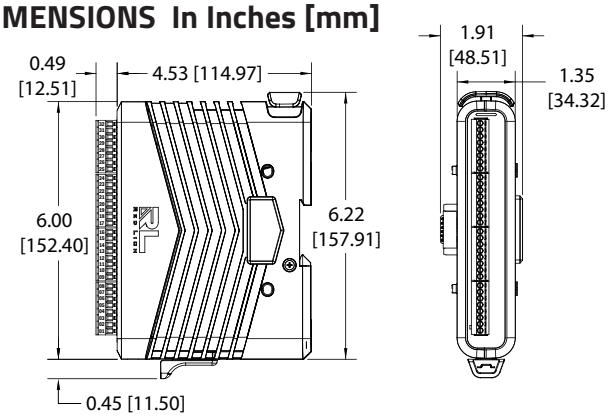
The inputs accept standard DC inputs or contact closures, and are configured for Sink/Source signals via software switches. Additionally, each input has a switch selectable input filter that can be used to prevent contact bounce. Each input may also be software configured as a high-active or low-active input.

The module is available with relay outputs that are capable of switching up to one amp each. For applications requiring large loads to be controlled, several DIN rail mount relays are available.

The modules connect and communicate via proprietary backplane to the DA host device. The DA host device, equipped with serial ports as well as an Ethernet port(s), allows the system to share data with PCs, PLCs, and SCADA systems.

Internal power management circuits allow the module to be replaced while power is applied, which reduces downtime in the event of a module failure. All configuration information is stored locally within the module, as well as in the Host, so replacement modules do not need to be configured.

DIMENSIONS In Inches [mm]



CONFIGURATION

The DA 8DI/8RO modules are configured with Windows® compatible Crimson® software. The software is an easy to use, graphical interface which provides a means of configuration and commissioning of new systems, as well as routine module re-calibration.

SAFETY SUMMARY

All safety related regulations, local codes as well as instructions that appear in this document or on equipment must be observed to ensure personal safety and to prevent damage to either the device or equipment connected to it.

Do not use these products to replace proper safety interlocking. No software-based device (or any other solid-state device) should ever be designed to be responsible for the maintenance of personnel safety or consequential equipment not equipped with safeguards. Red Lion disclaims any responsibility for damages, either direct or consequential, that result from the use of this equipment in a manner not consistent with these specifications.

CAUTION: Risk of Danger
Read complete instructions prior to installation and operation of the unit.

ATTENTION : Risque de danger
Lire les instructions complètes avant l'installation et l'utilisation de l'appareil.

WARNING - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.

AVERTISSEMENT - Danger d'explosion - Le remplacement de composants peut nuire à l'aptitude à la classe I, division 2.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D, or non-hazardous locations only.

Cet équipement est adapté à une utilisation dans des endroits de classe I, Division 2, Groupes A, B, C, D, ou dans des endroits non dangereux seulement.

WARNING - Explosion Hazard. Not hot swappable. Do not remove or replace while circuit is live unless the area is free of ignitible concentrations.

AVERTISSEMENT - Risque d'explosion. Non échangeable à chaud. Ne pas retirer ou remplacer sous tension sauf si la zone est exempte de concentrations inflammables.

SPECIFICATIONS

1. **POWER REQUIREMENTS**:
   Power is supplied by the DA host controller. Modules may be hot-swapped (replaced while powered up) in non-hazardous locations only.
   Max Power: 2.0 W
2. **LEDs**: One LED indicator for each I/O point and a status LED.
3. **MEMORY**: Non-volatile memory retains all programmable parameters.
4. **Digital Input: Software selectable for sink or source**
   Maximum voltage: +30 VDC, reverse polarity protected
   Off Voltage: < 1.2 Volts
   On Voltage: > 3.8 Volts
   Input Impedance: Source Mode 10K ohms; Sink Mode 20K ohms
   Input Frequency*:
   Software Filter selection on: 50 Hz
   Software Filter selection off: 300 Hz
   * Actual usable frequency limited by communication to external device.
5. **Form A Relay Output**: 4 relays per module
   Type: Normally Open
   Contact Ratings:
   Per Relay: 0.5 Amps @ 30 VDC/30 VAC at 65 °C T_{AMB}
   2 Amps @ 30 VDC/30 VAC at 60 °C T_{AMB}
   Life Expectancy: 100,000 cycles at max. load rating.
   (Decreasing load, increasing cycle time, and use of surge suppression such as RC snubbers increases life expectancy.)
6. **ISOLATION LEVEL**: 500 Vrms @ 50/60 Hz for 1 minute between the following:
   Inputs
   Outputs
   Host Controller
7. **COMMUNICATIONS**: Provided by the DA70 Controller
8. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: -40 to 75 °C T_{AMB}
   Storage Temperature Range: -40 to 80 °C T_{AMB}
   Vibration to IEC 60068-2-6: Operational 5-500 Hz, 2 g
   Shock to IEC 60068-2-27: Operational 15 g
   Operating and Storage Humidity: 0 to 95% max. RH non-condensing
   Altitude: Up to 2000 meters
   Installation Category II, Pollution Degree 2 as defined in IEC/EN 60664-1.
9. **CERTIFICATIONS AND COMPLIANCES**:
   CE Approved
   EN 61326-1 Immunity to Industrial Locations
   Emission CISPR 11 Class A
   IEC/EN 61010-1
   RoHS Compliant
   UL Hazardous: File # E317425
   Rugged IP30 enclosure
   ABS Type Approval for Shipboard Applications
10. **CONNECTIONS**: Removable wire clamp screw terminal blocks
    Wire Strip Length: 0.3" (7.5 mm)
    Wire Gauge Capacity: 14 to 24 AWG (2.08 to 0.20 mm^2) copper wire only
    Torque: 2 inch-lbs (0.23 N-m)
11. **CONSTRUCTION**: Polycarbonate enclosure with IP30 rating. For use only in an approved enclosure.
12. **MOUNTING REQUIREMENTS**: Mounts onto standard DIN style top hat (T) profile mounting rails according to EN50022 – 35 x 7.5 mm and 35 x 15 mm.
13. **WEIGHT**: 14.0 oz (397 g)

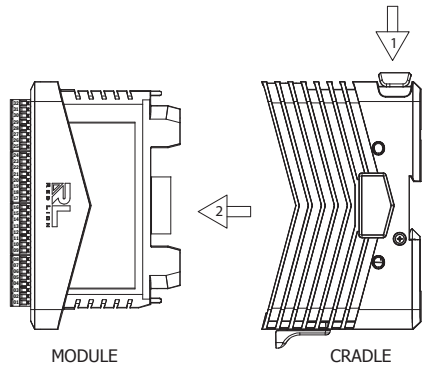
EMC INSTALLATION GUIDELINES

Visit https://www.redlion.net/emi for more information on EMI guidelines, Safety and CE issues as they relate to Red Lion products.

HARDWARE INSTALLATION

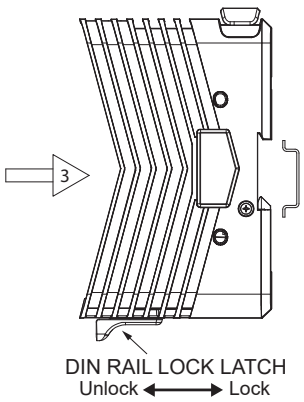
Removing Module From Cradle

To remove the module from the cradle, push in the module release button at the top of the cradle and pull the module out of the cradle.



Attaching the Module/Cradle to the DIN Rail

The DIN rail should be mounted horizontally so that the unit's ventilation holes are vertical in relation to installation orientation. A minimum clearance of 1 inch (25.4 mm) should be maintained above and below the unit to ensure proper thermal regulation.

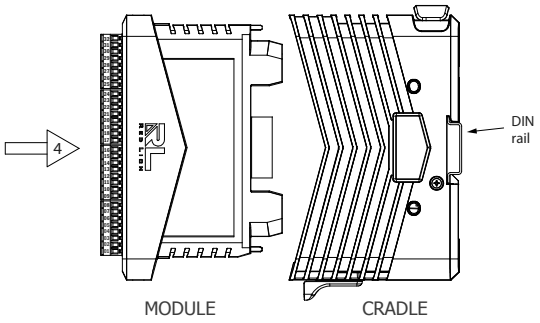


For hazardous location installation, the unit shall be installed inside a UL Listed Industrial Control Panel or similar type of enclosure that can only be opened with the use of a tool.

The cradle can be installed on the DIN rail with or without the module attached. Ensure the DIN rail lock latch is in the outward most position (unlocked). Hook the top back of the cradle DIN rail clip over the DIN rail. Press the cradle until flush with the rail and push the DIN rail lock latch to the latched (in) position.

Installing Module into Cradle

Push module into cradle until you hear an audible click indicating it is properly latched.



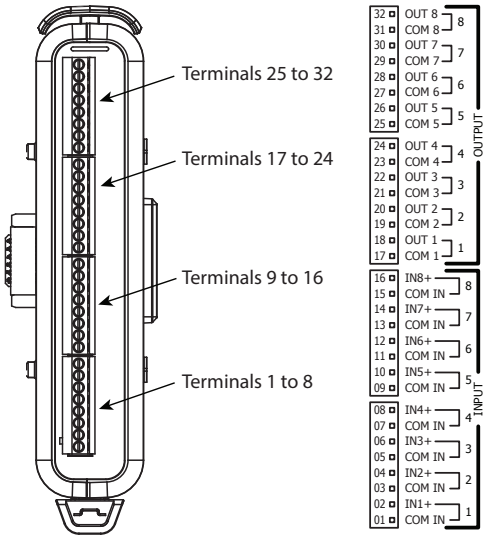
MODULE HOT SWAPPING

If the area is known to be non-hazardous (free of ignitable concentrations), then a module can be removed and/or installed into a cradle attached to the controller while power is applied. However, it is **NOT** recommended to connect to or remove from the controller, a module/cradle pair or group of modules/cradles, while power is applied. The power should be turned off anytime a cradle or group of cradles (with or without modules) is plugged into or removed from the controller.

WIRING

All power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods and in accordance with the authority having jurisdiction.

All conductors should meet voltage and current ratings for each terminal. When wiring the module, use the numbers on the label to identify the position number with the proper function. Strip the wire, leaving approximately 0.3" (7.5 mm) of bare wire exposed. Insert the wire into the terminal, and tighten.

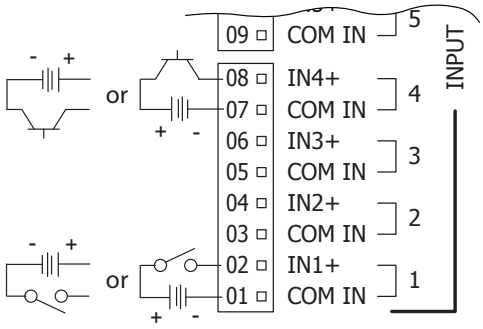


CAUTION: Only UL listed wiring with temperature ratings greater than 90 °C permitted for Class I, Division 2 installations.

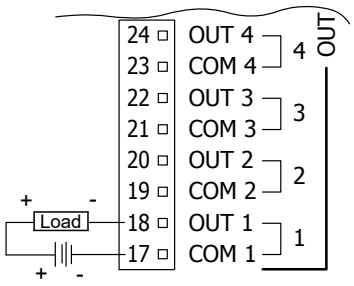
ATTENTION: Seul le câblage homologué UL avec des températures nominales supérieures à 90 °C est autorisé pour les installations de classe I, Division 2.

I/O Wiring

The DA 8DI/8RO offers 8 discrete inputs and 8 Form A relay outputs. The discrete inputs and outputs operate on the same voltage that powers the unit. Pluggable screw block terminals are provided for the I/O wiring connections. Refer to the diagrams below on how to make your I/O connections.



Sourcing Input Connections



Relay Output Connection

STATUS LED

LED COLOR(S)	LED STATE	MEANING
Blue	3 quick flashes	Module is booting.
Green	Solid	Module is configured and running.
Green/Off	Flashing	Module is running but is not configured.
Green/Purple	Flashing	Module is performing calibration.
Red/Green	Flashing	Module is running but communication with the controller is inactive. If status persists, contact technical support.
Red/Off	Flashing	An internal error has occurred. If status persists, contact technical support.
Yellow/Off	Flashing	Module position is unassigned. If status persists, contact technical support.
Off	Solid	Module application is not running or the module is not powered. If status persists, contact technical support.

FIRMWARE UPGRADE

The module's firmware is stored in flash memory so that software/ hardware conflicts are avoided, and so features can be added in the future.

During a download, Crimson compares its own library of firmware files with those stored in the module. If they do not match, Crimson will download the necessary firmware.

RED LION CONTROLS TECHNICAL SUPPORT

If for any reason you have trouble operating, connecting, or simply have questions concerning your new product, contact Red Lion's technical support.

Support: support.redlion.net
Website: www.redlion.net
Inside US: +1 (877) 432-9908
Outside US: +1 (717) 767-6511

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ORDERING INFORMATION

DESCRIPTION	PART NUMBER
DA 8 Channel DI/ 8 Channel RO Module	DA M00I0 DI0R0 0000

Spaces in listed part numbers are shown to improve readability; do not include when searching for or ordering these parts.

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