DA 4UI and 2UI MIX I/O Modules

Installation Guide

- Two models offering mix of inputs and outputs
  4UI Mix - 4 Universal Inputs, 3 DI/DO and 2 Analog Outputs
  2UI Mix - 2 Universal Inputs, 8 DI/DO and 2 Analog Outputs
- Universal inputs accept TC, RTD, 0-10 V and 0/4-20 mA signals
- Digital inputs and outputs (software selectable)
- Analog outputs capable of multiple ranges
- Configured using Crimson® software (version 3.2 or later)

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

II 3 G Ex ec IIC T4 Gc
DEMKO 20 ATEX 2268X
IECEx UL 20.0007X

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 Mix Module
- Installation Guide

GENERAL DESCRIPTION

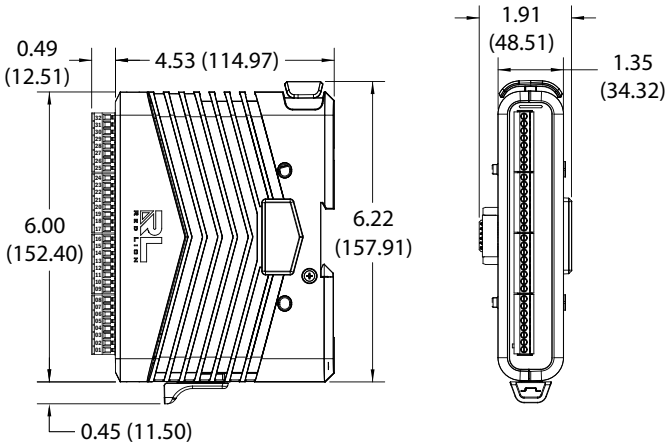
The DA Mix modules are available in two configurations for use with the DA70 controllers. The 4UI Mix module has 4 universal inputs, 3 digital inputs/outputs, and 2 analog outputs. The 2UI Mix module has 2 universal inputs, 8 digital inputs/outputs, and 2 analog outputs.

The design of the system provides a modular platform for multi-zone control applications. The modules can accept a wide range of thermocouple, RTD, 0-10 V, 0/4-20 mA signals, multiple discrete inputs/outputs, and analog outputs.

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, in non-hazardous locations only, 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 Mix modules are configured with Windows® compatible Crimson® software. The software is an easy to use, graphical interface which provides a means of configuring and commissioning new systems, as well as routine module re-calibration.

ALARMS

Each Universal Input channel has an alarm LED that illuminates to indicate a fault.

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 device. Modules may be hot-swapped (replaced while powered up) in non-hazardous locations only.
   4UI Mix Max Power: 2.7 W
   2UI Mix Max Power: 2.6 W
2. **LEDs**: (model dependent)
   STS - A status LED to show general module status
   AI1-AI4 - One alarm LED for each universal input channel
   DIO1-DIO8 - One LED indicator for each Digital I/O point
3. **MEMORY**: Non-volatile memory retains all programmable parameters. The controller also stores the parameters in order to reprogram any modules that need updates.
4. **UNIVERSAL INPUTS:**
   GENERAL:
   Sample Time: 50 msec nominal; software configurable from 4 msec to 1200 msec
   Common Mode Rejection: >110 dB, 50/60 Hz
   Normal Mode Rejection: >50 dB, 50/60 Hz
   Temperature Coefficient: 0.01%/°C
   Step Response Time: 100 msec typ., 200 msec max
   THERMOCOUPLE INPUT:
   Types: T, E, J, K, R, S, B, N, C
   Slope & Offset: Provides sensor error correction
   Input Impedance: 20 M ohm
   Lead Resistance Effect: 0.25 µV/ohm
   Cold Junction Compensation: Less than ±1 °C typical (±1.5 °C max) over -40 to 75 °C ambient temperature
   Resolution: 0.1°

TYPE	MEASUREMENT RANGE	WIRE COLOR	
		ANSI	BS 1843
T	-200 to +400 °C -328 to +752 °F	(+) Blue (-) Red	(+) White (-) Blue
E	-200 to +730 °C -328 to +1346 °F	(+) Violet (-) Red	(+) Brown (-) Blue
J	-200 to +760 °C -328 to +1400 °F	(+) White (-) Red	(+) Yellow (-) Blue
K	-200 to +1350 °C -328 to +2462 °F	(+) Yellow (-) Red	(+) Brown (-) Blue
R	0 to +1768 °C +32 to +3214 °F	No Standard	(+) White (-) Blue
S	0 to +1768 °C +32 to +3214 °F	No Standard	(+) White (-) Blue
B	+149 to +1820 °C +300 to +3308 °F	No Standard	No Standard
N	-200 to +1300 °C -328 to +2372 °F	(+) Orange (-) Red	(+) Orange (-) Blue
C W5/W6	0 to +2315 °C +32 to +4199 °F	No Standard	No Standard
mV	0 mV to 50 mV	N/A	N/A

   Temperature Indication Accuracy: ± (0.3% of span, +1 °C). Includes NIST conformity, cold junction effect, A/D conversion errors, temperature coefficient and linearization conformity at 23 °C after 20 minute warm up.
   Probe Break Response: Upscale drive, Input Fault Alarm bit set high, ALM LED illuminates.
   RTD INPUT:
   Type: 2 or 3 wire
   Excitation: 150 µA
   Lead Resistance: 15 ohms Max
   Resolution: 1 or 0.1°

TYPE	INPUT TYPE	RANGE
385	100 ohm platinum, Alpha = 0.00385	-200 to +600 °C -328 to +1100 °F
392	100 ohm platinum, Alpha = 0.003919	-200 to +600 °C -328 to +1100 °F
672	120 ohm nickel, Alpha = 0.00672	-80 to +215 °C -112 to +419 °F

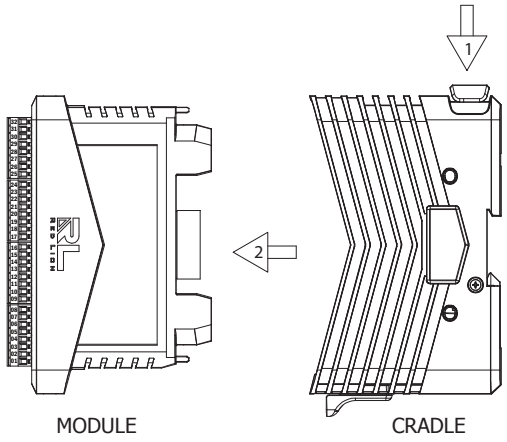
   Slope & Offset: Provides sensor error correction
   Temperature Indication Accuracy: Includes NIST conformity, A/D conversion errors, temperature coefficient and linearization conformity at 23 °C after 20 minute warm up.
   Probe Break Response: If channel is enabled: upscale drive, Input
   Fault Alarm bit set high, ALM LED illuminates
   CURRENT INPUT:
   Ranges: 0-20 mA or 4-20 mA
   Programmable Scaling: ±30,000
   Input Impedance: 10 Ohm
   Max. Continuous Overload: 100 mA
   Accuracy: ±0.1% of span
   Input Fault Response: Upscale Drive, Input Fault Alarm bit set high, ALM LED illuminates below -2 mA, and above 22 mA for 0-20 mA range; below +2 mA and above 22 mA for 4-20 mA signals.
   VOLTAGE INPUT:
   Ranges: 0-10 VDC
   Programmable Scaling: ±30,000
   Input Impedance: 1 M Ohm
   Max. Continuous Overload: 50 V
   Accuracy: ±0.1% of span
   Input Fault Response: Upscale Drive, Input Fault Alarm bit set high, ALM LED illuminates below -0.5 and above +10.5 VDC.
5. **DIGITAL INPUTS:**
   8 or 3 channels (model dependent)
   Maximum input voltage: 30 VDC, reverse polarity protected
   Guaranteed ON voltage: 3.8 V
   Guaranteed OFF voltage: 1.2 V
   Sinking Impedance: 20K Ohm
   Selectable hardware Filter: 50 Hz or 500 Hz
6. **DIGITAL OUTPUTS**:
   8 or 3 (model dependent) solid state N-channel open drain MOSFETs
   Rating: 1 ADC max
   V_{DS} ON: < 0.2 V @ 1 A
   V_{DS} MAX: 30 VDC
   Offstate leakage current: 0.5 µA max
   Isolation Level: 500 Vrms @ 50/60 Hz for 1 minute
7. **AO – ANALOG OUTPUTS**:
   Two (2) independently configured. The outputs are not isolated from each other, but are isolated from the power supply and all other I/O.
   Software programmable for 0-5 VDC, -10 VDC to 10 VDC, 0-20 mA, and 4-20 mA
   Effective Resolution: Full 16-bit (Signed)
   Voltage: 500 µV
   Current: 1 µA
   Accuracy: 0.2% of full scale (-40 to 70 °C)
   Isolation Level: 500 Vrms @ 50/60 Hz for 1 minute

8. **COMMUNICATIONS**: Provided by the DA70 controller
9. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: -40 to 75 °C
   Storage Temperature Range: -40 to 85 °C
   Operating and Storage Humidity: 0 to 85% max. RH non-condensing
   Vibration to IEC 60068-2-6: Operational 5-500 Hz, 2 g
   Shock to IEC 60068-2-27: Operational 15 g
   Altitude: Up to 2000 meters
   Installation Category II, Pollution Degree 2 as defined in IEC/EN 60664-1.
10. **CERTIFICATIONS AND COMPLIANCES**:
   CE Approved
   EN 61326-1 Immunity to Industrial Locations
   Emission CISPR 11 Class A
   IEC/EN 61010-1
   RoHS Compliant
   ATEX Approved
   Ⓔx II 3 G Ex ec IIC T4 Gc
   DEMKO 20 ATEX 2268X
   IECEx Approved
   IECEx UL 20.0007X
   UL Hazardous: File # E317425
   Rugged IP30 enclosure
11. **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)
12. **CONSTRUCTION**: Plastic enclosure with IP30 rating. For use only in an approved enclosure.
13. **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.
14. **WEIGHT**:
   2UI Mix: 11.3 oz (320 g)
   4UI Mix: 11.5 oz (326 g)

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.



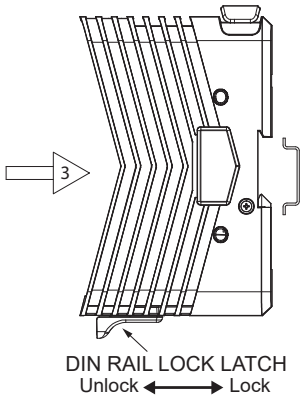
Attaching the Module/Cradle to the DIN Rail

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.

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.

For hazardous location installation, the following shall be taken into consideration:

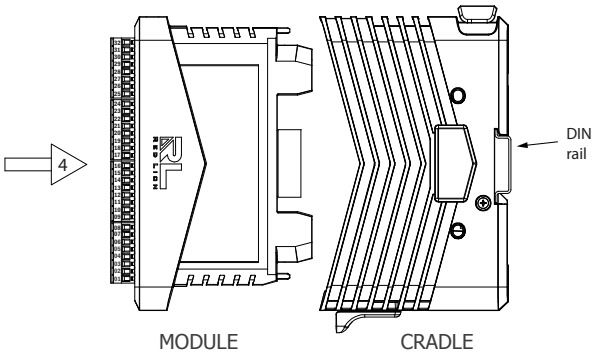
– The equipment shall only be used in an area of at least pollution degree 2, as defined in EN/IEC 60664-1.
– The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP54 in accordance with EN/IEC 60079-0. The enclosure shall be accessible only with the use of a tool.



– Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment.

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

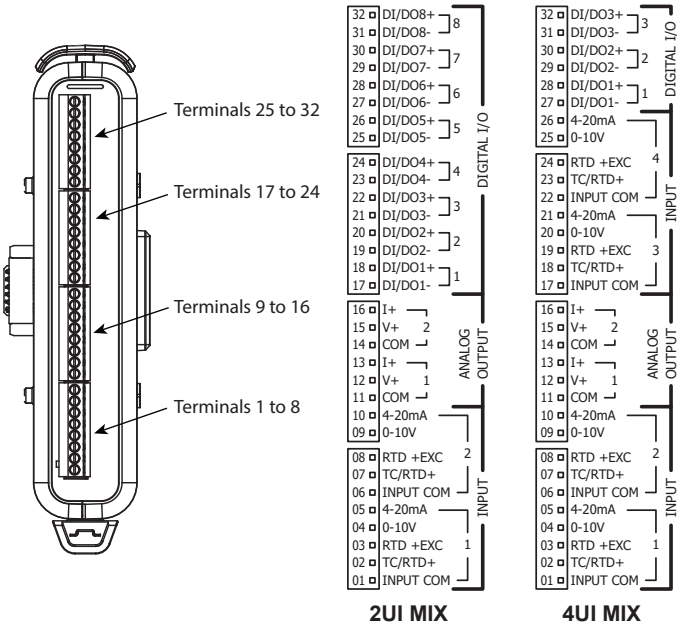
CAUTION: Only UL listed wiring with temperature ratings greater than 90 °C permitted for Class I, Division 2, Zone 2 and ATEX/IECex installations.

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

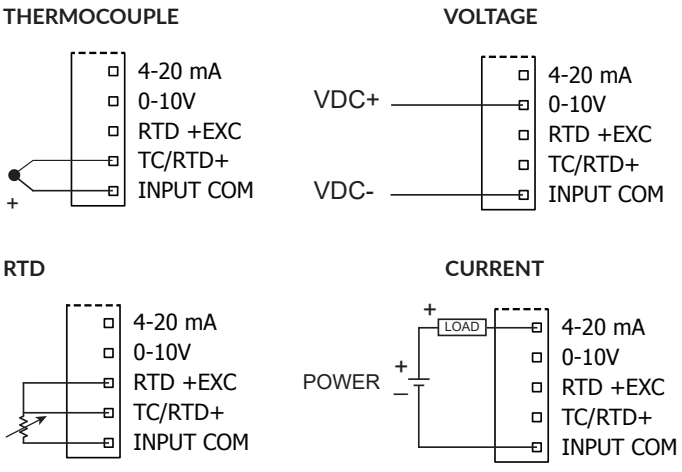
All power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods and in accordance with the authority having jurisdiction.

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.

WIRING CONNECTIONS

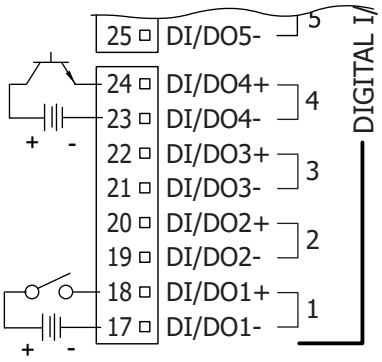


Universal Input Wiring

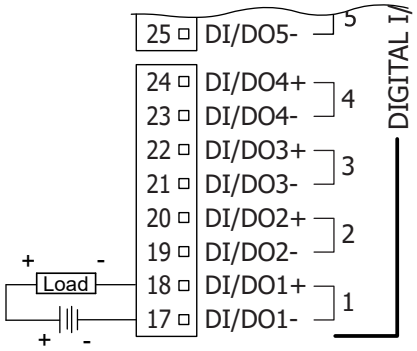


Digital I/O Wiring

The DA Mix Module offers either 8 or 3 digital inputs/NFET outputs. The digital 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 following diagrams on how to make your I/O connections. These diagrams show the 2UIN terminal numbers. Reference the full unit label shown for 4UIN terminal numbers.

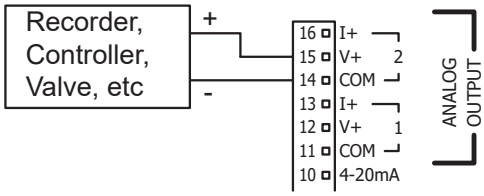


Input Connections - 2UI shown

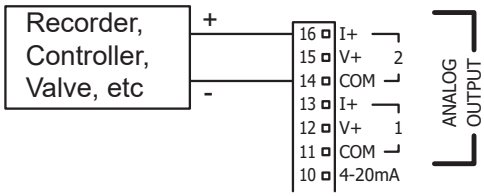


Solid State NFET Output Connection - 2UI shown

Analog Output Wiring



Voltage Analog Output



Current Analog Output

LEDS

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.

Alarm LEDs

Each universal analog input has an alarm LED that is factory configured to indicate an input value that is out of range. A red LED is lit when an alarm condition is present. Otherwise the LED is off.

RED LION CONTROLS TECHNICAL SUPPORT

If for any reason you have trouble operating, connecting, or simply have questions concerning your new DA Module, 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

Red Lion Controls, Inc.
20 Willow Springs Circle York, PA 17406

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
DAM00I0IN4DA0000	DA Series I/O Mix Module with 4UI
DAM00I0IN2DA0000	DA Series I/O Mix Module with 2UI

A listing of the entire DA Series family of products and accessories can be found at www.redlion.net.

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LIMITED WARRANTY

(a) Red Lion Controls Inc. (the "Company") warrants that all Products shall be free from defects in material and workmanship under normal use for the period of time provided in "Statement of Warranty Periods" (available at www.redlion.net) current at the time of shipment of the Products (the "Warranty Period"). **EXCEPT FOR THE ABOVE-STATED WARRANTY, COMPANY MAKES NO WARRANTY WHATSOEVER WITH RESPECT TO THE PRODUCTS, INCLUDING ANY (A) WARRANTY OF MERCHANTABILITY; (B) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; OR (C) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.** Customer shall be responsible for determining that a Product is suitable for Customer's use and that such use complies with any applicable local, state or federal law.
(b) The Company shall not be liable for a breach of the warranty set forth in paragraph (a) if (i) the defect is a result of Customer's failure to store, install, commission or maintain the Product according to specifications; (ii) Customer alters or repairs such Product without the prior written consent of Company.
(c) Subject to paragraph (b), with respect to any such Product during the Warranty Period, Company shall, in its sole discretion, either (i) repair or replace the Product; or (ii) credit or refund the price of Product provided that, if Company so requests, Customer shall, at Company's expense, return such Product to Company.
(d) **THE REMEDIES SET FORTH IN PARAGRAPH (c) SHALL BE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDY AND COMPANY'S ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH IN PARAGRAPH (a).**
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