DA Series Universal Analog Input Module With 6 Isolated Channels

Installation Guide

- Universal inputs accept TC, RTD, 0-5 V, 0-10 V, 0-20 mA, 4-20 mA, 0-50 mV signals
- Offers complete isolation; inputs, power and Controller
- Ideal for data acquisition applications
- Fully isolated design provides reliable operation
- Configured using Crimson® software (version 3.1 or later)

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IND.CONT. EQ.
E317425

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

UKCA **CE** **Ex**

II 3 G Ex ec IIC T4 Gc
DEMKO 20 ATEX 2268X
IECEx UL 20.0007X
UL22UKEX2576X

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 6UIN Module
- Installation Guide

GENERAL DESCRIPTION

The DA 6UIN module is designed for use with the DA70 controllers, that can support up to 10 I/O modules simultaneously. This module features 6 Universal Analog Inputs operating at 16-bit resolution, which makes it an ideal choice for a data-acquisition application. The module can accept a wide range of thermocouples and RTDs, as well as 0/4-20 mA and 0-10 V Process signals. Each input has a dedicated alarm LED that indicates a variety of conditions.

The modules connect and communicate via proprietary backplane to the DA host device. The DA host device, equipped with serial ports as well as 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]

0.49 [12.51]
4.53 [114.97]
6.00 [152.40]
6.22 [157.91]
0.45 [11.50]
1.91 [48.51]
1.35 [34.32]
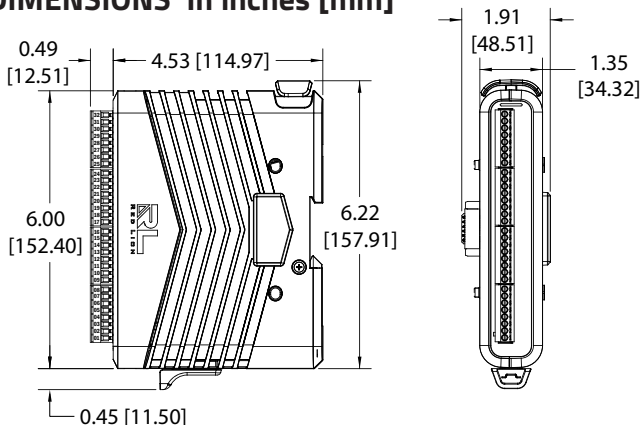
CONFIGURATION

The DA 6UIN 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.

ALARMS

There are a total of 6 red Alarm LEDs – one per Universal Input channel. The 6UIN module Status LED shows general module health status. Please reference the LED section for a list of LED functions.

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: Power is supplied by the DA host device. Modules may be hot-swapped (replaced while powered up) in non-hazardous locations only.

6UIN Port-Isolated Max Power: 1 W

2. LEDs:
STS: RGB Status LED shows module condition
AL1 - 6: Alarm LEDs are lit during an internal alarm condition

3. MEMORY: Non-volatile memory retains all programmable parameters.

4. INPUTS:
GENERAL:
Effective Resolution: Full 16-bit
Sample Time: 50 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 INPUTS:
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 T_{AMB}
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 INPUTS:
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

5. CURRENT INPUTS:
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, ALx 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.

6. VOLTAGE INPUTS:
Ranges: 0-10 VDC, 0-5 V, 0-50 mV
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, ALx LED illuminates below -0.5 or -10.5 VDC and above +10.5 VDC.

7. ISOLATION LEVEL: 500 Vrms @ 50/60 Hz for 1 minute between the following:
Power Supply Input to any Universal Input
Any Universal Input to any Universal Input

8. ENVIRONMENTAL CONDITIONS:
Operating Temperature Range: -40 to 75 °C T_{AMB}
Storage Temperature Range: -40 to +85 °C T_{AMB}
Operating and Storage Humidity: 0 to 85% max. Relative humidity, non-condensing.
Vibration to IEC 60068-2-6: Operational 5-500 Hz, 2 g
Shock to IEC 68-2-27: Operational 15 g
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
ATEX Approved
⚙ II 3 G Ex ec IIC T4 Gc
DEMKO 20 ATEX 2268X
IECEx Approved
IECEx UL 20.0007X
UKEX Approved
UL22UKEX2576X
UL Hazardous: File #E317425
ABS Type Approval for Shipboard Applications
Rugged IP30 enclosure

10. CONSTRUCTION: Polycarbonate enclosure with IP30 rating. For use only in approved enclosure.

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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. MOUNTING: Mounts onto standard DIN style top hat (T) profile mounting rails according to EN50022 – 35 x 7.5 mm and 35 x 15 mm.
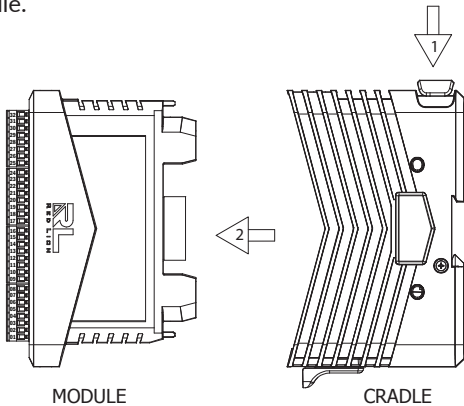**13. WEIGHT:** 10.2 oz (317.26 g)

EMC INSTALLATION GUIDELINES

Visit http://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.

MODULE   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.


DIN RAIL LOCK LATCH
Unlock ◄──► Lock
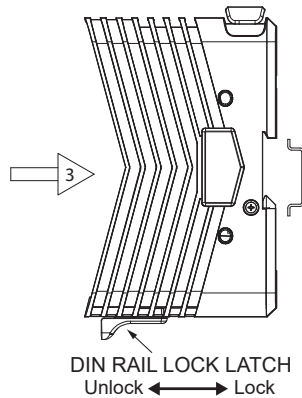
For hazardous location installation, the following shall be taken into consideration:
 — The equipment shall only be used in an area of at least pollution degree 2, as defined in EN/IEC 60664-1.
 — The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP54 in 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   CRADLE

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.
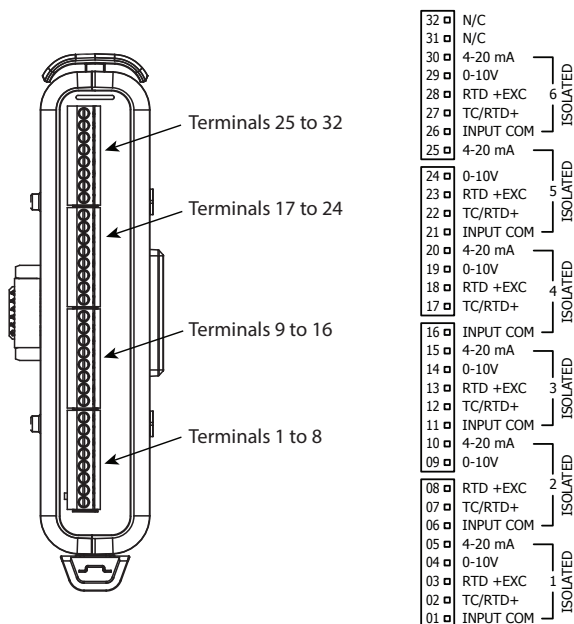
BLOCK DIAGRAM
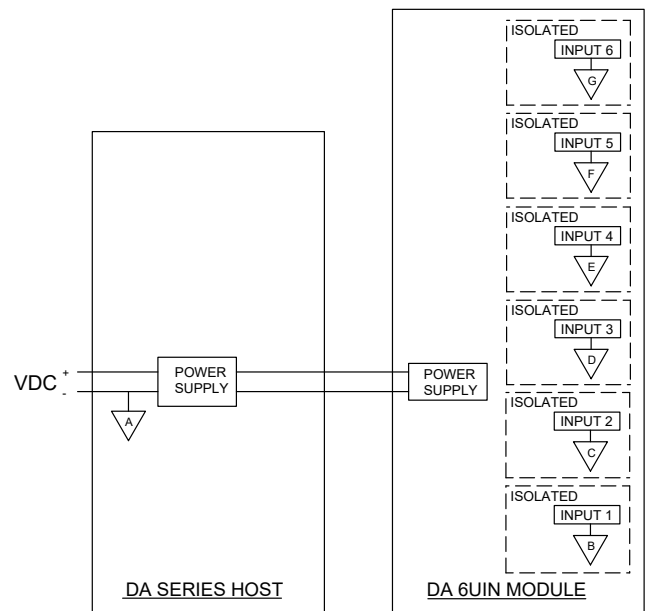
WIRING

WIRING CONNECTIONS

All power and input 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.
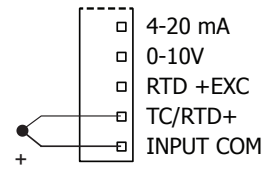
> ⚠️ **CAUTION:** Only UL listed wiring with temperature ratings greater than 90 °C permitted for Class I, Division 2, Zone 2 and ATEX, IECex and UKEX installations.
>
> **ATTENTION:** Seul le câblage homologué UL avec des températures nominales supérieures à 90°C est autorisé pour les installations de classe I, Division 2 , zone 2 et ATEX, IECex et UKEX.
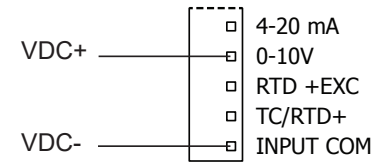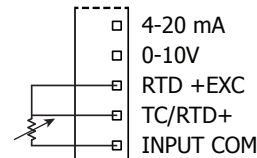

Terminals 25 to 32
Terminals 17 to 24
Terminals 9 to 16
Terminals 1 to 8

32	N/C	
31	N/C	
30	4-20 mA	
29	0-10V	
28	RTD +EXC	6 ISOLATED
27	TC/RTD+	
26	INPUT COM	
25	4-20 mA	
24	0-10V	
23	RTD +EXC	5 ISOLATED
22	TC/RTD+	
21	INPUT COM	
20	4-20 mA	
19	0-10V	
18	RTD +EXC	4 ISOLATED
17	TC/RTD+	
16	INPUT COM	
15	4-20 mA	
14	0-10V	
13	RTD +EXC	3 ISOLATED
12	TC/RTD+	
11	INPUT COM	
10	4-20 mA	
09	0-10V	
08	RTD +EXC	2 ISOLATED
07	TC/RTD+	
06	INPUT COM	
05	4-20 mA	
04	0-10V	
03	RTD +EXC	1 ISOLATED
02	TC/RTD+	
01	INPUT COM	

INPUT CONNECTIONS

THERMOCOUPLE

4-20 mA
0-10V
RTD +EXC
TC/RTD+
INPUT COM

VOLTAGE

VDC+
VDC-

4-20 mA
0-10V
RTD +EXC
TC/RTD+
INPUT COM

RTD

4-20 mA
0-10V
RTD +EXC
TC/RTD+
INPUT COM

CURRENT

LOAD
POWER

4-20 mA
0-10V
RTD +EXC
TC/RTD+
INPUT COM
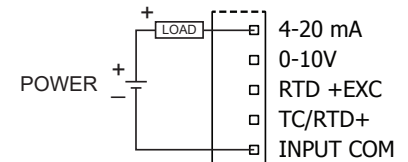
LEDs

STATUS LED

The red/green/blue Status LED is located at the top of the module and provides information regarding the state of the module. This includes indication of the various stages of the start-up routine (power-up), as well as any errors that may occur.

LED COLOR(S)	MEANING
Flashing Blue	Module is booting.
Flashing Green	Module is switching to configuration.
Green	Module is performing normally.
Flashing Green/Purple	Module is performing auto calibration.
Flashing Blue/Yellow	Module is being flash upgraded by Crimson.
Flashing Red	Error: general error with module.
Flashing Red/Green	Error: module is controlling properly, but has lost communication with the Host.
Flashing Yellow	Error: no bus frequency /module is not enumerated
Flashing Red/Green/Blue	Error: module is running the Factory Programming Console.

AL1 : AL6 – Alarm LEDs

The red Alarm LEDs indicate the presence of an alarm. Whenever one of the alarms is active, the LED turns on.

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

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

ORDERING INFORMATION

DESCRIPTION	PART NUMBER
DA 6 Universal Isolated Input Module	DA M00I0 UIN6I 0000

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

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

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