Specifications

Voltage Input:
Range: 10mV to ±200V; Impedance: >100K ohms
Overvoltage: 200V rms, max.

Current Input:
Range: 1mA to ±100mA; Impedance: 20 ohms, typical
Overcurrent: 170mA rms, max.
Overvoltage: 60VDC (self-resetting fuse)
Common Mode (Input to Gnd): 1800VDC, max.

LED Indicators:
Input (Green):
>110% input: 8Hz flash
<10% input: 4Hz flash
Setpoint (Red):
Tripped: Solid red
Safe: Off

Limit Differential (Deadband):
>50mV/5mA: 0.25% to 100% of span
<50mV/5mA: 1% to 100% of span

Response Time:
Dynamic Deadband:
Relay status will change when proper setpoint/process condition exists for 100msec.
Normal Mode (analog filtering): <250mSec, (10-90%)

Setpoints:
Effectivity: Setpoints are adjustable over 100% of the selected input span.
Repeatability (constant temp.):
>50mV/5mA: 0.1% of full scale
<50mV/5mA: 0.2% of full scale

Stability:
Temperature: +0.05% of full scale/°C, max.

Excitation Voltage:
24VDC, 20mA, maximum

Common Mode Rejection:
DC to 60Hz: 120dB

Terminal	Connection	Terminal	Connection
A1	Relay A, N.O.	C4	24 VDC Excitation
A2	Relay A, Common	C5	Input (-)
A3	Relay A, N.C.	C6	Input (+)
A4	Relay B, N.O.	P1	AC Power (Hot)
A5	Relay B, Common	P2	Not Used
A6	Relay B, N.C.	P3	Not Used
C1, C2, C3	Not Internally Connected	P4	AC Power (Neutral)

Isolation:
1800VDC between contacts, input and power

ESD & Transient Susceptibility: Meets IEC 801-2, Level 3 (8KV)

Humidity (Non-Condensing):
Operating: 15 to 95% @ 45°C
Soak: 90% for 24hours @ 65°C

Temperature Range :
Operating: 0 to 55°C (32 to 131°F)
Storage: -25 to 70°C (-13 to 158°F)

Power: 2.5W max.,100 to 240VAC +10%, 50Hz -400Hz

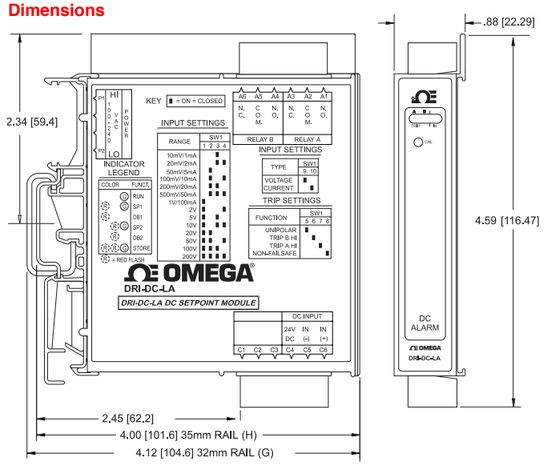
Relay Contacts: 2 SPDT (2 form C) Relays; 1 Relay per setpoint
Current Rating (resistive) 120VAC:5A; 240VAC: 2A; 28VDC: 5A
Material: Gold flash over silver alloy
Electrical Life:10^5 operations at rated load
Note: External relay contact protection is required for use with inductive loads.
Mechanical Life: 10^7 operations

Wire Terminations: Screw terminations for 12-22 AWG

Weight : 0.56 lbs.

Agency Approvals:
UL recognized per standard UL508 (File No E99775)
CE EN61326, EN61010-1

Dimensions



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If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.
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Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.
The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY RETURNS**, please have the following information available BEFORE contacting OMEGA.
1. Purchase order number which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY RETURNS**, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA.
1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product and
3. Repair instructions and/or specific problems relative to the product.

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DRI-DC-LA

AC Powered DC Input DIN Rail Limit Alarm

c UL us

INSTRUCTION SHEET

M5476/0715

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Provides Relay Contact Closures
at a Preset DC Input Level

- Field Configurable Input Ranges
- Touch Calibration Technology
- Setpoints Programmable HI or LO and Failsafe or Non-Failsafe
- DIN Rail Mounting
- Universal AC Power 85 to 265 VAC
- 24VDC Transducer Excitation
- Plug-in Terminals
- ASIC Technology for Enhanced Reliability

Description

The model DRI-DC-LA is a DIN rail mount, DC voltage or current input limit alarm with dual setpoints and two contact closure outputs. The field configurable input and alarm functions offer flexible setpoint capability. Input voltage spans from 10mV to 200V and input current spans from 1mA to 100mA can be field configured. Bipolar inputs are also accepted.

The DRI-DC-LA is configurable as a single or dual setpoint alarm, with HI or LO trips and failsafe or non-failsafe operation. Also included are adjustable deadbands (up to 100% of full scale input) for each setpoint, a 24VDC voltage source (isolated from line power) for transducer excitation, and a universal AC power supply which accepts any voltage between 85 and 265VAC.

Touch Calibration Technology

The DRI-DC-LA has simplified setpoint calibration. Using a pushbutton instead of potentiometers, improvements in calibration resolution and reliability are realized due to the elimination of the potentiometers' mechanical variability.

For calibration, simply input the signal level of the desired trip and press the pushbutton to store it in non-volatile memory. Deadband is entered the same way with another pushbutton press to store.

Diagnostic LEDS

The DRI-DC-LA is equipped with three front panel LEDs. The green LED is a dual function LED labeled IN, which indicates line power and input signal status. Active AC power is indicated by the illuminated LED. If this LED is off, check AC power and wiring connections. If the input signal is 7% above or below the configured input range the green LED will flash at 8Hz or 4Hz, respectively.

The two red LEDs indicate the relay state of each setpoint. An illuminated red LED indicates the tripped condition for the respective setpoint.

Output

The DRI-DC-LA is equipped with two SPDT (form C) relays, rated at 120VAC or 28VDC at 5 amperes. Each of these relays is independently controlled by the field configurable setpoint and deadband.

Operation

The DRI-DC-LA limit alarm setpoints can be configured for HI or LO, failsafe or non-failsafe operation. Each of the setpoints has a respective HI or LO deadband. In a tripped condition, the setpoint is exceeded and the appropriate red LED will illuminate. The trip will reset only after the process falls below the HI deadband or rises above the low deadband (see Figure 1). For proper deadband operation, the HI setpoint must be set above the LO setpoint. In failsafe operation, the relay is energized when the process is below the HI setpoint or above the LO setpoint (opposite for non-failsafe). In the failsafe mode, a power failure results in an alarm state output.

Dynamic Deadband

Circuitry in the DRI-DC-LA prevents false trips by repeatedly sampling the input. The input must be beyond the setpoint for 100 milliseconds, uninterrupted, to qualify as a valid trip condition. Likewise, the input must fall outside the deadband and remain there for 100 milliseconds to return the alarm to an untripped condition. This results in a "dynamic deadband" — based on time— in addition to the normal deadband.

Configuration

Unless otherwise specified, the factory presets the Model DRI-DC-LA as follows:

Input:	Current
Range:	0-20mA
Output:	Dual, SPDT
Trip:	A: HI, B: LO
Failsafe:	No
Deadband:	A, B: 0.25%

The AC power input accepts any AC source between 85 and 265VAC.

Note: An ACPB rail is required to power the modules. See ordering information.

For other I/O ranges, refer to Table 1 and Figure 5. Reconfigure switch SW1 for the desired input type, range and function.

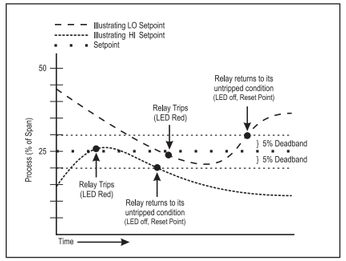

Figure 1: Limit alarm operation and effect of deadband.

WARNING: Do not change switch settings with power applied. Severe damage will result!

1. With the module removed from the rail and not powered, snap off the face plate by lifting the right edge away from the heat sink. Note the input switch (SW1) is located under the face plate. Set positions 9 & 10 for voltage or current input (see Table 1).

2. Set positions 1 through 4 of input range switch “SW1” for the desired input range (see Table 1).

3. Set position 5 of input range switch “SW1” to ON (closed) for unipolar (e.g., zero based, 0-20mA) range or OFF (open) for bipolar (e.g. -100% offset, -20 to 20mA) range.

4. Set positions 6 and 7 of input range switch “SW1” to ON for a HI trip setpoint or OFF for a LO trip setpoint.

5. Set position 8 of input range switch “SW1” to ON for non-failsafe operation or OFF for failsafe operation (e.g., alarm trips on power failure).

Calibration

1. After configuring the DIP switches, connect the input to a calibrated DC source and apply power. Refer to the terminal wiring in the specifications section.

Note: For best results, calibration should be performed in the operating environment, mounted on a DIN rail, allowing at least one hour for thermal equilibrium of the system.

2. After applying power to the unit all three LEDs will flash for approximately 10 seconds. Adjust the input signal level for the Relay “A” setpoint. The green LED should be on. Press and hold the CAL button for four seconds (until the red LED starts flashing) to enter the calibration mode. The green LED will be on and the red Relay “A” LED will be be flashing.

NOTE: If the green LED is flashing , the input is out of range (i.e. 7% above or below the configured range). Check to make sure the input signal is within the DIP switch configuration range. Double check the DIP switch settings.

3. Setpoint "A": Input the desired trip level for Relay "A" and press the CAL button. The green LED and the red Relay "A" LED will be flashing. Note that the green LED will stop flashing when the input drops below a high setpoint or rises above a low setpoint.

4. Deadband "A": For minimum deadband (approximately 0.25%), press and hold the CAL button for 4 seconds. For high setpoints, lower the input level to the desired deadband point and push the CAL button. For low setpoints increase the input level (green LED turns off) to the desired deadband level and push the CAL button. The green LED will be on and the red Relay "B" LED will be flashing.

5. Setpoint “B”: Input the desired trip level for Relay “B” and push the CAL button. The green and the red Relay “B” LED will be flashing. Note that the green LED will stop flashing when the input drops below a high setpoint or rises above a low setpoint.

6. Deadband “B”: For minimum deadband (approximately 0.25%), press and hold the CAL button for 4 seconds. For high setpoints lower the input level (green LED turns off) to the desired deadband point and push the CAL button. For low setpoints increase the input level to the desired deadband level and push the CAL button. The green LED will be on and both the red LEDs will be flashing.

7. Press the CAL button once again to exit the calibration mode. Check the setpoint and deadband to validate calibration.

Relay Protection and EMI Suppression

When switching inductive loads, maximum relay life and transient EMI suppression is achieved by using external protection (see Figures 2 and 3). Place all protection devices directly across the load and minimize lead lengths. For AC inductive loads, place a properly rated MOV across the load in parallel with a series RC snubber. Use a 0.01 to 0.1mF pulse film capacitor (foil poly-propylene recommended) of sufficient voltage, and a 47 ohm, 1/2W carbon resistor. For DC inductive loads, place a diode across the load (PRV > DC supply, 1N4006 recommended) with (+) to cathode and (-) to anode (the RC snubber is an optional enhancement).

Table 1: DRI-DC-LA Input Range Switch

Voltage	Current	Input Range Selector SW1			
		1	2	3	4
10 mV	1 mA			■	
20 mV	2 mA			■	■
50 mV	5 mA		■		
100 mV	10 mA		■		■
200 mV	20 mA		■	■	
500 mV	50 mA		■	■	■
1V	100 mA	■			
2V		■			■
5V		■		■	
10V		■		■	■
20V		■	■		
50V		■	■		■
100V		■	■	■	
200V		■	■	■	■
Key: ■ = 1 = ON or Closed					

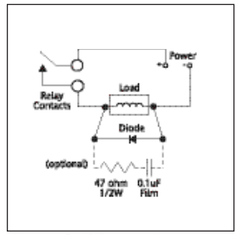

Figure 2: DC Inductive Loads

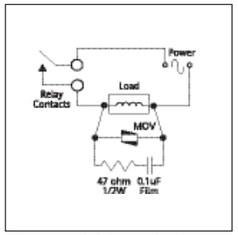

Figure 3: AC Inductive Loads

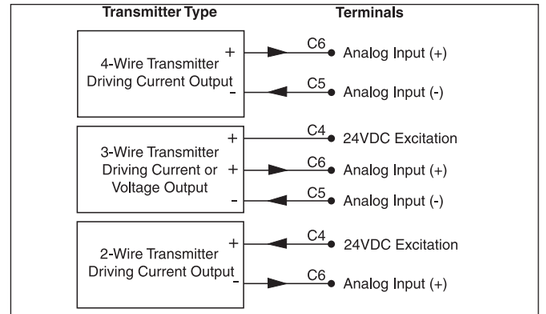

Figure 4: Typical Connections for Voltage or Current for DRI-DC-LA

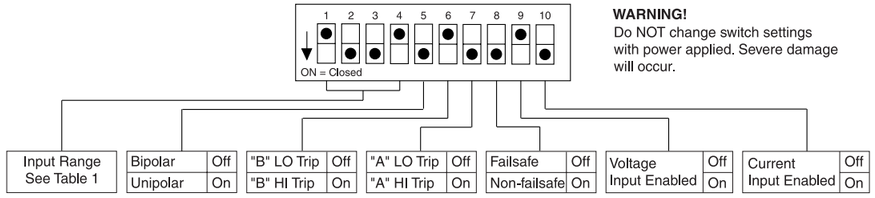

Figure 5: DRI-DC-LA Input Range/Function Selection (SW1) Factory Default Settings
Note: For voltage inputs Current Enable must be off. For current inputs Voltage Enable must be off.

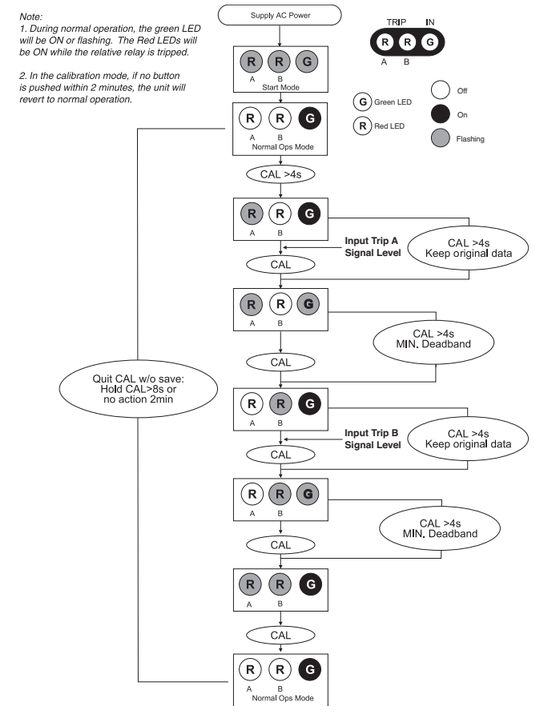

Figure 6: DRI-DC-LA Calibration Flow Chart