Specifications

Voltage Input:
- Range: 10mV to 200V
- Impedance: >10 kohms
- Overvoltage: 200V rms, max.
- Current Input:
  - 1mA to ±10mA: 20 ohms, typical
  - Overcurrent: 175mA rms, max.
- Overvoltage: 60VDC (self-resetting fuse)

Common Mode (Input to Gnd): 1800VDC, max.

LED Indicators:
- Input (Green): >10% input: 8Hz flash
- Input (Red): <10% input: 4Hz flash
- Setpoint (Red):
  - Tripped: Solid red
  - Off: 2Hz

Limit Differential (Deadband):
- >50mV/5mA: 0.25% to 100% span
- >50mV/5mA: 0.2% to 10% span

Response Time:
- Dynamic Deadband: Relay status will change when proper setpoint/process condition exists for 100msec.
- Normal Dynamic Deadband: Relay status will change when proper setpoint/process condition exists for 100msec.
- Safe: Offline for 100msec.

Response Time:
- Operating: 0.25s (22 to 131Hz)
- Storage: -25 to 70°C (13 to 158°F)
- Power:
  - 2.5W max., 100 to 240VAC +10%, 50Hz -400Hz

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

Excitation Voltage:
- 24VDC, 2mA, maximum

Common Mode Rejection:
- 1800VDC between contacts, input and power

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

Humidity (Non-Condensing):
- Operating: 15% - 95%
- Storage: 20° to 85°

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:
- 1SPDT (Form C) Relays: 5.  Relay per setpoint
- Current Rating (resistive) 120VAC: 5A, 24VAC: 2A, 28VDC: 5A
- Material: Solid State flash over silver alloy

Electrical Life: 10 operations at rated load
- Note: External relay contact protection is required for use with inductive loads.
- Mechanical Life: 10’ operations

Wire Terminations:
- Screw terminals for 12-22 AWG
- Weight: 0.56 lbs.

Agency Approvals:
- UL recognized per standard UL808 (File No. E99775)
- CE EN61326, EN61010-1

Dimensions:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Width</th>
<th>Height</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>14.5</td>
<td>4.0</td>
<td>0.9</td>
</tr>
<tr>
<td>A3</td>
<td>14.5</td>
<td>4.0</td>
<td>0.9</td>
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<tr>
<td>A4</td>
<td>14.5</td>
<td>4.0</td>
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<td>0.9</td>
</tr>
<tr>
<td>A6</td>
<td>14.5</td>
<td>4.0</td>
<td>0.9</td>
</tr>
</tbody>
</table>

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**Field Configurable Input Ranges**

- DIN Rail Limit Alarms

**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 point, press the pushbutton to store it in a non-volatile memory. Deadband is entered the same way with another pushbutton and 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 the input and power status signal. Active AC power is indicated by the illuminated green 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 configured 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.

The DRI-DC-LA’s deadband can be set above the HI LO trip setpoint. In a tripped condition, the setpoint is exceeded and the appropriate red LED will illuminate. If the trip will repeat after the process falls below the HI deadband or rises above the LO deadband (see Figure 1).

For fail safe operation, the HI setpoint must be set above the LO setpoint. In fail safe mode, 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, unsynchronized, to qualify as a valid trip signal. 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%
Figure 3: AC Inductive Loads

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 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 polypropylene 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

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current</th>
<th>Input Range Selection SW1</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 mV</td>
<td>1 mA</td>
<td>3</td>
</tr>
<tr>
<td>20 mV</td>
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<td>5V</td>
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<td>10V</td>
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</tr>
<tr>
<td>100V</td>
<td>10 A</td>
<td>3</td>
</tr>
<tr>
<td>200V</td>
<td>20 A</td>
<td>3</td>
</tr>
</tbody>
</table>

Key: ⊲ = 1 = ON or Closed

Figure 1: Limit alarm operation and effect of deadband.

Figure 2: DC Inductive Loads

Figure 3: AC Inductive Loads

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

Table 1: DRI-DC-LA Input Range Switch

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

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