

## Specifications

### Inputs:

- Voltage:
- Range Limits: 10mV to 100V (see Table 1)
  - Impedance:  $\geq 100k$  ohms
  - Overvoltage: 200V continuous
- Current Input:
- Range Limits: 1mA to 100mA
  - Impedance: 20 ohms typical
  - Overcurrent: 170mA, protected by self resetting fuse
  - Overvoltage: 60V
- Pushbutton Adjustment (inputs $>10mV$ )
- Effective zero offset:  $\geq 90\%$
  - Effective span turn down:  $\geq 90\%$  except 20mV/2mA range in which 50% is max. zero offset and span turndown

### Outputs:

- Voltage:
- Output: 0-5V, 0-10V
  - Source Impedance:  $<10$  ohms
  - Drive: 10mA max.
- Current:
- Output: 4-20mA, 0-1mA, 0-20mA (DRI-DC only)
  - Source Impedance:  $>100k$  ohms
- Compliance:
- 0-1mA: 7.5V max. (7.5k ohms)
  - 4-20mA: 12V max. (600 ohms)\*
  - 0-20mA: 12V max. (600 ohms)
  - \*10V max. (500 ohms) on dual out version

### Output Ripple:

- $<50\%$  offset or span adjust:  $<0.1\%$  off full scale span or 25mV RMS, whichever is greater
- $>50\%$  offset or span adjust:  $<0.2\%$  of full scale span or 50mV RMS, whichever is greater.

### Output Accuracy:

- $>2mA$  /  $>20mV$  input spans:  
 $\pm 0.1\%$  of full-scale input typical,  $\pm 0.2\%$  maximum
- $<2mA$  /  $<20mV$  input spans:  
 $\pm 0.35\%$  of fullscale input typical,  $\pm 0.5\%$  maximum; including linearity, repeatability and hysteresis @23C.

### Response Time: 200mSec, typical

### Stability: $\pm 0.025\%$ of full scale /C, maximum for fullscale and zero

### Common Mode Rejection: 120dB at DC, $>90dB$ at 60Hz

**Isolation:**  $\geq 1800VDC$  or peak AC between input, output, power and channel to channel

**ESD Susceptibility:** Capable of meeting IEC 801-2 level 3(8kV)

### Humidity (non-condensing):

- Operating: 15 to 95% RH @45°C
- Soak: 90% RH for 24 hours @60°C

### Temperature:

- 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%, 50 to 400Hz

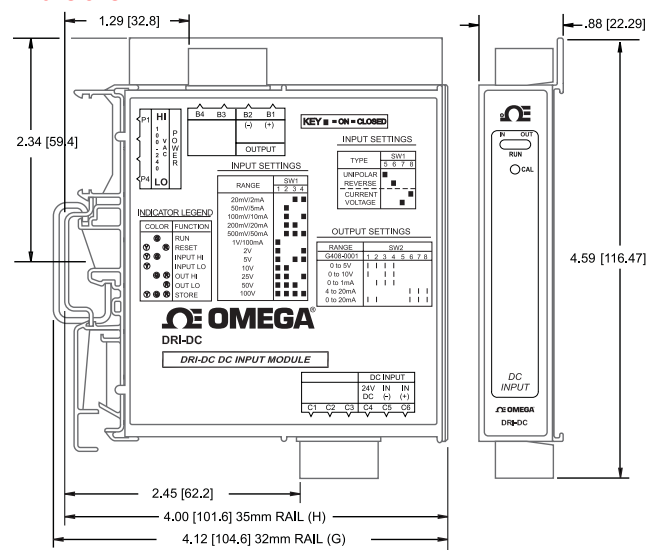
**Wire Terminals:** Socketed screw terminals for 12-22 AWG

### Agency Approvals:

- UL recognized per standard UL508 (File No. E99775).
- CE compliance per EMC directive 89/336/EEC and low voltage 73/23/EEC.

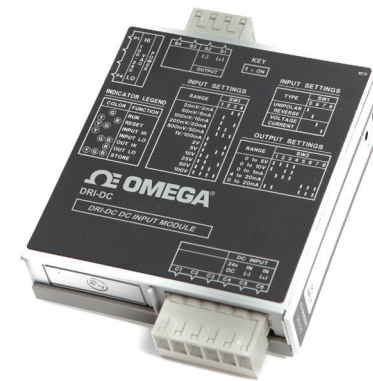
Terminal	Connection	Terminal	Connection
B1	Channel 1 Out (+)		
B2	Channel 1 Out (-)	C5	Channel 1 In (-)
B3	Channel 2 Out (+)	C6	Channel 1 In (+)
B4	Channel 2 Out (-)	P1	AC Power (Hot)
		P2	Not Used
		P3	Not Used
C3	Not Connected	P4	AC Power (Neutral)

### Dimensions



# DRI-DC and DRI-SP-AC

## AC Powered DC Input DIN Rail Multi-Channel Signal Conditioner



INSTRUCTION  
SHEET

M5477/0715

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Provides 1 or 2 Fully Isolated DC Output Signals  
in Proportion to 1 or 2 DC Inputs

- Field Configurable Input Ranges
- Field Configurable Output Ranges
- 1800VAC Isolation
- Touch Calibration Technology
- High Density DIN Rail Mounting
- Universal AC Power 85 to 265 VAC
- Plug-in Terminals

### Description

The model DRI-DC and DRI-SP-AC are AC powered, DIN rail mount, DC input signal conditioners, with 1800V isolation between input, output and power. The field configurable input and output feature offers flexible, wide ranging capability for DC current and voltage signals.

The DRI-DC is a single channel signal conditioner (1 input/1 output) and the DRI-SP-AC is a multi-channel signal conditioner (1 input/2 outputs). Both models maintain the high 1800V isolation level from channel to channel, as well as input to output to power.

### Touch Calibration Technology

Using a pushbutton instead of potentiometers, improvements in calibration resolution and reliability are realized due to the elimination of the potentiometers' mechanical variability. The thermal drift and mechanical variability of the potentiometers has been removed and replaced with a digitally stable circuit. Additionally, the inherent zero and span interactivity of analog amplifier circuitry is removed, providing 100% non-interactive adjustment.

The DRI-DC and DRI-SP-AC can be field configured for virtually any DC input to DC output within the limits specified. Calibration utilizes Touch Calibration technology where the user simply configures the input for the current or voltage range via switches, then follows the Calibration Flow Chart. The output is set by adjusting the input until the desired output is present and then pressing the CAL button to store the output level.

### Diagnostic LEDs

The DRI-DC and DRI-SP-AC have three diagnostic LEDs. The green (RUN) LED is used for diagnostics to indicate that power is on. It will flash quickly if the input signal is above the calibrated range or slowly if the input signal is below range. It is on continuously when the unit is functioning within the calibrated range.

The yellow (IN) LED is on while calibrating the input and the red

(OUT) LED is on while calibrating the output.

### Configuration

The DRI-DC and DRI-SP-AC can be configured for input ranges from 10mV to 100V or 1mA to 100mA, with  $>90\%$  input offset or will adjust down to  $<10\%$  of full scale input span (except on 20mV/2mA range where maximum offset or gain adjustment is 50%). Unless a specific custom calibration is specified, the factory presets the Model DRI-DC and DRI-SP-AC as follows:

Input Range:	20mA (Current on)
Input Configuration:	Unipolar
Calibrated Input:	4-20mA
Operation:	Direct (Reverse off)
Calibrated Output:	4-20mA

For other I/O ranges, refer to the tables below.

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

1. With power off, snap off the faceplate by lifting the right edge away from the heatsink. Slide the heatsink forward and off the module.

2. The single channel module has two eight position switch blocks, one for input and one for output. The dual output modules have a second board behind the heatsink. Gently lift this board away from the main board, rocking it back while lifting. The one input, two output module has one ten position switch block for input and channel 1 output, along with a two position switch for the second output.

3. For single channel modules, choose the desired input, function and output range from Table 1, 2, and 3. For multi-channel modules, use Table 4. Set the dip switches for the desired I/O.



[omega.com](http://omega.com) [info@omega.com](mailto:info@omega.com)

### Servicing North America:

U.S.A.:  
Omega Engineering, Inc., One Omega Drive,  
P.O. Box 4047, Stamford, CT 06907-0047 USA  
Toll-Free: 1-800-826-6342 (USA & Canada only)  
Customer Service: 1-800-622-2378  
(USA & Canada only)  
Engineering Service: 1-800-872-9436  
(USA & Canada only)  
Tel: (203) 359-1660  
Fax: (203) 359-7700  
e-mail: [info@omega.com](mailto:info@omega.com)

### For Other Locations Visit [omega.com/worldwide](http://omega.com/worldwide)

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### WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC., warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. 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. OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages. CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

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FOR **WARRANTY RETURNS**, please have the following information available BEFORE contacting OMEGA.

- Purchase order number which the product was PURCHASED.
- Model and serial number of the product under warranty, and
- 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.

- Purchase Order number to cover the COST of the repair,
- Model and serial number of the product and
- Repair instructions and/or specific problems relative to the product.

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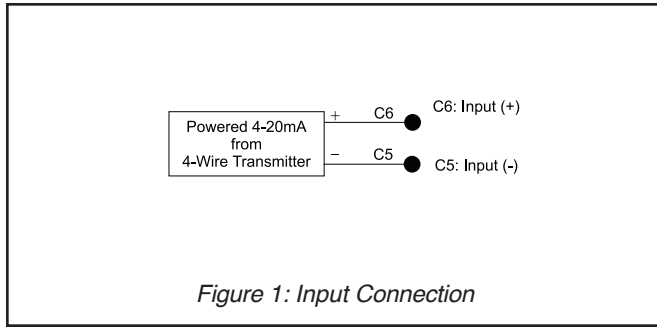


Figure 1: Input Connection

4. When the yellow and green LEDs stop flashing, the yellow and red LEDs will be on. Push the CAL button momentarily (the yellow and green LEDs will be on).

Note: To quit the calibration mode and reset the unit, push the CAL button and hold for more than 5 seconds. Or, wait for more than two minutes and the unit will timeout and reset itself to the previously stored calibration.

5. Apply the maximum input signal level desired, and push the CAL button to store (the yellow LED will be on).

6. Apply the minimum input signal level desired, and push the CAL button to store (the green and red LED will be on).

7. Adjust the input signal while monitoring the output signal until the output is at the desired maximum level (e.g. 20.00mA), then push the CAL button to store (the red LED will be on).

8. Adjust the input signal while monitoring the output signal until the output is at the desired minimum level (e.g. 4.00mA), then push the CAL button to store (the yellow, green and red LEDs will be on).

9. Push the CAL button one final time to store the calibration data. The green LED will be on if the input is within the calibrated range.

Table 3: Output Range Settings for Single Channel Module (DRI-DC)

Ranges	Selector SW2							
	1	2	3	4	5	6	7	8
Output								
0 to 5V	■	■	■	■				
0 to 10V	■	■	■					
0 to 1mA	■	■	■					
4 to 20mA							■	■
0 to 20mA							■	■

Key: ■ = 1 = ON or Closed

**Calibration**

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

1. Install the module on to a piece of DIN rail and the ACPB rail mounting combination. See the ACPB rail Data sheet for details.

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

2. Connect the input to a calibrated DC source and the output to a voltage or current meter. Apply power and allow the system to reach thermal equilibrium (approx. 20 minutes).

3. Adjust the input signal to the desired maximum and observe that the green LED is on or flashing. Push the CAL button and hold it down for more than 5 seconds (until the yellow and Green LEDs are flashing).

Table 1: Input Range Settings for Single Channel Module (DRI-DC)

Ranges		Selector SW1			
Voltage	Current	1	2	3	4
20mV	2mA		■	■	
50mV	5mA		■	■	
100mV	10mA		■	■	
200mV	20mA		■	■	
500mV	50mA		■	■	
1V	100mA	■			
2V		■			
5V		■	■	■	
10V		■	■	■	
25V		■	■	■	
50V		■	■	■	
100V		■	■	■	

Key: ■ = 1 = ON or Closed

Table 2: Input Function Settings for Single Channel Module (DRI-DC)

Type	Selector SW1			
	5	6	7	8
Unipolar	■	-	-	-
Bipolar	-	-	-	-
Reverse	-	-	-	-
Direct	-	-	-	-
Current	-	-	-	■
Voltage	-	-	-	■

Key: ■ = 1 = ON or Closed; - = n/a

Table 4: I/O Range & Function Settings for Dual Channel Module (DRI-SP-AC)

Ranges		Selector SW1										SW2**	
Voltage	Current	1	2	3	4	5	6	7	8	9	10	1	2
20mV	2mA			■	■								
50mV	5mA			■	■								
100mV	10mA			■	■								
200mV	20mA			■	■								
500mV	50mA			■	■								
1V	100mA	■											
2V		■											
5V		■		■	■								
10V		■		■	■								
25V		■		■	■								
50V		■		■	■								
100V		■		■	■								
Unipolar						■							
Voltage							■						
Current								■					
Output													
0 to 5V											■	■	■
0 to 10V											■	■	■
0 to 1mA											■	■	■
4 to 20mA													

Key: ■ = 1 = ON or Closed  
\*\*SW2, two position switch applies only to 1 input, 2 output module

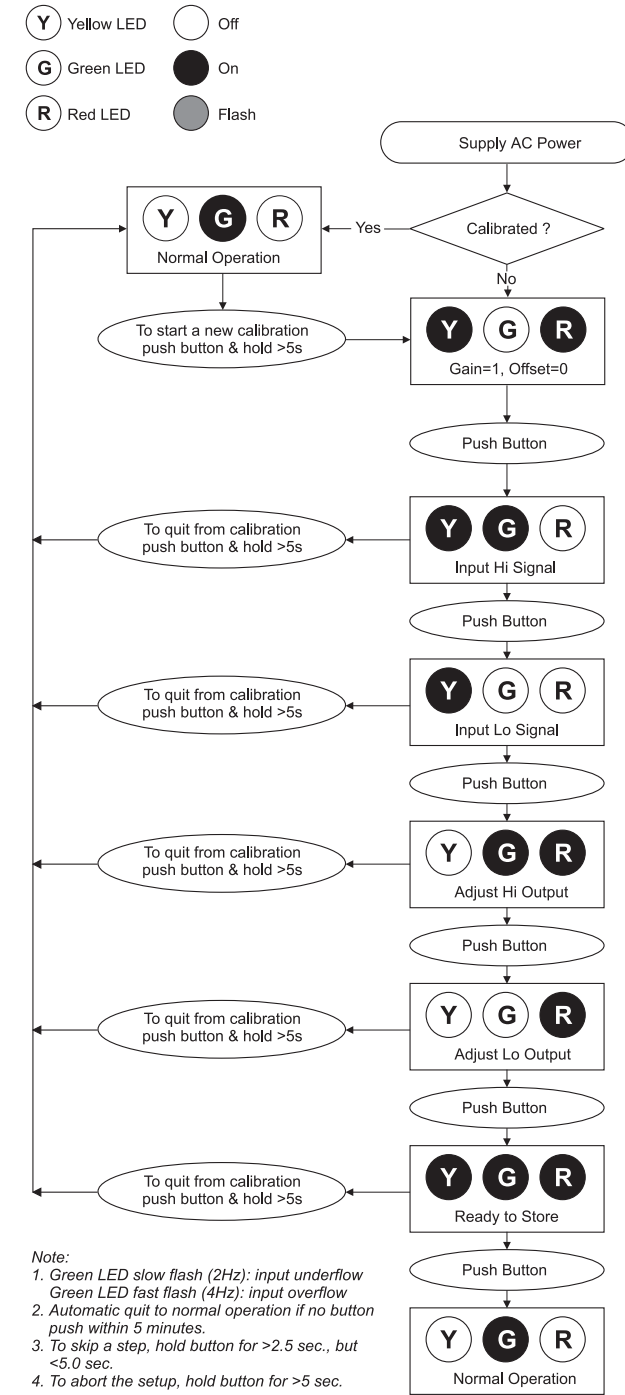


Figure 2: DRI-DC and DRI-SP-AC Calibration Flow Chart