DRG-SC-BG
Bridge Input, Field Configurable Signal Conditioner
Instruction Sheet M2390/0796

DESCRIPTION
The DRG-SC-BG is a DIN rail mount, bridge or strain-gage input signal conditioner with 1800VDC isolation between input, output and power. The field configurable input and output offers flexible, wide ranging capability for bridge or strain-gage input applications from 0.5mV/V to over 50mV/V.

Wide ranging, precision zero and span pots allow 50% adjustablity of offset and gain within each of the 11 switch selectable input ranges. The output can be set for either 0-5V, 0-10V, 0-1mA, 0-20mA or 4-20mA.

This flexibility, combined with an adjustable (1 to 10VDC) bridge excitation source, provides the user a reliable, accurate instrument to isolate and condition virtually any bridge or strain-gage input.

APPLICATION
The DRG-SC-BG field configurable, bridge input signal conditioner is useful in isolating ground loops and interfacing bridge sensors to data acquisition and control systems.

Three way isolation completely eliminates ground loops from any source. Isolation protects expensive SCADA systems from ground faults and provides filtering for noise reduction which can be a significant problem with small, millivolt, bridge signals.

Wide ranging flexibility allows the user to easily zero out dead-loads in weighing systems or configure bipolar input ranges for expansion-compression or vacuum-pressure bridge applications.

High density DIN rail mounting offers an extremely compact solution for saving valuable panel space.

DIAGNOSTIC LEDS
The DRG-SC-BG is equipped with a dual function LED signal monitor. The green, front mounted LED indicates both DC power and input signal status. Active DC power is indicated by an illuminated LED. If the input signal is more than 110% of the full-scale range, the LED will flash at 8Hz. If this continues to occur, you may wish to change your full-scale input range setting.

CONFIGURATION
A major advantage of the DRG-SC-BG is its wide ranging capabilities and ease of configuration. The DRG-SC-BG has 11 input range switch settings.Trim potentiometers allow 50% input zero and span adjustablity within each of the 11 full-scale, input ranges.

For example, the 200mV switch setting in Table 1 configures the input for a 0 to 200mV range. Since the span can be contracted by 50%, this enables an input span as narrow as 100mV of the range, or 50%. This span can be positioned anywhere within the 0-200mV range with a zero off-set as large as 50% of the full scale range (e.g. 100 to 200mV input).

Unless otherwise specified, the factory presets the Model DRG-SC-BG as follows:

Input Setting:	0 to 50mV
Input Range:	0 to 30mV (3mV/V)
Excitation:	10V
Operation:	Direct
Output:	4 to 20mA

The DC power input accepts any DC source between 18 and 30V, typically a 24VDC source is used .

For other I/O ranges refer to Tables 1 through 4 and reconfigure switches SW1 and SW2 for the desired input range, function, excitation and output range.

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

CALIBRATION
1. After configuring the DIP switches, connect the input to a calibrated millivolt source. Connect the output to the actual device load (or a load equivalent to the actual device load value) and apply power. (see Wiring Diagram, Figure 2 or 3).

NOTE: To maximize thermal stability, final calibration should be performed in the operating installation, allowing approximately 1 to 2 hours for warm up and thermal equilibrium of the system.

2. Set the calibrator to the desired minimum and adjust the zero potentiometer for the desired mimimum output.

3. Set the calibrator to the desired maximum and adjust the span potentiometer for the desired maximum output.

4. Repeat steps 2 and 3, if necessary for best accuracy.

Table 1: Input Range Selector-Switch Settings

	SW1 1	2	3	4	5
0 to 10mV	■			■	■
0 to 20mV	■	■			■
0 to 50mV	■	■	■	■	■
0 to 100mV	■				■
0 to 200mV	■			■	■
-5 to 5mV		■			
-10 to 10mV		■		■	
-20 to 20mV		■	■		
-50 to 50mV		■	■	■	
-100 to 100mV	■				
-200 to 200mV	■			■	

KEY ■ = ON

Table 2: Direct or Reverse Operation Setting

	SW1 6
DIRECT	
REVERSE	■

Table 3: Bridge Excitation Selector-Switch Settings

	SW1 7	8
9.8 to 10.1V	■	
4.8 to 5.2V		
0 to 10V	■	■
0 to 2.5V		■

Table 4: Output Range Selector-Switch Settings

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

KEY ■=ON

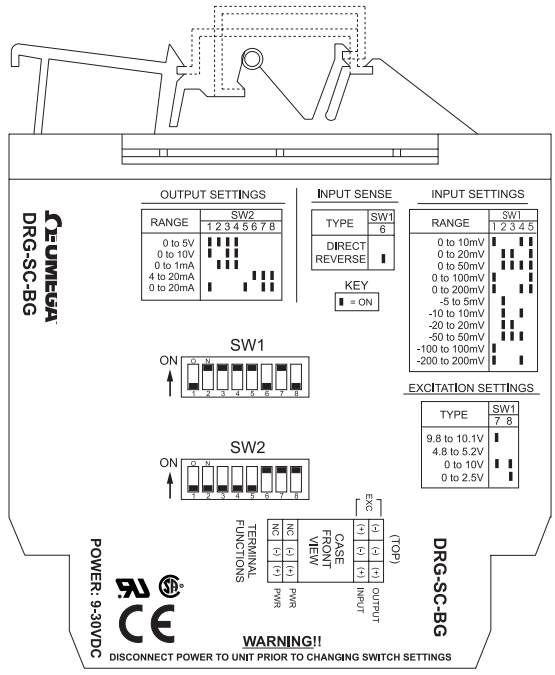
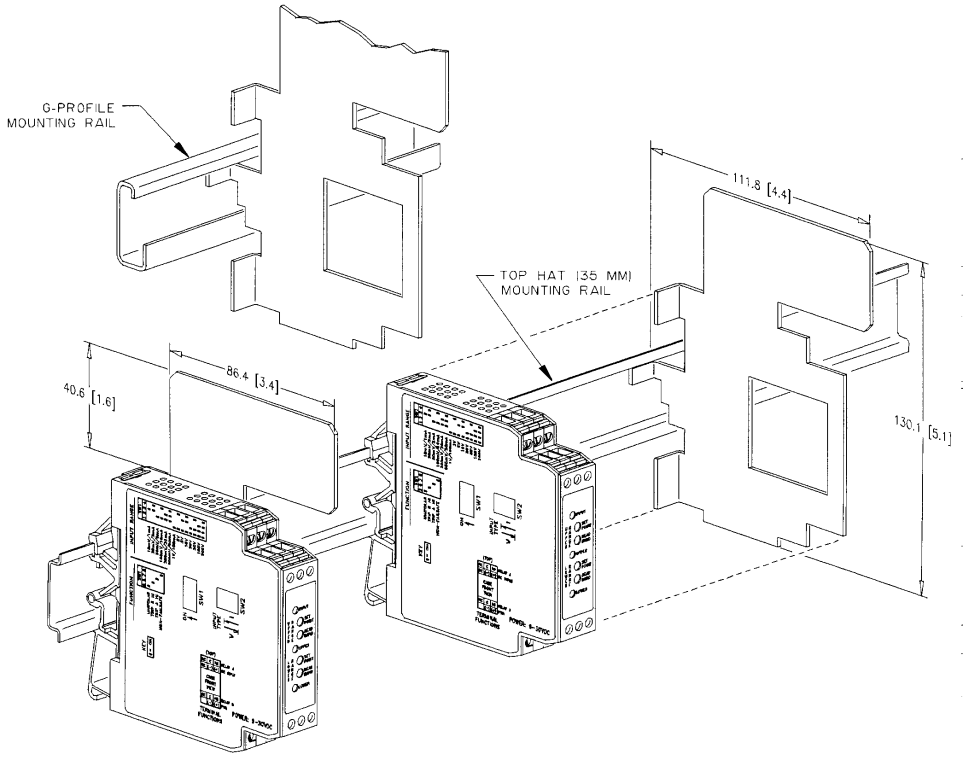


Figure 1: DRG-SC-BG Factory Calibration; 0 to 30mV (0 -50mV switch settings) 10V excitation, direct operation, 4-20mA output



Note1: All DRG Series modues are designed and tested to operate in ambient temperatures from 0 to 55° C, when mounted on a horizontal DIN rail. When five or more modules are mounted on a vertical rail, circulating air or model DRG-HS01 Heat Sink is recommended. Please refer to DRG-HS01 Technical Bulletin or contact factory for assistance.

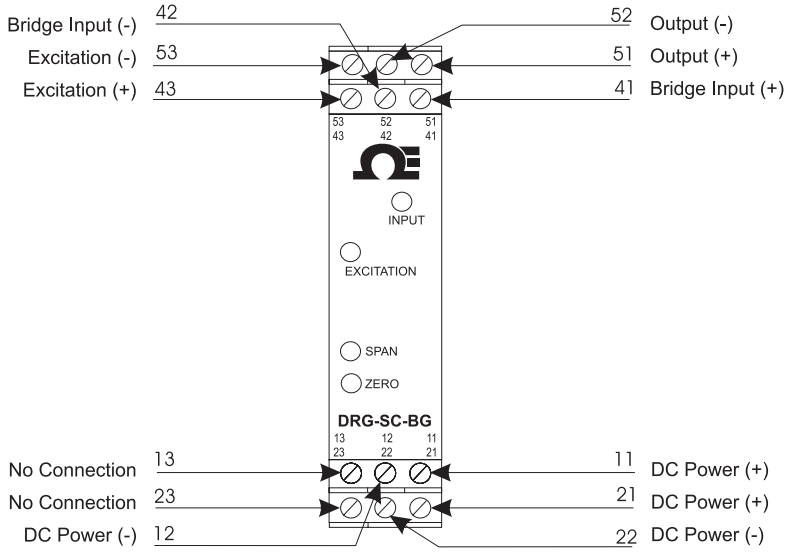


Figure 2: Wiring Diagram for DRG-SC-BG

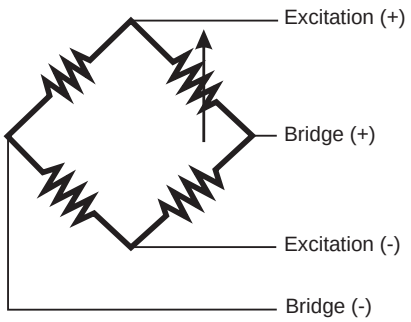


Figure 3: Bridge Reference Designations

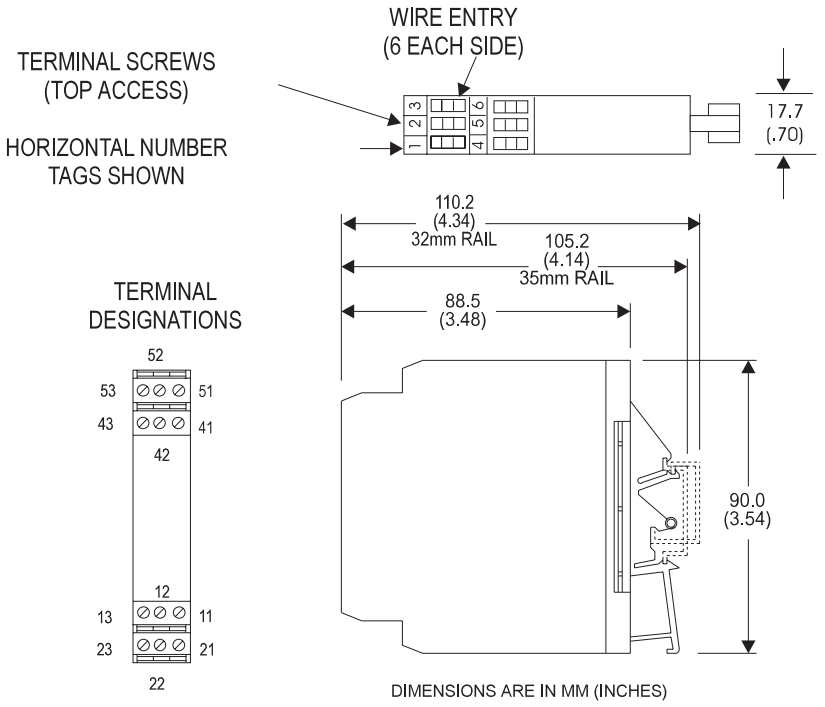


Figure 4: Mechanical Dimensions for DRG-SC-BG

SPECIFICATIONS

Input

Voltage Input
Full Scale Range: 10mV to ±200mV (Table 1).
Impedance: >1MΩ
Overvoltage: 400Vrms, max. (intermittent); 264Vrms, max. (continuous).
Common Mode (Input to Ground): 1800VDC, max.
Zero Turn-Up: 50% of full scale range
Span Turn-Down: 50% of full scale range
Operation: direct or reverse acting

Output

Voltage Output
Output: 0-5V, 0-10V
Impedance: <10Ω
Drive: 10mA, max. (1KΩ, min. @ 10V)
Current Output
Output: 0-1mA, 0-20mA, 4-20mA
Impedance: >100KΩ
Compliance:
0-1mA; 7.5V, max.(7.5KΩ, max.)
0-20mA; 12V, max. (600Ω, max.)
4-20mA; 12V, max. (600Ω, max.)

Bridge Excitation

1 to 10VDC, 120mA max.

Accuracy (Including Linearity, Hysteresis)

±0.1% typical, ±0.2% maximum of selected range at 25°C.

Stability

±0.025%/°C typical, 0.05%/°C maximum, of selected full scale range.

Output Noise (maximum)

0.1% of span, rms, or 10mV whichever is greater.

Response Time (10 to 90%)

<200mSec., typical.

Common Mode Rejection

DC to 60Hz:≥120dB
≥100dB (0 -1mA, range)

Isolation

1800VDC between input, output and power.

EMC Compliance

Emmissions: EN50081-1
Immunity: EN50082-2
Safety:EN50178

LED Indication (green)

Input Range (approx.)
>110% input: 8Hz flash
<0% input: 4Hz flash

Humidity (Non-Condensing)

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

Temperature Range[1]

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

Power

Consumption: 1.5W typical, 2.5W max. (one 350Ω bridge), 4W max. (four 350Ω bridges).
Range: 18 to 30VDC

Wire Terminations

Screw terminals for 12-22 AWG

Mounting:

32mm or 35mm DIN Rail

Agency Approvals

CSA certified per standard C22.2, No. 0-M91 and 142-M1987 (File No. LR42272) **UL** recognized per standard UL508 (File No.E99775). CE Conformance per EMC directive 89/336/EEC and low voltage 73/23/EEC.

PIN CONNECTIONS

11 DC Power (+)
12 DC Power (-)
13 No Internal Connection
21 DC Power (+)
22 DC Power (-)
23 No Internal Connection
41 Bridge Input (+)
42 Bridge Input (-)
43 Excitation (+)
51 Output (+)
52 Output (-)
53 Excitation (-)

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If the unit should malfunction, 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 being 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 which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:
1. P.O. number under 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

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2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

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