

DRG-SC-DC

DC Input Field Configurable Isolator

Instruction Sheet M2394/0796

DESCRIPTION

The DRG-SC-DC is a DIN rail mount, DC input signal conditioner with 1800VDC isolation between input, output and power. The field configurable input and output offers flexible, wide ranging capability for DC current and voltage signals.

The input of the DRG-SC-DC can be configured for any one of 12 voltage ranges from 10mV to 100V or 6 current ranges from 1mA to 100mA (see table 1). The output is linear to the input and can be set for either 0-5V, 0-10V, 0-1mA, 0-20mA or 4-20mA (for model DRG-SC-DC-U) and -5 to +5V or -10 to +10V (for model DRG-SC-DC-B).

Wide ranging, precision zero and span pots allow 50% adjustability of offset and span turn-down within each of the 18 switch selectable ranges. For example, the 0-2mA input range could be turned down to 0-1mA and provide a full scale output signal (e.g. 4-20mA), or turned down and offset to achieve a 1-2mA/4-20mA I/O combination.

The DRG-SC-DC accepts bipolar inputs (e.g. 10V range set to bipolar = -10 to +10V) and offers selectable normal, or reverse operation (e.g. 4-20mA/20-4mA). The ASIC based I/O channel is optically isolated to 1800VDC and is transformer isolated from the power supply.

APPLICATION

The DRG-SC-DC field configurable isolator is useful in eliminating ground loops, converting signal levels, and providing signal drive. The field configurable, wide ranging capability ensures maximum flexibility for most DC to DC applications, minimizing spare part requirements.

DIAGNOSTIC LED

The DRG-SC-DC 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. Below -10%, the flash rate is 4Hz.

CONFIGURATION

A major advantage of the DRG-SC-DC is its wide ranging capability and ease of configuration. The DRG-SC-DC has 18 input range settings. Trim potentiometers allow 50% input zero and span adjustability within each of the 18 full scale input ranges.

Unless otherwise specified, the factory presets Model DRG-SC-DC-U and DRG-SC-DC-B as follows:

DRG-SC-DC-U
Input Range: 4-20mA
Output Range: 4-20mA

DRG-SC-DC-B
Input Range: 4-20mA
Output Range: -10 to +10V

The DC power input accepts any source between 9 and 30V; typically a 12V or 24VDC source is used.

Redundant (parallel) power terminals are provided as a wiring convenience. When multiple units are powered from the same source, power can be connected from one unit to the next, in parallel strings of up to 24 units (5 Amps maximum).

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

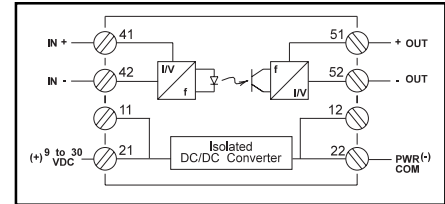


Figure 1: DRG-SC-DC block diagram.

Refer to Tables 1 through 5 for the proper switch settings. Use the switches on SW3 to select the input type (voltage or current), SW1 to select the desired input range and function setting and SW2 to select the desired type of output.

CALIBRATION

1. After configuring the dip switches, connect the input to a calibrated DC source. Connect the output to the actual device load (or a load approximately equivalent to the actual device load value) and apply power.

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 input and adjust the zero potentiometer for the desired minimum output.

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

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

Table 1: Input Range Selector- Switch settings for both DRG-SC-DC-U and DRG-SC-DC-B.

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

Table 3: Input Voltage or Current Selector- Switch settings for both DRG-SC-DC-U and DRG-SC-DC-B.

Input	SW1	
	7	8
Voltage	■	
Current		■

Table 2: Input Range and function settings for both DRG-SC-DC-U and DRG-SC-DC-B.

Functions	SW1	
	5	6
Unipolar	■	X
Bipolar		X
Normal	X	
Reverse	X	■

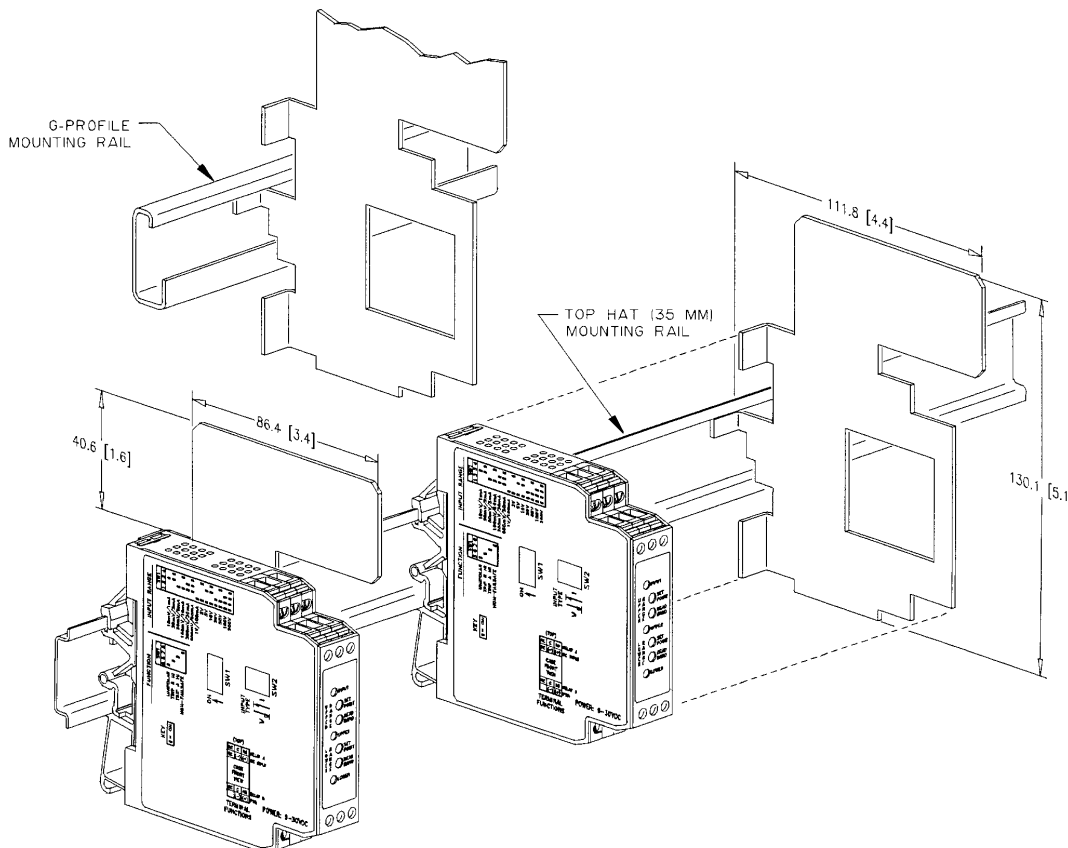
KEY
 ■ =ON
 X =Don't Care

Table 4: Output Range Selector-Switch settings for DRG-SC-DC-U.

Output Ranges	SW2							
DRG-SC-DC-U	1	2	3	4	5	6	7	8
0 to 5V	■	■	■	■				
0 to 10V	■		■	■				
0 to 1mA		■	■	■				
4 to 20mA						■	■	■
0 to 20mA	■	■				■	■	■

Table 5: Output Range Selector-Switch settings for DRG-SC-DC-B.

Output Ranges	SW1	
DRG-SC-DC-B	9	10
-5 to +5V	X	■
-10 to +10V	X	



Note1: All DRG series modules 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.

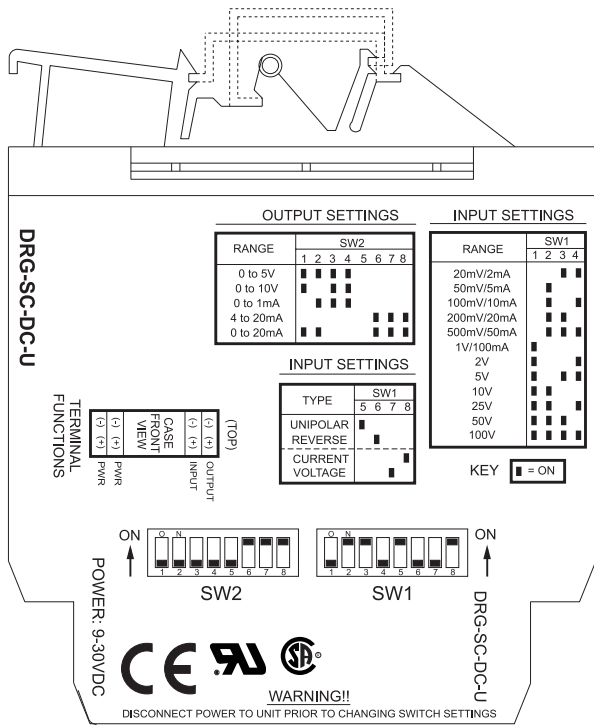


Figure 2: DRG-SC-DC-U factory calibration; 4-20mA, unipolar input, normal operation, 4-20mA output.

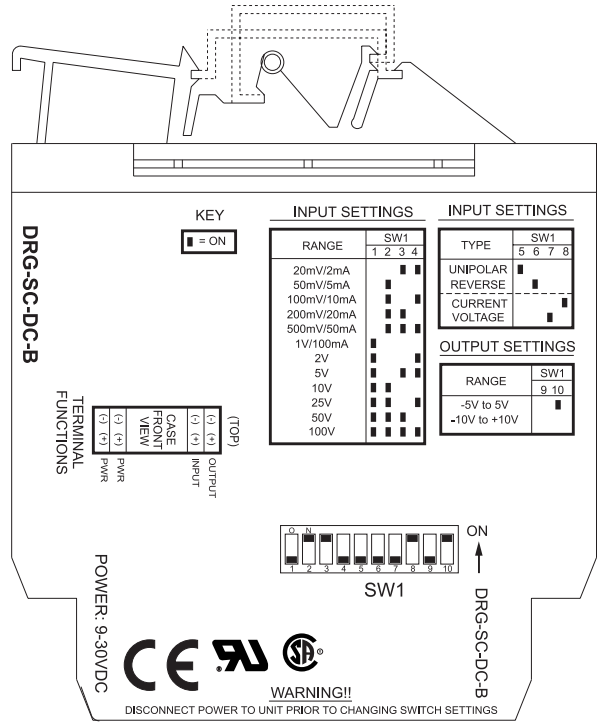


Figure 3: DRG-SC-DC-B factory calibration; 4-20mA, unipolar input, normal operation, -10 to +10V output.

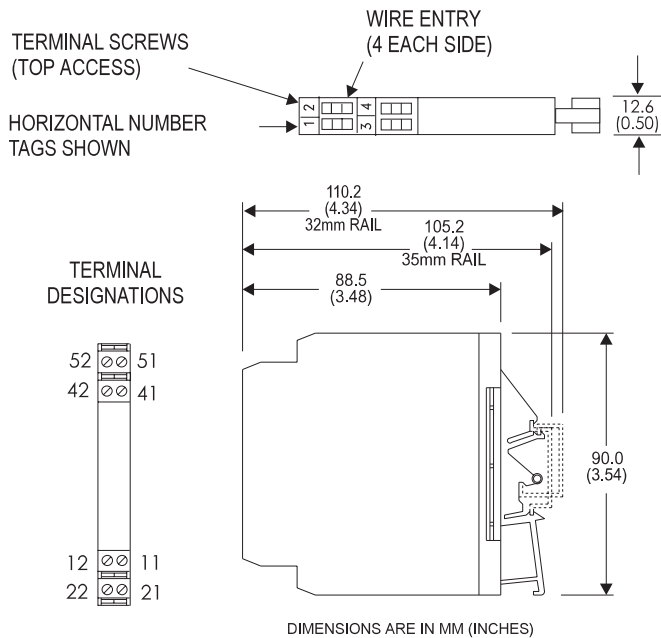


Figure 4: Mechanical dimensions for both DRG-SC-DC-U and DRG-SC-DC-B.

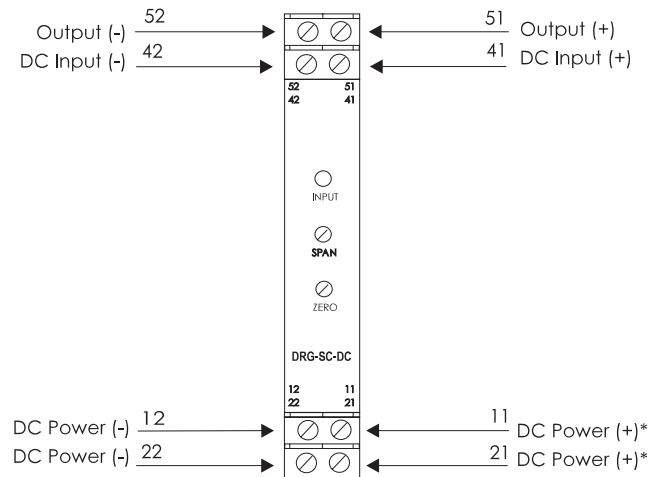


Figure 5: Wiring diagram for both DRG-SC-DC-U and DRG-SC-DC-B

*NOTE: Redundant (parallel) power terminals are provided to daisy chain power connections in high density applications.

SPECIFICATIONS

Input

Voltage Input

Range Limits: 10mV to 100V
Impedance: >100K Ω
Overload: 400 VRMS, max.

Current Input

Range Limits: 1mA to 100mA
Impedance: 20 Ω , typical
Overcurrent: 170mA RMS, max.
Overvoltage: 60VDC
Zero Turn-Up: 50% of full scale input
Span Turn-Down: 50% of full scale input
Common Mode (Input to Ground)
1800 VDC, max.

Output (DRG-SC-DC-U)

Voltage Output

Output: 0-5V, 0-10V
Source Impedance: <10 Ω
Drive: 10mA, max.

Current Output

Output: 0-1mA, 4-20mA, 0-20mA
Source Impedance: >100K Ω
Compliance:
0-1mA: 7.5V, max (7.5K Ω)
4-20mA: 12V, max (600 Ω)
0-20mA: 12V, max (600 Ω)

Output (DRG-SC-DC-B)

Voltage Output

Output: -5 to +5V, -10 to +10V
Impedance: <10 Ω
Drive: 10mA, max.

LED Indication (green)

Input Range

>110%(approx) input: 8Hz flash
< -10%(approx) input: 4Hz flash

Accuracy (Including Linearity, Hysteresis)

<2mA/<20mV: \pm 0.35% of full scale, typical; 0.5%, max.
>2mA/>20mV: \pm 0.1% of full scale, typical; 0.2%, max.

Response Time (10-90%)

200mSec., typical

Stability (Temperature)

\pm 0.025% of full scale/ $^{\circ}$ C, typical;
 \pm 0.05%/ $^{\circ}$ C, max.

Common Mode Rejection

DC to 60Hz: 100dB

Isolation (Input to Output)

1800VDC between
input, output and power

EMC Compliance (CE Mark)

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

Mean Time Between Failures

60K Hours (DRG-SC-DC)

Humidity (Non-Condensing)

Operating: 15 to 95%(@ 45 $^{\circ}$ C)
Soak: 90% for 24 hours (@ 65 $^{\circ}$ C)

Temperature Range ¹

Operating: 0 to 55 $^{\circ}$ C (32 to 131 $^{\circ}$ F)
Storage: -25 to 70 $^{\circ}$ C (-13 to 158 $^{\circ}$ F)

Wire Terminal

Screw terminals for 12-22AWG

Power

Consumption: 1.5W typical,
2.5W max.
Range: 9 to 30VDC

Mounting

32mm or 35mm DIN rail

Weight

.5lbs

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 (Input \leq 75VDC).

PIN CONNECTIONS

11 DC Power (+)
12 DC Power (-)
21 DC Power (+)
22 DC Power (-)
41 Input (+)
42 Input (-)
51 Output (+)
52 Output (-)



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