STATUS INSTRUMENTS

SEM1402

Loop Powered Trip Amplifier

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52-214-2410-01 Issue: Web 1401

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1.0 DESCRIPTION

The SEM1402 is a dual trip amplifier.

2.0 SPECIFICATIONS

2.1 INPUT

Type	Two wire (4 to 20) mA, 50 mA max.
Protection	Reverse connection protected
Loop Drop	5 V max.

2.2 OUTPUTS

Dual alarm contacts	
Alarms	2 x HIGH/LOW alarms selected by switches (side entry)
Contact	2 x N.O. relay contacts with shared common
Rating	Resistive Load 2 A @ 250 VAC/125 VDC max. Power 150 W (Inductive Loads)
Max. Vibration	12 G (10 to 55) Hz at double amplitude 2 mm
Shock Res.	12 G
Indication	2 x alarm LED on module front face
Set point	(0 to 100) % multi turn trip set potentiometer, (access on module front face). (Repeatability ± 0.2 %)
Hysteresis	Fixed at 0.5 %
Delay	0.5 second fixed delay
Failure Mode	On loss of signal: HIGH level, No alarm condition; LOW level, Alarm condition (i.e. alarm operates as if signal has fallen to -25 % or 0 mA)
Mounting	Snap on “Top Hat” (DIN EN 50022-35)
Minimum Current	3.5 mA

2.3 GENERAL SPECIFICATION

Isolation	3000 VAC rms between contacts and input; 1000 VAC rms between contacts
Ambient	(0 to 50) °C; (10 to 95) % RH non condensing
Compliant with	EN50081-1, EN50082-1
Connection	Captive clamp screws
Cable Size	4 mm^2 solid / 2.5 mm^2 stranded
Case Material	Grey Polyamide
Case Flammability	To UL94-V0 VDE 0304 pt3 level 111A
Dimensions	(60 x 60 x 21) mm (67.5 mm above rail)
Mounting	Snap on “Top Hat” (DIN EN50022-35)
Weight	60 g

3.0 INSTALLATION

- **WARNING!** Hazardous voltages may be present on the terminals - the equipment must be installed by suitability qualified personnel and mounted in an enclosure providing protection to at least IP20.
- **WARNING!** **If not installed and used in accordance with these instructions, protection against hazards may be impaired.**
- **IMPORTANT NOTE** It may be preferable to set the user adjustment on the bench prior to installation. Please read Section 3 before installation).

3.1 MECHANICAL

This trip must be housed within a suitable enclosure that will provide protection from the external environment, ensuring that the stated temperature and humidity operating ranges are maintained. As SEM1402 contains high quality relays, the usual precautions taken when using products containing relays apply, such as care must be taken to ensure the trip is not subjected to strong shock or vibration, as this may result in momentary opening of the relay contacts. The SEM1402 must not be located near a strong magnetic field, such as a transformer, solenoid or electric motor.

The SEM1402 case is designed to snap fit onto a standard “Top Hat” DIN rail. To remove from DIN rail, apply pressure at the bottom face at the back upwards towards the rail to release the spring clip and tip away from the top. The trip may be mounted in any orientation and stacked side by side along the rail.

3.2 ELECTRICAL

Connections to the trip are made via screw terminals with wire protector plates provided inside each terminal. To maintain CE compliance twisted pair (screened) cables are recommended for signal connections. It is also good practice to ensure that all (4 to 20) mA loops are grounded at a single point. Before installation ensure the (4 to 20) mA loop has enough voltage available to drive the trip. Refer to the above specification for the loop voltage drop. The dual contacts provided by the SEM1402 are capable of switching 250 VAC 125 VDC @ 2 A resistive load, 150 Watts inductive load. Internal Varistors are connected across the contacts to protect against over voltage. It is advised that a external R/C snubber network is used when switching inductive AC loads, see Figure 1. When switching DC inductive loads, a diode connected in parallel with the inductor must be used to protect the contacts from the energy stored in the inductor (See Figure 2).

Installation overvoltage category 2 (as per BS EN61010-1)

- If this equipment is to be used in environments with overvoltage category 3, transient suppressors should be installed on wiring carrying greater than 50 VAC or 75 VDC.
- Any power supply to the equipment greater than 50 VAC or 75 VDC must be protected by a suitable fuse and a switch or circuit breaker which should be near the equipment.
- The equipment contains no user serviceable parts.

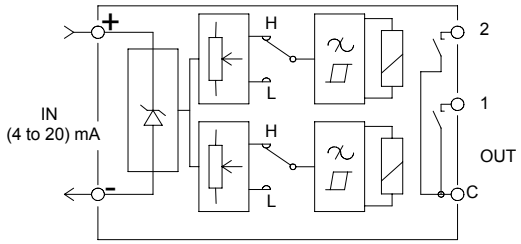


Figure 1

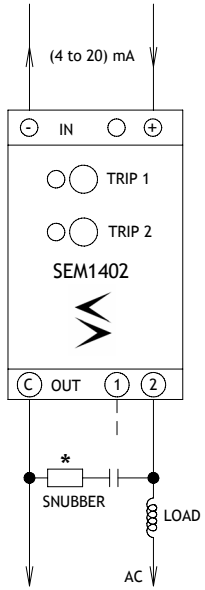
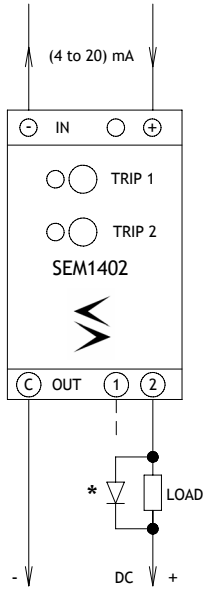


Figure 2



* Components not supplied

4.0 ALARM SETUP

NOTE: Latching relays are used in this product in conjunction with an advanced relay drive circuit. During commissioning, on initial power up, or after switch settings have been modified, one trip operation must be completed in order to synchronise the latching relay(s). Once this cycle has been completed the unit will function correctly during normal operation cycles. On power down the trip contacts will rest as for a -25 % (0 mA) process value and take this state indefinitely until power up. The initial power up cycle will only be required again if the unit switch settings are changed, or the unit is removed from the installation and is subjected to shocks greater that 12 G, i.e. during transit.

This section deals with the setting up of the trip. Two adjustment are available to the user on each channel:

- High/Low alarm selection switch located on the side of the trip, for each trip.
- Set point adjustment -15 turn potentiometer front panel provides (0 to 100) % set point range for each trip.

Hysteresis is fixed at 0.5 %. Hysteresis is necessary to stop relay chatter at the trip point.

The alarm status is indicated on the front panel by means of a red LED, one for each channel - "ON" indicates in alarm.

With care, the SEM1402 trip set points may be set up in the process but the task is greatly simplified by replacing the process signal with a adjustable (4 to 20) mA current source, to simulate the (4 to 20) mA process signal.

The set up process is as follows:

1. First decide on the type of trip required for each channel, “High” for alarm ON above set point, or “Low” for alarm ON below set point. Set the High/Low alarm selection switch on the side of the enclosure to the desired setting, by inserting a 3 mm blade screwdriver into the hole(s) and apply one press against the switch plunger. This will toggle the switch between the the two alarm settings being:

   High alarm state - plunger out (flush with the enclosure inside face).

   Low alarm state - plunger in (depressed below side face).

2. Set the process current to the desired trip alarm setting, then using a 3 mm screw driver adjust the set point until the alarm changes state. Clockwise to increase, anticlockwise to decrease. Adjust the set point backwards and forwards until it is positioned at the point at which the alarm LED has just come on. Repeat for other channel.

3. Now raise and lower the process input signal about the trip setting and unsure the alarm trips at set point and trips off at set point plus (minus) hysteresis. If required fine adjust settings.

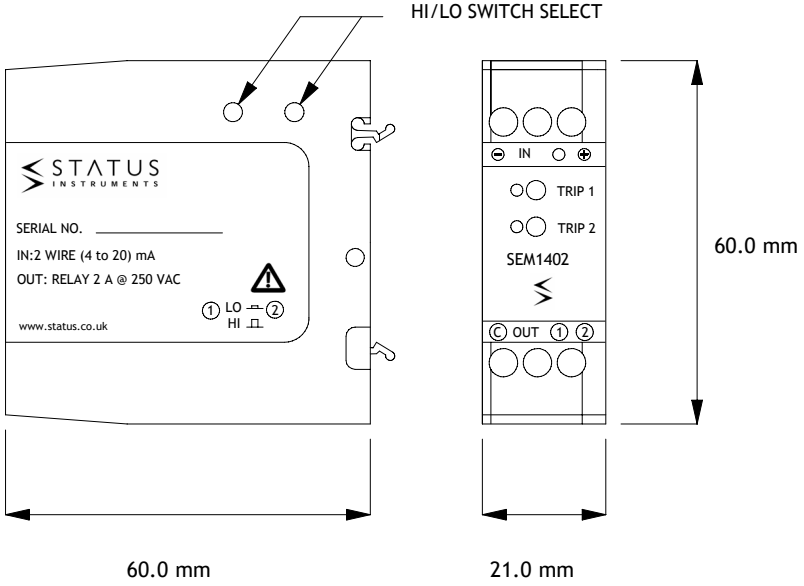
* Current calibrator must be capable of driving the expected 5 V loop drop.

5.0 OPERATION

Once setup and operating satisfactorily the trip amplifier requires no further user adjustments.

6.0 MECHANICAL DETAIL

Figure 3



ALSO AVAILABLE:

- Smart In Head Temperature Transmitters
- DIN Rail Mounted Temperature Transmitters
- Panel & Field Temperature Indicators
- Temperature Probes
- Trip Amplifiers
- Signal Conditioners
- And many other products

For further information on all products:

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