

## SEM1000 MkII USER INSTRUCTIONS

### Important - Please read this document before installing.

Every effort has been taken to ensure the accuracy of this document; however, we do not accept responsibility for damage, injury, loss or expense resulting from errors and omissions, and we reserve the right of amendment without notice.

### IMPORTANT – CE, UKCA & SAFETY REQUIREMENTS

Product must be DIN rail mounted, inside a suitable enclosure providing environmental protection to IP65 or greater.

To maintain CE EMC requirements, input and supply wires must be less than 30 metres.

The product contains no serviceable parts, or internal adjustments. No attempt must be made to repair this product. Faulty units must be returned to supplier for repair. Before attempting any electrical connection work, please ensure all supplies are switched off.

ABSOLUTE MAXIMUM CONDITIONS (To exceed may cause damage to the unit).	
Supply voltage input (SELV)	35 V
Input current	30 mA
Ambient	Temperature (0 to 70) °C Approvals EN61010_1, EN61326
Loop load must be > 250 Ω for ambient temperatures > 50 °C	
Input loop	30 mA fuse recommended
Output loop	30 mA fuse recommended

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### 1~DESCRIPTION.

The SEM1000 isolator is designed to be series connected into a new or existing (4 to 20) mA current loop and provide an isolated (4 to 20) mA signal capable of driving into 300 Ω maximum load. The output is powered from the input loop.

This isolator requires no user-adjustment during commissioning. Minor adjustments can be made to the calibration of the device by means of the two front-panel accessible calibration potentiometers. Incorrect connection in the loop will not damage the device as long as the specified maximum currents/voltages are not exceeded.

### 2~RECEIVING AND UNPACKING.

Please inspect the packaging and instrument thoroughly for any signs of transit damage. If the instrument has been damaged, please notify your supplier immediately.

### 3~SPECIFICATION.

Refer to data sheet for full specification. Download at

[www.status.co.uk](http://www.status.co.uk)

Factory defaults	(4 to 20) mA input to output
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### 4~INSTALLATION AND WIRING.

#### Important safety requirements

This equipment is suitable for environment Installation BS EN61010-1 Pollution Degree 2; Installation CAT II; CLASS I and is classed as "PERMANENTLY CONNECTED EQUIPMENT". The equipment is intended for industrial and commercial application only and not suitable for domestic or medical use.

The equipment must be mounted inside an enclosure that provides protection >= IP65. In NORMAL USE, the equipment will only be accessed for maintenance by qualified personnel. Please ensure the

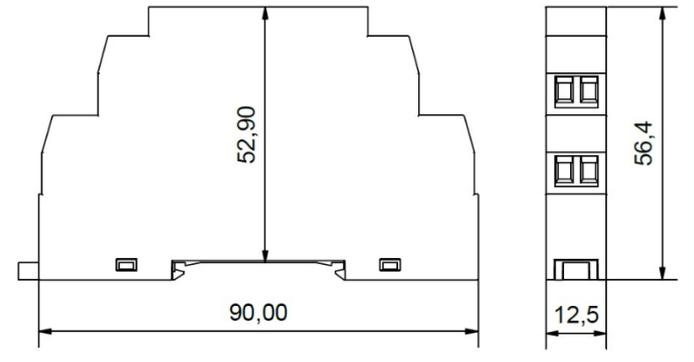
equipment is mounted vertically with terminals (7 and 8) at the bottom. This will provide maximum ventilation. This equipment may generate heat. Ensure the enclosure size is adequate to dissipate heat. Be sure to consider any other equipment inside the enclosure.

The equipment surfaces may be cleaned with a damp cloth. Use a mild detergent/water. Ensure the supply is off before cleaning and, on completion of cleaning, the equipment is completely dry before the supply is turned back ON.

This equipment must be installed by a qualified person. All electrical wiring must be carried out in accordance with the appropriate regulations for the place of installation.

### 4.1~MECHANICAL.

Dimensions in mm

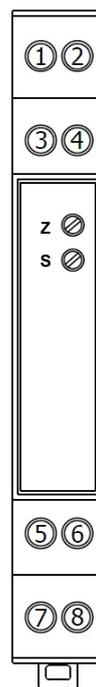


The equipment must be mounted on a DIN rail style DIN EN50022 inside a plastic or metal enclosure with a protection level >= IP65. All wiring must be secured. Maximum cable sizes 2.5 mm<sup>2</sup>. Connection via clamp terminals.

### 4.2~ELECTRICAL CONNECTIONS

For wiring connections refer to the side label on the SEM1000 and this document.

**Output:** connections for cable length >3 metres, use screened or twisted pair cables. Maximum cable run = 1000 metres. Connect to isolated loop to be powered by SEM1000 (secondary loop)



**Pin 1 = Output negative (Ch1 -)**  
**Pin 2 = Output positive (Ch1 +)**

**Adjustment**  
**Z = Zero adjust, 4 mA**  
**S = Span adjust, 20 mA**

**Input:** connections for cable length >3 metres, use screened or twisted pair cables. Maximum cable run 30 metres.

Connect to powered (4 to 20) mA loop (primary loop)

**Pin 7 = Input loop negative (-)**  
**Pin 8 = Input loop positive (+)**

Connections to the isolator are made via screw terminals. Wire protector plates are provided inside each terminal.

## 4.2-ELECTRICAL (continued)

It is good practice to ensure that all (4 to 20) mA loops are grounded at a single point in the loop. Before installation, care must be taken to ensure enough voltage is available in the loop to drive the total loop load.

Refer to the specifications listed for the voltage drop. In the case of the SEM1000, the additional voltage drop of the load connected in the isolated output circuit will be added to the loop drop of the isolator.

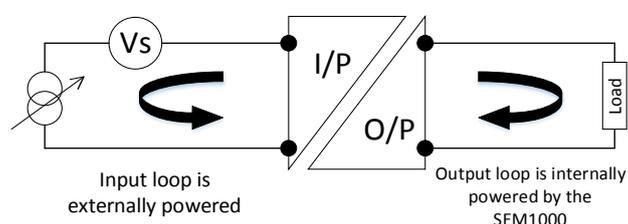
Example: a SEM1000 isolator driving into a 250 Ω output load will have a total input loop drop of 10.0 V.

$$5.0 \text{ V} + (250 \Omega * 0.020 \text{ A}) \text{ V} = 10.0 \text{ V}$$

Please note the isolation provided by this device is only suitable for providing isolation between two process signals and therefore must not be used to provide isolation from hazardous voltages, such as mains supplies.

**⚠ Note:** Loop load must be > 250 Ω for ambient temperatures above 50 °C

### Basic SEM1000 block diagram



## 5-USER CONFIGURATION.

**⚠** Read the Important Safety Requirements

This isolator requires no user-adjustment during commissioning. Minor adjustments can be made to the calibration of the device by means of the two front panel accessible calibration potentiometers. Incorrect connection in the loop will not damage the device as long as the specified maximum currents/voltages are not exceeded. If the isolator fails to operate, check loop for bad connections. Ensure enough voltage is available in the loop to power the isolator. In the unlikely event of the isolator not working, it should be returned to the supplier for repair or replacement.

Calibration steps	
1	Calibrate at 20 °C ambient temperature for best results
2	Connect a precision current calibrator to the input and a precision current meter to the output of the device to be calibrated. *1
3	Allow 60 s (powered) warm up time for the SEM1000.
4	Inject 4.000 mA ± 0.001 mA into the input and adjust ZERO potentiometer for 4.000 mA ± 0.001 mA output. *2
5	Inject 20.000 mA ± 0.001 mA into the input and adjust SPAN potentiometer for 20.000 mA ± 0.001 mA output. *2
6	Repeat steps 4 and 5 until both points are in calibration.
*1 Current calibrator must be capable of driving the expected loop drop	
*2 Please note that the above reading accuracies quoted in 4 and 5 are absolute values and do not include test equipment tolerances. Allow for any input source settling time.	



This guide is also available online at [www.status.co.uk](http://www.status.co.uk)  
Status Instruments Ltd, Status Business Park, Gannaway Lane, Tewkesbury, Gloucestershire, UK, GL20 8FD,  
Web Page: [www.status.co.uk](http://www.status.co.uk)  
Email: [sales@status.co.uk](mailto:sales@status.co.uk)  
Technical Support: [support@status.co.uk](mailto:support@status.co.uk)  
Tel: +44 (0) 1684 296818, Fax: +44 (0) 1684 293746