SEM1015
Voltage / Current Convertor

Designed, manufactured and supported by:

STATUS INSTRUMENTS

Status Business Park, Gannaway Lane
Tewkesbury Glos. GL20 8FD. UK
Tel: +44 (0)1684 296818   Fax: +44 (0)1684 293746
Email: support@status.co.uk

Every effort has been taken to ensure the accuracy of this specification, 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

UKCA CE ☒ ⚠ **Important – Read this document before installing.**

1.0 DESCRIPTION

This (4 to 20) mA isolator can be configured to accept most of the common voltage ranges found in both commercial and industrial applications. The input is fully isolated from the output circuit. The isolator range can be specified at the time of order, but if required the user may re-range the transmitter to a new range. The Isolator is housed inside a plastic enclosure, suitable for DIN rail mounting. Screw terminals are provided for wire connections. The enclosure provides side entry access to coarse offset and span adjusters and a range selector switch.

2.0 SPECIFICATION @ 20 ºC

2.1 Output

TYPE	Passive 2 wire current output
RANGE	(4 to 20) mA (30 mA MAX)
PROTECTION	Reverse connection plus overvoltage
VOLTAGE	(10 to 30) VDC
STABILITY	Typical 0.01 %/ºC
RIPPLE	Less than 40 µA/V
	(Measured at 1 V ripple 50 Hz)
RESPONSE	200 ms to reach 70 % of final value

2.2 Input

TYPE   Isolated DC Voltage covered by six ranges;

Range	Span	Offset
A	(20 to 200) mV	(-20 to 80) mV
B	(0.2 to 1.0) V	(-0.1 to 0.4) V
C	(1.0 to 5.0) V	(-0.5 to 2.0) V
D	(5.0 to 25) V	(-2.5 to 10) V
E	(25 to 48) V	(-5 to 25) V
F	(20 to 100) V	(-10 to 40) V

The above settings are capable of covering most standard industrial ranges.
Range F is provided to allow for (-10 to 10) V inputs.
Note: VMAX IN is limited to 48 VDC for BS EN61010-1 compliance.

ISOLATION	500 VDC (Flash tested to 1 kV)
IMPEDANCE	> 1 MΩ
ACCURACY	Typical linearity ± 0.01 % (0.05 % maximum)
RANGE SELECT	Coarse Settings, by side entry 16 setting position rotary screw adjustment switches. Fine by front access potentiometers. Range setting by side entry rotary switch.

2.3 General

AMBIENT	(0 to 50) ºC, (10 to 95) % RH non-condensing
CONNECTION	Captive clamp screws
CABLE SIZE	4 mm² solid / 2.5 mm² stranded
CASE MATERIAL	Grey Polyamide
DIMENSIONS	(60 x 60 x 11.5) mm (67.5 mm above rail)
MOUNTING	Snap on top hat (DIN EN50022-35)
EMC to	BS EN61326

Fig 1
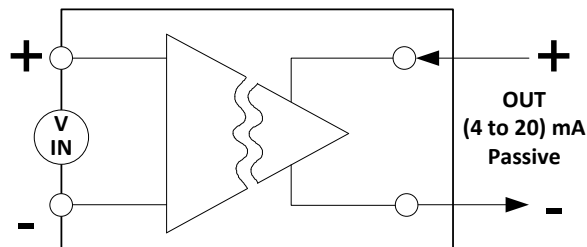
SEM1015

3.0 INSTALLATION

- **IMPORTANT NOTE !**

This Isolator is not suitable for providing isolation from hazardous voltages, such as mains supplies. It is intended for use in with low voltage signals only.

3.1 MECHANICAL

This isolator must be housed within a suitable enclosure that will provide protection from the external environment, to ensure that the stated temperature and humidity operating ranges are not exceeded. It is good practice to mount the isolator away from sources of electrical and magnetically radiated noise, such as switchgear and transformers. The transmitter enclosure is designed to snap fit onto a standard "TOP HAT" DIN rail. To remove from 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 isolator may be mounted in any orientation and stacked side by side along the rail. Span and offset fine adjustments can be made from the front panel, whilst re-ranging the transmitter, access to adjusters in the case side is required.

3.2 ELECTRICAL

Connection to the isolator are made via screw terminals. To maintain EMC compliance, twisted pair (screened) cables are recommended for the signal connections.

It is good practice to ensure all (4 to 20) mA signal loops are grounded at one point. Care must be taken when designing a (4 to 20) mA circuit to ensure that the total burden of the loop, (that is the total voltage requirement of all the equipment connected in the loop at 20 mA) does not exceed the loop power supply voltage.

To operate correctly the isolator requires a minimum of 10 volts across its output terminals.

The isolator is protected against reverse connection and over voltage. Figure 2 shows a typical (4 to 20) mA circuit, the load resistor represents equipment such as indicators loggers PLC etc.

Fig 2

SEM1015
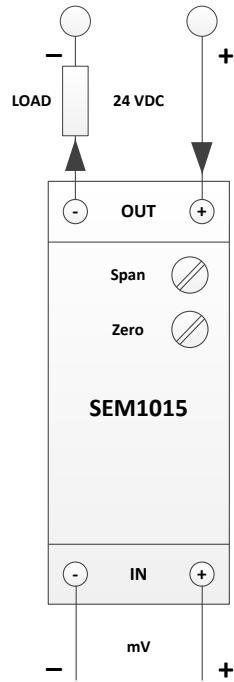
4.0 RANGES

The isolator is normally supplied factory ranged but if required the range can be changed by means of the range selection switch plus a sixteen step coarse, and multi turn fine, offset and span adjusters accessible from the side of the housing.

The following equipment is required:

- Precision mV/V calibrator, to simulate input
- DC milliamp meter (digital); accuracy 0.05 % on (0 to 20) mA range
- Power Supply; 24 VDC 30 mA min
- Trim tool

Decide on the range required and ensure the transmitter is capable of this range. If a range has not been specified at time of order, the transmitter will leave the factory set as 0-1V. Remove range selection switch cover by prising out with a screw driver. Re-fit cover after calibration. Refer to the table below and set the range selection switch to the correct position.

Switch Position	Range	Offset
0	(20 to 200) mV	(-20 to 80) mV
1	(0.2 to 1.0) V	(-0.1 to 0.4) V
2	(1.0 to 5.0) V	(-0.5 to 2.0) V
4	(5.0 to 25) V	(-2.5 to 10) V
8	(25 to 48) V	(-5 to 25) V
F	(20 to 100) V	(-10 to 40) V

Range F is provided to allow for (-10 to 10) V Inputs

5.0 Calibration

1. Connect the calibrator to input terminals, ensure polarity is correct.
   Connect as above with mA meter in place of, or in series with load.
   Turn on and wait a few minutes before calibration, to allow the transmitter to stabilise.

   Let Va = Input voltage for 4 mA output
       Vb = Input voltage for 20 mA output

2. Set calibrator to simulate Va, first rotate coarse offset to obtain a output reading close to 4 mA. Use fine adjuster to trim reading to 4 mA ± 0.005 mA. (If fine trim hits end of travel re-adjust coarse adjuster one step re-adjust fine offset).

3. Set calibrator to simulate Vb, first rotate coarse span to obtain a output reading close to 20 mA. Use fine adjuster to trim reading to 20 mA ± 0.005 mA. (If fine trim hits end of travel re-adjust coarse adjuster one step re-adjust fine span. Note clockwise rotation of the coarse adjuster reduces output current)

4. Set calibrator to Va, adjust fine offset for 4.00 mA ± 0.005 mA.

5. Set calibrator to Vb, adjust fine span for 20.000 mA ± 0.005 mA.

6. Repeat steps 4, 5 until both points are in calibration.

7. Turn off power and remove wires. Mark isolator with the new range.

6.0 Mechanical Detail