SIGNAL ISOLATOR

Field configurable with transmitter supply

Type B12-Txi

User Guide

Continuous development may necessitate changes in these details without notice

Document Ref: udb12-txi Rev 2

PROCESS MEASUREMENT, CONTROL & DISPLAY INSTRUMENTATION

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WARNING!

It is important that this guide is read and fully understood before attempting installation or commissioning of the instrument. Instructions appearing in this document, and current safety legislation, must be observed to ensure personal safety and to prevent damage to the instrument or equipment connected to it.

The instrument should be installed, commissioned and operated *only* by suitably qualified and authorised personnel.

Safety and EMC information

Safety: EN61010 -1
Immunity: EN50082-1
Emissions: EN50081-1
CE certified

The specifications for the instrument must not be exceeded. If the instrument is used in a manner not specified, the protection provided by the instrument may be compromised.

The instrument must be installed in an enclosure that provides adequate protection against electric shock.

Ensure that power to the instrument is switched off and signal wiring isolated from hazardous voltages before carrying out installation or maintenance.

The instrument is designed for installation in a clean, dry environment (Pollution degree 1).

Stroud Instruments Ltd strongly recommends that repairs and re-calibration work are done on a return to factory basis in order that our quality standards, product specifications and safety precautions are not compromised.

The instrument is double insulated

Note: Clean with a moist cloth - USE NO SOLVENTS.

Installation

WARNING: Installation should be conducted by appropriately skilled and authorised personnel only.

WARNING: Ensure that power to the instrument is switched off and signal wiring isolated from hazardous voltages before carrying out installation.

WARNING: The instrument must be installed in an enclosure that provides adequate protection against electric shock.

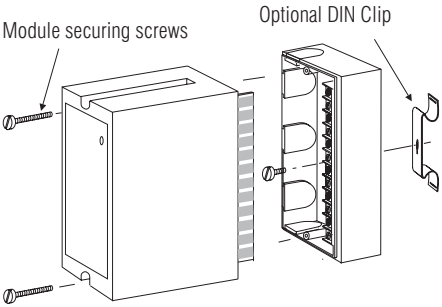
Location

- ☐ The instrument is designed for installation in a clean, dry environment
- ☐ Do not install near to switch gear, motor controllers or other sources of strong magnetic fields.
- ☐ Avoid exposure to direct sunlight and ensure the ambient temperature inside the enclosure that the unit is mounted in will not exceed our specification.

Fixing

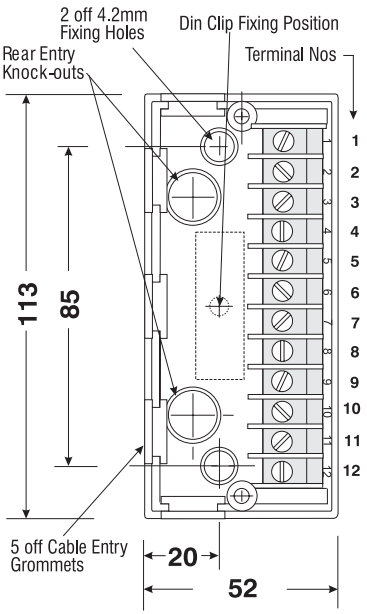
B12 Series Modules are designed to be fitted to a flat dry surface using two 4mm screws. Alternatively, by fitting an optional DIN clip, they may be clipped to a rail conforming to BS5584:1978, EN50 022, DIN46277-3.
Grommets are provided on three sides of the base section and there are two rear entry knock outs in the bottom.
To gain access to fixing points:

1. Remove the plug-in module securing screws.
2. Gently pull away the plug-in module from the base section.
3. To refit the module, align the module edge connectors with the socket in the base and carefully press home.
   NB do not overtighten the module securing screws.



Dimensions and fixing positions

Depth of unit 106mm



Wiring and connections

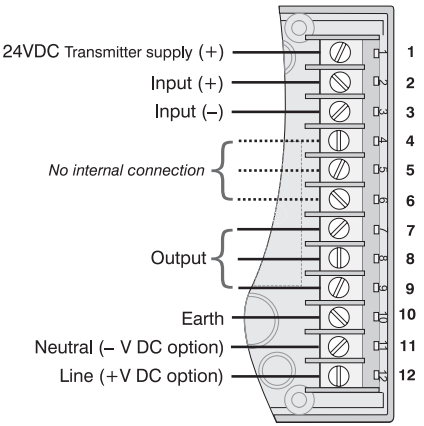
- ☐ Segregate power supply and signal wiring.
- ☐ Use screened cable for all signal wiring with the screen earthed at instrument end only.
- ☐ All connections should be made using ferrules.

Screw terminals are provided - wire capacity 2 x 1.5mm^2 (approx. 16 AWG).

Access to terminals

WARNING: Ensure that power to the instrument is switched off and signal wiring isolated from hazardous voltages

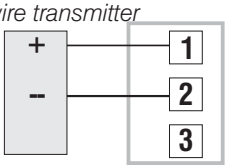
Loosen the two module securing screws. Gently pull away the top section of the module from its base to expose the fixing points and wiring terminals. To refit the module, align the module edge connectors with the socket in the base and carefully press home. NB do not over tighten the module securing screws.



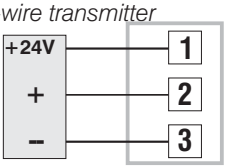
Input connections

For changing the type of input, see Configuration.

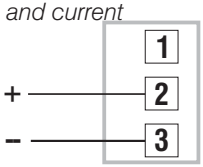
Two-wire transmitter



Three-wire transmitter



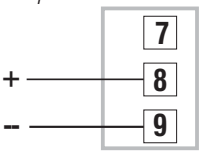
Voltage and current



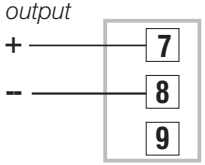
Output connections

For changing the type of output, see Configuration.

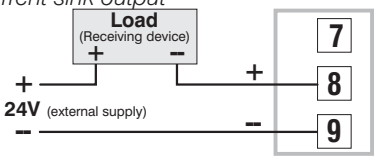
Voltage output



Current output



Current sink output



Power supply connections

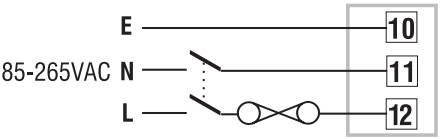
This instrument is supplied in *one* of two power supply versions.

1. AC mains supply in the range 85 - 260 V, 50/60Hz, 3VA.

WARNING: Check that the supply voltage on the data label (on side of instrument) is suitable for the application.

WARNING: Ferrules must be used for AC mains power wiring

Power supply wiring to the instrument should be protected by a suitable fuse and double pole switch - see below. The switch should be clearly marked as the isolating switch for the instrument.



Configuration

Changing input and output configuration requires adjustments to be made to internal links and switches.

Access to internal settings

WARNING: Switch off all supplies and isolate signal and other wiring from dangerous voltages before proceeding.

(i) Remove plug-in module as described in Access to Terminals in the Installation section.

(ii) The plate with the terminal connections label can now be removed by easing apart the longer sides of the module to release the interlocking tongue and groove.

(iii) Note the location of the printed circuit board which must be replaced in the same position. Slide out the board.

1. Input options

Please refer to Figs. 1 and 2.
The input signal type and range are selected using a combination of jumper links J2 and J3 and switch SW1.
J2 selects the input type i.e. mA or Volts;
J3 selects the input range;
Switch SW1, positions 1 and 2 select raised or true zero.

Example: Input signal 4-20mA
Set J2 to mA,
J3 to 20mA,
SW1 position 1 to 'OFF',
SW2 position 2 to 'ON'

2. Output options

Please refer to Figs. 1 and 2.
Output signal type and range are selected using a combination of jumper link J4 and switch SW1. J4 selects the output type i.e. mA or Volts SW1 positions 3 to 8 set the required range.

Example: Output signal 0-10 Volts
Set J4 to Voltage output
SW1 positions 3, 7 & 8 to 'ON'
SW1 positions 4, 5 & 6 to 'OFF'

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Fig 1. Jumper link settings

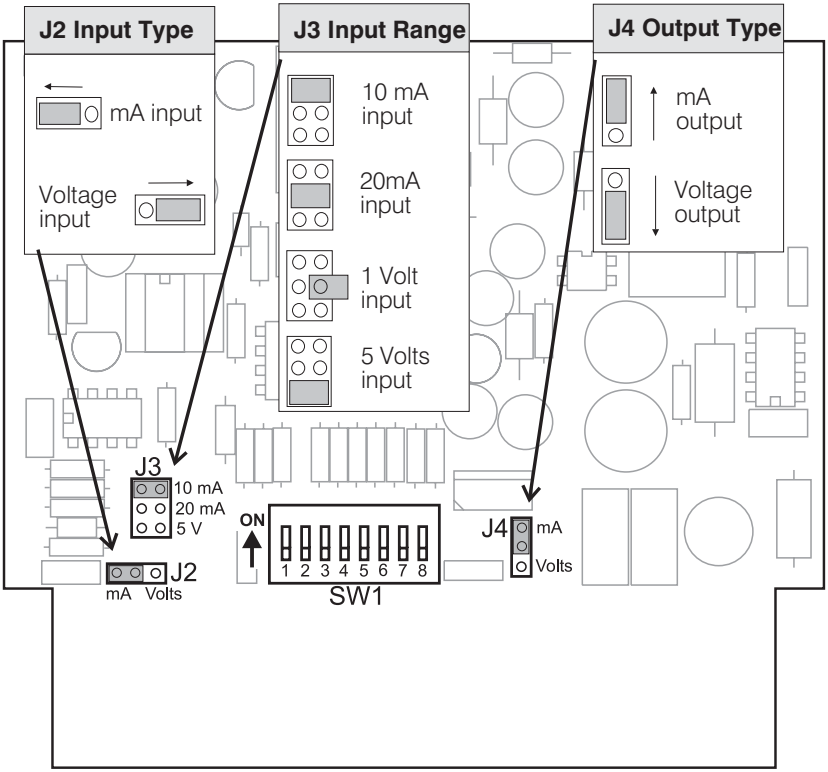

Fig 2. Switch 1 (SW1) settings

Input ranging		
Zero Type	SW1-Position	
	1	2
True	1	0
Raised*	0	1

* e.g. 4-20 mA or 1-5 V

NB '1' = ON, '0' = OFF

Output ranging						
Output signal	SW1-Position					
	3	4	5	6	7	8
0-10 Volts	1	0	0	0	1	1
2-10 Volts	0	1	0	0	1	1
0-10 mA	1	0	0	1	0	0
0-20 mA	1	0	1	0	0	0
4-20 mA	0	1	1	0	0	0

3. Replacing module cover

Replace the printed circuit board ensuring correct location in the module cover slots. Replace the plastic plate by locating the side with the two tongues around the protruding printed circuit board and engaging into the mating grooves. Press the plate home to engage the single tongue.

4. Span and zero adjustments

After returning the module to its base section, Span and Zero (front panel adjustments) should be checked and trimmed if necessary. Typical error without trimming will be in the order of 1% FSD.

Specifications

INPUTS (field programmable)

B12 Isolators are supplied with a facility that maintains an input signal current loop when the instrument is unplugged from its base section.

0-10 mA into 100 ohms
0-20 mA into 100 ohms
4-20 mA into 100 ohms
0-1v into greater than 200 k ohms
0-5v into greater than 200 k ohms
1-5v into greater than 200 k ohms

OUTPUTS (field programmable)

0-10 mA into 2000 ohms max.
0-20 mA into 1000 ohms max.
4-20 mA into 1000 ohms max.
0-10v into 500 ohms minimum
2-10v into 500 ohms minimum
Current sink 4-20mA @ 30 volts max.

INPUT/OUTPUT SELECTION

Options are selected using internal switches and jumper links.

TRANSMITTER POWER SUPPLY

24 VDC with current limit of 24mA

ISOLATION

The input and output are isolated from each other and from the power supply.
Maximum Voltage 250V RMS or 400V DC
Resistance between input, output(s) or power supply
$\geq 50 \times 10^6$ ohms measured at 1000V DC.

ACCURACY

$\pm$ 0.1% FSD at 100% when factory calibrated

LINEARITY ERROR

$\leq \pm$ 0.1% FSD

SUPPRESSION / ELEVATION ERROR

$\leq \pm$ 0.1% FSD

OUTPUT RIPPLE

$\leq$ 0.2% RMS of FSD

LOAD RESISTANCE EFFECT

$\leq$ 0.001% of span / 100 ohm change

STABILITY

Over 24 hours $\pm$ 0.1% FSD
Over 1 year $\pm$ 0.25% FSD

INTERFERENCE REJECTION

Filtering is incorporated to attenuate R.F. and other industrial noise.

SERIES MODE AC REJECTION RATIO

For 50/60Hz series mode signals with p.t.p. amplitude $\leq$ input; rejection ratio greater than 40dB.

RESPONSE TIME

1 sec as standard.

COMMON MODE REJECTION

<0.2% error for 250V RMS 50/60 Hz, or 400V DC, common mode signals.

INPUT OVERRANGE PROTECTION

Voltage Inputs: 250 volts RMS or DC
Current Inputs: 50mA

TEMPERATURE COEFFICIENTS

Zero: $\pm$ 0.02% span / °C
Span: $\pm$ 0.02% span / °C

TEMPERATURE RANGE

Operating: -10°C to +60°C
Storage: -20°C to +70°C

POWER SUPPLY

Universal 85-260 VAC 3VA