



FREQUENCY TO ANALOGUE CONVERTER

Type B12-10b

- Frequency ranges from 0 - 0.1Hz up to 0 - 10kHz
- Programmable filtering and ranging
- Transducer power supply
- High impedance output drive option
- AC or low voltage (11-32 VDC, 12-24VAC) powered versions
- Wall or DIN rail mounting
- Module unplugs without disturbing wiring



The B12-10b provides an output current or voltage which is proportional to the frequency of alternating voltage or pulse input signal. This instrument has many uses in applications including water consumption meters, flowmetering and rotational measurements. Optional PC software enables range changing, e.g. to suit a turbine meter replacement, and optimisation of digital filtering to suit site conditions.

Analogue filtering

The level of input signal at which the B12-10b triggers is set by the front panel control.

Digital filtering

Digital filtering enables effective attenuation of noise yet permits a rapid response to a change in the input frequency. Factory-set default settings are suitable for many situations, however, the B12-10b Programmer software enables the characteristics of the digital filter to be modified by the following parameters:

Averaging Count: (digital filtering) Spurious input signals are attenuated by averaging the number of input measurements specified by the Averaging Count.

Change Threshold: To enable a rapid response to a change in the input signal, the most recent input measurement is continuously compared with the running average. If the change in input is greater than that specified by the Change Threshold parameter, the current averaging cycle is abandoned and a new one started.

See the B12-10b User Guide for more comprehensive information on digital filtering.

Calibration

The output of the instrument may be scaled to the input signal frequency range with the following parameters.

Zero Scale Frequency The input signal frequency required for 'zero' output signal.

Full Scale Frequency The input signal frequency giving full scale output signal.

Other parameters which effect the output are:

Static State Timeout: If the period in which the input signal remains unchanged exceeds this value, the current measurement is abandoned and the output signal cut to zero. In the event of a transducer or signal line failure, this facility ensures the output is not erroneously held at the last reading. NB This parameter overrides 'Minimum Threshold.'

Minimum Threshold The percentage of full scale below which the output signal is cut-off to zero.

Optional Programming Kit

A Programming Kit, comprising Windows™ 95/98/NT/ME/2000/XP compatible software and infrared USB link is available. This option enables adjustments on all the above parameters to be made.

Specifications

Notes:

1. Outputs, other than those shown are possible - our sales team will be pleased to advise.
2. Input ranges are factory calibrated for one type of signal and not user configurable.

Input Type - factory set

Sine, square or triangular waveforms from volt-free switches, proximity switches, turbine meters, open collector (npn), current pulse, etc.

Input amplitude: 10 mV p.t.p. to 250 V R.M.S.

Current inputs: sense change in current drawn by proximity switches. Typical inputs include 1—3 mA.

Input Range: See programmable options

Transducer Power Supply

12VDC @ 10mA max.

Other voltages from 5V to 15V available to order.

Output Type - factory set

0-10mA (2000R), 0-20 mA (1000R), 4-20 mA (1000R)

High impedance output drive options: 0-10mA (5000R),

0-20 mA (2500R), 4-20 mA (2500R) *Maximum output impedances in ohms shown in brackets.*

0-5v, 1-5V, 0-10V, 2-10V (500R minimum)

Current sink 4-20mA @ 50 volts max.

Response Time

Typically 1sec without digital filtering (averaging count =1).

Isolation

The input and output are isolated from each other and from the power supply. Maximum voltage 250V RMS or 400V DC. Resistance 50×10^5 ohms measured at 1000V DC.

Programmable Options

Parameter	Min.	Max.	Default
Zero scale frequency (Hz)	0	10000	0
Full scale frequency (Hz)	0.1	10000	100
Minimum threshold (% of FS)	0	100	1
Change threshold (% of FS)	0	100	10
Static state timeout (s)	2	4000	2
Averaging count	1	20	5

Calibrated Accuracy

$\pm 0.2\%$ FSD at 100% when factory calibrated.

NB Error introduced by User output range changes, typically 1% but may be corrected by span control.

Linearity Error

$\pm 0.1\%$ FSD (from 1 to 100% FSD)

Output Ripple

0.1% (peak to peak) of FSD

Load Resistance Effect

0.001% of span / 100 ohm change

Stability

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

Temperature Coefficients

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



THIS UNIT CAN BE MAINS POWERED, AND ALL INPUTS TO IT MUST BE ISOLATED FROM DANGEROUS VOLTAGES BEFORE THE FRONT COVER IS REMOVED. LIVE TERMINALS WILL BE EXPOSED.

Continuous development may necessitate changes in these details without notice

Environmental

Temperature: operating -10 to +60°C, storage -20 to +70°C

Humidity: 0 – 95% RH non-condensing

Power Supply

AC Supply: 110, 220 or 230V $\pm 10\%$ 50/60Hz 5VA

Low voltage: 11-32VDC 4 W / 12-24VAC

Supply Voltage Rejection

Span change: $<0.02\%$ span / % supply change.

Safety & EMC

Safety: EN61010-1, Immunity: EN50082-1,

Emissions: EN50081-1, CE certified

Mechanical

Weight: approx. 0.5kg, Dimensions (mm): 106D x 52W x 113H

Enclosure: Fire retardent materials - PPO base, ABS cover

Screw terminal wire capacity: 2 x 1.5mm²

Information required when ordering

- Specify type B12-10b
- Input signal type and /or transducer
- Output signal (*see specification*)
- Supply voltage and frequency
- Zero scale frequency
- Full scale frequency
- Programming kit required?

For the following, if default settings are required, specify 'default' against the appropriate parameter

- Averaging count
- Change threshold (% of full scale)
- Static state timeout (seconds)
- Minimum threshold (% of full scale)

Options

- High output drive required (mA outputs) ?
- DIN rail mounting clip required ?

Electrical Connections



WARNING: these details are provided for pre-sales information only. Installation must be carried out in accordance with the User Guide

Inputs	1	Transducer supply (+)	
	2	Input Signal (~)	
	3	Input 0V	
	4	- reserved	
	5	- no internal connection	
	6	- no internal connection	
Outputs	7	mA Output (+)	Current Sink
	8	mA Out (-)	8 (+)
		Voltage Output (+)	9 (-)
	9	Voltage Output (-)	
Supply	10	Earth AC	Earth DC
	11	Neutral Mains	Negative (-) Supply
	12	Line Supply	Positive (+) Option

SIL

STROUD INSTRUMENTS LTD.
36-40 Slad Road, Stroud, Glos. GL5 1QW, England
Telephone: +44 (0)1453 765433 Fax No: +44 (0)1453 764256
www.sil.co.uk