

Sensorbox containing two sensors and two signal conditioners with 4...20mA, 2-wire outputs

Features

- robust pressure die cast aluminium housing (IP67) with saltwater proof coating
- twist free 4-point fastening of rigid, 3.2mm thick base PCB
- two integrated signal conditioners with 4...20mA, 2-wire outputs
- temperature drift compensation of the sensitivity
- no separate supply voltage necessary
- all SEIKA sensors of the B-, BDK-, N- and NB-series can be installed in different directions of operation
- the output signals for each sensor are calibrated to customer's specifications in the required directions of operation
- sensors and signal conditioners electrically isolated from housing
- both output channels are electrically isolated from and independent of each other
- EMC certified with sophisticated protective circuitry
- internal, highly stable sensor supply voltages
- 10V ... 30V terminal voltage
- programmable dynamic response
- loop current limitation
- high mechanical overload resistance
- either connection polarity - possibility of 3-wire connection for both measuring loops
- low pass filter with optional choice of cut-off frequency for suppression of interference frequencies

Description

The SB2I is a pressure die cast aluminium sensor housing (IP67) with two integrated sensors for measuring inclinations and/or accelerations along two axis.

As well as the sensors, the box contains two independent signal conditioners, each with a 4...20mA, 2-wire output, and two separate, highly stable voltage supply feeding off the corresponding current loop, one for each sensor. Furthermore, each signal conditioner includes an active low pass filter, whose upper cut-off frequency / settling time can be adjusted to suit the measurement task, an output stage with current limitation, a noise voltage filter and a diode bridge for unipolar connection to the current loop. Interference signals caused by unwanted ground currents are eliminated by electrically isolating each sensor and signal conditioner from each other and the housing. Electronic temperature compensation largely compensates for the temperature drift of the implemented sensors' sensitivity. Optionally, the temperature drift of both offset and sensitivity can be reduced significantly through individual compensation.

The compact metal cable gland and small housing size in combination with the 3-wire connection enable the use of this high quality measuring system in harsh operating conditions.

Application

The SB2I is used for applications requiring precise inclination or acceleration measurements along two axis under harsh circumstances and returning of a 4...20mA output signal each. Areas of successful implementation include construction, mining, agricultural machinery, transportation and conveyor systems, ships, operation and automation technology as well as general mechanical engineering.

Specifications

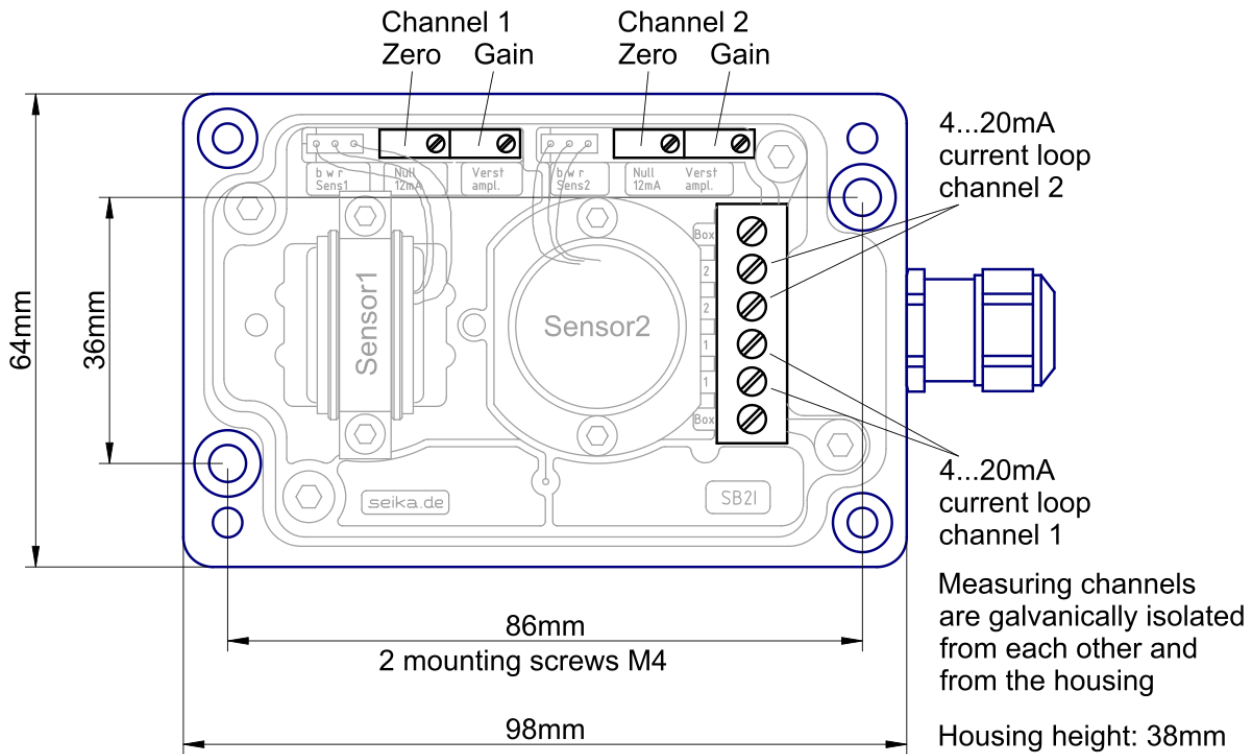
Terminals	6 x 1.5 mm ²
Cable gland	M12 x 1.5, metal cable gland with integrated strain relief, clamping range 6mm ... 7.5mm
Measuring range, Resolution, etc.	depending on implemented SEIKA sensors
Degree of protection	IP67
Mounting orientation	any (standard: wall mounting, cable on the right)
Measuring planes (N sensors)	3 main housing planes
Measuring directions (B and BDK sensors)	in X,Y,Z coordinate of housing
Terminal voltage	10V ... 30V
Minimum loop currents	2.1mA ... 3.5mA
Maximum loop currents	22mA ... 26mA
Output signal loop current	4...20mA (12mA for sensor zero position)
Adjustable variables	zero point (12mA), amplification
Maximum load resistances	500 Ohm (for 24 Volt supply voltage)
Operating temperature	-40°C ... +85°C
Low pass filter	active, 3rd order, minimal ripple
Weight	approx. 340g

• The box is delivered with an individual calibration record that includes the precise offset and sensitivity values, the static characteristic curves and the linearity deviation curves.

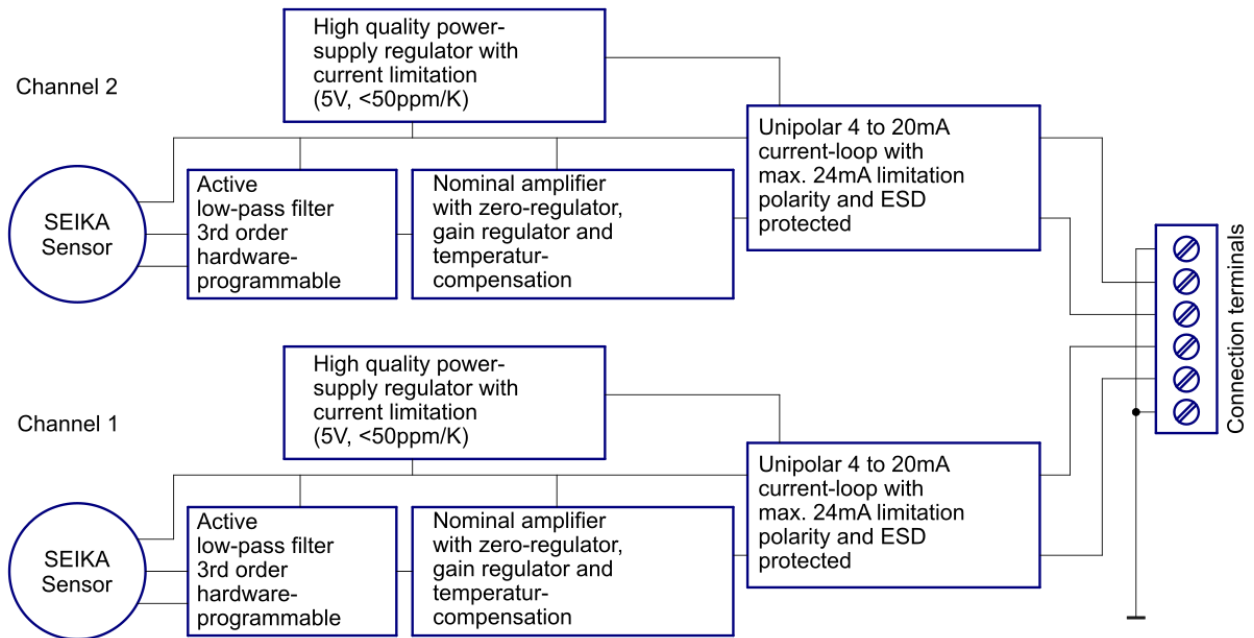
Options:

- special measuring ranges • silicon encapsulation • custom wiring
- individual temperature drift compensation of the offset and the sensitivity

Dimensions (in mm)

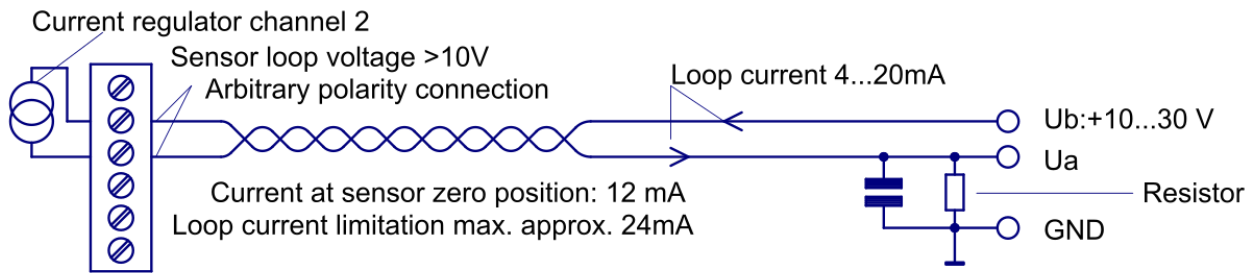


Block Diagram

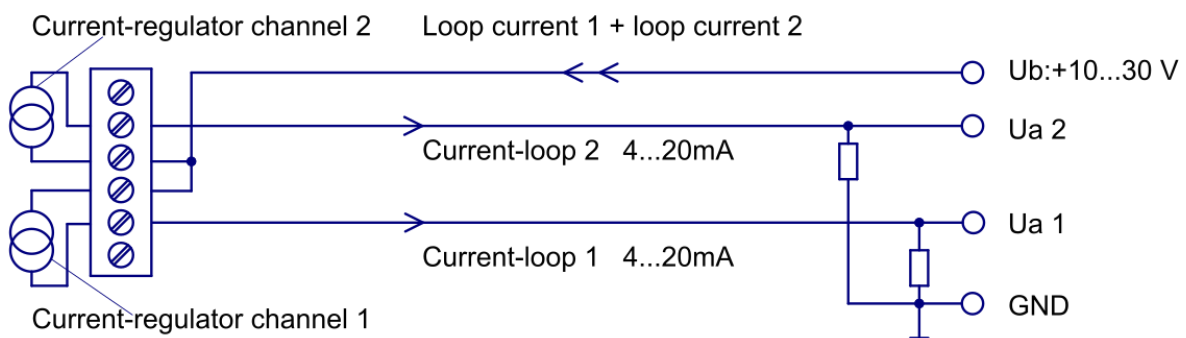


Connections

Current-loop diagram



Two current-loops with 3 connections



Minimal loop current: current supply sensor + electronics < 4mA.

Computing the minimal operating voltage $U_{b,min}$

$$U_{b,min} = 10V + \text{voltage drop at cabel} + \text{load resistor voltage drop at 20mA}$$

$$= 10V + 20mA \cdot R_{cabel} + 20mA \cdot R_{load}$$

Example computations:

$$U_{b,min} = 10V + (100m \text{ wire } 2 \times 0.14mm^2) 0.6V + (100 \text{ Ohm load}) 2V = 12.6V$$

$$U_{b,min} = 10V + (2km \text{ cabel } 2 \times 0.5mm^2) 3.2V + (500 \text{ Ohm load}) 10V = 23.2V$$