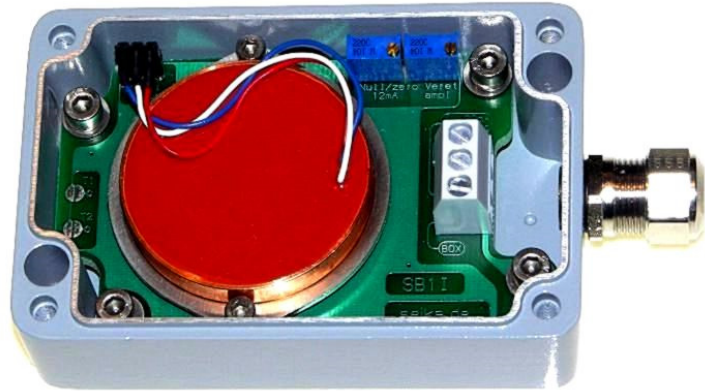


The SB1i is a rugged, all-weather sensor package providing 2-wire, current-loop 4..20mA output.



### Features

- Die-cast Aluminum housing with salt water resistant finish
- Environmental Protection up to IP67
- Housing designed for extra stable sensor platform
- 4..20mA amplifier for 2-wire connection
- Temperature compensated output
- No extra power required
- Customer specified angle ranges
- Sensor and amplifier are galvanically isolated from the housing
- Extensive EMC protection
- Highly stable sensor supply voltage
- Time constant delay up to 3 sec
- Current-loop with max current limit
- High overload resistance
- Reverse polarity protected
- Low-pass signal filter with optional setting of maximum frequency for suppression of interference frequencies

### Description

The SB1i sensor unit is packaged in a solid and compact pressure-cast Aluminum housing with an integrated sensor for single axis inclination or acceleration measurements.

Within the box are 2 sections: An amplifier with a 4..20mA output signal - allowing a 2-wire system; and a separate highly stable power supply for the sensor. The amplifier contains a low-pass filter for upper frequency limitation, with noise suppression filtering and a diode bridge for the unipolar current-loop operation. Both sensor and amplifier are galvanically isolated from the housing - further reducing susceptibility to outside noise. Specific response time constants and maximum current output limitations are additional options.

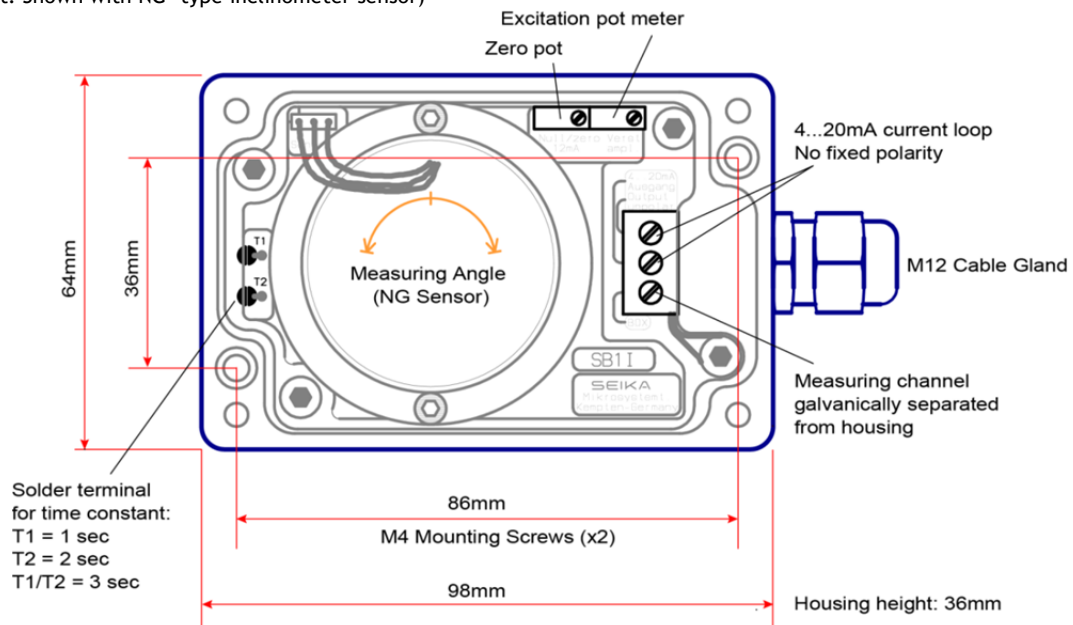
For a higher degree of accuracy, an NG-type sensor can be integrated into the SB1i box, which considerably reduces temperature drift over the entire temperature range. Along with the all-weather housing and current-loop output, the SB1i is a high-quality system for use under many types of harsh working conditions.

### Applications

The SB1i is used where inclination or acceleration measurements need to be combined with a 4..20mA current-loop output, especially where noise and/or distance to source are a concern. Typically used in building and bridge construction, mining, radar alignment systems, pitch and roll indication, agricultural equipment, and lift/access machinery.

TECHNICAL DATA	
Termination/Cable Diameter	max.: 3 x 1.5 mm <sup>2</sup>
Cable Fixing	M12 x 1.5 cable gland; clamping range 6...7mm
Measuring Ranges	In accordance with the actual sensor
Protection Degree	IP65
	IP67 with RTV fill
Mounting	Any direction
Inclinometer Measuring Plane	N Series: 3 directions of mounting
	NG Series: Parallel to the base of housing (default)
Accelerometer Measuring Directions	B, BDK Series: Place in X, Y, Z co-ordinates to the housing
Supply voltage to the box	+10...+30VDC
Minimum loop current	3mA
Maximum loop current	22...26mA
Output current loop signal	4...20mA (12mA as zero point)
Adjustable parameters via potentiometers	Signal-zero (12mA), Span
Max. Load impedance	500 Ohm (at 24 Volt loop supply)
Operating temperature	-40...+85°C
OPTIONS	
<b>Special measuring ranges, test report, custom wiring</b>	
<p>The SB1i Sensor Box is extremely versatile, allowing various configurations to measure most all tilt angles and acceleration directions. If you have an application that requires alternative specifications, one of our application experts will be happy to discuss how to customize the box for your inclination or acceleration needs.</p>	

**FIGURE 1: Dimensions and Mounting Position**  
(Default: Shown with NG -type inclinometer sensor)



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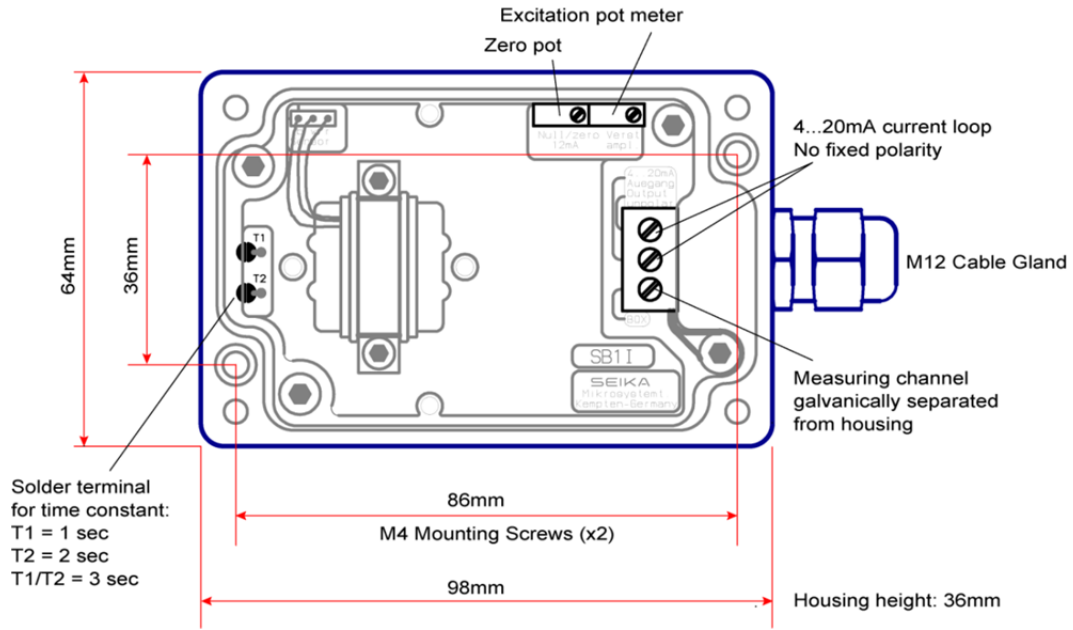
610-500-2000

fax 610-500-2002

[inquiry@riekerinc.com](mailto:inquiry@riekerinc.com)

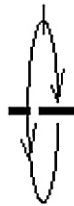
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**FIGURE 2: Dimensions and Mounting Position**  
(Shown with N- or NB-type inclinometer sensor or B- or BDK-type Accelerometer)



**FIGURE 3: Measuring Level and Rotation Directions**

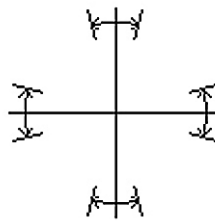
### Sensor Type: N, NB, B, BD, BDK



#### N-type Sensor

Angle zero can be ( $\pm$ ) rotated in both directions.

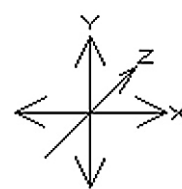
Cable output from the sensor box can be from the right (as shown), from the left, or the top. The NG-types have similar measuring directions.



#### NB-type Sensor

Zero point mountable in 90° steps.

Rotation in both directions possible.

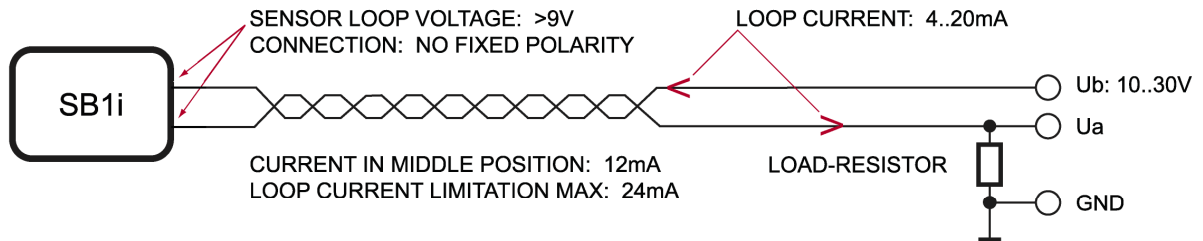
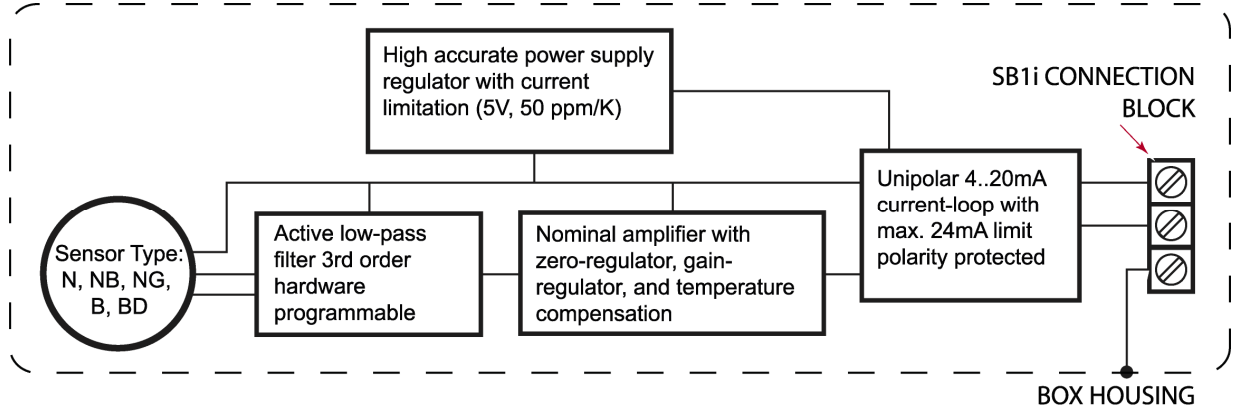


#### B, BD, BDK-type Sensors

Acceleration measurement is possible in X, Y, and Z direction through corresponding mounting position.

$\pm$  measuring possible in X and Y directions.

**FIGURE 4:** Block Diagram and Wiring Connections



**MINIMUM LOOP CURRENT = CURRENT SUPPLY SENSOR + ELECTRONICS < 4mA**

$U_b \text{ MIN} = 9V + \text{VOLTAGE DROP IN CABLE} + \text{VOLTAGE DROP OVER LOAD-RESISTOR TO } 20\text{mA}$

$U_b \text{ MIN} = 9V + (20\text{mA} \times R [\text{CABLE}]) + (20\text{mA} \times R [\text{LOAD-RESISTOR}])$

e.g. 1) (100M WIRE 2 x 0, 14MM:) 0.6V + (RESISTOR 100 Ohm:) 2V + 9V =  $U_b \text{ MIN} = 11.6V$

e.g. 2) (2KM CABLE 2 x 0, 5MM:) 3.2V + (RESISTOR 500 Ohm:) 10V + 9V =  $U_b \text{ MIN} = 22.2V$

**NOTES:** Since the supply voltage for the SB1i is obtained from the current-loop and requires a max. 3mA, an input voltage of 9 Volts/min. must be present at the connection block. This is also required in order to guarantee correct operation when the highest loop current of approximately 24mA is used.