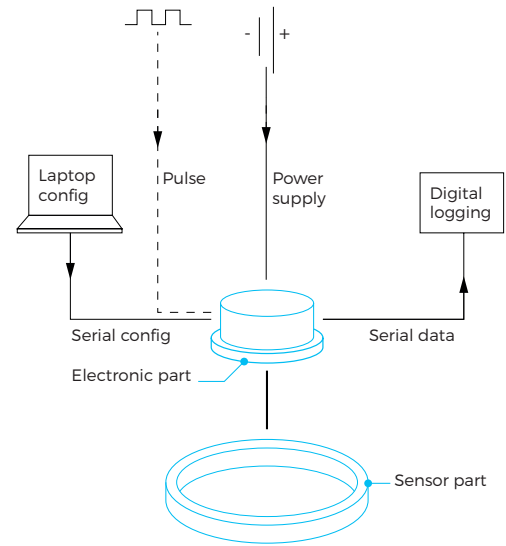
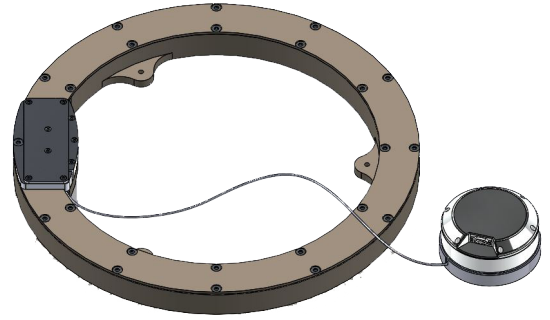


blueSeis-1C

Ultra-Low-Noise Portable 1 component Rotational Seismometer

blueSeis-1C is a portable one-component very-low-noise broadband rotational sensor, that is able to provide absolute digital rotation rate in nrad/s. It embeds the best gyroscope commercially available in the world. One of the major benefits is to have a sensor part without power consumption probed by a remote and compact electronic. It also allows the sensor to be deployed in complex systems with a limited risk of perturbation while ensuring easy access to electronic parts.

The very low power consumption makes the blueSeis-1C a highly versatile system. The circular shape of the sensor with empty space at its center, and the simple configuration of the factory-calibrated digital output make it the perfect sensor solution to develop innovative measurement systems for many applications: ocean-bottom studies, scientific instrument stabilization, seismic station upgrade. The high-dynamic range and robustness to mechanical environments offer an easy-to-deploy solution to measure rotation as a new and valuable observable in ground motion measurements.



FEATURES

- Interferometric Fiber Optic Gyroscope
- Absolute rotation rate measurement
- High dynamic range
- Digital output factory-calibrated (no need for user calibration)
- Flat frequency response over a large frequency band 10^{-3} - 200 Hz

BENEFITS

- Cold and static sensor part with remote electronic
- Low power consumption (3W)
- Best performance per volume ratio
- Optimized sensor shape to save volume

APPLICATIONS

- Seismology
- Hydrology
- OBS seismometer denoising
- Large instrument denoising
- Planetology
- Volcanology

SPECIFICATIONS

Performance

Sensor self-noise in nrad/s/√Hz Typical (maximum)	4 (5) nrad/s/√Hz / Flat on frequency band 10 ⁻³ Hz → 200 Hz
Passband	Flat from DC to 200 Hz
DC rotation rate accuracy at stabilized temperature in operating T°C range	< 2.4 μrad/s (=0.5 °/h) (< 0.24 μrad/s as an option ⁽¹⁾)
Scale factor stability (in operating T°C range and ON-OFF)	< 1 % guaranteed for life (< 800 ppm as an option ⁽¹⁾)
Calibration	Not needed

Operating range / environment

	Sensor part	Electronic part
Operating / storage temperature	-30 °C to 80 °C / -40 to 80 °C	-10 °C to 60° C / -40 °C to 80 °C
Dynamic range	0.1 rad/s	0.1 rad/s
Radiation compatible	Yes as an option ⁽²⁾	No
Acceleration susceptibility	None	
Pressure susceptibility	None	None
MTBF	150,000 hours	100,000 hours

Physical characteristics

	Sensor part	Electronic part
Ingress protection	IP65	IP65
Dimensions	External diameter-ϕ-400 mm Internal free diameter-ϕ-260 mm Height 48 mm	External diameter-ϕ-150 mm Height 75 mm
Weight	3.5 kg	1.5 kg

Interfaces

Communication	1 bit start, 8 bits data, parity odd, 1 stopbit Configuration: 115.2 kBit/s Data output: 230.4 kBit/s
Operating mode	Triggered mode: angle integrated since last pulse, from 1 Hz to 500 Hz Continuous mode: rotation rate at 1 / 10 / 100 / 250 / 500 Hz
Sensor control loop mode	closed-loop mode for measurement accuracy open-loop mode for dynamic feed-back with selectable gain
Power supply / consumption	5 V, +/-5%, 3 W, 200 mVp-p ripple and noise. Can be powered by USB ≥2 connection
Connector	Micro D 15 Female

(1) iX-1C upgrade option: Complete modelling of the sensor according to highest grade of calibration procedure used in navigation system manufacturing to provide long-term stability enhancement.

(2) Radiation hardened option: sensor coil can be made using space-grade fiber to be compliant to harsh environment of radiation.