

Fiber Optic Gyroscopes (1-axis)

The closed loop fiber optic gyroscopes (FOGs) are solid-state devices which offer a combination long life and high reliability along with the potential of low mass-production cost. The fundamental principle is based on Sagnac effect. Our FOGs have so-called minimum configuration that provides reciprocal optical paths for two beams counter-propagating in a fiber loop.

The FOGs consist of the one Light Source at 1550 nm wavelengths (SLD), Depolarizer (DP), one or three Photodetectors (PD), fiber Splitters (FS) to divide the light into two or three parts, one or three sets of ring interferometers to sense one or three sets of ring interferometers to sense one or three orthogonal angular rates, and printed circuit boards installed signal processing circuits. In this design a multifunction integrated optic chip (MIOC), fabricated by High Temperature Proton Exchange process is used for splitting the light into clockwise and counterclockwise waves, light polarization and for electro-optically imparting a phase modulation to the light waves in the loop. The signal processing design is based on conversion of the photodetector signal to a digital representation of the detected light intensity, followed by digital demodulation and integration. The loop is closed by driving the integrated optical phase modulator with a voltage ramp whose slope is proportional to rotation rate.

Specification	SRS501	SRS1000	SRS2000
Range of measured angular rate:	±300 deg/sec	±90 deg/sec	±30 deg/sec
Bias drift at fixed temperature:	<0.1 deg/h	<0.01 deg/h	<0.005 deg/h
Bias drift at changing temperature from -20°C till 50°C:	<1.0 deg/h	<0.1 deg/h	<0.05 deg/h
Scale factor repeatability:	<0.1%	<0.03%	<0.01%
Bandwidth:	100 Hz	100 Hz	50 Hz
Random walk:	<0.005 deg/√h	<0.0005 deg/√h	<0.0003 deg/√h
Power supply:	5 V	18-36 V	18-36 V
Power consumption:	< 6 W	< 6 W	< 6 W
Fiber coil's length:	500 m	1000 m	2000 m
Weight (net):	0.35 kg	0.8 kg	1.7 kg
Dimensions:	dia100x30 mm	dia150x40 mm	dia250x40 mm
Output:	RS-485	Digital / Discrete	Digital / Discrete