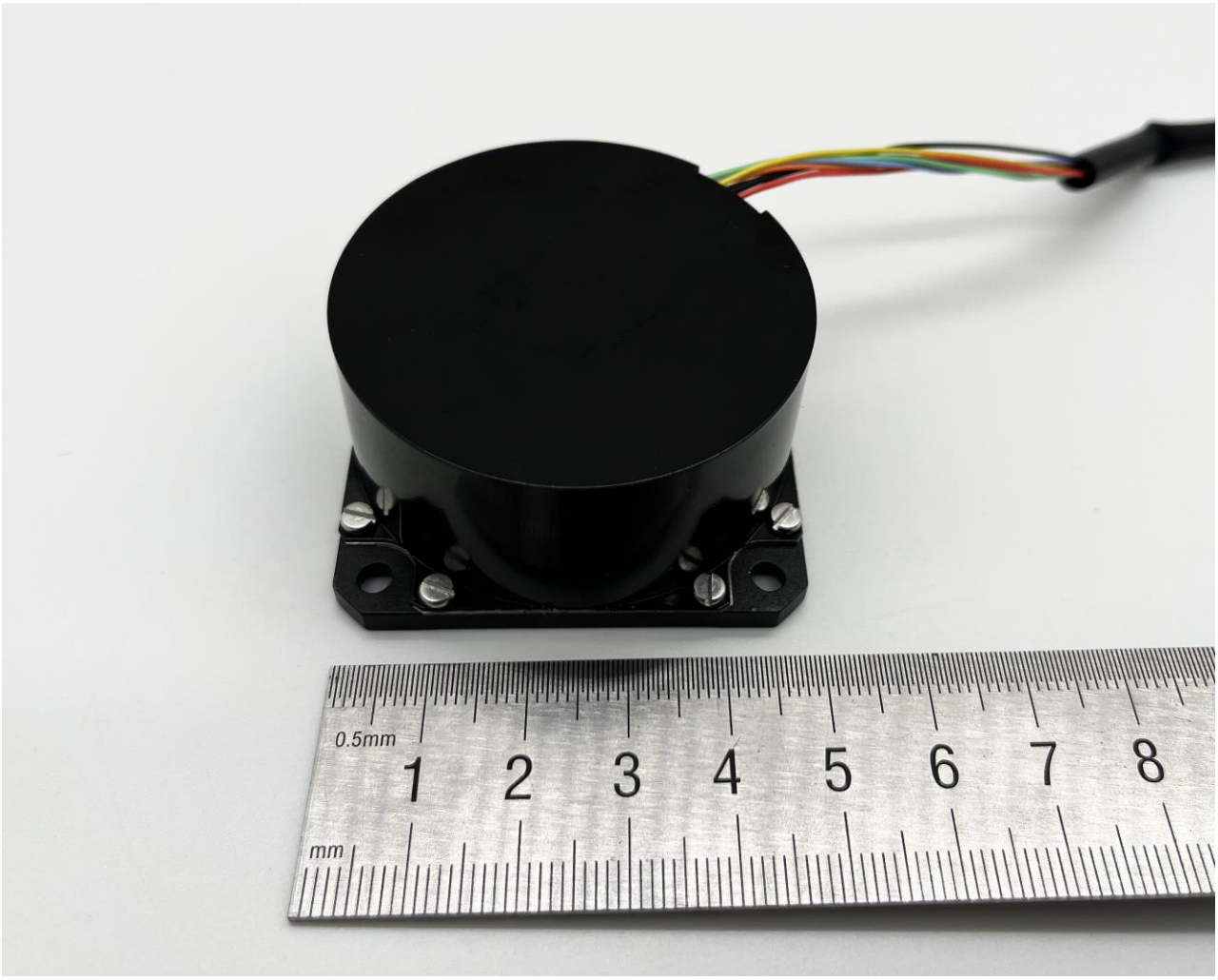

Figure 1. Top View of FG 1151 R07

Figure 2. Application Scenarios

FEATURES

- All-digital closed-loop control
- Micro-signal correlation detection technology
- ITAR-free design for global accessibility
- Low power consumption and compact size
- RS422 digital output (customizable)
- Wide operating temperature: −40°C to +70°C
- High shock and vibration resistance

APPLICATIONS

- Airborne navigation
- Unmanned aircraft/ship/vehicle
- Positioning and orientation systems
- Ship and aviation systems
- Infrared pod servo guidance
- Orbital detection and attitude control
- Civilian and commercial projects

DESCRIPTION

The FG 1151 R07 is a new type of all-solid-state gyroscope, fiber optic gyroscope has the advantages of fast startup, wide measurement range and high reliability. The medium-precision, single-axis fiber-optic gyro (FOG) combines advanced digital closed-loop control and micro-signal correlation detection technologies. Its miniaturized optical circuit components reduce volume while maintaining the inherent advantages of fiber-optic gyros, such as excellent linearity and high adaptability to temperature and environmental changes.

Designed with a +5VDC power supply and industry-standard RS422 digital output, the FG 1151 R07 simplifies integration into diverse systems. Its ITAR-free status eliminates export/import licensing complexities, making it ideal for global deployment.

SPECIFICATIONS

Table 1.

Parameter	Min.	Typ.	Max.	Unit/Note
Bias stability		0.3	0.5	°/h (10s, 1σ)
Stabilization time			10	s
Zero bias repeatability			0.3	°/h (1σ)
Zero bias repeatability over temperature			0.8	°/h
Random walk coefficient			0.03	° /√h
Scale factor nonlinearity ppm (1 σ)			25	At 25°C RT
Scale factor repeatability ppm (1 σ)			25	At 25°C RT
Dynamic Range	−500		500	°/S
Magnetic field sensitivity			0.1	°/h/Gs
Operating temperature	−40		70	°C
Storage temperature	−50		70	°C
Vibration conditions		4.2g	4	20Hz-2kHz
Product Weight			130	g
Supply voltage		+5V		

Mechanical testing

Sine sweep vibration

The gyroscope is fixed on the vibration table by the tooling according to the vibration direction. The gyroscope performs sinusoidal scanning in three directions, corresponding to the X-axis, Y-axis, and Z-axis directions respectively.

Vibration steps: add excitation to the vibration table, power on the gyroscope, and after a certain preheating time (gyroscope start-up time), test the gyroscope output value for about 5 minutes; perform sinusoidal vibration.

Vibration conditions: 20Hz-2000Hz, scanning time 5min, amplitude 4.2g. During the vibration, the gyroscope output was recorded.

The fiber optic gyroscope is connected to the J30-15 ZKP socket. The contact definitions are shown in the following.

Table 2 :

Contact No.	Contact Definition	Mark	Yan Color
1	Serial Port T+	TX+	yellow
2	Serial port T-	TX-	Orange
3	Serial port R+	RX+	blue
4	Serial port R-	RX-	green
5, 13	Power supply +5V	+5V	red
6, 7	Power Ground	GND	black

Outline Dimensions：L50×W50×H36.5（mm）

Top View	Side View
	Unit: mm

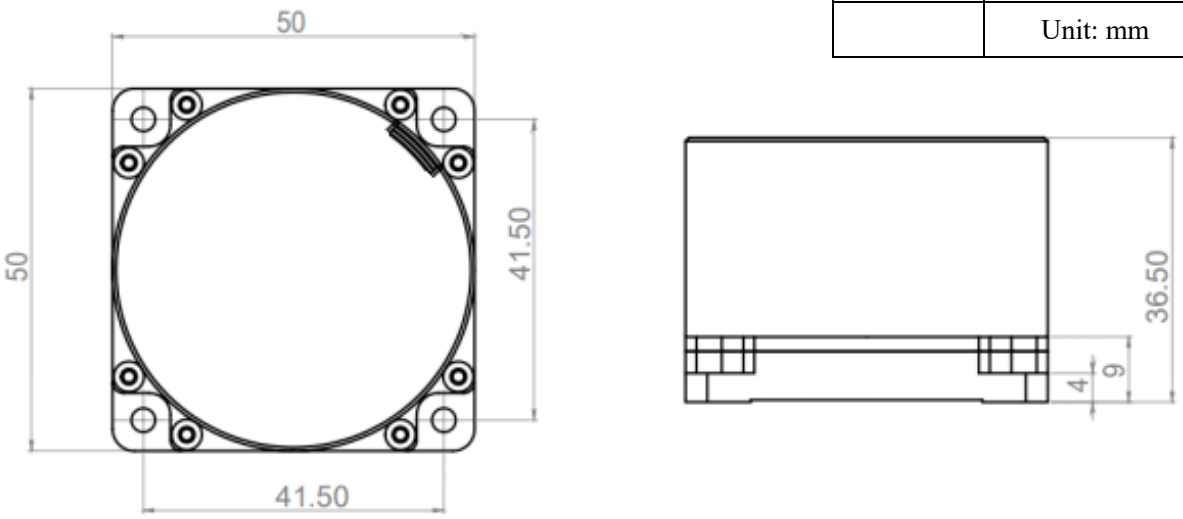

Figure 3. Outline Dimensions

Protocol

Communication Protocol

RS-422 mode (bidirectional)

1) Bidirectional serial communication, in line with RS-422 interface standard.
2) External trigger signal, 1000Hz square wave.
3) After the gyroscope detects the falling edge of the external trigger signal, it starts to send data outward.
4) The effective data of the gyroscope is 32 bits.
5) The effective temperature data is 14 bits.
6) The data transmission baud rate is 460.8kbps.
7) Data format:

a) Data transmission format: Each frame of data is 11 bits, including: the first bit is the start bit (0), the second to ninth bits are data bits, the tenth bit is the even parity bit, and the eleventh bit is the stop bit.

b) Check mode: even check.

c) The effective data of gyroscope is 32 bits (the highest bit is the sign bit, 0 is "+", 1 is "-"), and the effective data of temperature is 14 bits (the highest bit is the sign bit, 0 is "+", 1 is "-").

d) Data packet format: Each transmission includes 10 bytes in total. The first byte is the frame header (80H); the second byte is the first byte data of the gyroscope (low byte); the third byte is the second byte data of the gyroscope; the fourth byte is the third byte data of the gyroscope; the fifth byte is the fourth byte data of the gyroscope; the sixth byte is the fifth byte data of the gyroscope (high byte); the seventh byte is the check bit, which is the XOR value of the first 5 bytes (gyroscope data) in the data packet; the eighth byte is the low byte of the temperature data; the ninth byte is the high byte of the temperature data; the tenth byte is the check bit, which is the XOR value of the first 8 bytes (gyroscope data) in the data packet;

e) Data storage method.

	high							low
Byte 1(frame header)：	1	0	0	0	0	0	0	0
Byte 2：	0	D6	D5	D4	D3	D2	D1	D0
Byte 3：	0	D13	D12	D11	D10	D9	D8	D7
Byte 4：	0	D20	D19	D18	D17	D16	D15	D14
Byte 5：	0	D27	D26	D25	D24	D23	D22	D21
Byte 6：	0	0	0	0	D31	D30	D29	D28
Byte 7：	0	X	X	X	X	X	X	X
Byte 8：	0	T6	T5	T4	T3	T2	T1	T0
Byte 9：	0	T13	T12	T11	T10	T9	T8	T7
Byte 10：	0	X	X	X	X	X	X	X

EXECUTIVE STANDARD

Enterprise Quality System Standard: ISO9001:2015 Standard (Certificate No.064- 21-Q-3290-RO-S)

CE certification (certificate number: M.2019.103. U Y1151)

ROHS (certificate Number: G 190930099)

GB/T 191 SJ 20873-2003 General specification for inclinometer and level

GBT 18459-2001 The calculation method of the main static performance index of the sensor

JJF 1059.1-2012 Evaluation and expression of measurement uncertainty

GBT 14412-2005 Mechanical vibration and shock Mechanical installation of accelerometer

GJB 450A-2004 General requirements for equipment reliability

GJB 909A Quality control of key parts and important parts

GJB899 Reliability appraisal and acceptance test

GJB150-3A High temperature test

GJB150-4A Low temperature test

GJB150-8A Rain test

GJB150-12A Sand and dust experiment

GJB150-16A Vibration test

GJB150-18A Impact test

GJB150-23A Tilt and rock test

GB/T 17626-3A Radio frequency electromagnetic field radiation immunity test

GB/T 17626-5A Surge (impact) immunity test

GB/T 17626-8A Power frequency magnetic field immunity test

GB/T 17626-11A Immunity to voltage dips, short-term interruptions and voltage changes

ORDERING INFORMATION

Part Number	Communication Mode	Package Situation	Buy Now
FG-1151-R07	RS422	Metal package	* *

*: both and are our online store icons. Our products can be ordered from either one of them with the same pricing and delivery time.

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