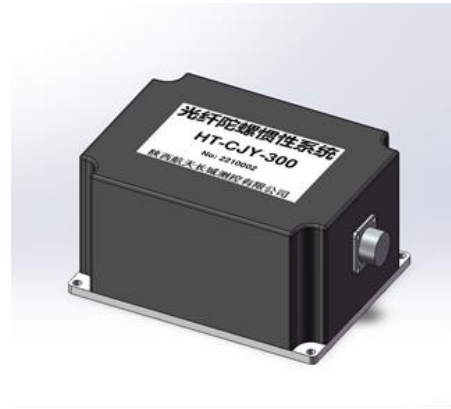


HT-CJY-300 fiber optic gyro inertial system

1 Product overview

The HT-CJY-300 fiber optic gyro inertial system (hereinafter referred to as the system) is a product that measures the attitude angle of the carrier in real time. It has built-in three-axis high-precision closed-loop fiber optic gyroscope and high-precision MEMS accelerometer. It can output attitude angle, three-axis integral angle and three-axis angular velocity and acceleration. Users can perform initial alignment, position calibration and other operations through serial port commands.



2 Product characteristics

- 1) Built-in 0.1 ° / h gyroscope, 10ug accelerometer
- 2) Full temperature temperature compensation, gyro adder orthogonal calibration
- 3) High reliability and stable performance.
- 4) pitch, roll without long-term drift
- 5) The initial alignment and position calibration can be re-initialized by serial command.

3.Application range

- 1) Vehicle mounted antenna
- 2) Platform stabilization
- 3) Driverless Unmanned
- 4) Shipborne antenna
- 5) Highway detection

4 Technical indicators

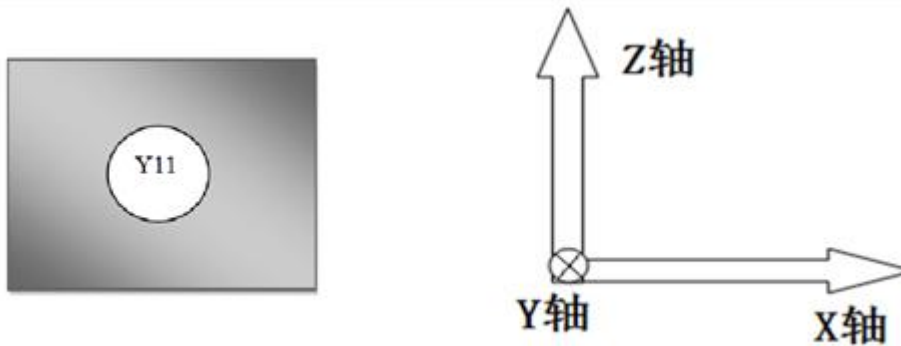
System performance			
Parameters	Conditional	Index	Unit
Measurement range		0~360	°
Initial alignment accuracy	1σ, full temperature	0.5	°
Initial alignment time		3	mim
Heading accuracy	full temperature	0.3	°/h
Attitude measurement accuracy	full temperature	0.08 (No long-term drift)	°
Angle integral accuracy		0.1	°/h

Gyroscope performance			
Parameters	Conditional	Index	Unit

Measurement range		500	°/s
Zero bias stability	10s standard deviation , 1σ, full temperature	0.1	°/h
Zero bias repeatability		0.1	°/h
Scale factor nonlinearity		<200	ppm
Accelerometer performance			
Parameters	Conditional	Index	Unit
Measurement range		±10/±20/±40 (optional)	g
Zero bias stability	Allan Variance	10	ug
Zero bias repeatability	1σ, full temperature	0.5	mg
Scale factor nonlinearity		300	ppm

Interface characteristics	
Physical properties	
Supply voltage	18-36V
Start time	<30s
Working temperature	-40°C~+60°C
Data interface	RS422
Storage temperature	-55°C~+85°C
Communication parameters	921.6k,n,8,1
Size	167.5*125*80mm

5. Connection port and definition



Socket Y11X1210ZJ10			Supporting plug
Core number	Definition	Description	Y11X-1210TK2
1	+24VDC	Power input is positive	
2	GND	Power source	
3	C-GND	Casing ground	
4	RS-422:TX+	422 output signal is positive.	
5	RS-422:TX-	422 output signal is negative.	
6	RS-422:Rx+	422 input signal is positive	
7	RS-422:Rx-	422 The input signal is negative.	

8	GND	Digital signal ground	
9,10	Factory use	Access to any level is strictly prohibited	

6. Data protocol

1) Data output protocol

RS422 interface: Baud=921.6K, no parity, data=8 bits, stop=1;			
Byte offset	Name	description	Size[bit]
0	Frame header	0xC0C0	16
2	Status word	uint8	8
3	X-axis angular velocity	float (deg/s)	32
7	Y-axis angular velocity	float (deg/s)	32
11	Z-axis angular velocity	float (deg/s)	32
15	Pitch angle value	float (deg)	32
19	Roll angle value	float (deg)	32
23	Heading angle value	float (deg)	32
27	X-axis angular velocity integral	float (deg)	32
31	Y-axis angular velocity integral	float (deg)	32
35	Z-axis angular velocity integral	float (deg)	32
39	X-axis adder	float (g)	32
43	Y axis addition	float (g)	32
47	Z-axis adder	float (g)	32
51	Angle of yaw	float (deg)	32
55	Checksum	2-54 Byte Sum	16

2) State word interpretation

Status word	0x00	North seeker is starting
	0x01	Start normal, can be north-seeking
	0x02	Looking North
	0x03	North-seeking completed, enter the course to maintain
	0x04	Calibration position 1 acquisition
	0x05	Calibration position 1 acquisition is completed
	0x06	Calibration position 2 acquisition
	0x11	Start abnormal

3) North-seeking command input frame format (a total of 4 bytes)

Byte serial number	Command meaning	Effective bit	Notes
0	North Finding Command	8	Hexadecimal number 24
1		8	Hexadecimal number 4E
2		8	Hexadecimal number 46
3		8	Hexadecimal number 2A

4) Heading clear input frame format (a total of 4 bytes)

Byte serial number	Command meaning	Effective bit	Notes
0	Yaw angle clearing	8	Hexadecimal number EB
1		8	Hexadecimal number 90
2		8	Hexadecimal number AA
3		8	Hexadecimal number 20

5) Zero calibration input frame format

Byte serial number	Command meaning	Effective bit	Notes
0	Position 1 Acquisition command	8	Hexadecimal number EB
1		8	Hexadecimal number 90
2		8	Hexadecimal number AA
3		8	Hexadecimal number 50
0	Position 2 Acquisition command	8	Hexadecimal number EB
1		8	Hexadecimal number 90
2		8	Hexadecimal number AA
3		8	Hexadecimal number 51

7. System installation

7.1 Requirements

The user is responsible for the installation of the product. The Y axis of the system points to the direction of the carrier head. During the installation process, the product cannot be impacted and the outer surface of the product cannot be machined.

7.2 Methods and steps

- (a) Recommended for fixed product surface flatness is better than 0.02 mm ;
- b) It is recommended that a layer of 0.2 ~ 0.5 mm thick thermal conductive silica gel should be uniformly coated on the bottom of the product when the product is installed ;
- c) It is recommended to place an aluminum plate (larger than the size of the product) under the product mounting surface during product testing ;
- d) The magnetic field strength of the product installation position is not greater than 1Gs.

7.3 Inspection after installation

Check whether each mounting screw meets the size of the mounting hole and is firm.

8. System work steps

1) Self-examination

Power supply to the system according to the wiring definition. Under normal circumstances, the system completes self-test within about 30 s. The state word of the self-test process is 0x00, and the self-test is completed into the north-seeking state.

2) North-seeking (initial alignment)

The system will automatically enter the north-seeking state after self-checking. During the north-seeking process, the carrier needs to be kept static. At this time, the state word is 0x02, and the north-seeking state lasts for about 3 minutes ;

3) Heading keeping

After the north-seeking, the system is transferred from the north-seeking state to the heading-keeping state. At this time, the state word is 0x03. In the heading-keeping state, the system can receive commands such as north-seeking and calibration, and the state of the system can be judged by the state word output by the system.

4) Shut down

In any case, the system can be shut down, and only the power supply of the system can be turned off.

9. Notes and storage conditions

The relevant notes are as follows :

- a) The system should not be frequently switched on and off during use to avoid damaging the performance of FOG and reducing the service life of FOG.
 - b) Before the system is powered on, the power supply system should be checked to ensure that there is no short circuit between the electrical points of the power supply and between the gyro shell and the electrical points ;
 - c) this product in case of abnormal work should consult manufacturers, prohibit unauthorized disassembly and maintenance ;
 - d) This product is a precision instrument, in the use and transportation process pay attention to take and put ;
 - (e) Must ensure the correct product input, output signal line and power supply line ;
 - f) Anti-static measures are required in the process of contacting products ;
- storage conditions and period considerations are as follows :
- a) Products placed in the packaging box should be under standard atmospheric pressure conditions, ambient temperature is $25\text{ }^{\circ}\text{C} \pm 10\text{ }^{\circ}\text{C}$, relative humidity is 30 % ~ 70 %, the surrounding magnetic field strength is less than 1Gs ;
 - b) The product storage period is 10 years.

10. Troubleshooting

Users in the process of using the following failure, can refer to the solution :

1) Abnormal starting current

Check the power supply, whether the voltage meets the requirements, the power supply polarity is strictly prohibited. If the power check is normal.

Is the product internal fault, please send the product back to our company for repair.

2) Digital output without signal

Check the serial port connection and serial port settings, data receiving format is correct. If there is no abnormality after inspection, it should be an internal fault of the product. Please send the product back to our company for repair.

3) If the following fault phenomenon, should immediately turn off the power supply. Record the fault phenomenon, contact the company for maintenance.

a) Self-test abnormal, fault words reported ;

b) abnormal state transition, loss of main functions (e.g., unable to enter the navigation state) ;

c) navigation information anomalies (such as large deviation of north-seeking results or large deviation of attitude information).

11. Shape size diagram

