

## SHT-3-05 MEMS-Gyro North Finder

### 1. Product Description

SHT-3-05 MEMS gyro north finder is mainly used to quickly and independently determine the true north direction. It consists of two high-precision MEMS gyros, high-precision three-axis MEMS accelerometer, processing circuit and power supply circuit. The high-precision MEMS gyro tracks and measures the angular velocity of the earth rotation. By using the different components of the angular velocity of the earth rotation sensitive to the gyroscope on the X and Y axes, the azimuth information of the product reference axis is obtained. Then, the tilt data of the product axial are obtained through the accelerometer, and the tilt compensation of the azimuth is carried out. **Not affected by magnetic and other environment!**

While the MEMS gyro north finder is fast and autonomously north-seeking, the user can also calibrate it through the serial port command to improve the north-seeking accuracy again.

### 2. Product features

- 1) Built-in 0.02°/h MEMS gyro, 10ug MEMS accelerometer
- 2) High reliability and stable performance
- 3) Small size, light weight
- 4) Strong impact resistance and vibration
- 5) The zero position can be corrected again through the serial port to improve the accuracy of north finding

- 6) **Not affected by magnetic and other environment!**

### 3. Main Specifications

- Azimuth measuring range : 0 ~ 360°
- Azimuth measurement accuracy : 0.5°(The accuracy after calibration is 0.2 °)
- Azimuth resolution : 0.01°
- Inclination measurement range: ±30°
- Inclination measurement accuracy : ±0.1°
- Inclination resolution : 0.01°
- North seeking time : 3min
- Preparation time : 30s
- Power supply : +9V-36VDC (recommended supply voltage: 12V)
- Digital output : RS422 or RS485
- weight : 240g
- Operating temperature : -40°C ~ +85°C
- Attack : 100g , 11ms
- Dimensions : 58\*58\*30mm
- Working mode: static state

### 4. Wiring ports and definitions

#### (1) J30J-9ZKP definition

Pin No.	Definition	Illustration
1	+12V	Positive power supply
2	GND	Power ground
3	Tx+/A	Data output positive /485A
4	TX-/B	Data output negative /485B
5	RX+	Data input positive

6	Rx-	Data input negative
7, 8, 9	Factory Used	Factory Used, It is forbidden to connect any level.

(2) Data output protocol

Byte sequence no.	Signal name	Range	Significant bit	Definition	Note	
0	Char1		8	Frame header	The hexadecimal number AA	
1	Char2		8	Frame header	The hexadecimal number 55	
2	State		8	State word	0x00	Activating the North Finder
					0x01	Startup is normal. Northfinding can be performed.
					0x02	Looking for North
					0x03	After north seeking, you can find north again
					0x11	Start exception
3、4	Roll	-30° ~ 30°	16	Roll angle	Complement, the third byte is the low byte, 1lsb = 0.01 °	
5、6	Pitch	-30° ~ 30°	16	Pitch angle	Complement, the 5th byte is the low byte, 1lsb = 0.01 °	
7、8	Azimuth	0° ~ 360°	16	azimuth	No sign number, the 7th byte is the low byte, 1lsb = 0.01 ° °	
9	Sum		8	Checksums	The check sum is the algebraic sum of all bytes from 2 bytes to 8 bytes, taking the lower 8 bits.	

(3) North seeking command input frame format (4 bytes in total)

Byte sequence no.	meaning	significant bit	Note
0	North seeking command	8	Hexadecimal number 24
1		8	Hexadecimal number 4E
2		8	Hexadecimal number 46
3		8	Hexadecimal number 2A

## (4) Zero calibration command

Byte sequence no.	meaning	significant bit	备注
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

## 5. Dimensions

