ER-MIMU-01 High Accuracy North-Seeking MEMS IMU

1. Introduction

Inertial Measurement Unit, referred to as IMU, is a device to measure the attitude angle (or angular velocity) and acceleration of the three axis of the object. Gyroscope and accelerometer are the core devices of inertial navigation system (INS). With the built-in accelerometer sensor and gyroscope, the IMU can measure the linear acceleration and rotation angular velocity from three directions and can obtain the attitude, velocity and displacement information of the carrier through the resolving.

ER-MIMU-01 uses MEMS accelerometer and gyroscope with high quality and reliability, RS422 and external communication, baud rate can be flexibly set between 9600~921600, through the communication protocol to set the user's required communication baud rate. With X, Y, Z three-axis precision gyro, X, Y, Z three-axis accelerometer with high resolution, can be output by RS422 X, Y, Z three axis of gyroscope and accelerometer's original hexadecimal complement data (including gyro hexadecimal complement the numerical temperature, angle, the accelerometer hexadecimal temperature, the acceleration hexadecimal complement number); It can also output float dimensionless values of the gyroscope and accelerometer processed by the underlying calculation.

2. Application areas

Construction machinery dip angle measurement, angle control, pylon operation monitoring, medical equipment angle control, satellite antenna star search, bridge, tall building, tower, dam monitoring and rock and soil monitoring, mining, attitude/heading reference system, integrated inertial navigation.

3. Features

Volume: 38.6 mm×44.8 mm× 21.8 mm;

5V power supply, low power consumption 1.0W;

Light weight: 50g;

Products include X, Y, Z three axis MEMS gyro and X, Y, Z three axis MEMS accelerometer;

RS422 bus communication, baud rate from 9600~921600 can be set.

4. Performance indicators

Item	Parameter		Unit
Gyro performance			
Range	100		deg/s
Bandwidth (-3dB)	12		Hz
Scale Factor at 25°C	80000		lsb/deg/s
Scale Factor Repeatability (1σ)	<50		ppm
Scale Factor VS Temperature (1σ)	300		ppm
Scale Factor Non-Linearity (1σ)	<200		ppm
Bias Instability	<0.02		deg/hr
Bias stability (10s 1σ)	<0.1		deg/hr
Angular Random Walk	<0.005		°/√h
Bias error over temperature (1σ)	3		deg/Hr
Bias temperature variations, calibrated (1σ)	<0.3		deg/Hr
Bias Repeatability (1σ)	<0.1		deg/hr
Accelerometer performance			
Range	2-10	10-30	g
Bandwidth	100.00	100	Hz
Bias Stability (1s)(1σ)	<20	<30	ug
Bias Repeatability	100-300	200-500	ug
Bias Temp Coefficient	<10	<20	ug/℃
Bias Temp Hysteresis	<0.5	<0.5	mg
Factor Scale Non-linearity	<500	<500	ppm
Factor Scale Repeatability	<300	<300	Ppm
Factor Scale Temp Coefficient	10	10	ppm/℃
Class II Non-linearity Coefficient	<100	<100	ug/g2
Factor Scale	4000000-800000	4000000-800000	Lsb/g
System Performance			
Supply Voltage	5V±0.25V		
Supply Consumption	1W		
Interface	RS422		
Vibration	6.06g (10~2000Hz)		
Shock	5000g, 0.1ms		
Operate Temp	-45℃~ + 85℃		
Storage Temp	-55℃~ + 105℃		
Weight	≤60g		
Size	38.6 mm×44.8 mm× 21.8 mm		