BW-IMU600 SERIES

MEMS Inertial

Measurement Unit

Technical Manual

V3.0

IMU600

MEMS Inertial Measurement Unit

Introduction

BW-IMU600 uses highly reliable MEMS accelerometers and gyroscopes, and uses algorithms to ensure accuracy. At the same time, the sealed design and strict production process ensure that the product can accurately measure the angular velocity, acceleration and other motion parameters of the carrier in harsh environments. Through various compensations such as nonlinear compensation, quadrature compensation, temperature compensation and drift compensation, the error source of BW-IMU600 can be greatly eliminated and the product accuracy level can be improved. BW-IMU600 has a digital interface, which can be easily integrated into the user's system。

Main features

- Orthogonal compensation
- Gyro range: ±1080°/s
- Acceleration measurement range: ± 60g
- RS422 interface output
- Wide temperature range: -40℃~+85℃, temperature compensation
- Volume shape: L44.8 * W38.6 * H24.8mm

Application

- Pipeline survey engineering
- Construction machinery
- Stable platform
- Autonomous driving navigation platform
- Underwater robot navigation
- Unmanned aerial vehicle

Specification

Electrical Indicators

Power supply	5V DC
Operating current	200mA (Typical value)
Operating temperature	-40~85℃

Performance Indicators

Gyro	Resolution	0.0001°
	Range	±1080°
	Room temperature stability (10S smooth)	< 2 °/h
	Full temperature offset repeatability	< 0.5 °/h
	Bias stability at full temperature (GJB 10S) smooth	< 5 °/h
	Bias stability at full temperature (ALLAN)	< 1 °/h
	Scale factor repeatability	< 300ppm
	Scale factor nonlinearity	< 50ppm
Accelerometer	Range	±60g
	Resolution	0.1 mg
	Bias stability at room temperature	0.1mg
	Zero offset repeatability (6 times)	< 0.5mg
	Bias stability at full temperature	< 1mg
	Bandwidth	100Hz
	Scale factor repeatability	< 50ppm
Maximum	500Hz	
Start delay	200ms	

Resolution: The smallest change value of the measured value that the sensor can detect and distinguish within the measurement range.

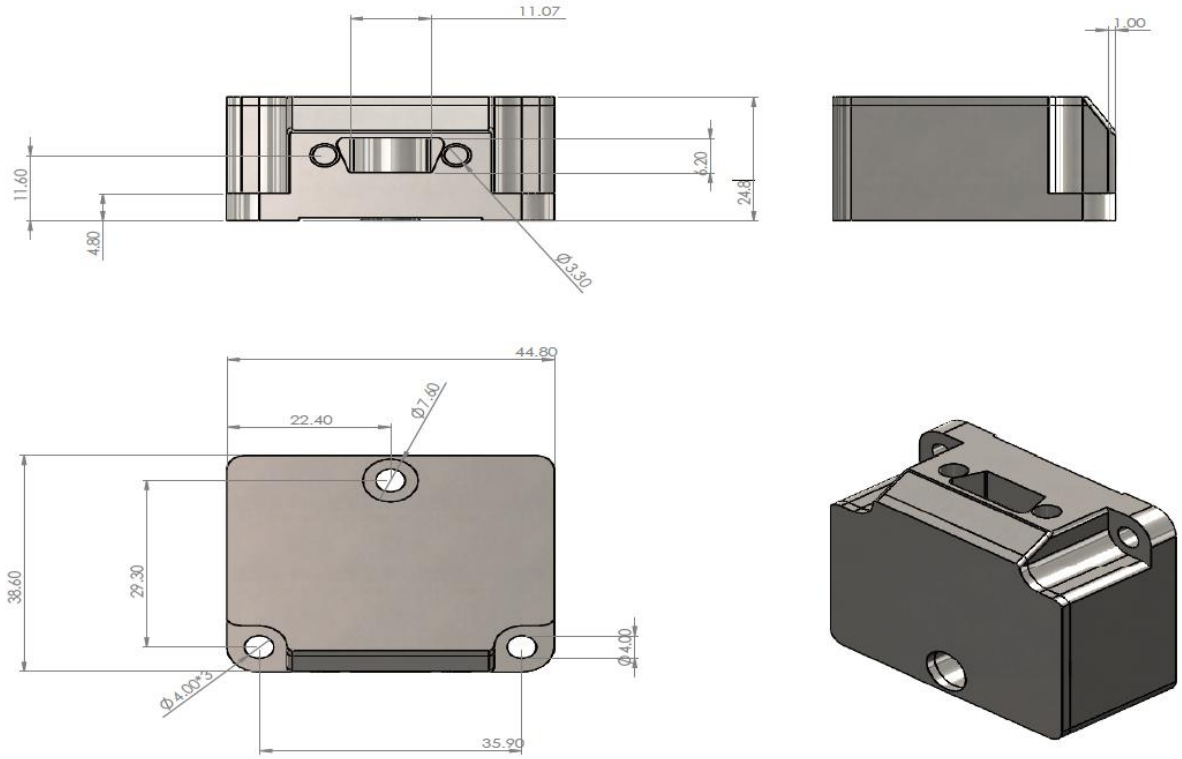
Accuracy: The root mean square error of the actual angle and the sensor measuring angle for multiple (≥16 times) measurements.

Mechanical Characteristic

Connector	J30J-15TJL(30cm)
Protection level	IP65
Shell material	Magnesium alloy sanding oxidation
Installation	Three M4 screws

Package size

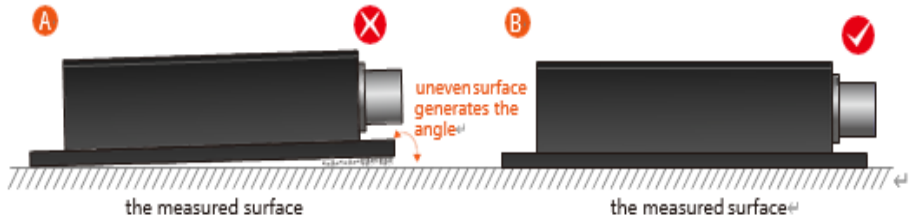
Product Size：L44.8 * W38.6 * H24.8（mm）

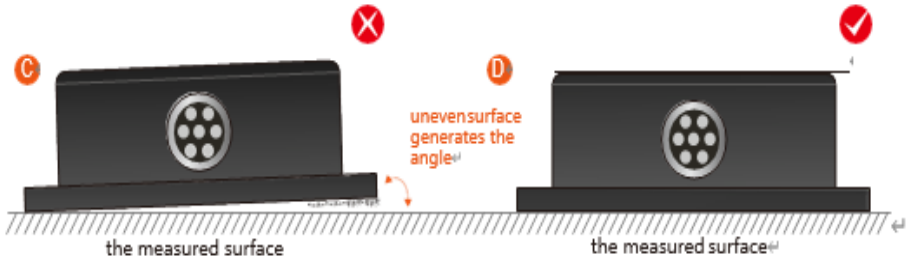


Installation

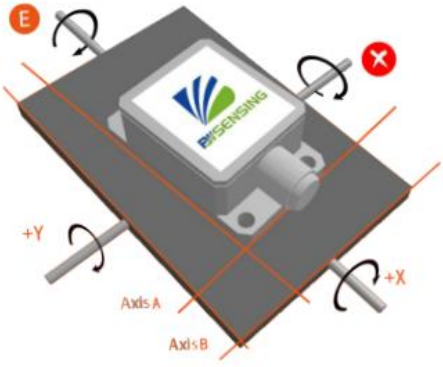
The correct installation method can avoid measurement errors. When installing the sensor, please do the following:

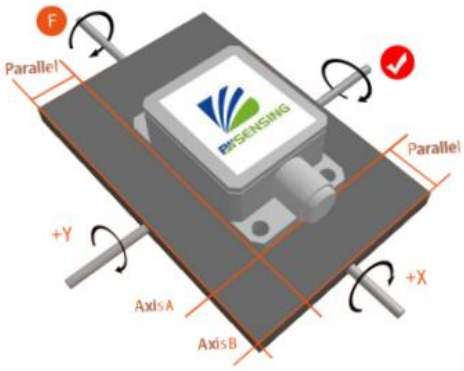
First of all, make sure that the sensor mounting surface is completely close to the measured surface, and the measured surface should be as level as possible, and there should be no included angles as shown in Figure A and Figure C. The correct installation method is shown in Figure B and Figure D





Secondly, the bottom line of the sensor and the axis of the measured object cannot have an angle as shown in Figure E. When installing, keep the bottom line of the sensor parallel or orthogonal to the axis of rotation of the measured object. This product can be installed horizontally or vertically (vertical installation needs to be customized), and the correct installation method is shown in Figure F.

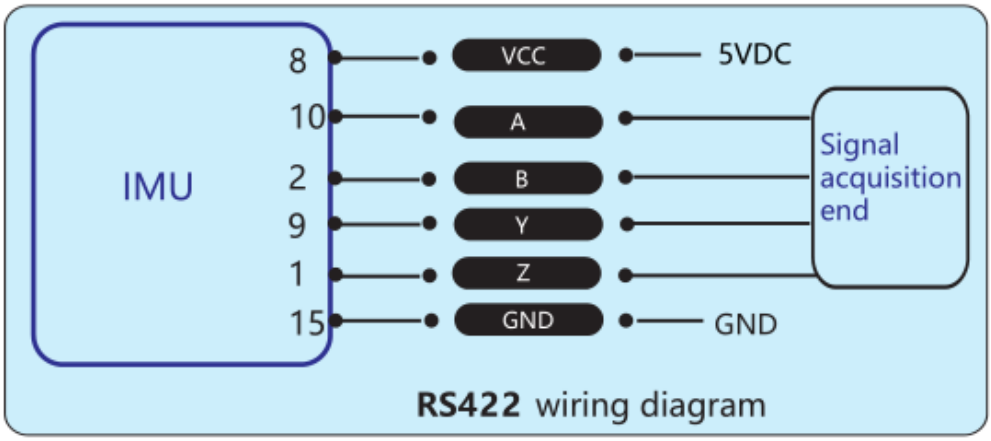




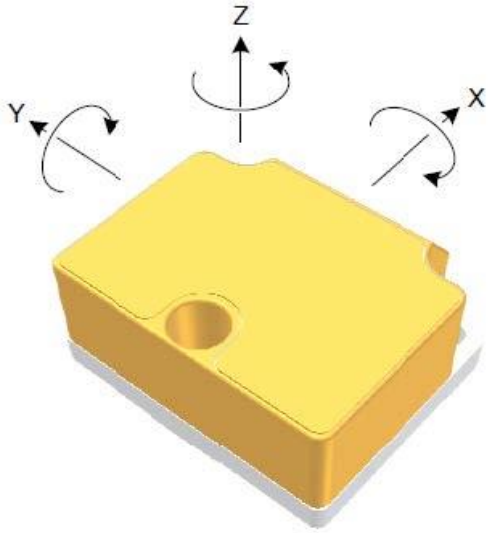
Connections

Wiring definition

Thread color	8	15	2	10	1	9
& Function	VCC DC 5V	GND	RXD- (B)	RXD+ (A)	T/R- (Z)	T/R+ (Y)



Axial definition



Ordering

Product number	Interface	IP level
BW-IMU600-422	RS422	IP65

Standard

- Enterprise quality system standard: ISO9001:2015 Standard (Certificate NO.: 23919Q10455R0S)
- CE Certification (Certificate No.: M.2019.103.UY1151)
- ROHS (Certificate No.: G190930099)
- GB/T 191 SJ 20873-2003 General specification for inclinometer and level
- GBT 18459-2001 Sensor main static performance index calculation method
- JJF1059.1-2012 Measurement uncertainty evaluation
- GBT 14412-2005 Mechanical vibration and shock mechanical installation of accelerometer
- GJB 450A-2004 General requirements for equipment reliability
- GJB 909A Key parts and quality control of important parts
- GJB 899 Reliability appraisal and acceptance test
- GJB2426A-2004 Fiber optic gyroscope test method
- GJB150-3A High temperature test
- GJB150-4A Low temperature test
- GJB150-8A Rain test
- GJB150-12A Sand and dust test
- GJB150-16A Vibration test
- GJB150-18A Impact test
- GJB150-23A Tilt and swing test
- GB/T 17626-3A Radio frequency electromagnetic field radiation immunity test
- GB/T 17626-5A Surge (impact) immunity test

BW-IMU600 Series

MEMS

Inertial Measurement Unit

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