BW-VG425C Series

High-precision CAN dynamic Inclinometer

Technical Manual

V3.0

BW-VG425C
High-precision CAN Dynamic Inclinometer

Introduction

The VG425C is a high-precision attitude measurement device that can measure the inertial attitude parameters of moving carrier's roll and pitch, angle velocity and acceleration. The attitude deviation is estimated by the 6-state Kalman filter with appropriate gain, which is suitable for inclination measurement in motion or vibration state. VG425C uses high-quality and reliable MEMS accelerometers and gyroscopes, and ensure measurement accuracy with algorithm. At the same time, the sealing design and strict process ensure that it can accurately measure the carrier's attitude parameters in harsh environments. Through various compensations such as nonlinear compensation, quadrature compensation, temperature compensation and drift compensation, the error caused by interference can be greatly eliminated, and the product accuracy level can be improved. VG425C has a digital interface, which can be easily integrated into the user's system.

Feature

- Dynamic accuracy: 0.2°
- Static accuracy: 0.01°
- Non-linear compensation, quadrature compensation
- Special offset tracking algorithm to eliminate drift
- CAN interface output optional
- Wide temperature range：-40℃~+85℃
- High-performance Kalman filter algorithm
- Dimension：L60x W59 x H29（mm）

Application

- Underwater unmanned boat
- Turbine sloshing monitoring
- Platform stability
- large ship
- Photoelectric pod
- Unmanned Drive
- Special Vehicles
- Unmanned Craft

Product Feature

Electrical indicators

Voltage	9-36V DC
Working current	30mA （40mA Max）
Temperature in use	-40~85℃
Temperature in store	-55~100℃

Performance Index

Attitude Parameter	Dynamic accuracy	0.2°
	Static accuracy	0.01°
	Resolution	0.01°
	Tilt margin	Pitch ± 90º, Roll ± 180º
Physical properties	Dimension	L60×W59×H29(mm)
	Weight (with cable)	280g
	Weight (With packaging)	360g
Interface characteristics	Start delay	<50ms
	Maximum sampling rate frequency	500Hz
	Serial communication rate	2400 to 115200 baud rate
	Digital output format	Binary High Performance Protocol
Trouble-free work on average	≥ 30000 hours	
EMC	According to GBT17626	
Insulation Resistance	≥ 100MΩ	
Surge suppression	2000g， 0.5ms， 3 Time/shaft	

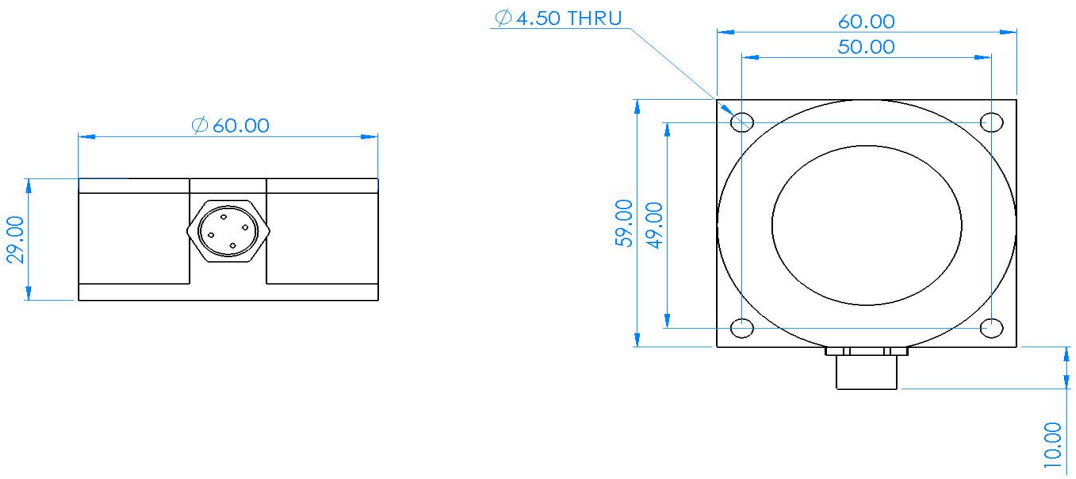
Resolution：The measured minimum change value that the sensor can detect and resolve within the measurement range.
Accuracy: The error between the actual angle and the Root mean square(RMS) of the measured angle of the sensor(≥16 times).

Mechanical

Connector	Metal interface（Cable 1.5m)
Protection level	IP67
Shell material	Magnesium aluminum alloy oxidation
Installation	Four M4 screws

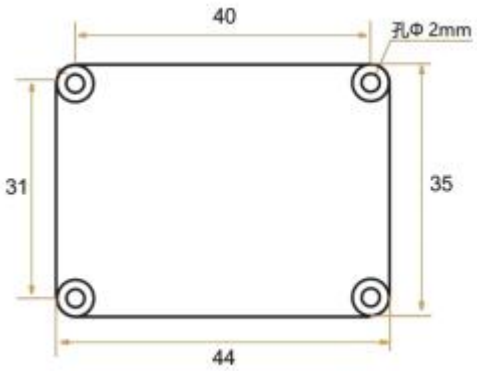
Package product size

Product Size：L60*W59*H29（mm）



PCB size

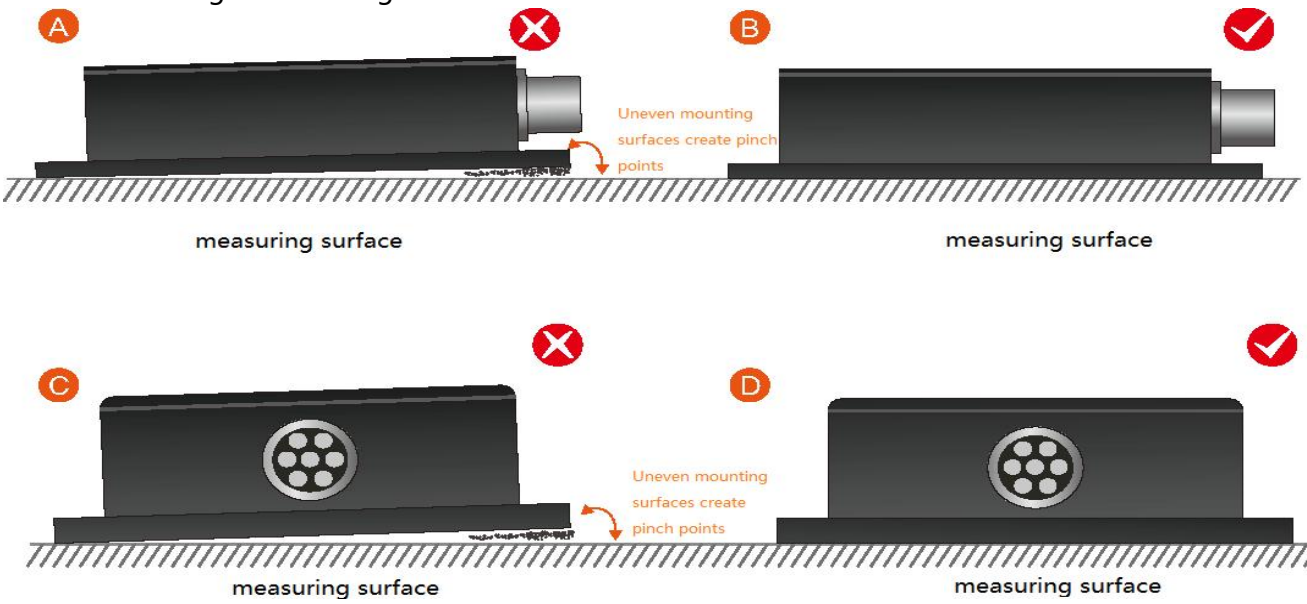
Product Size: L44*W35*H11mm, ±1mm error for length and width dimensions, please refer to actual product



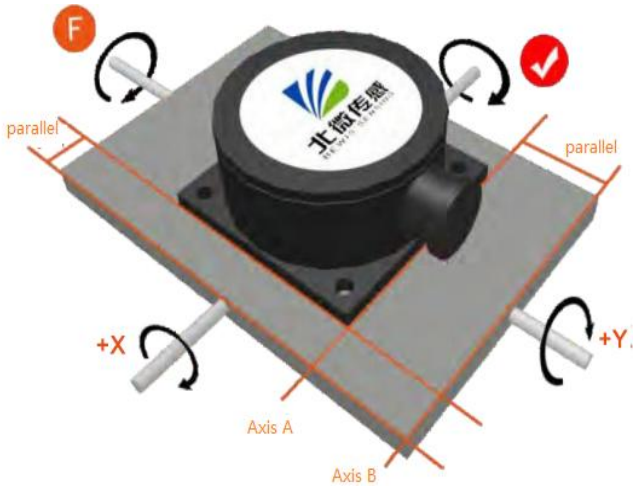
Installation

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. 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, and the bottom line of the sensor should be kept parallel or orthogonal to the axis of rotation of the measured object during installation. This product can be installed horizontally or vertically (vertical installation needs to be customized), and the correct installation method is shown in Figure F.

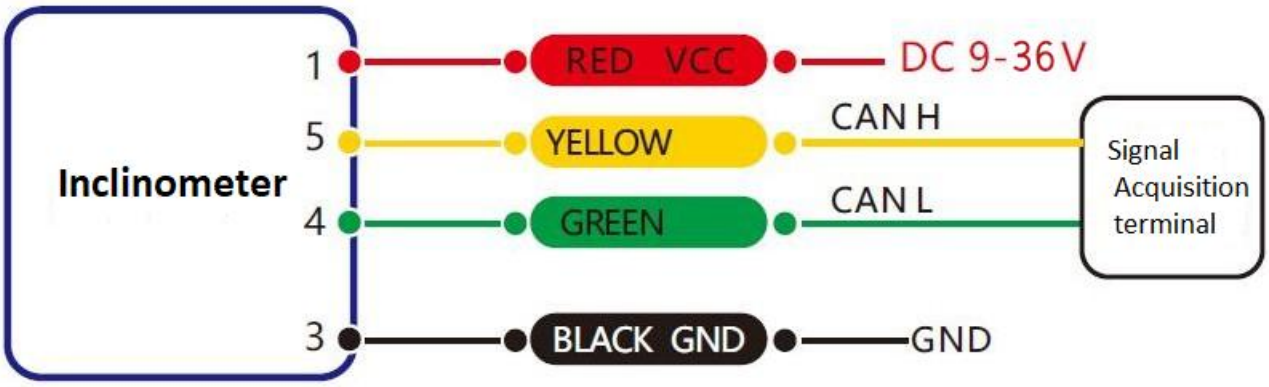


Finally, the mounting surface of the sensor and the surface to be measured must be tightly fixed, smooth in contact, and stable in rotation, and measurement errors due to acceleration and vibration must be avoided.

Electrical Interface

Wiring definition

	RED	BLUE	BLACK	GREEN	YELLOW
Line Color	1	2	3	4	5
Function	VCC DC 9-36V	NC	GND	CAN L	CAN H



CAN bus wiring diagram

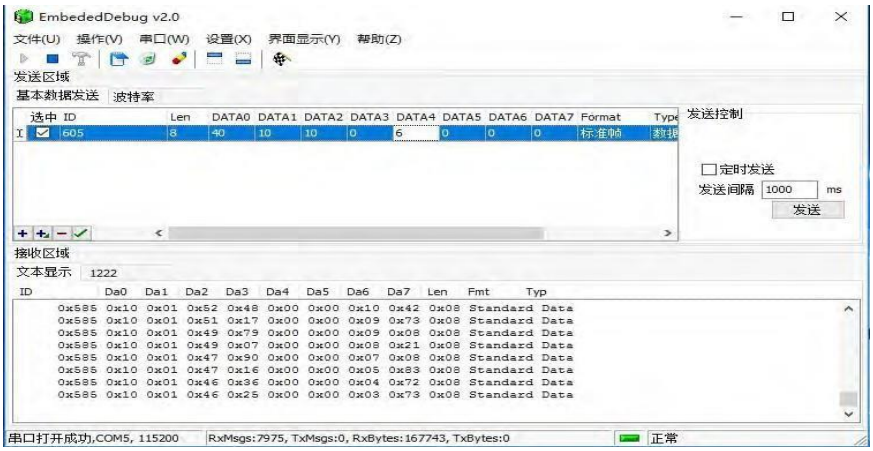
Testing software

Since there is usually a dedicated CAN receiving device for data communication with CAN interface products, the software is CAN.

The software that comes with the device is used in different ways, so there is no corresponding supporting software. Below is the CAN receiving module used by our company and take product communication as an example:

Configure CAN baud rate and parameters as follows:

The receiving and sending area is set as follows:



Order Information

Model	Communication Mode	Package Situation
BW-VG425C	CAN	IP67/ Metal interface

Executive standard

- Specification for static calibration of dual-axis tilt sensors National Standard (draft)
- GB/T 191 SJ 20873-2003 General specification for inclinometer and level

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