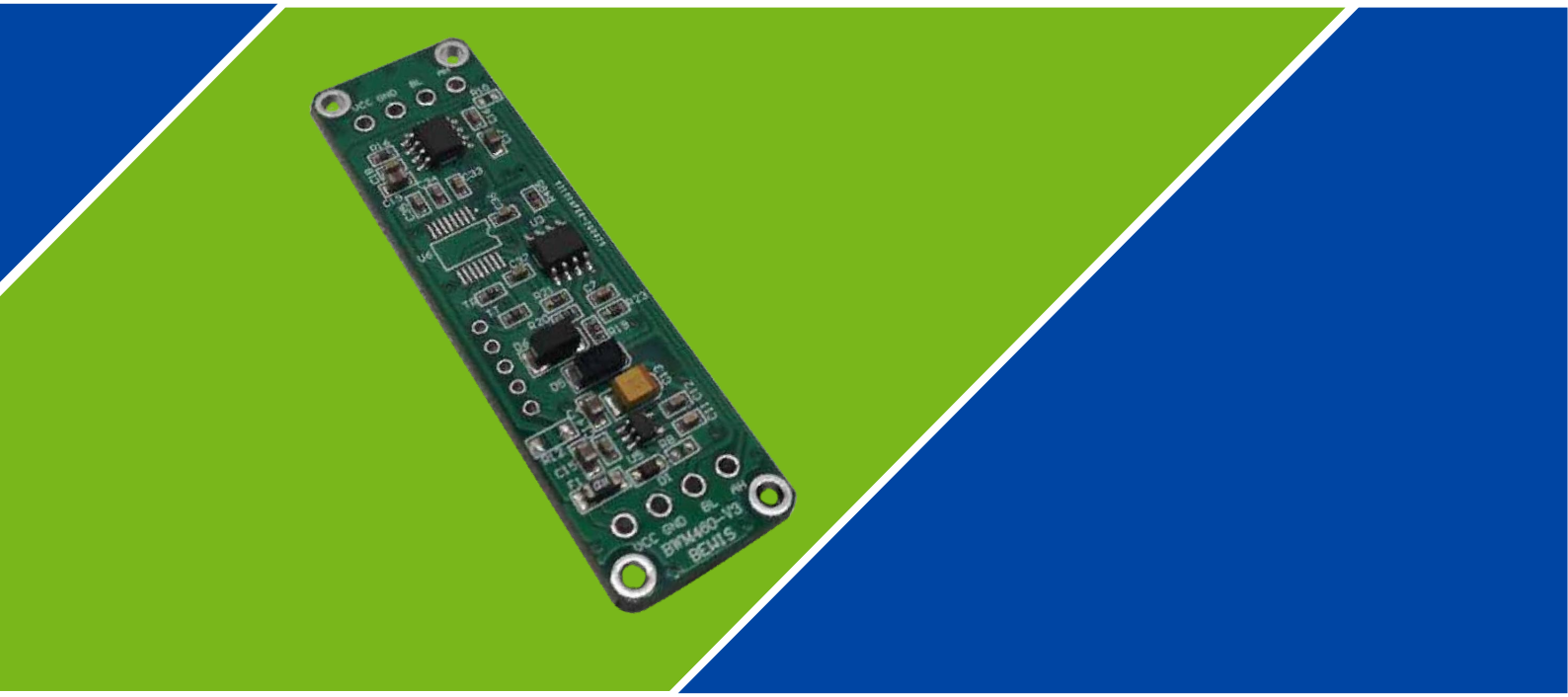


BWM466 Series

Digital Dual Axis Inclinometer

Technical Manual

V3.0

BWM466
Digital Dual Axis Inclinometer



Introduction

BWM466 is a cost-effective digital dual-axis inclinometer launched by Bewis Sensing Company. The output mode is RS485 and TTL optional. It can be used vertically or horizontally. The product adopts the latest technology micro-electromechanical production technology inclination unit, small size, low power consumption, high consistency and stability, because it is a digital inclinometer, the linearity is easier to be corrected. The working temperature reaches industrial level -40℃ ~ +85℃, it is a very cost-effective inclinometer.

When multiple sections are used in cascade, our company provides a multi-section inclinometer algorithm, which can achieve accurate displacement measurement of larger length and deeper depth, and provides an automatic calibration algorithm.

Main Feature

- Dual axis inclination measurement
- Range：±90°
- Highest accuracy：0.01°
- Wide voltage input：9～36V
- Output：RS485/TTL optional
- Can be cascaded for multiple sections
- Wide temperature work : -40℃ ~ +85℃
- High vibration resistance >2000g
- Resolution：0.001°
- PCBA size：67×20×8mm

Application

- Foundation pit monitoring
- Soil monitoring
- Dam tailings monitoring
- Exploration well
- Slope monitoring
- High-speed rail foundation monitoring
- Piling monitoring
- Deep displacement

Product Feature

Electric Index

Parameter	Condition	Minimum	Typical	Maximum
Power voltage (V)		9	12	36
Working current(mA)	No load	20	30	40
Operating Temperature (℃)		-40	25	85
Storage Temperature (℃)		-55	25	100

Performance Index

Measurement Range (°)	Condition	±90
Measurement axis		X-Y
Accuracy (°)	Room temperature	0.01
Resolution (°)	Completely still	0.001
Zero bias (°/℃)	-40~85℃	±0.001
Start-up time		< 3s
Output frequency (Hz)	5-100Hz adjustable	Up to 100
Mean time between failures MTBF	≥90000 h/times	
Electromagnetic compatibility	According to GBT17626	
Insulation resistance	≥100 MΩ	
Impact resistance	2000g，0.5ms，3 times/axis	

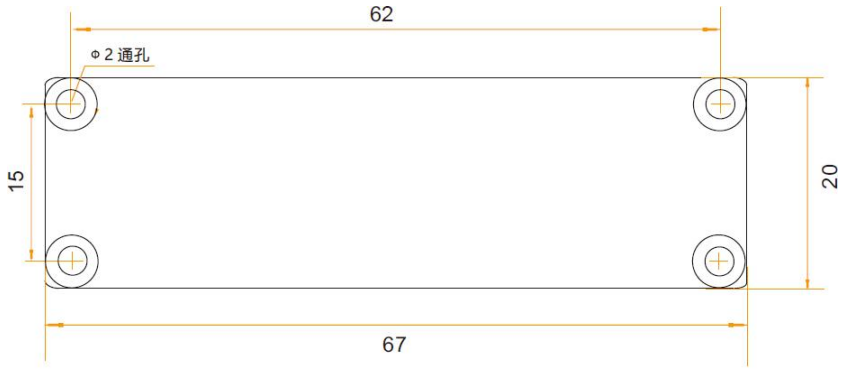
Resolution: The smallest change value of the measured value that the sensor can detect and distinguish within the measurement range.
Accuracy: The root mean square error of the actual angle and the sensor measuring angle for multiple (≥16 times) measurements.

Mechanical Index

Connector	Cable hole
Protection level	PCBA
Shell material	PCBA
Installation	Four M2 screws

Package product size

Product size：L67*W20*H8（mm）

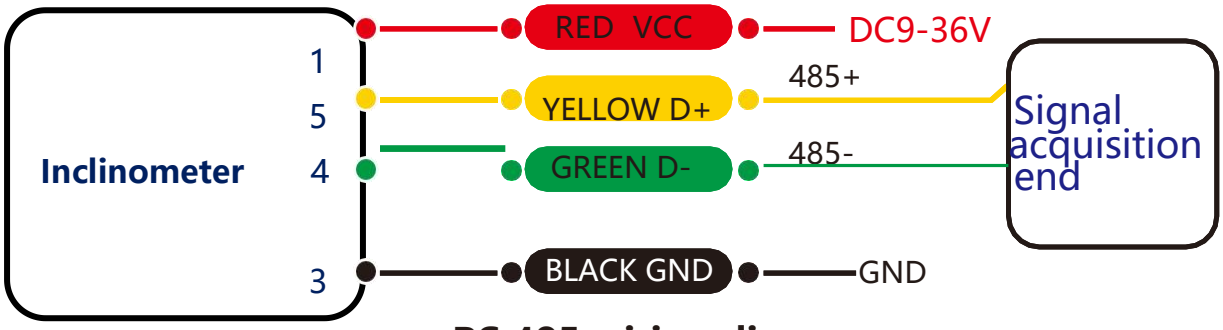


PCBA

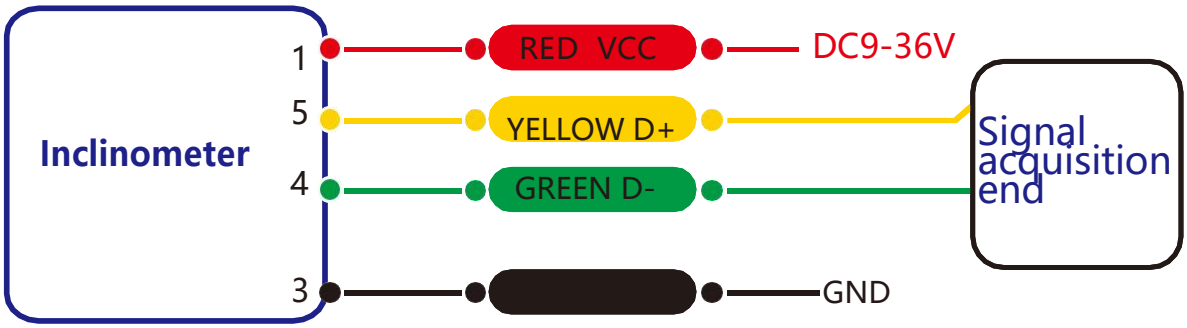
Electrical Interface

Wiring definition

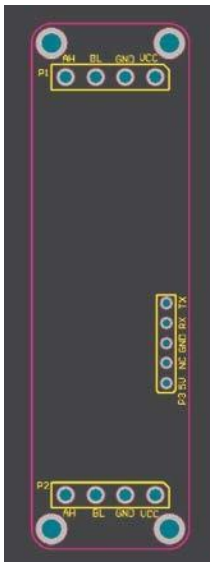
	RED	BLUE	BLACK	GREEN	YELLOW
Wire color	1	2	3	4	5
function	VCC DC 9-36V	NC	GND ground	B 485-	A 485+



RS 485 wiring diagram



TTL wiring diagram



Note: P1 and P2 correspond to the same number and the wiring is the same, and the RX and TX of P3 are the receiving and transmitting ends of TTL.

When RS485 is selected, it can be connected to VCC (9~36V), GND, AH (485+), BL (485-) of P1 or P2;

When TTL is selected, connect P1 or P2's VCC (9~36V), GND, and P3's RX, TX, the TX (transmitting end) of the acquisition end is connected to the RX (receiving end) of the sensor P3, and the RX (receiving end) of the acquisition end is connected to the sensor TX (transmitting end) of P3.

Debugging Software

You can download the serial debugging assistant directly on the official website (technical service -> download area), or you can use the more convenient and intuitive host computer software.

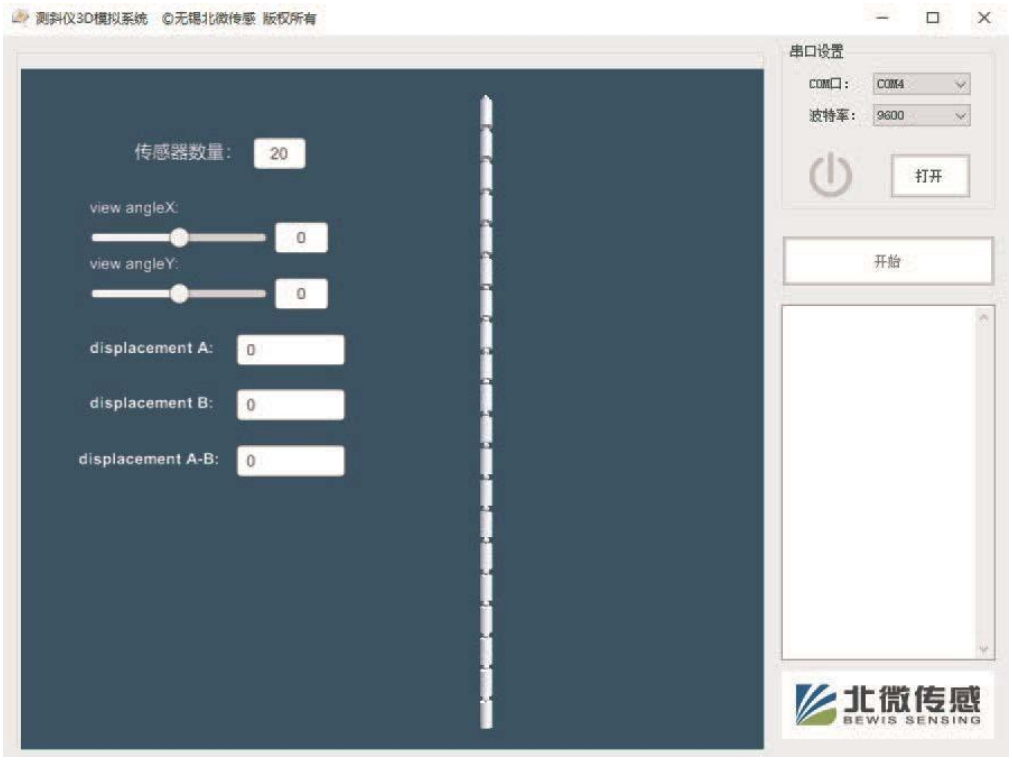
BWM466 supporting serial port debugging software can connect the inclination sensor on the computer to display the angle. The software debugging interface is shown in the figure below. Using the tilt angle to debug the host computer, you can conveniently display the current X direction and Y direction tilt angle, and you can also modify and set other parameters.

Step:

① Connect the serial port hardware of the inclinometer correctly, and connect the power supply.

② Select computer serial port and baud rate and click connect serial port.

③ Click start button and the current inclination Angle of the incliner in X and Y directions will be displayed on the screen.



Order information

Model	Communication mode	Package situation
BWM466-90-485	RS485	PCBA
BWM466-90-TTL	TTL	PCBA

Executive standard

- Enterprise Quality System Standard: ISO9001:2015 Standard (Certificate No.064-21-Q-3290-RO-S)
- CE certification (certificate number: M.2019.103. U Y1151)
- ROHS (certificate Number: G 190930099)
- GB/T 191 SJ 20873-2003 General specification for inclinometer and level
- GBT 18459-2001 The calculation method of the main static performance index of the sensor
- JJF 1059.1-2012 Evaluation and expression of measurement uncertainty
- GBT 14412-2005 Mechanical vibration and shock Mechanical installation of accelerometer
- GJB 450A-2004 General requirements for equipment reliability
- GJB 909A Quality control of key parts and important parts
- GJB899 Reliability appraisal and acceptance test
- GJB150-3A High temperature test
- GJB150-4A Low temperature test
- GJB150-8A Rain test
- GJB150-12A Sand and dust experiment
- GJB150-16A Vibration test
- GJB150-18A Impact test
- GJB150-23A Tilt and rock test
- GB/T 17626-3A Radio frequency electromagnetic field radiation immunity test
- GB/T 17626-5A Surge (impact) immunity test
- GB/T 17626-8A Power frequency magnetic field immunity test
- GB/T 17626-11A Immunity to voltage dips, short-term interruptions and voltage changes

BWM466 Series

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Wuxi Bewis Sensing Technology LLC

Add：Building 30, NO. 58, Xiuxi Road, Binhu District,

Wuxi City, Jiangsu Province, China

Tel：+86 18921292620

Mail：sales@bwsensing.com

Web：www.bwsensing.com