



V2.0

SINGLE AXIS TILT SENSOR

WCA360M

Technical Manual

WCA360M SINGLE AXIS TILT SENSOR

○ Revision time:2026-9-28

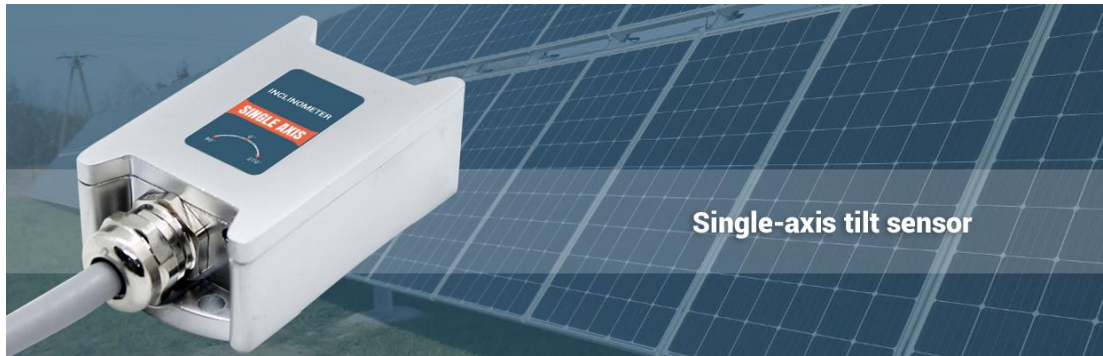
Note: Product functions, parameters, appearance, etc. will be adjusted with technical upgrades. Please contact our pre-sales business for confirmation when purchasing.

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WCA360M SINGLE AXIS TILT SENSOR



◆ Product Introduction

The WCA360M single-axis tilt sensor is a new, low-cost tilt measurement product developed in-house. It features the latest anti-interference platform design, integrates a novel micro-mechanical sensing unit, and offers wide temperature operating performance with superior anti-vibration capabilities. It is stable and reliable for long-term operation, with an effective working life of up to 10 years. This product employs a non-contact principle to measure the tilt angle of an object. It calculates the real-time tilt angle by measuring the component generated by the earth's gravity through an internal capacitive micro-mechanical unit. It is easy and convenient to install, requiring only to be fixed on the object being measured. There is no need to fix the axis and rotating shaft, meeting customer measurement needs. It is an ideal accessory for industrial equipment such as construction machinery vehicles and agricultural machinery..

◆ Key Features

- ★ Resolution 0.1°
- ★ Output method RS485
- ★ IP67 protection rating
- ★ Operating voltage: DC 9–36V
- ★ Output surge protection
- ★ High vibration resistance >3500g
- ★ Input Overvoltage and Overcurrent Protection

◆ Applications

- ★ Solar PV tracking systems
- ★ Wind deflection monitoring
- ★ Vertical monitoring
- ★ Woodworking machinery
- ★ Construction tower cranes
- ★ Medical beds
- ★ Electric vehicle control

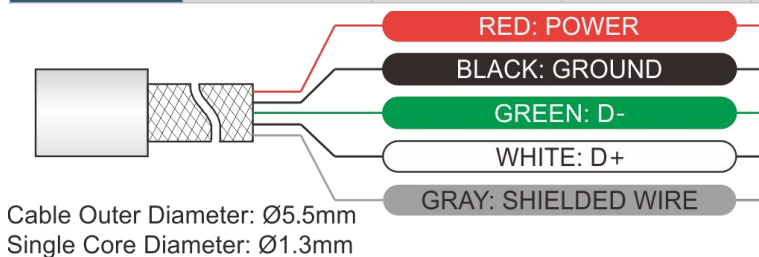


◆ Performance indicators

WCA360M	condition	parameter	unit
Rang	single-axis	0 ~ 360°	°
Resolution	-	0.1	°
Measurement accuracy	25℃	±0.2	°
Temp drift characteristics	-40 ~ +85℃	±0.003	°/℃
Response time	No filtering	0.1	s
Operating temp	-40℃~85℃		
Output interface	RS485 (MODBUS protocol)		
Output load	>500 ohms		
Working Hours	50,000 hours/time (no malfunction)		
Insulation resistance	>100 MΩ		
Vibration resistance	10grms / 10~1000Hz		
Impact resistance	100g@11ms / Three-axis (half-sine wave)		
weight	≤200g(Including 1-meter cable)		

◆ Wiring Definitions

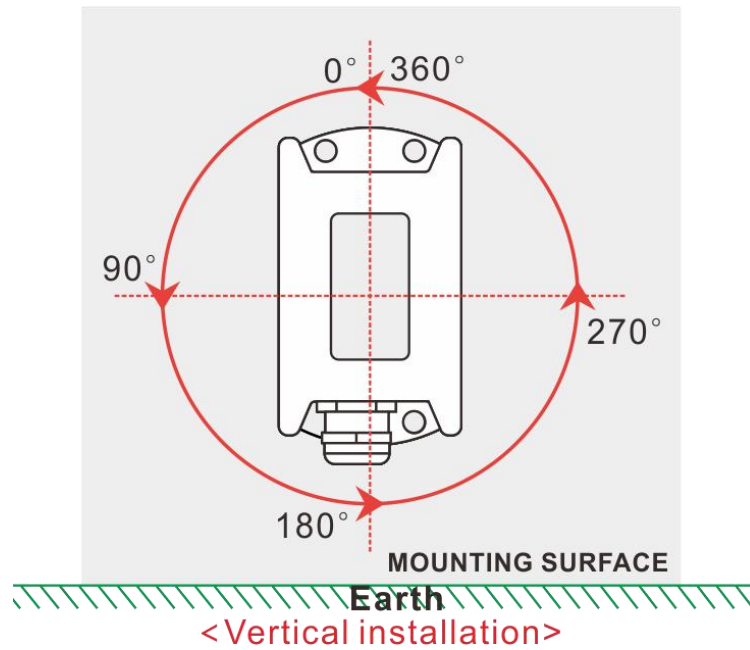
Thread color definition	RED	BLACK	GREEN	WHITE	GREY
	DC9~36V	GND	RS485_D-	RS485_D+	Shielded cable

**◆ Product instructions**

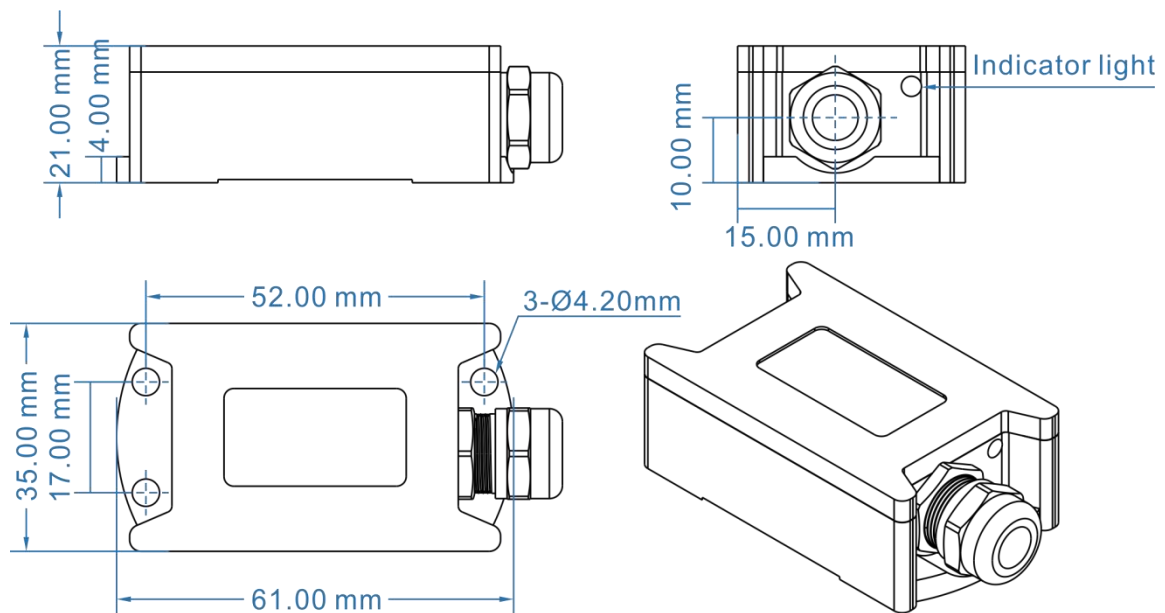
1. The inclinometer measures an object's tilt angle by sensing Earth's gravity. For optimal measurement accuracy, ensure the sensor's sensing axis is parallel to the object's tilt axis during installation. The sensor must be mounted securely and flush against a flat, stable surface; an uneven mounting surface can introduce angular measurement errors.
2. This sensor has an IP67 protection rating, meaning its internal components are unaffected by rain or powerful water jets. However, do not submerge the unit in water for extended periods, as this may damage internal circuitry; the manufacturer offers paid repair services for damage caused by such misuse.
3. After installation, ensure the signal line does not short-circuit with the positive power line during wiring to avoid damaging the output circuitry. Since the product's signal negative terminal shares a common ground with the power supply's negative terminal, connect the signal negative terminal at the data acquisition end to the product's power negative terminal.

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◆ Installation measurements



◆ Dimensional Drawing



Shell size: L24.5×W19×H21mm

◆ Communication protocol

1. The communication protocol is compatible with Modbus RTU; default settings: baud rate 9600 bps, parity: none, data bits: 8, stop bit.: 1;

Register address	Data Value Name	Data types	Range of values
0000H	X-axis angle value – high byte	Custom	Measuring range
0001H	X-axis angle value – low byte	Custom	Measuring range
0006H	Set/Cancel Relative Zero Point	Int16U	5A5AH
0007H	Local address	Int16U	0101H~FFFFH(除 6868H)
0008H	Baud rate	Int16U	A0A0H~A2A2H

Use 03H to read registers, 06H to write registers, and 42H to read the local address.

2. Command to set sensor address:

address	Function code	Register address High byte	Register address Low byte	Local Address (Target Value)	Local Address (Target Value)	CRC Check
1 byte	0x06	1 byte	1 byte	1 byte	1 byte	2 byte

response:

address	Function code	Register address High byte	Register address Low byte	Local Address (Target Value)	Local Address (Target Value)	CRC Check
1 byte	0x06	1 byte	1 byte	1 byte	1 byte	2 byte

Example:

Send command: 01 06 00 07 05 05 CRC Low CRC High

Return data: 01 06 00 07 05 05 CRC Low CRC High

This command sets the sensor's address to 0x05; the setting takes effect after a restart.

Note:

1. The address takes effect after a successful response and a system restart.
2. Address 0x68H is a factory-reserved ID and must not be used by the customer.

3. Command to read sensor address:

address	Function code	Address starting point high byte	Starting address Low byte	Number of addresses High byte	Number of addresses low byte	CRC Check
0x00	0x42	1 byte	1 byte	1 byte	1 byte	2 byte

response:

address	Function code	Returned data Number of bytes	Site Address	Site Address	CRC Check
1 byte	0x42	1 byte	1 byte	1 byte	2 byte

Example:

Send command: 00 42 00 07 00 01 CRC Low CRC High

Return data: 01 42 02 01 01 CRC Low CRC High

This command sets the sensor's address to 0x01.

4. Set sensor baud rate command:

Device Address	Function code	Baud rate start address high byte	Baud rate start address low byte	Baud rate code high byte	Baud rate code low byte	CRC Check
1 byte	0x06	1 byte	1 byte	1 byte	1 byte	2 byte

response:

Device Address	Function code	Baud rate start address high byte	Baud rate start address low byte	Baud rate code high byte	Baud rate code low byte	CRC Check
1 byte	0x06	1 byte	1 byte	1 byte	1 byte	2 byte

Example:

Send command: 01 06 00 08 A0 A0 CRC Low CRC High

Return data: 01 06 00 08 A0 A0 CRC Low CRC High

This command sets the sensor's baud rate to 4800 bps; the setting takes effect after a restart.

Note:

- The baud rate setting takes effect after a successful response and a restart.
- Supported baud rates: A0–4800, A1–9600, A2–19200.

5. Command to set or cancel the sensor's relative zero point.:

address	Function code	Set/Cancel Start from relative zero point High byte of address	Set/Cancel Start from relative zero point Address low byte	Set/Cancel Relative Zero Point Command Value High Byte	Set/Cancel Relative Zero Point Command Value Low Byte	CRC Check
1 byte	0x06	1 byte	1 byte	1 byte	1 byte	2 byte

response:

address	Function code	Set/Cancel Start from relative zero point High byte of address	Set/Cancel Start from relative zero point Address low byte	Set/Cancel Relative Zero Point Command Value High Byte	Set/Cancel Relative Zero Point Command Value Low Byte	CRC Check
1 byte	0x06	1 byte	1 byte	1 byte	1 byte	2 byte

Example:

Send command: 01 06 00 06 5A 5A CRC Low CRC High

Return data: 01 06 00 06 5A 5A CRC Low CRC High

6. Command to read angle data :

address	Function code	Read angle data Start address High byte	Start address for reading angle data Low byte	Number of angle data points to read High byte	Read the low byte of the angle data count.	CRC Check
1 byte	0x03	1 byte	1 byte	1 byte	1 byte	2 byte

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Response:

address	Function code	Returns the number of bytes of angle data.	Angle Data Hundreds Digit	Angle Data Tens and Units Digits	Angle data: decimal places, tenths place, hundredths place	Angle Data Decimal Places	CRC Check
1 byte	0x03	1 byte	1 byte	1 byte	1 byte	1 byte	2 byte

Example:

Send command: 01 03 00 00 00 02 C4 0B

Return data: 01 03 04 01 23 3C 00 CRC Low CRC High

The returned angle is 135.60° (Angle value = $[(1 * 100) + (2 * 16 + 3) + (3 * 16 + 12) / 100]$).