



Figure 1.1. Top View of TS-3420-R01



Figure 1.2. Side View of TS-3420-R01



Figure 1.3. Top View of TS-3420-R01



FEATURES

- Dual Axis Inclination Measurement
- Resolution: 0.01°
- Power Supply: 9-36V
- Size: 2.165 × 1.46 × 0.94 (inch)
55 × 37 × 24 (mm)
- Highest Accuracy: 0.1°
- Measurement Range: ±90°
- Output: CAN
- IP67 Protection Level

APPLICATIONS

- Industrial Automatic Leveling
- Medical Instruments
- Photovoltaic Automatic Tracking
- Tower Tilt Monitoring
- Special Valve
- Oil Drilling Equipment
- Industrial Converter
- Lifting Equipment Inclination Control

DESCRIPTION

The TS-3420-R01, developed and manufactured by AIT Sensing, is a cost - effective dual - axis inclinometer. It incorporates a well - established industrial - grade MEMS accelerometer, with a measurement range of ±90° and a maximum accuracy of 0.1°. The operating temperature range extends from -40°C to + 85°C.

Compact and lightweight, the TS-3420-R01 is well - suited for applications with space constraints. It converts variations in the static gravity field into changes in the inclination angle.

This inclinometer has numerous advantages, such as low cost, minimal temperature drift, ease of use, and strong anti - interference capabilities. Thus, it is an ideal choice for inclination measurement in industries like photovoltaic power generation, pan - tilt control, and tower monitoring.

During installation, users can employ the AIT serial port debugging assistant tool or AIT test and calibration software for on - site calibration. This helps correct any angle misalignment at the installation site.

SPECIFICATIONS

Table 1.

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit/Note |
|-----------------------------|------------------|------|------|------|-----------|
| Power Supply Voltage | | 9 | 12 | 36 | V |
| Operating Current | No load | 20 | 30 | 40 | mA |
| Storage Temperature Range | | -55 | | 100 | °C |
| Operating Temperature Range | | -40 | | 85 | °C |
| Measurement Range | | | ±90 | | ° |
| Measurement Axis | | X-Y | | | |
| Accuracy | Range ±60° @RT | | 0.1 | | ° |
| Accuracy | Range ±90° @RT | | 0.2 | | ° |
| Resolution | Completely still | | | | 0.01 |
| Cross-Axis Error | -40°C ~ 85°C | | 0.1 | | ° |



| Parameter | Test Conditions | Min. | Typ. | Max. | Unit/Note |
|---------------------------------|--------------------|----------------------------|------|------|-----------|
| Start-Up Time | | | | 50 | ms |
| Output Frequency | 5-100Hz adjustable | | | 100 | Hz |
| Mean Time Between Failures MTBF | | 90000 | | | h |
| Electromagnetic Compatibility | | According to GBT17626 | | | |
| Insulation Resistance | | 100 | | | MΩ |
| Impact Resistance | | 2000g, 0.5ms, 3 times/axis | | | |
| Weight | | | 210 | | g |
| | | | 0.46 | | lbs |
| | | | 7.41 | | Oz |

*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.

ELECTRICAL INTERFACE

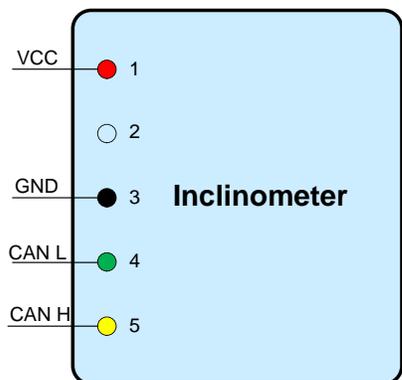


Figure 2. Pin Names

Table 2. Pin Number, Colors and Functions

| No. | Color | Functions |
|-----|--------|------------------|
| 1 | Red | VCC: DC 9V ~ 35V |
| 2 | Blue | NC |
| 3 | Black | Ground |
| 4 | Green | CAN L |
| 5 | Yellow | CAN H |

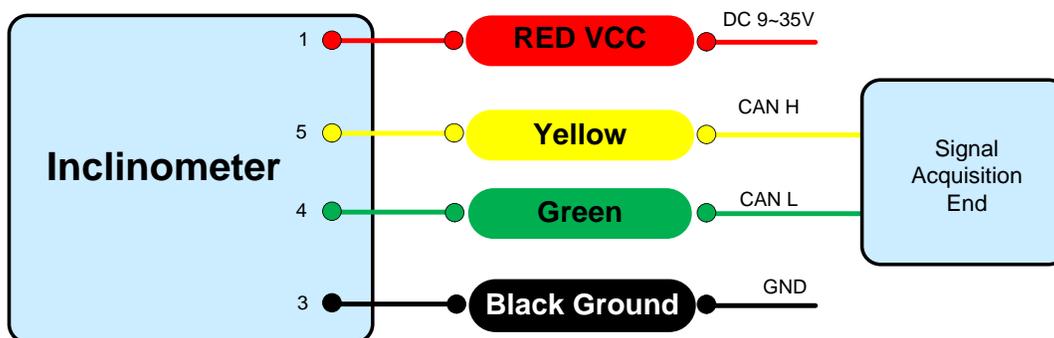


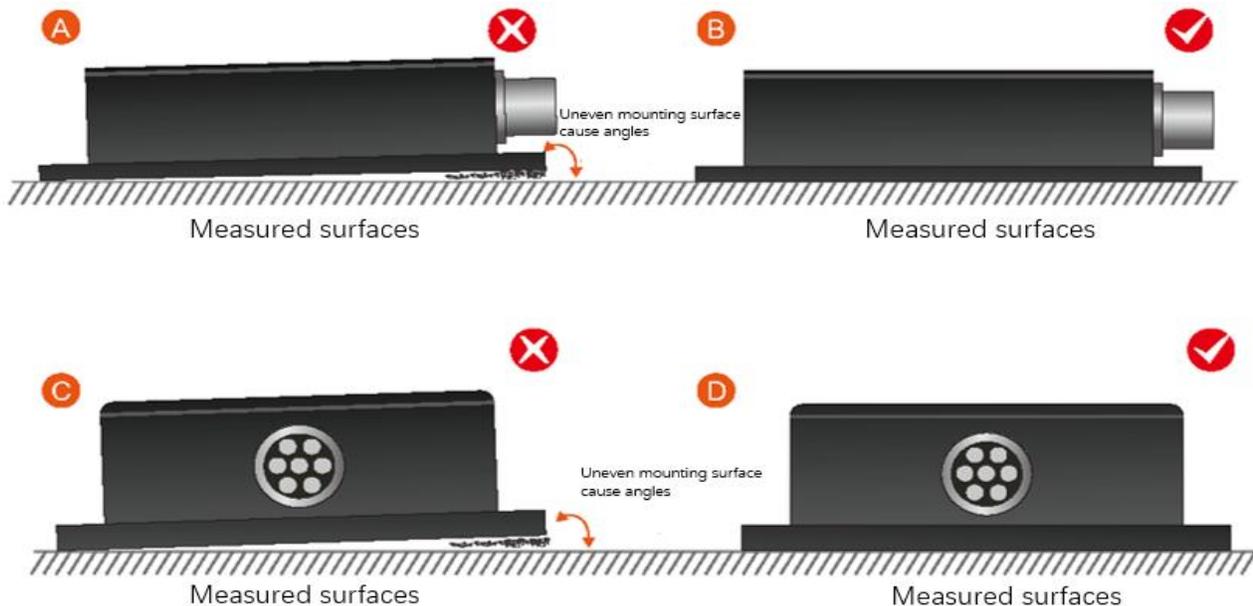
Figure 3. CAN BUS Wiring Diagram



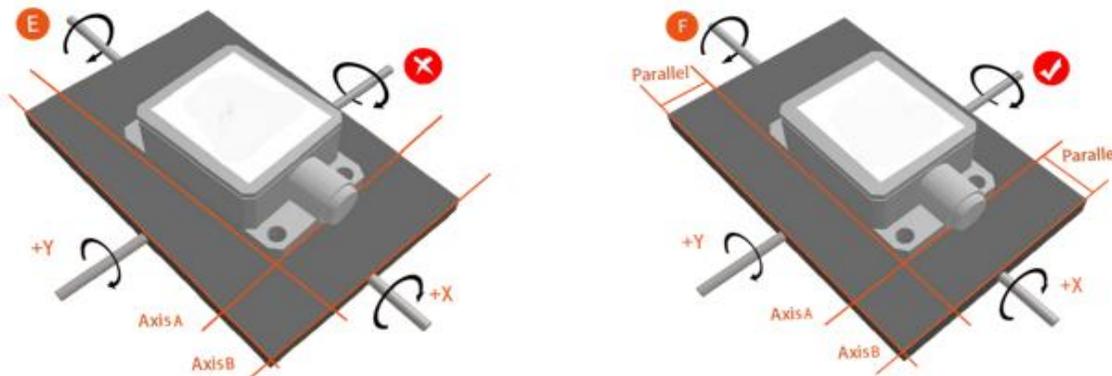
INSTALLATION

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.



DIMENSIONS

Outline Dimensions

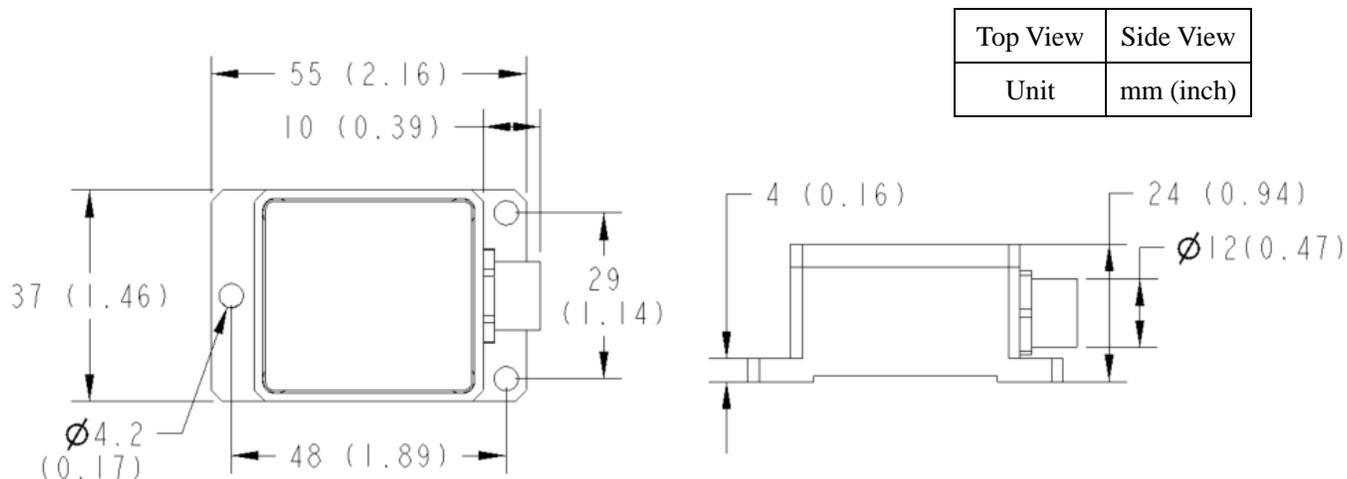
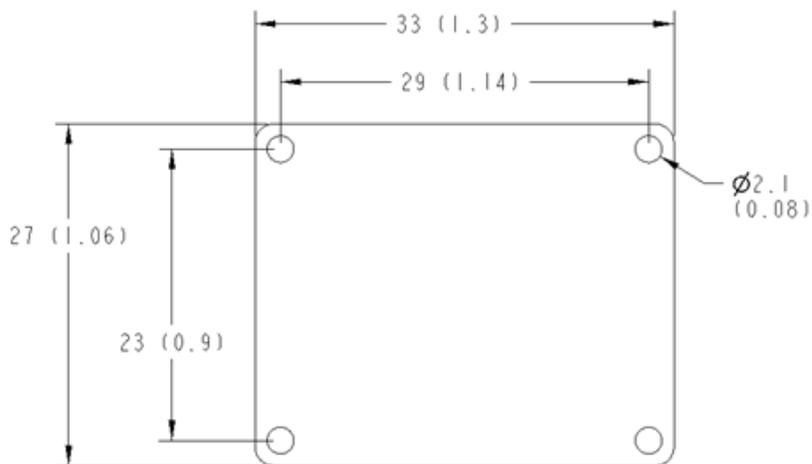


Figure 5. Outline Dimensions

PCB Dimensions

The length and width may have an error of ± 1 mm, please refer to the actual product.



| Unit | mm (inch) |
|------|-----------|
|------|-----------|

Figure 6. PCB Dimensions



Table 3. Mechanical Index

| | |
|------------------|------------------------------------|
| Connector | Metal joint (Cable 1.5m) |
| Protection level | IP67 |
| Shell material | Magnesium aluminum alloy oxidation |
| Installation | Three M4 screws |

ORDERING INFORMATION

| Part Number | Buy Now | Communication Mode | Package Situation |
|-----------------|---------|--------------------|--------------------------|
| TS-3420-R01-CAN | * * | CAN | IP67 Package/Metal joint |

EXECUTIVE STANDARD

- National Standard (Draft) for Static Calibration of Dual Axis Inclinometer Sensors
- GB/T 191 SJ 20873-2003 General Specification for Tiltmeters and Levelling Devices

NOTICE

1. It is important to carefully read and follow the warnings, cautions, and product-specific notes provided with electronic components. These instructions are designed to ensure the safe and proper use of the component and to prevent damage to the component or surrounding equipment. Failure to follow these instructions could result in malfunction or failure of the component, damage to surrounding equipment, or even injury or harm to individuals. Always take the necessary precautions and seek professional assistance if unsure about proper use or handling of electronic components.
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