



SERIE TXM-xxx - one or dual-axis inclinometer

(HIGH ACCURACY, WITH FUL TEMP-COMPENSATION)

Features

- Single / Dual-Axis Inclinometer
- Measuring Range $\pm 1 \sim \pm 90^\circ$ optional
- Wide voltage input: 9~36V
- Output interface : 4-20mA / 0-5 Vcc / Rs485 / CanBus / TTL
- Wide temperature working: $-40 \sim +85^\circ\text{C}$
- IP67 protection class
- Highly anti-vibration performance $>2000g$
- Resolution: 0.001°
- Small Volume : L90×W50×H33mm (customized)

Application:

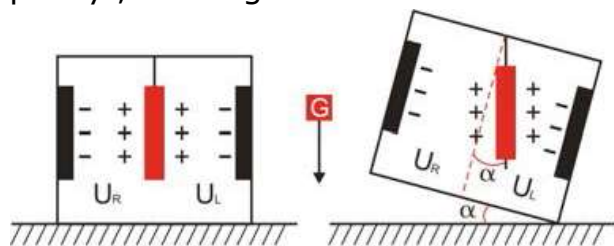
- Engineering vehicles automatic leveling
- Bridge & dam detection, geological equipment inclined monitoring
- Aerial platform vehicle, lifter safety & protection, directional satellite communications antenna
- Precision instrument level control
- Underground drill posture navigation, railway gauging rule , gauge equipment leveling
- Geological equipment inclined monitoring



| | TXM-1x-10 | TXM-1x-30 | TXM-1x-60 | TXM-1x-90 | UNIT |
|---|---|-----------|-----------|-----------|--------|
| Measuring rang | ±10 | ±30 | ±60 | ±90 | ° |
| Measuring axis | 1-2 | 1-2 | 1-2 | 1-2 | |
| Resolution | 0,001 | 0,001 | 0,001 | 0,001 | ° |
| Resolution Option (P) | 0,0005 | 0,0005 | 0,0005 | 0,0005 | ° |
| Absolute accuracy | 0,008 | 0,01 | 0,02 | 0,03 | ° |
| Absolute accuracy Option (P) | 0,002 | 0,003 | 0,005 | 0,01 | ° |
| Zero temp. coefficient -40~85° compensated | ±0.0004 | ±0.0004 | ±0.0004 | ±0.0004 | °/C |
| Sensitivity Temp. coeff -40~85° | ≤50 | ≤50 | ≤50 | ≤100 | ppm/°C |
| Response time | 0.5 | 0.5 | 0.5 | 0.5 | Seg. |
| Output | Output mode RS232/RS485/TTL / Can 0...5 Vcc / 4...20 mA | | | | |
| Power supply | 9...36 Vdc | | | | |
| Working temperature | -40...+85 | | | | °/C |
| Store temperature | -50...+100 | | | | °/C |
| Electromagnetic compatibility | According to EN61000 and GBT17626 | | | | |
| MTBF | ≥98000 hours/times | | | | |
| Insulation Resistance | ≥100MΩ | | | | |
| Shockproof | 100g@11ms、 3Times/Axis(half sinusold)) | | | | |
| Anti-vibration | 10grms、 10~1000Hz | | | | |
| Protection class | IP67 | | | | |
| Cables | Standard configuration: 2m length, wear-resistant, wide temperature, shielded cable 7P * 6.8mm aviation connector, cable weight ≤200g | | | | |
| Weight | 260g(without cable) | | | | |

Working Principle

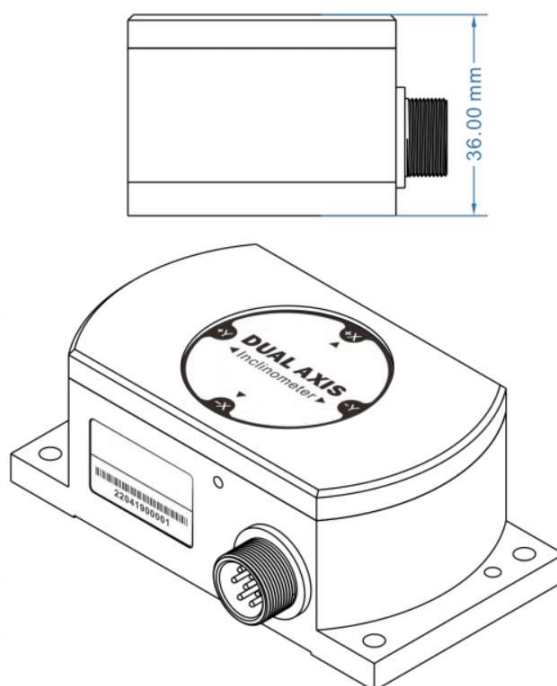
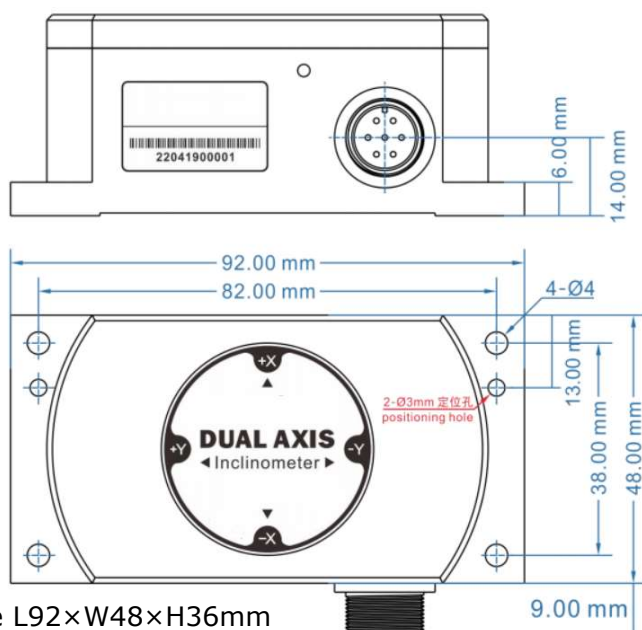
Adopt the European import of core control unit, using the capacitive micro pendulum principle and the earth gravity principle, when the the inclination unit is tilted, the Earth's gravity on the corresponding pendulum will produce a component of gravity, corresponding to the electric capacity will change, , by enlarge the amount of electric capacity , filtering and after conversion then get the inclination.



U_R, U_L Respectively is the pendulum left plate and the right plate corresponding to their respective voltage between the electrodes, when the tilt sensor is tilted, U_R, U_L Will change according to certain rules, so $f(U_R, U_L)$ On the inclination of α function:

$$\alpha = f(U_R, U_L)$$

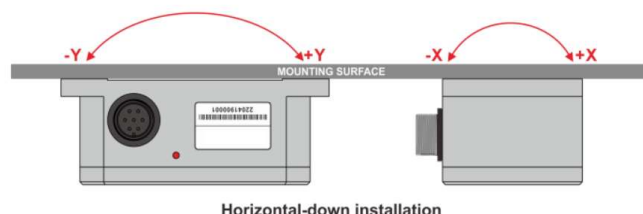
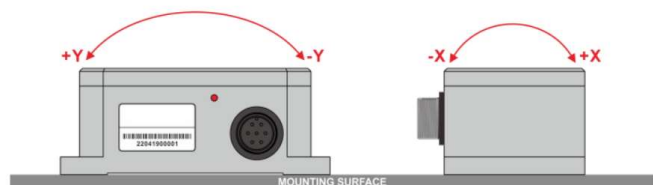
mechanical characteristics



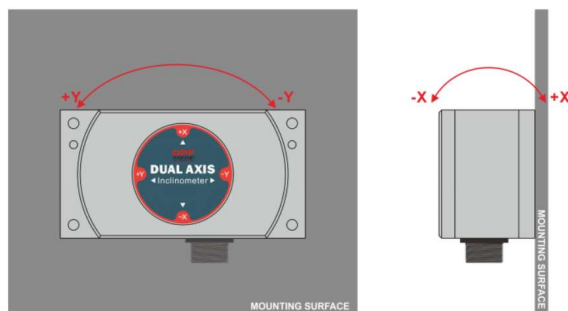
Shell size L92×W48×H36mm
Installation size L82×W38×H6mm
Installation crews 4 M4 screws

INSTALLATION DIRECTION

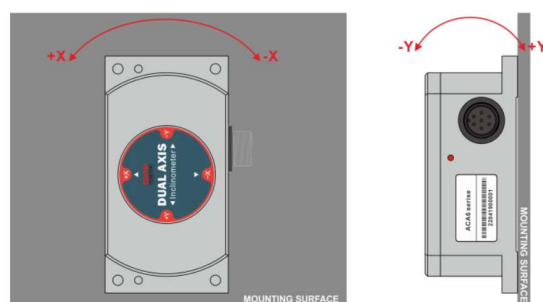
During installation, keep the sensor mounting surface parallel to the target surface to be measured, and reduce the impact of dynamics and acceleration on the sensor. This product can be installed horizontally or vertically, please refer to the following diagram for the installation method:



Horizontal-down installation



Vertical installation

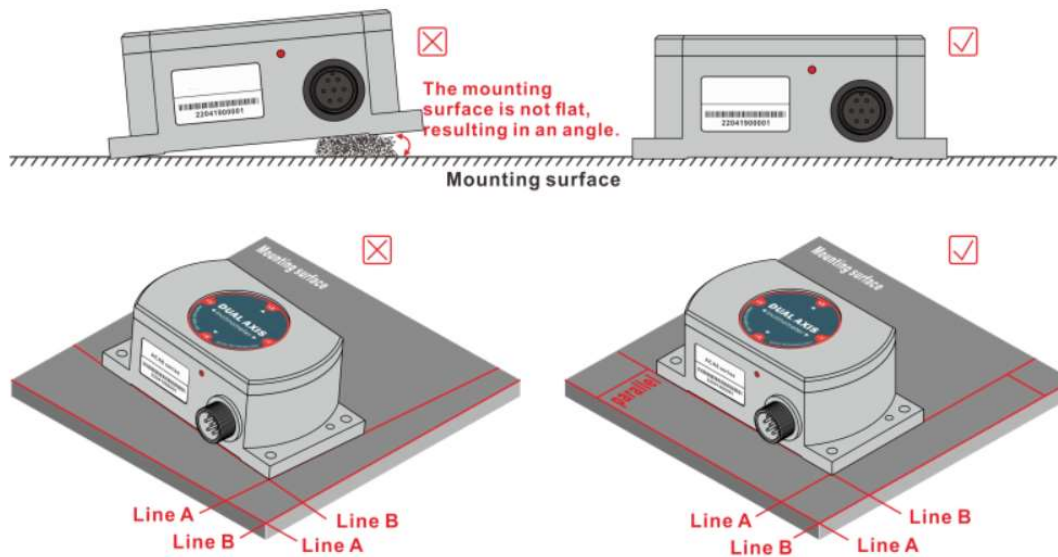


Vertical-Left installation

PRODUCTION INSTALLATION NOTES

Please follow the correct way to install tilt sensor, incorrect installation can cause measurement errors, with particular attention to the "surface", "line":

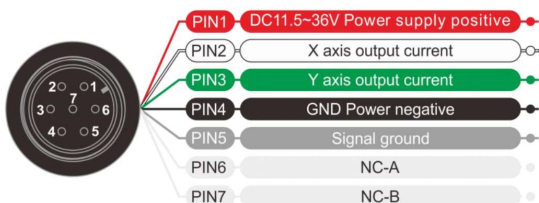
- 1) The Sensor mounting surface and the measured surface must be fixed closely, smoothly, stability, if mounting surface uneven likely to cause the sensor to measure the angle error.
- 2) The sensor axis and the measured axis must be parallel, the two axes do not produce the angle as much as possible.



ELECTRICAL CONNECTION

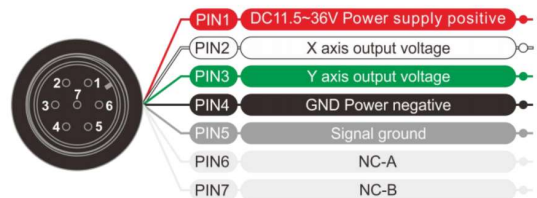
DUAL AXIS ELECTRICAL CONNECTION

| Wire Color | RED | WHITE | GREEN | BLACK | GRAY |
|------------|--|-----------------------------------|-----------------------------------|---------------------------------|------------|
| function | DC11.5~36V Power supply positive | Out X X axis output current | Out Y Y axis output current | GND Power supply negative | Signal GND |



DUAL AXIS ELECTRICAL CONNECTION

| Wire Color | RED | WHITE | GREEN | BLACK | GRAY |
|------------|--|-----------------------------------|-----------------------------------|---------------------------------|------------|
| function | DC11.5~36V Power supply positive | Out X X axis output voltage | Out Y Y axis output voltage | GND Power supply negative | Signal GND |



* Signal ground: output voltage signal. Connect the GND of acquisition device.

TXM is a high accuracy single-axis inclinometer, output adopt the standard industry electronic interface 4-20mA, 0-5 Vcc, RS485, or CAN 2.0B. The product uses the latest MEMS high technology for production, made precise compensation and correction to temperature error and nonlinearity error, small measuring range the highest accurate up to 0.003 ° (bigger measuring range index, please refer to product technical data), TXM inclinometer use the dynamic zero test compensation technology.

Ordering information:

| TXM | x | Installation | -XX | X | X |
|-----|-----------|---------------------|------------------|----------------|--|
| | 1: 1 AXIS | T: Horizontal | 10 (10°) | A (4...20 MA) | P: Improved linearity and accuracy, Only RS485 |
| | 2: 2 AXIS | TD: Horizontal-Down | 30 (30°) | B (0...5 VDC) | |
| | | V: Vertical | 60 (60°) | C (0...10 VDC) | |
| | | VL: Vertical-Left | 90 (90°) | D (RS232) | |
| | | VR: Vertical-Right | XX (OTHER RANGE) | M (MODBUS) | |
| | | | | CB (CANBUS) | |