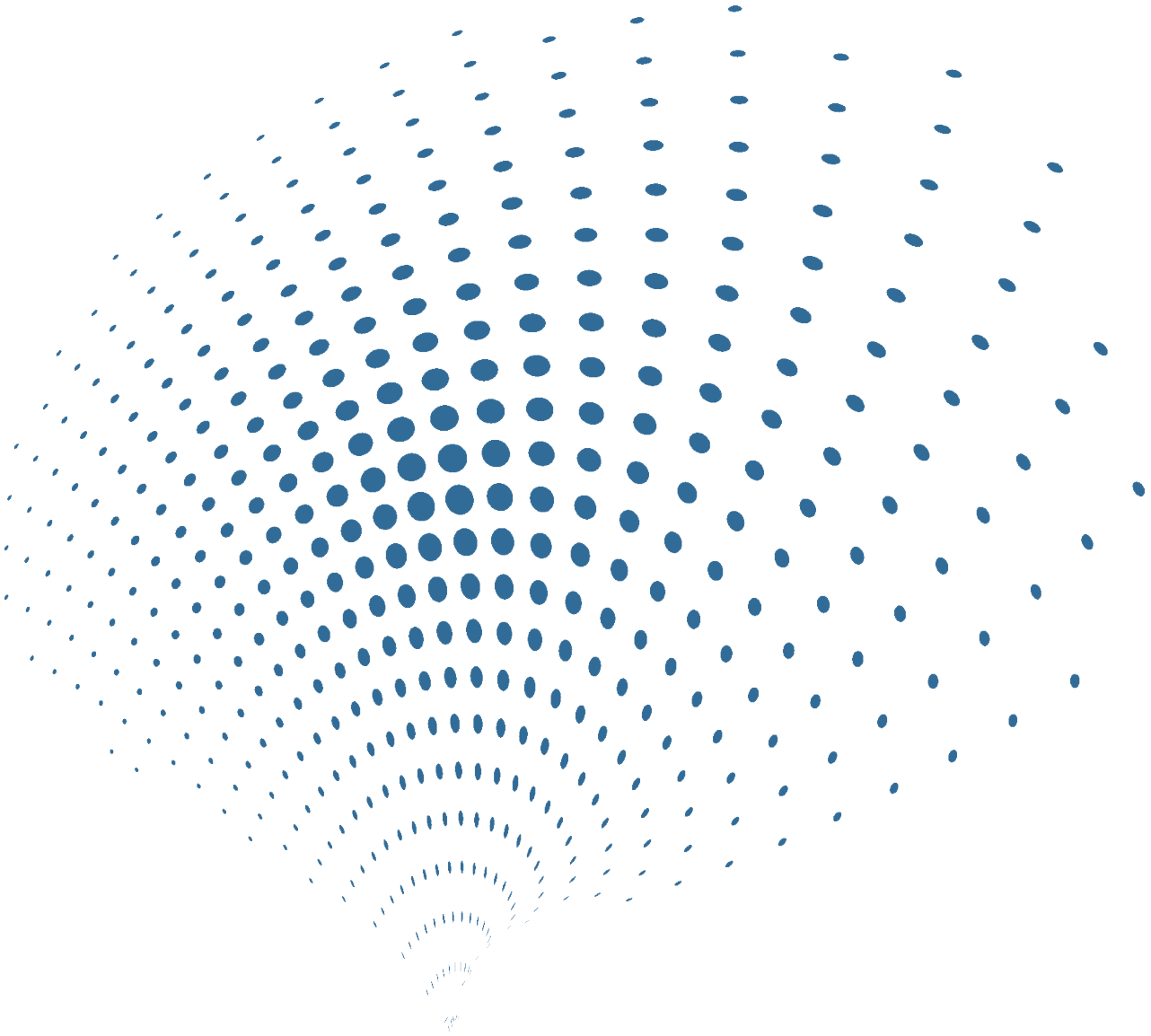
Vigor Technology



# SST500 Ultra High-Precision Inclinometer

# SST500 Ultra High-Precision Inclinometer

## Features


- Up to ±0.001° bias stability within 12 months
- Bias temperature drift achieve ±0.0005℃
- Optimization design based on CAE & EDA
- High reliability & flexibiliy
- Multi-functional management software
- Less than ±3″ bias
- Less than ± 1.5″ absolute linearity error
- Various land & aerospace application interfaces
- 3 classes: Industry class, Universal military class, High-quality military class
- Up to 15000 hours of MTBF
- Successfully applied to missile launch, radar, aerospace and other military projects
- Customized product available

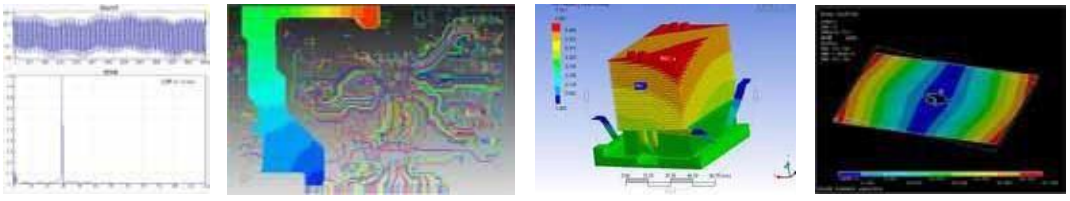
## Description

SST500 inclinometer is a revolutionary tilt measurement product, fully absorbs and learns from high precision military inertial navigation technology, precise fusion with machine-electric & inertial test technologies, applied to variety of high-class industrial & military applications.

SST500 inclinometer adopts inertial navigation grade servo accelerometer, with <0.1μg resolution, >25Hz frequency response, >120dB signal-noise ratio. Achieve ± 1.3″ accuracy at room temperature.

SST500 performs excellent dynamic characteristics, long-term stability, and environmental adaptability, experienced with various static & quasi-static long-term works under industrial & military harsh environment. Thanks Vigor's engineers for making complete modal testing for whole body & key components, to minimize interference from outside shock & vibration.

To maximize reliability of SST500 inclinometer, modeling analysis, regulated software & hardware reliability design, selected proven components directory, finite element analysis (thermal reliability analysis, structural reliability analysis) and FMEA, have been made to ensure the optimal performance and stability as well.



## Applications

Military: missile launch, rocket launch, military radar, mobile communication equipment, fire control system, bunkers monitoring, flight test, laser/video equipment, navigation system, etc.

Civil: large-scale bridge, tunneling guidance equipment, space observations, precision machine tools, optical instrument, etc.




## Carried Standards

- GB/T 191 SJ 20873 General requirements for Inclinometer & levelmeter (China)
- GBT 18459 Methods for Calculating the Main static performance specifications for tansducers(China)
- JJF 1059 Evaluation and Express of Uncertainty in Measurement(China)
- JJF 1094 Evaluation of the Characteristics of Measuring Instruments(China)
- JJF 1116 Calibration Specification for Linear Accelerometer used precision Centrifuger(China)
- QJ 2318 The test method of gyro & accelerometer(China)
- GJB 2786A General Requirements for Military Software Development(China)
- GJB 2884 General Specification for Three Axis angular motion simulator(China)
- EN61000-4-11 Voltage dips &Voltage variations
- MIL-HDBD-338B
- ISO 5348 IDT
- MIL-STD-810F-501.4
- MIL-STD-810F-502.4
- MIL-STD-810F-503.4
- MIL-STD-810F-506.4
- MIL-STD-810F-510.4
- MIL-STD-810F-514.5
- MIL-STD-810F-516.5
- IEC60529 IP
- EN61000 -4-2 ESD
- EN61000-4-3 RS
- MIL-STD-810F-507.4
- EN61000-4-4 EFT
- EN61000-4-5 SURGE
- EN61000-4-6 CS
- EN61000-4-8 PFMF
- ISTA-2A

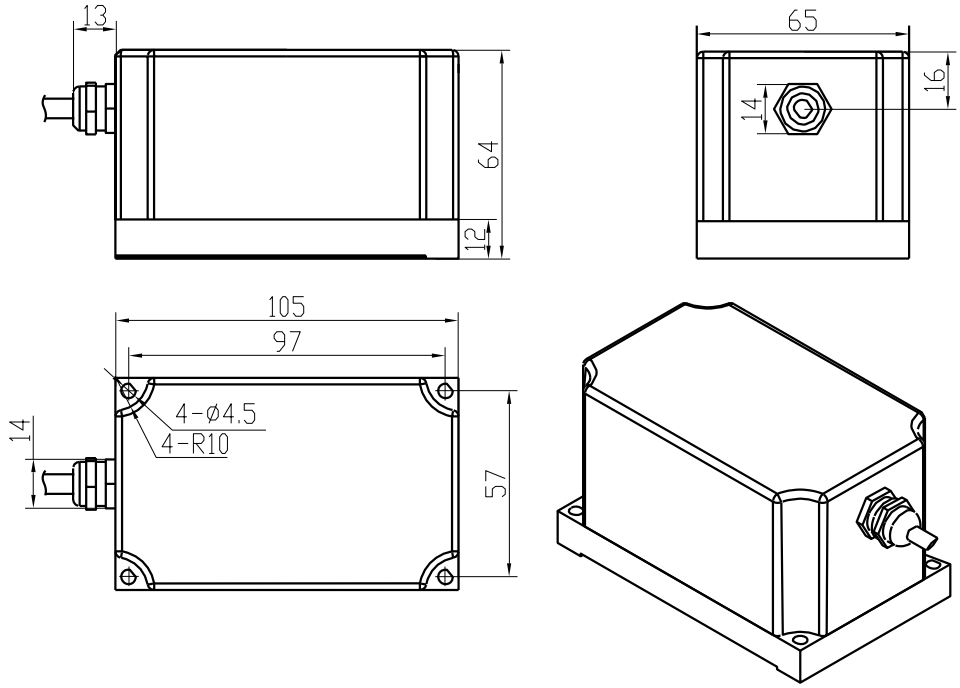
# Performances

Table 1 Specification

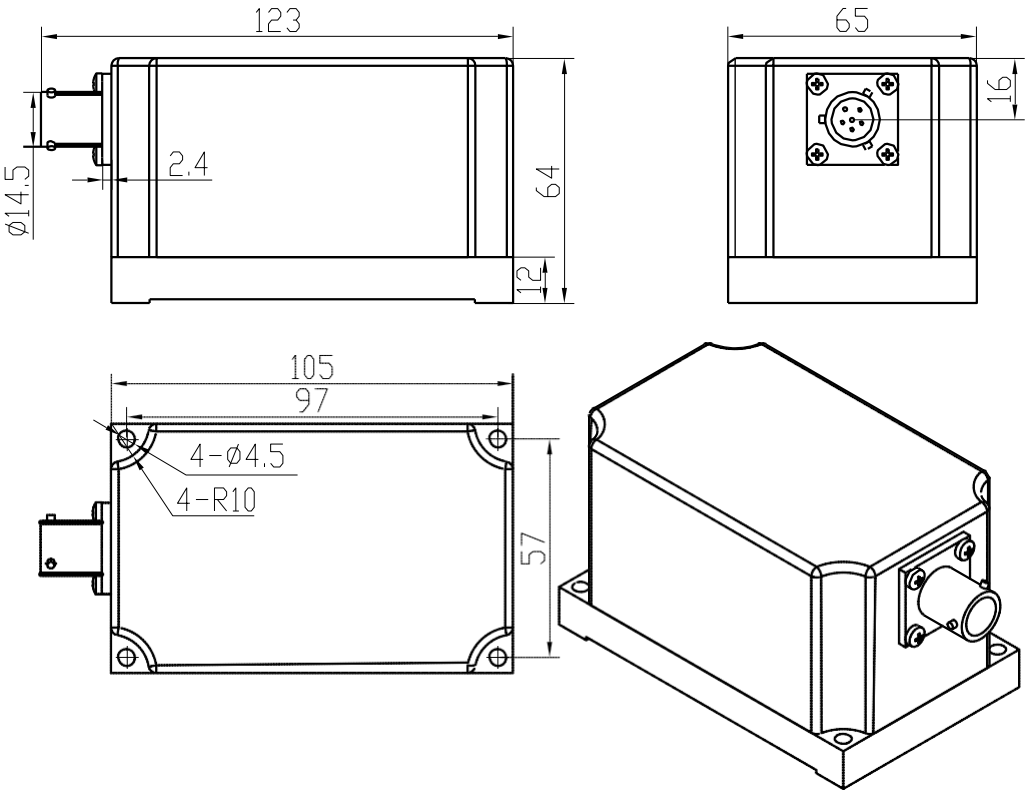
| Measurement range | | ±1° | ±5° | ±10° | ±15° | ±30° | ±45° | ±60° |
|---|---|---|---|---|---|---|---|---|
| Absolute linearity error(@20℃) | | ±1.5″ | ±5″ | ±10″ | ±10″ | ±15″ | ±25″ | ±40″ |
| Resolution | | 0.1″ | 0.2″ | 0.5″ | 0.5″ | 0.6″ | 1″ | 2″ |
| Axis | | Single/Double | | | | | | |
| Bias repeatability | Industry class | ±3.6″ | ±3.6″ | ±3.6″ | ±3.6″ | ±10″ | ±18″ | ±18″ |
| | Universal military class | ±3″ | | | | | | |
| | High-quality military class | ±2″ | | | | | | |
| Bias stability | Industry level @ 6 months | ±10″ | ±10″ | ±10″ | ±10″ | ±18″ | ±18″ | ±30″ |
| | Universal military class @ 6 months | ±3.6″ | | | | | | |
| | High-quality military class @ 12 months | ±3.6″ | | | | | | |
| Bias | Industry class | ±10″ | ±10″ | ±10″ | ±10″ | ±18″ | ±18″ | ±30″ |
| | Universal military class | ±8″ | | | | | | |
| | High-quality military class | ±3.6″ | | | | | | |
| Bias temperature drift. /℃ | Industry class @-20~65℃ | ±5″ | ±5″ | ±5″ | ±10″ | ±15″ | ±20″ | ±25″ |
| | Universal military class @-40~85℃ | ±0.5″ | ±0.5″ | ±0.5″ | ±1″ | ±1″ | ±2″ | ±2″ |
| | High-quality military class @-55~125℃ | ±0.5″ | ±0.5″ | ±0.5″ | ±1″ | ±1″ | ±2″ | ±2″ |
| Sensitivity temperature drift ppm/℃ | Industry class @-20~65℃ | ±35 | ±35 | ±40 | ±40 | ±50 | ±50 | ±60 |
| | Universal military class @-40~85℃ | ±30 | ±20 | ±20 | ±10 | ±10 | ±10 | ±10 |
| | High-quality military class @-55~125℃ | ±30 | ±20 | ±20 | ±10 | ±10 | ±10 | ±10 |
| Cross-axis sensitivity | Industry class | ±0.1%FS | | | | | | |
| | Universal military class | ±0.05%FS | | | | | | |
| | High-quality military class | ±0.02%FS | | | | | | |
| Misalignment | Industry class | ≤2mrad. | | | | | | |
| | Universal military class | ≤0.5mrad. | | | | | | |
| | High-quality military class | ≤0.05mrad. | | | | | | |
| Response time | Industry class | 0.3~1.0s(depends on requested accuracy ) | | | | | | |
| | Universal military class | 0.1~1.0s(depends on requested accuracy ) | | | | | | |
| | High-quality military class | 0.1~1.0s(depends on requested accuracy ) | | | | | | |
| Cold start warming time | Industry class | 180s | | | | | | |
| | Universal military class | 120s | | | | | | |
| | High-quality military class | 60s | | | | | | |
| Output | Industry class | Interface:RS232, RS485, update rate:5Hz, Format:9600bps(adjustable),8 data bits,1 start,1 stop, no parity, ASCII | | | | | | |
| | Universal military class | Interface:RS422,update rate:10Hz,20Hz,50Hz, Format:9600bps(adjustable),8 data bits,1 start,1 stop, no parity, ASCII | | | | | | |
| | High-quality military class | Interface:MIL-STD-1553B, ARINC429, IEEE1394, IBIS, or depend on request | | | | | | |
| EMC | Industry class | According to EN61000 or GBT17626 | | | | | | |
| | Universal military class | GJB 151A or MIL STD-461 | | | | | | |
| | High-quality military class | GJB 151A,or MIL STD-461,or depend on request | | | | | | |

| | | |
|---|---|---|
| MTBF | Industry class | ≥5000h/times |
| | Universal military class | ≥10000h/times |
| | High-quality military class | ≥15000h/times |
| Power supply | Industry class | 9~36VDC(unregulated),≤80mA@24VDC |
| | Universal military class | 12~48VDC(unregulated),≤80mA@24VDC |
| | High-quality military class | 12~48VDC(unregulated),consumption depends on request |
| Shock | Industry class | 100g@11ms,3 axis,6directions,half-sine,1times/axis, total 6 times |
| | Universal military class | 100g@11ms,3 axis,6directions,square wave,2times/axis, total 12 times |
| | High-quality military class | 100g@11ms,3 axis,6directions,square wave,3times/axis, total 18 times |
| Vibration | Industry class | 3grms, 20~2000Hz,random |
| | Universal military class | 5grms, 20~2000Hz,random,1g,1oct/min,20~2000Hz,sine |
| | High-quality military class | 6grms, 20~2000Hz,random,2g,1oct/min,20~2000Hz,sine |
| Rapid temperature change test | Industry class | -40~85℃ range,10℃ /min ratio |
| | Universal military class | -40~85℃ range,15℃ /min ratio |
| | High-quality military class | -60~125℃ range,15℃ /min ratio |
| Storage temperature test | Industry class | -40~85℃ range, 24h,according to GJB/MIL or depend on request |
| | Universal military class | -40~125℃ range, 2×24 h, according to GJB/MIL or depend on request |
| | High-quality military class | -60~125℃ range, 7×24 h, according to GJB/MIL or depend on request |
| Housing | Industry class | 6061-T6 aluminum housing,316N base |
| | Universal military class | Full 316N,10 cycles of heat treatment |
| | High-quality military class | Full 316N,10 cycles of heat treatment,6months natural stress release, or depends on request |
| Connecting | Industry class | Military connector or metal pigtail with 2m shield 7-wire cable (heavy duty up to 30kg) |
| | Universal military class | Military full stainless steel connector, or full stainless steel pigtail with 2m shield 7-wire cable (heavy duty up to 50kg) |
| | High-quality military class | Military full stainless steel connector, or full stainless steel pigtail with 2m shield 7-wire cable (heavy duty up to 50kg) |
| Protection | Industry class | IP65 |
| | Universal military class | IP67 |
| | High-quality military class | Depends on request |
| Operation temperature range | Industry class | -40~85℃ |
| | Universal military class | -40~85℃ |
| | High-quality military class | -55~125℃ |
| Storage temperature range | Industry class | -40~85℃ |
| | Universal military class | -60~125℃ |
| | High-quality military class | -60~125℃ |
| Weight | Industry class | 2Kg |
| | Universal military class | 3Kg |
| | High-quality military class | Depends on request |
| Size | Industry class | 105x65x64mm(without connector and pigtail) |
| | Universal military class | 105x65x64mm(without connector and pigtail) |
| | High-quality military class | Depends on request |
| Temperature sensor (internal) | Industry class | Range -50~125℃ , accuracy ±1℃ |
| | Universal military class | Range -50~125℃ , accuracy ±1℃ |
| | High-quality military class | Range -60~125℃ , accuracy ±1.5℃ |

## Dimensions (mm)

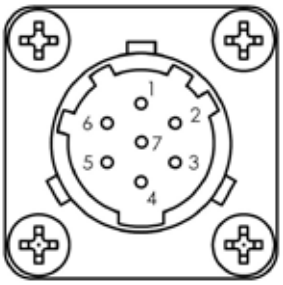



Picture 1 Mechanical draft
(Pigtail, suitable to industry class & universal military class)




Picture 2 Mechanical draft
(Military connector, suitable to industry class & universal military class)

# Wiring



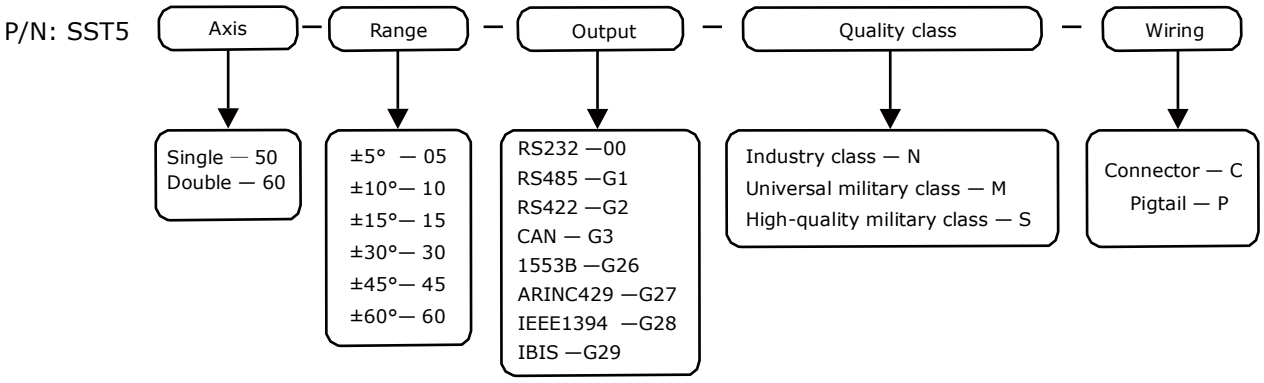

Picture 3 Connector socket
(view from outside)

Table 2 Wiring definition

| Socket pin | Pigtail cable | Output(single or double axis) | | | |
|---|---|---|---|---|---|
| | | RS232 | RS485 | RS422 | CAN |
| 1 | Red | Power + | Power + | Power + | Power + |
| 2 | Black | Power - | Power - | Power - | Power - |
| 3 | Green | Signal GND | Signal GND | Signal GND | Signal GND |
| 4 | Yellow | NC | NC | RS422-RXD+ | CAN-H |
| 5 | White | NC | NC | RS422-RXD- | CAN-L |
| 6 | Blue | RS232-TXD | RS485-A | RS422-TXD+ | NC |
| 7 | Brown | RS232-RXD | RS485-B | RS422-TXD- | NC |

Note: 1. Don't connect signal GND and Power GND together.
2. Other outputs on request.

# Ordering information



Shanghai Vigor Technology Development Co., Ltd.

Tel:021-58404921 Fax:021-58354552 Website: www.vigordigital.com
Address: Room 102, Block 4, No. 289 of Bisheng Road, Shanghai, China