



Features

- High accuracy dual-axis dynamic tilt sensor
- Measuring range: Pitch: $\pm 90^\circ$, Roll: $\pm 180^\circ$
- Static accuracy: 0.05° (typical)
- High resolution: 0.005° | 0.1 mg
- Ultra-low noise: $0.002^\circ/\sqrt{\text{Hz}}$
- Very low temperature offset drift: $\pm 0.002^\circ/\text{C}$ (Typical)
- Three-axis accelerometer
- Three-axis gyroscope data
- Simple ASCII interface language
- IP 67 compliant connector, cable and housing
- Robust aluminum housing
- Low power consumption: < 250 mW (< 50 mA @ 5 V)

Applications

- Dynamic platform alignment, and stabilization
- Vehicle control, ship, robot, automotive
- Tilt sensing and leveling
- Automotive safety systems
- Motion and position measurement
- Navigation and GPS compensation
- Robotics position sensing and control
- Agricultural and industrial vehicle tilt monitoring

Specifications – Mechanical

Protection	IP 67 (housing, connector, and cable)
Dimension	1.65" x 2.15" x 1.00"
Material	Enclosure: anodized aluminum Connector: brass/nickel Cable molded head: TPU Cable carrier: TPU or nylon Conductor insulation: PVC
Temperature range	-40°C to $+85^\circ\text{C}$ (-40°F to $+185^\circ\text{F}$)
Connection	Cable gland connector M8, 6-contact (female)

Terminal Assignment

Connector	RS232/UART/USB	RS422	RS485	Wire Color
Pin 1	+Vin	+Vin	+Vin	Brown
Pin 2	GND	GND	GND	White
Pin 3	TX	TX+	D+	Blue
Pin 4	–	TX-	D-	Black
Pin 5	RX	RX+	D+	Gray
Pin 6	–	RX-	D-	Pink

	Device: M 8 – 6-contact (female)	Cable: M 8 – 6-pin (male)	
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Specifications – Sensors

Angles

Range	Pitch: $\pm 90^\circ$, roll: $\pm 180^\circ$
Static accuracy	$\leq 0.05^\circ$
Dynamic accuracy	$\leq 0.75^\circ$ Dynamic (RMS)
Angular resolution	0.005° 0.1 mg (@ data rate ≤ 5)
Offset change versus temperature	$\pm 0.002^\circ/\text{C}$ (typical) $\pm 0.004^\circ/\text{C}$ (maximum)

Accelerometer

Range	± 2 g/ ± 4 g/ ± 8 g selectable
Zero offset error	$< \pm 0.03^\circ$ (@ 20°C)
In-run bias stability	X & Y: < 5 μg , Z: < 10 μg
Velocity random walk	X & Y: 0.007 m/sec/ $\sqrt{\text{hr}}$ Z: 0.011 m/sec/ $\sqrt{\text{hr}}$
Noise density	25 $\mu\text{g}/\sqrt{\text{Hz}}$ (@ 200Hz)
Nonlinearity	± 0.1 % FS
Resonant frequency	2.4 kHz

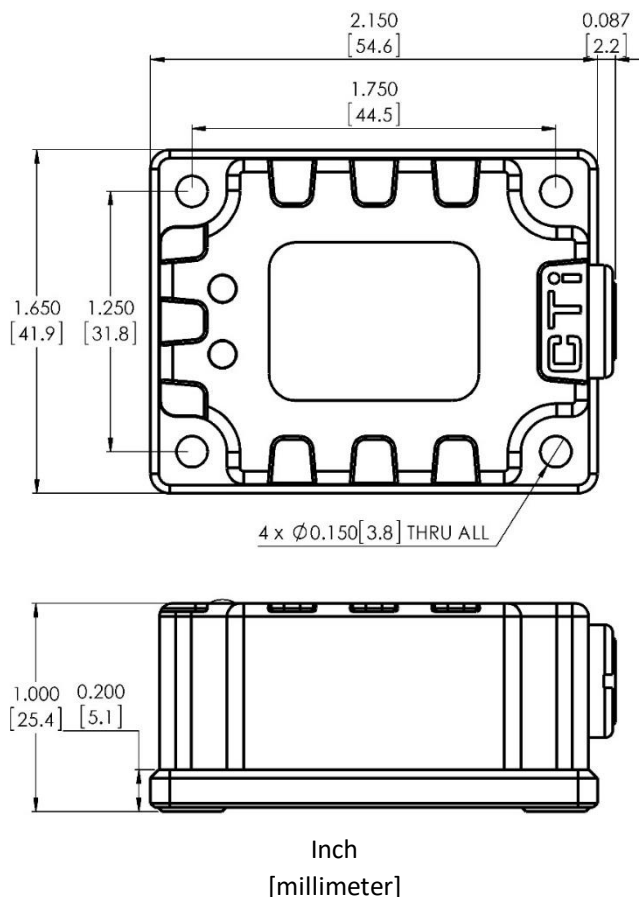
Gyroscope

Range	$\pm 250/500/1000/2000$ $^\circ/\text{s}$ selectable (Default: ± 500 $^\circ/\text{s}$)
In-run bias stability	< 20 $^\circ/\text{hr}$
Angle random walk	1.4 $^\circ/\sqrt{\text{hr}}$
Bias change versus temperature	X & Y: ± 0.02 $^\circ/\text{s}/^\circ\text{C}$ Z: ± 0.01 $^\circ/\text{s}/^\circ\text{C}$
Noise density	0.025 dps/ $\sqrt{\text{Hz}}$ (@ 100 Hz)
Nonlinearity	< 0.5 % FS

Specifications – System

Power source	4.1 – 38 VDC
Power consumption	250 mW (50 mA @ 5 V)
Data format	ASCII
Baud rate	2.4kbps – 921.6kbps selectable default: 115.2kbps
Output data rate	1 Hz to 400 Hz selectable
Serial interface options	RS232, RS422, RS485, UART/USB RS485 with multi-drop networking, Wireless
GUI software	WinCTi-Tilt®
Temperature sensor resolution	0.5°C resolution

Dimensional Drawing



Part Number

TILT - XX X - X - XX

Design model
A1

Interface

3 RS232
4 RS422
8 RS485
U UART/USB
S SSI*
W Wireless

Housing material

A Aluminum
P ABS Plastic*
S Stainless Steel 316L*
O OEM (No Housing)

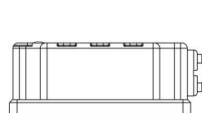
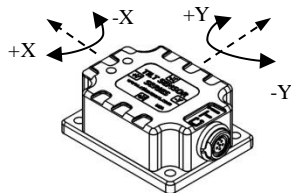
Family Series

- 05 Small size board (1"x1")
- 10 Board with multiple interfaces*
- 15 High accuracy analog inclinometer board
- 20 Low cost, ABS plastic enclosure*
- 3x High accuracy, aluminum enclosure
- 5x Dynamic inclinometer, aluminum enclosure
- 70 Harsh environment, stainless steel enclosure*

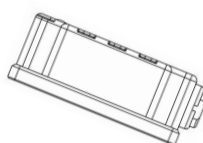
* Product/option not available

Horizontal installation position

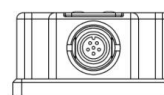
Measuring range: $\pm 90^\circ$ (two-dimensional)



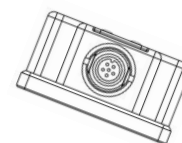
Default
Y=0



Inclination
Y=+30



Default
X=0



Inclination
X=+30

Warranty: This product has 18 months limited warranty. For more information, please visit:

www.CTiSensors.com/warranty

This product is fully designed and manufactured in the U.S.A.

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