TILT – 33A

High Accuracy
Three-Axis Accelerometer

Dual-Axis Inclinometer

Product Brief

Specifications – electrical

Power source	4.1 – 38 VDC
Measuring range (Dual mode)	±90° (two-dimensional) ±180° (one-dimensional)
Resolution	< 0.005° | 0.1 mg (@data rate ≤ 5)
Noise density	±0.0014°/$\sqrt{Hz}$
Accuracy: Horizontal installation Vertical installation	 Err. ≤ ±0.04° (typical) Err. < ±0.06° (within ±30° of Vertical)
Zero offset error	< ±0.02° (@20°C)
Temperature offset drift	±0.002° /°C (typical)
Repeatability	< 0.02°
Low-pass filter bandwidth	Selectable, 1 Hz to 1kHz
Baud rate	2.4kbps – 921.6kbps selectable, default: 115.2kbps
Data format	ASCII, port settings: 1 start bit, 8 data bits, 1 stop bit & no parity
Output data rate	1, 2, 5, 10, 20, 25, 40, 50, 100, 200, and 500 Hz selectable
LED indicators	Green: CPU heartbeat Flashing at 1 Hz Red: Data transmission rate Flashing at current data rate
Power consumption	< 30 mA (@ 5 V)
GUI software	WinCTi-Tilt®
Serial interface options	RS232, RS422, RS485, UART/ USB, Wireless, RS485 with multi-drop networking
Temperature sensor resolution	0.2°C

Accessories

Please refer to accessories' datasheets

Features

- Dual mode digital inclinometer
  - Dual-axis, horizontal installation: ±90°
  - Single-axis, vertical installation: ±180°
- High resolution: < 0.005° | 0.1 mg
- High accuracy: err. ≤ 0.04° (typical)
- Ultra-low noise: ±0.0014°/$\sqrt{Hz}$
- Very low temperature offset drift: ±0.002°/°C (Typical)
- Selectable accelerometer range: ±2 g/±4 g/±8 g
- Simple ASCII interface language
- Programmable bandwidth and response time
- IP 67 compliant connector, cable, and housing
- Robust aluminum housing

Applications

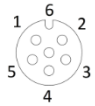
- Platform control, alignment, and stabilization
- Inclination and rotational movement measurement
- Antenna and satellite dish tracking and control
- Navigation and GPS compensation
- Robotic position sensing and control
- Position feedback for solar tracking systems
- Agricultural and industrial vehicle tilt monitoring

Specifications – mechanical

Protection	IP 67 (housing, connector, and cable)
Dimension	1.65" x 2.15" x 1.00"
Material (Cable is optional as a third party product)	Enclosure: anodized aluminum Connector: brass / nickel Cable molded head: TPU Cable carrier: TPU or nylon Conductor insulation: PVC
Temperature range	-40°C to +85°C (-40°F to +185°F)
Connection	Cable gland connector M8, 6-contact (female)

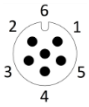
Terminal Assignment

Connector	RS232/UART/USB[1]	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)



[1] USB uses UART interface and a UART to USB cable.

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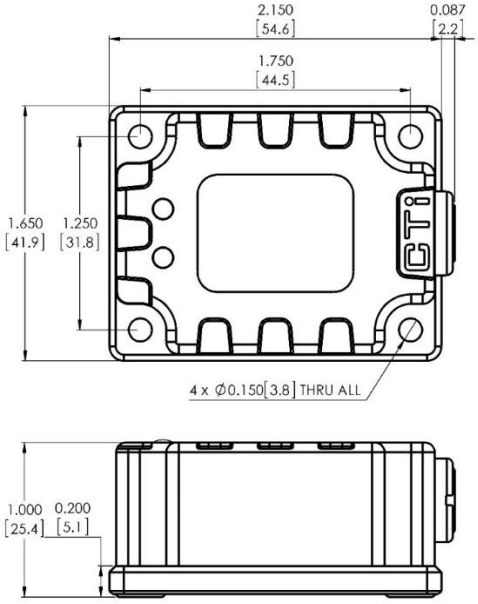
Dimensional drawing



Inch
[millimeter]

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)*

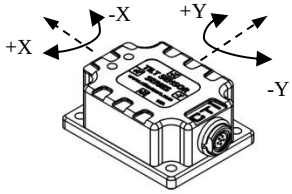
Family Series

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**

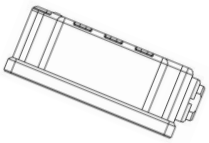
* Product/option not available

Horizontal installation position

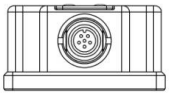
Measuring range: ±90° (two-dimensional)



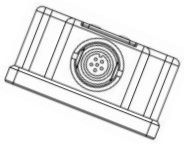
Default
Y=0



Inclination
Y=+30

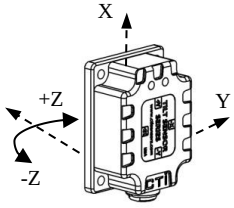


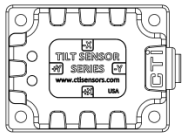
Default
X=0



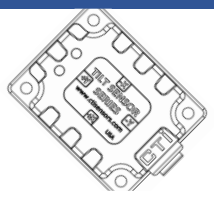
Inclination
X=+30

Vertical installation position

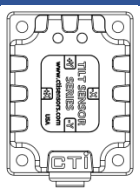




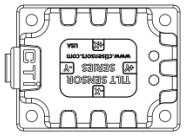
Rotation
R=0



Rotation
R=+45



Rotation
R=90



Rotation
R=+180

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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