



### Specifications – Sensors

#### Angles

Range	Pitch: $\pm 90^\circ$ , roll: $\pm 180^\circ$
Static accuracy	$\leq 0.03^\circ$ RMS (typical)
Dynamic accuracy	$0.5^\circ$ RMS (typical)
Angular resolution	$< 0.003^\circ$
Zero offset error	$< \pm 0.02^\circ$ (@20°C)
Offset change versus temperature	$\pm 0.002^\circ / ^\circ\text{C}$ (typical)

#### Accelerometer

Range	$\pm 2\text{ g}/\pm 4\text{ g}/\pm 8\text{ g}$ selectable
Zero offset error	$< \pm 0.5\text{ mg}$ (@20°C)
In-run bias stability	X & Y: $< 5\ \mu\text{g}$ , Z: $< 10\ \mu\text{g}$
Velocity random walk	X & Y: $0.007\text{ m/sec/vhr}$ Z: $0.011\text{ m/sec/vhr}$
Noise density	$25\ \mu\text{g}/\sqrt{\text{Hz}}$ (@200Hz)
Nonlinearity	$\pm 0.1\%$ FS
Resonant frequency	2.4 kHz

#### Gyroscope

Range	$\pm 125/250/500/1000/2000^\circ/\text{s}$ selectable
In-run bias stability	$10^\circ/\text{hr}$
Angle random walk	$0.35^\circ/\text{vhr}$
Initial bias error	$< 0.1^\circ/\text{s}$ (@ $\pm 500^\circ/\text{s}$ range)
Bias change versus temperature	X and Y: $< \pm 0.01^\circ/\text{s}/^\circ\text{C}$ (In-run compensated), Z: $< \pm 0.025^\circ/\text{s}/^\circ\text{C}$
Noise density	$0.007\text{ dps}/\sqrt{\text{Hz}}$ (@ 10 Hz)
Nonlinearity	$< 0.1\%$ FS

### Specifications – System

Power source	4.1 – 38 VDC
Power consumption	400 mW (80 mA @ 5 V)
Data format	ASCII
Baud rate	2.4kbps – 921.6kbps selectable default: 115.2kbps
Output data rate	1 Hz to 2 kHz selectable
Serial interface options	RS232, RS422, RS485, UART/USB RS485 with multi-drop networked
GUI software	WinCTi –Tilt-57®
Temperature sensor	$0.2^\circ\text{C}$ resolution

### Features

- High accuracy dual-axis dynamic tilt sensor
- Measuring range: Pitch:  $\pm 90^\circ$ , Roll:  $\pm 180^\circ$
- Static accuracy:  $\leq 0.03^\circ$  (typical)
- Dynamic accuracy:  $0.5^\circ$  (typical)
- High resolution:  $\leq 0.003^\circ$
- Ultra-low noise:  $0.001^\circ/\sqrt{\text{Hz}}$
- Very low temperature offset drift:  $\pm 0.002^\circ/^\circ\text{C}$  (Typical)
- Highest output data rate: up to 2 kHz
- Three-axis accelerometer and three-axis gyroscope data
- Simple ASCII interface language
- IP 67 compliant connector, cable and housing
- Robust aluminum housing
- Low power consumption: 400 mW (80 mA @ 5 V)

### Applications

- Motion and dynamics measurements
- Dynamic platform alignment, and stabilization
- Vehicle control; marine, robotics, automotive
- Inertial navigation and GPS compensation
- Agricultural and industrial vehicle tilt monitoring

### Specifications – Mechanical

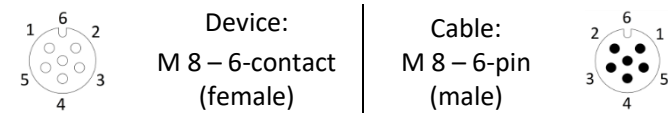
Protection	IP 67 (housing, connector, and cable)
Dimension	1.65" x 2.15" x 1.00"
Material	Enclosure: anodized aluminum
Temperature range	$-40^\circ\text{C}$ to $+85^\circ\text{C}$ ( $-40^\circ\text{F}$ to $+185^\circ\text{F}$ )
Connection	Cable gland connector M8, 6-contact (female)

### Shock and Vibration

Shock	MIL-STD-202H, Method 213 Half-Sine, 0.5 ms, 2000 g
Random Vibration	MIL-STD-202H, Method 214 50-2000Hz, 15 min/axis Overall RMS: 5.35 g

### 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



# TILT – 57A

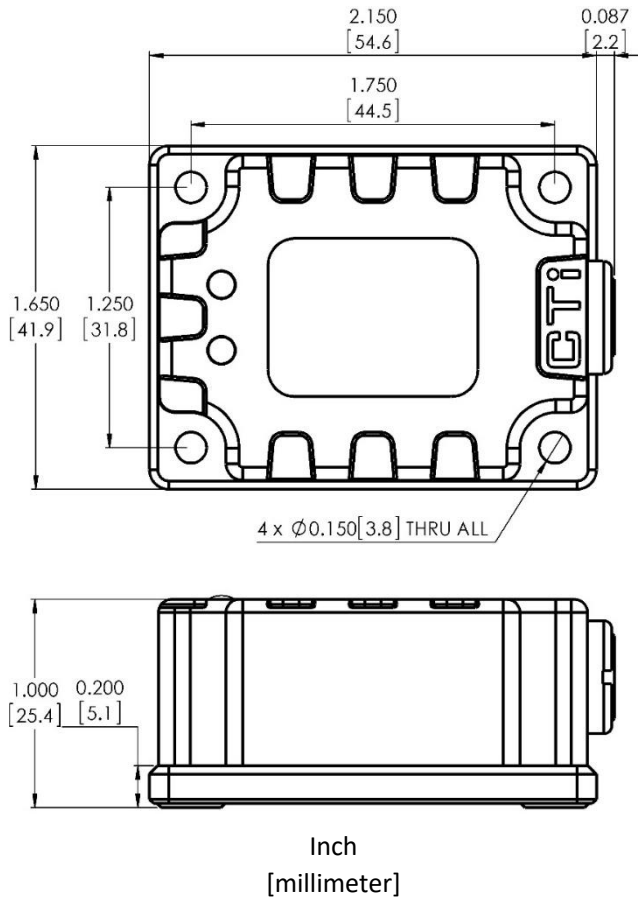
Three-Axis Accelerometer  
Three-Axis Gyroscope

# Dual-Axis Dynamic Inclinometer

## Product Brief



### Dimensional Drawing



### Part Number

TILT	-	XX	X	-	X	-	XX	
								<b>Design model</b>
								A1
								<b>Interface</b>
							3	RS232
							4	RS422
							8	RS485
							U	USB
							S	SSI*
							W	Wireless
								<b>Housing material</b>
							A	Aluminum
							P	ABS Plastic*
							S	Stainless Steel 316L*
							O	OEM (No Housing)

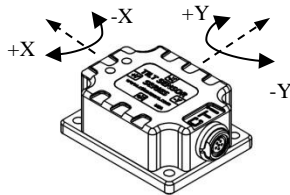
### Family Series

- 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\*

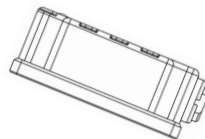
\* Product/option not available

### Horizontal installation position

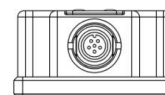
Measuring range:  $\pm 90^\circ$  (two-dimensional)



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](http://www.CTiSensors.com/warranty)

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

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