

The ACEINNA MTLT105D-R is a dynamic tilt sensor and accelerometer with programmable tilt threshold alarm and RS232 Interface. The MTLT105D-R integrates highly reliable MEMS based accelerometers and gyroscopes, a 32-bit microprocessor, protection and supporting circuitry for robust operation in many environments. The MTLT105D-R uses advanced sensor fusion, extended Kalman Filtering and calibration algorithms to achieve a 0.5-degree tilt and 10 milli-g acceleration accuracy in a wide variety of dynamic conditions. The MTLT105D-R includes an active high programmable tilt alarm for safety applications. It can be programmed to be triggered when the tilt exceeds a specified user set threshold and can be used to lock out controls or trigger a bell or warning light. The MTLT105D-R is available in a fully enclosed IP67 plastic over-molded enclosure with 1m flying leads.



## Applications

- Construction (boom tilt measurement, bucket leveling)
- Tilt/slope safety for dynamic vehicles (forklift, aerial lifts)
- Rollover detection
- Platform Stabilization
- Robotics Control



*Construction*



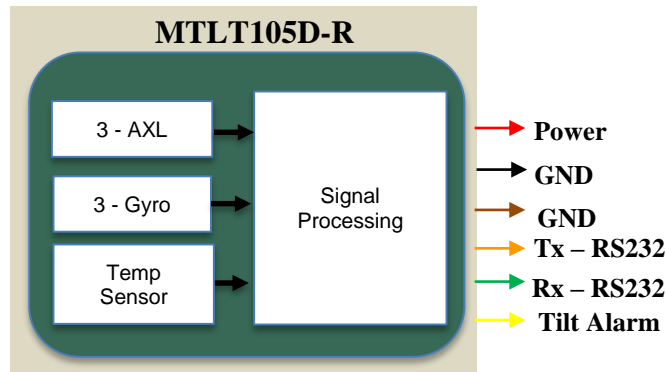
*Aerial Lift Safety*



*Platform Stabilization*

## Features

- High Performance 3 axis MEMS Accelerometer and 3 axis Gyroscope
- 0.5° accuracy in static conditions, 2° accuracy in dynamic conditions
- Gyro compensated for Dynamic conditions
- Programmable Tilt Alarm
- RS232 Interface
- Miniature IP67 enclosure (54 x 40 x 15 mm)
- Wide Temp Range, -40C to +70C
- High Reliability, MTBF > 50k hours
- ITAR- Free



### Performance Characteristics

Ta = 25°C, VDC = 15.0V, unless otherwise stated

Sensor Performance	
Axes (Tilt)	Pitch; Roll
Range	±90°, ±180°
Resolution	0.05°
Static Accuracy <sup>1</sup> (-40 to 70C)	0.5°
Dynamic Accuracy <sup>2</sup> (-40 to 70C)	2.0°
Axes (Acceleration)	X, Y, Z
Range (g)	±4
Resolution (mg)	0.5
Accuracy (mg) (±1g input; -40 to 70C)	±10
Programmable Tilt Alarm Vout (V)	3.3
Bandwidth (Hz)	50
Electrical	
Input Voltage (V)	9 to 32
Power Consumption (mW)	< 400
Interface	RS-232
Environment	
Operating Temperature (°C)	-40 °C to 70°C
Non-Operating Temperature (°C)	-55 °C to 85°C
Physical	
Enclosure	Plastic
Size (mm)	54 x 40 x 15
Protection Class	IP67

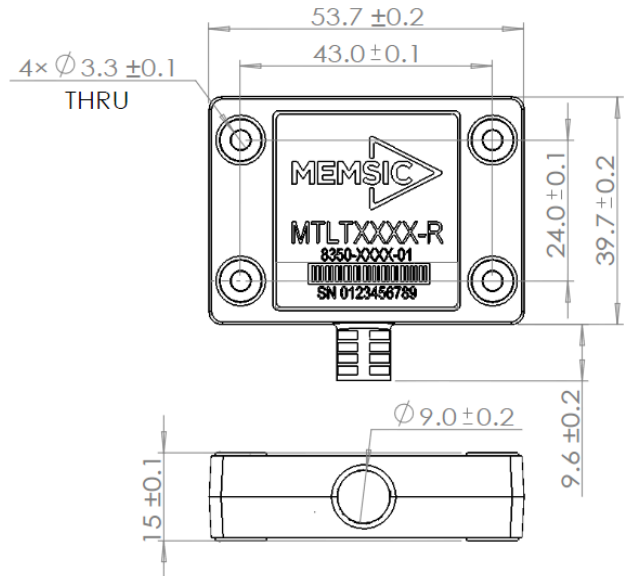
Note 1: RMS Error

Note 2: See Dynamic Test Conditions

## Tools and Support

NAV-VIEW provides an easy to use graphical interface to display, record, playback, and analyze all of the MTLT105D-R parameters.

NAV-VIEW can also be used to set a wide range of user-configurable fields in the MTLT105D-R to optimize the system performance for highly dynamic applications.



\* All dimensions in mm

Dynamic Test Conditions	
Linear acceleration	1 g, 0.5s
Shock	100 g 1/2 sine 0.1 ms or 20 g 1/2 sine 10 ms
Vibration	1 g RMS Random 5 Hz to 500Hz

Pin Out Description		
Pin Number	Flying Lead Color	Pin Description
1	Red	Power
2	Black	GND
3	Brown	GND
4	Orange	RS232 Tx
5	Green	RS232 Rx
6	Yellow	Tilt Alarm

Part Ordering Information	
MTLT105D-R	0.5° High Performance Dynamic Tilt Sensor Module with Flying Leads
MTLT105D-R-C	0.5° High Performance Dynamic Tilt Sensor Module with DB9 RS-232 Connector Installed

This product has been developed exclusively for commercial applications. It has not been tested for, and makes no representation or warranty as to conformance with, any military specifications or its suitability for any military application or end-use. Additionally, any use of this product for nuclear, chemical or biological weapons, or weapons research, or for any use in missiles, rockets, and/or UAV's of 300km or greater range, or any other activity prohibited by the Export Administration Regulations, is expressly prohibited without the written consent and without obtaining appropriate US export license(s) when required by US law. Diversion contrary to U.S. law is prohibited. Specifications are subject to change without notice.