

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*



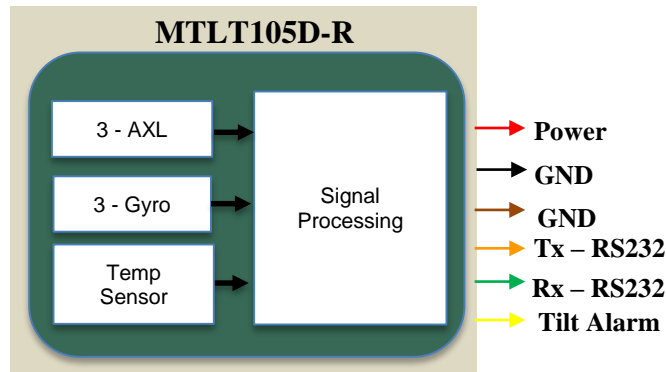
*Aerial Lift Safety*



*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

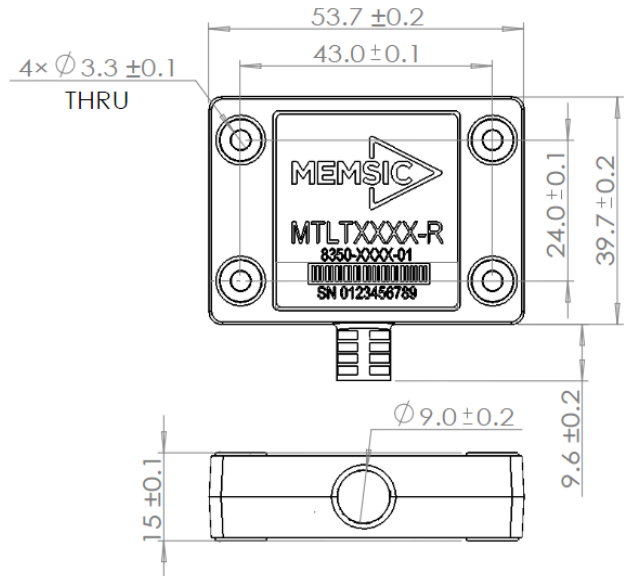
Note 2: See Dynamic Test Conditions

## 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.

NAV-VIEW software is available for download from ACEINNA's website at: [www.aceinna.com/support](http://www.aceinna.com/support)



\* 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

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