

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*



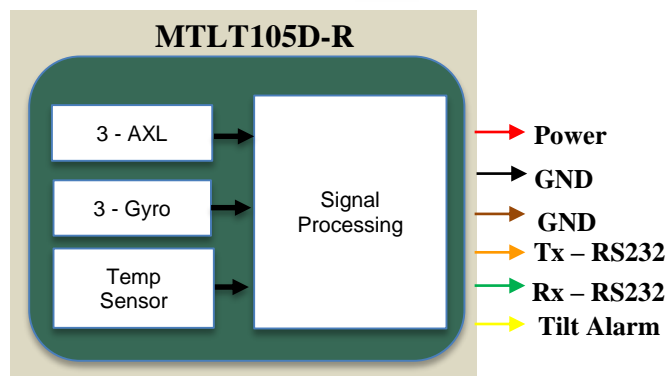
*Aerial Lift Safety*



*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)<br>(±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

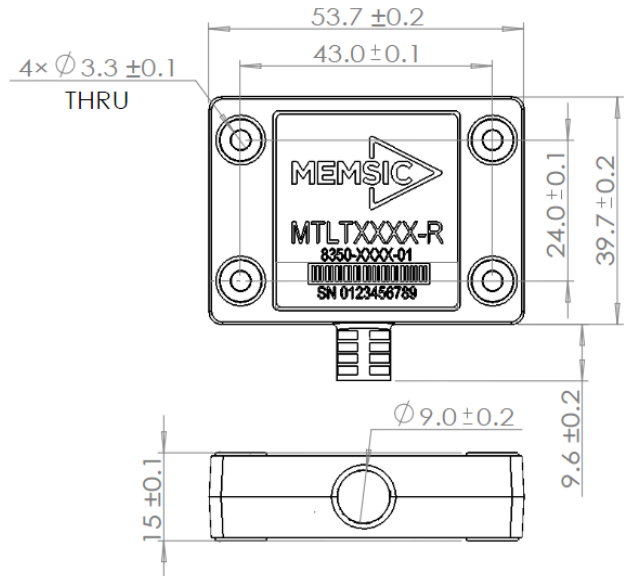
Note 2: See Dynamic Test Conditions

## 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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