

The MEMSIC MTLT105D-R series is a dynamic tilt sensor with programmable tilt threshold alarm and RS232 Interface. The MTLT105D-R integrates highly reliable MEMS based accelerometers and gyroscopes, a microprocessor to calculate tilt angles and protection circuitry for robust operating environments. The MTLT105D-R has complex sensor fusion and calibration algorithms to achieve a 0.5degree tilt 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



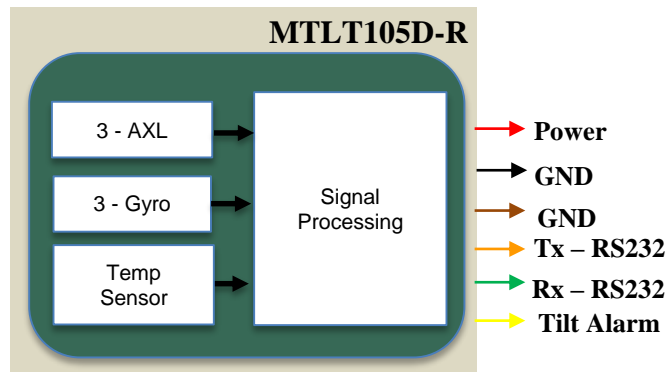
Aerial Lift Safety



Platform Stabilization

### Features

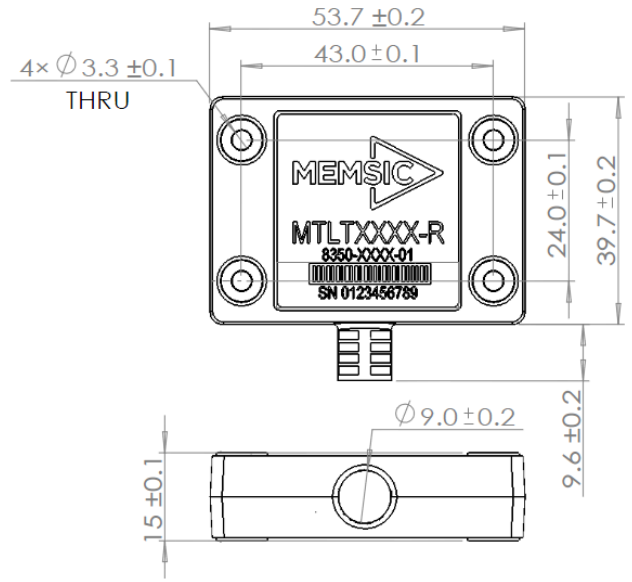
- High Performance 3 axis MEMS Accelerometer and 3 axis Gyroscope
- 0.5° accuracy in static conditions, 2° accuracy in dynamic conditions
- Gyro compensated for Dynamic conditions
- Programmable Tilt Alarm
- RS232 Interface
- Miniature IP67 enclosure (54 x 40 x 15 mm)
- Wide Temp Range, -40C to +70C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



Performance Characteristics

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

| Sensor Performance             |                |
|--------------------------------|----------------|
| Axes                           | 6              |
| Range                          | 90°, 180°      |
| Resolution                     | 0.05°          |
| Static Accuracy <sup>1</sup>   | 0.5°           |
| Dynamic Accuracy <sup>1</sup>  | 2.0°           |
| Programmable Tilt Alarm        |                |
| Vout (V)                       | 3.3            |
| Bandwidth(Hz)                  | 50             |
| Electrical                     |                |
| Input Voltage (V)              | 9 to 32        |
| Power Consumption (mW)         | < 400          |
| Interface                      | RS232          |
| 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           |



\* All dimensions in mm

## 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.

### 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 |
|------------|--|

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<sup>1</sup> RMS Error