

# MM8003, Orientation Sensor Module



## GENERAL DESCRIPTION

The MM8003 is a precision 9-axis Orientation Sensor Module (OSM) with wired (USB) and wireless (Bluetooth) connectivity that provides fused sensor data (Quaternion, Euler Angles, Linear Acceleration, Gravity, Heading) or raw data output using a 3-axis gyroscope, a 3-axis accelerometer, and a 3-axis magnetometer.

Each inertial sensor in the MM8003 combines with signal conditioning that optimizes dynamic performance. The factory calibration characterizes each sensor for sensitivity, bias, alignment, linear acceleration, and many other parameters. As a result, each sensor has dynamic compensation formulas that provide accurate sensor measurements over a broad set of conditions.

The high-performance sensor fusion algorithm with built-in mCube Extended Kalman Filter, EKF, can dynamically compensate noise and offset from three-axis gyroscope, accelerometer, and magnetometer to provide high accurate orientation measurement for different applications.

All necessary motion testing and calibration are part of the production process at the factory, greatly reducing system integration time. The serial peripheral interface (USB/UART) and desktop/mobile configuration software provide a simple interface for data collection and control. The MM8003 is available as a complete system solution measured at 50 × 50 × 20 mm and it is guaranteed to operate over an extended temperature range from -40 °C to +85 °C. For Configuring the MM8003, please refer to programming manual.



- Orientation Sensor Module (OSM)
- High Performance Sensor Fusion
- Bluetooth 5.0 Interface

## FEATURES

- Integrates 3 acceleration channels, 3 angular rate channels, 3 magnetic field channels
- USB/UART interface, ODR=25-100Hz
- Quaternion or raw data output

### 3-axis Accelerometer (mCube, MC3630)

- ±4 to ±16g FSR
- 0.9 μA @ 25Hz
- Low noise
- Factory Calibrated

### 3-axis Gyroscope (mCube MC5010)

- ±500 dps FSR
- Optimized for noise
- Factory Calibrated

### 3-axis Magnetometer

- ±8G FSR (16 bit)
- 0.25mG per LSB resolution
- 0.4mG total RMS noise
- Enables heading accuracy of 1°

## Applications

- Navigation, stabilization, and instrumentation
- Robotics, factory automation
- Fitness and medical devices
- Virtual and Augmented reality
- Internet of Moving Things

*Start using orientation sensor module, MM8003, to improve accuracy, performance and efficiency.*

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