

## PRODUCT BRIEF



9-axis System on Module with Bluetooth LE



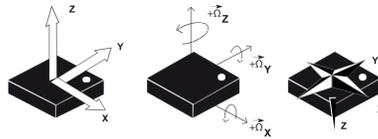
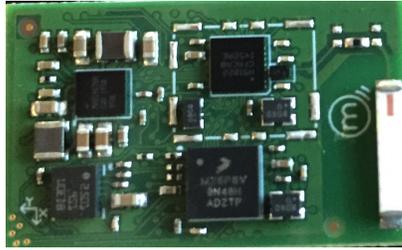
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System on module combining a 3-axis accelerometer, 3-axis gyroscope, 3-axis magnetometer, motion fusion engine, 32-bit microprocessor, Bluetooth Low Energy radio, power and battery management, and much more.

## Motion Sensing System on Module

### Description

The Neblina™ is a compact, low-power system on module, with a 3-axis accelerometer, 3-axis gyroscope, 3-axis magnetometer, patent-pending motion fusion engine, 32-bit processor, Bluetooth Low Energy radio, power management, and much more. It can be easily extended and integrated into a wide range of wearable, consumer, medical, and industrial products.



### Features

- 3-axis MEMS accelerometer
- 3-axis MEMS gyroscope
- 3-axis MEMS magnetometer
- 32-bit NXP Kinetis KL26Z for sensor fusion
- 32-bit Nordic nRF51822 processor for applications
- Bluetooth Low Energy radio
- 2 x 256 kB program memory
- Expansion connectors for external sensors, I/O
- UART for programming and debug

### Basic API Functions

- Quaternions
- Yaw, Pitch, Roll
- Pedometer step count
- Heading
- Linear acceleration
- Angular velocity
- Angular position
- Battery status

### SYSTEM CAPABILITIES

- Precision tracking of both fast and slow motion
- Tuneable motion parameters
- Bluetooth LE connection to smartphones, tablets, and other BLE devices
- Low-power activity detector, including precision pedometer
- Dedicated 32-bit processor and 256KB of flash memory for fusion engine
- Separate 32-bit processor and 256KB of flash memory for programming applications
- Over-the-air firmware updates
- Encryption support
- Li-ion polymer battery charger and management
- Connectors for added functionality or interface to existing design
- LED status indication
- Analog output for audio or haptic feedback

### OVERVIEW

The Neblina™ module from Motsai was developed using state of the art HDI PCB technology allowing the core functions needed for small motion capture and system integration to be rapidly deployed. The Neblina module is compatible with standard SMT assembly process and can be used as a component on lower density circuit boards.

The Neblina module represents the distillation of Motsai's collective knowledge gained after designing several successful motion products. The most important features that repeat frequently are packaged into a versatile motion capture system that enables rapid prototyping of product ideas.

### FUNCTIONS AND BENEFITS

The Neblina module facilitates the evaluation of real-life applications that require 3D orientation, 3D position, 3D velocity, and 3D dynamic data. It showcases Motsai's patent-pending quaternion sensor fusion along with the real-time control architecture to deliver full 9 DOF motion tracking in a miniature and very lightweight package.

The Neblina module can function as a IMU (Inertial Motion Unit), VRU (Vertical Reference Unit), and AHRS (Attitude and Heading Reference System). Typical applications include wearable devices, medical rehabilitation therapy, sports performance analytics, industrial motion measurement, robotics, etc.

A high-level API is provided for application developers, along with a library of popular motions, such as step counts or trajectory tracking. The module is fully programmable for developers who wish to customize and tune the algorithms.