Product Brief

November 2020

Ultimate Sensor Fusion Solution

USFSMAX

Actual size

Absolute Orientation Estimation Engine

Low-cost, ultra-small, high-accuracy, low-power module

Quaternions at the rate of the gyro, scaled 10 DoF sensor data, AHRS (Heading, Pitch, and Roll), gravity, and linear acceleration via fast I2C register reads from any MCU host

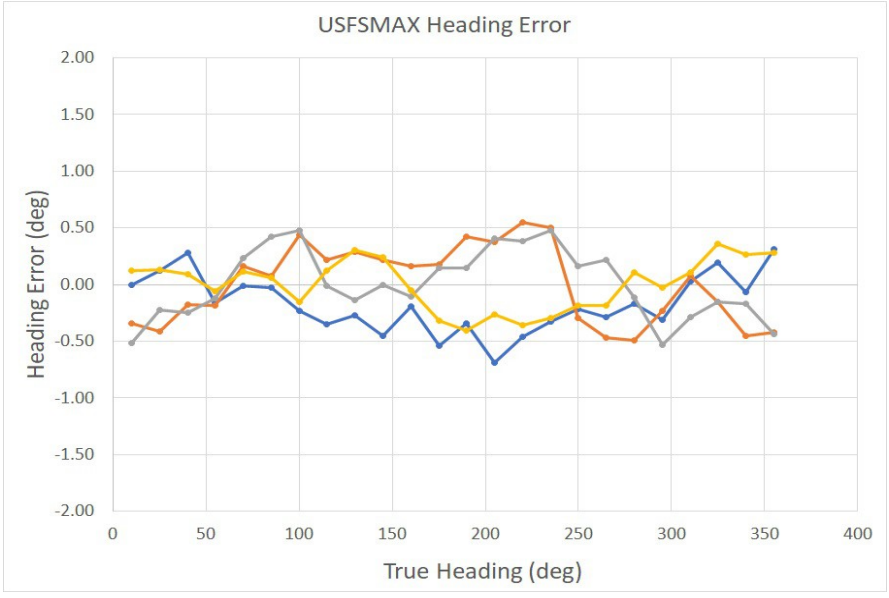
Components:*

- MAX32660 Cortex M4F Motion Co-Processor, 96 MHz, 256 kB flash, 96 kB SRAM
- LSM6DSM accel/gyro combo, 16-bit resolution, up to 6.67 kHz data rate:
  - Accel: ±16 g range, 80 µg/√Hz noise density, 130 mg-s/hour bias in-run stability
  - Gyro: ±2000 dps range, 5 mdps/√Hz noise density, 3º/hour bias in-run stability
- MMC5983A magnetometer, ±8 Gauss, 18-bit resolution, 0.4 mG RMS noise at 50 Hz data rate
- LPS22HB barometer, 24-bit (~10 cm) resolution, 1 - 75 Hz data rate, 7.5 µBar RMS noise

Features:*

- < 0.5° (0.25° typical) RMS heading accuracy, 0.1° pitch/roll accuracy
- Pre-calibrated, with cross-axis and sensor-to-sensor alignment errors corrected
- Embedded 2-D and 3-D dynamic hard iron corrector maintains accuracy in challenging magnetic environments (*i.e.*, cars, boats, robots, *etc*).
- Device-to-host data ready interrupt and host-to-device wake/sleep interrupt
- 1.8 - 3.3 V input voltage, 15 mA run current, 10 µA sleep current
- Modular, easy to integrate into OEM hardware
- < $50!

* Indicative, not guaranteed.



USFSMAX Carrier Board
12.8 mm x 17.9 mm x 1.6 mm

USFSMAX Module
12.8 mm x 12.9 mm x 1.6 mm

Sensors and co-processor are integrated into a 12.8 mm x 12.9 mm module with two connectors ready for insertion into custom hardware.

Simple C++ drivers for popular development boards and further technical information available: ***https://github.com/gregtomasch/USFSMAX* and *https://hackaday.io/project/160283-max32660-motion-co-processor*;**
Samples available at https://www.tindie.com/products/onehorse/usfsmax-module-and-carrier/ .

Quantity discounts available.