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10-DoF MEMS IMU Incorporates Sensor Fusion Algorithm for Exceptionally Precise Orientation Sensing in Industrial, Defense and Avionics Applications

NORWOOD, Mass.--(BUSINESS WIRE)-- [Analog Devices, Inc.](http://www.analog.com) (ADI) today introduced a 10-degree-of-freedom (DoF) MEMS inertial measurement unit (IMU) with an embedded sensor fusion algorithm that delivers extremely accurate orientation sensing in platform stabilization, navigation and instrumentation applications. The ADIS16480 10-DoF MEMS IMU is the latest addition to ADI's *iSensor*® MEMS IMU portfolio and integrates a tri-axis gyroscope, tri-axis accelerometer, tri-axis magnetometer, a pressure sensor and Analog Devices' ADSP-BF512 Blackfin® processor in a single package. The ADIS16480 incorporates an extended Kalman filter (EKF) that fuses the sensor inputs over time to render exceptionally precise positioning while reducing design time and cost compared to other MEMS IMUs. This is particularly useful in systems that require real-time positioning yet where movement is constant, complex and dynamic, such as military and commercial aircraft navigation, unmanned vehicles, movable platform positioning, and industrial robotics.

- Download data sheet and see product page: <http://www.analog.com/ADIS16480>
- Order samples and evaluation boards: <http://www.analog.com/ADIS16480>
- To learn more about improving platform stabilization, navigation and instrumentation applications using MEMS inertial sensors visit: <http://www.analog.com/en/mems-sensors/mems-inertial-measurement-units/products/index.html>

ADIS16480 Embedded, Extended Kalman Filter Yields Highly Accurate Orientation Sensing

Kalman filtering is a mathematical algorithm that estimates the given state of a noisy, variable process by taking multiple measurements over time, and merging these with a predictive state estimator. When embedded in the ADIS16480, the Kalman filter intelligently combines the MEMS IMU's motion sensor inputs to deliver exceptionally precise positioning data, even under complex operating conditions characterized by constant, unpredictable movement. By embedding the filter in the Blackfin processor's core, ADI also saves designers the time and cost associated with the intensive code development, testing and external processing required by other MEMS IMUs.

"When determining exact position or orientation, industrial and defense electronics systems are dependent not only on the accuracy of individual sensors, but on the sophistication of accurately and dynamically combining multiple inputs," said Bob Scannell, *iSensor* business development manager, MEMS/Sensors Group, Analog Devices. "The ADIS16480 MEMS IMU's embedded, extended Kalman filter helps the system discern which sensors to 'trust' based on contextual awareness. This allows system-level designers to achieve positional accuracy under a variety of demanding environmental conditions by either letting the filter autonomously adjust, or by tuning the filter via its programmable interface."

More About the ADIS16480 *iSensor* 10-DoF MEMS IMU

With a 330-MHz bandwidth that is 6x wider than competing sensors, the ADIS16480 *iSensor* 10-DoF MEMS IMU combines ADI's high-performance *iMEMS*® technology and precision sensor-signal processing to support closely aligned (0.05 degree) and phase-matched axes, and industry leading non-linearity of 0.01%. Every MEMS IMU is uniquely factory calibrated, which significantly reduces the time and risk associated with development and integration, as well as providing extremely low sensitivity to thermal drift.

ADIS16480 *iSensor* 10-DoF MEMS IMU Key Specifications

- Extended adaptive Kalman filter
- Tri-axis, digital gyroscope: $\pm 450^\circ/\text{sec}$ dynamic range
 - $6^\circ/\text{hr}$ in-run bias stability
 - $0.3^\circ/\sqrt{\text{hr}}$ angular random walk
- Tri-axis, digital accelerometer: ± 10 g
- Tri-axis, digital magnetometer: ± 2.5 gauss
- Digital pressure sensor: 300 mbar to 1100 mbar

- Fast start-up time: ~500 ms
- SPI-compatible serial interface
- 2000 g shock survivability

Analog Devices Expands iSensor MEMS IMU Portfolio

Also today, ADI further extended its iSensor MEMS IMU portfolio by introducing the ADIS16448 10-DoF and ADIS16485 6-DoF MEMS sensors. The ADIS16448 is designed for platform stabilization, navigation and instrumentation applications and delivers the industry's best combination of price, performance and package density (24-mm x 38-mm x 11-mm). The ADIS16485 MEMS IMU includes a tri-axis gyroscope and a tri-axis accelerometer, and features the best combined gyroscope (6°/hr) and accelerometer (32 µg) in-run bias stability of any available 6-DoF MEMS IMU.

Availability and Pricing

Product	Sample Availability	Full Production	Price each per 1k units	Packaging
ADIS16480	Now	Now	\$1545.00	47 mm x 44 mm x 14 mm 24-lead module with connector interface
ADIS16448	Now	July 15	\$459.00	24.1 mm x 37.7 mm x 10.6 mm 20-lead module with connector interface
ADIS16485	Now	Now	\$1095.00	47 mm x 44 mm x 14 mm 24-lead module with connector interface

About Analog Devices

Innovation, performance, and excellence are the cultural pillars on which Analog Devices has built one of the longest standing, highest growth companies within the technology sector. Acknowledged industry-wide as the world leader in data conversion and signal conditioning technology, Analog Devices serves over 60,000 customers, representing virtually all types of electronic equipment. Analog Devices is headquartered in Norwood, Massachusetts, with design and manufacturing facilities throughout the world. Analog Devices is included in the S&P 500 Index.

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