



## **KVH Introduces FOG-Based Inertial Navigation Systems (INS) for Demanding Unmanned and Autonomous Applications**

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### **The Rugged Systems Are Designed to Deliver Continuous, Highly Accurate Position, Navigation, and Control Information for a Wide Variety of Platforms, Even When GNSS is Unavailable**

MIDDLETOWN, R.I., Jan. 12, 2016 (GLOBE NEWSWIRE) -- KVH Industries, Inc., (Nasdaq:KVHI), has introduced the GEO-FOG™ 3D inertial navigation system (INS). This new product offers roll, pitch, and heading accuracies of .05° for demanding applications in unmanned, autonomous, and manned aerial, ground, marine, and subsurface platforms, such as subsea remotely operated vehicles (ROV) or mining systems.

The GEO-FOG 3D is based on the company's high-performance fiber optic gyro (FOG) technology combined with centimeter-level precision RTK GNSS receivers and advanced sensor fusion algorithms. The result is a solution that continuously provides fast, ultra-accurate position, velocity, and attitude measurements that keep applications operating no matter how challenging the conditions.

The core inertial sensor for the new system is KVH's 1750 IMU, a proven inertial measurement unit incorporating three axes of KVH's DSP-1750 FOG – the world's smallest high-performance fiber optic gyro – with three axes of advanced accelerometer technology. The 1750 IMU is then fully integrated with a GNSS receiver and a 3-axis magnetometer, a barometric pressure sensor, and a triple frequency RTK GNSS receiver to deliver reliable, real-time, centimeter-level positioning and orientation measurements. The system's breakthrough sensor fusion algorithms automatically switch from loosely- to tightly-coupled filtering for improved performance under poor GNSS signal conditions. The system also offers high-speed update rates and rapid north-seeking gyrocompass capabilities for high-accuracy heading in environments when magnetometers and GNSS-aided heading cannot be used.

KVH has also introduced a variant, the GEO-FOG 3D Dual, an INS and attitude and heading reference system (AHRS). This product features two GNSS antennas on a fixed RTK baseline that offers the same reliability and performance levels as the GEO-FOG 3D, with increased heading, pitch, and roll accuracy for static and dynamic applications where single antenna systems can be problematic. The GEO-FOG 3D Dual is a superior choice for applications that require heading at system startup or in low dynamic conditions.

"KVH's GEO-FOG 3D and GEO-FOG 3D Dual provide exceptional accuracy and outstanding performance in a single, small package (<1.6 lbs.), at price points never previously achieved in the industry," says Jay Napoli, KVH's FOG/OEM vice president. "And, because KVH controls the entire design and production process, from creating its own optical fiber to packaging its FOGs together with other sensors for advanced applications, these new products – and all of our open-loop FOGs, IMUs, and INSs – offer outstanding accuracy and excellent durability at a lower cost than competing systems."

Reliable, high-accuracy navigation and control are essential to unmanned, autonomous, and manned platforms that must operate in conditions that include magnetic interference and the absence of reliable satellite navigation data. The integrated FOG, GNSS, and sensor fusion technologies allow the GEO-FOG 3D and GEO-FOG 3D Dual to achieve performance levels that are beyond typical INS- or MEMS-based solutions.

Both the GEO-FOG 3D and GEO-FOG 3D Dual are designed to support current and future satellite navigation systems including GPS, GLONASS, GALILEO, and BeiDou. Both systems offer data rates up to 1000 Hz, and the ability to output data over a high-speed RS-422 interface or RS-232 interface, which ensures the systems can be easily and readily integrated in a wide range of platforms.

*Note to Editors:* For more information and specifications for the new GEO-FOG 3D and GEO-FOG 3D Dual, please visit the website, [Guiding Intelligent Systems: KVH Unmanned and Autonomous](http://GuidingIntelligentSystems:KVHUnmannedandAutonomous), [www.kvh.com/unmanned](http://www.kvh.com/unmanned). High-resolution images of KVH products are available at the [KVH Press Room Image Library](http://KVHPressRoomImageLibrary), [www.kvh.com/press-room/image-library](http://www.kvh.com/press-room/image-library).

#### **About KVH Industries, Inc.**

KVH Industries, Inc., is a premier manufacturer of high-performance sensors and integrated inertial systems for defense and commercial guidance and stabilization applications, having sold more than 19,000 TACNAV® systems and more than 90,000 fiber optic gyros. KVH is also a leading manufacturer of solutions that provide global high-speed Internet, television, voice services, and content via satellite to mobile users at sea, on land, and in the air. KVH is based in Middletown, RI, with research, development, and manufacturing operations in Middletown, RI, and Tinley Park, IL. The company's global presence includes offices in Belgium, Brazil, Cyprus, Denmark, Hong Kong, Japan, the Netherlands, Norway, Singapore, and the United Kingdom.

This release may contain certain forward-looking statements that involve risks and uncertainties. For example, forward-looking statements include statements regarding the functionality, characteristics, quality, and performance of KVH's products and technology; anticipated innovation and product development; and customer preferences, requirements and expectations. The actual results achieved could differ materially from the statements made in this press release. Factors that may cause such differences include, but are not limited to: uncertainties and risks associated with the delivery or performance of critical hardware; potential unanticipated technical impediments; unanticipated declines or changes in customer demand, due to competitive, economic, seasonal, and other factors; the need for, or delays in, qualification of products to customer or regulatory standards; continued substantial fluctuations in military and dual-use product sales, including to foreign customers; export restrictions and other international risks. These and other risk factors are discussed in more detail in KVH's most recent Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on November 9, 2015. KVH does not assume any obligation to update its forward-looking statements to reflect new information or developments, except as required by law.

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