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STMicroelectronics empowers data-hungry industrial transformation with unique dual-range motion sensor

- *Unique MEMS innovation means deeper contextual awareness for monitoring and safety equipment also in harsh environments*
- *Richly detailed motion and event tracking with simultaneous, independent sensing in high-g and low-g ranges*
- *Integrates ST's advanced in-sensor edge AI for autonomy, performance, and power saving*

Geneva, Switzerland – November 6, 2025 — STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, has revealed the ISM6HG256X, a tiny three-in-one motion sensor for data-hungry industrial IoT applications, serving as an additional catalyst for edge AI advancement. This smart, highly accurate IMU sensor uniquely combines simultaneous detection of low-g (±16g) and high-g (±256g) accelerations with a high performance and stable gyroscope within a single compact package, ensuring no critical event—from subtle motion or vibrations to severe shocks—is ever missed.

The ISM6HG256X addresses the growing demand for reliable, high-performance sensors in industrial IoT applications such as asset tracking, worker safety wearables, condition monitoring, robotics, factory automation, and black box event recording. By integrating accelerometer with dual full-scale ranges, it eliminates the need for multiple sensors, simplifying system design and reducing overall complexity. Its embedded edge processing and self-configurability support real-time event detection and context-adaptive sensing, which are essential for long lasting asset tracking sensor nodes, wearable safety devices, continuous industrial equipment monitoring, and automated factory systems.

"Traditional solutions require multiple sensors to cover low and high acceleration ranges, increasing system complexity, power consumption, and cost. The ISM6HG256X addresses these challenges by providing a single, highly integrated sensor," said Simone Ferri, APMS Group VP & MEMS Sub-Group GM, STMicroelectronics. *"These new sensing dimensions, made possible also in harsh environment, combined with machine-learning running inside the IMU sensor itself, allows to quickly recognize, track and classify motion, activities and events while using very little power, helping businesses make smart, data-driven decisions as they move toward digital transformation."*

Edge AI is a crucial driver for ST's MEMS activity as it boosts performance and efficiency by enabling real-time data processing on the device, reducing latency and energy use. It enhances privacy and security through local data handling, limits reliance on external processing, and provides scalability and flexibility for various applications. Additionally, edge AI supports innovative uses like advanced sensing and IoT integration, aligning with growing demand for smart, connected devices.

ST is a leader in the micro-electromechanical systems (MEMS) technology inside today's miniaturized inertial sensors, with over 600 patents and independent production capabilities that ensure supply-chain resilience and quality control. This foundation provided the launchpad for the Company's technical team to create the ISM6HG256X that combines 16g and 256g accelerometer ranges in the same device, operating concurrently and continuously. The sensor also co-packages a precision MEMS gyroscope for angular rate measurement.

Technical information
The ISM6HG256X contains the unique machine-learning core (MLC) and finite state machine (FSM), together with adaptive self-configuration (ASC) and sensor fusion low power (SFLP). These features bring edge AI directly into the sensor to autonomously classify detected events, ensuring real-time, low-latency performance and ultra-low system power consumption. This embedded technology can reconstruct signal dynamics to provide high-fidelity motion tracking. Thanks to the embedded SFLP algorithm, also 3D orientation tracking is possible with just few µA of current consumption.

ST's new X-NUCLEO-IKS5A1 industrial expansion board with MEMS Studio design environment and extensive software libraries, X-CUBE-MEMS1, are available to assist developers, helping implement functions including high-g and low-g fusion, sensor fusion, context awareness, asset tracking, and calibration.

The ISM6HG256X is available now, in a 2.5mm x 3mm surface-mount package built to withstand harsh industrial environments from -40°C to 105°C. Pricing starts at $4.27 for orders of 1000 pieces, from the eSTore and through distributors.

The ISM6HG256X is part of ST's longevity program, which ensures long-term availability of critical components for at least 10 years to support customers' industrial product ranges.

Further information can be found at www.st.com/ism6hg256x

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ST's latest MEMS sensor technology will be discussed in a dedicated STM32 Summit Tech Dive titled "From data to insight: build intelligent, low-power IoT solutions with ST smart sensors and STM32" on November 20. For more information and registration please click here.

About STMicroelectronics
At ST, we are 50,000 creators and makers of semiconductor technologies mastering the semiconductor supply chain with state-of-the-art manufacturing facilities. An integrated device manufacturer, we work with more than 200,000 customers and thousands of partners to design and build products, solutions, and ecosystems that address their challenges and opportunities, and the need to support a more sustainable world. Our technologies enable smarter mobility, more efficient power and energy management, and the wide-scale deployment of cloud-connected autonomous things. We are on track to be carbon neutral in all direct and indirect emissions (scopes 1 and 2), product transportation, business travel, and employee commuting emissions (our scope 3 focus), and to achieve our 100% renewable electricity sourcing goal by the end of 2027.

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