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STMicroelectronics high-performance vibration sensor with in-sensor AI offers a compelling alternative to piezosensor to fast-growing industrial condition-monitoring market

- ❖ *Industrial-grade vibration sensor delivers unprecedented wide-bandwidth and dynamic range sensing.*
- ❖ *Intelligent sensor processing unit (ISPU 2.0) inside the sensor boosts signal processing and edge AI performance while reducing energy consumption.*
- ❖ *Provides the first compelling alternative to piezosensor for condition monitoring, combining performances, lightweight design, ease of integration, ultra-accuracy, and energy efficiency.*

Geneva, June 3, 2026 – STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, introduces an intelligent vibration sensor designed for industrial condition monitoring applications that require high accuracy, reliability, and energy efficiency.

Built using ST MEMS (Micro Electromechanical Systems) technology, the [IIS3DWB10IS](#) vibration sensor with intelligent sensor processing unit (ISPU 2.0) brings advanced digital signal processing and AI inference closer to the sensing element. The result is a compact, rugged device that measures vibrations and shocks up to 200g at frequencies of 10 kHz and above. Combining digital precision and ease of use with a wide temperature range, up to 125°C, to withstand harsh environments, the vibration sensor is engineered to help customers improve equipment uptime, reduce unplanned downtime, and support predictive maintenance strategies across industrial environments.

Vibration analysis is the dominant segment in condition monitoring, as many industries use rotating and oscillating machinery for cutting, shaping, moving, cooling, and other processes. The ability to prevent equipment stoppages through early detection of issues, such as predicting bearing failures in advance, helps companies across all sectors, including automotive and other manufacturing activities to optimize production flow.

“Our industrial MEMS vibration sensor delivers the dynamic range and bandwidth needed for high-end applications and extends the advantages of ST in-sensor digital processing. Integrating the ISPU 2.0, with its new hardware accelerators for fast signal processing and AI inference, sharpens equipment-wear recognition while

*reducing latency and power consumption,” said **Simone Ferri, APMS executive VP MEMS sub-group.** “Industries can expect a new generation of condition monitoring sensors, the first compelling alternative to piezosensor, that is lightweight, easy to fit and design, ultra-accurate, and energy efficient enough for battery-powered operations.”*

*“The IIS3DWB10IS delivers unique properties for our target markets and environments. Its high dynamic range, wide bandwidth, and high-temperature capability, combined with ease of adoption and a cost-effective, simplified circuit design, allowed us to replace the incumbent piezosensor technology. Moreover, the integrated ISPU 2.0 processor positions complex signal processing and rapid AI inference close to the sensing element, enabling smarter system responses,” said **Andrea Torcelli, Chief Technology Officer at Bonfiglioli S.P.A.***

By enabling predictive and prioritized maintenance, remote condition monitoring allows companies to improve equipment uptime and operating efficiency while eliminating unexpected failures and enhancing safety. *Fortune Business Insights* states the global market for this technology will exceed \$5 billion by 2032, growing at over 9% CAGR¹.

Further technical information:

The IIS3DWB10IS vibration sensor is the first digital sensor with wide bandwidth and embedded processing to deliver performance meeting the needs of high-end industrial condition monitoring applications offering a compelling alternative to piezoelectric sensors.

Accurate measurement of vibrations above 10 kHz, with a large dynamic range up to 200g, combines with a noise floor as low as 35 µg/sqrt(Hz). This is comparable to the noise performance of piezoelectric sensors. Moreover, the IIS3DWB10IS delivers equivalent accuracy and sensitivity, adding digital-sensing advantages including smaller size, lower power consumption, simplified electrical and mechanical design, and greater flexibility in the computational partitioning.

ISPU 2.0 (Intelligent Sensor Processing Unit) introduces new hardware accelerators to perform real-time signal processing and AI at the edge. These hardware accelerators make frequently used functions faster and more power efficient. The core is C-programmable and contains on-chip program and data RAM.

The supporting ecosystem provides software libraries that facilitate executing typical vibration monitoring algorithms in the ISPU, including FFT, filtering, envelope, velocity severity, and anomaly detection.

With 40 MIPS and 40 MFLOPS digital signal processing, the ISPU 2.0 delivers up to four times the processing performance of the previous generation. In addition, the ISPU 2.0 sensor interface supports six times faster data transfer with the MEMS circuitry.

¹ <https://www.fortunebusinessinsights.com/machine-condition-monitoring-market-112654>

The IIS3DWB10IS also contains a 2048x80-bit FIFO register and an accurate temperature sensor.

The sensor's rugged MEMS-based design supports operation up to 125°C. The IIS3DWB10IS is supported in ST's 10-year industrial longevity program.

The [IIS3DWB10IS](#) is packaged as a 4.5 mm x 4.5 mm x 1.5 mm 16-lead LGA package with wettable flanks that facilitate automatic optical inspection in high-quality surface-mount assembly processes. The product is scheduled to be available by July 2026 from \$25 for orders of 1000 pieces.

Please visit <https://www.st.com/IIS3DWB10IS> for more information.

About STMicroelectronics

At ST, we are 49,000 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. Further information can be found at www.st.com.

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