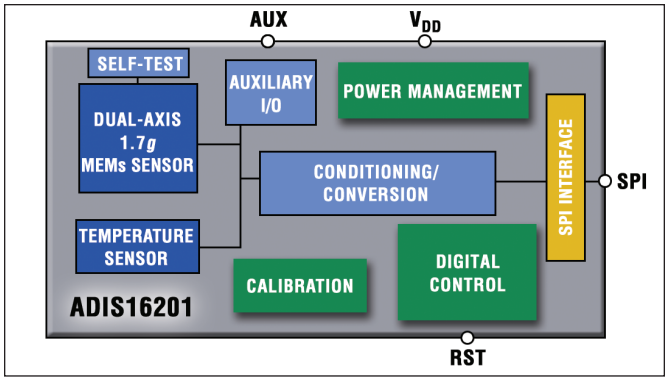
Highly Integrated, Programmable Single-Component Sensors Solve Problems in Industrial System Design

Sensors have the potential for providing revolutionary improvements in performance, reliability, safety, and cost-of-ownership within industrial system designs. Examples involving inertial sensors include platform stabilization, motion control for industrial machinery, security devices, antenna stabilization, robotics, navigation, mechanical leveling, and many others. However, a gap has long existed between good sensor technology and its implementation within critical industrial systems. Embedding sensor processing within industrial equipment typically requires that the designer have intimate knowledge of the sensor technology to design and implement a signal chain that properly tunes and calibrates a given sensor for its application. For inertial sensors, this typically also requires the capability for motion testing. The system expense of this implementation has created a barrier to more rapid sensor deployment, particularly for customers and applications with moderate production volumes. The problem is worsened by the physical limitations posed by some applications (for instance, embedded vibration analysis) where extreme density, environmental conditions, and remoteness have pushed requirements beyond what is available in standard sensor and signal conditioning components.

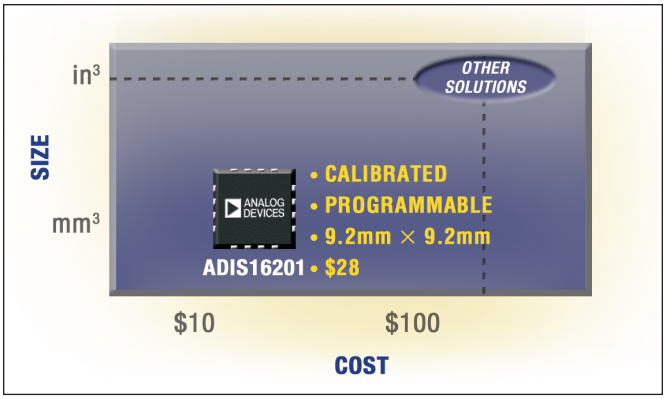
The Analog Devices' *i*Sensor™ product family was created in recognition of this gap in industrial sensor applications. The ADIS16201 *i*Sensor is the first implementation of a new patent pending single-package integration technology. It's the world's first direct output, linear-in-degrees inclinometer that is available as a single component. Incorporating a complete sensor and data processing signal path, the device is both a fully functional programmable dual-axis accelerometer and a dual-axis inclinometer.



A complete dual-axis acceleration and inclination angle measurement system in a single, compact package.

The ADIS16201 provides a gain and offset variability of less than 1%, reduces voltage and mechanical mounting sensitivities, and provides a simple single command interface which allows in-system auto-zero calibration.

It also includes several embedded features, including programmable sample rate, digital filtering, power management, configurable alarms, auxiliary analog and digital I/O, and self-test. This eliminates the need for external circuitry and enable a much simplified system interface, all controlled via an SPI port. Sensor outputs include two axes of ±1.7 *g* acceleration, two axes of ±90° inclination (with accuracy within 0.25°), and temperature. Previously, the same functionality and performance could only be found in devices more than 100× larger, and 10× more costly. The ADIS16201 is available in a small 16-lead laminate-based land grid array (LGA) package, at 1k unit pricing of $28.



With up to 100x size reduction and 10x cost reduction, the ADIS16201 brings embedded sensing to a broader base of customers and applications.

*i*Sensor integration eliminates a key barrier to the advancement of sensor applications in the industrial market by offering unprecedented functionality, programmability, and simplicity to the system designer. The standard programming interface also allows the user to easily tailor the devices to the application, and very quickly move through prototyping, evaluation, and implementation. Now in development are additional *i*Sensor products targeted at embedded vibration analysis and programmable angular rate sensing. For additional product information, visit *www.analog.com/iSensors.*

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