

Compact wireless module for motion detection in automotive, industrial and medical applications

I-Micronews

SensorDynamics, a producer of sensors for the automotive and manufacturing industries, is launching a wireless inertial measurement system consisting of a mobile sensor unit and a receiver. The combined sensors used here — the SD787 and SD788 — and the RF devices are produced by SensorDynamics.

These sensors integrate angular rate sensors and accelerometers plus signal processing in a single package. The inertial measurement unit also features an SD340 transceiver chip for ISM band frequencies of 315, 433, 868 and 915 MHz. Its SD330 and SD332 LF circuits are a specialty of the wireless system, enabling mobile unit wakeup by a 21 kHz signal to promote efficient energy management. By adding optionally obtainable transmitter coils, these LF circuits make it possible to localize the module at a range of up to 7 meters with 10 cm accuracy. SensorDynamics can deliver both the ready mobile and base modules and expertise in applications for customers wishing to incorporate the components described here in their own systems.

Key Features

The wireless measurement system comes with a calibrated range of $\pm 300^\circ/\text{s}$ for rotary rate and $\pm 2 \text{ g}$ for acceleration on all three spatial axes in each case. Outside the calibrated range, it is even possible to detect motion of up to $512^\circ/\text{s}$ and $\pm 6.78 \text{ g}$. The mobile unit withstands shock up to 2000 g, and the sensors also feature a continuous self-diagnostic functionality, ensuring high fail-safety of the system. The module integrates a 2D compass for determination of absolute orientation.

Synchronous wireless transmission of the measured values uses standard FMSK modulation in the license-free 433 MHz band. The high data transmission rate of up to 125 Kbps can carry all six 100 Hz measured values. The SD340 RF circuit is supported by a 32 Kbyte flash memory that can be used to execute custom programs such as encoding algorithms, conditioning of measured values or automatic channel switchover. The mobile unit, scaled $30 \times 85 \times 8 \text{ mm}^3$, will operate about 8 hours on a 1000 mAh battery. The exclusive use of components qualified for the automotive market makes the module suitable for a temperature range from -40 through to $+85^\circ\text{C}$. A mobile unit for 125°C operation will be available beginning of 2011.

The receiver unit provides the measurement data on a UART interface and supports a variety of antennas and can work with both an integrated and a rod antenna. A transmission range of more than 150 meters is possible. For more technical data, please refer to the attached short-form data sheet `Wireless_6DoF_IMU`, or visit www.sensordynamics.cc.

Application

The inertial measurement system is suitable for automotive, industrial and medical applications calling for a compact device to wirelessly detect motion or do away with connectors and cable harness. A typical example is detecting the motion of agricultural machinery that has to be towed by different kinds of tractor, making connectors impractical.

Availability and Price

The measurement system consisting of a transmitter and a receiver unit is available with immediate effect. The sample price of the entire measurement system — transmitter and receiver unit — is 1130 \$. The 1 ku price for a set of seven discrete semiconductor components is 70 \$. If you wish to receive a competitive quote for series production, please contact your local SensorDynamics representative.

SensorDynamics - Leading in micro and wireless sensor products SensorDynamics is a semi-fabless semiconductor company that focuses on innovative sensor solutions for high volume applications in automotive, industry and high-end consumer sectors.

SensorDynamics develops and supplies fail-safe micro and wireless semiconductor products for automotive, industry and high-end consumer key accounts and is certified under ISO/TS 16949. The company acts as a general contractor with in-house MEMS production and cooperates closely with leading international technology partners.

With its headquarters in Lebring near Graz, Austria, SensorDynamics has subsidiaries in Italy and Germany and a world-wide sales network.

For more information on SensorDynamics and its products, please go to:

www.sensordynamics.cc

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