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MEMS sensors from Bosch enable cars to navigate without GPS SMI230 inertial sensor improves reliability of navigation systems

- New MEMS sensor from Bosch helps to keep on track even under poor GPS signal conditions
- Accelerometer and gyroscope combined in a single package
- Sensor is highly precise, stable and extremely power-efficient

Munich and Reutlingen, Germany – The loss of a GPS signal has brought many relaxing car trips to an abrupt end. At Munich's world-renowned electronics exhibition: electronica, Bosch today announced the new SMI230 six-axis inertial sensor. With this sensor onboard, navigation systems will not take their eye off the destination – even when the GPS signal is interrupted. The SMI230 from Bosch provides the navigation system with motion data, enabling the current position of the travelling vehicle to be determined even when the GPS signal is weak or nonexistent. Navigation systems will become even more precise and reliable.



No longer travelling blind when without GPS

Millions of car drivers today rely on GPS navigation. If a satellite signal is weak, distorted or interrupted, e.g. due to mountains, tall buildings or even tunnels, then the navigation system will lose its direction. That is when the SMI230 MEMS sensor from Bosch comes into play: it precisely measures the yaw rate and acceleration of the vehicle. In this way the onboard navigation system continuously calculates the travel direction and position while the car is moving. The navigation is not disrupted when inside a tunnel or an 'urban canyon'. The capabilities of the sensor improve not only navigation but also find their niche in fleet management, toll systems and car alarm installations. Here too, precise determination of position is essential.

Versatility brings flexibility

The SMI230 conveniently combines one three-axis MEMS accelerometer with one three-axis MEMS gyroscope in a single compact package. Both sensors run digitally in 16-bit mode based on proven MEMS technology from Bosch. Adding to this already powerful combination is the fact that the gyroscope and accelerometer can either be operated individually or interconnected for data synchronization purposes.

Accurate, stable and power efficient

The SMI230 delivers high accuracy – the prerequisite for the best-possible precision in navigation: noise is only $0.02^\circ/s/\sqrt{\text{Hz}}$ (rms) for the gyroscope and $0.12 \text{ mg}/\sqrt{\text{Hz}}$ (rms) for the accelerometer. Also, the accelerometer has rock-solid temperature stability, with a low temperature coefficient offset (TCO) of typically below $0.2 \text{ mg}/\text{K}$ and temperature coefficient sensitivity (TCS) of only $0.002 \text{ \%}/\text{K}$. Typical bias

instability of the gyroscope is well below 2°/h. Power consumption plays a decisive role in many applications. Therefore, the SMI230 supports three power saving modes - accelerometer: suspend mode; gyroscope: suspend mode and deep suspend mode.

SMI230 inertial sensor:
Localization – stays focused
on your destination



flexible

Gyroscope and accelerometer can either be operated individually or linked for data synchronization.



Backward compatible to accelerate the development cycle

The SMI230 is pin-for-pin compatible with Bosch's SMI130, and offers an identical gyroscope programming interface, making it fast and easy to integrate into existing platforms without any time-consuming layout re-work. The new sensor is housed in an ultra-compact 16-pin standard LGA package, measuring just 3 mm x 4.5 mm x 0.95 mm.

The sensor will be available in May 2019.