



Accurate indoor localization can save thousands of lives – enabled by pressure sensing solution

Bosch launches barometric pressure sensor BMP390 for smartphones, wearable and hearable devices

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- ▶ Best performance on the market due to unique accuracy and temperature stability
- ▶ Ideally suited for smartphones, hearables and wearables thanks to low package height
- ▶ Enables accurate indoor localization with smartphones in case of emergencies
- ▶ FCC estimates addition of vertical-specific information could save up to ten thousand lives per year

Bosch Sensortec announces the [BMP390](#), a barometric pressure sensor that delivers unmatched accuracy for altitude tracking in smartphones as well as wearable and hearable devices. The new sensor can measure height changes below 10 centimeters thanks to the improved resolution, and is 50 percent more accurate than its predecessor.

Accurate altitude detection helps to localize people indoors, where GPS signals are not available. The addition of the vertical-specific position to existing horizontal information enables first responders to determine the floor level of smartphone users who trigger an emergency call. The Federal Communications Commission (FCC) estimates that the additional vertical information has the potential to save up to 10,000 lives per year just in the USA alone¹.

"The use of Bosch Sensortec's latest BMP390 pressure sensor in smartphones, enables a high precision localization service that ultimately has the potential to save thousands of lives," said Dr. Stefan Finkbeiner, CEO at Bosch Sensortec.

¹<https://docs.fcc.gov/public/attachments/DOC-360516A1.pdf>

Enabling enhanced emergency calls

According to a [recent report by the FCC](#), wireless providers in the US will soon be required to meet an increasingly stringent series of location accuracy benchmarks in accordance with a timetable, including providing the caller's dispatchable location. The order adopts a z-axis location accuracy metric of ± 3 meters relative to the handset for 80 percent of indoor wireless 9-1-1 calls starting in 2021. Emergency applications such as the enhanced 911 (E911) system in the US could also be implemented in other regions like Europe or Asia, to further improve people's safety and peace of mind.

Bosch and NextNav LLC, a 3D geolocation service provider, have collaborated on component specifications and system performance resulting in consistent, high accuracy z-axis capabilities indoors. This is accomplished by applying [barometric pressure sensors](#) in the phone, like the Bosch BMP390, and combining them with NextNav's Metropolitan Beacon System (MBS) z-axis service to determine three-dimensional location and positioning.

Accurate indoor and outdoor navigation and improved fitness tracking

Not limited to emergency applications, the sensor also enables improved indoor navigation in general, for example in combination with the Position Tracking Smart Sensor [BHI160BP](#). These navigation solutions compensate for traditional localization technologies such as GPS that do not work efficiently in shielded environments. This will help users to save time and avoid the hassle of getting lost, for example when searching for their car in an underground garage.

Furthermore, the new BMP390 supports enhanced GPS applications for outdoor navigation and calorie expenditure estimation tasks. The use of advanced barometric pressure sensing can determine whether a user is walking up or down an incline, stairs or lifting weights during a fitness training session. This helps to increase the precision of calorie tracking by up to 15 percent². Thanks to the improved accuracy of altitude measurements, fitness trackers are able to show exactly how far a user has run, walked or cycled.

Accurate, stable and compact

The BMP390 provides a typical relative accuracy of ± 0.03 hPa, which is superior to any other comparable product on the market today. Typical absolute accuracy is ± 0.5 hPa. The excellent accuracy is the result of significant improvements in temperature stability, drift behavior and noise. The sensor offers high temperature stability across its entire operating temperature and pressure range of 0 to 65 °C and 700 to 1100 hPa respectively, with an average temperature

²<https://pdfs.semanticscholar.org/fecf/d7f13e68b3cd05a58d8fc92c4234844d8ad0.pdf>

coefficient offset (TCO) of just ± 0.6 Pa/K. Noise is also low, at only 0.9 Pa typical, an improvement of 25 percent relative to the predecessor BMP380. The device also provides high long-term stability, and low short- and long-term drift.

Its small size, measuring only 2.0 mm x 2.0 mm x 0.75 mm, makes the new sensor easy to integrate into portable devices. Power consumption is kept low at 3.2 μ A at 1 Hz (typical) to maximize battery life on portable devices.

Availability

The BMP390 is available for high-volume smartphone, wearable and hearable manufacturers.

Press photo: #2951042, #2951043, #2951044, #2971706

YouTube: Discover how the pressure sensor works: [link](#)

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Bosch Sensortec GmbH, a fully owned subsidiary of Robert Bosch GmbH, develops and markets a wide portfolio of microelectromechanical systems (MEMS) sensors and solutions tailored for smartphones, tablets, wearables and hearables, AR/VR devices, drones, robots, smart home and IoT (Internet of Things) applications. The product portfolio includes 3-axis accelerometers, gyroscopes and magnetometers, integrated 6- and 9-axis sensors, smart sensors, barometric pressure sensors, humidity sensors, gas sensors, optical microsystems and comprehensive software. Since its foundation in 2005, Bosch Sensortec has emerged as the MEMS technology leader in the markets it addresses. Bosch has been both a pioneer and a global market leader in the MEMS sensor segment since 1995 and has, to date, sold more than 10 billion MEMS sensors.

For more information, please visit www.bosch-sensortec.com, twitter.com/boschMEMS, community.bosch-sensortec.com

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