



## **Location matters: 3D positioning helps first responders achieve faster response times**

### **Emergency calls pinpointed vertically inside a building**

April 22, 2020  
PI 101 RB TW

- ▶ Combination of Bosch sensor expertise and NextNav beacon technology leads to breakthrough
- ▶ FCC estimates addition of vertical-specific information could save up to ten thousand lives per year
- ▶ Technology enables the three-dimensional location and positioning of mobile phones, automated vehicles and IoT devices
- ▶ Bosch BMP390 enables precise altitude tracking in smartphones as well as wearable and hearable devices

SUNNYVALE, Calif – A breakthrough technology can now precisely locate a caller vertically within multi-story buildings. The addition of vertical-specific position to existing horizontal information enables first responders to determine the altitude of smartphone users who call 9-1-1, reducing response time. The Federal Communications Commission (FCC) [estimates](#) that reducing response times by one minute has the potential to save up to ten thousand lives per year<sup>1</sup>.

Bosch and NextNav LLC, a 3D geolocation service provider, 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.

The new method is used to determine a device's vertical position (or z-axis) in addition to the x-y axis, allowing first responders to more precisely pinpoint the origin location of an emergency call on a standard cell phone – a process that is not possible using GPS on a standard cell phone. Currently, location detection services utilized by emergency responders can only plot the horizontal position (or x-y axis.)

“At Bosch, we continue to explore new and exciting ways to leverage sensor technology to enhance everyday life as part of our unwavering focus on creating solutions that are ‘Invented for Life,’” said Marcellino Gemelli, director of business development for Bosch Sensortec. “This technology is poised to deliver on that

---

<sup>1</sup> Page 24, item 54 of FCC FACT SHEET - Wireless E911 Location Accuracy Requirements, Fifth Report and Order and Fifth Further Notice of Proposed Rulemaking - PS Docket No. 07-114

promise to end-users and is positioned to reduce emergency response times and—in turn—save lives.”

### **Mapping the future**

According to a recent [report](#) by the FCC, wireless providers 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  $\pm 3$  meters relative to the handset for 80 percent of indoor wireless 9-1-1 calls.

The floor level technology has undergone numerous successful testing rounds in locations throughout the U.S. since the collaboration began in 2013. Bosch and NextNav are also actively exploring other potential applications for the technology including IoT devices and automated vehicles.

### **Altitude tracking in smartphones, hearables and wearables**

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.

Not limited to emergency applications, the sensor will also improve indoor navigation in general, compensating 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 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 percent<sup>2</sup>. Thanks to the improved accuracy of altitude measurements, fitness trackers are able to show exactly how far a user has run, walked or cycled.

The BMP390 provides a typical relative accuracy of  $\pm 0.03$  hPa, which is superior to any other comparable product on the market today. Typical absolute accuracy is  $\pm 0.5$  hPa.

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

### **Contact person for press inquiries:**

Tim Wieland

phone: +1 248-876-7708

[Tim.Wieland@us.bosch.com](mailto:Tim.Wieland@us.bosch.com)

Twitter: @Timwieland

### **About Bosch**

*Having established a regional presence in 1906 in North America, the Bosch Group employs 35,400 associates in more than 100 locations, as of December 31, 2019. In 2019 Bosch generated consolidated sales of \$14.4 billion in the U.S., Canada and Mexico. For more information, visit [www.bosch.us](http://www.bosch.us), [www.bosch.ca](http://www.bosch.ca) and [www.bosch.mx](http://www.bosch.mx).*

---

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

*The Bosch Group is a leading global supplier of technology and services. It employs roughly 403,000 associates worldwide (as of December 31, 2019). According to preliminary figures, the company generated sales of \$86.5 billion in 2019. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT company, Bosch offers innovative solutions for smart homes, smart cities, connected mobility, and connected manufacturing. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to deliver innovations for a connected life. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiary and regional companies in 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At 125 locations across the globe, Bosch employs some 72,000 associates in research and development.*

*The company was set up in Stuttgart in 1886 by Robert Bosch (1861–1942) as "Workshop for Precision Mechanics and Electrical Engineering." The special ownership structure of Robert Bosch GmbH guarantees the entrepreneurial freedom of the Bosch Group, making it possible for the company to plan over the long term and to undertake significant upfront investments in the safeguarding of its future. Ninety-two percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The majority of voting rights are held by Robert Bosch Industrietreuhand KG, an industrial trust. The entrepreneurial ownership functions are carried out by the trust. The remaining shares are held by the Bosch family and by Robert Bosch GmbH.*

*Additional information is available online at [www.bosch.com](http://www.bosch.com), [www.iot.bosch.com](http://www.iot.bosch.com), [www.bosch-press.com](http://www.bosch-press.com), [www.twitter.com/boschpress](https://www.twitter.com/boschpress).*

*Exchange rate: 1 EUR = \$1.1100*

**About NextNav LLC:**

*NextNav's revolutionary Metropolitan Beacon System (MBS)-based services enable mobile phones, autonomous vehicles and IoT devices to reliably provide Position, Navigation and Timing Services (PNT) and serve as a backup to GPS in indoor and urban metropolitan environments. Delivered over a managed terrestrial network with carrier-grade dependability and metropolitan-wide coverage, NextNav's services are designed for public safety applications, E911, PNT services for Critical Infrastructure, as well as a multitude of consumer, IoT and commercial applications that require reliable 3D geolocation and timing services indoors and in urban areas. For more information, visit [NextNav.com](http://NextNav.com) or follow NextNav on [LinkedIn](https://www.linkedin.com/company/nextnav).*