

[01] Mobile World Congress 2017: Bosch shows smart IoT solutions in Barcelona

[02] Mobile World Congress 2017: New Bosch microscanner BML050 for interactive laser projection

Robert Bosch GmbH
Postfach 10 60 50
70049 Stuttgart

Media und Public Relations
Leitung: René Ziegler
Presse-Forum:
www.bosch-presse.de



February 21, 2017

PI 9573 RB CM

Mobile World Congress 2017: Bosch shows smart IoT solutions in Barcelona

Connectivity is turning the car into a third living space, Bosch's sensor technology enables connectivity beyond mobility

- ▶ Connected mobility: concept car as the third living space
- ▶ Connected capabilities helps increase Two wheeler safety
- ▶ Sensor technology: tiny sensors enable connectivity solutions for many devices and applications
- ▶ World premiere: new optical MEMS solution for IoT applications
- ▶ Bosch booth at MWC: Hall 6, booth 6E20

Barcelona, Spain – From **February 27 to March 2, 2017**, **Bosch** is showing smart IoT solutions **at MWC 2017 in Barcelona**. The global supplier of technology and services is presenting innovative solutions at the trade show for **connected mobility and sensor technology**. These technologies make everyday life easier, more comfortable, and safer. Bosch can be found in the **Hall 6 at booth 6E20**.

The car is becoming the third living space

Alongside home and work, connectivity is turning the car into the third living space. With the help of personalized communication between the car and the driver, increasingly high performance and comprehensive services will be safe to operate in the future as well. By 2022, the global market for connected mobility is set to [grow by almost 25 percent per year](#). In just a few years, cars will become an active part of the IoT and will be able to communicate with other modes of transportation as well as with the smart home. The car can also be seen as a personal assistant. Automated driving will soon give drivers more time to dedicate to other tasks. For instance, drivers and passengers will be able to use time spent in the car to write e-mails, or entertain themselves with streamed music or videos. At MWC 2017, Bosch is presenting **a concept car** that shows how different spheres of life will be seamlessly interconnected in the future beyond the vehicle itself. Personalized

communication between the car and its driver will also be expanded. The Bosch Forward ShowCar comprises a broad range of innovative technologies: The Driver Monitoring Camera makes face recognition and personalization possible from the moment the driver is in the car. For instance, the car sets the steering wheel, mirrors, interior temperature, and radio station according to the driver's personal preferences. The concept car also includes the first ever gesture control with haptic feedback, that uses ultrasound sensors that sense whether the driver's hand is in the correct place. Thanks to the touchscreen with haptic feedback, the buttons that appear on the touchscreen feel like real buttons. Drivers can thus keep their eyes on the road, and this improves safety. The Mirror Cam System is a camera-based solution that replaces both exterior mirrors. The video sensors can be integrated into the vehicle interior, and images are shown on displays close to the A-pillars on the right and left sides of the car.

Perfectly Keyless: the car key safe in your smartphone

More applications are being geared around the mobile phone, to make life easier and more personalized for users. Keyless entry is just another example of personalization: Perfectly Keyless is a user-centric vehicle access system that offers the driver full passive entry and passive start functionality using the smartphone as a digital car key. With the encrypted digital key on the phone, the vehicle can be unlocked and started without any interaction. When approaching the vehicle, the system will automatically identify the secret key on the smartphone and perform a distance measurement: within a specified range to the car (approximately two meters), the access is allowed. In a similar way, starting of the car is only permitted if Perfectly Keyless localizes the mobile device inside the car.

Community-based parking

New functions are connecting the car to its environment, Bosch is working on the integration of smart services into the vehicle. When communicating with its surroundings, the car also takes on important tasks in the connected city. For instance, with **community-based parking**, the car is becoming a parking space locator. When driving down the road, the car detects gaps between parked cars with its on-board sensors. The data gathered is then transmitted to a digital street map. High-performance Bosch algorithms assess the plausibility of the data and make forecasts on the parking spot situation. A cloud-based service that uses this data to create a real-time parking map, saves the driver a great deal of time and money, and also helps reduce stress, as well as traffic, when looking for a parking space. In cooperation with Mercedes-Benz, Bosch is currently testing the community-based parking concept in the city of Stuttgart and in further European cities.

Cloud-based wrong-way driver warning

Traffic reports about wrong-way drivers are an all-too-familiar occurrence. Often, these incidents lead to critical situations, including serious accidents. At present, traffic is warned via the traffic message channel. Here the average time span between receipt of the notification and the broadcast alert is around three and a half to four minutes. However, it takes several minutes for warnings to be broadcasted over the radio, and so the endangered road users are often warned a few decisive minutes too late. The new **Bosch cloud-based wrong-way driver warning** alerts the driver and the endangered road users within seconds much faster and more precise. To detect wrong-way driving, the algorithm compares when a vehicle is approaching a highway entrance ramp or exit ramp and the vehicle's actual movements with the permitted direction of travel. If the two sets of information clash, the wrong-way driver is alerted to their error. At the same time, drivers of oncoming vehicles are also warned. The function relies on regular, anonymized reporting of each vehicle's position on highway entrances to the cloud. The more connected vehicles there are, the denser the invisible safety net and the more road users can be alerted of wrong-way drivers. The wrong-way driver warning system is available as in-app functionality as a smartphone version. This app can be integrated as part of a Software Development Kit (SDK) into pre-existing apps from other partner applications or into automobile manufacturers' infotainment solutions.

Secure communication with all domains

The **Central Gateway** CGW is a hub to make connectivity possible. It ensures communication with all domains across all data buses. Bosch subsidiaries ETAS and ESCRYPT enable fast and secure updating of the vehicle software via the internet (SOTA/FOTA). While ESCRYPT experts provide holistic security solutions to protect against software manipulation and theft, ETAS embedded experts, with the appropriate architecture and software components, ensure that the updates can be safely and reliably executed - even after numerous updates. In addition, ETAS experts have further developed technologies for application in the automotive sector, which make updates up to **seven times faster**. Based on many years of automotive, safety and security experience, ETAS and ESCRYPT support vehicle manufacturers in the holistic view of functional safety and automotive cyber-security.

Two wheelers solutions for increased comfort and security

Bosch also focuses on the growing demand for smart connectivity solutions for motorcycles. The Integrated Connectivity Cluster (ICC) is a rider information system developed specifically for motorcycles. It features variable display sizes and resolutions and, thanks to the latest technology, is easy to read in all

situations. “mySPIN for two wheelers” is a hardware-independent smartphone integration system for motorbikes, eScooters, eBikes and powersports vehicles. It works well with the ICC but can also run on other two wheeler displays. Already available for cars since 2014, this technology has now been adapted for two wheelers, and provides the perfect solution for increased comfort and safety, for example with information about traffic situations, or sharing route preferences with other bikers. mySPIN for two wheelers is compatible with iOS and Android smartphones. The Software Development Kit (SDK) for app developers to integrate in their app is available via developer.myspin@bosch-softtec.com.

The integrated eScooter system from Bosch shows the improved interaction between single components as connected system solution. It provides easy access to the most relevant and reliable information via HMI and/or smartphone app: e.g., battery status, speed, remaining mileage, and failure and diagnosis information. The ‘take me home’ function can calculate the optimal route, and the “anti-theft” function alerts the eScooter owner via smartphone if the scooter is being moved without authorization. Sharing as well as fleet management functionality is part of the integrated system too.

Smart sensor technology: New optical sensor solution for IoT applications

Tiny Bosch MEMS sensors (Microelectromechanical systems) can be found in most electronic devices. From, smartphones, gaming consoles and tablets, to many found in vehicle applications and safety systems and countless other devices. Although they are tiny, they are extremely effective, making systems far safer, energy efficient and more comfortable and easy to use. Bosch MEMS sensors are the “eyes and ears of millions” of electronic devices. At MWC 2017, Bosch presents its world’s first **optical MEMS solution**. It can be used for various applications in the Internet of Things (IoT), e.g. for the virtual control of home appliances, tablets and social robots.

Transport Data Logger provides transparency along the entire supply chain

With the Transport Data Logger (TDL) Bosch brings transparency into the entire supply chain. By being attached to the shipment of sensitive industrial goods, e.g. industrial machines, and recording relevant measured parameters such as temperature, humidity, tilt, and shock, the TDL makes the delivery process to be monitored and tracked. These measurements are then documented and visualized through an app for smartphones and tablets. Since the limits of each parameter can be individually configured, any parameter that exceeds its limit is traceable thereby ensuring that each appropriate stage of the supply chain is held accountable. In the event that a parameter exceeds its limit, the TDL provides verifiable proof and reliable indication for possible primary and secondary damage.

In the case that no limits are exceeded, the TDL forms the evidence of a carefully conducted and failure-free transport chain. Thus, the TDL provides an added value for every logistical situation. It creates trust and peace of mind between relevant partners and provides important data for the optimization of logistics processes.

EXPERIENCE BOSCH AT MWC 2017: February 27 – March 2, 2017 at Hall 6, booth 6E20

FOLLOW Bosch's MWC 2017 Highlights on Twitter: [#BoschMWC](#)

Press photos: #452462, #455948, #455952, # 455977, #536141, #785164, #940099, #948141

Contact person for press inquiries:

Christine Maier,
phone: +34 91 327 95 20

The Bosch Group is a leading global supplier of technology and services. It employs roughly 390,000 associates worldwide (as of December 31, 2016). According to preliminary figures, the company generated sales of 73.1 billion euros in 2016. 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 industry. 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 create solutions for a connected life, and to improve 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 450 subsidiaries and regional companies in some 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 120 locations across the globe, Bosch employs 59,000 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 up-front 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, www.iot.bosch.com, www.bosch-press.com, www.twitter.com/BoschPresse.



February 27, 2017

PI 9560 SM/Ma

Mobile World Congress 2017: New Bosch microscanner BML050 for interactive laser projection

Transforming any surface into a virtual user interface

- ▶ Optical MEMS based scanner
- ▶ Creating flexible and intuitive virtual user interfaces
- ▶ Superior image quality and focus-free projection
- ▶ Bosch booth at MWC: Hall 6, booth 6E20

Barcelona, Spain – "The exciting developments in the Internet of Things are advancing at an amazing pace and Bosch Sensortec continues to drive innovations," says Stefan Finkbeiner, CEO of Bosch Sensortec, "It is not just about how devices communicate or sense their surrounding environments, but increasingly about how technology interacts with human beings. Laser projected virtual interfaces are a new fascinating solution in a world of previously undreamed of opportunities."

A core component of this solution that enables focus-free laser projection and turns any surface into a virtual user interface (UI) is the BML050 - a high-precision MEMS scanner for interactive laser projection applications. The virtual UI solution gives any kind of device a unique personality of its own, enabling technology to interact with people, to make life simpler and more exciting.

With the help of the BML050, a precise on-demand UI can be created for the interconnected world of the IoT, e.g. for home appliances, tablets and social robots. The BML050 is a ground-breaking solution for embedded projectors and augmented reality applications such as games, infotainment and in-car head-up displays. With this solution devices can interact in complex, intuitive and convenient ways to merge their function with our everyday lives.

Bosch technology enables interactive projectors

With the BML050 microscanner Bosch Sensortec is extending its current portfolio by optical microsystems. The scanner includes two tiny MEMS mirrors to project an RGB color laser onto any surface to create a projected image. The BML050 is

both compact and power efficient, making it ideal for space- and power-restricted devices.

Bosch Sensortec provides a ready to use projector reference design including an RGB light source. This facilitates fast evaluation and saves design-in time to give early adopters an important head start. Interactivity is enabled by a photo diode that measures the reflected light intensity pixel by pixel - no calibration required.

Bosch Sensortec's solution provides outstanding projection quality by means of advanced speckle reduction and precise control of the MEMS scanning mirrors and laser diodes. The BML050 projection principle eliminates the need for focus adjustment tasks, and the native laser color-space vastly exceeds industry standards, such as Adobe®RGB.

Robust, compact and easy to integrate solution

Bosch Sensortec's MEMS scanner is based on a well-established and robust core technology housed in compact wafer-level module packages. At the core of our system, there are two independent, hermetically-encapsulated MEMS scanning mirrors, which are optically aligned for fast and easy integration. The BML050 also includes a video processor, control circuits, laser drivers and power management ICs.

The partitioning of the BML050 supports a wide range of applications, significantly cutting down time to market deadlines, giving customers an edge at this early-adopter stage in the market's development.

Bosch Sensortec provides software support for major operating systems and is ready to assist customers with operation and parameter configurations as well as hardware integration and calibration tasks.

The BML050 will be available for selected customer projects in the second half of 2017.

The market research company IHS Markit predicts that between 2017 and 2020, revenues from MEMS scanning mirrors will increase at a healthy CAGR of 18%*. "MEMS scanners are currently emerging for a wide range of use cases,*" explains Jérémie Bouchaud, Director MEMS & Sensors at IHS Markit. "The Bosch Sensortec MEMS scanner BML050 enables two functions in one product, namely projection display and gesture user interface. Other new use cases of MEMS scanners include e.g. adaptive headlights and automotive head up displays."

Press Contact

Press who would like to meet with Bosch Sensortec may contact embedded PR, Anja-Maria Hastenrath, phone: +49 89 64913634-11, email: ah@embedded-pr.de.

EXPERIENCE BOSCH AT MWC 2017: Monday, February 27, to Thursday, March 2, 2017 at Hall 6, booth 6E20

Twitter: follow us on [#BoschMEMS](https://twitter.com/BoschMEMS)

Press photos: 957677, 957678, 957679

Youtube: [link](#)

Contact:

Silvia Mayer

phone: +49 7121 35-18453

Contact person for press inquiries:

Christian Hoenicke

phone: +49 711 811-6285

*Information based on IHS Markit, Technology Group, MEMS Market Tracker – Automotive, January 2017. Information is not an endorsement of Bosch-Sensortec. Any reliance on these results are at the third party's own risk. Visit www.technology.ihs.com for more details.

Bosch Sensortec GmbH is a fully owned subsidiary of Robert Bosch GmbH that is dedicated to delivering a complete portfolio of microelectromechanical systems (MEMS) sensors and solutions that enable consumer electronics to be connected. Bosch Sensortec develops and markets a wide portfolio of MEMS sensors and solutions tailored for smartphones, tablets, wearable devices and IoT (Internet of Things) applications.

The product portfolio includes 3-axis acceleration, gyroscope and geomagnetic sensors, integrated 6- and 9-axis sensors, environmental sensors, and a comprehensive software portfolio. 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 8 billion MEMS sensors.

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

The Bosch Group is a leading global supplier of technology and services. It employs roughly 390,000 associates worldwide (as of December 31, 2016). According to preliminary figures, the company generated sales of 73.1 billion euros in 2016. 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 industry. 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 create solutions for a connected life, and to improve 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 450 subsidiaries and regional companies in some 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 120 locations across the globe, Bosch employs 59,000 associates in research and development.

Additional information is available online at www.bosch.com, www.iot.bosch.com, www.bosch-press.com, <https://twitter.com/BoschPresse>