

Bosch is making construction sites safer

Surround sensing and collision warning system for more precise vehicle maneuvering

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- ▶ Assistance systems decrease the risk of accidents caused by construction vehicles and reduce stress for drivers
- ▶ Modular sensors and systems from Bosch offer high flexibility, functional reliability, and exceptional robustness
- ▶ Simple integration into the BODAS digital ecosystem from Bosch Rexroth possible
- ▶ Powerful Off-Highway Robotics Controller “BODAS ORC” forms the basis for partial and full automation

Abstatt – Many workplace accidents happen on construction sites. In 2021 alone, more than 100,000 occupational accidents occurred in the construction industry, 85 of which had deadly consequences (statistics from BG Bau for 2021). To avoid common injuries caused by construction vehicles, such as collisions with people and obstacles, the drivers must always have the entire area surrounding the vehicle in view. This often leads to mental stress and physical strains, such as those caused by drivers constantly turning their heads left and right to look behind them while driving backwards. Electronic assistance systems make a crucial contribution to increasing safety on the construction site and make work easier for the drivers of construction vehicles. They are also the first stage of the automated construction site. “Bosch has therefore developed a modular system with tailor-made systems and sensors for extensive assistance functions especially for construction vehicles. We are also working with Bosch Rexroth to offer the off-highway robotics controller, a powerful control unit that forms the heart of the automated machine and can provide support and relief in complex use cases,” says Stefan Schenk, who is responsible for the off-highway product area at Robert Bosch GmbH.

Flexible modular sensors for assistance systems

To make the vision of an automated construction site a reality, Bosch is already offering various assistance functions for construction vehicles today. These functions lighten the challenging workload for the driver and make the construction site safer. The different functions provide direct assistance to workers, such as load sensing in excavator buckets and a collision warning to protect the front and rear of the vehicle. If the systems detect people or objects in the danger zone, they warn the driver acoustically and/or visually and show the objects on the display. Drivers can therefore keep an eye on even the most hidden areas around their vehicles. The modular sensor system includes a variety of ultrasonic, radar, and multicamera systems. This enables customers to tailor the systems flexibly to their specific applications and assistance functions. Bosch draws on its expertise and proven key solutions from the passenger car domain and adapts these technologies specially for use in the off-highway segment. The result is that the systems combine a high level of functional safety with exceptional robustness, even under the toughest of operating conditions.

Manufacturers design their own assistance functions

For simple visual presentation of the sensor information, Bosch has developed the Off-Highway Vision System. It displays the video stream from the multicamera system and adds an overlay that visually emphasizes the objects detected within the detection area of the radar and ultrasonic sensors. The electronic fusion of the sensor data allows the benefits of the different sensor types to be optimally combined, thereby increasing the performance of the assistance system. The off-highway Vision System has been designed to be a prototype system. Manufacturers of construction vehicles obtain a validated, functional basic modular system with which they can design and develop their own assistance systems using the “plug and play” principle – tailored to their requirements.

The possible functional scope includes blind spot monitoring, object recognition, and maneuvering assistance.

The path to automated construction vehicles

The assistance functions that are currently available are a first step toward the fully automated and connected construction vehicles of the future. Bosch is working with Bosch Rexroth to make it easier for construction vehicle manufacturers to move toward vehicle automation with a tested and verified all-in-one system that is perfectly tailored to the use case – the Off-Highway Robotics Controller (ORC). It comprises sensors and an electronic control unit and forms the link between the sensor controllers and the machine’s electronic system. As a central unit, the ORC supports sensor fusion, terrain mapping, and object localization and thus forms the foundation and the next step for partial and full automation.

The automation software and hardware from Bosch can be seamlessly integrated into the BODAS (Bosch Rexroth digital application solutions) digital ecosystem. BODAS provides users a bundle of mobile electronics solutions that support the digital transformation, thereby increasing productivity and efficiency and simplifying automation. "With the systems from Bosch, the vision of the automated construction site of tomorrow is already within reach today," says Schenk.

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More information

Find out more: Meet the Bosch off-highway experts at bauma, at the Bosch Rexroth stand in hall 3, stand 327

Come to our presentation:

Camille Marbach – Bosch innovative surround sensing conquers construction market
Tuesday, October 25, 2:00 to 2:30 p.m., ICM – Innovation hall B0

You can also find more info at the [Netzwerk Baumaschinen](#) stand in hall C2, stand 133

Digitalization: haptic collision avoidance

<https://www.youtube.com/watch?v=yOFWV5c6fQY>

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About Bosch Engineering GmbH

Bosch Engineering GmbH is a wholly owned subsidiary of Robert Bosch GmbH and is head-quartered in Abstatt, Germany. As a systems development partner to the automotive industry since 1999, the company with its more than 3,000 associates offers development services for powertrains, safety and convenience systems, and electrical and electronic systems – from the original concept to series production. Specialized in electronics and software, it draws on Bosch's proven large-scale series production technology to develop tailored solutions for a wide variety of applications in passenger cars, commercial vehicles, off-highway and recreational vehicles, and in rail applications, ships, and industry. Bosch Engineering GmbH also coordinates all the Bosch Group's motorsports activities. Additional information can be accessed at www.bosch-engineering.com.

Mobility Solutions is the largest Bosch Group business sector. It generated sales of 45.3 billion euros in 2021, and thus contributed 58 percent of total sales from operations. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector pursues a vision of mobility that is safe, sustainable, and exciting, and combines the group's expertise in the domains of personalization, automation, electrification, and connectivity. For its customers, the outcome is integrated mobility solutions. The business sector's main areas of activity are injection technology and powertrain peripherals for internal-combustion engines, diverse solutions for powertrain electrification, vehicle safety systems, driver-assistance and automated functions, technology for user-friendly infotainment as well as vehicle-to-vehicle and vehicle-to-infrastructure communication, repair-shop concepts, and technology and services for the automotive aftermarket. Bosch is synonymous with important automotive innovations, such as electronic engine management, the ESP anti-skid system, and common-rail diesel technology.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 402,600 associates worldwide (as of December 31, 2021). The company generated sales of 78.7 billion euros in 2021. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology.

As a leading IoT provider, Bosch offers innovative solutions for smart homes, Industry 4.0, and connected mobility. Bosch is pursuing a vision of mobility that is sustainable, safe, and exciting. 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 facilitate connected living with products and solutions that either contain artificial intelligence (AI) or have been developed or manufactured with its help. 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 some 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. With its more than 400 locations worldwide, the Bosch Group has been carbon neutral since the first quarter of 2020. The basis for the company's future growth is its innovative strength. At 128 locations across the globe, Bosch employs some 76,100 associates in research and development, of which more than 38,000 are software engineers.

Additional information is available online at www.bosch.com, www.iot.bosch.com, www.bosch-press.com, www.twitter.com/BoschPress.