Press release
Cross-Domain Computing Solutions

April 25, 2023
PI11665 BBM jck/af

Driverless vehicles: Bosch's automated vehicle maneuvering boosts automakers' efficiency
Maneuvering service speeds up production

- New: with automated vehicle maneuvering, Bosch is opening the door to the driverless maneuvering of vehicles on factory premises.
- Based on the technology used in Bosch automated valet parking, the maneuvering service increases efficiency in automotive production.
- Driverless maneuvering from the end of the assembly line to the charge spot: automated driving improves plant safety.

Stuttgart, Germany – Getting vehicles from the assembly line to the test bench without a driver will soon be a realistic alternative. The automated vehicle maneuvering solution developed by Bosch significantly optimizes automotive production processes while also increasing safety. Automakers can finally get to grips with challenges such as the tight maneuvering of vehicles on the shop floor, downtimes in production due to absent drivers, accidents or damage caused by collisions, and a lack of information on where vehicles are located in the plant. Based on its automated valet parking system, Bosch equips the automaker's plant with a lidar-sensor infrastructure, which it supplements, where required, with Bosch stereo cameras. The information generated by the sensors is fed into edge computers, and smart algorithms tell the vehicle which route to take. In this way, Bosch makes it possible for vehicles to maneuver without drivers – even where space is tight. Smart technology installed in the plant keeps the technical requirements in the vehicle itself to a minimum.

"Automated vehicle maneuvering stems from the systematic work we have done to continuously improve automated valet parking. This driverless maneuvering service is a further key component of automated mobility. Our solution is designed to offer automakers a new level of efficiency and to help them address challenges such as the shortage of skilled production workers," says Claudia Barthle, head of sales for software and services in the Cross-Domain Computing Solutions division at Bosch. "Based on feedback from our customers, we

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identified an urgent need for a solution that would enable automated vehicle maneuvering both inside and outside the manufacturing shop. Now our portfolio features a system that meets precisely those requirements." Bosch is in talks with various automakers regarding the installation of automated vehicle maneuvering in their plants.

One solution, many benefits

The driverless maneuvering service can be used in a wide range of applications both inside and outside the manufacturing shop. For example, once a new vehicle has successfully completed first ignition, the system can maneuver it from the assembly line to the next stage in the process. This enables vehicles to be moved without a driver or any other human interaction, for example from one test bench to the next. The automated vehicle maneuvering system can also comfortably maneuver vehicles through calibration lines while maintaining a constant speed. Should a manufacturing error be detected, the smart solution will also automatically drive the vehicle to the plant's repair shop. Once a car has reached the end of the assembly line, it drives out of the factory and into the logistics parking area, ready for its onward journey. But that's not all. In the future, the new Bosch solution will also enable vehicles to be maneuvered between free parking spaces and charge spots, enabling them to be automatically recharged overnight, for example. The benefits are clear: the driverless maneuvering service saves automakers not just time, but also money – the technology eliminates the need for associates to drive the cars from one stage of the process to the next. This increases efficiency while reducing downtime and costs, enabling automakers to significantly optimize their shop-floor processes and workflows and make them more efficient. Automated vehicle maneuvering also offers other advantages, such as improved safety on the factory floor. Lidar sensors scan the environment, identify the driving aisle, and reliably detect obstacles or people that are in the vehicle's path. If an unexpected obstacle is detected, the vehicle brakes and safely comes to a complete stop. Only once the route is clear does it continue on its way.

Automated valet parking: the success story continues

Automated vehicle maneuvering is another chapter in the success story of Bosch automated valet parking. Last year, the world's first fully automated driverless (SAE Level 4) parking function was given official approval for regular use in Germany. Drivers simply park their car in a drop-off area and leave it up to Bosch's intelligent parking garage infrastructure and the technology installed in the vehicle to work together to find a free parking space and maneuver the car into it. Automated vehicle maneuvering employs the same principle.

Press photos: #3ac368b0, #863ddacd

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Mobility Solutions is the largest Bosch Group business sector. According to preliminary figures, it generated sales of 52.6 billion euros in 2022, and thus contributed almost 60 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 420,000 associates worldwide (as of December 31, 2022). According to preliminary figures, the company generated sales of 88.4 billion euros in 2022. 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 85,000 associates in research and development, of which nearly 44,000 are software engineers.

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