

## Press release



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## Bosch launches multi-camera system on the logistics market

- Fewer accidents: multi-camera system for forklifts helps with precision maneuvers
- Four near-range cameras capture the vehicle's entire surroundings
- 360°, 3D model helps drivers in steering

Stuttgart, Germany – In a warehouse, space is often hard to come by. Forklift drivers frequently have to maneuver their vehicles through tight spaces between shelves. Time and again, this leads to accidents that result in damage to the goods or the vehicles, that can be quite expensive. A far worse consequence than property damage is personal injury. In Germany alone, official reports put the number of accidents involving forklifts at some 12,000 each year (source: WEKA). According to a study by the German employers' liability insurance association for the wood and metal industries (BGHW), personal injuries occur most often when the vehicle is backing up in a small space of one to three meters. "A driver's eyes cannot be everywhere at once – that's where the Bosch multi-camera system comes in," says Andrew Allen, responsible for Bosch's Commercial Vehicle and Off-Road unit.

### 360° view helps with maneuvering

With the help of the multi-camera system, drivers can see a full 360° view around the forklift – even if it is carrying bulky freight. This simplifies the task of picking up and moving loads, even in tight spaces. The system helps the forklift maneuver with precision and makes it possible to estimate distances more accurately while on the move. Drivers can thus execute logistics tasks simply, safely, and efficiently. The multi-camera system consists of a control unit plus four very compact near-range cameras. Working together, they can capture an area measuring eight by eight meters. The cameras were originally designed for Bosch's passenger-car segment but have now been adapted for the special needs of the logistics market.

### Cameras capture the vehicle's entire surroundings

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Cameras are positioned at the front, rear, and each side of the vehicle. With an aperture of nearly 190°, they capture the vehicle's entire surroundings. Drivers see a realistic representation of their vehicle as a detailed 3D model on a display. As the vehicle moves, the display adjusts the view of its surroundings in real time. To better suit the vehicle's purpose, the manufacturer can preconfigure the screen to display individual or 360° views as well as full-screen or split-screen views. The driver then can choose the best view for the task at hand from the preprogrammed options.

The multi-camera system can visually project the vehicle's immediate path over the forward, rear, or top view, which provides aid in maneuvering and merging. The control unit measures the steering angle, calculates the resulting route, and shows it on the display. If the steering angle changes, the system recalculates the route and adapts the display accordingly.

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## Basic information:

Mobility Solutions is the largest Bosch Group business sector. According to preliminary figures, it generated sales of 47 billion euros in 2018, and thus contributed 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 accident-free, emissions-free, and stress-free, and combines the group's expertise in the domains of 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 410,000 associates worldwide (as of December 31, 2018). According to preliminary figures, the company generated sales from operations of 77.9 billion euros in 2018. 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 69,500 associates in research and development.

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