Press release
Automotive Steering

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Steer-by-wire ready for large-scale production: Bosch and Arnold NextG enter into an alliance
Systems expected on the market by mid-decade

- Bosch and the startup Arnold NextG have agreed to collaborate on steer-by-wire systems.
- The alliance aims to bring large-scale solutions to market by the middle of the decade.
- Dr. Gerta Marliani: “We’re excited to see the momentum this alliance will lend to our work on system optimization.”

Schwäbisch Gmünd, Germany – Bosch wants to bring steer-by-wire systems to the market on a commercial scale by the middle of the decade. Together with the startup Arnold NextG, the supplier of technology and services is taking the next step. The two partners have recently entered into an alliance to pool their development expertise and accelerate the process of readying the solutions for the market.

Steer-by-wire systems are considered the steering systems of the future. As one of the world’s leading suppliers of electric steering systems, Bosch recognized the potential of steer-by-wire systems early on and is systematically driving their development forward. “We’re seeing rapidly rising demand for steer-by-wire systems. This should prove to be an exceptionally large market over the long term – especially, although by no means only, for the age of automated driving. We’re excited to see the momentum this alliance will lend to our work on system optimization,” says Dr. Gerta Marliani, president of Robert Bosch Automotive Steering GmbH. The aim of the partnership is to accelerate the large-scale production of steer-by-wire solutions.

Arnold NextG specializes in the development of multi-redundant drive-by-wire systems with all interfaces for autonomous driving in small and very small batch sizes. Founded in 2021, the startup has employees with over 20 years’ combined experience in street-legal drive-by-wire technology, giving the

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company unique expertise in developing retrofit solutions for all by-wire applications. Experience has shown that, thanks to the redundancy of Arnold NextG technology, the authorities can issue system approvals for driving on public roads more quickly and efficiently. Together, Bosch and Arnold NextG aim to accelerate the development of systems that can be manufactured on a commercial scale.

Steer-by-wire applications eliminate the physical connection between a vehicle's steering wheel and its wheels. This opens up new possibilities for, say, redesigning the vehicle interior: the steering wheel can be lowered or stowed away, giving rise to entirely new cockpit concepts, especially in an age of automated driving. The technology also enables new safety features in vehicle dynamics control. For instance, even small automated steering interventions can stabilize the vehicle without the driver at the wheel even noticing. In addition, the vehicle's driving feel can be tailored to the requirements of individual vehicle manufacturers.

The use of a vehicle-independent and add-on-capable drive-by-wire technology in the radically changing series vehicle platforms of the future is of crucial importance, especially for people with the most severe physical mobility impairments. Only in this way will it be possible for this target group to continue to benefit directly from all developments in the field of autonomous and automated driving, assistance and safety systems.

Pooling by-wire expertise

"The alliance with Arnold NextG provides ideal support and accelerates our product development. We can apply our expertise in large-scale production and, with the Arnold NextG technology installed, we can now carry out tests on public roads more quickly," says Dr. Stefan Waschul, the member of the Robert Bosch Automotive Steering GmbH management board responsible for development.

"We've seen that the Bosch steer-by-wire system has the best and most natural steering feel in the market. Bosch is one of the world's leading suppliers of electric steering systems and already offers a strong package of control technology and performance for large-scale applications downstream. That's why I'm proud, not only to be able to build on one of the best systems, but also to have Bosch – one of the biggest automotive suppliers in the world – at our side," says Kevin Arnold, founder and CEO of Arnold NextG, in commenting on the new alliance. "With the Arnold NextG technology, Bosch has a vehicle-agnostic development platform for drive-by-wire retrofit solutions that makes it possible to validate data and requirements for large-scale production projects at an early stage of development. Together, we can further develop this technology

for large-scale manufacturing. Access to Bosch technology and the experience of a global corporation in implementing large-scale production projects is crucial for the further development of our systems."

Innovative mobility solutions thanks to by-wire technology

By-wire systems use electronics to transmit mechanical signals and pulses. They will also be a basic requirement for assisted and automated driving in order to fully tap the capabilities of individual functions. For example, the lane-keeping support system would be able to correct the direction of travel without the driver feeling it in the steering wheel. The vehicle can also avoid an unexpected obstacle without jerking the steering wheel and injuring the driver. With this technology, it may even be possible in the future to steer the wheels individually. This ensures a smaller turning radius and opens the door for new vehicle concepts for local traffic and goods transport in cities.

Press photographs: #ffeecdde, #fff4e350, #c9636172, #1e006859, #8b0c006e

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Mobility is the largest Bosch Group business sector. It generated sales of 52.6 billion euros in 2022, and thus contributed almost 60 percent of total sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility 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 421,000 associates worldwide (as of December 31, 2022). The company generated sales of 88.2 billion euros in 2022. Its operations are divided into four business sectors: Mobility, 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 470 subsidiary and regional companies in over 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 136 locations across the globe, Bosch employs some 85,500 associates in research and development, of which nearly 44,000 are software engineers.

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