Press release

Test stand for partially and fully autonomous vehicles

Dürr Assembly Products commissions x-road curve in Korea

Püttlingen, 2 June 2022 – Dürr Assembly Products has successfully launched and commissioned its innovative x-road curve multi-function test stand for autonomous and partially autonomous vehicles in Korea. The client was the Korea Transportation Safety Authority (KOTSA), a public authority responsible for vehicle and traffic safety. The project was implemented in cooperation with dSPACE, which specializes in the simulation of driving scenarios.

Unlike with conventional roll test stands, the x-road curve permits free driving with steering movements to simulate cornering. Laser measurement technology detects the steering angle of the front axle, while a pivoting roller unit automatically compensates the movements of the front wheels. The vehicle thus remains in the center of the test stand, even at high speeds, regardless of the steering wheel position. In combination with the virtual environments developed by dSPACE, typical traffic situations are simulated to elicit a response from the sensors installed in the vehicle. This enables the functionality of driver assistance systems to be tested.

Dürr Assembly Products demonstrated what this looks like in practice to KOTSA officials on its test stand in Püttlingen. For the first time, the experts used a random vehicle off the street for this. They simulated two scenarios: The vehicle is in danger of leaving its lane, therefore a steering intervention is needed. The vehicle has to perform an emergency stop in response to the vehicle in front braking. Appropriate realistic traffic situations were depicted on a monitor. Radar signals simulated other traffic users to match the display on the monitor.

For Timo Wallscheid, **x-road** Product Line Manager at Dürr Assembly Products, the successful commissioning of the **x-road** **curve** is a major step in the testing of partially and fully autonomous vehicles: “For the first time, the actual reaction of safety-related systems on a vehicle that had not been prepared in any way was tested in a simulated traffic situation. The steerable **x-road curve** test stand from Dürr and the simulation environment from dSPACE complemented each other perfectly.”

Dirk Berneck, Senior Manager Engineering Services at dSPACE, views the new complete validation system from Dürr and dSPACE as decisive for the testing and homologation of highly automated vehicles by testing organizations, and explains: “Imaging sensors like radars and cameras are playing an ever-greater role here. dSPACE’s highly precise traffic and environment simulation with a comprehensive library of flexibly executable driving situations is an efficient way of validating vehicle and sensors on compact test stands.”

The public authority KOTSA performs a similar role in Korea to the TÜV in Germany and is responsible for the PTI (Periodical Technical Inspection). The x-road curve was installed and commissioned at its headquarters in Gimcheon, and officially presented to the public in mid-March. The event was attended by representatives from the Korean Ministry for Land, Infrastructure and Transport. The guests also included the Hyundai Motor Company and Mercedes-Benz Korea as well as reporters and representatives from other testing organizations like the German KÜS (an automotive monitoring organization made up of independent professional automotive experts).

Sensors and actuators in autonomous and semi-autonomous vehicles are extremely complex. On top of this, different software versions have to be compatible. Dürr Assembly Products, a subsidiary of the Dürr Group, therefore expects that test stands like the x-road curve will be indispensable in the future, especially as legislation will require such tests as proof of operational safety.

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Picture 1: x-road curve multi-function test stand at KOTSA

The Dürr Group is one of the world's leading mechanical and plant engineering firms with extensive expertise in automation and digitalization/Industry 4.0. Its products, systems and services enable highly efficient and resource-saving manufacturing processes in different industries. The Dürr Group supplies sectors like the automotive industry, mechanical engineering, chemical, pharmaceutical, medical technology and woodworking industries. It generated sales of € 3.54 billion in 2021. The company has around 17,800 employees and 120 business locations in 33 countries. The Dürr Group operates in the market with the brands Dürr, Schenck and HOMAG and with five divisions:

* **Paint and Final Assembly Systems:** paint shops as well as final assembly, testing and filling technology for the automotive industry, assembly and test systems for medical devices
* **Application Technology:** robot technologies for the automated application of paint, sealants and adhesives
* **Clean Technology Systems:** air pollution control, noise abatement systems and coating systems for battery electrodes
* **Measuring and Process Systems:** balancing equipment and diagnostic technology
* **Woodworking Machinery and Systems:** machinery and equipment for the woodworking industry

dSPACE is a leading provider of simulation and validation solutions worldwide for developing connected, autonomous, and electrically powered vehicles. The company's range of end-to-end solutions are used particularly by automotive manufacturers and their suppliers to test the software and hardware components in their new vehicles long before a new model is allowed on the road. Not only is dSPACE a sought-after partner in vehicle development, engineers also rely on our know-how when it comes to aerospace and industrial automation. Our portfolio ranges from end-to-end solutions for simulation and validation to engineering and consulting services as well as training and support. With approximately 2,000 employees worldwide, dSPACE is headquartered in Paderborn, Germany, has three project centers in Germany, and serves customers through regional dSPACE companies in the USA, the UK, France, Japan, China, Croatia, and South Korea.

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