

## Press release

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## KION Group launches IMOCO research project

- **Project partners from industry and the research community to team up on development of safe and intelligent self-driving trucks for use in warehousing and production**
- **Support for the project from Germany's Ministry of Education and Research and EU research incubator KDT JU**
- **Project scheduled to be completed in the fourth quarter of 2024**

Frankfurt am Main, February 9, 2022 – The KION Group has just launched the European research project IMOCO. The objective of the project is to enable intelligent trucks to navigate autonomously in a factory or warehouse. IMOCO, which stands for 'intelligent motion control', is dedicated to the safe use of mobile robotic systems in fast-moving intralogistics environments. The German project consortium is led by the KION Group and its subsidiary STILL. The German partners are the Fraunhofer Institute for Material Flow and Logistics, Hahn Schickard, IMST GmbH, Nuromedia, and DigitalTwin Technology. IMOCO is supported by the Federal Ministry of Education and Research in Germany and, in the European Union, through the research incubator KDT JU (Key Digital Technologies Joint Undertaking), which provides funding for public-private partnerships engaged in cutting-edge research.

Semi-autonomous trucks are already being used profitably in many warehouses and production environments. Yet they still have their limitations. For example, although it is now standard for these trucks to independently identify obstacles and brake accordingly, much more is needed for them to have full self-driving capability. Intelligent trucks need to navigate in the warehouse entirely autonomously, without any exceptions. They should be able to avoid obstacles, find the most efficient routes, and analyze, i.e. understand, their surroundings. IMOCO addresses four scenarios in which artificial intelligence (AI) can be used, namely navigation, the collection and movement of goods, and delivery to their final position. The scope of the project sets a high bar for the truck in terms of flexibility, environmental perception, solution-oriented strategies, and secure connectivity. This is where the research project comes in.

“The prospects for the IMOCO project look very promising. Our intensive research and development efforts are focused on the desired advances in fields such as artificial intelligence, robotics, sensor technology, and machine perception,” says Henry Puhl, Chief Technology Officer of KION GROUP AG. “The results of the research project can be applied wherever autonomous functions for mobile robots or trucks add value for our customers.”

### **STILL's iGo neo platform serves as the basis**

The IMOCO project will see a demonstrator set up at the STILL site in Hamburg that will bring together all the work of the national partners. STILL will also be coordinating the integration of the components. The aim of the project is to use a semi-autonomous or automated industrial truck (e.g. STILL's iGo neo) in a realistic warehouse environment. The semi-autonomous iGo neo is currently restricted to use in aisles; fully autonomous operation in the warehouse is not yet possible with this product. IMOCO is now taking the next step, giving the truck the capability to autonomously recalculate its route based on the situation at hand and dealing with moving objects such as people and other vehicles.

“The aim of the research project is to use artificial intelligence to upgrade the self-driving paradigm from identify, analyze, and act to perceive, understand, and execute,” says Ansgar Bergmann, project manager for IMOCO at the KION Group. “Many different sensor systems are used, enabling trucks not only to identify objects that they have been trained to recognize, but also to analyze the movements of these objects. The benefit in terms of autonomous navigation is that this allows them to detect obstacles in real time.”

### **Autonomous truck fleets for typical warehouse tasks**

The technical challenges that IMOCO has to overcome are considerable. The truck needs to be able to perceive its surroundings using a wide range of sensors. And this does not just mean physical objects such as racking, but also signs, markings, and notifications. Cameras, laser scanners, and radar are all used here. The second step is for the truck to understand what it perceives. This involves classifying objects into categories such as static (racking), movable (pallets), and moving (vehicles, people). A further requirement is the ability to self-locate (Where am I?) and understand the assigned tasks (What do I need to do?). In the final step, the truck must be able to execute its tasks autonomously. It needs to navigate independently to where the required goods are stored, identify and pick up the load, drive through the warehouse – avoiding obstacles and making other machine-based decisions – and finally find a logical place to set down the pallet. These are all typical warehouse processes that could be undertaken by fleets of self-driving trucks in the future.

Completion of the project is planned for the fourth quarter of 2024.

## The Company

The KION Group is among the world's leading suppliers of industrial trucks and supply chain solutions. Its portfolio encompasses industrial trucks, such as forklift trucks and warehouse trucks, as well as integrated automation technology and software solutions for the optimization of supply chains, including all related services. Across more than 100 countries worldwide, the KION Group's solutions improve the flow of material and information within factories, warehouses, and distribution centers.

The Group, which is included in the MDAX, is the largest manufacturer of industrial trucks in Europe in terms of units sold in 2020. In China, it is the leading foreign manufacturer (as measured by revenue in 2020). The KION Group is also one of the world's leading providers of warehouse automation (as measured by revenue in 2019).

At the end of 2020, around 1.6 million of the KION Group's industrial trucks were in use by customers of various sizes and in numerous industries on six continents. The Group currently has around 40,000 employees and generated revenue of €8.3 billion in 2020.

*Current KION Group images can be found in our image database at <https://mediacenter.kiongroup.com/categories> and on the websites of our various brands.*

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Further information for the media

Michael Hauger

Senior Vice President Corporate Communications

Tel: +49 (0)69 201 107 655

Mobile: +49 (0)151 1686 5550

[michael.hauger@kiongroup.com](mailto:michael.hauger@kiongroup.com)

Frank Grodzki

Senior Director External Communications & Group Newsroom

Tel: +49 (0)69 201 107 496

Mobile: +49 (0)151 6526 2916

[frank.grodzki@kiongroup.com](mailto:frank.grodzki@kiongroup.com)

Further information for investors

Sebastian Ubert

Vice President Investor Relations

Tel: +49 (0)69 201 107 329

[sebastian.ubert@kiongroup.com](mailto:sebastian.ubert@kiongroup.com)