PRESS RELEASE

Pfronstetten-Aichelau, November 4, 2025

Teleoperation meets autonomy: MIRA, Rheinmetall, and Arnold NextG develop teleoperated tractor

The partners are shaping the future of agricultural mobility through a joint project on a scalable platform, with drive-by-wire technology at its core for autonomous agricultural machinery.

High tech meets practical application: This tractor has been prepared for teleoperation and is equipped with sensors and camera systems. It is fitted with the NX NextMotion drive-by-wire system and the DuxAlpha 3D guidance system for autonomous field work during system configuration. Photo: Arnold NextG

Pfronstetten-Aichelau/Düsseldorf, 4 November 2025 – The agriculture sector is undergoing radical change, with driverless mobility playing a pivotal role. Arnold NextG GmbH, the Rheinmetall Technology Centre (RTC) and MIRA GmbH have joined forces to bring state-of-the-art control technologies to the field. A tractor that can operate autonomously in the field and be safely moved on the road via teleoperation demonstrates how the future is already a reality.

The technological basis for autonomy and teleoperation is drive-by-wire.

For the first time, MIRA GmbH and the Rheinmetall Technology Centre are introducing their teleoperation technology to the agricultural sector. Together, they are developing systems that enable the safe remote control of agricultural vehicles over long distances. This is based on the NX NextMotion platform from Arnold NextG, which is a fully electronic, multi-redundant drive-by-wire system. This system is the backbone of driverless mobility, controlling both autonomous field work and safe teleoperation between the operating site and the place of use. In collaboration with Arnold NextG, this creates a comprehensive system that combines the strengths of both technologies seamlessly.

The NX NextMotion platform was specifically developed for safety-critical applications in challenging environments. Its multi-redundant architecture (including control, communication and power supply) guarantees full control even in the event of a malfunction, and is certified as fail-operational according to ASIL D and SIL3. This enables precise control of autonomous fieldwork and safe remote control on public roads.

While Arnold NextG provides the technology for autonomous fieldwork, RTC and MIRA are responsible for integrating teleoperation and connecting to a control centre. The interaction between these systems results in a practical, integrated concept that demonstrates how autonomous driving and remote control can be combined.

For precise, autonomous processing in the field, the system can be combined with the optional DuxAlpha add-on — the world's first 3D track planning solution for centimetre-precise operations.

Designed in partnership and built to be scalable.

'The combination of autonomy and teleoperation is a significant milestone that opens up new possibilities for agriculture in the future,' says Kevin Arnold, CEO of Arnold NextG GmbH. "Together with MIRA and the Rheinmetall Technology Centre, we are developing systems that will make everyday work in the field much easier. Our NX NextMotion platform provides the technological basis for automating work processes, deploying skilled workers more effectively, and increasing the efficiency of machines and operating resources in a sustainable way."

The interaction of teleoperation and drive-by-wire creates an overall system that sets new technical standards and demonstrates the power of close partnerships in driving innovation across industries.

'With teleoperation, we are bringing driverless mobility to new areas of application, even outside urban environments,' explains Win Neidlinger, MIRA GmbH's Managing Director. 'Our technology enables vehicles to be safely controlled over long distances and integrated into existing control centre and communication systems.'

Ready for use in the field, on the road and beyond.

The joint project demonstrates how networked and automated technologies can actively support structural changes in agriculture. By combining autonomy and teleoperation, agricultural machinery can be operated flexibly, safely and economically in future, even in the face of skilled labour shortages and rising cost pressures.

At the heart of the system is the NX NextMotion drive-by-wire system from Arnold NextG. This platform is multiply redundant and fail-operational, and is certified to the world's highest safety standards, including ASIL D, SIL3 and ISO 21434. It can be integrated independently of the platform and forms the basis for scalable, driverless applications in agriculture, logistics, construction, mining and public transport. The system can be homologated for public road traffic and already meets the relevant international requirements, including UNECE R79 and FMVSS 126.

This teleoperation technology is being developed as part of the PoQuaSIA project, which is funded by the German Federal Ministry for Economic Affairs and Energy (BMWi) as part of the European IPCEI-CIS initiative.

The system will be presented to the public for the first time at Agritechnica 2025, which takes place from 9 to 15 November in Hanover. In Hall 21, Booth H05, visitors can experience autonomous field work and safe teleoperation interacting in one system for themselves – offering a glimpse into the future of agricultural mobility.

Looking ahead: Precise autonomy in the field with 3D track planning

In anticipation of the next stage of automation, Arnold NextG is presenting DuxAlpha, an award-winning system extension which was honoured with the DLG Silver Medal at the Agritechnica 2025 Innovation Award. The first of its kind, DuxAlpha enables three-dimensional, topography-based track planning with centimetre-precise route calculation, supplemented by real-time networking and automated documentation. This brand-independent, retrofittable, cloud-based solution is highly versatile. When used with NX NextMotion, it provides the basis for precise autonomy in the field, from the initial track to full process integration.

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For maximum visibility: The integrated camera system provides a seamless 360° field of view—the basis for precise, safe teleoperation in agricultural environments. Photo: Arnold NextG GmbH

A look inside the control center: The teleoperator controls the tractor remotely—via multiscreen visualization, sensor feedback, and a digital cockpit. Photo: Arnold NextG

In action: The tractor is operated remotely—the camera image replaces the view from the cab, and control and system monitoring are carried out entirely from the control center. Photo: Arnold NextG

About Arnold NextG GmbH:

Arnold NextG is bringing tomorrow's Safety-by-Wire® technology to life: the multi-redundant NX NextMotion central control unit enables fail-safe and customised implementation, independently of the vehicle platform, and is unique worldwide. This system allows autonomous vehicle concepts to be implemented safely and in accordance with the latest hardware, software and safety standards, as well as providing solutions for remote operation, teleoperation and platooning. As an independent advanced developer, incubator and system supplier, Arnold NextG takes care of the entire process, from vision to road approval. With the road approval of NX NextMotion, we are setting the global drive-by-wire standard. www.arnoldnextg.com

About MIRA GmbH:

MIRA GmbH is shaping the future of mobility. As a technology leader in teleoperation, the company develops pioneering solutions for the safe, reliable and efficient remote control of vehicles in real time, both on public roads and in closed operating areas. Thanks to its proven, modular and interoperable systems, MIRA has been setting the standard for public road traffic for years, covering everything from urban mobility applications to logistics and transport processes. Thanks to robust connectivity, ultra-fast image transmission and multi-level security architectures, MIRA is paving the way for scalable, cost-effective and driverless mobility solutions. MIRA is now transferring this innovative strength to a new field: smart farming. Integrating teleoperation technology into agricultural machinery is redefining efficiency, productivity and occupational safety in agriculture, paving the way for highly automated farming. As a cross-system integrator, MIRA delivers comprehensive, end-to-end solutions, including vehicle integration, control centre software, and operational and safety concepts. Thus, the company combines technological excellence with practical applicability, shaping the transition to a remote-controlled, networked, and sustainable mobility future.

Abnout Rheinmetall Technology Center:
The Rheinmetall Technology Centre is a group-wide unit of the Rheinmetall Group that focuses on technology and cross-group applications. It primarily focuses on developing innovative technologies and products, building initial functional models and prototypes, and validating them from technical and economic perspectives. If the evaluation is positive, these technologies and products are transferred to existing or new Group units for commercialisation. The main areas of focus are sensor technology, digitalisation, automation and (e-)mobility.

For further information:

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