Press Release

Gaia-X data space: ARENA2036 to supply parts to Kaiserslautern

- PILZ handling station for truck parts delivered to Stuttgart
- SmartFactory-KL expands production network beyond city limits

In June, PILZ delivered a handling station to ARENA2026, a research campus for the production innovation in Stuttgart. In the coming weeks it will be integrated in the Gaia-X data space at SmartFactory Kaiserslautern (SF-KL). At which time, the station will become part of the *Production Level 4*-ecosystem. This cooperation represents the first practical outcome of the Memorandum of Understanding between SmartFactory-KL and ARENA2026 signed at the Hannover Messe.

The PILZ-module in the data space

Currently, model trucks are being built using shared production at three locations in Kaiserslautern. In this research scenario, customers design and build their truck using a product configurator. The PILZ module is planned to become part of the future production infrastructure in Stuttgart. Production starts in ARENA2026 as soon as the option "yellow cab" is clicked on the truck configurator. The first step is printing the driver's cab in the color of the PILZ Company (yellow). Next, a robot arm grips and holds it at various angles in front of a quality control camera. An AI algorithm checks for possible defects and clears it for release. Now it is ready for transport to Kaiserslautern, where it is mounted on the model truck. The basis for the cooperation between the locations is a secure data space. In the words of Susanne Kunschert, managing partner at PILZ, "The reason we decided to participate in this project is because the data space ecosystem supports people: It creates the opportunity to try out, test, and demonstrate. As a result, we gain new knowledge about safe automation – entirely in the sense of Manufacturing-X. Data spaces are a valuable foundation for digital collaboration. When linked together, they contain information from a variety of production environments about what services are available." The example application carried out in ARENA-X illustrates the successful combination of different approaches within the data space. "The exchange between the different players as well as the standardization within Gaia-X, Catena-X, and other 'X-initiatives' forms the technical basis required for such innovation. All those who want to participate are welcome to actively try it out with us," said Johannes Diemer of ARENA2026.

Data spaces shift the boundaries

"By shifting manufacturing processes, coordination, and secure data transfers to a data space, we are entering a new dimension in production. The temporary integration of the PILZ station in Stuttgart with our production planning system enables us to experience how shared production can work in the future," said Prof Martin Ruskowski, CEO of SmartFactory-KL. Two scenarios are already technically possible: either (1) the ARENA2036 station is part of the SF-KL Gaia-X data space, where it can be integrated relatively easily; or (2), ARENA2026 builds its own data space which, in turn, is connected with the data space at SmartFactory-KL. In the latter case, the newly developed Eclipse Dataspace Connector (EDC) would be used. This was tested in the smartMA-X research project and also evaluated positively by a broad community at the Tech-X Hackathon in Bilbao in May 2023. "I am very pleased that the collaboration described in our MoU with ARENA2026 is beginning to bear fruit," said Ruskowski, while adding, "Joint project development strengthens the positioning of Germany as a leading business location. That is so much more constructive than competing against each other."

About SmartFactory-KL

SmartFactory-KL is the name of a research and industry network with three pillars of support – the non-profit association, Technologie-Initiative SmartFactory KL (SF-KL), plus two scientific research institutes ("Innovative Factory Systems" at DFKI and "Machine Tools and Control Systems" at the RPTU campus Kaiserslautern). Prof. Dr. Martin Ruskowski has been responsible for organization and content since 2019. He serves as chair of the association's management board as well as the faculty chair and head of the DFKI research department. SmartFactory-KL brings stakeholders from industry and research together in a unique Industrie 4.0 network to facilitate collaboration in the joint development and implementation of future production concepts for the factories of the future. The manufacturer-independent demonstration and research platform enables industry representatives and researchers to conduct joint testing of innovative production technologies in a realistic factory environment.

In 2019, the partner network revisited the concept of Industrie 4.0 and that resulted in the upgrade now known as *Production Level 4* (PL4) (only in german). In 2020, SmartFactory-KL introduced the world's first PL4 demonstrator (only in german). Since then, the association has participated in the European GAIA-X network with its smartMA-X research project. The demonstrator plays a major role as a testbed in the European effort.

In 2021, SF-KL presented the concept of Shared Production (only in german) – implemented for the first time as a skill-based, PL4 manufacturing ecosystem in Kaiserslautern. This represents a major advance in production, enabling completely revolutionary manufacturing architectures that are individually configurable via digital platforms. The PL4 ecosystem currently consists of three production cells, one of which – the production island "KUBA" – was exhibited for the first time at the 2022 Hannover Messe (only in german). Many key enabling technologies such as AI operations, digital twins, operational safety intelligence, and industrial edge cloud applications have been implemented to date. SF-KL and DFKI are technology leaders in the TWIN4TRUCKS projects launched on the first of September 2022. Daimler Truck is lead manager for that project. The aim is to optimize commercial vehicle production at the Würth plant.

In 2016, the German Federal Ministry for Economic Affairs and Energy (BMWi) appointed SF-KL lead manager of the Mittelstand 4.0 Competence Center (SME4.0) (only in german) Kaiserslautern, which supported the digitalization efforts of SMEs until 2021. Since 2021, that work continues as the Mittelstand-Digital Zentrum Kaiserslautern (only in german) with SmartFactory-KL providing continuity as lead manager.

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