SPS-PRESSTRIP 2025

Siemens Autonomous Factory Lab

The Autonomous Factory Lab in Nuremberg, Germany is a place to learn, experiment and create the vision of the autonomous factory, designed by and for people.

SIEMENS

"In the Siemens Autonomous Factory Lab, ideas merge with practice: Our lab environment tests concepts, evaluates technologies, and translates insights directly into production."

Carsten Braunroth, Project Lead Autonomous Factory Lab

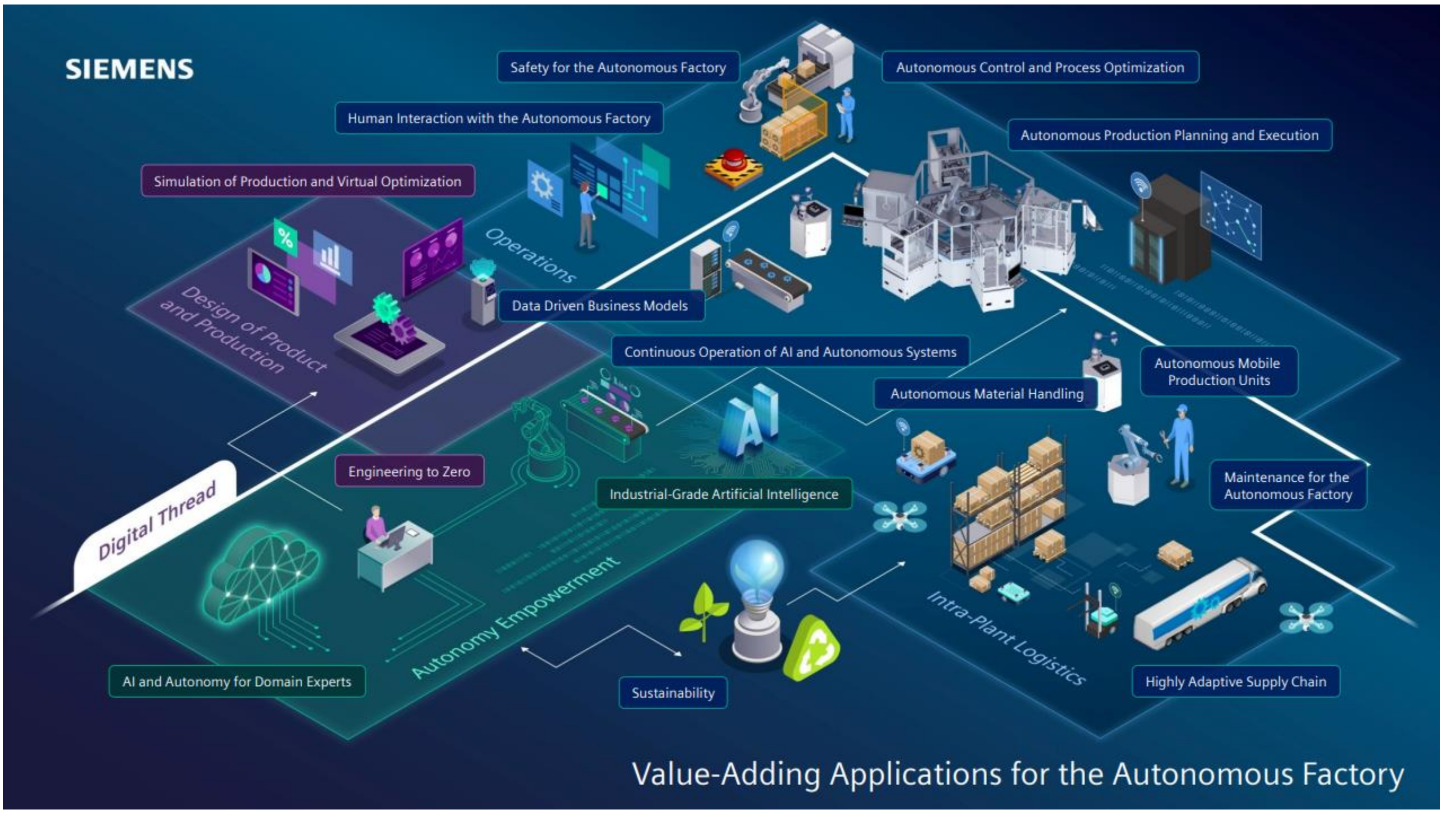
The Siemens Autonomous Factory Lab is a modular, flexible research facility for advanced development. It serves as a platform for discussions with customers, co-creation, and patent applications; a plug-and-produce approach enables rapid testing of new concepts.
The lab focuses on the following areas:"

- **Future of Manufacturing:** Factory environment of the future with advanced machines and robotic systems. Focus on automation and precision as well as future topics such as Industrial Edge, virtual controllers, and other IIoT solutions. Concepts for virtual controllers developed in the Autonomous Factory Lab were deployed for the first time in a production environment at Audi in 2025 (press release).
- **Industrial-grade AI:** Development and testing of diverse AI solutions for industry, including vision-based systems for intelligent monitoring, Industrial Copilots to support engineering processes, as well as research on Physical AI for the autonomous manufacturing of the future.
- **Flexible Production**: Flexible production setup with modular robotics and machine lines to demonstrate plug-and-produce capabilities.
- **Advanced Safety**: Development of forward-looking safety concepts for flexible manufacturing environments with human-robot collaboration.

The Autonomous Factory Lab researches a broad spectrum of topics for autonomous manufacturing: **from autonomous production planning and process optimization to data-driven business models and simulation and virtual optimization of manufacturing processes.** Additional research fields include autonomous material handling, continuous operation of AI systems, maintenance concepts, highly adaptive supply chains, as well as human-machine interaction and sustainability aspects in the autonomous factory

The Lab particularly supports the advancement of generative AI-based solutions along the value chain. The focus is on three manufacturing types: Process Manufacturing, Discrete Manufacturing, and Hybrid Manufacturing. Central to this is a Copilot architecture that provides support in every phase of production: Engineering Copilots assist with concepts and designs, Planning Copilots support scheduling and resource allocation, Design Copilots facilitate iterative product and process design, Operations Copilots optimize throughput times and quality, Service Copilots ensure maintenance and support. This occurs across industries with the goal of increasing efficiency, accelerating decision-making processes, and improving collaboration between humans and machines**.**

Most recently, the Autonomous Factory Lab has established itself as a center of competence for the integration of mobile robots into production workflows. New developments include Safe Velocity, a state-of-the-art safety solution for AMRs. Safety features include Safe Person Detection & Collision Avoidance, Safe Velocity Monitoring, Safe Braking/Emergency Stop, and Laser Scanner Environment Detection. This solution, developed in the Lab, is already available as a product (press release). Under the motto "We make your factory see," Siemens is working in the Autonomous Factory Lab on real-time monitoring of safety zones, such as robot cells or loading areas. People are automatically anonymized, and no image data leaves the edge devices. The advantage: edge computing-controlled monitoring and control with minimal data transfer. **The goal is safe collaboration between humans and machines, from today's mobile robots to the humanoid robots of the future.**



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