TRANSFORMATION OF THE CHEMICAL INDUSTRY

Control technology that combines continuity with innovation

In the chemical industry, innovation is essential for meeting the major challenges of our time, such as solving future issues, growing profitably, and maintaining competitiveness. At the same time, production must continue smoothly. How can a control system help the chemical industry combine continuity and innovation?

From AI applications to cloud and edge computing to modular and autonomous production, the opportunities for technological innovation are diverse, and many companies in the chemical industry are implementing projects in these areas. For instance, BASF's current initiatives focus on advanced digital and autonomous production. At the heart of this new approach lies data driven, robust, and flexible process control. In line with this vision, BASF is evaluating the next-generation process control system, SIMATIC PCS neo from Siemens, directly in the plant. BASF already runs around 80 installations of the proven SIMATIC PCS 7 process control system. As the world's largest chemical company, BASF is thus underlining its commitment to future-oriented automation.

SIEMENS

BASF's biotechnology center: Pioneering through innovation

One example of how the group is addressing pressing future issues is its new approach to producing vitamin B2. This vitamin plays a central role in human and animal metabolism and can be obtained via an industrial, multi-stage organic synthesis process. At the biotech center, however, production is now possible via a lean, energy-efficient, one-step process. Thus, BASF demonstrates the potential of biotechnology to reduce the carbon footprint of production processes. In the biolab center for white biotechnology, BASF uses SIMATIC PCS neo from Siemens to produce chemical intermediates. This fully web-based system allows for remote work and optimizes global engineering projects through efficient, uniform operation.

BASF - Biotechnikum Ludwigshafen

Breaking new ground in terms of flexibility

In the innovative environment of the biotech center, where BASF is developing future technologies, SIMATIC PCS neo is in its element. It redefines process control technology and supports BASF's progressive work by integrating the latest automation technology. Full support of the MTP (Module Type Package) standard is a decisive factor here. MTP enables manufacturer-independent, modular automation. With a suitable basic infrastructure, intelligent process modules can be integrated into the control system via Plug & Produce without additional engineering effort. For BASF, this means shifting towards flexible production architectures that can quickly adapt to new requirements.

Software-Defined Automation (SDA) implements this flexibility even more comprehensively. The rigid automation pyramid is replaced by a flexible network in which hardware and software are decoupled. Siemens' SIMATIC PCS neo consistently uses this approach, integrating real-time data from intelligent field devices directly into higher-level controls via Industrial Internet of Things (IIoT) technologies and edge computing.

This architecture enables BASF to adapt production processes dynamically to market requirements and shortens time-to-market.

"We have a large installed base of SIMATIC PCS 7, so it is vital that we can continue to **rely on the existing hardware**. At the same time, we want to take advantage of the technical innovations offered by SIMATIC PCS neo."

Dr. Christian Mücksch
Manager Automation, Control System Technology Team

Shaping the future together!

Using SIMATIC PCS neo in real plant operations ensures the system meets all requirements before being rolled out to larger plants. Close cooperation between BASF and Siemens enables prompt implementation of new functions and short feedback loops that promote continuous optimization. Siemens' commitment to a seamless evolutionary process is demonstrated by its extension of support for SIMATIC PCS 7 until at least 2040.

Using existing SIMATIC hardware from the large installed SIMATIC PCS 7 base protects BASF's investment. At the same time, the chemical company benefits from several key SIMATIC PCS neo functions that meet its requirements for a modern, secure, reliable, and flexible process control system. These include browser-based operation with a user-friendly interface, access from any authenticated device, and support for global collaboration through multi-user engineering.

Preinstalled security measures ensure plant safety, system integrity, and network security, setting new standards. Industry-standard AI and cloud technology functions can be integrated step by step.

"The successful pilot is the first step toward a **global release of SIMATIC PCS neo** for use at BASF. Testing under real conditions is essential for this. Now, we know that we can rely on the technology that will accompany us on our journey toward autonomous production."

Dr. Christian Mücksch
Manager Automation, Control System Technology Team

The introduction of SIMATIC PCS neo to other plants is planned for the near future. Through their collaboration, BASF and Siemens aim to establish the foundation for reliable and future-proof plant operation with flexible, user-friendly automation technology. The results of this strategic partnership could also serve as a blueprint for other customers in process industries.

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