



News for the **Digital Enterprise**

November 2021
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SIEMENS



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FUTURE OF AUTOMATION

The Totally Integrated Automation portfolio is constantly being expanded with innovations that are shaping the future of automation and optimally equip companies to meet their current and future challenges.

ARTIFICIAL INTELLIGENCE, EDGE, AND CLOUD

Smart solutions for sustainable, customized consumption



As the world's population increases and the land available for agricultural use shrinks, the challenges confronting the food industry are growing. Along with cultivatable land, water is also becoming scarcer, while consumers are demanding more transparency with regard to where and how their food is made.

Siemens is already experimenting with innovative technologies together with customers in its own laboratories. This results in solutions that advance sustainability and enable the flexible production of customized products – such as a specifically created soft drink.

How exactly does this work? Take the example of a lemon-mint soft drink. In the future, mint will be cultivated right where it is needed, in close

Highlights

- **Edge, cloud, and AI: The perfect team** for a sustainable future
- **Intelligent processes** across the entire value chain
- **Extended data analysis** using edge and Mendix apps – from the sensor to the cloud
- **Individual order management** thanks to AI

proximity to the soft drink manufacturer. Smart applications analyze the entire lifecycle of the mint plants in order to preserve as many resources as possible. The data from integrated sensors is acquired via edge systems and evaluated in real time to guarantee precise control over lighting, temperature, nutrients, and other factors. Intelligent robot systems take care of the optimal life cycle of plants and fruits as they're converted into a customized soft drink. These systems know exactly what products to grasp and pack in the box. Thanks to AI, the right decisions are made at runtime. ■

- › [siemens.com/futureofautomation](https://www.siemens.com/futureofautomation)
- › [siemens.com/agriculture](https://www.siemens.com/agriculture)

ARTIFICIAL INTELLIGENCE

From the vision to the customer's application

Autonomous production has been more than just a theory for a long time. Thanks to innovative technologies and solutions such as artificial intelligence (AI), it is gradually become a reality. Following new pathways in digitalization doesn't require a total and immediate redesign of production. The desired level of autonomy needs to be defined on an individual basis. The higher the level of automation, the more the system needs to rely on autonomous processes and adjustments in the production plant. The most important factor continues to be the human element: AI will never suggest a creative solution to a problem.

The Italian company E.P.F. Elettrotecnica S.r.l. exemplifies the areas of machine building where AI is already being used as well as the associated benefits. One of the products manufactured by the machine builder are lines for the production of brake pads. The company was faced with the challenge of automating the manual brake-pad inspection process. The main advantage of the Siemens solution for E.P.F. was that the AI model could be easily integrated into the existing automation system based on Simatic S7-1500. A camera connected to the Simatic S7-1500 TM NPU (neuronal processing unit) technology module produces an image of each individual brake pad. A neural network in the TM NPU analyzes these images and generates a reliable quality indicator for every brake pad.

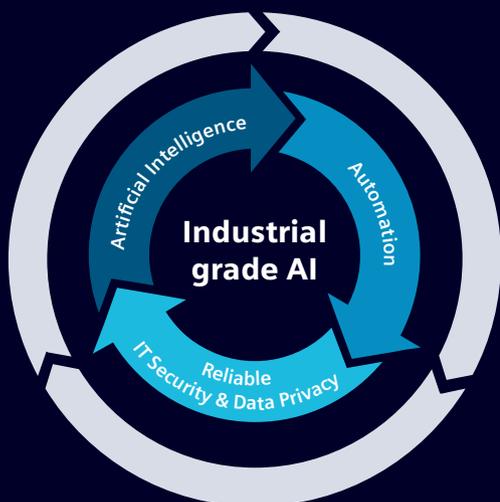


This project, along with many others, is taking plant operators and machine builders one major step closer to the goal of transforming their factories into smart factories. ■

> [siemens.com/futureofautomation](https://www.siemens.com/futureofautomation)

Highlights

- **Scale knowledge** with the help of AI solutions
- **Seamlessly integrate** AI in existing automation systems
- Fast and precise **data handling and processing**



Creating value

for machine builders and plant operators with solutions based on [industry](#)-focused use cases



Easy to use

for integration to automation, operation, and serviceability



Robust and reliable

hardware and model monitoring in an integrated lifecycle



TOTALLY INTEGRATED AUTOMATION

Totally Integrated Automation (TIA) stands for integration in three dimensions: Hardware, software, and services are seamlessly interconnected, information flows horizontally and vertically, and new technologies are gradually integrated to create added value across industries.

TIA IN THE AGE OF DIGITALIZATION / OT/IT INTEGRATION

Integrated automation now and in the future

As early as 1996, Siemens laid the cornerstone for integrated automation with its comprehensive automation platform Totally Integrated Automation (TIA). The core characteristic of TIA both then and now is its maximum end-to-end consistency, which is made possible by the integrated automation of all components and fields of expertise.

With TIA, all components are harmonized and communicate with each other, from the field level to the corporate management level – with room for innovations that are already being explored and gradually integrated today. The result is known as integration³.

In today's factories, a huge volume of data is being generated. When efficiently utilized, this data holds the key to plant optimization and increased competitiveness. What is required is high data transparency and quality. Siemens' answer is consistent data management, global standards, standardized interfaces, and openness – from OT (operational technology) to IT (information technology).

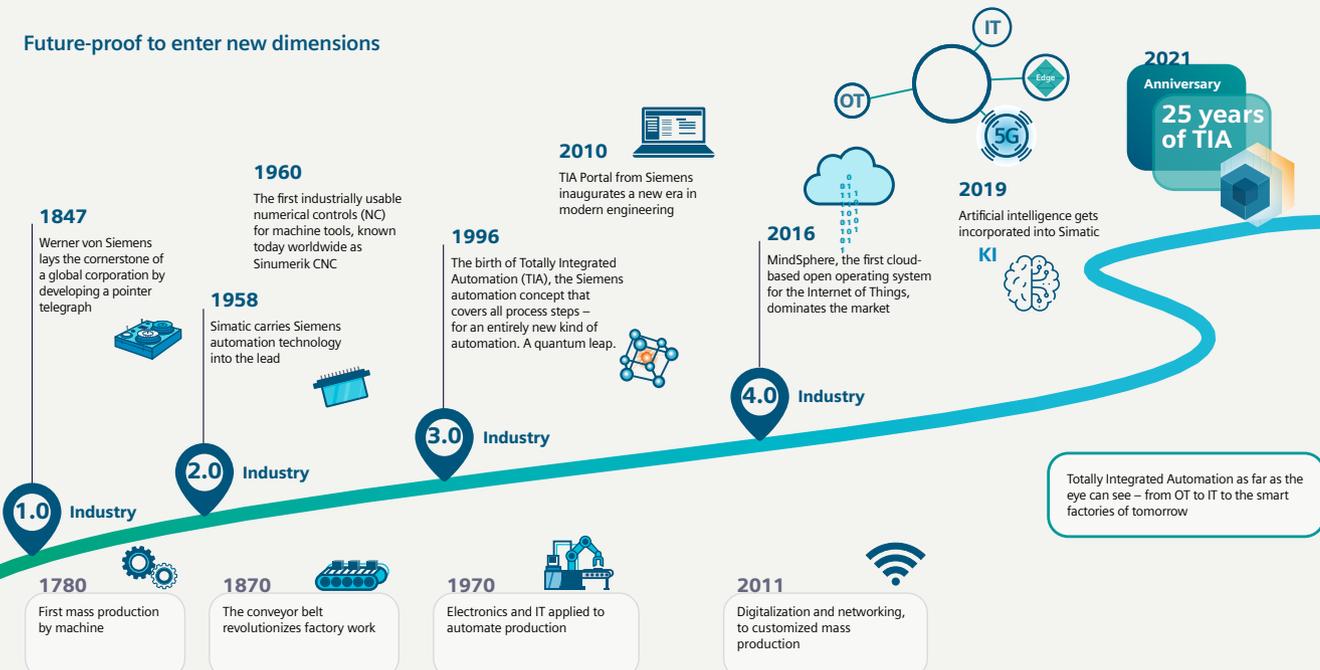
The connection between OT and IT networks is the basic requirement for advancing digitalization in companies. End-to-end solutions from OT to IT are driving digitalization forward and enabling customers to achieve market maturity more quickly with the help of new technologies that increase productivity and sustainability. ■

- > [siemens.com/tia](https://www.siemens.com/tia)
- > [siemens.com/ot-it](https://www.siemens.com/ot-it)

Highlights

- **Maximum data transparency** thanks to consistency, global standards, and uniform interfaces on all levels
- **New business models** thanks to OT/IT integration
- Future-proofing through the **integration of innovations**

Future-proof to enter new dimensions



TIA IN THE AGE OF DIGITALIZATION / USE CASE

Becoming a digital enterprise with Totally Integrated Automation

The integrated TIA platform helped logistics system manufacturer Automha gradually develop into a digital enterprise, transforming itself from a small family business to an international player. Successful digitalization with high data transparency and quality requires the integrated automation of machines and plants. And Automha relied on the fully coordinated hardware and software components from Siemens.

The top priority is efficient engineering that is accompanied by an ongoing simulation process. Simulation solutions shorten the time to commissioning – in the case of Automha, by 35 percent. The digital twin of the machine enables an even faster start of production and simplifies future expansions of the plant.

To achieve consistent, end-to-end communication from machine to machine and from OT to IT, Automha uses the OPC UA open standard via Profinet. Thanks to tools such as plant simulation and machine simulation, the company can perform a large part of its commissioning activities via remote control. Automha also wants to collaborate with

Siemens on the use of new technologies such as artificial intelligence (AI). In the future, AI could be utilized in a variety of applications such as automated guided vehicles, object recognition in order picking, data analytics, remote maintenance, and predictive maintenance. ■

- > [siemens.com/tia](https://www.siemens.com/tia)
- > [siemens.com/ot-it](https://www.siemens.com/ot-it)

Highlights

- **Efficient engineering** thanks to a seamless interplay between components, standardized interfaces, the TIA Selection Tool, and TIA Portal
- **Simulation of machine behavior and performance** in the digital world using the Machine Simulator, NX Mechatronics Concept Designer, and Plant Simulation
- **Secure remote access** with Sinema Remote Connect for functions such as continuous remote maintenance



SIMULATION FOR AUTOMATION

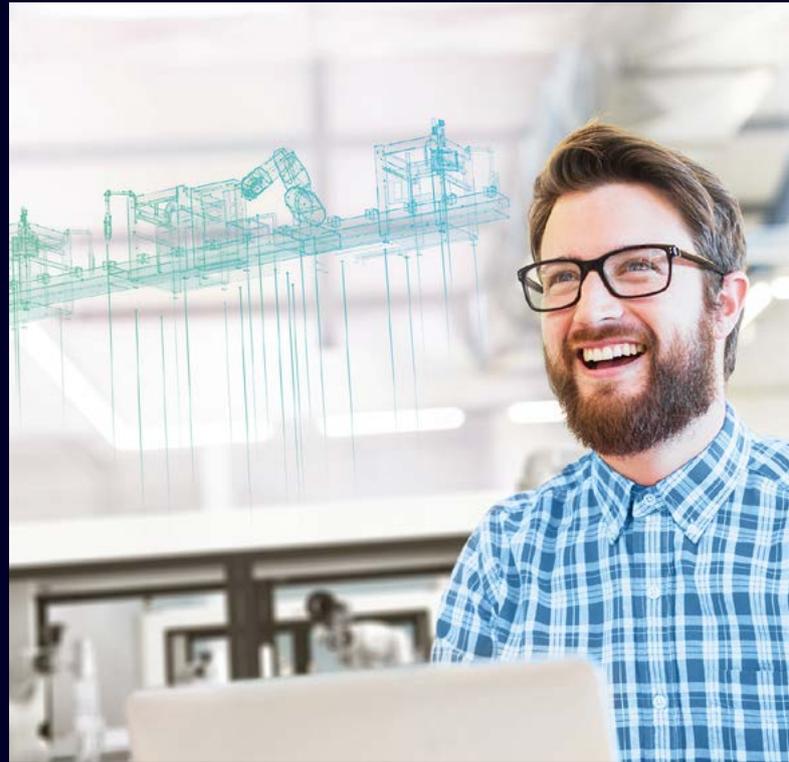
It's time to simulate

Whether it is a shorter time to market, a faster start of production, reduced costs, improved quality, or greater flexibility – most industrial companies have to deal with constantly changing challenges in order to adapt to market changes. Simulation offers crucial answers to these challenges.

Key element in simulation is the digital twin, a virtual representation of the production machine, the production line, or an entire factory. It enables you to build machines more smoothly, make production lines available faster, and get the most out of your production. Simulation and the digital twin offer added values throughout the entire lifecycle, from design and engineering to setup, operation, and servicing.

The virtual model can be used in many different ways: for example, to evaluate different machine designs, to train operators to ensure a smooth start of production, or to serve as a demonstration model in a virtual showroom. The end-to-end simulation portfolio from Siemens facilitates ongoing coordination between all engineers. Thanks to the modularity of the simulation tools, customer-specific use cases can be realized. Users can start with simulation at any time to deal with their customer-specific challenges. And best of all, you can implement it in steps. ■

› [siemens.com/simulation](https://www.siemens.com/simulation)



Highlights

- **Added values throughout the entire value chain** with simulation and the digital twin
- **Modular portfolio** exploiting the potentials of simulation on all levels (machine, line/cell, factory)
- **Shorter development times** thanks to drive simulation with standard libraries
- **Risk-free testing** of safety scenarios with the digital twin

SIMATIC S7-PLCSIM ADVANCED V4.0

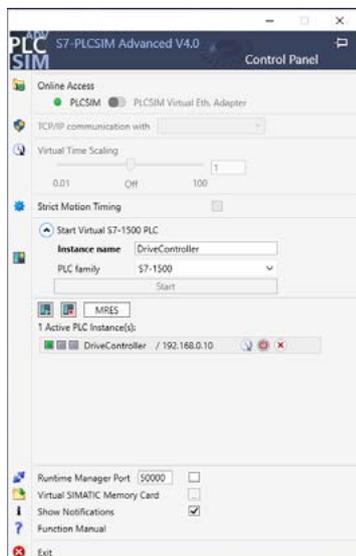
Improved communication

Simatic S7-PLCSIM Advanced allows users to create virtual controllers to simulate Simatic S7-1500-based controllers and use them to simulate an extensive range of functions. Simatic S7-PLCSIM Advanced V4.0 offers several new options like better communication simulation capabilities. The virtual controller supports various types of Simatic S7-1500 CPUs, which permits secure communication via OPC UA, Open User (OUC), and web server connections. It also offers up to 128 UDP Multicast connections and DNS and DHCP, comparable to a hardware CPU with V2.9 firmware. Users benefit from two new operating modes: one on the API for bus-synchronous coupling for

co-simulation tools such as Simit, and one for improved simulation of motion control functions in Simatic S7-1500. A number of new packages are available

to make it easier for users to launch into working with this software. ■

> [siemens.com/simatic-s7-plcsim-advanced4.0](https://www.siemens.com/simatic-s7-plcsim-advanced4.0)



Highlights

- **Support for Simatic S7-1500 CPUs**
H/R CPU in RUN Solo mode, ET 200pro CPU, Drive Controller, Simatic S7-1518 T/TF, and Siplus Extreme
- **Support for CPU firmware V1.8 to V2.9**
- **New package:** Bundle of Simatic S7-PLCSIM Advanced and TIA Portal Test Suite

Quick and easy to configure

TIA Selection Tool is the **free, smart configurator** for the entire Siemens automation portfolio.

From **automation to electrical engineering and mechanical design** – with TIA Selection Tool, you can easily select, configure, and order your devices from the Siemens portfolio. **Smart selection assistants help you** configure individual devices and entire systems **with zero errors** – there is **no need for expert knowledge or manuals**. ■

> [siemens.com/tst](https://www.siemens.com/tst)



TIA PORTAL CLOUD

Cloud solution for integrated engineering

The world of automation is undergoing a transformation. On the agenda is mobile employment where location is irrelevant, as well as virtual commissioning and remote maintenance. That is why cloud solutions are of inestimable value for dealing with the challenges industry is facing.

TIA Portal Cloud gives users rapid access to the TIA Portal engineering – web-based and flexible from any location. In addition, there are options at your disposal such as the fail-safe engineering software Simatic Step 7 Safety, the energy monitoring Simatic Energy Suite, the simulation software Simatic S7-PLCSIM Advanced and Simatic Visualization Architect (SiVArc). Project planning of drives can be realized in TIA Portal Cloud, too. As all engineering and solution scenarios are included, the cloud also offers users a simple and high-performance test environment for TIA Portal scenarios. The cloud-based engineering solution not only maximizes flexibility and user-friendliness, it also eliminates time-consuming updates.

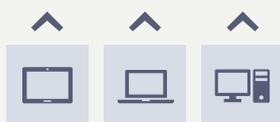


Lots of extra value is added through the needs-based payment model that can be adapted to your requirements. With the subscription model for TIA Portal Cloud, the services used are covered either by a monthly subscription or on a pay-per-use basis – that is per hour – calculated on length of use. The subscription models offer users the great advantage that only a small initial investment is necessary. ■

> [siemens.com/tia-portal-cloud](https://www.siemens.com/tia-portal-cloud)



Hosting as VM (lift and shift)



Pay-per-use
monthly subscription

Highlights

- **Standardization** with a flexible library concept and nested F-UDTs
- **Collaboration on projects** using the TIA Portal project server and Multiuser
- **Enhanced software quality** thanks to integrated tests with Simatic S7-PLCSIM Advanced and TIA Portal Test Suite
- New functions for **user management and openness expansions**

INDUSTRIAL EDGE

The volume of data in industry is continually growing. Industrial Edge takes full advantage of the potential of data from machines and plants – locally or in the cloud. This not only optimizes processes, it also opens the door to new business models.

IIOT – EDGE COMPUTING

Simplify shop-floor IT and get more from production data!

Edge Computing with Industrial Edge

Improve processes by using
machine data in real time



Data is the future of industry – that is clear from the rapid developments in the Internet of Things (IoT) in recent years. It is the key to greater productivity, improved efficiency, better use of resources, and much more. Industrial automation systems of the future will need to be agile and quick to adapt in order to meet requirements for faster product development cycles and a faster time to market.

Edge computing will help manufacturing companies connect automation systems to the digital factory even more effectively in the future, in order to transmit any process data that is generated but still unused from the devices to the right (central) locations – for example, to production control or cloud systems – and make better use of it than is possible today. IT market research companies also consider edge

computing technology as necessary to overcome many of the challenges of Industrie 4.0. Because of huge data volumes and the speed with which they are being generated, but also due to the need for real-time insights and current network restrictions, it is essential to use edge computing solutions and process the data closer to where it is generated.

A key feature of Industrial Edge is local data processing and analysis using edge devices at the production level or directly integrated into the automation portfolio. This can be achieved using the edge-capable Simatic HMI Unified Comfort Panel, for example, with apps that expand the panel functions. The Edge Management System serves as the central infrastructure for managing hundreds of edge devices of all kinds, factory-wide and even worldwide.

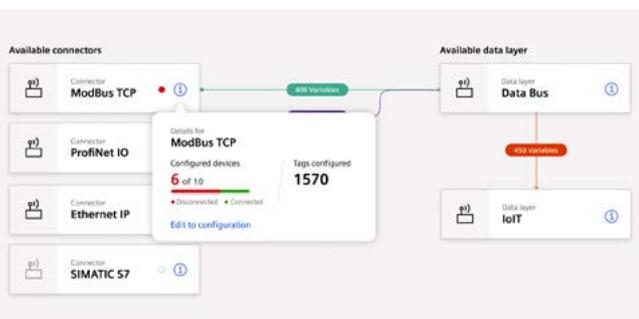
The system can either be installed within the company's own IT infrastructure, which is the preferred solution for users who prioritize data security and control, or in private or public cloud infrastructures. Edge application software and updates such as safety-critical firmware updates can be rolled out centrally and remotely on connected edge devices.

Wide-ranging user management helps administrators to guarantee high system and software availability for the planned rollout and finely differentiated allocation of rights. ■

› [siemens.com/industrial-edge](https://www.siemens.com/industrial-edge)

Highlights

- Efficiently **integrates IT and data processing functions** into automation systems
- Enables **automation of IT processes** to make software available scalably and allow it to be used in production
- Edge applications for **machine-level data processing, analysis, and sharing**
- B2B **marketplace for applications and services from** Siemens and third-party providers
- In conjunction with cloud systems, it lays the groundwork **for new business models in mechanical engineering** thanks to the use of apps for global machine data analysis



Highlights

- Central **access level** available **for all apps** including hybrid apps
- **Bidirectional access** to any information
- Plug-and-play **connection to OPC servers** without additional mapping
- **Brownfield support** with mapping next to data source

INTEGRATED DATA LAYER FOR INDUSTRIAL IIOT

Synchronize data and information everywhere

The information layer for industrial IIoT permits storing machine data in a structured manner and setting them into context. This makes it easy to integrate future plants and machines into existing structures. The integration layer synchronizes information models and values between different OT/IT layers with less configuration effort and reduces commissioning time for vertical integration. Changes in information models and values will be updated automatically. With this integration layer, a unified information model from the data source to the app and/or the cloud is available for users. The layer can be put into operation per plug and play without additional configuration effort. For the aggregation of data over several levels, there are appropriate mechanisms that ensure that information is synchronous and available when needed. ■

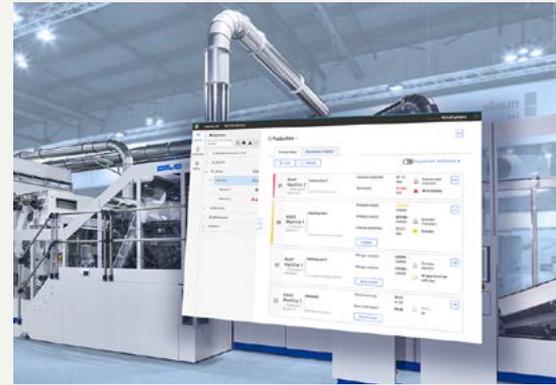
› [siemens.com/iiot](https://www.siemens.com/iiot)

MACHINE MONITOR

The perfect choice for machine builders and operators

Machine Monitor for MindSphere helps machine builders who want to offer their customers predictive maintenance as a service, benefit from automatic notifications, and optimize their service quality worldwide. Machine operators will profit from maximum capacity utilization for their machines as well as optimized maintenance cost. All this without putting the continuous availability of their production machinery at risk. Using Machine Monitor, you can create freely configurable maintenance rules for all types of machines that users can activate to continuously monitor their machines. This includes notifying users about maintenance work that will be due in the near future. You can also trace the service history of your machines in the maintenance logbook. ■

› [siemens.com/machine-monitor-app](https://www.siemens.com/machine-monitor-app)



Highlights

- **Efficiently assess maintenance requirements** for machines, based on actual machine utilization
- Easily **trace necessary maintenance intervals** (time- and usage-based or condition-based)
- **Optimize the utilization of service employee capacity** thanks to notifications about upcoming maintenance via Notifier app or email



Highlights

- Predictive action thanks to **edge, cloud, and AI**
- **Collect shop-floor data** using edge apps – developed by Siemens or by the machine tool manufacturer
- **More powerful Simatic IPC427E** for AI-based edge applications and sophisticated data analyses

PROTECT MYMACHINE /SETUP AND PROTECT MYMACHINE /TOOLCHECK

AI-based quality monitoring

Artificial intelligence is the future on the CNC shop floor. In addition to high-performance machines, high-frequency data is playing an increasingly important role in future-proof CNC manufacturing. By continuously analyzing this data, you can constantly optimize machines and processes on your own shop floor and stay competitive. The data generated in the workshop is collected using edge apps to make these analyses possible.

Apps such as Protect MyMachine /Setup and Protect MyMachine /Toolcheck depend on artificial intelligence. Data anomalies can be found by camera monitoring and uploaded to the cloud. In the medium term, after this initial training stage, artificial intelligence will trigger alarms via the edge app, allowing users to take predictive action. ■

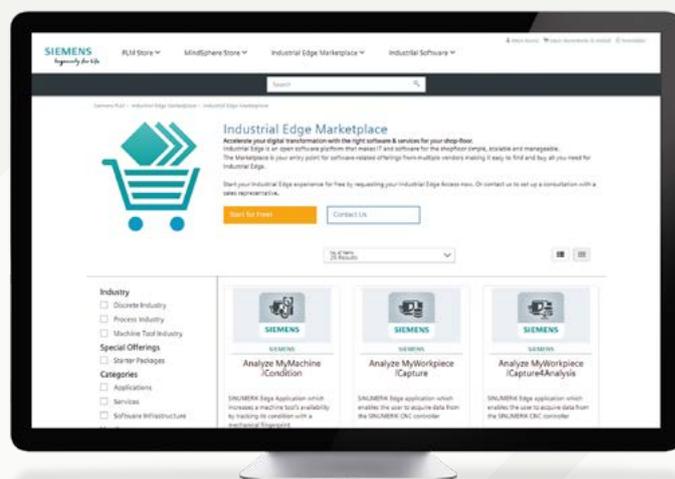
› [siemens.com/sinumerik-edge](https://www.siemens.com/sinumerik-edge)

MARKETPLACE FOR INDUSTRIAL EDGE

Modern way of shopping software and services

Highlights

- Platform to find and buy all **Industrial Edge software products from different vendors** very easily
- App developers find **ideal market access for industrial automation technology** through global presence of Siemens
- Other than with industry stores of today, **no direct interaction necessary between partner and customer** when it comes to ordering, paying for, and delivering the software



A new independent multi-vendor app store is expected to enable B2B customers to buy and run software from one provider. With this marketplace for Industrial Edge, users benefit from a simple and end-to-end shopping experience such as they are used to in the B2C environment. In a few steps, they can put together their app shopping cart, order, pay, and use the acquired products. In addition to traditional payment methods, credit card payment is also offered. Users benefit from a diverse range of software components from different vendors, too. The offering ranges from

data storage, data analysis, and visualization to machine monitoring and energy and asset management. The marketplace will be expanded step-by-step with a focus on offering additional services and software apps from partners within the Industrial Edge ecosystem. Additional applications from Siemens and third-party vendors are already in the pipeline. ■

[siemens.com/
industrial-edge-marketplace](https://www.siemens.com/industrial-edge-marketplace)

AUTOMATION SYSTEMS

Consistent and efficient: Whether it is a Basic, Advanced Distributed, or a Software Controller, Simatic automation systems offer the right product for any application. Fail-safe redundant models and motion control functions ensure even more flexibility.

SIGREEN

Making your product carbon footprint actionable

The transition to a low-carbon economy is picking up speed around the world. Many companies are already measuring their energy-related emissions, and a growing number are implementing measures to reduce them. The majority of product-related emissions occur in the supply chain, which means that reducing a product's carbon footprint (PCF) requires cooperation along what are often complex supply chains.

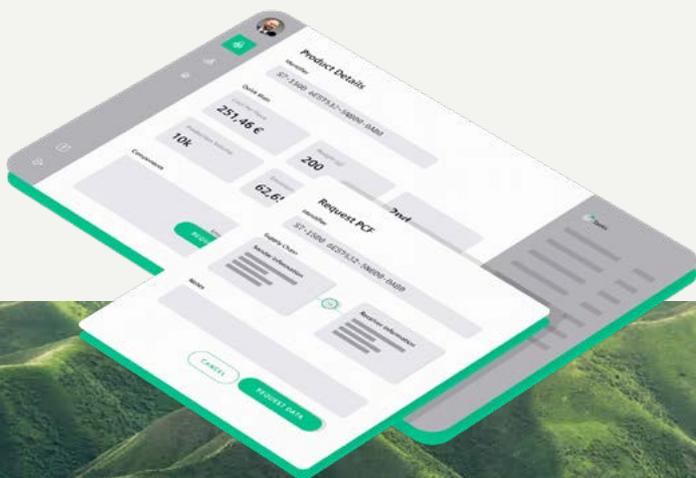
As an industry and software group, Siemens has developed a solution for digitally managing decarbonization. SiGreen makes it possible to efficiently share emissions data across the supply chain and combine it with data from a company's own value creation to generate carbon footprints on product level.

Siemens uses the open Estainium network, which is based on a distributed architecture, to exchange trustworthy PCFs. Innovative distributed ledger technology is used to create and exchange cryptographic certificates to verify the data provided and enable a trustworthy aggregation of a product's carbon footprint along the entire supply chain – without the participating companies having to disclose their supply chains. This is how SiGreen provides a trustworthy basis for data-driven reduction measures with quantifiable results. ■

> [siemens.com/sigreen](https://www.siemens.com/sigreen)

Highlights

- **Highest data protection:** no central data storage, no analysis or access to data by third parties
- **Unique PCF solution,** thanks to simple supplier integration, a cross-sector network, and extensive manufacturing expertise
- **Interaction with other participants in the Estainium network,** even if they don't use SiGreen



SIMATIC CONTROLLER

Great things come from small beginnings

Whether for industry or hobbyists, LOGO! is the perfect solution for fast and straightforward controller tasks. It arrived on the market 25 years ago as a logic module that would fill the gap between relay and controller, and LOGO! has since acquired more and more functions and blossomed into a complete mini-controller. It is also grown ever more flexible in terms of communication, and it now offers cloud connectivity. We wish LOGO! a happy birthday as it marks 25 years of innovative solutions at a very affordable price.

The other controllers in the Simatic portfolio are also winners thanks to cloud connectivity, either native or via IT mechanisms. The cloud is where all of a plant's data is collected, sorted, and made available for analyzing the production process and identifying the actual condition of machines or plants. The controllers are also the core element in vertical OT/IT dovetailing with IT mechanisms. Because future technologies such as AI and edge are anticipated and integrated, Simatic controllers not only offer powerful hardware to control machines and systems – they also lay the perfect foundation for innovative solutions. ■

Highlights

- **Support for AI** with Simatic S7-1500 TM NPU (neural processing unit) module for Simatic S7-1500 and Simatic ET 200MP
- **Implementation of local, cloud-based, or hybrid edge solutions** with Simatic S7-1500 TM MFP
- **Cloud connectivity** for Simatic S7-1500, Simatic S7-1200, and LOGO! via the standard MQTT protocol

Easily locate the right controller using our Simatic Controller Configurator:

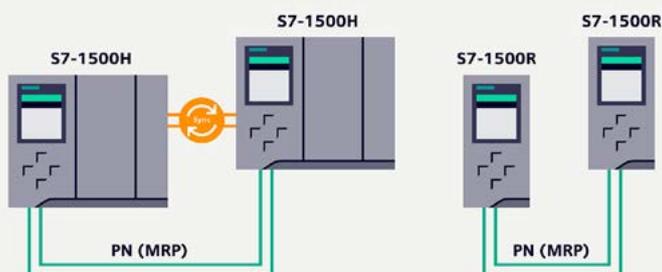
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› siemens.com/controller

SIMATIC S7-1500 R/H

Double protection from failure



Highlights

- **Programming via TIA Portal**
- **No special expertise required** to set up and synchronize the active and backup CPU – even in fail-safe, redundant applications
- **Integrated synchronization concept** for Simatic S7-1500 R and S7-1500 H

In addition to the basic machine or plant function itself, unexpected events can also result in undesired machine downtime or a system outage. Users enjoy protection from undesired events with the redundant Simatic S7-1500 R and S7-1500 H controllers. Redundant Simatic S7-1500 controllers use standard or fail-safe CPUs with Profinet as their communication standard. Users can scale their solution depending on the risk of outage: from the standard Simatic S7-1500 CPU to the redundant solution using Simatic S7-1500 R or H and LRedIO library. Two R or H CPUs are needed in all cases. Determining the correct CPU to use will also depend on the required switchover time. We can provide the two smaller 1513R and 1515R CPUs with a Profinet cable, which allows for a distance of 100 m and a switchover time of 300 ms. The 1517H and 1518HF CPUs with fiber-optic cable allow for distances of up to 10 km and a shorter switchover time of just 50 ms. ■

› [siemens.com/s7-1500-RH](https://www.siemens.com/s7-1500-RH)

OPC UA IN TIA PORTAL V17

Important standard for digitalization

The open, platform-independent communications standard OPC UA enables easy communication with applications from third-party providers and is flexibly scalable to meet requirements in every case. Thanks to standardization, OPC UA is predestined for processing data in IIoT applications. And thanks to internationally defined interfaces known as “companion specifications,” production data can be transferred as structured information to higher-level IT systems such as MES, SAP, edge, and cloud applications. OPC UA can be integrated into existing Industrial Ethernet networks and run using the existing Profinet infrastructure with no impact on performance. Authentication, authorization, and encryption in OT and IT guarantee secure data exchange. OPC UA ideally integrates unified alarm handling via smart HMI systems. ■

› [siemens.com/opcua](https://www.siemens.com/opcua)



Highlights

- **OPC UA Alarms & Conditions** for alarm handling on any smart devices without TIA runtime
- **Certificate management via OPC UA** with Global Discovery Service for higher security with maximum plant availability
- Easy **representation of OT data** on the OPC UA data model in TIA Portal

SIMATIC S7-1500 TECHNOLOGY CPU

More performance for motion control

Flexible production lines with a high throughput rate call for machines and manufacturing lines that can be quickly and easily adapted to a range of formats, sizes, product types, and production workflows. The new Simatic T-CPU 1518T-4 PN/DP and 1518TF-4 PN/DP controllers are an ideal solution for sophisticated high-end motion control applications, which are very demanding in terms of performance, axis quantity structures, and cycle times. This means that they're therefore predestined for use in the pharmaceutical field or in machines that manufacture components for electromobility.

Thanks to integrated technology I/Os and powerful communications interfaces, the compact and cost-optimized drive controllers let you create sophisticated machine designs for machines used in the food and packaging industries, for example. The 1504D TF and 1507D TF CPUs now also offer a simulation function with Simatic S7-PLCSIM Advanced. With a realistic function test of the user program, you can detect errors at an early stage and validate its functionality – for a shorter commissioning process and a faster time to market.

Several axes can be controlled in parallel using the gearing and camming technology function for the T-CPU. Thanks to a new type of cam disk with up to 10,000 interpolation points, users can now handle sophisticated demands that require a high level of precision. ■

› [siemens.com/simatic-technology](https://www.siemens.com/simatic-technology)

Highlights

- **Expanding the controller portfolio:**
1518T-4 PN/DP CPU (also available as a fail-safe version) with more memory and performance
- **Functional expansions for drive controllers:**
PLCSIM Advanced, shorter minimum application cycle time, more functions with Sinamics Integrated
- **Expanding synchronization functions**



SISTAR / BRAUMAT

Easily scalable process control system

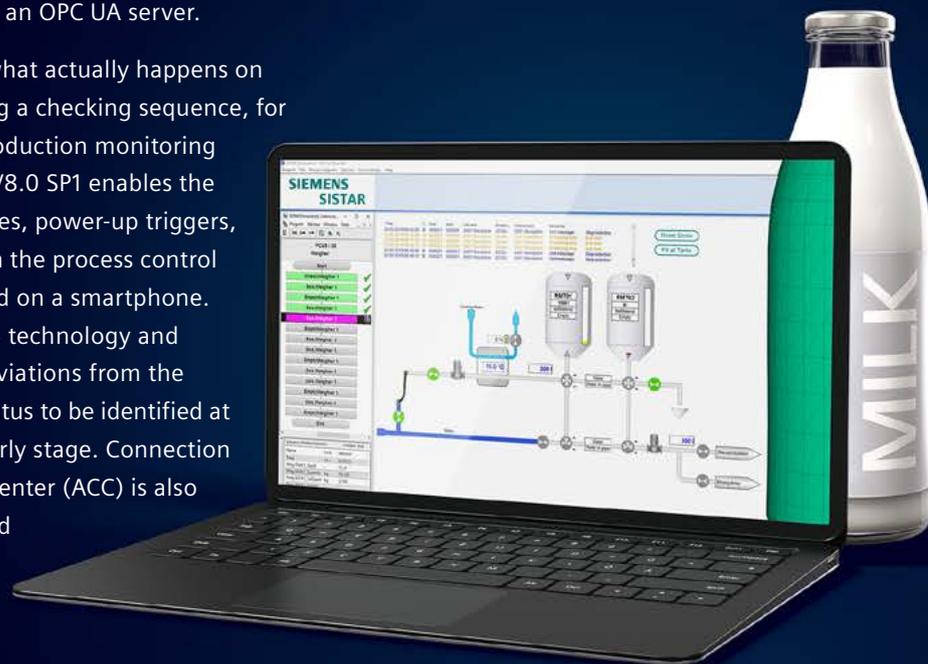
The new version 8.0 Service Pack 1 for the Sistar and Braumat process control systems offers new functions with greater flexibility for dairy producers and other food manufacturers. The new OPC UA interface gives users open and standardized access to production data from the IOS server. This means that the IOS station (server or client) can be used as an OPC UA server.

Many users wonder what actually happens on their shop floor during a checking sequence, for example. The new production monitoring function included in V8.0 SP1 enables the key status values, times, power-up triggers, and other values from the process control system to be displayed on a smartphone. This leverages HTML5 technology and permits undesired deviations from the theoretical process status to be identified at any time and at an early stage. Connection to the alarm control center (ACC) is also supported. Alarms and messages from Sistar or Braumat can be sent fully automatically to many potential recipients if required, in addition to the ACC: for example, push notifications on apps for iPhone and

Android, voice output to telephones, text output to pagers and telephones, text messages to smartphones, and emails to the appropriate terminals. ■

► [siemens.com/sistar](https://www.siemens.com/sistar)

► [siemens.com/braumat](https://www.siemens.com/braumat)

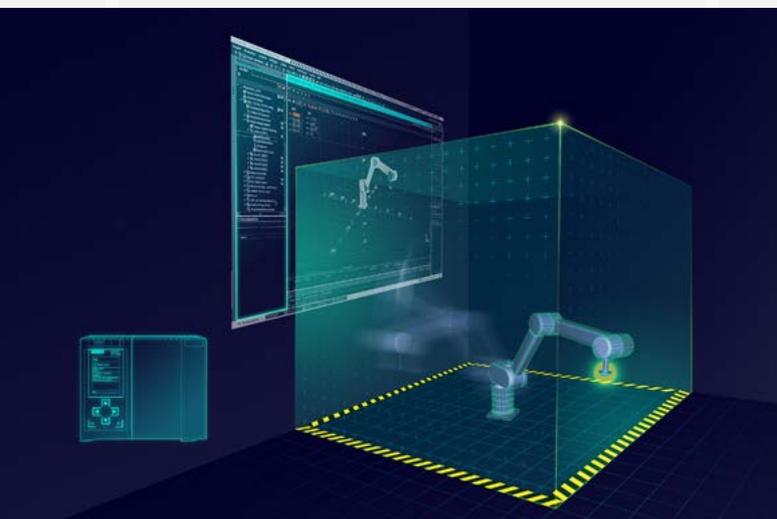


Highlights

- New **OPC UA connection**
- **Production monitoring** – now also via smartphone
- **Integrated weighing control** via Siwarex WP351 for the Simatic S7-1500 range
- **Expanded flexibility for route selection** with Route Control
- **New tank modules** for tank zone cooling and tank history

SIMATIC SAFE KINEMATICS V17

Maximum safety for people and robots



Robots are taking on more and more handling tasks. Industrial robots often work in a cell that is secured by a protective fence. Thanks to Simatic Safe Kinematics, operators can now be kept safe with no need for a protective fence, which saves space without impacting safety. This software-based solution is fail-safe and can monitor the movement of predefined kinematics with up to 12 interpolating axes in a multidimensional space.

The new 3D visualization makes commissioning much easier, because Safe Kinematics shows the kinematic geometry and all parameterized functions in graphic form. The digital twin of the Safe Kinematics parameterization is included with the system. The twin makes it easy to simulate the

Highlights

- **Smaller robot cell footprint**, because the protective fence can be omitted or placed closer to the robot
- Increased flexibility thanks to **flexible zone concepts** using safe zone monitoring
- Huge **time savings for configuration and acceptance** thanks to 3D visualization and predefined test cases

motion control of the kinematics in a 3D visualization with no additional tools, and it also evaluates how the kinematic motion and parameterized functions work together.

The new acceptance test from Simatic Safe Kinematics includes predefined test cases to assist with the verification and validation of monitoring functions. If users have processed the test cases, they'll receive simple standards-compliant acceptance documentation for the Safe Kinematics functions at the push of a button. ■

› [siemens.com/safe-kinematics](https://www.siemens.com/safe-kinematics)

SAFETY CONSULTING

Functional safety for automated guided vehicles

Machine safety is a complex, sensitive, and cost-intensive subject, especially when new technologies such as automated guided vehicles have to be assessed and certified for functional safety. To support its users in the process, Siemens has expanded its range of machine safety services to include Safety Consulting. The safety-relevant aspects of these systems are assessed on a step-by-step basis as part of a structured process, in which the safety experts first identify and assess potential risks. The next step is to define and implement the necessary technical actions. The final steps in the consulting process are validation, documentation, and verification.

We can see how this approach works in practice by looking at the example of an automated guided vehicle system from evocortex. The EvoRobot is an especially compact automated guided vehicle system that can move loads and transportation boxes autonomously on the shop floor. Different levels of freedom make the system very versatile and flexible, but that also renders certification in accordance with the functional machine safety guidelines more difficult.

Therefore, evocortex worked with the experts from Siemens Safety Consulting to find a way to obtain CE certification for the EvoRobot. The result is a fully certified industrial product. Armed with the knowledge it gained in the process, evocortex plans to prepare more products for CE certification entirely on its own: for example, the EvoCarrier, a transport robot for small load transfer devices. ■

> [siemens.com/safety-consulting](https://www.siemens.com/safety-consulting)



Highlights

- Joint development of a **CE-compliant transport system**
- Coordinated, individual **risk assessment**
- **Modified certification** as an incomplete machine with CE declaration of incorporation
- Support for follow-up projects with **tools and expertise**



Highlights

- **Standards-compliant** and **consistently safe automated** thermal process plants
- Settings are easy to adjust via **web server** or **Simatic HMI**
- **Lower emissions** and **fewer quality losses**

SIMATIC SAFETY INTEGRATED BURNER LIBRARY

Integrated safety for thermal process plants

Integrating the free, TÜV Süd-tested module library for burners into the fail-safe Simatic S7-1200/1500 machine controllers not only meets the requirements of EN 746 and ISO 13577; it also offers even more benefits for plant builders and operators. With just a single controller, it is possible to control multiple firing zones, and detailed system diagnostics keep downtime to a minimum.

The module library contains functions such as controlling and monitoring a gas or oil burner, pre-purging, and performing a gas tightness test. It is easy to add more functions such as temperature or oxygen control in order to increase gas quality tolerance and improve energy-efficiency. ■

› [siemens.com/simatic-safety/burner-library](https://www.siemens.com/simatic-safety/burner-library)

SAFETY INTEGRATED FOR SIMATIC ET 200AL / ET 200SP

A growing family

The electronic modules F-DI 4 and F-DQ 2 expand the Simatic ET 200AL distributed I/O product range in protection class IP65/67. This lets you connect secure sensors and actuators to the machine right on-site. The M12 connection can be used on the input side to connect either two individual sensors or one two-channel sensor: for example, a position switch or a light curtain. Pulses must be reliably evaluated in many applications: for example, in connection with speed, position, and flow monitoring. In conjunction with a suitable Sin/Cos encoder, the compact, fail-safe technology module F-TM Count HF for Simatic ET 200SP can record signals up to a frequency of 200 kHz and forward them to the F-CPU as a numeric value or in units representing values such as speed, frequency, and cycle duration. The integrated safety functions are run directly, and any violation of conditions is transmitted to the F-CPU. ■

› [siemens.com/et200al](https://www.siemens.com/et200al)
› [siemens.com/et200sp](https://www.siemens.com/et200sp)



Highlights

- Can be used up to **PL e/SIL 3**
- F-DI 4/F-DQ 2: **two fail-safe digital outputs** 24 V DC/2 A, positive/negative switching (M12)
- F-TM Count HF: **integrated safety functions** SOS (Safe Operating Stop), SLS (Safely Limited Speed), SDI (Safe Direction)

DISTRIBUTED I/O SYSTEMS

Whether Simatic ET 200 is deployed in the control cabinet, right at the machine, or in potentially explosive areas – it provides a multifunctional, modular, and finely scalable system for distributed automation.

SIMATIC ET 200AL

New function with IO-Link modules



Highlights

- **Safety-related shutdown**
- Protection class: **IP65/67**
- **Lightweight, flexible, and robust**
- **Compact** design
- Connection technology: **M8 and M12**

New functions have been added to the Simatic ET200 AL IO-Link IO modules: Users now get IO-Link IO-modules that can be shut down safely. What is special about this? The shutdown is non-interacting, which means that communication between the IO-Link master and the IO-Link device is maintained after the shutdown, and diagnoses and other activities can still be performed. This makes the system more transparent. ■

> [siemens.com/et200al](https://www.siemens.com/et200al)

SIMATIC ET 200ECO PN M12-L

More connectivity and integration

The MultiFieldbus function for the Simatic ET 200eco PN M12-L peripheral devices allows communication to the Profinet, Modbus TCP, and EtherNet/IP field buses. Applications can therefore be implemented with different controllers, which increases flexibility and makes integration easier.

The S2 system redundancy of Simatic ET200eco PN M12-L ensures the exchange of process data with no interruptions in the case of a CPU failure in a redundant CPU system. The IO-Link master also supports this function, so that a large number of IO-Link devices can be integrated into highly available applications.

The Simatic ET 200eco PN block library for Simatic PCS 7 easily and conveniently integrates the devices of the decentralized Simatic ET 200eco PN M12-L peripheral system into the Simatic PCS 7 process control system. This significantly reduces the number of engineering steps required and simplifies engineering. ■

> [siemens.com/et200ecopn](https://www.siemens.com/et200ecopn)



Highlights

- **MultiFieldbus function**
- **S2 system redundancy**
- **PCS7** integration
- Protection class **IP65/67**
- **Clock-synchronous** operation
- **Multi-shared input and output**
- **Safety-related shutdown**



Highlights

- Fully integrated into **TIA Portal**
- **Cross-compatible with ST and HF** for using standard or HF Energy Meter modules with an identical hardware configuration
- **Comprehensive add-on functions**, including time stamping of minimum/maximum values, measured value recorder, remanent storage of measured values, and limit value monitoring

SIMATIC ET 200SP AI ENERGY METER

Optimized energy costs and consumption

The Simatic ET 200SP AI Energy Meter lets you detect and measure current and voltages: for example, in control cabinet infeeds and in special applications such as engine test benches. Analyzing harmonics with a Fourier transform allows comprehensive monitoring of network quality and fault localization. With the Simatic ET 200SP AI Energy Meter, users can display the capacity utilization of connected electrical cables and the daily electrical energy consumption. The energy production of a PV plant can also be recorded for billing purposes and to establish the plant's energy costs. When integrated into the Simatic ET 200SP ecosystem, the Energy Meter module can be easily connected to Profinet, Profibus, EtherNet/IP, or Modbus TCP. ■

› [siemens.com/et200sp](https://www.siemens.com/et200sp)

NAMUR MODULE FOR SIMATIC S7-1500 / ET 200MP

Robust device for enhanced applications

A new module enables the detection of NAMUR signals in compliance with IEC 60947-5-6. It can be used centrally with a Simatic S7-1500 CPU and also locally on Profinet or Profibus via Simatic ET 200MP. The module has 16 input channels that are arranged and electrically isolated in two groups. To wire the NAMUR sensors right on the module, the latter feeds out the 8.2 V on two sets of eight pins. The integrated shielding concept on Simatic S7-1500 allows the module to be mounted quickly and without tools. Thanks to the shield guide in the control cabinet, the module is extremely robust, and is even protected from interfering signals in the control cabinet itself. Typical applications include those in the semiconductor industry, logistics, and even railway interlocking systems. ■

› [siemens.com/et200mp](https://www.siemens.com/et200mp)

Highlights

- Four of 16 inputs act as **counters at up to 20 kHz**, the others are regular inputs
- Integrated **control functions** such as pulse stretching, chatter monitoring, and signal inversion
- **Flexible connection technology** with a front connector or Simatic Top connect
- **Clock-synchronous operation** up to 250 μ s
- **Expanded application conditions** makes it suitable for temperatures from -30°C to 60°C and elevations up to 5,000 meters



HUMAN MACHINE INTERFACE

The motto “Efficient to a new level” describes an end-to-end portfolio of human-machine interfaces that are optimally tailored to the specific requirements of operator control and monitoring.

VISUALIZATION SYSTEM SIMATIC WINCC UNIFIED V17

Flexible diagnosis and documentation of processes

With the new Simatic WinCC Unified version V17, users get remote access to visualizations with HMI Unified Comfort Panels. Multiple authorized users can access the visualization simultaneously via modern HTML5-compatible web browsers, and they can operate the machine locally, independent of the display on site – without having to install additional applications or programs. Employees who have to keep an eye on multiple machines and processes can use the WinCC Unified Collaboration option. It enables integration of visualizations from another station into their own visualizations. With the latest update, Collaboration can receive notifications from other Unified devices, too. That is how users can prevent double engineering.

The Audit option in WinCC Unified is now also supported by the Unified Comfort Panels. Audit makes it easier for users to trace quality assurance actions and document processes when process values change. WinCC Unified Audit places the data relevant to the audit trail in a protected log and provides it in a report, if needed. Because it is important for companies to protect access to plant visualization, Simatic WinCC Unified consistently relies on secure communication. ■

> [siemens.com/wincc-unified](https://www.siemens.com/wincc-unified)

Highlights

- **Central display of notifications** from other machines
- **Flexible choice of machines** whose notifications should be displayed
- **Central identification of notifications** of remote devices



INDUSTRIAL PC

PC-based automation allows the implementation of applications and solutions that reach far beyond the functions of traditional control systems. Simatic IPCs provide a flexible and innovative platform with long-term availability that allows machine builders to easily master the challenges of the digital factory.

SIMATIC TENSORBOX**Developed for
AI applications****Highlights**

- **24-V/50-W power supply unit**
- **4 × USB 3.0, 1 × USB 2**
- **2 × M.2 slot, internal** (e.g., for 5G/SSD)
- **4 × digital inputs und 2 × digital outputs**

The new Simatic Tensorbox for AI applications comes with an integrated Nvidia Jetson Xavier NX Accelerator card, which makes it ideal for use in a variety of applications, including automated guided vehicles, machine-vision systems, condition monitoring, predictive maintenance, and visual inspections. Smart temperature management allows fan-less operation in harsh industrial environments. With its four gigabit Ethernet interfaces, this Box IPC is seamlessly connected. Two of the interfaces are PoE-/PSE-capable, enabling the direct use of cameras with no additional power supply. In addition, all the interfaces are mounted on one side, and that makes it much simpler to install. ■

› [siemens.com/tensorbox](https://www.siemens.com/tensorbox)

SIMATIC IPC327G AND IPC377G**IPCs for price-sensitive
applications**

Simatic IPC3x7G is the new generation of IPCs with an Intel Atom CPU in the basic segment. Thanks to its closed all-metal enclosure, this embedded industrial PC can be used flexibly even in harsh conditions. Its compact design means that it can be integrated in a control cabinet or right on a machine in the automation system with minimal space requirements. Maintenance-free Simatic IPC327G and IPC377G Box and Panel PCs provide proven interfaces and can easily be expanded thanks to two M.2 slots. The modules that can be plugged into these slots also make it convenient to integrate the IPCs into the automation solution. The energy-saving Intel Quad Core processors offer high power in a compact design. The IPCs are available as preconfigured variants ex stock and thus have very short delivery times. ■

› [siemens.com/ipc3x7g](https://www.siemens.com/ipc3x7g)

**Highlights**

- Much higher **CPU performance**
- **M.2 solid-state drive** (SSD)
- **2 × display port**
- **M.2 mass storage**
- **2 x independent Ethernet interfaces**

DRIVE SYSTEMS

Siemens offers complete drive solutions that can be seamlessly integrated in any automation environment throughout the entire lifecycle. Today digitally supported drive technology is creating new dimensions in transparency – for greater efficiency, reliability, and productivity.



DIGITALIZATION IN DRIVE TECHNOLOGY

Drive simulation shortens development times

End-to-end digitalization also means putting functioning solutions in place at the beginning of the engineering chain when designing and virtualizing machines and plants. Using Sinamics DriveSim Basic, you can simulate, modify, and optimize specific drive combinations and their behavior – even before a definitive product selection has been made. The virtual drive model represents the drives, including the motor. The focus of the application is on the drive environment and supporting the customer's application. It provides a realistic representation of the drive system with the level of detail required for the virtual setup of the PLC or complex mechanics on the virtual driveshaft. Users configure only the part of the drive they need for their simulation purposes; there is no need for the drive to undergo full virtual commissioning.

Sinamics DriveSim Basic is available as a standardized FMU (functional mock-up unit) model and is compatible with many of the market-standard simulation programs.

That makes your entry into drive simulation fast, easy, and more precise than current solutions thanks to the validated model. The development phase can be much faster using Sinamics DriveSim Basic thanks to the clear focus on compatibility, user-friendliness, and simulation speed. In addition to saving time, users also save costs and the effort involved in testing. ■

► [siemens.com/drive-virtualization](https://www.siemens.com/drive-virtualization)

Highlights

- **Verified and validated digital twins** of your drives and minimal configuration effort
- **New features** (including position control in the PLC and load profiles for drive arrangement in the Sizer/TIA Selection Tool) mean that you can implement more applications
- **Free download** in Siemens Industry Online Support (SIOS)

SINAMICS S210

The servo drive system for **versatile use**

With the Sinamics S210 servo drive system comprising a servo drive and servomotor, the emphasis is on the highly dynamic servo solutions. These are often found in handling systems, packaging and printing machinery, and automotive manufacturing.

When you are looking for a compact gear configuration that also moves heavy loads precisely, the servo planetary geared motor Simotics S-1FK2 for Sinamics S210 is just the right solution. With a large number of gear ratios and sizes, they can be adjusted perfectly to handling applications or highly dynamic movement tasks in the machine.

The Simotics S-1FT2 is suitable for the deployment of machines in harsh environments. A higher protection class and a special motor paint make the motor robust; higher resolution encoders improve the system's precision. This guarantees precise results in highly dynamic applications in machine manufacturing under harsh conditions, too.

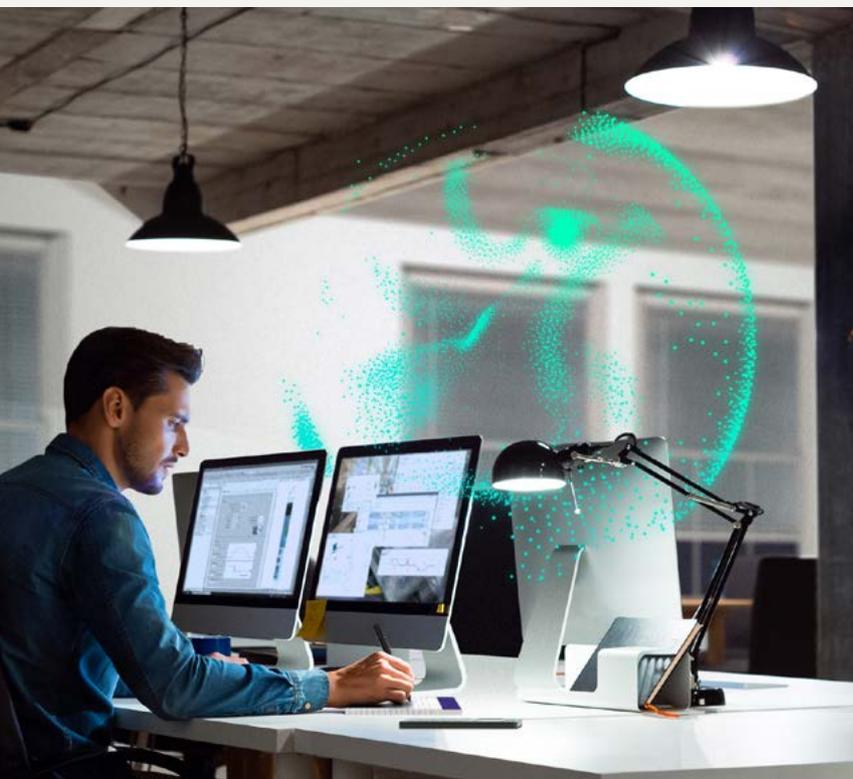
The Simotics S-1FS2 servomotor was specially developed for packaging, handling, and filling plants in the pharmaceutical and food and beverage industries. With a stainless-steel enclosure and highest protection class IP67/69, it meets all hygiene requirements in these industry branches. ■

› [siemens.com/sinamics-s210](https://www.siemens.com/sinamics-s210)



Highlights

- **Simotics S-1FK2 servo planetary geared motors:** drive solution for optimal adjustment of speed, torque, and inertia
- **Simotics S-1FT2 servomotors:** protection class IP67 with 26-bit encoder and highly rated speed
- **Simotics S-1FS2 servomotors:** in stainless-steel enclosure with specific product properties required in the pharmaceutical and food and beverage industries in protection class IP69K



Highlights

- **Save time and prevent errors** with the Safety Activation Test
- **Modify and expand running programs** with no need to restart and download in DCC online mode
- **Intellectual property protection** for machine builders thanks to DCC knowledge protection
- **Optimal control settings** for every machine with Bode diagram in Trace

SINAMICS STARTDRIVE

Optimized commissioning software

Whether it is speed-controlled axes or high-end motion control functions: The extensive portfolio of drives in Sinamics Startdrive lets you commission all types of applications. V17 – the current version of Sinamics Startdrive in TIA Portal – provides lots of new functions that offer many benefits for users. The current Safety Acceptance Test has been expanded to include the Safety Activation Test, so you can validate the entire control chain for a given safety function – from the sensor to the drive reaction that is triggered. This means that application engineers responsible for safety functions can set up all their test cases in advance, including their specific expectations. The wizard

then guides the commissioning engineer through the acceptance process step-by-step and automatically produces an acceptance report. Sinamics Startdrive now offers experienced drive experts a Bode plot of a number of controlled variables to enable precise optimization of Sinamics servo converters. In addition to general expansions to user and access rights in the Startdrive project, there is now also separate knowledge protection for DCC plans. They can be modified in online mode with the system in operation and expanded to include new functions. ■

› [siemens.com/startdrive](https://www.siemens.com/startdrive)

SINAMICS S120**Flexible and powerful drive system**

Users can now benefit from the entire range of Sinamics S120 solutions. Using Sinamics DriveSim Basic, you can now simulate all Sinamics S120 device types

under realistic conditions, even ahead of the design stage – with easy handling and minimum parameterization effort. That saves time, speeds up the entire planning stage, and improves quality.

Sinamics S120 Booksize Active Line/ Motor Modules are now integrated into the TIA Selection Tool to facilitate fast and transparent dimensioning and configuration.

New OEM installation kits are also now available for Sinamics S120 Chassis-2 frequency converters to ideally support the construction of your own cabinets. ■

› [siemens.com/sinamics-s120](https://www.siemens.com/sinamics-s120)

Highlights**Sinamics DriveSim Basic**

- Import a standardized **functional mock-up unit (FMU)** directly into the simulation tool
- **Specific drive parameters and interfaces** for simulation, modification, and optimization of drive combinations

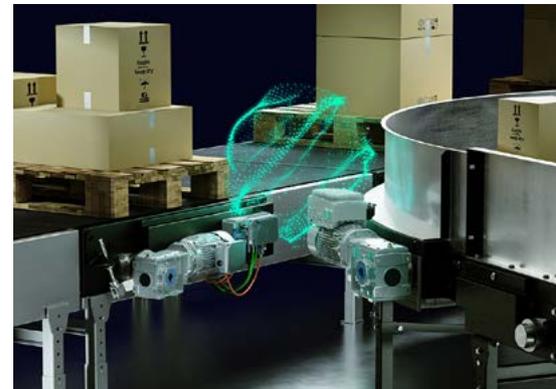
OEM kits for Sinamics S120 Chassis-2

- **Easy selection and ordering** to create complete turnkey drive systems with little effort

SINAMICS G115D**A broader portfolio, better communications, increased safety**

The Sinamics G115D distributed drive system fulfills relevant standards with the features of IE3 and IE4 motors. The geared motors are now available with power ratings of up to 7.5 kW in wall-mounted and up to 4 kW in motor-mounted versions. They can be easily dimensioned with the DT Configurator or the TIA Selection Tool and configured using Sinamics Startdrive V17. A new function block is also available. It integrates the special Sinamics G115D control and status word, which is transmitted comfortably into the PLC program via an additional free telegram. In addition, Sinamics G115D has an integrated fail-safe digital input via which the STO safety function can be activated. It can be used, for example, to connect a decentralized emergency-off button to the drive. When the button is pressed, it triggers a safety-related shutdown of the drive. ■

› [siemens.com/sinamics-g115d](https://www.siemens.com/sinamics-g115d)

**Highlights**

- Easy commissioning via **TIA Portal with Sinamics Startdrive V17**
- Improved **Profinet connectivity**
- Flexible, **functional safety**
- **Integrated braking resistor** as standard
- **New: External braking resistors** for higher regenerative energy

SIMOTICS CHEMSTAR

Tailor-made motors for oil, gas, and chemicals

Simotics Chemstar motor series is specifically designed for the oil, gas, and chemical industries. It includes both Simotics SD rugged low-voltage motors with cast-iron housing and explosion-proof motors Simotics XP. Users receive preconfigured options such as steel

fan covers, reinforced bearings,

external grounding, and protec-

tion class IP66. To comple-

ment these options, addi-

tional industry-specific

features such as VIK

design for chemical

applications and

stainless-steel screws

for the oil and gas

industry are offered.

Other options are avail-

able, including paintings

up to Class CX according to

ISO 12944-2:2018. Users can also choose

between customer- and project-specific documentation packages. The IOGP (International Association of Oil & Gas Producers) has confirmed that the proven, certified designs of Chemstar motors meet its specifications. ■

Users receive preconfigured options such as steel fan covers, reinforced bearings, external grounding, and protection class IP66. To complement these options, additional industry-specific features such as VIK design for chemical applications and stainless-steel screws for the oil and gas industry are offered. Other options are available, including paintings up to Class CX according to ISO 12944-2:2018. Users can also choose between customer- and project-specific documentation packages. The IOGP (International Association of Oil & Gas Producers) has confirmed that the proven, certified designs of Chemstar motors meet its specifications. ■

► [siemens.com/simotics-xp-chemstar](https://www.siemens.com/simotics-xp-chemstar)

Highlights

- **All types of explosion protection available:**

Ex db, Ex eb, Ex ec, Ex tb, Ex tc – in addition to robust cast-iron low-voltage motors

- **Comprehensive power range** from 0.09 to 500 kW

- **„Easy Business“:** Simple and fast project execution – from planning to procurement, engineering and integration, all the way to operation – saves time and money



Highlights

- **Safety extra-low voltage range: 24 to 48 V DC**

I_{nom} : 5 A, I_{max} : 15 A

- **Safety:**

hardwired STO

(safe torque off) **SIL3**

- **High power density:**

20 mm wide

SIMATIC MICRO-DRIVE

Drive system for the safety extra-low voltage range

Simatic Micro-Drive – the safe, integrated drive system for the safety extra-low voltage range from 24 V to 48 V DC – is suitable for a wide range of applications, including precise positioning, shuttles for storage systems, automated guided vehicles (AGVs), and much more. Top performance is ensured by features such as its compact design and easy cabling and assembly, with Safety Integrated for maximum safety. The performance of PDC Drives and TM Drives complement each other perfectly. The new F-TM ServoDrive HF technology module optimally completes the TM Drives portfolio. Both EC motors with rated power of 280 W and stepper motors can be controlled by the module in the smallest of spaces. Three-times overload capacity and support for Biss-C encoders make the F-TM ServoDrive HF the high-end device among TM Drives. ■

► [siemens.com/micro-drive](https://www.siemens.com/micro-drive)

SIMOTICS SD

Highly efficient motors in IE4

Commission Regulation (EU) 2019/1781 – also known as the Ecodesign Regulation, which defines the energy efficiency requirements for electric motors – has been in force since July 2021. It requires efficiency class IE3 (Premium Efficiency) for electric motors between 0.75 and 1,000 kW. Starting in July 2023, IE4 (Super Premium Efficiency) will be mandatory for motors in the medium power range between 75 and 200 kW. Simotics SD cast-iron low-voltage motors are already available in IE4 from 2.2 to 1,000 kW. That means the IE4 range in this series already exceeds the requirements that will apply from 2023. In addition to its high energy efficiency, Simotics SD scores with maximum reliability even in the harshest environments, extremely compact design and high flexibility thanks to market- and application-specific variants. ■

› [siemens.com/simotics-sd](https://www.siemens.com/simotics-sd)



Highlights

- **Lower operating costs** thanks to Super Premium Efficiency across the entire power range
- **Smaller envelope dimensions** for easier system integration
- **High flexibility** thanks to a broad range of designs, terminal box positions, and standard options
- **Variable-speed operation** in all voltage classes with no additional output filters



Highlights

- **Economical solution** due to reduced total cost of ownership
- **Very short delivery times** – ex warehouse
- **Easy selection**, ordering, operation, and maintenance
- **Reliable** due to high quality
- **Continuous power spectrum** from 0.55 to 45 kW, depending on the power rating with aluminum or cast-iron housing

SIMOTICS FL

Deliverable from Stock – for **standard applications**

Simotics FL motors are the first choice when it comes to very reliable and at the same time economical operation of standard applications in an industrial environment without special requirements. They are tailored for moving liquids, air, or materials, making them ideal for industries such as HVAC (heating, ventilation, air conditioning), water and wastewater, food and beverage, and material handling. These motors are make-to-stock products. The offered scope is multiplied by the variants, available from the warehouse especially set up for this purpose. The excellent delivery times can, for example, benefit machine builders. Moreover, the warehouse delivery enables also small order quantities. Due to its high grade of standardization, Simotics FL is very easy to configure, install, operate, and maintain. Spare parts are quick and easy to obtain. ■

› [siemens.com/simotics-fl](https://www.siemens.com/simotics-fl)

PROCESS AUTOMATION

From integrated engineering to integrated operations: With the solutions for process automation, users benefit from the digitalization of their plant, production, and processes over the entire lifecycle. The foundation is a comprehensive, integrated portfolio, a broad range of services, and industry expertise.



SIMATIC ET 200SP HA

Robust and high-performance distributed I/O

Meeting the requirements of the process industries but also with clear benefits for all applications in discrete industries where robustness and highest availability are a must: the high-performance I/O-system Simatic ET 200SP HA! Redundantly designed components, online module replacement, and Configuration in Run (CiR), as well as online firmware updates significantly increase the availability of plants. Furthermore, users can adapt the compact and modular system precisely to their needs.

New additions to the Simatic ET 200SP HA portfolio now also make it possible to harness the benefits of the high-performance peripheral system in a wide range of further sophisticated applications. Fail-safe I/O-modules support the implementation of safety functions that transfer a plant into a safe state in case of demand. And

channel-isolated HART AI/AQ modules with parallel A/D and D/A conversion provide very fast signal processing and robustness, ensuring measurement availability and accuracy. With this combination of standard, fail-safe, or Ex-I/O modules, Simatic ET 200SP HA offers highest flexibility for every field of application. ■

► [siemens.com/simatic-et200spha](https://www.siemens.com/simatic-et200spha)

Highlights

- **Profinet R1 interface and I/O redundancy**
- **Extended temperature range:**
–40°C to +70°C
- Up to **32 channels** per module and up to **56 modules** per station
- Installation up to **Ex-zone 2**
- **Channel-specific diagnostic functions**

SIMATIC PCS NEO V3.1

The next step to the control system of the future: **Think neo!**

Even more scalable, powerful, and secure, Simatic PCS neo achieves a whole new dimension in flexibility in the new version of the completely web-based process control system. The new version 3.1 makes it possible to integrate 32,000 process objects and is ready for large-scale plants. Its extreme scalability also allows it to be used in the smallest plants, which have never before been a focus for control systems. Even device integration has been improved: In the future, upward-compatible device integration will guarantee compatibility throughout the entire plant lifecycle.

Thanks to its open and flexible architecture, Simatic PCS neo permits modular engineering. The new version already fully implements the published standards for the Module Type Package (MTP) and is prepared for all future publications.

Simatic PCS myExpert supports plant operators with firmware and software updates. This means that plants are kept up to date within the framework of the software maintenance packages and are protected from security vulnerabilities. ■

› [siemens.com/simatic-pcs-neo](https://www.siemens.com/simatic-pcs-neo)



Highlights

- **Scalable** for both large and small plants
- Ready for **MTP**
- Plants **always up to date**

SIMATIC IOT2000 SG-SHIELD

The easy way to **digitalize weighing data**

Simatic IOT2000 SG-Shield is the convenient solution for remotely viewing measured values from load cells on the basis of strain gauges. The load cell cable is easily connected directly to the shield. The system digitalizes the analog data and sends it to the cloud via the Simatic IOT2050 gateway so that users can retrieve their customers' levels at any time and adjust their delivery routes accordingly. In-depth, specialized IT or automation expertise isn't necessary for setting up the solutions. ■

› [siemens.com/iot2000sgshield](https://www.siemens.com/iot2000sgshield)



Highlights

- **Many communication options** in conjunction with Simatic IOT2050
- **High flexibility** thanks to Node-RED software
- **Easy setup** of MindSphere thanks to the ready-to-use MindConnect Library
- **High accuracy:** +/- 1,000,000 parts resolution

COMOS MOBILE WORKER

Augmented reality solution for service and maintenance

Comos Mobile Worker takes maintenance management to the next level. All plant information from sources such as ERP, engineering, and CMS is always up to date and available via a single mobile solution. Comos Mobile Worker makes it possible to edit data in the field and enables a bidirectional exchange with Comos or any other information source. Maintenance personnel can add photos, notes, and redlining information to circuit diagrams right on-site. The augmented reality and navigation features spare users from conducting lengthy searches of the field devices in their plant. The

video-chat function integrated in the software allows users to video-chat with experts and reduce unplanned plant shutdowns to a minimum or prevent them altogether. ■

> [siemens.com/comos](https://www.siemens.com/comos)



Highlights

- **Augmented reality information** and navigation
- **Intuitive to operate** and easy to use
- **Fewer faults** and plant shutdowns
- **Faster and more reliable maintenance**



XHQ OPERATIONS INTELLIGENCE SOFTWARE

Personalization at your fingertips

XHQ operations intelligence software integrates various applications for process engineering, engineering, operation, or analytics into a single entry point. Companies get easy access to complex data from various sources and are empowered to make better informed decisions.

XHQ 6.2 offers enhanced functionalities and new features. The Visual Tile Composer (VTC) was updated and now offers personalization enhancements. New in version 6.2 are a native connectivity for Comos and features for charts and controls. Additional security providers for the cloud are also supported. Introducing client caching for the modern browser, Solution Viewer enhances the software's performance. ■

> [siemens.com/xhq](https://www.siemens.com/xhq)

Highlights

- **Faster time to value** through personalization with VTC
- **Richer data integration** through the new Comos connectivity
- **Reduced IT overhead** through cloud-friendly features

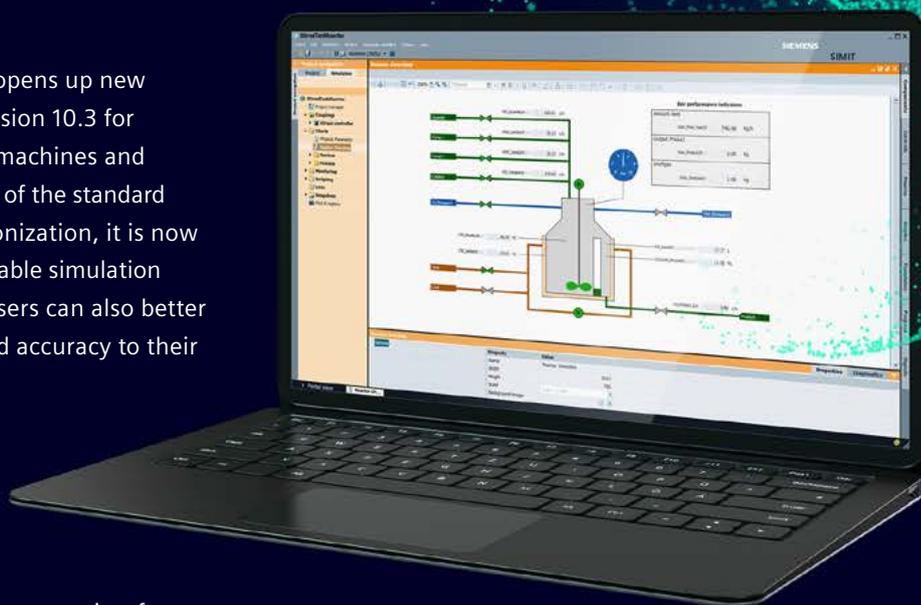
SIMIT SIMULATION PLATFORM

Optimized interfaces

The Simit simulation platform opens up new opportunities with the new version 10.3 for creating simulation models of machines and plants. Thanks to the extension of the standard interface, including bus synchronization, it is now possible to embed freely selectable simulation tools and any co-simulations. Users can also better adjust the simulation depth and accuracy to their specific requirements because Simit enables the synchronization of acyclic data between simulation and automation environments. The switchover between hardware-in-the-loop and software-in-the-loop happens reaction-free through the exchange of parameters or messages.

These innovations allow for an even more extensive reuse of existing data for the simulation, making it even more cost-effective to use Simit over the entire lifecycle of machines and plants. ■

> [siemens.com/simit](https://www.siemens.com/simit)



Highlights

- Integration of **functional mock-up units (FMUs)** that were created using **64-bit tools**
- **Expanded communication options** to include third-party tools and customer-specific solutions
- Comprehensive integration and utilization of existing data to **facilitate generation of the digital twin**
- Operator Training System (OTS) for secure and **efficient training of plant personnel** in a virtual environment

PROCESS INSTRUMENTATION AND ANALYTICS

Process instrumentation and analytics from Siemens provide holistic solutions from a single source. The intelligent Sitrans instruments are also designed for seamless interplay with the larger world of industrial automation and control systems – enabling greater process transparency and smarter decisions for your business.

SITRANS SCM IQ

Smart Condition Monitoring with IIoT sensors

All plant operators and maintenance personnel know that there are certain plant components and machines that they prefer to double-check, if only to verify that all the parameters really are in the green zone. Because they're not considered highly critical, they aren't extensively monitored – but if they fail, the result is often a long and expensive plant shutdown.

With the Sitrans SCM IQ Smart Condition Monitoring solution, these shutdowns can be prevented. This smart system is easy to install to monitor the condition of rotating and vibrating plant components. For this purpose, Sitrans MS200 multisensors are attached, for example, to pumps, gear units, or compressors. These wireless and robust IIoT sensors collect important condition data, which is continuously analyzed by artificial neural networks. Even before a threat is imminent, the system issues timely, event-related warnings that notify users of the potential failure of these assets. This prevents unscheduled downtime, reduces maintenance costs, and boosts plant availability. ■

› [siemens.com/scmiq](https://www.siemens.com/scmiq)



Highlights

- **Monitoring of machine condition** with IIoT sensors, gateway, and app
- **AI-supported anomaly detection**
- **Easy installation** and rapid commissioning
- **Low investment and operating costs**

SITRANS MOBILE IQ

Conveniently parameterize field devices via smartphone

Sensors are ideal for measurement tasks, but they're often installed in places that are hard to access such as deep shafts, a maze of pipes, or an exposed position on tall tanks.

The Sitrans mobile IQ app is a convenient way to commission and parameterize field devices such as Sitrans LR100. To commission and set up the 80 GHz compact radar transmitter, users download the free Sitrans mobile IQ app from one of the large app stores to their mobile device and

access the transmitter via a secure Bluetooth connection. Devices with no Bluetooth interface but with a service interface – for example, the Sitrans Probe LU240 ultrasonic level transmitter, or Sipart PS100 positioner – can be retrofitted with the Sitrans AW050 Bluetooth adapter. Combining Sitrans mobile IQ with compatible Siemens field devices makes commissioning and ongoing maintenance easier and more efficient. ■

› [siemens.com/mobileiq](https://www.siemens.com/mobileiq)



Highlights

- Automatically **detects and displays all supported field devices** in the vicinity
- **Fast commissioning** and detailed setup, including graphical support
- **Displays device status** and profile of selected measured and diagnostic values

SITRANS LCS050

Cost savings and digitalization combined

Sitrans LCS050 is the cost-effective stainless-steel capacitance point level switch for a wide variety of liquid applications. The device's ultra-compact design, 360-degree visual indication, and chemically resistive probe are ideal for use in spaces requiring a small device with a short insertion length. Sitrans LCS050 features M12 connector and threads starting at 0.5" for installation flexibility. Fast, convenient installation requires no calibration or setup: Users simply power up and their backup, safety, or demand level needs are taken care of. The added IO-Link

option provides the ability to fine-tune the relevant application for advanced measurement options. ■

> [siemens.com/sitransLCS050](https://www.siemens.com/sitransLCS050)

Highlights

- Full **diagnostics** and **commissioning** via **IO-Link**
- **Detect foam, liquids, or slurries** and change in material type with the ability to manage buildup
- Applicable for many industries such as **general factory, food and beverages, pharmaceutical, and chemical**



Highlights

- Use it flexibly **in any location** thanks to battery operation
- **Easy access** to measured data from anywhere and at any time via a web browser application
- **Secure data acquisition** and protected storage in a local database
- **Integration in an existing SCADA system** via a standard interface

SITRANS FM MAG8000 / SERVE IQ APP

Easy monitoring of measured values from very distant measuring points

Operating the Sitrans FM MAG8000 electromagnetic flowmeter with the Sitrans serve IQ app makes it easy to acquire measured data from very distant measuring points with no infrastructure. A communication module integrated in Sitrans FM MAG8000 securely transmits the data, which is then stored in a local database. Past and present measured values are graphically visualized on a web browser. In addition, Sitrans serve IQ enables the simple integration of process values into a control system. Typical applications include the water sector. ■

> [siemens.com/serveiq](https://www.siemens.com/serveiq)

ANALYZER SYSTEM MANAGER

Predictive and smart maintenance for process analytics

Siemens' Analyzer System Manager (ASM) is the monitoring and optimization software for process analytics. It collects all relevant data from process analyzers in a central application, including internal diagnostic data, and evaluates it using statistical functions. ASM visualizes the data in diagrams and also enables predictive maintenance. This means that users can analyze future device behavior and detect potential problems before they arise.

Users benefit from a reduction in unexpected downtime and unnecessary service activities. This boosts the availability of devices and the plant as a whole and significantly reduces maintenance expenditures. With ASM, smart service is within reach. ■

> [siemens.com/process-analytics](https://www.siemens.com/process-analytics)



Highlights

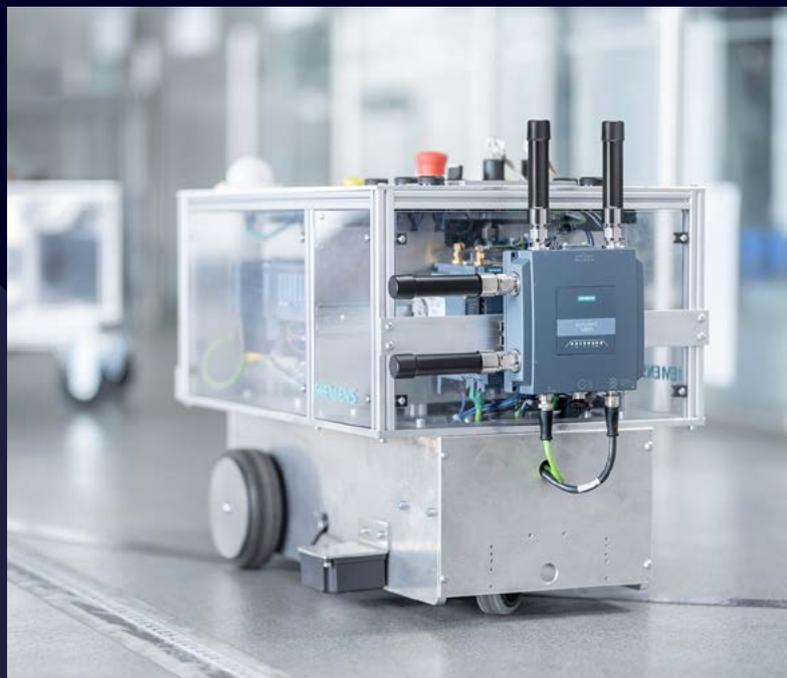
- Continuously monitors **diagnostic data (including NOA parameters)**
- Statistical functions that **analyze device behavior**
- **Displays service recommendations** based on smart data analysis

INDUSTRIAL COMMUNICATION

As a basis for the digital transformation, Siemens offers the right solution for every network level from field to IT connection. With the solution portfolio consisting of hardware, software, and services, digital enterprises can master challenges such as cloud/edge computing, wireless applications with Wi-Fi 6 and 5G, and everything ranging from network planning to commissioning.

Highlights

- 5G communication in **public and private networks**
- **Fallback to lower mobile wireless standards** (3G, 4G) if 5G connectivity is unavailable
- **Simple VPN remote access** via public 5G networks with the Sinema Remote Connect management platform
- Robust **IP65 and IP30** housing for industrial use



SCALANCE MUM856-1 AND MUM853-1

Industrial 5G routers for Industrie 4.0

5G is the communication standard that will raise future Industrie 4.0 and IIoT applications to a whole new level. The highest data rates, maximum reliability, and lowest latencies will enable new potential applications in industry. For example, 5G lets users implement augmented reality applications for service technicians, autonomous logistics systems, and mobile robots. And it is possible to remotely upload firmware updated to machines.

Scalance MUM856-1 and MUM853-1 (available in spring 2022) will bring 5G to the industrial space. These 5G routers allow for the connection

of machines, control elements, and other devices to private 5G campus networks and public 5G mobile wireless networks. Development was focused on the special hardware requirements of industry. The devices support Release 15 of the 5G standard and deliver data rates of up to 1 Gbit/s. This makes Scalance MUM856-1 and MUM853-1 the next step on the journey to the industry of tomorrow. ■

› [siemens.com/industrial-5g-router](https://www.siemens.com/industrial-5g-router)

PRIVATE 5G NETWORKS FOR INDUSTRIAL APPLICATIONS

Test Industrial 5G for yourself

Copyright: Deutsche Messe AG

5G provides important opportunities for developing flexible new factory concepts in all industries. Private 5G networks in particular offer major advantages for industry. A company can operate the 5G network using a private 5G frequency, which means it can precisely customize the network to meet its requirements for data rates, reliability, and the required latency time. The data also remains on-site in a self-managed network, and the company decides, among other things, which data will be forwarded, for example, to a cloud. At its Automotive Test Center in Nuremberg, Siemens tests industrial applications in a private, standalone 5G network that was developed to take the technology to the point where it can be used in industry. Prototypes of this solution were also installed in the factories in Amberg and Karlsruhe.

In 2022 interested parties will be able to test their applications very easily in a private 5G network. The 5G Smart Venue will open in Hanover at the world's largest exhibition site, making this site a test area and a showcase for the use of 5G in industry. Siemens is installing a permanent private 5G network in Hall 9. The 24,000 m² hall provides optimal conditions for large structures and can be leased for the purpose of conducting tests under real conditions when no trade shows are in session. ■

> [siemens.com/industrial-5g](https://www.siemens.com/industrial-5g)

Highlights

- Private 5G networks offer tremendous **benefits for industry**
- Operation using **local 5G licenses**
- **Data security** in own hands

SCALANCE W ACCESS POINTS AND CLIENT MODULES

Versatile IWLAN applications with Wi-Fi 6

Industrial wireless LAN increases flexibility in future-proof modular factories because mobile IIoT devices can connect wirelessly. Scalable industrial WLAN (IWLAN) solutions from Siemens have proved their worth in industry for almost 20 years and enable many applications in all industries – and they now also work with Wi-Fi 6. For example, mobile robots and automated guided vehicles (AGVs) can be conveniently connected wirelessly using powerful Scalance W Access Points and Client Modules. Everything is possible, from small sub-applications to complex plant networking. Experts from Siemens also support the planning, configuration, commissioning, and monitoring of these networks. ■

› [siemens.com/iwlan](https://www.siemens.com/iwlan)



Highlights

- **New IP30** and IP65 devices with the latest WLAN standard for industry
- Special **added industrial functions**, including redundancy via WLAN
- **Gigabit data rates** and highly efficient data transmission
- **Energy-efficient operation** of mobile participants
- **Global approvals** and industry-specific certifications



CP 1543-1 V3.0 COMMUNICATION PROCESSOR

Identify advanced controllers in secure networks

The new firmware version (V3.0) of the CP 1543-1 communications processor for Simatic S7-1500 supports authentication in a secure network via IEEE802.1X using an extensible authentication protocol (EAP). This means that Simatic S7-1500 controllers can be authorized to access the network via the CP 1543-1 using the mechanisms as per IEEE802.1X in a network with an authentication server (Radius server). Using the new firmware version 3.0 of the CP 1543-1 communication processor, you can also connect the Simatic S7-1500 controller to a Sinema RC server. ■

› [siemens.com/cps-for-s7-1500](https://www.siemens.com/cps-for-s7-1500)

Highlights

- **Authentication via IEEE 802.1X** using the EAP processes TLS, MD5, PEAPv0, MSCHAPv2, PWD, or TTLS
- **OpenVPN** for connection to Sinema RC
- **Firewall and VPN** to protect S7-1500
- Easy and fast programming, networking, and setup through **standard engineering with TIA Portal Step 7 Professional V17**

SCALANCE X – POWER OVER ETHERNET

Energy and data for **PoE-capable end devices**

Industry uses the Power over Ethernet (PoE) technology known from office environments and supplements the industrial grade portfolio with Scalance XC216-3G PoE Industrial Ethernet switches from the Scalance X family. PoE switches are available for the entire industrial network, including the power supply of surveillance cameras, Scalance W IWLAN Access Points, Simatic RTLS gateways, and Simatic MV500 optical identification systems. The existing 8-port versions of the Scalance XC-200 line are added with Scalance XC216-3G PoE devices with 19 ports. This permits a maximum power budget of 300 W that can be individually distributed to the PoE ports. With a total of 14 PoE ports – 12 with up to 30 W of power and two with up to 60 W – end devices can be optimally connected, for example, in tunnel applications and automotive productions. ■

> [siemens.com/poe](https://www.siemens.com/poe)



Highlights

- **Comprehensive PoE portfolio** consisting of switches, power supplies, and end devices
- PoE switches in **24 V DC or 54 V DC versions**
- Unmanaged and managed **PoE switches with a maximum of 10 Gbit/s ports** (3 × 10 Gbit/s ports with Scalance XC216-3G)

SCALANCE LPE

Powerful processing engine close to the process



Highlights

- Implementation of **edge and cloud applications**
- Temperature range from **-40°C to +60°C**, redundant power supply, and fiber-optic connection
- **Low maintenance** with no internal battery

More and more companies are using edge computing and exploiting the benefits of local data processing. Scalance LPE local processing engine implements a variety of applications close to the process. It collects data, preprocesses it, and makes it available to other systems. Thanks to its Simatic S7-1500 design, Scalance LPE can be seamlessly integrated into automation.

Scalance LPE comes with a preinstalled Linux operating system (based on Debian) and is used, among other things, to distribute or analyze network information (data mirroring) right on the machine. The installed applications, which can also run simultaneously, allow predictive maintenance and detects anomalies. Additional security-related applications can also be implemented by installing “Zscaler Private Access” as a docker container on Scalance LPE. ■

> [siemens.com/local-processing](https://www.siemens.com/local-processing)

ZERO TRUST / ZSCALER INC.

OT/IT security concept for production and office networks

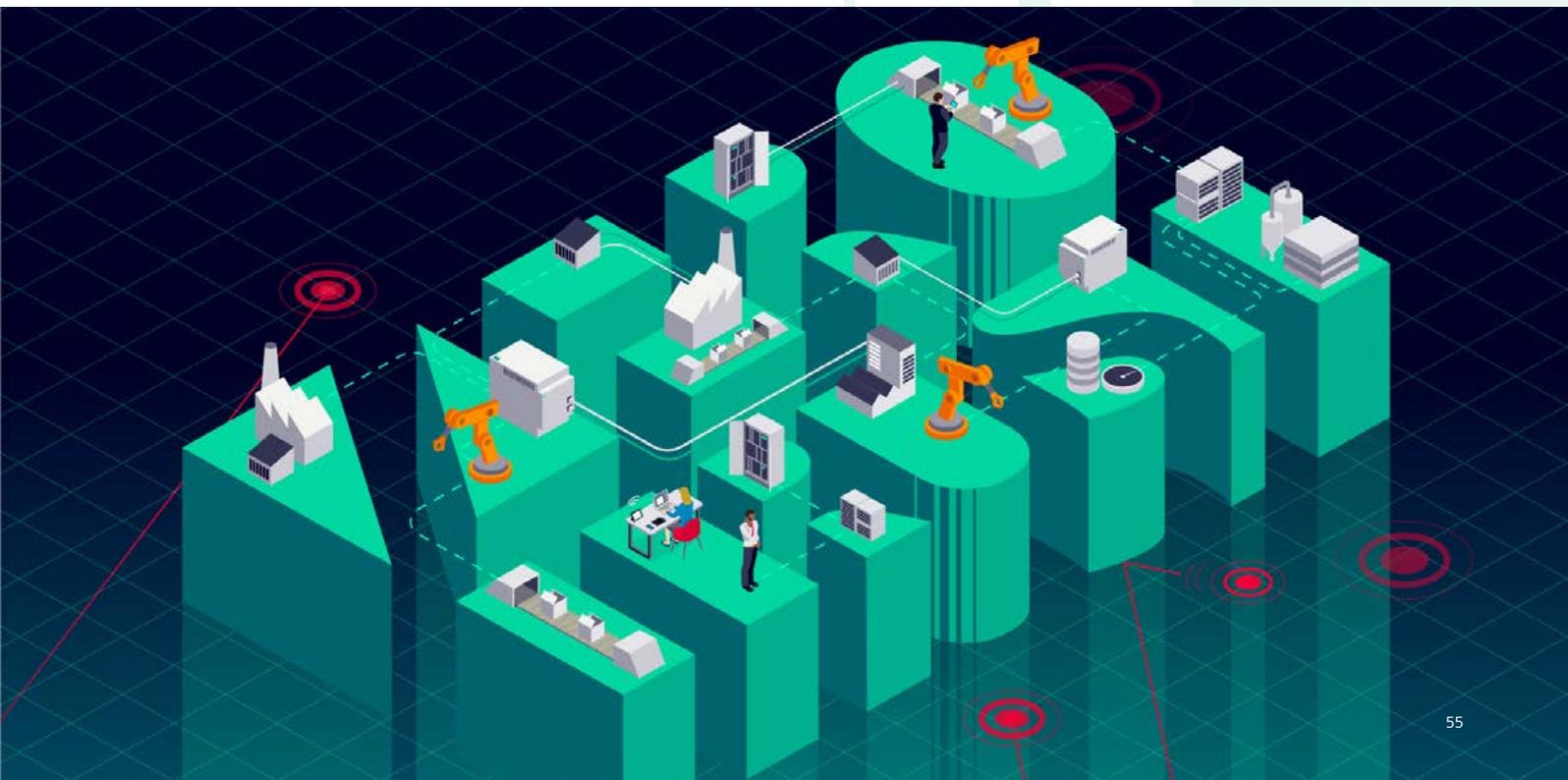
Operators of larger corporate networks are increasingly faced with the challenge of performing production work remotely using uniform OT (operational technology) and IT (information technology) security guidelines. Siemens and Zscaler Inc., provider of a cloud-based security platform, have entered into a collaboration agreement that makes it possible to access production networks securely from any authorized device, whether it is at the office or at home: for example, to conduct remote diagnostics. To prevent exposing the communication network to an increased threat potential, the defense-in-depth OT concept has been expanded to include the Zero Trust IT security concept. This means that access authorization and identification of connection requests can also be used in production and combined with established cell protection firewalls. Users simply install the cloud-based remote access service "Zscaler Private Access" (ZPA) – which is operated via the "Zscaler

Zero Trust Exchange" platform – as a docker container on the Scalance LPE local processing engine. Centralized management on the "Zscaler Zero Trust Exchange" cloud platform and exclusive use of outbound connections result in a more restrictive configuration of existing firewall rules. Existing legacy systems can be easily retrofitted. ■

› [siemens.com/zero-trust](https://www.siemens.com/zero-trust)

Highlights

- **Increased protection from cyberattacks** thanks to a combination of cell protection and Zero Trust principles
- **Boost in productivity** thanks to flexible, dynamic, on-demand remote access
- **Reduced operating costs** thanks to minimized administration outlay





CLOUDCONNECT

From the sensors to the cloud – the professional way

Cloud computing is the first step toward exploiting the benefits of digitalization in industry, which include shorter development cycles, higher productivity, and improved quality. But these benefits are available only if the cloud receives valid data from the field level: Power consumption, temperature, vibration, and corresponding curve progressions over time can all provide indications of plant conditions and process quality. When combined with additional information such as materials used and tool status, this creates entirely new possibilities, including improved product quality, process optimization, and the ability to perform preventive maintenance. With CloudConnect products, this information can be optimally transferred to a wide variety of cloud platforms such as MindSphere, Microsoft Azure, Amazon Web Services (AWS), and Oracle IoT Cloud. ■

› [siemens.com/cloudconnect](https://www.siemens.com/cloudconnect)

Highlights

- **Simatic CP 1545-1** for modern TIA installations offers a direct and easy data exchange with cloud platforms thanks to full integration in TIA Portal and an integrated firewall to protect against unauthorized accesses
- **Simatic CloudConnect 7** as an Industrial IoT gateway enables optimal connection of existing Simatic systems to the cloud via their Ethernet or Profibus/MPI interface without changing the automation program
- **RX1400 with CloudConnect and APE1808:** Ruggedcom routers with CloudConnect are ideal for extreme conditions such as those in the energy sector

POWER SUPPLIES

A reliable power supply is a fundamental requirement for efficient plant operation. The portfolio of Sitop DC UPS and add-on modules ensures stable 24 V even under critical grid conditions and prevents plant downtime and production outages in every industry worldwide.

SITOP PSU6200

Supplemented by **efficient power supply units**

The Sitop PSU6200 product line was expanded to include a powerful 3-phase 24 V power supply unit with 40 A rated output current. For 48 V applications, four additional power supply units are now available: 10 A for 1-phase mains connection and 5 A, 10 A, and 20 A for 3-phase mains connection. This new generation of power supply units offers very high efficiency levels that set new benchmarks in the standard power supply category. Their low heat loss permits a very slim design for space-saving installation with no lateral installation clearances. Important operational data can be transferred through the diagnostics interface. Economical plant integration is provided via a single digital PLC input and a free-of-charge Step 7 function block. ■

> [siemens.com/sitop-psu6200](https://www.siemens.com/sitop-psu6200)



Highlights

- **High efficiency** of up to 96.6%
- **Slim design:** 960 W units only 95 mm wide
- **Active PFC** (power factor correction) for a low inrush and reactive current
- High **overload capacity**
- **Diagnosis of operating data** such as output voltage/ current and temperature status



SITOP DC-UPS

Power heroes for a stable 24 V

Highlights

- **Integration in automation** via Industrial Ethernet/Profinet in TIA Portal or via OPC UA in vendor-neutral networks
- **High plant availability** thanks to state-of-health (SOH) checks to record the battery status over the entire lifecycle
- **Ease of handling** thanks to predefined battery parameters
- Diagnosis via energy storage link for **robust battery charging** and monitoring the charging status

Sitop DC UPS with the new, maintenance-free Sitop BAT1600 lead or lithium batteries provides a long buffering time for extreme reliability in the event of a power outage. High-capacity energy storage units are especially vital for applications in which processes require a continuous supply of power during a power outage, data must continue to be recorded, and communication channels need to be kept open. ■

> [siemens.com/sitop-ups](https://www.siemens.com/sitop-ups)

INDUSTRIAL IDENTIFICATION AND LOCATING

Industrial processes in the digital enterprise demand total transparency. The ability to gather and process data at strategically relevant points is more and more becoming a determining factor in achieving long-term business success. Industrial identification and real-time locating systems (RTLS) are key technologies.



Highlights

- Individual **control of access rights**
- Individual and centralized **assignment of rights via central databases** such as Active Directory
- **Traceability of parameter changes** with the aid of an audit trail minimizes faults and production problems

SIMATIC RF1000

Greater **security,** **traceability,** **and efficiency**

Since their initial creation, industrial plants have always been protected. In the beginning, fences and factory security services were enough, but not anymore. For example, staffed entrance gates have been replaced by automatic revolving doors. Operators also need to ensure that only authorized personnel can operate machines and plants or change parameters.

The solution needs to be integrated in existing automation technology, and following the installation its operation has to be user-friendly, flexible, and secure. Simatic RF1000 seamlessly meets

these requirements. Once the reader is installed – for example, in the Comfort Panel – employees can use their ID cards to access their workstations. This isn't just convenient, it also minimizes the potential for misuse.

In addition to access control, Simatic RF1000 can also be used to trace every login on a machine. This is called an audit trail, and it significantly reduces production errors and downtime. ■

> [siemens.com/rf1000](https://www.siemens.com/rf1000)



SIMATIC RTLS4083T, PLUS

Paperless and data-controlled for greater transparency

The new Simatic RTLS4083T transponder in the Plus variant expands the portfolio of the RTLS ePaper family and provides more options for the digital transparency of process information. It is ideal for locating objects such as pallets and containers as well as people. Employees can view important production data in black and white as text or optical code on the e-Ink display. This is combined with seamless, real-time locating down to the centimeter range, which allows them to access order-based and position-specific information on the current status of processes at any time – all paperless. As a result, coordinated digital processes are established that permit greater transparency, improved quality, and fact-based decision making. ■

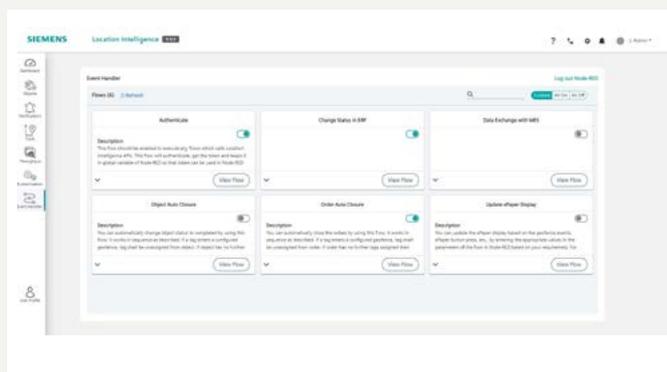
> [siemens.com/rtls](https://www.siemens.com/rtls)

Highlights

- Improved process execution thanks to **paperless production**
- Process **monitoring** in real time
- **Notification** of responsible employees in real time
- **Improved quality** thanks to seamless documentation
- **Fact-based decision-making** and complete digitalization

SIMATIC RTLS WITH LOCATION INTELLIGENCE

Greater transparency in production and logistics



Highlights

- **Reduced search procedures** thanks to visualization of all relevant objects on a range of terminals in real time
- **Real-time analysis of the material flow and dwell times** in order to identify problems with orders and prevent them in the future
- **Optimization of production and logistics** thanks to process automation

Location Intelligence, a software application for locating systems, expands Simatic RTLS to include the digital twin of performance. By intelligently linking transponder IDs and order data, and by using “geofences” (virtually defined areas), movement data can be displayed and analyzed – which in turn allows the derivation of site-specific events in real time. The new Location Intelligence Event Handler feature enables a highly flexible and targeted assignment of actions to these events, such as controlling a PLC or sharing information with an ERP, MES, or shop-floor management system. It is also possible to transfer KPIs such as dwell and throughput time to the cloud for advanced analytics while production is still in progress. ■

> [siemens.com/rtls#LocationIntelligence](https://www.siemens.com/rtls#LocationIntelligence)

DIGITAL ENTERPRISE SERVICES

Siemens' service experts assist and support companies throughout the entire digitalization process and align the Digital Enterprise Services offerings with each customer's requirements. The result is faster product launches, higher product quality, and more efficient and sustainable production.

SITRAIN – DIGITAL INDUSTRY ACADEMY

The future of learning starts today

Global megatrends such as digitalization, new work, customization – and of course, the pandemic – are changing the way we learn. With its vision of the “Future of Learning,” Sitrain is pursuing a comprehensive approach that combines a variety of learning methods. Thanks to personalized training, learners and their employers are given the opportunity to build very specific knowledge and capabilities and learn only what they actually need. Learners can participate in a live group led by a trainer that is always at the same time and in the same place, either online or in person. Or they can develop their own content and process it at their own speed on their own schedule. The best learning outcome is achieved by combining the two learning methods.

Relevant content and combined methods ensure an efficient learning outcome, flexible learning concepts, and better integration into the everyday work routine. Content is based on the nature of the knowledge to be communicated and the customer’s specific needs – and is prepared using the optimal methods for the relevant format. Subject areas can also be communicated via multiple channels to promote a modern learning culture. The result is an ongoing and sustainable learning experience that increases innovative strength and competitiveness. ■

› [siemens.com/sitrain](https://www.siemens.com/sitrain)

Highlights

- **Effective:** Knowledge acquisition through a combination of learning methods
- **Flexible:** Selection of the most suitable learning concept
- **Relevant:** Learning what you need whenever you really need it
- **Ongoing:** A learning experience that is always up to date



PREDICTIVE SERVICE ANALYZER

Edge app for **predictive maintenance**

Aging and wear of mechanical and electrical components of a drive system can lead to critical faults and costly unplanned downtimes. The unexpected failure of a single part in the production line can stop the complete production even for several days. Users face varied challenges such as: How can they increase asset availability and prevent unplanned downtimes? How can they arrange maintenance activities during planned downtimes? At the same time, they want to increase productivity and efficiency and realize cost savings.

Predictive Services for Drive Systems enables users to conduct optimized maintenance planning through the utilization of artificial intelligence.

The latest offering from Predictive Services for Drive Systems is Predictive Service Analyzer: the Industrial Edge service application that makes artificial intelligence serviceable. With the help of machine learning algorithms, anomalies can be detected early – via data capture without the internet and on-site analysis. Availability is considerably increased by a continuous monitoring of the drive systems together with real-time notification and visualization of the health status in an integrated dashboard. Also, with Predictive Service Analyzer, KPIs can be forwarded to higher-level maintenance systems or cloud applications such as MindSphere. ■

› [siemens.com/drivesystemservices](https://www.siemens.com/drivesystemservices)



Highlights

- **Data capture without internet**
- Evaluation of **high-frequency process data**
- **Identification of mechanical damages** in the drive train (e.g., bearing damage, imbalance)
- **Integrated dashboard** for display of calculated KPIs (e.g., anomaly score, residual useful lifetime)

SMART ELECTRIFICATION

A reliable electrical power supply is not just a lever for increasing availability and profitability. It is also essential to the digital transformation. With smart electrification, Siemens provides solutions and the associated hardware, software, and services for seamless integration in the digital enterprise.

SMART CONTROL PANEL DESIGN

The new standard in electrical engineering

Electrical planners are often confronted with the challenge of having to select not only the correct components for a motor-starting application but also all the parameters associated with the motor feeder. With Control Panel Design in the TIA Selection Tool, it is possible to design and dimension the main electrical components of a machine in compliance with standards. Dimensioning the cables all the way to the motor is equally important as selecting the suitable switching and protection devices. With Control Panel Design in the TIA Selection Tool, the cables are designed in compliance with the IEC 60204-1 and UL 508A and other relevant standards. To begin with their configuration, electrical planners just need the current offline version of the free TIA Selection Tool and some basic information to describe the motor. On this basis, tool users are guided step by step through the freely selectable parameters of the configuration process. Planners are also shown the correct devices for the entire motor feeder,

which they can then easily add to an order list in a subsequent step. Finally, they are provided with complete documentation of the technical data and calculations, which they need, for example, for verifying short-circuit strength. ■

> [siemens.com/cpd](https://www.siemens.com/cpd)

Highlights

- Dimensioning of fuseless and fused load feeders according to **IEC** and **UL** up to **250 kW and 500 hp**
- **Main disconnect dimensioning for IEC infeeds**
- Visual planning of the main circuit in a **single-line diagram** and easy selection of required accessories
- Complete **PDF documentation** of technical data and calculation results



CONCEPTS AND TOOLS FOR ELECTRICAL PLANNERS AND PROJECT MANAGERS

Conceptual consulting for power distribution projects

The world is changing and so are requirements for the energy distribution in buildings. With a growing pressure on total operating costs, the obligation to deliver sustainability reporting, and a focus on energy efficiency, users rely on integrated energy assets. They offer more transparency and are the basis for condition and predictive maintenance.

Electrical planners and project managers are faced with projects growing in complexity, time and cost pressure, and rising customer requirements for future-proof technology, quality, and the lowest life cycle costs. That is why they need conceptual support in the project's early planning phase. This includes not only dimensioning of a reliable, secure, and efficient energy supply (TIP – Totally Integrated Power) but takes it one step further.

Siemens offers conceptual consulting and tools to facilitate the work of planners and project managers. The target: maximum efficiency when planning a project, maximum performance during the installation and commissioning phase. For a project it is important to create an energy distribution that is reliable, maintainable, and operable at any time. To realize this, users can analyze their



system continuously with intelligent and self-diagnosing products. But Siemens supports the maintenance of a secure and stable energy, too: on the one hand, by ensuring personal and plant protection, on the other hand by preventing severe power outages and identifying errors. And in all concepts, users benefit from advanced cybersecurity functions. ■

> [siemens.com/lowvoltage/planning](https://www.siemens.com/lowvoltage/planning)

> [siemens.com/lowvoltage/implementation](https://www.siemens.com/lowvoltage/implementation)

Highlights

- Conceptual support during **planning and implementation of power distribution projects**
- Integrated **power monitoring** for controlling total life cycle cost (TLC) and CAPEX
- **Condition monitoring** with self-monitoring devices for maximum availability and reliability
- Securing **personal and plant protection** and **cybersecurity**

SENTRON COMPONENTS

Equipped for digitalization

From planning and engineering to operation: With Sentron components, all process steps in electrical power distribution can be totally supported digitally for industrial plants, infrastructure, and buildings. The 3WA air circuit breaker offers all the functions that digital enterprises need: from reliably protecting people and facilities from electrical damage and accidents to seamless integration into digital environments. 3VA molded-case circuit breakers ensure highly available production processes. With the new condition monitoring function, users get a quick overview of the health status of the circuit breaker and can detect its remaining service life. The compact 5SL6 COM miniature circuit breakers, AFDD/LS miniature circuit breakers, and 5ST3 COM auxiliary fault-signal contacts bring digitalization right into the final circuit. The record of electrical

values such as current, voltage, temperature, and switching states makes it possible to quickly detect consumers with increased power consumption, irregularities, and faults in the final circuit and to rectify these defects at an early stage. The 7KN Powercenter 1000 data transceiver collects the recorded data and transmits it to mobile devices, PCs, and cloud solutions for visualization and analysis. The Sentron LV HRC fuse link 3NA COM enables easy integration of existing installations into digital structures. With the help of easy-to-install Sentron measuring devices and intuitive energy monitoring, users can identify potential savings with minimal effort. ■

> [siemens.com/sentron](https://www.siemens.com/sentron)



Highlights

- **3WA air circuit breaker** with smart electric release unit ETU600 for all requirements
- **3VA molded-case circuit breakers** with motor operator with stored energy feature SEO520 up to 630 A (IEC) and up to 600 A (UL)
- **Sentron circuit protection devices** with measurement and communication functions with a width of only 1 MW
- **Sentron LV HRC fuse link 3NA COM** for effective protection of people and facilities
- **Sentron measuring devices and energy monitoring** for efficient and safe monitoring of power distribution

ALPHA 3200 ECO

Engineering with the digital twin

As the demands on power distribution grow and project lead times become shorter, switchgear manufacturers require increasingly complex solutions. The response to these challenges is 3D engineering with the digital twin of the Alpha 3200 Eco power distribution board. Switchgear manufacturers start by performing the entire engineering process digitally in the Simaris configuration software, from simple, fail-safe, and standards-compliant configuration to rapid calculation, bid preparation, and system documentation. The newly developed 3D processor then generates a detailed digital twin that can be viewed via the Simaris Sketch visualization software – easily, with the press of a button. The digital twin makes it easy to try out system alternatives, manage complex systems, and implement shorter project lead times.

But the Alpha 3200 Eco also has a lot to offer in terms of hardware. The busbar at the center of the board device makes installation much easier and requires 30% less copper than conventional solutions. The high packing density provides greater functionality in a smaller space. ■

> [siemens.com/alpha](https://www.siemens.com/alpha)



Highlights

- The 3D output's **high level of detail** improves technical communication in all areas
- **Resource-saving** thanks to the use of 30% less copper
- **Practically based** thanks to application-specific design verification according to IEC 61439 directly accessible in Simaris
- **Modular design** thanks to flexibly combinable 8GK installation systems

SIRIUS SYSTEMBAUKASTEN

Economical solution for many applications

With the Sirius modular system, users have all the devices they need to switch, protect, control, and monitor motors. Thanks to its high functionality, the system can be used in a variety of applications, including pumps, fans, and compressors. This totally innovated device generation has over 50,000 combination checks and approvals for worldwide use. Sirius switching and protective devices are also an economical and ecofriendly solution because they can be used for the reliable and energy-efficient switching of highly efficient IE3/IE4 motors. Electrical designers benefit from CAx data that can be retrieved at any time and comprehensive, standards-compliant configuration support that simplifies workflows and speeds up electrical design.

In applications that require more protection, the new F-PLC contactors – which are controlled directly from fail-safe controllers – can be used. The major advantages of this solution are that no additional coupling level is needed and safety is

much simpler to assess. Safety Evaluation in the TIA Selection Tool (TST) for the IEC 62061 and ISO 13849-1 standards helps users evaluate the safety features of their machines quickly and reliably. ■

› [siemens.com/sirius](https://www.siemens.com/sirius)

Highlights

- **Modular system** across all sizes for each specific application
- **End-to-end performance range** from 3 kW to 250 kW
- **F-PLC contactors** from 18.5 kW to 250 kW
- For motors with enhanced **efficiency in efficiency class IE3/IE4** and **utilization category AC-3e**

SIRIUS 3RQ1 COUPLING RELAYS

Maximum safety for people and systems

The Sirius 3RQ1 series completes the portfolio of coupling relays for electrical systems in industry and infrastructure. Thanks to their force-guided operation according to IEC 60947-5-1 (IEC 61810-3), these devices offer maximum safety for people and systems, making them especially well suited for use in railway and signaling applications as well as in elevators and industrial production facilities. The coupling relays offer additional safety as an output expansion of the Sirius 3SK safety relays using a device connector. This reliably prevents wiring errors and protects against electrical accidents and damage during assembly. The Sirius 3RQ1 coupling relays are also ideal for coupling and reproducing signals to controllers. ■

› [siemens.com/sirius-coupling-relays](https://www.siemens.com/sirius-coupling-relays)

Highlights

- **Universally usable**
thanks to a wide-range power voltage from 24 to 240 V AC/DC
- **Certified up to SIL 3/PL e**
(IEC 61508/ISO 13849) and approved for railway applications
- **Simple assembly**
reduces time required for building control panels



SIRIUS SIM / SIRIUS SAFETY ES (TIA PORTAL)

New level for safety relays

The combination of Sirius Safety ES (TIA Portal) and Sirius Sim 3SK2 yields brand-new digitalization options for Sirius 3SK2 safety relays. With this combination, users can configure not just the 3SK2 devices, but also the entire application. The integrated interface to Sirius Sim makes it possible to test the functioning and parameter assignment of 3SK2 devices directly on a digital twin in the simulator without any actual devices, sensors, or actuators. Consequently, anyone can find the appropriate device for their application without any diversions. This means that they save a substantial amount of time and money on engineering because no real components are required and applications can be quickly and easily adapted. ■

› [siemens.com/safety-relays](https://www.siemens.com/safety-relays)

Highlights

- Interface to **TIA Portal V17**
- Extensive **selection of sensors and sensors** for the simulation
- **Simple replacement of devices** and elements

SIRIUS 3RF2

Economical grounding



Highlights

- For 1-phase **3RF2310 to 3RF2330** solid-state contactors and 3-phase **3RF2410** solid-state contactors **with standard rail mounting**
- **Standards-compliant grounding connection** on DIN rails or mounting plates
- **Reduced overall height (5 mm) and depth (2 mm)** with the same drilling pattern

Sirius 3RF23 and 3RF24 solid-state contactors have a new grounding concept. Instead of the usual insulated design with a plastic mounting bracket that requires a ground conductor, the new contactors are now equipped with a metal mounting bracket for mounting directly on grounded materials. They can be snapped onto grounded DIN rails or screwed onto an even, grounded mounting surface. Nothing more is required than to snap on the solid-state contactor. Additional grounding on the 3RF2 is no longer necessary. Alternatively, users can continue to connect the relays via a grounding cable. ■

› [siemens.com/3RF2](https://www.siemens.com/3RF2)

SIRIUS SAFETY INTEGRATED PORTFOLIO

Robust devices with new features

Like the Simatic ET 200SP and Simocode motor starters, the Sirius 3RM1 motor starters and Sirius 3SK1 and 3SK2 safety relays can now also be deployed at very high elevations above 2,000 meters. All the devices listed can be operated at temperatures from -25°C to $+60^{\circ}\text{C}$ without derating. Even in hot and dusty environments, users can rely on the safety portfolio from Siemens. Sirius safety relays, Simocode, and Sirius coupling relays are reliably robust thanks to optional coated printed circuit boards. They easily cope with condensation, rapidly fluctuating temperatures, corrosion, and harmful gases. Because Sirius safety relays as well as Simocode and Simatic motor starters are resistant to shock and vibrations, they're also approved for marine use. ■

› [siemens.com/safety-integrated](https://www.siemens.com/safety-integrated)



Highlights

- **Installation altitudes above 2,000 m:** Sirius 3RM1, Sirius 3SK1, Sirius 3SK2, Simatic ET 200SP motor starter, Simocode
- **Temperature range from -25°C to $+60^{\circ}\text{C}$:** Sirius 3RM1, Sirius 3SK1, Sirius 3SK2, Simatic ET 200SP motor starter, Sirius 3RT, Sirius 3RQ1, Simocode
- **Marine approval:** Sirius 3SK1, Simatic ET 200SP motor starter, Simocode
- **Coated printed circuit board as special variant:** Sirius 3SK1, Sirius 3SK2, Sirius 3RQ1, Simocode

SIRIUS ENGINEERING SOFTWARE IN TIA PORTAL

Quickly connect Sirius devices

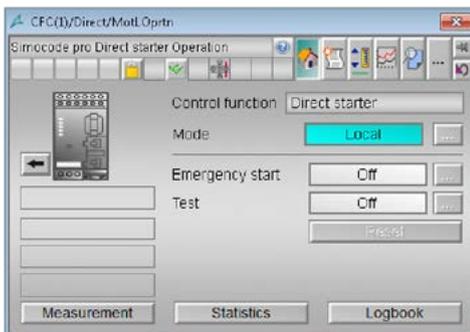
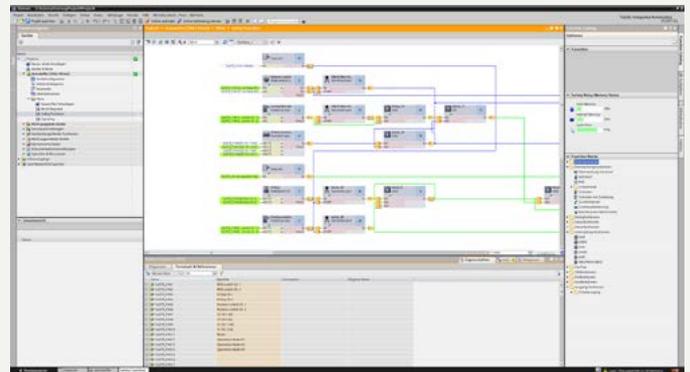
The new Sirius Engineering Software V17 allows users to configure, commission, and diagnose their Sirius devices in TIA Portal. Thanks to an intuitive layout and simple navigation, device features and parameters are easy to set.

Sirius 3SK2 safety relays are now also integrated in TIA Portal. The Sirius Safety ES V17 engineering software makes it easy to implement logic and safety applications. Sirius Simocode ES V17 for Simocode pro devices and Sirius Soft Starter ES V17 for the 3RW5 and 3RW44 soft starters have been improved in terms of their performance and convenience. ■

› [siemens.com/sirius-engineering-software](https://www.siemens.com/sirius-engineering-software)

Highlights

- **Intuitive engineering** thanks to a flexible screen layout, a uniform look and feel for program editors, and graphical network and device configuration
- **Efficient engineering** thanks to a common hardware configuration for all system components
- **Simple integration** of existing and previous Sirius ES projects
- **Universally usable** thanks to a stand-alone version or seamless integration into the central engineering framework (with Step 7, WinCC)



Highlights

- Straightforward **faceplates, function blocks** for accessing Simocode and the required **driver blocks**
- Easy **transitioning from conventional motor feeders** in Simatic PCS 7 to Simocode pro
- **Use of blocks** from the engineering software in the PCS 7 system **in multiple automation systems**

SIMOCODE PCS 7 V9.1 LIBRARIES

Easily connect motor management and process control systems

The Simocode motor management system can be easily and conveniently integrated into the Simatic PCS 7 process control system thanks to the Simocode pro function block library for Simatic PCS 7. The library substantially reduces the number of configuration steps required, which greatly simplifies the configuration process. Different versions of the function block library are available for different versions of Simatic PCS 7. One new addition to the program is the Simocode Libraries PCS 7 version 9.1 for the Simatic PCS 7 V9.1 control system, which includes many functions. ■

› [siemens.com/simocode](https://www.siemens.com/simocode)

SIRIUS 3RW5 SOFT STARTERS

Start softly, stop safely



Highlights

- **System redundancy S2** with the Profinet High Feature module
- **Power range** from 5.5 to 560 kW (at 400 V)
- **Safety-related shutdown** for SIL 1/PL c to SIL 3/PL e and integrated Safe Torque Off (STO)

The new high-performance Sirius 3RW55 Failsafe soft starters with integrated safety technology enable users to economically generate failsafe solutions for many different applications. As of firmware version 3.0, the Profinet High Feature modules for Sirius 3RW55 and Sirius 3RW55 Failsafe support the S2 system redundancy mechanisms of Profinet IO. This makes it possible to operate the soft starters directly on highly available systems such as Simatic S7-400 H and S7-1500 H. In cases where system availability and control system redundancy are a top priority, 3RW55 and 3RW55 Failsafe soft starters offer crucial added value, including on the field level. ■

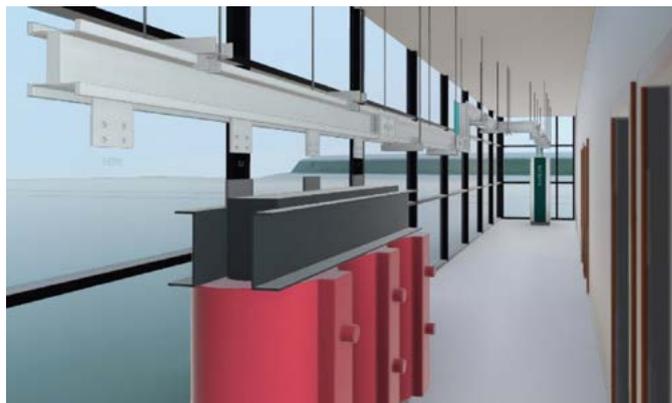
› [siemens.com/softstarter](https://www.siemens.com/softstarter)

SIMARIS BUSBARPLAN

BIM-compliant planning of busbar trunking systems

For future-oriented planning in the context of BIM (building information modeling), the free Simaris busbarplan software can be used to generate Sivacon 8PS busbar runs in buildings as a digital twin. The process is quick and easy. Users simply select the busbar trunking systems that are right for their projects and plan the busbar run layout in the building in a three-dimensional space. The planned busbar runs can be further processed via a smart interface in Simaris project in order to obtain budget prices, functional parts lists, and tender specification texts. ■

› [siemens.com/simarisbusbarplan](https://www.siemens.com/simarisbusbarplan)



Highlights

- **Part of the Simaris suite**, the platform for uniform access to all Simaris planning tools
- Available for free as a **plug-in for Autodesk Revit**
- Automatic **check of constructability** according to planning rules
- **Intuitive and fault-free planning** of busbar runs even in complex buildings

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